File: PR-195.004 Doc: IC19/681

ITEM 5 PUBLIC EXHIBITION - DRAFT CRINGILA HILLS RECREATION MASTER PLAN

The Cringila Hills recreation area provides opportunity for a range of recreation pursuits and spectacular views to the coast. The site also features areas of remnant and regenerating natural vegetation.

A draft master plan has been prepared to guide and enhance the Cringila Hills Recreation Park.

The draft master plan focuses on providing new recreational opportunities for residents and visitors to improve the activation of the area. This includes providing for an upgraded and relocated playground, improved baseball facilities and walking trails, as well as featuring beginners and intermediate mountain biking trails, a pump track and bike skills park.

Public exhibition of the draft master plan will allow the community to provide further insight and input into the refinement of the plan. This report seeks Council's endorsement of the report for public exhibition and for a subsequent report with findings from engagement be presented to Council on completion.

RECOMMENDATION

1 Council endorse the draft Cringila Hills Recreation Master Plan for public exhibition from 19 November 2019 to 31 January 2020.

2 Following public exhibition, Council receive a further report with an updated master plan incorporating the community engagement findings.

REPORT AUTHORISATIONS

Report of: Lucielle Power, Manager Property + Recreation (Acting)
Authorised by: Kerry Hunt, Director Community Services - Creative and Innovative City

ATTACHMENTS

1 Draft Cringila Hills Recreation Master Plan
2 Dirt Art Concept Design Report

BACKGROUND

Council at its 12 August 2019 meeting resolved:

1. The master plan for the Cringila International Park is expedited.
2. The master plan to incorporate the baseball fields and the proposed children's playground.
3. Consideration is given to the possibility of incorporating the proposed bike trail within the existing walk trail.
4. The community is consulted and involved in the development of the master plan.

The Cringila Hills precinct offers spectacular views and is visually the dominant elevation in the southern suburbs. The area has a history of Aboriginal custodianship, then land clearing for agriculture, industrial uses and more recently planted native revegetation. The site also has important areas of remnant and regenerating natural vegetation, notably patches of the Endangered Ecological Community – Illawarra Subtropical Rainforest.

The site is currently home to the Wollongong Cardinals Baseball Club and is a popular place for passive recreational activities such as walking and bird watching. Cringila Community Park, which forms part of the study area, is significant to the Cringila community. This area has over many decades been host to various landscape and cultural initiatives that reflect the diversity and interest of the local surrounding community, such as the 'World Forest', community bread oven, community garden and well executed public art feature on the entrance gates.

A small local playground is also located in the middle reaches of Cringila Community Park. The playground is difficult to access, has poor passive surveillance and from observation is underutilised.

Council at its meeting on 24 June 2019 resolved to relocate the existing playground to near the baseball field.

The study area does incorporate a number of site constraints including steep and uneven topography, previous industrial uses, evidence of illegal dumping and motor bike riding. The area has poor connectivity with the local residential area which has historically limited recreational uses of the site.

To assist in further understanding the capability of the site, Council commissioned significant investigations including a site survey, terrain mapping, geotechnical assessment, service location analysis, contaminated land mapping, amenity assessment, site hydrology, bushfire studies, ecological assessments and more recently concept designs for a future mountain bike park.

PROPOSAL

In accordance with the Council meeting of 12 August 2019, a draft master plan has been developed to provide Council with an evidence base and strategic direction for the sustainable long-term development and enhancement of the Cringila Hills precinct.

The draft master plan focuses on providing multiple recreational opportunities for residents and visitors to improve activation of the area. This includes providing for existing uses such as an upgraded and relocated playground, incorporating accessible play features, baseball facilities and opportunities for walking, but adding beginners and intermediate mountain biking trails, a pump track and bike skills park to the mix. More walking trails would be added including an accessible pathway around the existing baseball area and linking to an upgraded carpark located adjacent to baseball field and servicing all park elements.

Key aspects of the draft master plan include:

- Relocation of the existing playground with additional features and rubber soft fall – a larger area is envisioned that in future will allow additional play offerings
- A variety of mountain bike trails, a bike skills park and pump track
- A new formal car parking area and asphalt driveway connecting Lackawanna Street
- Improvements to entry of park including signage, new gates and landscaping
- A formalised walking trail network including an accessible walking circuit
- Park amenity upgrades including tree planting, picnic settings and drinking water
- Perimeter security improvements to limit unauthorised access and activities
- An emphasis to prepare and implement a vegetation management plan.

The relocated playground is sited on the draft master plan adjacent to baseball field and west of the school fence. The draft plan provides for an area up to 1,000-1,500m² for the playground which will allow the relocation of existing playground and additional equipment and rubber soft fall, plus space for future landscaping and play elements, picnic shelters, tree planting, pathways etc.

The topography of the site and its natural setting lend itself to mountain biking. The draft master plan has been carefully structured around the aspiration of developing the Cringila Hills site as a bike-park style facility that caters for recreational riding for both locals and visitors. The proposed bike park concept plan seeks to provide recreational opportunities for a variety of mountain biking styles and cater for riders of all abilities and ages having a strong focus on the provision of trail experiences for beginners to intermediate riders to complement the current advanced rider offerings within the Illawarra region.

The proposed bike park plan offers 11.8km of concept trail alignments as well as a dirt jumps area and pump track. The facility capitalises on the undulating terrain of the site while framing the spectacular views. A ‘stacked loop’ configuration has been implemented throughout the network to offer maximum flexibility for riders to compose their own unique rides to suit their fitness, ability, and time within the park. The ‘stacked loop’ concept also allows one or two loops to be opened to the public while successive loops are constructed and added over time.

The addition of the mountain bike park is supported by Council's *Sportsground and Sporting Facilities Strategy 2017-2021* which outlines the need to invest in infrastructure to support and accommodate emerging sports and independent recreation pursuits. The strategy specifically notes the need to create a mountain bike riding park within the LGA.

Due to the difficulty of accessing the site by walking and public transport, a new 80-100 space public car park has been included in plans to service the relocated playground, baseball field and mountain bike park. The car park is centrally located to service all park elements.

The existing baseball facilities will be strengthened by upgrading the sporting amenities to incorporate new change rooms, toilets, and kiosk whilst additional spectator seating is proposed to support game day activities.

To assist park users, upgraded amenities include public toilets, sporting amenities; tree planting, signage, picnic shelters, barbecues, pathways and water bubbler are also envisaged.

Finally, perimeter control including fencing and other security measures are proposed to limit unauthorised access and activities eg motor bike riding occurring on site.

CONSULTATION AND COMMUNICATION

This project includes a diverse range of stakeholders who will be engaged as part of the project to clarify aspirations for the site. They include**:**

- Local community groups and residents
- Illawarra Local Aboriginal Lands Council
- Wollongong Cardinals Baseball Club
- Sydney Water
- Local schools and preschools
- Local mountain bike clubs/groups
- Non-government service providers working within the local area.

The community engagement is anticipated to run from 19 November 2019 to 31 January 2020 and will involve the following:

- Mail out – all households/businesses within 400m of site
- Have your Say Page with online survey, FAQ, key documents
- Media release
- Newspaper notice
- Flyers/posters/feedback forms dropped off at local libraries
- Engagement stalls at Cringila Public School and Cringila Hall
- Workshops with local school and pre-school children to inform playground embellishment
- Social media.

The findings of the community engagement will be used to refine the master plan for Council's future consideration.

PLANNING AND POLICY IMPACT

This report contributes to the delivery of Our Wollongong 2028 goal "Goal 5 - We have a healthy community in a liveable city". It specifically delivers on the following:

Community Strategic Plan	Delivery Program 2018-2021	Operational Plan 2019-20
Strategy	3 Year Action	Operational Plan Actions
5.1.1 We work in partnership to build on opportunities to strengthen vulnerable communities	5.1.2.3 Use data to assess the current community infrastructure available, community demand and develop a strategic framework and policies to either rationalise, enhance or expand to meet community needs	Undertake a detailed site assessment for the future development of a Cringila Hills Master Plan
	5.1.2.3 Use data to assess the current community infrastructure available, community demand and develop a strategic framework and policies to either rationalise, enhance or expand to meet community needs	In consultation with the community develop the Cringila Hills Master Plan
	5.1.4.1 Provide an appropriate and sustainable range of quality passive and active open spaces and facilities	Relocate and enhance the Cringila Hills playground

It is recognised that a number of other projects are running concurrently that should be taken into consideration in planning for Cringila Hills. In particular, planning has commenced for the UCI–Road World Championship in 2022. This master plan provides an opportunity for investment in legacy infrastructure for the local community and its visitors in the lead up to an international event.

ECOLOGICAL SUSTAINABILITY

The draft master plan has carefully considered the natural values of the site in developing this mountain bike concept plan ensuring minimal disturbance by aligning trail concepts to avoid areas of high sensitivity and/or conservation value. This includes the remnant patches of Endangered Ecological Community, Illawarra Subtropical Rainforest and populations of the threatened plant, Cynanchum elegans.

New trails proposed in this study feature predominantly gentle, sustainable gradients, which eliminate any issues associated with erosion and sediment dispersion, resulting in a greatly reduced or eliminated environmental impact.

Whilst primary revegetation areas are shown on the draft plan, also identified is the need to prepare a vegetation management plan to manage the site to ensure that biodiversity on the site is protected, maintained and enhanced whilst supporting proposed activities.

FINANCIAL IMPLICATIONS

The draft master plan envisages significant works that will provide new and upgraded recreational facilities, additional supporting amenities and improved security of site.

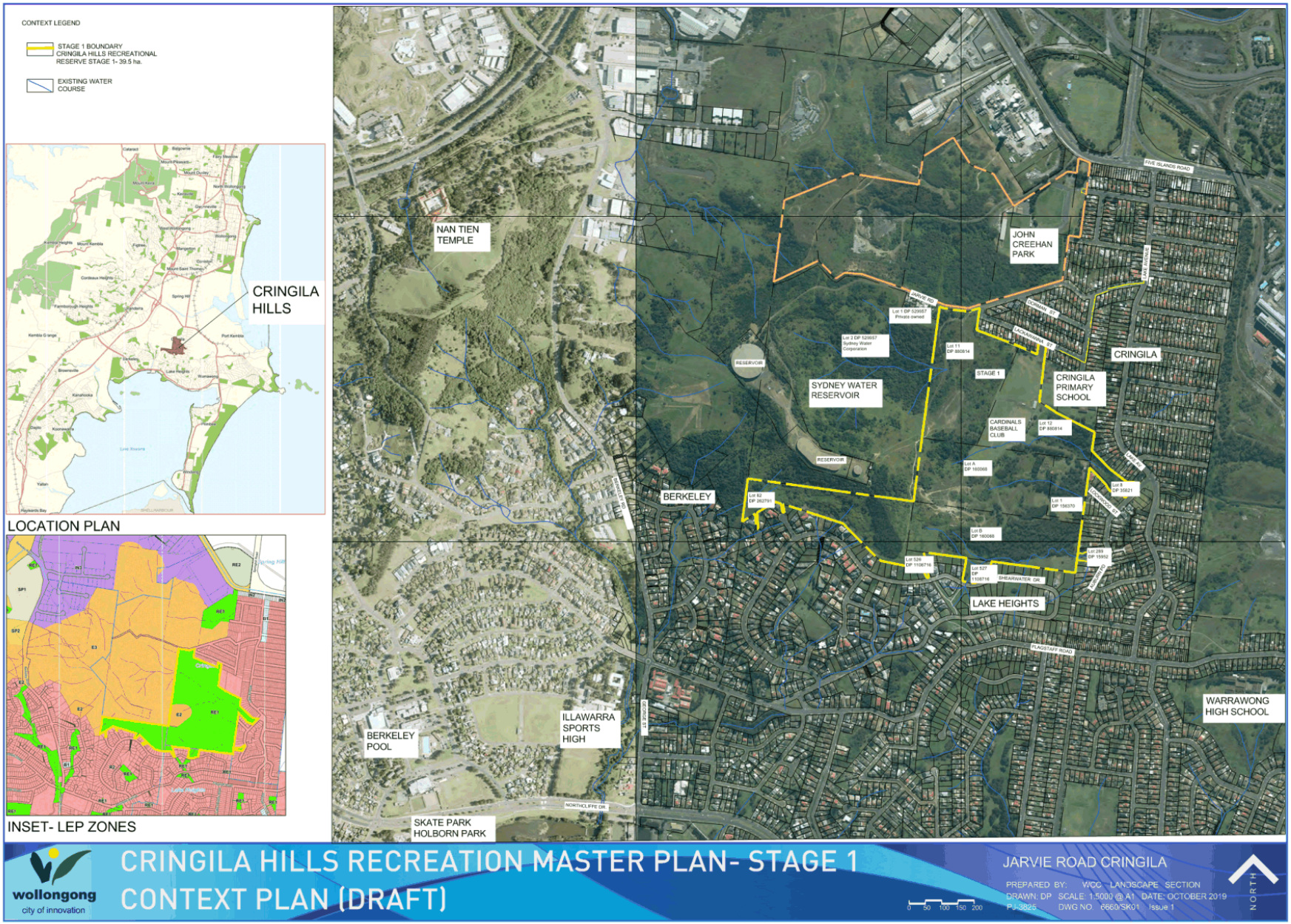
More information regarding the initial cost estimates will be provided to Council in March 2020 following community feedback and development of a revised master plan and an accompanying implementation plan.

It is anticipated that once adopted, the master plan will help inform the forward capital delivery program requirements and external grant opportunities.

CONCLUSION

A draft Cringila Hills Recreation Master Plan has been developed to stimulate community input into the future development of Cringila Hills. The draft master plan focuses on expanding recreational opportunities for residents and visitors and includes providing for existing uses such as an upgraded and relocated playground, enhanced baseball facilities and opportunities for walking. A key feature of the draft master plan is the addition of beginners and intermediate mountain biking trails, a pump track and bike skills park. More walking trails are incorporated including an accessible pathway around the existing baseball area and linking to an upgraded carpark located adjacent to baseball field and servicing all park elements.

Endorsement of the draft Cringila Hills Recreation Master Plan for public exhibition will allow community feedback and input to assist in refining the master plan ensuring its success.


