

Letter Report

19 June 2026

To	Thomas Meulemans	Contact no.	-
Copy to		Email	-
From	Arien Quin/Dan Eyles	Project no.	12628564
Project name	Atlas-Campaspe Mineral Sands Project – Optimised Services Corridor Modification (Modification 6) (SSD 5012-Mod-6) – Biodiversity Development Assessment Report		
Subject	Response to Conservation Planning and Assessment (CPA) review comments		

Dear Thomas,

This letter report provides a response to the comments from the Conservation Planning and Assessment (CPA) Branch of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) regarding the Biodiversity Development Assessment Report (BDAR) that has been prepared to support the Atlas-Campaspe Mineral Sands Project – Optimised Services Corridor Modification (SSD 5012-MOD 6) (the Modification).

In addition to this letter report, the BDAR has been updated based on the advice and recommendations provided by the CPA Branch, where applicable. A summary of how comments have been addressed and overview of additional information incorporated into the revised BDAR is provided below.

Recommendation 1.1 - Update the BDAR to demonstrate how avoid and minimise has been applied for the proposal location consistent with s7.1.1 of the BAM.

Additional information has been included in Section 7.1 of the revised BDAR to demonstrate how avoidance and minimise principles have been applied consistent with s7.1.1 of the Biodiversity Assessment Methodology (BAM). This includes discussion regarding design constraints and measures that have been taken to avoid and minimise impacts associated with the Modification.

Background

The approved Atlas-Campaspe Mine includes the development of a pre-concentrator plant (PCP) at the Campaspe deposit to initially process Campaspe deposit ore to produce a pre-mineral concentrate that is approved to be pumped and/or trucked via the transport route to the existing primary gravity concentration unit (PGCU) at the Atlas deposit for further processing. The transport route follows the approved services corridor between the Atlas and Campaspe deposits (Refer to Figure 1 and Figure 1.2 of the BDAR).

The Modification would include the development of an optimised services corridor between the Atlas and Campaspe deposits to reduce the length of the transport route between the PCP and PGCU (Figure 1) to improve operational efficiency and reduce greenhouse gas emissions at the Atlas-Campaspe Mine. The selection of the location of the optimised services corridor is therefore largely constrained by the location of the approved PCP and PGCU.

Planning measures

As part of initial planning for the siting of the optimised services corridor, Tronox considered a range of aspects, including design/operational considerations (e.g. most direct alignment, avoidance of low-lying areas subject to flooding) and environmental considerations (e.g. avoidance and minimisation of biodiversity and Aboriginal cultural heritage impacts).

For the biodiversity aspect of the initial planning, a desktop assessment of biodiversity constraints within the area between the PCP and PCGU where the optimised services corridor could be located was undertaken, including a review of the following databases and biodiversity resources:

- NSW State Vegetation Types Map (SVTM) (NSW DCCEEW 2025b) to identify candidate PCTs and to help map native vegetation extent
- NSW BioNet Vegetation Classification (NSW DCCEEW 2025c) to identify candidate TECs
- BioNet Atlas records of threatened biota (NSW DCCEEW 2025a)
- Aerial photography

Figure 2 presents the SVTM and BioNet Atlas records of threatened biota in the desktop assessment area between the PCP and PCGU. The desktop assessment area consists of relatively intact native vegetation which has a consistent composition of intact PCTs (Figure 2). This provided limited options to avoid/minimise impacts to biodiversity values when siting the optimised services corridor as there were no significant cleared areas or areas of lower value PCTs that could be targeted.

Given the above, the most direct route between the PCP and PCGU was selected for the optimised services corridor study area to minimise the proposed disturbance area required. Any alternative routes would result in increased disturbance of vegetation with similar biodiversity values and therefore result in increased biodiversity impacts.

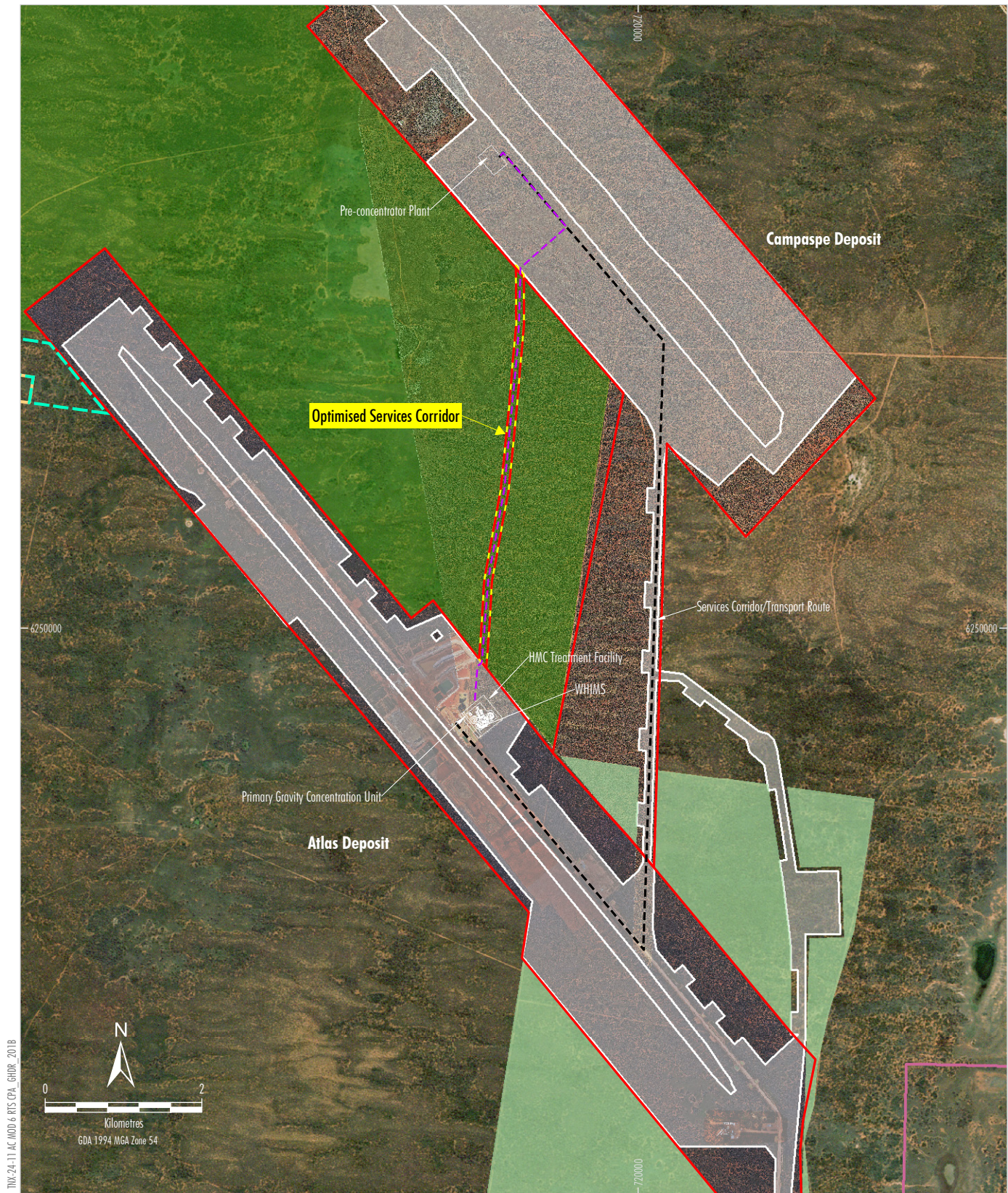
Following this initial planning, targeted threatened flora surveys and BAM VI plot assessments were completed in October 2024 and targeted fauna surveys were completed in November and December 2024 in the study area (refer to the revised BDAR for survey details). Based on these survey outcomes, the optimised services corridor alignment was further refined to avoid and minimise biodiversity impacts.

