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Your Ref: SSD-10410

Director- Resource Assessments, Planning and Assessment  
Department of Planning and Environment  
Locked Bag 5022  
Parramatta NSW 2124

Dear Sir/Madam,

**Development Application SSD-10410: Maroota Friable Sandstone Extraction Project**

1. P.F. Formation Sand and Concrete (**P.F.**) objects to the development application lodged by the Deerubbin Local Aboriginal Land Council.
2. The development application is so deficient on three issues that it must be refused:
  - a. no information is provided about the proposed upgrade to Patricia Fay Drive; its impacts (including on a critical pipeline) cannot be assessed;
  - b. the application does not include an assessment of downstream (or any other) greenhouse gas emissions, such that the consent authority cannot undertake the consideration required by *State Environmental Planning Policy (Resources and Energy) 2021* (**Resources and Energy SEPP**); and
  - c. the development does not minimise significant adverse impacts on biodiversity values.
3. Even if the proponent overcomes these hurdles, the application should be refused for three further reasons:
  - a. the development will likely have a serious and irreversible impact upon biodiversity values;
  - b. the use of Patricia Fay Drive by the proponent will likely compromise traffic safety; and

- c. the traffic assessment significantly understates the heavy vehicle movements associated with the adjoining quarry.

### **Upgrade of Patricia Fay Drive**

4. The application proposes to obtain access to the site only from Patricia Fay Drive.
5. Running alongside Patricia Fay Drive are 3 pipelines operated by P.F. That pipeline which carry sand, tailings and water to P.F.'s property on the opposite side of Wisemans Ferry Road. Without the pipeline, P.F. cannot operate and supply washed constructions sands throughout Sydney.
6. The EIS states that the proponent will need to construct a crossing over the pipeline: p 46.
7. No plans are provided indicating what this will entail. The proponent intends to delay providing plans until the construction certificate stage: EIS, p 46.
8. The consent authority is required under s 4.15 of the *Environmental Planning and Assessment Act 1979 (EPA Act)* to consider the impacts of that crossing, and its construction, now: *Tomasic v Port Stephens Council* [2021] NSWLEC 56, [174].
9. It cannot defer that consideration to the assessment of any application for a construction certificate: *Bay Simmer Investments Pty Ltd v State of New South Wales* [2017] NSWCA 135, [61]-[62]; *Weal v Bathurst City Council* (2000) 111 LGERA 181, 201 [93]-[94].
10. Without plans of the crossing, or any detail of what works are required, the consent authority cannot assess:
  - a. whether clearing is required;
  - b. any impacts on biodiversity values;
  - c. the safety of use of the crossing;
  - d. any visual impact;
  - e. impacts on the pipelines; and
  - f. any other engineering and construction impacts.
11. The appropriateness of the only proposed means of entry to the development cannot be assessed.

12. The development application must therefore be refused in its entirety.

### **Resources and Energy SEPP**

13. Before granting consent for development for the purposes of mining, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development: Resources and Energy SEPP, cl 2.20(2).
14. This is a precondition to the grant of development consent: *Mullaley Gas and Pipeline Accord Inc v Santos NSW (Eastern) Pty Ltd* [2021] NSWLEC 110, [95].
15. No assessment has been prepared of emissions associated with the:
  - a. actual mining of friable sandstone;
  - b. transport of that friable sandstone; and
  - c. downstream use of the friable sandstone.
16. The downstream use is generally '*private and State infrastructure projects*'. The assessment must address the emissions associated with use of the sand in those projects: *Mullaley Gas*, [100].
17. Absent that information, and any assessment, the consent authority cannot properly undertake the consideration required by clauses 2.20(1) or (2) of the Resources and Energy SEPP. It cannot have an understanding of the relevant impacts and their significance to the decision to be made: *Weal v Bathurst City Council* (2000) 111 LGERA 181; [2000] NSWCA 88 at [13].
18. Consent must be refused.

### **Avoid and minimise**

19. The site is mapped as '*biodiversity*' for the purposes of *The Hills Local Environmental Plan 2019*.
20. Clause 7.4(4) of the LEP therefore applies:

*Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—*

- (a) *the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*
- (b) *if that impact **cannot** be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
- (c) *if that impact **cannot** be minimised—the development will be managed to mitigate that impact. [emphasis added]*

21. Unless the consent authority reaches the state of satisfaction required by cl 7.4, it has no power to grant consent: *Al Maha Pty Ltd v Huajun Investments Pty Ltd* [2018] NSWCA 245.
22. The provision reflects the biodiversity mitigation hierarchy, which requires, ‘*in order, avoiding impacts, minimising impacts and only then offsetting or compensating for residual impacts that remain after all steps are taken to avoid or minimise these impacts*’: *Tomasic v Port Stephens Council* [2021] NSWLEC 56, [169].
23. Offsets are separate from minimisation strategies: *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited* [2013] NSWLEC 48 at [147] –[152].
24. It is only when impacts *cannot* be reasonably avoided, or minimised, that cl 7.4(4)(c) is enlivened and mitigation measures, such as offsets, can be considered: cll 7.4(b) and (c).
25. **Attached** to this letter is an expert report by Corey Mead.
26. That report identifies that no minimisation measures are proposed for the Serious and Irreversible Impacts on the broad-headed snake. This is despite the fact that measures are possible, including the relocation of bushrock habitat.
27. The inadequate assessment of other SAIL species prevents a proper consideration of whether significant adverse impacts are avoided, minimised, and (if they cannot be avoided or minimised), mitigated.
28. Nonetheless, minimisation measures for the broad-headed snake can clearly be adopted. They have not. Clause 7.4(4)(b) is not satisfied.
29. There is therefore no power to grant consent to the development application.