CONTEXT LEGEND
STAGE 1 BOUNDARY
CRINGILA HILLS RECREATIONAL RESERVE STAGE 1- 39.5 ha.
EXISTING WATER COURSE
CRINGILA HILLS
LOCATION PLAN
INSET- LEP ZONES
NAN TIEN TEMPLE
JOHN CREEHAN PARK
SYDNEY WATER RESERVOIR
CRINGILA
CRINGILA PRIMARY SCHOOL
CARDINALS BASEBALL CLUB
BERKELEY
LAKE HEIGHTS
WARRAWONG HIGH SCHOOL
ILLAWARRA SPORTS HIGH
BERKELEY POOL
SKATE PARK HOLBORN PARK
FIVE ISLANDS ROAD
JARVIE RD
FLAGSTAFF ROAD
NORTHCLIFFE DR
wollongong city of innovation
CRINGILA HILLS RECREATION MASTER PLAN- STAGE 1
CONTEXT PLAN (DRAFT)
JARVIE ROAD CRINGILA
PREPARED BY: WCC LANDSCAPE SECTION
DRAWN: DP SCALE: 1:5000 @ A1 DATE: OCTOBER 2019
PJ-3825 DWG NO 6660/SK01 Issue 1
0 50 100 150 200
NORTH


STAGE 1 BOUNDARY
LOWLAND DRY-SUBTROPICAL RAINFOREST TO BE RETAINED & ENHANCED
EXISTING VEGETATION
OVERHEAD ELECTRICAL LINES
EXISTING WATER COURSE
EXISTING AMENITIES
EXISTING ASPHALT WALKING TRACK
EXISTING GATE
ADDITIONAL BOUNDARY CONTROL REQUIRED
EXISTING INFORMAL ACCESS TRACK
EXISTING DRAINAGE PIPE
EXISTING CAR PARK
EXISTING PLAYGROUND LOCATION
EXISTING LICENCE AGREEMENT AREA WITH WESTERN SUBURBS CARDINALS BASEBALL CLUB
EXISTING SHELTER EXISTING BARBEQUE
BUSHFIRE MANAGEMENT ZONE- ASSET PROTECTION ZONE 37M (WIDTH)
BUSHFIRE MANAGEMENT ZONE- ASSET PROTECTION ZONE 24M (WIDTH)
BUSHFIRE MANAGEMENT ZONE- ASSET PROTECTION ZONE 15M (WIDTH)
REFER TO BUSH FIRE MANAGEMENT PLAN REPORT PREPARED BY ECOLOGICAL DATED JUNE 2019
JARVIE ROAD
DOWNAN STREET
KAMPINNA STREET
Lot 2 DP 529957 Sydney Water Corporation
LOWLAND DRY-SUBTROPICAL RAINFOREST
EXISTING GATE
RE1- PUBLIC RECREATION
FORMER SPORTS FIELD
CRINGILA PRIMARY SCHOOL
CARDINALS BASEBALL DIAMOND
CRINGILA COMMUNITY PARK
LOWLAND DRY-SUBTROPICAL RAINFOREST
EXISTING ASPHALT WALKING TRAIL
LOWLAND DRY-SUBTROPICAL RAINFOREST
E2- ENVIRONMENTAL CONSERVATION ZONE
RESERVOIR
LOWLAND DRY-SUBTROPICAL RAINFOREST
EXISTING GATE
LOCKWOOD ST
AUBURN PARADE
CRINGILA COMMUNITY PARK- WORK FOREST PLANTINGS
EXISTING ASPHALT WALKING TRAIL
ACACIA SCRUB
ACACIA SCRUB
ACACIA SCRUB
BIS PLACE
HERON PLACE
SHEARWATER DR
EXISTING GATE
AUBURN PARADE
wollongong city of innovation
CRINGILA HILLS RECREATION MASTER PLAN
SITE ANALYSIS PLAN (DRAFT)
JARVIE ROAD CRINGILA
PREPARED BY: WCC LANDSCAPE SECTION
DRAWN DP SCALE: 1:2000@ A1 DATE: OCTOBER 2019
PJ-3625 DWG NO 6660/SK02 Issue 1
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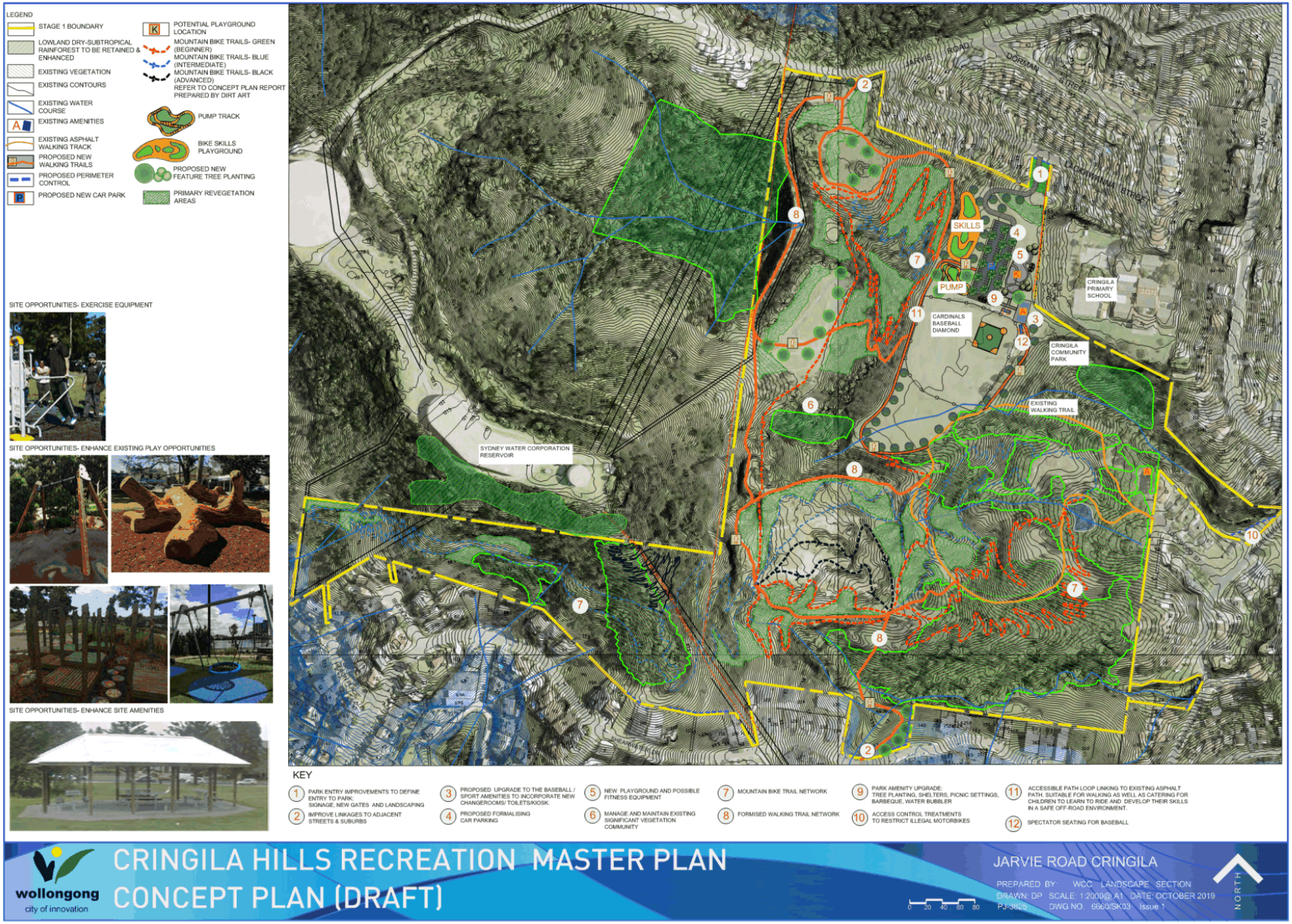
NORTH


LEGEND
STAGE 1 BOUNDARY
LOWLAND DRY-SUBTROPICAL RAINFOREST TO BE RETAINED & ENHANCED
EXISTING VEGETATION
EXISTING CONTOURS
EXISTING WATER COURSE
EXISTING AMENITIES
EXISTING ASPHALT WALKING TRACK
PROPOSED NEW WALKING TRAILS
PROPOSED PERIMETER CONTROL
PROPOSED NEW CAR PARK
POTENTIAL PLAYGROUND LOCATION
MOUNTAIN BIKE TRAILS- GREEN (BEGINNER)
MOUNTAIN BIKE TRAILS- BLUE (INTERMEDIATE)
MOUNTAIN BIKE TRAILS- BLACK (ADVANCED)
REFER TO CONCEPT PLAN REPORT PREPARED BY DIRT ART
PUMP TRACK
BIKE SKILLS PLAYGROUND
PROPOSED NEW FEATURE TREE PLANTING
PRIMARY REVEGETATION AREAS
SITE OPPORTUNITIES- EXERCISE EQUIPMENT
SITE OPPORTUNITIES- ENHANCE EXISTING PLAY OPPORTUNITIES
SITE OPPORTUNITIES- ENHANCE SITE AMENITIES
JARVIE ROAD
DORMAN STREET
SKILLS
PUMP
CRINGILA PRIMARY SCHOOL
CARDINALS BASEBALL DIAMOND
CRINGILA COMMUNITY PARK
EXISTING WALKING TRAIL
SYDNEY WATER CORPORATION RESERVOIR
KEY
1 PARK ENTRY IMPROVEMENTS TO DEFINE ENTRY TO PARK: SIGNAGE, NEW GATES AND LANDSCAPING
2 IMPROVE LINKAGES TO ADJACENT STREETS & SUBURBS
3 PROPOSED UPGRADE TO THE BASEBALL / SPORT AMENITIES TO INCORPORATE NEW CHANGEROOMS/ TOILETS/KIOSK.
4 PROPOSED FORMALISING CAR PARKING
5 NEW PLAYGROUND AND POSSIBLE FITNESS EQUIPMENT
6 MANAGE AND MAINTAIN EXISTING SIGNIFICANT VEGETATION COMMUNITY
7 MOUNTAIN BIKE TRAIL NETWORK
8 FORMISED WALKING TRAIL NETWORK
9 PARK AMENITY UPGRADE: TREE PLANTING, SHELTERS, PICNIC SETTINGS, BARBEQUE, WATER BUBBLER
10 ACCESS CONTROL TREATMENTS TO RESTRICT ILLEGAL MOTORBIKES
11 ACCESSIBLE PATH LOOP LINKING TO EXISTING ASPHALT PATH, SUITABLE FOR WALKING AS WELL AS CATERING FOR CHILDREN TO LEARN TO RIDE AND DEVELOP THEIR SKILLS IN A SAFE OFF-ROAD ENVIRONMENT.
12 SPECTATOR SEATING FOR BASEBALL
wollongong city of innovation
CRINGILA HILLS RECREATION MASTER PLAN
CONCEPT PLAN (DRAFT)
JARVIE ROAD CRINGILA
PREPARED BY WCC LANDSCAPE SECTION
DRAWN: DP SCALE: 1:2000@ A1 DATE: OCTOBER 2019
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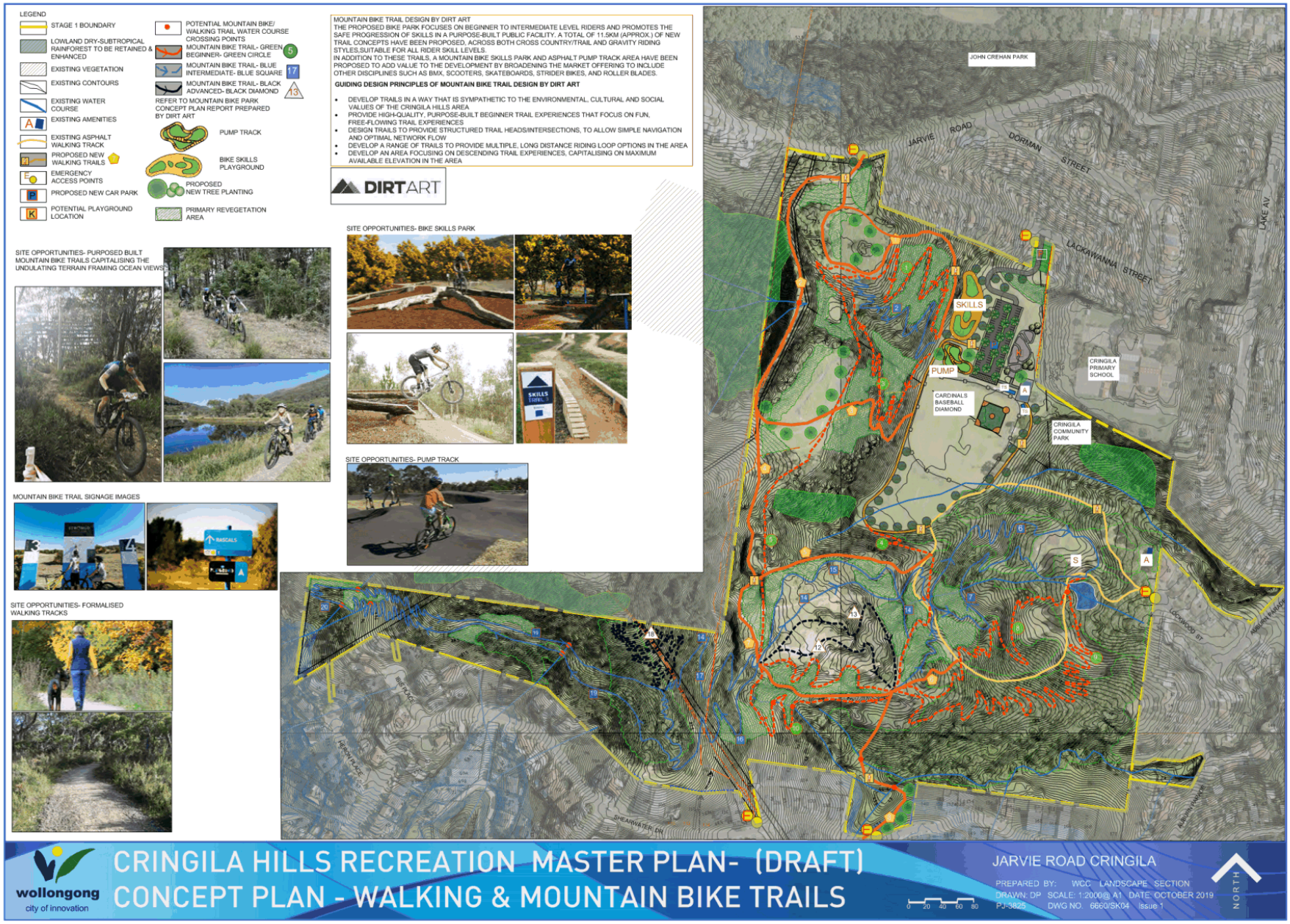
LEGEND
STAGE 1 BOUNDARY
LOWLAND DRY-SUBTROPICAL RAINFOREST TO BE RETAINED & ENHANCED
EXISTING VEGETATION
EXISTING CONTOURS
EXISTING WATER COURSE
EXISTING AMENITIES
EXISTING ASPHALT WALKING TRACK
PROPOSED NEW WALKING TRAILS
EMERGENCY ACCESS POINTS
PROPOSED NEW CAR PARK
POTENTIAL PLAYGROUND LOCATION
POTENTIAL MOUNTAIN BIKE/ WALKING TRAIL WATER COURSE CROSSING POINTS
MOUNTAIN BIKE TRAIL- GREEN BEGINNER- GREEN CIRCLE
MOUNTAIN BIKE TRAIL- BLUE INTERMEDIATE- BLUE SQUARE
MOUNTAIN BIKE TRAIL- BLACK ADVANCED- BLACK DIAMOND
REFER TO MOUNTAIN BIKE PARK CONCEPT PLAN REPORT PREPARED BY DIRT ART
PUMP TRACK
BIKE SKILLS PLAYGROUND
PROPOSED NEW TREE PLANTING
PRIMARY REVEGETATION AREA
MOUNTAIN BIKE TRAIL DESIGN BY DIRT ART
THE PROPOSED BIKE PARK FOCUSES ON BEGINNER TO INTERMEDIATE LEVEL RIDERS AND PROMOTES THE SAFE PROGRESSION OF SKILLS IN A PURPOSE-BUILT PUBLIC FACILITY. A TOTAL OF 11.5KM (APPROX.) OF NEW TRAIL CONCEPTS HAVE BEEN PROPOSED, ACROSS BOTH CROSS COUNTRY/TRAIL AND GRAVITY RIDING STYLES,SUITABLE FOR ALL RIDER SKILL LEVELS.
IN ADDITION TO THESE TRAILS, A MOUNTAIN BIKE SKILLS PARK AND ASPHALT PUMP TRACK AREA HAVE BEEN PROPOSED TO ADD VALUE TO THE DEVELOPMENT BY BROADENING THE MARKET OFFERING TO INCLUDE OTHER DISCIPLINES SUCH AS BMX, SCOOTERS, SKATEBOARDS, STRIDER BIKES, AND ROLLER BLADES.
GUIDING DESIGN PRINCIPLES OF MOUNTAIN BIKE TRAIL DESIGN BY DIRT ART
DEVELOP TRAILS IN A WAY THAT IS SYMPATHETIC TO THE ENVIRONMENTAL, CULTURAL AND SOCIAL VALUES OF THE CRINGILA HILLS AREA
PROVIDE HIGH-QUALITY, PURPOSE-BUILT BEGINNER TRAIL EXPERIENCES THAT FOCUS ON FUN, FREE-FLOWING TRAIL EXPERIENCES
DESIGN TRAILS TO PROVIDE STRUCTURED TRAIL HEADS/INTERSECTIONS, TO ALLOW SIMPLE NAVIGATION AND OPTIMAL NETWORK FLOW
DEVELOP A RANGE OF TRAILS TO PROVIDE MULTIPLE, LONG DISTANCE RIDING LOOP OPTIONS IN THE AREA
DEVELOP AN AREA FOCUSING ON DESCENDING TRAIL EXPERIENCES, CAPITALISING ON MAXIMUM AVAILABLE ELEVATION IN THE AREA
DIRTART
SITE OPPORTUNITIES- PURPOSED BUILT MOUNTAIN BIKE TRAILS CAPITALISING THE UNDULATING TERRAIN FRAMING OCEAN VIEWS
SITE OPPORTUNITIES- BIKE SKILLS PARK
SITE OPPORTUNITIES- PUMP TRACK
MOUNTAIN BIKE TRAIL SIGNAGE IMAGES
SITE OPPORTUNITIES- FORMALISED WALKING TRACKS
JOHN CREHAN PARK
JARVIE ROAD
DORMAN STREET
LACKAWANNA STREET
LAKE AV
SKILLS
PUMP
CARDINALS BASEBALL DIAMOND
CRINGILA PRIMARY SCHOOL
CRINGILA COMMUNITY PARK
SHEARWATER DR
wollongong
city of innovation
CRINGILA HILLS RECREATION MASTER PLAN- (DRAFT)
CONCEPT PLAN - WALKING & MOUNTAIN BIKE TRAILS
JARVIE ROAD CRINGILA
PREPARED BY: WCC LANDSCAPE SECTION
DRAWN: DP SCALE: 1:2000@ A1 DATE: OCTOBER 2019
PJ-3825 DWG NO 6660/SK04 Issue 1
0 20 40 60 80
NORTH


DIRTART
WORLD LEADERS IN TRAILS
CONCEPT DESIGN REPORT
Cringila Hills Mountain Bike Park

mountain bikers

about us.

