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26 November 2019

Clearing Permit Section
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Delivered by email to: info@dwer.wa.gov.au

CLEARING PERMIT (PURPOSE PERMIT) APPLICATION FOR PART LOT 103 GREAT NORTHERN HIGHWAY, MIDDLE SWAN- BRICK STORAGE AREA

Emerge Associates (Emerge) has been engaged to provide environmental consultancy services to support a future hard stand storage area within part Lot 103 Great Northern Highway, Middle Swan (the 'application area').

The application area is approximately 4.95 hectares (ha) in size and supports 3.14 ha of 'non-native vegetation' which includes scattered native plants and bare ground, but which does not constitute an intact plant community. The proposed earthworks will necessitate the removal of all vegetation within the application area, with no vegetation within the application area proposed to be retained.

The following letter is provided in support of a clearing permit application (purpose permit) pursuant to Part V of the *Environmental Protection Act 1986* (EP Act) and includes the following attachments required by the Department of Water and Environmental Regulation (DWER).

- **Attachment 1** - Signed clearing permit application form.
- **Attachment 2** - Certificate of Title for Lot 103 Great Northern Highway, Middle Swan
- **Attachment 3** – Technical Memorandum – Flora and Vegetation Assessment, Part Lot 103 Great Northern Highway, Middle Swan (Emerge Associates 2019b)
- **Attachment 4** - Technical Memorandum – Fauna Assessment, Part Lot 103 Great Northern Highway, Middle Swan (Emerge Associates 2019a)
- **Attachment 5** - Clay Pit Earthworks Plan (Tabec Civil Engineering Consultants, 2019)
- **Email Attachments** to the submitted application: spatial data (shapefile) of the application area and zip file containing the IBSA data files.

Introduction and background

The application area is located within the northern portion of the Midland Bricks brickworks site, which is bounded by Reid Highway to the north, Great Northern Highway to the east, Bassett Road to the south, and the Swan River foreshore to the west. This portion of the brickworks site is located within the City of Swan (CoS) municipality and is zoned 'Industrial' under the Metropolitan Region Scheme (MRS) and 'General Industrial' under CoS Local Planning Scheme (LPS) No. 17. Infrastructure associated with the brickworks surrounds the application area; the northern, eastern and southern boundaries typically follow the edges of sealed internal roads and the western boundary is formed by conveyor infrastructure, which together with an internal road, separates the application area from the Swan River foreshore. The location and extent of the application area is shown in **Figure 1**.

The purpose of the clearing is to facilitate the conversion of the inundated clay basin and surrounding area into a hardstand area for brick storage as shown in the Clay Pit Earthworks Plan (**Attachment 5**). The inundated clay basin is not a natural surface water feature and does not meet the definition of a watercourse¹. The clay basin currently receives water directly from rainfall, in addition to stormwater runoff from within the northern portion of the Midland Bricks site and the surrounding catchment. In order to preserve the basin's existing stormwater drainage function, two swales will be constructed and maintained to receive stormwater from the area, with provision of a pumped system to then transfer the water to the existing system consistent with its current operation.

A Development Application is being lodged with the City of Swan concurrently with this clearing permit application, to facilitate the proposed earthworks outlined. Clearing and earthworks is anticipated to begin in March 2020 once the relevant approvals have been obtained.

Summary of environmental conditions

Historical clearing

Review of historical images available from 1965 (Landgate 2019) onwards indicates the majority of the application area was historically cleared of native vegetation for industrial land uses associated with the Midland Brick site. As such, the application area has been subject to long term repeated historical disturbance. The application area was used for extraction and quarrying purposes until 1977, after which the clay basin was decommissioned and became inundated. From 1977 until present, the clay basin has changed shape several times due to areas being reclaimed/backfilled; an illustration of the type of material used, in addition to the current inundated clay basin and brick storage area is presented in **Plate 1 to Plate 3**.

Scattered vegetation surrounding the clay basin and the northern portion of the application area is present circa 2000, and it is uncertain whether those areas have been planted or regenerated naturally. The northern portion of the application area was converted to hard-stand circa 2016, for the purposes of brick storage. Refer to **Plate 4 to Plate 7** for examples of historical aerial imagery.

¹ Section 3, Rights in Water and Irrigation Act 1914.



Plate 1: Illustration of material historically used to infill the clay pit. Photograph taken from within the application area, close to the northern boundary, facing east.



Plate 2: inundated clay basin within the central portion of the application area.



Plate 3: bituminised brick storage area within the northern portion of the application area.



Plate 4: Aerial photograph of the application area in 1965 showing historical land clearance (WALIA 2019).



