



Application for Works Approval Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6800/2023/1
Works Approval Holder	Square Kilometre Array Observatory
File Number	DER2023/000155~2
Premises	SKAO Construction Camp Legal description - Part of Lot 18 on Deposited Plan 220344 As defined by the coordinates in Schedule 2 of the Works Approval
Date of Report	21 November 2024
Decision	Revised works approval granted

**MANAGER WASTE INDUSTRIES
REGULATORY SERVICES**

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Works approval W6800/2023/1 is held by Square Kilometre Array Observatory (Works Approval Holder) for the SKAO Construction Camp (the premises), located at on Part of Lot 18, Deposited Plan 220344.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the premises. As a result of this assessment, Revised Works Approval W6800/2023/1 has been granted.

The revised works approval issued as a result of this amendment consolidates and supersedes the existing works approval previously granted in relation to the premises.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Amendment summary

On 25 July 2024, the Works Approval Holder submitted an application to the department to amend works approval W6800/2023/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are proposed:

Extension of the environmental commissioning and time limited operations periods

On 6 June 2024 the applicant was informed they can commence environmental commissioning for items of infrastructure listed in condition 5 as the Environmental Compliance Report (ECR), which was successfully submitted in accordance with conditions 2 and 3.

Following the completion of the current environmental commissioning phase the applicant reported the Wastewater Treatment Plant (WWTP) was not going to meet the Total Dissolved Solids (TDS) criteria of <2800 mg/L required during time limited operations (TLO) as per condition 15 of the works approval.

The applicant has requested an extension of the commissioning phase by a further 30 days to monitor the (WWTP) effluent with a modified brine stream. An additional 60 days has been provided, effective from the date of approval of this amendment to ensure there is more than sufficient time to ensure the TLO criteria can be met.

The proposed solution to maintain the final effluent within the works approval TDS limit criteria is to use the spray field for the WWTP effluent, while diverting brine produced by the RO plant to the proposed evaporation pond. It is expected that the WWTP effluent without the brine will be compliant with the current limits of the works approval for the commissioning and TLO phases. No change to the TDS limit during TLO is proposed.

In addition to extension of the commissioning period, the current works approval provides for 120 calendar days for time limited operations. Due to logistical issues experienced during the commissioning phase relating to road closures and on-site storage ability, the time limited operations period has been extended to the maximum 180 calendar days in accordance with DWER's Guideline Industry Regulation Guide to Licensing to ensure there is sufficient overlap in transferring operations from the works approval to a subsequent licence application.

Inclusion of the Turkey's nest and additional tanks

The existing turkey's nest is proposed to be included in the prescribed premise boundary of the works approval. It will be used to store brine from the RO plant while a new evaporation pond is being constructed, as well as in the event that additional storage is required during TLO. The Turkey's nest has a volume of 450 m³ and is lined with a 0.05mm LLDPE liner.

Brine will also be stored in the proposed new tanks with a minimum total volume of 135 m³. The daily maximum brine production is 50 KL, allowing the Turkey's nest and tanks to store up to 11 days' worth of brine. The Turkey's nest will always maintain a minimum freeboard of 0.5 m, with daily inspections conducted to prevent overflow. The tanks will be equipped with an overflow pipe into the turkeys nest to control maximum storage. A truck schedule will be arranged with an external contractor to remove brine from the site before 80% of total storage capacity (Turkey's nest and tanks combined) is reached.

The Turkey's nest and new tanks are also proposed to be used as an emergency storage of brine in case of severe weather events such as tropical cyclones, which may cause road closures, or potentially fill the evaporation pond to its limit.

Remove the requirement for a blended effluent

With the new proposed modified brine stream the spray field will receive WWTP effluent, while brine produced by the RO plant will be diverted to the proposed evaporation pond negating the need for the works approval to specify blended effluent in conditions.