## **Serious and irreversible impacts**

30. The development literally takes a bulldozer to over 50 hectares of potential habitat for endangered and critically endangered fauna.
31. The report by Mr Mead identifies 10 candidate Serious and Irreversible Impact (**SAIL**) species that are simply not assessed against the SAIL test in cl 6.7 of the *Biodiversity Conservation Regulation 2017*. Those species are the:
- a. Large-eared Pied Bat;
  - b. Eastern Cave Bat;
  - c. Swift Parrot;
  - d. Regent Honeyeater;
  - e. Little Bent-winged Bat;
  - f. *Darwinia peduncularis*;
  - g. *Eucalyptus* sp. *Cattai*;
  - h. *Persoonia hirsuta*;
  - i. *Eucalyptus fracta*; and
  - j. Brush-tailed Rock Wallaby.
32. In this respect, the Biodiversity Development Assessment Report (**BDAR**) is not in accordance with parts 10.2.2 and 10.2.3 of the *Biodiversity Assessment Method*, and the Secretary's Environmental Assessment Requirements.
33. Surveys carried out on site show the presence of both the Large-eared Pied Bat, and potentially the Eastern Cave Bat. Both are candidate SAIL species, and yet neither is assessed for SAIL.
34. To the extent that there is any assessment at all (and not for SAIL), that assessment is deficient. For example, the EPBC Act assessment for the Swift Parrot and Regent Honeyeater is copied and pasted from that for the Large-eared Pied Bat; BDAR, 177-8.
35. Absent a proper assessment of these 10 candidate entities, as required by the BAM and the SEARs, the consent authority cannot properly fulfil its function in s 7.16(3) of the *Biodiversity Conservation Act 2016* (**BC Act**).
36. The BDAR only assesses one candidate species, the broad-headed snake, against the SAIL test. It assumes presence and concludes that the development will have a serious and irreversible impact on that species.

37. This in itself is a reason to refuse the development application (it ordinarily would require refusal).
38. By reason of that impact, the consent authority must:
- a. take into account those serious and irreversible impacts; and
  - b. determine whether there are any additional and appropriate measures to minimise those impacts, if consent is to be granted: BC Act, s 7.16(3).
39. The impacts cannot simply be *offset* (which is what the proponent seeks to do). The consent authority must determine measures to minimise those impacts. As set out above, minimisation measures have simply not been explored.

### **Unsafe Access**

40. Patricia Fay Drive is approximately 10.3 metres wide for its entire length, with a 90 degree bend towards P.F.'s site to the north. It is mostly unsealed.
41. P.F. is currently the only user of Patricia Fay Drive. The majority of its vehicles which use Patricia Fay Drive are:
- a. Truck and dog and semi-trailers; and
  - b. B Doubles.
42. Traffic conflict along Patricia Fay Drive is currently limited by the control that P.F. has over the arrival and exit times of its own vehicles.
43. The introduction of an additional and separate source of vehicles outside of P.F.'s control, increases the potential for conflict between vehicles using Patricia Fay Drive. It will in all likelihood compromise the safety of that road.
44. No assessment has been submitted of whether there are adequate site lines before or after the 90 degree bend (where it is proposed to establish a T-intersection) to avoid a crash between trucks travelling in opposite directions. Nor is there an assessment of whether two B-doubles can safely navigate that or any part of Patricia Fay Drive when travelling in opposite directions.
45. The traffic assessment states that the haul roads for the development will be 15 metres wide: Traffic Impact Assessment, p 28. Patricia Fay Drive, is almost 5 metres narrower.

46. If the road must be widened, this raises issues of the impact on the pipeline and the need for clearing. None of this has been considered.
47. Unless further information is provided (on which P.F. would like a further opportunity to make a submission), the consent authority cannot be fully apprised of whether access can be achieved safely. In all likelihood, safety will be compromised.

### **Inadequate traffic assessment**

48. The proponent's traffic assessment severely understates the number of vehicles that use Patricia Fay Drive and the surrounding road network.
49. P.F. have approval pursuant to DA 06\_0104 to:
  - a. receive up to 200 heavy vehicles each day; and
  - b. dispatch up to 200 heavy vehicles: DA 06\_0104, condition 8 (as modified in November 2021).
50. That is up to 400 vehicle movements per day.
51. The traffic assessment adopts a figure of 70 vehicle movements per day: p 20.
52. This error infects the entire report. The assessment of levels of service and the performance of the surrounding network are all premised on their being significantly fewer heavy vehicle movements than there will be in reality.
53. Further, it underlines the need for an assessment of the viability of the increased use of Patricia Fay Drive. The proponent seeks to increase the number of heavy vehicles using the mostly unsealed Patricia Fay Drive from 400 per day to 520.
54. No assessment has been carried out as to whether Patricia Fay Drive can accommodate that many heavy vehicles, and what measures (such as sealing of the entire road, or ongoing maintenance) will be required to ameliorate impacts, and ensure that any use remains safe over time.

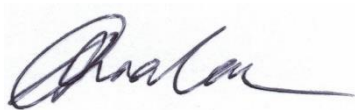
### **Necessary conditions**

55. If the proponent manages to address each of these fundamental problems with the development application, conditions ought to be imposed to ensure the development does not prejudice the continued operation of P.F.'s quarry to the north.

56. There should be conditions to the effect that:
- a. there is to be no interference with, or removal of support for, the pipeline;
  - b. any traffic or construction management plan for the upgrade of the Patricia Fay Drive- Wiseman's Ferry Road intersection, is to ensure that heavy vehicles can continue to access P.F.'s quarry during the upgrade works;
  - c. any traffic or construction management plan for any upgrade to Patricia Fay Drive (including construction of the crossing) is to ensure that heavy vehicles can continue to access P.F.'s quarry during the upgrade works; and
  - d. the proponent is to maintain Patricia Fay Drive in perpetuity such that it can continue to be used safely by heavy vehicles.

