RAC Tourism Assets Pty Ltd

Monkey Mia Dolphin Resort

Nutrient and Irrigation Management Plan

6 July 2020

57540-129792 (Rev 2)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

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Appendices

1. Summary

This Nutrient and Irrigation Management Plan (NIMP) is submitted in accordance with Ministerial Statement (MS) 709 Condition 8 for the Monkey Mia Dolphin Resort expansion (the Project) by RAC Tourism Assets Pty Ltd (RAC).

Table 1.1 below presents the environmental criteria to measure achievement of the conditioned environmental outcome that must be met through implementation of this NIMP.

Table 1.1: Environmental criteria

Required information	Response	
Title of proposal	Expansion of the Monkey Mia Dolphin Resort Monkey Mia, Shark Bay.	
Proponent	RAC Tourism Assets Pty Ltd.	
Ministerial Statement number	709.	
Purpose of this Condition EMP	The Nutrient and Irrigation Management Plan is submitted to fulfil the requirements of Condition 8 of the above Statement.	
EPA's environmental objective for the key environmental factors	**Environmental factor**	**EPA environmental objective**
	Factor 4 Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.
	Factor 5 Marine Environmental Quality	To maintain the quality of water, sediment and biota so that the environmental values are protected.
Management targets	**Environmental factor**	**Management target**
	Factor 4 Inland Waters	No waterlogging within irrigated areas. (T4.2) No increase in soil nutrient above the loading rate. (T4.3).
	Factor 5 Marine Environmental Quality	Prevent potential contaminants from the Project area entering the marine environment. (T5.2).

I hereby certify that to the best of my knowledge, the Condition EMP provisions within this Nutrient and Irrigation Management Plan are true and correct and address the legal requirements of condition 8 of MS 709.

[Signature of duly authorised proponent representative]

Name: Antony Pickworth Signed: 

Designation: Director
RAC Tourism Assets Pty Ltd

Date: 10 July 2020

2. Context, scope and rationale

RAC Tourism Assets Pty Ltd (RAC) owns and manages the current Monkey Mia Dolphin Resort (the proposal; Appendix A) located within a World Heritage area on a Shire of Shark Bay reserve. Approval for the proposal under the *Environmental Protection Act 1986* (EP Act)

was granted to the former proponent Monkey Mia Dolphin Resort Pty Ltd through issue of MS 709 on 28 December 2005. A section 46 approval extending the period for substantial commencement was granted under MS 919 on 18 December 2012 to the then proponent, Aspen.

Substantial commencement of the proposal occurred in April 2013 with construction of the wastewater treatment plant, a key element of the proposal, which satisfied the requirement of condition 4 in MS 919.

Aspen transferred ownership to RAC in December 2015. An application to change conditions and increase the extent of the proposal in MS 709 under section 45C/46 of the EP Act, was submitted in April 2017.

In June 2017, the Deputy Chairman of the Environmental Protection Authority (under delegation authority from the Minister for Environment) approved changes to MS 709 under section 45C of the EP Act. The change to the proposal included:

- An increase in the clearing area for the wastewater treatment plan
- The development and use of borrow pits requiring 3.14 ha of vegetation clearing
- Administrative changes to Schedule 1 of MS 709 to describe the Development Envelope
- Simplification of the resort expansion and removal of elements to the design that were not relevant to the environment
- Schedule 1 of MS 709 was replaced by Attachment 1 and outlines the authorised extent of the physical and operational elements of the project (Appendix A).

Commencement of earthworks for the other key elements of the proposal, the resort expansion and staff accommodation facilities, commenced in October 2017 and were completed in October 2018.

MS 1067 was subsequently issued on 14 November 2017, changing conditions 3, 4 and 5 and deleting condition 6 of MS 709.

2.1 Scope

Condition 8 of MS 709 requires the proponent to prepare a Nutrient and Irrigation Management Plan (NIMP) to ensure that nutrient and irrigation applications from the Project are being appropriately managed.

Given that the upgrading of the wastewater treatment plant was completed in 2014, and no wastewater is proposed to be used for irrigation within the resort area, this NIMP specifically refers to the nutrient and irrigation management system used for the landscaping areas within the resort expansion area and staff facilities area.

2.1.1 Key environmental factors

The environmental factors, EPA objectives and environmental aspects of the Project are provided in Table 2.1.

Table 2.1: Key environmental factors, objectives and environmental aspects

Factor	EPA objective	Environmental aspects of the Project
Factor 4 Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	Uncontrolled application of irrigation water has the potential to result in waterlogging which may discharged into the marine environment Unregulated application of fertiliser has the potential to impact on the marine environment during high rainfall events (e.g. cyclonic events).
Factor 5 Marine Environmental Quality	To maintain the quality of water, sediment and biota so that the environmental values are protected.	

2.2 Requirements of MS 709

This NIMP is submitted in accordance with condition 8 of MS 709. Table 2.2 details the requirements of this condition and indicates which sections of this NIMP they are addressed.

