

6 September 2023

Department of Water and Environmental Regulation,
Native Vegetation Regulation
Locked Bag 10
JOONDALUP DC WA 6919

Attention: [REDACTED], Native Vegetation Regulation

Dear [REDACTED],

RE: Native Vegetation Clearing Permit Application - Water Bores & Borrow Pits - SKA1-Low Project

On behalf of the Commonwealth Scientific Industry and Research Organisation (CSIRO) please find enclosed a native vegetation clearing permit application for the purposes of establishing water bores and borrow pits for the Square Kilometre Array (SKA) Low Project (SKA1-Low Project). The SKA1-Low Project is located on Inyarrimanha Ilgari Bundara, the CSIRO Murchison Radio-astronomy Observatory (MRO); encompassing both the former Pastoral Station referred as Boolardy Station, and lot 502 that had been excised from Boolardy Station and called the MRO (where the Australian Square Kilometre Array Pathfinder (ASKAP) and Murchison Widefield Array (MWA) are located) within the Shire of Murchison, approximately 350km north-east of Geraldton and 770km north of Perth (Figure 1).

Included with this letter is:

- A completed application form: Application for new permit or referral to clear native vegetation (Attachment 1).
- An ESRI shapefile, encompassing the eleven discrete areas that are the subject of the clearing permit application.
- Report 'Ecological Assessment – November 2022 - Square Kilometre Array' undertaken by AECOM (2022) (Attachment 2).

This letter provides context for the proposed clearing and includes an assessment against the ten Clearing Principles, as defined under Schedule 5 of the *Environmental Protection Act 1986* (EP Act). The assessment refers, in particular to, the relevant findings of the ecological survey and assessment work conducted by AECOM (2022) (Attachment 2).

1 BACKGROUND

The SKA Project is a large international radio telescope project, which aims to answer key cosmological questions, using radio waves from across the universe to look back into the cosmic dark ages. The SKA project will draw on the skills, experiences, and support, of 14 countries working collaboratively to construct and operate elements of the SKA project, with the first phase of the project being hosted by South Africa and Australia. Australia will host the SKA1-Low Frequency Aperture Array (SKA1-Low) (the Project). SKA1-Low will consist of up to 512 array stations. Each array station will consist of up to 256 individual antennas, representing more than 130,000 antennas in total.

The Project was referred under Part IV of the EP Act and the referral decision of 20 March 2017 was 'not assessed by the Environmental Protection Authority (EPA) - Dealt with Under Part V Division 2 (Clearing) (Not appealable)'. The Project was also referred under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and was determined 'not a controlled action'.

Considerable ecological survey and assessment work was undertaken for the abovementioned Project referrals and subsequently for several associated native vegetation clearing permits (Purpose Permits), as shown in Table 1.

TABLE 1: NATIVE VEGETATION CLEARING PERMITS FOR ASKAP, BOOLARDY OR SKA1-LOW PROJECT

NVCP#	AREA (HA)_	APPLICANT	COMMENCEMENT	EXPIRY
CPS 3317/1	57.0	CSIRO	03/01/2010	03/01/2015
CPS 4439/1	33.84	CSIRO	05/09/2011	05/09/2015
CPS 6465/1	18.0	CSIRO	30/05/2015	30/05/2020
CPS 7562/1&2	53.5569	CSIRO	17/03/2018	17/03/2033
CPS 8003/1	11.318	CSIRO	03/08/2018	03/08/2023
CPS 9547/1&2	129.75	CSIRO	09/01/2023	09/01/2033
CPS 10114/1	578.6	CSIRO	24/07/2023	24/07/2028

Source: DWER Clearing Permit System <https://cps.dwer.wa.gov.au>

The work undertaken for the clearing permits listed in Table 1 included detailed flora and vegetation assessments, basic fauna assessments, and targeted flora and fauna searches. The most recent work undertaken to support this current permit application (AECOM, 2022) (Attachment 2), has benefitted from the preceding surveys and assessments and its scope included the following:

- Reconnaissance flora and vegetation assessment, in accordance with the EPA (2016) *Flora and Vegetation Survey Technical Guide*.
- Targeted significant flora searches.
- Basic fauna assessment, in accordance with the EPA (2020) *Fauna Survey Technical Guide*.
- Targeted searches for conservation significant fauna and their habitat.

The land associated with this application encompasses Lot 18 on Deposited Plan 220344 and is leased by CSIRO under Crown Land Title *LR3064-479*.

2 CLEARING LOCATIONS AND EXTENT

The permit application seeks approval to clear up to 18.80ha of vegetation at various locations, listed in Table 2 and provided in the enclosed shapefile. Note that the shapefile provided, includes additional sites which do not form part of this application. The application to clear native vegetation only relates to the locations listed in Table 2.

