

Statement of Reasons

MICK BURNS – LAMBELL’S LAGOON CROCODILE FARM

PROPOSAL

Mick Burns (the Proponent), submitted a Notice of Intent (NOI) for the Lambell’s Lagoon Crocodile Farm (the Proposal) to the Northern Territory Environment Protection Authority (NT EPA) on 19 February 2020 for consideration under the *Environmental Assessment Act 1982* (EA Act). Further information was requested on 14 April 2020 to inform the NT EPA’s decision. The Proponent responded to the further information request on 22 May 2020.

The Proposal is to construct and operate a new crocodile farm for commercial production of saltwater crocodiles (*Crocodylus porosus*) for skin and meat products. The farm is located at Lambells Lagoon on Sections 1606 (71 ha), 1611 (140 ha) and 1688 (165 ha) Hundred of Guy (~376 ha in total), about 17 km east of Humpty Doo and 45 km southeast of Darwin.

Production involves a process of incubation, hatchery, grower and finishing stages. The main components of the Proposal are:

- production areas including an egg incubator laboratory, hatchery, grower pens, finishing pens, open farm area, cleaning area and a refrigerated feed preparation and storage area
- water and waste infrastructure including a wastewater storage tank, water storage tanks, a wastewater treatment plant and a composting facility for treatment of solid wastes
- irrigation areas for disposal of wastewater
- supporting infrastructure including a workshop, office area, solar farm, 3 x accommodation houses, and fuel storage tanks.

Construction of the Proposal would occur over a 12-18 month period, followed by ongoing production for more than 30 years that would include a start-up phase in year 2 with about 4,000 grower animals, gradually increasing to a crocodile stocking capacity of 50,000 animals in year 5. Full production would be maintained with about 50,000 animals from year six onwards. The Proposal would employ about 30 people in full production.

CONSULTATION

The NOI and further information has been reviewed as a notification under the EA Act in consultation with Northern Territory Government (NTG) advisory bodies (see Attachment A) in accordance with clause 8(1) of the Environmental Assessment Administrative Procedures 1984.

JUSTIFICATION

The NOI and further information was assessed against the NT EPA’s environmental factors and objectives. The NT EPA identified four environmental factors (Table 1) that could potentially be significantly impacted by the Proposal. The NT EPA considered the importance of other environmental factors during the course of its assessment; however, the impact on those factors was not identified as potentially significant.

Table 1. Key NT EPA environmental factors

Theme	Key Environmental Factor	Objective
Land	1. Terrestrial flora and fauna	Protect the NT's flora and fauna so that biological diversity and ecological integrity are maintained.
	2. Inland water environmental quality	Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.
Water	3. Hydrological processes	Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.
People and Communities	4. Social, economic and cultural surroundings	Protect the rich social, economic, cultural and heritage values of the Northern Territory.

1. Terrestrial flora and fauna

Objective: Protect the NT's flora and fauna so that biological diversity and ecological integrity are maintained.

The Proposal is surrounded by the Adelaide River coastal floodplains Site of Conservation Significance and is located immediately to the east of the Black Jungle Conservation Reserve, and to the west of the Lambells Lagoon Conservation Reserve. Fogg Dam Conservation Reserve is located 1.8 km to the east of the Proposal. The majority of the Proposal site (90%, 340 ha) has been previously cleared and used for various irrigated seasonal horticulture crops; and is therefore not considered to provide quality habitat for native flora and fauna.

The Proposal would require clearing of 15 ha of remnant Eucalyptus woodland vegetation, which is a common habitat type in the region and is well represented in nearby conservation reserves and vacant Crown land. The area to be cleared is likely to contain Darwin cycads (*Cycas armstrongii*) listed as Vulnerable under the *Territory Parks and Wildlife Conservation Act 1976* (TPWC Act), and while retaining or translocating individual plants¹ may reduce the risk to the local population of *Cycas armstrongii*, risk to the total population of the species from the Proposal is likely to be low.

A search of the Department of Environment and Natural Resources (DENR) flora and fauna database identified records of the following species within 10 km of the Proposal; Macarthur's palm (*Ptychosperma macarthurii*), Luisia (*Luisia corrugata*), black-footed tree-rat (*Mesembriomys gouldii*), northern quoll (*Dasyurus hallucatus*), yellow-spotted monitor (*Varanus panoptes*), pale field-rat (*Rattus tunneyi*), partridge pigeon (*Geophaps smithii*), curlew sandpiper (*Calidris ferruginea*), Mertens' water monitor (*Varanus mertensi*) and plains death adder (*Acanthophis hawkei*). The risk to these species is considered to be low due to the relatively small area proposed to be cleared and limited habitat suitability within the proposal area.