Table 2.2: Requirements of condition 8 of MS 709

Condition	Requirement	Section in NIMP
8-1	Prior to commencement of construction associated with the resort expansion, the proponent shall prepare a Nutrient and Irrigation Management Plan, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority. This Plan shall address:	NIMP
	method of application of nutrients;	Section 3.1 , NIMP 8, Appendix D
	irrigation program;	Section 3.1, NIMP 1, NIMP 3, NIMP 4, Appendix C
	water conservation;	Section 3.1, NIMP 3, 5, 6, Appendix C.
	recommendation for low nutrient and water requirement plants and grasses; and	NIMP 5 and NIMP 6
	prescribed fertiliser applications.	NIMP 7, NIMP 8, NIMP 10, Appendix D
	Note: In preparation of advice to the Minister for the Environment, the Environmental Protection Authority expects that the advice of the following agencies will be obtained: Department of Conservation and Land Management; and Shire of Shark Bay.	Section 6
8-2	The proponent shall implement the Nutrient and Irrigation Management Plan required by condition 8-1.	Section 2 & 4
8-3	The proponent shall make the Nutrient and Irrigation Management Plan required by condition 8-1 publicly available.	Section 4.1

2.3 Rationale and approach in meeting the environmental objective

The approach for managing any potential nutrient and irrigation impacts is to develop a comprehensive management program that identifies:

- Management risks
- Key management based targets
- Management actions
- Monitoring measures
- Review and revision requirements.

An adaptive risk based management approach has been developed in order to create a robust management system, that prioritises and manages significant risks using the mitigation hierarchy (i.e. avoid, minimise, manage, rehabilitate and offset).

This management approach allows for flexibility, to enable the management program to adapt to any changes in the Project conditions, as well as to respond to the dynamic nature of the surrounding environment. The methodology for the risk-based approach is provided in Appendix A.

2.3.1 Rationale for choice of management targets

Management targets in Table 3.2 were selected in order to prioritise the significant risks identified for the project, and are based on:

- Review of available data for the region
- The relationship between the Project aspects and the environmental factors
- Industry standards and legislative requirements
- the requirements of MS 709.

3. Nutrient and irrigation management

The objective of the NIMP is to identify the management provisions RAC proposes to implement to manage and minimise potential impacts from irrigation during operation in order to:

- Meet the EPA's objectives for inland waters and marine environmental quality as described in Table 2.1
- Meet the requirements of MS 709 (Table 2.2).

3.1 Management actions

Risk-based management actions have been identified and prioritised in Table 3.1 based on the methodology provided in Appendix A. These management actions focus on Project operation activities that have the highest likelihood of causing environmental impact, and were specifically developed to reduce potential impacts of activities upon the surrounding environment. Given the low lying nature and uniform topography of the project area, contours and physical features are not considered to be determinants of potential impacts. Areas which may be potentially impacted by nutrient and irrigation activities include the foreshore reserve and marine environment.

The Monkey Mia water application programme is designed to ensure compliance with bore licenses, by applying the minimal amount of water to maintain healthy turf. The Monkey Mia irrigation schedule is provided within Appendix C.

In terms of nutrient application, fertilisers (in the form of Bactivate microbial granules and Eco-prime Emerald fertiliser) are applied in accordance with the Monkey Mia Application Guidelines (Appendix D). Bactivate Microbial granules at 250kg per ha are applied twice per year in February and August, while Eco-Prime Emerald fertiliser is applied at a half rate of 125 km per ha. twice per year in October and March.

Table 3.1: Risk based management actions

Risk and key impacts	NIMP management action reference	Management actions	Risk-based priority	Timing	Relevant management target	Status
Uncontrolled application of irrigation water has the potential to result in waterlogging.	NIMP 1	Design, install and test the irrigation system to prevent water logging and erosion.	High	Prior to operation	T4.2	Complete
	NIMP 2	Use a probe (or other device) for measuring soil moisture content to ensure over-irrigation does not occur.	High	During operation	T4.3	Ongoing
	NIMP 3	Cease irrigation prior to and during forecast high rainfall events and when soil field capacity has been reached.	High	During operation	T4.3	Ongoing
	NIMP 4	Schedule irrigation based on soil moisture level, plant requirements (lawn and native plantings), weather conditions, evaporation and transpiration rates.	High	Prior to operation	T4.3	Ongoing
Unregulated application of fertiliser has the potential to impact on the marine environment.	NIMP 5	Landscaped areas (open space and streetscapes) to be planted with hardy coastal species needing low nutrients and water, as agreed by the Shire of Shark Bay.	High	Prior to operation	T5.2	Complete
	NIMP 6	Turfed areas to be planted using a grass species with: high salt tolerance low water requirements low nutrient requirements as agreed by the Shire of Shark Bay.	High	Prior to operation	T5.2	Complete
	NIMP 7	Fertiliser application loading rates will be determined and provided to the OEPA once master planning for the resort has been finalised and final areas (m2) of lawn and native planting are known.	High	Prior to operation	T4.3	Complete
	NIMP 8	Slow release fertiliser will be applied in accordance with Appendix D.	High	During operation	T4.3	Ongoing
	NIMP 9	If required all pesticide and herbicides will be applied according to the manufacturers' specifications.	Medium	During operation	T5.2	Ongoing
	NIMP 10	Fertiliser, pesticide and herbicides will not be applied to waterlogged soil.	High	During operation	T4.2	Ongoing
	NIMP 11	Soil nutrients, pH and EC will be assessed to measure the efficiency of applied nutrients and determine whether deficiencies or toxicities are occurring. Topsoil from turfed areas will be sampled annually in March, and tested by the CSBP soil and Plant laboratory. Indicative soil sampling results are presented within Appendix E	High	Annually, during operation	T5.2	Ongoing
	NIMP 12	Fertiliser, pesticide and herbicides used on-site will be stored in accordance with the Explosives and Dangerous Goods Act 1961 and requirements outlined in the Material Safety Data Sheets for the products.	High	At all times	T5.2	Ongoing

