

19 May 2020

Our Reference: 14292B-20-BILR-1Rev0_200519

Michelle Doak
Senior Advisor Environmental Approvals
Rio Tinto
Central Park
152-158 St Georges Terrace
Perth WA 6000

Dear Michelle,

Re: Hope Downs 2 Proposal – Ghost Bat Cave Characteristics, February/March 2020

1 Introduction

Rio Tinto required additional assessment to be made of previously recorded caves by Astron Environmental Services (Astron) within the Hope Downs 2 (HD2) Proposal survey area. Astron was commissioned to confirm the GPS coordinates and record cave characteristics, including estimated number of Ghost Bat (*Macroderma gigas*) (VU; VU) scats, external and internal dimensions, entrance orientation and any other annotations, of the previously recorded Ghost Bat caves 1, 2, 4, 5, 6 and 8.

2 Methods







Astron previously recorded six Ghost Bat caves (Cave 1, 2, 4, 5, 6 and 8) within the HD2 Proposal survey area in 2017 (Astron Environmental Services 2020), prior to being permitted to enter caves to record internal dimensions. Astron zoologists Matthew Love and Lucy Dadour revisited the six Ghost Bat caves between 25 February and 2 March 2020 to confirm the GPS coordinates and record the following:







- external and internal dimensions of the cave, including annotations
- cave entrance orientation
- the number of Ghost Bat scats present and any other evidence of Ghost Bats
- photographs.


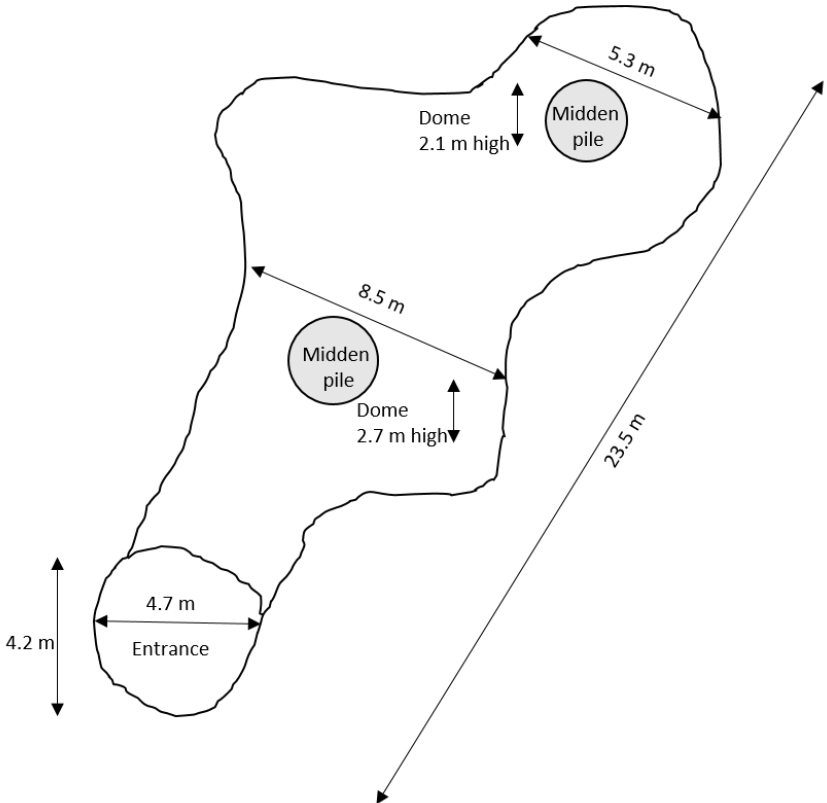
3 Results

The GPS coordinates and physical characteristics of the six previously recorded Ghost Bat caves are provided in Table 1. In addition to the six previously recorded caves, Astron zoologists located an additional Ghost Bat cave within the HD2 Proposal survey area that had not previously been recorded. The location and characteristics of this cave (Cave 10) are also provided in Table 1.

Table 1: Location of caves within Hope Downs 2 Proposal Survey Area.