## Conclusion

57. P.F. submits that the development application is so deficient that it must be rejected.
58. The consent authority cannot carry out its function to assess all impacts of the development as required by s 4.15 of the EPA Act and the Resources and Energy SEPP. The failure to take any steps to minimise SAI is also fatal.
59. Even if these matters are addressed by an amendment of the development application, it should still be refused. Use of Patricia Fay Drive by the proponent will likely compromise the safety of that road. The development may also hasten the extinction of critically endangered species.



Joshua Graham, Director



Luke Graham, Director



REF: 22 CL 01

DATE: MARCH 21, 2022

RE: DA SSD-10410 - Maroota Friable Sandstone  
Extraction Project – BDAR review on SAI

Dear Sir/Madam,

TreeHouse Ecology has been engaged to provide ecological advice in relation to a proposed sandstone extraction development within the subject lands incorporating Lot 213 DP752025, Lot 7005 DP1055724, and Lot 202 DP752025. As per your correspondence (Ref: DM:20/2628 dated 15/3/22) my opinion is sought specifically on the following aspects:

- a. whether the development is likely to have a serious and irreversible impact on threatened species having regard to the test in the Biodiversity Conservation Act 2016;*
- b. whether the surveys carried out for threatened species are sufficient;*
- c. whether sufficient steps are proposed to minimise any SAI, and other impacts of the development; and*
- d. whether the proposed offsets are genuine and appropriate.*

The above considerations are applied based on a review of the Biodiversity Development Assessment Report (*Eco Logical Australia* 2021) for the subject lands prepared for *Deerubbin Local Aboriginal Land Council* (DLALC).

It is understood that the proposed development involves the following:

- The site is currently undeveloped and comprises native bushland.
- The proposed quarry will have an extraction area of 43.89 hectares, with at least an additional 2.71 hectares to be used for a site infrastructure area and access haul road.
- The BDAR prepared in support of the development application indicates that:
  - a. 50.95 hectares of native vegetation will be removed;
  - b. 9.97 hectares of native vegetation will be indirectly impacted within the site;
  - c. the majority of the vegetation to be removed is Red Bloodwood - Grey Gum Woodland;

- d. Maroota Sands Swamp Forest exists on the site to the north of the extraction zone; and
  - e. there is proposed to be a 50-metre buffer between the extraction zone and the Maroota Sands Swamp Forest.
- The BDAR assumes the presence of the Broad-headed Snake (*Hoplocephalus bungaroides*). We understand that snake is listed as a candidate SAI entity.
  - The site is also identified as containing: a. Shale Sandstone Transition Forest of the Sydney Basin Bioregion, which is listed as a critically endangered ecological community; and b. the Dural Land Snail (*Pommerhelix duralensis*), which is listed as an endangered ecological community; under the Environmental Protection and Biodiversity Conservation Act 1999 (Cth).
  - The BDAR recommends an offset of approximately 306 hectares. It identifies the intention to establish a Biodiversity Stewardship Site using other land managed by the DLALC, however, the specific land that will be used is not identified beyond an overlay of potential offset areas on page 163.

My advice is as follows:

***a. whether the development is likely to have a serious and irreversible impact on threatened species having regard to the test in the Biodiversity Conservation Act 2016;***

**Response:** The approval authority is responsible for deciding whether an impact is serious and irreversible. This decision is to be made in accordance with principles set out in clause 6.7 of the Biodiversity Conservation Regulation 2017.

The concept of serious and irreversible impacts (SAII) is fundamentally about protecting threatened entities that are most at risk of extinction from potential development. The Biodiversity Offsets Scheme recognises that there are some types of serious and irreversible impacts that the community expects will not occur except where the consent authority considers that this type of impact is outweighed by the social and economic benefits that the development will deliver to the State (DPE website).

The proposed development is classified as a State Significant Development (SSD) under the NSW EP&A Act 1979. It is recognised also that the approval authority can approve a SSD proposal which is likely to have serious and irreversible impacts.

Table 41 (Section 2.2.7) of the BDAR lists the candidate SAI values of which only the Broad-headed Snake is listed. This table does not provide a detailed consideration of whether impacts on candidate species are serious and irreversible, this is instead provided for the Broad-headed Snake in Table 42. Therefore Table 41 does not list any other potential SAI entities for consideration to the development. This is despite the fact that the report does elsewhere recognise the potential to occur for other threatened species that are identified by DPE as

potential SAI entities. These include the Large-eared Pied Bat, Eastern Cave Bat, Swift Parrot, Regent Honeyeater, Little Bent-winged Bat, Large Bent-winged Bat, *Darwinia peduncularis*, *Eucalyptus sp. Cattai* and *Persoonia hirsuta*. None of these species have been considered against SAI assessment principles outlined by Clause 6.7 of the Biodiversity Conservation Regulation, or otherwise clearly explained why they have been omitted for consideration.

It should be noted that Table 23 also lists *Eucalyptus fracta* as a candidate species for consideration. This table indicates that the justification for the species to be excluded from further assessment is that it is “out of geographic range for this species”. This is not a recognised justification for omission. Section 5.2.2 and 5.2.3 of the BAM 2020 outlines the criteria that can be used to exclude a species credit species. This criteria includes, that 1) none of the habitat constraints listed in the TBDC for the species are present, that 2) the species is a vagrant (fauna) in the IBRA subregion, or 3) that after carrying out a field assessment the assessor determines that microhabitats required by a species are absent (or degraded) from the subject land. This with reference to either the habitat constraints in the TBDC or published literature. Therefore, *Eucalyptus fracta*, another candidate SAI species, has not been appropriately discounted as a subject species.