A summary of the avoidance and minimisation measures implemented for the Modification is provided below.

Practical avoidance and minimisation measures

The location of the optimised services corridor was carefully refined to minimise impacts to biodiversity values as far as practicable. Specifically:

- Optimised Services Corridor Width – Following a review of preliminary environmental survey data (including the preliminary findings of the biodiversity and Aboriginal cultural heritage surveys) the initial corridor width was reduced from approximately 150 metres (m) wide to 100 m wide to avoid impacts on biodiversity values while allowing for the absolute minimal width required to adequately accommodate the necessary infrastructure. This reduction in corridor width reduced the area of native vegetation disturbance from approximately 92 hectares (ha) to 50.5 ha.
- Targeting Poor Condition Vegetation – aligning the optimised services corridor within areas where native vegetation is in the poorest condition with the lowest VI scores (including approximately 4.5 ha of previously cleared native vegetation). Vegetation that has been disturbed through past clearing represents approximately 11 percent of the optimised services corridor.
- Avoidance of Cobar Greenhood Orchid Individuals and Habitat – the optimised services corridor was realigned to avoid approximately 64 percent of Cobar Greenhood Orchids that were recorded during the initial planning and survey work (refer to Figures 7-1 and 7-2) of BDAR). Further discussion on the Cobar Greenhood Orchid avoidance is provided in the response to Recommendation 1.2.
- Water Courses and Large Trees – the optimised services corridor was realigned to avoid water courses, and minimal number of large or old trees to be impacted and avoiding indirect impacts to retained native vegetation where practicable.
- Refinement during detailed design - impacts would be confined to the Development footprint. Within this area, the final placement of infrastructure, access tracks, parking, and laydown areas would be refined during detailed design to minimise the extent of vegetation clearing.



LEGEND

Approved Project Components

- Mining Lease Boundaries (ML 1762 & ML 1882)
- Exploration Licence Boundary (EL 5359)
- Surface Development Area
- Mine Path Extent
- Mineral Transport Route
- Biodiversity Offset Area
- Vegetation Management Area

Modification Components

- Mining Lease Application (MLA2)
- Surface Development Area
- Mineral Transport Route
- Supplementary Biodiversity Offset Area
- Potential Biodiversity Stewardship Site

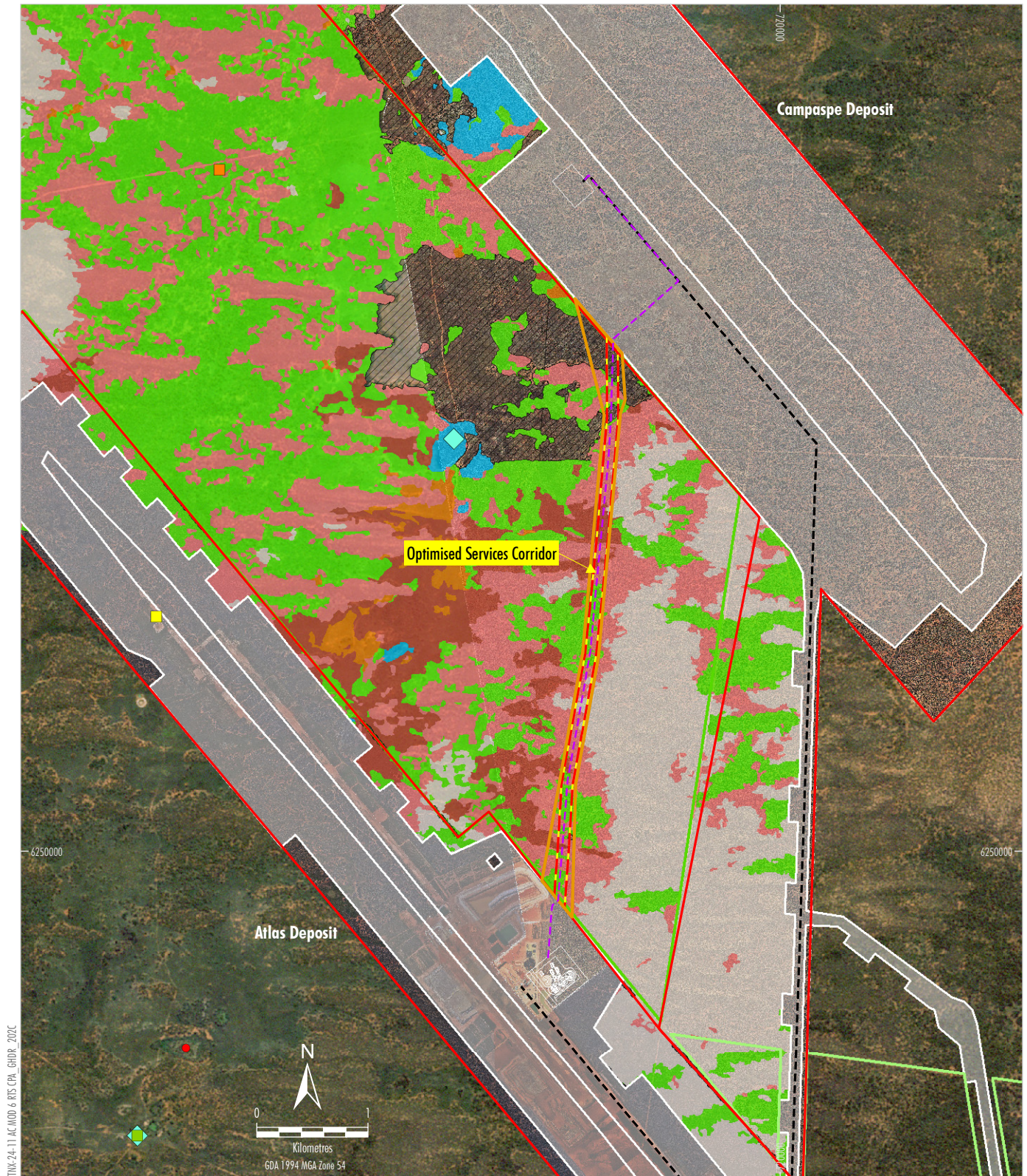
Source: NSW Spatial Services (2025); Tronox (2025); Cristal Mining Australia (2012)
Orthophoto Mosaic: Tronox (2023); AAM (2011)

