EPBC Assessment of Impact Significance on Listed Endangered Ecological Communities in the Study Area

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:	**Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin** This community is analogous to areas mapped as RE s 11.3.21, 11.4.4, 11.4.11, 11.8.11, 11.9.9, 11.9.12 and 11.11.17 under the provisions of the Queensland *Vegetation Management Act 1999*. One vegetation community recorded within the Study Area (i.e. Community 2) is analogous to RE 11.8.11. Areas currently mapped as RE 11.8.11 were generally observed to be heavily infested by Parthenium weed.	Proposed disturbance to ground-truthed REs and significant ecological communities is illustrated on Figures 8.6 and 8.7. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on vegetation communities due to construction and clearing, and operation, is provided in Tables 8.5 and 8.6.
Reduce the extent of an ecological community.	Polygons that are mapped as part of the current study as RE 11.8.11 (i.e. vegetation community 2) will be subject to removal and/or disturbance within the northern portion of the Study Area. The total area that is affected is more than 100 ha. Within the relevant Local Government Area (former Belyando Shire), the area that is affected equates to a loss of approximately 0.33% of its remaining extent. Within the relevant bioregion (Brigalow Belt North), it equates to a loss of approximately 0.07% of its remaining extent. With mitigation through offsetting, the result of the proposed action would not significantly reduce the extent of this ecological community.*	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of the Endangered Natural Grassland community associated with the proposed activities will be offset by means negotiated with DEWHA. Under a 1:1 offset scenario, no long-term net loss of RE 11.8.11 would occur as a result of the Project. Should there be a lag between the clearing of RE 11.8.11 and the establishment of an equal area of offset RE 11.8.11 elsewhere in the local landscape, the resulting short term loss of RE 11.8.11 is not considered to be significant at the local or bioregional scale.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	A significant area of RE 11.8.11 within the project site would be removed as a result of the proposed action. However, with mitigation through offsetting and the control of Buffel Grass and Parthenium on site and within offset areas, the result of the proposed action would not contribute to the regional fragmentation of this already highly fragmented ecological community.	Given the isolated and degraded nature of RE 11.8.11 ground-truthed on site, the proposed actions and associated offset and enhancement measures are highly unlikely to result in further fragmentation of this ecological community. An offset strategy will be developed through negotiation with DEWHA to ensure fragmentation of this community does not increase.
Adversely affect habitat critical to the survival of an ecological community.	Polygons that are mapped as part of the current study as RE 11.8.11 (i.e. vegetation community 2) will be subject to removal and/or disturbance within the northern portion of the Study Area. The total area that is affected is more than 100 ha. Within the relevant Local Government Area (former Belyando Shire), the area that is affected equates to a loss of approximately 0.33% of its remaining extent. Within the relevant bioregion (Brigalow Belt North), it equates to a loss of	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of the Endangered Natural Grassland community associated with the proposed activities will be offset by means negotiated with DEWHA.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
	approximately 0.07% of its remaining extent. As this represents a small portion of the existing extent of this community, with mitigation through offsetting and the control of Buffel Grass and Parthenium on site and within offset areas, the result of the proposed action would not significantly adversely affect habitat critical to the survival of this ecological community.	Under a 1:1 offset scenario, no long-term net loss of RE 11.8.11 will occur as a result of the Project. Should there be a lag between the clearing of RE 11.8.11 and the establishment of an equal area of offset RE 11.8.11 elsewhere in the local landscape, the resulting short term loss of RE 11.8.11 is not considered to be significant at the local or bioregional scale.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	The community occurs on Cainozoic igneous rocks, particularly fresh basalt, and is generally associated with undulating to gently undulating rises. It usually occurs on the crests and middle and upper slopes (slopes 2–6%), although in places is occasionally present on lower slopes and flat areas (slopes 0–2%). Associated soils are moderately shallow to deep cracking clay soils with gravel, stone or linear gilgai sometimes present. The occurrence of this community in association with specific landforms, soil types and inferred drainage requirements indicates that a narrow range of conditions are required for its establishment. While the proposed action will remove these features, thus reducing potential areas for the distribution of this community, these are currently degraded due to the presence of Buffel Grass and Parthenium, which have contributed to the Endangered status of RE 11.8.11 as both species outcompete and suppress native grasslands in the region. Control of these species on site and as part of the management program for offsets may well establish healthier examples of this RE type than are currently present within the areas proposed for disturbance.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of the Endangered Natural Grassland community associated with the proposed activities will be offset by means negotiated with DEWHA.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	While the proposed action would remove the majority of the Natural Grasslands on site, these are currently degraded due to the presence of Buffel Grass and Parthenium, which have contributed to the Endangered status of RE 11.8.11 as both species outcompete and suppress native grasslands in the region. Control of these species on site and as part of the management program for offsets may well establish healthier examples of this RE type than are currently present within the areas proposed for disturbance.	As above.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to	While the proposed action would remove the majority of the Natural Grasslands on site, these are currently degraded due to the presence of Buffel Grass and Parthenium, which has contributed to the Endangered status of RE 11.8.11 as both species outcompete and suppress native grasslands in the region. Control of these species on site and as part of the management program for offsets may well establish healthier examples of this RE type than are currently present within the areas proposed for disturbance,	As above.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
– become established; or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.		
Interfere with the recovery of an ecological community.	It is proposed that areas of the community retained on site will be managed to control exotic species. With mitigation through offsetting and the control of Buffel Grass and Parthenium on site and within offset areas, the loss of Natural Grasslands through the proposed action would not interfere with the recovery of this ecological community.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of the Endangered Natural Grassland community associated with the proposed activities will be offset by means negotiated with DEWHA. Under a 1:1 offset scenario, no long-term net loss of RE 11.8.11 will occur as a result of the Project. Should there be a lag between the clearing of RE 11.8.11 due to the Project and the establishment of an equal area of offset RE 11.8.11 elsewhere in the local landscape, the resulting short term loss of RE 11.8.11 is not considered to be significant at the local or bioregional scale.