Table 23 also lists Brush-tailed Rock Wallaby as a candidate species for consideration. As noted in this table the habitat constraint for the species is defined as *Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines*. The justification for the species exclusion by the BDAR however is that “Potential habitat (rocky escarpments, outcrops and cliffs) are not present within the development site. No BioNet records within the development site, and no records within 5km of development site.” Again, this is not a recognised acceptable justification for omission by the BAM 2020. The constraint is the presence of these rocky habitats within 1km, not limited only to the development site itself. The report also contradictorily recognises the presence of such nearby habitat stating in Table 53 the “presence of rugged Hawkesbury sandstone terrain directly adjacent to the development site”

In summary, the BDAR fails to outline eleven (11) candidate SAI species and give direct explanation to their omission for consideration to SAI. This is particularly concerning given that the BDAR indicates that Large-eared Pied Bat (*Chalinolobus dwyeri*) was actually recorded during Anabat surveys within the subject lands. The species has also been recorded at three separate locations previously nearby to the north, all within 400m of the subject land in 2013.

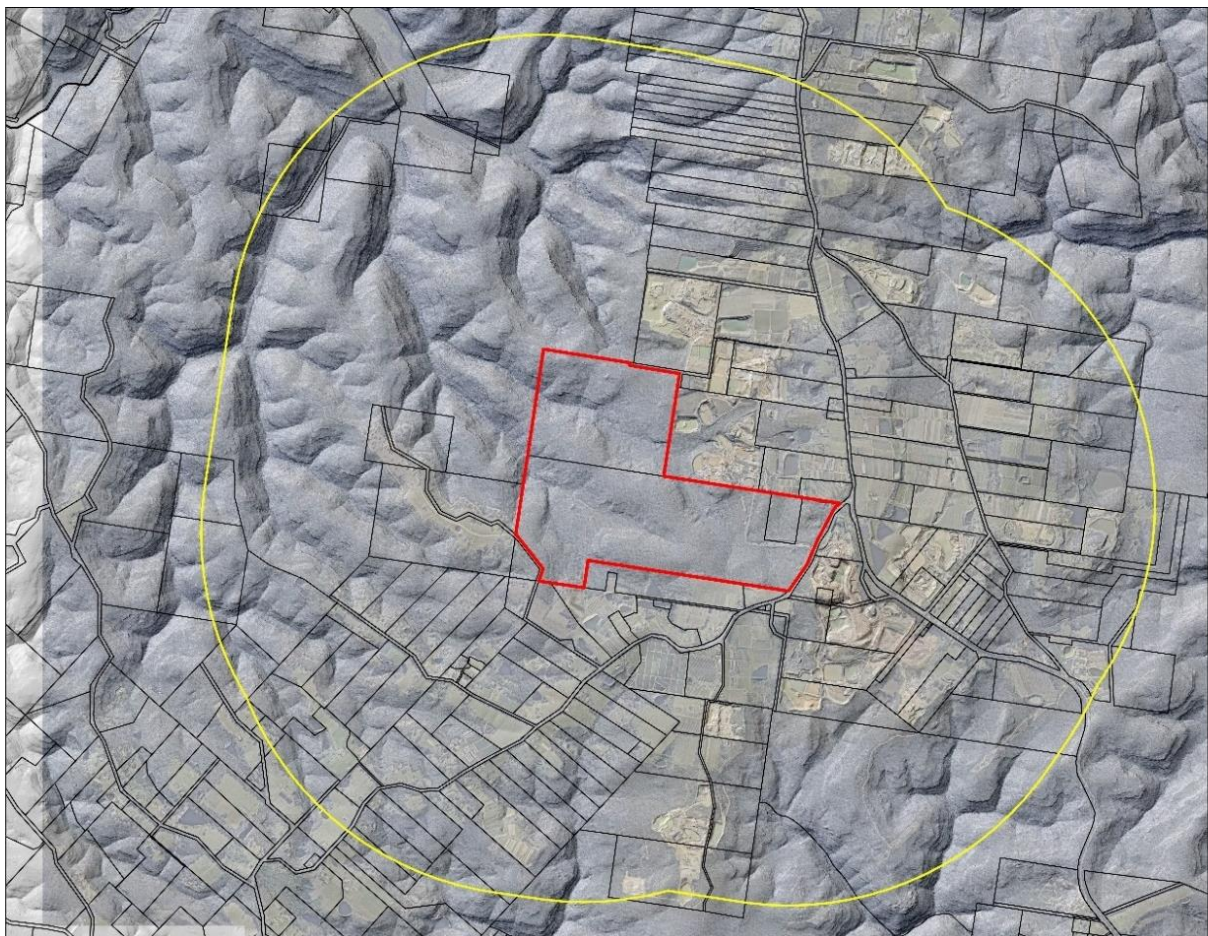
The Threatened Biodiversity Data Collection (TBDC - NSW DPE 2022) provides profiles and guides the habitat considerations and constraints for threatened biodiversity, for consideration in BDARs. It identifies habitat constraints for Large-eared Pied Bat as being *within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels*.

The species polygon is defined as associated PCTs in the development footprint within this 2km buffer where such potential roost features may be present. The BDAR states in Table 28 that

“a detailed analysis using high resolution aerial imagery and topographic mapping was undertaken to identify potential roost habitat features within the subject land and outside of the subject land within a 2 km buffer. No suitable roost features were identified within the subject land and the 2km buffer during this exercise. Therefore a species polygon is not required for Large-eared Pied Bat.”

