



# Report and recommendations of the Environmental Protection Authority



## Shamrock Station Irrigation Project

Argyle Cattle Company Pty Ltd

Report 1615

May 2018

## Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
5/10/2017	Public comment on Referral Information commences	
11/10/2017	Public comment on Referral Information closed	1
21/11/2017	EPA decides to assess – level of assessment set	
12/01/2018	EPA issues notice for further information	4
12/02/2018	Proponent provides Final Referral Supplementary Report	4
19/04/2018	EPA completed its assessment	9
25/05/2018	EPA provided report to the Minister for Environment	6
30/05/2018	EPA report published	5 days
13/06/2018	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the EPA decides to assess the proposal and records the level of assessment.

In this case, the Environmental Protection Authority did not meet its timeline objective to complete its assessment and provide a report to the Minister.



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Chairman

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## Summary

This report provides the Minister for Environment with the outcomes of the Environmental Protection Authority's (EPA) environmental impact assessment of the proposal to develop the Shamrock Station Irrigation Project by Argyle Cattle Company Pty Ltd (ACC).

## Proposal

The Shamrock Station Irrigation Project is a proposal to develop a pivot irrigation project on Shamrock Station, to produce fodder for station use. The proposal has a disturbance footprint of up to 1,200 hectares (ha) (comprising of 650 ha of clearing and 550 ha of pastoral grazing) within a development envelope of 2,560 ha.

The site is located 64 kilometres (km) south of Broome and approximately 130 km by road. The proposal is situated within the Shamrock Pastoral Station on the Great Northern Highway in the locality of La Grange, within the Shire of Broome (Figure 1).

## Background and context

The proponent referred the project on 21 September 2017. On 31 October 2017 the EPA submitted a notice requiring further information to the proponent, to better enable it to decide whether or not to assess the proposal. On 21 November 2017 the EPA decided to assess the proposal and set the level of assessment at Assessment on Referral Information.

The *Environmental Protection Act 1986* (EP Act) requires that the EPA's report on the outcome of its assessment sets out key environmental factors identified during the assessment, as well as the EPA's recommendations as to whether or not the proposal may be implemented and, if so, the conditions and procedures that should apply. The EPA may also include any other information, advice and recommendations in the assessment report that it thinks fit.

## Public submissions

Key issues raised in the submissions on the Referral Supplementary Report information included:

- potential for movement of the saltwater/groundwater interface inland;
- potential impact to Groundwater Dependent Ecosystems(GDE) due to water extraction from continuous pumping;
- potential impact to significant flora *Seringia* (formally *Keraudrenia*) *exastia* as it is difficult to distinguish from *Seringia nephosperma*;
- potential impact to the habitat of the Greater Bilby;
- potential for the long term plans to extract 22 gigalitres (GL) from the La Grange North Canning-Broome aquifer (this proposal is for 9.5 GL) to have a significant impact on the water users in the region;

- potential impact on water quality from fertiliser use, which could impact on the water resources for the indigenous communities, situated along the coast from Yardoogarra to Bidyadanga;
- potential impact to Injudinah Swamp; species composition, water source and groundwater flow requirements from the drawdown on the aquifer; and
- potential impact to stygofauna caused by the drawdown of groundwater.

## Key environmental factors and relevant principles

The EPA identified the following key environmental factors (see Section 4) during the course of its assessment:

- a) **Flora and Vegetation** – potential impacts from direct clearing of native vegetation.
- b) **Terrestrial Fauna** – potential impacts to conservation significant fauna, including migratory birds and the Greater Bilby.
- c) **Hydrological Processes and Inland Waters Environmental Quality**– potential impacts to water quality from the use of chemicals, nutrients, and water run-off, leading to a decline in groundwater quality; potential impacts to groundwater-dependent vegetation at Injudinah Swamp from water abstraction.

In identifying the key environmental factors, the EPA had regard to the object and principles set out in section 4A of the EP Act. The EPA considered that all the principles were relevant to this assessment (see Section 4):

- a) the precautionary principle;
- b) the principle of intergenerational equity;
- c) the principle of the conservation of biological diversity and ecological integrity;
- d) principles relating to improved valuation, pricing and incentive mechanisms;
- e) the principle of waste minimisation.

## Assessment

The EPA has taken the following into account in its assessment of the proposal as a whole:

- the impacts to the key environmental factors including Flora and Vegetation, Terrestrial Fauna and Hydrological Processes and Inland Waters Environmental Quality;
- the proponent's proposed mitigation measures;
- the relevant EP Act principles, including the precautionary principle, the principle of intergenerational equity and the principle of the conservation of biological diversity and ecological integrity;
- the view that the key environmental factors are manageable, subject to the inclusion of a condition requiring that an Environmental Management Plan is developed and implemented.

Given the above, the EPA has concluded that the proposal is environmentally acceptable and therefore recommends that the proposal may be implemented subject to the conditions recommended in Appendix 4.

## **Conclusion and recommendations**

Having assessed the proposal, the EPA has concluded that the proposal is environmentally acceptable.

The EPA recommends that the Minister notes:

- a) Key environmental factors identified by the EPA during its assessment are Flora and Vegetation, Terrestrial Fauna and Hydrological Processes and Inland Waters Environmental Quality.
- b) The EPA has concluded the proposal may be implemented, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures set out in Appendix 4. Matters addressed in the conditions include the preparation and submission of an Environmental Management Plan that aims to:
  - a) avoid, where possible, and minimise impacts to the Greater Bilby within the development envelope;
  - b) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts to the environmental values of the Injudinah Swamp and on the hydrological regime and water quality of the Broome Sandstone Aquifer;
  - c) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause significant change in the location of the saltwater interface due to the abstraction of water for the proposal;
  - d) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts on Aboriginal heritage values.

# 1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the outcomes of the EPA's environmental impact assessment of the proposal for a pivot irrigation project for the production of irrigated pasture and fodder to support intensive cattle grazing at Shamrock Station. The proposal is located in the West Kimberley region of Western Australia, and the proponent is Argyle Cattle Company Pty Ltd (ACC).