* Based on a 1:1 offset scenario, excluding those areas subject to existing onsite clearing approval (see **Sections 5.1.1 and 5.2 of main report**).

An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:	**Brigalow (*Acacia harpophylla* dominant and co-dominant) communities** This community is analogous to areas mapped as REs 6.4.2, 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14, 11.12.21, 12.8.23, 12.9-10.6 and 12.12.26 under the provisions of the Queensland *Vegetation Management Act 1999*. Four vegetation communities contained within the Study Area (i.e. Communities 4, 14, 16 and 18) have been identified as being analogous to REs 11.4.8, 11.4.9 and 11.9.5.	Proposed disturbance to ground-truthed REs and significant ecological communities is illustrated on Figures 8.6 and 8.7. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on vegetation communities due to construction and clearing, and operation, is provided in Tables 8.5 and 8.6.
Reduce the extent of an ecological community.	Within the relevant Local Government Area (former Belyando Shire), approximately 0.03% of the remaining extent of RE 11.4.8, 0.04% of the remaining extent of RE 11.4.9 and 0.79% of the remaining extent of RE 11.9.5 would be affected by the proposed action. Within the relevant bioregion (Brigalow Belt North), this equates to a losses of approximately 0.01%, 0.02% and 0.003%, respectively, for each RE	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
	of their remaining extent. As this represents very small portions of the existing extent of the analogous communities, with mitigation through offsetting, the result of the proposed action would not significantly reduce the extent of this ecological community.*	and quantified in Table 8.4) will be offset by means negotiated with DEWHA. Under a 1:1 offset scenario for those areas not subject to existing surface area approvals for vegetation clearing, no long-term net loss of RE 11.4.8 will occur as a result of the Project. A net loss of 3.1 ha of RE 11.4.9 and 3.9 ha of RE 11.9.5 will occur, which in both cases equates to 0.003% of the remaining bioregional extent. These losses are not considered to be significant. In addition, areas currently supporting Brigalow will be managed to control the extent of Buffel Grass and other weed species to ensure the continued persistence of the communities within the subject area.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	Relatively small areas of REs 11.4.8, 11.4.9 and 11.9.5 within the project site would be removed as a result of the proposed action. However, with mitigation through offsetting and the control of Buffel Grass within offset areas, the result of the proposed action would not significantly contribute to the local fragmentation of this already highly fragmented ecological community.	Given the fragmented and degraded nature of Brigalow communities ground-truthed on site, the proposed actions and associated offset and enhancement measures are highly unlikely to result in further fragmentation of this ecological community. An offset strategy will be developed through negotiation with DEWHA to ensure fragmentation of this community does not increase.
Adversely affect habitat critical to the survival of an ecological community.	Within the relevant Local Government Area (former Belyando Shire), approximately 0.03% of the remaining extent of RE 11.4.8, 0.04% of the remaining extent of RE 11.4.9 and 0.79% of the remaining extent of RE 11.9.5 would be affected by the proposed action. Within the relevant bioregion (Brigalow Belt North), this equates to a losses of approximately 0.01%, 0.02% and 0.003%, respectively, for each RE of their remaining extent. As this represents very small portions of the existing extent of the analogous communities, with mitigation through offsetting and the control of Buffel Grass on site and within offset areas the result of the proposed action would not significantly adversely affect habitat critical to the survival of this ecological community.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5 and quantified in Table 8.4) will be offset by means negotiated with DEWHA. Under a 1:1 offset scenario for those areas not subject to existing surface area approvals for vegetation clearing, no long-term net loss of RE 11.4.8 will occur as a result of the Project. A net loss of 3.1 ha of RE 11.4.9 and 3.9 ha of RE 11.9.5 will occur, which in both cases equates to 0.003% of the remaining bioregional extent. These losses are not considered to be significant.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		In addition, areas currently supporting Brigalow will be managed to control the extent of Buffel Grass and other weed species to ensure the continued persistence of the communities within the subject area.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	The presence of Buffel Grass has contributed to the Endangered status of Brigalow as this species invades the understorey, outcompetes and suppresses Brigalow species recruitment, and increases fire frequency and intensity in Brigalow communities. Control of this species on site and as part of the management program for offsets may well establish healthier examples of this RE type than are currently present within the areas proposed for disturbance.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5 and quantified in Table 8.4) will be offset by means negotiated with DEWHA.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	While the proposed action would remove a portion of the Brigalow communities on site, these areas are currently highly disturbed due primarily to invasion by Buffel Grass which has contributed to the Endangered status of Brigalow as this species invades the understorey, outcompetes and suppresses Brigalow species recruitment, and increases fire frequency and intensity in Brigalow communities. Offset areas and the remaining areas of Brigalow on site would be managed to exclude Buffel Grass and other weed species and, with the application of fire management aimed at reducing the frequency and intensity of fires in these areas, it is likely that there will be an increase in the number of functionally of important species within the Brigalow communities.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5 and quantified in Table 8.4) will be offset by means negotiated with DEWHA.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established; or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	While the proposed action would remove a portion of the Brigalow communities on site, which have been assessed as being in poor ecological condition, offset areas and the remaining areas of Brigalow on site would be managed to exclude Buffel Grass and too frequent fire, thereby possibly effecting an increase in the quality of the woodland.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5 and quantified in Table 8.4) will be offset by means negotiated with DEWHA.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
Interfere with the recovery of an ecological community.	It is proposed that areas of the Brigalow communities that are retained on site will be managed to control exotic species. With mitigation through offsetting and the control of Buffel Grass and too-frequent fire on site and within offset areas, the loss of areas of Brigalow through the proposed action would not interfere with the recovery of this ecological community.	As noted in Table 8.5 and Section 8.1.2.5 of Chapter 8, it is proposed that the loss of those areas of Endangered Brigalow communities associated with the proposed activities that are not subject to existing surface area approvals for vegetation clearing (as shown on Figure 8.5 and quantified in Table 8.4) will be offset by means negotiated with DEWHA. Under a 1:1 offset scenario for those areas not subject to existing surface area approvals for vegetation clearing, no long-term net loss of RE 11.4.8 will occur as a result of the Project. A net loss of 3.1 ha of RE 11.4.9 and 3.9 ha of RE 11.9.5 will occur, which in both cases equates to 0.003% of the remaining bioregional extent. These losses are not considered to be significant. In addition, areas currently supporting Brigalow will be managed to control the extent of Buffel Grass and other weed species to ensure the continued persistence of the communities within the subject area.

