

**December
2010**

**New Parallel Runway Project
Minor Variation to MDP
(Approved 8 February 2011)**



TABLE OF CONTENTS

1	INTRODUCTION	5
1.1	Content and Purpose	5
1.2	Consultations	5
1.3	Other Approvals	6
1.4	Need and Objectives for the NPR Project	6
2	MINOR VARIATION DESCRIPTION AND ASSESSMENT	7
2.1	Current Design	7
2.2	New Design	7
2.2.1	Initial NPR Construction Length	7
2.2.2	Runway End Safety Area	7
2.2.3	MOS Requirements for Perimeter Road	8
2.3	Environmental Effects	8
2.3.1	Background on Lewin's Rail ESA	8
2.3.2	Habitat Connectivity	8
2.3.3	Habitat Structure	9
2.3.4	Mitigation for Wildfire	9
2.4	Hydraulics	9
2.5	Flood Modelling	9
2.5.1	Approach and Method	9
2.5.2	Flood Results	9
2.6	Airside Security	10
3	PROPOSED MITIGATION	11
3.1	Habitat Conversion	11
3.2	Improved Fire Management	11
3.3	Project CEMP	11
3.4	Research and monitoring	11
3.5	Summary of Outcomes	12
4	OTHER APPROVALS	13
4.1	The Airport Environment Strategy (AES)	13
4.2	Amendment to EIS – Biodiversity Zone map	13
4.3	Amendment to Town Planning Approval	13
	APPENDIX 1A	19
	APPENDIX 1B	20
	PHOTO 1: LEWIN'S RAIL AREA WILDFIRE (NORTH)	21
	PHOTO 2: LEWIN'S RAIL AREA WILDFIRE (SOUTH)	21

LIST OF FIGURES

FIGURE 1 - EIS/MDP DRAINAGE LAYOUT (EIS/MDP FIGURE 4.9A)	14
FIGURE 2. PROPOSED Kbfd ALIGNMENT	15
FIGURE 3: AIRSIDE PERIMETER ROAD OUTSIDE THE RUNWAY STRIP	16
FIGURE 4. BIODIVERSITY ZONE WITH LEWIN'S RAIL ESA	17
FIGURE 5: EXISTING LEWIN'S RAIL ESA (FIGURE 13, AES 2009)	18

1 INTRODUCTION

BAC received major development approval for its New Parallel Runway (NPR) Project in September 2007 and has now advanced the project into final design and tender preparation for the first phase of works for the project. The MDP approval allowed for an initial runway length of 3000m and a Runway End Safety Area (RESA) length of 90m.

Following MDP approval BAC and the airlines in 2009-2010 have undertaken a further review of the NPR length and RESA. The review recommended a length of 3300m and width of 60m as the optimum dimensions for the initial stage of construction for the NPR and provision of 240m RESAs at either end of the runway.

The RESA length was reviewed in light of the current International and Australian standards for Runway End Safety Areas (RESAs) which recommend, for runways longer than 1800 metres, a length of 240m. ICAO, the International Civil Aviation Organisation, has signalled that this recommendation may become mandatory in the future. BAC has adopted the recommendation of 240m RESAs for the design of the NPR. At the time of preparing the EIS/MDP the RESA length was 90m long in accordance with the Australian Standard at the time. As a result of now adopting a 240m RESA, the southern end of the NPR has shifted 150m to the south.

This shift has meant that there is a geometric challenge in locating the NPR, the RESA, the airside perimeter road, the airside security fence, airside drainage and the Kedron Brook Floodway Drain (KBFD) within BAC's boundary. In order to design all elements of the NPR infrastructure in accordance with current standards, the western extent of the KBFD alignment is required to shift. However, the shift results in a portion of the drain being relocated within the Lewin's Rail Environmentally Significant Area (ESA).

The realignment has provided the opportunity to expand and enhance the Lewin's Rail habitat on airport. BAC will convert an area of approximately 11ha of *Casuarina glauca* plantation to habitat suitable for the Lewin's Rail which expands the current habitat area on airport by about 20%. The habitat conversion will be underpinned by the findings of the recent QUT Masters Research Project into the Lewin's Rail on airport which identified key requirements for the Rail's habitat.

The realignment of the KBFD is considered to be a variation of a minor nature and this Draft Minor Variation to the MDP (Draft Minor Variation) has been prepared in accordance with the requirements of Section 95 of the Airports Act 1996.

1.1 Content and Purpose

This Draft Minor Variation contains the relevant information necessary for the Minister to make a decision on the variation outlined herein. It addresses the need for the new drain alignment, results of flood modelling of the new alignment and an assessment of the environmental issues.

1.2 Consultations

Consultation and notifications regarding the Minor Variation are as follows:

Notifications:

- Notification to the authority responsible for town planning or use of land - BAC notified Queensland Department of Infrastructure and Planning by letter of 15 December 2010);

- Notification to the Local Government body in which the airport is situated - BAC notified Brisbane City Council by letter of 15 December 2010);

Public Comment Period

- BAC provided public notification in the Courier Mail on 13 November 2010, with the public comment period closing on 3 December 2010
- BAC also met individually with:
 - Nudgee Golf Club on 22 November 2010; and
 - Brisbane City Council on 30 November 2010.