The EPA has prepared this report in accordance with section 44 of the *Environmental Protection Act 1986* (EP Act), which requires that the EPA prepare a report on the outcome of its assessment of a proposal and provide this assessment report to the Minister for Environment. The report must set out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- the EPA's recommendations as to whether or not the proposal may be implemented, and, if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

The EPA may also include any other information, advice and recommendations in the assessment report it thinks fit.

The proponent referred the proposal to the EPA on 21 September 2017. On 21 November 2017 the EPA decided to assess the proposal and set the level of assessment at 'Referral Information'. As part of the process to determine whether or not to assess the proposal, the EPA requested supplementary information. The Supplementary Report was submitted and was released for public review from 5 October 2017 to 11 October 2017.

## 1.1 EPA procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2016*.

## 2. The proposal

### 2.1 Proposal summary

The proponent, Argyle Cattle Company Pty Ltd (ACC), proposes to develop the Shamrock Station Irrigation Project on the Shamrock Station in the West Kimberley region of Western Australia (Figure 1). The proposal entails the production of irrigated fodder for station use.

The proposed development of the Shamrock Station Irrigation Project includes the following activities:

- Clearing up to 650 ha for pivots, access tracks and irrigation infrastructure;
- Installation of 11–12 groundwater abstraction bores (in addition to one already established) and up to four monitoring bores (in addition to six already established);
- Construction of 12–13 circular irrigation pivots of up to 42.5 ha each (maximum 368 m radius, including 5–10 m buffer);
- Construction of supporting infrastructure, including solar/diesel hybrid pumps;
- Establishing and maintaining a 50–100 m square fenced vegetation buffer around each pivot, up to 550 ha in total;
- Soil preparation, fertiliser application and seeding of fodder crop such as Rhodes grass, oats and sorghum within pivots;
- Abstraction of up to 9.5 GL of groundwater annually from the Broome Sandstone Aquifer to supply the irrigation system;
- ‘Stand and graze’ operations within the pivot areas, entailing onsite rotational stocking of cattle from Shamrock Station and other stations owned by ACC;
- Baling of surplus fodder for internal use on ACC stations.

The pivot irrigation system will utilise technology, where possible, to enable accurate water and nutrient application. Monitoring will be undertaken to determine any adjustments required to the application regime. Water requirements will be calculated based on soil moisture content, evaporation and transpiration rates and optimal requirements for each irrigation species. Nutrient application requirements will be determined through soil and pasture analysis.

Once the area is in production it will be managed using annual and perennial cropping and grazing techniques. Ground cover will be maintained as much as practically possible.

The key characteristics of the proposal are summarised in Tables 1 and 2 below. A detailed description of the proposal is provided in Section 2 of the Supplementary Report (Phoenix Environmental Services Pty Ltd (Phoenix, 2018).



**Table 1: Summary of the Proposal**

<b>Proposal title</b>	Shamrock Station Irrigation Project
<b>Short description</b>	Development of a pivot irrigation project for the production of irrigated pasture and fodder to support intensive cattle grazing at Shamrock Station, located in the West Kimberley region of Western Australia.

**Table 2: Location and proposed extent of physical and operational elements**

<b>Element</b>	<b>Location</b>	<b>Proposed extent</b>
<b><i>Physical elements</i></b>		
Irrigation pivots and supporting infrastructure	Figure 2	Clearing of up to 650 ha within a 1,200 ha indicative footprint.
Vegetation disturbed through grazing	Figure 2	Up to 550 ha in total within a 1,200 ha indicative footprint.
<b><i>Operational elements</i></b>		
Groundwater abstraction	Figure 2	Up to 9.5 GL per annum



**Figure 1: Regional location**



**Figure 2: Proposal development envelope and indicative footprint**

## 2.2 Context

Shamrock Station is located 64 km south of Broome. The proposal is situated within Shamrock Pastoral Station on the Great Northern Highway in the locality of La Grange (Figure 1). The study area is situated in the Dampierland Interim Biogeographic Regionalisation for Australia (IBRA) region, specifically within the DAL02 (Pindanland) subregion. Shamrock Station is within the mapped Yeeda land system.

The study area is adjacent to the following pastoral leases; Thangoo Station to the north, Nita Downs to the south and Frazier Downs to the west. The Development Envelope is situated approximately 12.5 km from the coast. Shamrock Gardens, a small irrigated agriculture project, is the closest settlement to the Development Envelope, located 8.2 km south. Bidyadanga Aboriginal Community, is located 35 km to the southwest and Port Smith Caravan Park is located 24.8 km to the west. Shamrock Station is surrounded by Karajarri Indigenous Protected Area on its eastern and western boundaries, overlapping with Frazier Downs in the latter instance.

Groundwater used for irrigation is sourced from the Broome Sandstone aquifer. The Broome sandstone aquifer is an unconfined aquifer forming part of the Canning Basin. A groundwater licence application has been lodged for an abstraction of 22 GL/annum, to be staged over a three year period. This proposal is for stage 1 only, the water requirements are limited to a total maximum annual abstraction of 9.5 GL.

### 3. Consultation

The EPA advertised the referral information for the proposal for public comment in October 2017 and received three submissions. All comments requested that the EPA assess the proposal at the level of Public Environmental Review.

The proponent consulted with government agencies and key stakeholders during the preparation of the supplementary report provided with the referral. The agencies and stakeholders consulted, the issues raised and the proponent's response are detailed in Appendix 3 of the proponent's Supplementary Report (Phoenix, 2018).

The draft Supplementary Report was released for public review from 5 October to 11 October 2017. Key issues raised in the submissions on the Supplementary Report included:

- potential impacts to threatened species of national significance the Greater Bilby and the Rainbow Bee-Eater habitat;
- potential impacts to stygofauna;
- direct loss of native vegetation as a result of clearing;
- potential impact to Groundwater Dependent Ecosystems (GDE's);
- potential impact to water quality, saltwater interface affecting GDE's and existing users including Aboriginal communities from water pollution from fertilisers;
- potential long-term impacts to the La Grange North Canning-Broome aquifer from 22 GL of groundwater abstraction, having a significant effect on water users in the Kimberley region;
- potential impact to the Injudinah Swamp and saltwater intrusion.

