


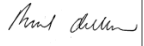


Bushfire Risk Assessment – Block 1582 Belconnen ACT

Canberra Sand and Gravel Relocation

Suburban Land Agency

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GHD Pty Ltd ABN 39 008 488 373

Level 15, 133 Castlereagh Street

Sydney, NSW 2000, Australia

T +61 421 935 356 | E mick.george@ghd.com | ghd.com

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1. Introduction

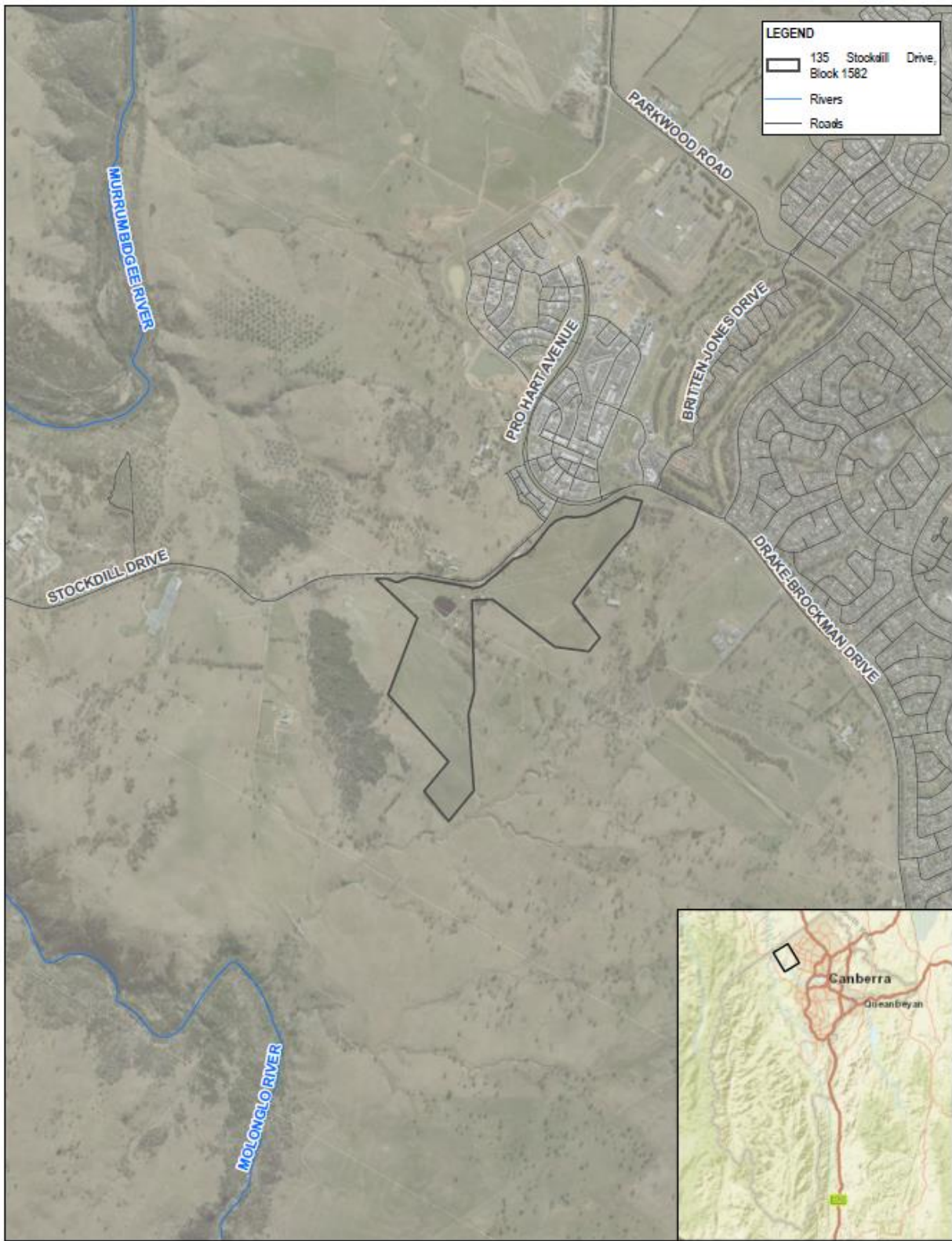
GHD Pty Ltd (GHD) was engaged to prepare a Bushfire Risk Assessment (BRA) for the Suburban Land Agency for a licenced area within Block 1582 Belconnen ACT. The BRA is to support specific requirements of a Development Application and comments from the ACT Emergency Services Agency (ESA) so that the proposed future land use is in an appropriate location to minimise the risk to life and property from bush fire attack.

The BRA covers a licenced area within Block 1582 Belconnen ACT (see Figure 1) and is to facilitate the temporary relocation of Canberra Sand and Gravel operations from the current site at the former Belconnen Landfill (Block 1686, off Parkwood Road), to the site. Within the site, the proposed works are towards the southern end, in an area that has previously been developed as a vineyard. The remainder of Block 1582 will continue to be owned and maintained by the Suburban Land Agency.

The current facilities include active composting of the greenwaste that is received, and this has been identified as a risk by the ACT ESA in relation to the potential for mulch fires to occur within the site and spread into nearby vegetation areas.

The proposed works within the licence area are shown on Figure 2 and will include:

- An all weather access road
- A new access point off Stockdill Drive
- 40,000 litre firefighting water supply with associated hardstand
- Utility connections as required
- Earthworks and structures to accommodate the operations as indicated in the plans provided (Figure 2).
- Works to manage stormwater and runoff.
- Fencing, minor landscaping and other associated works.




