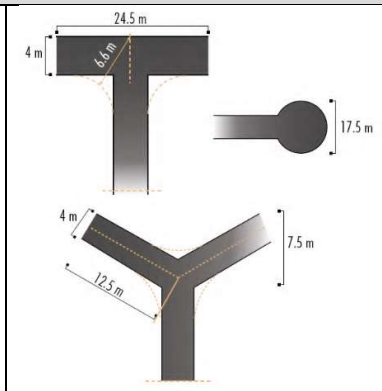
Private driveway longer than 50 metres	
	

Table 6 from Guidelines

Technical requirement	1	2	3	4	5
	Public road	Cul-de-sac	Private driveway longer than 50 m	Emergency access way	Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5
* Refer to E3.2 Public roads: Trafficable surface					

Appendix 4: Water technical standards of the Guidelines

Non-reticulated areas	
Acceptable solution A4.2	Water tanks for firefighting purposes with a hydrant or standpipe are provided and meet the following requirements: • **Volume:** minimum 50,000 litres per tank • **Ratio of tanks to lots:** minimum one tank per 25 lots (or part thereof) • **Tank location:** no more than two kilometres to the further most house site within the residential development to allow a 2.4 fire appliance to achieve a 20 minute turnaround time at legal road speeds • **Hardstand and turn-around areas**: suitable for a type 3.4 fire appliance (i.e. kerb to kerb 17.5 metres) are provided within three metres of each water tank • **Water tanks and associated facilities:** are vested in the relevant local government.
Explanatory note E4.2	A procedure must be in place to ensure that water tanks are maintained at or above the designated capacity, including home tanks on single lots, at all times. This could be in the form of an agreement with the local government and the fire service.

Appendix 5: Shire of Ashburton Firebreak Notice (2020-2021)

shire of Ashburton
reef to range

Firebreak Notice

2021



www.ashburton.wa.gov.au

BUSH FIRES ACT 1954 - SECTION 33

NOTICE TO ALL OWNERS AND/OR OCCUPIERS OF LAND SITUATED IN THE SHIRE OF ASHBURTON

Pursuant to the powers contained in Section 33 of the Bush Fires Act 1954, you are hereby required on or before the 1st day of January, (or within fourteen days of your becoming owner or occupier of land should this be after the 1st day of January), to clear and maintain mineral earth breaks and reduce the fuel load from the land owned or occupied by you as specified hereunder and to have the specified land and firebreaks clear of all flammable material all year round.

(1) LAND IN TOWNSITES- INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

1.1 Where the area of land is 2000 square metres (approximately 1/2 an acre) or less, all flammable material must be reduced over the whole of the land. Grasses shall be slashed to a height 75mm.

1.2 Where the area of land exceeds 2000 square metres, mineral earth breaks of at least five (5) metres in width must be cleared of all flammable material immediately inside and along the boundaries of the land. Where there are buildings on the land additional mineral earth breaks five (5) metres in width must be cleared immediately surrounding each building.

(2) LAND OUTSIDE TOWNSITES INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

2.1 For all buildings on land outside of the townsite, two mineral earth breaks with a width not less than five (5) metres and cleared of all flammable material must surround the buildings. The inner mineral earth break must be sited not be less than twenty (20) metres from the perimeter of the building or group of buildings and the outer mineral earth break sited not less than one hundred (100) metres from the inner mineral earth break.

(3) POWERLINES AND POWER TRANSMISSION LINES IN TOWNSITES INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

3.1 Aerial hazards to power and power transmission lines must be maintained as per the guidelines issued by the *Energy Safety - Department of Mines, Industry Regulation and Safety.*

For power lines conducting less than or equal to 33,000 volts; ground fuels such as grasses and ground storey species must be cleared to a minimum of five (5) metres either side of a centre line created by the poles, or towers. The total cleared area must not be less than ten (10) metres wide and the entire area must be maintained to the standard of a mineral earth break.

3.2 For power transmission lines greater than 33,000 volts, a mineral earth break of not less than five (5) metres in width must be maintained either side of the widest point of any arms or cross arms on the pole or tower. A mineral earth break of no less than five (5) metres width is to be maintained directly under the power line corridor. All power and transmission lines are to be maintained as per Australian Standard AS7000, to assist in minimizing the risk from sparks or arcing and shall be the responsibility of the owner of the transmission line.

(4) WATER SUPPLY PIPELINES AND INFRASTRUCTURE

4.1 All water supply pipelines and associated infrastructure must have mineral earth breaks not less than five (5) metres wide on both sides of the pipeline and all associated infrastructure and be cleared of all flammable material to prevent the spread of fire and damage to the pipelines or associated infrastructure. Access points must be installed and maintained to allow for Emergency Services access and maintenance use.

(5) EXPLOSIVES MAGAZINES AND STORAGE AREAS

5.1 All Flammable Materials are to be removed to bare earth between any bunkers or storage facilities and all Flammable Materials are to be removed for a distance of not less than fifteen (15) metres from the perimeter of any such storage area.

(6) FUEL DEPOT / FUEL STORAGE AREA / HAYSTACKS / STOCKPILED FLAMMABLE MATERIAL

6.1 For all fuel depots/fuel storage areas all flammable matter within 10 metres of where fuel drums, fuel ramps or fuel dumps are located, and where fuel drums, whether containing fuel or not, are stored.

6.2 For all haystacks/stockpiled flammable materials a mineral earth break of not less than ten (10) metres in width must be installed immediately adjacent to any haystacks or stockpiled flammable material.

(7) RAILWAY RESERVES IN TOWNSITES

7.1 Mineral earth breaks of at least five (5) metres in width must be installed immediately inside all boundaries continuous with any railway reserve on which railway traffic operates and are the responsibility of the owner of the railway.

(8) APPLICATION TO VARY FIREBREAK REQUIREMENTS

If you consider it to be impractical to clear a mineral earth break or remove flammable material as required by this Notice, you may apply to Council or its Authorised Officer no later than the 30th day of August, for permission to provide firebreaks in alternative positions or take alternative action to remove or abate fire hazards. If permission is not granted by Council or Authorised Officer, you must comply with the requirement of this Notice.

(9) BURNING GARDEN REFUSE DURING LIMITED BURNING TIMES

9.1 A person must not burn garden refuse at a place (other than a rubbish tip) during the limited burning times for that place unless it is burned:

(a) in an incinerator in accordance with subsection (2); or

(b) on the ground in accordance with subsection (3).

9.2 Garden refuse burned in an incinerator is burned in accordance with this subsection where:

(a) the incinerator is designed and constructed so as to prevent the escape of sparks or burning material; and

(b) either

(i) the incinerator is situated not less than two (2) metres from any building or fence; or

(ii) if the incinerator is less than two (2) metres from a building or fence, the Council or its Authorised Officer has given written permission in writing for the incinerator to be used; and

(c) there is no flammable material within two (2) metres of the incinerator while it is in use; and

(d) at least one person is present at the site of the fire at all times until it is completely extinguished; and

(e) the fire is no longer required, the person ensures that the fire is completely extinguished by the application of water or earth.

9.3 Garden refuse burned on the ground is burned in accordance with this subsection where:

(a) there is no flammable material (other than that being burned) within 5m of the fire at any time while the fire is burning; and

(b) the fire is lit between 6:00pm and 11:00pm and is completely extinguished before midnight on the same day; and

(c) at least one person is present at the site of the fire at all times until it is completely extinguished; and

(d) when the fire is no longer required, the person ensures that the fire is completely extinguished by the application of water or earth.

9.4 The Council or Authorised Officer must not give permission under subsection 9.2 (b) (ii) unless it is satisfied that the use of the incinerator is not likely to create a fire hazard.

10. ADDITIONAL WORKS

10.1 In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the Shire rates record for the relevant land.

10.2 If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Act*.

10.3 Pursuant to Section 33(4) of the *Act*, where the owner and/or occupier of land fails or neglects to comply with the requisitions of this Notice within the times specified, the Shire may by its officers and with such servants, workmen and contractors, vehicles and machinery as the officers deem fit, enter upon the land and carry out the requisitions of this Notice which have not been complied with and pursuant to Section 33(5) of the *Act*, the amount of any costs and expenses incurred may be recovered from the owner and or occupier of the land.

10.4 The penalty for failing to comply with this notice is a fine of $5000. A person in default is also liable, whether prosecuted or not, to pay the cost of performing the work directed in this notice, if it is not carried out by the owner or occupier by the date required by this notice.



Compliant Residential Property



Compliant Vacant Land



Non-Compliant Residential Property



Compliant Mineral Earth Break

DEFINITIONS

For the purpose of this Notice the following definitions apply:

Act means the Bush Fires Act 1954.

Chief Bush Fire Control Officer is a person appointed as the Chief Bush Fire Control Officer by the Fire and Emergency Services Commissioner pursuant to Section 38A of the *Act*

Authorised Officer is a person appointed by the Shire as a Fire Control Officer pursuant to Section 38 of the *Act*.

Bush includes trees, bushes, plants, stubble, scrub, and undergrowth of all kinds whatsoever whether alive or dead and whether standing or not standing and also a part of a tree, bush, plant, or undergrowth, and whether severed therefrom or not so severed.

Council means the Council of the Shire of Ashburton.

Explosives has the same meaning given to it by the Dangerous Goods Safety Act 2004 and the regulations pursuant to it.

Firebreak Period means the time from 1 January until 31 December each year.

Flammable Material means material that can be easily ignited or burnt. i.e. dead or dry grass, leaves, timber, paper, plastic and other materials or things deemed by an authorised officer to be capable of combustion. Flammable material does not include green growing trees or live plants growing in a garden.

Fuel Depot / Fuel Storage Area means an area of land, a building or structure where fuel, i.e. (petrol, diesel, kerosene, liquid gas or any other fossil fuel) is kept in any container or manner.

Mineral Earth Break means an area of ground, of a specified width that has all material (living or dead) removed by scarifying, cultivating, ploughing or other means removed to bare mineral earth, and includes the pruning and removal of any living or dead trees, scrub or other material that overhangs the cleared firebreak area to a vertical height of four (4) metres from the ground. A prepared fire break shall be trafficable.

Shire means the Shire of Ashburton.

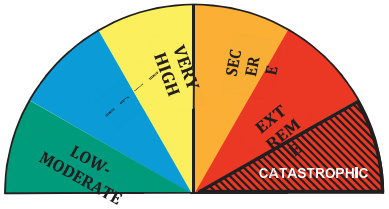
Trafficable means able to be driven around, unhindered, in a standard four-wheel drive vehicle.

Townsite Land means land within the district that is within the boundaries of a townsite (and for the purposes of this definition "townsite" has the meaning given it in Section 6 (1) of the *Local Government Act 1995*).



IMPORTANT INFORMATION

FIRE DANGER RATINGS



The Fire Danger Rating tells you how dangerous a fire would be if one started. It helps you to know when conditions are dangerous enough to put your bushfire survival plan in to action.

Ratings are forecast using Bureau of Meteorology data for up to four days in advance, based on weather and other environmental conditions such as fuel load.

The rating is your prompt to take action to stay safe.

www.emergency.wa.gov.au/#fdr

CATASTROPHIC

What does it mean?

These are the worst conditions for a bush or grass fire. Homes are not designed or constructed to withstand fires in these conditions. The safest place to be is away from high risk bushfire areas.

What should I do?

Leaving high risk bushfire areas, the night before or early in the day is your safest option - do not wait and see. Avoid forested areas, thick bush or long, dry grass.

Know your trigger - make a decision about when you will leave

- Where will you go?
- How will you get there?
- When will you return?

EXTREME

What does it mean?

Expect extremely hot, dry and windy conditions. If a fire starts and takes hold, it will be uncontrollable, unpredictable and fast moving. Spot fires will start, move quickly and come from many directions. Homes that are situated and constructed or modified to withstand a bushfire, that are well prepared and actively defended, may provide safety. You must be physically and mentally prepared to defend in these conditions.

What should I do?

Consider staying with your property only if you are prepared to the highest level. This means your home needs to be situated and constructed or modified to withstand a bushfire*, you are well prepared, and you can actively defend your home if a fire starts If you are not prepared to the highest level, leaving high risk bushfire areas early in the day is your safest option.

- What will you do if you cannot leave?

SEVERE

What does it mean?

Expect hot, dry and possibly windy conditions. If a fire starts and takes hold, it may be uncontrollable. Well prepared homes that are actively defended can provide safety. You must be physically and mentally prepared to defend in these conditions.

What should I do?

Well prepared homes that are actively defended can provide safety - check your bushfire survival plan. If you are not prepared, leaving bushfire prone areas early in the day is your safest option.

VERY HIGH

What does it mean?

If a fire starts, it can most likely be controlled in these conditions and homes can provide safety. Be aware of how fires can start and minimise the risk. Controlled burning off may occur in these conditions if it is safe - check to see if permits apply.

What should I do?

Check your bushfire survival plan. Monitor conditions. Action may be needed. Leave if necessary.

HIGH

What does it mean?

If a fire starts, it can most likely be controlled in these conditions and homes can provide safety. Be aware of how fires can start and minimise the risk. Controlled burning off may occur in these conditions if it is safe - check to see if permits apply.

What should I do?

Check your bushfire survival plan. Monitor conditions. Action may be needed. Leave if necessary.

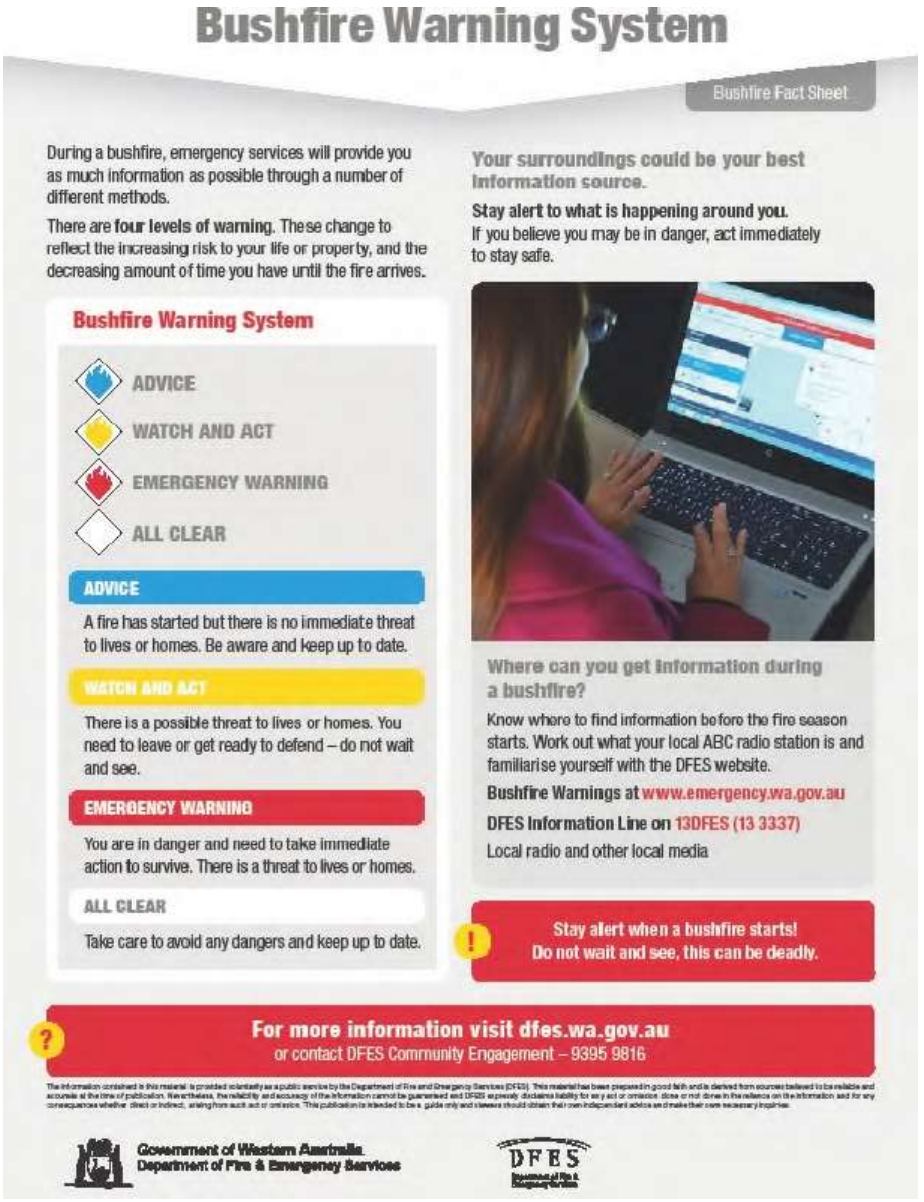
LOW-MODERATE

What does it mean?

If a fire starts, it can most likely be controlled in these conditions and homes can provide safety. Be aware of how fires can start and minimise the risk. Controlled burning off may occur in these conditions if it is safe - check to see if permits apply.

What should I do?

Check your bushfire survival plan. Monitor conditions. Action may be needed. Leave if necessary.



RESTRICTED BURNING

The Shire of Ashburton is in a **RESTRICTED BURNING** period all year round, therefore Camping and Cooking Fires are not permitted;

- When the Fire Danger rating is Very High or above.
- Where campgrounds prohibit camping and cooking fires at any time.
- On public land that is not a designated area.
- Are permitted on Private Property during the hours of 6:00pm and 12:00am with consent from the landowner and or occupier and a Permit has been issued by an Authorised Fire Control Officer.

Wood / Solid Fuel BBQ's, Pizza Ovens and Incinerators.

- Are not permitted to be used when the Fire Danger Rating is Very High or above.
- Are not permitted where campgrounds prohibit the use of wood / solid fuel BBQ's.
- Are permitted to be used on Private Property at any time only if a spark arrestor is fitted. A permit is required for operation outside of the hours of 6:00pm and 12:00am.

Gas / Electric Fueled BBQ's and Pizza Ovens

- Are permitted to be used at any time of the year.

Garden Refuse and Rubbish

- Garden refuse and rubbish in one (1) small heap, up to one (1) cubic metre may be burnt during the Restricted Burning Times between the hours of 6:00pm and 11:00pm.
- One (1) able bodied person capable of extinguishing the fire must be in attendance at all times.
- All fires must be extinguished by 12:00am.
- A courtesy call to your neighbours and a Fire Control Officer prior to undertaking any burning of garden refuse and rubbish would be appreciated.



WHAT IS A TOTAL FIRE BAN

- A Total Fire Ban (TFB) is declared on days of extreme weather or when widespread fires are seriously stretching firefighting resources.
- The need for the ban is assessed throughout the day and the ban may be revoked if weather conditions ease.
- A Total Fire Ban is declared the evening before it is to take effect. You should check the Emergency WA website after 6pm to see if a ban has been declared for the next day.
  www.emergency.wa.gov.au/#totalfirebans
- When a TFB is declared it prohibits the lighting of any fires in the open air and any other activities that may start a fire.
- The ban includes all open-air fires for the purpose of cooking or camping. It also includes incinerators, welding, grinding, soldering or gas cutting.

