

Bush fire risk assessment

Elizabeth Drive Landfill Expansion
Environmental Impact Statement

Prepared for:
SUEZ Recycling and Recovery Pty Ltd

July 2019



AUSTRALIAN BUSHFIRE CONSULTING SERVICES



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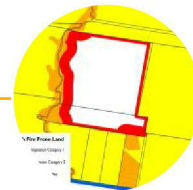
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Bush Fire Assessment Report



SUEZ Recycling & Recovery

Elizabeth Drive Landfill

3rd October 2018
Reference 18-205/1

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Abbreviations:

ABCS	Australian Bushfire Consulting Services Pty Ltd
APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 including amendments 1-3
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Penrith City Council
DA	Development Application
DSF	Dry Sclerophyll Forest
EP&A Act	Environmental Planning and Assessment Act - 1979
ELVIS	Geoscience Australia Elevation Information System
ESD	Ecologically Sustainable Development
FR NSW	Fire & Rescue NSW
IPA	Inner Protection Area
LGA	Local Government Area
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2006
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Executive summary.

As part of a proposal to raise the height of the landfill by 15 metres Australian Bushfire Consulting Services has been engaged by SUEZ Recycling & Recovery C/o AECOM to provide a Bush Fire Report in response to the following request by the Department of Planning to assess:

hazards and risk – including:

- *an assessment of the risk of bushfire, including addressing the requirements of Planning for Bush Fire Protection 2006 (RFS). Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers). Provision is to be made for their appropriate management into the future.*

fire and incident management – including:

- *an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines;*

I have inspected the property and have consulted informally with the NSW Rural Fire Service regarding the proposal in the preparation of this report. I have composed this report on the existing conditions with respect to bushfire protection measures observed. Where appropriate this includes building construction, asset protection zones, service supply, access, emergency management planning and any other matters considered appropriate to bush fire protection.

In undertaking my assessment, I give reference to, and have sought to abide by, the NSW RFS Fast Fact 1/12 *Application of s100B* which details:

In order to adequately protect persons and property, the RFS may deem it necessary to apply conditions to an existing development on bush fire prone land that is the subject of a development application.

This would arise in situations where the RFS is determining an application for a Bush Fire Safety Authority (BFSA) for a site that incorporates an existing development (e.g. subdivision of a site that includes an existing dwelling), or development which is an extension to an existing special fire protection purpose development).

The conditions of the BFSA may require modification to the land or existing structures which lie outside the physical boundaries of the new development proposal. For such situations the extent to which upgrading is applied will be reasonable and commensurate with the works proposed. In addition, there will be a link between any conditions imposed and the subject of the development and the link will not be too remote.

Further to this, the Land and Environment Court adopted the Newbury test as the accepted test for determining the validity of consent conditions in NSW. In order to be valid under the Newbury test, a condition must:

*be imposed for a planning purpose
fairly and reasonably relate to the development for which permission is given
be reasonable*

The RFS will also consider the Newbury test when recommending conditions for the provision of bush fire protection measures.

This application does not seek a Bush Fire Safety Authority from the NSW RFS and the development does not seek approval for any new buildings, residential development, Special Fire Protection Purpose development, change of use or intensification of existing uses. There are no extensions to the existing site or development boundaries or modification of land use zones that would otherwise allow for additional uses. The application is simply for an increase in height of the final landfill which will extend the operating timeframe of the site.

In this instance I conclude that the current application is outside the scope whereby upgrading works can be enforced on existing structures. Moreover, it is my considered opinion that, regardless of the above, upgrading works are not warranted in this instance.

I have however, considered the site in a wholistic approach and, again with consideration to the aforementioned Fast Fact, taken into account matters that are appropriate to the ongoing use of the site including access arrangements, emergency management planning, service supply to assist emergency services personnel and ongoing maintenance of existing bushfire protection measures.

It has transpired that, the degree to which these matters are currently catered for, warrants no additional recommendations being imposed for bushfire protection reasons. I have included a recommendation to ensure that the existing asset protection zone around the perimeter of the landfill area continues to be maintained for the operational use of the site.

I have also assessed the existing bushfire risk onsite and any potential increase in bushfire risk that may be incurred by this proposal. It is my opinion that the bushfire risk is low and that this proposal does not increase that risk, nor is it detrimental to any existing bushfire protection measures currently present.

The end use of this site as a final capped landfill is many years away and rezoning to industrial uses to coincide with the future airport occupation is likely to occur in this locality. A reassessment of the site's restoration and bushfire protection measures should be undertaken at the time the site ceases to operate as an active landfill.