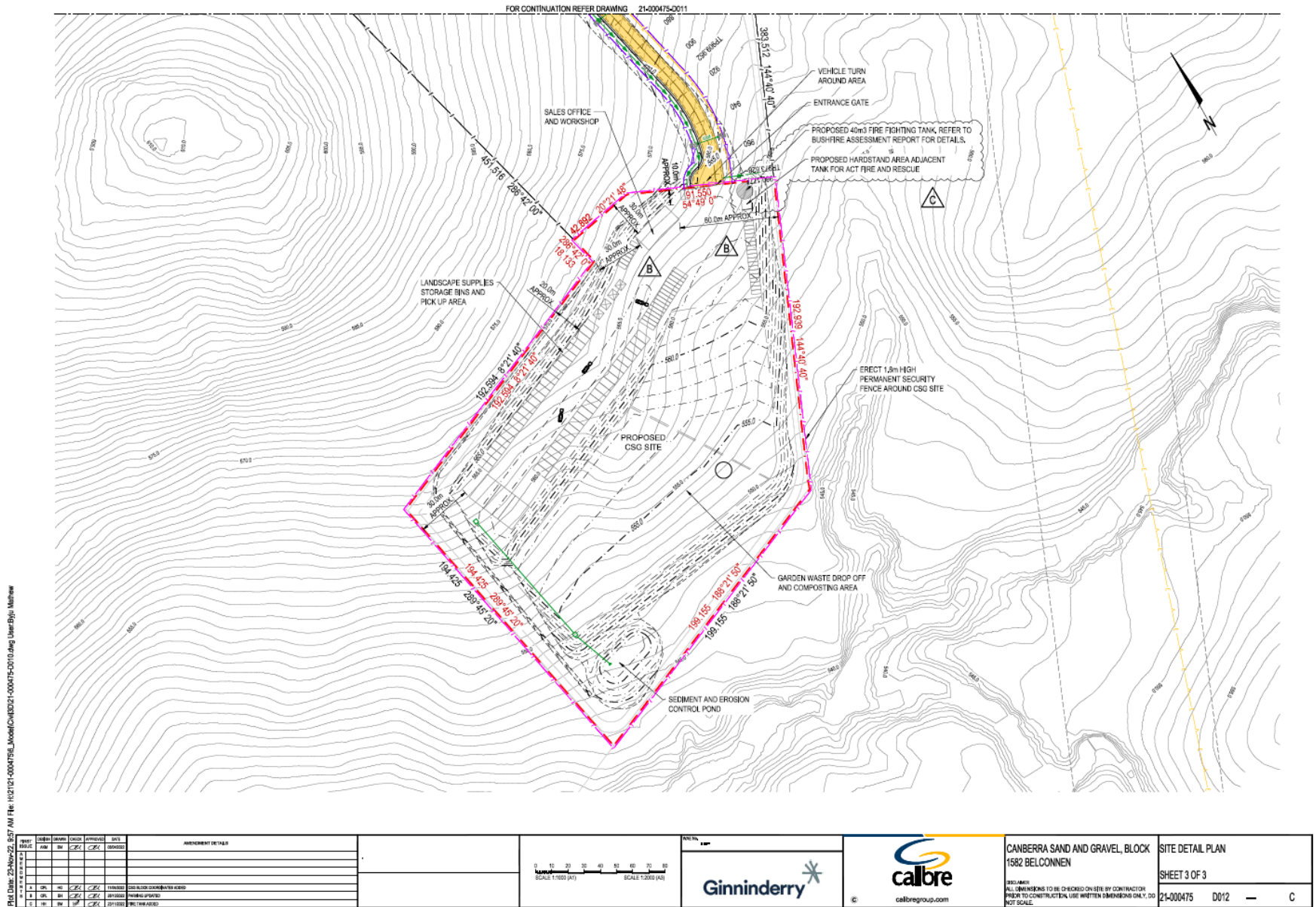
<p>Paper Size ISO A4</p> <p>0 0.5 1 Kilometres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 55</p>		<p>Suburban Land Agency - ACT Govt Canberra Sand and Gravel Relocation Bushfire Risk Assessment</p>	<p>Project No. 12593690 Revision No. A Date 28/10/2022</p>
<p>Site Location</p>			<p>FIGURE 1</p>

Figure 1 Proposed site and existing land uses



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 Plot Date: 23/06/21 2:57 PM

Figure 2 Site detail plan

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

1.1 Purpose of this report

The BRA addresses the bush fire risk and the potential impact of potential development in the identified areas upon the wider infrastructure network to assess the appropriateness of the proposal in the bush fire hazard context, particularly with regard to the risk of and from mulch fires. The BRA will assess the strategic implications for bush fire mitigation and management.

1.2 Scope and limitations

This report has been prepared in accordance with the Strategic Bushfire Management Plan 2019 - 2024 (SBMP) and ACT Bushfire Management Standards (BMS), addressing the following:

- Bush fire landscape assessment
- Land use assessment
- Access and egress
- Emergency services
- Infrastructure
- Adjoining land.

GHD proposed the following scope to address the requirements of the report:

- Site inspections to collect site information and data.
- Consultation with the ACT Emergency Services Agency (ESA) to agree on the Bushfire Protection Measures to be assessed and identified for the site given SBMP and the BMS are primarily focused on residential type developments
- Preparation of the Study, involving responses to the issues detailed above on the project description, consultation with the client and the ESA and the desktop assessment. The responses will include:
 - assessment of the risk profile of the site and the impact of siting on Asset Protection Zones.
 - identification and prioritisation of mitigation measures appropriate for proposed use and development type
 - assessment of the existing and proposed road networks to evaluate the capacity to deal with evacuating site users and responding emergency services
 - consideration and analysis of the increase in demand for emergency services responding to a bush fire, and the ability of emergency services to carry out fire suppression because of the proposal.