Nil submissions were received during the public comment period.

1.3 Other Approvals

The variation being sought to the MDP also requires co-ordinated changes to other planning approvals associated with the Kedron Brook Floodway Drain. These include:

1. Changes to Brisbane Airport's Airport Environment Strategy (AES) regulated under the Airports Act and administered by the Department of Infrastructure and Transport (DIT);
2. Changes to the EIS approval conditions regulated under the Environment Protection and Biodiversity Conservation Act and administered by the Department of Sustainability, Environment, Water and Population Control (DSEWPC); and
3. Changes to the town planning approval regulated under Queensland's Integrated Planning Act and administered by Brisbane City Council (BCC) in this instance.

BAC has held initial discussions regarding the realignment of the KBF Drain and the implications to the Lewin's Rail ESA with the relevant Australian and Local Government planning agencies. The regulatory processes attached to the changes to these approvals are discussed in more detail in Section 4.

1.4 Need and Objectives for the NPR Project

Annual monitoring of passenger and aircraft movements through Brisbane Airport since the approval of the EIS/MDP has reconfirmed the need for the NPR. BAC's objectives for the NPR remain focussed on the objectives stated in the EIS/MDP (2006) which are as follows:

- To facilitate passenger and aircraft movement through the delivery of a safe runway system and airspace architecture;
- To meet the future capacity needs through the staged delivery of the NPR in an appropriate and economically justifiable timeframe;
- To maintain Brisbane Airport as a major contributor to the regional economy and through the project assist in the generation of regional economic growth;
- To balance economic benefit, social and environmental impact;
- To implement appropriate environmental management plans for all facets of the NPR that meet the requirements of the AES and statutory requirements;
- To ensure a review and update of airspace approvals prior to opening (as appropriate);
- To implement and maintain risk management processes;
- To seek key stakeholder support including the Airlines;
- To enhance shareholder value through the delivery of the project.

2 MINOR VARIATION DESCRIPTION and ASSESSMENT

2.1 Current Design

The current drainage design for the project includes new major permanent drainage channels located north and south of the NPR development called Kedron Brook Floodway Drain (KBFD) and Serpentine Inlet Drain (SI Drain). Refer to Figure 1 attached which is the EIS/MDP Figure 4.9a *Drainage Layout Plan* detailing the overall drainage layout at that time. The location of the KBFD wraps around the southern edge of the NPR and runs parallel to the NPR for approximately 400m before discharging into the Kedron Brook Floodway.

2.2 New Design

BAC is seeking approval for the change in location for the western extent of the Kedron Brook Floodway Drain as shown in Figure 2. The proposed realignment of the western extent of the KBFD no longer wraps around the base of the NPR runway strip but proceeds ahead through the Lewin's Rail ESA on a more direct route which shortens the drain length by around 100m and enters the KBF at a drainage outfall location approximately 300m upstream from the original design.

The realignment is required due to a number of converging factors including the findings of the airfield review conducted by BAC and the airlines in 2009-2010 and subsequent compliance with the standards in the Manual of Standards Part 139 – Aerodromes (MOS). An explanation of the reasons for the change in alignment is outlined below.

2.2.1 Initial NPR Construction Length

The EIS/MDP sought and received approval for a runway 3600m in length. The intention was for the initial stage of construction to be a length of 3000m. In 2009-2010 BAC hosted the Aviation Industry Working Group (AIWG) consisting of representatives from BAC, major airlines including the Qantas Group, Virgin Group, Air New Zealand, Singapore Airlines, Emirates, peak international airline representative group, BARA, and Australian Government agencies CASA and Airservices Australia. The finding of the AIWG which examined a range of initial construction staging scenarios endorsed an initial NPR construction design of 3300m long by 60m wide. The 3300m initial runway construction is within the envelope of the approval and is consistent with the approved MDP.

2.2.2 Runway End Safety Area

The Runway End Safety Area (RESA) standard for length is currently mandated for a minimum of 90 metres and this was the design standard adopted in the EIS/MDP. However, MOS also includes a recommendation for a Code 4 runway (that is, a runway greater than 1800 metres long) to increase the length of the RESA to 240 metres¹. The Civil Aviation Safety Authority (CASA) has advised that while the 240 metres is currently a "recommendation" in Australia, the International Civil Aviation Organisation (ICAO) is likely to mandate the extended RESA length. Given the International and Australian RESA recommendation BAC considers that it is prudent and good planning to adopt the 240m as the standard for the NPR. The AIWG also endorsed the adoption of the 240m RESA length.

The adoption of the 240m RESA has resulted in the NPR shifting 150m to the south. The original footprint for the NPR project was 3600m for the runway with 90m RESAs either end for a total length of 3780m. The current design proposal is for a 3300m runway with 240m RESAs at either end for a total of 3780m. The refined design of the NPR is within the original EIS/MDP project footprint and runway dimensions which is consistent with the approved MDP.