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MODIFICATION 6

Approved and Modified
Services Corridor General Arrangement

Figure 1



LEGEND

Approved Project Components

- Mining Lease Boundaries (ML 1762 & ML 1882)
- Surface Development Area
- Mine Path Extent
- Mineral Transport Route
- Biodiversity Offset Area
- Vegetation Management Area
- Modification Components
- Mining Lease Application (MLA2)
- Surface Development Area
- Mineral Transport Route
- Study Area

Threatened Species Records

- ◆ Brown Treecreeper (eastern subspecies)
- Pied Honeyeater
- South-eastern Hooded Robin
- Varied Sittella
- Winged Peppercress

PCT Mapping

- Not classified
- PCT 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 16 - Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 23 - Yarran tall open shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones
- PCT 43 - Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones
- PCT 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
- PCT 143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
- PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
- PCT 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion

Source: NSW Spatial Services (2026); Tronox (2025); Cristal Mining Australia (2012); GHD (2026); BioNet Atlas (2026)
Orthophoto Mosaic: Tronox (2023); AAM (2011)

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MODIFICATION 6

NSW State Vegetation Types Mapping
and BioNet Species Records

Figure 2

Recommendation 1.2 - Provide justification for no avoidance of Cobar Greenhood habitat.

The Modification has been designed to avoid disturbance to Cobar Greenhood Orchid habitat while balancing other environmental, heritage and operational constraints. Initial considerations for the study area were based on aerial imagery and the best route to avoid low-lying drainage areas and clay-pans, minimise impacts to native vegetation and tree clearing, and minimising required earthworks. The Modification does include avoidance of Cobar Greenhood Orchid individuals and habitat (refer above). Complete avoidance of Cobar Greenhood Orchid habitat was not however feasible because suitable habitat is widespread around the optimised services corridor (refer to Figure 7.2 of the BDAR).

Within the optimised services corridor habitat for the Cobar Greenhood Orchid is present within PCTs 170 and 171. These PCTs are widely distributed and comprise two of the dominant PCTs across the Atlas-Campaspe Mine area (refer to Figure 7.2 of the BDAR). The widespread distribution of this habitat has been confirmed during multiple rounds of surveys undertaken over the past decade at the Atlas-Campaspe Mine, that have recorded this species in relatively large numbers within these PCTs across the Atlas-Campaspe Mine. The reduction in width of the corridor from 90 ha to 50.5 ha has resulted in the avoidance of impacts to Cobar Greenhood Orchid.

In the broader area, the extent of suitable habitat and the number of local records within vegetation adjoining the optimised services corridor indicate that the species is likely to be widely distributed through the area. The distribution of modelled habitat within a 5 km radius of the optimised services corridor is shown on Figure 7.2 of the revised BDAR.

The widespread nature of habitat suitable for the Cobar Greenhood Orchid in the Atlas-Campaspe area means it is not feasible for an optimised service corridor to completely avoid the habitat. Alternative alignments located to the west of the proposed alignment would reduce the disturbance to potential Cobar Greenhood Orchid habitat. However, as the route is constrained by the approved locations of the PCP and PGCU those alignments would result in a longer service corridor than proposed, requiring greater disturbance of Cobar Greenhood Habitat and resulting in sub-optimal operational efficiency and greater greenhouse gas emissions.

Recommendations 2.1 and 2.2

These recommendations have been addressed by Tronox in the Submissions Report.

Recommendation 2.3 Include an additional 534 hectares in the biodiversity offset to the west of the proposal to account for the loss of connected vegetation in the offset to the east of the proposal.

The temporary separation of 534 ha of vegetation and habitat that forms part of the existing biodiversity offset area is not expected to significantly restrict the movement of or substantially impact on threatened species or their habitats.

The 534 ha of existing biodiversity offset area is bounded to the north and south by the Atlas-Campaspe mine and is proposed to be temporarily bounded by the 100 m wide optimised service corridor to the west. To the east the offset area will remain connected to over 500 ha of remnant vegetation and persist as a patch of approximately 1,035 ha of similar condition remnant native vegetation and habitat (Figure 3). This area is large enough to provide sustained feeding and breeding habitat for all resident local threatened species.

Furthermore, the optimised services corridor would be rehabilitated with endemic native species so that it can be reincorporated into the approved biodiversity offset area at the end of the Project life (approximately 2034). The optimised services corridor would therefore represent only a temporary impact to any species unable to disperse across the alignment during its relatively short, eight years of operation.

In considering possible impacts to threatened species from fragmentation effects; microbat species, such as the South-eastern Long-eared Bat (*Nyctophilus corbeni*), which are highly mobile, are not likely to be impacted by the optimised services corridor, as they are capable of moving up to four kilometres a night from their roost sites to hunt and forage (Lumsden et al. 2008). The proposed 100 m gap in native vegetation along the optimised services corridor would therefore not prevent the movement of microbats within habitat within the offset landscape and beyond.

Threatened small mammal species within the 1,035 ha of remnant native vegetation are also unlikely to be impacted by fragmentation effects. Species such as Western Pygmy Possum, Bolam's Mouse and Stripe-faced Dunnart, whilst not detected during targeted surveys within the optimised services corridor, have the potential to be present. These species however have adequate mobility (Van Dyck & Strahan (2008) describe Stripe-faced Dunnart making overnight movements of 300 to 2,000 metres, Bolam's Mouse moving 300 metres in several hours, and Western Pygmy-possum as being extremely mobile), which are unlikely to be impacted by the construction and operation of the temporary optimised services corridor.

Threatened woodland birds, such as Pink Cockatoo and Southern Whiteface (both recorded within and around the optimised services corridor) are also highly mobile species unlikely to be impacted by the minor fragmentation effects. Other threatened woodland and shrubland birds (detailed in Table 6-1 of the revised BDAR) similarly would not have their movement limited by the optimised services corridor or temporary habitat loss, as all these species have wide home ranges and, are highly mobile and would easily move across the optimised services corridor and fences.

Despite being ground-based and rarely taking flight, Malleefowl are highly mobile and considered unlikely to be restricted in their movements by the optimised services corridor. Notwithstanding despite many years of intensive survey across the Atlas-Campaspe Mine (GHD 2018a, GHD 2019a, GHD 2019b, GHD 2019c, GHD 2019c, GHD 2020a, GHD 2020b, GHD 2022a, GHD 2022b, GHD 2023a, GHD 2023b, GHD 2024a, GHD 2024b, GHD 2024c, GHD 2025 and GHD 2026), that has included targeted surveys for Malleefowl and their nest mounds, none have been recorded within this part of the Atlas-Campaspe Mine. The closest recorded Malleefowl record is located seven kilometres west of the optimised services corridor. The next closest record is located nine kilometres north-west of the optimised services corridor (refer to Figure 5.1 of the revised BDAR). Breeding Malleefowl tend to be sedentary, nesting in the same general area year after year (Benshemesh 1992, DCCEEW 2024), suggesting that the temporary separation of approximately 1,035 ha of remnant native vegetation is very unlikely to have any immediate impact on the Malleefowl population in the vicinity of the Atlas-Campaspe Mine, and despite birds sometimes moving several kilometres between nesting seasons this movement would be unhindered by the proposed development following its completion and rehabilitation from 2034.