This report: has been prepared by GHD for Suburban Land Agency and may only be used and relied on by Suburban Land Agency for the purpose agreed between GHD and Suburban Land Agency as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Suburban Land Agency arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Suburban Land Agency and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified

information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.3 Assumptions

Information on the vegetation is based on preliminary ecological a mapping published on ACTMapi.

The layout on which this assessment is based has been provided by the client.

It is assumed that the site be managed lands and not revert to vegetated state unless otherwise specified.

1.4 Relevant documentation

In undertaking this bushfire risk assessment, the following has been considered:

- Planning and Development Act 2007;
- Emergencies Act 2004;
- ACT Strategic Bushfire Management Plan 2019 (SBMP v4);
- ACT Bushfire Management Standards 2014 (BMS); and
- Australian Standard 3959-2018 (AS 3959-2018) Construction of buildings in bushfire-prone areas.

ACT ESA advised via Development Application review (14 July 2022) that it did not support the development in its current design until evidence of appropriate bushfire protection measures and sufficient water supply for firefighting purposes could be demonstrated. Follow up conversations over phone between GHD and ACT ESA (Station Officer Stuart Laing Bushfire and Development Assessment Officer) confirmed that a 40,000-litre static water supply dedicated for firefighting purposes was suitable for the development as the site would not be serviced by reticulated water.

2. Bushfire Threat Assessment

2.1 Assessment requirements

The subject land is currently mapped as a Bushfire Prone Area by the ACT ESA (<http://www.actmap.act.gov.au>) and the following assessment is undertaken in accordance with the BMS and Method 1 of AS 3959-2018.

Determination of Asset Protection Zone (APZ) dimensions is guided by BMS, which defines the measurable outcomes of strategies detailed in the SBMP v4. The two stage process consists of an initial risk assessment matrix (Asset Interface Classification (AIC)) and the APZ determination matrix. The result determines the minimum size of the APZ.

2.2 Asset Interface Classification

The initial risk assessment, utilising the AIC matrix, provides a risk ranking used to determine the size of the APZ. The asset interface is classified as either Primary, Secondary or Lee based on the aspect (direction of fire threat) and potential length of fire run towards the asset. Table 1 shows the AIC matrix with the results highlighted, being primary to the North, South-west and North-west, secondary to the east, and lee to the south-east given the surrounding grassland vegetation.

Table 1 Asset Interface Classification Matrix

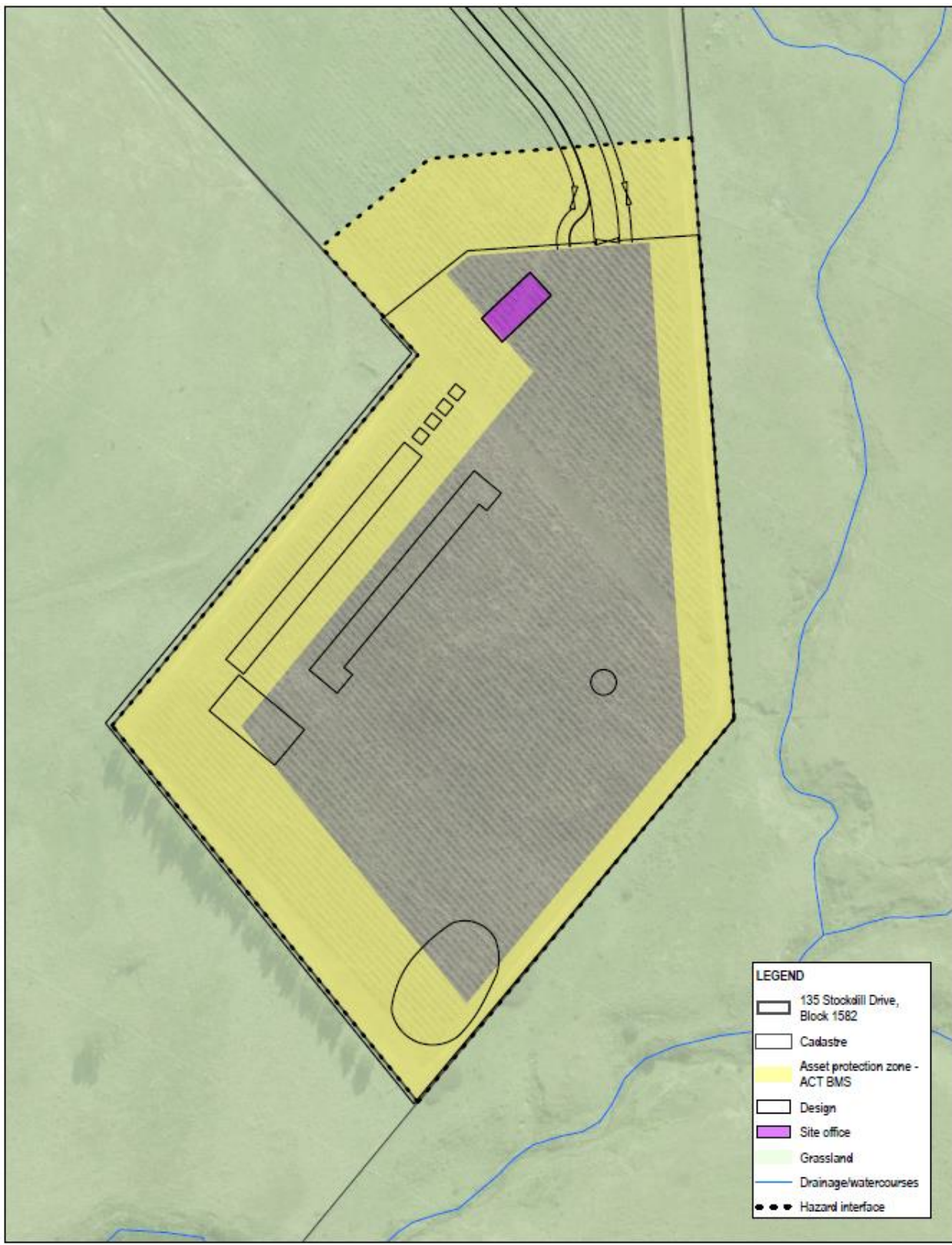
Aspect of fire	Length of fire run to asset interface (meters)		
	<100	100 - 350	>350
North			Primary
East			Secondary
South-east			Lee
South-west			Primary
North-west			Primary