¹ Please refer to the Manual of Standards (MOS) Part 139 - Aerodromes, Section 6.2.26 "Dimensions of RESA".

2.2.3 MOS Requirements for Perimeter Road

The location of the NPR, the perimeter road, the security fence and the Kbfd were reviewed against the standards outlined in the MOS and compliance with the MOS precludes the airside perimeter road and security fence from being located within the runway strip.

Figure 3 attached shows that the perimeter road and security fence cannot be located outside the runway strip without the Kbfd shift to the south into the Lewin's Rail ESA. The new alignment as shown in Figure 2 locates the airside perimeter road and security fence outside the runway strip which is required under the MOS.

2.3 Environmental Effects

The main Lewin's Rail habitat area at Brisbane Airport is located parallel to Kedron Brook Floodway between Council land and the Central Parking Area and was designated, with the approval of BAC's 2009 Airport Environment Strategy (AES), as an Environmentally Significant Area (ESA) within part of the Biodiversity Zone in the Canal Area. Refer to Figures 4 and 5 attached which have been reproduced from BAC's approved AES.

The proposed realignment of the Kedron Brook Floodway Drain will segment a small northern section of the Lewin's Rail ESA from the main section. The effect on the Lewin's Rail population is expected to be minimal and with the proposed measures by BAC to convert an additional area adjacent to the ESA of over 11ha to Lewin's Rail habitat will extend and enhance the overall availability of the habitat.

2.3.1 Background on Lewin's Rail ESA

The comprehensive flora and fauna investigations undertaken for the EIS/MDP revealed that the rank grasslands south of the NPR footprint supported a population of Lewin's Rails which were listed as "Rare", now listed as "Near Threatened"², under the Queensland Nature Conservation and Wildlife Regulations (NCWR). The Lewin's Rail (*Lewinia pectoralis*), a cryptic ground-dwelling bird, is found in patches throughout the Canal Area of Brisbane Airport and also in patches directly opposite, across Kedron Brook Floodway. This suggests that the occupied patches on the BAC site are part of a series of patches that occur along Kedron Brook and possibly throughout the Boondall wetlands. The population has likely been able to persist in the area as a result of the connectivity of these patches.

Rails were studied in a number of patches around Brisbane Airport between April 2007 and November 2008 as part of a QUT Masters Research Project (Gibson 2009). Measurement of vegetation structure at sites where rails were present and where they were absent, found that lateral and horizontal vegetation density to 0.6m were the key vegetation attributes at sites where they were present (Gibson 2009).

2.3.2 Habitat Connectivity

The airport Lewin's Rail population interacts with other patches of Lewin's Rail both on the same side as well as the opposite side of the Kedron Brook Floodway up to the Boondall Wetlands (Gibson 2009). This means, the rails would need to cross the existing Kedron Brook Floodway with a base width of 70m in order to colonise the Brisbane Airport site and vice versa. As the base width of the proposed drain through the ESA is much narrower at 30m, it is considered that the connectivity for the Rails between the two airport patches would be maintained.

² The Queensland Nature Conservation and Wildlife Regulations have recently renamed the threatened status categories to be consistent with Australian and international status naming protocols. The previous category of "Rare" has been renamed "Near Threatened".

2.3.3 Habitat Structure

A major finding of the research was that lateral and horizontal vegetation density to 0.6m was a key vegetation attribute at sites where the Rails were present (Gibson 2009). This would imply that the smaller patch should remain viable for the species, assuming that the vegetation structure is maintained.

2.3.4 Mitigation for Wildfire

The QUT research indicates this disjunct patch will also perform a separate service in the event that the main patch is burnt by wildfire, as drainage lines make for excellent firebreaks. Therefore this separate patch will be able to provide refuge in the event that the main area becomes unsuitable due to temporary habitat loss.

2.4 Hydraulics

The design of the Kbfd realignment conforms in cross sectional dimensions to the original Kbfd dimensions. That is, the design at the western extent has an unlined base width of 30m, a bank batter of 1 in 4 and mangrove benching of approx. 10m in width for the portions of drain not within the Lewin's Rail ESA. The overall length of the drain is shorter by approximately 100m which improves hydraulic capacity as it allows flows from Landers Pocket floodplain to reach the KBF more quickly.

The realignment provides a more direct longitudinal profile (straight line) for the Kbfd. It provides the maximum flexibility to geometrically locate all aviation elements such as airside perimeter road, RESA and airside security fence in accordance with the standards and also provides the best option for hydraulic performance.

2.5 Flood Modelling

AECOM, the final design engineering consultants for Phase 1 of the NPR project, were tasked with preparing the alternative drain alignment to allow Kbfd and the future western airside perimeter road and security fence to be constructed clear of the runway strip for a 3300m runway and a future extension of the runway to its ultimate design length of 3600m.

AECOM was also tasked with investigating the flood impact of the proposed realignment of Kbfd to identify potential changes to the flood impact assessment presented in the EIS/MDP.