RO Brine diversion to new evaporation pond and increase of the RO brine output

A new evaporation pond is proposed to be constructed within the existing irrigation spray field. The total area of the spray field (4.2 ha) will be split into two areas: 1.18 ha will be designated to the construction of the proposed evaporation pond and 2.7 ha will continue to be used as a spray field for the effluent from the WWTP.

The proposed updated sprayfield and evaporation pond design and per person effluent disposal rates were calculated based on monitoring to date from the environmental commissioning period, which included daily monitoring of camp occupancy and wastewater generation. An anticipated maximum of 200 people was used to inform the design load of the evaporation pond and remaining section of the irrigation sprayfield. Based on this maximum wastewater generation per day is expected to be 31.3m³ per day, which will be less than the existing works approval maximum of 50m³ of wastewater.

Based on the anticipated treated effluent quality, the minimum sprayfield area required for the premises (soil risk category of D) is 1.7 hectares. As the proposed sprayfield is 2.7 hectares it is considered sufficiently sized.

However based on the current RO brine rejection rates at the site, the maximum brine generation per day is currently a 1:1 ratio to the treated effluent. As a result, the applicant requested that the RO brine limit is increased from 20m³ to 50m³. The proposed evaporation pond will be designed to account for this maximum.

The water balance for the evaporation pond was calculated using the Water Corporation Design Guideline DS231, and the pond dimensions are provided below. A proposed design markup is presented in Schedule 1: Figure 4 of the attached works approval.

The evaporation pond is proposed to be constructed once the extension to the commissioning period is approved.

The proposed evaporation pond will:

- operate with a minimum freeboard of 0.5 m
- include daily inspections to prevent overflow
- be fenced off to prevent access of unauthorised people and fauna
- be emptied before severe weather events if required based on daily inspections to assure no overflow will occur.
- have an impervious plastic pond liner with a minimum 10-year design life

3.0 Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

2.3 Source-pathways and receptors

2.3.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Works Approval Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Works Approval Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Evaporation pond construction	Air/windborne pathway causing impacts to health and amenity.	Dust suppression activities Area proposed for the evaporation pond is already cleared
Noise			No noise outside working business hours
Hydrocarbons (spills and leaks)		Localised contamination of soils causing impacts to amenity	Regular servicing of vehicles and machinery Vehicles and machinery checked for service logs prior to coming to site Spill kits made available at the location
Operation (including time-limited-operations)			
Odour	Turkeys nest and evaporation pond water	Air/windborne pathway causing impacts to health and amenity.	None proposed

Emission	Sources	Potential pathways	Proposed controls
Ro reject (brine) water from turkeys nest, evaporation pond and tanks	Spills/leaks Discharge during high rainfall events.	Overland runoff, direct discharge and migration via soil to groundwater.	External contractor to remove brine from the site before 80% of total storage capacity Freeboard of 0.5 m adopted Routine inspections Emptied before severe weather events if the forecast rainfall or road closures are likely to result in an overflow

2.3.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Works Approval Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Native Title Holders of the Wajarri Yamatiji Part A	The premises is located within the south-west Wajarri Yamatiji Part A Native Title Determination area
Commercial premises - Boolardy Airport	3.8 km south-west of premises boundary
Environmental receptors	Distance from prescribed activity
Gascoyne groundwater area	Located within the proclaimed surface water area
Roderick River	2.6 km north-west of premises boundary