PERMIT TO BURN

Bush Fire Permits can be obtained by contacting an Authorised Fire Control Officer (FCO). Before requesting a permit please have the following information ready

- What is the size of the proposed burn?
- What type of material are you intending to burn?
- What is the location of the burn area?
- Have you notified your neighbours?
- Do you have the appropriate resources to control and suppress the burn?

PLEASE NOTE: Permit holders must give notice of their intention to burn prior to ignition to:

- Adjoining landowners / occupiers.
- The CBFCO or DCBFCO.
- The Department of Biodiversity, Conservation & Attractions if the planned burn is situated within 3km of DBCA Managed Lands.

SHIRE OF ASHBURTON FIRE CONTROL OFFICERS

NAME	CONTACT	POWERS	AREA of RESPONSIBILITY
District Officer Hamersley Range	0448 971 505	CBFCO	Shire of Ashburton
Wayne Hatton	0448 894 035	DCBFCO	Shire of Ashburton
Craig Mackrell	0429 964 354	FCO	Shire of Ashburton
Tristian Padfield	0429 653 044	FCO	Shire of Ashburton
Kyle Cameron	0457 000 283	FCO	Shire of Ashburton
Hamish James	0417 949 661	FCO	Shire of Ashburton
Terry Mellor	0419 952 604	FCO	Shire of Ashburton
Eilish McNulty	0488 427 997	FCO	Pannawonica Area Only
Leigh Mullholland	0429 947 582	FCO	Shire of East Pilbara Boundary
Keith Squibb	0427 701 065	FCO	Town of Pt Hedland Boundary
Colin Walker	0427 491 399	FCO	Shire of Exmouth Boundary

IF I DON'T COMPLY WHAT PENALTIES CAN BEAPPLIED?

The below are just some of the modified penalties issued by the Shire of Ashburton and are 10% of the maximum penalty that may apply should a matter proceed to court.

Property not compliant on first inspection	**Penalty of $250**
Property not compliant on further subsequent inspections	**Penalty of $250 + costs of works should a contractor be engaged to undertake works**
Burning on restricted times without a permit	**Penalty of $250**
Failure to extinguish a bush fire	**Penalty of $250**
Failure to obtain a permit	**Penalty of $250**
Failure to state name and address	**Penalty of $250**

INTERESTED IN BECOMING A VOLUNTEER WITHIN YOUR COMMUNITY?

Volunteer Fire Service Units are always on the lookout for new Volunteers. If you think you have what it takes to Volunteer within your community, please contact your local Brigade:

Tom Price Volunteer Bush Fire Brigade
Lot 2003 Boonderoo Rd, Tom Price
Mob: 0448 894 035
Email: admin@tpbfb.com.au

Tom Price Volunteer Fire & Rescue Service
Lot 30 Central Rd, Tom Price
Ph: 0458 813 101
Email: tpvfrs@gmail.com

Paraburdoo Volunteer Fire & Rescue Service
Lot 630 McRae Ave, Paraburdoo
Ph: 0413 014 052
Email: paravfrs.captain@gmail.com

Pannawonica Volunteer Fire & Rescue Service
Pannawonica Rd, Pannawonica
Ph: 0488 427 997
Email: Pannawonica.vfrs@hotmail.com

Onslow Volunteer Fire & Emergency Services Unit
Cnr McGrath & Hooley Ave, Onslow
Ph: 0409 091 954
Email: onslowvesu@bigpond.com.au

shire of Ashburton
reef to range

Lot 246 Poinciana Street
Tom Price WA 6751

PO Box 567
Tom Price WA 6751

Phone: (08) 9188 4444
Freecall: 1800 679 232
Fax: (08) 9189 2252
Freecall Fax: 1800 655 086

Email: soa@ashburton.wa.gov.au



www.ashburton.wa.gov.au

Appendix F
Onslow Township Resort Bushfire Emergency Management Plan

Onslow Township Village

Bushfire Emergency Management Plan

Date: 8 April 2022

Prepared For: Mineral Resources

Linfire Ref: 20210707149360ENV-BEMP-001_4

Linfire Consultancy

ABN: 577 930 47299

Revision	Issue Date	Revision Description	Approved By
0	5 Aug 2021	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
1	25 Aug 2021	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
2	19 Nov 2021	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
3	19 Jan 2022	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
4	8 April 2022	Amended layout	Linden Wears (Level 3 BPAD 19809)

Disclaimer and Limitation

This report is prepared solely for the nominated client, and any future residents of the subject lot(s), and is not for the benefit of any other person and may not be relied upon by any other person.

To the maximum extent permitted by the law, Linfire Consultancy, its employees, officers, agents and the writer ("Linfire") excludes all liability whatsoever for:

1. claim, damage, loss or injury to any property and any person caused by fire or as a result of fire or indeed howsoever caused;
2. errors or omissions in this report except where grossly negligent; and the proponent expressly acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

If despite the provisions of the above disclaimer Linfire is found liable then Linfire limits its liability to the lesser of the maximum extent permitted by the law and the proceeds paid out by Linfire's professional or public liability insurance following the making of a successful claim against such insurer.

Fire is an unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire. The strategies contained in the Bushfire Emergency Management Plan (BEMP) are considered to be prudent minimum standards only, based on the standards prescribed by relevant authorities. It is expressly stated that Linfire do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Linfire has no control. If the proponent becomes concerned about changing factors then either a review of the existing BEMP should be requested. Linfire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

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1.0 Bushfire Emergency Action Summary

This Bushfire Emergency Management Plan (BEMP) provides information for planning for a bushfire emergency, as well as responding to a bushfire.

This section provides a quick reference for the Emergency Response Team, or other onsite personnel, when there is an imminent bushfire threat to the facility and/or the surrounding vehicular access network, and they need to rapidly access response procedures.

The Bushfire Emergency Management Map in Appendix 2 provides a quick reference summary.

This BEMP applies to the entire **Onslow Township Village.**

The Primary Emergency Action to follow under normal bushfire conditions is to:

EVACUATE ☑ **SHELTER-IN-PLACE ☐**

- **Shelter-in-place procedures are to be carried out as a last resort only. Given the direct connection to the existing built-up residential portion of Onslow townsite, remaining on-site is not considered the safest option.**
- **The safety and wellbeing of occupants (staff, guests and visitors) is, at all times, the main priority. Property protection is not considered a priority.**
- **Staff are not expected to fight bushfires**

For quick reference where the bushfire threat to the facility is imminent, including the surrounding vehicular access network:

Section No.	Page No.	Information
Appendix 2	N/A	• Emergency Management Map including Evacuation Routes
Section 3.0	Page 13	• Facility details and occupant details
Section 4.0	Page 16	• Emergency Contacts including ERT, Emergency Services and utility agencies details
Section 5.0	Page 18	• Bushfire Emergency Warnings, Fire Danger Rating and Total Fire Ban information
Section 7.0	Page 26	• Awareness and Pre-emptive Procedures (based on forecast FDR and TFB)
Section 8.0	Page 30	• Bushfire decision making tool (based on warnings, location and visual cues)
Section 9.0	Page 33	• Standby/Controlled Shutdown Procedures (when sufficient time to react)
Section 10.0	Page 36	• Offsite Evacuation Procedures (when evacuation routes are safe to use) including Emergency Shutdown Procedures (when little time to react)
Section 11.0	Page 45	• Onsite Shelter-in-Place (last resort action when unsafe to evacuate offsite)

Key information to know to use this BEMP:

- How to find the ERT, emergency services and utility agency contact details (see Section 4.0)
- How to determine the forecast Fire Danger Rating, Total Fire Ban and current Emergency Warnings and bushfire status (see Section 5.0).

- How to use the decision- making tool to make an informed assessment of bushfire situation and the required course of action, especially whether offsite evacuation is safe to conduct (see Section 8.0)
- How to implement offsite evacuation procedures including the nominated offsite locations (see Section 10.0) or onsite shelter-in-place (see Section 11.0) based on the bushfire situation.

2.0 Purpose of the Bushfire Emergency Management Plan

This bushfire emergency management plan (BEMP) has been developed to provide guidance regarding:

- ***Preparedness prior to, and during, bushfire season***
  - to ensure the facility and the occupants are well prepared for a bushfire emergency, which is a critical element of effective emergency managements
- ***Awareness and pre-emptive actions during bushfire season***
  - to promote awareness of forecast high-risk bushfire conditions, and enable pre-emptive actions to reduce exposure of people to this elevated risk
- ***Actions to be undertaken during, and following, a bushfire emergency***
  - to provide the relevant personnel with the emergency management plan to effectively control and coordinate all occupants, and liaise with relevant agencies, during a bushfire emergency

This document is the current BEMP for the **Onslow Township Village** and is a "live" document, that will require ongoing review.

2.1 Regulatory Framework and Reference Material

The approved Bushfire Management Plans for the facility detail bushfire risk management measures designed to reduce the risk of bushfire impact to the site to tolerable levels, including such measures as vegetation management (Asset Protection Zones and low threat vegetation), bushfire construction and suitable vehicular access and bushfire fighting water

As the proposed development has been assessed as a "vulnerable land use" as per State Planning Policy 3.7 Planning in Bushfire-Prone Areas (SPP 3.7; WAPC 2015), this BEMP has been developed to address the requirements of Policy Measure 6.6 of SPP 3.7.

This BEMP details the emergency management procedures for proposed occupants to satisfy SPP 3.7 Policy Measure 6.6, and has been prepared to specifically consider bushfire in the context of the risk identified within the project Bushfire Management Plan (Linfire 2021) for the facility.

This BEMP was developed using reference and guidance from the following documents:

- Section 5.5.2 from the Guidelines for Planning in Bushfire Prone Areas (the Guidelines; WAPC 2017)
- A Guide to developing a Bushfire Emergency Evacuation Plan (WAPC 2019)
- Australian Standard 3745-2010, Planning for Emergencies in Facilities (Standards Australia 2010)
- Endorsed Bushfire Management Plan/s for the facility
  - 20210707149360ENV-BMP-001 Rev 2 dated 19 November 2021 (prepared by Linfire)

2.2 BEMP Development and Implementation

It is expected that the development will have an overall Emergency Management Plan, which identifies various hazards that could impact the facility (e.g building fires, explosion, floods, cyclones, bomb threats, armed threat/robbery etc.), and details the required response actions. Whilst this BEMP is presented as a standalone plan, this should be reference, or otherwise incorporated, into the overall Emergency Management Plan for the development, once it is produced

The BEMP will primarily be used by two groups of people at the facility:

2.2.1 Emergency Management Team (EMT)

- ***The group of people responsible for the development, documentation, review and revision of the BEMP to enable its use in a bushfire emergency***
- Assigning appropriate personnel roles for the Emergency Response Team
- Responsible for overseeing the successful implementation of all Preparedness actions outlined in Section 6.0.
- This is the same entity as the Emergency Planning Committee referenced in AS 3745
- The members of the ERT are nominated below in Table 1

Table 1: Emergency Management Team personnel

Name of person	Position/Organisation	Contact Details
TBC	TBC	TBC
TBC	TBC	TBC
TBC	TBC	TBC
TBC	TBC	TBC
TBC	TBC	TBC

2.2.2 Emergency Response Team (ERT)

- ***The group of people responsible for directing and controlling the implementation of the BEMP in a bushfire emergency***
- ***The members of the ERT are nominated in in Section*** Table 3
- Personnel should be trained and certified to conduct specific tasks in the event of a bushfire emergency including first aid, communication protocols and the operation of relevant firefighting equipment.
- The Emergency Response Team can be formed from the following positions (see Appendix 1 for further descriptions):
    - Chief Fire Warden
    - Deputy Chief Fire Warden
    - Fire Warden.
    - First Aid Personnel.
    - Traffic Warden.
    - Communications Officer.
- This is the same entity as the Emergency Control Organisation referenced in AS 3745

2.3 BEMP Assumptions

The following are the assumptions upon which this BEMP is based:

- The facility will implement the management measures within the latest version of the approved Bushfire Management Plan, and are done so prior to occupancy (unless stated in the BMP).
- All management measures and bushfire construction measures are to be maintained for the life of the development, with a focus on compliance immediately prior to, and during, bushfire season.

- The facility will comply with all relevant requirements of the annual firebreak notice.
- Information not available at the time of preparation of this BEMP is noted as being to be confirmed "(TBC)", and it to be updated prior to occupation by the Proponent.
- Guests can see and smell smoke and can see a fire.
- Guests can read and understand the English language, or will be accompanied or guided by people who can.
- The hotel facility is manned by staff at all times.

Should any of the above assumptions no longer be accurate, the BEMP shall be reviewed, and amended as required.

2.4 BEMP and Evacuation Plan Distribution

The BEMP is an internal document, to be used by the facility to prepare for, and manage bushfire emergencies. The latest approved version of the BEMP is to be made available to all relevant occupants and also be provided at appropriate locations or communication mediums:

- Administration building (TBC)
- Noticeboards (TBC)

The latest approved version of the Bushfire Emergency Management Map (see Appendix 2) is also to be displayed so it is readily visible and available to all occupants and also be provided on any relevant communication mediums:

- Administration building (TBC)
- Noticeboards (TBC)

2.5 Exercise Drills and Training

Ensure nominated personnel in the facility forming the Emergency Response Team (see Table 3 in Section 4.1) and any other relevant staff (preferably all staff) are fully conversant and trained in the procedures outlined in this BEMP.

Exercise drills covering evacuation and/or shelter-in-place procedures as outlined within this BEMP, **shall be practiced on an annual basis, preferably in the month prior to bushfire season.**

To ensure correct implementation of the BEMP, the drills and supplementary training, should include the following:

- understanding the bushfire warning system, where to access the Fire Danger Rating and Total Fire Ban day forecasts, and where to current emergency warning and road condition information.
- how to contact DFES, local fire brigade and any other emergency services personnel
- how to use the various communication methods (see Section 3.2)
- how to safely operate the fire hose reels and, when it is appropriate and safe to do so, to undertake firefighting activities. This would only be considered appropriate if the bushfire is very small. Liaise with the local fire brigade regarding this training.
- have a basic understanding of bushfire behaviour and how it threatens people and property. Liaise with the local fire brigade regarding this training.
- What critical actions are required to improve building resilience to bushfire impact including, but not limited to, closing doors, window, roof vents and other openings, turning off evaporative coolers, moving flammable items away from the building etc.
- It is recommended that sufficient staff are trained in senior first aid to enable first response

care in any emergency. Facility management should ensure sufficient staff holding a current senior first aid certification are rostered on each day.

Prior to all exercise drills, staff should be briefed to discuss the process and objectives of the drill. Following drills, staff shall be debriefed to discuss any issues associated with implementing the BEMP. Staff debriefing should also occur following any bushfire event, and this information used to inform improvements to the BEMP as part of the review.

Understanding the BEMP should be incorporated into the staff induction process to ensure they know the ERT members, learn how it is to be implemented and have a broad knowledge regarding its proper application.

The implementation of the BEMP may also relate to, or impact, occupants in surrounding areas. Where possible it is recommend that any relevant residents and members of the public, facility managers and staff in adjacent developments, and any other relevant parties, are also invited to any training to ensure they are broadly familiar with the BEMP procedures.

2.6 Ongoing Review of BEMP

Like all such plans, the BEMP is considered a "live" document, that will require ongoing review and amendment as required, to reflect changes to staff, occupants, the facility, vehicular access routes or the surrounding bushfire hazard including:

- Changes to staff, or their contact details, especially for members of the EMT and/or ERT
- Changes to emergency contacts or forecast or emergency information sources
- Ensure the off-site safer locations and nominated evacuation routes are current and still represent the best options, and confirm their availability for use during a bushfire emergency.
- Ensure any nominated off-site transportation suppliers have continued availability and capability to enable their use during a bushfire emergency.
- Incorporate any changes building construction, extent or locations that could have implications for the BEMP.
- Incorporate any changes to occupant numbers that could have implications on the BEMP, especially impacting any response actions.

As a minimum, the BEP shall be reviewed:

- annually (prior to bushfire season)
- following any actual bushfire emergency requiring the plan to be implemented
- prior to habitation of any new or renovated buildings within the site
- should there be deviation from any assumptions in Section 2.3

Ensure that any review of the BEMP incorporates any bushfire advice received from authorised personnel from:

- Department of Fire and Emergency Services (DFES)
- Local Emergency Management Committee (LEMC)
- Community Emergency Services Manager (CESM); or
- external experts.

Ensure that any review of the BEMP following a bushfire event considers the following:

- what worked and what didn't?
- was anything overlooked?
- what could you and your staff do better next time?

- should roles change?
- if changes are made, incorporate them into the formal plan and advise the appropriate parties including staff and other authorities
- share the knowledge with other facilities (if relevant)
- test the revised bushfire management plan and procedures.

Ensure that following any amendments to the BEMP and/or the Bushfire Emergency Plan, these are replaced in the locations specified in Section 2.4.

3.0 Facility and Occupant Details

This BEMP is for the entire **Onslow Township Village** and has been designed to assist management to protect life and property in the event of a bushfire. Table 2 provides a brief summary of the facility and the anticipated occupants that could be onsite during a bushfire emergency. The subsequent subsections provide further detailed information.

Table 2: Facility and Occupant Summary

Address	Lot 300 Back Beach Road, Onslow
Onsite Contact person	TBC prior to occupation
Position / role of Contact Person	TBC prior to occupation
Phone number (Before hours)	TBC prior to occupation
Phone number (After hours)	TBC prior to occupation
Type of facility	Short-term accommodation; public resort
Number of buildings	TBC prior to occupation
Number of employees	• TBC prior to occupation • approximately 50 onsite staff consisting of full-time and part-time employees
Maximum number of occupants	• TBC prior to occupation • approximately 300 guests staying in the overnight accommodation • approximately 50 public visitors • Total occupant load, including staff of up to 400 people
Number of occupants with support needs	Yes. Guest and visitors will be a representative of the general population
Description of support needs	Support needs could include a range of physical or mental impairments that are found throughout the general population. If anyone has special needs, it is expected they will be accompanied by an able-bodied adult, and that if there is a requirement for assistance, this will be provided by the accompanying adult or other adult guests or staff.

3.1 Vulnerable Occupants

For the purposes of these procedures, people are considered to be vulnerable if they are unable to relocate without assistance, or if their time to relocate would be much greater than the average person. The reasons for this could be:

- Mental or physical impairment
- Very young children or the elderly
- Pre-existing conditions such as respiratory issues
- Sickness, illness or injured
- People unfamiliar with surroundings

Given the use of the facility by mining personnel, it is anticipated there will be very few vulnerable people at the site, other than those potentially being unfamiliar with the layout. There will be members of the public using part of the facility, and while some may be Onslow residents, some may also be visitors to the town. These people would be expected to be representative of the general population, and could be impaired, young, elderly or sick/injured, as well as unfamiliar with their surroundings.

While it is expected vulnerable occupants would typically be accompanied by an able-bodied adult, that will be able to provide assistance, however if this is not the case, then this would be the responsibility of the ERT and other staff. In these instances, the Chief Fire Warden or nominated delegate, should arrange for a staff member or another responsible guests or visitor, to assist the vulnerable occupant/s throughout the bushfire emergency.

In the case of sickness or injury, there may be need for an ambulance to render professional medical attention. The ability to get an ambulance during a bushfire emergency will be variable depending on the nature and extent of the bushfire. It may be possible to evacuate these occupant/s to a hospital depending on the nature sickness or injury and the bushfire. The pre-emptive relocation of such vulnerable occupants should be a primary consideration during a bushfire emergency.