A study of Malleefowl dispersal has demonstrated that chicks are capable of rapid and wide-ranging movement soon after emerging from nests. Benshemesh (1992) recorded mean dispersal rates exceeding 600 m per day, with some individuals averaging more than two kilometres per day. Dispersing chicks were observed moving from unburnt habitats into recently burnt mallee and open woodland areas with limited cover, indicating a low sensitivity to habitat boundaries. These findings suggest that the species has a strong capacity to disperse and recolonise habitat patches, even where fragmentation is present.

In the unlikely event that Malleefowl colonise and begin utilising the approximately 1,035 ha of separated remnant native vegetation, the relatively narrow cleared area (with a maximum width of approximately 100 m) is unlikely to impede movement. The proposed offset fence, which will not incorporate a barbed top, is not expected to restrict movement and would be readily traversable by the species.

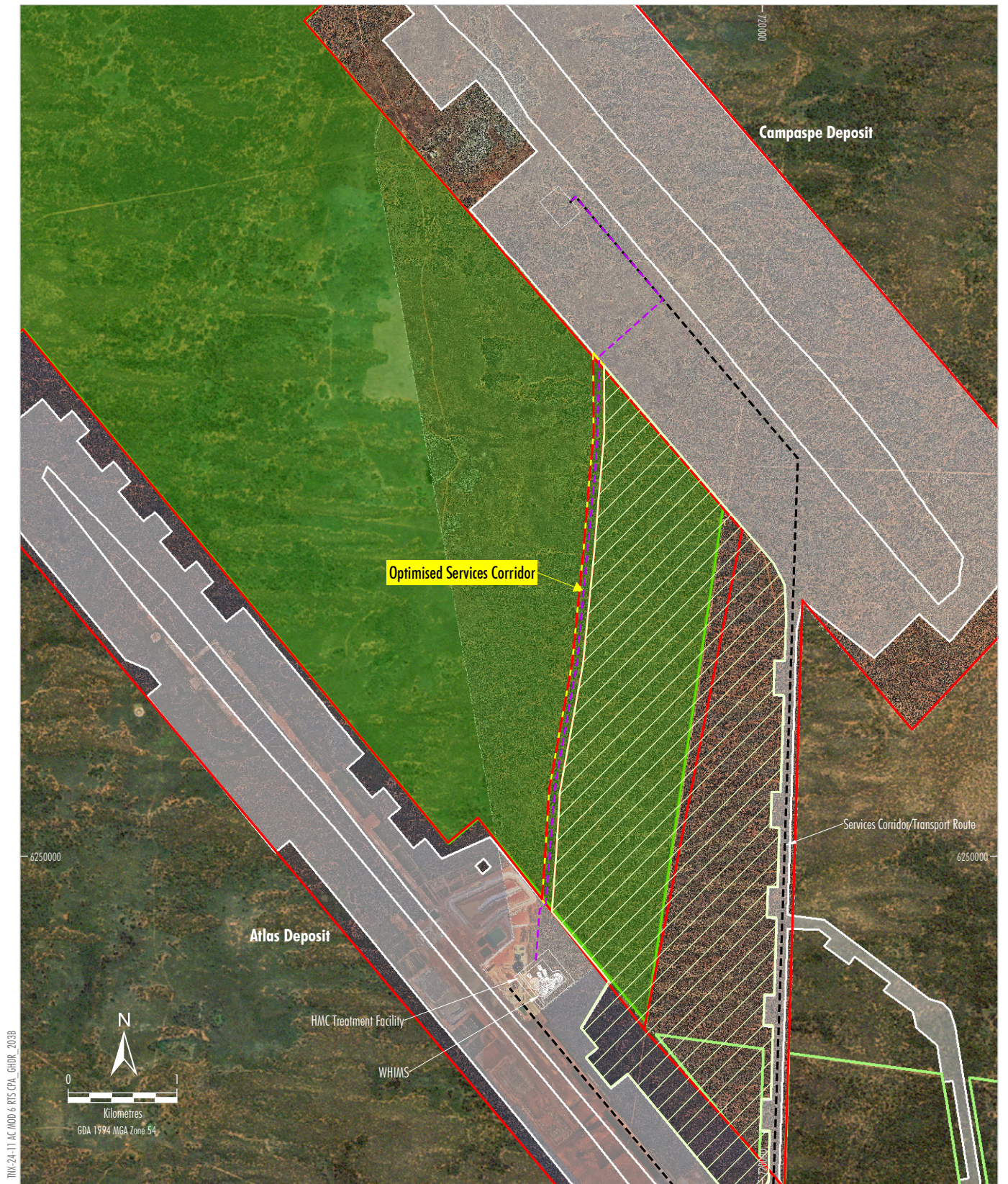
Furthermore, Malleefowl typically occupy home ranges of between 50 and 500 ha. As such, sufficient habitat would be available within the approximately 1,035 ha of separated remnant native vegetation to support the species should it utilise this area in the future.

The Chestnut Quail-thrush, another threatened ground-dwelling bird species recorded within the optimised services corridor, is capable of short-distance flight. The optimised services corridor is therefore unlikely to represent a barrier to movement of this species across the broader landscape.

The Jewelled Gecko was detected during spotlighting surveys within the optimised services corridor, though numerous other threatened reptile species are likely to be present within and adjacent to the footprint, including within the approximately 1,050 ha of separated remnant native vegetation, including the Mallee Worm-lizard and Marble-faced Delma. Jewelled Geckos are *Triodia*-obligate species and would be limited to areas of mallee with a *Triodia* understorey within the offset area, being unlikely to travel far from the safety of their *Triodia* habitat. The Mallee Worm-lizard is another mallee specific species, mostly living within ant colonies underground within sandy habitat with scattered surface debris, such as mallee tree roots. Like the Mallee Worm-lizard, the Marble-faced Delma is restricted to mallee habitats but has a greater ability to utilize both *Triodia* and leaf litter microhabitats within the mallee zone. These species are unlikely to be negatively impacted by the fragmentation effects as they require comparatively small areas to forage, breed and shelter within, and as with many reptile species, are small-bodied animals that are quite sedentary, being unlikely to move far from their shelter sites. In the rare case that reptiles do move over the haul road and/or out of the offset, the fenceline will not create a barrier, due to the small size of these animals.

The optimised services corridor would be relatively narrow in extent and temporary in duration and is not expected to impede species movement or substantially affect the suitability of the area for threatened species. The resulting isolated area would exceed 1,000 ha, which is considered sufficient to support populations of the threatened species relevant to the site.

Any potential impacts associated with habitat fragmentation are expected to be temporary and would be resolved following rehabilitation after cessation of mining operations in 2034. On this basis, the inclusion of an additional 534 ha within the existing offset area is not considered necessary or appropriate.