Source: ACT Bushfire Management Standards (2014)

2.3 Vegetation

The existing mapped vegetation for the site and surrounding land is shown in Figure 3, showing grassland vegetation. The site was previously a vineyard with abandoned vines left in situ. The current/existing flora values of the site are considered to be limited, with the majority of the vegetation comprised of introduced/non-native species.

The grassland vegetation on the surrounding lands is owned by the Suburban Land Agency and this ownership will be retained for the life of the licence agreement for the Canberra Sand and Gravel operations.



LEGEND	
	135 Stockkill Drive, Block 1582
	Cadastral
	Asset protection zone - ACT BMS
	Design
	Site office
	Grassland
	Drainage/watercourses
	Hazard interface

Paper Size ISO A4
 0 25 50
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 55



Suburban Land Agency - ACT Govt
 Canberra Sand and Gravel Relocation
 Bushfire Risk Assessment

Project No. 12593690
 Revision No. A
 Date 24/11/2022

Asset protection zone

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 Print date: 25 Nov 2022 - 09:50

Date source: Imagery - Mapbox Tile Service, 2022; General Topography, Vegetation - ACTmap - 2022
 Created by: pherandis

Figure 3 Bushfire Hazard Assessment and Asset Protection Zones

3. Bushfire Protection Measures

3.1 Asset Protection Zones

APZs are typically determined by AIC and vegetation type, being forest / woodland or grass and open woodland. They can either contain an Inner APZ (IAPZ) and Outer APZ (OAPZ) or an Inner only APZ. Where both Inner and Outer APZs are utilised, the IAPZs is to be located within the development site while the OAPZ may be located on adjacent lands. Where the adjacent land cannot provide the required OAPZ management e.g. because of operational constraints, conflict with management of high conservation value ecological assets, financial resources or other land management constraints, the IAPZ only option may be used.

The application of these zones has been discussed with ACT Government agencies (ESA) and provides the following APZs based on the BMS and AS 3959. The AIC approach (see Table 1) has been used to determine the required APZ, using Widths for Inner APZs with no outer APZ of the ACT BMS (2014). The results for each aspect are provided in Table 2, with an indication of the separation distances shown in Figure 4.

Table 2 Asset Protection Zone requirements (m)

Aspect	Vegetation type (BMS)	Location	Asset Interface Classification	Inner APZ (m)	Comment
North	Grass and open woodland	Grassland within licence site and adjoining Suburban Land Agency Land	Primary	40	11 m of the APZ would be outside the licence area to the north in grassland.
East	Grass and open woodland	Grassland withing licence site	Secondary	20	Within licence area
South-east	Grass and open woodland	Grassland withing licence site	Lee	10	Within licence area
South-west	Grass and open woodland	Grassland withing licence site	Primary	40	Within licence area
North-west	Grass and open woodland	Grassland within licence site and adjoining Suburban Land Agency Land	Primary	30	Non-compliant APZ due to neighbouring land, however still provides a maximum BAL 12.5 exposure to the site office. Leaseholders in the ACT have an obligation to prevent fire occurring or spreading from their properties, so the neighbouring property has an existing firebreak/fuel modified area along boundary that would extend the APZ in practical terms.

Landscape supplies storage bins are identified in Figure 2 in the north-west of the site, and Figure 3 shows some of these bins fall within the proposed APZ. Any of the storage bins located in the APZ will only contain no combustible materials, with combustible materials to be stored in bins outside of the APZ only.

For the APZ located on adjoining land owned by the Suburban Land Agency to the north will be maintained by Canberra Sand and Gravel. Written agreement between Suburban Land Agency and Canberra Sand and Gravel about APZ management on SLA land adjoining the facility will be provided prior to operation of the facility.

3.2 Construction Standard

The building construction standard for bushfire prone land required under the SBMP v4 is a minimum of Bushfire Attack Level (BAL) of BAL-12.5 and maximum of BAL-29 as defined in AS 3959-2018. As noted in advice from ACT ESA, as per the Planning for Bushfire Risk Mitigation General Code only class 1, 2 and 3 buildings are referenced as requiring bushfire design and construction and do not apply in this instance. Based on the proposed layout using a Fire Danger Index of 100 for the ACT, the indicative BAL for the development is indicated in Table 3 and shown in Figure 4. The proposed Sales office and workshop will be constructed with Colourbond cladding and can meet BAL12.5 construction requirements as defined in AS 3959-2018. This will provide for a shelter-in-place location for site users in the event of a bushfire.