2.5.1 Approach and Method

The hydraulic model originally developed by AECOM and DHI for the EIS/MDP was used to assess the flood impacts of the proposed realignment. The model was revised to reflect the proposed realignment. The airfield layout for the NPR and layout of on-airport drainage was retained from the original EIS/MDP model, to the extent possible. The two dimensional topographic grid was updated to represent the proposed changes to the Kbfd alignment.

2.5.2 Flood Results

A comparison of the maximum flood levels and impact on existing flood levels (flood afflux) for the original Kbfd alignment and proposed Kbfd realignment was undertaken. Maximum estimated flood levels and flood afflux at key locations were reported. The proposed Kbfd realignment has only very minimal changes to flood levels previously identified in the EIS/MDP. Estimated flood levels are increased by up to 0.03m in Kedron Brook Floodway (refer to locations B and D) and Nudgee Golf Course (refer to locations G, H and I). There are reductions in flood levels at the original Kbfd discharge outfall and also on airport in Landers Pocket Drain upstream from the Kbfd. Most sites have no change in flood levels.

The table of flood and flood afflux levels are shown in Appendix 1A and the map of the locations referred to are shown in Appendix 1B.

Though there are some small increases in flood afflux levels of up to 0.03m at the Nudgee Golf Course during a 100 year ARI regional flood event, the overall flood impact of the NPR remains a negligible to minor impact consistent with the assessment presented in the EIS/MDP.

2.6 Airside Security

The shift of the KBFD further to the south also offers improved security arrangements for separating airside areas from landside. The KBFD which is large enough to be navigable by small watercraft can now be positioned an adequate distance away from the airside security fence and also comply with the MOS for height clearance standards.

3 PROPOSED MITIGATION

The currently designated Lewin's Rail ESA has a total area of 38ha. Realignment of the KBFD will result in a reduction in area of the ESA with the excisement of the drain and an access track either side of it. Following the proposed conversion of the adjacent casuarina area to Lewin's Rail habitat, however, the total area of the ESA will be increased to approximately 46ha, an increase of approximately 20%.

3.1 Habitat Conversion

The habitat conversion process is likely to involve:

- Removal of the Casuarinas and any established weeds in the designated area via mulching machinery;
- Any required ground works to ensure the soil/topography is suitable for revegetation;
- Either hydromulching to enable natural re-colonisation of the site by a colonising species (most likely to be the Common Reed (*Phragmites australis*)); and/or
- Planting of *Phragmites australis* seedlings at set intervals.

3.2 Improved Fire Management

The new alignment of the KBFD would create a very effective fire break and the intention is to also create a fire break track around the new conversion area in order to provide further protection for the different areas of the ESA. The effectiveness of a fire break track in the ESA environment is demonstrated by Photos 1 and 2 which were taken of the Lewin's Rail ESA immediately following the wildfire event which burnt a large portion of the main ESA in late 2007. The fire was stopped very effectively by the access road as the area up to the road was burnt and the area on the other side of the track was untouched. It is proposed the design of access tracks around the area to be converted will be based on the existing track.

The fire in 2007 which was initiated by lightning occurred during the QUT research study and characteristics of the revegetation were recorded during the study. The habitat was suitable for Rails within 7 months post-fire (Gibson 2009) suggesting that the habitat is quick to regenerate after disturbance.

3.3 Project CEMP

The habitat conversion works would be subject to the NPR Project CEMP requirements and captured in the Environmental Compliance Plan process. BAC considers the clearing and revegetation works would be best managed as part of the NPR Phase 1 works to construct the KBFD. The area for the drain must be cleared ahead of excavation and the impact of construction works would be best managed with all clearing and access construction in the vicinity being undertaken in a similar timeframe.

3.4 Research and monitoring

BAC will develop a research and monitoring program that will identify:

1. Lewins Rail response to construction impacts (presence/absence monitoring)
2. Success of conversion to Phragmites wetland (vegetation structure monitoring; presence/absence monitoring)
3. Lewins Rail colonisation of an area (presence/absence monitoring)
4. Success of salt marsh habitat creation (species composition monitoring and photographic monitoring)
5. Success of natural propagation of mangroves (photographic monitoring)

3.5 Summary of Outcomes

There are some net benefits which result from the realignment of the KBFD:

1. An increase in the aerial extent of the Lewin's Rail ESA from 38ha to approx. 46ha, a net increase of approximately 20%;
2. Additional habitat suitable for Lewin's Rail occupation is established;
3. The ESA will now incorporate three separate fire management units that will minimise the effects of wildfire on the Brisbane Airport population by ensuring available habitat in the event that one fire management unit is burnt;
4. Other than the ecosystem services provided by these vegetation communities, Lewin's Rail are also known to occupy salt couch vegetation therefore creating a natural transition from the estuarine drainage channel to the freshwater ephemeral wetland.

4 OTHER APPROVALS

As mentioned previously, the change in alignment of the Kbfd requires amendments to other planning and environment approvals and it is essential that these are co-ordinated within the correct timeframes. The additional amendments required are addressed below in the chronological order in which they will be sought.