There are potential risks to the terrestrial flora and fauna values within the adjacent water dependent ecological communities in the Black Jungle and Lambells Lagoon conservation reserves from groundwater drawdown, and surface runoff of irrigated wastewater (refer to sections 3 and 4). Black Jungle and Lambells Lagoon conservation reserves have high biodiversity values, protect a number of threatened and endemic species and habitats, and also provide for research,

¹ Liddle 2009. [Management Program for Cycads in the Northern Territory of Australia 2009-2014](#).

recreational and commercial activities. The Proponent committed in the NOI to manage groundwater drawdown through monitoring and adherence to the groundwater extraction licence (GWEL) conditions, and discharge water quality in accordance with Environment Protection Licence (EPL) conditions, to avoid potential indirect impacts to flora, fauna and aquatic ecosystems.

The NT EPA has taken into account the advice provided by the DENR Flora and Fauna and Water Resources divisions, and considers that the risks from the Proposal to terrestrial flora and fauna are low, and that the objective for terrestrial environmental quality is likely to be met.

2. Hydrological processes

Objective: Maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.

The Proposal is in the Adelaide River Catchment, overlying the Eastern Management Zone of the Howard Groundwater System² (which includes the Koolpinyah Dolostone Aquifer). The Howard Groundwater System is a high yielding aquifer (2 – 60 L/s) covering 1,462 km² of the Darwin Rural area. The aquifer has value as an important water source for agricultural development, rural and public water supply and also discharges to several surface water ecosystems including Howard Springs and Black Jungle.

Water use

The Proposal is located within the Darwin Rural Water Control District, however is outside of a water allocation plan area. The Proposal site currently has 14 bores, 10 of which are licensed for a maximum allocation of 3,216 ML/yr under a GWEL (GWEL HGS10000³) under section 60 of the *Water Act 1992* (Water Act). Groundwater levels range from 4-5 m below ground level (bgl) in the wet season and 13-19 m bgl in the dry season. There are no surface waterbodies or waterways in the Proposal area, however there are existing unlined drains that divert overland flows to the property boundaries; and then west towards Black Jungle (Sections 1688 and 1611) and east towards Lambells Lagoon.

Water use for the Proposal has the potential to reduce groundwater levels and availability leading to impacts on groundwater users and groundwater dependent ecosystems (GDEs) in the receiving environment.

Groundwater would be extracted at a rate of up to 1,186 ML/yr (3.25 ML/day; ~38 L/s); which is 30% more than the forecast water demand of 912.5 ML/yr (2.5 ML/day; 30 L/s) to account for the likely maximum water use. This is considered a conservative estimate and is ~37% of the maximum amount that is currently allocated to the Proposal under the GWEL.

The Proponent considered the total volume of water that could be extracted from the Eastern Management Zone of the Howard Groundwater System taking into account existing allocations licensed to other users (954 ML/yr); water required for domestic and stock use (164.5 ML/yr); and estimated maximum water requirements for the Proposal (1,186 ML/yr). It concluded that the total volume of extraction from the Eastern Management Zone (~2,305 ML/yr) would be less than the DENR Water Resources modelled limit³ of available extraction (~3,000 ML/yr); the volume that could be taken from the aquifer on a sustained basis without impairing water quality or causing environmental damage. However, advice from DENR suggests there is a high capacity for pumping impacts on other licensed groundwater users in close proximity to the Proposal as the

² DENR n.d., *Howard Groundwater System*, DENR, available at:

https://denr.nt.gov.au/_data/assets/pdf_file/0007/386890/Howard-Goundwater-System.pdf

³ NTG 2020, *Groundwater Extraction Licence Register*, available at: <http://www.ntlis.nt.gov.au/walaps-portal/noiNodSod/licence/HGS10000>

GWEL for the Proposal site is the largest entitlement for the Eastern Management Zone and is spread over 10 nominated bores. There is also potential for saline intrusion of the aquifer on the edges of the floodplains in the lower elevation (northern) areas of Lambells Lagoon and the potential for formation of a localised zone of depressurisation in the longer term (>30 years), if the pumping regime is not well managed.

The Proponent proposes to implement water use efficiency and water treatment measures, which would reduce the demand for groundwater. The Proponent has committed to monitoring groundwater levels, quality and usage as part of its Water Management Plan to achieve a target of no significant reduction of groundwater levels in the Howard Groundwater System and thereby avoid impacts to nearby groundwater users and GDEs. The Proponent is required to manage groundwater extraction activities in accordance with the conditions of the GWEL to the satisfaction of DENR Water Resources Division.

The NT EPA supports the Proponent's commitments to limit and monitor its groundwater extraction regime to avoid impacts to other users and GDEs.

Wastewater

The disposal of treated wastewater from the Proposal involves irrigating to land. Irrigated wastewater may alter surface water flows resulting in increased runoff.