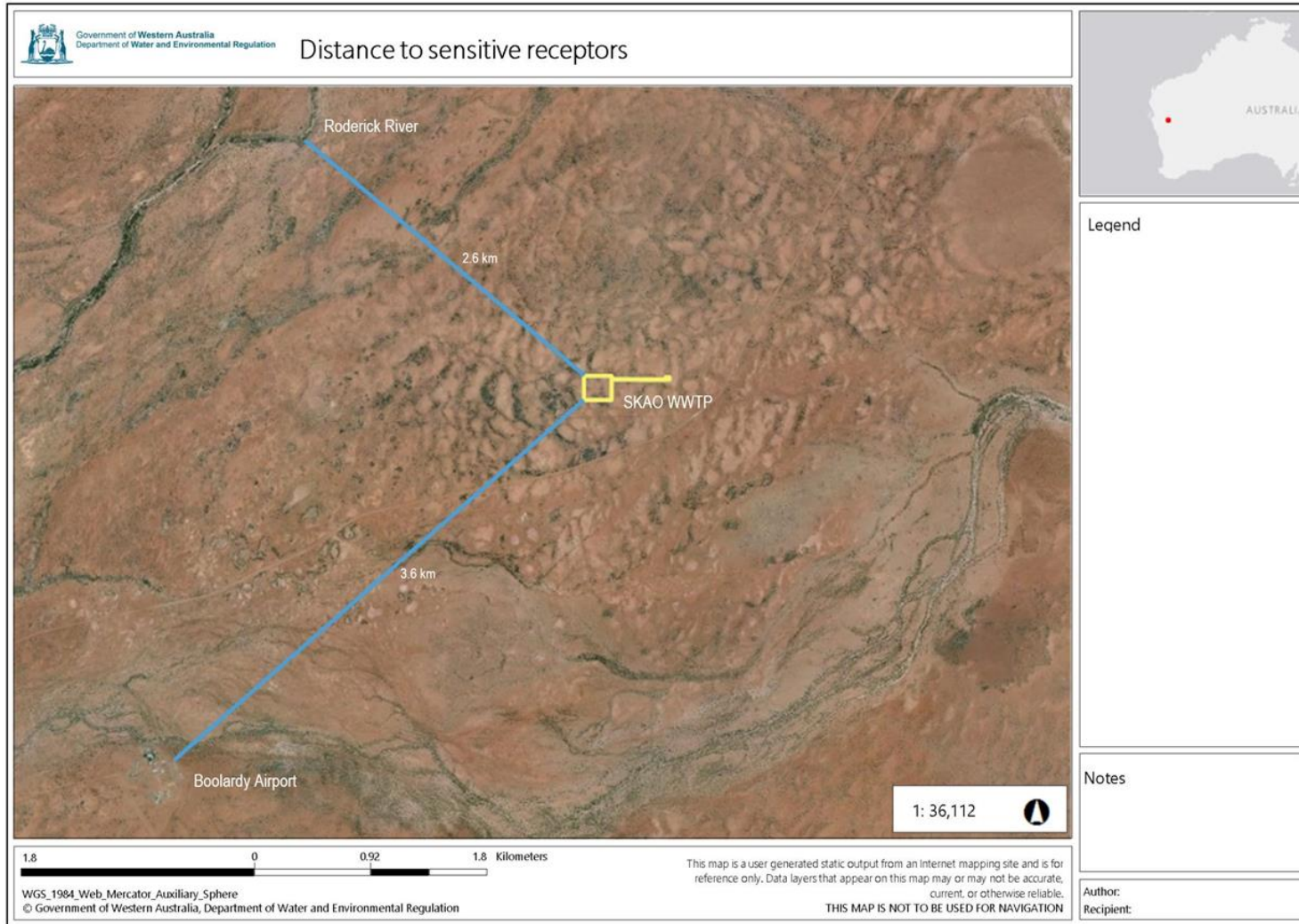


Figure 1: Distance to sensitive receptors

2.4 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 2.3. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Works Approval Holder has proposed mitigation measures/controls (as detailed in Section 2.3), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Works Approval Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the Works Approval Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The revised works approval W6800/2023/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the revised works approval have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3. Risk assessment of potential emissions and discharges from the premises construction and operation