LEGEND

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|---|---|--|---------------------------|
| | Approved Project Components | | Remnant Vegetation Extent |
| | Mining Lease Boundaries (ML 1762 & ML 1882) | | |
| | Surface Development Area | | |
| | Mine Path Extent | | |
| | Mineral Transport Route | | |
| | Biodiversity Offset Area | | |
| | Vegetation Management Area | | |
| | Modification Components | | |
| | Mining Lease Application (MLA2) | | |
| | Surface Development Area | | |
| | Mineral Transport Route | | |

Source: NSW Spatial Services (2025); Tronox (2025); Cristal Mining Australia (2012)
Orthophoto Mosaic: Tronox (2023); AAM (2011)

Figure 3

Recommendation 2.4

This recommendation has been addressed by Tronox in the Submissions Report.

Recommendation 3.1 Update the BDAR to address prescribed impacts in accordance with s6 and s8.3 of the BAM.

Table 8-4 and 8-5 have been revised in the BDAR to expand on information provided that addressed prescribed impacts relating to connectivity and vehicle strikes in accordance with s6 and s8.3 of the BAM. Table 8-4 and 8-5 of the revised BDAR are reproduced below.

Table 8-4 Impacts on connectivity

Criteria	Assessment
describe the nature, extent and duration of short and long-term impacts (during operation, during construction, that are uncertain)	Nature The assessment of landscape context according to the BAM is provided in section 4.1. of the BDAR, which shows the extent of the patch of vegetation that the optimised services corridor falls within, with extensive areas of connected vegetation surrounding the Study area. There are hundreds of thousands of hectares of semi-arid shrubland and woodland similar to that in the optimised services corridor, which form part of the same contiguous block of remnant vegetation as the optimised services corridor. In this context the optimised services corridor is unlikely to comprise a key link in a resource corridor, or to be critical to the ongoing connectivity of habitat in the local area. The optimised services corridor however is located within an existing biodiversity offset site and would result in the fragmentation of the site, into two smaller patches. After construction the optimised services corridor would create a temporary gap in native vegetation cover and a barrier to east-west movement through the landscape approximately 100 meters wide. The optimised services corridor would contain structures, roads and fences as well as noise, light and human activity which may limit the ability of fauna to move through the landscape. This infrastructure is not however expected to significantly restrict the movement of threatened species across the site (refer to consequences section below). Extent The optimised services corridor would include clearing of native vegetation and construction of infrastructure and access tracks in around 50.41 ha of land, of which 20.68 ha is considered Malleefowl habitat. Removal of native vegetation cover and operation of the optimised services corridor would create a gap in east-west connectivity about 100 m wide and 5.2 km long. When considered alongside the existing approved extent of surface development for the Atlas and Campaspe deposits the Proposal would contribute to temporary barriers in east-west connectivity about 10 km long. This barrier is not however expected to significantly restrict the movement of threatened species across the site Duration The impact is expected to occur over a period of up to 8 years during the operation of the corridor. Following decommissioning in 2034, the area would be rehabilitated to native vegetation and subsequently incorporated back into the mine's offset area.

predict the consequences of the impacts for the persistence of the threatened entities identified in Sub-Section 6.1.3, taking into consideration mobility, abundance, range and other relevant life history factors. justify predictions of impacts with relevant literature and other published sources of information and describe any limitations to data, assumptions and predictions about impacts on biodiversity).	The optimised services corridor may be traversed by fauna and provides some groundcover that may be used as shelter by smaller species, including those listed in Table 6-2. The site does not contain water bodies or other key habitat features that function as critical connectivity links between habitat areas. However, the optimised services corridor occurs within a broader vegetated corridor between existing and proposed developments within the tenement and would bisect the existing biodiversity offset site, resulting in an offset area of 534 ha to the east of the optimised services corridor that is temporarily separated from the larger offset area by a corridor of 100 m width. The offset area will remain connected to over 500 ha of similar condition remnant native vegetation and habitat immediately to the east and, therefore, persist as a patch of approximately 1,050 ha. The threatened species identified for the site (section 5.1 of BDAR) may traverse the optimised services corridor opportunistically as part of their broader use of surrounding habitat but are unlikely to be reliant on this area to maintain connectivity within the local landscape. Regional habitat connectivity would continue to be supported by extensive tracts of comparable semi-arid woodland and shrubland surrounding the Project footprint. Notwithstanding, when considered cumulatively with existing approved disturbances, the Proposal would contribute to fragmentation at a regional scale within the broader biodiversity offset area. At a finer scale, an area of vegetation approximately two by five kilometres would remain between the main areas of surface disturbance. This extent of habitat is considered sufficient to support populations of less mobile species with smaller home ranges. More mobile species, including microbats, woodland birds, Malleefowl and raptors, are capable of moving across, around or over the Development footprint, although such movements may incur minor energetic costs or a minor increased risk of harm, such as from interaction with fencing. The optimised services corridor does not involve the installation of large or hazardous structures that would substantially increase the risk or energetic cost of fauna movement. However, vegetation clearing associated with the services corridor and associated infrastructure would result in a moderate increase in habitat fragmentation between retained habitat areas to the east and west of the alignment. The resulting gap in vegetation, approximately 100 metres in width, is not expected to disrupt key ecological processes such as migration or pollination. Despite being primarily ground-dwelling and infrequently taking flight, Malleefowl are highly mobile and are unlikely to have their movements constrained by the optimised services corridor. Extensive survey effort across the Atlas-Campaspe Mineral Lease Area (GHD 2018a–2026), including targeted surveys for Malleefowl and their mound sites, has not recorded the species within this portion of the site. The nearest recorded mound is approximately seven kilometres west of the corridor, with another located approximately nine kilometres to the north-west (refer to Figure 5.1). No active mounds are currently known within or immediately adjacent to the Development footprint or the offset area to be isolated. Malleefowl are generally sedentary during breeding, returning to the same nesting areas annually (Frith 1959; Benshemesh 1992; DCCEE 2024), indicating that the temporary isolation of the offset area is unlikely to have any immediate impact on the local population. While individuals may move several kilometres between breeding seasons, such movements would not be expected to be impeded by the Proposal, particularly following rehabilitation of the corridor after 2034. Research by Benshemesh (1992) also demonstrates that Malleefowl chicks are capable of rapid dispersal, with mean movement rates exceeding 600 metres per day and some individuals travelling more than two kilometres per day shortly after hatching. Observations of chicks moving into recently burnt and sparsely vegetated habitats indicate a capacity to traverse open areas and a limited sensitivity to habitat boundaries. This suggests that the species retains the ability to recolonise habitat patches even where fragmentation occurs. Overall, the proposed optimised services corridor is relatively narrow and temporary in nature and is not expected to significantly impede fauna movement or reduce habitat suitability for threatened species. Mobile species are expected to readily traverse or bypass the corridor while the extent of habitat that would remain adjacent to the west and east of the corridor is considered sufficient to continue to support populations of less mobile species. Any fragmentation effects would be temporary and would be resolved following rehabilitation of the corridor after cessation of mining operations in 2034. While the optimised services corridor would contribute a minor, cumulative reduction in landscape connectivity and may temporarily impede movement of some less mobile ground-dwelling fauna, these impacts are expected to be moderate in scale and duration and not significant at the population level.
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Table 8-5: Impacts of vehicle strike