Dirt Art are a team of specialist consultants, designers and construction experts dedicated to the design, construction and management of innovative and sustainable mountain bike, and walking trails and facilities. We produce fresh and exciting trail concepts based upon proven construction technologies.

DIRTART

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Table of Contents

1 DOCUMENT CONTROL

Version	Date	Author	Notes
Draft 1 Preliminary	03/07/2019	Jason Lam	N/A
Draft 2- For client review	23/07/2019	Simon French	N/A
Final Report	30/08/2019	Jason Lam	Final Revisions

Concept Design Report - Cringila Hills Mountain Bike Park

Prepared by Dirt Art Pty Ltd, August 2019

Acknowledgements

This report was commissioned by the Wollongong City Council who have provided significant ongoing support throughout the planning process.


EXECUTIVE SUMMARY

2 EXECUTIVE SUMMARY

New South Wales has one of the largest concentrations of mountain bike riders in Australia, and the least number of formally sanctioned mountain bike trails. As one of the fastest growing adventure-based activities in the world, mountain biking is quickly emerging into a mass-market pursuit with an ever-increasing demand for trails and destinations to cater for a multitude of riding styles and abilities.

The Greater Wollongong area has an extensive network of informal trails located across the Illawarra Escarpment, and a popular private facility, Greenvalleys Mountain Bike Park, is located just a short 30-minute drive from the CBD. At this time, the majority of trails on offer generally cater for the intermediate to advanced sector of the mountain biking market.

The purpose of this report is to provide details relating to the proposed concept design plan for the Cringila Hills site in Wollongong's south. The Council owned and managed land is currently underutilised and experiencing issues relating to unauthorised access and illegal rubbish dumping. The site itself holds significant development potential with undulating terrain, scenic ocean views, and good accessibility. One of the greatest strengths of the site is the single tenure, which vastly improves the viability of the proposed developments by avoiding the complexities relating to cross-tenure dependencies.

The concept design process has involved the following key tasks;

- **Liaise with the client to establish the projects aims and aspirations**
- **Explore and review the site including analysis of; existing amenities, infrastructure, roads and access points**
- **Provide a current mountain bike market overview**
- **Develop a facility plan that compliments and where possible enhances the natural values of the site; where possible allowing these values to be sensitively experienced by trail users**
- **Target trail experiences to the "wants and needs" of local riders**
- **Develop a variety of trail concepts that facilitate a variety of riding styles and caters for all abilities**

- **Develop a budgeted and staged construction implementation plan**

The proposed design seeks to compliment the current trail offerings in Wollongong by providing a peri-urban bike park that focuses on beginner to intermediate level riders and promotes the safe progression of skills in a purpose-built public facility. A total of 16 trail concepts have been proposed in variety of styles with difficulties ranging from beginner (Green Circle) to advanced (Black Diamond). A 'stacked loop' design has been utilised to maximise user configurability; riders are able to shorten or lengthen their rides by choosing different trails. In addition to these trails, a mountain bike skills park and asphalt pump track area have been proposed to add value to the development by broadening the market offering to include other disciplines such as BMX, scooters, skateboards, strider bikes, and roller blades.

A total of 11.5km (approx.) of new trail concepts have been proposed, across both cross country/trail and gravity riding styles, suitable for all rider skill levels. An additional 3.1km (approx.) of new walking trail concepts have also been proposed to supplement the offerings of the park.

PROJECT OVERVIEW

3 PROJECT OVERVIEW

3.1 PROJECT METHODOLOGY

Dirt Art has employed the following methodology in developing this mountain bike concept plan;

3.2 PLANNING AND DESIGN CONTEXT

3.2.1 Overview

The development of any trail facility must be undertaken with an approach that is sensitive and considerate to the natural environment. *Dirt Art* have carefully considered the natural values of the site in developing this mountain bike concept plan ensuring minimal disturbance by aligning trail concepts to avoid areas of high sensitivity and/or conservation value. An environmentally sensitive approach also improves the trail users' experience and lowers planning and construction costs.

Dirt Art will undertake a comprehensive background analysis during the development of all mountain bike facilities. This background research ensures all relevant past planning and research documents are considered when formulating the final facility plan.

3.2.2 Natural environment, native flora and fauna

The area proposed for development has wide-ranging environmental values though, notably, higher sensitivity sites have been avoided. This includes the remnant patches of Endangered Ecological Community (ECC), Illawarra Subtropical Rainforest and populations of the threatened plant, Cynanchum elegans.

New trails proposed in this study predominantly feature a gentle sustainable gradient, which eliminate any issues associated with erosion and sediment dispersion and results in a greatly reduced environmental impact.

3.2.3 Other user groups

The proposed development areas have limited evidence of use by other formal user groups including horse riding and motor-bike riding. There is evidence of illegal dumping in specific sites throughout the development area. The project seeks to eliminate this by introducing a more active and positive use of the entire site; more frequent visitation results in greater passive surveillance.

The proposed trail network has carefully considered other users where relevant, and where possible has avoided any potential conflict between users. This has been achieved by;

- Proposing trails, where possible, away from areas frequented by other formal users such as the existing Cringila Baseball grounds
- Keeping trail alignments away from neighbouring houses
- Providing connections to existing pathways / bike paths
- Transforming areas that are prone to illegal rubbish dumping to more active sites, e.g. trailhead / carpark

3.2.4 Project aims and aspirations

The proposed development has been carefully structured around the aspiration of developing the Cringila Hills site as a bike-park style facility that caters for recreational riding. The network of trails has been composed to offer a series of varying styles of trails ranging from cross-country, all-mountain, and gravity focused experiences. A dirt jumps area and associated pump track provide opportunities for further skills development and caters for a user group that is not currently serviced in the region.

The facility has a strong focus on beginner to intermediate riders while also providing more challenging trails for advanced riders. The network uses a ‘stacked loop’ configuration to offer maximum diversity and options for riders of all ages, fitness, and abilities. This arrangement of the various trails allows riders to choose their own adventure by mixing and matching trails to suit their

needs. It also provides a solid basis for the local mountain bike club to organise regular cross-country races, something which is lacking as there is no formal place to facilitate this currently. The 'stack loop' configuration allows a range of different race courses to be set at the same facility.

3.3 PREVIOUS REPORTS AND PLANS

3.3.1 Cringila Hills Preliminary Site Assessment – Final Report

A preliminary analysis of the Cringila Hills project site was conducted by *Eco Logical Australia* (ELA) on behalf of *Wollongong City Council* (WCC) in mid 2013. ELA were responsible for compiling information relating to the following opportunities and constraints of the given study area:

- Terrain
- Geotechnical conditions (conducted by Douglas Partners)
- Contaminated lands (conducted by Douglas Partners)
- Site hydrology
- Infrastructure (recreational facilities and services)
- Natural values
- Visual amenity
- Bushfire hazard
- Heritage

The report has been reviewed by *Dirt Art* prior to undertaking concept trail design works. The opportunities and constraints identified in the report have formed the basis by which the concept trail alignments have been designed and established.


THE MOUNTAIN BIKE MARKET

4 THE MOUNTAIN BIKE MARKET - OVERVIEW

4.1 THE MOUNTAIN BIKE MARKET - NATIONAL AND LOCAL

4.1.1 History

Mountain biking has been well established in Australia since the early 90's, though the sport really began to prosper in the mid-late 90's, which saw a period of some of the first purpose-built mountain bike infrastructure in Australia. In 2004 some of Australia's first large-scale mountain bike parks were developed, namely Glenorchy Mountain Bike Park in Tasmania and Mount Stromlo in Canberra. Prior to these developments, mountain biking was taking place largely on existing walking trails and on informal trails created by the riders themselves.

Between 2005 and present day there have been significant advances in mountain bike technology, which is contributing to defining the type of riding experience achievable for and desired by riders. While some trends in riding have come and gone, the format of downhill and cross–country have remained, with some blurring between these styles of riding with the emergence of the all–mountain bicycle.

4.1.2 Current market

The current mountain bike market is dominated by longer travel cross–country mountain bikes, broadly referred to as 'all–mountain' or 'enduro' bicycles. This style of bike is incredibly capable at both climbing and descending and has effectively increased the capability of the average rider.

Currently riders are seeking a broad range of experiences from local urban and peri-urban trails through to remote wilderness style longer distance riding experiences. Generally speaking, the mountain bike tourist market is seeking these destination-

adventure experiences in more remote natural environments, involving longer distance loops or point-to-point trails. Trails proximate to urban areas are typically most popular with local riders because of their accessibility and convenience, though visitors drawn to an area for other experiences may also ride them.

Research consistently indicates that the current demographic of riders is predominately male, with an age of 30-40 years and a high disposable income.[1] This market is a key target for tourism as they are seeking longer, destination-based stays and typically seek out high quality dining and accommodation options.

Demand for gravity-based trail experiences in Australia is very high, with a major undersupply affecting this segment of the market across Australia.

4.1.3 Mountain bike tourism markets

4.1.3.1 Overview

Tourists engaging in mountain biking can be divided into two distinct categories, the 'complementary market'; those who engage in mountain biking as a complementary activity (not as a primary motivator or sole purpose for travel), and the 'enthusiast market'; those who have travelled with mountain biking being the primary reason for their trip.

4.1.3.2 Complementary tourist market

Mountain bike riding as a complementary activity has risen dramatically in popularity in recent years, as the sport has moved beyond the 'extreme sport' image of the past, and more towards the more accurate perception of the sport as a safe, inclusive

[1] Koepke, J. (2005) Exploring the Market Potential for Yukon Mountain Bike Tourism, Cycling Association of Yukon, Canada, page 5.

and fun adventure activity. The emergence of mountain biking as a commercially viable complementary activity has been driven largely through the development of safer, more beginner-friendly trails, and by the growing number of commercial operators including the sport in their activity programs. Commercial viability of mountain biking as a complimentary activity requires a lower volume of trail than for the enthusiast market, though the required quality and maintenance demand of trails will be higher. As a complementary activity, mountain biking offers genuine avenues for commercial return, while also potentially lengthening the duration of stay for existing guests. In addition to this, targeted marketing may draw in guests that may otherwise have travelled to an alternative location.

4.1.3.3 Enthusiast tourist market

The enthusiast market is defined by the principle of mountain biking acting as a primary motivator/purpose for their travel. The enthusiast market seeks out new and exciting mountain bike destinations, and typically travel multiple times annually to engage in mountain biking.

The mountain bike enthusiast market is typically populated by 25-45-year-old males with a high disposable income, who are seeking opportunities to travel to destinations with the primary purpose of going mountain bike riding. While mountain bike riding may be a primary travel motivator, the availability of alternative activities will still influence this traveller as they will often look for destinations where they can viably travel with family, their spouse or non-enthusiast travelling companion/s. The mountain bike enthusiast is typically travelling for multi-day stays and is seeking unique and high-quality trail experiences. These users will typically seek higher volumes of trail, as they will often ride 30-40km+ per day.

4.1.4 The success stories - Australia

Current participation data for mountain biking in Australia is distinctly lacking, although as new commercial venues emerge more data is becoming available. Traditionally the recording of trail usage numbers has been a relatively rare practice, but in a current climate, often characterised by particularly frugal government and corporate investment, this practice is increasingly being used to justify investment in trails. Sample data from some of Australia's key mountain bike destinations can be found below.

Blue Derby (Tasmania) is widely-regarded as the current mountain bike destination market leader in Australia. Housing a purpose built 80km trail network, Blue Derby combines a ride in/ride out town, with high quality trails, and unique Tasmanian wilderness. A range of trail experiences are on offer, with stand-out experiences being the destination's wilderness descents; the Blue Tier Trail and Atlas.

Thredbo (NSW) has a long history of mountain bike activity and is currently the only ski resort in Australia with a dedicated season-long lift-assisted trail network. Thredbo is investing significantly in trails over the next two seasons, which has already seen resort visitation increase significantly. Unfortunately, Thredbo's mountain bike visitation statistics are not publicly available.

Mount Buller (Victoria) have invested over $2m over a five-year period in developing predominantly all–mountain and cross–country mountain bike trails. Data for the resort from the 2011/12 summer recorded a total rider count of 23,000 over a five-month period.[2] The resort notes a 6% increase in mountain bike visitation between 12/13 and 13/14, though this small increase is likely related to the development staging at the time, and the style of trail being developed at Mount Buller, which is similar to many other cross–country trail networks closer to urban centres.

More recently, Mount Buller has slowed down trail development, and is seeing a fairly static annual visitation.

[2] www.world-trail.com accessed 25th November 2012.

You Yangs (Victoria) consistently records annual rider visitation over 150k p.a.[3]

4.1.5 The future

4.1.5.1 The future- general

The sport of mountain biking has continued to see sustained and expanding growth both in Australia and overseas. With current demand for high-quality riding opportunities still far exceeding supply, there exists significant potential to see excellent return on investment when developing world-class mountain bike trails and facilities.

The next few years will likely see the all mountain category of riding continue to grow, resulting in an increasing demand for more challenging, descending-focused riding. *Dirt Art* suggests that the next five years will see a huge increase in demand for chairlift or shuttle accessed descending cross country and all mountain trail experiences.

4.1.5.2 The future- E bikes

While traditional bike technology is likely to continue to stabilise, the rapid emergence of the E-bike is likely to have a profound impact on the sport. In *Dirt Art's* view, E-bikes will never replace the traditional mountain bike, but as technology improves the bikes will become a much more common feature on the trails. E-bikes make the sport more accessible to newer and less-capable riders and increase the ride duration for more experienced riders.

[3] Data provided by Parks Victoria staff July 2011.

It is important to recognise the distinction in E-bikes between high-powered throttle assisted bikes and lower-powered pedal-assisted bikes. Pedal assisted bikes have no additional impacts on trails, whereas throttle powered bikes are illegal in most public areas and will cause significant additional damage to trails.

4.2 THE GENERAL CYCLING MARKET

4.2.1 Overview

While aspects of the proposed development are targeted at the enthusiast mountain bike rider, much of the initial stage of the proposed development is targeted at the recreational cyclist who may be a visitor to the area regardless of the mountain bike program on offer. This complementary market of users is better analysed by looking at data relating to the general recreational cycling market. *Dirt Art* suggest that many visitors with some cycling experience will be highly-motivated to engage with the proposed mountain bike activities, despite not recognising themselves as a mountain bike rider.

4.2.2 Cycling participation data

Research for the Australian Bicycle Council and Austroads surveyed 8,375 randomly selected households, who were interviewed regarding cycling participation. This survey sample represented 20,879 individuals.[4]

Key findings included:

- 36.3% of Australians had participated in cycling in the last year
- 24.3% of Australians had participated in cycling in the last month

[4] *National Cycling Participation Survey (2015)* conducted by CDM

- 17.4% of Australians had participated in cycling in the last week
- 85.5% of those who cycled in the past month did so for recreational purposes.