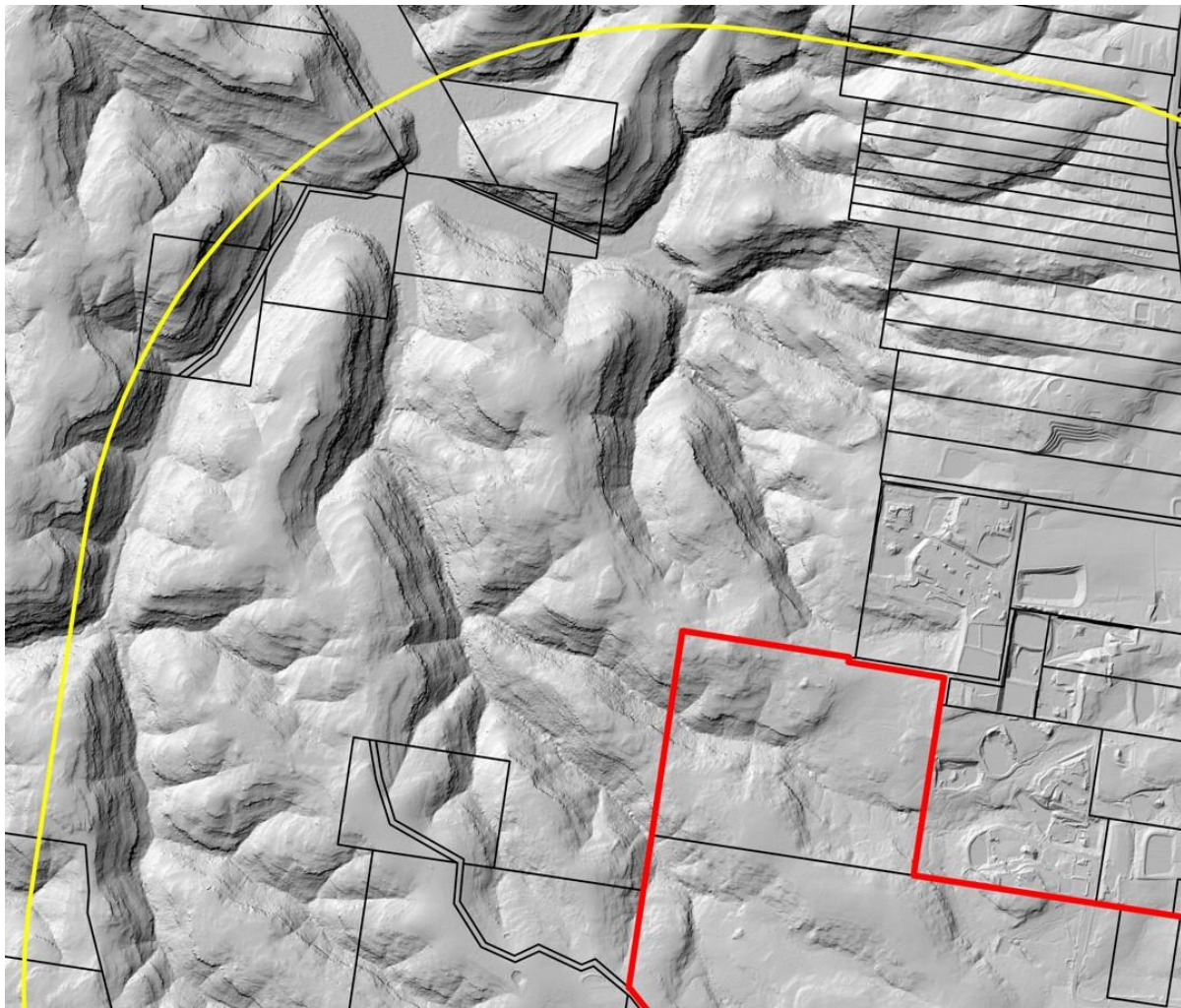
Table 23 of the BDAR however recognises that there is “Likely to be suitable foraging habitat within the development site due to presence of Hawkesbury sandstone terrain to the north and west of the subject land”. Table 53 further specifically recognises the “presence of rugged Hawkesbury sandstone terrain directly adjacent to the development site which may provide suitable breeding habitat (caves/overhangs/escarpments etc.).”

Maroota and the surrounding geology is well known to contain sandstone escarpments, many of which are likely to contain potential breeding habitat for the recorded Large-eared Pied Bat. Map 1 below shows the local topography on an aerial photo out to 2km from the subject land. Map 2 further below shows a zoom in of this landscape out to the immediately connective areas to the north and west on 30cm DEM Interpolation for hillshade. These clearly show the presence of rocky escarpments off the plateau edges where steeper adjacent slopes occur, and strongly dispute the assumption by Eco Logical that no nearby roosting potential exists.



**Map 1** – Aerial of topography out to 2km from the subject land  
(Source: Nearmap 25/10/2021)





**Map 2** – Hillshade of topography out to 2km to the N & W from the subject land  
(Source: LiDAR interpolated Digital Elevation Model 2017)

Furthermore, the habitat constraints and polygon requirements for the Large-eared Pied Bat are also completely the same as the Eastern Cave Bat. This is another candidate SAIL species also recognised by the BDAR as having potential to occur. Actually, Table 28 states that the species was “potentially detected during the Anabat survey”. Yet both species not only are not mentioned in consideration to SAIL but also are completely omitted as subject species, whilst they both clearly require species polygons and subsequent credit obligations. Particularly in the absence of suitable surveys.

Section 1.6.1 of the BDAR summarises microbat surveys and recognises that the survey was undertaken outside of the BAM defined survey period for both the Large-eared Pied Bat and Eastern Cave Bat. One ultrasonic detector also failed resulting in the recording of only 12 of the 16 survey nights required for these species under the *‘Species credit’ threatened bats and their habitats NSW survey guide for the BAM* (OEH 2018). Hence, the microbat survey was not undertaken within the appropriate survey period, nor for the appropriate effort. The BDAR does not give adequate explanation of why the survey undertaken should otherwise be accepted (ruling out presence of Eastern Cave Bat) and subsequently why these two species should be omitted from credit obligations.