In February 2018, the proponent provided the EPA with a revised Supplementary Report including and draft Environmental Management Plan which contained additional information that describes the proposed management and predicted impacts.

The EPA considers that the consultation process has been appropriate and that reasonable steps have been taken to inform the community and stakeholders on the proposed development. Relevant significant environmental issues identified from this process were taken into account by the EPA during its assessment of the proposal.

## 4. Key environmental factors

In undertaking its assessment of this proposal and preparing this assessment report, the EPA had regard for the object and principles contained in s4A of the EP Act to the extent relevant to the particular matters that were considered.

The EPA considered the following information during its assessment:

- Proponent's referral information;
- Public comments received on the referral, stakeholder comments received during the preparation of proponent documentation;
- EPA's own inquiries;
- EPA's *Statement of environmental principles, factors and objectives*;
- Relevant principles, policy and guidance referred to in the assessment of each key environmental factor in sections 4.1 to 4.3.

Having regard to the above information, the EPA identified the following key environmental factors during the course of its assessment of the proposal:

- **Flora and Vegetation** – Potential impacts from clearing native vegetation.
- **Terrestrial Fauna** – Potential impacts to conservation significant fauna, including migratory birds and the Greater Bilby.
- **Hydrological Processes and Inland Waters Environmental Quality** – Potential impacts to water quality from the use of chemicals, nutrients and water runoff, leading to a decline in groundwater quality; potential impacts to groundwater-dependent vegetation at Injudinah Swamp from water abstraction.

The EPA considered other environmental factors during the course of its assessment of the proposal. These factors, which were not identified as key environmental factors, are discussed in the proponent's referral documentation (Phoenix, 2018). Appendix 3 contains an evaluation of why these other environmental factors were not identified as key environmental factors.

Having regard to the EP Act principles, the EPA considered that all principles were relevant to its assessment of the proposal:

- a) The precautionary principle** - Investigations on the biological and physical environment undertaken by the proponent have provided sufficient certainty to assess risks and identify measures to avoid or minimise impacts.
- b) The principle of intergenerational equity** - The EPA notes that the proponent has taken measures to avoid and minimise impacts, and this, together with the recommended conditions, will ensure the environment is maintained for future generations.
- c) The principle of the conservation of biological diversity and ecological integrity** - The EPA has concluded that provided the recommended conditions are imposed on the implementation of the proposal, the proposal



will not compromise the biological diversity and ecological integrity of the affected areas.

- d) Principles relating to improved valuation, pricing and incentive mechanisms** – The EPA notes that the proponent will take responsibility for preventing pollution, particularly the containment of chemicals used for the proposal.
- e) The principle of waste minimisation** – The EPA notes that the proposal will apply the waste hierarchy to project operations.

Appendix 2 provides a summary of the principles and how the EPA considered these principles in its assessment.

The EPA's assessment of the proposal's impacts on the key environmental factors is provided in sections 4.1 – 4.3. These sections outline whether or not the EPA considers that the impacts to each factor are manageable. Section 5 provides the EPA's conclusion as to whether or not the proposal as a whole is environmentally acceptable.

## 4.1 Flora and Vegetation

### EPA objective

The EPA's environmental objective for this factor is to protect flora and vegetation so that biological diversity and ecological integrity are maintained.

### Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline—Flora and Vegetation* (EPA, 2016a);
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016b).

The considerations for environmental impact assessment (EIA) for this factor are outlined in *Environmental Factor Guideline - Flora and Vegetation* (EPA, 2016a).

The proponent has undertaken a single season detailed flora and vegetation survey relevant to the proposal. The flora and vegetation assessment of the Shamrock Station study area was undertaken at a level 2 standard as defined by the Environmental Protection Authority's (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016b).

### EPA assessment

The flora and vegetation survey (Phoenix, 2018) identified:

- 114 species and subspecies representing 32 families and 78 genera present within the study area;
- that no introduced flora species were recorded;

- no flora species listed as 'Threatened' under the *Wildlife Conservation Act 1950* were recorded during the survey. Three Priority Flora species were recorded in the study area during the survey: *Tephrosia andrewii* (P1), *Polymeria* sp. *Broome* (P1) *Triodia caelestialis* (P3).

The EPA notes that the development area excludes areas where priority flora has been recorded and that the proposed management includes buffer zones between non-native pastures and native vegetation as well as monitoring and control of cultivation species.

The EPA considers that, given the measures taken to avoid impacts by the proponent, direct impacts on flora and vegetation of the proposal are unlikely to be significant. The EPA considers that to avoid indirect impacts, a condition that requires the preparation and submission of an Environmental Management Plan be imposed that formalises the monitoring of weed species.

## Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA, 2016a);
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016b);
- the application of the mitigation hierarchy to avoid and minimise the impacts to flora and vegetation.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Flora and Vegetation that the impacts to this factor are manageable and would no longer be significant, provided there is:

- implementation of recommended condition 6 for an EMP that will minimise impacts of irrigated cropping on adjacent vegetated areas;
- control of impacts through the authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4).

## 4.2 Terrestrial Fauna

### EPA objective

The EPA's environmental objective for this factor is to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

### Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016c);
- *Technical Guidance – Sampling methods for terrestrial vertebrate fauna* (EPA, 2016d).



The considerations for environmental impact assessment (EIA) for this factor are outlined in *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016c).

## EPA assessment

The proposal would involve development of up to 1,200 ha of land and would result in some loss of fauna habitat. Terrestrial fauna could also be impacted from increased light, noise, and vibration from construction and operational activities.

Shamrock Station development envelope contains one broad fauna habitat type; tall shrubland thicket with scattered eucalypt trees, with variable density of understorey. The proponent has mapped Shamrock Station, following the April–May 2017 survey (Phoenix, 2018).