4.1 The Airport Environment Strategy (AES)

Following the NPR MDP approval in late 2007, the 2009 Airport Environment Strategy (AES) which was approved on 19 August 2009 detailed the location of the Biodiversity Zone (BZ) on airport and designated the Lewin's Rail area as an Environmentally Significant Area (ESA) within the BZ. The ESA designation was considered an appropriate step given the undertaking in the EIS/MDP and the subsequent conditions of approval to set aside the 285ha BZ for conservation purposes of which the Lewin's Rail area (38ha) was a key component. The realignment of Kbfd being sought under the Minor Variation process has a portion of the drain crossing the Lewin's Rail ESA.

It is the intention to excise the area of the drain and associated construction buffers either side of the drain from the ESA in order for construction of the drain to occur. Seeking the change to the ESA boundary will occur in conjunction with the Minor Variation requiring Ministerial approval of the ESA boundary change prior to the decision on the Minor Variation.

4.2 Amendment to EIS – Biodiversity Zone map

BAC intends to apply to the Department of Sustainability, Environment, Water, Population and Communities for an amendment under Section 143 of the EPBC Act to the EIS approval conditions. This application will be made if BAC's application for the Minor Variation to the MDP is approved.

4.3 Amendment to Town Planning Approval

The confluence of the Kbfd into the Kedron Brook Floodway is outside of the airport boundary and BAC in 2008 obtained the required town planning approval for this drainage connection from Brisbane City Council. BAC will be applying for an amendment to this approval to reflect the new location of the Kbfd mouth if BAC's application for the Minor Variation to the MDP is approved.

Figure 4.9a: Drainage Layout Plan.



Figure 1 - EIS/MDP Drainage Layout (EIS/MDP Figure 4.9a)

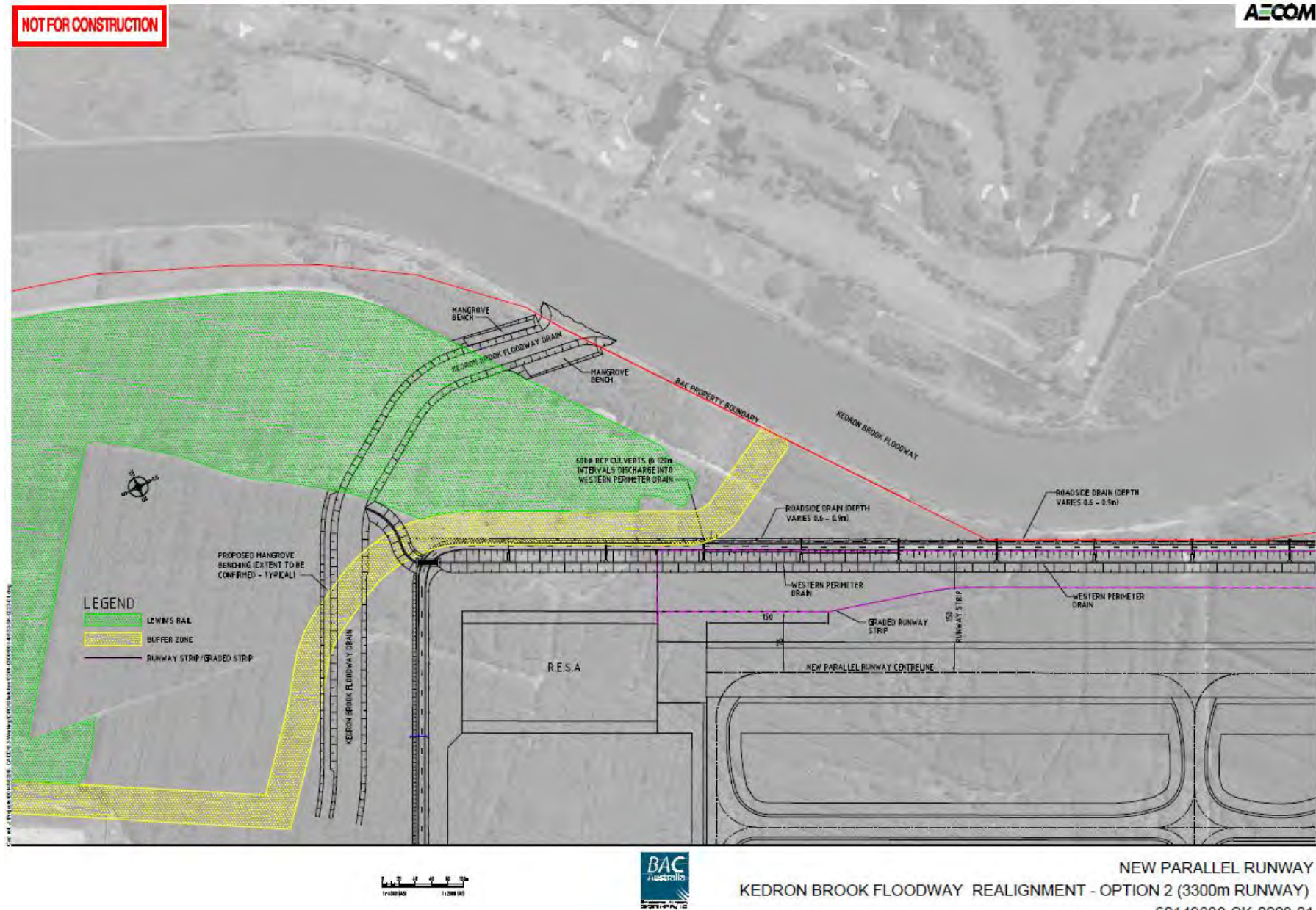


Figure 2. Proposed KBFD Alignment (Western extent realigned to the south through the Lewin's Rail ESA)