1.0 Introduction.

The subject site is located over two separate lots at 1725a Elizabeth Drive, Badgerys Creek. Within the southeast corner of the site is an office, weigh bridge and ancillary structures used for the operation, management and maintenance of the site. In the northwest corner of the site is an existing resource and recovery plant for recycling purposes. Across the site is a methane recovery system that feeds a power generating plant and any excess gasses is flared off in a controlled manner. The resource recovery plant operates under a separate planning approval and is not directly affected by this development application.

The site is surrounded by RU2 zoned rural land to all aspects. Badgerys Creek is within an E2 zoned corridor along the western portion of the site. The subject site is situated to the north / north east of the proposed Western Sydney Airport.

2.0 Property details.

Address: 1725a Elizabeth Drive Badgerys Creek
Lot/DP: Lots 1 DP 542395 & Lot 740 DP 810111
Zoned: RU2 Rural Landscape & E2 Environmental Conservation
LGA: Penrith City Council

3.0 Legislative context.

This report has been prepared as a submission document in support of an Environmental Impact Statement to the Sydney Western City planning Panel. In terms of assessment under PBP 2006 the development is captured under section 4.3.6 “*PBP and other development*” which states:

Applications for developments that are not residential/rural residential subdivisions, SFPPs or residential infill should:

- *note the range of available bush fire protection measures;*
- *satisfy the aim and objectives of PBP;*
- *propose an appropriate combination of bush fire protection measures, with evidence that the intent of each measure (with reference to the relevant Tables in sections 4.1.3 and 4.2.7 of PBP 2006) is satisfied.*

The proposal meets the aims and objectives of PBP 2006 by means of compliance with the deemed to satisfy provisions of this document.

4.0 Referenced documents and people.

The following documents have been referenced in the preparation of this report;

- Penrith Local Environmental Plan 2010
- Penrith Development Control Plan 2014,
- Penrith City Council’s Bushfire Prone Land Map,
- AS3959 – 2009 Construction of buildings in bushfire prone areas,
- Planning for Bush Fire Protection 2006,
- Rural Fires Act 1997
- Rural Fires Regulation 2013
- 10/50 Vegetation Clearing Code of Practice
- NSW RFS Guide for bush fire prone land mapping V5b Nov 2015
- Ocean Shores to Desert Dunes – David Andrew Keith 2004

I have inspected the property on 28/8/18. On this occasion I had free access within the subject site with views into the neighbouring lots to all aspects. have consulted with the NSW Rural Fire Service regarding the proposal in the preparation of this report.

5.0 Copyright, scope and disclaimer.

This assessment of possible bushfire impact (including smoke, ember, radiant heat and flame contact) and compliance with other matters such as access and service supply is pertinent to the subject site only. Where reference has been made to the surrounding lands, this report does not assess impact to those lands rather it is an assessment of possible bushfire progression and impact on or from those lands towards the subject site.

Apart from any use permitted under the Copyright Act 1968 no part of this document, including any wording, images, or graphics, can be modified, changed or altered in any way without written permission from Australian Bushfire Consulting Services Pty Ltd. This report may only be referenced, distributed or forwarded to other parties in its original format.

The statements and opinions contained in this report are given in good faith and in the belief that such statements and opinions are correct and not misleading.

AS3959 – 2009 states that “...there can be no guarantee that a building will survive a bushfire event of every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions”. The NSW RFS state “Homes are not designed to withstand fires in catastrophic conditions”. Correspondingly any representation, statement of opinion, or advice expressed or implied in this document is made on the basis that Australian Bushfire Consulting Services Pty Ltd is not liable to any person for any injury, damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice made by Australian Bushfire Consulting Services Pty Ltd.

6.0 Images and maps.



Image 01: Aerial image from NSW Land &Property Information / Spatial Information Exchange