* Based on a 1:1 offset scenario, excluding those areas subject to existing onsite clearing approval (see **Sections 5.1.1 and 5.2 of main report**).

EPBC Assessment of Significance on Listed Vulnerable Species in the Study Area*

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Brigalow Scaly-foot *Paradelma orientalis*** The Brigalow Scaly-foot was once thought to be confined to remnant Brigalow (*Acacia harpophylla*) or sparse tussock grass vegetation on grey cracking soils (Shea 1987). Recent records, however, have found the species in additional habitats including *Acacia falciformis* woodland, Gidgee (*A. cambagei*) woodland, Poplar Box *Eucalyptus populnea* open woodland, sandstone rises in dry sclerophyll forests, *Corymbia maculata* and *E. crebra* dominated forest and mixed open woodland with *Triodia mitchelli* (Schulz and Eyre 1997; Kutt *et al.* 2003). Most records are from relatively undisturbed habitats but the species does also occur in young regrowth (two-three years old) and heavily grazed areas (Kutt *et al*. 2003). Fragments of invertebrates such as spiders and crickets have been recorded from scats. However, sap, particularly from *Acacia* species, constitutes a significant proportion of this species diet (Tremul 2000). The species was not recorded during recent surveys within and adjacent to the project site, but it is considered to have a reasonable possibility of occurrence, given the habitats available.	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.
Lead to a long-term decrease in the size of an *important population* of a species.	A portion of potential habitat for this species would be lost as a result of the proposed action. With mitigation through offsetting, the result of the proposed action would not significantly reduce the local extent of these habitats. It is expected that any possible decrease in any possible local population would be minor and temporary.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 140 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 32% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As the species is only predicted to occur within the project site, and no important population has been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an *important population*.	It is expected that any reduction in the area of occupancy of any possible local population of the species would be minor and temporary.	As above.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
Fragment an existing *important population* into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur.	
Adversely affect *habitat critical to the survival of a species*.	A lack of historical records and study records indicates that there is no habitat present that is critical to the survival of the species.	
Disrupt the breeding cycle of an *important population*.	It is expected that any disruption to any possible local population of the species would be minor and temporary.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The Study Area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 140 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 32% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As the species is only predicted to occur within the project site, and no important population has been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	
Interfere with the recovery of the species.	The species is not known to occur in the Study Area, however, habitat rehabilitation and restoration activities using seed or seedlings of local provenance are likely to assist, rather than interfere, with the recovery of the species in the	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing,