Plate 5: Aerial photograph of application area in 1974 showing historical land clearance (WALIA 2019).



Plate 6: Aerial photograph of the application area in 1983, Plate 7: Aerial photograph of the application area in 2001, showing water retention within the clay basin (WALIA 2019). showing vegetation regrowth and basin realignment (WALIA 2019).

Flora and vegetation values

A detailed flora and vegetation assessment encompassing the application area (in conjunction with the broader Middle Swan Brickworks facility) was undertaken by Emerge over two days: 18 September 2019 and 8 October 2019. The findings of this assessment that are of relevance to the application area are provided as a Technical Memorandum (**Attachment 3**). The following provides a summary of the flora and vegetation values pertaining to the application area.

The database search results identified a total of 27 threatened and 47 priority flora species occurring or potentially occurring within a 10 km radius of the application area. However, no occurrences of threatened or priority flora species were recorded during the field study and are subsequently not considered to occur within the application area.

The application area has been subject to long-term disturbance and modification, and as such only one plant community '**non-native vegetation**' was identified within the application area which was not considered representative of an intact plant community. This community was described as 'heavily disturbed areas comprising planted non-native trees and shrubs over non-native herbs and grasses, with occasional native shrubs and forbs', extending over 3.14 ha as shown in **Figure 2**. Given the plant community was not considered intact, a comparison to regional floristic community types (FCTs) could not be undertaken. Therefore, the plant community was not determined to be representative of a threatened or priority ecological community. Representative photographs of the plant community '**non-native vegetation**' are provided in **Plate 8** and **Plate 9** below.

Vegetation condition within the application area was assessed by Emerge as 'completely degraded' using methods from Keighery (1994). All vegetation within the application area was determined to be in a 'completely degraded' condition due to the intensive historical and ongoing disturbance from the Midland Bricks industrial land uses in the area. Vegetation condition mapping across the application area is provided in **Figure 3**.



Plate 8: Plant community non-native/cleared in 'completely degraded' condition, showing native Casuarina obesa trees (right).



Plate 9: 'Plant community non-native/cleared in 'completely degraded' condition

Fauna values

A level 1 fauna and targeted black cockatoo assessment has been completed across the application area and the broader Middle Swan Brickworks site. The findings of this assessment that are of relevance to the application area are provided as a Technical Memorandum (**Attachment 4**). The assessment was undertaken over three days: 18 September 2019, 8 October 2019 and 24 October 2019. The survey included the identification of all fauna species which could potentially occur within the application area based on existing habitat values, in addition to recording of opportunistic fauna observations.

As part of the fauna assessment, a search of the Department of the Environment and Energy's (DoEE) *Protected Matters Search Tool* was undertaken. A total of 10 conservation significant fauna species were identified from the database search and considered to have the potential to utilise the application area, including Carnaby's black cockatoo (CBC), Forest red-tailed black cockatoo (FRTBC), Baudin's black cockatoo (BBC), Quenda, Glossy Ibis, Australasian bittern, Blue-billed duck, Carter's freshwater mussel, Peregrine falcon and Pacific swift.

The fauna assessment indicated the fauna values within the application area are generally limited, given the intensive historical and ongoing disturbance causing limited vegetation cover. The vegetation within the application area provides limited habitat for common and widespread native species without specific habitat requirements. The inundated clay pit may contain turtles which are likely to be *Chelodina colliei* (oblong turtle), if present. While the clay basin may contain common turtle species which have non-specific habitat requirements, it is noted that these species are mobile and are able to move to preferable habitat within neighbouring conservation reserves, such as within the adjacent Swan River foreshore area.

A total of three fauna habitats were identified within the application area, 'scattered native and non-native trees and shrubs', 'cleared area' and 'water body' as shown in **Figure 4**. The majority of the application area comprises 'water body' which relates to the inundated clay basin extending over 1.81 ha, and 'cleared area' extending over 1.64 ha, both of which do not provide valuable fauna habitat due to the removal of most or all native vegetation. The remainder of the application area (1.50 ha) comprises 'scattered native and non-native trees and shrubs', which contains various planted species, particularly *Eucalyptus camaldulensis* (river red gum), and *Eucalyptus rudis* (flooded gum) over scattered native and non-native shrubs. The likelihood that this fauna habitat type would provide important habitat for conservation significant species is low, given its 'completely degraded' condition and limited extent.

The site does not provide breeding or foraging habitat for CBC, FRTBC or BBC due to the lack of forging plant species and suitable breeding trees. In addition, due to the scattered nature and limited number of large trees, in addition to the absence of any evidence of roosting activity, the site is not considered to contain any roosting habitat of local or regional importance to CBC, BC or FRTBC.