The Proponent undertook modelling to develop a preliminary design for its irrigation regime, including determination of the volume of wastewater that would be generated, how frequently it could be discharged, and the required irrigation area and wet weather storage capacity. Modelling indicated daily effluent volumes ranging from 1,365 – 1,724 KL. Irrigation would initially occur over a 150 ha area, with an additional 78 ha available for irrigation if required (228 ha in total).

To avoid the potential for irrigation runoff and associated offsite discharge impacts, the proponent committed to minimise wastewater volumes, adopt water efficiency measures including recycling and reuse, treat wastewater to maximise reuse, establish large irrigation areas and provide contingent wet weather storage capacity. This would provide for sufficient capacity to contain wastewater onsite during periods of soil saturation in the wet season when irrigation would not be feasible.

The Proponent would be required to discharge wastewater in accordance with the conditions of an EPL issued under section 34 of the *Waste Management and Pollution Control Act 1998* (WMPC Act). This would include the development and implementation of an Irrigation Management Plan to the satisfaction of the NT EPA, as well as monitoring and reporting of irrigation volumes and impacts on the receiving environment. The Proponent stated that potential impacts from stormwater runoff would be managed through installation of a stormwater drainage system and implementation of an Erosion and Sediment Control Plan prepared in accordance with best practice guidelines. The NT EPA considers that the Proponent's commitments to avoid runoff from irrigated land and manage stormwater risks are appropriate.

The NT EPA supports the Proponent's approach to avoid impacts to other groundwater users and the receiving environment and is satisfied that the potential impacts and risks to hydrological processes can be mitigated through implementation of the management measures presented in the NOI and Further Information. The NT EPA considers that its objective for hydrological processes is likely to be met.

3. Inland water environmental quality

Objective: Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

The Proposal has the potential to cause localised impacts to surface water and groundwater quality through the long term irrigation (30+ years) of wastewater generated during operations from flushing and cleaning of farm production areas. Potential contaminants of concern associated with the Proposal are nutrients, bacteria, hydrocarbons, herbicides/pesticides and other chemicals used in the farming operations, as well as sediment loads in surface water discharges.

Environmental values of surface water and groundwater in the Darwin Rural Water Control District are reflected in the declared beneficial uses which are agriculture, aquaculture, public water supply, environment, cultural, industry, rural stock and domestic, mining activity, and petroleum activity.

The Proponent conducted a desktop assessment of receiving environment water quality and found that there is a high inflow of nutrients to the adjacent wetlands in Lambells Lagoon Conservation Reserve and nutrient concentrations in springs and spring fed creeks of the Howard Groundwater system are higher than typically observed in freshwater creeks in the region⁴. Groundwater quality in the Darwin Rural area is generally good with very little contamination, although low levels of herbicide and insecticide chemicals, and elevated nitrate, have been detected in some bores⁵.

The Proponent committed to undertake sampling and analysis of surface water and groundwater to establish baseline water quality conditions, and provided a preliminary water quality monitoring program with indicative trigger values for a range of physico-chemical and toxicant parameters. The parameters are derived from various sources including ANZECC & ARMCANZ water quality guidelines⁶, irrigation water quality short term trigger values, baseline data, interim site specific short-term guideline values; NSW Guideline for Use of Effluent by Irrigation⁷, limits of reporting; and the drinking water guidelines⁸. The Proponent's baseline dataset and water quality monitoring program would be reviewed and considered in determination of appropriate irrigation discharge criteria and decision-making for an EPL.

The Proponent's effluent quality modelling was based on predicted daily effluent production volumes ranging from 1,365 – 1,724 KL. However, actual effluent volumes for disposal could be higher depending on the water treatment system used as the effluent volume inputs to the model assumed treatment and reuse. The modelling indicates that an irrigation area ranging from 100 – 130 ha would be required initially to accommodate effluent generated by the Proposal; with any variation in area influenced by the percentage of water that would be reused (0-75%) and the available wet weather storage volume (40 – 120 ML). As discussed above, the Proposal includes a total area of 228 ha of land for irrigation if required.

All wastewater would undergo primary treatment involving removal of solids. Depending on EPL requirements to meet beneficial uses of the receiving environment, secondary treatment options being considered by the Proponent include a particulate air separation system and a floating wetland treatment system, followed by disinfection for final pathogen reduction to achieve reuse or irrigation criteria.

Solids would be dewatered as part of primary waste treatment and then composted. Potential water quality impacts from composting wastes would be managed through prevention of rainfall ingress and installation of an impermeable concrete base to minimise seepage to ground.

⁴ Schult, J. 2014. [Pesticide and nutrient monitoring in five springs of the Darwin region in the 2014 dry season](#). Report 10/2014D, Palmerston, Department of Land Resource Management.