A fauna assessment was undertaken at a Level 1 and a targeted assessment in line with the EPA's *Guidance Statement No. 56* (EPA 2004b). As a result of these assessments the Greater Bilby (*Macrotus lagotis*) listed as Vulnerable under the *Wildlife Conservation Act 1950* (WC Act) was recorded, as was the Rainbow Bee-eater (*Merops ornatus*), which was recently delisted from the list of migratory birds under the WC Act. The Rainbow Bee-eater (*Merops ornatus*), was recorded on several occasions, however this is a common and widely distributed bird and the habitat of the study area is not considered critical habitat for the species (Phoenix, 2018).

The EPA notes that the habitat of the development envelope may host the Princess Parrot (*Polytelis alexandrae*, Priority 4) and the Night Parrot (*Pezoporus occidentalis*, Critically Endangered under the WC Act); however, no evidence of these species' presence was found during the survey.

The proponent will use management based actions to control invasive fauna species as required to minimise negative environmental impacts, within the statutory requirements of the *Biosecurity and Agriculture Management Act 2007* and the *Wildlife Conservation Act 1950*. Management targets will include:

- no Greater Bilby mortality or active burrow destruction;
- no observed increase in feral animals (rabbits, cats, foxes or other species) in proximity to the proposal area.

Monitoring will include a pre-clearance survey and visual monitoring of feral animals as part of ongoing farm management and recording pest fauna damage and numbers.

Reporting will include summary information in the Annual Environmental Report of any fauna pest control undertaken.

The EPA considers it important that indirect impacts of the proposal are managed to prevent off-site impacts on areas of more important fauna habitat, including Injudinah Swamp. The EPA notes that the proposal is not expected to affect the conservation status of any Threatened or Priority taxa, Short Range Endemic (SRE) species or fauna habitats.

The EPA considers the measures contained in the Shamrock Station Supplementary Report are appropriate to prevent significant impacts on Terrestrial Fauna as a result of the implementation of the proposal. The EPA therefore recommends that a condition is applied that requires the proponent to prepare and submit an Environmental Management Plan (EMP) to formalise these measures.

## Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016c)*;
- mitigation measures proposed by the proponent to avoid and minimise impacts to fauna and fauna habitat.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Terrestrial Fauna that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4);
- implementation of recommended condition 6 to avoid and minimise impacts to the Greater Bilby within the Development Envelope through the implementation of an Environmental Management Plan.

## 4.3 Hydrological Processes and Inland Waters Environmental Quality

### EPA objective

The EPA's environmental objectives for these factors are:

- Hydrological Processes – to maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.
- Inland Waters Environmental Quality – to maintain the quality of groundwater and surface water so that environmental values are protected.

### Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for these factors:

- *Environmental Factor Guideline – Hydrological Processes (EPA, 2016e)*;
- *Environmental Factor Guideline – Inland Waters Environmental Quality (EPA, 2016f)*.

The considerations for environmental impact assessment (EIA) for these factors are outlined in *Environmental Factor Guideline – Hydrological Processes (EPA, 2016e)* and *Inland Waters Environmental Quality (EPA, 2016f)*.

## EPA assessment

Injudinah Swamp is the main groundwater-dependent significant system that may be impacted by water abstraction for the Proposal. It represents a wetland situated along the contact zone of the Pindan woodlands and the tidal marshes of La Grange Bay. The wetland is maintained by seepage of freshwater from the regional aquifers interfacing with the muds of the tidal zone (Phoenix, 2018).

Water abstraction as part of the Proposal may lead to lowering of groundwater levels which may negatively affect GDEs or impact other users of the La Grange groundwater area (Phoenix, 2018). The EPA notes that the allocation of 9.5 GL/a would be within the allocation limits for the aquifer.

The proponent has indicated that baseline groundwater analysis will be undertaken as new monitoring bores are established and that baseline surface water parameters will be established at Injudinah Swamp.

At the ocean interface, a saltwater toe penetrates the base of Broome Sandstone Aquifer due to the higher density of saltwater. This toe interface occurs approximately between 3.5 – 4.2 km from the coast at the closest point to the Project (Phoenix, 2018). Advice received from the Department of Water and Environmental Regulation (DWER) indicates that while the toe of the interface may move inland there are unlikely to be any impacts on sensitive receptors.

The EPA notes that as a result of advice from DWER the proponent has included monitoring of GDEs and wetland vegetation in its management plan, and incorporated early warning monitoring specifically to facilitate detection of potential movement of the saltwater interface. The EPA notes that surface water levels, depth of water level, and surface water quality at Injudinah Swamp, will be monitored and that the proponent will maintain groundwater heads/levels to support springs of cultural value.

The EPA considers that given the measures taken to avoid impacts by monitoring of the Injudinah Swamp, groundwater, and surface water, that direct impacts of the proposal can be managed and are unlikely to be significant. The EPA considers that the preparation and submission of an EMP to formalise the required monitoring and to avoid indirect impacts is important and has recommended condition 6.

## Summary

The EPA has paid particular attention to the:

- *Statement of Environmental Principles, Factors and Objectives* (EPA, 2016);
- *Environmental Factor Guideline – Hydrological Processes* (EPA, 2016e);
- *Environmental Factor Guideline – Inland Waters Environmental Quality* (EPA, 2016f).

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Hydrological Processes and Inland Waters

Environmental Quality, that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4);
- implementation of recommended condition 6 for an EMP that will:
  - avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts to the environmental values of the Injudinah Swamp and on the hydrological regime and water quality of the Broome Sandstone Aquifer;
  - avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause significant change in the location of the saltwater interface due to the abstraction of water for the proposal;
  - avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts on Aboriginal heritage values.

## 5. Conclusion

In conclusion, the EPA has considered the assessment in the previous sections and taken a holistic view of the likely residual impacts of the proposal. The EPA has considered the degree of connectivity and inter-relatedness of processes operating across systems and communities that make up the environment.