3.2 Management target

Management targets have been developed to measure and report against the proposed RAC environmental objective (Table 3.2).

Table 3.2: Management targets

Environmental factor	EPA environmental objective	Management targets (Unique identifier)
Factor 4 Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	No waterlogging within irrigated areas. (T4.2) No increase in soil nutrient above the loading rate. (T4.3).
Factor 5 Marine Environmental Quality	To maintain the quality of water, sediment and biota so that the environmental values are protected.	Prevent potential contaminants from the Project area entering the marine environment. (T5.2).

3.3 Monitoring program

The purpose of monitoring program is to inform, through the management targets, if the environmental objective is being achieved, as well as to determine if management actions need to be reviewed and revised.

Table 3.3 outlines the monitoring program proposed to be undertaken by RAC.

Table 3.3: Monitoring program to achieve management targets

NIMP monitoring action number	Indicator	Parameter	Monitoring method	Frequency	Location	Relevant NIMP management action reference	Relevant management target
NIMP M1	No waterlogging within irrigated areas of the resort	Irrigation flow	Meter reading	Monthly	Water meter	NIMP 1 NIMP 2 NIMP 3 NIMP 4	T4.2
NIMP M2		Soil moisture	Soil moisture probe	Monthly	Irrigated areas		T4.2
NIMP M3	No excess application of nutrients from irrigation	Soil nutrients	Nutrient audit/assessment	Annually in March	Irrigated areas	NIMP 6 NIMP 7 NIMP 8 NIMP 9 NIMP 10 NIMP 11 NIMP 12	T4.3 and T5.2

Monitoring of excess nutrient loads in groundwater and bacteria in seawater is also required under the WWTP Licence L7426-2000/8, issued by Department of Water and Environment Regulation (DWER) under Part V of the EP Act. Seawater monitoring is currently undertaken as a contingency measure, in the event that monitoring of ambient groundwater quality records levels of Enterococci and Escherichia coli above the thresholds (10 MPN / 100 ml for enterococci or 10 cfu/ 100 ml fir *Escherichia coli*). Seawater monitoring would involve weekly spot sampling of sea water at four points (SW1, SW2, SW3 and SW4; see p. 22 of L7426/2000/8), with Enterococci and *Escherichia coli* as parameters. Weekly sampling would continue until two consecutive samples of the affected groundwater bores fall below 10 MPN/ 100 ml for enterococci or 10 cfu/ 100 ml for *Escherichia coli*.

4. Review and revision of management actions

In the event that management targets are not met, RAC will investigate the potential cause and any potential impacts that may have resulted. If the management targets are not met, and it is deemed to be the result of the project, the corrective actions detailed in Table 4.1 will be implemented.

Table 4.1: Corrective actions for management targets

NIMP corrective action	Performance indicator	Action	Responsibility	Relevant NIMP monitoring action reference	Relevant management target
NIMP CA1	Waterlogging in the irrigated areas	Investigate cause, including assessing irrigation rates and timing. Implement corrective actions which could include reducing irrigation rates and informing staff of correct procedures as required. Monitor to ensure remedial measures are successful. Revise and update risk assessment and management actions where applicable.	RAC	NIMP M1 NIMP M2	T4.2
NIMP CA2	Increase in nutrient levels above loading rates	Investigate cause. Implement corrective actions, which could include reducing fertiliser application rates and informing staff of correct procedures as required. Monitor to ensure remedial measures are successful. Revise and update risk assessment and management actions where applicable.	RAC	NIMP M3	T4.3 and T5.2

4.1 Reporting provisions

The performance of the NIMP will be assessed annually against the management targets in Table 3.2, and will be reported on as part of the Compliance Assessment Report (CAR). The NIMP reporting template is presented in Table 4.2. This NIMP will also be made publicly available in accordance with condition 8-3 of MS 709, via the RAC Parks and Resorts website.