With respect to the Swift Parrot and Regent Honeyeater, the BDAR does correctly specify that the development site is not within DPIE mapped important areas for either species. Although there is no specific conclusion on SAI drawn from this in the BDAR, not being mapped as important means these two species are not at likely risk of SAI under the BAM process.

Both species are however also listed as critically endangered under the EPBC Act 1999, yet they have only been assessed against the lesser 'vulnerable' species criteria for Matters of National Environmental Significance (MNES). Critically endangered (and even endangered) species listed under the EPBC Act 1999 require assessment criteria considerations to any population, not just an important population.

In fact, the assessment for the Swift Parrot and Regent Honeyeater does not even mention these species but rather the Large-eared Pied Bat. The assessment is the same as Large-eared Pied Bat and it therefore appears that the assessment has simply been copied across. Therefore, an EPBC assessment for Swift Parrot and Regent Honeyeater has not been effectively undertaken.

As mentioned, the Broad-headed Snake is the only candidate SAI species assessed under SAI criteria. By comparison with Large-eared Pied Bat and Eastern Cave Bat, the Broad-headed Snake is in-fact unlikely to be present based on no previous known records in the locality south of the Hawkesbury River. Nonetheless the species is correctly assumed to occur by the BDAR based on surveys being outside of the BAM survey period, and also as potential habitat exists within rocky areas. The recording of Squirrel Glider within the subject lands is an example of the reasoning to assume presence of any candidate species regardless of the absence of local records.

With this, the SAI impacts summary Table 43 outlines a direct impact area of 25.24ha for the Broad-headed Snake. Table 42 of the BDAR provides the evaluation of an impact on Broad-headed Snake against SAI criteria. The following table is a summary of selected parts of the assessment presented by the BDAR:

**Table 1** – Summary of Broad-headed Snake SAI assessment criteria (*Eco Logical* 2021)

Impact Assessment Provision	Assessment
1. Action and measures taken to avoid direct and indirect impacts	The BDAR recognises that direct and indirect impacts cannot be avoided.
2a. Evidence of rapid decline	The BDAR recognises that the species had declined by 60% over a 29 year study.
2b. Evidence of small population size	<p>The BDAR states that whilst no specific data on the current population size was sourced, records can provide some evidence that the current population size is relatively small. The species is highly restricted in its range and also its habitat requirements.</p> <p>The BDAR states that snakes are unlikely to move into unoccupied habitat due to short dispersal distances and strong site fidelity, and then goes immediately on to conclude that the local population</p>

	remaining within the subject land would continue to have a direct connection to other populations of this species due to the direct connectivity available in rugged bushland which is <u>expected</u> to comprise similar habitat features. This is contradictory.
2c. Evidence of limited geographic range	As above, and that there are only four general areas of occurrence.
2d. Evidence that the species is unlikely to respond to management	<p>The BDAR recognises that the proposed development is contradictory to the presented management actions for the species and will increase threats identified in the Approved Conservation Advice as “disturbance of habitat, in particular the removal of large hollow-bearing trees adjacent to sandstone escarpments and bush rock removal”. Clearance of habitat is another key threat that will result in fragmentation and isolation of habitat.</p> <p>The BDAR concludes that the proponent is proposing to establish an offset site in the IBRA region and subregion if possible, in similar habitat to the development site. This statement is irrespective of the on site SAII considerations. SAII is effectively criteria that cannot be offset.</p>
4a. Impact on the species population	<p>The BDAR states that:</p> <ul style="list-style-type: none"> <li>- The development will indirectly affect 7.94 ha and directly affect 25.24 ha of habitat for the Broad-headed Snake, therefore affecting the ecology of the local population by removing or modifying an area of habitat previously available for dispersal, breeding and foraging.</li> <li>- Fragmentation and isolation will occur due to the Broad-headed Snake’s high site fidelity and short dispersal distances.</li> <li>- It is estimated that approximately 10 home ranges will be affected by the proposals direct and indirect impacts.</li> </ul>
4b. Impact on geographic range	<p>The BDAR states that the local population at Maroota is not at the limit of the species range: the range of Broad-headed Snake extends to suitable sandstone habitat within an approximate 200 km radius of Sydney (Cogger et al. 1993; NSW NPWS 2001 in DAWE 2020c). This conclusion however after establishing earlier above that According to DAWE, there are four general areas of occurrence: Blue Mountains, southern Sydney, an area north-west of the Cumberland Plain and the Nowra hinterland. In this case, a review of the closer more localised ranges, a population at Maroota would most certainly be at the limit of the known range. Particularly as there are no records to the south or east across the entire Sydney basin before records commence again further south in Royal National Park.</p>

Against the above criteria, if Broad-headed Snake is assumed to occur within the development site, the proposal will clearly result in a serious and irreversible impact on the species. It would instead be prudent to undertake further target surveys to effectively rule out species presence. In the absence of this survey, the BDAR should be recognising a likely SAII on Broad-headed snake, particularly with the information it presents in Table 42.

***b. whether the surveys carried out for threatened species are sufficient;***

**Response:** With consideration to sufficient survey, the priority is to ensure that a BDAR follows the correct procedure of assessment. The BAM has put a price on biodiversity loss, as well as a clear set procedures for accredited ecologists to follow, such that the assessment will remain consistent between any assessors on the same site. Fundamentally, if a species cannot be ruled out by survey, by an absence of constraints as identified by the TBDC, by a demonstrated reduced habitat quality threshold, or otherwise by an expert report; then the assessor is to assume presence and calculate subsequent credits.