From its assessment of the proposal – including how the environment responds to pressures generated by irrigated agriculture activities – the EPA has taken into consideration:

- The impacts to all the key environmental factors.
- Its confidence in the proponent's predictions and proposed mitigation measures including application of mitigation hierarchy.
- The five EP Act principles and the EPA's objectives for the key environmental factors.
- Its view that the impacts to the key environmental factors are manageable, provided the recommended condition requiring preparation and submission of a Shamrock Station Irrigation Project Environmental Management Plan to meet defined Environmental Protection Outcomes is imposed.

Given the above, the EPA has concluded that the proposal is environmentally acceptable and therefore recommends that the proposal may be implemented subject to the conditions recommended in Appendix 4.

## 6. Recommendations

That the Minister for Environment notes:

- a) That the proposal assessed is for the construction and operation of the Shamrock Station Irrigation Project which would require up to 650 ha of clearing within a disturbance envelope of 1,200 ha.
- b) The key environmental factors identified by the EPA in the course of its assessment are:
  - a) Flora and Vegetation.
  - b) Terrestrial Fauna.
  - c) Hydrological Processes and Inland Waters Environmental Quality, set out in Section 4.
- c) The EPA has concluded that the proposal may be implemented, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures set out in Appendix 4. Matters addressed in the conditions include the preparation and submission of an Environmental Management Plan that aims to:
  - a) avoid, where possible, and minimise impacts to the Greater Bilby within the development envelope;
  - b) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts to the environmental values of the Injudinah Swamp and on the hydrological regime and water quality of the Broome Sandstone Aquifer;
  - c) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause significant change in the location of the saltwater interface due to the abstraction of water for the proposal;
  - d) avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts on Aboriginal heritage values.

# **Appendix 1**

## **References**

Department of Water and Environmental Regulation, 2017, *Request for advice on the Environs Kimberley Submission (Dr Ryan Vogwill), Shamrock Station Irrigation Agriculture Project Letter*, Prepared for EPA Services, Perth, WA.

EPA 2004a, *Guidance Statement No. 51 – Guidance for the assessment of environmental factors – terrestrial flora and vegetation surveys for environmental impact in Western Australia*. Environmental Protection Authority, Perth, WA.

EPA 2004b, *Guidance for the assessment of environmental factors 56 - Terrestrial fauna surveys for environmental impact assessment in WA*. Environmental Protection Authority, Perth, WA.

EPA 2016a, *Environmental factor guideline – Flora and vegetation*, Environmental Protection Authority, Perth, WA.

EPA 2016b, *Technical guide – Flora and vegetation surveys for environmental impact assessment*, Environmental Protection Authority, Perth, WA.

EPA 2016c, *Environmental factor guideline – Terrestrial fauna*, Environmental Protection Authority, Perth, WA.

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EPA 2016f, *Environmental factor guideline – Inland waters environmental quality*, Environmental Protection Authority, Perth, WA.

Phoenix Environmental Sciences Pty Ltd, 2018, *Shamrock Station Irrigation Project – Section 38 Referral Supplementary Report*, Prepared for Argyle Cattle Company Pty Ltd, Perth, WA.



## **Appendix 2**

### **Consideration of principles**

EP Act Principle	Consideration
<p><b>1. The precautionary principle</b></p> <p><i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by –</i></p> <ul style="list-style-type: none"> <li><i>a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i></li> <li><i>b) an assessment of the risk-weighted consequences of various options.</i></li> </ul>	<p>In considering this principle, the EPA notes that Flora and Vegetation, Terrestrial Fauna, Hydrological Processes and Inland Waters Environmental Quality could be significantly impacted by the proposal. The assessment of these impacts is provided in this report.</p> <p>Investigations into the biological and physical environment undertaken by the proponent have provided sufficient scientific certainty to assess the risks and identify measures to avoid or minimise impacts. The EPA has recommended a condition to ensure these measures are implemented by the proponent.</p> <p>From its assessment of this proposal the EPA has concluded that if the recommended conditions are imposed on the implementation of the proposal, there is no threat of serious or irreversible damage.</p>
<p><b>2. The principle of intergenerational equity</b></p> <p><i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	<p>The EPA considers that this principle is particularly relevant to its assessment. The EPA notes that the proponent has taken measures to avoid and minimise impacts of the proposal on the environment. Additionally, the EPA has recommended a condition to manage impacts to the key environmental factors identified during the course of this assessment.</p> <p>From its assessment of this proposal the EPA has concluded that provided the recommended conditions are imposed on the implementation of the proposal, the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the benefit of future generations.</p>

<p><b>3. The principle of the conservation of biological diversity and ecological integrity</b></p> <p><i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	<p>The EPA considers that this principle is particularly relevant to its assessment. In considering this principle, the EPA notes that the proposal will result in impacts to Flora and Vegetation and Terrestrial Fauna. In assessing this proposal, the EPA has considered these impacts and taken into consideration measures proposed by the proponent to avoid and minimise impacts to the affected values.</p> <p>From its assessment of this proposal the EPA has concluded that provided the recommended conditions are imposed on the implementation of the proposal, the proposal will not compromise the biological diversity and ecological integrity of the affected areas.</p>
<p><b>4. Principles relating to improved valuation, pricing and incentive mechanisms</b></p> <p>(1) <i>Environmental factors should be included in the valuation of assets and services.</i></p> <p>(2) <i>The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</i></p> <p>(3) <i>The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</i></p> <p>(4) <i>Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.</i></p>	<p>In considering this principle, the EPA notes that the proponent will take responsibility for preventing waste and pollution, and that rehabilitation and ongoing management of the proposal would be the responsibility of the proponent.</p> <p>The EPA has had regard to this principle during the assessment of the proposal.</p>

**5. The principle of waste minimisation**

*All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*

In considering this principle, the EPA notes that the proponent's management approach for its irrigated agricultural development will apply the waste hierarchy to project operations.

The EPA has had regard to this principle during the assessment of the proposal.

