ALBEMARLE KEMERTON PLANT

FLORA AND VEGETATION MONITORING AND MANAGEMENT PLAN

13 DECEMBER 2024

DOCUMENT ID: ALB-KEM-EMP-02
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ACKNOWLEDGEMENT OF COUNTRY

Preston Consulting acknowledges the Traditional Owners of the lands on which it works, in particular the Whadjuk people of the Noongar Nation and the Yamatji people, the Traditional Custodians of the land on which the activity is proposed. Preston Consulting pays its respects to Elders past and present, to emerging community leaders and to all Aboriginal and Torres Strait Islander peoples.

DOCUMENT CONTROL

Document Title	Flora and Vegetation Monitoring and Management Plan - Albemarle Kemerton Plant		
Document Number	ALB-KEM-EMP-02		
Revision Number	**3**		12/12/2024
Status	Final		
Author	Darren Coulson Albemarle Lithium Pty Ltd		12/12/2024
Checked	Gavin Edwards - Director Preston Consulting Pty Ltd		13/12/2024
Authorisation	Tom Baddeley – Head of External Affairs Albemarle Lithium Pty Ltd		13/12/2024

Rev.	Date	Status	Prepared By	Reviewed By	Operations Approval	Approved
A	06-May-21	Draft	C. Greenem	R. Srdarev	C. Harkin	E. Berends
0	17-May-21	Final	C. Greenem	R. Srdarev	C. Harkin	E. Berends
1	31-Jan-23	IFU	C. Greenem	C. Thomson	C. Maina	J. Rowan
2	12-Sep-24	Final	C. Thomson	C. Thomson	D. Coulson	N/A
3	12-Dec-24	Final	D. Coulson	B. Bell	D. Coulson	T. Baddeley

EXECUTIVE SUMMARY

Albemarle Lithium Pty Ltd (Albemarle) operates the Albemarle Kemerton Plant (AKP; Proposal), a lithium hydroxide product manufacturing plant and its associated infrastructure. The AKP is located on Kemerton Road, Wellesley, within the Kemerton Strategic Industrial Area (KSIA), approximately 17 kilometres (km) north-east of Bunbury (Figure 1).

Environmental approval was granted under the *Environmental Protection Act 1986* (EP Act) on 26 October 2018 via Ministerial Statement (MS) 1085. MS 1085 requires the implementation of four conditioned Environmental Management Plans (EMP), including a Flora and Vegetation Monitoring and Management Plan (FVMMP; this document). A summary of the Proposal details and the FVMMP are provided in Table 1.

Table 1: Summary

Proposal Name	Albemarle Kemerton Plant
Proponent Name	Albemarle Lithium Pty Ltd
Ministerial Statement number	1085
Purpose of this FVMMP	To fulfil the requirements of condition 6 of MS 1085. To provide management and monitoring measures for native vegetation and flora that are potentially impacted by the Proposal. In particular, the low lying *Banksia attenuata* Woodlands or Shrublands Priority Ecological Community (PEC) and the three threatened orchids, *Drakaea elastica*, *Drakaea micrantha* and *Diuris micrantha* (Orchids).
Key environmental factor	Flora and Vegetation
EPA's environmental objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained
MS 1085 Condition clauses	Condition 6 of MS 1085
Key components	The key components of this (post-clearing) version of the FVMMP include avoiding, minimising and reducing the impacts of the Proposal by: • Maintaining the perimeter fence around the Development Envelope boundary; • Restricting vehicle movement along designated tracks and cleared areas; • Training relevant personnel in the use of fire suppressant equipment; • Implementing Albemarle's Water Management Plan; • Maintaining vehicles, plant and equipment and cleaning to reduce the spread of weeds throughout the Development Envelope; • Prohibiting plant and soil materials from being brought on site unless approved for a specific purpose; and • Implementing a hygiene procedure for vehicles and machinery entering the Development Envelope which includes a requirement for all equipment which have been working in, or travelling through, areas with known or potential dieback to be cleaned prior to arrival on site, and presented for inspection to confirm they are free from soil and vegetative material.

The Environmental Protection Authority's (EPA) objective for the environmental factor 'Flora and Vegetation' is to '*protect flora and vegetation so that biological diversity and ecological integrity are maintained*'. A previous version of the FVMMP was submitted to the EPA and approved in 2018. The purpose of the FVMMP was to ensure that the EPA's objective is achieved and to comply with Condition 6 of MS 1085.

Since approval of the original Proposal, Albemarle identified that an area of the Development Envelope designated for use as a laydown area during the construction phase of the Proposal was no longer required. As a result, Albemarle applied for approval under Section 45C (S45C) of the *Environmental Protection Act 1986* (EP Act) in October 2019 to make changes to the original Proposal. The change detailed in the S45C application that is relevant to this FVMMP is a reduction in the authorised extent of clearing and the size of the Development Envelope.

This revision of the FVMMP also includes updates to reflect that all vegetation clearing has now been completed, and to ensure it aligns with the EPA's current instructions on the development of EMPs (EPA, 2024). Based on the EPA's instructions, this FVMMP has been developed as an Objective-based EMP (previously known as management-based EMPs).

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1 CONTEXT, SCOPE AND RATIONALE

1.1 PROPOSAL

Albemarle Lithium Pty Ltd (Albemarle) has been granted approval for the development of the Albemarle Kemerton Plant (AKP; Proposal), a lithium hydroxide product manufacturing plant and associated infrastructure, within the Kemerton Strategic Industrial Area (KSIA), approximately 17 kilometres (km) north-east of Bunbury, Western Australia (WA; Figure 1).

The Proposal was assessed by the WA Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (EP Act) and approved by the WA Minister for Environment via Ministerial Statement (MS) 1085 on 26 October 2018. Albemarle obtained approval under Section 45C (S45C) of the EP Act to change the original Proposal to include a reduction in the extent of the Development Envelope and the extent of clearing of native vegetation. Albemarle also obtained approval under Section 46 of the EP Act to amend MS 1085 to reflect the changes detailed above. An amended MS (MS 1187) was issued on 15 March 2022. The details of these changes are provided in Section 1.1.1.

The Development Envelope for the Proposal as described in the Ministerial Statement is approximately 84 ha and is located wholly within Lot 254 (Deposited Plan 416516), Kemerton Road (Figure 2). The Proposal authorised the clearing of no more than 48.8 ha of native vegetation and 33.39 ha of pine plantation within the Development Envelope. Development of the Proposal commenced in late 2018, clearing commenced in January 2019 and the construction of the first of five process trains (Train 1) was completed in November 2021 and has been commissioned. Train 2 commenced commissioning in October 2023 but has since been put into care and maintenance. Construction of subsequent trains has not been completed although all clearing at the site was required as part of initial construction for Trains 1 and 2.

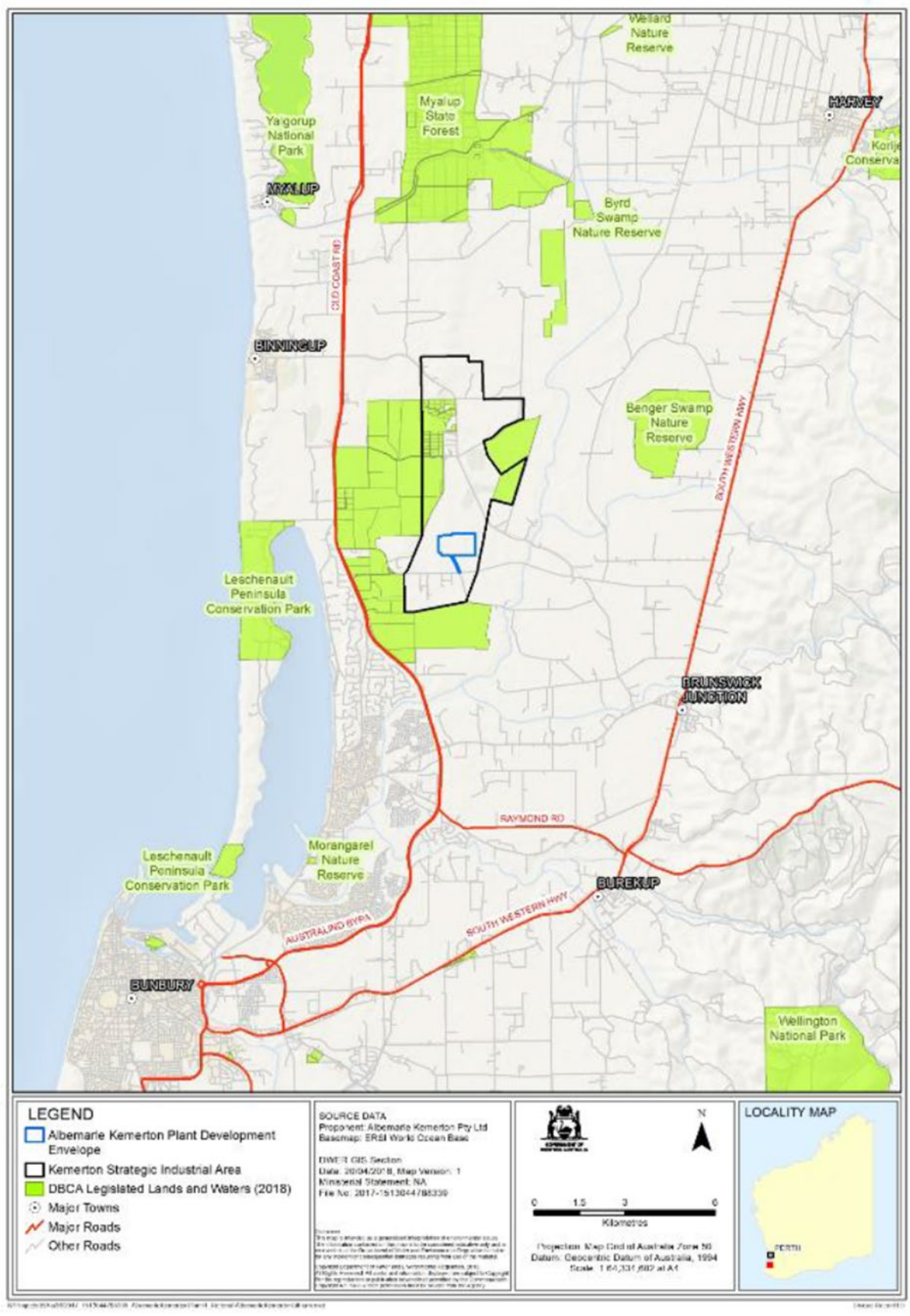

Figure 1: Regional location of the Proposal

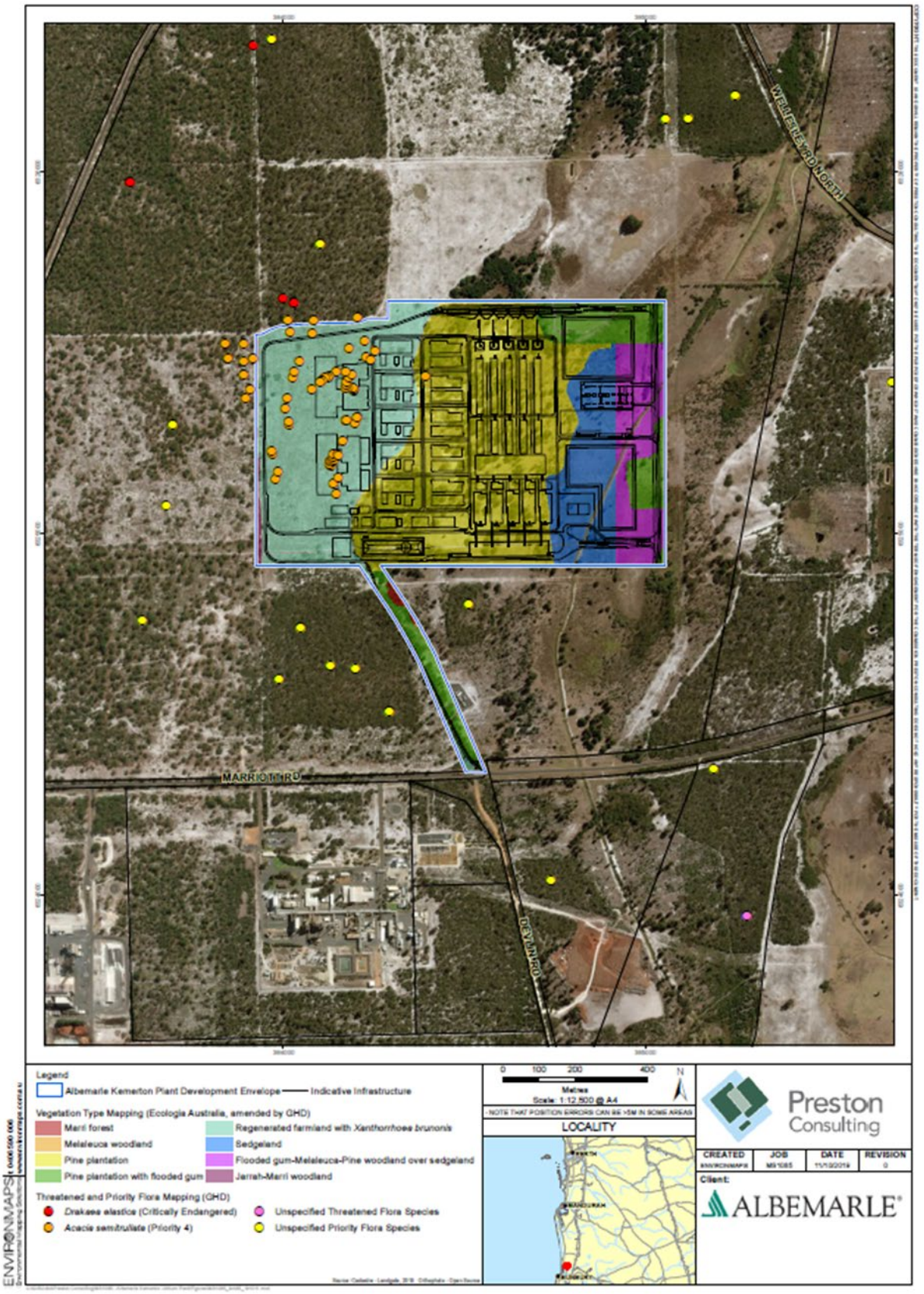

Figure 2: Revised Proposal Development Envelope, vegetation types and Significant Flora

1.1.1 CHANGES TO THE ORIGINAL PROPOSAL

Part of the Development Envelope of the Original Proposal was designated for use as laydown during the construction phase of the AKP. Albemarle was able to utilise existing laydown areas within the KSIA during construction and as such were able to avoid clearing of this area.

