

Rockingham Industrial Zone Strategic Environmental Assessment

LANDCORP

Report and recommendations of the Environmental Protection Authority

Environmental Protection Authority Perth, Western Australia

> Report 1390 April 2011

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
16 August 2004	Level of Assessment set (date appeals process completed)	
7 December 2009	Proponent Document Released for Public Comment	275
2 March 2010	Public Comment Period Closed	12
10 December 2010	Final Proponent response to the issues raised	37
28 March 2011	EPA report to the Minister for Environment	14
4 April 2011	Publication of EPA report	1
18 April 2011	Close of appeals period	2

STATEMENT ON TIMELINES

Timelines for an assessment may vary according to the complexity of the project and are usually agreed with the proponent soon after the level of assessment is determined.

In this case, the Environmental Protection Authority did not meet its agreed timeline objective of 10 weeks for the completion of the assessment and provision of a recommendation to the Minister due to extended discussions with the proponent during the consultation on conditions.

Mogel

Paul Vogel Chairman 28 March 2011

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Summary and Recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for Environment following the Strategic Environmental Assessment (SEA) of a proposal by Landcorp to identify an appropriate development footprint and Conservation Area within a 339 hectare (ha) area (SEA Area) in the Rockingham Industrial Zone (RIZ).

Section 44 of the *Environmental Protection Act 1986* (EP Act) requires the EPA to report to the Minister for Environment on the outcome of its assessment of a proposal. The report must set out:

- The key environmental factors identified in the course of the assessment; and
- 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 include in the report any other advice and recommendations as it sees fit.

The EPA is also required to have regard for the principles set out in Section 4A of the EP Act.

Key environmental factors and principles

The EPA decided that the following key environmental factor relevant to the proposal required detailed evaluation in the report:

(a) Conservation Values - the protection of Threatened Ecological Community 19b (TEC) and associated wetlands within the Conservation Area.

There were a number of other factors which were relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergeneration equity; and
- (c) The principle of the conservation of biological diversity and ecological integrity.

Conclusion

The EPA has considered the proposal by Landcorp to identify an appropriate development footprint and Conservation Area within a 339ha area of the RIZ.

The EPA considers that the proponent has put forward a proposal that conserves some areas of high environmental value.

The SEA Area contains significant environmental values which require protection. Therefore, the Conservation Area, which is intended to protect and enhance some of the best examples of the SEA Area's environmental values, in the context of the proponent's aim of providing land for industrial development, was determined to be the key issue in assessing this proposal.

Landcorp's proposed Conservation Area secures some areas of highest environmental value in the SEA Area for conservation. These areas are also the most viable long-term TEC and wetlands in the SEA Area after taking into account long-term rainfall trends.

However, the EPA has modified the boundary of Landcorp's proposed Conservation Area to include a small but important additional area west of the existing boundary. This land contains high environmental values, including TEC vegetation in good to very good condition and associated wetlands. This modification increases the Conservation Area from the proposed 78ha to 92ha and improves the environmental outcomes of the proposal.

The EPA has also identified key attributes that derived proposals (i.e. derived from this strategic proposal) would need in order to meet environmental objectives for the environmental factors it has assessed.

The EPA has therefore concluded that it is likely that the EPA's objectives would be achieved provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4.

Recommendations

The EPA submits the following recommendations to the Minister for Environment:

- 1. That the Minister notes that the proposal being assessed is for Landcorp to identify an appropriate development footprint and Conservation Area within a 339ha area of the RIZ;
- 2. That the Minister considers the report on the key environmental factors and principles as set out in Section 3;
- 3. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's environmental objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4; and
- 4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Conditions

Having considered the information provided in this report, the EPA has developed an Implementation Statement that the EPA recommends be applied to the strategic proposal by Landcorp to identify an appropriate development footprint and Conservation Area within a 339ha area of the RIZ, if it is approved for implementation.

This Implementation Statement is presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) Conditions to be applied to the strategic proposal, namely:
 - the preparation of a Conservation Area Management Plan to improve environmental values prior to incorporation into the Conservation Estate and to maintain environmental values thereafter;
 - (2) the ceding of the area set aside for conservation to be vested to the Conservation Commission;
 - (3) the preparation of an offsets package for likely impacts on TECs within the development footprint; and
 - (4) the preparation of a Water Management Strategy to guide future developments.
- (b) Identification of derived proposals including a description of key characteristics.

Contents

Sur	nmary	and Recommendations	i
1.	Intro	duction and background	1
2.	The p	proposal	1
3.	Key e	environmental factors and principles	2
	3.1	Conservation Values	5
	3.2	Environmental principles	.21
4.	Cond	litions	.21
	4.1	Recommended conditions	.21
	4.2	Consultation	.21
5.	Othe	r Advice	.22
6.	Reco	mmendations	.22

Figures

- Figure 1: Rockingham Industrial Zone Strategic Environmental Assessment Regional Location
- Figure 2: Rockingham Industrial Zone and Strategic Environmental Assessment Boundary
- Figure 3: Extent of TEC 19b
- Figure 4: Vegetation Condition
- Figure 5: Wetlands
- Figure 6: Water Table Contours
- Figure 7: Threatened Ecological Community and Landcorp's Proposed Conservation Area (78ha).
- Figure 8: Threatened Ecological Community and EPA's Modified Conservation Area (90.5ha).

Appendices

- 1. List of submitters
- 2. References
- 3. Summary of identification of key environmental factors
- 4. Recommended Environmental Conditions and nominated Decision-Making Authorities
- 5. Summary of submissions and proponent's response to submissions

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment, following the Strategic Environmental Assessment¹ (SEA), on the key environmental factors and principles of a proposal by Landcorp to identify an appropriate development footprint and Conservation Area within a 339 hectare (ha) area (SEA Area) in the Rockingham Industrial Zone (RIZ).

The proposal was referred by Landcorp to the EPA in 2004 and the EPA determined the proposal should be assessed as a SEA. The final SEA document was approved and released by the EPA for public review in December 2009.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the key environmental factors and principles for the proposal. The conditions to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice by the EPA and Section 6 presents the EPA's Recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

2. The proposal

The proposal was referred by Landcorp to the EPA in 2004. The EPA determined the proposal to be a 'Strategic Proposal' as defined under section 37B of the EP Act and it has been assessed as a SEA.

A SEA provides the means for a proponent to voluntarily refer a strategic proposal for assessment by the EPA, even if the proposal itself does not have an immediate significant effect on the environment. In essence, a strategic proposal might be a plan, program, or conceptual development that will lead to future specific proposals with likely environmental impacts.

When a future proposal is referred to the EPA, which is under the umbrella of, and consistent with, a previous strategic environmental assessment, the EPA may declare that this proposal is a 'derived proposal' under section 39B of the *Environmental Protection Act 1986* (EP Act). A proposal declared as a derived proposal would not require further assessment by the EPA.

¹ The term 'Strategic Environmental Assessment' was in use by the OEPA at the time this proposal was referred to the EPA and set a level of assessment in 2004. It has since been replaced by the term 'Assessment of a Strategic Proposal'.

Subdivisions and provision of infrastructure have been identified as future proposals that may be considered by the EPA to be 'derived' proposals under this Strategic Environmental Assessment (for more information refer to Section 5 'Other Advice').

The SEA Area is 339ha of land within the RIZ that has been zoned Industrial under the Metropolitan Region Scheme for 20 years. Figure 1 shows the regional location of the RIZ and SEA. Figure 2 shows the detailed RIZ and SEA Area boundary.

The proponent describes the SEA Area as a significant strategic and economic asset to the State. This undeveloped portion of the RIZ has been identified as one of the last significant landholdings in the Perth Metropolitan Region that is designated for Heavy Industrial purposes. It is well situated with access to deep-water port facilities, road, rail and energy resources and the community resources of Kwinana and Rockingham. The SEA area excludes most of the land within the RIZ that does not have any environmentally significant features.

The purpose of the strategic proposal was to identify areas within the SEA Area (refer to Figure 2) to be reserved for conservation purposes with the remainder to be cleared for infrastructure and made available for industrial uses.

3. Key environmental factors and principles

Section 44 of the EP Act requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the key factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as fauna and geomorphology, are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that the following key environmental factor for the proposal requires detailed evaluation in this report:

1. Conservation Values - the protection of Threatened Ecological Community 19b (TEC) and associated wetlands within the Conservation Area.



Figure 1: Rockingham Industrial Zone Strategic Environmental Assessment – Regional Location



Figure 2: Rockingham Industrial Zone and Strategic Environmental Assessment Boundary

This key factor was identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics.

Details on the key environmental factor and its assessment are contained in Section 3.1. The description of the factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of the factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergeneration equity; and
- (c) The principle of the conservation of biological diversity and ecological integrity.