## **Appendix 3**

### **Evaluation of other environmental factors**

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
<b>Land</b>			
Subterranean Fauna	<ul style="list-style-type: none"> <li>Impacts to stygofauna habitat from groundwater drawdown in the Broome Sandstone Aquifer.</li> </ul>	<p><b>Agency comments</b></p> <ul style="list-style-type: none"> <li>The work undertaken to date does not fully meet EPA standards for subterranean fauna survey, however given the volume of the aquifer, it is likely that impacts on stygofauna will be minimal.</li> </ul> <p><b>Public comments</b></p> <ul style="list-style-type: none"> <li>The stygofauna report outlines that no research has been done in the locality of the proposal, and generously suggests that if it is similar to other locations it could be indeed unique. It would be a shame to lose a species before we known it existed.</li> </ul>	<p>Subterranean Fauna was not identified as a preliminary key environmental factor at the level of assessment.</p> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>groundwater drawdown being predicted to be minimal and most of the aquifer volume will remain after drawdown, therefore the impacts to stygofauna are likely to be 'negligible based on size of aquifer and extent of habitat'; and</li> <li>the stygofauna having been found in similar hydrogeological conditions north and south of the Development Envelope and that it is likely, given continuity of habitat, that stygofauna is also present in similar faunal composition at Shamrock Station,</li> </ul> <p>the EPA considers that it is unlikely that the proposal would have a significant impact on Subterranean Fauna and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA did not consider Subterranean Fauna to be a key environmental factor at the conclusion of its assessment.</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Terrestrial Environmental Quality	<ul style="list-style-type: none"> <li>Impacts on soil quality from water erosion during irrigation practices, fertiliser and chemical application.</li> <li>Soil erosion, causing loss of topsoil.</li> <li>Reduction in soil structure from displacement of calcium and magnesium.</li> </ul>	<p><b>Agency comments</b></p> <ul style="list-style-type: none"> <li>Department of Water and Environmental Regulation (Water) has taken water quality into consideration and, where they can be managed through the <i>Rights in Water and Irrigation Act 1914</i>, these potential impacts have been addressed in the applicants proposed monitoring program. This includes changes to water quality due to abstraction and/or fertiliser application and groundwater salinity management objectives, measurement, trigger levels and responses. This has been agreed by the proponent.</li> </ul> <p><b>Public comments</b></p> <ul style="list-style-type: none"> <li>Water pollution from nitrates and fertilisers could have severe impacts for the water quality in the region in particular for the Aboriginal communities, which are situated along the coast from Yardoogarra to Bidyadanga. A priority must be that these communities have access to clean drinking water. Their source of clean drinking water could be compromised due to saltwater intrusion, aquifer drawdown and pollution by fertilisers and chemicals. Aboriginal</li> </ul>	<p>Terrestrial Environmental Quality was not identified as a preliminary key environmental factor at the level of assessment.</p> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>a repeated monitoring program of groundwater salinity and quality being conducted;</li> <li>soil sampling and analysis, and additional analysis of groundwater quality and assessment of groundwater condition at the project area occurring as production and monitoring bores are established;</li> <li>regular monitoring being undertaken for soil moisture and erosion. Other mitigation, if required (e.g. if high SAR soils are present), may include application of soluble calcium and/or organic matter to improve soil structure;</li> <li>a site-specific nutrient application and management plan being prepared following soil testing;</li> <li>the potential for offsite nutrient drift which may alter offsite soils being managed through the use of soil pH and moisture probes, irrigation scheduling and wet season management of soluble fertilisers,</li> </ul> <p>the EPA considers that it is unlikely that the proposal would have a significant impact on Terrestrial</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		communities further north in the Kimberley, like Pandanas Park have been impacted by nitrates in their water and no immediate solution in sight for their communities bore. They feed their children bottled water.	Environmental Quality and that the impacts to this factor are manageable.  Accordingly, the EPA did not consider Terrestrial Environmental Quality to be a key environmental factor at the conclusion of its assessment.
<b>PEOPLE</b>			
Social Surroundings	<ul style="list-style-type: none"> <li>Potential impact to Karajarri Aboriginal heritage sites.</li> <li>Potential impact to surrounding aboriginal communities who have a strong connection with the groundwater resources and surface water flows.</li> </ul>	<b>Public comments</b> <ul style="list-style-type: none"> <li>The long term plans to extract 22GL from the La Grange North Canning-Broome aquifer, will have a significant impact on the water users in the region, as it is the largest proposal for a single user of water in the entire Kimberley region. Even the initial proposal of 9.5 GL/year, would double the use of 9.9 GL/year (Nov 2012) of the available 35 GL /year, leaving just 30 per cent for other proposals and users. If the full proposal of 22 GL/year is approved for Shamrock Station, the northern La Grange aquifer would be pushed to its known ecological limits with up to 91.1 per cent of the aquifer becoming fully allocated.</li> <li>Groundwater desktop modelling, the impact of drawdown of up to 2.59 m of the groundwater in the locality of the project after 10 years of continuous</li> </ul>	<p>Social Surroundings was not identified as a preliminary key environmental factor at the level of assessment.</p> <p>Having regard to:</p> <ul style="list-style-type: none"> <li>there being no registered Aboriginal sites or other heritage places located within the development envelope;</li> <li>hydrogeological modelling for drawdown impact having considered nearby users (Groundwater monitoring to manage impacts will be in the EMP);</li> <li>condition 6-1: Avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts on Aboriginal heritage values;</li> <li>condition 7-1: Prior to the commencement of ground-disturbing activities, the proponent shall consult with the Karajarri Native Title Claim group</li> </ul>



Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		<p>pumping, is also significant, and there has been limited assessment of the direct impacts that this will have on the groundwater dependent ecosystems, and indeed the indigenous communities and culturally significant sites, within the locality of the proposal.</p> <ul style="list-style-type: none"> <li>• Cultural flows have not been assessed as part of this proposal and impact, therefore this is a huge gap which needs to be filled. A study of the area's cultural values and the links with ecological features was carried out by Sarah Yu in 2000 and described in Ngapa kunangkul (living water): An Aboriginal community view of groundwater. The study highlighted three key characteristics of groundwater that were important to the local people: <ul style="list-style-type: none"> <li>- the interface between salt and fresh water along the coastal zone</li> <li>- the importance of GDEs including jila (permanent waterholes),</li> <li>- springs, soaks and other 'on-top' waters</li> <li>- recharge of the underground aquifer to maintain water cycles. These all need to more deeply</li> </ul> </li> </ul>	<p>and ensure that it is aware of its obligations under the <i>Aboriginal Heritage Act 1972</i>; and</p> <ul style="list-style-type: none"> <li>• the H3 hydrogeological assessment having been designed in consultation with Water Regulatory Services (DWER) to assess drawdown impacts at indigenous communities,</li> </ul> <p>the EPA considers that it is unlikely that the proposal would have a significant impact on Social Surroundings and that the impacts to this factor are manageable.</p> <p>Accordingly, the EPA did not consider Social Surroundings to be a key environmental factor in the conclusion of its assessment.</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		<p>- assessed if this proposal is to proceed.</p> <ul style="list-style-type: none"> <li>• The La Grange water allocation plan outlines that if demand on the water resource increases, a regional monitoring network may be required, If the system reaches the limit of 50 per cent. This initial proposal will push the allocation to 60 per cent, triggering the assessment of a regional monitoring network, which we need to be considered more broadly in line with other water users the region.</li> </ul>	

## **Appendix 4**

### **Identified Decision-Making Authorities and Recommended Environmental Conditions**

### Identified Decision-making Authorities

Section 44(2) of EP Act specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This Appendix contains the EPA's recommended conditions and procedures.

Section 45(1) requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following decision-making authorities have been identified:

<b>Decision-making Authority</b>	<b>Legislation (and Approval)</b>
1. Minister for Environment	<i>Wildlife Conservation Act 1950</i> <ul style="list-style-type: none"><li>• Taking of flora and fauna</li></ul>
2. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> <ul style="list-style-type: none"><li>• Licence to take water</li><li>• Permit for certain works</li><li>• Licence for construction of well</li></ul>
3. Minister for Lands	<i>Land Administration Act 1997</i> <ul style="list-style-type: none"><li>• Easements on crown land for pumping stations</li></ul>
4. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i> <ul style="list-style-type: none"><li>• Section 18 clearances</li></ul>
5. Pastoral Lands Board	<i>Land Administration Act 1997</i> <ul style="list-style-type: none"><li>• Permit to use land for fodder (s120)</li></ul>
6. Shire of Broome	<i>Planning and Development Act 2005</i> <ul style="list-style-type: none"><li>• Planning approval</li></ul>

Note: In this instance, agreement is only required with DMA 1 - 4 since these DMAs are Ministers.

Statement No. xxx

## RECOMMENDED ENVIRONMENTAL CONDITIONS

### STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (*Environmental Protection Act 1986*)

#### SHAMROCK STATION IRRIGATION PROJECT

**Proposal:** Develop a pivot irrigation project for the production of irrigated pasture and fodder to support intensive cattle grazing at Shamrock Station, located in the West Kimberley region of Western Australia.

**Proponent:** Argyle Cattle Company Pty Ltd  
Australian Company Number 613 455 379

**Proponent Address:** 534 Wickham Hill Road Kuitpo South Australia 5201

**Assessment Number:** 2137

**Report of the Environmental Protection Authority:** 1615

Pursuant to section 45 of the *Environmental Protection Act 1986* it has been agreed that the proposal described and documented in Table 1 of Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

#### **1 Proposal Implementation**

- 1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 in Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have been approved under the EP Act.

#### **2 Contact Details**

- 2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

#### **3 Time Limit for Substantial Commencement**

- 3-1 The proposal must be substantially commenced within 5 years from the date of this Statement.
- 3-2 The proponent must provide to the CEO documentary evidence demonstrating that they have complied with condition 3-1 no later than 30 days after expiration of 5 years from the date of this Statement.

#### **4 Compliance Reporting**

- 4-1 The proponent shall prepare, and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation of the proposal, whichever is sooner.
- 4-2 The Compliance Assessment Plan shall indicate:
  - (1) the frequency of compliance reporting;
  - (2) the approach and timing of compliance assessments;
  - (3) the retention of compliance assessments;
  - (4) the method of reporting of potential non-compliances and corrective actions taken;
  - (5) the table of contents of Compliance Assessment Reports; and
  - (6) public availability of Compliance Assessment Reports.
- 4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.
- 4-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.
- 4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.
- 4-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

- (1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;
- (2) include a statement as to whether the proponent has complied with the conditions;
- (3) identify all potential non-compliances and describe corrective and preventative actions taken;
- (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and
- (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

## **5 Public Availability of Data**

5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)) relevant to the assessment of this proposal and implementation of this Statement.

5-2 If any data referred to in condition 5-1 contains particulars of:

- (1) a secret formula or process; or
- (2) confidential commercially sensitive information;

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

## **6 Operational Environmental Management Plan**

6-1 Prior to the commencement of ground disturbing activities or as otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Operational Environmental Management Plan to the CEO, to demonstrate that the following environmental objectives will be met:

- (1) Avoid, where possible, and minimise impacts to the Greater Bilby within the development envelope as defined in Figure 2 of Schedule 1.
- (2) Avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts to the environmental

values of the Injudinah Swamp and on the hydrological regime and water quality of the Broome Sandstone Aquifer.

- (3) Avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause significant change in the location of the saltwater interface due to the abstraction of water for the proposal.
- (4) Avoid, where possible, and minimise direct and indirect impacts so that the proposal does not cause long term impacts on Aboriginal heritage values.