3.2 Communication Equipment and Strategy

Communication systems are critical to enable the onsite ERT to relay status and actions to occupants during a bushfire in order to manage the emergency and the recovery, as well as communicate with offsite emergency services.

The following communication systems are expected to be available for use during a bushfire emergency (TBC):

- Mobile phones
- Two-way handheld radios/walkie talkies
- Mobile loudspeakers
- Onsite PA/Fire Occupant Warning systems
- Battery powered radio to receive radio information
- Noticeboards depicting emergency management map and daily bushfire advice
    - Administration building (TBC)

3.3 Vehicular Access

The primary vehicular access to the local area is via Third Avenue, which extends to the south-west via First Street, Second Avenue and Simpson Street.

Within the development, vehicular access is via the internal driveway (compliant with the public road standards) and the carpark.

Perimeter firebreaks are also provided for fire appliance use only.

3.4 Pedestrian Access

Pedestrian access within, to and from the site, is available via running/walking tracks throughout the site, with gates at the main entrance and the egress gates in the south-west providing access to Onslow. The egress gates will be locked for normal use, but can be unlocked in a bushfire emergency to enable rapid pedestrian egress to Onslow.

3.5 Fire fighting and other Emergency Equipment

The development has the following onsite firefighting equipment available for use by emergency personnel:

- Onsite fire hydrant system including firewater tanks with suction from booster connection
- Street hydrants throughout the residential areas
- Fire hose reels
- Portable fire extinguishers
- First aid kits

All equipment should be maintained annually (as a minimum) in accordance with equipment specifications and the relevant Australian standards.

3.6 Vegetation Management and Building Bushfire Construction

These main vegetation management and landscaping treatments around the site to reduce bushfire spread and impact on buildings and people are as follows:

- Nominated Asset Protection Zones (APZs; highly modified low vegetation zone) along the key interfaces between buildings and unmanaged vegetation
- Low threat vegetation throughout the entire village

The bushfire construction elements work in conjunction with the vegetation management measures above:

- All accommodation buildings are constructed to the bushfire standards of the assessed BAL rating
- All other buildings are not required to be constructed to the assessed BAL rating, but are located in areas of BAL-29 or less.

4.0 Emergency Contacts

4.1 Onsite Emergency Response Team

Table 3 outline the people within the ***Emergency Response Team who are responsible for implementing the emergency procedures in the event of a bushfire***. Guidance on the responsibilities associated with each position is provided in Appendix 1.

Table 3: Emergency Response Team members

Emergency Role	Name of person	Organisational Position	Phone number
Chief Fire Warden	TBC	e.g. Site Manager	TBC
Deputy Chief Fire Warden	TBC	TBC	TBC
Fire Warden/s	TBC	TBC	TBC
First Aid Personnel	TBC	TBC	TBC
Traffic Warden	TBC	TBC	TBC
Communications Officer	TBC	TBC	TBC

4.2 Emergency Services and Other Organisations

Table 4 provides a summary of contacts for emergency services agencies and other organisations that may of useful in a bushfire emergency. Further information relating to bushfire emergency warning and status are provided in Section 5.0.

Table 4: Emergency contacts

Organisation	Office /contact	Information	Phone number / website
Local Fire Brigade	DFES Communications	Report a fire	000
Department of Fire and Emergency Services (DFES)	Communications Centre	Emergency warnings and incidents in local area	13 DFES (133 337)
Ambulance	Communications Centre	Report a medical emergency	000
Police	Communications Centre	Report other emergencies	000
Department of Fire and Emergency Services (DFES)	Website	Emergency warnings and incidents in local area	www.dfes.wa.gov.au twitter.com/dfes.wa

Organisation	Office /contact	Information	Phone number / website
EmergencyWA	Website	Emergency warnings and incidents in local area	www.emergency.wa.gov.au
Bureau of Meteorology	Website	Forecast fire danger ratings and weather	www.bom.gov.au/wa/forecasts
Parks and Wildlife Services	Website	Emergency warnings and prescribed burning in national parks	www.dpaw.wa.gov.au
Secondary contacts			
Shire of Ashburton	Ranger Services	Emergency management	(08) 9184 6001 0417 949 661
Onslow Hospital		Emergency medical	(08) 9184 3200
Onslow Volunteer Fire and Emergency		Local volunteer fire service	(08) 9184 6555 onslowvesu@bigpond.com.au
DFES State Emergency Service (SES)	Communications Centre	SES services for building damage and rescue	132 500
Main Roads WA	Office / website	Road closures	138 138 www.mainroads.wa.gov.au
Western Power		Electrical outages and damage	131 351

5.0 Bushfire Emergency Warnings and Forecast Bushfire Information

5.1 Bushfire emergency status information

In order to best understand the bushfire situation and the scale of response, information is available from the following sources:

- **Emergency WA website**: https://www.emergency.wa.gov.au/
  - the website is a map-based display with the best available emergency information across Western Australia
- **DFES website**: https://www.dfes.wa.gov.au/newsandmedia/Pages/NewsHome.aspx
  - which will redirect to Emergency WA website
- **DFES emergency information telephone:** 13 DFES (13 3337)
- **DFES Twitter:** https://twitter.com/dfes_wa
- **DFES Facebook:** https://facebook.com/dfeswa/
- **Emergency Alert national telephone warning system:** http://www.emergencyalert.gov.au/
  - one of the ways emergency services (police, fire and emergency services etc) can warn a community of a likely or actual emergency
  - Emergency Alert is not used in all circumstances. Whether emergency services decide to issue telephone warnings through Emergency Alert will depend on the nature of the incident
  - the warning system sends voice messages to landline telephones and text messages to mobile telephones within a specific area defined by the emergency service organisation issuing the warning message about likely or actual emergencies such as fire, flood, or extreme weather events
- **Emergency WA RSS and CAP AU feeds**: https://www.emergency.wa.gov.au/#cap-rss
  - RSS and CAP AU feeds allow you to receive updates of emergency information from official sources, including summaries and web content with links to any other available information
  - CAP AU is a standard web format that allows consistent and easy to understand emergency warning messages to be broadcast across a variety of communication systems. Specific feed readers are required to access these services.
  - DFES has provided further information on RSS feeds on the following website: https://www.dfes.wa.gov.au/pages/rss.aspx
- **ABC Local Radio** or local radio news bulletins
- **Main Roads Travel Map (road status):** https://travelmap.mainroads.wa.gov.au/Home/Map
  - the website is a map-based display with the road status information across WA
- **Bureau of Meteorology:** http://www.bom.gov.au/wa/index.shtml
  - Current and forecast weather
- **Bushfire IO:** https://bushfire.io/
  - This is website that integrates information from a variety of sources and provides in a single configurable map. It provides good visuals on fire locations, emergency warnings, weather and prevailing wind directions, and road hazards.
  - While this a good visual tool, it is run by a private organisation and should be used with care and corroborated with the other sources above.

- Emergency Services personnel
- local knowledge and being alert and aware of your surroundings.

5.2 Fire Danger Ratings

Department of Fire and Emergency Services (DFES) uses Fire Danger Ratings (FDR) to provide advice on the level of bushfire threat on a particular day. Anyone working or living in bushfire prone area should know the FDR is for their area, monitor local conditions and keep informed.

Information on forecast and current FDRs can be found on the Emergency WA website, with links to this also available from the DFES and Bureau of Meteorology websites.

- **Bureau of Meteorology website (4-day forecast FDR)**
  http://www.bom.gov.au/wa/forecasts/fire-danger-ratings.shtml
- **Emergency WA website (current and next day forecast FDR):**
  https://www.emergency.wa.gov.au/index.html#firedangerratings

The relevant weather district for the forecast FDR is: **WEST PILBARA COAST**

Information on the different FDR levels and what they mean is provided in Plate 1.

FIRE DANGER RATING	WHAT DOES IT MEAN?	
CATASTROPHIC 100+	• These are the worst conditions for a bush or grass fire • If a fire starts and takes hold, it will be extremely difficult to control and will take significant firefighting resources and cooler conditions to bring it under control	• Spot fires will start well ahead of the main fire and cause rapid spread of the fire. Embers will come from many directions • Homes are not designed or constructed to withstand fires in these conditions • The only safe place to be is away from bushfire risk areas.
EXTREME 75-99 SEVERE 50-74	• These are very hot, dry and windy conditions for a bush or grass fire • If a fire starts and takes hold, it will be unpredictable, move very fast and difficult for firefighters to bring under control • Spot fires will start and move quickly. Embers may come from many directions	• Homes that are prepared to the highest level, have been constructed to bushfire protection levels and are actively defended may provide safety • You must be physically and mentally prepared to defend in these conditions • The only safe place to be is away from bushfire risk areas.
VERY HIGH 32-49	• These are hot, dry and possibly windy conditions for a bush or grass fire • If a fire starts and takes hold, it may be hard for firefighters to control	• Well prepared homes that are actively defended can provide safety • You must be physically and mentally prepared to defend in these conditions.
HIGH 12-31 LOW-MODERATE 0-11	• If a fire starts, it is likely to be controlled in these conditions and homes can provide safety • Be aware of how fires can start and reduce the risk	• Controlled burning may occur in these conditions if it is safe – check to see if permits apply.

Plate 1: Fire Danger Ratings

Understanding the FDR categories and what they mean will assist personnel in making decisions about what to do if a bushfire starts. The FDR is based on forecast weather conditions and gives advice about the level of bushfire threat on a particular day. When the rating is high, the threat of a bushfire increases.

5.3 Total Fire Ban days

A Total Fire Ban (TFB) is declared on days when fires are most likely to threaten lives and property. This is because of predicted extreme fire weather or when there are already widespread fires and firefighting resources are stretched. TFB days are often aligned with days with an elevated FDR, however they may be declared outside of a fire season due to other factors such as higher temperatures and expected strong winds preceding a storm front.

To determine if a TFB has been declared for the next day (evening after 6pm and prior to 8.15am), the following resources are able to be used:

- **Emergency WA website (current and next day forecast FDR):** https://www.emergency.wa.gov.au/#totalfirebans
- **Total Fire Ban Hotline:** (1800 709 355)
- **DFES phone:** (13 3337)
- **DFES Twitter:** https://twitter.com/dfes_wa

There are restrictions on what activities can be conducted on a TFB day, such as it being illegal to light an open-air fire or conduct any activity that could start a fire. Further information is provided regarding these activities in Section 7.2.

5.4 DFES emergency warning system

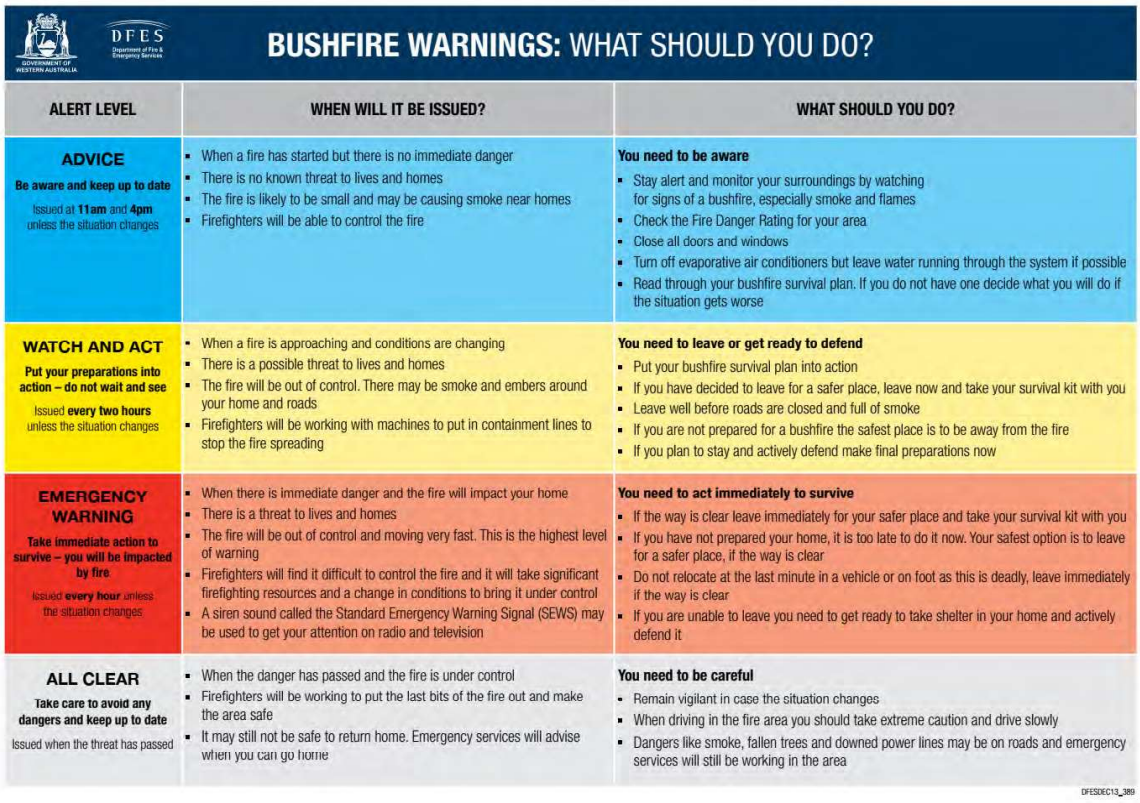
During a bushfire, emergency services will provide information through the issuing of community alerts. The alert level changes to reflect the increasing risk to life and the decreasing amount of time until the fire arrives. Further information on the warnings and what they mean are provided below.

DFES issues the following warnings (see Plate 2 or further information):

- **Advice**
- **Watch and Act**
- **Emergency Warning**
- **All clear**

The best place to determine the current alert level is from the Emergency WA website, which shows the alert level as part of the Bushfire Advice note for each bushfire.

- **Emergency WA website:** https://www.emergency.wa.gov.au/



BUSHFIRE WARNINGS: WHAT SHOULD YOU DO?

ALERT LEVEL	WHEN WILL IT BE ISSUED?	WHAT SHOULD YOU DO?
ADVICE **Be aware and keep up to date** Issued at **11am** and **4pm** unless the situation changes	▪ When a fire has started but there is no immediate danger ▪ There is no known threat to lives and homes ▪ The fire is likely to be small and may be causing smoke near homes ▪ Firefighters will be able to control the fire	**You need to be aware** ▪ Stay alert and monitor your surroundings by watching for signs of a bushfire, especially smoke and flames ▪ Check the Fire Danger Rating for your area ▪ Close all doors and windows ▪ Turn off evaporative air conditioners but leave water running through the system if possible ▪ Read through your bushfire survival plan. If you do not have one decide what you will do if the situation gets worse
WATCH AND ACT **Put your preparations into action – do not wait and see** Issued **every two hours** unless the situation changes	▪ When a fire is approaching and conditions are changing ▪ There is a possible threat to lives and homes ▪ The fire will be out of control. There may be smoke and embers around your home and roads ▪ Firefighters will be working with machines to put in containment lines to stop the fire spreading	**You need to leave or get ready to defend** ▪ Put your bushfire survival plan into action ▪ If you have decided to leave for a safer place, leave now and take your survival kit with you ▪ Leave well before roads are closed and full of smoke ▪ If you are not prepared for a bushfire the safest place is to be away from the fire ▪ If you plan to stay and actively defend make final preparations now
EMERGENCY WARNING **Take immediate action to survive – you will be impacted by fire** Issued **every hour** unless the situation changes	▪ When there is immediate danger and the fire will impact your home ▪ There is a threat to lives and homes ▪ The fire will be out of control and moving very fast. This is the highest level of warning ▪ Firefighters will find it difficult to control the fire and it will take significant firefighting resources and a change in conditions to bring it under control ▪ A siren sound called the Standard Emergency Warning Signal (SEWS) may be used to get your attention on radio and television	**You need to act immediately to survive** ▪ If the way is clear leave immediately for your safer place and take your survival kit with you ▪ If you have not prepared your home, it is too late to do it now. Your safest option is to leave for a safer place, if the way is clear ▪ Do not relocate at the last minute in a vehicle or on foot as this is deadly, leave immediately if the way is clear ▪ If you are unable to leave you need to get ready to take shelter in your home and actively defend it
ALL CLEAR **Take care to avoid any dangers and keep up to date** Issued when the threat has passed	▪ When the danger has passed and the fire is under control ▪ Firefighters will be working to put the last bits of the fire out and make the area safe ▪ It may still not be safe to return home. Emergency services will advise when you can go home	**You need to be careful** ▪ Remain vigilant in case the situation changes ▪ When driving in the fire area you should take extreme caution and drive slowly ▪ Dangers like smoke, fallen trees and downed power lines may be on roads and emergency services will still be working in the area

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Plate 2: Bushfire Warning Levels

6.0 Bushfire Preparedness

Preparation prior to, and during, the declared bushfire season is paramount to increasing the chances of occupants surviving a bushfire including the resilience of buildings to withstand bushfire impact. These actions focus on management of onsite combustible material, maintenance of buildings, access routes and fire and emergency systems and ensuring emergency management preparedness, to not only reduce the intensity of bushfire impact but also to maximise the chance for successful occupant evacuation or refuge (as per the project BMP).

Bushfire Season: **(Shire of Ashburton firebreak notice 2020/2021)**	**Compliance Dates** **1 January – 31 December each year**

Below is a summary of the bushfire preparations that should be carried out within the facility throughout the year, and specifically prior to and during the bushfire season. While this list of tasks is comprehensive, throughout the life of the facility there may be other actions that become necessary to improve bushfire resilience. It is requirement that this is reviewed as part of the annual BEMP review by the Emergency Management Team, and amended as required.