The proposed processing, stockpiling and green waste area to the south of the site (see Figure 4 and Figure 7) is located well out of Flame zone and within BAL 12.5 or BAL Low, minimising risk of fire entering the mulch piles from offsite or escaping off-site from a fire starting on-site.

Table 3 Indicative Bushfire Attack Levels for the proposed development

Aspect	Vegetation	Separation distance	Slope	BAL (AS3959)
North	Grassland	40 m (Sales office and workshop)	Upslope	BAL 12.5
East	Grassland	60 m (Sales office and workshop)	5-10 degrees downslope	BAL Low
South-east	Grassland	10 m (Greenwaste drop off and processing area)	0-5 degrees downslope	BAL 40 through to BAL Low
South-west	Grassland	40 m (Sediment and erosion control pond)	10-15 degrees downslope	BAL 12.5
North-west	Grassland	40 m (Storage bins and pick up area)	Upslope	BAL 12.5

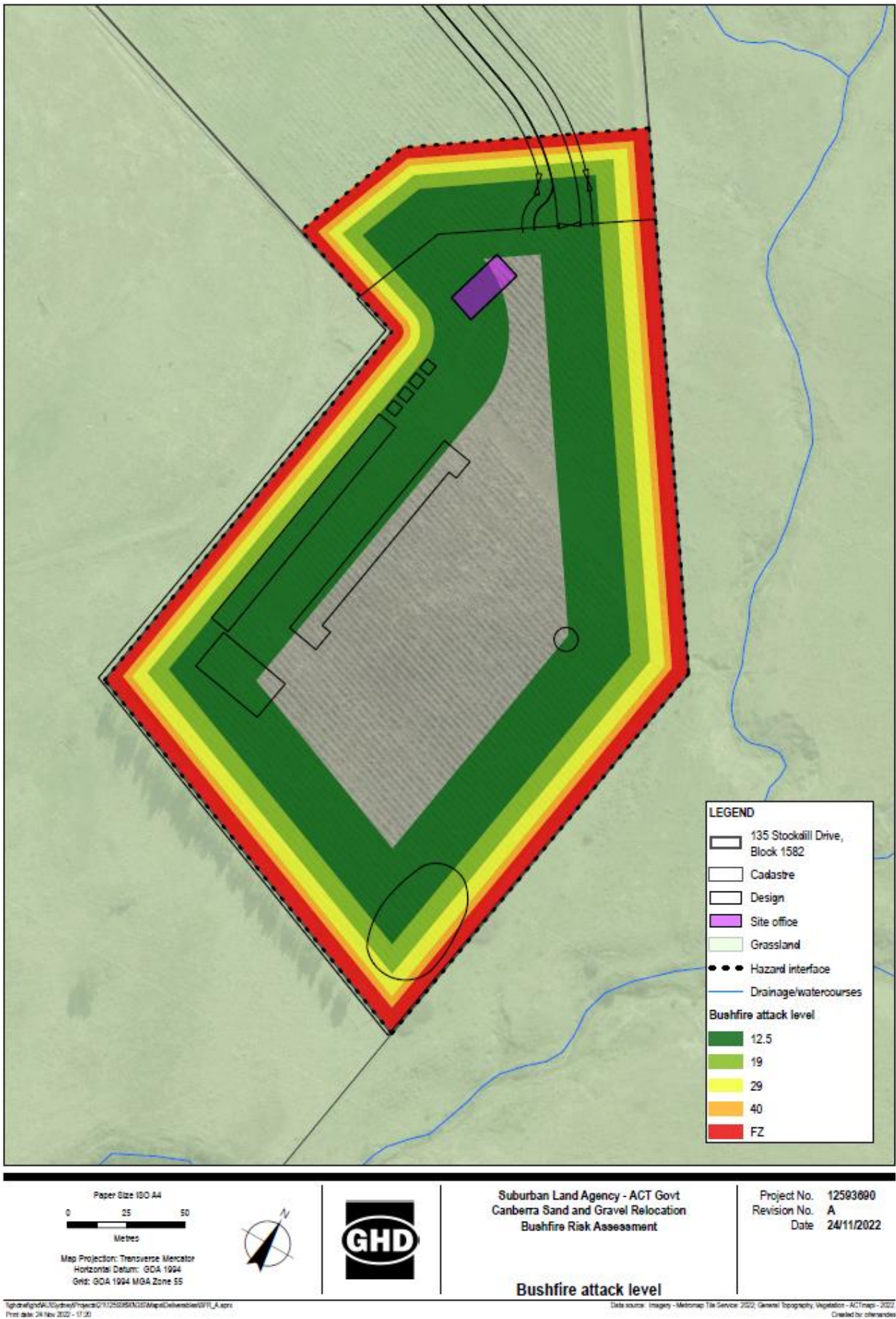


Figure 4 Indicative Bushfire Attack Levels for proposed site

3.3 Water Supply

The site will be serviced by a static water supply. A dedicated 40,000 litre tank for firefighting purposes will be provided on site providing 1 hour of firefighting water based on one outlet operating at a flow rate of 10 L/s. The following requirements associated with the static water supply will be provided:

- a connection for firefighting purposes is located within the APZ or non-hazard side and away from the structure
- 125mm Storz outlet with a ball valve is fitted to the outlet
- 65mm Storz outlet with a ball valve is fitted to the outlet
- ball valve and pipes are adequate for water flow and are metal
- supply pipes from tank to ball valve have the same bore size to ensure flow volume
- 3 lengths of 125mm hard suction hose to be stored on site in weather proof cabinet in the vicinity of tank
- if an underground tank is installed, have an access hole of 200mm to allow tankers to refill direct from the tank
- all-weather paved area capable of supporting 25 tonne vehicle as per hardstand definition in AS 2419.1 is supplied within 4m
- above-ground tank manufactured from concrete or metal
- raised tank have stand constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959-2018)
- tank to be located within a defensible space easily accessible by fire appliances underground tanks are clearly marked
- tank on the hazard side of a building are provided with adequate shielding for the protection of firefighters
- all exposed water pipes external to the building are metal, including any fittings
- where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack
- any hose and reel for firefighting connected to the pump shall be 19mm internal diameter
- fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005
- tank is refilled to capacity by CSG within 24 hours of use.

3.4 Utilities

Gas is not proposed to be used on the site.

There are no criteria to be addressed for electrical supplies. The site is serviced by overhead powerlines clear of existing vegetation.

3.5 Access and egress

As indicated on Figure 5, the proposed entry and exit point proposed for the site is off Stockdill Drive to the north through a new proposed road. B-doubles will access the site, therefore the applicable access requirements detailed in the BMS (Table 10) for emergency services appliances (tankers and pumpers) will be met. This includes:

- minimum vertical clearance to a height of 4.2 m above access at all times
- road widths (minimum 3.5 m for one way and 6.5 m for two way)
- road capacity (25 tonnes minimum)
- minimum inner radius of 6m for curves and minimum distance between inner and outer curves is 6 m
- crossfall of roads not exceeding 6%

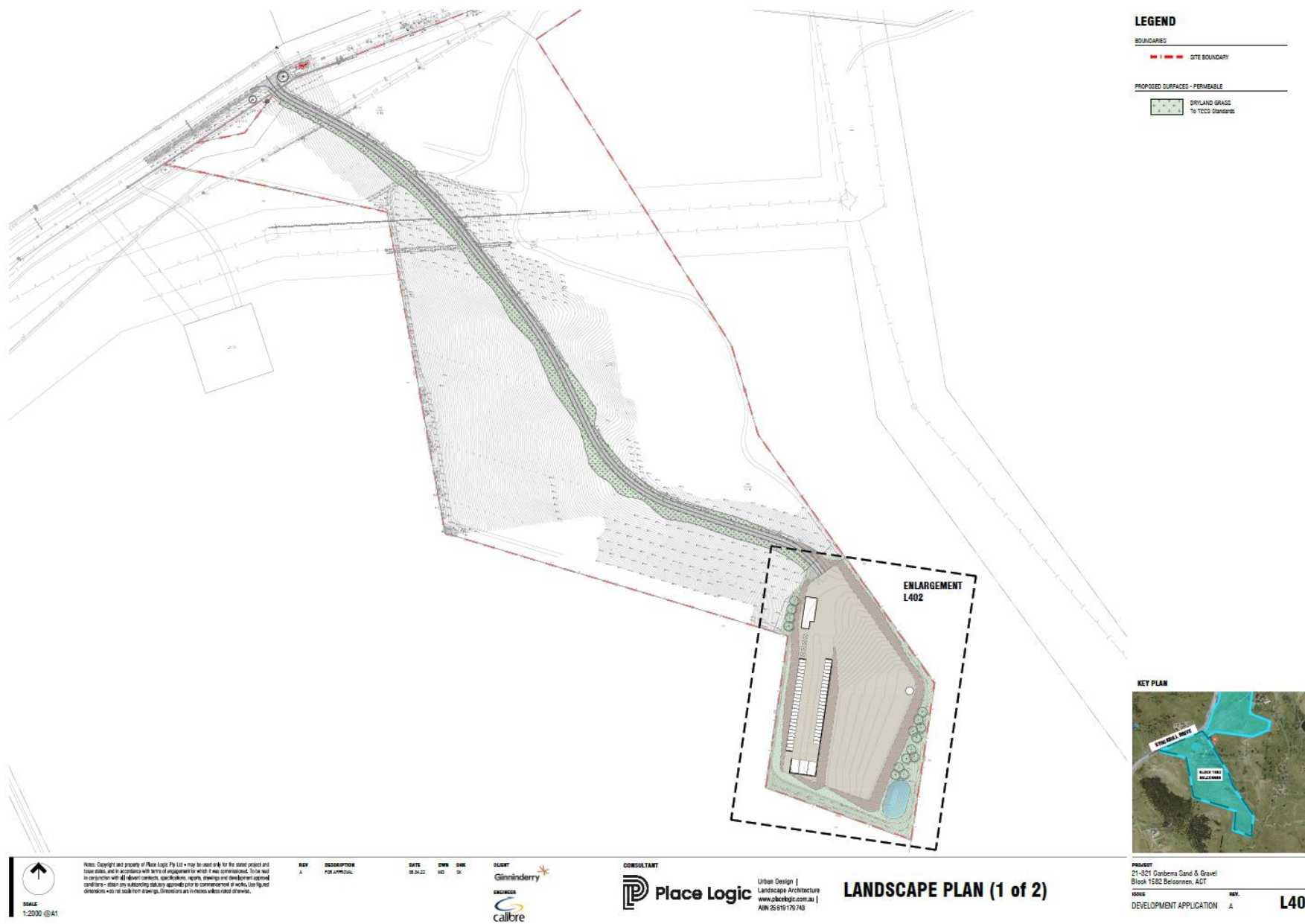


Figure 5 Access arrangements

3.6 Landscaping and bushfire mitigation plans

Fires at composting and mulching facilities can occur under certain conditions if internal heat builds up to ignition point. Fires can be caused by human error (e.g., a carelessly discarded cigarette), improper procedures (e.g., a welding spark from doing equipment repair next to a pile of material), lightning, arson, spontaneous combustion and bushfires. A number of these causes can be addressed through operational planning and bushfire preparedness planning and should form part of the emergency and evacuation planning for the site.