4.1.1 Reporting on exceedance of the management target

In the event that management targets are not met during the reporting period, a written report will be included in the CAR detailing the corrective actions that were undertaken, and the effectiveness of the corrective actions to rectify any potential impacts.

Table 4.2: Environmental management plan reporting table

Condition environmental objective and management target set in the Condition EMP		Reporting on the management objective and management target	Status1
EPA objective	**Management target**		
Factor 4 Inland Waters To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	No waterlogging within irrigated areas. (T4.2).	No waterlogging within irrigated areas.	• Yes • No
	No increase in soil nutrient above the loading rate. (T4.3).	No increase in soil nutrient above the loading rate.	• Yes • No
Factor 5 Marine Environmental Quality To maintain the quality of water, sediment and biota so that the environmental values are protected.	Prevent potential contaminants from the Project area entering the marine environment. (T5.2).	Prevented potential contaminants from the Project area entering the marine environment.	• Yes • No

Notes:

[1]The status of achievement of the condition environmental objectives is indicated by the following symbols:

- Condition environmental objective achieved
- Condition environmental objective not achieved

5. Adaptive management

RAC will implement an adaptive management system to provide a robust management plan, which effectively meets the environmental objectives. To achieve this, the NIMP will be reviewed on an annual basis to ensure that the plan takes into consideration amendments to operations, monitoring results, audits, continuous improvement and changes in regulatory and corporate requirements. If revised, a copy of the revised NIMP will be provided to the Department of Water and Environment Regulation as part of the CAR.

6. Stakeholder consultation

Consistent with the EPA's expectations for this NIMP, RAC consulted with a number of stakeholders during the development of the plan.

This section provides a summary of consultation that occurred and key comments received from each stakeholder (Table 6.1).

Table 6.1: Stakeholders consulted, comments and responses

Organisation(s)	Comments	RAC response to comments/concerns
Department of Parks and Wildlife (previously known as Department of Conservation and Land Management CALM)	Identification of excess nutrient loading in groundwater and adjacent seawater could also be identified in this plan as per requirements for monitoring within the licence for the wastewater treatment plant.	Reference to the WWTP DER licence monitoring requirements in Section 3.3.
Shire of Shark Bay (SoSB)	Nil.	Nil.

7. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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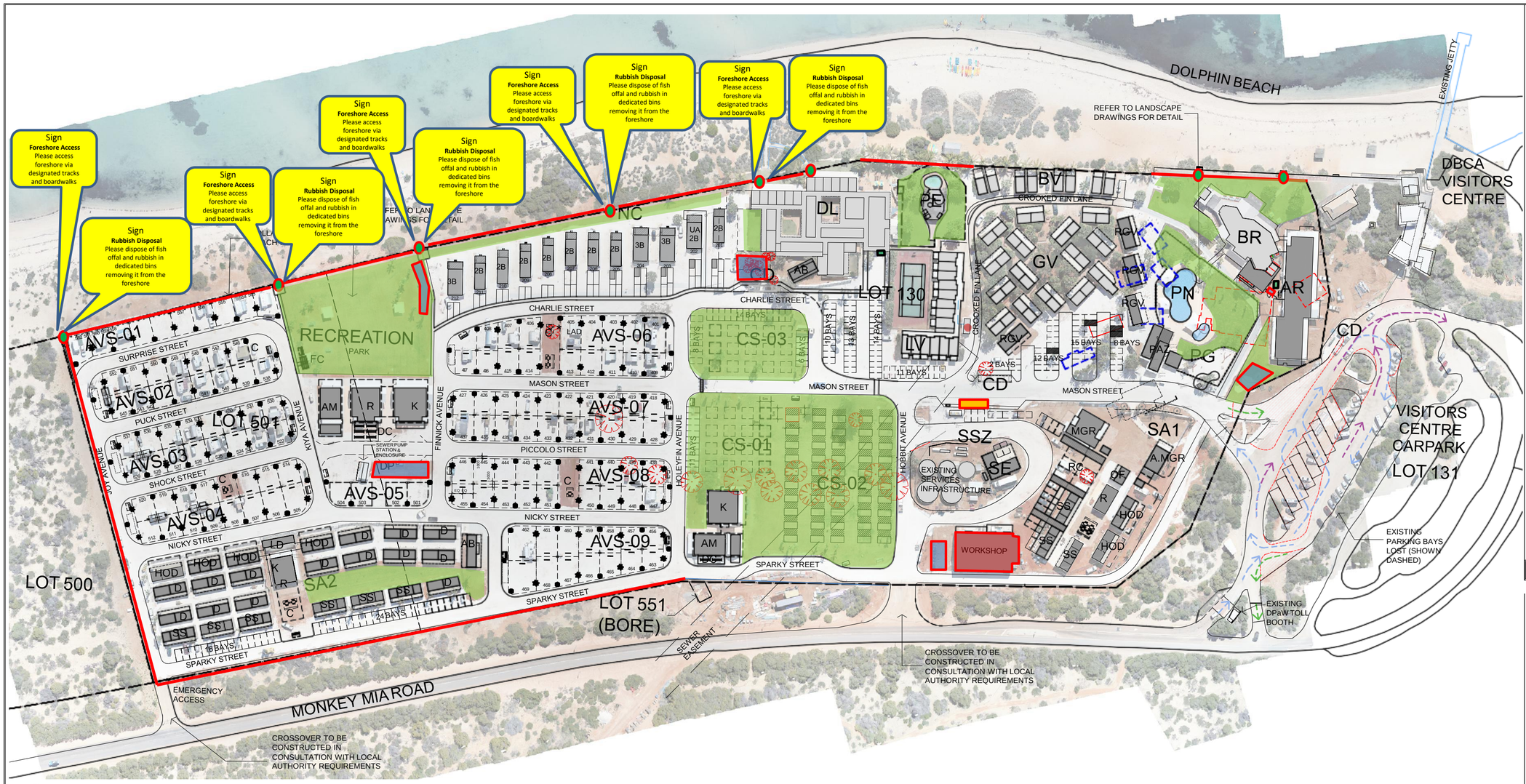
8. References