Based on the above, and of direct relevance to this Management Plan, Albemarle obtained approval under S45C of the EP Act to make changes to the original Proposal, including:

1. Reduce the authorised extent of clearing;
2. Reduce the size of the Development Envelope; and
3. Replace Figure 1 of Schedule 1 of MS 1085 with a figure illustrating the reduced size of the Development Envelope.

1.1.2 SCOPE OF THIS REVISION

This revision of the Flora and Vegetation Monitoring and Management Plan (FVMMP) includes changes to the original Proposal included in Albemarle's Section 45C application, listed above. The changes include reductions in the extent of the:

- Development Envelope from 89.25 ha to approximately 84 ha (5.25 ha reduction);
- Clearing of native vegetation from 54.31 ha to 48.8 ha (a reduction of 5.33 ha of native vegetation and 0.18 ha of regenerated farmland); and
- Clearing of Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodland TEC) and 'Low lying *Banksia attenuata* woodlands or shrublands Priority Ecological Community (Banksia Woodlands PEC; both referred to as Banksia Woodlands PEC / TEC) from 6.37 ha to 1.04 ha (5.33 ha reduction).

This revision also reflects that all vegetation clearing has now been completed and includes additional updates to ensure it aligns with the latest EPA guidance on the development of Environmental Management Plans (EPA, 2024). The key changes to the FVMMP are summarised in Table 2.

It should be noted that the Development Envelope (current, following the above amendment) does not accurately reflect the final plant lease area granted to Albemarle by Development WA as it includes portions of the (public) Kemerton Road (following realignment) and other minor additional areas that are not part of Albemarle's lease area. This has been raised with DWER EPA Services. The advice received at the time was that as this is an inclusion of additional area not used or usable by Albemarle and not cleared or clearable by Albemarle, and as there is no effect on any conditions (including clearing limits and offset requirements) and instead is administrative in nature, the alignment of the Development Envelope with Albemarle's lease area can be deferred until such time when a substantive change or changes are required to the Part IV authorisations. References to the Development Envelope in this FVMMP refer to its size as being *approximately* 84 ha throughout this Plan to reflect the future planned size of the Development Envelope.

Table 2: Key changes in this revision of the FVMMP

Heading	Reference	Original FVMMP	This document
Proposal Description	Section 1.1	The Development Envelope for the Proposal is approximately 89.25 ha and is located wholly within Lot 253 (Deposited Plan 411027), Wellesley Road. Development of the Proposal will require the clearing of no more than 87.7 ha of vegetation within the Development Envelope.	The Development Envelope for the Proposal is approximately 84 ha and is located within Lot 254 (Deposited Plan 416516), Kemerton Road. Development of the Proposal will require the clearing of no more than 82.37 ha of vegetation within the Development Envelope. (Note that MS1085 has the reduction in authorised extent in clearing of 5.25 ha and does not include the 0.18 ha which is regenerated farmland which results in 5.33 ha in reduced clearing.)
	Figure 2	Figure updated to show the reduced Development Envelope area.	
Threatened and priority ecological communities	Section 1.5.1	The Development Envelope contains 6.37 ha of Banksia Woodlands PEC / TEC, with an additional 3,122 ha occurring within the broader KSIA. The location of the Banksia Woodlands PEC / TEC is shown in Figure 2.	The Development Envelope contains 1.04 ha of Banksia Woodlands PEC / TEC[1], with an additional 3,122 ha occurring within the broader KSIA. The location of the Banksia Woodlands PEC / TEC is shown in Figure 2.
	Table 6	Excellent – 0.09 ha Good - 0.24 ha Completely Degraded – 0.1 ha Total – 0.43 ha	Excellent – 0.09 ha Good - 0.24 ha Completely Degraded – 0.1 ha Total – 0.43 ha
		Good – 5.94 ha	Good – 0.61 ha
		Total - 6.37 ha	Total - 1.04 ha
Adaptive management and Review	Section 3	N/A	Section added
Stakeholder Engagement	Section 4	N/A	Section added
Throughout document	Section 2.2 and 2.3	Included management actions related to vegetation clearing	Management actions related to vegetation clearing have been removed as all clearing has now been completed

[1] Please refer to Sub-section "Priority Ecological Communities" in Section 1.5.1 for clarification regarding use of TEC / PEC.

1.2 PURPOSE OF THIS MANAGEMENT PLAN

This FVMMP provides management actions and monitoring measures for native vegetation and flora that are potentially impacted by the Proposal. In particular, this plan has been developed for the Banksia Woodlands PEC / TEC and three threatened orchids (*Drakaea elastica, Drakaea micrantha and Diuris micrantha;* Orchids).

This FVMMP has been prepared to meet Condition 6 of MS 1085 (Section 1.4) and includes:

- Management actions that will be undertaken to prevent impacts from weeds, dieback, fire, edge effects, litter (impacts from changes to surface and groundwater regimes are addressed in Albemarle's Water Management Plan; WMP);
- Trigger criteria that will trigger implementation of contingency actions to prevent direct or indirect impacts to the Banksia Woodlands PEC / TEC and Orchids;
- Management or contingency actions to be implemented in the event the trigger criteria are exceeded; and
- Monitoring methodology including the frequency, timing and indicative locations for the Banksia Woodlands PEC / TEC and Orchid monitoring sites.

This revision of the FVMMP also includes sections on both adaptive management and review, and stakeholder engagement to ensure it aligns with the EPA's current instructions on the development of EMPs (EPA, 2024).

1.3 KEY ENVIRONMENTAL FACTOR

The EPA's Key Environmental Factor relevant to this FVMMP is Flora and Vegetation. The EPA's objective for this Key Environmental Factor is to *protect flora and vegetation so that biological diversity and ecological integrity are maintained.*

1.4 MINISTERIAL CONDITIONS

Table 3 lists the conditions from MS 1085 relevant to the FVMMP and where they are addressed in this plan.

Table 3: Relevant conditions

Condition and requirement	Reference
6 Flora and Vegetation	
6-1 The proponent shall ensure that the construction and ongoing operation of the proposal is undertaken in a manner that avoids direct or indirect impacts to Threatened Flora and Communities, including Glossy-leafed Hammer Orchid (*Drakaea elastica*), Dwarf Bee-orchid (*Diuris micrantha*), Dwarf Hammer-orchid (*Drakaea micrantha),* Banksia Woodlands of the Swan Coastal Plain and Low lying *banksia attenuata* woodlands or shrublands outside of the Albemarle Development Envelope, as shown in Schedule 1.	All sections
6-2 Prior to ground-disturbing activities or as otherwise agreed by the CEO, the proponent shall prepare and submit a FVMMP (the Plan) to the CEO. The Plan shall: (1) when implemented, substantiate and ensure that condition 6-1 is being met;	(Requirement complete) Section 2.5
(2) detail the proposed frequency, timing and indicative locations of Threatened Flora and Communities monitoring to be implemented during construction and operational phase of the Albemarle Plant;	(Requirement complete) Section 2.4

Condition and requirement	Reference
(3) specify management actions for potential impacts including but not limited to those from weeds, *Phytophthora cinnamomi* (Dieback), increased fire risk and litter, and changes to surface water and groundwater regimes that will be implemented during construction and operations to ensure the management objective in condition 6-1 is achieved;	(Requirement complete) Section 2.2
(4) specify trigger criteria that will trigger the implementation of contingency actions to prevent direct or indirect impacts to Threatened Flora and Communities outside of the Albemarle Development Envelope; and	(Requirement complete) Section 2.3
(5) specify management or contingency actions to be implemented in the event that the criteria identified required by condition 6-2(4) have been triggered.	
6-3 In the event that the monitoring specified in the Plan indicates that the criteria specified in the Plan have been triggered, the proponent shall: (1) report such findings to the CEO within twenty-one (21) days of the criteria being triggered;	Section 2.5
(2) provide evidence to the CEO which allows for determination of the likely cause of the trigger criteria being reached and to identify any additional contingency actions required to prevent the criteria being triggered in the future; and	
(3) if the triggering of the criteria is determined by the CEO to be a result of activities undertaken in implementing the proposal, immediately implement the management and/or contingency actions specified in the Flora and Vegetation Monitoring and Management Plan and continue implementation of those actions until the trigger criteria are met, or until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 6-1 will continue to be met and implementation of the management and/or contingency actions is no longer required.	
6-4 The proponent may review and revise the FVMMP.	Section 3
6-5 The proponent shall review and revise the FVMMP as and when directed by the CEO.	
6-6 The proponent shall implement the latest version of the FVMMP, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 6-2.	

1.5 RATIONALE AND APPROACH

Albemarle's approach to management used in this FVMMP is to emphasise managing impacts through planning, organisation and controlling aspects of the AKP during construction and operation. A hierarchical approach to manage potential impacts from the Proposal has been used:

- Avoidance: measures used to avoid or prevent impacts from the Proposal; and
- Minimisation: measures taken to reduce the duration, intensity and/or extent of impact.

Results from surveys, study findings and the EPA's assessment of the Proposal (EPA Report 1618) inform Albemarle's management approach for meeting the EPA's environmental objective and Ministerial Conditions (MS 1085).

1.5.1 SURVEY AND STUDY FINDINGS

A number of flora and vegetation assessments have been undertaken within the Development Envelope and wider KSIA. Baseline assessments that are relevant to the Proposal were identified and discussed in the AKP Environmental Referral Supporting Document and Additional Information Request Response (GHD, 2017a & 2018b).

Environmental reports and surveys in support of the Proposal are shown in Table 4. The key findings of these assessments are detailed in the following sections.

Table 4: Environmental report and survey programs undertaken to-date

Survey Description	Area of Coverage	Field Dates	Report Title
Prior to Development			
Biological desktop and reconnaissance field assessment.	Two sites within the KSIA. The AKP lies within the Eastern lot.	20 March 2017	Desktop Assessment of Selected Lots within Kemerton Industrial Area (Eco Logical Australia Pty Ltd, 2017a; ELA).
Biological survey including: • Desktop assessment; • Detailed and targeted flora and vegetation assessment; and • Level 1 fauna survey.	Proposed access road area within the KSIA.	6 July 2017	Kemerton Industrial Area Additional Assessment of Proposed Access Road Area (ELA, 2017b).
Biological survey including: • Desktop assessment; • Detailed and targeted flora and vegetation assessment; and • Level 1 fauna survey.	Proposed AKP area within the KSIA.	4 - 5 September 2017	Kemerton Industrial Area Spring Flora and Fauna Survey (ELA, 2017c).
Biological survey including: • Reconnaissance flora and vegetation survey; • Targeted flora survey for *Acacia semitrullata;* and • Level 1 fauna survey.	Northern and Western areas of the AKP Development Envelope.	19 October 2017	Additional Area Assessment (GHD, 2017b).
Biological survey including: • Revised desktop assessment; • *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected matters database; • NatureMap; • Western Australian Herbarium database; and • Field assessment to determine presence of *Phytophthora cinnamomi* within the Development Envelope.	Within the Development Envelope and Surrounds.	Desktop search in 2018	Response to EPA Notice of Decision to Assess: Additional Information Request (GHD, 2018b).
Biological survey including: • Quadrat-based vegetation assessment; and • Multivariate analysis.	Within the 6.73 ha identified as 'low lying *Banksia attenuata* woodlands or shrublands' PEC within the Development Envelope of the original proposal and within Banksia Woodlands at the proposed offset site, Lot 42 Wellesley Road.	30 October 2018	An Investigation using Multivariate Analysis of Vegetation on Part Lot 508 Marriott Road and Lot 42 Wellesley Road North, Kemerton (Ecoedge, 2019).

Survey Description	Area of Coverage	Field Dates	Report Title
During Development			
Biological survey including monitoring as prescribed in the original FVMMP	Within the existing transects around the perimeter of the Proposal and two control sites. Revisiting the Photographic Monitoring Points (PMP). Within areas where *Drakaea elastica* has historically been recorded (within Lot 511 and Lot 40).	13 - 15 August 2019	Banksia Woodland Threatened Ecological Community and *Drakaea elastica.* First Year Monitoring (GHD, 2019).
		11 - 13 August 2020	Banksia Woodland Threatened Ecological Community and *Drakaea elastica.* Second Year Monitoring (GHD, 2020).
		2, 3 and 28 September 2021	Banksia Woodland Threatened Ecological Community and *Drakaea elastica* - Spring 2021 Monitoring (Onshore Environmental, 2021).
		21-23 September 2022	Banksia Woodland Threatened Ecological Community and *Drakaea elastica* - Spring 2022 Monitoring (Onshore Environmental, 2022).
		November 2023	Banksia Woodland Threatened Ecological Community and *Drakaea elastica* - Spring 2023 Monitoring (Onshore Environmental, 2023).

Significant Flora

Conservation significant flora recorded within and surrounding the Development Envelope are shown in Figure 2. Two species of conservation significance, *Drakaea elastica* (Threatened; discussed in detail below) and *Acacia semitrullata* (Priority 4), were found within or in close proximity to the Development Envelope. Impacts to *Acacia semitrullata* were not deemed significant relative to the known extent of this species (clearing of 118 individuals totalling 27.67% of recorded individuals; GHD, 2017a) therefore, impacts to *A semitrullata* have not been considered in the Rationale for Choice of Provisions in Section 1.5.4.