Response to EP Act Clearing Principles

When assessing clearing permit applications, DWER has regard to the ten clearing principles contained in Schedule 5 of the EP Act so far as they are relevant to the matter under consideration. In support of this permit clearing application, we have considered and responded to the ten clearing principles in the following sections. These responses have been prepared with reference to the applicable guidelines published by the (former) DER (2014).

Principle (a) - Native vegetation should not be cleared if it comprises a high level of biological diversity.

The application area is located within the Swan Coastal Plain, which as a region is recognised as an area of high biological diversity (EPA 2007). The detailed flora and vegetation survey (Emerge Associates 2019b) identified one plant community '**non-native vegetation**' extending over 3.14 ha of the application area, which comprises predominately non-native species with scattered native plants in a 'completely degraded' condition, as shown in **Figure 2**.

Based on the small extent of the vegetation proposed to be cleared (3.14 ha), and the degraded nature of vegetation, the vegetation is not considered to represent an intact plant community with high flora diversity. In addition, given no intact native plant communities were identified, no priority or threatened ecological communities are considered to occur within the application area.

In summary, the proposed clearing of 3.14 ha of plant community '**non-native vegetation**' within the application area is unlikely to have a significant impact on biological diversity. This is based on the following:

- a) The '**non-native vegetation**' plant community identified within the application area was considered to be too degraded to assign an FCT and consequently does not represent an intact plant community with high flora diversity.
- b) No priority or threatened flora species were observed within the application area. Overall, the flora species diversity within the application area is much lower than what would be expected if the land had not been previously cleared and subject to the high levels of disturbance and modification observed.
- c) Due to the level of historical disturbance, small extent and highly fragmented location of the application area surrounded by industrial land uses, the entirety of the vegetation is in a 'completely degraded' condition and provides habitat only for common and widespread fauna species. As a result, the application area does not support a high level of faunal diversity.

On the basis of the above, the application area does not contain native vegetation which comprises a high level of biological diversity and therefore the proposed clearing is not considered to be at variance with Principle (a).

Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

The level 1 fauna and targeted black cockatoo assessment identified three fauna habitats 'scattered native and non-native trees and shrubs', 'cleared area' and 'water body' as shown in **Figure 4**. Historical disturbance has significantly compromised the latter two habitat types, which extend over the majority of the application area and as a result does not provide valuable fauna habitat.

As such, fauna habitat is constrained to the areas of 'scattered native and non-native trees and shrubs', however the extent of this habitat within the application area is relatively small (1.50 ha). This habitat contains a mixture of *Eucalyptus camaldulensis*, with scattered *Eucalyptus rudis* over non-native grassland with occasional native species, and has limited potential to provide value to a range of native species including some that are conservation significant, such as species of Black Cockatoo. For the majority of the application area, habitat values are reduced by the previous removal of most or all of the native vegetation and now primarily provides limited habitat for common and widespread fauna species with non-specific habitat requirements.

The fauna assessment identified a total of 10 species of conservation significance considered to have potential to occur within the application area. However, no conservation species were recorded, and the likelihood that the application area would provide important habitat for these species is low, as the habitat within the application area is in relatively poor condition and limited in extent, as described below. A total of eight native and two introduced fauna species were directly or indirectly (from secondary evidence) recorded during the field survey of the broader Midland Brick site. Additionally, Midland Brick staff have advised Emerge Associates that the inundated clay pit has been observed to contain turtles, which are likely to be *Chelodina colliei* (oblong turtle). A fauna relocation plan will be prepared to support construction activities to manage any potential impacts to fauna within the application area.

The application area does not provide breeding or foraging habitat for the three threatened species of black cockatoo (CBC, FRTBC and BC) due to the lack of forging plant species and suitable breeding trees (native eucalypt trees with diameter at breast height (DBH) ≥ 50 cm). The site is not considered to contain any roosting habitat of local or regional importance to CBC, BC or FRTBC, due to the scattered nature and limited number of large trees, in addition to the absence of any evidence of roosting activity.

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. One ecological linkage, no. 35, occurs in the north western portion of the application area. This linkage appears to be associated with the Swan River and extends beyond the application area. The location of this linkage is shown in **Figure 5**. Whilst part of the application area intersects with the ecological linkage, the high degree of disturbance and modification to vegetation within the application area suggests it is unlikely that this vegetation provides any significant ecological linkage functionality.

Based on the above, it is unlikely that the application area would provide important fauna habitat to any conservation significant fauna species and as a result clearing is not considered to be at variance with Principle (b).

Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

The detailed flora and vegetation survey did not identify any threatened or priority flora species within the application area. In addition, there are no records of threatened flora species previously recorded within the application area.