6.1 Preparation – Ongoing year round

Tasks detailed in Table 5 are to be performed throughout the year on the following basis:

- Year-round on an ongoing basis
- **Specifically prior to bushfire season**

Table 5: Preparation tasks/actions – Ongoing tasks throughout year

Task/Action	***Timing (if relevant)***
Comply with current Shire of Ashburton firebreak notice, including any approved variations and maintenance of perimeter firebreaks.	Ongoing; regularly with attention prior to, and during, bushfire season
Ensure all management actions documented within any endorsed Bushfire Management Plans (supporting planning applications) is undertaken in particular the ongoing maintenance of Asset Protection Zones and low threat vegetation	Ongoing; regularly with attention prior to, and during, bushfire season
Maintain and test any firefighting equipment present within the facility (e.g. fire hydrant system, fire hose reels, extinguishers) to ensure it is fit for purpose and is in good working order.	Ongoing; regularly with attention prior to, and during, bushfire season
Maintain and test any onsite communication equipment required for bushfire emergencies, is fit for purpose and is in good working order.	Ongoing; regularly with attention prior to, and during, bushfire season
Ensure there is sufficient first aid equipment, and that it is available and in good working order. Ensure sufficient staff are trained in Senior First Aid.	Ongoing; regularly with attention prior to, and during, bushfire season

Task/Action	*Timing (if relevant)*
Ensure all landscaping reticulation systems, especially around buildings, is in good working order and providing sufficient coverage.	Ongoing; regularly with attention prior to, and during, bushfire season
Maintain all AS 3959 bushfire construction elements for implemented on the various accommodation buildings	Ongoing; at least an annual basis with attention prior to, and during, bushfire season
Ensure nominated personnel in the Emergency Response Team are fully trained in the procedures outlined in this BEMP and conduct drills to practice evacuation procedures as outlined in Section 2.5. Ensure appropriate members of the ERT know how to use any site communication systems. Ensure sufficient staff are trained in first aid and first response firefighting (extinguishers, hose reels). Ensure all other staff are aware of the procedures outlined within this BEMP	Ongoing; regularly with attention prior to, and during, bushfire season
Update contact details of the emergency response team in the BEMP.	Ongoing; at least an annual basis with attention prior to, and during, bushfire season
Review and update this Bushfire Emergency Management Plan as outlined in Section 2.6, including any required bushfire preparedness tasks, training and exercises.	Ongoing; at least an annual basis with attention prior to, and during, bushfire season
Ensure procedures are in place to ensure visitor registers are readily available for use in an emergency.	Ongoing; regularly with attention during bushfire season
Comply with any forecast declared Total Fire Bans as outlined in Section 7.2	Total Fire Ban days

6.2 Preparation – Daily actions throughout bushfire season

Tasks detailed in Table 6 are to be performed daily throughout bushfire season, on declared Total Fire Ban Days, or when conditions may otherwise support significant bushfire behaviour

Table 6: Preparation tasks/actions – Daily throughout bushfire season

Task/Action	*Timing (if relevant)*
Ensure all vehicular access/egress routes are clear of any obstructions and have the appropriate vertical and horizontal clearances to ensure they are in good traversable condition. Ensure any gates along egress routes are in good working order, with keys available at all times to unlock any locked gates.	

Task/Action	*Timing (if relevant)*
Ensure any internal personnel egress pathways onsite and within buildings, are also clear and available. Ensure any pedestrian egress gates are in in good working order, with keys available at all times to unlock any locked gates.	
Check exterior of buildings and any decks, and remove/relocate combustible items (rubbish, wood piles, furniture etc that can ignite) that can be stored 10m from building and decks. Ensure all objects attached to the buildings are non-combustible or can be easily removed in a bushfire event Clear all roofs, roof gutters and valleys of any leaf litter, debris or other combustible material.	
Ensure nominated assembly points and onsite safer places are appropriately maintained including and are available and fit-for-purpose.	
Ensure all required communication equipment is available, in good working order and ready for use. Ensure all mobile phones and any radio communication devices are fully charged. Ensure site has access to a battery-operated radio.	
Ensure sufficient first aid kits and other emergency resources are available and fit-for-purpose.	
Record the presence of all people using or visiting the site, and when they have left	
Review forecast Fire Danger Rating, weather and for Total Fire Bans as outlined in Section 7.0, and implement pre-emptive actions as required. Advise all relevant staff, ERT and occupants of the forecast FDR or TFB status as required.	
Regularly check the monitor the Emergency WA website, DFES phone (13 3337), DFES Twitter and local ABC radio for current emergency warning status and bushfire information. Regularly visually scan local area for signs of bushfire	

6.3 Additional resources

Table 7 provides a list of publications that provide additional information relating to bushfire preparedness and awareness. It is recommended that facility management review these publications prior to and during the bushfire season.

Table 7: Preparation and awareness publications

Agency	Resource	Website
Department of Fire and Emergency Services (DFES)	5 Minute Fire Chat online resource	https://www.dfes.wa.gov.au/firechat/Pages/default.htm
	5 Minute Fire Chat publications	https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/Pages/publications.aspx
	Bushfire Preparation Toolkit	https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/DFES-Fire-Chat-Bushfire-Preparedness-Toolkit.pdf
Shire of Ashburton	Bushfire Control	https://www.ashburton.wa.gov.au/live/services/ranger-services/bush-fires.aspx
	Fire and Emergency	https://www.ashburton.wa.gov.au/live/services/fire-and-emergency.aspx

7.0 Awareness and pre-emptive procedures

This section outlines when and what monitoring actions are to be undertaken to ensure the facility maintains awareness of any forecast elevated bushfire weather days, and the associated pre-emptive procedures the facility can implement to respond to heightened risk. The ERT, or nominated staff, shall ensure they undertake the following monitoring and pre-emptive actions based on:

- the forecast Fire Danger Rating (FDR)
- declared Total Fire Ban days

Maintaining a high level of situational awareness, including forecast conditions, will also assist with the rapid assessment of any bushfire emergency as outlined in Section 8.0.

7.1 Forecast Fire Danger Rating

Monitoring the forecast FDR is to be conducted daily using the resources outlined in Section 5.2. The pre-emptive responses are detailed in Table 8.

Table 8: Forecast Fire Danger Rating Pre-Emptive Actions

FDR MONITORING TRIGGER (Refer Section 5.2 to determine FDR):

- **On all days during bushfire season, if the FDR will be Very High or above, or any declared Total Fire Ban days**
- **On days outside bushfire season with when weather is hot, dry or windy or there has been recent bushfires in the area**

Weather District: WEST PILBARA COAST

Action/Task	Fire Danger Rating					
	Low/Mod	High	Very High	Severe	Extreme	Catastrophic
Maintain situational awareness by: • having nominated staff visually monitor land in the local area around the development for signs of bushfire • monitoring the Emergency WA website, DFES phone (13 3337), DFES Twitter and local ABC radio for current emergency warning status and bushfire information.	Conduct checks if conditions are unusually warm and windy		Conduct regular checks throughout the day, at the following times as a minimum: • 8am • 11am • 2pm • 5pm If a bushfire is detected, go to Table 10.		Forecast FDR of Extreme or Catastrophic are less common in this location, and the facility should treat these days with great caution with potential for worst bushfire behaviour. Conduct hourly checks throughout the day, from sunrise to 1 hour after sunset If a bushfire is detected, go to Table 10.	
Contact DFES or local Fire Control Officer to discuss the next days operation	No specific requirements		No specific need to contact DFES or the or City of Busselton CESM for this forecast FDR unless there are specific circumstances result in high visitation to the area		Advise the Chief Fire Warden ASAP. They are to make contact with DFES or local Fire Control Officer as soon as the forecast FDR of Extreme or Catastrophic is identified (which may be several days in advance) and determine what pre-emptive actions can be undertaken including: • reduce visitation to the development (public visitors, functions etc) • rostering additional staff to handle an emergency • review whether a local brigade appliance is able to be in the local area	
Advise the ERT and relevant staff	No specific requirements		Ensure all ERT and relevant staff are notified of the elevated bushfire risk			
Update guests and visitors of the Fire Danger Rating	No specific requirements		Advise guests and visitors of the elevated bushfire risk. Post forecast bushfire weather and warnings on nominated noticeboards (see Section 2.4) Recommend they remain at the development and be ready for potential bushfire response such as offsite evacuation Recommend if they leave the development, they should go to areas with low bushfire risk areas (e.g. a town centre) during the hottest part of the day (e.g. 10 am to 4pm).			

FDR MONITORING TRIGGER (Refer Section 5.2 to determine FDR):

- **On all days during bushfire season, if the FDR will be Very High or above, or any declared Total Fire Ban days**
- **On days outside bushfire season with when weather is hot, dry or windy or there has been recent bushfires in the area**

Weather District: WEST PILBARA COAST

Action/Task	Fire Danger Rating					
	Low/Mod	High	Very High	Severe	Extreme	Catastrophic
Conduct daily preparations from Table 6	Recommended, but no specific requirements		Conduct daily preparations the day prior or in early morning			
Conduct year-round preparation from Table 5	Conduct preparations on ongoing basis, with focus on prior to bushfire season					
Open air fires/Campfires/Cooking fires	Can be conducted in accordance with Shire firebreak notice, and provided conditions are benign No open fires on declared Total Fire Ban days					

7.2 Forecast Total Fire Ban

Total Fire Ban (TFB) procedures are triggered on days when a Total Fire Ban is declared due to extreme fire weather, when widespread fires are stretching firefighting resources or even outside bushfire season due to higher temperatures or expected strong winds.

A TFD will be declared the evening before it is to take effect and the resources detailed in Section 5.3 can be used to determine the forecast and current TFB status.

There are restrictions on what activities can be conducted on a TFB day and Table 9 lists the procedures the required actions when a Total Fire Ban is declared.

Table 9: Total Fire Ban Actions

TFB MONITORING TRIGGER (Refer Section 5.3 for how to determine TFB day status): • **On all days during bushfire season** • **On days outside bushfire season with when weather is hot, dry or windy or there has been recent bushfires in the area**	
Action	**Person responsible**
If a Total Fire Ban is declared, ensure all relevant staff and occupants are notified to ensure all relevant actions are undertaken.	Chief Fire Warden (or nominated delegate)
Ensure the following actions are avoided if a Total Fire Ban is declared: • no fire or flames allowed in the open air • no open fires for the purpose of cooking or camping are not allowed • no 'hot work' such as metal work, grinding, welding, soldering, gas cutting or similar is allowed unless a formal exemption has been obtained • no use of chainsaws, plant or grass trimmers or lawn mowers in bushland areas • no other activities that may start a fire • ensure equipment or machinery is mechanically sound • ensure all reasonable precautions are taken to prevent a bushfire igniting, including postponing any activity that could result in a bushfire ignition. Further information on prohibited activities can be found on the DFES website below	Chief Fire Warden (or nominated delegate)
Maintain situational awareness by: • having nominated staff visually monitor land in the local area around the development for signs of bushfire (signs or smell of smoke etc) • monitoring the Emergency WA website, DFES phone (13 3337), DFES Twitter and local ABC radio for current emergency warning status and bushfire information. • If a bushfire is detected, either visually or via website/radio/social media, obtain information on the fire location and direction and speed of travel **If a bushfire is detected, refer to Table 10.**	Nominated Fire Warden

The Department of Fire and Emergency Services advice is that chainsaws, plant or grass trimmers or lawn mowers can be used during a total fire ban in suburban or built up areas which are cleared of flammable material, but not in bushland or other areas where their use is likely to cause fire. Further information on TFB days and the prohibited activities can be found on the following DFES website https://www.dfes.wa.gov.au/totalfirebans/#faqs

Individuals could be fined up to $25,000 or jailed for 12 months or both if the Total Fire Ban is ignored.

8.0 Bushfire Emergency Triggers and Decision making

The onsite ERT, in particular the Chief Fire Warden (or nominated delegate), must assume responsibility for assessing the bushfire situation, using the information available, and making a decision regarding the response occupants need to undertake to stay safe. While there are various sources of potential information available upon which to base decision making, in a bushfire emergency to timing and accuracy of the information is not always clear and if the bushfire is close to the development, onsite personnel may be the most aware of the current situation by being the closest. Additionally, when the bushfire is near the development or the evacuation routes, onsite personnel will need to exercise greater situational awareness, judgement and caution as the margin of safety is less.

There are two main response options for this facility to keep people safe:

- **Offsite Evacuation –** vehicular evacuation along the road network to an offsite location
- **Onsite Shelter-in-Place –** relocating occupants and public to an onsite location

Prior to the two main response actions, there will be two other actions:

- **Standby and Controlled Shutdown –** shutdown tasks where there is adequate time for controlled preparation for safe offsite evacuation or onsite shelter-in-place
- **Emergency Shutdown** - – shutdown tasks where the bushfire impact to the site or roads will occur shortly and rapid shutdown is required with the intention of getting occupants to a place of relative safety. Given the limited time to conduct these, they have been incorporated into the Offsite Evacuation procedures.

In bushfires, people often plan to remain in place and become overwhelmed by the bushfire causing them to leave for a safer place too late. The key to a safe evacuation is leaving early, this means long before the development or evacuation roads come under bushfire attack. Driving is very dangerous during a bushfire with smoke making it hard to see, fallen trees over the road and power lines down can all trap vehicles on the road, and result in fatalities. Traffic on the roads can also hamper firefighting operations, especially when the bushfire is close.

Early detection of a bushfire's existence and location, provides the best opportunity to conduct early evacuation. Warning of a bushfire is often provided by emergency authorities (e.g. EmergencyWA, radio, SMS alert etc) however this can't be relied upon in all cases. Visual or olfactory cues or information from arriving visitors may also be other sources of information.

When assessing the bushfire situation, the Chief Fire Warden, or nominated delegate, should consider the following:

- the location and behaviour of the bushfire based on the following:
    - current bushfire warnings that have been issued
    - any available local knowledge (e.g. visual signs of bushfire, relayed information from occupants/visitors etc), which if the bushfire is close, can be more relevant for decision-making than the regional bushfire warnings
- the nature of the hazard between the current fire location and the development e.g. type of vegetation and slope
- the development layout and incorporated bushfire protection measures as a measure of bushfire resilience
- the evacuation network (roads, paths etc) including potential to be impacted by bushfire
- variations in the facility operational routines that can impact the amount of time required to commence and complete the evacuation procedure

Advice may be provided by emergency authorities to self-evacuate which greatly assists because it confirms the safety of evacuation routes and makes the process relatively straight forward.

While it is highly recommended that the specific direction/advice of authorised emergency services personnel is followed if they are onsite, however they may not be familiar with the development, so one should always use their judgement and all available information to balance advice and make the most informed assessment possible regarding potential impact to the occupants, the development and evacuation routes.

Table 10 provides a summary of likely information that will be available to make decisions during a bushfire emergency, complete with actions to be considered. The main sources of information include:

- DFES Bushfire Emergency Warnings
- Decision Zones where the bushfire location is known
    - From reputable website, radio etc
    - Physical cues (visual, olfactory) of fire
    - relayed information (from occupants, arriving visitors or adjacent land uses)

Table 10: Bushfire Triggers and Response Actions

Trigger	Action/Tasks
Bushfire Emergency Warnings (see Section 5.1 for where to obtain warnings)	
Advice	• Commence Standby/Controlled Shutdown Procedures • Consider pre-emptive use of Offsite Evacuation procedures (depending on location and if bushfire is moving toward facility • Continue monitoring and re-evaluating situation
Watch and Act	• Commence or continue Offsite Evacuation procedures • Continue monitoring and re-evaluating situation
Emergency	• Urgently commence or continue Offsite Evacuation procedures • Only consider Onsite Shelter-in-Place as a last resort action only • Continue monitoring and re-evaluating situation
All Clear	• Commence Recovery Procedures (Offsite Evacuation or Shelter-in-Place) • Continue monitoring and re-evaluating situation
Decision Zones – based on distance of bushfire from development (from reputable website, visual signs of bushfire, relayed information from occupants/visitors etc). Bushfire conditions can change rapidly and evidence of a nearby fire may precede any formal bushfire warning.	
Monitoring Zone • Distance from site: >20km	• Call 000 and advise DFES of the bushfire (and obtain any information) • Consider commencing Standby/Controlled Shutdown Procedures (if bushfire is moving toward facility) • Continue monitoring and re-evaluating situation
Readiness Zone • Distance from site: 10 -20km	• Call 000 and advise DFES of the bushfire (and obtain any information) • Commence or continue Standby/Controlled Shutdown Procedures • Consider pre-emptive use of Offsite Evacuation procedures • Continue monitoring and re-evaluating situation
Response Zone • Distance from site: <10km	• Call 000 and advise DFES of the bushfire (and obtain any information) • Commence or continue Offsite Evacuation procedures • Only consider Onsite Shelter-in-Place as a last resort action only • Continue monitoring and re-evaluating situation

9.0 Standby and Controlled Shutdown Procedures

Where the bushfire is sufficiently far away that it is not clear whether it will impact the facility or vehicular access routes, but is close enough to trigger a heightened level of awareness by occupants which may also include commencing a shutdown response by the facility. There is still considered adequate time for shutdown to be conducted in a controlled way in preparation for safe offsite evacuation.

Bushfire situations can change rapidly, so where the bushfire is close enough to the facility and/or evacuation routes to require rapid shutdown of the development, with the priority to get occupants to a place of relative safety, emergency shutdown may need to be triggered during a controlled shutdown. Given the limited time to conduct emergency shutdown actions when the bushfire is close, these actions have been incorporated into the Offsite Evacuation procedures.

Table 11: Standby and Controlled Shutdown Procedures

Action	Person responsible
Chief Fire Warden to take charge and to assess the situation relating to level of bushfire threat and potential impact on the facility, occupants and the evacuation network through the following: • using latest emergency, weather and road information obtained from Section 5.0 • implementing the following procedure: ◦ obtain aerial photo ◦ plot where bushfire is located and whether it is moving toward the development. Wind direction is typically an indicator of fire direction ◦ obtain the Fire Danger Rating for the day from EmergencyWA website ◦ note temperature, wind direction and speed from live BoM observations from website.	Chief Fire Warden
Contact DFES (000) if not already undertaken: • inform that the facility is operating and has vulnerable occupants and the number of occupants • seek advice about the fire location, behaviour and likelihood of impacting the facility • seek instructions from DFES (preferably Emergency Services Incident Controller who is managing the fire) about what actions to take • determine Emergency Services Incident Controller/DFES point of contact (if any) • Determine where offsite safer locations or Welfare Centres are being designated (open). If they are not known, determine where to evacuate if possible. ◦ If this information is not possible to obtain, use the offsite safer location/s nominated in this BEMP on Table 13	Chief Fire Warden Communications Officer
Assemble entire ERT and relevant staff: • Ensure all ERT members remain contactable • Update ERT and staff of the bushfire situation and the planned emergency management strategy.	Chief Fire Warden All ERT members All staff (if possible)

Action	Person responsible
Ensure all other emergency communication equipment around the site is available and ready for use (e.g. connected, batteries charged etc)	Communications Officer Fire Wardens
Ensure all first aid equipment is available and ready for use.	First Aid Personnel
Begin arranging any guest and visitor registers and information to create a current and collated register enable accounting for all known occupants (staff, guests and visitors) as possible • Begin accounting for all occupants and staff, • Begin identifying any known vulnerable people that may require pre-emptive evacuation offsite safer location/s or hospital	Deputy Chief Fire Warden Fire Wardens
Contact all guests and visitors: • Sounding alarms, • Using communication systems outlined in Section 3.2 or • Direct occupants to gather at the onsite assembly area Inform guests and visitors of the following: • The current emergency warning and bushfire situation • The anticipated response actions (offsite evacuation or onsite shelter-in-place): • Confirm the location of the offsite safer location • Ensure occupants are able to walk to the offsite safer location or have access to a vehicle and identify those that don't • Identify any vulnerable occupants (young, elderly, impaired, sick, injured, respiratory or other illness etc) who may require pre-emptive offsite evacuation or relocation to the local hospital. Arrange any required emergency transportation to relocate any vulnerable occupants offsite (this may need to be an ambulance)	Chief Fire Warden All ERT members All staff (if possible)
Consider ceasing some or all non-essential operations Consider ceasing activities with guests, visitors and public, including functions ***NOTE: This is a consideration only and should be based on current bushfire situation, including location, discussion with local Emergency Services and DFES, and the nature of the activity. A remote offsite activity poses a greater risk than onsite indoor activities).***	Chief Fire Warden
Where appropriate, request guests commence undertaking shutdown of their accommodation including: • Begin gathering their belongings and packing to be ready for offsite evacuation or onsite sheltering and request they close any doors or doors. • Close all windows and doors including roller and sliding doors • Put away all external combustible items or put inside building/s • Turn off air-conditioners especially evaporative coolers, or keep the water running and turn off the fan if possible • Leave on adequate lighting including points of entry lighting.	Deputy Chief Fire Warden Fire Wardens
Where appropriate, commence shutting down the facility buildings	Deputy Chief Fire Warden

Action	Person responsible
including: • Close all windows and doors including roller and sliding doors • Put away all external combustible items or put inside building/s • Turn off air-conditioners especially evaporative cooler	Fire Wardens
Ensure all internal emergency vehicular access routes are unlocked, and clear and available for use by staff, guests, visitors and firefighters including: • Main entrance gate • All internal driveways • Access to the booster connection and/or firewater tanks • Perimeter firebreaks	Traffic Warden Fire Wardens
Ensure all internal emergency pedestrian access routes are unlocked, and clear and available for use by staff, guests, visitors and firefighters including: • Main entrance gate • Emergency egress gates • All internal walkways • Any secured access points	Deputy Chief Fire Warden Fire Wardens
If safe to do so, organise for regular patrols of the facility (if not easily observed through regular activities) to check for any signs of bushfire ignition. Those conducting the patrols are to wear appropriate PPE ***Strongly consider commencing offsite evacuation while evacuation routes are open and unimpacted by smoke, embers or fire or congested with traffic***	Deputy Chief Fire Warden Fire Wardens
• Continue monitoring and re-evaluating the bushfire scenario. • Maintain situational awareness by: ◦ having nominated staff visually monitor land in the local area around the development for signs of bushfire (signs or smell of smoke etc) ◦ monitoring the Emergency WA website, DFES phone (13 3337), DFES Twitter and local ABC radio for current emergency warning status and bushfire information. • If a bushfire scenario is changing, obtain information on the new warning status, fire location and direction and speed of travel • Review Table 10 with new information to determine new response actions ◦ Where possible, undertake decision making process in consultation with Emergency Services Incident Controller/DFES point of contact ◦ Initiate Offsite Evacuation or Onsite Shelter-in-Place response procedures as required.	Chief Fire Warden and Communications Officer

10.0 Offsite Evacuation Response

Where the bushfire is close enough to the facility and/or egress routes to require rapid shutdown of the development, with the intention of getting occupants to a place of relative safety. Priority shall be on ensuring occupants are evacuated offsite to safety, with a focus on egress routes, however if this unsafe to conduct, they shall be relocated to the onsite location to shelter-in-place. Site shutdown to be undertaken if safe to do so, although this may have been commenced as part of the Standby/Controlled Shutdown procedures.