Unlike many cycling participation surveys, the *National Cycling Participation Survey* does include children in the data, providing a more holistic picture of cycling participation in Australia.

There is no currently specific data on mountain bike participation rates in Australia, however it widely accepted that mountain biking makes up a substantial proportion of the overall cycling participation rates; noting studies have shown that approximately 70% of the bicycles sold in Australia are mountain bikes.[5]

[5] *The Australian Bicycle Industry Report 2006*

THE SITE

5 THE SITE

5.1 LOCATION

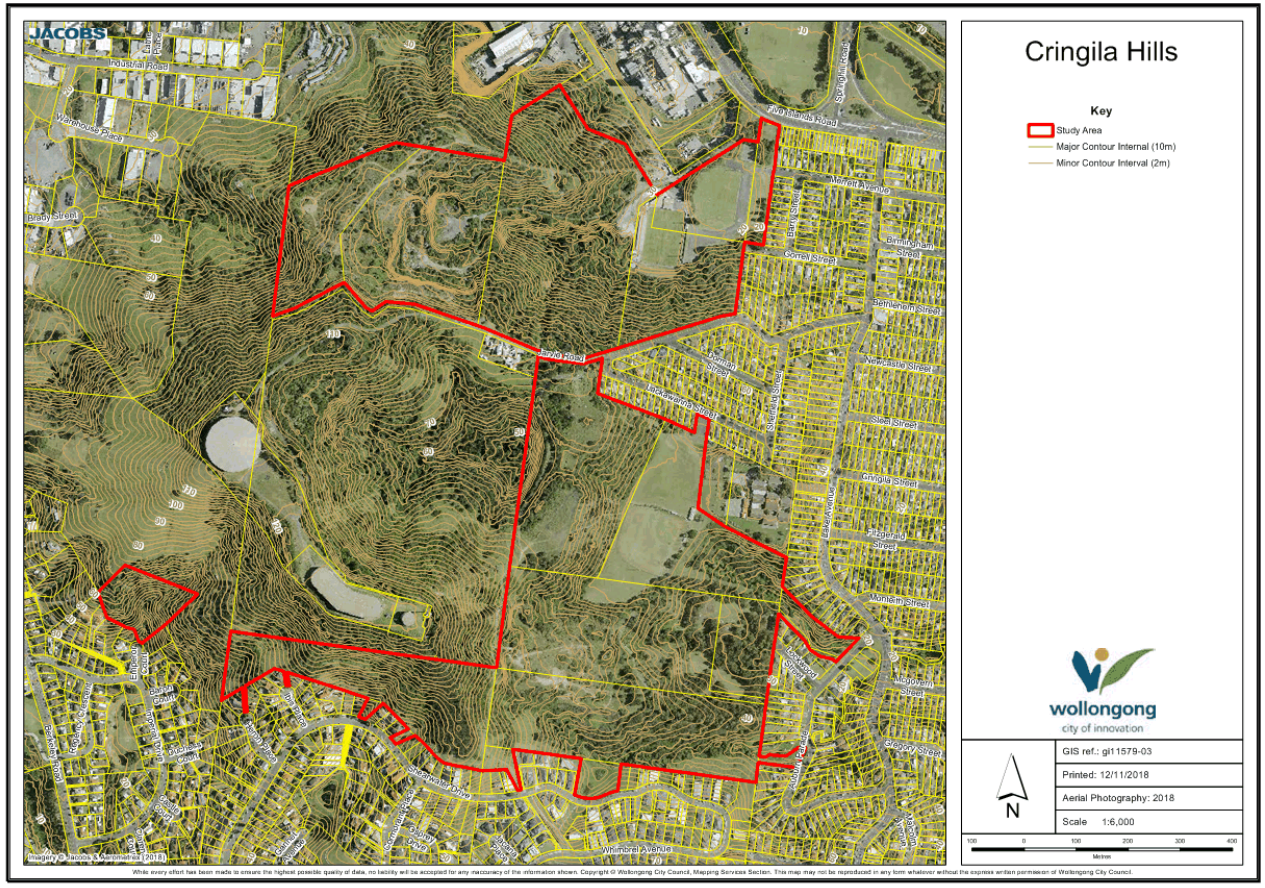
Cringila Hills is located in Wollongong's south near Mt Kembla and sits within the local government area of Wollongong City Council. The project site is made up of three separate land parcels totalling 72.6ha. The proposed development area occurs between Five Islands Road, The Southern Freeway, and Northcliff Drive. The three land parcels form a horse shoe shape that wraps around the lower foothills of a large parcel of land owned by Sydney Water, which occupies the upper portions of the hill as well as the summit. The site offers spectacular views out to the ocean and is visually dominant from the Southern Freeway.

The project site is split into two distinct areas bisected by Jarvie Road:

1. **Current Development Area (approx. 39.5ha)**
Community land on the southern side of Jarvie Road comprising of the former the following:
    - 'FutureWorld' site
    - Cringila Community Park
    - Cringila Baseball Grounds

2. **Future Development Area (approx. 31 ha)**
Refers to the operational and community land area north of Jarvie Road comprising of the following:
    - Former quarry
    - John Creehan Park

5.2 SITE MAP


JACOBS
Cringila Hills
Key
Study Area
Major Contour Internal (10m)
Minor Contour Interval (2m)
wollongong
city of innovation
GIS ref.: gi11579-03
Printed: 12/11/2018
Aerial Photography: 2018
Scale 1:6,000
N
Imagery © Nearmap & Aerometrex (2017)
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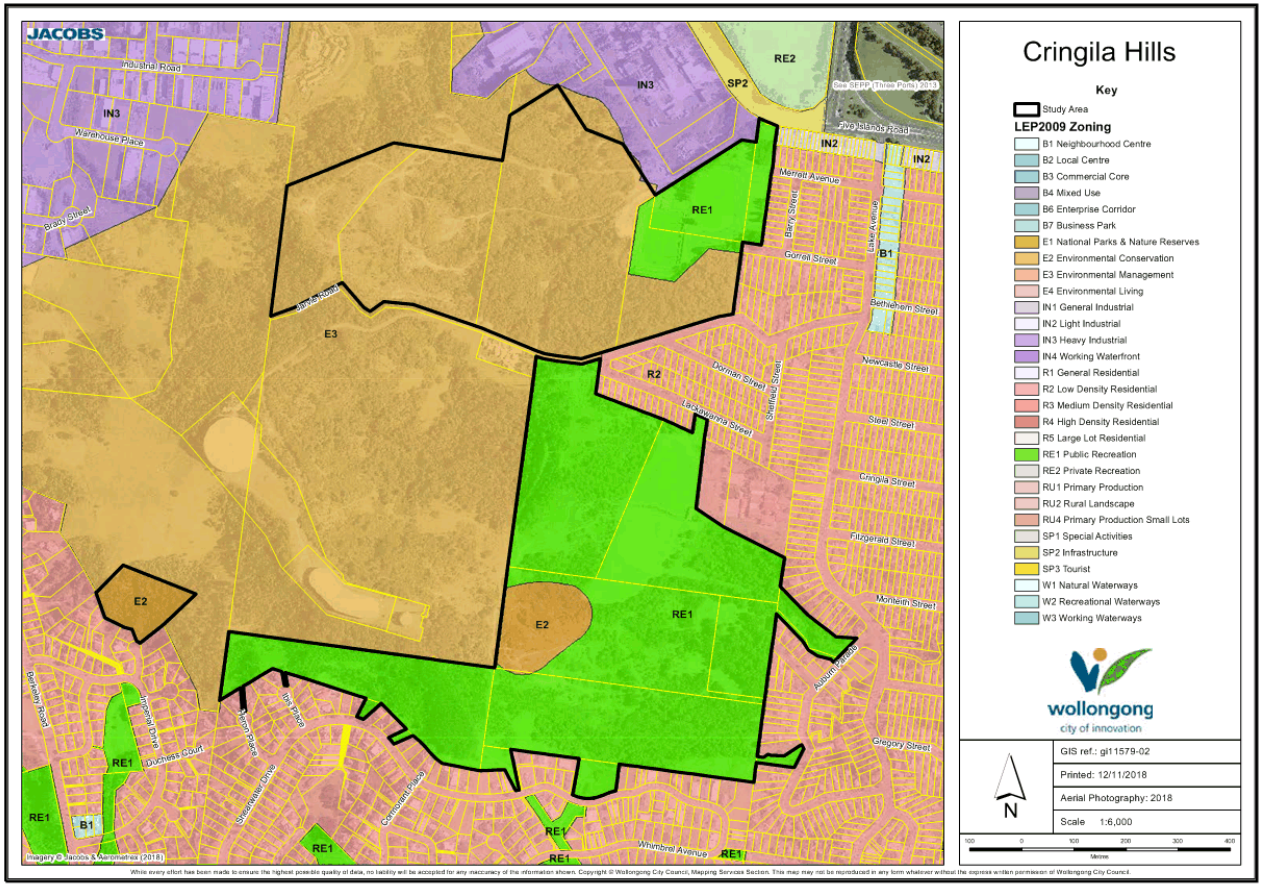
5.3 LAND ZONING

Current Development Area
The majority of the site to the south of Jarvie Road is currently zoned as Public Recreation (RE1), with a small section in the middle marked as Environmental Conservation (E2). This development area represents the primary focus of the project as it is the least constrained out of the two available areas and the undulating terrain is suited to variety of different trail styles.

Future Development Area
The site located to the north of Jarvie Road is predominately zoned as Environmental Management (E3) with the exception of the playing fields in the north-eastern corner, which are zoned as Public Recreation (RE1). This development area is highly constrained with the steeper topography being less conducive to beginner to intermediate riding experiences. The future development site would be better suited to intermediate to advanced trails given the nature of the terrain.

5.4 ZONING MAP




DESIGN CONCEPT

6 DESIGN CONCEPT

6.1 OVERVIEW

The proposed bike park concept plan at Cringila Hills seeks to provide recreational opportunities for a variety of mountain biking styles and cater for riders of all abilities and ages. There is a strong focus on the provision of trail experiences for beginners to intermediate riders to compliment the current offerings within the Illawarra region.

The proposed bike park plan offers 11.5km of concept trail alignments as well as a mountain bike skills park and pump track. The facility capitalises on the undulating terrain of the site while framing the spectacular ocean views. A 'stacked loop' configuration has been implemented throughout the network to offer maximum flexibility for riders to compose their own unique rides to suit their fitness, ability, and time within the park.

Notably, all proposed trail alignments are conceptual in nature and will require a detailed design process and route flagging to confirm viability and precise location.

6.2 OPPORTUNITIES ANALYSIS

6.2.1 Land Parcels Overview

Through the concept design process, *Dirt Art* has analysed the three separate development areas identified for this project (please refer to map in **Section 6.2.3**) as listed below:

1. Current Development Area
2. Future Development Area

3. Area to be Preserved

These three respective sites have been investigated via desktop analysis, limited field surveys, and reviewing previous reports by external consultants. The area marked as 'Current Development Area' has proven to be the most conducive to trail development with a variety in the terrain on offer combined with pre-existing access points and associated amenities. In addition to this, the land parcel has minimal areas that pose high conservation or environmental value – with most being isolated to specific areas and thereby easily avoidable.

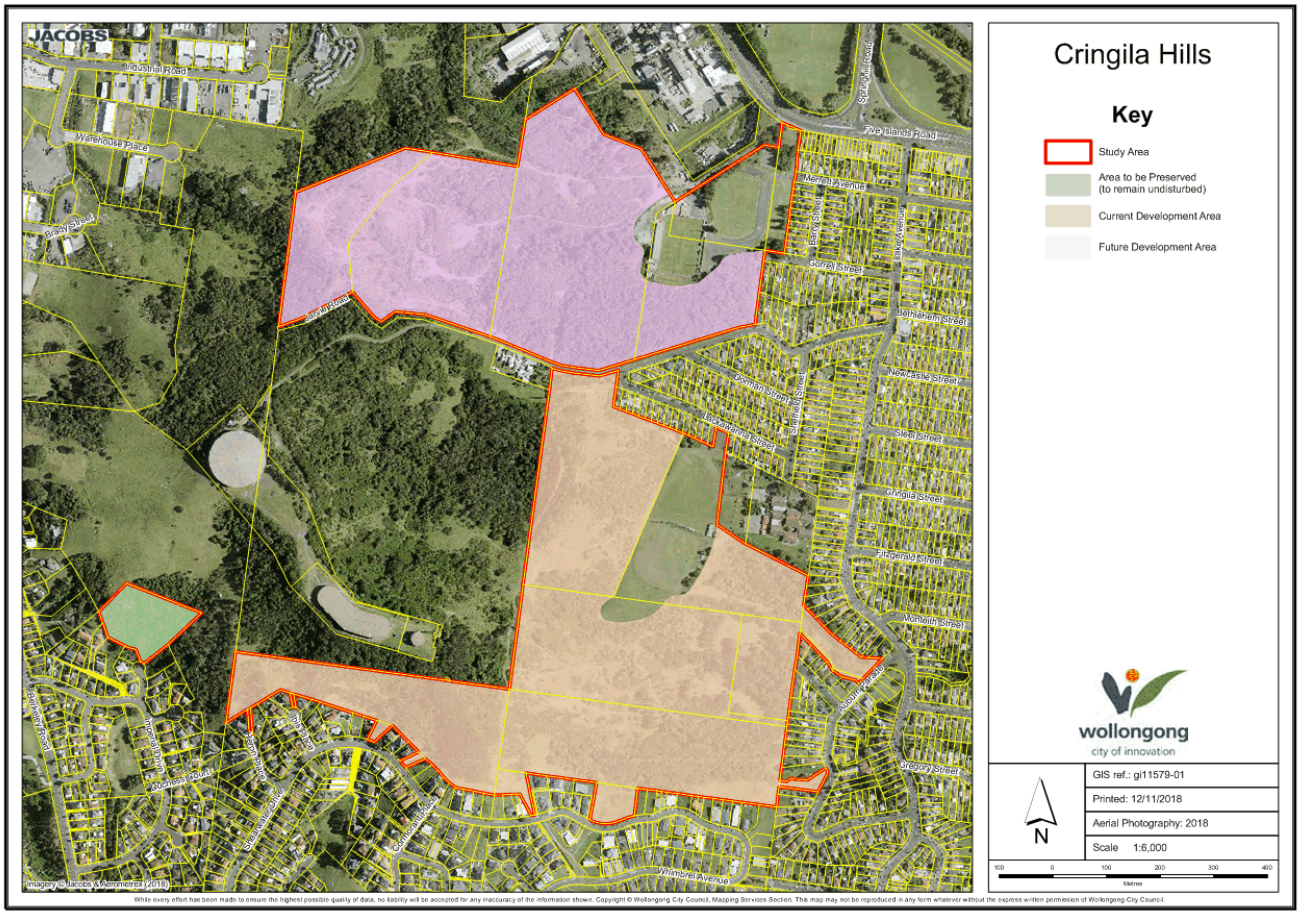
6.2.2 Rejected Land Spaces

Both parcels of land marked as 'Future Development Area' and 'Area to be Preserved' have been rejected for use in the bike park scheme due to their environmental constraints and sensitivities.

Future Development Area
The foremost site refers to the operational and community land area north of Jarvie Road (approx. 31ha), which is made up of a former quarry to the west and John Creehan Park to the east. The quarry site has been identified as a safety hazard in the *Cringila Hills Preliminary Site Analysis* (prepared by Eco Logical Australia) due to potentially contaminated builders waste and household waste. In addition, the area of natural vegetation situated between the quarry and John Creehan Park is classified as a 'Natural Resource Sensitivity – Biodiversity' area. As such, for these two reasons, the Future Development Area has been omitted from the concept design until further investigations are completed by a suitably qualified consultant.

Area to be Preserved
The isolated parcel of land to the west has been identified as an area for preservation and therefore left alone. The area does not offer any foreseeable benefit to the bike park scheme.