Threatened Orchids

A number of flora surveys have been completed within the KSIA and Development Envelope between 1999 to 2017 (GHD, 2017a). None of the previous surveys identified the presence of any Threatened orchid species within the Development Envelope. However, three Threatened orchids (*Drakaea elastica, Drakaea micrantha* and *Diuris micrantha*) were identified within the broader KSIA. A brief summary of the surveys that identified Threatened orchids within the broader KSIA is provided in Table 5. The locations of Threatened orchids recorded during the surveys in relation to the Development Envelope are provided in Figure 2.

Table 5: Summary of surveys in the broader KSIA that recorded Threatened orchid species

Author	Title	Survey Timing	Survey Details
AECOM (2012)	Kemerton Industrial Park - Threatened Orchid Survey	Spring 2011	**Targeted Flora Survey** AECOM (2012) conducted a Threatened Orchid Survey on the Development Envelope of the Industrial Park. The survey area included patches of native vegetation within the Albemarle Development Envelope in addition to areas to the north and west. The target species (based on the baseline survey) were *Caladenia procera, Drakaea elastica* and *Drakaea micrantha*. The survey comprised traverses or sweeps in a grid format with personnel spaced 20 metres (m) apart. Areas that contained particularly suitable habitat within vegetation in good condition were searched thoroughly. The survey was carried out over a period of 17 days between 3 October 2011 to 27 October 2011 by six to eight personnel. The survey identified: • Nine *Drakaea elastica*. One location (with three plants) was located immediately north (45 m) from the Development Envelope and another location (with two plants) was located north west (approximately 80 m) from the Development Envelope; and • Four confirmed *Drakaea micrantha* and five possible *Drakaea micrantha*. All records were over 700 m from the Development Envelope.
Eco Logical Australia Pty Ltd (ELA, 2013)	Targeted Ecological Surveys for Kemerton Industrial Park	Spring (August and September) 2013	**Targeted Flora Survey** Surveys were completed in August and September 2013 using a transect method. The surveys included native vegetation within the Development Envelope and within the broader KSIA. The results confirmed: • *Drakaea elastica* was recorded from Lot 511 and Lot 40 with a total of 69 individuals recorded. This survey recorded *Drakaea elastica* at the same location as AECOM (2012), the closest record at approximately 45 m north of the Development Envelope boundary; and • *Drakaea micrantha* was recorded from Lot 511, Lot 2 and Lot 40 with 39 flowering and 25 non-flowering individuals recorded. The non-flowering plants were recorded as possibly *Drakaea micrantha* with flowers required to confirm the identification.
GHD (2018b)	Albemarle Kemerton Plant – Response to EPA Notice of Decision to Assess: Additional Information Request	N/A	**Desktop Assessment** GHD (2018b) completed revised desktop searches of the EPBC Act Protected Matters database, Department of Biodiversity, Conservation and Attractions (DBCA) *NatureMap* and Western Australian Herbarium databases and reviewed previous reports for the Development Envelope and surrounds. Based on the above, no threatened orchids were recorded within the Development Envelope. The searches confirmed the presence of *Drakaea elastica* and *Drakaea micrantha,* with records at the same distances as reported in AECOM (2012) and ELA (2013). A third threatened orchid, *Diuris micrantha,* is known to occur in the KSIA, with the closest known location 2.3 km northeast of the Development Envelope.

The key orchid targeted in this FVMMP is *Drakaea elastica*, which is the closest known threatened orchid (45 m from the Development Envelope) and may be indirectly impacted by the Proposal. The surrounding *Banksia* Woodland community provides potential habitat for *Drakaea elastica*.

Although other threatened orchids (*Drakaea micrantha* and *Diuris micrantha*) are known to occur within the KSIA, these have not been recorded within 700 m of the Development Envelope. It is therefore considered unlikely that the known locations of these orchids would be indirectly

impacted by the Proposal. While other orchid species have not specifically been included in this monitoring program, management measures in this FVMMP provide provisions for the avoidance / minimisation of impacts beyond the Development Envelope. The monitoring program also allows for the identification of changes in vegetation condition / floristic composition in the surrounding vegetation that would provide indication of orchid habitat modification and trigger a contingency response. These measures are considered adequate to avoid direct and indirect impacts to other threatened flora species and their habitats. Botanical information for three conservation significant orchids recorded in the broader KSIA is provided in Appendix 1.

Priority Ecological Communities

Surveys within the KSIA and the Development Envelope by ELA (2013, 2017a & b) and GHD (2017b) identified six vegetation units closely resembling Floristic Community Type (FCT) 21c (Table 6). This FCT is listed as the 'Low lying *Banksia attenuata* woodlands or shrublands PEC' (Banksia Woodlands PEC). In 2016, the Banksia Woodlands TEC was listed as Endangered under the EPBC Act. Based on the information provided in the surveys (listed above), the six vegetation units are also considered representative of the Banksia Woodlands TEC. For the purposes of this FVMMP, FCT21c and the six vegetation units that it is comprised of will be referred to as Banksia Woodlands TEC / PEC.

The revised Development Envelope contains 1.04 ha of Banksia Woodlands PEC / TEC, with an additional 3,122 ha occurring within the broader KSIA. The Banksia Woodlands PEC / TEC is mapped and labelled as 'Jarrah-Marri woodland' in Figure 2.

Table 6 summarises the extent of Vegetation Units (representative of FC21c and Banksia Woodlands PEC / TEC) that were present within the (revised) Development Envelope and remain in the surrounding KSIA.

Table 6: Vegetation Units representing Banksia Woodlands PEC / TEC and their extent within the Development Envelope and the broader KSIA (prior to clearing)

Vegetation Unit	Condition and Extent in (revised) Development Envelope	Extent (ha) in Surrounding Area (KSIA)
EmKgMr - *Eucalyptus marginata* subsp. *marginata* and *Banksia ilicifolia* low open woodland over *Kunzea glabrescens* tall sparse shrubland over *Macrozamia riedlei* and *Xanthorrhoea brunonis* shrubland.	Excellent: 0.09 ha Good: 0.24 ha Completely Degraded: 0.1 ha Total: 0.43 ha	2.83
EmCcXb - *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* woodland with *Allocasuarina fraseriana*, *Banksia attenuata* and *Xylomelum occidentale* isolated trees over *Xanthorrhoea brunonis, Acacia pulchella* and *Adenanthos meisneri* shrubland over *Ehrharta calycina* open grassland over *Dasypogon bromeliifolius* open forbland on uplands.	Good: 0.61 ha	71.32
EmCcBa - Woodland of *Eucalyptus marginata* subsp. *marginata* with the occasional *Corymbia calophylla* over *Banksia attenuata*, *Banksia ilicifolia* and *Banksia grandis* with the occasional *Agonis flexuosa* and *Kunzea glabrescens* over *Melaleuca thymoides*, *Xanthorrhoea brunonis*, *Hibbertia hypericoides* and *Dasypogon bromeliifolius* over *Lyginia imberbis*, *Drosera stolonifera*, *Burchardia congesta* and *Caladenia flava* subsp. *flava* on lower slopes to flats of gently undulating dunes on white to grey sand. ELA (2013) – aligned with FCT21C	Not recorded in Development Envelope	2,885.23

Vegetation Unit	Condition and Extent in (revised) Development Envelope	Extent (ha) in Surrounding Area (KSIA)
BaBiKg - Woodland to Low Forest of *Banksia attenuata*, *Banksia ilicifolia*, *Kunzea glabrescens* and *Eucalyptus marginata* subsp. *marginata* over *Dasypogon bromeliifolius*, *Hibbertia hypericoides*, *Hibbertia vaginata* and *Xanthorrhoea brunonis* over *Conostylis serrulata*, *Hypolaena exsulca*, *Hovea trisperma*, *Drosera stolonifera*, *Lyginia imberbis*, *Pyrorchis nigricans*, *Drosera erythrorhiza* and *Burchardia congesta* on lower slopes to flats on grey sand. ELA (2013) – aligned with FCT21C		155.74
EmBiKgAs - *Eucalyptus marginata* subsp. *marginata, Agonis flexuosa* and *Banksia attenuate* woodland over *Banksia ilicifolia* low open woodland over *Kunzea glabrescens* and *Jacksonia sternbergiana* tall sparse shrubland over *Acacia semitrullata* (P4), *Hibbertia hypericoides* subsp. *hypericoides* and *Xanthorrhoea brunonis* sparse shrubland over *Dasypogon bromeliifolius* sparse forbland		11.81
CcBaKgXb - *Corymbia calophylla* open woodland over *Banksia attenuata, Banksia ilicifolia* and *Melaleuca preissiana* low open woodland over *Kunzea glabrescens* tall sparse shrubland over *Xanthorrhoea brunonis* low open shrubland over *Dasypogon bromeliifolius* open forbland		1.06
Total	**1.04 ha**	**3,128 ha**

Since approval of the Proposal, Albemarle commissioned Ecoedge Pty Ltd (Ecoedge, 2018) to conduct additional quadrat-based vegetation assessments within the area of vegetation that was determined to be representative of the Banksia Woodlands PEC. The assessments were conducted to assess the similarity of the FCT within the Development Envelope with those that are proposed as offset sites (as required under Condition 10 of MS 1085).

Ecoedge (2018) determined that the FCTs within the Development Envelope do not align with those detailed in Gibson *et. al.,* (1994) and cannot be said to represent an occurrence of the Banksia Woodlands PEC. Further, they cannot be described as a 'Banksia woodland or shrubland' because of the paucity of Banksia trees or shrubs, which, even when combined, make up less than 2% of the canopy of the total area. Based on an assessment against the area and condition criteria as presented in the Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands TEC (DotEE, 2016), this vegetation also does not meet the criteria for recognition as Banksia Woodlands TEC.

Regardless of the above and given this re-classification has not been formally accepted by the Department of Water and Environmental Regulation (DWER) or the Department of Climate Change, Energy, Environment and Water (DCCEEW), this FVMMP has taken a conservative approach and manages the vegetation as if it were representative of the Banksia Woodlands PEC / TEC.

Low Lying Banksia attenuata woodlands or shrublands PEC

State: Low Lying *Banksia attenuata* woodlands or shrublands (Priority 3).

Description: The Banksia Woodlands PEC is associated with the Swan Coastal Plain of southwest WA. A key diagnostic feature is a prominent tree layer of *Banksia*, with scattered eucalypts and other tree species often present among or emerging above the *Banksia* canopy.

The Banksia Woodlands PEC typically occurs on well drained, low nutrient soils in sands of dune landforms, in particular deep Bassendean and Spearwood sands, or occasionally on Quindalup sands. It is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau.

The Banksia Woodlands PEC is one of eight Western Australian PECs that are included in the conservation advice for the Banksia Woodlands TEC. The Banksia Woodlands of the Swan Coastal Plain Ecological Community was listed as a TEC under the EPBC Act in September 2016. Its listing took into account the following:

- The community has undergone a decline of about 60% in its extent;
- Almost all of the remaining ecological community, occurs as highly fragmented patches; less than 10 ha in size. It is estimated that over 12,000 patches now exist, compared to 132 previously, with the median patch size now being only 1.6 ha; and
- The Banksia Woodlands TEC has recorded a severe reduction in its community integrity due to the combined effects of clearing and fragmentation, dieback disease, invasive weeds and feral animals, changes to fire regimes, hydrological degradation, climate change, and other disturbances.

Banksia Woodlands vary in their structure and species composition across the region where they occur. They all have a dominant Banksia component, which includes at least one of the four key species, *Banksia attenuata*, *B. menziesii, B. prionotes* and *B. ilicifolia*. *Banksia littoralis* and *B. burdettii* may also be co-dominant but where they become dominant it typically is not the Banksia Woodlands TEC. The understorey is species rich and has many wildflowers, including sclerophyllous shrubs, sedges and herbs.

Dieback

A dieback assessment was undertaken for the Development Envelope and vegetation immediately surrounding (i.e., within 50 m) for the presence of *Phytophthora cinnamomi* (Dieback) in August 2018. The presence of Dieback was based on symptoms and disease signatures in susceptible vegetation. Indicator species includes several species of *Banksia, Patersonia*, *Persoonia*, and *Xanthorrhoea*.

Due to the disturbed nature of the Development Envelope, the presence or absence of Dieback could not be determined. Vegetation adjacent to the Development Envelope where Dieback indicator species are present, has been assessed as not infested (Figure 3). This includes the vegetation surrounding the previously recorded *Drakaea elastica* location (45 m north of the Development Envelope) and areas of Banksia Woodlands TEC / PEC.