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
	local area.	approximately 140 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 32% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As the species is only predicted to occur within the project site, and no important population has been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Yakka Skink *Egernia rugosa*** Yakka Skinks live in colonies, occupying communal burrows, often under dead timber or deep rock crevices. They are found in dry open forests and woodlands, usually on coarse gritty soils that are well drained (Ehmann 1992; Cogger 2000; Drury 2001; Wilson 2005). The species is threatened by loss of habitat, loss of shelter sites through agricultural practices, too-frequent fire, trampling of burrows by livestock and predation by foxes and cats (Drury 2001). Based on soil type it is considered unlikely that Yakka Skink occurs north of Cherwell Creek on the Study Area. The species was targeted in earlier surveys south of Cherwell Creek (Ecoserve and LAMR 2005) but was not located nor was it reported as likely to occur. There are no database or survey records for the Study Area. Overall, this species is considered to have a low possibility of occurrence within project site.	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.
Lead to a long-term decrease in the size of an *important population* of a species.	It is expected that any possible decrease in any possible local population of the species would be minor and temporary.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 240 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 35% of the available native habitat for this species within the project site, but only represents 0.1% of

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an *important population*.	It is expected that any reduction in the area of occupancy of any possible local population of the species would be minor and temporary.	As above.
Fragment an existing *important population* into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur.	
Adversely affect *habitat critical to the survival of a species*.	A lack of historical records and study records indicates that there is no habitat present that is critical to the survival of the species.	
Disrupt the breeding cycle of an *important population*.	It is expected that any disruption to any possible local population of the species would be minor and short-term.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The Study Area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 240 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 35% of the available native habitat for this species within the project site, but only represents 0.1% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		the proposed mitigation measures are implemented.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	
Interfere with the recovery of the species.	The species is not known to occur in the Study Area, however, habitat rehabilitation and restoration activities using seed or seedlings of local provenance are likely to assist, rather than interfere, with the recovery of the species in the local area.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 240 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 35% of the available native habitat for this species within the project site, but only represents 0.1% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Ornamental Snake *Denisonia maculata*** Ornamental Snake was recorded for the Study Area during a previous fauna survey on Peak Downs Mine. Two individuals were found during a nocturnal search. The location included known habitat characteristics for this species of inundated gilgais and Brigalow on deep-cracking clays. Targeted searches failed to locate any more individuals or suitable habitat (Ecoserve and LAMR 2005). The Ornamental Snake occurs in low-lying areas with deep-cracking clay soils that are subject to seasonal flooding, and in adjacent areas of clay and sandy loams. The	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
	species is found in woodlands and shrublands, such as Brigalow, and in riverine habitats, and lives in soil cracks and under fallen timber (Ehmann 1992; Wilson 2005; Wilson and Swan 2008). The location described above is almost 12 km south-east of the southern edge of the Study Area. There are no database records for the Study Area.	the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.
Lead to a long-term decrease in the size of an *important population* of a species.	It is expected that any possible decrease in any possible local population of the species would be minor and temporary.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 3.1 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This only represents approximately 3% of the available native habitat for this species within the project site, and only represents 0.008% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only predicted to occur within the project site, based on a nearby record, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an *important population*.	It is expected that any reduction in the area of occupancy of any possible local population of the species would be minor and temporary.	As above.
Fragment an existing *important population* into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur.	
Adversely affect *habitat critical to the survival of a species*.	A lack of historical records and study records indicates that there is no habitat present that is critical to the survival of the species.	
Disrupt the breeding cycle of an *important population*.	It is expected that any disruption to any possible local population of the species would be minor and temporary.	

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The Study Area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 3.1 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This only represents approximately 3% of the available native habitat for this species within the project site, and only represents 0.008% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only predicted to occur within the project site, based on a nearby record, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	
Interfere with the recovery of the species.	The species is not known to occur in the area of proposed disturbance, however habitat rehabilitation and restoration activities using seed or seedlings of local provenance are likely to assist, rather than interfere, with the recovery of the species in the local area.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 3.1 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This only represents approximately 3% of the available native habitat for this species within the project site, and only represents 0.008% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site).