6.2.3 Development Areas Map



6.3 OVERALL TRAIL DIFFICULTY RATING SYSTEM (TDRS) BREAKDOWN

Green Circle	Blue Square	Blue Square (Freeride)	Black Diamond	Black Diamond
4.6km	3.3km	1.9km	1.1km	0.6km
42%	30%	18%	10%	5%

The above TDRS breakdown provides a diverse facility, that will cater for the broadest possible market of riders. The nearby Illawarra Escarpment network of informal mountain bike trails currently caters for the upper spectrum of the trail difficulties in the intermediate to advanced level. As a result, there has been a strong focus placed on the beginner (Green Circle) and intermediate (Blue Square) market with 42% and 46% of the proposed trails in these respective categories. The proposal also recognises the importance of providing a series of trails to progress from and offers a smaller selection of more challenging advanced (Black Diamond) trails. The proposed trail difficulty breakdown offers a diverse network of high-quality trails for all abilities.

6.4 GUIDING DESIGN PRINCIPLES

New trail concepts proposed have been developed based upon a number of guiding principles. All trails are listed in priority (numbered) order, based upon a suggested staging approach to trail construction. Overall project priority staging can be found in the action plan for this project. Guiding principles for the new trail concepts proposed are as follows;

- Develop trails in a way that is sympathetic to the environmental, cultural and social values of the Cringila Hills area
- Provide high-quality, purpose-built beginner trail experiences that focus on fun, free-flowing trail experiences
- Design trails to provide structured trail heads/intersections, to allow simple navigation and optimal network flow
- Develop a range of trails to provide multiple, long distance riding loop options in the area
- Develop an area focusing on descending trail experiences, capitalising on maximum available elevation in the area

6.5 OVERVIEW OF THE CONCEPT DESIGN PROCESS

All new trails proposed in this document have been developed as working desktop concepts, and do not represent detailed trail designs. *Dirt Art* undertakes a structured concept design process, based upon the below workflow;

Dirt Art has ground-truthed trails to approximately 10m corridor accuracy. Concepts have in most cases been designed to feature average gradients of approximately 4-7%, and to reside in areas conducive to construction of economical, high-quality trail infrastructure. Average gradients have been calculated using detailed contour and elevation data for the target area.

Due to the conceptual nature of trail alignments, and the highly varied topography of the site, a comprehensive on-ground design phase will be required for all new trails proposed. During the detailed design process, alignments and trail distances will be subject to change.

6.6 MOUNTAIN BIKE TRAIL SUMMARY

Trail No.	Trail Zone	Trail Direction	Trail Style	Trail Difficulty	Trail Length (m)
1	NORTH	Descent	XC	Green Circle	511
2	NORTH	Descent	Freeride	Blue Square	535
3	NORTH	Climb	XC	Green Circle	539
4	CENTRAL - MID	Two-Way	Link	Green Circle	358
5	CENTRAL - UPPER	Two-Way	Link	Green Circle	667
6	CENTRAL - UPPER	Descent	Freeride	Blue Square	643
7	CENTRAL - UPPER	Descent	Flow	Blue Square	474
8	CENTRAL - UPPER	Descent	XC	Green Circle	589
9	CENTRAL - LOWER	Climb	XC	Green Circle	1169
10	CENTRAL - LOWER	Descent	XC	Green Circle	420
11	CENTRAL - LOWER	Climb	XC	Green Circle	337
12	CENTRAL - LOWER	Descent	Freeride	Black Diamond	233
13	CENTRAL - LOWER	Descent	Freeride	Black Diamond	340
14	CENTRAL - LOWER	Descent	Freeride	Blue Square	285
15	CENTRAL - LOWER	Descent	Freeride	Blue Square	468
16	WEST	Climb	XC	Blue Square	566
17	WEST	Descent	All Mountain	Blue Square	456
18	WEST	Loop	All Mountain	Black Diamond	1102

19	WEST	Loop	XC	Blue Square	665
20	WEST	Loop	All Mountain	Blue Square	1097
				TOTAL =	**11,454m**
					11.5km

6.7 WALKING TRAIL SUMMARY

Trail No.	Trail Zone	Trail Direction	Trail Style	Trail Difficulty	Trail Length (m)
N/A	NORTH	Two-Way	Shared	N/A	521
W1	NORTH	Two-Way	Walking	N/A	468
W2	NORTH	Two-Way	Walking	N/A	451
W3	NORTH	Two-Way	Walking	N/A	291
W4	CENTRAL	Two-Way	Walking	N/A	200
W5	CENTRAL	Two-Way	Walking	N/A	279
W6	CENTRAL	Two-Way	Walking	N/A	457
W7	CENTRAL	Two-Way	Walking	N/A	200
W8	CENTRAL	Two-Way	Walking	N/A	271
				TOTAL =	**3,138**
					3.1km

6.8 MOUNTAIN BIKE TRAIL MAP

6.9 WALKING TRAIL MAP

6.10 NORTHERN TRAIL ZONE

6.10.1 Overview

The northern trail zone represents the primary access point to the proposed Cringila Hills Bike Park. The proposal utilises an existing carpark entry located on Lackawanna Street, which provides access to the current Cringila Park. The northern zone has a strong beginner focus and provides opportunities for shorter riding options that are close to carparking. The trails in this area present a good introduction to visitors that are new to the sport and the adjoining mountain bikes skills park and pump track facility provide further opportunities for riders to warm-up before heading off to the trails.

6.10.2 Carparking / Trailhead

The large vacant section to the north of the existing baseball field is proposed to be redeveloped to house a formal carpark that will service both the baseball ground and the bike park. The existing entrance situated on Lackawanna Street will be utilised as the primary entrance. The design seeks to exploit the level topography of this area and re-purpose it as the facility's primary trailhead to incorporate a mountain bike skills park and adjoining pump track. There is scope for a children's playground to the east of the proposed carpark.

6.10.3 Skills Park / Pump Track Area

A mountain bike skills park and pump track are proposed to the west of the carpark, nestled at the foothills of the northern trail zone. The area marked for the skills park and pump track is conveniently located to the primary trailhead and allows riders to pass the skills facilities on their way to the main trails. The proximity of the facility to the carpark provides a fantastic opportunity for families with younger children to enjoy the skills facilities and pump track without having to travel to far from the carpark.

6.10.3.1 Concept Imagery

Figure 1 – Skills Park - Balance Features

Figure 2 – Skills Park – Jumps Features


Figure 3 – Intermediate Freeride / Jumps Trail Feature


Figure 4 – Asphalt Pump Track – Advanced Rider


Figure 5 – Asphalt Pump Track – Beginner Rider

6.10.4 Northern Zone – Trail Map

6.10.5 Trail One

TRAIL 1

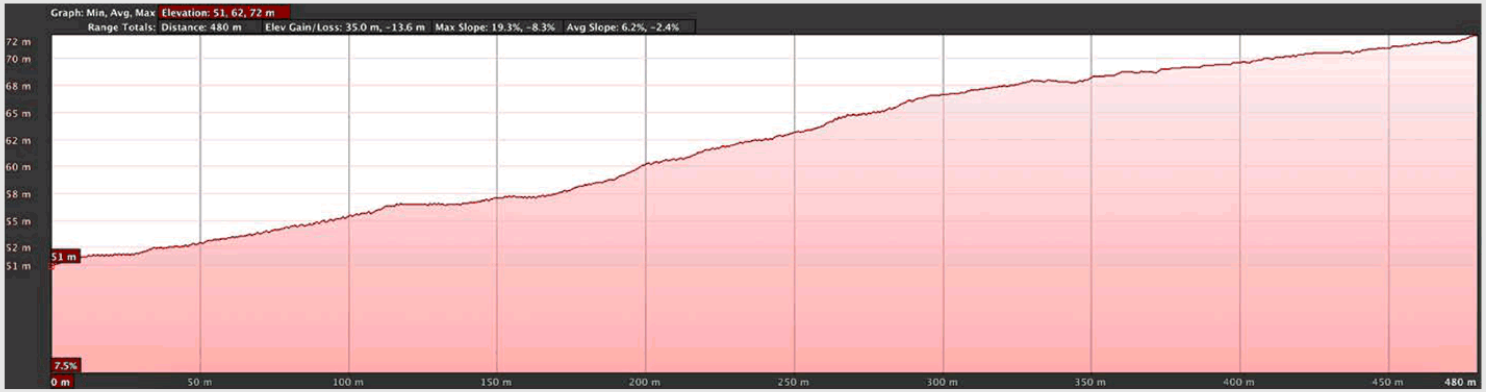
ELEVATION PROFILE

TRAIL DISTANCE (M)	511m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	A beginner-friendly descent brings riders back down to the pump track and skills area.

6.10.6 Trail Two

TRAIL 2

ELEVATION PROFILE



TRAIL DISTANCE (M)	535m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Freeride / Jumps
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Intermediate freeride / jumps trail accessed via Trail 3 and brings riders down a series of manmade features back down to the pump track and skills area.

6.10.7 Trail Three

TRAIL 3

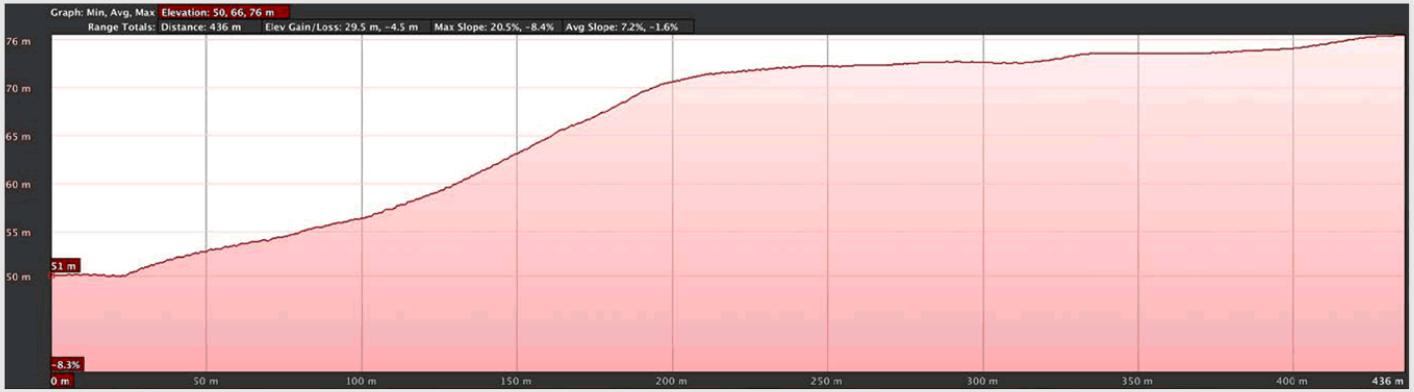
ELEVATION PROFILE

TRAIL DISTANCE (M)	539m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Climb / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	An easy climbing trail that follows a mellow gradient up the hill to bring riders to the start of Trails 1, 2, and 5.

6.10.8 Walking Trail W1

WALKING TRAIL W1

ELEVATION PROFILE

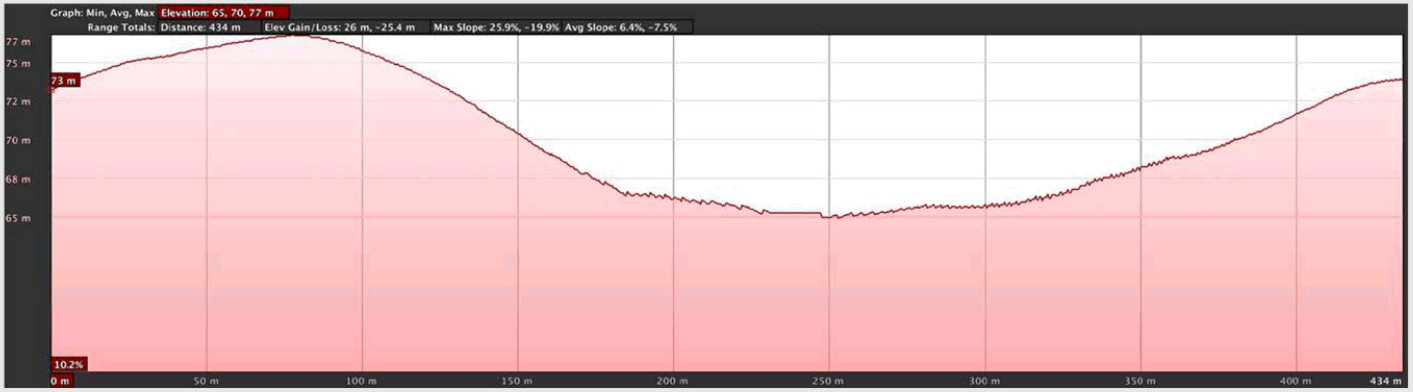


TRAIL DISTANCE (M)	468m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	This trail is located on the northern perimeter of the site and begins/finishes at the proposed mountain bike skills park and pump track. The walking trail follows an alignment alongside the Trail 1 descent, allowing views back towards the trail, and ends at the existing access track (W2).

6.10.9 Walking Trail W2

WALKING TRAIL W2

ELEVATION PROFILE



TRAIL DISTANCE (M)	451m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Existing Access Track
DESCRIPTION	W2 utilises the existing access track from Jarvie Road and formalises it within the network of proposed trails in the park. The track provides a link to the proposed W3 walking trail located to the south.

6.10.10 Walking Trail W3

WALKING TRAIL W3

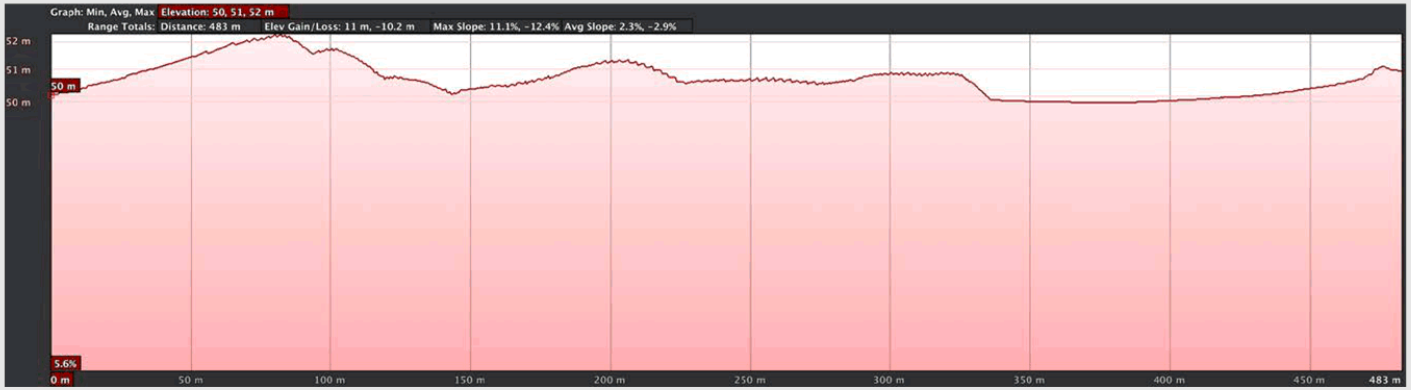
ELEVATION PROFILE

TRAIL DISTANCE (M)	291m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	This trail allows users to create a smaller loop with W1 and W2, bringing individuals back to the base trail hub / carpark

6.10.11 Shared Path

SHARED PATH

ELEVATION PROFILE



TRAIL DISTANCE (M)	521m
TDRS (IMBA)	N/A
TRAIL STYLE	Shared Path
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	The proposed shared path provides a connecting path between the northern trail hub and the existing Cringila Community Park walking loop. The proposed alignment follows a relatively flat profile around the southern perimeter of the existing baseball field.

6.11 CENTRAL TRAIL ZONE

6.11.1 Overview

The central trail zone houses the greatest proportion of trails in the bike park with the hill being split into upper and lower zones by Trail 4. The splitting of the hill into two halves allows riders to shorten or lengthen their rides as they please to suit their fitness or available time. It promotes the use of a single climb (Trail 9 and 10) to service a multitude of descending options and creates opportunities to cater for a range of descending experiences for riders. The central trail zone is designed to allow an assortment of trails to be combined to form a cross-country race course for the local mountain biking club.