3.1 Conservation Values

The key environmental factor of Conservation Values was selected for further detailed evaluation in order to identify the area to be reserved for conservation purposes and to protect the highest environmental values. Early in this assessment vegetation, wetlands and groundwater were identified as key issues and these are described below. There is a close relationship between these environmental features as the ecologically important vegetation in the SEA Area is associated with the groundwater fed wetlands, as such they have all been incorporated into the assessment of the overarching key environmental factor of 'Conservation Values'.

Description

<u>Vegetation</u>

The vegetation in the proposed development area will be mostly cleared, including 17ha of FCT19b which is a TEC at the State and Commonwealth level.

The vegetation of the SEA Area is part of the Quindalup Vegetation Complex and includes a large array of different vegetation types and structure from coastal heath close to the beaches through to Acacia shrublands, Tuart woodlands and a wide range of wetland vegetation types. A total of 21 vegetation associations were mapped by the proponent on the whole RIZ and all of these vegetation associations are included within the SEA boundary.

The vegetation in the RIZ was inferred to be representative of four different Floristic Community Types (FCTs). Floristic Community Types are different from vegetation associations in that they are described according to the floristic composition rather than by the height and density of the dominant species. The 21 vegetation associations were considered to represent the following four FCTs:

- FCT 17 *Melaleuca rhaphiophylla Gahnia trifida* seasonal wetlands (also recorded with *Eucalyptus gomphocephala*);
- FCT 19b Woodlands over Sedgelands in Holocene Dune Swales. All the wetlands that contain woodlands in the linear swales throughout the site are likely to be representative of this FCT;
- FCT 29b Acacia shrublands on taller dunes; and
- FCT 30c2 Quindalup *Eucalyptus gomphocephala* and/or *Agonis flexuosa* woodlands.

The areas of each of the FCT's in the SEA Area are:

- 14ha of FCT 17;
- 32ha of FCT19b;
- 114ha of FCT 29b; and
- 128ha of FCT 30c2

FCT 19b is present within many of the dune swales and is a TEC at the State and Commonwealth level (refer to Figure 3). FCT 19b is associated with the groundwater dependant wetlands on the site. The other three FCTs are not listed as Threatened Ecological Communities, however FCT 29b is on the Priority Ecological Communities list.

All of the FCTs and most of the vegetation associations are represented in nearby Bush Forever sites:

- Bush Forever Site 341 Woodman Point;
- Bush Forever Site 377 Port Kennedy;
- Bush Forever Site 355 Point Peron and Adjacent Bushland, Peron/Shoalwater Bay;
- Bush Forever Site 349 Leda and Adjacent Bushland, Leda;
- Bush Forever Site 356 Lake Cooloongup, Lake Walyungup and Adjacent Bushland Hillman to Port Kennedy; and
- Bush Forever Site 358 Lake Richmond, Rockingham.

Two unusual or uncommon vegetation associations occur on the site. These are the *Melaleuca huegelii* dominated vegetation occurring on wetland soils with a limestone substrate and the Tuart/*Melaleuca rhaphiophylla* wetland vegetation both of which are located to the west of the woolscouring plant.

The SEA Area contains native vegetation in a range of condition from Completely Degraded to Very Good. Vegetation condition generally improves to the south and east of the SEA Area. Approximately 58% of the SEA Area is in Good or better than Good condition, with 19% being Good to Degraded, 13% Degraded and 11% being Cleared or Completely Degraded (refer to Figure 4).

The condition of the vegetation in the SEA is gradually declining due to rubbish dumping, illegal tracks for off-road vehicles, fires, weeds and feral animals. Several areas are recovering from fires and the high degree of weed species is highly likely to be a direct result of the high frequency of fires. Fires are often started from the burning of abandoned cars which is common in the southern half of the site. The SEA Area contains a large number of vehicle tracks and access for 4WD and 2WD and motorcycles is very easy as the site is not fenced and the soils are conducive to vehicle access. There is also a significant amount of dumping taking place over the site including household bulk waste such as white goods, mattresses and sofas and general household refuse.

Development of the SEA Area according to the RIZ Structure Plan would involve clearing of the majority of the native vegetation for industry and associated infrastructure. The proposed development will clear up to 222ha of vegetation in the SEA Area. The areas of each of the FCT's to be cleared in the SEA Area are:

- 4ha out of 14ha of FCT 17;
- 17ha out of 32ha of FCT19b;
- 99ha out of 114ha of FCT 29b; and
- 102ha out of 128ha of FCT 30c2

The proposal as put forward by the proponent would result in the clearing of 17ha of FCT19b in the SEA Area. This represents a loss of approximately 12% of the remaining extent of TEC FCT19b (on the Swan Coastal Plain). Landcorp's proposed Conservation Area would retain 13.7ha of FCT19b.

<u>Wetlands</u>

The proposed development of the SEA Area will result in the direct loss of 22 of the wetlands covering 20ha in the SEA Area.

The SEA Area contains 34 wetlands, including 29 Conservation Category and 5 Resource Enhancement Category wetlands, which are mostly located in narrow linear swales. These wetlands are damplands and sumplands. The size of the wetlands was mostly less than 1ha. In total there is around 49.4ha of the site mapped as wetland. The two broad wetlands in the southern central section of the SEA Area make up 19.1ha or 39% of this total (refer to Figure 5).

Some of the vegetation associations in the SEA Area are considered to be TEC 19b. The areas of TEC 19b are located in wetlands that contain *Melaleuca rhaphiophylla* and *Banksia littoralis*. The condition of the vegetation was mapped as Degraded to Very Good.









The wetlands are all part of the Becher Suite of consanguineous wetlands which are located only on the Rockingham-Becher Plain. The Becher Suite wetlands in the SEA Area are of an age (5,000- 6,000 years old) that is not known to occur elsewhere on the Rockingham-Becher Plain in conservation areas apart from two small areas at the upper end of the age range within the Rockingham Lakes Regional Park to the west of Lake Cooloongup. The wetlands also appear to have a vegetation composition that is significantly different from younger Becher Suite wetlands.

Development of the SEA Area according to the RIZ Proposed Structure Plan will result in the direct loss of 22 of the wetlands covering 20ha in the SEA Area. Seven full and five part wetlands will be retained in Landcorp's proposed Conservation Area that have a total area of 28ha.

Four Conservation Category wetlands are bisected by Landcorp's proposed Conservation Area boundary and are partially in the development footprint. The proponent predicts that due to the fact that these are groundwater dependant, as outlined by the hydrological studies undertaken for this SEA, the hydrological function in retained areas will not be altered by the bisection of the wetlands.

The development may also have indirect impacts on retained wetlands through hydrological changes (water quantity and water quality) caused by stormwater infiltration, and groundwater abstraction (although the proponent has committed to no groundwater abstraction).

Groundwater

The proposed development could impact on groundwater due to land developed for industry having different rainfall runoff and infiltration characteristics to that of native vegetation.

Modelling of groundwater changes due to both proposal impacts and potential changes to climate are important in determining the long term viability of the Conservation Area.

The groundwater in the SEA Area is alkaline with pH ranging from 8.30-8.77. The shallow groundwater is predominantly fresh, with a salinity of less than 1,000 milligrams per litre (mg/L), apart from one bore located on the southern boundary which has a salinity of 4,900mg/L, influenced possibly by saline water from Lake Cooloongup.

The groundwater beneath the RIZ SEA Area has a general movement towards the coast. Monitoring of the groundwater levels in 2005 showed a seasonal range in groundwater levels between 0.9 in April up to 1.7 metres Australian Height Datum (mAHD) in September. The wetlands did not contain any surface water from perching and water levels were never closer than 1.1 metres (m) from the surface in this period. The dry condition of the wetlands could be the result of a drying climate which has seen a drop in water levels of approximately one metre since 1992.



Figure 5: Wetlands

Groundwater modelling was undertaken by the proponent to study the interaction between the groundwater levels and climate variability and to predict the potential sustainability of the wetlands on the site given the decline in groundwater and likely further reductions under climate change scenarios for Perth.

The modelling suggests that the wetlands in the SEA Area are controlled by groundwater levels, rather than being perched, and have had a decline in water levels of approximately one metre since 1990. The topography of the RIZ was also modelled in relation to the groundwater contours and it was found that the wetlands in the south-east portion of the RIZ had a shallower distance to the watertable than those in the north of the site. Using established root depths for species within the wetlands, specifically those typically associated with FCT19b, the model predicted that the wetland vegetation needs to be sustained by water levels within 1.8-1.9m below surface during the dry months of the year. Based on the analysis, it was considered that the wetlands in the southeast portion of the site could be sustainable in the future, whereas other wetlands are not likely to survive in their current condition (refer to Figure 5).

Landcorp's proposed Conservation Area was delineated from the groundwater modelling as being the area in which current groundwater trends will sustain FCT19b longer into the future. These wetlands have the shallowest distance to the groundwater, thus, according to the Umwelt modelling, the vegetation has the highest potential to survive in its current form as FCT19b.