RPS Bowman Bishaw Gorham (RPS) 2004, *Expansion of Monkey Mia Dolphin Resort Public Environmental Review (EPA Assessment Number 1455),* report prepared for Monkey Mia Dolphin Resort Pty Ltd, Perth, June 2004

Appendix A Overall masterplan



- Point of entry to beach
- Fencing
- Drainage Tank / Infiltration Swale
- Chemical Storage Area
- Bunded Fuel Bowser
- Grease Trap/Tank
- Grassed Area
- Sealed/ Paved Area
- Shell Grit
- Pindan

Rev	Date	Issued To
12	21.08.18	ISSUED TO CONSULTS, CLIENT & BLDR
11	10.07.18	ISSUED TO CONTRACTOR & SURVEYOR & LANDSCAPE
10	15.06.18	ISSUED TO CLIENT & BLDR
9	25.05.18	ISSUED TO CONSULTS & BLDR
9	21.05.18	ISSUED TO CONSULTS & BLDR
8	16.05.18	ISSUED TO CONSULTS & BLDR
7	20.04.18	ISSUED TO CONSULTS & BLDR
6	16.03.18	ISSUED TO BPA, DG Cons.
5	14.02.18	ISSUED TO DDM
4	11.12.17	ISSUED TO BPA, AMS, BESEEN & BLACKWELL
3	04.12.17	ISSUED TO BPA AND AMS
2	01.12.17	ISSUED TO STRATEGEN
1	23.11.17	ISSUED TO DDM

Rev	Date	Description
12	21.08.18	AERIAL PHOTO UPDATE (19.08.18)
11	10.07.18	DBCA & ARRIVALS BACKGROUNDS UPDATED
10	15.06.18	SITE MARKERS ADDED, STREET NAMES UPDATED
9	25.05.18	AERIAL PHOTO UPDATED (19.05.18)
9	21.05.18	ENTRY ROAD ADJUSTED, DB07 REPOSITIONED, 1ST AVE RE-ALIGNED, COORDS PROVIDED
8	16.05.18	ENTRY POINT & MAIN ST ROAD RE-ALIGNMENT, C'PARK LAYOUT CHANGED TO SUIT EXIST TREES
7	20.04.18	AERIAL PHOTO UPDATED, 3 BED UNIT REPOSITIONED, WADING POOL REPOSITIONED
6	16.03.18	MODIFIED FUEL TANK POSITION
5	14.02.18	SWAP CABANA WITH AVS-E SITE IN AVS-04. POOL FOOT PRINT CHANGED
4	08.12.17	INSERT PAZ FOOTPRINT
3	04.12.17	INSERT SA2 LAUNDRY AND STAFF QUARTERS SHIFTED TO SUIT 3m CLEARANCE
2	01.12.17	INSERT BUSHFIRE CLEARANCE ZONES
1	23.11.17	INITIAL ISSUE

CONTRACT DOCS

Job Title
MMDR
MONKEY MIA DOLPHIN RESORT

Sheet Title
OVERALL MASTERPLAN

Scale 1:1000
Job No. 16-131
Drawn PGA Checked PGA Date AUG 2017
DRAWING No. A01 Rev. 12

PERTH
Level 1 | 9 Havelock Street | West Perth | WA 6005
t | 08 9485 2122
f | 08 9485 2037
e | admin@patersongroup.com.au
w| www.patersongroup.com.au