6-2 The Operational Environmental Management Plan shall:

- (1) specify the environmental objectives to be achieved, as specified in condition 6-1;
- (2) specify risk-based management actions that will be implemented to demonstrate compliance with the environmental objectives specified in 6-1. Failure to implement one or more of the management actions represents non-compliance with these conditions;
- (3) specify measurable management target(s) to determine the effectiveness of the risk-based management actions;
- (4) specify monitoring to measure the effectiveness of management actions against management targets, including but not limited to, parameters to be measured, baseline data, monitoring locations, and frequency and timing of monitoring;
- (5) specify a process for revision of management actions and changes to proposal activities, in the event that the management targets are not achieved. The process shall include an investigation to determine the cause of the management target(s) being exceeded;
- (6) provide the format and timing to demonstrate that 6-1 have been met for the reporting period in the Compliance Assessment Report required by condition 4-6 including, but not limited to:
  - (a) verification of the implementation of management actions; and
  - (b) reporting on the effectiveness of management actions against management target(s).

6-3 After receiving notice in writing from the CEO that the Condition Environmental Management Plan satisfies the requirements of condition 6-2 for condition 6-1, the proponent shall:



- (1) implement the provisions of the Condition Environmental Management Plan; and
  - (2) continue to implement the Condition Environmental Management Plan until the CEO has confirmed by notice in writing that the proponent has demonstrated the objectives specified in condition 6-1 have been met.
- 6-4 In the event that monitoring, tests, surveys or investigations indicate exceedance of management target(s) specified in the Operational Environmental Management Plan, the proponent shall:
  - (1) report the exceedance in writing to the CEO within 21 days of the exceedance being identified;
  - (2) investigate to determine the cause of the management targets being exceeded;
  - (3) provide a report to the CEO within 90 days of the exceedance being reported as required by condition 6-4(1). The report shall include:
    - (a) cause of management targets being exceeded;
    - (b) the findings of the investigation required by conditions 6-4(2);
    - (c) details of revised and/or additional management actions to be implemented to prevent exceedance of the management target(s); and
    - (d) relevant changes to proposal activities.
- 6-5 In the event that monitoring, tests, surveys or investigations indicate that one or more management actions specified in the Operational Environmental Management Plan have not been implemented, the proponent shall:
  - (1) report the failure to implement management action/s in writing to the CEO within 7 days of identification;
  - (2) investigate to determine the cause of the management action(s) not being implemented;
  - (3) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to the failure to implement management actions;
  - (4) provide a report to the CEO within 21 days of the reporting required by condition 6-5(1). The report shall include:
    - (a) cause for failure to implement management actions;

- (b) the findings of the investigation required by conditions 6-5(2) and (3);
- (c) relevant changes to proposal activities; and
- (d) measures to prevent, control or abate the environmental harm which may have occurred.

6-6 The proponent:

- (1) may review and revise the Operational Environmental Management Plan, or
- (2) shall review and revise the Operational Environmental Management Plan as and when directed by the CEO.

6-7 The proponent shall implement the latest revision of the Operational Environmental Management Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 6-2.

## **7 Aboriginal Heritage**

7-1 Prior to the commencement of ground-disturbing activities, the proponent shall consult with the Karajarri Native Title Claim group and ensure that it is aware of its obligations under the Aboriginal Heritage Act 1972.

## Schedule 1

Table 1: Summary of the Proposal

<b>Proposal Title</b>	Shamrock Station Irrigation Project
<b>Short Description</b>	<p>Argyle Cattle Company Pty Ltd (ACC) is seeking to develop a pivot irrigation project for the production of irrigated pasture and fodder to support intensive cattle grazing at Shamrock Station, located in the West Kimberley region of Western Australia.</p> <p>The key components of the Proposal include:</p> <ul style="list-style-type: none"> <li>- Clearing of up to 650 ha by mechanical clearing for pivots, access tracks and irrigation infrastructure.</li> <li>- Installation of 11 - 12 groundwater abstraction bores and 4 monitoring bores.</li> <li>- Construction of 12 - 13 circular irrigation pivots of up to 42.5 ha each.</li> <li>- Construction of supporting infrastructure, including solar/diesel hybrid pumps.</li> <li>- Establishing and maintaining a 50 - 100 m square fenced vegetation around each pivot, up to 550 ha in total.</li> <li>- Soil preparation, fertiliser application and seeding of fodder crop such as Rhodes grass, oats and sorghum within pivots.</li> <li>- Abstraction of up to 9.5 GL of groundwater annually from the Broome Sandstone Aquifer to supply the irrigation system.</li> <li>- "Stand and graze" operations within the pivot areas, entailing onsite rotational stocking of cattle from Shamrock Station and other stations owned by ACC.</li> <li>- Baling of surplus fodder for internal use on ACC stations.</li> </ul>

**Spatial coordinates for the boundaries of the proposal (MGA Zone 51)**

Coordinates defining the boundaries shown in Figures 1 and 2 are held by the Department of Water Environmental Regulation, Document Reference Number DWERDA - 027620.

Table 2: Location and authorised extent of physical and operational elements

Column 1	Column 2	Column 3
Element	Location	Authorised Extent
Irrigation pivots and supporting infrastructure	Figure 2	Clearing of up to 650 ha within a 1,200 ha indicative footprint.
Vegetation disturbed through grazing	Figure 2	Up to 550 ha in total within a 1,200 ha indicative footprint.
Groundwater abstraction		Up to 9.5 GL per annum.

**Table 3: Abbreviations and Definitions**

<b>Acronym, abbreviation or term</b>	<b>Definition</b>
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or their delegate.
Environmental Management Plan Provisions	Key component of the Environmental Management Plan which are the legal requirements to be met by the proponent in implementing the Environmental Management Plan.
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986</i>
ha	Hectare
<b>Management-based provisions</b>	
Management actions	Risk-based actions to be implemented to meet the environmental objective.
Management targets	Targets to determine the effectiveness of the management actions.
Monitoring	Monitoring to measure the effectiveness of management actions.
Reporting	Reporting of implementation of management actions and reporting on the effectiveness of management actions to demonstrate that the objective/s have been met.

**Figures (attached)**

Figure 1 Regional location

Figure 2 Proposal development envelope and indicative footprint



**Figure 1 Regional location**



**Figure 2 Proposal development envelope and indicative footprint**