Risk Event					Risk rating ¹	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls	C = consequence L = likelihood			
Construction								
Construction of evaporation pond	Dust	Air/windborne pathway causing impacts to health and amenity	Visitors to the Eastern Guruma Native Title determination area	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	N/A	N/A
	Noise				C = Slight L = Unlikely Low Risk	Y	N/A	N/A
	Hydrocarbons (spills and leaks)	Localised contamination of soils causing impacts to amenity	Gascoyne groundwater area		C = Moderate L = Unlikely Medium Risk	Y	Condition 1, Table 1, Item 6 (e)	N/A
Operation (including time-limited-operations operations)								
Commissioning and time limited operation of the Turkeys nest, evaporation pond and brine tanks	Odour	Air/windborne pathway causing impacts to health and amenity	Native Title Holders of Wajarri Yamatiji	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 1, 5, 13 and 20	N/A
	Discharge of RO reject (brine) water Spills/ unintended releases of RO reject (brine) water	Overland runoff / migration into surface water ways potentially causing ecosystem disturbance or impacting surface water quality; Localised contamination of soils; Infiltration to groundwater	Gascoyne groundwater area Surface water ecosystems: Roderick River (2.6 km north-west) Native Title Holders of Wajarri Yamatiji	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1, 5, 6, 13, 14 and 16	N/A

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Works Approval Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

3. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Works Approval Holder was provided with draft amendment on 17 October 2024	<p>Works approval holder replied on 1 November 2024 requesting:</p> <ul style="list-style-type: none"> • Removal of requirement for above ground infrastructure to be on a hardstand • Replace pumps requirement for brine tanks with overflow pipe to turkeys nest • Replace 0.05 mm LLDPE liner requirement for proposed evaporation pond with impervious plastic pond liner with a minimum 10 year design life. • Removal of spill kit requirement for evaporation pond • Confirmation 60 day increase to commissioning phase is from date of amendment approval • Replace daily inspections with routine inspections • Add storage tanks to infrastructure and as a discharge point 	<p>Noted</p> <p>The department agree to all changes proposed. The proposed changes do not alter the risk profile of the premises.</p> <p>The department confirms the 60 day increase to commissioning phase commences from date of approval of this amendment as stated in Section 2.2 of this report.</p>

4. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a revised works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

4.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised works approval as part of the amendment process.

Table 5: Summary of works approval amendments

Condition no.	Proposed amendments
1, Table 1, Item 2 (c)	Removal of requirement for above ground infrastructure located on a hardstand.

1, Table 1, Item 2	Rewording to state RO brine will be delivered to the turkeys nest and/or evaporation pond and tanks.
1, Table 1, Items 3, 5 and 6	Addition of brine tanks, turkeys nest and evaporation pond infrastructure and requirements.
1, Table 1, Item 4	Decrease minimum size of irrigation sprayfield to 2.7 ha.
5, Table 2	Increase commissioning phase by 60 days effective from the date of approval of this amendment. Addition of turkeys nest and brine tanks infrastructure and commissioning requirements.
6, Table 3 13: Irrigation sprayfield 14, Table 6 19	Rewording of “blended effluent” to “treated effluent”.
6, Table 3	Addition of RO reject water (brine) emission and discharge point for commissioning.
12 (a)	Time limited operations increased from 120 days to 180 days.
13, Table 5 – RO brine pipeline, b)	Increase discharge amount of RO brine to no more than 50 m ³ per day.
13, Table 5	Addition of turkeys nest, brine tanks and evaporation pond infrastructure and operational requirement during time limited operations.
14, Table 6	Addition of RO reject water (brine) emission and discharge points for time limited operations.
16, Table 8	Rewording to state the cumulative flow volume supplied to the turkeys nest and/or evaporation pond and tanks.
Definitions	Deletion of blended effluent definition
Schedule 1: Maps, Figure 1	Updated map of the boundary of the prescribed premises
Schedule 1: Maps, Figure 4	Updated map to include proposed evaporation pond
Schedule 2: Premises boundary	Updated premises boundary coordinates to include turkeys nest

References

1. Standards Australia 2008, *AS 3780 2008 The storage and handling of corrosive substances*, Standards Australia, Sydney, NSW.
2. Department of Environmental Regulation (DER), July 2015. *Guidance Statement: Regulatory principles*. Perth, Western Australia. Accessed at: www.wa.gov.au
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7. DWER December 2020, *Guideline: Risk Assessments*, Perth, Western Australia. Accessed at: www.wa.gov.au