A database search conducted over the application area identified several threatened and priority flora species as having potential to occur in the application area, based on landscape and soil mapping. However, the field survey determined that the application area does not provide suitable habitat for the identified species due to the high level of historical disturbance.

As no threatened or priority flora species has been identified within the application area, nor is it likely that any threatened or priority flora will occur, the proposed clearing is not considered to be at variance with Principle (c).

Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.

A database search conducted over the application area, indicated that no Threatened Ecological Communities (TEC)'s or Priority Ecological Communities (PEC)'s are known to occur, but that the following three TECs were considered to have potential to occur, based on geomorphology, soils and regional vegetation patterns:

- '*Corymbia calophylla* - *Kingia australis* woodlands on heavy soils, Swan Coastal Plain' TEC which is listed as 'endangered' under the EPBC Act and 'critically endangered' under the BC Act.
- '*Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain' TEC which is listed as 'endangered' under the EPBC Act and 'critically endangered' under the BC Act.
- 'Clay pans of the Swan Coastal Plain' TEC which is which is listed as 'critically endangered' under the EPBC Act and 'vulnerable' or 'endangered' under the BC Act, depending on the vegetation type.

As previously stated, the flora and vegetation survey determined that only one plant community '**non-native vegetation**' was identified within the application area. This community is characterised by a high level of disturbance through vegetation clearing and is no longer considered intact and therefore does not represent a listed community.

As no TECs or PECs have been identified within the application area the proposed clearing is not considered to be at variance with Principle (d).

Principle (e) – native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Based on the results of the flora and vegetation survey, vegetation within the application area is no longer an intact plant community, given the significant modification and disturbance to the vegetation as a result of historical and ongoing industrial land uses, which have resulted in its observed ‘completely degraded’ condition. As such, it is not considered to represent a significant remnant of native vegetation either at a local or regional scale and is unlikely to provide any significant ecological linkage functionality.

On this basis the proposed clearing is not considered to be at variance with Principle (e).

Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

The *Geomorphic Wetlands of the Swan Coastal Plain* dataset does not identify any mapped wetlands within the application area. The locations of mapped hydrography features in and near the application area is shown in **Figure 6**.

Examination of the Department of Water and Environmental Regulation (DWER) hydrography dataset (DWER 2018) shows a perennial lake occurring in the central portion of the application area, as well as a major drain in the south east of the application area (**Figure 6**).

As is illustrated in the aerial photography shown in **Plate 1 to Plate 4**, the mapped lake coincides with the location of the inundated clay basin which is not considered to be representative of a wetland or watercourse due to its artificial formation and highly modified hydrology. In addition, the vegetation surrounding the clay basin was not identified as riparian vegetation and is instead considered to comprise predominately non-native species with scattered native plants in a ‘completely degraded’ condition.

The mapped major watercourse (drain) occurs in the same location as the clay basin and hard stand infrastructure associated with the Midland facility. As is illustrated in the aerial photography shown in **Plate 4 to Plate 7**, there is not historical evidence for the existence of this drain, and since circa 2000, the majority of the supposed drains alignment has been covered by hardstand. It is probable that the drain was simply an artificial overflow path from the inundated clay pit, that follows the contours of the land to a low point in the south east corner. On this basis, the drain at no time reflected a natural watercourse, and site investigations related to future stormwater management, found no evidence of its existence.

Given the above, the DWER hydrology mapping does not reflect the current conditions of the application area, as no wetlands or watercourses are considered to be located within the application area.

As there are no wetlands or watercourses located within the application area, the proposed clearing is not considered to be at variance with Principle (f).

Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

For the purposes of this principle and in the context of the applicable guidelines (DER 2014), land degradation as a result of vegetation clearing includes:

- Increase in salinity
- Increase in waterlogging
- Nutrient export
- Increase in water and wind erosion
- Increase in soil acidity.

Landform and soil mapping undertaken by Churchward and McArthur (1980) indicates that the application area is situated within the ‘Pinjarra Plain’ which occurs along watercourses, and is described as ‘Poorly drained coastal plain with clayey to sandy alluvial soils and wet areas’ (Churchward and McArthur 1980).

Due to the features of these poor-draining soils and the application area’s proximity to the Swan River, the key risks for land degradation are; increased waterlogging, increase in water and wind erosion and nutrient export into the Swan River.

Two swales will be constructed and maintained within the application area to receive stormwater from the area with provision of a pumped system to then transfer the water to the existing system which is consistent with the current hydrology for the Midland Brock facility. The remainder of the stormwater system would operate as at present, with water continuing to flow to the Blackadder Creek tributary in frequently occurring events via the existing stormwater treatment system, and to the Swan River in larger events.