Criteria	Assessment
(a) predict the likelihood of vehicle strike to each relevant species, taking into consideration mobility, abundance, range and other relevant life cycle factors	The optimised services corridor will introduce additional traffic associated with the construction and operation of the Proposal. It is anticipated that approximately four haul trucks per hour will utilise the services corridor during operations, travelling at a maximum speed of 50 km/h. Construction traffic will be minimal and largely limited to existing plant and equipment already present at the Atlas-Campaspe mine site. Overall, the low volume of traffic and restricted vehicle speeds are expected to minimise the risk of vehicle strike to fauna within the optimised services corridor. The haul road will be operational for approximately eight years, from October 2027 to June 2034, after which the optimised services corridor will be rehabilitated in accordance with the existing SSD consent conditions. Most threatened species occurring in the locality are either highly mobile (e.g. birds, microbats) or are small mammals and reptiles with relatively small home ranges and a low likelihood of attempting to cross the optimised services corridor. Accordingly, the risk of vehicle strike for these species is considered low. Microbat species, with advanced echolocation capabilities, and mobile woodland birds and ground-dwelling birds such as the Chestnut Quail-thrush (<i>Cinclosoma castanotum</i>), are expected to readily avoid vehicles travelling at low speeds and in low numbers. Less mobile species, including small mammals such as the Western Pygmy Possum (<i>Cercartetus concinnus</i>) and reptiles such as the Jewelled Gecko (<i>Strophurus elderi</i>), are unlikely to frequently traverse the corridor while it is present, further reducing exposure to vehicle strike risk. Malleefowl have been identified as the species most potentially at risk of vehicle strike due to their ground-dwelling behaviour. However, extensive survey effort across the Atlas-Campaspe Mineral Lease Area (GHD 2018a–2026), including targeted surveys for Malleefowl and their mound sites, has not recorded the species within this portion of the site. The nearest recorded mound is approximately seven kilometres west of the optimised services corridor, with another located approximately nine kilometres to the north-west (refer to Figure 5.1), and no active mounds are known within or adjacent to the optimised services corridor or the offset area to be isolated. Given the sedentary nature of breeding Malleefowl (Frith 1959; Benshemesh 1992; DCCEE 2024), individuals are considered unlikely to occur within the optimised services corridor, and the risk of vehicle strike for this species is therefore very low. In the unlikely event that Malleefowl do utilise the south-eastern portion of the offset, the combination of low traffic volumes and reduced speed limits (50 km/h) would maintain collision risk at a low level. Any potential impacts associated with vehicle strike are expected to be minor, temporary, and limited to the operational life of the optimised services corridor. Upon cessation of mining operations in June 2034, the optimised services corridor will be rehabilitated to native vegetation, and any residual risk to fauna associated with vehicle movements will cease.
(b) estimate vehicle strike rates with supporting data or literature, where available	Tronox maintains a register of fauna vehicle strike incidents across the Atlas-Campaspe Mineral Lease Area and associated haul roads. Over the nine-year operational period of the mine to date, no vehicle strikes involving Malleefowl or any other threatened species have been recorded or are suspected to have occurred. Recorded incidents have predominantly involved livestock (sheep and cattle), with some occurrences involving feral goats and kangaroo species (likely Western Grey Kangaroo and Red Kangaroo). Most of these incidents have occurred along the 135 kilometre haul route to the Ivanhoe processing facility, which is a largely unfenced public road with a speed limit of 100 km/h, where haulage vehicles typically travel at approximately 80 km/h. On the basis of this historical record, and taking into account the substantially lower traffic volumes, significantly shorter route and reduced speed limits proposed for the optimised services corridor (50 km/h, averaging four vehicles per hour), the likelihood of vehicle strike during the proposed eight-year operational period is expected to be very low, and likely negligible.
(c) predict the consequences of the impacts for the persistence of the relevant species	Given the low number of vehicle movements and the reduced speed limits that will be enforced, the risk of vehicle strike during both construction and operation is expected to be minimal. As such, impacts to threatened species at both the local and regional scale are unlikely to be significant. Most threatened species known to occur in the locality are either highly mobile (e.g. birds and microbats) or comprise small mammals and reptiles with relatively small home ranges. These ecological characteristics further reduce the likelihood of interaction with vehicles, and consequently the overall risk of vehicle strike is considered low.

Recommendation 3.2 Update the BDAR to assess the impacts to connectivity within the remaining offset areas, and the increased risk of vehicle strike

Section 8 of the revised BDAR has been updated to provide an expanded assessment of impacts to habitat connectivity within the remaining offset areas and the potential for increased vehicle strike risk.

Tronox maintains a register of fauna vehicle strike incidents across the Atlas–Campaspe Mine and associated haul roads. Over the nine-year operational life of the mine to date, no vehicle strikes involving Malleefowl or any other threatened species have been recorded or are suspected to have occurred. Recorded incidents have largely involved livestock (sheep and cattle), with occasional records for feral goats and kangaroo species (likely Western Grey and Red Kangaroos), predominantly along the 135 km haul route to the Ivanhoe Rail Facility. This route is largely unfenced, has a speed limit of 100 km/h, and is used by heavy vehicles travelling at approximately 80 km/h.

Extensive survey effort across the Atlas–Campaspe Mine (GHD 2018a–2026), including targeted Malleefowl and mound surveys, has not recorded the species within the optimised services corridor. The nearest known mound is approximately seven kilometres west of the corridor, with the next closest located approximately nine kilometres to the north-west. No active mounds are known within or adjacent to the optimised services corridor or within the offset area that would become temporarily separated. Given the sedentary nature of breeding Malleefowl (Frith 1959; Benshemesh 1992; DCCEEW 2024), the likelihood of individuals occurring within the optimised services corridor is very low, and the risk of vehicle strike is therefore negligible.

While minor fauna strike events may be under-reported due to detectability limitations, the risk of vehicle strike to Malleefowl within the optimised services corridor is considered very low. This is due to the combination of reduced vehicle speeds (maximum 50 km/h) and the low likelihood of Malleefowl occurring within the optimised services corridor.

Notwithstanding their largely ground-dwelling behaviour, Malleefowl are capable of extensive movement. In particular, chicks have been shown to disperse widely shortly after hatching, with mean movement rates exceeding 600 metres per day and some individuals travelling more than two kilometres per day (Benshemesh 1992). These observations demonstrate a capacity to traverse open or disturbed habitats and support the conclusion that the optimised services corridor is unlikely to restrict movement or prevent recolonisation of suitable habitat.

Although road mortality can be a significant threat to Malleefowl populations, this risk is typically associated with higher-speed roads where individuals may be attracted to spilled grain and may not evade approaching vehicles (DCCEEW 2024). These conditions are not present within the optimised services corridor. The proposed haul road will operate at a maximum speed of 50 km/h, with low traffic volumes (approximately four vehicles per hour), substantially reducing collision risk.