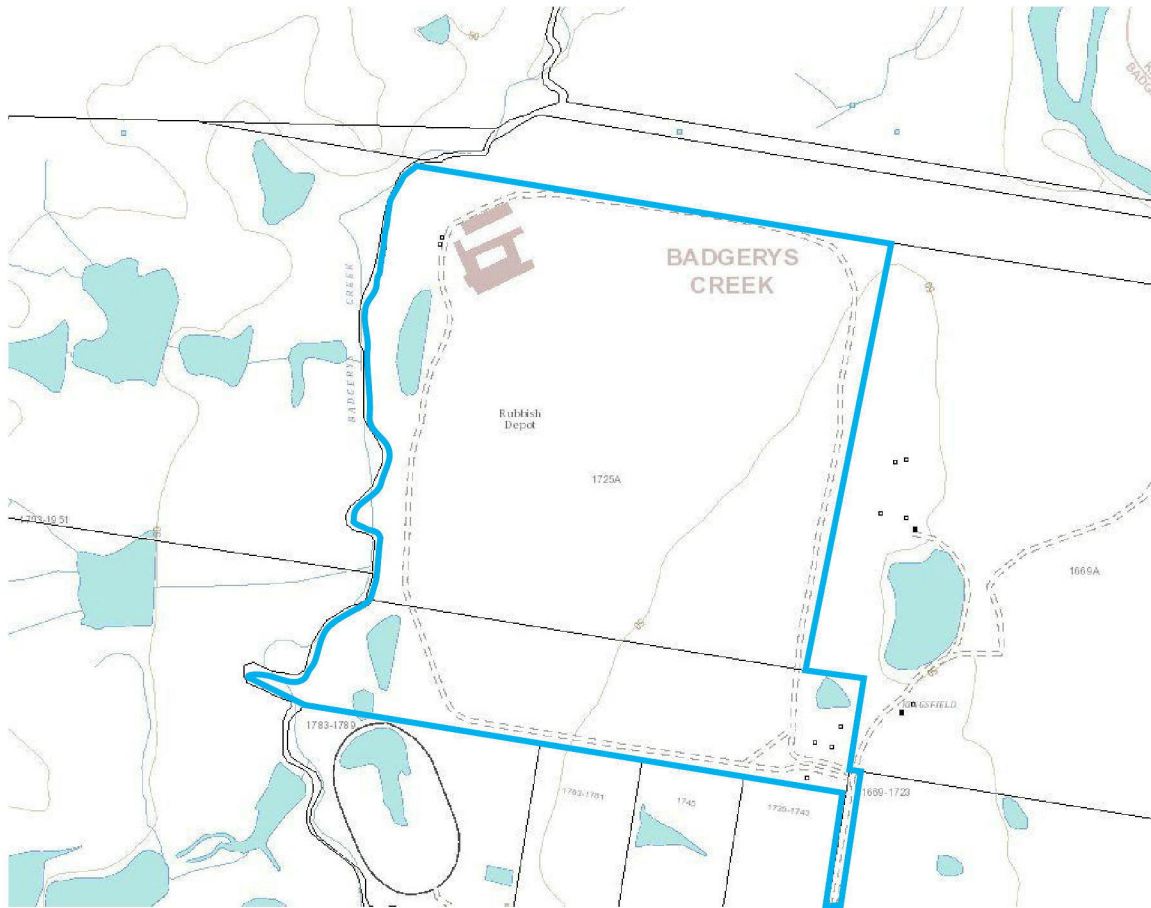


Image 02: Topographic image from NSW Land & Property Information / Spatial Information Exchange