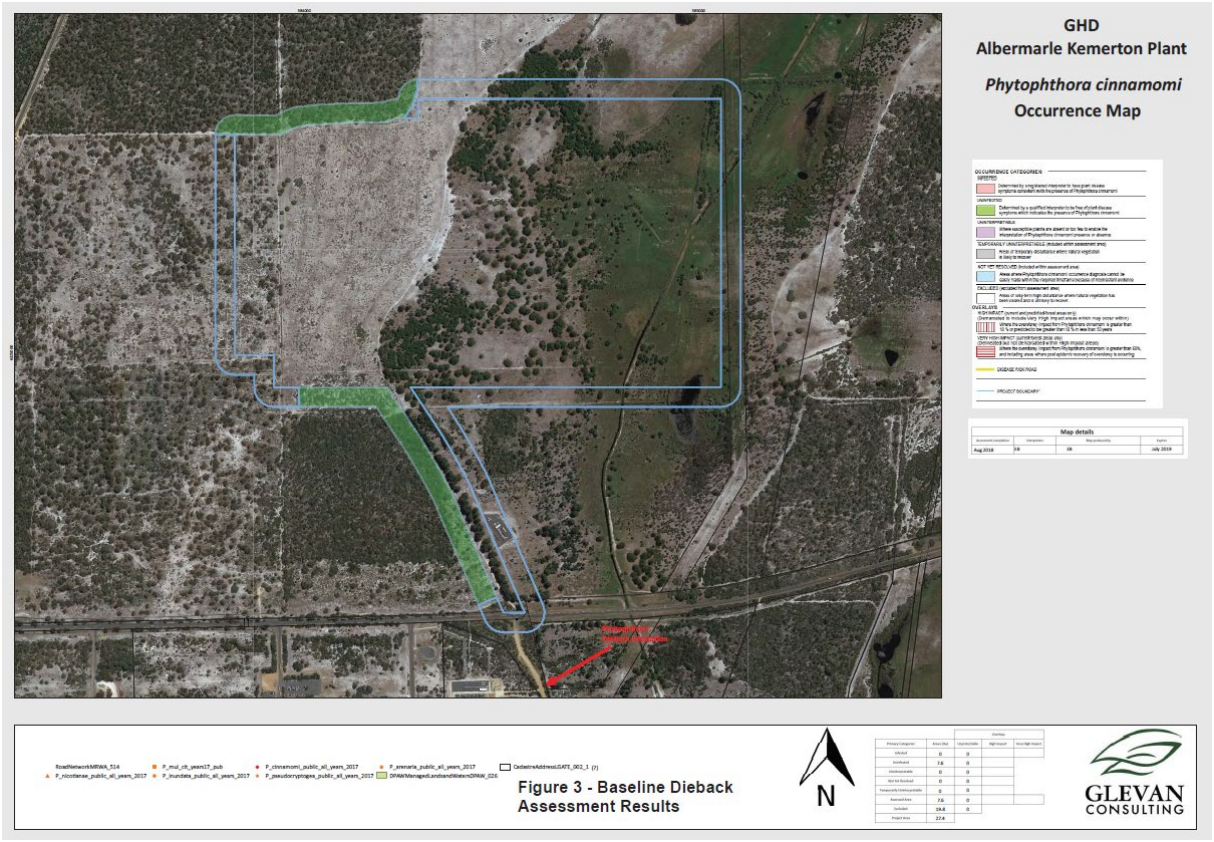

Figure 3: Baseline Dieback Results (note original development envelope shown)

1.5.2 Key Assumptions and Uncertainties

Changes made in this revision of the FVMMP relate to a reduction in the extent of the Development Envelope (and subsequently avoiding the clearing of almost all of the Banksia Woodlands TEC/ PEC), updates to reflect that all vegetation clearing has been completed, and to ensure the document aligns with EPA guidance (EPA, 2024). These changes are considered minor. No additional assumptions and uncertainties have been identified.

1.5.3 Management Approach

The management approach developed in this document is based on the mitigation hierarchy - avoid, minimise, rehabilitate, offset - to ensure potential impacts to flora and vegetation have been avoided and minimised where possible. The strategy focuses on avoidance primarily, followed by minimisation.

The Proposal has resulted in a reduction in the extent of the Banksia Woodlands TEC / PEC. The residual impacts of this reduction in extent from the development envelope was considered to be significant therefore an Offset Strategy was prepared to address Condition 10 of MS 1085. Following the amendment via section 45C and section 46 (reducing the Development Envelope and the clearing impact to Banksia Woodland PEC / TEC), the Offset condition was amended, with (new) Condition 10 in Ministerial Statement 1187 not requiring an offset for Banksia Woodland TEC / PEC. Accordingly, the primary and dominant management approach has been through avoidance to completely remove the need for clearing 5.33 ha of Banksia Woodland TEC / PEC

Risks and management actions were identified and prioritised using information gained from studies, EPA (2018) report and recommendations on the Proposal and other regional and local information within the public domain.

1.5.4 RATIONALE FOR CHOICE OF PROVISIONS

The rationale for the choice of provisions is based on implementing the management approach described above to avoid, minimise, rehabilitate and offset the potential impacts of the Proposal on the Banksia Woodlands TEC / PEC and three threatened flora orchids. A critical element to this management approach is identifying and quantifying the potential direct and indirect impacts of the Proposal; these impacts are described below.

Potential impacts to the Banksia Woodlands TEC / PEC and threatened orchids are described in the AKP Environmental Referral Supporting Document and Additional Information Request Response (GHD, 2017a & 2018b), and the Section 45C application (Preston Consulting, 2020). A summary of the potential impacts of the Proposal is included in the following sections.

Direct Impacts

Vegetation representative of the Banksia Woodlands TEC / PEC occurs within the Development Envelope, 1.04 ha of which has been cleared for the development of the Proposal. Vegetation representative of the Banksia Woodlands TEC / PEC has also been mapped adjacent to the Development Envelope along a section of the northern and the western boundary as well as to the west of the access off Marriott Road (Figure 2).

There are no records of threatened orchids within the Development Envelope, furthermore they are not considered likely to occur given the surveys conducted and the disturbance history of the Development Envelope. Therefore, no direct impacts on threatened orchids are expected as a result of the Proposal.

Indirect Impacts

A discussion of the indirect impacts to the Banksia Woodlands TEC / PEC, Orchids and their habitat is included in the following sections.

Altered Hydrology Impacts

The alteration of natural surface water run-off has the potential to indirectly impact adjacent Banksia Woodlands TEC / PEC, Orchids and their habitat. The drainage design for the Proposal is self-contained preventing surface water run-off from the Proposal entering the surrounding environment.

The closest known record of *Diuris micrantha* is approximately 2.3 km north-east of the Development Envelope and *Drakaea micrantha* approximately 735 m north of the Development Envelope. Given the distance of these records from the Development Envelope and their position away from the planned flow of surface water (which will be directed east of the Development Envelope), it is not expected these species will be directly or indirectly impacted by the Proposal. *Drakaea elastica* has been recorded approximately 45 m from the northern boundary of the Development Envelope and the plant has the potential to indirectly impact on this species.

Albemarle has prepared a WMP (Preston Consulting, 2024) that further details the potential impacts of the Proposal and the proposed management and monitoring of surface and groundwater. By incorporating Best Available Techniques (BAT) for water management; the WMP and associated environmental engineering works undertaken both inside and outside the site boundary (Kemerton Road) are expected to achieve suitable environmental outcomes by managing run-off through separate collection and re-use systems and controlling potential pollution sources from process areas.

The Proposal does not require ongoing groundwater abstraction or dewatering therefore indirect impacts as a result of drawdown will not occur.

Acid Sulphate Soils

There is the risk of exposure of Acid Sulphate Soils (ASS) during the construction phase. Management of ASS was required during construction of Trains 1 and 2 and was managed in accordance with the Acid Sulphate Soils and Dewatering Management Plan (ASSDMP). Disturbance of ASS can potentially mobilise acid and metals which can have a detrimental impact on Banksia Woodlands TEC / PEC, Orchids and their habitat as well as impact on groundwater quality.

The Acid sulfate soils initial closure report was completed in December 2022 (RPS, 2022). Based on its review of the monitoring results, RPS has determined that no substantive impacts have been caused to the natural environment in the vicinity of the Kemerton Lithium Plant during earthworks and dewatering operations. Monitoring confirmed that groundwater quality had a low pH and elevated acidity prior to construction commencing.

Annual Compliance Assessment Reports have been submitted to DWER since 2018 and confirm that no construction impacts with respect to ASS on ground and surface waters has occurred.

The site has been fully cleared and all major earthworks have been completed (including those potentially required for any future construction of Trains 3 – 5). No additional disturbance of ASS is predicted to be required during construction of the remaining trains, and during operation.

Dust deposition

There is a potential risk that air quality in close proximity to the Proposal may be affected due to dust from activities. Potential sources of dust during the Proposal's remaining construction phase include unsealed areas, open soil stockpiles and earthmoving. During the operational phase potential sources of dust may include spodumene concentrate stockpiles (although these are contained within the spodumene shed), open areas and stack emissions. The dust may settle on adjacent vegetation, potentially affecting the health of the Banksia Woodlands PEC / TEC and Orchids and causing degradation to their habitat.

Given that any source of dust from the plant will be greater than 45 m from the nearest Orchid location the risk of dust to orchids can be expected to be low.

The AKP has been designed to include emission control measures considered to be BAT in accordance with the European Commission Industrial Emissions Direction Best Available Techniques Reference Document for the Non-Ferrous Metals Industries in relation to preventing dust emissions. This design includes enclosed or covered storage for dust forming materials, covered conveyors, and bag filters, cyclones or scrubbers for process stacks or vents. In addition

the sealing of roads, the use of water tankers to minimise dust on unsealed roads, stabilisation and moisture control of stockpiles, control of truck movements on site, all act together to manage the risk of dust emissions. Monitoring of dust emissions will continue using MicroVol-1100 particulate samplers and Trolux dust monitoring units which offer real time particulate sampling. Periodic stack emissions monitoring is also conducted in accordance with AKP's EP Act Part V monitoring requirements.

Air emissions that could lead to impacts on Banksia Woodlands TEC / PEC and Orchids during the operational phase are considered unlikely.

Edge effects

Clearing and development of the Proposal has resulted in the creation of new edge zones, which will interact with a new land use element. There is the potential to introduce or spread weeds and Dieback (*Phytophthora cinnamomi*) into adjacent vegetation particularly during the construction phase (which is now complete). The Development Envelope already had a high population and range of weeds, and there is a risk of dieback (dieback has been recorded south of Marriott Road) (GHD, 2018b). Spread is most likely to occur as a result of poor hygiene practices of vehicles that enter the Development Envelope, particularly where vehicles may have driven in dieback infested areas. Cleared soils could also potentially cause spread of weeds and dieback if they are not contained within the Development Envelope.

Fire

Fire or inappropriate fire regimes is listed as one of the key threatening processes for the Orchids (DEC, 2009; TSSC, 2008 a & b) and the Banksia Woodlands PEC / TEC (TSSC, 2016). The Proposal could lead to the damage of surrounding vegetation through accidental generation of bushfire.

Litter

Uncontrolled litter has the potential to impact individual flora species, their habitat and degrade vegetation. The Proposal has the potential to release litter to the surrounding environment which may have an impact on the Banksia Woodlands TEC / PEC, Orchids and their habitat.

2 COMPONENTS

2.1 OBJECTIVES

The objectives of this FVMMP are based on the Ministerial Conditions provided in MS 1085 and the EPA's environmental objectives for the Flora and Vegetation Key Environmental Factor. These requirements and conditions are provided below.

2.1.1 MINISTERIAL CONDITIONS

Based on the requirements of Condition 6-1 of MS 1085, the environmental objective for threatened communities and flora for the Proposal is:

> "ensure that the construction and ongoing operation of the Proposal is undertaken in a manner that avoids direct and indirect impacts to Threatened Flora and Communities"

This includes the Banksia Woodlands of the Swan Coastal Plain TEC and 'Low Lying *Banksia attenuata* woodlands or shrublands PEC and *Drakaea elastica, Drakaea micrantha* and *Diuris micrantha'*.

2.1.2 EPA OBJECTIVES

The EPA's environmental objective for Flora and Vegetation are more broadly set out within *Environmental Factor Guideline: Flora and Vegetation* (EPA, 2016a). The EPA's objective for the Flora and Vegetation Key Environmental Factor is "to protect flora and vegetation so that biological diversity and ecological integrity are maintained" (EPA, 2016a). In the context of this objective: "ecological integrity" is listed as the composition, structure, function and processes of ecosystems, and the natural range of variation of these elements (EPA, 2016a).

To achieve these objectives, management targets and actions have been developed to address the key potential impacts associated with the Proposal. The management targets and actions which will be implemented in accordance with this plan are summarised in the following Section (Section 2.2). Management targets and actions relating to hydrological impacts are included in the WMP which has also be implemented for the Proposal in accordance with the requirements of MS 1085.

2.2 MANAGEMENT ACTIONS, TARGETS AND MONITORING

Condition 6-2 (3) of MS 1085 requires that this FVMMP specify management actions for potential impacts from the Proposal. Table 7 presents the environmental management objectives and actions that the Proposal has implemented or will implement during operation in order to achieve the objectives of MS 1085 and the EPA (2016a). Management actions are focused on minimising the potential impacts of the Proposal including clearing, the introduction and spread of weeds, dieback, increased fire risk and litter. Changes to surface water and groundwater regimes have been addressed in Albemarle's WMP therefore they have not been repeated in this FVMMP.

To assess the performance of the management actions against the objectives, measurable management targets have been developed with associated triggers. Monitoring will be implemented to provide sufficient information to determine when triggers are being exceeded, this information is summarised in Section 2.3. Further detail on the proposed threatened flora and community monitoring is included in Section 2.4.