Given the location and relatively direct connection to the residential part of Onslow townsite, offsite evacuation conducted early is the safest response in a bushfire event, while evacuation routes are open and unimpacted by smoke, embers, fire or blocked or congested with traffic, however these will likely still be available during bushfire impact on the site.

The decision to evacuate occupants to the off-site location will depend on the location and behaviour of the bushfire, and where possible, should always be conducted in consultation with the Emergency Services Incident Controller or authorised DFES personnel managing the bushfire emergency.

10.1 Emergency Onsite Assembly Point and Offsite Safer Locations

In the event that offsite evacuation is to be conducted, understanding where to assemble people onsite prior to evacuation, and the offsite locations available to safely send people, will be critical to ensure its success.

10.1.1 Designated on-site assembly point

An on-site assembly point is an area within the development where occupants are to meet on becoming aware that there is a bushfire in the area, to obtain further status information and be advised of response actions.

Although the communication strategy for the facility is considered to be sufficient to avoid the need for onsite assembly, there may be instances where on-site assembly is required. It is proposed that the designated on-site assembly point identified below in Table 12 and depicted in Appendix 2.

Table 12: Designated on-site assembly point

Designated assembly point
Administration, Training/Inductions, Medical/Wellness and Creche/Comms buildings area

10.1.2 Designated off-site locations

DFES and the Shire of Ashburton may provide advice on the day as to the locations of the designated off-site safer location/welfare centres.

In the event that this information is not yet available, Table 13 lists potential offsite location areas that are to be considered during an evacuation. The safer location/s have been chosen based on:

- relative proximity to the facility
- relative safety of evacuation route
- whether the refuge is located away from the effects of a bushfire

Table 13 nominates when the various offsite locations should be considered, while also providing

primary route to the location as well as estimated travel times during normal traffic. ***Allowance needs to be made for increased travel times due to bushfire conditions (e.g. smoke) and traffic congestion on the road network.***

Table 13: Designated off-site safer location

Location and address	Route to location	Travel Distance and Time (normal travel)
Onslow Sports Club (47 Third Avenue, Onslow)	***Primary Route*** Third Avenue (S) – Onslow Sports Club (R)	600 m (7 - 10 min walk) (2 - 5 min drive)

10.2 Offsite Evacuation Procedures

Once the decision has been made conduct offsite evacuation of the facility, Table 14 lists the evacuation procedures to be followed.

Table 14: Offsite Evacuation procedures

Action	Person responsible
Chief Fire Warden to take charge and to assess the situation relating to level of bushfire threat and potential impact on the facility, occupants and the evacuation network through the following: • using latest emergency, weather and road information obtained from Section 5.0 • implementing the following procedure: • obtain aerial photo • plot where bushfire is located and whether it is moving toward the development. Wind direction is typically an indicator of fire direction • obtain the Fire Danger Rating for the day from EmergencyWA website • note temperature, wind direction and speed from live BoM observations from website. Once the decision is made to evacuate offsite, use the available information to: • Determine the preferred offsite location (pending advice from DFES or Emergency Services Incident Controller) • Determine the safest route to get to the offsite location that takes occupants as far from the fire as possible.	Chief Fire Warden
Contact DFES (000) if not already undertaken: • inform that the facility is operating and has vulnerable occupants and the number of occupants • seek advice about the fire location, behaviour and likelihood of impacting the facility. Alternatively provide current bushfire observations if fire is close to facility or town. • seek instructions from DFES (preferably Emergency Services Incident Controller who is managing the fire) about what actions to take	Chief Fire Warden Communications Officer

Action	Person responsible
• determine Emergency Services Incident Controller/DFES point of contact (if any) • Determine where offsite safer locations or Welfare Centres are being designated (open). ◦ If this information is not possible to obtain, use the offsite safer location/s nominated in this BEMP on Table 13. • If decided, advise that offsite will be conducted, including the preferred offsite location and the route to be used.	
Ensure all relevant Standby and Controlled Shutdown actions are completed. The key actions are repeated below: • Assemble ERT and relevant staff • Update ERT and staff of the bushfire situation and the planned emergency management strategy. • Cease all operations including any functions and activities • Begin accounting for all occupants and staff ◦ Identify any known vulnerable people and arrange any required emergency transportation for priority evacuation to offsite safer location/s or hospital	Chief Fire Warden Deputy Chief Fire Warden All ERT members

Once decision is made to evacuate the site (following confirmation with the Emergency Services Incident Controller or authorised DFES personnel if possible), implement this broad process:
• Contact all guests and visitors (if not already undertaken):
  ◦ Sounding alarms,
  ◦ Using communication systems outlined in Section 3.2 or
  ◦ Direct occupants to gather at the onsite assembly area
• Inform guests and visitors of the following:
  ◦ The current emergency warning and bushfire situation
  ◦ The plan to evacuate offsite
  ◦ Confirm the offsite safer location
  – if the Emergency Services Incident Controller or DFES representative do not advised of an off-site location, use the one nominated in this as per Table 13
  ◦ the evacuation route to travel to the off-site location
  ◦ ensure occupants are able to walk to the offsite safer location or have access to a vehicle and identify those that don't
  ◦ Identify any vulnerable occupants (young, elderly, impaired, sick, injured, respiratory or other illness etc) who may require pre-emptive offsite evacuation or relocation to the local hospital.
• **If safe to do so (i.e. sufficient time)**, instruct guests and visitors to gather their belongings and either evacuate to the nominated offsite location by foot or meet at onsite assembly point prior to evacuation.
  ◦ Belongings are to be limited to mobile phone or other communication devices, wallets/purses, medicines and other health/mobility aids, food and water. They shall not bring bulky luggage, only a small bag.
	Chief Fire Warden
	Deputy Chief Fire Warden
	Communications Officer
	Fire Wardens

Action	Person responsible
◦ Encourage them to close all windows and doors at their accommodation where time to do so • **If there is insufficient time to collect belonging**, instruct guests and visitors to evacuate directly to the nominated offsite location by foot. • all evacuating occupants are to move in an orderly manner as a group, ideally with staff members, to ensure guests and visitors don't become lost • organise people traveling by vehicle to carpool as much as possible to reduce traffic. • **prioritise the evacuation of the following people, to evacuate those most at risk first and to minimise congestion of internal and local roads:** ◦ **any vulnerable occupant (elderly, respiratory problems, sick/injured)** ◦ **occupants along parts of the facility likely to be impacted by bushfire first**	
• Instruct ERT to conduct the following (if not already undertaken) ◦ use guest and visitor registers to monitor the evacuation as occupants leave the site and to confirm that all staff, guests and visitors are successfully relocated to the nominated offsite location ◦ ensure all internal emergency vehicular and pedestrian access routes are unlocked, clear and available including the emergency egress gates to Third Avenue ◦ conduct a thorough check of the site, doing a walk-through of all buildings and areas, to confirm all persons have evacuated ◦ Final evacuating staff are to travel in a group of no less than 2 people. • **If safe to do so**, instruct ERT and relevant staff to shut down the facility buildings including: ◦ Close all windows and doors including roller and sliding doors ◦ Put away all external combustible items or put inside building/s ◦ Turn off air-conditioners especially evaporative cooler • **If safe to do so**, organise for regular patrols by ERT of the facility to check for any signs of bushfire ignition.	Deputy Chief Fire Warden Fire Wardens
If not previously conducted, advise Emergency Services Incident Controller or DFES if the facility is being impacted by bushfire (i.e. bushfire ignites on or adjacent to the site) and that the facility is performing an evacuation and advise number of occupants and where they are going.	Chief Fire Warden Communications Officer
Upon arrival of occupants at off-site safer location: • confirm all relocated occupants are accounted for and safe • advise Emergency Services Incident Controller of relocation to off-site location and whether anyone is missing	Chief Fire Warden First Aid Personnel Communications Officer
To improve resilience of off-site safer location and ensure the safety of the occupants: • close all doors and windows	Deputy Chief Fire Warden First Aid Personnel Fire Wardens

Action	Person responsible
• turn off any evaporative air-conditioners or if possible, keep the water running and turn off the fan. • fill sinks, bath and buckets with water for putting out any fires that may start inside or soaking towels, blankets or clothes • soak towels and rugs in water and lay them along the inside of external doorways or block any other gaps for embers or smoke • soak woollen blankets and keep them available for protection against radiant heat • take down curtains and push furniture away from windows • erect ladder next to roof space manhole to enable inspection for spot fires. • obtain any firefighting equipment e.g. fire extinguishers, hose reels, garden hoses and determine area of coverage. • evenly distribute fire extinguishers throughout the building • immediately before the fire arrives, wet down decks and landscaping close to the building • where possible, turn on any garden reticulation for areas surrounding the offsite safer location • ensure occupants to get down low to limit exposure to smoke and drink plenty of water to avoid becoming dehydrated • where safe to do so, nominate teams of no less than two persons to regularly inspect building exterior and roof cavity (wearing suitable protective clothing - at a minimum long sleeves, trousers and leather boots) to inspect building exterior for embers and fire ignitions, and extinguish where possible • Monitor the condition of the building/s including regular inspection of the inside of the building, including the roof space for sparks and embers, and extinguish where possible. Stay in the offsite safer location while the fire front is passing. If the building catches fire and/or conditions inside become unbearable: • leave through the door furthest from the approaching fire • go to another unaffected building onsite or an area that has already burnt, or a large open space. Once the fire has passed, you will need to regularly inspect the inside and outside of the building for several hours. Go outside and extinguish any fires on the building or in adjacent landscaping.	
• Continue monitoring and re-evaluating the bushfire scenario. • Maintain situational awareness by: ◦ having nominated staff visually monitor land in the local area around the development for signs of bushfire (signs or smell of smoke etc) ◦ monitoring the Emergency WA website, DFES phone (13 3337), DFES Twitter and local ABC radio for current emergency warning status and bushfire information. • If a bushfire scenario is changing, obtain information on the new warning status, fire location and direction and speed of travel	Chief Fire Warden and Communications Officer

Action	Person responsible
• Review Table 10 with new information to determine new response actions ◦ Where possible, undertake decision making process in consultation with Emergency Services Incident Controller/DFES point of contact ◦ Initiate Offsite Evacuation or Onsite Shelter-in-Place response procedures as required.	

10.3 Recovery procedures following Offsite Evacuation

Recovery procedures are triggered when emergency services have advised that the bushfire threat has passed and it is safe to return to the facility (DFES 'All Clear' alert).

Table 15 lists the recovery procedures to be carried out following an evacuation of the facility,

Table 15: Recovery procedures (following offsite evacuation)

Action	Person responsible
Following a bushfire, emergency services are required to confirm conditions within facility and local area are safe for people to return to including the vehicular access network and services (electricity, water, gas etc) If the facility has been impacted by fire, ensure no one returns or re-enters until Emergency Services have declared it as being safe.	Chief Fire Warden Fire Wardens
Liaise and take directions from Emergency Services Incident Controller or DFES regarding whether safe return is possible. If safe to do so, consider conducting a preliminary review of the site for obvious damaged or destroyed buildings. Based on this information make the decision whether to reopen and return to the facility or whether it shall remain closed. The first priority is to ensure the safety of all people including staff. If the decision is made to keep the facility closed, seek alternative accommodation if required for displaced persons.	Chief Fire Warden Communications Officer
Once decision is made to either reopen or relocate: • arrange for occupants to be moved back to the facility or to alternative location (nominated by Emergency Services Incident Controller or DFES): • confirm all occupants are accounted for on their return to the facility (or have been otherwise safely relocated elsewhere) using the occupant/visitor register procedure used by the facility • advise Emergency Services Incident Controller of relocation to facility or alternative location and whether anyone is missing.	Chief Fire Warden All ERT members

10.4 Transport Arrangements for Offsite Evacuation

Given the location of the facility with respect to Onslow, that offsite evacuation will be into the town, and that many guests are unlikely to have access to a vehicle, offsite evacuation from the development will likely be by foot.

While it is not expected that alternative transport arrangements will be required to facilitate offsite evacuation, it is recommended that the ERT negotiate with a local transport company, the necessary arrangements to use their vehicles to evacuate occupants offsite, should it be required. It is recommended this alternative (see Table 16) is at least in place prior to bushfire season, to provide the Chief Fire Warden with transport options to deal with any unforeseen circumstances.

Table 16: Alternative transport arrangements

Alternative Transportation Arrangements To be used should there be enough people onsite without transportation	
Name of organisation providing transportation	TBC (arrange with local transportation company)
Contact phone number	TBC
Time required for transportation to arrive	TBC (but expect delays due to traffic, smoke etc)
Estimated travelling time to destination	TBC (but expect delays due to traffic, smoke etc)

10.4.1 Ambulances or Medical Transport

As noted in Section 3.1, there may be a need to pre-emptively relocate vulnerable occupants using ambulances or medical transport. Additionally it may be necessary to attempt to evacuate these occupants during the bushfire emergency, depending on the nature sickness or injury.

It is recommended that the ERT make contact with the relevant agencies and transport providers in the local area to discuss the access and extraction options available to them, prior to, during and following a bushfire emergency, so the Chief Fire Warden is clear on how to contact these services, and what the options are likely to be.

10.4.2 Traffic Awareness and Management

Any vehicles used for offsite evacuation should be in good working order and should have sufficient fuel to travel at least 100 km, and if they are not considered appropriate for evacuation, alternative transport should be found for the occupants.

10.4.3 Potential Traffic and Congestion

Evacuation from the development to an off-site location, my occur simultaneously with occupant egress from nearby facilities and the local residential population of the area. On this basis, there is likely to be traffic congestion on the road network, that potentially worsens at time passes. On that basis, the following shall be considered:

- Initiating early evacuation will be critical to ensure all occupants are able to relocate off-site, and minimise the potential for disruption of the local road network, which could prevent timely egress or impact firefighter access.
- The Chief Fire Warden (or nominated delegate) who is managing the evacuation of the development, shall ensure they are cognisant of the traffic conditions to the off-site conditions, and react to any disruption to the road network (bushfire, congestion). Traffic congestion may be sufficient to require a change in evacuation destination to the secondary

off-site location.

- Given the potential for traffic congestion, evacuation by foot shall be encouraged where safe to do so, to reduce vehicle traffic.

10.4.4 Safety considerations for evacuating by car:

While the intent of the Offsite Evacuation procedures is for early evacuation ahead of bushfire impact, including embers and smoke, or prior to any traffic congestion, there is always a chance the bushfire situation changes. Travel by vehicle through areas being impacted by bushfire, can present a significant risk to occupants, however occupants in this situation can improve their chances of survival through the following actions:

- **Before leaving**
  - Ensure there are fire blankets (or woollen blankets) and a water supply within the vehicle
  - Obtain a fire extinguisher if possible
  - Dress in protective clothing, preferably long-sleeved shirts and pants, and shoes.
  - Confirm there is sufficient fuel in the vehicle, and that it is roadworthy
    - If not, seek alternative transport or consider remaining onsite in well-prepared building
  - Ensure the vehicle headlights are on
- **If approaching bushfire on the road**
  - If there is considerable smoke
    - ensure headlights and hazard lights on
    - close windows and outside vents and put air-conditioning on recirculation
    - slow down as there could be people, vehicles and livestock on the road.
    - if you can't see clearly, pull over and wait until the smoke clears.
  - Carefully pull over and assess the situation.
    - It is a considerable risk to drive through smoke and flames. This is common cause of fatalities.
    - If safe, turn around and drive to safety in a different direction (if the option is available)
- **If you are trapped by bushfire**
  - Park and shelter within the vehicle.
    - Park off the road to avoid collisions with other vehicles
    - Park where there is the least vegetation (around, above and under the vehicle).
    - If possible, park behind a physical barrier (e.g. rock, earth mound) to minimise direct flame contact or radiant heat exposure
    - Face the vehicle towards the oncoming fire front as the front windscreen is generally thicker glass
    - Do not park too close to other vehicles in case a vehicle catches alight.
  - Inside the vehicle
    - As the fire front approaches, the intensity of the heat will increase along with the amount of smoke and embers. Smoke will gradually get inside the vehicle and fumes will be released from interior plastics.
    - Stay in the vehicle (unless there is a well-protected building nearby).

- Call 000 to inform of situation (if mobile reception available)
- Close doors, windows and outside vents, keep headlights and hazard lights on and turn the engine off.
- stay as close to the floor as possible to minimise exposure to radiant heat, preferably in the foot wells, and shelter under the blankets.
- Cover mouth with moist cloth to minimise inhalation of smoke and toxic fumes being released from the interior of the vehicle
- Continue to drink water to minimise dehydration.
- Stay in the car until the fire front has passed and do not open windows or doors.