In the unlikely event that Malleefowl utilise the 534 ha component of the existing biodiversity offset, the relatively narrow corridor (maximum width of 100 m, with a total vegetation removal of 50.5 ha) is unlikely to impede movement. The biodiversity offset fencing, which would not include barbed wire, would be readily traversable and will not restrict fauna movement.

More broadly, the Modification would result in a temporary increase in habitat fragmentation and a localised reduction in connectivity, including the temporary isolation of approximately 1,050 ha of vegetation to the east of the corridor (including 534 ha of the existing offset). However, this vegetation remains substantial in extent and is part of a much larger (>100,000 ha) contiguous remnant that connects to Mungo National Park. At the regional scale, connectivity would continue to be maintained through extensive surrounding habitat.

The optimised services corridor (approximately 100 metres wide) may temporarily deter or reduce movement of some small, less mobile fauna (e.g. small mammals and reptiles). However, more mobile species, including microbats, woodland birds, raptors and Malleefowl, are expected to readily traverse or bypass the corridor. The scale of fragmentation is therefore considered moderate and localised, and is not expected to significantly disrupt key ecological processes such as dispersal, migration or pollination.

Importantly, all fragmentation and vehicle strike risks are temporary. The haul road would operate for approximately eight years (2027–2034), after which the corridor would be rehabilitated to native vegetation in accordance with existing approval conditions. Following rehabilitation, connectivity across the landscape would be restored.

Accordingly, the Modification is not expected to result in significant impacts to habitat connectivity or a meaningful increase in vehicle strike risk for threatened species.

Recommendation 4.1 Provide further detail about measures to mitigate, monitor and manage potential impacts, including risk of failure

Table 9-1 in the revised BDAR has been updated to include additional information regarding mitigation of prescribed impacts. This includes commitments from the proponent for environmental inductions for all workers on site, continued implementation of a thorough Vegetation Clearance Protocol that include ecological pre-clearance surveys for threatened flora and fauna, weed and pest animal monitoring and control measures across the site, soil erosion and surface water controls, vehicle strike controls using reduced speed limits and wildlife-safe fencing to restrict animals, and a Rehabilitation Management Plan that would commence at the end of the project to manage the rehabilitation of the optimised services corridor to native vegetation.

Recommendation 5.1 Update the BDAR to address information required to complete the bilateral assessment as per Attachment C.

Where relevant the revised BDAR has been updated to address information require to complete the bilateral assessment as per Attachment C of the CPA comments. Most of the information required is already contained within the BDAR and the sections where this information can be located is provided in Table 1 below. Where additional information or specific tables have been requested this is also outlined in Table 1.

Table 1 *Response to CPA comments regarding MNES*

Ref	CPA Requirement	Relevant BDAR Section / Location	Response
C1.1	Describe the operational and construction footprints of the project that relate to MNES and provide the relevant maps.	Section 1.3.3; Section 1.3.4; Figures 1-1 and 1-2	Addressed in Section 1.2; Section 2.2; Figures 1-1 and 1-2. The BDAR includes: optimised services corridor (50.53 ha) and study area (~90 ha) defined. Infrastructure includes haul road, pipelines and powerline. Mapped in Figures 1-1 and 1-2.
C1.2	Describe staging and timing of the action that may impact on MNES and provide the relevant maps.	Section 1.3.3; Section 1.3.4 and 1.3.5	Addressed in Section 1.3.3, Section 1.3.4 and 1.3.5. The BDAR includes: Construction (clearing, earthworks) and operational phases described, including rehabilitation at end of mine life (~2034).
C1.3	Provide maps of the subject land boundary showing the final proposal and disturbance footprint with regards to MNES.	Figures 1-1, 1-2 and Figure 5-1	Refer to figures 1-1, 1-2 and 5-1 of the BDAR which show the optimised services corridor and study area as well as threatened fauna and habitat resources mapped during the site assessment.
C1.4	Submit GIS shapefiles of all maps that relate to MNES.	GIS files have been uploaded into BOAMS	GIS files have been uploaded into BOAMS
C2.1	Ensure that the 'Establishing the site context' of BAM 2020 (Section 3) have been fully met in the BDAR in relation to MNES.	Section 3; Section 5.4	Site context has been assessed in accordance with the BAM and is provided in Section 3 of the BDAR. This includes a site maps (Figure 1-1 and Figure 1-2) and location map (Figure 3-1). Landscape features are discussed in detail in section 3.2. Appendix F also provides information regarding habitat for relevant MNES within the surrounding landscape.

Ref	CPA Requirement	Relevant BDAR Section / Location	Response
C3.1	Demonstrate that field-based survey effort meets survey guidelines and, where available, Commonwealth survey guidelines.	Section 2.4; Tables 2-1, 2-3	Addressed in Section 2.4; Tables 2-1 and 2-3. The BDAR includes: All field surveys completed were undertaken in accordance with BAM survey guidelines, including targeted surveys and trapping. For some MNES species such as Corben's Long Eared bat - targeted surveys were not completed as the species is known to occur and therefore has been assumed present within the development footprint due to the presence of suitable habitat
C3.2	Demonstrate supporting databases have been accessed and used (e.g. NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results).	Section 2.3.1	The BDAR includes review of multiple databases including BioNet, PMST, SPRAT and SVTM. Refer to section 2.3.1 of BDAR for information regarding database reviews.
C3.3	Demonstrate peer-reviewed literature has been accessed and used.	Section 2.3.1; Appendix F	Addressed in Section 2.3.1 and Appendix F. The BDAR includes: Commonwealth guidance and literature referenced to inform MNES assessment.
C3.4	Demonstrate local data has been accessed and used.	Section 2.3; Section 2.4	Sections 2.3 and Section 2.4 of the BDAR provides information regarding review of historical survey data and local surveys that were completed as part of this assessment.
C3.5	Demonstrate all EPBC Act-listed threatened species and communities have been appropriately mapped in accordance with the relevant Commonwealth listing advice.	Figure 5-1	Figure 5-1 provides mapping of EPBC listed species and communities recorded within the optimised services corridor.
C3.6	Demonstrate important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans have been considered.	Appendix F	Appendix F considers important populations and critical habitat as defined in approved listing advice, conservation advice and species recovery action plans. AoS have determined that all MNES considered are likely part of an important population however the optimised services corridor does not include critical habitat for any of these species
C3.7	Provide a list of all EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity (including species that are 'ecosystem credits' in BAM).	Section 5.4; Table 5-5, Table 5-6 and Figure 5-2	Section 5.4, Table 5-5 and Table 5-6 of the BDAR includes EPBC-listed threatened and migratory species identified as present or likely to occur within the optimised services corridor. Figure 5.2 shows EPBC listed species identified within the site.