It is then the decision moving forward if the proponent wishes to undertake further survey, expert reports, etc, to eliminate species credits. This is all irrespective of the assessor's opinion if the species has potential to occur or not. The potential to occur can simply advise whether additional survey should be undertaken or not. Therefore, it is not for me to establish whether surveys for threatened species are sufficient, but rather to determine if credits have not been obtained where surveys are insufficient.

*TreeHouse Ecology* is a fauna focused consultancy. Therefore, we cannot advise on flora survey adequacy. Table 2 further below shows the process of elimination of all subject fauna species for credit retirement and consideration to adequacy. The table summarises the assessment on candidate fauna species by *Eco Logical Australia* with the process of elimination being either through 1) habitat potential, 2) survey adequacy, or 3) reasons otherwise to exclude subject species. An orange coloured box shows exactly where the species has been eliminated. Green boxes show current species credit species requiring offset credits. At the end of each section is a column to identify if *TreeHouse Ecology* agrees with the reasons for exclusion or inclusion.

Reasons for disagreement of select species are clarified below.

Habitat Potential

- Gang-gang Cockatoo (end. pop) – The site is not within the recognised extent of this population.
- Brush-tailed Rock Wallaby – the habitat constraint is identified as *Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines*. The site is clearly within this extent (as demonstrated by Figures 1 & 2 above) however the BDAR justifies the exclusion based on the absence of these habitat features only within the development site. Presence cannot be ruled out based on BioNet records and adequate survey has not been demonstrated. In the absence of demonstrated survey effort, or an expert report, this species should be a candidate species for credit obligations.
- Pale-headed Snake – The BDAR justifies the exclusion based on the species being “out of range”, based on “No BioNet records within the development site or within 5km radius of the development site” and “No specimens were detected during fieldwork”. Presence cannot however be ruled out based on BioNet records or species range without support literature. It is difficult to consider that adequate survey for this species



has been undertaken as the BDAR indicated that adequate surveys have not been undertaken for the Broad-headed Snake. There is no explanation within the BDAR how surveys were undertaken for this species. Regardless of the unlikely potential to occur, in the absence of demonstrated survey effort, or an expert report, this species should be a candidate species for credit obligations.

#### Survey Adequacy

- Gang-gang Cockatoo (breeding) – The survey period for this species to detect breeding is between October to January. Table 27 of the BDAR indicates that surveys were undertaken between 16/1/20 – 7/7/20. It is unclear if this is two days effort or there were a number of days of survey in between, however the majority of this period is outside of the survey period to detect breeding presence. The surveys undertaken on 16/1/20 have not described how hollows were targeted, and how many. Therefore, in the absence of demonstrated survey effort during the breeding period, or an expert report, this species should be a candidate species for credit obligations.
- Brush-tailed Phascogale – The survey comments within the TBDC for this species indicates that survey must be undertaken using baited arboreal cameras set for a minimum of 4 weeks in a predetermined grid based on the size of the site or as advised by DPE. Such surveys have not been undertaken. The listening/call-playback and spotlighting survey effort suggested by the BDAR is insufficient. Therefore, in the absence of the appropriate demonstrated survey effort, or an expert report, this species should be a candidate species for credit obligations.

#### Nearby Breeding Habitat

- Large-eared Pied Bat – This species was recorded during surveys however the BDAR concludes that no suitable roost features were identified within the subject land and within the 2km buffer during aerial image and topographic analysis. A similar analysis by TreeHouse Ecology as shown in Maps 1 & 2 above clearly shows that there is potential for roosting and subsequent breeding habitat within 2km of the development footprint. Therefore, in the absence of an expert report or localised habitat searches beyond the site to prove otherwise, this species should be a candidate species for credit obligations.
- Eastern Cave Bat - This species was recorded to a possible level of certainty during surveys however the BDAR concludes that no suitable roost features were identified within the subject land and within the 2km buffer during aerial image and topographic analysis. A similar analysis by TreeHouse Ecology as shown in Maps 1 & 2 above clearly shows that there is potential for roosting and subsequent breeding habitat within 2km of the development footprint. Therefore, in the absence of an expert report or localised habitat searches beyond the site to prove otherwise, this species should be a candidate species for credit obligations.

*c. whether sufficient steps are proposed to minimise any SAI, and other impacts of the development; and*

**Response:** As mentioned above, the BDAR prepared by *Eco Logical Australia* for the subject lands gives a detailed assessment on the Broad-headed Snake, and no other candidate SAI species. This assessment would advise that if present, the proposal may result in a SAI on this species. The first impact assessment provision in Table 42 is to outline the action and measures taken to avoid the direct and indirect impact on the species at risk of a SAI. The assessment response to this is that “Due to the inherent nature of this proposal, i.e. sand extraction from friable sandstone, direct and indirect impacts to Broad-headed Snake cannot be avoided.”

The *locating of the project to avoid and minimise impacts on vegetation and habitat* are outlined in Section 2.1.1. This section states that “Due to the location of the Hawkesbury Sandstone deposit it has not been feasible to locate the project in an area which wholly avoids impacts to vegetation and habitat. It is therefore acknowledged that this project has considerable impact on biodiversity values”.

Within Table 31 in this section, discussion is provided on how project location and design principles have been addressed and justified. The Broad-headed Snake is not mentioned in this section for consideration to any habitat avoidance or minimisation.

Prescribed biodiversity impacts are outlined in Section 2.1.2. Within Table 31, the Broad-headed Snake is recognised as an affected species by the Impacts of development on the habitat of threatened species or ecological communities associated with: 1) Crevices, and other geological features of significance, or 2) rocks.

Section 2.2.1 identifies direct impacts on threatened species in Table 35. This calculates that 25.24 ha of habitat for Broad-headed Snake will be impacted.