Key conditions that lead to spontaneous combustion are biological activity, relatively dry materials or dry pockets, large well-insulated piles, limited air flow, and time for temperature to build up. The ignition point for compost is 150-200 degrees Celsius (www.tcf forensic.com.au/docs/article10.html). In addition, there may be other contributing factors such as a nonuniform mix of materials, poor moisture distribution, difficulty in knowing temperatures throughout a pile, and sometimes a lapse or oversight in monitoring.

Fire safety guideline – Fire safety in waste facilities (NSW Fire and Rescue 2020) provides guidance to manage fire risk, for fire prevention using effective storage management, monitoring hazards and implementing polices and procedures that should be considered in the development of bushfire mitigation and operational plans for the site. Included is guidance on pile dimensions to reduce fire risks, as pile height, length and width play a key role in the severity, duration and intensity of fires. A maximum pile height of 4 m is recommended, with a maximum width of 20 m if accessible from both sides of the pile or 10 m if accessible from only one side. Separation distances between piles to create to reduce fire risk is related to pile length, and recommended distances (m) are provided in Figure 6.

Any proposed landscaping and management of open spaces or residual areas is required to consider bushfire risk in determining location, species, density, extent and ongoing maintenance. This has been incorporated into the landscape plan (Figure 7) so as to avoid increasing future bushfire risks. All open space within the site will undergo management to meet APZ or low hazard standards under AS3959-2018.

The proposed APZ will not require vegetation clearance or tree removal to support the proposed development due to the predominant cleared nature of the site, the proposed site layout, distance to vegetation surrounding the subject land and existing and proposed access. Fuel management practices to be implemented by the site operator within the APZ (both within the licence area and outside to the north and north -west) shall be as follows in accord with the ACT BMS:

- For grass and open woodland - All APZs will require regular slashing of grass fuels to a maximum height of 200 mm before the start of the bushfire season (generally 1st October) and maintained at this maximum height when grassland curing is ≥ 70 per cent.

When establishing and maintaining an APZ the following requirements should also apply as applicable:

- canopy cover should be less than 15% (at maturity);
- trees (at maturity) should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above ground;
- preference should be given to smooth barked and evergreen trees;
- avoid connective pathways across the ground toward a building;
- small, isolated clumps need to be site specific in design;
- avoid creating fuel ladders (shrubs, bark, dropped branches, leaves etc.);
- select suitable plants (low flammability, avoid dense and elevated fine fuels);
- no plants near vulnerable building components (windows, decks); and
- leaves and vegetation debris should be removed.