Ref	CPA Requirement	Relevant BDAR Section / Location	Response
C3.8	Include a discussion, with data and analysis where any species and communities identified by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) referral documents have been ruled out as occurring on or near the subject site.	Section 5.4; Appendix A	Section 5.4 provides justification for species excluded based on the absence of suitable habitat, geographic constraints or survey effort.
C4.1	Demonstrate all feasible alternatives and efforts to avoid and minimise impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) has occurred including an analysis of alternative: a) designs and engineering solutions b) modes or technologies c) routes and locations of facilities d) sites within the subject site e) the identification of any other site constraints in der	Section 7	Section 7 of the BDAR includes discussion of efforts to avoid and minimise impacts to MNES where possible while working with project constraints.
C4.2	Include a discussion and justification of all feasible measures to avoid, mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts)	Sections 7, 8, 9	Sections 7, 8 and 9 of the BDAR includes mitigation measures to avoid and manage impacts on EPBC Act species and communities.
C5.1	Identify the residual adverse impacts likely to occur to each EPBC Act listed threatened species and/or community after the proposed avoidance and mitigation measures are taken into account.	Section 8.5 and Table 8-5	Section 8.5 of the BDAR includes residual impacts and summary of AoS. An additional table (table 8-5) has also been included to summarise residual impacts to MNES.

Ref	CPA Requirement	Relevant BDAR Section / Location	Response
C5.2	Justify and provide evidence for the predicted level of impact, with reference to the Commonwealth's 'Significant Impact Guidelines 1.1 - Matters of National Environmental Significance' ¹ and DPIE's 'Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact' ² .	Appendix F	Appendix F of the BDAR includes Assessment consistent with Significant Impact Guidelines. An additional table has been included in Section 8.5 summarising findings of the AoS (refer to Table 8-5).
C5.3	Provide summary impact table.	Table 8.5 and 8.6	Table 8.5 and 8.6 has been added to BDAR summarising residual impacts to EPBC listed species and communities.
C5.4	Provide data and justification where any EPBC Act-listed threatened species or communities to be considered in the BDAR are considered to be at low risk of impact during the assessment.	Section 8.5 and Appendix F	Section 8.5 and Appendix F of BDAR provides data and justification regarding the significance of impacts to threatened species and communities listed under the EPBC Act.
C6.1	Identify any MNES that have not been offset using the BAM.	Section 11.3	Discussion has been added to Section 11.3 of the BDAR regarding offsets for MNES (including predicted species that would be offset through ecosystem credits). All MNES impacted could be offset from ecosystem credits that would be retired (no species credits required).
C6.2	Provide details of how impacts requiring offset correlate to the MNES impacts.	Section 11.3	Discussion has been added to Section 11.3 of the BDAR regarding offsets for MNES (including predicted species that would be offset through ecosystem credits)
C6.3	Provide details on the PCTs that require offsetting and the number and type of ecosystem credits required for impacts to MNES.	Section 11.3; Table 11.5	Addressed in Section 11 Table 11.5 including a summary of ecosystem credit requirements calculated for impacted PCTs and how these relate to MNES.
C6.4	Provide details of threatened species requiring offset and the number of species credits required for impacts to MNES.	Section 11.3	Species credits required for Cobar Greenhood only which is not listed under the EPBC Act. As outlined in section 11.3 no MNES require species credit offsets.
C6.5	Demonstrate the correct uses the BAM (and BAM calculator) to identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.	Section 11.1	Section 11.1, Tables 11-1, 11-2 and 11-3 summarises the results of the BAM calculator to identify the number and class of biodiversity credits that need to be retired to achieve a standard "no net loss" of biodiversity.

Ref	CPA Requirement	Relevant BDAR Section / Location	Response																		
C6.6	Provide any details of ecological rehabilitation and/or biodiversity conservation actions proposed for offsetting.	N/A	No ecological rehabilitation or biodiversity conservation actions are proposed for offsetting.																		
C6.7	Identify any other offsetting approach proposed, such as land-based offsets, retiring credits by payment into the Biodiversity Conservation Fund and/or through supplementary measures.	Section 11.4	Section 11.4 of the BDAR has been added to outline the proposed approach to offsetting impacts of the optimised services corridor.																		
C6.8	Provide a summary table with the following information:		Conclusions of AoS determined that the project is not likely to have a significant impact on any MNES to the retirement of credits is not required for MNES. Regardless as all EPBC species likely to be impacted are ecosystem credit species, the retirement of credits to meet offset obligations under the BAM would also offset impacts to EPBC listed species. A summary of PCTs that would be offset, associated EPBC listed species and offsetting approach is provided in Table 11.6 of the BDAR.																		
	<table><tr><td>Threatened Species / Community listed under EPBC Act</td><td>PCTs associated with the ecosystem credit species / ecological community (if applicable)</td><td>Area of Impact (ha)</td><td>Credits Required</td><td>Offsetting Approach</td><td>Reference (EIS/BDAR)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>TOTAL</td><td></td><td></td><td></td><td></td><td></td></tr></table>			Threatened Species / Community listed under EPBC Act	PCTs associated with the ecosystem credit species / ecological community (if applicable)	Area of Impact (ha)	Credits Required	Offsetting Approach	Reference (EIS/BDAR)							TOTAL					
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TOTAL																					
C7.1	Consider all relevant Commonwealth guidelines and policy statements that are applicable to the action and listed threatened species and/or communities,	Appendix F	Applicable commonwealth Guidelines and policy statements have been reviewed and considered when preparing Assessments of Significance for EPBC listed species and communities (Refer to Appendix F of BDAR).																		

Ref	CPA Requirement	Relevant BDAR Section / Location	Response
C7.2	Include an assessment for each EPBC Act listed threatened species and/or community, that has been adequately informed by applicable Commonwealth guidelines and/or policy statements. For example, the interaction between the proposed action and important populations or critical habitat identified in policy documents and/or the interaction between the proposed action and threatening processes or recommended conservation actions outlined in Commonwealth policies and plans.	Section 8.5; Appendix F	Addressed in Section 8.5; Appendix F. Assessment of significance have been completed for MNES recorded or identified as having potential to occur within the optimised services corridor and are included as Appendix F.

Limitations

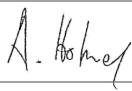
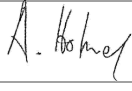
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Project name		Atlas-Campaspe Mineral Sands Project – Optimised Services Corridor Modification (Modification 6) (SSD 5012-Mod-6) – Biodiversity Development Assessment Report					
Document title		Letter Report					
Project number		12628564					
File name		MOD6 CPA Response Document_V2					
Status code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	1	A Quin D Eyles	A Holmes		A Holmes		12/6/2026
S3	2	A Quin D Eyles	A Holmes		A Holmes		19/6/2026
S3	3	A Quin D Eyles	A Holmes		A Holmes		24/6/2026

GHD Pty Ltd | ABN 39 008 488 373

Contact: Arien Quin, Senior Ecologist | GHD

105 Hume Street, Suite 5

Wodonga, Victoria 3690, Australia

T +61 2 6043 8700 | **F** +61 2 6043 8711 | **E** abxmail@ghd.com | **ghd.com**

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