As such, the system will continue to capture, treat and convey surface water runoff from existing and future hardstand surfaces within the application area. This will reduce potential waterlogging and nutrient export into the Swan River.

The finished levels will tie in with the existing hard stand levels minimising risk of standing water collecting in localised depressions and potential waterlogging.

In addition, given the existing disturbance of the land across the application area, and the limited extent of the remaining vegetation, the proposed clearing of vegetation within the application area is considered unlikely to result in any appreciable land degradation to what already exists within the application area. Furthermore, the majority of the application area is proposed to comprise bituminised sealed areas providing greater protection against wind and water erosion than what currently exists.

On this basis, the proposed clearing of native vegetation is not considered to be at variance with Principle (g).

Principle (h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

No conservation areas occur within the application area. Bush Forever Site 302 (‘Swan River and Jane Brook, Ashfield to Upper Swan’) is located approximately 50 m to the west of the application area and extends further to the north and south-west. An Environmentally Sensitive Area (ESA) designation provides a buffer to Conservation Category Wetland (CCW) (UFI 14356), which coincides with the Swan River (**Figure 6**). The ESA protrudes into the application site, covering an area equal to ~0.7% of the application area. The majority of this area of protrusion is already cleared of native vegetation, as it serves as an access way for the conveyor that forms the western boundary of the application area.

Due to the condition and low value of the vegetation within the application area, and the separation of the application area from the Swan river foreshore by an internal Midland Brick access road and above ground

conveyor system, the application area is not considered to add value and function to either the CCW or the Bush Forever Site.

The proposed clearing and earthworks will be limited to the application area and will therefore will not impact on the environmental values within the adjacent ESA. In addition, two swales will be constructed and maintained within the application area to receive stormwater from the area with provision of a pumped system to then transfer the water to the existing system consistent with its current operation.

As such, the proposed clearing is not considered to be at variance with Principle (h).

Principle (i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

There are no wetlands or watercourses located within the application area, so the proposed clearing will not result in adverse impacts to surface water. There are also no sensitive receptors or groundwater dependent ecosystems within the application area. Nevertheless, dust mitigation measures will be implemented during clearing of vegetation and subsequent bulk earthworks to ensure that the proposed clearing of vegetation within the application area will not cause deterioration of surface water or groundwater in the surrounding area. In addition, two swales will be constructed and maintained within the application area to receive stormwater from the area with provision of a pumped system to then transfer the water to the existing system consistent with its current operation.

Acid sulfate soil (ASS) mapping prepared by DWER (2019) indicates that the application area is not mapped as occurring within an ASS risk area. It is noted that the land immediately adjacent to the west of the site is identified as having a high to moderate risk of ASS occurring within 3 m of the natural soil surface.

There is the potential for the presence of ASS at the base of the clay basin. If present as a measurable thickness, the bottom sediments will be managed via excavation and placement on a suitable treatment area where they can dry and be assessed in accordance with DWER guidelines to determine treatment requirements.

It is expected that the water removed from the clay basin will be managed through the existing stormwater infrastructure incorporating the settlement basins located in the far west of the Midland Brick landholding, and the subsequent storage lakes prior to discharge. This will allow any reactions to be completed and any resulting metals to be settled prior to any off-site discharge.

Based on the above, the proposed clearing of vegetation is consequently unlikely to cause ASS to be an issue.

The proposed clearing is therefore not considered to be at variance with Principle (i).

Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

A review of the *Perth Groundwater Map* (DWER 2018) indicates that the depth of ground level to the water table is between 0.8 m within the centre of the clay basin, to 7.5 m within the northern portion of the application area. The application area is not mapped as occurring within a floodplain area (DWER-003), and no wetlands are located within the application area, as shown in **Figure 6**.

Due to the limited extent of the remaining vegetation within the application area the proposed clearing of vegetation is considered unlikely to cause or exacerbate the incidence of flooding. Notwithstanding this, two swales will be constructed and maintained within the application area to receive stormwater from the area with provision of a pumped system to then transfer the water to the existing system consistent with its current operation.

Based on the above, the proposed clearing is not considered to be at variance with principle (j).

Summary and closing

The proposed clearing permit application area is approximately 4.95 ha in size and contains:

- 3.14 ha of heavily degraded/cleared areas consisting of non-native vegetation, bare soil, weeds and occasional individual native shrubs or trees.