OVERALL MASTER-PLAN
SCALE 1:1000 @ A1, 1:500 @ A3

LEGEND

EXISTING BUILDINGS

BR	BOUGHSHED RESTAURANT
LV	LIMESTONE VILLAS
GV	GARDEN VILLAS
BV	BEACH FRONT VILLAS
DL	DOLPHIN LODGE
	B1 - BEACHVIEW 1 BED
	SE - SHARED ENSUITE 2 BED
	D4 - 4 BED DORM
	D8 - 8 BED DORM
	DMA - DUTY MANGER'S ACCOMMODATION

BUILDINGS

K	CAMP KITCHEN
R	RECREATION BUILDING
C	BBQ AND SEATING CABANA
AM	AMENITY AREA
DC	DRYING COURT
FC	FISH CLEANING STATION
NC	NEW CABINS
	2B 2 BED - NEW CABINS
	3B 3 BED - NEW CABINS
	UA 2B ACCESSIBLE 2 BED - NEW CABINS
AR	ARRIVALS BUILDING
PAZ	POOL AMENITY ZONE
PE	POOL EXISTING
PN	POOL NEW
PG	PLAY GROUND

SA1	STAFF ACCOMMODATION AREA
SA2	STAFF ACCOMMODATION AREA
MGR	MANAGER'S ACCOM.
A.MGR	ASSISTANCT MANAGER'S ACCOM.
HOD	HEADS OF DEPARTMENT ACCOM.
D	DUPLEX (DOUBLES) STAFF ACCOM.
SS	SEASONAL STAFF ACCOM.
RGV	RELOCATED GARDEN VILLAS
AVS	ACCOMMODATION VEHICLE SITES
AB	RELOCATED EXISTING ABLUTION BLK
SE	SERVICES ENCLOSURE
CS-01	CAMPING SITES (MIN SIZE 25m² NOMINAL 5x5m AND MINIMUM REGULATION SEPARATION SHOWN. SITES MAY BE LARGER OR AGGREGATED FOR LARGER GROUPS AT REDUCED YIELD)
SSZ	SITE SERVICES ZONE (LAUNDRY, WORKSHOP ETC)
FB	FUEL BOWSER
FT	FUEL TANK
CD	COACH DROP OFF
DP	DUMP POINT
ST	STORE RM
RC	RELOCATED CARAVANS (EXISTING)
OF	OFFICE
SC	SEWER PUMP STATION ENCLOSURE
LD	LAUNDRY
GT	GAS TANKS

CLIENT:

RAC Monkey Mia Dolphin Resort For the better

SYMBOL LEGEND

- EXISTING BUILDINGS / INFRASTRUCTURE
- NEW BUILDINGS / REFURBISHED BUILDINGS
- PROPOSED DPAW LAND TO BE MODIFIED BUT NOT PART OF THIS DEVELOPMENT APPLICATION
- RELOCATION
- DEMOLITION
- ENSUITES
- GROUND WATER MONITORING WELL LOCATION
- MACERATOR PIT
- STAFF AREA
- EXISTING FENCE LINE
- *LAD — LOCAL AUTHORITY DISCRETION REQUIRED FOR 90m RULE (CPCGR SCHEDULE 7: DIVISION 6. cl. 19.1 - ABLUTIONS AND TOILET FACILITIES, DIVISION 8 cl. 31 - WASHING UP FACILITIES FOR CAMPERS)
- 25m NOMINAL WIDE REDUCED FIRE LOAD ZONE
- NOMINAL 4m WIDE PROPOSED BATTER
- NOMINAL 5m CLEARED ZONE - IMMEDIATELY ADJACENT TO BOUNDARY
- NOMINAL 3m CLEARED ZONE
- NOMINAL 7m ZONE OF EXISTING VEGETATION TO BE MAINTAINED

STAFF ACCOMMODATION MODULES

- 3 ROOM FULL MODULE - HEADS OF DEPARTMENT
- 2 ROOM DOUBLE MODULE - DOUBLE
- 1 ROOM SINGLE MODULE - SEASONAL STAFF
- 2 ROOM DOUBLE HALF MODULE - PERMANENT

NEW CAR BAY PROVISIONS

SA1	:7 BAYS
SA2	:40 BAYS
WORKSHOP	:10 BAYS
DOLPHIN LODGE, LIMESTONE VILLAS & CAMP SITES	:126 BAYS (INCLUDES 37 OVERFLOW BAYS)
ADMIN & PARK ENTRY	: TBA
GARDEN VILLAS	: 48 BAYS
NEW BEACH CABINS	: 19 BAYS WITH BOAT LAYDOWN BESIDE