Table 7: Management objectives and actions

Management Objective	Key Management Action	Management Target	Proposal Phase	Monitoring	Reporting
Objective 1 **Avoid indirect impact to known threatened orchid species**	• The integrity of the perimeter fence will be maintained. • Vehicle speeds will be restricted (25 km/h on unconsolidated surfaces in dry conditions). • Comply with fire management actions listed in Objective 6. • Implement the Albemarle Kemerton Plant WMP. • Dust forming material storage facilities will be covered, enclosed or silos/bins. This includes spodumene ore concentration, acid roasted solids, tailings, Lithium Hydroxide product and Sodium Sulfate Anhydrous (SSA)-product, and dust producing reagents. • All Lithium Hydroxide product and SSA produced by the Plant will be packaged in enclosed, lined bags and transported in enclosed containers. • Transfer points will either be enclosed or have dust extraction. • Conveyors outside of buildings will be enclosed or covered to prevent water ingress and dust egress. • There will be no visible process generated dust on vehicle wheels leaving the Development Envelope. Washdown or other suitable technique will be provided if necessary. • Road sweeping campaigns will be included within operational procedures for the Proposal as required.	No reportable decline of nearby *Drakaea elastica* individuals or habitat, attributable to the Proposal.	Operations	Annual *D. elastica* and Banksia TEC/ PEC monitoring (using quadrats and photographic reference points) for five years was undertaken from 2019. The monitoring method and parameters selected comprised a combination of quantitative and qualitative measures that will provide an overall assessment of the presence/absence of *D. elastica*, the health of *D. elastica* habitat and the Banksia Woodland TEC / PEC and any evidence of disturbance from the Proposal. This includes: • Quadrats - 2 impact and 2 reference for *D. elastica*; • Transects with five (5 x 5 m) plots: 3 impact and 2 reference; and • 18 photographic reference points. As construction has stopped, survey is now limited to every two years for the next four years if there is no change to the TEC / PEC.If there is no change attributable to the Proposal after this four year period, the need to continue monitoring will be discussed with DCCEEW and EPA Services. Should construction resume, this would be limited to non-clearing and non-bulk earthworks activities (such as structural and steelworks etc.) and hence would not prompt a resumption of annual monitoring	Compliance with this FVMMP, monitoring results and performance against management targets will be reported annually in the Compliance Assessment Report (CAR). Exceedance of trigger criteria will be reported to the DWER EPA Service within 21 days as per MS 1085 Condition 6-3.
Objective 2 **Avoid indirect impact to vegetation and flora (Banksia Woodland TEC) Low lying Banksia *attenuata* woodlands or shrublands (PEC) outside of the Development Envelope.**		No reportable decline to adjacent areas representative of the Banksia Woodlands of the SCP TEC / Low lying *Banksia attenuata* woodlands or shrublands PEC, attributable to the Proposal. No incidents of fire originating within, and spreading outside of, the Development Envelope.	Operations		

Management Objective	Key Management Action	Management Target	Proposal Phase	Monitoring	Reporting
				due to the low risk profile for flora and vegetation.	

Objective 3
Prevent introduction and/or spread of weeds into adjacent areas
	• Vehicles, plant and equipment to be maintained and cleaned to reduce the spread of weeds throughout the Development Envelope.
	• Prior to commencing ground disturbance, a baseline survey was conducted for evidence of weeds within the area immediately outside the (original) Development Envelope boundary and the result of the survey was recorded for future reference.The Development Envelope was also surveyed, therefore the surrounding area following reduction of the Development Envelope was also understood.
	• Restrict movement of machines and other vehicles to within the Development Envelope or on designated tracks only outside the area.
	• Plant and soil materials are not allowed to be brought to site unless approved for a specific purpose and confirmed as likely to be weed free (eg: materials for administration building landscaping).
	• Comply with the requirements of the *Biosecurity and Agriculture Management Act 2007* for listed Declared Pests recorded within the Development Envelope.
		No new Declared or Weeds of National Significance within surrounding vegetation, attributable to the Proposal.
		No significant increase in weed cover within immediately adjacent vegetation, attributable to the Proposal.
			Operations	As part of the Banksia TEC / PEC and *D. elastica* monitoring the following will be recorded at transects and quadrats:
				• Pathogen attack – visual evidence of dieback;
				• Plant death:
				  ○ Number of dead shrubs or trees and a percentage for grasses /groundlayer within each quadrat;
				  ○ Percentage death of upper, mid and groundlayer for transects; and
				• All species present and the per cent cover including weeds.
					Reported annually in accordance with Condition 6 of MS 1085.

Objective 4 **Avoid introduction and/or spread of Dieback within adjacent areas**	• A baseline survey was conducted for evidence of dieback within the area immediately outside the (original) Development Envelope boundary and record the result of the survey for future reference. The Development Envelope was also surveyed, therefore the surrounding area following reduction of the Development Envelope was also understood. • Implement a Hygiene Procedure/Standard for vehicles and machinery entering the Development Envelope which includes a requirement for all vehicles/plant/equipment which have been working in, or travelling through, areas with known or potential dieback to be cleaned prior to arrival on site, and presented for inspection to confirm they are free from soil and vegetative material • Any fill material sourced off-site must be clean fill from sources known to be free of dieback • Plant and soil materials are not allowed to be brought to site unless approved for a specific purpose and confirmed as	No evidence of Dieback infestation identified within immediately adjacent areas/ vegetation resulting from the Proposal			

Management Objective	Key Management Action	Management Target	Proposal Phase	Monitoring	Reporting
	likely to be weed free (e.g. materials for administration building landscaping) • Restrict movement of machines and other vehicles to within the Development Envelope or on designated tracks only outside the area				
Objective 5 **Avoid the release of litter to the surrounding environment**	• Provide waste receptacles around the site. Waste receptacles will be: o Sized appropriately; o Suitable for the separation of waste types; o Emptied as required; o Strategically located around the site; and o Signposted. • Inform and educate workers on proper waste management practices and the importance of litter avoidance.	Removal of litter when identified within immediately adjacent areas/ vegetation resulting from the Proposal.	Operations	As part of the Banksia TEC / PEC and *D. elastica* monitoring the following will be recorded at transects and quadrats: • Other conditions including rubbish dumping and presence of litter; • Plant death: o Number of dead shrubs or trees and a percentage for grasses /groundlayer within each quadrat; and o Percentage death of upper, mid and groundlayer for transects.	Reported annually in accordance with Condition 6 of MS 1085.
Objective 6 **Prevent the occurrence of fire and, in the event of fire, implement contingencies to prevent the spread of fire to the surrounding environment**	• Construct and maintain firebreaks around the Proposal. • Fire detection and suppression systems incorporated in the Proposal design. • Distribution of firefighting equipment such as fire extinguisher or charged water supply. • Provide relevant personnel with fire suppressant training. • During bushfire season, adhere to Western Australian restrictions. If restrictions cannot be adhered to, additional permits or exemptions may be obtained as required. • Machinery to be fitted with approved spark arresting exhaust system. • Fires to be immediately extinguished if identified and practical and safe to do so. All fires reported to the Site Manager.	No incidents of fire originating within, and spreading outside of the Development Envelope. Prior to each bush fire season, fire breaks maintained once per year or checked and confirmed as not requiring additional maintenance.	Operations	As part of the Banksia TEC / PEC and *D. elastica* monitoring the following will be recorded at transects and quadrats: • Fire history; • Plant death: o Number of dead shrubs or trees and a percentage for grasses /groundlayer within each quadrat; and o Percentage death of upper, mid and groundlayer for transects.	Reported annually in accordance with Condition 6 of MS 1085.

2.3 TRIGGERS AND CONTINGENCY ACTIONS

Incidents, 'near misses' and non-compliances with this FVMMP and other management documents will be reported and investigated in accordance with a Proposal-specific incident reporting and investigation procedure, root causes identified and appropriate measures implemented to prevent recurrence and rectify impacts where applicable. Where applicable, environmental incidents will be reported to the relevant government agency.

The following procedure will be implemented when a non-compliance with this FVMMP occurs:

- Report the incident (within 21 days), investigate the cause and identify contingency actions if incident attributable to the proposal;
- Implement contingency actions which may include:
  - Review management measure's practicality or relevance;
  - Improve training and education for all personnel;
  - Improve and implement increased protective measures as necessary; and
- Monitor outcomes.

Thresholds for triggering contingency actions and attributing outcomes to the proposal are difficult to determine given the cryptic / seasonal nature of the target orchid species (*Drakaea elastica* may not occur 'naturally' each year). Regardless, triggers and contingency actions have been prepared to meet the objectives and management targets outlined in Section 2.2. Triggers and contingency actions are summarised in Table 8.

Table 8: Objectives, triggers and contingency actions of the monitoring program

Management Objectives	Triggers	Contingency Action
Objective 1 **Avoid indirect impacts to known threatened orchid species** **Objective 2** **Avoid indirect impact to vegetation and flora (Banksia Woodland TEC / Low lying Banksia attenuate woodlands or shrublands PEC) outside of the Development Envelope**	**Trigger 1** **Exceedance of hydrological trigger criteria for ground water levels or quality with predicted impacts extending into known threatened orchid locations/adjacent Banksia Woodland TEC / PEC**	The WMP contains trigger criteria for surface and groundwater. The trigger criteria are provided in this FVMMP for completeness and are: • Set for a suite of analytes and are unique for each sampling location; and • Based on baseline sampling data and DES (2021) guidance. If sampling results are above the trigger criteria for any sampling round, the magnitude of the exceedance will be reviewed in the context of the historical site data and the associated trigger criteria. Should the result be deemed to be outside of what is considered "seasonal" or "natural variation" a confirmation sampling event will be undertaken within five weeks to confirm if there is an exceedance of the trigger criteria. For sites where analytes had concentrations below the Limit of Reporting (LoR) prior to and during construction, a result may be above the LoR but is not considered an exceedance as a result of site activities. For these analytes, the trigger value is proposed to be five times the LoR (apart from process related analytes). An exceedance of the trigger criteria is considered to occur when the trigger criteria is exceeded at a sampling site over two consecutive monitoring events (with the exception of process-related analytes lithium, uranium, thorium, radium and cobalt) for which an exceedance is considered to occur the first time that the trigger criteria is exceeded). An assessment would be undertaken to determine whether site activities was likely to have caused the exceedance. The assessment would include the following: • Further validity testing of the result, cross-checking concentration with the laboratory. Retesting sample if the

Management Objectives	Triggers	Contingency Action
		result appears to be an error or silica gel clean up and or speciation of hydrocarbons; • Review of sampling procedures (including QA/QC) to determine whether a sampling error or contamination, may have contributed to the result; • Comparison of the sample against the mean and variance of baseline and up-gradient water quality data; and • Consideration of other potential environmental effects and contaminant sources including flood flows within the drain, changing land uses or activities external to the site. **Threshold criteria**: The WMP also contains threshold criteria for surface and groundwater. These threshold criteria are provided below for completeness. In consultation with DWER, an exceedance of threshold criteria is considered to have occurred once the exceedance is determined to pose a risk to either human health or the environment. Should an exceedance be determined, an assessment on the nature and extent of the impacts will be undertaken. If the exceedance is predicted to extend beyond the boundary of the Proposal into an area known to contain threatened orchids or Banksia Woodland TEC/PEC the following will occur: 1. Implement corrective actions, monitor and assess success of the corrective actions; 2. Determine the magnitude and extent of the impact, and the likelihood for impacts to known threatened orchid locations /habitats and or Banksia Woodland TEC/PEC; 3. If impacts are likely to threaten orchids/their habitat or the adjacent Banksia Woodland TEC/PEC undertake monitoring (as described in Section 2.4). If this is outside of the optimal timing for orchid presence, the monitoring will be undertaken and comparisons between vegetation health at the reference and impact sites will be used as a proxy; 4. Analyse data between all sites to determine any significant (reportable decline) difference in measured parameters; 5. If orchids or the Banksia Woodland TEC/PEC are in reportable decline, discuss the results with DBCA / EPA and implement agreed corrective actions. In the first instance this will involve management of the impact i.e., if water contamination is the impact this will be remediated with further monitoring to assess the recovery of the community / habitat / orchids.
	Trigger 2 Threatened orchid not re-recorded or in reportable decline/orchid habitat in reportable decline	If monitoring identifies that the *Drakaea elastica* population or the measured orchid habitat are in reportable decline the following will occur: <u>First year not re-recorded / decline:</u> 1. Determine if habitat proxy data identify a change compared to the reference sites. • Review water monitoring data to confirm whether there are any significant change in result; • Review field data from flora and vegetation monitoring to determine if other disturbances are evident, such as grazing/fire/erosion; • Review environmental incidents to determine their nature and extent and whether they could have impacted the sampling sites; • Implement Trigger 1 contingency actions; and 2. If there are no changes in habitat proxy data and no evidence of other disturbances – no further action is required in year 1. The null record may be due to the species not emerging each year or a result of the influence of other external factors such as foraging animals.

Management Objectives	Triggers	Contingency Action
		Due to the cryptic nature of *Drakaea elastica,* unless there is an obvious direct link for the decline or no record to be attributable to the Proposal, this first year will not be assumed as a non-compliance, and instead is an investigation threshold. In the case of two or more years of reportable decline of orchid numbers but habitat data remains consistent with reference sites: 1. Follow process outlined for year 1; 2. Discuss results with DBCA/EPA; 3. Implement agreed actions from the DBCA/EPA discussion if determined to be attributable to the proposal; and 4. Continue to monitor at the standard frequency and report results as per the agreed annual compliance reporting requirements.
	Trigger 3 Banksia woodland TEC in reportable decline and/or *Drakaea elastica* habitat in reportable decline	If monitoring identifies that the Banksia Woodland TEC/ PEC / *Drakaea elastica* habitat monitoring parameters has decreased (greater than 20 %) in comparison to the change at reference sites (reportable decline) the following will occur: 1. Review water monitoring data to confirm whether there are any relevant changes in results. Review environmental incidents to determine their nature and extent and whether they could have impacted the sampling sites. Implement Trigger 1 contingency actions where appropriate / applicable; 2. If there have been no environmental incidents recorded / occurred, assess monitoring sites and their adjacent area for evidence of other impacts such as erosion or sedimentation, dumping of waste, dust accumulation on vegetation or an increase in weed species. Assess these impacts to determine whether they are likely to be attributable to the Proposal (i.e., does the erosion extend from the Development Envelope into the TEC or is there evidence of alternative pathways); 3. Discuss findings with DBCA/EPA and implement management actions if impacts attributable to the Proposal are detected; 4. Monitor effectiveness of management actions and recovery of the Banksia Woodland /orchid habitat. Update /revise management measure if needed (impact persists despite management actions); and 5. Continue to monitor at the standard frequency and report results as per the agreed annual compliance reporting requirements.
Objective 3 **Prevent introduction and/or spread of weeds into adjacent area** **Objective 4** **Avoid introduction and/or spread of Dieback within adjacent areas** **Objective 5** **Avoid the release of litter to the surrounding environment**	**Trigger 4** **Banksia Woodlands PEC / TEC / *Drakaea elastica* monitoring identifies significant increase in weeds or new declared weed species present or visual evidence of dieback or litter**	If monitoring identifies there is a greater than 20% increase in weeds species cover since the 2022 baseline monitoring round (current Development Envelope), new declared weed species present, or the presence of dieback in areas previously dieback free (based on visual evidence of dieback susceptible species) or visual presence of litter, the following will be undertaken: 1. Determine whether the increase in weeds / presence of dieback / occurrence of litter is attributable to the Proposal; 2. If dieback is suspected, undertake a dieback survey to confirm visual observations of dieback are correct; 3. Discuss findings with EPA Services / DBCA and implement management actions if impacts attributable to the Proposal are detected; and 4. Monitor effectiveness of management actions. Update / revise management measures if needed (impact persists despite management actions). In addition to the above actions, regardless of whether trigger 4 is met, litter reduction and weed control activities will continue appropriate to risk.
Objective 6 **Prevent the occurrence of fire attributable to**	**Trigger 1** **Occurrence of fire on or surrounding the Site**	1. If fire occurs on or surrounding the site, implement internal firefighting measures (including notification to the local firefighting authority as required) to control and extinguish the fire (if safe to do so).