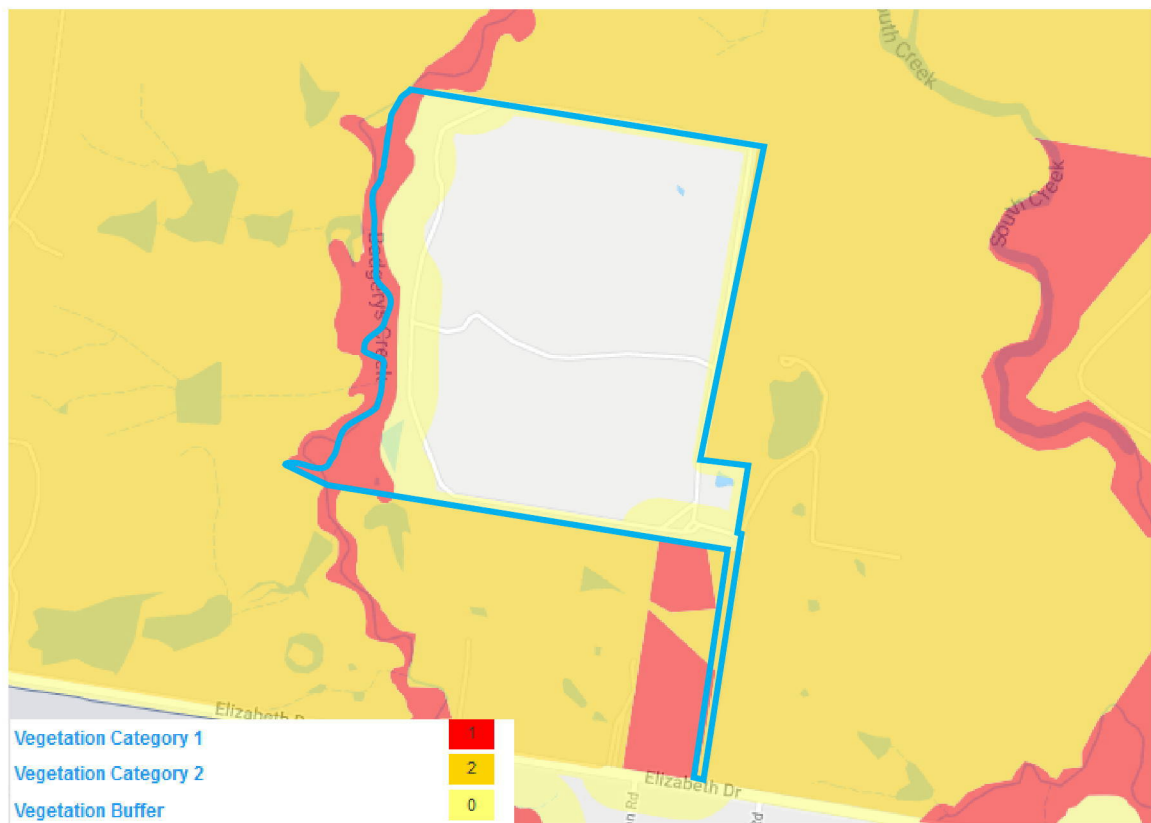


Image 03: Extract of Penrith City Council's Bushfire Prone Land Map from Dept Planning Property Information

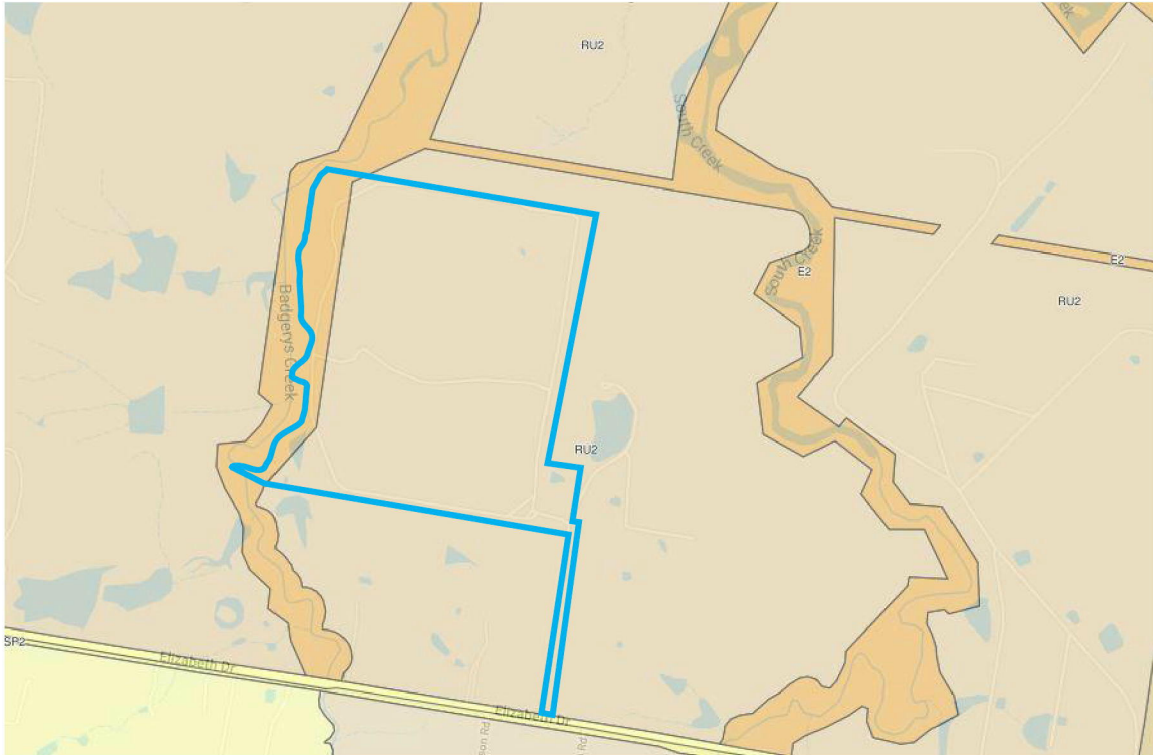


Image 04: Extract from Penrith City Council LEP Zoning Map from Dept Planning Property Information