TABLE 2: PROPOSED CLEARING LOCATIONS

LOCATION	AREA (HA)
BP01 boundary	2.44ha
BP01 access road	0.27ha
BP05	1.26ha
BP05 access road	0.35ha
BP06	3.28ha
BP07	4.25ha
TN BP road construction camp	2.06ha
TN BP road ASKAP turnoff	1.81ha
Dorothie's boundary	1.43ha
Dorothie's access road (option #2)	0.48ha
Pia Bubba boundary	1.20ha
TOTAL AREA	18.80ha

Note that while the AECOM (2022) survey and assessment report has included all those locations listed in Table 2, there are three additional locations (*Kali amended corridor route – 35.57ha, TN Kali road east – 1.70ha, and Dorothie's access road option 1 – 0.37ha*) referred to in the AECOM report, which are not the subject of this current application.

3 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

The proposed clearing has been assessed against the ten Clearing Principles, as set out in Schedule 5 of the EP Act (Table 3).

TABLE 3: ASSESSMENT AGAINST TEN CLEARING PRINCIPLES

ASSESSMENT	SOURCES	OUTCOME
<p>Principle (a) - Native vegetation should not be cleared if it comprises a high level of biological diversity.</p> <p>The locations where clearing is proposed, do not contain a high level of biological diversity. The following has been summarised from AECOM (2022) and is applicable for the entire survey area:</p> <ul style="list-style-type: none"> • A total of 41 native flora species from 20 genera and 12 families were recorded AECOM (2022). • No weed species were recorded during the survey (AECOM, 2022). • No 'Threatened' flora species listed under the EPBC Act, or the Biodiversity Conservation Act 2016 (BC Act), were recorded. • Three 'Priority' flora species listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded: 33 individuals of <i>Eremophila muelleriana</i> (P3), 305 individuals of <i>Gunniopsis divisa</i> (P3), and 15 individuals of <i>Hemigenia tysonii</i> (P3). <ul style="list-style-type: none"> – <i>Eremophila muelleriana</i> and <i>Hemigenia tysonii</i> did not occur on any of the locations the subject of this current clearing permit application. – <i>Gunniopsis divisa</i> occurred at the TN BP road construction camp location only. 'Priority 3' flora species <i>Gunniopsis divisa</i> is a prostrate annual succulent herb that grows up to 10 cm high. Where the species was recorded it was considered locally common, as it was found in high concentrations in an adjacent area. Further, the single-phase 'Level 2' flora and vegetation assessment conducted by AECOM in 2014 for the indicative SKA1-Low project area, recorded nine populations of <i>G divisa</i>, comprising a total of 149 individuals, 138 of which within the AvEp Acacia Woodland community. • During the AECOM (2022) field survey the vegetation was observed as being homogenous, characterised by Mulga Open Woodlands with various understorey components. The terrain was flat with clays, clay loams, and clay sands, on flat terrain sometimes with quartz on the surface. The application area does not contain vegetation that is in a better condition than surrounding areas, noting that the land has been subject to historical sheep and cattle grazing since 1876, but was de-stocked approximately four years ago. • No Threatened Ecological Communities (TECs) listed under the EPBC Act or BC Act, were identified in the AECOM (2022) survey. • Three communities were defined and mapped and are further described in AECOM (2022): <ul style="list-style-type: none"> – AiAtEf Acacia Woodland; 47.58 ha; 32 native flora species. – AvEp Acacia Woodland; 1.68 ha; 16 native flora species. 	<p>Square Kilometre Array Ecological Assessment, AECOM, 2022.</p> <p>Square Kilometre Array Ecological Assessment, AECOM 2014.</p> <p>Technical Guide Flora and Vegetation Assessment – EPA, 2016a.</p> <p>National Vegetation Information System (NVIS) framework at level V Association (DotEE, 2021).</p>	<p>The proposal is not likely to be at variance with this clearing principle.</p>