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		As no important population has been detected during recent surveys and the species is only predicted to occur within the project site, based on a nearby record, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Australian Painted Snipe *Rostratula australis*** The Australian Painted Snipe is a secretive, cryptic, crepuscular species that occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains (Marchant and Higgins 1993). The species is patchily distributed throughout Australia, with most records being in the south-east. Records are erratic, the species being absent from areas in some years and common in others. There are no records for the Study Area and the species would only be expected to occur occasionally at best. Artificial waterbodies possibly suitable for this species are not within the area of proposed disturbance.	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.
Lead to a long-term decrease in the size of an *important population* of a species.	Any impacts on any local population will be minor and temporary. The creation of additional dams on site could result in a net increase in available habitat.	Artificial waterbodies possibly suitable for this species are not within the area of proposed disturbance.
Reduce the area of occupancy of an *important population*.	The actual area of occupancy of the species will be unaffected in the long-term. The creation of additional dams on site could result in a net increase in available habitat.	As above.
Fragment an existing *important population* into two or more populations.	No population of this highly mobile species will be fragmented due to the proposed action.	As above.
Adversely affect *habitat critical to the survival of a species*.	No habitat considered critical to the survival of the species is present in the Study Area.	As above.
Disrupt the breeding cycle of an *important population*.	It is expected that any disruption to any possible local population of the species would be minor and temporary.	As above.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased by the Project would result in the species decline. The creation of additional dams on site could result in a net increase in available habitat.	As above.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Any impacts on any local populations or individuals would be minor and short-term, particularly following the implementation of a pest and weed management plan, as is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	
Interfere with the recovery of the species.	Population scale movement would be unaffected in the long-term and significant disruptions to breeding cycles and interference to species recovery is therefore unlikely. The creation of additional dams on site could result in a net increase in available habitat.	As above.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Squatter Pigeon (southern subspecies) *Geophaps scripta scripta*** During the recent BAAM survey Squatter Pigeons were observed on a number of occasions, usually as singletons, though two pairs were recorded in very close proximity. Most observations were at the same location, near a creek, and may have been of the same individual. All individuals were observed in areas of active grazing and substantial habitat degradation and their occurrence may reflect the nearby presence of water rather than food resources, or be simply a result of increased visibility. Earlier surveys of the Study Area recorded Squatter Pigeons in groups of up to seven individuals. Habitat details are not available for most of these records though the report authors state that the species is likely to occur anywhere within the area that has grassland (Ecoserve and LAMR 2005). The Squatter Pigeon, despite substantial declines and even local extinctions in the southernmost parts of its range, remains common locally even in areas degraded by cattle. What is uncertain is the extent to which such populations are dependent on less disturbed patches of habitat within the landscape. Squatter Pigeons are terrestrial, foraging and breeding on the ground. The species occurs in open dry sclerophyll woodland with grassy understorey, nearly always near permanent water. Birds may occasionally feed in sown grasslands and pastures. Squatter	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
	Pigeons eat mainly seeds, including those of exotic pasture plants, and some insects (Crome and Shields 1992; Higgins and Davies 1996).	
Lead to a long-term decrease in the size of an *important population* of a species.	Any impacts on any local population would be minor and temporary.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 170 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 30% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is known to occur in areas of active grazing and substantial habitat degradation, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an *important population*.	The actual area of occupancy of the species would be unaffected by the proposed action in the long-term.	As above.
Fragment an existing *important population* into two or more populations.	No important population of this mobile species would be fragmented due to the proposed action.	As no important population has been detected during recent surveys and the species is relatively mobile and known to occur in areas of active grazing and substantial habitat degradation, fragmentation of an important population due to the Project is extremely unlikely.
Adversely affect *habitat critical to the survival of a species*.	No habitat considered critical to the survival of the species is present in the Study Area.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 170 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 30% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is known to occur in areas of active grazing and substantial habitat degradation, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Disrupt the breeding cycle of an *important population*.	Population scale movement would be unaffected in the long-term and no known breeding sites would be lost. As such, significant disruptions to breeding cycles as a result of the proposed action are unlikely.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased by the Project would result in species decline.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 170 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 30% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is known to occur in areas of active grazing and substantial habitat degradation, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Any impacts on any local populations or individuals would be minor and temporary, particularly following the implementation of a pest and weed management plan, as is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
Interfere with the recovery of the species.	Population scale movement would be unaffected in the long-term and significant disruptions to breeding cycles and interference to species recovery as a result of the proposed action are therefore unlikely.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 170 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 30% of the available native habitat for this species within the project site, but only represents 0.2% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is known to occur in areas of active grazing and substantial habitat degradation, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Greater Long-eared Bat (south-eastern form) *Nyctophilus timoriensis*** The Greater Long-eared Bat is a medium-sized insectivorous bat species that occurs in dry forest and woodland, mallee, and other arid and semi-arid habitats. It roosts in tree hollows or under bark (NPWS 2003). It is a little known species that is rarely caught (Churchill 1998). This species occurs across southern Australia, including Tasmania, but avoids coastal regions on the south-eastern mainland (NPWS 2003). Mating occurs in autumn and a single litter is produced each year (Churchill 1998). The Greater Long-eared Bat is threatened by loss and fragmentation of habitat, loss of mature hollow-bearing trees, and the use of pesticides (NPWS 2003). The genus *Nyctophilus* is readily identifiable by Anabat call analysis, though there are major difficulties in further resolution to species level. However, there are no Anabat records for any species of *Nyctophilus* for the Study Area. It is therefore unlikely that the Greater Long-eared Bat is present in the Study Area; however sporadic use of the site by any individuals possibly present in the local area cannot be discounted.	Known or potential use of the project site by listed vulnerable species is summarised in Table 8.8, while Regional Ecosystem use within the relevant bioregional province is summarised for each species in Table 8.9. Proposed disturbance to ground-truthed REs is illustrated on Figure 8.6. A comparison of the extent of each ground-truthed RE to be disturbed during the Project with the approximate current extent of each RE within the Bioregion, Local Government Area and project site is provided in Table 8.4. An assessment of impacts on fauna species due to construction and clearing, and operation, is provided in Tables 8.11 and 8.12.
Lead to a long-term decrease in the size of an *important*	Any impacts on any local population would be minor and temporary.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
population of a species.		existing surface area approvals for vegetation clearing, approximately 100 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 31% of the available native habitat for this species within the project site, but only represents 0.05% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an *important population*.	The actual area of occupancy of the species would be unaffected by the proposed action in the long-term.	As above.
Fragment an existing *important population* into two or more populations.	No population of this highly mobile species would be fragmented due to the proposed action.	
Adversely affect *habitat critical to the survival of a species*.	No habitat critical to the survival of the species is present in the Study Area.	
Disrupt the breeding cycle of an *important population*.	Overall, population scale movement would be unaffected in the long-term and significant disruptions to breeding cycles as a result of the proposed action are therefore unlikely.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased by the Project would result in the species decline.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 100 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 31% of the available native habitat for this species within the project site, but only represents 0.05% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project