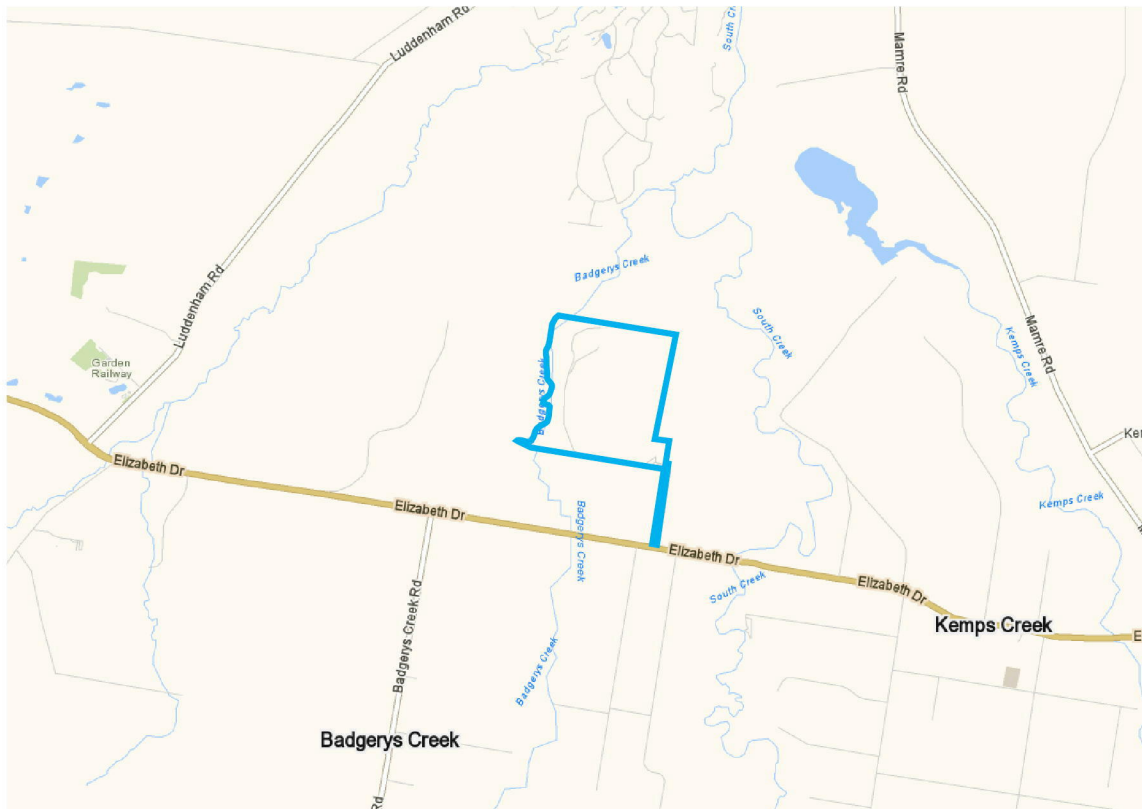


Image 05: Extract from whereis.com

7.0 Bush fire hazard assessment

Properties considered to be bushfire prone land are identified on Penrith City Council's Bushfire Prone Land Map as being:

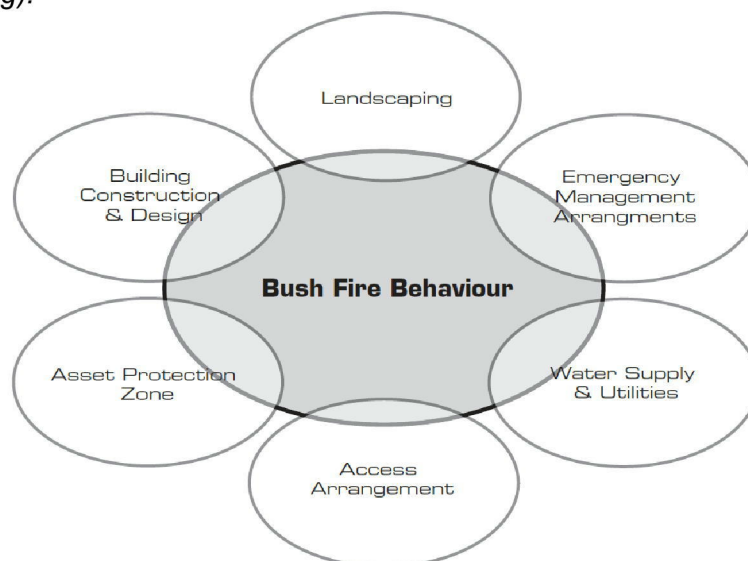
- *Within, or within 100 m of, Category 1 (high) hazards or,*
- *Within, or within 30 m of, Category 2 (low) hazards or,*
- *Within, or within 30 m of, Category 3 (medium) hazards.*

The proposed development has been assessed in terms of section 4.3.6 of PBP 2006 and the submission requirements detailed within Appendix 4 section A4.1 of PBP 2006 have been used as a guide to assess the site and formulate this report and include;