The proponent has committed in the SEA Document to prohibiting groundwater abstraction during construction and for ongoing industry in the SEA Area. The proponent has also committed to maintaining groundwater levels in the Conservation Area at pre-development winter levels and maintaining groundwater quality in the Conservation Area to pre-construction criteria. These commitments are expected to be given effect through the Water Management Strategy.

Landcorp's proposed Conservation Area

The proponent recognises that the SEA Area contains environmental features of regional significance and proposes to create a Conservation Area of approximately 78ha in the south-central portion of the SEA Area to be protected from industrial development and managed for conservation.

Landcorp's proposed Conservation Area (refer to Figure 7) was determined by the proponent using the following rationale:

- Retention of regionally significant vegetation;
- Retention of vegetation associations that are representative of vegetation within the developable area;
- Retention of vegetation that is in Very Good to Excellent condition;



Figure 6: Water Table Contours

- Retention of the conservation significant wetlands that are considered to be most viable in the long term;
- Preservation of ecological linkages to surrounding conservation areas;
- Protection of any other values considered to be of regional significance, e.g. geomorphology; and
- Provision of an area that is large enough to be viable in the long term.

The Conservation Area size was subjected to a triple bottom line assessment by the proponent and compared with other possible options including a 22ha, 54ha, 78ha (proposed in the SEA document) and 96ha. The 78ha Conservation Area was deemed by the proponent to have the optimum outcome for society and the environment, while keeping the economic costs to an acceptable level.

Landcorp considers its proposed Conservation Area protects the following environmental values of the SEA Area:

- The Melaleuca huegelii dominated vegetation on wetland soils with a limestone substrate;
- The largest wetland on the limestone substrate;
- All areas of the Tuart (Eucalyptus gomphocephala) / Melaleuca rhaphiophylla wetland vegetation;
- 13.7ha of Threatened Ecological Community 19b in Good to Very Good condition;
- Area of wetlands that is most likely to sustain FCT19b under future climate conditions;
- 14 of the 20 vegetation associations that occur in the SEA Area;
- Seven complete (and parts of five more) of the 34 wetlands in the SEA Area. All twelve wetlands are Conservation Category wetlands;
- Swale and Tuart tree habitat for the mygalomorph spider species Teyl "waldockae"; and
- A large portion of the beach-ridge plain within the SEA Area that provides evidence of the early formation of the Point Peron peninsula.

Landcorp's proposed 78ha Conservation Area (Figure 7) protects about 42.5% of TEC in the SEA Area, secures some areas of highest environmental value in the SEA Area for conservation and secures what could be considered the most viable long-term TEC and wetlands while enabling some development of the site.



Figure 7: Threatened Ecological Community and Landcorp's Proposed Conservation Area (78ha).

Submissions

Thirteen submissions were received from government agencies and nongovernment organisations; one submission was received from a member of the public.

The majority of submissions, not including those in support of the proposal, were focused on the Conservation Area boundary and the environmental values to be included within the Conservation Area. Submissions also related to the vesting of the Conservation Area to a managing authority, environmental offsets to mitigate clearing of TEC and the future monitoring and management of groundwater in the SEA Area.

Submissions ranged from suggesting 100% of TECs and associated wetlands be retained within the Conservation Area boundary to slight modifications to the boundary to incorporate additional ridges and swales, TECs, wetlands and Tuart woodlands.

The DEC submission contended that the conservation outcomes of the TEC would be substantially improved if the area that includes the remainder of the two long swales that contain TEC to the west of Landcorp's proposed Conservation Area was included in the Conservation Area. The DEC also requested that the Conservation Area be ceded to a managing authority and that a Conservation Area Management Plan and Water Management Strategy be developed in consultation with the DEC.

Public submissions in some cases questioned the proponent's justification for not including some wetlands and vegetation into the Conservation Area. The proponent's justification is mostly based on findings from the Umwelt groundwater modelling showing future viability of the TEC and associated wetlands.

Submissions also questioned the validity of the groundwater modelling and predictions of future wetland viability, specifically the finding that the TEC outside the Conservation Area, in particular the TEC in the north of the SEA Area, are less viable into the future than the TEC within the Conservation Area.

Apart from the request for a minor modification, the DEC was mostly supportive of Landcorp's proposed Conservation Area and the general area selected for inclusion, although this was based on the environmental values and vegetation condition of the area, not the groundwater modelling.

Department of Water submissions queried where alternative water supplies would be sourced as the proponent has committed to prohibiting any groundwater abstractions.

Public and DEC submissions also requested that environmental offsets for any loss to TECs will be required if development in the SEA Area is approved.

Assessment

The EPA's environmental objective for the key environmental factor of Conservation Values is to protect and enhance the environmental values of areas identified as having significant environmental attributes.

The numerous submissions relating to the boundary of Landcorp's proposed 78ha Conservation Area, and the environmental values to be retained within its boundary, have been assessed by the EPA. A recommended increase in the size of the Conservation Area is discussed in more detail below.

Vegetation and Wetlands

The EPA considers the highest conservation values of the SEA Area include:

- 1. 32ha of TEC FCT19b listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* and listed as Critically Endangered by the Department of Environment and Conservation. Only 142ha of this TEC remains and 17ha is proposed to be cleared, which represents approximately 12% of the remaining extent of this TEC.
- 34 wetlands (50ha of wetlands) of which at least 29 are Conservation Category Wetland (CCW). The wetlands are part of the Becher Suite of wetlands and are located in swales estimated to be 5,000-6,000 years old. Wetlands of this suite and age-range are not currently protected in the Conservation Estate (Coffey 2009). The proposal would protect only 12 CCWs.
- 3. *Melaleuca huegelii* dominated vegetation community in limestone wetlands that may not occur elsewhere in the Perth Metropolitan Region.
- 4. 34ha of a Tuart/*Melaleuca rhaphiophylla* vegetation community on wetlands that is uncommon in the Perth Metropolitan Region (only recorded elsewhere at Moore River, Yanchep and Lake Cooloongup-Leda).

The EPA notes the strategic regional significance of the SEA Area as a future industrial area; however, the SEA Area also contains significant environmental values which require protection. The environmental values of the SEA Area, including the TEC, are in decline due to rubbish dumping, illegal tracks for off-road vehicles, fires, weeds, feral animals and the potential impact of a drying climate on groundwater levels.

The EPA has assessed Landcorp's proposed 78ha Conservation Area and concludes that it is in the correct location within the SEA Area and the reasoning behind the selection of the area for conservation is mostly supported. Landcorp's proposed Conservation Area protects important environmental values including very good condition vegetation, significant fauna habitat, unique landforms, conservation category wetlands and some of the best examples of TEC FCT19b in what could be the most viable area for conservation into the future.

Although the EPA believes Landcorp's proposed Conservation Area will conserve some environmental values in the SEA Area, the EPA believes that a small but important modification to Landcorp's Conservation Area boundary could deliver a better conservation outcome for the TEC and associated wetlands.

EPA's modified Conservation Area

The EPA's modified 90.5ha Conservation Area (Figure 8) is 12.5ha larger than Landcorp's proposed 78ha Conservation Area. This Conservation Area is very similar in shape to Landcorp's proposed Conservation Area and in comparison to the total SEA Area (339ha) is only 3.7% larger. However, it protects 58% of the TEC in the SEA Area compared to Landcorp's proposal which protected 42.5%.

The EPA's modified Conservation Area protects the same environmental values of the SEA Area as Landcorp's proposal but has some important gains. EPA's Conservation Area protects:

- 18.5ha of Threatened Ecological Community 19b in Good to Very Good condition (a gain of 15.5% of the total TECs within the SEA Area);
- Nine complete (and parts of three more) of the 34 wetlands in the SEA Area. All twelve wetlands are Conservation Category wetlands; and
- A larger portion of the beach-ridge plain within the SEA Area that provides evidence of the early formation of the Point Peron peninsula.

This modification includes the remainder of the two long swales that contain the TEC to the west of Landcorp's proposed Conservation Area. This land has TEC vegetation and associated wetlands in good to very good condition. The inclusion of this land is consistent with a request from the DEC who have committed to managing EPA's modified Conservation Area.

To protect the environmental values within the Conservation Area, certain requirements will need to be met by the proponent. The Conservation Area is to be ceded to the Conservation Commission of Western Australia, to be managed by the DEC. Prior to this, improvements are be made to the Conservation Area to bring it to a standard suitable for handing over to DEC management. A Conservation Area Management Plan is to be prepared by the proponent, on advice from the DEC, which describes what the specific improvements are. An early priority will be to fence the Conservation Area to prevent unauthorised access.