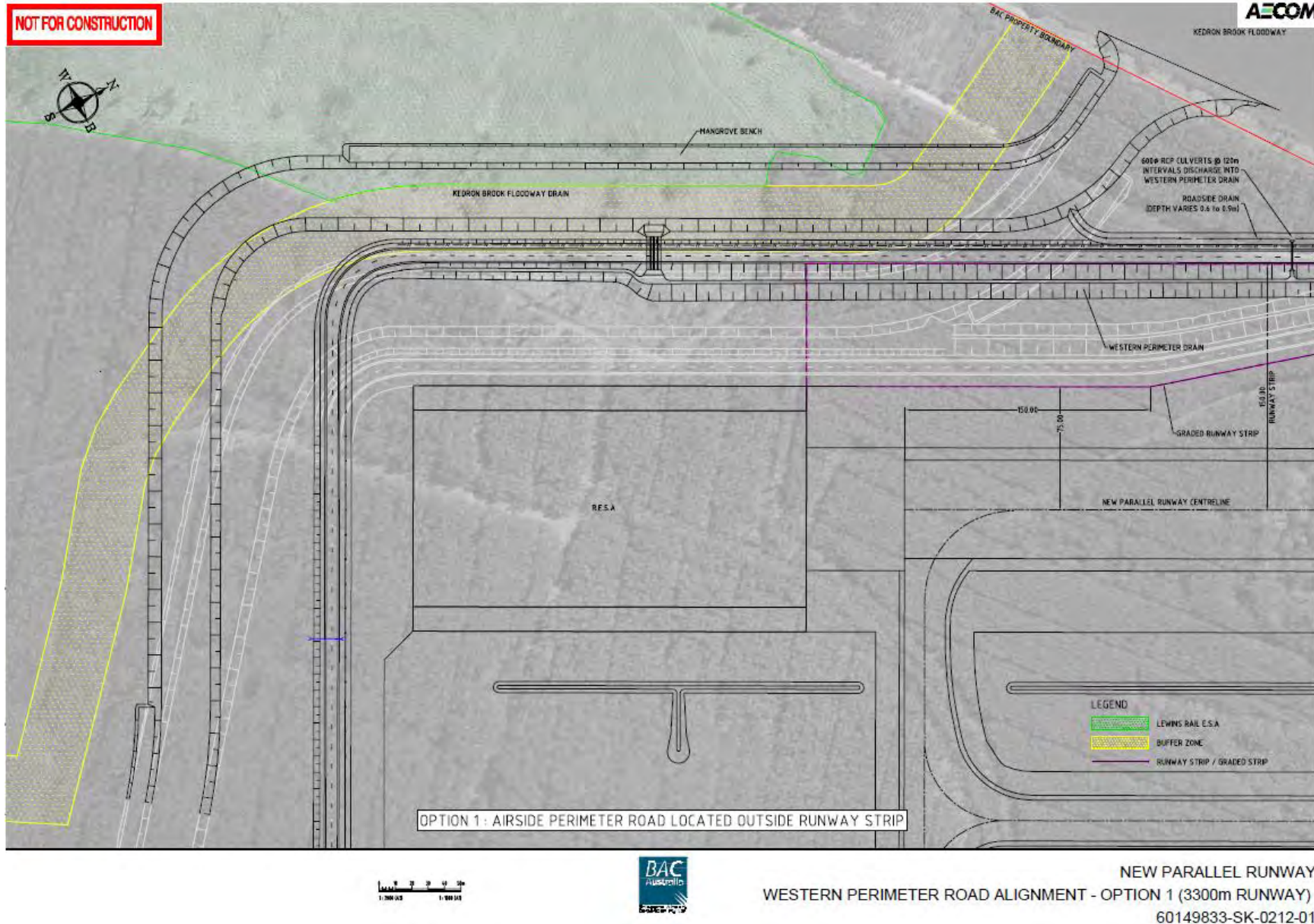


Figure 3: Airside Perimeter Road outside the Runway Strip – KBF D pushed west into ESA