Section 2.2.6 identifies measures proposed to mitigate and manage impacts in Table 40. This table proposes the recovery and relocation of hollows as a standard for such habitat removal but does not mention this for any benefit or consideration to Broad-headed Snake. No mitigation measures are elsewhere identified in this table, or the report, specifically for the consideration to Broad-headed Snake habitat loss. This includes no mention to relocate important bushrock habitat which the report acknowledges as being:

- 1) Of notable importance to the species (Table 23 candidate species and Section 1.8.1 summarising prescribed impacts),
- 2) being a key threat to the species (Table 42 SAI assessment), and
- 3) being a noted indirect impact (Table 38)

Therefore, in summary, if Broad-headed Snake is present within the subject lands, as the BDAR assumes, then sufficient steps have not been undertaken to avoid or minimise impacts specific to this species, which is also recognised as a candidate SAI species by the report.

*TreeHouse Ecology* has not undertaken a site visit to confirm presence / absence of habitat features identified. As noted earlier in this review, other SAI entities that should be considered under Cl 6.7 of the BC Reg 2017 for this proposal include Large-eared Pied Bat, Eastern Cave Bat, Swift Parrot, Regent Honeyeater, Little Bent-winged Bat, Large Bent-winged Bat, Brush-tailed Rock Wallaby *Darwinia peduncularis*, *Eucalyptus sp. Cattai* and *Persoonia hirsuta* and possibly *Eucalyptus fracta*. Based on the review of the habitat features described, I do not anticipate that if an assessment was undertaken across all SAI principles, a SAI would result for any of these additional species.

***d. whether the proposed offsets are genuine and appropriate.***

**Response:** My response to (b) above, on survey adequacy, also gives an outline of the fauna species that I believe should be added to credit obligations, based on an inappropriate interpretation of habitat constraints for these species, a lack of survey, or likely presence of nearby breeding habitat. These species included Brush-tailed Rock Wallaby, Pale-headed Snake, Gang-gang Cockatoo (breeding), Brush-tailed Phascogale, Large-eared Pied Bat and Eastern Cave Bat.

If you have any further questions, please do not hesitate to contact me via the details provided below.

Yours faithfully,



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Table 2 – Threatened fauna species credit table

Common name	BC Act	Habitat potential			Survey adequacy				Candidate species (polygon)		
		Potential to occur	Breeding habitat present	TreeHouse	Referred survey period (TBDC)	Actual Survey period	EcoLogical	TreeHouse	Expert report	EcoLogical	TreeHouse
Red-crowned Toadlet	V	Yes (recorded)	n/a	agree	All months	Feb	✓	agree	x	✓	agree
Powerful Owl (breeding)	V	Yes (recorded)	✓	agree	May-Aug	Jun, Jul	✓	agree			
Glossy Black-Cockatoo (breeding)	V	Yes (recorded)	✓	agree	Mar-Aug	Jan - Jul	x	agree	x	✓	agree
Squirrel Glider	V	Yes (recorded)	n/a	agree	All months	Jun, Jul	✓	agree	x	✓	agree
Large-eared Pied Bat	V	Yes (recorded)	n/a	agree	Nov-Jan	Feb	x	agree	x	x	disagree
Southern Myotis	V	Yes (recorded)	n/a	agree	Oct-Mar	Feb	✓	agree	x	✓	agree
Dural Land Snail	E	Yes (recorded)	n/a	agree	All months	June	✓	agree	x	✓	agree
Grey-headed Flying-fox (breeding)	V	Yes (recorded)	x	agree							
Little Bent-winged Bat (breeding)	V	Yes (recorded)	x	agree							
Eastern Cave Bat	V	Yes (possible)	n/a	agree	Nov-Jan	Feb	x	agree	x	x	disagree
Eastern Pygmy Possum	V	Yes	n/a	agree	Oct-Mar	-	x	agree	x	✓	agree
Gang-gang Cockatoo (breeding)	V	Yes	✓	agree	Oct-Jan	Jan - Jul	✓	disagree			
Gang-gang Cockatoo (end. pop)	E2	Yes	n/a	disagree	All months	Jan - Jul	✓	agree			
Masked Owl (breeding)	V	Yes	✓	agree	May-Aug	Jun	✓	agree			
Barking Owl (breeding)	V	Yes	✓	agree	May-Dec	Jun, Jul	✓	agree			
Giant Burrowing Frog	V	Yes	n/a	agree	Sep-May	-	x	agree	x	✓	agree
Koala (breeding)	V	Yes	✓	agree	All months	Jun, Jul	✓	agree			
Broad-headed snake (breeding)	E	Yes	✓	agree	Aug-Sep	-	x	agree	x	✓	agree
Brush-tailed Phascogale	V	Yes	n/a	agree	Dec-Jun	x	✓	disagree			
Greater Glider	n/a	Yes	n/a	agree	All months	Jun	✓	agree			
Large Bent-winged Bat (breeding)	V	Yes	x	agree							
Little Eagle (breeding)	V	Yes	x	agree							
White-bellied Sea Eagle (breeding)	V	Yes	x	agree							
Eastern Osprey (breeding)	V	Yes	x	agree							
Square-tailed Kite (breeding)	V	Yes	x	agree							
Swift Parrot (breeding)	E	Yes	x (IMA)	agree							
Regent Honeyeater (breeding)	E4A	Yes	x (IMA)	agree							
Bush Stone-curlew	E	No (very unlikely)	n/a	agree							
Brush-tailed Rock Wallaby	E	No	n/a	disagree							
Pale-headed Snake	V	No	n/a	disagree							
Green and Golden Bell Frog	E	No	n/a	agree							
Booroolong Frog	V	No	n/a	agree							
Littlejohn's Tree Frog	V	No	n/a	agree							
Stuttering Frog	E	No	n/a	agree							

IMA – Important Mapped Areas