In summary:

- All native vegetation within the application area has been assessed as being in a 'completely degraded' condition and does not represent a high level of biological diversity.
- Fauna habitat values within the application area are limited and do not provide significant habitat for native fauna. Minimal roosting habitat for black cockatoos occurs within the application area, however, the importance of this habitat to black cockatoo species is limited given its highly disturbed and modified condition, the absence of evidence of habitat usage by black cockatoos, and the high availability of more suitable black cockatoo habitat in surrounding areas.
- No threatened or priority flora species were recorded within the application area during the survey, nor are any considered likely to occur.
- No threatened or priority ecological communities occur within the application area.
- The vegetation within the application area is not considered an intact plant community complexes due to its 'completely degraded' condition and therefore not considered significant as a remnant of native vegetation in the area.
- The regional mapping did not identify any wetlands within the application area. While the inundated clay basin is identified within the DWER hydrography mapping as a 'perennial lake', the water body is not reflective of this due to its artificial formation and highly modified hydrology. In addition, the vegetation surrounding the clay basin was not identified as riparian vegetation and is instead considered to comprise predominately non-native species with scattered native plants in a 'completely degraded' condition.
- The DWER hydrography mapping identifies a 'major drain' within the application area; however, there is not evidence on site to support the existence of this drain.
- The proposed clearing will not cause appreciable land degradation.
- The proposed clearing of vegetation is unlikely to impact upon the environmental values of nearby conservation areas and there are no conservation areas identified within the application area.
- The proposed clearing is not considered to pose a risk of deteriorating surface or groundwater.
- The proposed clearing is not likely to cause or exacerbate a risk of flooding.

Yours sincerely
Emerge Associates



Ashley Bird

SENIOR ENVIRONMENTAL CONSULTANT

- Encl: Figure 1: Application Area Location
Figure 2: Plant Communities
Figure 3: Vegetation Condition
Figure 4: Fauna Habitat
Figure 5: Environmental Features
Figure 6: Hydrological Features

Attachment 1: Signed Clearing Permit Application C2 Form
 Attachment 2: Certificate of Title for Lot 103 Great Northern Highway, Middle Swan
 Attachment 3: Flora and Vegetation Technical Memorandum
 Attachment 4: Level 1 Fauna and Targeted Black Cockatoo Assessment Technical Memorandum
 Attachment 5: Clay Pit Earthworks Plan (Tabec Civil Engineering Consultants, 2019)
 Email Attachments to the submitted application: spatial data (shapefile) of the application area and zip file containing the IBSA data files.

General references

Churchward, H. M. and McArthur, W. M. 1980, '*Landforms and Soils of the Darling System, Western Australia*', in Department of Conservation and Environment (ed.), *Atlas of Natural Resources Darling System Western Australia*, Department of Conservation and Environment.

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Department of the Environment and Energy (DoEE) 2019, *Protected Matters Search Tool*, <<http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>>.

Landgate 2019, *Map Viewer*, viewed November 2019, <https://www0.landgate.wa.gov.au/maps-and-imagery/interactive-maps/map-viewer>

Western Australian Herbarium 2019, *FloraBase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. <<https://florabase.dpaw.wa.gov.au>>.

Figures



Figure 1: Application Area Location

Figure 2: Plant Communities

Figure 3: Vegetation Condition

Figure 4: Fauna Habitat

Figure 5: Environmental Features

Figure 6: Hydroglogical Features



Scale: 1:12,500@A4
GDA 1994 MGA Zone 50

Plan Number: EP19-105(2)-F39a
 Drawn: RAW
 Date: 26/11/2019
 Checked: BRB
 Approved: ACW
 Date: 26/11/2019

Figure 1: Application Area Location

Project: Clearing Permit Application
 Lot 103 Great Northern Highway, Middle Swan

Client: Boral Bricks Western Australia Pty Ltd

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used



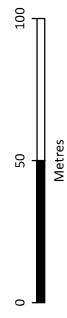
Application area [Red outline]

Cadastral boundary [Black outline]

Plant communities

- Non-native vegetation** [Yellow fill]
- Water body** [Blue hatched fill]

Heavily disturbed areas comprising planted non-native trees and shrubs over non-native herbs and grasses, with occasional native shrubs and forbs.