Criteria	Assessment of Significance	Further Justification and Relevant Section of EIS Chapter 8
		site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Result in *invasive species* that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Any impacts on any local populations or individuals would be minor and short-term, particularly following the implementation of a pest and weed management plan, as is required under State legislation to control and prevent the establishment of invasive species as a result of the Project.	
Introduce disease that may cause the species to decline.	The implementation of a pest and weed management plan is required under State legislation to control and prevent the establishment of invasive species (and associated diseases) as a result of the Project.	
Interfere with the recovery of the species.	Population scale movement will be unaffected in the long-term and significant disruptions to breeding cycles and interference to species recovery as a result of the proposed action are therefore unlikely.	Under a 1:1 offset scenario for those areas of Endangered or Of Concern Regional Ecosystems not subject to existing surface area approvals for vegetation clearing, approximately 100 ha of potential native habitat for this species will be lost as a result of the proposed activities (refer Table 8.4 and Table 8.9). This represents approximately 31% of the available native habitat for this species within the project site, but only represents 0.05% of the remaining extent of the associated REs within the Local Government Area (which excludes those REs that also provide habitat, but do not occur within the project site). As no important population has been detected during recent surveys and the species is only considered to have a low possibility of occurrence within the project site, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.

***** Does not include EPBC Act listed species obtained from database searches but undetected in the Study Area during current and/or previous surveys and not expected to occur (as determined in Appendix 5).

EPBC Assessment of Significance on Listed Migratory Species in the Study Area*

Criteria	Assessment of Significance
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	• **Australian Cotton Pygmy-Goose *Nettapus coromandelianus albipennis*;** • **Great Egret *Ardea alba* (also known as Eastern Great Egret *Ardea modesta*);** • **Cattle Egret *Bubulcus ibis* (also known as *Ardea ibis*);** • **White-bellied Sea-Eagle *Haliaeetus leucogaster;*** • **Australian Painted Snipe *Rostratula australis* **;** • **Latham's Snipe *Gallinago hardwickii*;** • **Little Curlew *Numenius minutus*;** • **Marsh Sandpiper *Tringa stagnatilis*;** • **Common Sandpiper *Actitis hypoleucos*;** • **Red-necked Stint *Calidris ruficollis*;** • **Sharp-tailed Sandpiper *Calidris acuminata*;** • **Caspian Tern *Sterna caspia* (also known as *Hydroprogne caspia*)** • **White-throated Needletail *Hirundapus caudacutus*;** • **Fork-tailed Swift *Apus pacificus*;** • **Rainbow Bee-eater *Merops ornatus;*** • **Black-faced Monarch *Monarcha melanopsis*;** • **Rufous Fantail *Rhipidura rufifrons*;** • **Satin Flycatcher *Myiagra cyanoleuca;* and** • **Australian Reed-Warbler *Acrocephalus australis* (also known as *Acrocephalus stentoreus*).**
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of *important habitat* for a migratory species.	There is little evidence to suggest that the Study Area supports 'important habitat' for migratory species. Given their migratory habits, the ephemeral nature of food and habitat resources, and the extent of habitat across their range, it is likely that the existing resources within the Study Area would be utilised infrequently and on a transitory basis only. Within the Study Area migratory wetland species are basically restricted to artificial waterbodies such as dams rather than natural systems such as Cherwell Creek and a variety of ephemeral gullies which do not provide suitable resources. A number of small artificial waterbodies will be lost due to the Project which will reduce the quantity of suitable habitats, however, the larger and more suitable waterbodies are not within the area of proposed disturbance. Given their artificial nature, their size and the highly modified landscape within which they are set these waterbodies are not regarded as important habitat. The creation of additional dams on site could result in a net increase in available habitat for many of these species. Those remaining wetland species for which specific potential impacts need to be considered are discussed separately below, along with those migratory species that do not inhabit wetland areas. • **Australian Cotton Pygmy-Goose *Nettapus coromandelianus albipennis*** This species has previously been recorded within the Study Area, although not during the BAAM field survey. There is no potential for a direct impact associated with the removal of existing wetland habitat for the proposed mine. The proposed action would have minimal effects on any local population of this species. • **Great Egret *Ardea alba* and Cattle Egret *Bubulcus ibis*** These species are predicted to occur, within or nearby to the Study Area. Great Egret was recorded during the BAAM survey and has been recorded in previous surveys. There is no record of Cattle Egret and it is considered unlikely to occur on the study site. There is