YIELD TABLE

GUEST ACCOMMODATION

ACCOMMODATION VEHICLE SITES (ALL NEW)			*129*
AVS	POWERED STANDARD	(105)	
	POWERED STANDARD WITH ENSUITES	(14)	
AVS	POWERED STANDARD ON BEACH FRONT	(10)	
CAMPING SITES			*81*
CS	NEW UNPOWERED CAMP SITES	81	
BUILT ACCOMMODATION			*124*
DL	EXISTING DOLPHIN LODGE	52	
	B1 BEACHVIEW 1 BED	(24)	
	SE SHARED ENSUITE 2 BED PER ENSUITE	(16)	
	D8 DORMS 8 BED UNITS	(7)	
	D4 DORMS 4 BED UNITS	(5)	
LV	EXISTING LIMESTONE VILLAS	14	
BV	EXISTING BEACHFRONT VILLAS	8	
GV	EXISTING DUPLEXED GARDEN VILLAS	30	
RGV	RELOCATED DUPLEXED GARDEN VILLAS	8	
NC	NEW CABINS ON BEACHFRONT - 2 BED (INCL. 1 ACCESSIBLE UNIT)	9	
	NEW CABINS ON BEACHFRONT - 3 BED	3	
	GUEST ACCOMMODATION SUBTOTAL		***334***

STAFF & DPAW RESEARCH ACCOMMODATION (ALL NEW U.O.N)

SA1^	STAFF ACCOMMODATION		22
	MGR MGR'S RESIDENCE	(1)	
	A.MGR ASST.MGR'S RESIDENCE	(1)	
	HD HEADS OF DEPARTMENT - (FULL MODULE)	(2)	
	RC RELOCATED CARAVANS - (EXISTING)	(6)	
	SS SEASONAL STAFF - (QUARTER MODULE)	(12)	
SA1^	OFFICE		2
	OF OFFICE - (HALF MODULE - 2 ROOM)	(2)	
SA2^	STAFF ACCOMMODATION		56
	HD HEADS OF DEPARTMENT - (FULL MODULE)	(4)	
	PS PERMANENT STAFF - (HALF MODULE)	(28)	
	~~SS SEASONAL STAFF - (QUARTER MODULE)~~	~~(24)~~	
DMA	EXISTING DUTY MANGER'S RESIDENCE (DOLPHIN LODGE)		1
	STAFF & DPAW RESEARCH ACCOMMODATION SUBTOTAL		81

^ ALLOCATION OF ACCOMMODATION IS INDICATIVE ONLY

GUEST & STAFF ACCOMMODATION TOTAL ON COMPLETION 415

Appendix B Risk Matrix

Risk-based priority

A risk assessment determines whether a hazard could harm the environment. The following stages are undertaken once an environmental hazard has been identified

- Stage 1: Risk identification to identify and document environmental risks and impacts associated with the organisation activities, goods and services
- Stage 2: Qualitatively ranking potential environmental impacts to establish relative significance
- Stage 3: Establishing and documenting control measures to mitigate potentially significant environmental impacts.

RAC shall control all environmental risks identified within the organisation to an extent that is practically possible (Table A 1), once they have been identified through the risk management and identification process.
Risk ranking is generally undertaken by assigning likelihood and consequence levels to each identified activity or issue and determining risk levels through the use of a risk matrix. After completing this process management measures are implemented and a residual risk is determined.

Table A 1: Qualitative risk rating matrix

	Consequences			
Likelihood	Critical (4)	Major (3)	Moderate (2)	Minor (1)
Almost Certain (A)	VH	VH	H	M
Likely (B)	VH	VH	H	M
Unlikely (C)	VH	H	M	L
Rare (D)	H	M	L	L

VH	Very High	Immediate action required. Task stopped.
H	High	Senior Management attention needed.
M	Medium	Management responsibility must be specified.
L	Low	Manage by routine procedures.

Table A 2: Likelihood Classification

Likelihood	Description
Almost Certain (A)	Event is a common or frequent occurrence and is expected to occur daily
Likely (B)	Event is expected to occur annually.
Unlikely (C)	Event may occur. If the event has occurrence in the project area it is very infrequent. It is likely to have occurred within the industry.
Rare (D)	The event is unlikely to not occur in the project area but has been known to occur infrequently within the industry. The event may occur at a frequency of more than 10 years.

Table A 3: Consequence Classification

Consequence	Definition
Critical (4)	**Environment:** Long term large scale damage to habitat or environment. **Legal:** Non-compliance having a critical financial or community profile impact. **Community:** Widespread community disruption with significant adverse economic impact.
Major (3)	**Environment:** Severe impact requiring remedial damage to environment. **Legal:** Non-compliance and having high financial or community profile impact. **Community:** Extensive community complaints extending beyond the region or adverse state level media coverage. Wider community disruption up to 7 days with adverse economic impact.
Moderate (2)	**Safety:** Moderate impact on environment. No long term or irreversible damage. **Legal:** Non-compliance having moderate financial or community profile impact. **Community:** Widespread local complaints or adverse regional media coverage. Isolated community disruption up to 3 days with limited adverse economic impact.
Minor (1)	**Environment:** Minor breach of environmental policy. Negligible impact on environment. **Legal:** Technical breach with no sanction. **Community:** Few complaints or minor adverse media coverage. Negligible impact on reputation. Isolated community disruption up to 1 day with minimal economic.