- **As fire front passes**
  - Parts of the car may be extremely hot. Tyres and external plastic body parts may catch alight and in more extreme cases the interior may catch on fire. Fuel tanks are unlikely to explode.
  - Stay in the vehicle, with windows and doors closed, until the fire front has passed, and the outside temperature has dropped sufficiently.
  - Stay covered by blankets, continue to drink water.
  - Once the fire front has passed cautiously exit the vehicle, move to a safe area such as an area of land already burnt or rocky outcrop.
  - Call 000 to inform of situation (if mobile reception available)
  - Wait for assistance

11.0 Onsite Shelter-in-Place Response (Last Resort Action Only)

The alternative to offsite evacuation is for occupants to shelter-in-place within the facility. This would typically be expected to occur if there is insufficient time to conduct a safe offsite evacuation or the risk associated with offsite evacuation otherwise considered to be greater than sheltering in place on-site.

Given the facility is directly connected to the existing built-up residential portion of Onslow townsite, remaining on-site is not considered the safest option. Whilst pre-emptive and early off-site evacuation is always considered the best approach to avoid any bushfire impact on the evacuation route, the location is such that evacuation should be available even during bushfire impact on the development.

Onsite shelter-in-place is only to be conducted as a last resort action only.

The facility has no building specifically constructed for onsite refuge, and if required, should be undertaken as far from the approaching bushfire as possible. This is expected to be on the eastern side of the facility, either within a building or in open space.

If onsite shelter is being conducted within a building, the following actions should be implemented to improve building resilience:

- close all doors and windows
- turn off any evaporative air-conditioners or if possible, keep the water running and turn off the fan.
- fill sinks, bath and buckets with water for putting out any fires that may start inside or soaking towels, blankets or clothes
- soak towels and rugs in water and lay them along the inside of external doorways or block any other gaps for embers or smoke
- soak woollen blankets and keep them available for protection against radiant heat
- take down curtains and push furniture away from windows
- erect ladder next to roof space manhole to enable inspection for spot fires.
- obtain any firefighting equipment e.g. fire extinguishers, hose reels, garden hoses and determine area of coverage.
- Immediately before the fire arrives, wet down decks and landscaping close to the building
- where possible, turn on any garden reticulation for areas surrounding the building
- ensure occupants to get down low to limit exposure to smoke and drink plenty of water to avoid becoming dehydrated
- where safe to do so, nominate teams of no less than two persons to regularly inspect building exterior and roof cavity (wearing suitable protective clothing - at a minimum long sleeves, trousers and leather boots) to inspect building exterior for embers and fire ignitions, and extinguish where possible
- monitor the condition of the building/s including regular inspection of the inside of the building, including the roof space for sparks and embers, and extinguish where possible.

Stay inside while the fire front is passing. If the building catches fire and/or conditions inside become unbearable:

- leave through the door furthest from the approaching fire
- go to another unaffected building onsite or an area that has already burnt, or a large open space.

Once the fire has passed, you will need to regularly inspect the inside and outside of the building for several hours. Go outside and extinguish any fires on the building or in adjacent landscaping.

Appendix 1: Responsibilities for emergency roles

Chief Fire Warden

The Chief Fire Warden is responsible for:

- Reviewing the forecast FDR and ensuring the pre-emptive actions are undertaken based on the FDR.
- Evaluating the available information to assess the bushfire emergency
- Initiating, coordinating and supervising shutdown, offsite evacuation or onsite shelter-in-place actions.
- Supervising the emergency response from the command centre.
- Liaising with emergency authorities including advising when offsite evacuation or onsite shelter-in-place is underway
- Re-evaluating the emergency response actions during the emergency based on situational updates during the emergency.
- Supervising the recovery response and debriefing
- Documenting the circumstances of the emergency, processes and outcome.

Deputy Chief Fire Warden

The Deputy Chief Fire Warden is responsible for:

- Taking direction from and carrying out tasks allocated by the Chief Fire Warden.
- Assume the Chief Fire Warden responsibilities if not available.
- Ensuring all staff, guests, residents and visitors have been alerted of the bushfire emergency
- Once initiated, ensuring the shutdown, offsite evacuation or onsite shelter-in-place actions are being conducted correctly
- Monitoring the bushfire emergency to provide situation reports of fire location or impact on buildings and potential danger to people.
- Monitoring the response actions (shutdown, evacuation or shelter-in-place) and location of people to provide situation reports on any potential danger to people.
- Maintaining communication with, and updating the Chief Fire Warden with situation reports.
- Assisting oversee and contribute to the recovery response, debriefing and reporting.

Fire Wardens

Fire Wardens are responsible for:

- Taking direction from and carrying out tasks allocated by the Chief Fire Warden and/or Deputy Chief Fire Warden.
- Assisting in alerting all staff, guests, residents and visitors of the bushfire emergency
- Assisting the initiation and implementation of shutdown, offsite evacuation or onsite shelter-in-place actions as directed by the Chief Fire Warden and/or Deputy Chief Fire Warden.
- Monitoring the bushfire emergency to provide situation reports of fire location or impact on buildings and potential danger to people.
- Monitoring the response actions (shutdown, evacuation or shelter-in-place) and location of people to provide situation reports on any potential danger to people.

- Maintaining communication with, and updating the Chief Fire Warden, Deputy Chief Fire Warden and other relevant ERT members to provide situation reports.
- Contribute to the recovery response, debriefing and reporting.
- All permanent staff are to be trained in the role of Fire Warden.

First Aid Personnel

First Aid Personnel, under the direction of the Chief Fire Warden, Deputy Chief Fire Warden or Fire Warden are responsible for:

- Evaluating the extent of any injuries.
- Administer first aid (only where safe to do so).
- Assess if injured personnel can be evacuated safely.

Traffic Warden

The Traffic Warden is responsible for:

- In collaboration with the Chief Fire Warden, arranging and coordinating additional offsite transport to come to the development to assist with offsite evacuation, if safe to do so.
- Ensuring all onsite access control measures (gates, bollards etc) are unlocked and removed to enable full use of the onsite access network.
- Coordinating and supervising the placement of Fire Wardens to nominated locations to coordinate vehicle movement and traffic flow oversee the orderly evacuation to offsite location, if the decision is made to evacuate the development.
- Ensuring any Fire Wardens conducting traffic management have communication devices to enable them to provide and receive situation reports

Communications Officer

The Communications Officer is responsible for:

- Taking direction from and carrying out tasks allocated by the Chief Fire Warden.
- Maintaining communication with, and updating the Chief Fire Warden and/or Deputy Chief Fire Warden with situation reports.
- Providing situation updates (bushfire characteristics, emergency response update) to the Traffic Warden to enable them to update the Fire Warden conducting traffic management.
- Receive traffic situation updates from the Traffic Warden and relay to the Chief Fire Warden and/or Deputy Chief Fire Warden
- Liaise with external adjacent accommodation and residential properties to provide situation updates and receive information to relay to the Chief Fire Warden and/or Deputy Chief Fire Warden
- Liaise with emergency agencies under the direction of the Chief Fire Warden
- Assist the Chief Fire Warden collect any available information about the bushfire emergency

Appendix 2: Bushfire Emergency Management Map

BUSHFIRE EMERGENCY MANAGEMENT MAP

Lot 300 Back Beach Road, Onslow

Emergency Response Team Contacts

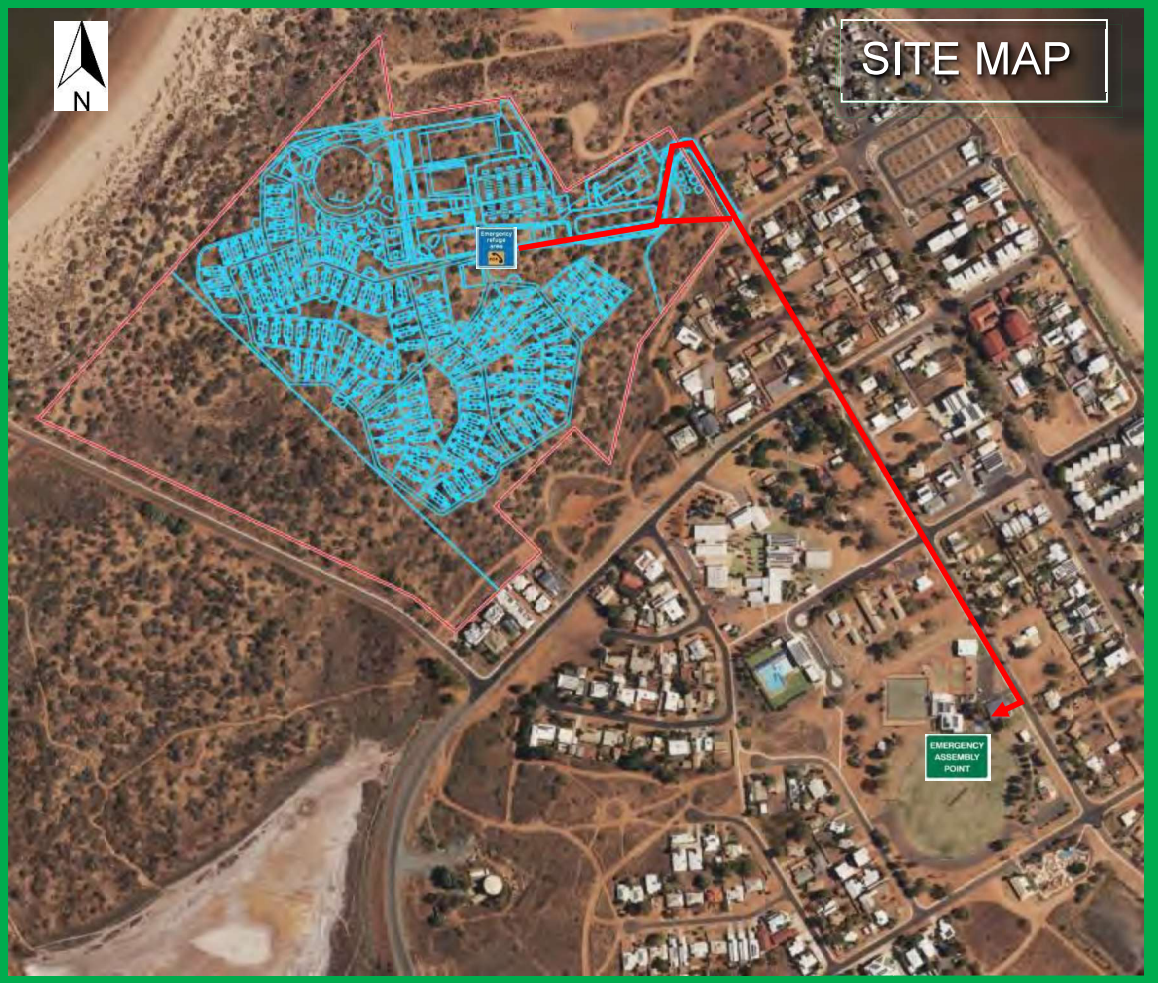
Chief Fire Warden:	Joe Bloggs (0400 000 000)
Deputy Chief Fire Warden:	Joe Bloggs (0400 000 000)
First Aid Personnel:	Joe Bloggs (0400 000 000)

Emergency Services Contacts

DFES/Ambulance/Police:	000
DFES:	13 DFES (13 3337)

Bushfire Information and Updates:

EmergencyWA	www.emergency.wa.gov.au
DFES:	13 DFES (13 3337)
Radio Updates:	1188 AM (ABC Pilbara
Fire Danger Ratings:	www.emergency.wa.gov.au
	www.bom.gov.au



Bushfire Awareness Actions (using forecast FDR)



ERT	Guests/Visitors
• Rare event with potential for worst bushfire behaviour. • Contact DFES • Update guests and visitors • Monitor for bushfires hourly • Prepare all staff, systems procedures and the refuge for bushfire emergency	• Know where onsite assembly point and offsite safer location is located • Be prepared for rapid offsite evacuation • Listen to ERT instructions
• Update guests and visitors • Monitor for bushfires (every few hours) • Prepare all staff, systems procedures and the refuge for bushfire emergency	
• Monitor for bushfires (if conditions are unusually warm and windy)	• Be aware of bushfires • Listen to ERT instructions

ERT are to refer to facility Bushfire Emergency Management Plan for further detail on pre-emptive action

Bushfire Response Actions

- Offsite evacuation into Onslow townsite is considered the safest response action given the development is adjacent to a residential area.
- Evacuation will be safest when conducted early, prior to bushfire impact.
- This facility has an Emergency Response Team (ERT) who are trained to deal with bushfire emergencies. Listen to their instructions
- Take a copy of map with you if evacuating offsite
- Refer to response table on other side of sheet for further actions

Bushfire Triggers and Response Actions

Trigger	ERT	Guests/Visitors
Bushfire Emergency Warnings		
Advice	• Controlled Shutdown • Consider pre-emptive Offsite Evacuation • Monitor & re-evaluate	• Listen to ERT instructions • Know where offsite safer location is located • Be prepared for offsite evacuation
Watch and Act	• Commence Offsite Evacuation • Monitor & re-evaluate	
Emergency Warning	• Commence Offsite Evacuation • Monitor & re-evaluate	• Relocate to offsite safer location • Listen to ERT instructions
All Clear	• Recovery Procedures • Monitor & re-evaluate	• Listen to ERT instructions
Bushfire Location (Decision Zones based on distance from site – use if no emergency services guidance)		
Monitoring Zone: >30km away	• Consider Controlled Shutdown • Monitor & re-evaluate	• Listen to ERT instructions • Monitor bushfire
Readiness Zone: 20km - 30km	• Start Controlled Shutdown • Consider pre-emptive Offsite Evacuation • Monitor & re-evaluate	• Listen to ERT instructions • Know where onsite bushfire refuge is located • Be prepared for offsite evacuation or relocation to bushfire refuge
Response Zone: **Offsite Evacuation** 7.5km - 20km	• Emergency Shutdown • Offsite Evacuation if safe. If not, Onsite Shelter-in-Place • Monitor & re-evaluate	
Response Zone: **Onsite Shelter-in-Place** <7.5km	• Emergency Shutdown • Onsite Shelter-in-Place • Monitor & re-evaluate	• Relocate to onsite bushfire refuge • Listen to ERT instructions

ERT are to refer to facility Bushfire Emergency Management Plan for detail on response actions

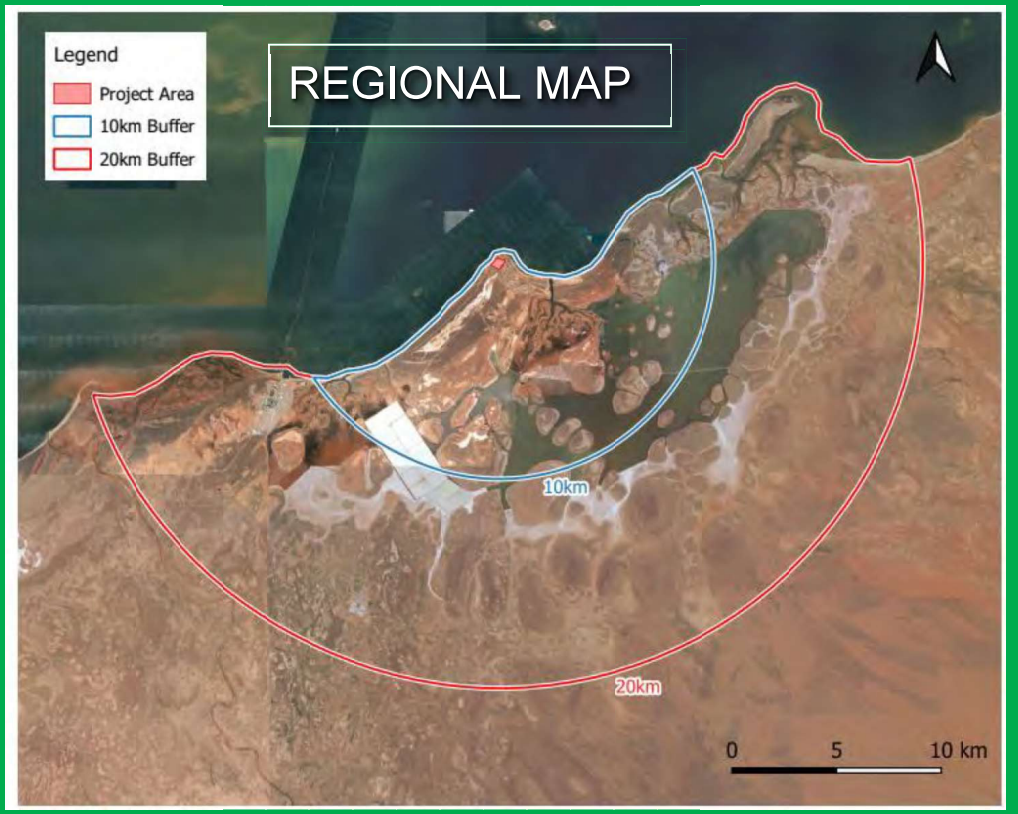
Onsite Assembly Point

- **Administration, Training/Inductions, Medical/Wellness and Creche/Comms buildings area**

Offsite Safer Location/s

- Use the designated welfare centres or nominated locations as advised by DFES or Emergency Incident Controller
- ***If this information is not available, the offsite safer location is to be***

  Onslow Sports Club (47 Third Avenue, Onslow)



Driving in Bushfire

Before leaving

- Is car roadworthy and have sufficient fuel?
- Take fire blanket, extinguisher, maps, PPE, plenty of water

Approaching bushfire

- Headlights on; close windows; air-con on recirculation; slow down
- Pull over; assess situation; can you go to a safe place in other direction?

If trapped in car in bushfire

- Park off road in least vegetation or behind non-combustible barrier
- Face vehicle toward fire; don't park too close to other cars
- Close up car (windows; doors; vents); engine off; lights/hazards on
- Stay close to floor; shelter under blankets and wet cloth on mouth
- Drink water
- Stay in car until outside temperature has dropped; exit cautiously
- Call 000; wait for assistance

Appendix G
Urban Water Management Plan for Lot 300 Back Beach Road, Onslow

360 environmental

Lot 300 Back Beach Rd, Onslow

Urban Water Management Plan

Prepared for

Mineral Resources Limited

August 2021

people • planet • professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4757AA_Rev0	Internal Draft	LSC	PD			
4757AA_Rev1	Client Draft	PD	DT	LI	1x electronic	06/08/2021
4757AA_Rev2	Client Draft	PD, NC	DT	LI	1x electronic	27/08/2021

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Executive Summary

Rowe Group, on behalf of Mineral Resources Limited (the proponent), commissioned 360 Environmental Pty Ltd (360 Environmental) to produce an Urban Water Management Plan (UWMP) to support the development of Lot 300 Back Beach Rd, Onslow (the site) into a transient workers resort.

The site covers an area of 20.45 ha and is located in the Shire of Ashburton. Back Beach Road bounds the site to the south and the Indian Ocean coast to the west. Residential development borders the site to the east and the Onslow Memorial Park to the north.

This UWMP has been prepared in accordance with the Better Urban Water Management guidelines (WAPC 2008) to secure approval (via the Regional Joint Development Assessment Panel and State Development Assessment Unit) for the development of a high-quality 500-person permanent resort-style 'Transient Workforce Accommodation Resort' to cater for the Client's operations workforce associated with its Onslow Iron Project.