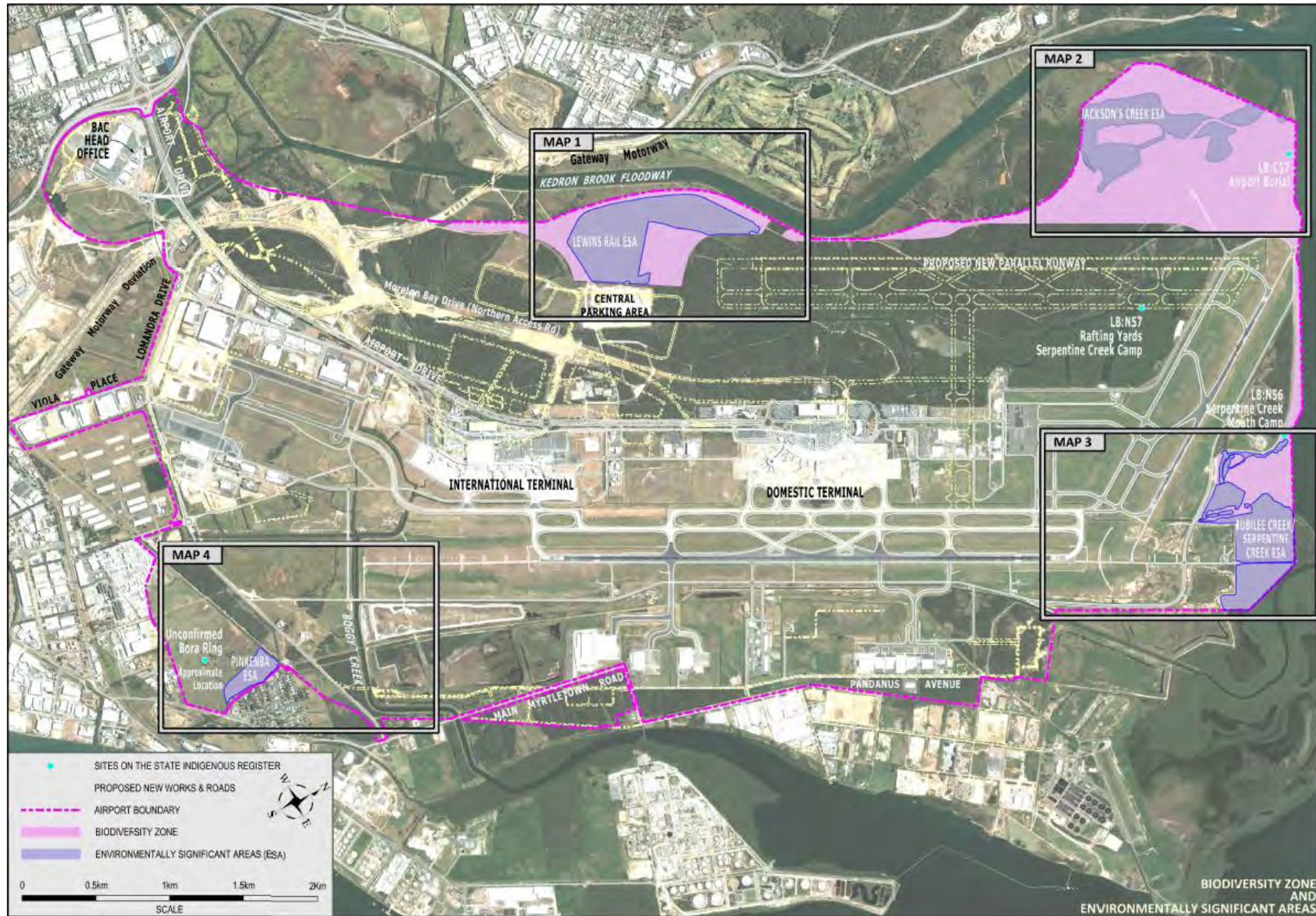


Figure 4. Biodiversity Zone with Lewin's Rail ESA (Map1) (Figure 11, AES 2009)