Groundwater

Submissions also questioned the validity of the groundwater modelling predictions that were used to delineate Landcorp's proposed Conservation Area. For example, modelling concluded that the TEC in the north of the SEA Area is under threat from a drying climate. Although there is some debate about this, the TEC in the south east of the SEA Area does have the same or better chance for survival into the future as those in the north due to higher groundwater levels (refer to Figure 5). Retaining this area and maintaining the groundwater in the area will ensure that the areas of FCT19b in the Conservation Area will be preserved into the future. The south east of the SEA Area also generally contains the highest environmental values. It is for these reasons that the EPA determines that the Conservation Area should be in the south-east of the SEA Area.



Figure 8: Threatened Ecological Community - EPA's Modified Conservation Area (90.5ha).

The Proponent's commitment to not allowing groundwater abstraction in the developable area and to source an alternative water supply is supported and will be detailed in the Water Management Strategy. The purpose of the Water Management Strategy is to maintain the water regime throughout the SEA Area into the future and to guide future proposals in the SEA Area.

Offsets

Given that this proposal will have residual adverse impacts on the TEC within the developable area, the EPA has determined that an offsets package is appropriate. This offsets package, which is to be developed in consultation with the DEC, is in line with the EPA's Guidance Statement No. 19 *Environmental Offsets* (EPA, 2008).

The offsets package will require that the proponent rehabilitates at least 9ha of TEC 19b outside of the SEA area. This will involve activities such as weeding and planting to improve the condition of the TEC. The offsets value of 9ha was calculated based on a worse-case development scenario and taking into account proposed rehabilitation work in the EPA's recommended 90.5ha Conservation Area.

There is 14ha of TEC in the SEA developable area which the EPA assumes will be cleared as a worst case (acknowledging that Landcorp intends to retain TEC vegetation when practical). The EPA determined that a 2:1 offset ratio was appropriate; this gives a value of 28ha. However, the EPA also acknowledges the proponent will be rehabilitating approximately 19ha within EPA's modified Conservation Area, which results in the final offsets value of 9ha.

In addition to modifying the Conservation Area boundary, the EPA's requirements, which have led to the recommended conditions outlined in Section 4.1 and Appendix 4, will include:

- ceding of the area set aside for conservation to be vested to the Conservation Commission;
- preparation of a Conservation Area Management Plan that outlines how the Conservation Area will be managed to ensure the protection of its environmental features;
- improvement to the condition of the Conservation Area to a level suitable for incorporation into the Conservation Estate;
- early fencing of the Conservation Area to prevent unauthorised access;
- preparation of a Water Management Strategy; and
- preparation of an offsets package.

Summary

It is the EPA's opinion that, with particular regard to EPA's modified Conservation Area, the proposal can be managed to meet the EPA's environmental objective for this factor subject to the implementation of conditions for the future management of the Conservation Area.

3.2 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the *Environmental Protection Act* (1986). Appendix 3 contains a summary of the EPA's consideration of the principles.

4. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for Environment on the key environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

4.1 Recommended conditions

Having considered the information provided in this report, the EPA has developed an Implementation Statement that the EPA recommends be applied to the strategic proposal by Landcorp to identify an appropriate development footprint and Conservation Area within the SEA Area, if it is approved for implementation.

This Implementation Statement is presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) conditions to be applied to strategic proposal, namely:
 - (1) the preparation of a Conservation Area Management Plan to improve environmental values prior to incorporation into the Conservation Estate and to maintain environmental values thereafter;
 - (2) the ceding of the area set aside for conservation to be vested to the Conservation Commission;
 - (3) the proponent will also be required to prepare an offsets package for likely impacts on TECs within the development footprint; and
 - (4) the preparation of a Water Management Strategy to the requirements of the OEPA, on advice from DEC and the Department of Water.
- (b) identification of derived proposals including a description of key characteristics.

4.2 Consultation

In developing these conditions, the EPA consulted with the proponent and DEC in respect of matters of fact and matters of technical or implementation significance. Minor changes, which did not change the intent or scope, were made to conditions 4, 5 and 6.

5. Other Advice

Subdivisions and provision of infrastructure have been identified as future proposals that may be considered by the EPA to be 'derived' proposals under this Strategic Environmental Assessment.

Provided the footprint of successive subdivision and infrastructure development remains consistent with any environmental approval and conditions, they would be considered derived proposals and would not require separate environmental assessment.

The actual industrial developments to be built on the land are not part of the assessment, so environmental factors related to industrial processes (for example air quality, noise, solid and liquid wastes) have been deferred. Future industrial projects within the development area are not within the scope of 'derived proposals' and would require separate referral to the EPA if they are likely to have significant environmental impacts.

6. Recommendations

The EPA submits the following recommendations to the Minister for Environment:

- 1. That the Minister notes that the proposal being assessed is for Landcorp to identify an appropriate development footprint and Conservation Area within the SEA Area;
- 2. That the Minister considers the report on the key environmental factors and principles as set out in Section 3;
- 3. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's environmental objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4; and
- 4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Government Organisations:

- 1. Department of Indigenous Affairs
- 2. Department of Water
- 3. City of Rockingham
- 4. Department of Mines and Petroleum
- 5. Department of State Development
- 6. Department of Environment and Conservation

Non government Organisations:

- 1. Kwinana Industries Council
- 2. Wetlands Conservation Society
- 3. Wetlands Research Association Inc.
- 4. Conservation Council of Western Australia
- 5. Lark Hill Landcare Group
- 6. Urban Bushland Council WA Inc
- 7. Cockburn Sound Management Council

Individuals:

1. Norman Hodgkinson

Appendix 2

References

Coffey Environments (June 2009), Rockingham Industrial Zone Strategic Environmental Assessment.

Coffey Environments (July 2010), RIZ SEA Response to Submissions.

Environmental Protection Authority, September 2008. *Environmental Offsets* – *Biodiversity, EPA Guidance on the Assessment of Environmental Factors No. 19.*

Appendix 3

Summary of identification of key environmental factors and principles

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Key Environmental Factors
BIOPHYSICAL			
Conservation Values – The protection of TEC 19b and associated wetlands into Conservation Area	The proponent recognises that the SEA Area contains environmental features of regional significance and proposes to create a Conservation Area of approximately 78ha in the south-central portion of the SEA Area that will be protected from industrial development and set aside as a Conservation Area. The Conservation Area size was subjected to a triple bottom line assessment and compared with other possible options including a 22ha, 54ha 78ha (proposed in this SEA) and 96ha. The 78ha Conservation Area is deemed to have the optimum outcome for society and the environment, while keeping the economic costs to an acceptable level. The Conservation Area protects the following environmental values of the SEA Area: ·Protects the <i>Melaleuca huegelii</i> dominated vegetation on wetland soils with a limestone substrate to the west of the wool scouring plant Includes the largest wetland on the limestone substrate; · All areas of the Tuart (<i>Eucalyptus gomphocenhala</i>) / <i>Melaleuca</i>	 Department of Environment and Conservation (DEC); The inclusion of a conservation area in the SEA is supported, and the reasoning behind the selection of the area for conservation is mostly supported. However, the conservation outcomes for the TEC would be substantially improved if the area that includes the remainder of the two long swales that contain the TEC to the west of the proposed conservation area was included in the conservation zone. The justification for only including about half of each of these swales in the conservation area is not clear. The timing of ceding the conservation area to an appropriate authority is not stated, and an approximation of the timetable required for conservation management activities including weed control, rubbish removal, providing for appropriate passive recreation facilities rehabilitation of degraded areas access control and monitoring of vegetation and hydrology. This work should be guided by a Management Plan that should be developed by the proponent in consultation with DEC. DEC's position is that the area between the Conservation Area and Bush Forever Site 349 contains significant environmental 	The Conservation Area and the protection of TEC 19b and associated wetlands within the Conservation Area is a key factor in the assessment of this proposal. Ongoing monitoring of groundwater is also essential to record and understand any changes to groundwater level and ensure preservation of the TEC19b and associated wetlands. Considered to be a key environmental factor.