6.11.2 Carparking / Trailhead

The lower trail hub is located at the existing Cringila Community Park, which offers existing amenities such as toilets and a sealed road for limited vehicular access. There is minimal available parking in this area and no further expansion is proposed. The access point to the bike park is seen as predominately catering to riders pedaling into the park from adjacent suburbs. The hub is proposed to be a secondary access point into the bike park, with the main trailhead located to the north and accessed via Lackawanna Street. After consultation with the client and stakeholders, Dirt Art deemed it insensitive to surrounding residents to funnel the expected high volumes of vehicular traffic from bike park visitors through a narrow suburban street (Lockwood Street). Instead, the northern entry will be promoted as the official and primary trailhead / bike park entry.

6.11.3 Central Zone – Trail Map

6.11.4 Trail Four

TRAIL 4

ELEVATION PROFILE

TRAIL DISTANCE (M)	358m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Link
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	This two-way link trail utilises an existing fire road to provide a north-south connection between the proposed primary northern trail hub and the central trail zone.

6.11.5 Trail Five

TRAIL 5

ELEVATION PROFILE

TRAIL DISTANCE (M)	667m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Link
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	This two-way link trail provides a north-south connection between the northern trail hub and upper central zone.

6.11.6 Trail Six

TRAIL 6

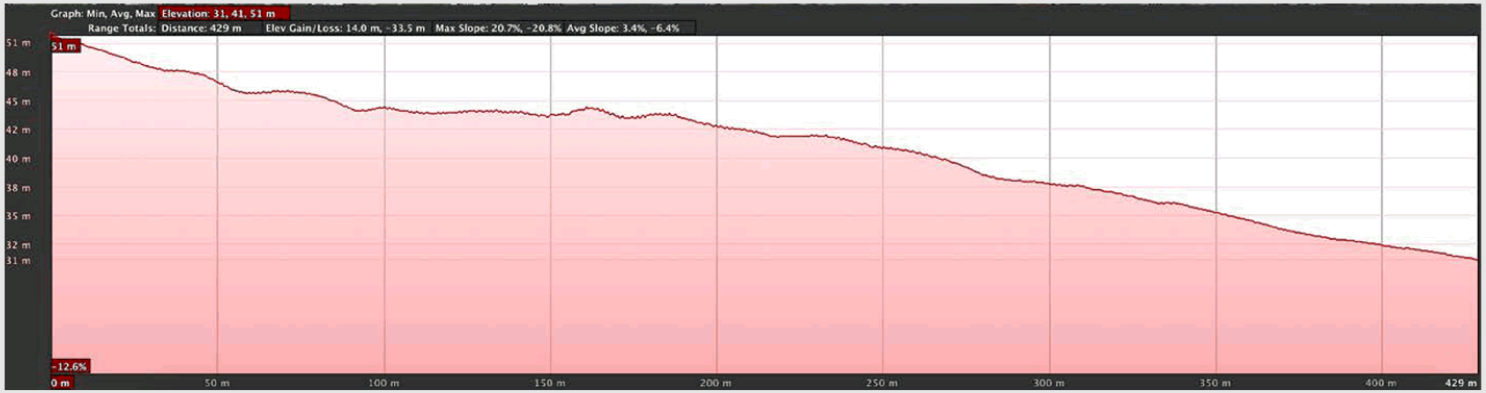
ELEVATION PROFILE

TRAIL DISTANCE (M)	643m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Freeride
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	The lower freeride/jumps trail is an introduction for intermediate riders to manmade features and allows riders to progress from Trail 7.

6.11.7 Trail Seven

TRAIL 7

ELEVATION PROFILE

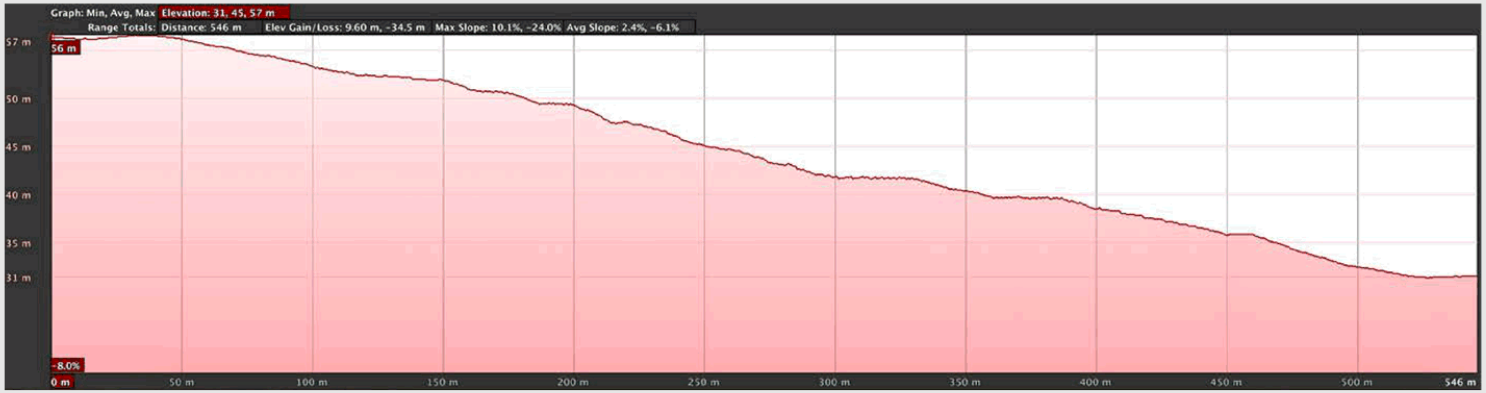


TRAIL DISTANCE (M)	474m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Flow
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	An intermediate flow trail that descends through the middle of Cringila Community Park. This trail provides a beginner to intermediate experience and allows riders to progress from Trail 8.

6.11.8 Trail Eight

TRAIL 8

ELEVATION PROFILE

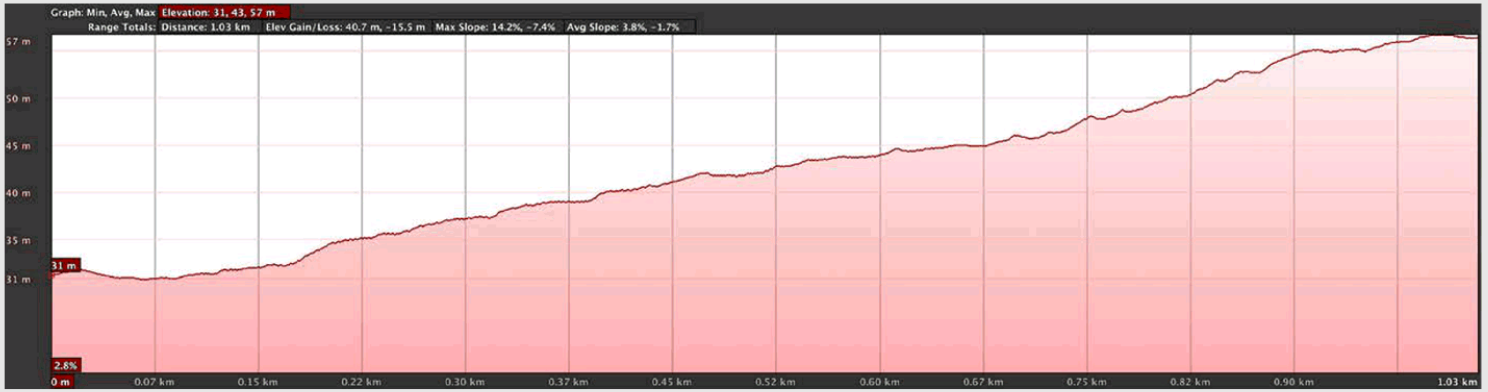


TRAIL DISTANCE (M)	589m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	The lower descending trail provides the easiest option for beginner riders to get back down to Cringila Community Park. The trail can be used as a loop with Trail 9.

6.11.9 Trail Nine

TRAIL 9

ELEVATION PROFILE



TRAIL DISTANCE (M)	1169m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Climb / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	The beginner-friendly climbing trail gradually weaves its way through the most pristine bushland in the park and can be used as a lower loop with Trail 8.

6.11.10 Trail Ten

TRAIL 10

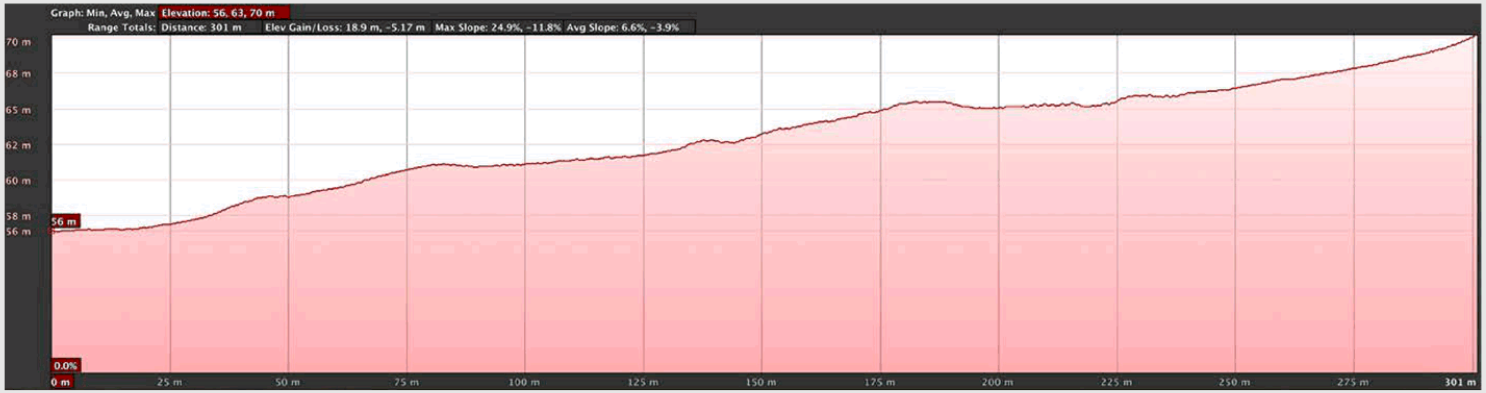
ELEVATION PROFILE

TRAIL DISTANCE (M)	420m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Upper cross-country climbing trail is an extension of Trail 9 and services the various freeride/jump trails located in the upper central zone as well as Trail 11.

6.11.11 Trail Eleven

TRAIL 11

ELEVATION PROFILE

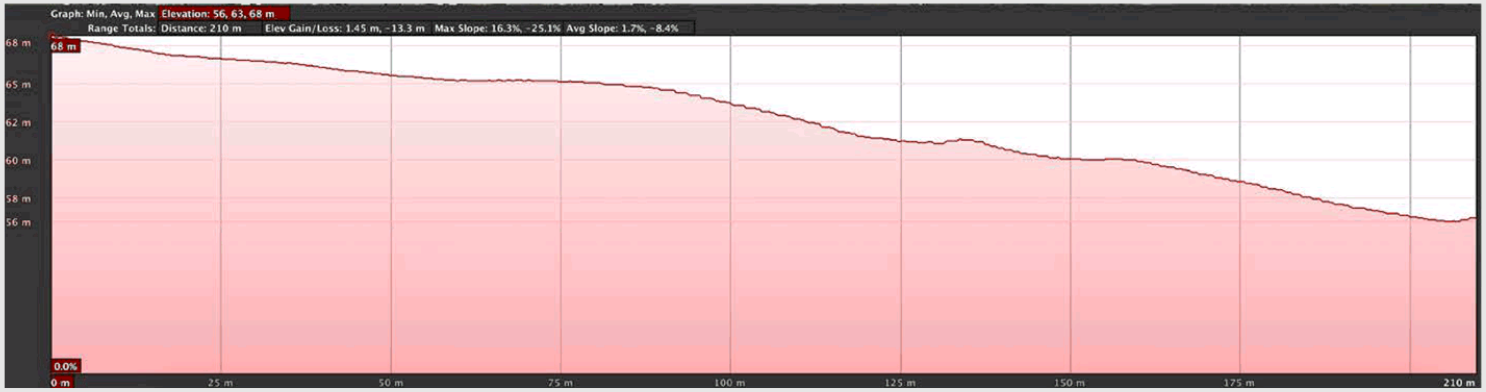


TRAIL DISTANCE (M)	337m
TDRS (IMBA)	Green Circle
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	A beginner-friendly descending trail follows a gradual alignment down the hill and can be linked into trail 8 to form an extended descent for beginner riders.

6.11.12 Trail Twelve

TRAIL 12

ELEVATION PROFILE

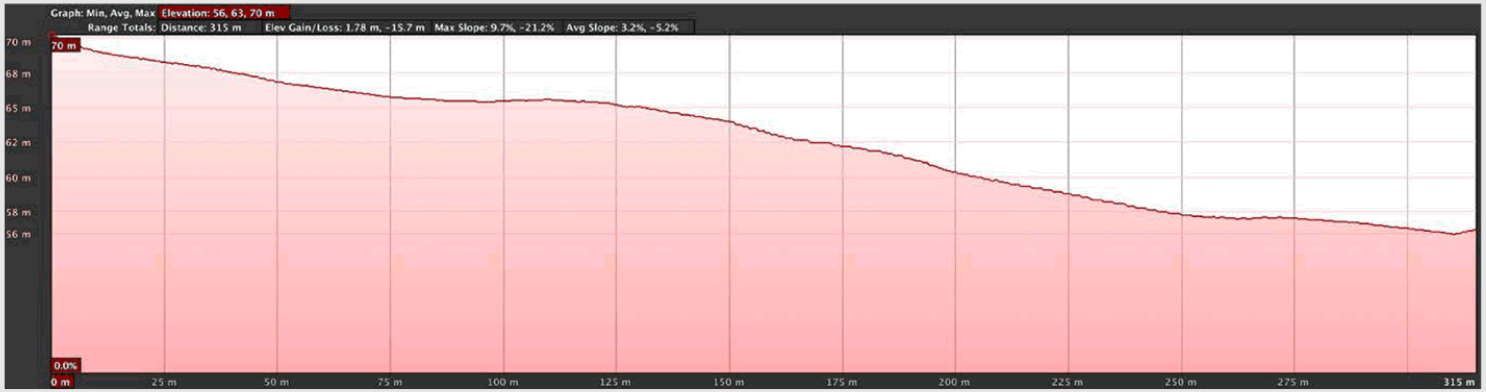


TRAIL DISTANCE (M)	233m
TDRS (IMBA)	Black Diamond
TRAIL STYLE	Freeride
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Advanced descent located on the upper central zone that follows a mellow gradient and incorporates a number of manmade features such as jumps/berms.

6.11.13 Trail Thirteen

TRAIL 13

ELEVATION PROFILE

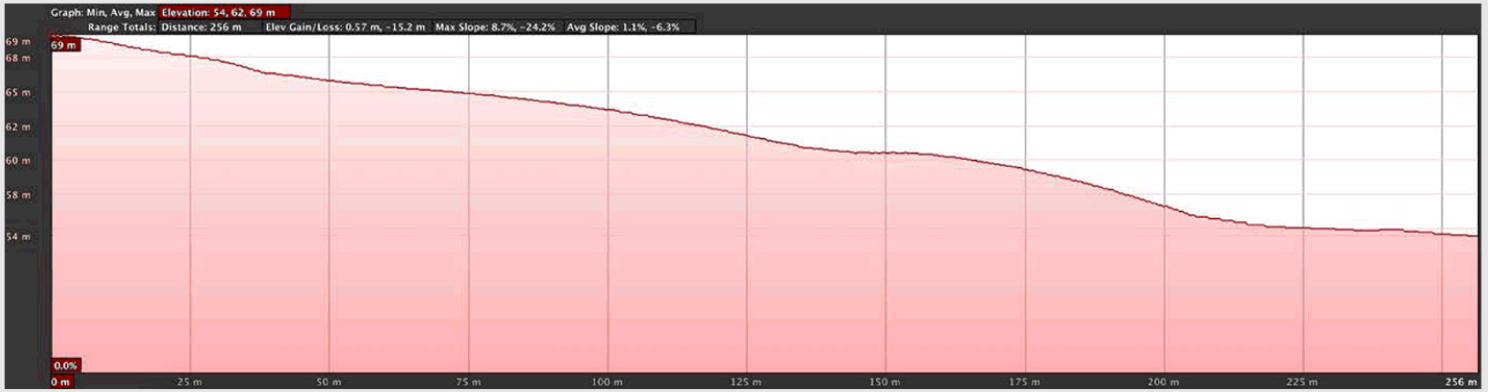


TRAIL DISTANCE (M)	340m
TDRS (IMBA)	Black Diamond
TRAIL STYLE	Freeride
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Advanced descent located on the upper central zone that follows a mellow gradient and incorporates a number of manmade features such as jumps/berms.