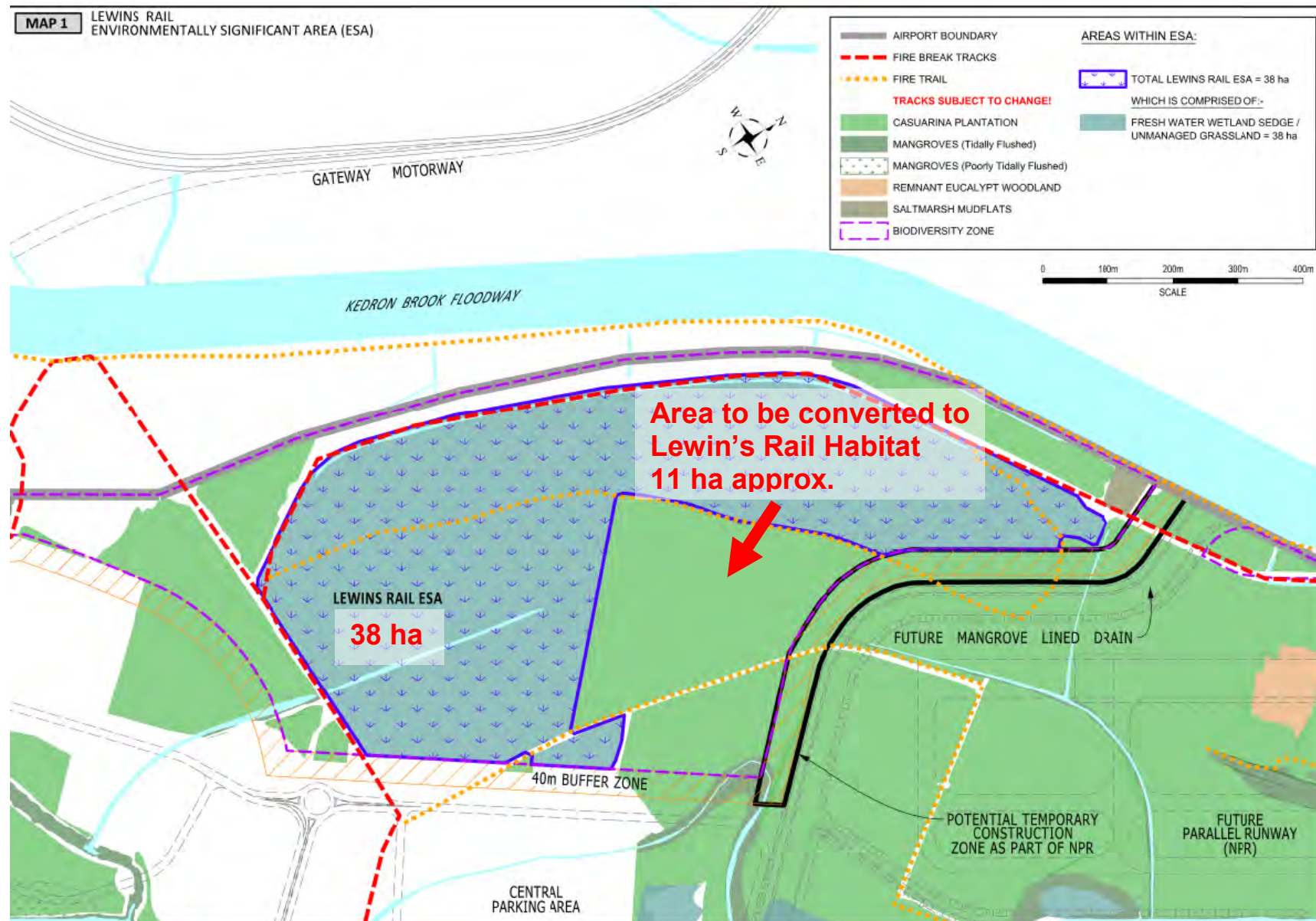


Figure 5: Existing Lewin's Rail ESA (Figure 13, AES 2009)

APPENDIX 1A

Table 1 Comparison of Maximum Estimated Flood Levels for 100 Year ARI Regional Flood Event with MHWS Tailwater

Location ID	Description	Original KBFD Alignment (EIS/MDP, 2006)		Proposed KBFD Realignment (2010)		Change in Flood Afflux (m)
		Maximum Estimated Flood Level (m AD)	Flood Afflux (m)	Maximum Estimated Flood Level (m AD)	Flood Afflux (m)	
A	Kedron Brook Floodway at Bramble Bay	1.90	0.00	1.90	0.00	0.00
B	Kedron Brook Floodway at Nudgee Golf Course Constriction	2.68	0.10	2.71	0.13	0.03
C	Kedron Brook Floodway at confluence of <i>Original</i> Kedron Brook Floodway Drain alignment	2.88	0.18	2.87	0.17	-0.01
D	Kedron Brook Floodway downstream of Transition Structure from Schulz Canal	3.54	0.02	3.56	0.04	0.02
E	Shultz Canal downstream of Gateway Motorway	4.62	0.00	4.62	0.00	0.00
F	Battery Drain downstream of Airport Drive	4.03	0.00	4.03	0.00	0.00
G	Nudgee Golf Course adjacent Kedron Brook Floodway	2.76	0.13	2.78	0.15	0.02
H	Nudgee Golf Course (centre)	2.77	0.14	2.79	0.16	0.02
I	Nudgee Golf Course adjacent Gateway Motorway	2.66	0.13	2.69	0.16	0.03
J	Floodplain adjacent Toombul Road Interchange	3.95	0.00	3.95	0.00	0.00
K	Battery Drain downstream of Gateway Motorway	5.03	0.00	5.03	0.00	0.00
L	Battery Drain upstream of Airport Drive	4.14	0.00	4.14	0.00	0.00
M	Landers Pocket area	3.85	0.00	3.85	0.00	0.00
N	Landers Pocket area	3.63	0.02	3.64	0.03	0.01
O	Landers Pocket upstream of Kedron Brook Floodway Drain	3.53	0.20	3.49	0.16	-0.04
P	Cannery Drain downstream of Gateway Motorway	3.95	0.00	3.95	0.00	0.00

APPENDIX 1B

Figure 7.6b: Flood Reference Point Location.





Photo 1: Lewin's Rail Area Wildfire (North)

Taken late 2007 looking northwards from access track



Photo 2: Lewin's Rail Area Wildfire (South)

Taken late 2007 looking southwards from access track