 <i>rhaphiophylla</i> wetland vegetation; 28ha of Threatened Ecological Community 19b in Good to Very Good condition; Area of wetlands that is most likely to sustain FCT19b under future climate conditions; Contains vegetation largely in Good – Very Good condition (the highest condition rating in the SEA Area); 14 of the 20 vegetation associations that occur in the SEA Area; 7 complete and parts of 5 more of the 34 wetlands in the SEA Area. All twelve wetlands are Conservation Category wetlands; Contains swale and Tuart tree habitat for the mygalomorph spider species <i>Teyl</i> "waldockae"; and Contains a large portion of the beach-ridge plain within the SEA Area that provides evidence of the early formation of the Point Peron peninsula. 	 features, including tuart woodland, and forms an important ecological link between the conservation area and Bush Forever Site 349. Removal of this link will affect fauna movement between remnants and also reduce the amount of suitable fauna habitat available to species such as Carnaby's cockatoo. Without adequate linkages the proposed conservation area will be fragmented and isolated particularly impacting short range endemics and mammals. Linkages need to be of adequate size, width and condition to be functional. There is no hydrological evidence that shows clearing and potential use of the southern half of the two long swales in the south west corner of the proposed development for drainage will not affect the hydrology of the remainder of the swales. These data need to be provided. Cockburn Sound Management Council (CSMC); As much of the semi-concentric ridges and swales and consequently the TEC should be incorporated into the Conservation Area. 	
peninsula.	 There are wetlands in good condition outside of the Conservation Area and this should be integrated into the Conservation Area and the development Wetlands Conservation Society (WCS): The Conservation Area should be converted to secure reserves to stop the proponent applying for permission to 	

		develop them.	
		<u>Kwinana Industries Council (KIC):</u> Proposal for the Conservation Area boundary to the south should be linked with the old tip site which will provide a greater buffer in this area.	
		City of Rockingham (CoR) and DEC:AlinkagecorridorbetweenbetweentheConservationAreaAndBushBushForeverStep349should be established.	
		<u>CoR:</u> Establishment of ecological linkage between Bush Forever site 349 and the Conservation Area could be considered an offset	
		CoR and KIC: No managing authority for the Conservation Area in perpetuity has been named in the SEA.	
		Urban Bushland Council WA Inc.: Adequate buffers should be placed around the Conservation Area.	
Wetlands	Potential impact on 34 wetlands, including: • 29 Conservation Category wetlands; and • 5 Resource Enhancement	 DEC: The reasoning behind not considering that the flat wetlands west of the wool scouring plant may align with FCT 19 is not provided in the documentation. 	None of the wetlands in the SEA Area are protected by the <i>Environmental Protection</i> (<i>Swan Coastal Plain Lakes</i>) Policy 1992 or are listed as RAMSAR wetlands.
	 Category wetlands. Wetlands listed under Environmental Protection (Swan Coastal Plain Lakes Policy 1992). 	• Comments about lack of wetland viability for wetlands located outside of the proposed conservation area may be based on dubious logic. As a general principal, wetlands that occur in areas where	The only wetlands considered to have regional significance are the Conservation Category swale wetlands containing vegetation considered to be Floristic Community Type 19b which is a Threatened

	Development of the SEA Area would result in the clearing of 22 out of the 34 wetlands present in the SEA Area. 7 full and 5 part wetlands will be retained to a total of 28ha in the SEA Area.	 groundwater is closer to the surface are likely to be more dependent on groundwater than those that occur on groundwater at greater depth (Froend <i>et al.</i> 2004). WRA, Conservation Council of Western Australia (CCWA) and Lark Hill Landcare Group (LHLG): The commitment to further scientific study and monitoring on wetland ecology and hydrology is supported and needs to be a specific detailed condition of the development. CCWA and LHLG: All wetlands and adequate buffers should be preserved. WCS and WRA: The wetlands and damplands on the site must be conserved with adequate buffer zones. 	Ecological Community at the State and Commonwealth level. It is anticipated that the development of a conservation management plan and groundwater monitoring program will be conditions of the proposal if approved. Due to the close association between the SEA wetlands and TEC 19b and the boundary of the Conservation Area, wetlands will be addressed together with TEC 19b in the Conservation Values key environmental factor.
Flora and Vegetation	A total of 166 plant species has been recorded from the RIZ, of which 98 are native and 68 introduced. No Declared Rare or Priority Flora has been recorded from the RIZ or SEA Area. Full development of the SEA Area would result in the clearing of the majority of native vegetation which contains a total of 20 vegetation associations in a range of condition	 DEC: The impact on the TEC FCT19b must be mitigated by an appropriate Offset Strategy in accordance with EPA Guidance Statement 19 - Environmental Offsets – Biodiversity There are very significant impacts to the TEC proposed in this development, and given the significance of the TEC and its listing at both federal and State levels, substantial offsets will be required for the areas proposed for impact if this development is approved. There are a suite of TEC wetlands in the 	No Declared Rare or Priority listed flora species or Commonwealth Listed species has been recorded or were identified within the vicinity of the study area or during the Vegetation and Flora Assessment. The Conservation Area protects about half of the Threatened Ecological Community 19b in the SEA Area, in Good to Very Good condition. The proponent has commited to developing an offsets package in accordance with EPA Guidance Statement 19 - <i>Environmental</i>

from Completely Degraded to Very		northern sector of the IP14 area that were	Offsets – Biodiversity.
Good. The vegetation is part of the		recently re-surveyed by DEC and found to	
Quindalup Vegetation Complex		be in Good Condition on Bush Forever	The implementation of the proposal does not
(Heddle et al., 1980) and contains a		scales and are planned for development in	appear to involve losing any significant
total of 21 vegetation associations		this proposal. The species composition that	ecological linkage between the Conservation
from four Floristic Community		is found in the TEC in this northern area of	Area and Bush Forever Site 349.
Types:		IP 14 is a very uncommon variant and has	
• Floristic Community Type		not been located outside of this immediate	Road verges that are only planted with an
17 – Melaleuca		area. In this particular area, the substrate	overstorey do have limited potential to
rhaphiophylla – Gahnia		contains a cemented limestone component	provide linkage, however the proponent has
trifida seasonal wetlands		that would be expected to hold water in the	committed to developing vegetation on the
(also recorded with E.		unsaturated zone longer. Along with a peat	road sides that will also include an
gomphocephala)		layer, this substrate may assist the survival	understorey in a similar fashion to the
• Floristic Community Type		of the TEC vegetation in a drying climate.	vegetated verges on Patterson Road. These
19b – Woodlands over	•	The report states that wetlands are	verges will also be linked to drainage
Sedgelands in Holocene		occurring where groundwater is 2.5m	infrastructure such as vegetated swales and
Dune Swales. All the		below surface in the north end of the SEA.	bioretention rain gardens.
wetlands that contain		It is then stated in Appendix F that TEC	
woodlands in the linear		areas will not survive where groundwater	At least 34 ha of tuart vegetation and 100%
swales throughout the site		falls below 1.9m below surface. As	of tuart wetland vegetation will be conserved
are likely to be		wetlands are surviving with these lower	in the Conservation Area.
representative of this FCT.		groundwater levels now, there is no reason	
• Floristic Community Type		to assume they will not be able to do so in	The Tuart woodlands, although in the
29b – Acacia shrublands		future.	Quindalup Soil System, are not within the
on taller dunes.	•	Long-term monitoring of groundwater and	600-690 and 900-999mm rainfall zones, and
• Floristic Community Type		vegetation composition will be required,	also do not contain 'low disturbance
30c2 – Quindalup		and are recommended, to determine	understorey' and are therefore not identified
Eucalyptus		tolerances of the TEC wetlands to	in the draft Tuart Conservation and
gomphocephala and/or		groundwater fluctuations.	Management Strategy as Priority 1 or 2
Agonis flexuosa	•	The Water Management Strategy Scoping	'indicative high conservation areas'. The
woodlands.		Document states that 'it is apparent without	Tuart woodlands are not recognised in DEC's
		additional inputs; the existing TEC	Tuart Atlas.
FCT 19b is present within many of		wetlands will not survive'. The statement	
the dune swales and is a Threatened		is simply not logical or supported by other	The Conservation Area will protect the
Ecological Community at the State		data in the remainder of the report.	Melaleuca huegelii dominated vegetation on
and Commonwealth level. The other	•	Figure 4 of the SEA displays indicative on-	wetland soils with a limestone substrate to
three FCTs are not listed as		site ecological linkages that do not seem to	the west of the wool scouring plant.