- *a statement that the site is bush fire prone land, where applicable*
- *the location, extent and vegetation formation of any bushland on or within 100 metres of the site*
- *the slope and aspect of the site and of any bush fire prone land within 100 metres of the site which may determine the likely path of any bush fires*
- *any features on or adjoining the site that may mitigate the impact of a high intensity bush fire on the proposed development*
- *a statement assessing the likely environmental impact of any proposed Bush Fire Protection Measures*
- *whether any building is capable of complying with AS 3959-2009 in relation to the construction level for bush fire protection*

By incorporating bush fire protection measures into a development, the six objectives of PBP 2006 are addressed:

1. *afford occupants of any building adequate protection from exposure to a bush fire*
2. *provide for a defensible space to be located around buildings*
3. *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition*
4. *ensure that safe operational access and egress for emergency service personnel and residents is available*
5. *provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)*
6. *ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).*



7.1 Site

The subject site is located at 1725a Elizabeth Drive Badgerys Creek. The existing infrastructure onsite includes an office, weigh bridge, an existing resource and recovery plant and ancillary structures used for the operation, management and maintenance of the site. Across the site is a methane recovery system that feeds a power generating plant and any excess gas is flared off in a controlled manner.

The site is surrounded by rural allotments to all aspects and Badgerys Creek riparian corridor is located along the western portion of the subject site.

Penrith City Council's Bushfire Prone Land Map identifies the property as containing Category 1 & 2 Vegetation and the 100 & 30 metre buffer zones from a Category 1 & 2 Vegetation. The potential bushfire prone vegetation was identified onsite as wooded vegetation associated with the riparian corridor along Badgerys Creek to the west, and potential grassland hazard within surrounding properties to all other aspects.

7.2 Vegetation

The vegetation considered to pose the highest bushfire threat is within the western portion of the subject site itself along Badgerys Creek. There is also potential of a grassland hazard occurring within surrounding properties to all other aspects.

The vegetation along Badgerys Creek comprised a mix of eucalypt and she oak trees 10 – 25 metres in height having approx. 50 – 60 % canopy foliage cover, with an understorey consisting of a sparse scattering of shrubs. Grasses were very short although this may just be a seasonal influence due to the recent poor rainfalls in the area. In the main the entirety of the vegetation along Badgerys Creek has been determined to be a forest.

Land within the properties to the remaining aspects consisted of large open plain grazing paddocks. At the time of my inspection grasses were found to be very short, cured and in areas non-existent with bare earth exposed. Again, it is assumed that this is just a seasonal influence due to the recent poor rainfalls in the area and it is recognised that the potential for these areas to pose a grassland hazard exists.



Photograph 01: View northwest along Badgerys Creek within the western portion of the subject site.



Photograph 02: View south along Badgerys Creek within the western portion of the subject site.



Photograph 03: View north adjacent Badgerys Creek within the western portion of the subject site.



Photograph 04: View northeast from the northeast corner of the subject site.



Photograph 05: View north from the northeast corner of the subject site.

7.3 Topography

PBP 2006 outlines that the slope must be assessed over a distance of at least 100m from the existing property boundary (or building footprint) towards the various vegetation communities constituting the hazard. In assessing the slope, it may be found that there are a variety of slopes covering different distances. The gradient within the hazard (vegetation) which will most significantly influence the fire behaviour must be determined.

The surrounding pastures to the north and east were found to be flat to slightly undulating downslope away from the site. The property to the south is also on a slight downslope of approx. 1 degree toward Elizabeth Drive. To the west of Badgerys Creek there is a slight upslope of 1 – 2 degrees away from the site.

Along Badgerys Creek there appeared to be little discernible fall in either direction although Badgerys Creek itself drains to the north. The effective slope to the western aspect has been assessed to be 0 degrees or upslope.

7.4 Asset Protection Zones

An Asset Protection Zone (APZ) is a buffer zone between a bush fire hazard and buildings, although can be used to describe any buffer applied adjacent a bush fire hazard to protect any form of asset such as the landfill site. In its functionality the APZ can also act as a perimeter fire break, reducing the potential of any ignition within the landfill site to spread and ignite the surrounding area. An APZ is managed progressively to minimise fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack. This fuel-reduced, physical separation between assets and bush fire hazards is a key element in the suite of bushfire protection measures.