Management Objectives	Triggers	Contingency Action
the Proposal and, in the event of fire, implement contingencies to prevent the spread of fire to the surrounding environment.	**Trigger 2** **Banksia Woodlands TEC / PEC / *Drakaea elastica* monitoring identifies evidence of a previous fire event.**	2. Investigate the source of the fire. 3. If the fire is attributed to the Proposal: a. Report findings to EPA Services within 21 days of the criteria being triggered; b. Develop and implement management actions to minimise the risk of future fires (in consultation with EPA Services / DBCA and the Department of Fire and Emergency Services (DFES) as appropriate); and c. Monitor effectiveness of management actions. Update / revise management actions if needed.

2.4 MONITORING PROGRAM

This monitoring program has been prepared to meet and demonstrate compliance with objectives and management targets outlined in Table 7.

2.4.1 REVIEW AND CONSIDERATIONS

The monitoring program has been developed with reference to the following documents:

- Environmental Factor Guideline: Flora and Vegetation (EPA, 2016a);
- Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016b);
- Survey guidelines for Australia's Threatened Orchids – Guidelines for Detecting Orchid Listed as Threatened under the EPBC Act 1999 (DotEE, 2013);
- Glossy-leafed Hammer Orchid (*Drakaea elastica*) Recovery Plan (DEC, 2009); and
- Banksia Woodlands TEC Conservation Advice (TSSC, 2016).

Changes Identified to Date

Since the development of the original FVMMP, several rounds of monitoring have been conducted as required under the original FVMMP (2019) for the Banksia Woodlands TEC/PEC and Orchids. During monitoring, GHD (2019, 2020), Onshore Environmental (2021, 2022, 2023) identified several issues relating to the monitoring program defined in the original FVMMP. GHD has proposed several management and mitigation measures to rectify these issues. The issues and the relevant mitigation measures are summarised in Table 9.

Table 9: Issues identified during monitoring (incl. GHD, 2019 and 2020)

Issues	Management/Mitigation Measures	Implementation Schedule
First round of monitoring (GHD, 2019)		
Plot 1 from Transect 4 was slightly affected by a fallen tall shrub during the construction of the perimeter fence however, this event has not significantly altered the integrity of the plot or transect.	No mitigation measures required.	N/A
The western boundary of the Proposal has been moved to reflect the amended Development Envelope.	PMP 6 and 10 have been moved to align with the amended alignment of the western boundary. PMP 5 and 11 have been removed.	Implemented during the first round of monitoring (GHD, 2019).

Issues	Management/Mitigation Measures	Implementation Schedule
The perimeter fence was constructed on PMP 16 and 17.	No mitigation measures required.	N/A
Drakaea elastica was not recorded during monitoring and may be locally extant.	Annual monitoring for this species is recommended to continue as *Drakaea elastica* habitat still remains (no change).	Annually, based on the revised FVMMP.
Second round of monitoring (GHD, 2020)		
Drakaea elastica was not recorded during monitoring and may be locally extant.	Annual monitoring for this species is recommended to continue as *Drakaea elastica* habitat still remains (no change).	Annually, based on the revised FVMMP.
Third round of monitoring (2021)		
No Drakaea elastica observed. Higher leaf litter than 2020. Lower wood litter than 2020.	Perimeter fence was erected on top of PMP 16 and 17. However, the integrity of the area as a whole was not affected and the overall vegetation condition remained the same (PMP 18)	Annually, based on the revised FVMMP.
Fourth round of monitoring (2022)		
No *Drakaea elastica* observed. Bridal Creeper observed. *Asparagus asparagoides* was recorded in close proximity to previous *Drakaea elastica* sites within Lot 40.	No mitigation measures required.	Annually, based on the revised FVMMP.
Fifth round of monitoring (2023)		
No *Drakaea elastica* observed, could be due to the survey being carried out late in the season (November). Higher leaf litter than during construction or baseline.	No mitigation measures required.	Annually, based on the revised FVMMP.

Personnel

Surveys will be conducted by a Botanist with appropriate experience and qualifications, including:

1. Demonstrated experience as a field Botanist in the Swan Coastal Plain;
2. Experience in field identification of threatened orchid species and similar species that might be encountered in the area; and
3. Experience in field identification of weed species that might be encountered in the area.

Timing

Orchids

Drakaea elastica is distinguished from all other Drakaea species by its glossy light-green leaf. The best time to look for this plant is in July and August when the leaves are relatively conspicuous (DEC, 2009). DBCA flora officer (pers. comms 31 May 2018) has advised that late August to early September is typically suitable for *Drakaea elastica* sampling in the Bunbury area.

Prior to the survey, the local DBCA office (flora officer) will be contacted to confirm if other known populations in the Bunbury area have leaf emergence.

Banksia Woodlands TEC / PEC

Identifying the community and its general location is possible at most times of the year, however for this FVMMP, consideration has been given to the role the season may play in the assessment. Sampling would be carried out in conjunction with the monitoring in late August / early

September which provides the optimal time to survey for both the Banksia Woodlands TEC / PEC and *Drakaea elastica*.

It is recognised that timing and seasons can vary slightly and hence the above timing is indicative and may adjust as needed based on the advice of DBCA, the field botanist and other relevant local advice.

Frequency

The monitoring program was undertaken annually for the first five years (2019 – 2023 inclusive). As there has been no change to the Banksia Woodlands TEC / PEC, Orchids or their habitat after this time (that is attributable to Proposal) monitoring will be reduced to every second year for four years (2025 and 2027). If there is no change attributable to the Proposal after this four year period, the need to continue monitoring will be discussed with DCCEEW and EPA Services.

Flora Results

Any Threatened or Priority flora and TEC/ PEC occurrences sampled will be submitted following each and every monitoring occurrence as per the DBCA / WA Herbarium requirements.

2.4.2 MONITORING TYPE AND LOCATIONS

The monitoring method and parameters selected comprise a combination of quantitative and qualitative measures that will provide an overall assessment of the presence / absence of *Drakaea elastica,* the health of *Drakaea elastica* habitat and the Banksia Woodlands TEC / PEC and any evidence of disturbance from the Proposal. As *Drakaea elastica* may not flower or emerge each year, the monitoring program allows for the collection of habitat and floristic data for use as a proxy in years when the orchids do not emerge.

Drakaea elastica

Monitoring sites were nominated based on historical records, these included two permanent quadrats at the closest known *Drakaea elastica* sites and two reference quadrats. The monitoring sites are described in Table 10.

Table 10: *Drakaea* elastica monitoring sites

Site Number	Description	Type	Comments
***Drakaea elastica* Monitoring sites**			
Quadrat 1	*Drakaea elastica* known location 45 m from Proposal northern boundary.	Impact	The area was sampled in 2013, three *Drakaea elastica* known to be present. The area has been searched annually in accordance with the Plan requirements and no *Drakaea elastica* have been observed during the spring surveys for 2018 through to 2023.
Quadrat 2	*Drakaea elastica* known location 80 m from Proposal northern boundary.	Impact	The area was sampled in 2013, two *Drakaea elastica* known to be present. The area has been searched annually in accordance with the Plan requirements and no *Drakaea elastica* have been observed during the spring surveys for 2018 through to 2023.

Site Number	Description	Type	Comments	
Quadrat 3 and 4	Location within DBCA managed lands within the KSIA buffer area. One site in Lot 40 and one site in Lot 511.	Reference	**Lot 40** Three individuals were recorded from one location within Lot 40 during the August 2018 survey. 15 individuals were recorded from 3 locations within Lot 40 during the August 2019 survey. 69 individuals were recorded from two locations within Lot 40 during the August 2020 survey. 15 plants were recorded from two of the three historical locations situated in the northeast and southeast during surveys in Spring on 2, 3 and 28 September 2021. No *Drakaea elastica* were recorded in or around the historical locations previously recorded at Lot 40 between 21-23 September 2022. No *Drakaea elastica* were recorded during a search in November 2023. This could be due to the late timing of the survey.	**Lot 511** Searches in Lot 511 in August 2018 survey did not record any *Drakaea elastica*. Searches in Lot 511 in August 2019 survey did not record any *Drakaea elastica*. Searches in Lot 511 in August 2020 survey did not record any *Drakaea elastica*. No *Drakaea elastica* were recorded in or around the historical locations previously recorded at Lot 511 during surveys in Spring on 2, 3 and 28 September 2021 northeast and southeast. No *Drakaea elastica* were recorded in or around the historical locations previously recorded at Lot 511 between 21-23 September 2022. No *Drakaea elastica* were recorded during a search in November 2023. This could be due to the late timing of the survey.

An initial survey was undertaken to confirm whether *Drakaea elastica* remains at the historical locations and confirm the monitoring sites. The survey was undertaken from 13 - 15 August 2018 by GHD Botanist and a DBCA officer.

At Lot 511 one occurrence of *Drakaea micrantha* was recorded, however there were no occurrences of *Drakaea elastica*. On 14 August 2018, two previously recorded locations of *Drakaea elastica* were surveyed (45 m and 80 m north from the Development Envelope) by meandering in a 10 - 20 m radius around these locations.

On 15 August 2018, the potential reference site locations were surveyed within Lot 40 (DBCA-managed land). This area was also searched by meandering in a 10 – 20 m radius around the known locations. Survey locations are shown in Figure 4.

No suitable reference site was selected for *Drakaea elastica* as only one small population was found (within Lot 40). Lot 40 had favourable conditions for *Drakaea elastica*, as a recent fire (<2 years) had opened up the vegetation to create bare ground. A section of Lot 40 (250 m southeast), where the *Drakaea elastica* were located, was water-logged at the time of the survey. Hydrology is important to *Drakaea elastica* and this species is often found near watercourses or damp areas (DEC, 2009). Locating this population confirms that the timing of the survey was correct for the presence of the species.

It was recommended by a DBCA officer that the monitoring effort should focus on monitoring the Banksia Woodlands TEC / PEC vegetation instead of the three *Drakaea elastica* individuals. The population was too small to be of benefit as a reference site. He also noted that because the Banksia Woodlands TEC / PEC monitoring would include measures of species density for component taxa, for example if the density monitoring found that geophytes were declining, then it could safely be assumed that any *Drakaea elastica* individuals in the area would also be doing the same (DBCA Officer, pers. comm, 11 September, 2018).

Like many terrestrial orchids, *Drakaea elastica* may not flower every year, instead waiting until environmental conditions are favourable to do so. Due to this cryptic nature of *Drakaea elastica* the historic locations (45 m and 80 m north of the Development Envelope and at reference sites) were resurveyed in 2019 and 2020 to confirm if the individuals were dormant in 2018 or have died. No records of *Drakaea elastica* were found at either site during the 2019 and 2020 surveys at either Quadrat 1 or 2 (Table 10). Since the initial survey, the monitoring locations have been surveyed each year (in accordance with the survey frequency defined above). The results of these surveys are described in Table 10 and shown in Figure 4.

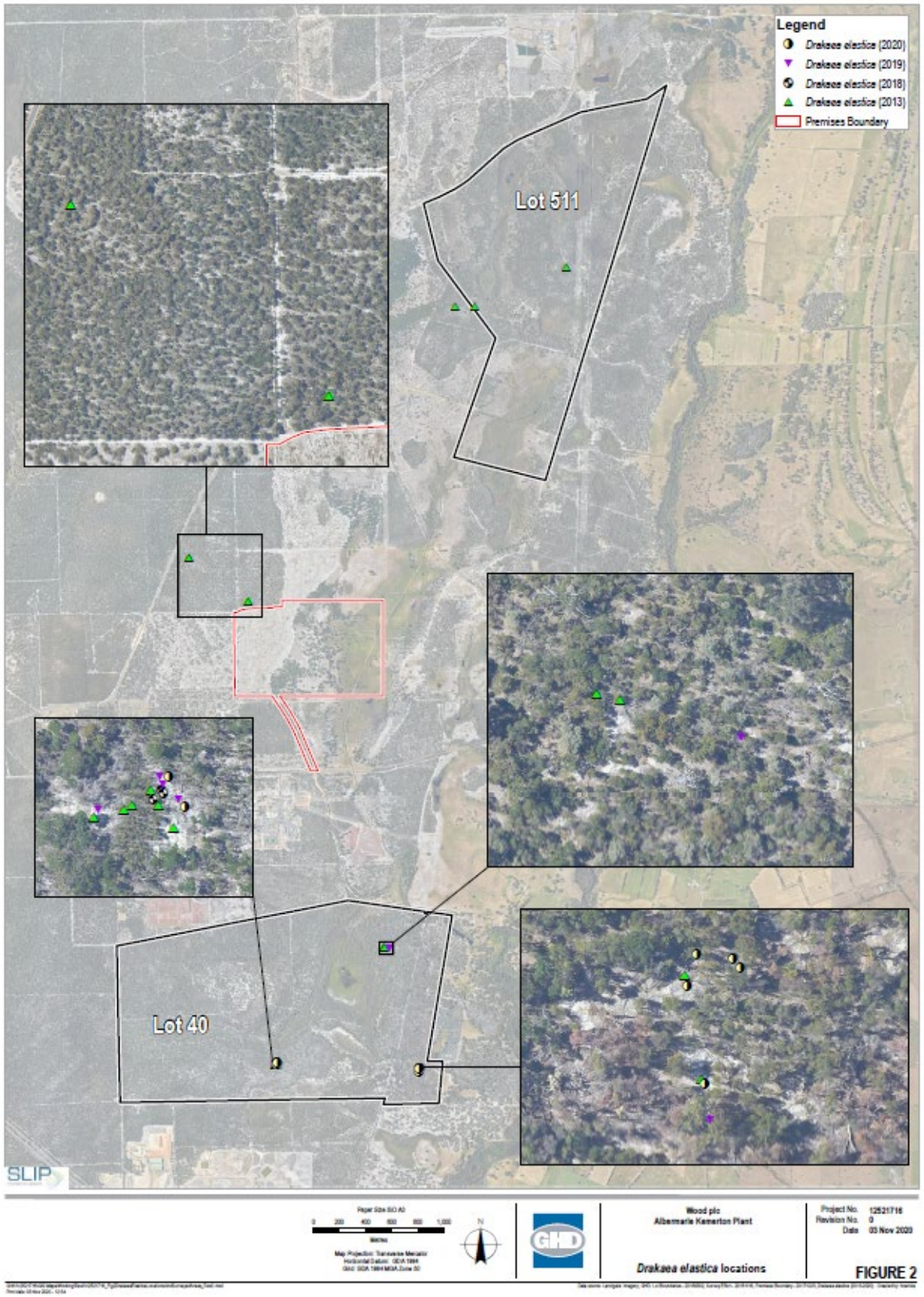

Figure 4: *Drakaea elastica* locations and surveyed areas

Banksia Woodlands PEC / TEC

Three transects have been established on sides of the Development Envelope (North, West (Northwest) and South) that contain Banksia Woodlands TEC / PEC. Two reference transects have been established in retained vegetation within the buffer zone of the KSIA.