Threatened Ecological Communities	be viable or achievable and further	
(TECs). FCT19b is closely	information should be provided on the	Buffers to the retained wetlands within the
associated with the groundwater	nature, size and location of these linkages	development will be treated with integrated
dependant wetlands on the site.	to enable adequate assessment.	landscaped including the contouring and
1	• The proponent states that the buffers	planting of native species around the edge of
Development of the SEA Area	around wetlands are considered to be	the bisected area to create a dense buffer.
according to the RIZ Structure Plan	adequate. There are no data provided to	
would result in 222ha of native	support this conclusion. This is particularly	The value of the remnant vegetation on the
vegetation being cleared including	pertinent as the buffer required will be	site has been acknowledged by the proponent
17ha of FCT19b and 99ha of Tuart	dependent on the adjacent land use.	by proposing a Conservation Area. Outside
vegetation.	amongst other things, and as is noted	of the Conservation Area there is a lot of
	several times in the response to	degraded habitat and limited areas of higher
The Melaleuca huegelii dominated	submissions, adjacent land uses have not	quality habitat.
vegetation occurring on wetland	vet been determined.	1 2
soils with a limestone substrate	y	However, it is proposed that vegetation will
to the west of the woolscouring	Wetlands Research Association Inc. (WRA)	be established, wherever possible, in road
plant is a very unusual vegetation	Threatened Ecological Communities (TEC)	verges and drainage infrastructure using
association which might not be	is protected by Federal Law under the	native species to provide linkages between
represented in the conservation	EPBC Act. As such the State Government	remaining areas of remnant vegetation.
estate and while not a Threatened	is required to protect 100% and not 57% by	Vegetation will also be retained wherever
Ecological Community is	law, together with adequate buffers. Further	possible in car parks and other areas.
considered of high conservation	under EPA guidelines, 100% of the	
significance.	Conservation Category Wetlands.	The protection of TEC FCT 19b is the
		significant vegetation issue and is directly
The Tuart woodlands are not in the	WCS and WRA:	linked to the boundary of the
Quindalup Soil System within the	Tuart woodlands are under pressure and	Conservation Area. As such the issue of
600-690 and 900-999mm rainfall	good quality stands should be protected.	TEC19b will be addressed under the
zones, and also do not contain 'low		Conservation Values key environmental
disturbance understorey' and are	CCWA and LHLG:	factor.
therefore not identified in the draft	• Wetlands and significant biodiversity areas	
Tuart Conservation and	like this cannot be compared to jobs and	
Management Strategy as Priority 1	loss of income as there is little remaining	
or 2 'indicative high conservation	vegetation on the Swan Coastal Plain. The	
areas'.	Tuart woodlands are now recognized as	
	endangered and no Tuart or other over-	
	storey should be cleared.	
	• The report suggests conserving less than	

	the total area, 70% of the vegetation association on site and 57% of the Threatened Ecological Communities 19b present on site. We say it should be 100% of both.	
	 Cockburn Sound Management Council (CSMC); The importance of the remnant vegetation on the site is diminished in the SEA and more of this vegetation should be retained and rehabilitated. Tuart woodlands in the area have the potential to be rehabilitated to provide an area of higher quality of environmental asset and importance. Future landscaping design should include ecological linkage which is not adequately committed to in the SEA. 	
	CCWA, LHLG and CSMC: All Tuart and significant trees to be surveyed and individual trees plotted for retention prior to clearing.	
	CSMC and KIC: Ecological linkages must be established over the development between remnant vegetation on the site.	
	 CoR: The proponent does not give a timeframe to the length of monitoring periods. The proposed use of road verges has a low potential to provide ecological linkage. Conservation of the Tuart dominated vegetation running west from Lot 803 Mandurah Road within Public Open Space 	

		 and/or street verges should be considered. Linkage shown on the proposed Waste Water Treatment site could be used as an offset for the clearing of vegetation on this site. 	
Fauna	Three, and possibly four species of fauna listed under Commonwealth and State government legislation requiring special protection due to their vulnerability are predicted or were recorded on site. The Southern Brown Bandicoot, Rainbow Beeeater, Carnaby's Cockatoo and possibly the Carpet Python are either present or likely to be present. The unusual spider species <i>Teyl</i> <i>'waldockae'</i> occurs in the area in dune swales. The Carnaby's Cockatoo's preferred habitat is the woodland where it preferentially feeds on plants of the Proteaceae family but it also eats seeds and nectar form a range of plants. In winter, flocks can be found in heaths. It is observed regularly on the Swan Coastal Plain, occurs in the region, and is likely to be found in the project area although not observed during the survey. There is little suitable habitat for foraging on the project site. Carnaby's Black Cockatoos	 WCS: The RIZ contains and supports rare flora and fauna. WRA, CCWA and LHLG: The submission supports the commitment to further scientific study and monitoring on fauna but need this to be a condition of development CCWA and LHLG: More work is required for fauna research, especially over more seasons, to establish both what remains on site and what other species (e.g. Carnaby's cockatoo, Wedge tail eagles and other birds of prey) use the area for foraging and food source. This location is close to the Shoalwater Marine Park and a link to the Rockingham Lakes Regional Park and offshore islands. CSMC: More trapping in the area may reveal a higher abundance of species, however it is noted that this may not improve the value of the faunal habitat. Fauna trapping prior to construction must be determined to be feasible and humane. 	Generally, the Conservation Area will retain most of the vegetation associations within the RIZ and as a result will also contain most of the fauna habitat and fauna species in the RIZ, including habitat for the unusual spider species <i>Teyl 'waldockae'</i> . Although no breeding pairs of Carnaby's Black Cockatoos were found in the SEA area, there is potential for breeding habitat and they are likely to occur. As such, hollows from trees to be cleared will be harvested prior to construction and placed along with artificial breeding habitat in the Conservation Area. Surveying for Carnaby's Black Cocatoos at other times of the year may result in identifying slightly different assemblages; however this is unlikely to change the conclusions that were reached during the fauna assessment. The assessment concluded that Carnaby's Black-Cockatoo are likely to be observed in the area and may roost in the large Eucalypts, however it is unlikely that they will feed or nest on site due to the limited potential habitat.
	large Tuart trees on the site for roosting. The survey of tree hollows on the site also indicates that there	CoR: The retention of existing tree hollows will result in securing Carnaby's Black	Management Plan, the proponent will eradicate feral bees from any retained trees in the SEA Area.

on Garden Island, and have been factor.	is no b breedin The r across WA i lightly water. Gascoy moves Septen north f scarce range. been expect breedin Southe (Quend one m swamp feed woodla basis a croplan Southe record in the s The so inhabin areas a in bra occur on Ga	breeding and limited potential ing habitat on the site. rainbow bee-eater is found a the better-watered parts of including islands. It prefers / wooded, sandy country near . It spends its winters from the oyne north to Indonesia. It s south mainly in late mber and early October and from February to April. It is e to very common across its . The Rainbow Bee-eater has seen in the region and is ted to utilize the SEA Area for ing in the summer months. ern Brown Bandicoot da) prefer dense scrub (up to netre high), often in or near py vegetation. They will often in adjacent forest and land that is burnt on a regular and in areas of pasture and ind lying close to dense cover. ern Brown Bandicoots were led in the RIZ and may occur SEA Area. buth west carpet python its forest, heath, or wetland and shelter in hollow logs or anches of large trees. They in relatively high abundance arden Island, and have been	•	Cockatoo potential breeding habitat. The tree hollow survey may have underestimated the number of hollows present in the SEA Area due to the size considered to be appropriate is less than the criteria used in the report. The majority of potential breeding hollows are located in a narrow stretch of land and the City of Rockingham have employed a consultant who have indicated that this is significant in terms of recovery of Carnaby's Black Cockatoos. There may be vegetation types present that may be considered breeding and feeding habitat present on the site and the food resource condition has not been measured - clearing of which may be considered significant by DEWHA. Eradicating bees from the area could enhance the potential of the hollows to provide breeding habitat. The tuarts may provide potential nesting habitat and as such the significant trees in areas to be developed should be replaced by nesting habitat elsewhere.	The Rainbow Bee-eater has a range of alternative foraging and nesting areas in the region and is unlikely to be adversely affected by any clearing. Southern Brown Bandicoots and Carper Pythons, if they are in the area, would most probably be lost if the bushland was cleared however, the Conservation Area will provid habitat for these two species. It is also the Proponent's intention that southern brown bandicoots and carpet pytho will be relocated from the development are prior to development. No trapping will tak place prior to development if other method such as staged clearing could be used to move fauna on to minimise stress to the animals. If trapping is required it will be undertaken by an appropriately qualifie consultant in accordance with <i>Australia</i> <i>code of practice for the care and use of animals for scientific purposes</i> . As a result of the Conservation Area native fauna will be protected from predation from feral animals. The proponent has also carried out a Gracefu Sun-moth survey for the RIZ which concludes that GSM do not occur in the RIZ so will not be impacted by clearing of vegetation. Not considered to be a key environmenta factor.
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	This species is widespread within the south west, but is not in high density across its distribution. It is possible that Carpet Pythons could be found in the SEA Area. Full development of the SEA Area would result in the clearing of the majority of vegetation and associated fauna. This includes 37ha of the Acacia and Xanthorrhoea shrubland, 101ha of the Tuart dominated woodland, 29ha of the Melaleuca and Banksia woodland and 61ha of the degraded shrubland. The Conservation Area retains 34ha of Tuart dominated habitat and 39ha of the Melaleuca and Banksia woodland.	
Geomorphology	The SEA Area is located in the northern portion of the Rockingham-Becher Plain and contains shore-parallel ridges and swales. The area includes the early formation of the Point Peron peninsula around 5,000-6,000 years Old.No comments receivedDevelopment of the SEA Area would remove the surface features in the remaining portion of the northern part of the Rockingham-No comments received	A large area of the unique Low Ridge and Swale Landform is being preserved in the 78 ha Conservation Area. A 1989 EPA assessment concluded that the most complete sequence of shore-parallel beach ridges and intervening swales is located in the southern part of the Point Becher area and not the RIZ. The southern area also contains the best quality vegetation and wetlands within the dunes. As a result of this and other studies of the
	Becher Plain.	area, a large portion of the southern part of