6.11.14 Trail Fourteen

TRAIL 14

ELEVATION PROFILE



TRAIL DISTANCE (M)	285m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Freeride
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Intermediate descent located on the upper central zone that follows a mellow gradient and incorporates a number of manmade features such as jumps/berms.

6.11.15 Trail Fifteen

TRAIL 15

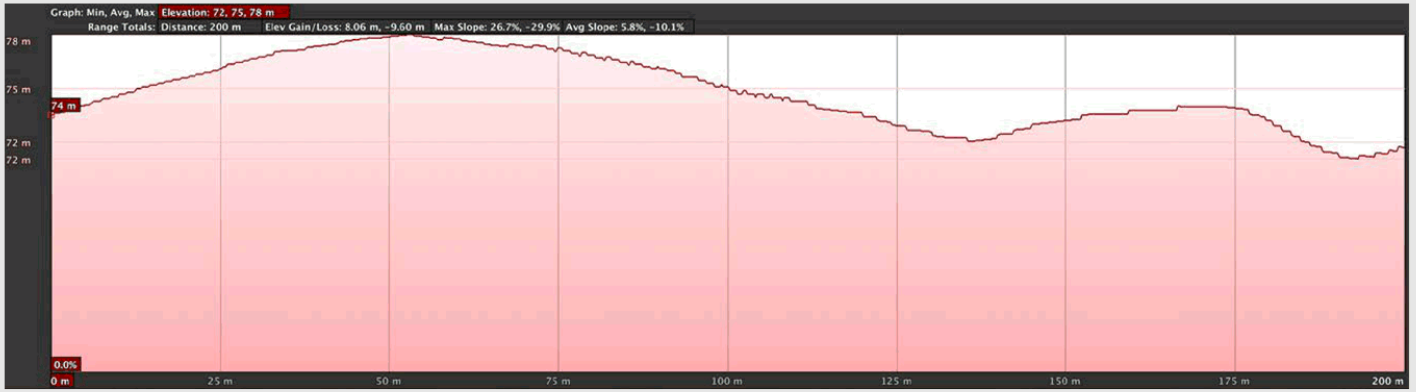
ELEVATION PROFILE

TRAIL DISTANCE (M)	468m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Freeride
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	Intermediate descent located on the upper central zone that follows a mellow gradient and incorporates a number of manmade features such as jumps/berms.

6.11.16 Walking Trail W4

WALKING TRAIL W4

ELEVATION PROFILE



TRAIL DISTANCE (M)	200m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	W4 provides a north / south connection and extended walking loop option when linked into the central trail network.

6.11.17 Walking Trail W5

WALKING TRAIL W5

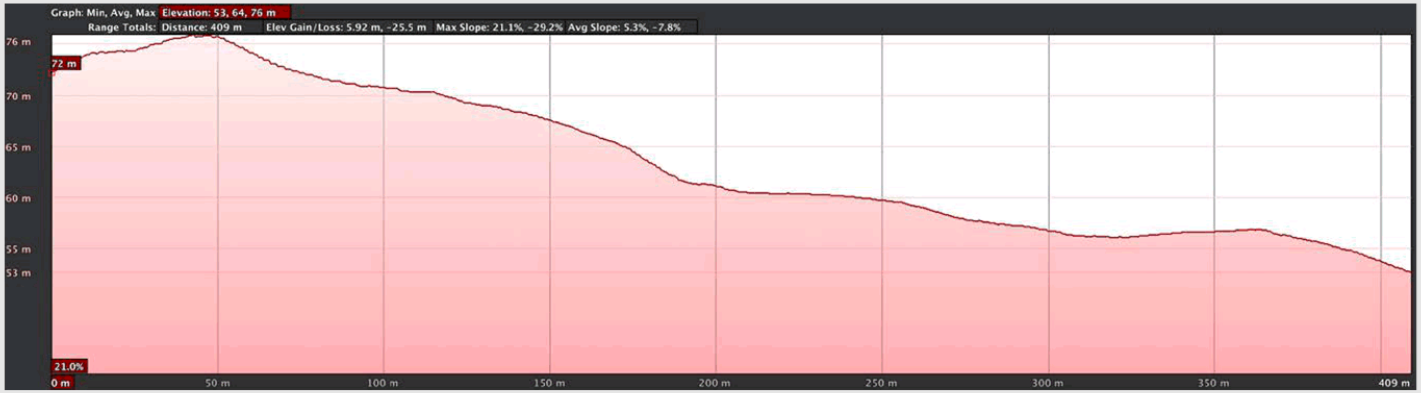
ELEVATION PROFILE

TRAIL DISTANCE (M)	279m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	W5 links W4 with the lower trail loop that already existing in Cringila Community Park. The trail alignment runs alongside the proposed Trail 15.

6.11.18 Walking Trail W6

WALKING TRAIL W6

ELEVATION PROFILE



TRAIL DISTANCE (M)	457m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	W6 forms an upper walking loop with W5 and can be used as a natural extension of the existing Cringila Community Park loop.

6.11.19 Walking Trail W7

WALKING TRAIL W7

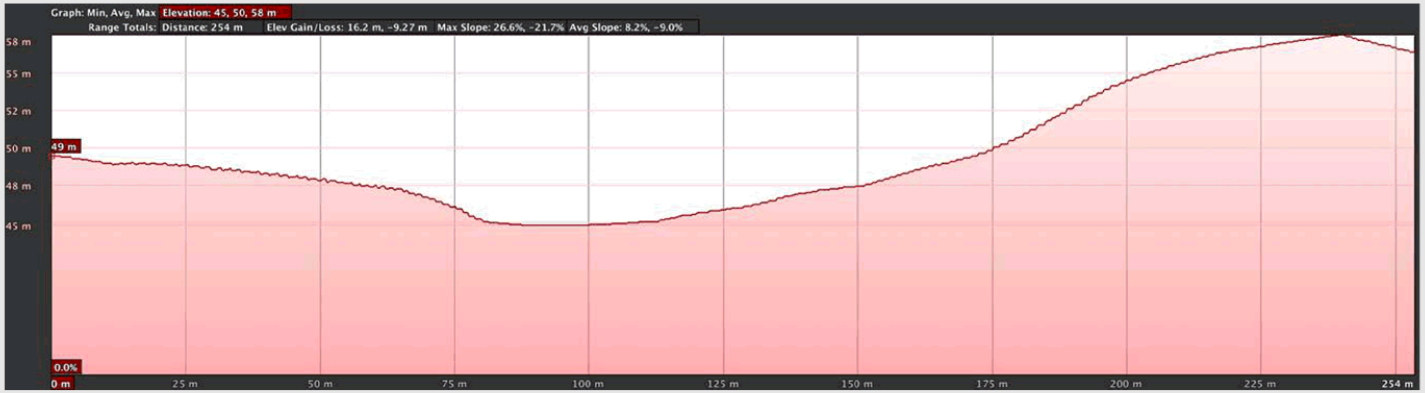
ELEVATION PROFILE

TRAIL DISTANCE (M)	200m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	W7 seeks to formalise an existing pedestrian connection to Shearwater Drive.

6.11.20 Walking Trail W8

WALKING TRAIL W8

ELEVATION PROFILE



TRAIL DISTANCE (M)	271m
TDRS (IMBA)	N/A
TRAIL STYLE	Walking Trail
FORMAT / DIRECTION	Two-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	W8 seeks to formalise an existing pedestrian connection to Shearwater Drive.

6.12 WESTERN TRAIL ZONE

6.12.1 Overview

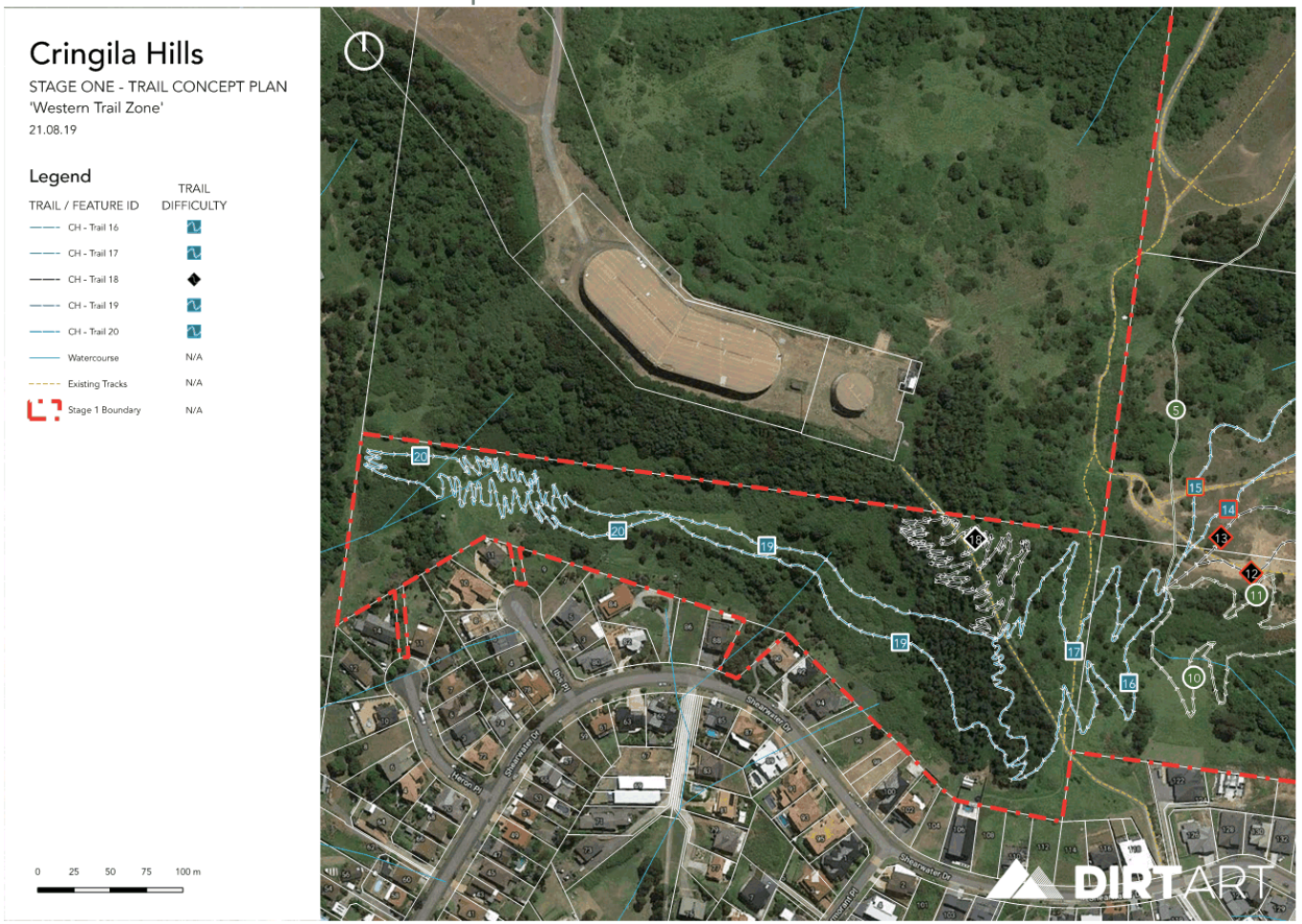
The western trail zone has some of the steepest terrain on the site and the undulating topography combined with the narrow land parcel makes it conducive to an out and back riding loop – that is, Trails 19 and 12. The highest point of the project site is also located in the western trail zone and sits directly under the Sydney Water reservoirs, which currently visually dominate the landscape. An all-mountain loop is proposed to take riders to this highpoint, before descending back down to the trail junction of Trail 19 (extended western loop) and Trail 17 (descent back to the central trail zone).

6.12.2 Access

There is no vehicular accessible entry point proposed for the western trail zone other than those for the purposes of emergency services access (Ibis Place / Shearwater Drive). Instead, the zone is accessible via Trail 16 and Trail 17, which bring riders to and from the area respectively. The trails in this zone are designed to be more challenging, both in terms of trail difficulty (intermediate to advanced) and physical fitness (steeper/sustained climbing). Thus, the location of the western trail zone is specifically made as pedal-access only to ensure riders who arrive at this outer network are adequately prepared; having already been filtered through less demanding trails to get there.

Trails 19 and 20 are particularly suited to cross-country racing with an out and back loop through naturally undulating and challenging terrain.

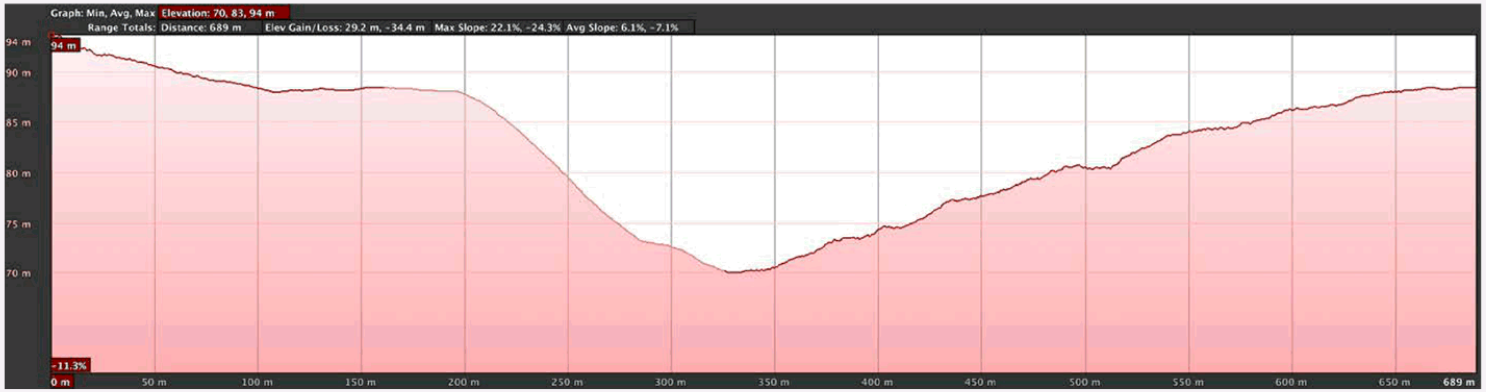
6.12.3 Western Zone – Trail Map



6.12.4 Trail 16

TRAIL 16

ELEVATION PROFILE



TRAIL DISTANCE (M)	456m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Climb / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	An intermediate climbing trail that brings riders out to the western trail zone.