Scale: 1:2,500@A4
GDA 1994 MGA Zone 50



Plan Number: EP19-105(22)-F40a
Drawn: RAW
Date: 26/11/2019
Checked: BRB
Approved: ACW
Date: 26/11/2019

Figure 2: Plant Communities

Project: Clearing Permit Application
 Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

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Application area
 Cadastral boundary

Vegetation condition

- Pristine
- Excellent
- Very good
- Good
- Degraded
- Completely degraded
- Water body



0 50 100
 Metres
 Scale: 1:2,500@A4
 GDA 1994 MGA Zone 50



Plan Number: EP19-105(2)-F41a
 Drawn: RAW
 Date: 26/11/2019
 Checked: BRB
 Approved: ACW
 Date: 26/11/2019

Figure 3: Vegetation Condition

Project: Clearing Permit Application
 Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

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406600

406400

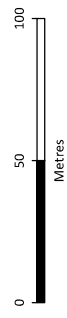
406200

6473800

6473600

6473800

6473600



Scale: 1:2,500@A4
GDA 1994 MGA Zone 50



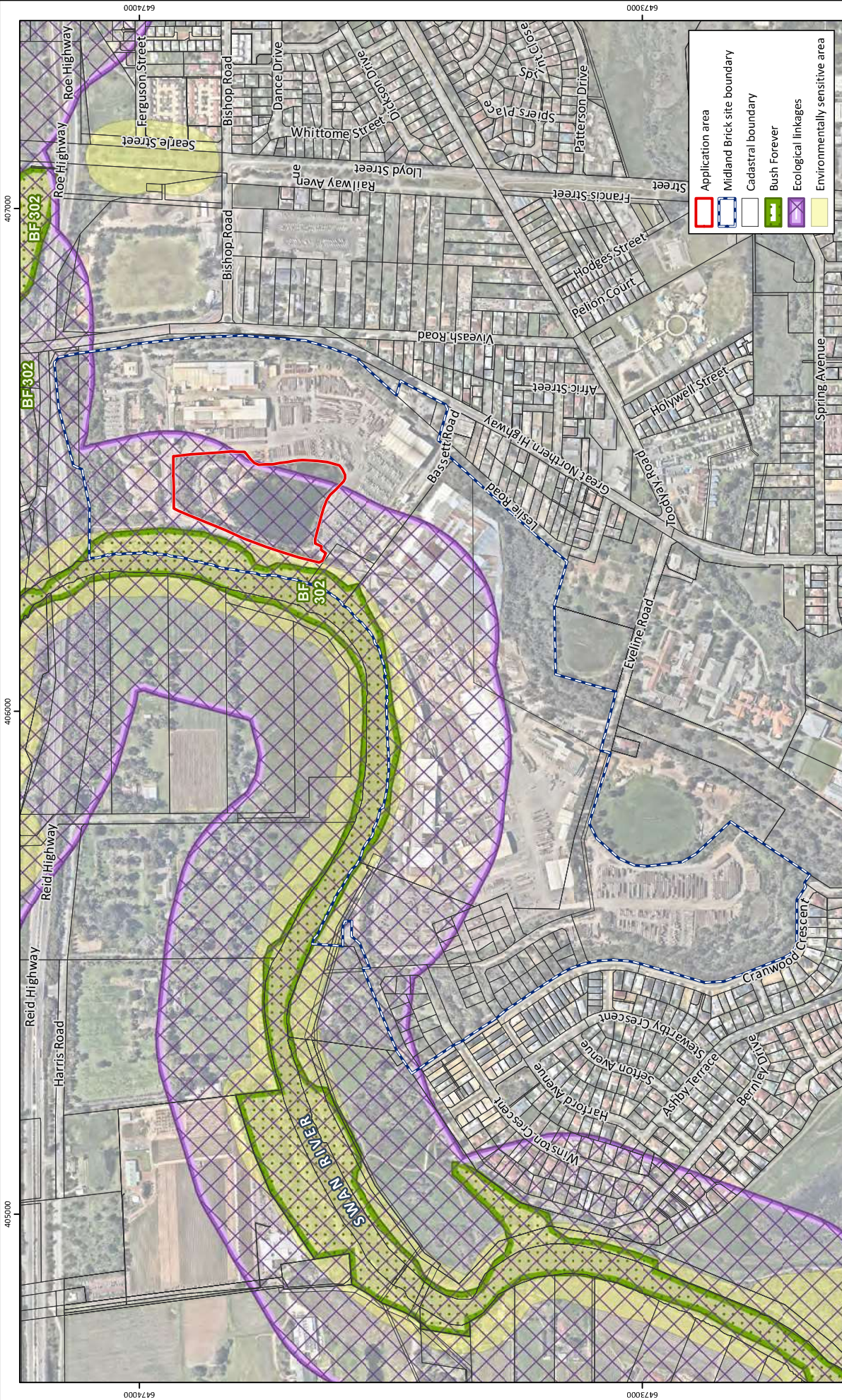
Plan Number: EP19-105(2)-F42a
 Drawn: RAW
 Date: 26/11/2019
 Checked: BRB
 Approved: ACW
 Date: 26/11/2019

Figure 4: Fauna Habitat

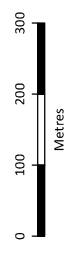
Project: Clearing Permit Application
 Lot 103 Great Northern Highway, Middle Swan
 Client: Boral Bricks Western Australia Pty Ltd