Table 1 provides an overview of the site description and summary of the water management strategies to implement.

Table 1: Key UWMP Design Elements

Site Overview	Description
Proposed Development Section 1.2	The site is proposed to be developed into a transient workforce accommodation resort. It comprises 500 independent accommodation pods and a communal space including the main entry gatehouse, car parks, a medical centre, restaurants, tavern with dedicated alfresco area, gymnasium, outdoor pools, recreation room, driving range, oval and outdoor cricket. The site will be developed, ensuring minimal on-site works are carried out, minimising the development footprint. The development will contain drainage infrastructure, roads, gardens, and water services infrastructure. Mineral Resources Limited (MRL) will lease the site for approximately 30 years. It will be returned to the landowner with the intent of continuing as a public resort.
Existing Land use Section 3.1	The site is Unallocated Crown vacant land owned by Western Australia's Government. The land will be ceded to the Aboriginal Corporation, and MRL will hold a lease over the land for approximately 30 years.
Topography Section 3.2	The site elevation is approximately 16 m AHD to the north and slopes down to the southwest to approximately 12 m AHD. The site has three natural depressions around the centre of the land, and steep slopes are found from the site to the west towards Back Beach. The eastern portion of the land gently slopes towards Simpson Street.
Soil Type Section 3.3	The regional soil mapping indicates the site is located on the Dune System, characterised by dune fields and deep red sand. The geological unit within the site comprises light grey sand and unconsolidated and poorly consolidated quartzose calcarenite. The desktop study also concluded a substantial likelihood of limestone units being encountered at shallow depths.

Site Overview	Description
Surface Water Section 3.5	There are no surface water features, including drains or waterways within site. The closest surface waters are Beadon Creek (2.5 km east) and a Salt Lake (0.5 km south), located outside of the site.
Groundwater Section 3.7	The site lies within the Pilbara groundwater area and Ashburton sub-area. Carnarvon superficial aquifer and the Carnarvon Birdrong artesian aquifer are present within site. Water drawn from the Birdrong Aquifer is the primary local bore water source. It is the principal artesian aquifer for the Carnarvon Artesian Basin. The Groundwater Resource Allocation Plan developed by DWER in October 2013 indicated that 1,000,000 kL/year of water were available for allocation and licencing from Ashburton – lower Cane Alluvial. Water level monitoring has been recorded at bores 3/97 and 4/97, located approximately 300 m to the site's southeast. The AAMGL ranged from 0.08 m AHD to 0.81 m AHD. The LWMS reported groundwater salinity to be less than 3,000 mg/L on average, which is considered moderately salty and suggests groundwater is unsuitable for garden bores.
Water Servicing Section 4.0	The Water Corporation has provided support for the site to supply potable water and wastewater disposal. Groundwater for irrigation has not been considered because it has been identified as an unfeasible source in the LWMS (hyd2o, 2012). Alternative sources were assessed, and scheme water is a reliable source for POS irrigation compared to other sources. Other sources can ease the demand but will not suffice the irrigation requirements for the site.
Water Conservation Strategy Section 5.0	Water use within the development will be consistent with the Water Corporation's waterwise land development criteria and Australia's urban water-saving scheme (WELS), including: • Use of high-density accommodation pods to reduce the use of water outside of these • Promotion of waterwise practices, including water-efficient fixtures and fittings (taps, showerheads, toilets, waterwise landscaping) within the accommodation pods and administration buildings • Non-structural controls implemented to minimise water evaporation from pools • Use of native plants and natural mosquito repellent trees and vegetation in landscaped areas and hydro zoning as much as possible, including along the edges of the accommodation pods' boardwalks • Maximising on-site retention of stormwater by decreasing the development footprint including protecting the current cultural significance site.
Stormwater Management Strategy Section 6.1	A stormwater management strategy has been developed, which demonstrates that the site can effectively manage stormwater generated during the small, minor, and major rainfall events: • All runoff from the roads and car park will be treated at source or as close to the source as possible. • All other runoff from impervious areas within Catchment C (Figure 7) will be directed, via overland flow paths, to Storage C (Figure 9). There will be

Site Overview	Description
	no runoff from pervious areas of Catchment A and B (Figure 7) during the small rainfall event. • Minor (20% AEP) and major (1% AEP) rainfall events will be managed via safe overland flow to the natural depressions. Three natural depressions will be used for storage and infiltration.
Groundwater Management Strategy Section 6.2	Imported fill will not be required to raise the site to a minimum elevation of 6.4 m AHD as the development will use elevated boardwalks and accommodation pods. These will be built to provide a minimum clearance to the AAMGL plus sea-level rise of approximately 2.7 m. Therefore, subsoil drainage is not required. The proposed stormwater management practices will ensure that groundwater quality is maintained. The site has been identified as having a moderate to low risk of acid sulfate soils (ASS). Since the natural landform will be used, i.e. no excavation or earthworks will be required around the ASS identified area (Figure 5), an ASS management plan will not be required.
Implementation Plan Section 7.0	A construction and post-development maintenance program has been provided. The operation and maintenance of the stormwater management infrastructure will be the responsibility of the site managers during construction. Post-development, the following measures will be undertaken to ensure the system functions correctly: • Ongoing removal of debris and liter from the swales and the natural depressions to guarantee their designed life cycle • Maintaining the landscape feature to ensure effective infiltration and protect the site from erosion.

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1 Introduction

Mineral Resources Limited proposes to develop Lot 300 Back Beach Rd, Onslow (the site). This UWMP has been prepared in accordance with the Better Urban Water Management guidelines (WAPC, 2008) to secure approval for the development of a high-quality 500-person permanent resort-style 'Transient Workforce Accommodation Resort' to cater for the proponent's operations workforce associated with its Onslow Iron Project. The site is set to include recreational facilities, a restaurant and the village operations and administration buildings.

The site is approximately 20.45 hectares (ha) and is located in the Shire of Ashburton, in Onslow. Back Beach Road bounds the site to the south and the Indian Ocean coast to the west. Residential development borders the site to the east and the Onslow Memorial Park to the north (Figure 1).

1.1 Planning Background

The site falls within Unallocated Crown land zoned 'Conservation, Recreation and Nature Landscape' in the Shire of Ashburton Town Planning Scheme No. 7 (TPS7). However, the Onslow Townsite Structure Plan, developed in 2016, identified the area for further development investigation. This plan has been prepared to support the site's development application to be approved via the Regional Joint Development Assessment Panel and the State Development Assessment Unit.

The Residential Design Codes of WA (R-Codes) and Clause 4.1.1 of the Structure Plan apply where the area is found suitable for residential development subject to the approval of the Shire of Ashburton and WAPC.

A Local Water Management Strategy (LWMS) (hyd2o, 2012) was prepared to support the Onslow Townsite Structure Plan.

1.2 Proposed Development

The site's Masterplan is provided in Figure 2 and comprises 500 accommodation pods and communal spaces, including:

- Main Entry gatehouse and car parks
- Administration blocks including a medical centre, restaurants, tavern, and their dedicated alfresco area
- Wellness facilities including gymnasium, outdoor pools, recreation room, driving range, oval and outdoor cricket.

The site will be developed by retaining the current landform. The development footprint will be minimised by providing elevated boardwalks and connecting with, also elevated accommodation pods. The southern portion of the site, ending at Back Beah Road (approximately 6.5Ha), has been preserved for cultural heritage values and will not be developed.

The site will be serviced with roads, carparks, landscape and water and drainage services. The site will be leased to Mineral Resources Limited (MRL) over a period of more than 30 years.

The development proposes to house up to 500 transit workers. However, only around 60% of the site is expected to be occupied in the future due to MRL operations.

1.3 Guiding Documents

This UWMP has been prepared in accordance with the following guidelines, policy documents and previous site investigations:

- Stormwater Management Manual for Western Australia (DoW, 2004-2007)
- State Planning Policy 2.9 Water Resources (WAPC a, 2006)
- Better Urban Water Management (WAPC, 2008)
- State Planning Policy 2.6 State Coastal Planning Policy (WAPC b, 2006)
- Onslow Townsite Development Local Water Management Strategy (hyd2o, 2012)
- Onslow Townsite Development – Development Plan – Engineering Servicing Report (WGE, 2012)
- Decision Process for Stormwater Management in Western Australia (DWER, 2017)
- Desktop Geotechnical Study (Golder Associates, 2011)
- Onslow Townsite Planning Coastal Setbacks and Development Levels (MP Rogers & Associates Pl, 2011).

2 Design Criteria

The site design criteria were adopted from the LWMS (hyd2o, 2012). This plan shows compliance with these criteria as described in sections 4 to 7.

Table 2: Design Criteria

Criteria	Strategy Elements	Criteria
Water Use Sustainability		
CW1	Water Efficiency	Reduce consumptive use through adoption of waterwise practices.
CW2	Water Supply	Develop 'fit for purpose' water supply strategy and minimise potable water use where drinking quality water is not essential.
CW3	Wastewater	Provide a wastewater system that meets agency requirements.
Stormwater		
CS1	Ecological Protection	Maximise the retention of stormwater generated from the site during frequently occurring events. Establishment of storage invert levels no lower than seasonal maximum groundwater levels. Use of infiltration systems for frequently occurring events to minimise mosquito breeding opportunities. Implement non-structural controls.
CS2	Serviceability	Road drainage system to be designed so that roads are passable in the 20% Average Exceedance Probability (AEP) storm event.
CS3	Flood protection	Provide safe conveyance during the 1% AEP storm event from the site. Habitable building floor levels are set at 1% AEP storm surge levels allowing for 1% climate change (or suitable building restrictions where not feasible). Habitable building floor levels are set at 0.5 m above 1% AEP flood levels.
Groundwater		
CG1	Fill Requirement and Subsoil Drainage	Establish development levels with acceptable clearance above post-development groundwater levels. If required, provide subsoil drainage to control any post-development groundwater rise.
CG2	ASS and Contamination	If required, criteria and management of ASS to be handled as a separate process consistent with the Department of Water and Environmental Regulation (DWER) requirements.

3 Existing Environment

3.1 Existing Land use

The site is Unallocated Crown vacant land owned by Western Australia's Government. The land will be ceded to the Aboriginal Corporation, with MRL holding a lease over the land for approximately 30 years. Land negotiations are progressing between MRL, the State Government and the Aboriginal Corporation.

3.2 Current climate

Weather data from 2011 – 2020 were collected from the Onslow Airport weather station (Ref 005017), located approximately 4.1 km south of the site. The annual mean maximum temperature is 32.84 °C, and the annual mean minimum temperature is 21.22 °C. The recorded mean yearly rainfall was 240.92 mm (BoM, 2021).

3.3 Topography

The site gently slopes from the north to the south. The contours indicate that the site elevation is approximately 16 m to the north and 12 m AHD to the south. The site has a steep slope from the northeast to the middle of the site, featuring a low portion (4 m AHD), and then gently slopes towards the southwest of the site (Figure 3) to Back Beach Road, with the lowest ground elevation being 2 m AHD close to Back Beach Road

The site has three natural depressions around its centre:

- A small depression is located to the east
- A medium-size depression around the middle (Storage B in Figure 9)
- A larger depression to the west (Storage C in Figure 9).

Steep slopes are found to the west towards Back Beach. The site features views towards the beach. The eastern portion of the land gently slopes towards exiting housing located on Simpson Street.

The main area to be developed within site has been planned to be at and above 4 m AHD.

3.4 Geology and Soils

3.4.1 Regional Geology

The regional soil mapping indicates the site is located within the Dune System, characterised by dune fields supporting soft and minor hard spinifex grassland and red deep sand (Figure 4).

3.4.2 Soils

Based on the Western Australia Soil Landscape Mapping (DPIRD, 2019), the soils are characterised predominantly by deep red sands. In addition, tidal soils are found to the south and outside the site, within Salt Lake.

3.4.3 Topsoil Condition

Golder Associates Pty Ltd conducted a desktop geotechnical investigation of the site and surrounding region in September 2011 (Golder Associates, 2011).

The geotechnical investigation suggested the beach and coastal dunes (Qs) – light grey sand and unconsolidated and poorly consolidated quartzose calcarenite geological units are present within the site. This unit occurs over the site and may comprise a variable cover of sand over limestone.

The areas are likely to be underlain predominantly by beach and coastal dune deposits. However, the desktop study also concluded a substantial likelihood of limestone units being encountered at shallow depths from the ground level.

3.4.3.1 Infiltration Testing

Hyd2o undertook seven permeability tests on 8 March 2012 to investigate the saturated hydraulic conductivity of the soil across Onslow's townsite area, and the infiltration rates recorded were found to be between 5 m/day and 20 m/day. PM4, a test point, was located on the site's eastern boundary, and a high hydraulic conductivity was observed at this location (16 m/day) (**Table 3**).

Higher rates were observed within Onslow's townsite in lower elevation areas than those conducted within elevated areas. It has been assumed that these rates apply to the site as the site shares the same surface geology as for the LWMS investigation area (hyd2o, 2012).

Stormwater disposal by infiltration is considered suitable for the site, subject to any lower permeability materials such as caprock limestone. Lower infiltration rates may be expected for the elevated area that extends northeast to southwest.

Table 3: Infiltration Test Result Adjacent to the Site

Test Location	Stratigraphy	Average Unsaturated Permeability1 k (m/day)		
		Test 1	Test 2	Test 3
PM4	Sand	15.5	18.57	15.2

3.5 Acid Sulfate Soils

Pilbara Coastline ASS mapping (DWER, 2021) indicates the site is mapped as having a moderate to low risk of ASS occurring within 3 m of the natural soil surface from the site centre to Back Beach Road (Figure 5). The rest of the site is classified as no known ASS disturbance risk less than 3 m from the surface.

3.6 Surface Water

The site is located within the Ashburton River surface water area. The Ashburton River is 20 km southwest of the site. The closest surface water features are located approximately 2.5 km east (Beadon Creek) and 0.5 km south (Salt Lake) of the site. There are no surface water features, including drains or waterways within site.

3.7 Wetland Mapping

The Department of Biodiversity Conservation and Attractions (DBCA, 2021) wetland mapping indicates no wetlands on-site.

3.8 Groundwater

3.8.1 Groundwater Resources

The Water Register (DWER a, 2021) indicates that the site lies within the Pilbara groundwater area and Ashburton subarea. Carnarvon superficial aquifer and the Carnarvon Birdrong artesian aquifer are present within site. Water drawn from the Birdrong Aquifers is the principal artesian aquifer for the Carnarvon Artesian Basin, and therefore the primary local water source. The geological units above the Birdrong Aquifer consist of interbedded claystone, siltstones, sandstones, limestones, and dolomite with wide variability in permeability characteristics. The varying permeability characteristics of the interbedded geological units within the overlying layer have most likely resulted in an alternating sequence of aquifers and confining units.

The Onslow townsite is supplied with groundwater from a bore field that draws water from the lower Cane Alluvial. The bore field is owned and operated by Water Corporation and is approximately 40 km to the east of the Onslow townsite. The latest Groundwater Resource Allocation Plan (DWER, 2013) indicated 1,000,000 kL/year of water was available for allocation and licencing from the lower Cane Alluvial. Of this, 550,000 kL/year had been allocated for public water supply and 92,500 kl/year for general licensing (WGE, 2012). Additionally, the DWER has reserved approximately 2,000,000 kL from the Lower Robe Alluvial aquifer for future public water supply. This source is located approximately 70 km east of Onslow.

3.8.2 Groundwater Levels

3.8.2.1 Regional Groundwater Mapping

The historical maximum groundwater levels provided in the Perth Groundwater Map (DWER b, 2021) do not extend to the site.

3.8.2.2 Local Groundwater Monitoring

A search of the Water Information Reporting Database (DWER c, 2021) indicates three WIN groundwater monitoring bores in the vicinity of the site with no valid groundwater readings available.

3.8.2.3 On-site Groundwater Monitoring

Onslow Salt and Water Corporation own five bores, of which two bores are near the site (3/97 and 4/97) (Figure 6). The water levels are monitored bi-monthly within the Onslow area since 1999. The bore records indicated groundwater flowing from south to north, towards the shoreline.

Bore 3/97 and 4/97 are located in the townsite, less than 300 m to the site's southeast. These bores are considered representative of the site groundwater characteristics.

Based on LWMS (hyd2O, 2012), groundwater in the Onslow townsite area ranges from fresh to saline. Freshwater is contained in the Carnarvon superficial aquifer that floats above hyper-saline groundwater. The superficial aquifer relies on surface recharge during rainfall events and experiences increases in salinity during periods of low rainfall.

3.8.2.4 Design Groundwater Level

Bore 3/97 and 4/97 were recorded and reported an average annual maximum groundwater level (AAMGL) ranging from 0.08 m AHD to 0.81 m AHD. The bores were drilled at a ground elevation of 5 m AHD (Golder Associates, 2011).

The site's developable area will be located at or above 6.4 m AHD. Therefore, enough clearance to groundwater from the ground surface is expected on site. Additionally, no excavation has been proposed as the development will be built on the pre-development landform.

The lowest ground elevation at the site (2 m AHD) is located within the heritage area, to the south and near Back Beach Road. This area will not be developed.

No groundwater controls (i.e. subsoil drainage) are proposed to be used at the site, satisfying design criteria CG1.

3.8.3 Groundwater Quality

The LWMS (hyd2o, 2012) suggests that the historical salinity within the Onslow townsite reported an annual mean of less than 3,000 mg/L within the existing townsite at bore 3/97, which is considered of low quality to use for POS irrigation.

4 Water Servicing

4.1 Potable Water Supply and Wastewater Disposal

An Engineering Servicing Report was prepared in May 2012 by Wood & Grieve Engineers (WGE, 2012) to support the Onslow townsite development. The investigation extension area covered the site. The report indicated that the Water Corporation supplies the potable water sourced from the Cane River alluvial aquifer located approximately 30 km east of Onslow.

The Onslow Water Supply Scheme is operating close to full capacity with an annual drawing of 0.55 GL/year. Discussions were undertaken between MRL, the project team and Water Corporation on 22 July 2021, suggesting that their current Water Supply Scheme can supply the expected occupancy rate (around 300 workers at one time).

Water Corporation will build a desalination plant to serve the local population growth. The desalination plant has been estimated to provide 1.5 ML/day to cater to population increase for the next 20 years (Water Corporation, 2021). The Water Corporation is currently seeking environmental approvals from the Environmental Protection Authority. It is expected that the desalination plant will be operating in 2024. Therefore, the site will benefit from this source within the next three to five years.

Water Corporation has also provided support to connect to their reticulated sewerage system for an increase of about 125 kL/day of wastewater. This is based on 300 people residing on-site at any one time, satisfying design criteria CW3.

In the coming months, ongoing negotiations will continue between MRL and Water Corporation to finalise approvals for water supply and sewerage connections.

4.2 Irrigation Water

Table 4 highlights the irrigation schedule and worst-case water use scenario. It shows the total was demand during the plants' establishment phase (first 2 years). During this phase more water will be used per day. The water demand decreases by 50% post establishment for garden beds and dune planting.