ASSESSMENT	SOURCES	OUTCOME
<ul style="list-style-type: none"> - ApAgEf Acacia Woodland; 3.24 ha; 11 native flora species. <p>Principle (b) - Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</p> <p>The proposed clearing locations are considered not to contain habitat for conservation significant fauna species. The following has been noted from AECOM (2022):</p> <ul style="list-style-type: none"> • Fauna habitats throughout the survey area consisted of three habitat types: <ul style="list-style-type: none"> - Hardpan Plains with Intermittent Sandplains (predominant and recorded at all clearing locations). - Channels and Creek Line (minor component) (recorded at TN BP road ASKAP turnoff, TN BP road construction camp and BP07). - Granite Boulders and Heaps (minor component) (recorded in BP01 only). • The desktop fauna assessment identified 27 conservation significant fauna species that could potentially occur within the survey area. The likelihood assessment determined that: <ul style="list-style-type: none"> - Two species are likely to occur; - Four species could possibly occur; - 18 species are unlikely to occur; and - Three species are considered to be negligible in their likelihood of occurrence. • The two species considered likely to occur and the four species assessed as possibly occurring were: <ul style="list-style-type: none"> - Western Spiny-tailed Skink <i>Egernia stokesii badia</i> (listed as 'Vulnerable' under the BC Act and 'Endangered' under the EPBC Act). - Northern Shield-backed Trapdoor Spider <i>Idiosoma clypeatum</i> (listed as 'Priority 3' by the DBCA). - Grey Falcon <i>Falco hypoleucos</i> (listed as 'Vulnerable' under the EPBC and the BC Acts). - Peregrine Falcon <i>Falco peregrinus</i> (listed as 'Other Specially Protected' under the BC Act and 'Vulnerable' under the EPBC Act). - Australian Painted Snipe <i>Rostratula australis</i> (listed as 'Endangered' under both the BC Act and EPBC Act). - Woma <i>Aspidites ramsayi</i> (listed as 'Priority 1' by the DBCA and 'Endangered' under the EPBC Act). 	<p>Square Kilometre Array Ecological Assessment, AECOM, 2022.</p> <p>Native Vegetation Clearing Permit Supporting Document, Square Kilometre Array, AECOM 2021.</p> <p>Square Kilometre Array Ecological Assessment, AECOM 2014.</p> <p>Technical Guide – Fauna Surveys, EPA 2020.</p> <p>Environmental Management Plan <i>Egernia stokesii</i> subsp. <i>badia</i>, AECOM (2021). [prepared in relation to protection of MNES during the SKM-Low Project].</p>	<p>The proposal may be at variance with this clearing principle.</p>

ASSESSMENT	SOURCES	OUTCOME
<ul style="list-style-type: none"> ● AECOM (2022) identified 59 fauna species comprising 46 bird, two mammal (including one introduced), three invertebrate, seven reptile and one amphibian species. Four conservation significant fauna species were recorded during the survey, but not all within the proposed clearing areas. The species recorded were: <ul style="list-style-type: none"> – Grey Falcon <i>Falco hypoleucos</i> (recorded approximately 30km east of BP07). It is likely that this species is an uncommon visitor, taking advantage of optimal hunting conditions following high rainfall in the months preceding the survey (AECOM, 2022). – Northern Shield-backed Trapdoor Spider <i>Idiosoma clypeatum</i> recorded within BP01 (one location), BP06 (two locations), and BP07 (four locations); two additional locations were also recorded approximately 30km east of BP07. Previous surveys by AECOM (2014, 2021) and Phoenix (2015), recorded a trapdoor spider that is now considered likely to be the North Shield-backed Trapdoor Spider (AECOM, 2022). Nine trapdoor burrows were recorded during the survey, with three intact (two in BP06 and one in BP07) and potentially active at the time of the survey, the remaining six burrows had been disturbed and the occupants predated by a goanna (AECOM, 2022). – Welcome Swallow <i>Hirundo neoxena</i> (listed as ‘Marine’ under the EPBC Act) (seen/heard within TN BP road ASKAP turnoff). This species is widespread and common, found in a broad range of habitat types throughout the country (AECOM, 2022). – Black-faced Cuckoo-shrike <i>Caracina novae-hollandiae</i> (listed as Marine under the EPBC Act). One specimen recorded approximately 30 km east of BP07. This species is widespread and common, found in a broad range of habitat types throughout the country (AECOM, 2022). ● The habitat requirements of the conservation significant species (from the AECOM (2022) data search and field survey) are not likely to be compromised for one or more of the following reasons: <ul style="list-style-type: none"> – Widespread distribution of the species outside the survey area. – Widespread extent of its preferred habitat(s) outside the survey area. – Unsuitable or very marginal habitat within the survey area for some species. – Infrequent occurrence – temporary or seasonal visitation only for some species. ● AECOM (2022) considered the small granite boulders and rocks within BP07 as marginal suitable habitat for <i>Egernia stokesii</i> subsp. <i>bardia</i>. Crevices within this habitat were shallow and unlikely to represent critical habitat, and no evidence of use by this species was noted (AECOM, 2022). In accordance with the Environmental Management Plan: <i>Egernia stokesii</i> subsp. <i>bardia</i>, a pre- 		