When determining risk controls, the hierarchy of risk controls, summarised in Table A 4 must be considered.

Table A 4: Hierarchy of risk controls

Option	Examples
Elimination	Stop using equipment or substance, or stop undertaking the procedure causing the risk.
Substitution	Use an alternative substance, equipment or process which poses less risk.
Isolation	Separate receivers from the source of the risk.
Engineering Controls	Reduce exposure to the risk by making physical changes to equipment, procedures or the work environment (e.g. using dust control measures on equipment).
Change work practices	Adopt work procedures which minimise exposure to the risk (e.g. wet sweeping a dusty environment rather than dry sweeping, to minimise the amount of airborne dust.

Appendix C Irrigation schedule

Monkey Mia

Water Station Run Time / Monthly Scheduling

Station Number	Valve Numbers	Area Type	Application Rate (mm/hr)	Peak Station Run Time applying 10mm (Min) January
1	2, 4 ,6	Turf	13	46
2	8, 9	Turf	13	46
3	10	Turf	25	24
4	11	Turf	25	24
5	12	Turf	25	24
6	13	Turf	25	24
7	26, 27	Turf	13	46
8	28, 30	Turf	25	24
9	29, 31	Turf	25	24
10	32, 35	Turf	13	46
11	16, 17, 18	Turf	13	46
12	23	Turf	13	46
13	20, 36, 37	Turf	13	46
14	19, 21, 22	Gardens	13	46
15	14, 33, 34	Gardens	32	19
16	3, 1, 5 ,7, 15	Trees		15

Month	Controller Scheduling (%)
January	100%
February	97%
March	87%
April	66%
May	50%
June	No Irrigation Required
July	No Irrigation Required
August	49%
September	66%
October	81%
November	92%
December	99%

Turf require three (3) water applications per week

Garden and trees required two (2) water applications per week

Appendix D Nutrient application guidelines

Application Guidelines: Monkey Mia projects

Main Turf Areas (3.8Ha):

- **1st Application**
  - Apply *Bactivate granules* (250kg/Ha) to prepared soil surface prior to laying new turf.
  - Water over top of turf with mix of *BioBoost Plus* (2.5L/Ha) with *Seaweed Solution* (1L/Ha) in approx. 500L water.

- **2nd Application (at 6 – 8 weeks)**
  - Water over top of turf with mix of *BioBoost Plus* (2.5L/Ha) with *Seaweed Solution* (1L/Ha) mixed in approx. 500L water. Shake bottles thoroughly.
- ***Notes:***
  - ***For stolons*** *– apply as above after planting stolons.*

Palms:

- **1st Application**
  - Apply *Bactivate granules* (approx. 500g around base of each palm)
  - Water in with mix of *BioBoost Plus* (2.5L/Ha) with *Seaweed Solution* (1L/Ha) in approx. 500L water.

- **2nd Application (at 6 – 8 weeks)**
  - Water over top of turf with mix of *BioBoost Plus* (2.5L/Ha) with *Seaweed Solution* (1L/Ha) in mixed in approx. 500L water. Shake bottles thoroughly.

Important information on storing your products:

- *Bactivate granule* products contain living organisms and must be stored in a cool dry place, out of direct sunlight, rain and humidity whilst not in use. Part used bags should have as much air as possible expelled and sealed tight for your use at a later date.
- *BioBoost Plus* and *Bactivate Seaweed Solution* may be stored for up to 18 months and kept out of direct sunlight and excess heat, do not refrigerate.

For additional assistance, contact your local Growise/Bactivate representative, John Rukavina 0411 086 292

Appendix E Soil monitoring results example

Analysis Results

CSBP Soil and Plant Laboratory

93842
Total Eden - Bibra Lake

Lab No		MTS20124
Name		RAC
Code		Top Soil
Customer		Total Eden
Depth		0-10
Colour		BRRD
Gravel	%	0
Texture		2.0
Ammonium Nitrogen	mg/kg	< 1
Nitrate Nitrogen	mg/kg	< 1
Phosphorus Colwell	mg/kg	< 2
Potassium Colwell	mg/kg	53
Sulfur	mg/kg	0.8
Organic Carbon	%	0.15
Conductivity	dS/m	0.014
pH Level (CaCl2)		6.1
pH Level (H2O)		7.4
DTPA Copper	mg/kg	0.46
DTPA Iron	mg/kg	5.90
DTPA Manganese	mg/kg	0.68
DTPA Zinc	mg/kg	0.07
Exc. Aluminium	meq/100g	0.200
Exc. Calcium	meq/100g	0.90
Exc. Magnesium	meq/100g	0.67
Exc. Potassium	meq/100g	0.10

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

		Lab No
		MTS20124
Exc. Sodium	meq/100g	0.11
Boron Hot CaCl2	mg/kg	0.27
PBI		14.6

CSBP Lab. Extract Value.

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