Groundwater for irrigation has not been considered because it has been identified as an unfeasible source in the LWMS (hyd2o, 2012). Additionally, water quality is poor. The DWER manages allocations from the Carnarvon superficial aquifer and the Carnarvon Birdrong artesian aquifer on a case-by-case basis. This strategy was adopted as actual storage volume within the aquifers are unknown.

An analysis of alternative sources is provided below. It suggests that the only reliable and cost-effective source of irrigation for the site is scheme water.

Greywater and blackwater have been considered as potential sources. Calculated volumes, however, do not significantly reduce the scheme water use demand. When compared to capital costs associated with the systems construction and maintenance and operational costs, these systems become non-cost-effective (compared to scheme water) and unfeasible at this time.

The irrigation costs, if water is sourced from scheme water, is around $735,000 per year.

Table 4: Proposed irrigation schedule

Landscape	Area (m^2)	Irrigation schedule	Application rate during establishment (mm/day)	Irrigation volume (kL/year)
Managed Native Garden Bed	18,260	5 days a week	5	28,486
Managed Native Dune Planting (Sparse)	31,647	5 days a week	5	41,141
Turf	5,750	5 days a week	8	11,960
Total	**55,657**			**81,587**

4.2.1 Estimation of alternative water supplies

4.2.1.1 Groundwater

The licensed aquifers in the Onslow townsite area are the Carnarvon Birdrong artesian and Carnarvon superficial aquifers. The groundwater is described in the LWMS as being of limited and insufficient quantity and marginal quality.

DWER adopts licensing on a case-by-case basis for both aquifers. This is because actual volumes within the aquifers are unknown and the impacts to the aquifers.

Groundwater availability, quantity and quality on-site cannot be ascertained at this time without further investigations, as required by DWER. However, the site is approximately 150 m from the Indian Ocean. Therefore, with a very high likelihood of seawater intrusion occurring.

Additionally, the Birdrong aquifer's water quality is primarily brackish (3,000-10,000 mg/L). It is found over 300 m below ground level in the area. The known presence of gas in the area would also entail additional studies and costs to ensure safe abstraction from this resource.

As groundwater quality is moderately brackish and groundwater volumes from the superficial and the confined aquifer are unknown and unreliable at this time, groundwater has not been further investigated as a source for public open space (POS) irrigation. This is in accordance with the LWMS, suggesting other water sources should be explored.

4.2.1.2 Stormwater/rainwater

Based on the LWMS (hyd2O, 2012), Onslow's limited annual rainfall (240.92 mm) at the same time with episodic cyclonic events makes stormwater and rainwater harvesting schemes problematic and expensive. This is in line with the LWMS recommendations. Furthermore, the use of gutters in cyclonic areas also raises issues concerning potential over-topping, which can be a function of sizing and lack of maintenance/cleaning of gutters. Consequently, stormwater harvesting is not considered a sustainable and steady water source for irrigation.

4.2.1.3 Greywater

Greywater is wastewater from washing machines, showers, baths, washbasins, spa baths, laundry, tubes, and kitchen. Greywater reuse has been considered as a source, and a feasibility analysis has been undertaken. Bathroom's greywater and laundry greywater are the two primary greywater sources at the site, primarily coming from the accommodation pods.

The amount of greywater was calculated based on the Portable Water Calculator for Green Star projects. The water demand from each potable water use is identified to estimate the greywater generated on-site. The calculations assume the maximum number of people at the site (500 people) and accommodation pods and buildings are installed with water efficiency fixtures and fittings, including: Taps – WELS 6 Stars, Toilets – WELS 4 Star (3.5L/min), Urinals – WELS 5 Star (0.8L/flush or water less) and showers – 3 Star (<=7.5 L/min). Washing machines, dishwashers, heat rejection, washdown water, swimming pools and fire system water are excluded from the greywater calculations. The total greywater available for reuse is summarised in **Table 5**.. The recycled greywater can only fulfil 13% of the irrigation demand. Other resources will be needed to meet the requirement.

Table 5: Greywater and blackwater calculations

Proposed Building	Water demand (kL/year)	Greywater (kL/year)	Blackwater (kL/year)
Toilets	2,546.9	-	2,546.9
Urinals	138.3	-	138.3
Taps	635.4	635.4	-
Showers – occupants	11,634.4	11,634.4	-
Showers – Sports	3,421.9	3,421.9	-
TOTAL	**18,376.9**	**15,691.6**	**2,685.2**

The kitchen's greywater from the site restaurant has not been considered in the estimation, but this amount is not expected to change the above calculations significantly, and most definitely, will not suffice for irrigation. Additionally, the greywater treatment system will need to be conditioned to receive a more organically loaded wastewater source if this source is used.

In conclusion, the use of greywater minimally reduces the scheme water demand. However, when the small volumes are compared to the high capital costs associated with a greywater system's construction and its associated and stringent maintenance and operational requirements, the source becomes a non-cost-effective solution. Therefore, it has been considered unfeasible for use at this time.

4.2.1.4 Wastewater (Blackwater)

Blackwater is produced from toilets and urinals. The amount of blackwater was calculated based on the Potable Water Calculator developed by Green Building Council of Australia. **Table 5** estimates the blackwater generated on-site. As with greywater, the calculations have been assumed the maximum number of people at the site (500 people), and the use of WELS star rated fittings and fixtures. Again, the estimation of blackwater is lower than greywater, and therefore less water is available to be recycled for POS irrigation.

The Shire of Ashburton has expressed interest in developing a recycled water scheme to irrigate Onslow's existing and proposed future POS areas, thus removing these demands from the drinking water supply. This scheme offers to assist the future growth of the town sustainably and cost-effectively. Water demand and wastewater volumes are expected to increase over a period of 15 years. When the Shire warrants the development of the recycling scheme, this source may assist in reducing or eliminating the use of scheme for POS irrigation at the site in the future. MRL is to initiate discussions with the Shire about the use of this source in the future.

5 Water Conservation Strategy

5.1 Proposed Strategy

Development of the site will lead to an increased demand for potable water use and irrigation of landscaped areas. Water conservation measures will be implemented to reduce the scheme water consumption and satisfy design criteria CW1 and CW2.

Water use within the development will be consistent with the Water Corporation's waterwise land development criteria and Australia's urban water-saving scheme (WELS), including:

- Use of high-density accommodation pods to reduce the use of water outside of these
- Promotion of waterwise practices, including water-efficient fixtures and fittings (taps, showerheads, toilets, waterwise landscaping) within the accommodation pods and administration buildings
- Non-structural controls implemented to minimise water evaporation from pools
- Use of native plants and natural mosquito repellent trees and vegetation in landscaped areas and hydro zoning as much as possible, including along the edges of the accommodation pods and boardwalks
- Minimising turfed areas as much as possible and using eco-zoning
- Maximising on-site stormwater retention by decreasing the development footprint, including not developing the cultural significance area to the south.

5.2 Water Efficiency and Conservation

5.2.1 Buildings

To achieve water efficiency targets, it is envisaged that all accommodation pods and buildings on-site will be built consistent with the current Building Codes Australia energy and water efficiency standards. WELS 3-star (and above) fitting and fixtures are recommended for use. The development footprint will be reduced by building infrastructure that is easily removable such as elevated boardwalks along and connecting the accommodation pods and the accommodation pods.

5.2.2 Landscaped Areas

The Landscape Plan is provided in Appendix A. The following will be implemented to improve water efficiency within landscaped areas. These have been based on benchmarked landscape industry best practices with an emphasis on water efficiency:

- Appropriate species selection and planting of drought-tolerant, dunal and native garden beds plant species and mosquito repellant plant species. Hydro zoning will be implemented.
- Retention of existing vegetation where possible to provide amenity, shade, and landscaping features.

- Mulching to improve moisture and nutrient retention.
- Provide optimal irrigation rates during plant establishment, with irrigation reduced or eliminated at plant maturity.
- Staged irrigation in line with the project's anticipated rate of development.
- The use of a water-efficient sprinkler system and controlled water application rates to suit the water requirement of plants, climate, and rainfall patterns.

The landscape architects estimated the amount of water required for best practice irrigation across the development for garden beds, dunal vegetation, and turfed areas. **Table 4** summarises the water demands for each vegetation type. During the establishment phase, the water requirements can be as much as treble. The application rate in Table 4 is a typical establishment period of up to 2 years. The water demand for native dune planting will be reduced by up to 50% after establishment. Therefore, the approximate establishment rates for garden beds and dunal planting will be 6 mm/day and 5 mm/day, respectively.

Based on the irrigation schedule, approximately 81,587 kL/year of water demand would be required for irrigation. This demand would need to be met entirely through a scheme water supply with the possibility of other sources alleviating the demand. These have been described in Section 4.2 above.

5.2.2.1 Water Efficient Irrigation System

A water-efficient irrigation system will irrigate trees and plants. The irrigation water demand volumes will maintain a constant and uninterrupted supply, especially during dry and hot periods. However, water demand will be minimised as much as possible by, for example, hydro zoning according to water requirements. This allows the reticulation to the endemic plantings to be separately controlled and significantly reduce following their establishment period.

The automated irrigation system will be designed to include monitors to detect malfunctions so that rapid response rectification can be programmed before the planting is detrimentally affected by a disruption of water supply.

6 Water Management Strategy

Stormwater management is proposed to be undertaken consistent with DWER's recommended water sensitive design practices for the northwest of Western Australia and the Onslow Local Water Management Strategy.

The main aim for stormwater management for the site is to mimic, as closely as possible, the pre-development environment post-development. This will be achieved by maintaining, where possible, the natural topography of the site. Runoff throughout the site will be conveyed via overland flow, using the natural topography, to depression storage within site.

6.1 Stormwater Management

A stormwater management strategy has been developed, which demonstrates that the site can effectively manage stormwater generated during minor and major rainfall events and meet design criteria CS1 to CS3.

The drainage design will aim to achieve the following objectives:

- Maximise retention of stormwater generated from the site during frequently occurring events
- Ensure serviceability of the site during the 20% AEP event
- Provide safe conveyance of stormwater during the 1% AEP storm event from the site.

The site will provide permanent resort-style FIFO accommodation with an oval located in the site's northwest corner. The natural landforms of the site will be retained where possible. An engineering design plan has been provided in Appendix B.

The first 10 mm of runoff from roads and car parks will be treated and infiltrated at the source. All other runoff from the site will be conveyed via the natural landforms as overland flow to natural depression storage within site.

6.1.1 Post-development modelling

Post-development stormwater catchments are shown in Figure 7, with the land use breakdown within each catchment summarised in **Table 6**.

For the post-development modelling, only areas of the site that the development has altered have been modelled. The cultural heritage area (to the south of the site) and some of the boundaries of the site where no development is proposed, no runoff from site will be conveyed, or the natural landforms have been maintained, have not been modelled.

Three catchments were developed for the post-development model, each with a natural storage depression. The total area of the catchments is 12.45 ha. The eastern portion of the site drains to a depression (Storage A) with an invert of 7 m AHD. A southern, eastern portion of the site drains to two connected depressions (Storage B) with an invert of 5 m AHD. The remainder of the site, and the total developed area to the north, drains to the largest of the three depressions

(Storage C) to the south, and during major storm events will overflow downstream to further depression storage located within the cultural heritage area.

Australian Rainfall and Runoff Guidelines (ARR) (Geoscience Australia 2019) guide the choice of loss parameters across Australia. There are no recommendations for design losses for arid areas with mean annual rainfalls less than 350 mm.

Infiltration testing, conducted by part of the LWMS (hyd20 2012), indicated infiltration rates across the entire structure plan area ranged from 5 m/day to 20 m/day, with higher rates observed in the lower elevation areas. Infiltration rates on the edge of the site (hyd2o 2021) were recorded as 16.4 m/day.

GHD used a constant rate of 72 mm/hr for modelling in the *Shire of Ashburton Report for Onslow Drainage Assessment, Review of Stormwater Drainage System in Onslow* (GHD 2010).

For consistency with the previous modelling undertaken for the area, a constant rate of 73 mm/hr has been adopted for the natural landforms. In addition, following the recommendation made in the LWMS, a rate of 10 m/day (hyd2o 2012) was adopted for the depression storage.

In accordance with ARR guidelines, all building and hardstand areas were modelled with an initial loss of 1 mm and no continuing losses.

Table 6: Post-development Catchments

Catchment	Land use				Total area (ha)
	Buildings and Hardstand (ha)	Roads (ha)	POS (ha)	Natural ground (ha)	
Catchment A	0.1	na	na	2.9	3
Catchment B	0.1	na	na	2.0	2.1
Catchment C	1.65	0.8	0.8	4.1	7.35

6.1.2 Small Event (63.2% AEP)

The LWMS recommends that the first 10 mm from roads are to be retained and treated. All runoff from the roads and car park will be treated at the source or as close as possible.

All other runoff from impervious areas within Catchment C will be directed, via overland flow paths, to Storage C. The modelling results indicate that there will be 0.14 m of ponding in Storage C during the small event.

Due to the high infiltration rates of the native soils, there will be no runoff from pervious areas of Catchment A and B during the small rainfall event.

6.1.3 Minor Event (20% AEP) and Major Event (1% AEP)

Minor (20% AEP) and major (1% AEP) rainfall events will be managed via safe overland flow to the natural depressions. Three natural depressions will be used for storage and infiltration. Modelling for the site indicates that all Catchments will produce ponding during the 1% AEP event. Catchment C will produce ponding during the 1%, 20%, 63.2% AEP events. Results from the modelling suggest Storage C will overflow during the 1% AEP event to depression storage located downstream in the cultural heritage area.

The extents of inundation in the 20% and 1% AEP events are shown in Figures 8 and 9. The maximum flood depths, storage volumes, topwater levels (TWL), overflow rates and volumes, for the 20% AEP and 1% AEP events are shown in **Table 7.**

Table 7: Rainfall runoff storage

Storage	Depth (m)	Volume (m^3)	TWL (m AHD)	Overflow (m^3/s)	Overflow Volume (m^3)
20% AEP					
Storage C	1.5	3,172	5.5	na	na
1% AEP					
Storage A	0.3	467	8	na	na
Storage B	0.9	1156	5.9	na	na
Storage C	1.9	4,974	5.9	0.9	8,510

Elevated accommodation pods and boardwalks will be used throughout the site to ensure a minimum 0.5 m clearance from maximum TWLs of flood storage.

Roads have been designed to be passable in the minor events with water flowing to vegetated swales and downstream depressions storage.

6.2 Groundwater Management

6.2.1 Groundwater Levels

Use of fill or excavation will not be undertaken at the site. The site's floor levels will be required to be raised to a minimum elevation of 6.4 m AHD, which will provide enough clearance to the AAMGL plus sea-level rise (approximately 2.7 m). Therefore, subsoil drainage is not proposed.

6.2.2 Groundwater Quality

The proposed stormwater management practices will ensure that groundwater quality will be maintained.

The two key strategies include infiltrating the first flush of rainfall at the source and minimising the development footprint to replicate current (pre-development) conditions and natural groundwater recharge. Other critical strategies for managing groundwater quality at the site include:

- Maximising native and waterwise vegetation within landscaped areas
- Fertiliser and pesticide use on-site to be minimised through waterwise and or native landscaping, minimal community open space and private gardens due to development style.

6.2.3 Acid Sulphate Soil Management

ASS investigations are commonly required as part of the conditions of subdivision application. As moderate to low risk of ASS (Figure 5) have been identified at the site's southern portion, and the natural landform is to be used (i.e. no excavation or earthworks will be required) an ASS management plan will not be required.

6.3 Flood Management

The overland flow will be safely conveyed to the natural depressions, and the site will use natural flow paths.

Figure 9 shows the maximum flood depth for the Storage A, B and C depressions in the 1% AEP storm event. A clearance of 0.5 m to habitable floor levels from the 1% AEP will need to be accounted for to provide the minimum clearance requirement under DWER flood management policy.

Hence, the site's development floor level has been designed to be at a minimum of 8.5 m AHD (at Storage A) and 6.4 m AHD (at Storage B and C). These provide an adequate freeboard to the 1% AEP return period cyclonic storm surge allowing for climate change as specified in the coastal strategy (MP Rogers & Associates Pl, 2011).

7 Implementation Plan

The success of the water management strategy relies on the implementation throughout all stages of development, including construction and post-development.

The commencement of the project construction phase is expected to be in November 2021. The site is scheduled to be completed and ready for use as early as August 2022. Approximately nine months of construction has been proposed, and high-water demand is expected during this phase. However, it has been anticipated that water demand would drop and reach an equilibrium in 2023 when the site's residential condition enters into a steady state. MRL will provide a monthly forecast of water demand to the Water Corporation when construction phasing details, scheduling and implementation are determined. However, the following sections detail implementation practices to be followed during construction and after development completion.

7.1 Construction Phase

During the project's construction phase, water management requires considering direct impacts from any construction activities and maintaining the pre-development hydrological regime at post-development.

7.1.1 Management of Construction Activities

Potential impacts from construction activities related to the water cycle include:

- Dust generation during bulk earthworks and building construction
- Erosion of exposed surfaces.

All of these potential impacts are manageable through appropriate engineering design and site management practices.

Contractors and staff will be notified of the requirement to implement management practices to limit any potential impacts resulting from these activities.

The timing of the construction activities will be dependent on several factors not related to water management. Where possible, the construction schedule should allow for work to be undertaken when impacts on the water cycle are minimised. These include completing civil works during summer or autumn. MRL intends to initiate works in November 2021.

7.2 Post-Development

After completing construction activities, maintenance of any stormwater management infrastructure and assessment of their performance will be required. As there is no drainage pipes and pits system constructed on-site, swales near roads and car parks would be the critical maintenance features.

7.2.1 Maintenance

The operation and maintenance of the stormwater management infrastructure will be the responsibility of the site managers. The stormwater management infrastructure will remain private and will not be ceded to the Shire for management or maintenance. The following measures will be undertaken to ensure the infrastructure functions correctly:

- Street sweeping to reduce the particulate build up on road surfaces
- The ongoing removal of debris and liter from the swales and the natural depressions to guarantee their designed life cycle
- Maintaining the landscape feature to ensure effective infiltration and protect the site from surface erosion.

7.2.2 Roles and Responsibilities

Table 8 details the roles and responsibilities for water management during the construction phase of the development and post-development.

Table 8: Roles and Responsibilities

Role	Responsibility	Description
Construction		
Dust suppression	Site managers	Scheduled water uses for dust suppression with effective watering technique.
Street Sweeping	Site managers	Carry out street sweeping of roads, car parks, and hard surfaces during construction to prevent sediment and other pollutants mobilisation. This is to be carried out as required throughout the construction phase.
Post Construction		
Stormwater infrastructure	MRL	Manage and repair/replace infrastructure as required.
Maintenance	MRL	Undertake maintenance of the stormwater infrastructure (swales), oval and landscaping. Activities include removing sediment build-up, frequent maintenance during the established period of plants. Inspections are to be completed every six months during the first year of operation.

8 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data, and analyses ('client's information') provided by the Client and other individuals and entities. In most cases where the Client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the Client's information is accurate, exhaustive, or current, and the validity and accuracy of any aspect of the report including, or based upon, any part of the Client's information is contingent upon the accuracy, exhaustiveness, and currency of the Client's information. 360 Environmental shall not be liable to the Client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the Client's information was not accurate, exhaustive, and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions, and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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