Criteria	Assessment of Significance
	potential for a direct impact associated with the removal of existing wetland habitat during mine construction. Any such impacts involving habitat would be minor and may be mitigated by the habitat creation and enhancement activities noted above for other wetland species. The proposed action would have minimal effects on any local population of these species. • **White-bellied Sea-Eagle *Haliaeetus leucogaster*** This species has been recorded in previous surveys and is predicted to occur. There is potential for a direct impact associated with the removal of large trees during mine construction. Any such impacts involving habitat would be minor and may be mitigated by the retention of large trees (both live and dead), where practical. • **Australian Painted Snipe *Rostratula australis* and Latham's Snipe *Gallinago hardwickii*** These species are predicted to occur, within or nearby to the study area, although neither have been recorded previously. As little suitable wetland vegetation occurs in the Study Area these species would only be expected to occur on the study site occasionally, at best. There is no potential for a direct impact associated through the removal of existing wetland habitat during mine construction. The proposed action is not expected to have any effect on these species. • **Little Curlew *Numenius minutus*** This species may occur within or nearby to the Study Area, but has not been recorded previously. It is expected to occur on the study site occasionally, at best. There is potential for a direct impact associated with the removal of existing wetland and grassland habitat during mine construction. Any such impacts involving habitat would be minor. The proposed action is not expected to have any effect on this species. • **Marsh Sandpiper *Tringa stagnatilis,* Common Sandpiper *Actitis hypoleucos,* Red-necked Stint *Calidris ruficollis* and Sharp-tailed Sandpiper *Calidris acuminata*** These species have been recorded previously within or near the Study Area. There is potential for a direct impact associated with the removal of existing wetland habitat during mine construction. However, habitat considered suitable for these species (whether or not it can be considered 'important' habitat) will not be impacted by the proposed works. • **Caspian Tern *Sterna caspia*** This species has been recorded within or nearby to the study area in previously surveys. It is considered to be a sporadic visitor to the study site. There is no potential for a direct impact associated with the removal of existing wetland habitat during mine construction. The proposed action is not expected to have any effect on this species. • **Fork-tailed Swift *Apus pacificus* and White-throated Needletail *Hirundapus caudacutus*** These species have been recorded within or nearby the Study Area in previous surveys, and are predicted to occur. Both are aerial species for which the Study Area will not represent 'important habitat' and no impacts are expected due to mine construction or operation as these species forage over a wide variety of land use, including human infrastructure and large waterbodies. • **Rainbow Bee-eater *Merops ornatus*** Rainbow Bee-eater was regularly recorded across the Study Area and is a very common, widespread species. Consequently, the Study Area will not represent important habitat for the bird and any potential impacts during mine construction, such as loss of breeding substrate and loss of prey species due to clearing and inundation, would be negligible.