Minimum APZs for residential and other Special Fire Protection Purpose Development (e.g. schools) are determined under PBP 2006 and must be such that, during a bushfire event, a building footprint is not exposed to greater than 29 k/Wm² (residential) or 10 k/Wm² (special fire protection purpose development). APZs can be determined from either deemed to satisfy tables within PBP 2006 or by alternate solutions using bushfire design fire modelling. In the case of infill development such as this there are no minimum APZs applied or enforced however the aims and objectives of PBP 2006 apply.

To meet the aims and objectives of PBP 2006 a perimeter fire break should be provided around the land fill that would limit the potential for flame contact across the APZ, i.e. provide an APZ greater than or equal to potential flame length or commensurate with BAL 29 construction. This APZ would equate to 25 metres to the west and 10 metres to the south, north and east measures from the toe of the landfill batter outwards.

My inspection of the site found that the above APZ distances around the perimeter of the landfill are achieved or exceeded in all instances. There is no vegetation management or tree removal necessary to create the asset protection zones and as such there is no additional environmental impact of the bushfire protection measures. It is recommended that the existing APZ and any future landscaping is maintained in accordance with Appendix 2 & 5 of PBP 2006.

At the cessation of the landfill operations it is assumed that the final capped state is maintained grass only. Alternatively, the site may become repurposed for other activities which may reduce or remove any potential landscaping. Based on a current assessment of surrounding land uses it would be appropriate to recommend that the APZs to the north, east and south are maintained in perpetuity however the need to provide an APZ to Badgerys Creek is superfluous. Any future development on the western side of Badgerys Creek would need to address bushfire risk and apply APZs to Badgerys Creek regardless of this site's status.

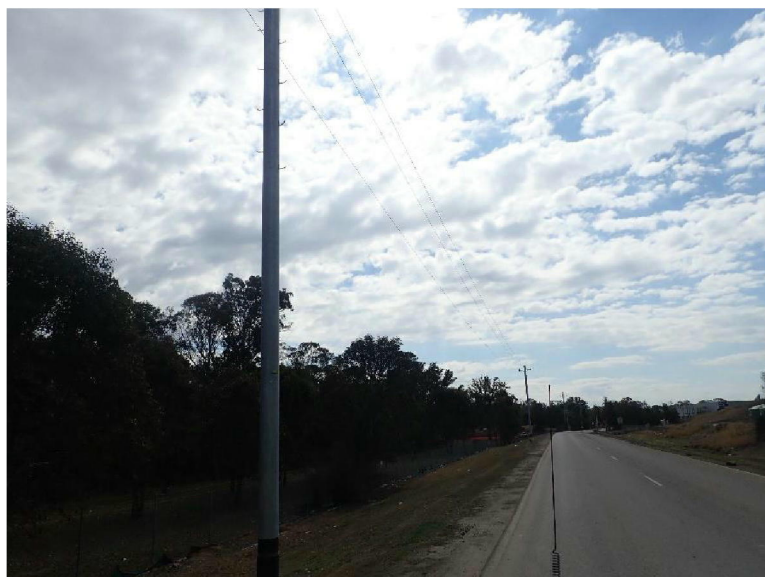
The end use of this site as landfill is many years away and rezoning to industrial uses to coincide with the future airport occupation is to occur in this locality. A reassessment of the site's restoration and bushfire protection measures should be undertaken at the time the site ceases to operate as a landfill.

7.5 Access & egress

The subject site has access to Elizabeth Drive via an 8 metre wide formed two way access drive which extends approx. 560 metres to the south. The formed access drive continues through to the resource and recovery centre in the northwest corner of the site adjacent to the southern boundary and north parallel to Badgerys Creek. In most areas the entire 8 metre width is fully formed and where it is marginally short of this width cleared verges exist ensuring a full 8 metre trafficable width is sustained.

Partway along the eastern boundary there is a dirt access drive which is two way and variable width. This road is traversed by trucks larger than a Category 1 Fire appliance on a day to day basis and is wide enough for them to pass in opposite directions. These access roads are interconnected by a perimeter service trail which completes entire perimeter access around the site. The service trail is 4 – 5 metres in width and by the nature of the sites uses and frequent traffic movements has verges either side which enables passing in opposite directions at regular intervals along its entire length. An internal loop is also available around the resource and recovery centre. Dissecting the entire site are vehicle tracks designed to enable the movement of heavy articulated vehicles.

It is my opinion that suitable access for fire services exist and no further recommendations are considered necessary. No new access drives or upgrades to existing service trails is required.



Photograph 06: View north along the internal access road adjacent Badgerys Creek.



Photograph 07: View south along the access drive adjacent the eastern boundary.