ASSESSMENT	SOURCES	OUTCOME
<p>clearing surveys will be undertaken to confirm the absence of the skink within demarcated clearing areas and establishment of a 50m buffer around any confirmed skink populations.</p> <p>Principle (c) - Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</p> <p>AECOM (2022) noted the following:</p> <ul style="list-style-type: none"> Targeted searches were conducted for conservation significant flora species considered likely to occur in the survey area. No 'Threatened' flora species listed under the EPBC Act or BC Act, were recorded within the survey area. Three listed 'Priority' flora species were recorded during survey: 33 individuals of <i>Eremophila muelleriana</i> (P3), 305 individuals of <i>Gunningsia divisa</i> (P3), and 15 individuals of <i>Hemigenia tysonii</i> (P3). <ul style="list-style-type: none"> <i>Eremophila muelleriana</i> and <i>Hemigenia tysonii</i> did not occur within any of the locations the subject of this clearing permit application. <i>Gunningsia divisa</i> was recorded within the <i>TN BP road construction camp</i> location. An estimated 235 specimens were present at this location, with 50 specimens located outside but adjacent to this location, and a further 20 individuals approximately 50km east-northeast. 'Priority 3' flora species <i>Gunningsia divisa</i> is a prostrate annual succulent herb that grows up to 10cm high. Where the species was recorded it was considered locally common, as it was found in high concentrations in an adjacent area during the survey (AECOM, 2022). 	<p>Square Kilometre Array Ecological Assessment, AECOM, 2022.</p>	<p>The proposal is not likely to be at variance with this clearing principle.</p>
<p>Principle (d) - Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a threatened ecological community.</p> <p>AECOM (2022) recorded and mapped three vegetation communities within the proposed clearing areas. No federally or State-listed TEC or priority ecological communities (PEC), were recorded within the application area.</p> <p>The nearest PEC is the 'Priority 1' <i>Meka calcrete groundwater assemblage</i> type on <i>Murchison palaeodrainage on Meka Station</i> and is approximately 15km from the nearest site of proposed clearing.</p> <p>Principle (e) - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</p> <p>The AECOM (2022) survey area intersects four pre-European vegetation associations (18, 29, 39, and 204) mapped by Beard et al. (1976). All have more than 99% remaining within the Murchison Interim</p>	<p>Square Kilometre Array Ecological Assessment, AECOM, 2022.</p> <p>Square Kilometre Array Ecological Assessment, AECOM 2014.</p>	<p>The proposal is not likely to be at variance with this clearing principle.</p>

ASSESSMENT	SOURCES	OUTCOME
<p>Biogeographic Region of Australia (IBRA) region and the Shire of Murchison (Statewide Vegetation Statistics, Govt. of WA, 2019). The EPA's Guidance Statement No. 33 has identified a threshold of the retention of 30% of pre-European extent of each community and advises that ecological communities with levels below 30% should be fully retained in unconstrained areas (EPA, 2008).</p> <p>The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) recognises that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biodiversity is to be protected. This is consistent with the EPA Position Statement No. 2 on <i>Environmental Protection of Native Vegetation in Western Australia</i> (EPA, 2000).</p> <p>The proposed clearing represents a very minor proportion of the remaining extent of the four Beard vegetation associations and will not alter the conservation status of these associations.</p>		<p>variance with this clearing principle.</p>
<p>Principle (f) - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p> <p>There are no wetlands of national importance within the application area. Two wetlands of national significance are located within the surrounds of the proposal. Wooleen Lake is located approximately 42km to the south-west and Breberle Lake lies approximately 55km to the north-west.</p> <p>The application area does not contain any obvious well-defined watercourses. AECOM (2022) Field survey recorded fauna habitat described as 'Channels' and 'Creek Line', within three of the proposed clearing areas.</p> <p>Inspection of those sites where clearing is proposed using the ESRI shapefile, supplied with the permit application, shows that all sites appear to be in areas of ephemeral sheet-flow drainage (ill-defined overland drainage) and not within or adjacent to significant drainage channels. The proposed clearing is not likely to significantly impact the local hydrological conditions within the area, noting that the application area only intersects a small proportion of this habitat type.</p>	<p><i>Square Kilometre Array Ecological Assessment, AECOM 2021.</i></p> <p><i>SKA EP Act Referral Supporting Document, AECOM, 2017.</i></p> <p><i>Square Kilometre Array Ecological Assessment, AECOM 2014.</i></p>	<p>The proposal may be at variance with this clearing principle.</p>
<p>Principle (g) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p> <p>While the soils in the application area are susceptible to wind and water erosion, the proposed clearing of 18.80ha within an extensively vegetated landscape, is not likely to result in appreciable land degradation. The clearing of 18.80ha will be conducted across 11 small and discrete locations and will not lead to appreciable land degradation.</p> <p>Examination of the ESRI shapefile provided with this clearing permit application indicates that the proposed areas of clearing are located outside areas of dendritic drainage, so there would be no interference with drainage banks that might otherwise lead to significant soil erosion; excavation at borrow sites would result in internally-drained, small-shallow, depressions resulting in some very</p>	<p><i>Square Kilometre Array Ecological Assessment, AECOM, 2022.</i></p> <p><i>SKA EP Act Referral Supporting Document, AECOM, 2017.</i></p>	<p>The proposal is not likely to be at variance with this clearing principle.</p>