		Point Becher has been retained in the Rockingham Lakes Regional Park. The Regional Park includes a complete sequence of dunes from the present coastline inland to Lakes Walyungup and Cooloongup. Not considered to be a key environmental factor.
LUTION		
aceand ndwateraceand ndwatertyandtyandtity.andtity.ballowgroundwaterispredominantly fresh (<1,000mg/L) apart from one bore located on the southern boundary which has a salinity of 4900mg/L, influenced possibly by saline water from Lake Cooloongup.The groundwater beneath the RIZ SEA Area has a general movement towards the coast. Monitoring of the groundwater levels in 2005 showed a seasonal range in groundwater levels between 0.9 in April up to 1.7m AHD in September. The wetlands did not contain any surface water from perching and water levels were never closer than 1.1m from the surface in this period. The dry 	 DEC: A detailed monitoring plan for groundwater levels and quality, and floristic composition in the TEC and other wetlands should be developed in consultation with DEC and DoW, and implemented by the proponent well in advance of commencement of any development of the site to ensure enough baseline information exists prior to potential radical changes to the hydrologic regime. Much more detailed information will be required for the WMP. The interactions between ground surface and water table need to be considered. The minor differences calculated for pre and post development groundwater contours only appear to be calculated based on impacts associated with clearing, and not to include the hydrological impacts from the Waste Water Treatment Plant (WWTP) that are likely to be far more major. Given the biodiversity significance of the site, DEC should be consulted with regard to planning work to be done in developing 	A Conservation Area Management Plan and Water Management Strategy will be conditions for the proposal if implemented and will identify monitoring timeframes, management strategies and alternative sources of water for development. These plans will be developed in consultation with the DEC and DoW. Groundwater abstraction for use by industry within the SEA Area will not be undertaken in the development as part of the design guidelines for the development. The use of WSUD design features will mitigate the impact of industrial development on groundwater in the SEA Area and in particular will add to the management options for the Conservation Area. Run off from the hardstand developed areas directed into the conservation area will result in very little change to groundwater levels and will reflect natural surface/groundwater flow interaction. There may be a slight increase, but no decrease in groundwater levels in the Conservation Area.

 bootenspire of the RIZ Proposed Structure Plan could impact on the groundwater quality and levels in a number of ways including: Contamination of the groundwater and surface water by nutrients and pollutants from industry; Transfer of pollutants to Cockburn Sound Lowering of groundwater levels by abstraction for industry; Raising of groundwater following clearing of native vegetation; Increase in salinity of shallow groundwater; or Increase the surface run-off due to hardstand areas in the development. 	 Water from the WWTP should not be pumped (artificial recharge) into the conservation area unless monitoring of wetland TEC vegetation and water levels indicates that water levels have fallen significantly and that this is having a significant effect on wetland vegetation. It is also about water quality. It should not be concluded that artificial recharge will be advantageous to the wetlands without much more evidence for the requirement to do so. In addition, the health of the TEC wetlands is also most likely to be related to the seasonality of fluctuations in water levels, as well as maintaining water levels and quality in general. If artificial recharge was ever to be contemplated, then these factors would also need to be considered, following longer-term monitoring of predevelopment seasonality of water levels and quality. The predicted water chemistry from the waste water treatment plant is also considered highly inappropriate for this use. 	 will provide filtration outsits and burlet strips will provide filtration for stormwater to remove nutrients and pollutants. This will ensure that the groundwater quality is maintained at pre-development criteria. The Waste Water Treatment Plant is subject to a separate approvals process and is not part of the SEA Area. Hydrological impacts of this development cannot be commented upon by the proponent and cannot be included in the modelling for the SEA Area. Any hydrological changes that may occur due to the development of the WWTP must be controlled and mitigated by the approvals of the individual development. The EPA is not considering artificial recharge from the WWTP when assessing this proposal; however, any future plans for artificial recharge of the Conservation Area will need to be addressed in the Conservation and Management Plan. Management and monitoring of groundwater in the Conservation Area is the key significant groundwater issue. As
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 water supplies will be sourced if no groundwater abstraction is used. Management of water resources during construction and operational phases is not adequately covered. 	
<u>CoR:</u> Details have not been given for the remediation that would take place if groundwater levels or quality are not maintained to pre-development conditions.	
 CSMC: The WSUD on the site must ensure that there is no contaminated groundwater to threaten Cockburn Sound. Remnant vegetation in the SEA Area may moderate groundwater and nutrient flows and this is not addressed in the SEA. WSUD must be implemented over the entire development rigorously 	

PRINCIPLES			
Principle	Relevant Yes/No	If yes, Consideration	
The precautionary principle			
Where there are threats of serious or irreversible damage	. lack of full scientif	ic certainty should not be used as a reason for postponing measures to prevent	
environmental degradation.	,	<i>J J J J J J J J J J</i>	
In application of this precautionary principle, decisions sh	ould be guided by –		
(1) careful evaluation to avoid, where practicable, serio	ous or irreversible da	amage to the environment; and	
(2) an assessment of the risk-weighted consequences of	various options.		
	Yes	The SEA contains extensive scientific study and there is sufficient	
		knowledge to address potential environmental impacts. Specialist studies of	
		the relevant environmental factors have been undertaken to assess the	
		environment and potential impacts.	
2. The principle of intergenerational equity	2. The principle of intergenerational equity		
The present generation should ensure that the health, di	versity and product	ivity of the environment is maintained and enhanced for the benefit of future	
generations.	generations.		
	103	representation of all significant environmental features of the RIZ in a	
		Conservation Area to be managed by DEC.	
		The proponent has scientifically modelled future environmental effects of a	
		drying climate and has designed all principles of the development for	
		sustainability in areas such as vegetation and fauna protection and	
		groundwater management.	
3. The principle of the conservation of biological diversity and ecological integrity			
Conservation of biological diversity and ecological integrity should be a fundamental consideration.			
	Yes	Investigations undertaken for flora (remnant vegetation, DRF and TEC) and	
		fauna (priority and scheduled species) have been undertaken in accordance	
		with the EPA's relevant guidance statements. The findings will form the	
		basis of the Conservation Management Plan to be prepared for the SEA	
		Area.	

Appendix 4

Identified Decision-making Authorities and Recommended Environmental Conditions

Identified Decision-making Authorities

Section 44(2) of the *Environmental Protection Act 1986* (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 decisionmaking authorities, 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 and interested parties have been identified for this consultation:

Decision-making Authority	Approval
Minister for Land	Transfer of Conservation Area to
	Conservation Commission.

The following have been identified as interested parties:

Interested Party
Conservation Commission
Department of Environment and Conservation
Department of Water
Water Corporation

RECOMMENDED ENVIRONMENTAL CONDITIONS

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

ROCKINGHAM INDUSTRIAL ZONE STRATEGIC ENVIRONMENTAL ASSESSMENT (FORMERLY IP14)

Proposal:	The strategic proposal is to identify a development
	footprint for future industrial development over a 339
	hectare area of the Rockingham Industrial Zone, while
	retaining an area as a conservation reserve.

The strategic proposal and identification of derived proposals is further documented in schedule 1 of this statement.

Proponent: Landcorp

Proponent Address: Level 3 Wesfarmers House 40 The Esplanade Perth WA 6000

Assessment Number: 1534

Report of the Environmental Protection Authority: Report 1390

The strategic proposal and future proposals referred to in the above report of the Environmental Protection Authority may be implemented. The implementation of the proposal shall be subject to the following conditions and procedures (subject to the Minister for Environment's identification of relevant conditions under section 45A(3) of the *Environmental Protection Act 1986*):

1 Proponent Nomination and Contact Details

- 1-1 The proponent for the time being nominated by the Minister for Environment under sections 38(6) or 38(7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal.
- 1-2 The proponent shall notify the Chief Executive Officer of the Department of Environment and Conservation of any change of the name and address of the proponent for the serving of notices or other correspondence within 30 days of such change.

2 Time Limit of Authorisation for Strategic Proposal

2-1 The authorisation provided for in this statement to request a derived proposal under section 39B(1) of the *Environmental Protection Act 1986* shall lapse and be void 20 years after the date of this statement.

3 Time Limit of Authorisation for a Derived Proposal

3-1 The authorisation to implement a derived proposal provided for in this statement shall lapse and be void five years after the declaration of the Environmental Protection Authority under section 39B(3) of the *Environmental Protection Act 1986* that the proposal is a derived proposal.