The transect locations were finalised during an initial site visit (August 2018) prior to commencing the first round of monitoring.

Photographic monitoring points (PMP) have been positioned around the perimeter of the Development Envelope in Banksia Woodlands TEC / PEC vegetation, monitoring points have been positioned at a minimum of 100 m intervals. The locations of the transects and PMPs are detailed in Table 11 and shown in Figure 5.

Table 11: Tentative monitoring locations

Site Number	Description	Type	Comments
Banksia Woodlands PEC/ TEC Monitoring Sites			
Transect 1	Located in Lot 511 within the KSIA buffer area and in DBCA managed land.	Reference	Initial baseline surveys in 2018 identified the site as Banksia Woodlands TEC / PEC and in Very Good condition. 2019 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2020 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2021 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2022 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2023 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. There has been little to no change evident in vegetation since the 2018 baseline survey to the most recent survey in 2023.
Transect 2	Northern perimeter in vegetation mapped by ELA (2013) as EmCcBa in Excellent condition. This transect is located near the known *Drakaea elastica* record.	Impact	Site confirmed as Banksia Woodlands TEC / PEC and in Very Good condition. 2019 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2020 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2021 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2022 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2023 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'.

Site Number	Description	Type	Comments
			There has been little to no change evident in vegetation since the 2018 baseline survey to the most recent survey in 2023.
Transect 3	(North-) Western corner of the original Development Envelope in vegetation mapped in GHD (2018a) as being EmCcXb in Good condition. This area was also mapped by ELA (2013) as EmCcBa.	Impact	Site confirmed as Banksia Woodlands TEC / PEC and in Very Good condition. 2019 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2020 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2021 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2022 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2023 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. There has been little to no change evident in vegetation since the 2018 baseline survey to the most recent survey in 2023.
Transect 4	On the southern boundary and west of the access road. This site is located in the Banksia block, which has been mapped by ELA (2013) and in GHD (2018a) as EmCcBa in Very Good condition.	Impact	Site confirmed as Banksia Woodlands TEC / PEC and in Good condition. 2019 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2020 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2021 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2022 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2023 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. There has been little to no change evident in vegetation since the 2018 baseline survey to the most recent survey in 2023.
Transect 5	On the western side of Lot 40.	Reference	Confirmed as Banksia Woodlands TEC / PEC, in Very Good condition with a section of Good condition at the initial plot due to the high percentage of weeds/recent fire (<2 years). 2019 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good', two points remained assessed as 'Good' condition. 2020 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good', two points remained assessed as 'Good' condition. 2021 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good', the two points

Site Number	Description	Type	Comments
			previously assessed as 'Good' were rated as 'Very Good' during this survey. 2022 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. 2023 surveys confirmed no change in vegetation condition from previous year and assessed as 'Very Good'. There has been little change evident in vegetation since the 2018 baseline survey to the most recent survey in 2023, with overall assessment increasing to all points assessed as very good condition since 2021.
PMPs	On the western and northern side of the Development Envelope.	Impact sites – Photographic monitoring	20 PMPs were initially installed around the perimeter. PMP 5 and 11 have since been removed from the monitoring program due to the amended site boundary leaving 18 PMPs.

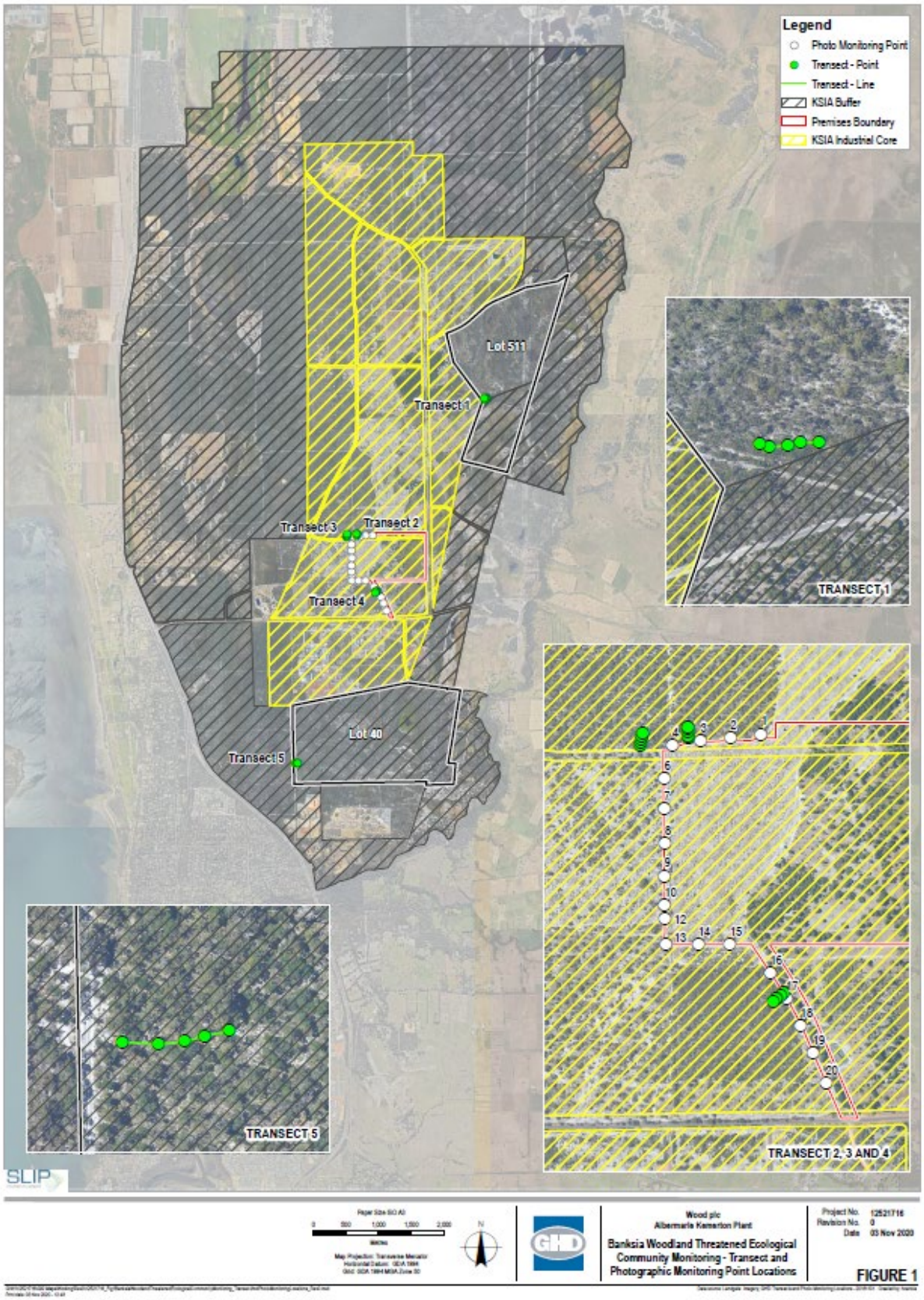

Figure 5: Banksia Woodlands PEC / TEC community monitoring - transect and PMP locations

2.4.3 SITE ESTABLISHMENT

Drakaea elastica

Each quadrat (10 x 10 m plots) has been measured using a tape, and the corners of each plot has been marked with a galvanised steel post and geo-referenced (recorded using a handheld Global Positioning System; GPS). The quadrat has been orientated to include as many *Drakaea elastica* individuals as possible. Each *Drakaea elastica* location has been geo-referenced with a Differential GPS unit.

Banksia Woodlands PEC / TEC

Transects have been established that are 45 m long by 5 m in width. Each transect has been positioned from the edge of the Banksia Woodland PEC / TEC closest to the Development Envelope. Along each transect, plots (5 x 5 m) has been established. Each plot has been measured using a tape, and the corners of each plot will be marked with a galvanised steel post and geo-referenced (recorded using a handheld GPS). The layout of the transect is shown in Table 11.

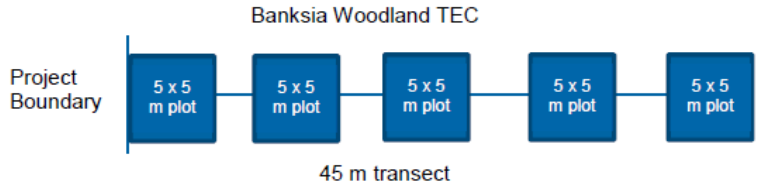

Figure 6: Transect layout

2.4.4 MONITORING POINTS

The monitoring parameters selected comprise a combination of quantitative and qualitative vegetation measures that will provide an overall assessment of the health of the vegetation. The selected monitoring parameters are summarised in Table 12 and discussed in the following sections. Data will be collected using standardised data sheets.

Table 12: Summary of monitoring parameters

Parameter	Quadrat (10 x 10 m) and transect plots (5 x 5 m)
Photographic monitoring	Each corner post – facing towards the center of the quadrat / plot.
Vegetation community structure	Described for the quadrat / plot
Site conditions	Recorded for the quadrat / plot
Species diversity	Recorded for the quadrat / plot
% bare ground, leaf litter	Recorded for the quadrat / plot

Photographic Monitoring

Visual vegetation health will be captured using photographs taken from permanent PMPs, the following will be noted at each point:

- Dominant species in each structural layer;
- Weed species present and overall cover; and
- Site conditions (defined below).

Photographs will be replicated in subsequent monitoring events.

Site Conditions

The following site conditions will be assessed:

- Condition in accordance with the rating scale (EPA, 2016b);
- Pathogen attack – visual evidence of dieback;
- Fire history;
- Erosion evidence – description and photograph of erosion if present. Description to include depth and width characteristics;
- Dust on vegetation – record any evidence of dust;
- Plant death:
    - number of dead shrubs or trees and a percentage of grasses / groundlayer within each quadrat;
    - percentage death of upper, mid and groundlayer for transects; and
- Other disturbances (e.g., rubbish dumping, access tracks, grazing).

Vegetation Community Structure

Vegetation will be described based on structure, dominant taxa and cover characteristics. Vegetation unit descriptions will follow the National Vegetation Information System (NVIS) and will be consistent with NVIS Level V (Association). At Level V up to three taxa per stratum are used to describe the association (Executive Steering Committee for Australian Vegetation Information (ESCAVI, 2003)).

Species Diversity

In each quadrat the following will be collected:

- Species present – identify all species present within the quadrat and their height range;
- An estimate of cover and abundance of species using the Domin-Krajina scale;
- Ratio of exotics: natives; and
- Number of threatened orchids present.

Ground Characteristics

The percentage of bare ground, leaf litter, twig and logs will be recorded in 5% intervals (i.e., 0 - 5%, 5 - 10%, etc.).

2.4.5 THREATENED ORCHID LOCATIONS

For each threatened orchid identified in any of the monitoring methods (quadrats / traverse / transects) the following will be recorded:

- Identify and GPS each individual orchid;
- Pin – tags to be placed near the location;
- Plant growth form – leaves emergent, flowering;
- Herbivory impact / other notable damage;
- Photograph in situ and habitat for each orchid; and
- Measure and photograph (with ruler showing) the length and width of leaves / flowers (if present).

2.4.6 Data Analysis

Data collected from monitoring will be entered into electronic spreadsheets and analysed for trends in vegetation health. Table 13 provides a summary of the calculations to be completed for each parameter. Photographs from each transect will be appropriately labelled and stored.

Table 13: Summary of calculations for each parameter

Parameter	Description
Number of orchids present	Number of orchids recorded in each monitoring quadrat.
Species diversity	Diversity calculated by counting the number of different species present in the quadrat / plot.
Species composition	% composition calculated by the per cent cover for each species.
Weed species	Number and total cover calculated.
Vegetation health	Visual comparison of photographs taken from permanent photo points at each transect.
Ground Characteristic	Comparison of the previous years to note change over time.

For the monitoring quadrats and transect plots, data analysis includes the use of parametric univariate statistical tests including a paired t-test (two sampling events) or Analysis of Variance (more than two sampling events) when testing for change between years at sites or between sites within a single survey event.