ASSESSMENT	SOURCES	OUTCOME
<p>minor areas of waterlogging and no significant erosion, as is the case with historical excavations seen at several of the sites.</p> <p>Clearing and excavation will be managed by:</p> <ul style="list-style-type: none"> • Limiting the degree or magnitude of the cleared footprint in the first instance [minimizing footprint; not disturbing soil while clearing bore hole locations]. * • Careful planning and construction of roads to minimise capture and channelling overland flows, particularly on hardpan plains. * • Rehabilitate: restoring the maximum environmental value that is reasonably practicable. * <p>*As per mitigation measures stated within proponent's referral document <i>Square Kilometre Array Radio Telescope SKA EP Act Referral (2017)</i>.</p>	<p><i>Square Kilometre Array Ecological Assessment, AECOM 2014.</i></p>	<p>Principle (h) - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</p>
<p>The proposed clearing will not impact on the environmental values of any conservation areas, considering the following:</p> <ul style="list-style-type: none"> • The nearest PEC is the 'Priority 1' <i>Meka calcrete groundwater assemblage type on Murchison palaeodrainage on Meka Station</i> and is approximately 15km from the nearest site of proposed clearing. This habitat type is not represented in the areas of proposed clearing. • The nearest conservation areas are the Toolonga nature reserve located approximately 120km west and Lakeside National Park 150km south-east of the SKA1-Low Project location. 	<p><i>Square Kilometre Array Ecological Assessment, AECOM 2014.</i></p>	<p>Principle (i) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</p>
<p>The proposed clearing of 18.80ha will be conducted across 11 small and discrete areas and will not result in a perceptible rise in groundwater levels, noting the extent of surrounding vegetation. The proposed clearing will not result in a perceptible increase in sheet runoff from the application area. The removal of native vegetation from areas described by AECOM (2022) as 'Channels' and 'Creepline' at three clearing locations (TN BP road ASKAP turnoff, TN BP road construction camp, and BP07), may result in increased sedimentation following heavy rainfall. However, the impact of this will be negligible, given the small area impacted and with consideration of the extent of native vegetation surrounding the application area.</p>	<p><i>Square Kilometre Array Ecological Assessment, AECOM 2014.</i></p>	<p>Principle (j) - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</p>

ASSESSMENT	SOURCES	OUTCOME
<p>The climate of the region is described as arid, with an average annual rainfall of 190 to 240mm. It is expected that given the high average daily evaporation rate for the area, any surface water resulting from rainfall events is likely to be relatively short lived, even in bare areas post clearing. Noting the above, and that the proposed clearing is limited to 18.80ha across 11 small and discrete locations, surrounded by extensive tracts of remnant vegetation, run-off and surface flows will be limited, and the risk of flooding is considered very low.</p>	<p><i>Square Kilometre Array Ecological Assessment, AECOM 2021.</i></p>	<p><i>The proposal is not likely to be at variance with this clearing principle.</i></p>

4 CLOSING

We trust that the information provided is sufficient for the Department to make its decision on this clearing permit application. Please do not hesitate to contact the undersigned should you have any questions or require any additional information.

For and on behalf of Aurora Environmental,


Principal Environmental Scientist

Figures:

1. Site Locations

Attachments:

1. Application Form – New Permit or referral to Clear Native Vegetation
2. Ecological Assessment – November 2022, Square Kilometre Array (AECOM, 2022)

Enclosed with application (on email) is a shapefile containing the proposed clearing areas. Please note this Shapefile also includes additional areas that were surveyed and assessed that are not included within this application.

DISCLAIMER

This document has been produced in accordance with and subject to an agreement between Aurora Environmental (“Aurora”) and the client for whom it has been prepared (“Client”). It is restricted to those issues that have been raised by the Client in its engagement of Aurora and prepared using the standard of skill and care ordinarily exercised by Environmental / Occupational Health and Safety consultants in the preparation of such documents.

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