⁵ Schult, J. 2016. [Pesticides and nutrients in groundwater of the Darwin region](#), Report No. 21/2016D, Department of Land Resource Management.

⁶ Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000 [Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, The Guidelines](#).

⁷ DEC 2004, [Use of Effluent by Irrigation](#). NSW.

⁸ NHMRC 2018 [Australian Drinking Water Guidelines](#) 6, 2011 Version 3.5 (Updated August 2018)

The NT EPA is satisfied that the potential impacts and risks to inland water environmental quality can be mitigated through implementation of the management measures presented by the Proponent; and through management and monitoring of water quality impacts in accordance with an EPL. The NT EPA considers that its objective for inland water environmental quality is likely to be met.

4. Social, economic and cultural surroundings

Objective: Protect the rich social, economic, cultural and heritage values of the Northern Territory.

The Proposal has the potential to generate odour emissions from crocodile pens, the composting facility and irrigation areas, which may impact surrounding land users. The NT EPA guidance for recommended land use separation distances⁹ states that an activity with livestock / holding pens containing >10,000 animals per year should be separated from sensitive land uses by 1,000 m radius. The NOI states that there are three neighbouring horticultural properties within a 1 km radius that contain buildings that may be residences or workplace facilities, located 500 m northeast and ~800 m south. The nearest known residential properties are along Wanderie Road about 8 km west of the Proposal.

The Proponent proposed the following measures to avoid or mitigate potential impacts:

- excluding stormwater from the composting area
- compost leachate management
- implementing pen hygiene procedures
- wastewater treatment processes
- implementing an Irrigation Management Plan
- avoiding irrigation during strong winds
- minimising overspray/drift of irrigation droplets
- avoiding ponding or runoff from irrigation
- implementing an odour complaints management system.

There is a risk that the Proposal could increase the biting insect population, which is a public health concern. The Proponent proposes to address this risk by minimising biting insect breeding habitat through the Proposal's stormwater drainage design and an updated biosecurity management plan.

The NT EPA is satisfied that the potential impacts and risks to social, economic and cultural surroundings can be mitigated through implementation of the proposed management measures presented in the Proponent's NOI and Further Information. The NT EPA considers that its objective for Social, cultural and economic surroundings is likely to be met.

Conclusion

The NT EPA considers that the potential environmental impacts and risks associated with the Proposal are not significant and that the Proposal does not require assessment under the EA Act.

Comments from NTG advisory bodies have been provided to the Proponent and the NT EPA has provided recommendations to the Proponent to ensure that potential impacts on the environment are minimised and responsibilities under legislation can be met.

DECISION

The proposed action, which was referred to the NT EPA by Mick Burns has been examined by the NT EPA and preliminary investigations and inquiries conducted. The NT EPA has decided that the potential environmental impacts and risks of the proposed action are not so significant as to

⁹ NT EPA 2017, [Guideline: Recommended Land Use Separation Distances](#), October 2017 Version 1.0.

warrant environmental impact assessment by the NT EPA at the level of a Public Environmental Report or Environmental Impact Statement, under provisions of the EA Act.

Environmental management of the potential environmental impacts is the responsibility of Mick Burns through preparation and implementation of procedures and management plans specified in the NOI and Further Information, and through compliance with an EPL under the *Waste Management and Pollution Control Act 1998*, and other relevant legislation.

This decision is made in accordance with clause 8(2) of the EAAP and the administrative procedures are at an end with respect to the proposed action.

A handwritten signature in blue ink, appearing to read 'P. Vogel', with a horizontal line underneath.

DR PAUL VOGEL AM MAICD
CHAIRPERSON
NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY
25 JUNE 2020

Attachment A: Northern Territory Government Advisory bodies consulted on the Notice of Intent

Department	Division
Department of Environment and Natural Resources	Flora and Fauna Water Resources Weeds Environment Bushfires NT Rangelands
Department of Infrastructure, Planning and Logistics	Planning Transport and Civil Services Infrastructure
Department of Primary Industry and Resources	Mining Compliance Petroleum Primary Industry Fisheries
Department of Tourism, Sport and Culture	Parks and Wildlife Heritage Tourism NT Arts and Museums
NT Police, Fire and Emergency Services	Business Improvement and Planning
Department of Health	Environmental Health Medical Entomology
Department of Trade, Business and Innovation	Economics and Policy Strategic Policy and Research
Department of Local Government, Housing and Community Development	Maintenance Planning Housing supply
Power and Water Corporation	
Aboriginal Areas Protection Authority	Technical
Department of the Attorney-General and Justice	Commercial Division NT Worksafe
Land Development Corporation	
Department of the Chief Minister	Economic and Environmental Policy Social Policy