2.4.7 Assessment Against Trigger Values

Results from each round of monitoring will be assessed against the triggers outlined in Table 8. If an exceedance of a trigger value is recorded, the relevant contingency action will be implemented. The overarching contingency management principles defined in Section 2.3 will also be implemented for any exceedances.

2.4.8 Reporting

The results of each monitoring round will be described in a report, which includes:

- Introduction and purpose;
- Methodology – this will be consistent with those described above;
- Monitoring results and comparison with previous years; and
- Discussion and recommendations:
    - Discuss the changes observed between monitoring rounds and reference / impact sites;
    - Comment on the seasonality and any other disturbances (eg: fire, grazing and weeds) observed;
    - Discuss the results in relation to trigger values and contingency actions and provide recommendations in relation to contingency measures; and
    - Provide a conclusion as to whether changes have occurred and if these are likely to be attributable to the Proposal.

2.5 MANAGEMENT PLAN REPORTING

Albemarle will undertake reporting in accordance with regulatory and legislative requirements.

The results of implementing this FVMMP (including the results of the monitoring program) will be reported annually in the Annual Compliance Assessment Reports which will be submitted in accordance with Condition 4 of MS 1085. In the event that monitoring indicates that the triggers specified in this FVMMP (Section 2.3) have been exceeded, Albemarle will report such findings in accordance with Condition 6-3 of MS1085. Reporting requirements of Condition 6-3 include:

1. Reporting such findings to the CEO within twenty-one (21) days of a criteria being triggered;
2. Provide evidence to the CEO which allows for determination of the likely cause of the trigger criteria being exceeded and to identify any additional contingency actions required to prevent the criteria being triggered in the future; and
3. If the triggering of the criteria is determined by the CEO to be a result of the activities undertaken in implementing the proposal, immediately implement required management and/or contingency actions specified in the FVMMP and continue implementation of those actions until the trigger criteria are met, or until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 6-1 will continue to be met and implementation of the management and/or contingency actions is no longer required.

3 ADAPTIVE MANAGEMENT AND REVIEW

Albemarle will use an adaptive management and review strategy that includes ongoing evaluation of monitoring data to check that the environmental objectives are being met. If the FVMMP is failing to meet the objectives defined in Section 2.1, Albemarle will initiate a review and revision of the FVMMP.

In order to facilitate an adaptive management approach, the FVMMP will be revised every three years or earlier if directed by DWER EPA Services or monitoring results indicate a review may be appropriate. As adaptive management has only been introduced in this version of the FVMMP, the first scheduled revision of the FVMMP incorporating adaptive management will occur in 2027. Each revision will draw on information learned in the preceding years and will typically include a review of the following:

- Key assumptions and uncertainties (Section 1.5.2);
- The performance of the FVMMP against the outcomes defined in Section 2.1;
- Re-evaluation of the rationale for the choice of provisions in Section 1.5.4;
- A refined understanding of the ecological regime in Section 1.5.1; and
- The consideration of any external changes during the life of the Proposal.

4 STAKEHOLDER CONSULTATION

Changes in this revision of the FVMMP relate to changes to the Development Envelope and a reduction in clearing and updates to ensure the document aligns with the EPA's instructions for the development of Environmental Management Plans (EPA, 2024). Representatives from Albemarle and Preston Consulting have met and liaised with DWER EPA Services to discuss the changes to the Development Envelope and the reduction in clearing as a result of the changes outlined in the S45C application.

A draft version of this FVMMP was provided to DWER EPA Services for consideration. The resultant feedback has been addressed in this update.

Approved versions of this Management Plan will be made publicly available on the company's external facing website under the Australian operations specific information, along with other management plans and reports requiring publication in accordance with the Ministerial Statement (https://www.albemarle.com/global/en/who-we-are/global-locations/australia).

GLOSSARY

Term	Meaning
AKP	Albemarle Kemerton Plant
Albemarle	Albemarle Lithium Pty Ltd
ASS	Acid Sulphate Soils
ASSDMP	Acid Sulphate Soils and Dewatering Management Plan
Banksia Woodlands PEC	Low lying *Banksia attenuata* woodlands or shrublands Priority Ecological Community
Banksia Woodlands TEC	Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community
BAT	Best Available Techniques
CAR	Compliance Assessment Report
cm	Centimetre
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DFES	Department of Fire and Emergency Services
Dieback	*Phytophthora cinnamomi*
DWER	Department of Water and Environmental Regulation
Ecoedge	Ecoedge Pty Ltd
ELA	Eco Logical Australia Pty Ltd
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FCT	Floristic Community Type
FVMMP	Flora and Vegetation Monitoring and Management Plan
GHD	GHD Pty Ltd
GPS	Global Positioning System
ha	Hectare
km	Kilometre
KSIA	Kemerton Strategic Industrial Area
LoR	Limit of Reporting
m	metre
MS	Ministerial Statement
NVIS	National Vegetation Information System
Orchids	The three threatened orchids, *Drakaea elastica*, *Drakaea micrantha* and *Diuris micrantha*
PEC	Priority Ecological Community
PMP	Photographic monitoring points
Proposal	Albemarle Kemerton Plant
S45C	Section 45c
TEC	Threatened Ecological Communities
WA	Western Australia

Term	Meaning
WMP	Water Management Plan

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APPENDICES

Appendix 1 - Botanical information for *Drakaea elastica, Drakaea micrantha* and *Diuris micrantha*.

Glossy-leafed Hammer-orchid (*Drakaea elastica*)

EPBC Act: Endangered

BC Act: Threatened Flora (Declared Rare Flora – Extant)

The following information on *Drakaea elastica* is summarised from the species recovery plan (DEC, 2009) unless otherwise referenced.

Description: *Drakaea elastica* has a slender flower stem up to 30 centimetre (cm) high and a single distinctively glossy, bright green, prostrate, heart-shaped leaf one to two cm in diameter (Figure 7). The leaf emerges in May and starts to wither by the time the orchid flowers in September. The single flower is three to four cm long with a hinged labellum. Flowers are first seen in late September and continue flowering until late October or more rarely early November.

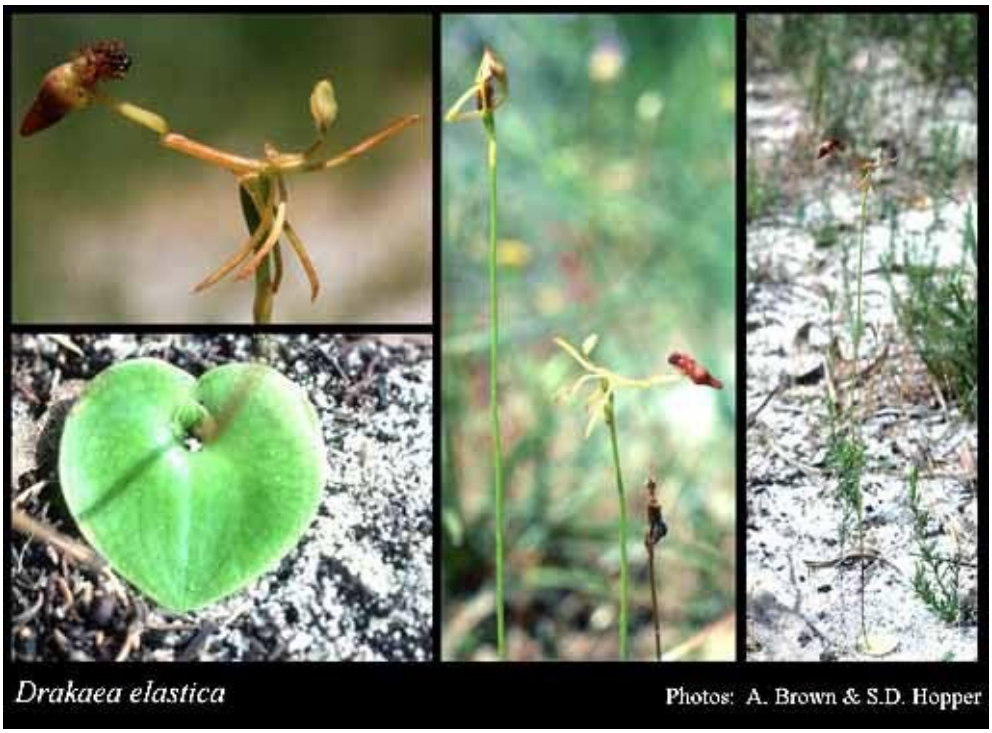

Figure 7: Images of *Drakaea* elastica (Source: WA Herbarium 1998-)

Habitat: *Drakaea elastica* is known to occur over a range of approximately 350 km, from Cataby in the north to Busselton in the south. The species grows on bare patches of grey-white sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps and flats, typically in Banksia woodlands or Spearwood (*Kunzea glabrescens*) thicket vegetation (Hoffman and Brown 1998 in recovery plan).

Biology: Drakaea seed is very fine and wind-dispersed, often for many kilometres. It relies on an association with mycorrhizal fungus to germinate its seed and supply nutrients to the plant throughout its life cycle. If the fungus disappears from the habitat, the orchid cannot survive.

Drakaea elastica typically occurs in areas of sparse understorey, on bare sand or with light leaf litter. These are often nutrient poor.

Identification: Individual plants may not flower every year. The plant dies back to a dormant underground tuber over summer. *Drakaea elastica* is distinguished from all other Drakaea species by its glossy light-green leaf. *D. glyptodon* and *D. livida* often grow in association with *Drakaea elastica* but *D. glyptodon* has a grey, often prominently veined leaf while *D. livida* has a dull, slightly grey-green leaf (Hoffman and Brown 1998 in *Drakaea elastica* recovery Plan). The best time to look for this plant is in July and August when the leaves are relatively conspicuous.

Dwarf Hammer-Orchid (Drakaea micrantha)

EPBC Act: Vulnerable

BC Act: Threatened Flora (Declared Rare Flora – Extant)

The following information on *Drakaea micrantha* is summarised from the Threatened Species Scientific Committee (TSSC; 2008a) unless otherwise referenced.

Description: *Drakaea micrantha* is a tuberous terrestrial herb, which has a flower 1.2 - 2.5 cm long, on a stem up to 30 cm high. Its heart shaped leaf is silvery – grey with prominent green veins (Figure 8). The species flowers from September to October (Brown *et. al.,* 2013).

Habitat: *Drakaea micrantha* is known from scattered populations from Perth to Albany. The species is usually found in cleared fire breaks or open sandy patches that have been disturbed, and where competition from other plants has been removed.

Identification: The species is distinguished from the similar 'King-in-his-carriage' orchid (*Drakaea glyptodon*), by its smaller flower, prominent apical projection to the column and less pouched labellum (Brown *et. al.,* 2013).

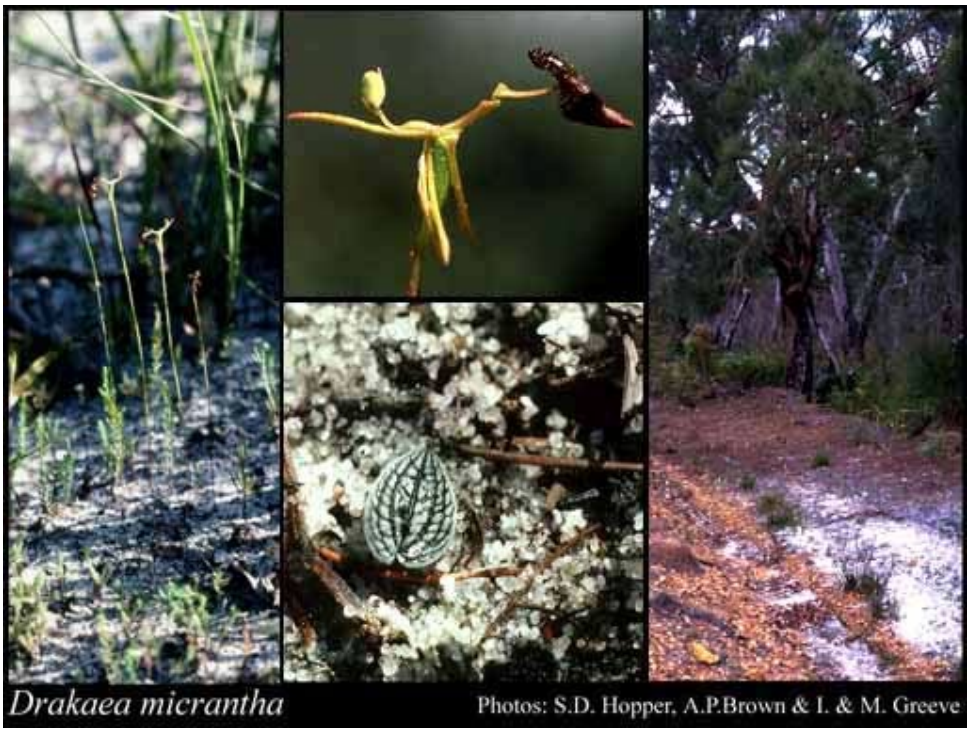

Figure 8: Images of Drakaea micrantha (source: WA Herbarium 1998-)

Dwarf Bee-Orchid *(Diuris micrantha)*

EPBC Act: Vulnerable

WC Act: Threatened Flora (Declared Rare Flora – Extant)

The information presented below on *Diuris micrantha* was summarised from TSSC (2008b) unless otherwise referenced.

Description: *Diuris micrantha* has a basal tuft of narrow, linear leaves and a loose, slender inflorescence up to 60 cm high. The yellow flowers, which can number up to seven, have reddish-brown markings and are the smallest in the genus (Figure 9). Flowers appear from August to early October.

Habitat: *Diuris micrantha* is known from east of Kwinana and south towards the Frankland area. It is found in small populations, on dark grey to blackish sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water.

Identification: This species is distinguished from other, often co-occurring members of the *Diuris laxiflora* complex by its smaller flowers, usually more rod petals and shorter, generally flattened labellum mid-lobe (Brown *et. al.,* 2013).

Figure 9: Images of *Diuris micrantha* (source: WA Herbarium 1998)