4 Compliance Reporting

- 4-1 The proponent shall prepare and submit a compliance assessment plan to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority at least 6 months prior to the first compliance report required by condition 4-6 or prior to the commencement of future proposals, whichever is sooner.
- 4-2 The proponent shall implement and maintain to the Chief Executive Officer of the Office of the Environmental Protection Authority the compliance assessment plan required by condition 4-1. The compliance assessment plan shall indicate:
 - a) the frequency of compliance reporting;
 - b) the approach and timing of compliance assessments;
 - c) the retention of compliance assessments;
 - d) the reporting of potential non-compliances and corrective actions taken;
 - e) the table of contents of compliance reports; and
 - f) the public availability of compliance reports.
- 4-3 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 Chief Executive Officer of the Office of the Environmental Protection Authority.
- 4-5 The proponent shall advise the Chief Executive Officer of the Office of the Environmental Protection Authority of any potential non-compliance as soon as practicable.

- 4-6 The proponent shall submit a compliance assessment report annually from the date of the Minister for Environment's notice under section 45A(2) of the *Environmental Protection Act 1986* addressing the previous twelve month period or other period as agreed by the Chief Executive Officer of the Office of the Environmental Protection Authority. The compliance assessment report shall:
 - a) be endorsed by the proponent's Managing Director or a person, approved in writing by the Office of the Environmental Protection Authority, delegated to sign on the Managing Director's behalf;
 - b) include a statement as to whether the proponent has complied with the conditions;
 - c) identify all potential non-compliances and describe corrective and preventative actions taken;
 - d) be made publicly available in accordance with the compliance assessment plan; and
 - e) indicate any proposed changes to the compliance assessment plan required by condition 4-1.

5 Conservation Area

- 5-1 Within 6 months of the date of this statement the proponent shall construct and maintain fencing, gates and signage of the Conservation Area, as delineated by Figure 1 and Table 2 in Schedule 1, to assist in preventing unauthorised access until such time the land is ceded to the Conservation Commission of Western Australia.
- 5-2 Within 6 months of the date of this statement the proponent shall remove all dumped rubbish from the Conservation Area and maintain the Conservation Area free of rubbish.
- 5-3 Within two years of the date of this statement the proponent shall prepare an Initial Conservation Area Management Plan for the Conservation Area to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice from the Department of Environment and Conservation. The objective of this Initial Conservation Area Management Plan is to improve the condition of the Conservation Area to a level suitable for incorporation into the Conservation Estate.

The Initial Conservation Area Management Plan will address:

1 Protecting and rehabilitating the threatened ecological community Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain;

- 2 Maintenance of fencing of the area to control access to designated areas within the Conservation Area;
- 3 Design and implementation of appropriate monitoring of the vegetation within the Conservation Area, including the threatened ecological community Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain;
- 4 Design and implementation of appropriate monitoring of hydrology including groundwater levels and quality and contingencies in the event of unacceptable hydrological impacts;
- 5 Maintaining Conservation Area free of dumped rubbish;
- 6 Rehabilitation of degraded areas within the Conservation Area including tracks not required for strategic access;
- 7 The control of feral animal populations in the Conservation Area;
- 8 Weed control in the Conservation Area;
- 9 Fire prevention and response;
- 10 Enhancement of the fauna habitat in the area by providing harvested and artificial breeding infrastructure for significant fauna;
- 11 Using artificial polishing drainage basins outside of the Conservation Area, for the re-infiltration of stormwater into the Conservation Area; and
- 12 Completion criteria for handover to another management authority.
- 5-4 The proponent shall implement the Initial Conservation Area Management Plan required by Condition 5-3 until the Conservation Area is ceded to the Conservation Commission of Western Australia
- 5-5 When the completion criteria of Condition 5-3-12 are met, or within two years of a written request from the Department of Environment and Conservation, the proponent will arrange to cede the Conservation Area to the Conservation Commission of Western Australia.
- 5-6 Within one year of ceding land (pursuant to Condition 5-5) the proponent shall prepare a Conservation Area Management Plan to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice from the Department of Environment and Conservation. The objective of this Conservation Area Management Plan is to guide continued management of the conservation values of the area.

The Conservation Area Management Plan will address:

- 1 Protecting and rehabilitating the threatened ecological community Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain;
- 2 Maintenance of fencing of the area to control access to designated areas within the Conservation Area;
- 3 Ongoing vegetation monitoring of the threatened ecological community Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain;
- 4 Ongoing monitoring of hydrology including groundwater levels and quality and implementation of contingencies in the event of unacceptable hydrological impacts;
- 5 Management of rehabilitated areas within the Conservation Area
- 6 The control of feral animal populations in the Conservation Area;
- 7 Weed control in the Conservation Area;
- 8 Fire prevention and response;
- 9 Enhancement of the fauna habitat in the area by providing harvested and artificial breeding infrastructure for Carnaby's Cockatoos; and
- 10 Using artificial polishing drainage basins outside of the Conservation Area for the re-infiltration of stormwater into the Conservation Area.

6 Water Management Strategy

6-1 Within two years of the date of this statement the proponent shall prepare a Water Management Strategy to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice from the Department of Environment and Conservation and the Department of Water.

The Water Management Strategy will address:

- 1. Managing stormwater as a resource;
- 2. Maintaining stormwater and groundwater quality to pre-development levels;
- 3. Maintaining hydrology including water quality and levels of natural ecosystems;
- 4. Retaining or improving groundwater balance;
- 5. Managing the salt wedge / Cockburn Sound interface;
- 6. Creating industrial landscapes as ecologically functioning units; and

- 7. Integrating Water Sensitive Urban Design within landscape at site, precinct and district scales.
- 6-2 The proponent shall implement the Water Management Strategy required by Condition 6-1.

7 Offsets

- 7-1 Within two years of the date of this statement the proponent shall prepare an Offsets Package to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice from the Department of Environment and Conservation that will ensure the rehabilitation of at least 9 hectares of threatened ecological community *Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain*, outside of the Strategic Environmental Assessment boundary, that requires active management in land managed by the Department of Environment and Conservation and at other high priority sites in the Rockingham region.
- 7-2 The proponent shall implement the Offsets Package required by Condition 7-1 within three years of the date of this statement.

The Strategic Proposal for the Rockingham Industrial Zone and Identification of Derived Proposals (Assessment No. 1534)

The Strategic Proposal is to:

- identify a development footprint for future industrial development within a 339 ha section of the Rockingham Industrial Zone (the SEA Area shown in Figure 1);
- retain an area as a conservation area as delineated in Figure 1 and by coordinates in Table 2.

Derived proposals are expected to include:

- subdivision for industrial purposes; and
- the provision of infrastructure (such as roads, water services and power services) within the development footprint.

The main characteristics and the extent of derived proposals of the strategic proposal are summarised in Table 1 below.

Strategic proposal		
Element	Description	
Overall area	339 hectares of Rockingham Industrial Zone (SEA Area).	
Development area:	All land within the SEA Area, excluding the Conservation Area.	
Derived proposals		
Type of derived proposal	Key characteristics	
Subdivision and provision of infrastructure.	 Within the development area In accordance with the Water Management Strategy (of Condition 5-1). includes a Construction Environmental Management Plan to: Retain, where practical, vegetation within the developed area; Include a fauna trapping and relocation program to be implemented in consultation with the DEC; Salvage potential breeding habitat for 	

Table 1: Summary of Key Proposal Characteristics

 avifauna during clearing for integration into the Conservation Area; and Establish vegetation in road reserves using appropriate local native species to provide linkages between areas of remnant vegetation. includes an Environmental Management Plan
 (overall or site specific) to guide future development of industry within the site to: Retain, where practical, vegetation within the developed area, especially the threatened ecological community Sedgelands in Holocene dune swales of the Southern Swan Coastal Plain;
 Include a fauna trapping and relocation program to be implemented in consultation with the DEC; and Salvage potential breeding habitat for avifauna during clearing for integration into the Conservation Area;



Figure 1: SEA Area and Conservation Area Boundary

Table 2: Co-ordinates defining the boundary of theConservation area

co-ordinates derived in GDA 94 MGA Zone 50

ID	Easting	Northing
1	383863.69	6429479.27
2	383926.94	6429537.90
3	383962.12	6429569.02
4	384036.59	6429635.46
5	384551.58	6429634.96
6	384558.70	6429634.99
7	384562.18	6429255.29
8	384511.07	6429254.87
9	384512.58	6429074.48
10	384492.56	6429074.31
11	384492.81	6429044.20
12	384494.36	6428859.42
13	384484.45	6428849.34
14	384484.61	6428829.36
15	384298.45	6428827.86
16	384294.35	6428827.86
17	384285.65	6428798.95
18	384324.40	6428639.14
19	384341.24	6428639.02
20	384378.42	6428588.06
21	384379.61	6428535.65
22	384268.47	6428534.84
23	383934.89	6428532.42
24	383597.19	6428529.97
25	383603.50	6428698.24
26	383486.31	6428859.12
27	383486.31	6428935.12
28	383543.70	6428947.53
29	383559.21	6429068.50
30	383557.66	6429135.19
31	383720.51	6429363.17
32	383790.19	6429419.72
33	383863.69	6429479.27

Appendix 5

Summary of Submissions and Proponent's Response to Submissions