Criteria	Assessment of Significance
Result in invasive species that are harmful to the migratory species becoming established in an area of *important habitat* for the migratory species.	As noted above, the Study Area is not considered to be an area of 'important habitat' for migratory birds, whether they are wetland or terrestrial species. The local area has a history of forest clearing and habitat modification, which has benefited a number of feral and invasive flora and fauna species. The proponent proposes the implementation of a weed and feral animal control program for the Project in accordance with any local and/or State government pest or weed management plans that will contribute to the overall enhancement of habitat for migratory species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an *ecologically significant proportion* of the *population* of a migratory species.	There is no evidence to suggest that the Study Area supports an 'ecologically significant proportion of a population' of any of the migratory birds known or considered likely to occur. The creation of additional dams on site could result in a net increase in available habitat for many of these species. Those wetland species for which specific potential impacts need to be considered are discussed below, along with those migratory species that do not inhabit wetland areas. • **Australian Cotton Pygmy-Goose *Nettapus coromandelianus albipennis*** This species was not recorded within or nearby the Study Area, but is predicted to occur sporadically in low numbers. It breeds from late spring to mid autumn, nesting high in hollow trees near water and, if present, there is potential for a direct impact associated with the removal of existing wetland habitat and associated large dead trees suitable for nesting during mine construction. There is potential for breeding by this species within the Study Area but none of the possible areas is within the area of proposed disturbance. Any possible impacts on other aspects of lifecycle would be minor. • **Great Egret *Ardea alba* and Cattle Egret *Bubulcus ibis*** These species are predicted to occur, within or nearby to the study area. Great Egret was recorded during the BAAM survey and has been recorded in previous surveys. There is no record of Cattle Egret and it is considered unlikely to occur on the study site. There is potential for a direct impact associated with the removal of existing wetland habitat during mine construction. Any such impacts involving habitat would be minor. The proposed action would have minimal effects on any local population of these species. • **White-bellied Sea-Eagle *Haliaeetus leucogaster*** This species has been recorded in previous surveys and is predicted to occur. There is potential for a direct impact associated with the removal of large trees during mine construction. Any such impacts involving habitat would be minor and may be mitigated by the retention of large trees (both live and dead), where practical. Any possible impacts on lifecycle as a result of the proposed action would be minor. • **Australian Painted Snipe *Rostratula australis* and Latham's Snipe *Gallinago hardwickii*** These species are predicted to occur, within or nearby to the Study Area, although neither have been recorded previously. As little suitable wetland vegetation occurs in the Study Area these species would only be expected to occur on the study site occasionally, at best. Latham's Snipe breeds in the northern hemisphere. There is no potential for a direct impact associated with the removal of existing suitable wetland habitat during mine construction. Any such impacts involving habitat would be minor. The proposed action is not expected to have any effect on these species. • **Little Curlew *Numenius minutus*** This species may occur within or nearby to the Study Area, but has not been recorded previously. It breeds in the northern hemisphere and is expected to occur on the study site occasionally, at best. There is potential for a direct impact associated with the removal of existing wetland and grassland habitat during mine construction. Any such impacts involving habitat would be minor. The proposed action is not expected to have any effect on this species. • **Marsh Sandpiper *Tringa stagnatilis,* Common Sandpiper *Actitis hypoleucos,* Red-necked Stint *Calidris ruficollis* and Sharp-tailed Sandpiper *Calidris acuminata***

Criteria	Assessment of Significance
	These species have been recorded within or near the Study Area on previous surveys. All of these species breed in the northern hemisphere. Habitat considered suitable for these species would not be impacted by the proposed action and would not have any effect on these species. • **Caspian Tern *Sterna caspia*** This species has been recorded within or nearby to the study area in previously surveys. It is considered to be a sporadic visitor and is not expected to breed within the Study Area. There is no potential for a direct impact associated with the removal of existing suitable wetland habitat during mine construction. Any such impacts involving habitat would be minor. The proposed action is not expected to have any effect on this species. • **Fork-tailed Swift *Apus pacificus* and White-throated Needletail *Hirundapus caudacutus*** These aerial species have been previously recorded within or nearby the Study Area, and are predicted to occur outside of their breeding seasons (they do not breed in Australia). Both are common, widespread species for which the Study Area will not support an 'ecologically significant proportion of a population' and no impacts are expected due to mine construction or operation. • **Rainbow Bee-eater *Merops ornatus*** Rainbow Bee-eater was regularly recorded across the Study Area and is a very common, widespread species. Consequently, the Study Area will not support an 'ecologically significant proportion of a population' and any potential impacts during mine construction, such as loss of breeding substrate and loss of prey species due to clearing and inundation, would be negligible. • **Black-faced Monarch *Monarcha melanopsis*, Rufous Fantail *Rhipidura rufifrons* and Satin Flycatcher *Myiagra cyanoleuca*** These species are predicted to occur within or nearby the Study Area. The Rufous Fantail and Satin Flycatcher have been recorded in previous surveys. These species would only be expected to occur on the study site occasionally, at best. If present, they have the potential to be directly impacted by the loss of riparian habitat suitable for foraging, resting during migration and/or breeding. However, most suitable habitat for these species lies outside of the area for proposed works resulting in a predicted insignificant impact on these species overall. • **Australian Reed-Warbler *Acrocephalus australis*** This species was recorded within the Study Area during the BAAM field survey and has also been recorded within or nearby in previous surveys. Where present, it has the potential to be directly impacted by the removal of existing wetland habitat during mine construction, although the most suitable habitat identified for this species lies outside the zone of the proposed works. Any associated impacts on the life cycles of any local population as a result of the proposed action would be minor.

* Does not include EPBC Act listed species obtained from database searches but undetected in the Study Area during current and/or previous surveys and not expected to occur (as determined in Appendix 5).

** Painted Snipes in Australia have previously been considered a migratory subspecies of *Rostratula benghalensis* (Marchant and Higgins 1993). Most recently, the Australian birds have been considered to be an endemic species, *R. australis*, in which case *R. benghalensis* does not occur in Australia (Garnett and Crowley 2000; Geering *et al*. 2007).