7.6 Services

Existing overhead electrical supply is available to the subject site and continues internally through to the resource and recovery centre. Reticulated water mains is also available to the site and an 80 mm ring main extends throughout the site. Hydrants are located at intervals around the perimeter and adjacent structures. The resource and recovery plant is fitted with internal sprinklers and this installation necessitated two back up static water supplies / fire suppression water tanks (estimated to hold approx. 500,000 litres). These tanks are dedicated to the fire suppression system and the external fittings available are camlock fittings. There are diesel pumpsets onsite capable of connecting to these tanks. In addition to the water tanks and hydrant system there are several large dams / water catchment retention areas that can be accessed by both tanker and aerial units should the need arise. There are large water transfer pump sets capable of transferring the water between dams onsite. There are also two overhead water truck filling points, one of which is fed via a pumpset from a dam.

The site currently has three water carts (trucks) used for wetting down the fill and each cart is fitted with a water cannon. The carts are capable of suppressing fires onsite and have been used to fulfil this role as a first response resource in the past. The carts include:

- 30 tonne CAT truck with spray bar and water cannon
- 40 tonne CAT truck with spray bar and water cannon
- Volvo 9,000 litre cart with spray bar and water cannon



Photograph 08: 30 tonne CAT truck with spray bar and water cannon.



Photograph 09: 40 tonne CAT truck with spray bar and water cannon.



Photograph 10: Volvo 9,000 litre cart with spray bar and water cannon

As part of its operation the site collects methane generated by the fill and utilises it to generate electricity in a small onsite power station. Any excess methane is flared off inside a chimney stack. The methane generator plant and flair stack are located greater than 140 metres from any wooded vegetation and greater than 100 metres from any grassland vegetation. Furthermore, burning methane does not generate embers or fire brands. There is minimal risk or potential ignition of surrounding bushland from the methane plant.

7.8 Emergency management plan / incident response

I have reviewed the Kemps Creek Resource Recovery Park Emergency Response Plan. This plan has a section addressing fires onsite however does not specifically address bushfire and tends to concentrate on fires within the landfill area. I recommend that this plan be updated to include appropriate triggers and responses to a bushfire event onsite. The plan shall be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.

8.0 Recommendations

8.1 Asset Protection Zones / landscaping

1. That the existing managed grounds around the perimeter of the landfill area within the subject property continue to be maintained as an asset protection zone, inner protection area, for a minimum distance of 10 metres along the northern, eastern and southern perimeter and 25 metres along the western perimeter of the land fill measured from the toe of the landfill outwards.

Note: These APZs are existing and this recommendation relates to their ongoing maintenance only.

8.2 Emergency management plan.

2. That the Kemps Creek Resource Recovery Park Emergency Response Plan is updated to include appropriate triggers and responses to a bush fire event onsite. The plan shall be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.

This plan should also specifically detail cessation of any hot works on predicted Catastrophic fire danger weather days or when a total fire ban has been declared. It is important to be aware of operations that may be carried out on days of Total Fire Ban and any prohibited activities or exemptions that are notified by the Commissioner of the NSW RFS under section 99 of the *Rural Fires Act 1997*. In the event of a Total Fire Ban being declared by the Commissioner of the NSW RFS, a formal request for exemption will need to be submitted for 'urgent and essential works'.

9.0 Conclusion

The subject property is determined to be bushfire prone land and it is appropriate to consider bushfire as part of any proposed development within the site. In this instance the application is for an increase in land fill height within an existing landfill depot only, which will extend the site's operational life. There is no new building or change of use and occupancy proposed. The development does not seek approval for any expansion, construction or intensification and a Bush Fire Safety Authority from the NSW RFS is not required.

I have undertaken an inspection of the site and in the context of the NSW Rural Fire Services Fast Fact 1/12 *Application of s100B* have made recommendations considered commensurate and appropriate to the proposal. In this undertaking I have considered matters that are appropriate to the ongoing use of the current activities including access arrangement, emergency management planning, service supply to assist emergency service personal and ongoing management of existing bushfire protection measures.

It has transpired that, the degree to which these matters are currently catered for, warrants no additional recommendations being imposed for bushfire protection reasons. I have included a recommendation to ensure that the existing perimeter asset protection zones around the perimeter of the landfill area continue to be maintained for the operational use of the site.

I have also assessed the existing bushfire risk onsite and any potential increase in bushfire risk that may be incurred by this proposal. It is my opinion that the bushfire risk is low and that this proposal does not increase that risk, nor is it detrimental to any existing bushfire protection measures currently present.

The end use of this site as landfill is many years away and rezoning to industrial uses to coincide with the future airport occupation is to occur in this locality. A reassessment of the site's landform and bushfire protection measures should be undertaken at the time the site ceases to operate as a landfill.

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List of attachments

Nil Attachments

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