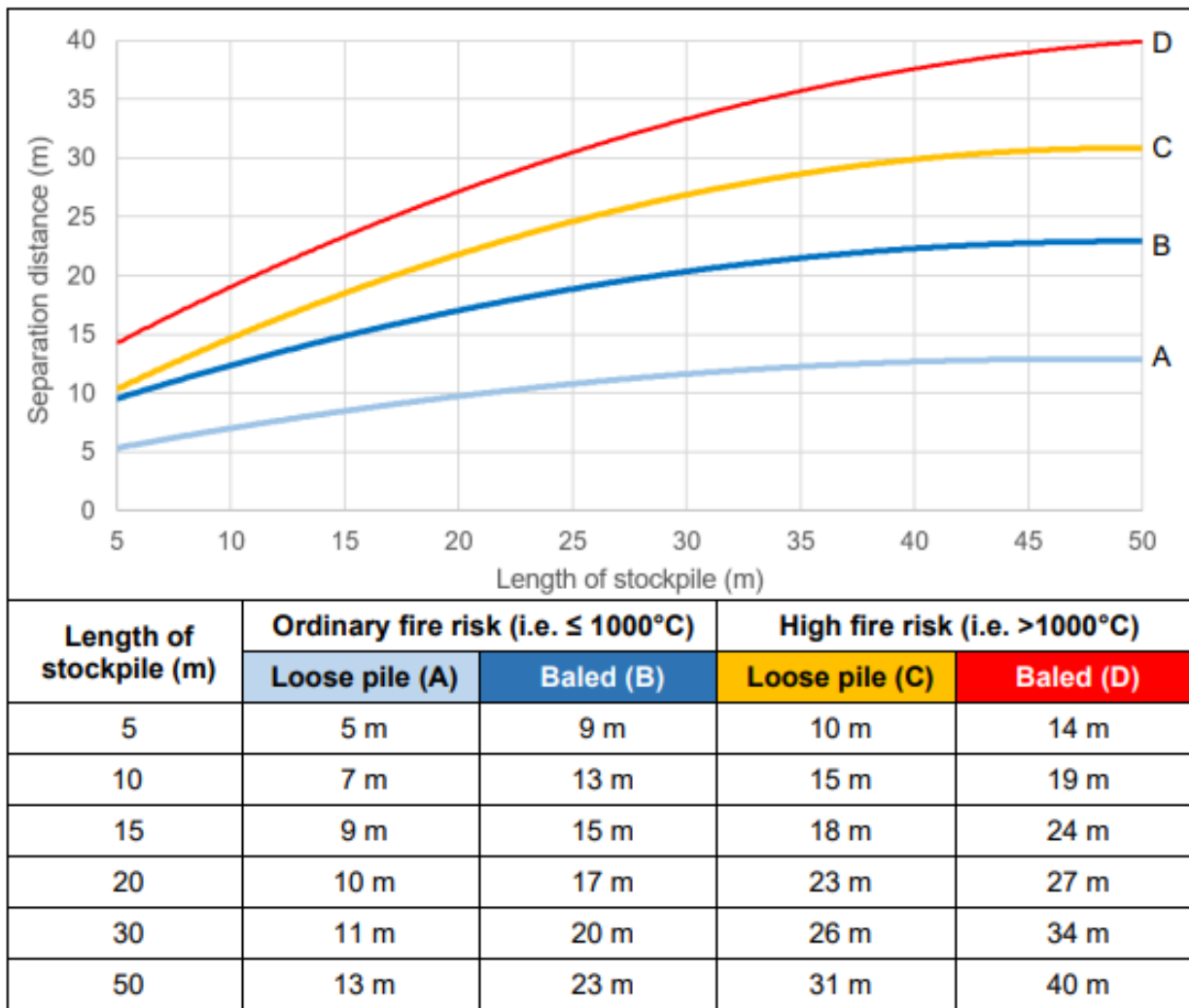


Figure 6 Minimum separation distances between external stockpiles (NSW Fire and Rescue 2020)



<p>SCALE 1:500 @A1</p>	<p>Notes: Copyright and property of Place Logic Pty Ltd - may be used only for the stated project and issue date, and in accordance with terms of engagement for which it was commissioned. To be used in conjunction with all relevant contracts, specifications, reports, drawings and development control conditions - obtain any authorising authority approval prior to commencement of any work. Size and dimensions - do not scale from drawings. Dimensions are in metres unless noted otherwise.</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>DESCRIPTION</th> <th>DATE</th> <th>OWN</th> <th>CHK</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>FOR APPROVAL</td> <td>28.04.22</td> <td>MO</td> <td>SK</td> </tr> </tbody> </table>	REV	DESCRIPTION	DATE	OWN	CHK	A	FOR APPROVAL	28.04.22	MO	SK	<p>CLIENT</p> <p>ENGINEERING</p>	<p>CONSULTANT</p> <p>Urban Design Landscape Architecture www.placelogic.com.au ABN 26 616 176 743</p>	<p>LANDSCAPE PLAN (2 of 2)</p>	<p>PROJECT</p> <p>21-321 Canberra Cand & Gravel Block 1582 Belconnen, ACT</p> <p>ISSUE</p> <p>DEVELOPMENT APPLICATION A</p>	<p>REV.</p> <p>L402</p>
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Figure 7 Landscape Plan

3.7 Emergency and evacuation planning

Any existing emergency management plans in place for the current Canberra Sand and Gravel site will be required to be updated and amended to reflect the new site prior to operation and occupancy of the new site. These plans should clearly identify bushfire preparedness actions, bushfire response actions, evacuation plans and procedures (for onsite and offsite evacuation), and on-site refuge locations.

There is a risk to users of this facility, particularly on days of elevated fire danger. Therefore, it is proposed that a usage restriction be placed on the site and the public access to the facility such that it is not occupied on days where the Fire Danger Rating is forecast to be Catastrophic and potentially at lower levels depending on risk and advice from relevant authorities.

4. Recommendations and Conclusion

4.1 Recommendations

The Development Application is required to address bushfire prevention measures identified within this report and summarised below:

Recommendation 1- Asset Protection Zones are to be provided in accord with Table 2, noting the part of the APZ (11 m) to the north will be located on adjoining land owned by the Suburban Land Agency but to be maintained by Canberra Sand and Gravel;

Recommendation 2- Any of the storage bins located in the APZ will only contain no combustible materials, with combustible materials to be stored in bins outside of the APZ only

Recommendation 3- Access to meet the specifications detailed in Section 3.5, including:

- minimum vertical clearance to a height of 4.2 m above access at all times
- road widths (minimum 3.5 m for one way and 6.5 m for two way)
- road capacity (25 tonnes minimum)
- minimum inner radius of 6m for curves and minimum distance between inner and outer curves is 6 m
- crossfall of roads not exceeding 6%

Recommendation 4- A 40,000litre static water supply for firefighting purposes is to be installed meeting the requirements for access and availability as detailed in Section 3.3;

Recommendation 5- APZ landscaping is to comply with the ACT BMS fuel management standards for Inner APZ and be guided by the fuel management principles, including for mulch piles, listed in Section 3.6 of this report. These will be managed by the site operator.

Recommendation 6 – Piles should be no higher than 4m, no wider than 20 m if accessible from both sides or 10 m if accessible from one side, and provide a separation distance between piles in accordance with Figure 6

Recommendation 7 – existing emergency and evacuation plans be updated and amended prior to occupancy and operation at the proposed site and include restrictions on access and operations on days of catastrophic fire danger as summarised in Section 3.7.

4.2 Conclusion

In the author's professional opinion, the proposed development can comply with all bushfire planning requirements if the above recommendations are incorporated.

References

ACT Government. 2019. ACT Strategic Bushfire Management Plan 2019-2024 (SBMP v4) ACT Emergency Services Authority, Canberra.

ACT Government. 2014. ACT Bushfire Management Standards 2014 (BMS) ACT Emergency Services Authority, Canberra.

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