Site ID	MGA Zone 50 K		Category rating for Ghost Bat usage according to Bat Call WA (2019)	Reason	Description	Photographs
	Easting (mE)	Northing (mE)				
Cave 1	712290	7450626	3	Ghost Bat nocturnal roost. Occasional diurnal roost possible due to size and depth.	Entrance: Large open overhang (4.5 m high x 16.7 m wide x 8.7 m deep) Orientation: East Internal: One internal dome (7.5 m high x 8.7 m wide) Conditions: Bat smell; bat scats present; raised humidity/temperature. Northern Quoll scats recorded.	 
Cave 2	716871	7450090	4	Potential Ghost Bat nocturnal roost.	Entrance: Wide open entrance (3 m high x 3 m wide) Orientation: South-east Internal: Slanted slated Rock (0.5 m high x 2 m wide x 14.4 m deep) Conditions: No raised humidity/temperature; microbats present.	 
Cave 4	712491	7451075	4	Confirmed Ghost Bat nocturnal roost	Entrance: Open exposed overhang (10 m wide x 3 m high) Orientation: North Internal: Shallow Conditions: Ghost Bat scats present (x5 scats) in November 2017 but not in February/March 2020; no raised humidity/temperature; microbats present in November 2017 but not in February/March 2020.	 

Site ID	MGA Zone 50 K		Category rating for Ghost Bat usage according to Bat Call WA (2019)	Reason	Description	Photographs
	Easting (mE)	Northing (mE)				
Cave 5	710765	7450679	3	Ghost Bat nocturnal roost. Occasional diurnal roost possible due to depth and presence of rear chamber.	Entrance: Small narrow opening (3 m wide x 1.9 m high) Orientation: West Internal: One long tunnel 22.5 m deep, average 1 m high average width 3 m Conditions: Ghost Bat scats present (approximately 1,000).	 
Cave 6	710740	7450865	4	Potential Ghost Bat nocturnal roost	Entrance: Narrow (1 m wide x 5 m high) Orientation: East Internal: One long flat tunnel (0.5 m high x 2.7 m wide) Conditions: Bat smell; bat scats present; raised humidity/temperature.	 
Cave 8	699014	7444987	4	Potential Ghost Bat nocturnal roost	Entrance: Small entrance (3 m wide x 0.9 m high) Orientation: North-west Internal: Two main domes each with side or rear caverns. Solitary Ghost Bat present (flushed). East dome 1.4 m high x 5.4 m wide x 8.3 m deep. Rear chamber off east dome 0.5 m high x 5 m deep x 2 m wide. West dome (high ceiling) 3.6 m high x 4 m wide x 5.2 m deep. Side bubble off west dome 2 m high x 1.6 m wide x 1.7 m deep. Behind rock pile to entrance 4.7 m. Conditions: Bats present; Ghost Bat (x1) present in February/March 2020; raised humidity/temperature.	 

Site ID	MGA Zone 50 K		Category rating for Ghost Bat usage according to Bat Call WA (2019)	Reason	Description	Photographs
	Easting (mE)	Northing (mE)				
Cave 10	715713	7450542	2	Ghost Bat diurnal roost with regular occupancy	<p>Entrance: Open/wide (4.7 m wide x 4.2 m high x 23.5 m deep)</p> <p>Orientation: West</p> <p>Internal: One long cave tapering upwards. First dome 2.7 m high x 8.5 m wide</p> <p>Second dome (rear) 2.1 m high x 5.3 m wide</p> <p>Side north chamber 1.6 m high x 2.5 m wide</p> <p>Conditions: First dome ~ 5,500 Ghost Bat scats, midden and feeding debris.</p> <p>Second dome 120 Ghost Bat scats, midden and feed debris.</p> <p>Side north chamber 20 Ghost Bat scats.</p> <p>Bats present; bat scats, Ghost Bat scats; raised humidity/temperature.</p> <p>Northern Quoll scats recorded.</p>	 

During the survey Northern Quoll (*Dasyurus hallucatus*) (EN; EN) scats were also recorded within Cave 1 (Plate 1) and Cave 10 (Plate 2).



Plate 1: Northern Quoll scat recorded within Cave 1.



Plate 2: Northern Quoll scats recorded within Cave 10.

This letter was prepared by Environmental Scientist Brittany Osborn and Senior Environmental Scientist Matthew Love, and was technically reviewed by Principal Environmental Scientist Dr Jessica Johnston. If you would like to discuss this further, please feel free to contact me on 9421 9600.

Yours sincerely

ASTRON ENVIRONMENTAL SERVICES

Brett Lucas
Manager - Biodiversity

References

Astron Environmental Services. 2020. Hope Downs 2 Proposal Fauna Survey, March 2019. Unpublished report prepared for Rio Tinto, Perth, WA.

Bat Call WA. 2019. Rio Tinto Hope Downs 2 and Bedded Hilltop, Pilbara WA, Acoustic Survey of Bat and Night Parrot Activity - Phases 1 (November 2017), 2 (May 2018), 3 (March 2019) and 4 (September 2019). Unpublished report for Astron Environmental Services.