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	Application area
	Midland Brick site boundary
	Cadastral boundary
	Bush Forever
	Ecological linkages
	Environmentally sensitive area



Scale: 1:10,000@A4
GDA 1994 MGA Zone 50



Plan Number:	EP19-105(22)-F43a
Drawn:	RAW
Date:	26/11/2019
Checked:	BRB
Approved:	ACW
Date:	26/11/2019

Figure 5: Environmental Features

Project: Clearing Permit Application
Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used

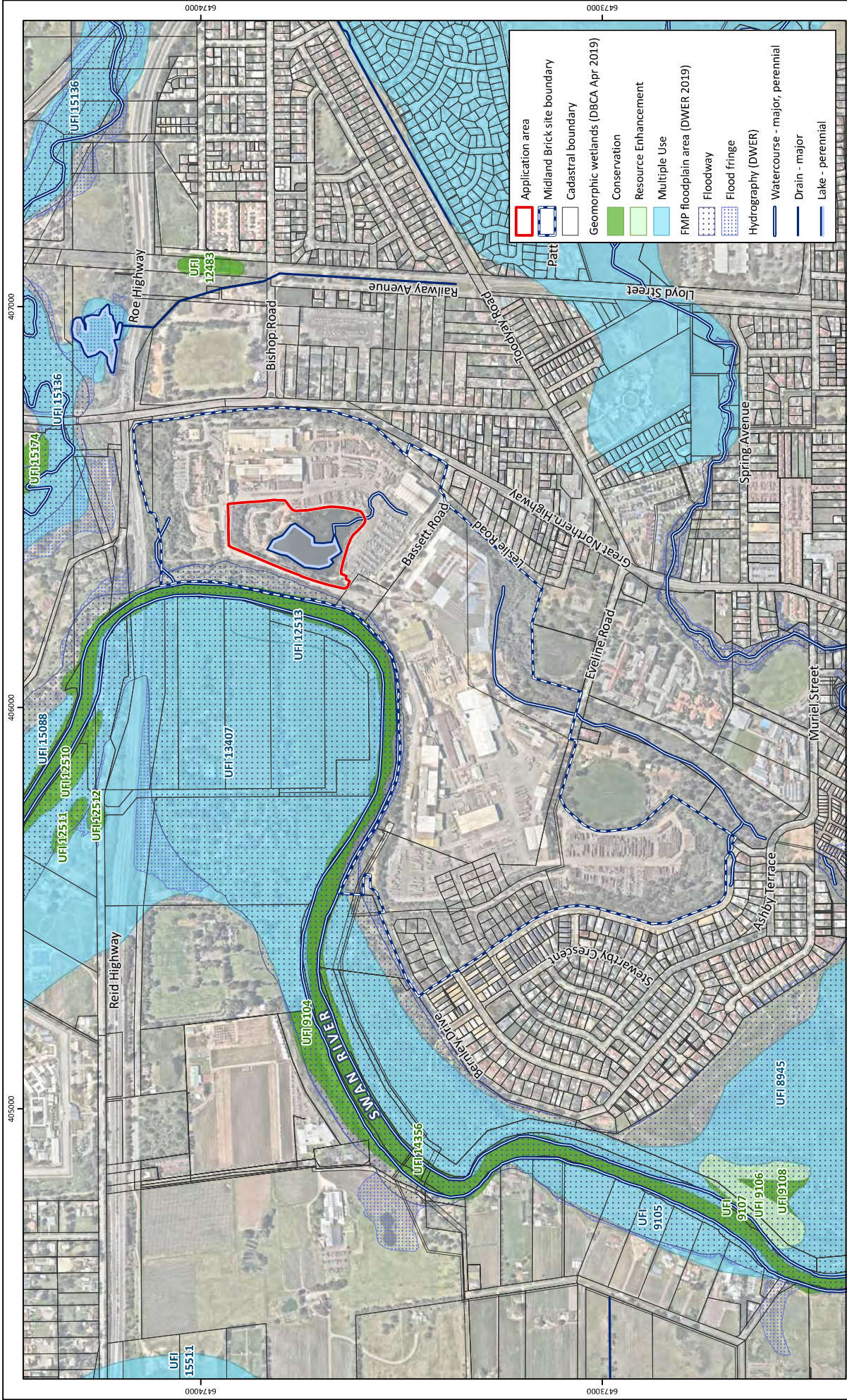


Figure 6: Hydrological Features

Project: Clearing Permit Application
 Lot 103 Great Northern Highway, Middle Swan
Client: Boral Bricks Western Australia Pty Ltd

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