6.12.5 Trail 17

TRAIL 17

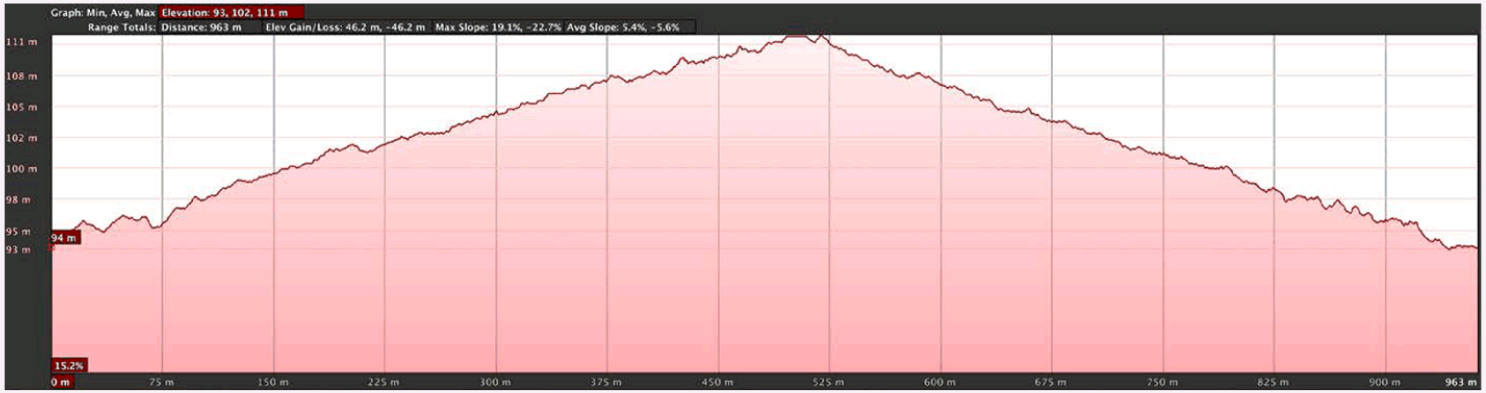
ELEVATION PROFILE

TRAIL DISTANCE (M)	842m
TDRS (IMBA)	Blue Square
TRAIL STYLE	All Mountain
FORMAT / DIRECTION	Descent / One-Way
CONSTRUCTION TYPE	Machine / Hand-Build
DESCRIPTION	An intermediate descending trail that brings riders back to the central trail zone.

6.12.6 Trail 18

TRAIL 18

ELEVATION PROFILE



TRAIL DISTANCE (M)	1102m
TDRS (IMBA)	Black Diamond
TRAIL STYLE	All Mountain
FORMAT / DIRECTION	Loop / One-Way
CONSTRUCTION TYPE	Machine / Hand-Build
DESCRIPTION	An advanced all-mountain trail with a more technical focus and generally narrower trail tread. The trail climbs to the highest point in the park, before descending down to the start of trail 17.

6.12.7 Trail 19

TRAIL 19

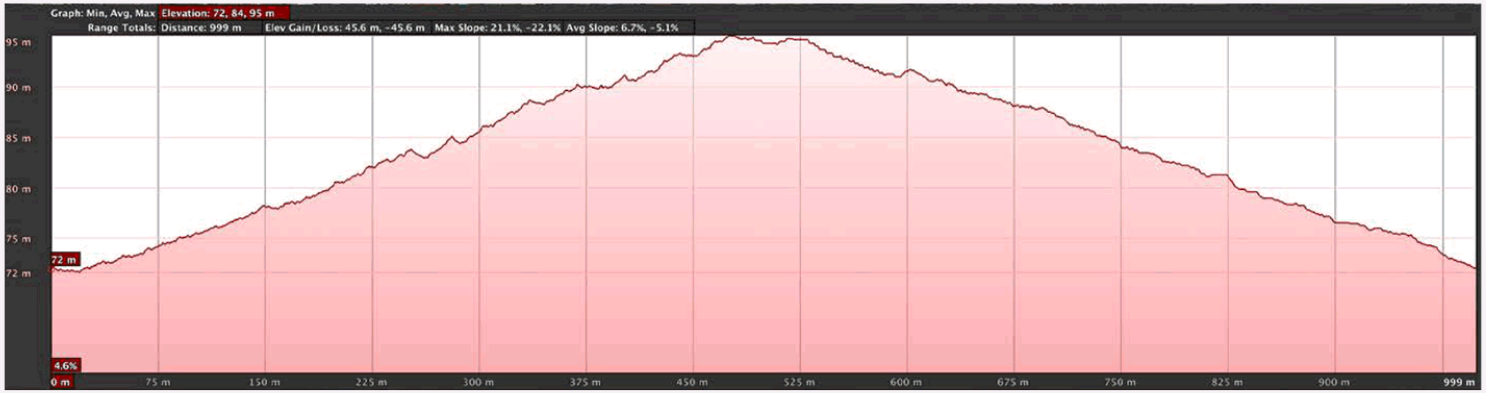
ELEVATION PROFILE

TRAIL DISTANCE (M)	848m
TDRS (IMBA)	Blue Square
TRAIL STYLE	Cross-Country
FORMAT / DIRECTION	Loop / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	An intermediate cross-country trail that takes riders out to trail 20 and provides riders with a longer duration riding option.

6.12.8 Trail 20

TRAIL 20

ELEVATION PROFILE



TRAIL DISTANCE (M)	1097m
TDRS (IMBA)	Blue Square
TRAIL STYLE	All Mountain
FORMAT / DIRECTION	Loop / One-Way
CONSTRUCTION TYPE	Machine
DESCRIPTION	An intermediate all-mountain loop that represents the most western point in the park. When used in conjunction with trail 19, the trail provides one of the longest rides in the park.

IMPLEMENTATION PLAN

7 IMPLEMENTATION PLAN

7.1 OVERVIEW

The proposed implementation plan provides a suggested approach for delivering the various aspects of the trail development proposed in this mountain bike concept plan. While not intended to be prescriptive in its nature, the prioritised order provided has been carefully developed to allow for optimal progression through the development process in a logical, cost-effective fashion.

Dirt Art suggests a staged approach, which commences design and construction of the northern trailhead as the priority to ensure this becomes the park's primary access point. Trails 1, 2, and 3 are proposed to be built first in conjunction with the pump track and mountain bike skills park. In addition to this, proposed walking trails W1, W2, and W3 are recommended to be implemented into this stage along with the Shared Path connection to the existing Cringila Community Park walking loop. The first stage will have a heavy focus on providing trails and facilities that target beginner riders as well as a popular intermediate freeride/jumps trail.

Stage 2 implements the bulk of the new trails in the southern area of the site with a secondary access point via the Cringila Community Park. It seeks to bolster the offerings of the bike park by establishing a range of different descending trails and extended riding options. An extended walking loop is proposed to supplement the existing Cringila Community Park loop and link into the proposed walking trails in Stage 1.

The last stage of the development, Stage 3, focuses on the western sector of the site and providing intermediate to advanced riding opportunities. These trails seek to provide riders with extended riding loops over more challenging and undulating terrain.

7.2 APPROVALS COST ESTIMATES

Cost of approvals can vary significantly from project to project, though *Dirt Art* typically recommends a budget of approximately 5% of construction capital expenditure, though notably this figure does not include internal or external project management time required to prepare and administer the approvals process.

The cost for sourcing approvals includes satisfying council approval process, as well as approvals from other relevant agencies. The budgeted costs are inclusive of external consultancy around areas such as environmental and cultural assessments.

7.3 TRAIL DESIGN AND CONSTRUCTION COST ESTIMATES

The cost estimates provided represent current upper-end market rates for all services, materials and equipment listed. The information contained in this section of the report has been based around *Dirt Art's* experience in development and operational plans for a range of large-scale mountain bike facilities around Australia. The information should not be considered financial advice and is provided for indicative purposes only. Exact planning and development costs can only be ascertained through a formal quotation process with relevant providers. The rates for trail construction provided represent upper-end market rates and do not necessarily represent the rates that may be provided through a formal construction quotation from *Dirt Art.*

7.4 STAGE ONE – NORTHERN TRAIL ZONE

7.4.1 Trail Design and Approvals

Item / Description	Type	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
Trail Design	Design	3316	$1.00	$ 3,316.00
Approvals (5% of Design & Construction Cost)	Approvals	N/A	N/A	$ 21,766.30
			TOTAL =	**$ 25,082.30**

7.4.2 Trail Construction

Trail No.	Trail Style	Trail Difficulty	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
1	XC	Green Circle	511	$35.00	$ 17,885.00
2	Freeride	Blue Square	535	$50.00	$ 26,750.00
3	XC	Green Circle	539	$35.00	$ 18,865.00
W1	Walking	N/A	468	$50.00	$ 23,400.00
W2	Walking	N/A	451	$10.00	$ 4,510.00
W3	Walking	N/A	291	$50.00	$ 14,550.00
Shared Path		N/A	521	$50.00	$ 26,050.00
Pump Track		N/A	N/A	N/A	$ 200,000.00
Skills Park		N/A	N/A	N/A	$ 100,000.00
				TOTAL =	**$ 432,010.00**

7.4.3 Ancillaries

Item / Description	Type	Rate ($/Lm)	Total Cost (ex. GST)
Trail Signage (2.5% Construction)	Signage	N/A	$ 10,800.25
Marketing (2.5% Construction)	Marketing	N/A	$ 10,800.25
Landscaping (5% Construction)	Landscaping	N/A	$ 21,600.50
		TOTAL =	**$ 43,201.00**

7.4.4 Total Stage 1 Development Cost

Item / Description	Total Cost (ex. GST)
Total Design and Approvals Cost	$ 25,082.30
Total Construction Cost	$ 432,010.00
Total Ancillaries Cost	$ 43,201.00
TOTAL STAGE 1 DEVELOPMENT COST =	**$ 500,293.30**

7.5 STAGE TWO – CENTRAL TRAIL ZONE

7.5.1 Design and approvals

Item / Description	Type	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
Trail Design	Design	7032	$1.00	$ 7,032.00
Approvals (5% of Design & Construction Cost)	Approvals	N/A	N/A	$ 15,378.35
			TOTAL =	**$ 22,410.35**

7.5.2 Trail Construction

Trail No.	Trail Style	Trail Difficulty	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
5	Link	Green Circle	667	$ 30.00	$ 20,010.00
6	Freeride	Blue Square	643	$ 50.00	$ 32,150.00
7	Flow	Blue Square	474	$ 50.00	$ 23,700.00
8	XC	Green Circle	589	$ 35.00	$ 20,615.00
9	XC	Green Circle	1169	$ 35.00	$ 40,915.00
10	XC	Green Circle	420	$ 35.00	$ 14,700.00
11	XC	Green Circle	337	$ 35.00	$ 11,795.00
12	Freeride	Black Diamond	233	$ 50.00	$ 11,650.00
13	Freeride	Black Diamond	340	$ 50.00	$ 17,000.00
14	Freeride	Blue Square	285	$ 50.00	$ 14,250.00
15	Freeride	Blue Square	468	$ 50.00	$ 23,400.00
W4	Walking	N/A	200	$ 50.00	$ 10,000.00
W5	Walking	N/A	279	$ 50.00	$ 13,950.00
W6	Walking	N/A	457	$ 50.00	$ 22,850.00
W7	Walking	N/A	200	$ 50.00	$ 10,000.00
W8	Walking	N/A	271	$ 50.00	$ 13,550.00
				TOTAL =	**$ 300,535.00**

7.5.3 Ancillaries

Item / Description	Type	Rate ($/Lm)	Total Cost (ex. GST)
Trail Signage (2.5% Construction)	Signage	N/A	$ 7,513.38
Marketing (2.5% Construction)	Marketing	N/A	$ 7,513.38
Landscaping (5% Construction)	Landscaping	N/A	$ 15,026.75
		TOTAL =	**$ 30,053.50**

7.5.4 Total Stage 2 Development Cost

Item / Description	Total Cost (ex. GST)
Total Design and Approvals Cost	$ 22,410.35
Total Construction Cost	$ 300,535.00
Total Ancillaries Cost	$ 30,053.50
TOTAL STAGE 2 DEVELOPMENT COST =	**$ 352,998.85**

7.6 STAGE THREE – WESTERN TRAIL ZONE

7.6.1 Trail Design and Approvals

Item / Description	Type	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
Trail Design	Design	3886	$1.00	$ 3,886.00
Approvals (5% of Design & Construction Cost)	Approvals	N/A	N/A	$ 7,821.30
			TOTAL =	**$ 11,707.30**

7.6.2 Trail Construction

Trail No.	Trail Style	Trail Difficulty	Trail Length (m)	Rate ($/Lm)	Total Cost (ex. GST)
16	XC	Blue Square	566	$ 35.00	$ 19,810.00
17	All Mountain	Blue Square	456	$ 35.00	$ 15,960.00
18	All Mountain	Black Diamond	1102	$ 50.00	$ 55,100.00
19	XC	Blue Square	665	$ 35.00	$ 23,275.00
20	All Mountain	Blue Square	1097	$ 35.00	$ 38,395.00
				TOTAL =	**$ 152,540.00**

7.6.3 Ancillaries

Item / Description	Type	Rate ($/Lm)	Total Cost (ex. GST)
Trail Signage (2.5% Construction)	Signage	N/A	$ 3,813.50
Marketing (2.5% Construction)	Marketing	N/A	$ 3,813.50
Landscaping (5% Construction)	Landscaping	N/A	$ 7,627.00
		TOTAL =	**$ 15,254.00**

7.6.4 Total Stage 3 Development Cost

Item / Description	Total Cost (ex. GST)
Total Design and Approvals Cost	$ 11,707.30
Total Construction Cost	$ 152,540.00
Total Ancillaries Cost	$ 15,254.00
TOTAL STAGE 3 DEVELOPMENT COST =	**$ 179,501.30**

7.7 TOTAL DEVELOPMENT COST

Stage / Trail Zone	Total Cost (ex. GST)
Stage 1 – Northern Trail Zone	$ 500,293.30
Stage 2 – Central Trail Zone	$ 352,998.85
Stage 3 – Western Trail Zone	$ 179,501.30
TOTAL DEVELOPMENT COST =	**$1,032,793.45**


CONCEPT TO CONSTRUCTION

8 MOVING FROM CONCEPT TO CONSTRUCTION

8.1 OVERVIEW

Dirt Art suggest that all trail and facility elements described in this plan be constructed by a professional mountain bike trail company with significant experience in these specialised areas of development. Professional construction ensures all elements of the facility should meet relevant safety and sustainability standards, and that the trails will ultimately 'flow' well and will be enjoyable for users. While the designs provided for trail corridors in the plan provide the suggested optimum corridors for development, the final 'character' of the trail will be dictated by the construction team undertaking the trail build.

8.2 FINAL DESIGN

The new trail concepts provided in this concept plan constitute a broader high-level vision for the proposed development rather than detailed trail designs. These concept corridors have been established through limited on-ground exploration and desktop research. The proposed corridors have not been completely ground-truthed and as such a final design phase will be required prior to any trail development.

Cost estimates for final trail design have been included in the implementation plan section of this report.

8.3 MANAGEMENT STRUCTURE

Dirt Art suggests that Wollongong City Council utilises the services of a professional trail builder to maintain the trails and associated skills facilities. Regular trail maintenance will be essential to ensuring the longevity and safety of the public facility. Thus, a detailed maintenance plan should be created and implemented on a scheduled weekly/monthly basis.

8.4 PLANNING APPROVALS AND ASSESSMENTS

8.4.1 Overview

The planning and approvals process for this type of process is multi-faceted, and if not undertaken by those with significant relevant experience may be lengthy and costly. *Dirt Art* suggests that public and stakeholder consultation is a key component in the process and will often result in a more streamlined approvals process.

The below approvals do allow for some parallel processes, which can reduce the total approvals timeframe significantly. *Dirt Art* suggest that the likely approvals timeframe will be approximately 6+ months, with a shorter timeframe possible with streamlined processes and parallel works through the approvals process.

8.4.2 Required and potential approvals

The approval process for proposed trails will be dependent on their tenure. The following key processes will likely form components of the required approvals and assessments required prior to construction commencing;

- Council development application (DA)
- Environmental assessments

Dirt Art suggests that an EPBC federal referral is unlikely to be required, though this should be confirmed by a suitably qualified consultant.

8.5 TIMEFRAMES

8.5.1 Detailed trail design/construction plan development

Detailed design of the entire network would require approximately 20 days (4 weeks).

Compilation of a construction plan could be completed in approximately 2 weeks.

TOTAL TIME REQUIRED- 6 Weeks

8.5.2 Natural Values Assessment (NVA)

This stage in the process will vary greatly depending on the requirements for field time, which will be largely dictated by the level of environmental assessment required for the site(s).

Desktop assessment should be competed in 1-week and may require revisions to trail designs.

A window of 8 weeks should be allowed for field assessments and report preparation.

TOTAL TIME REQUIRED- 8 Weeks

8.5.3 EPBC referral (if required)

Dirt Art suggest that an Environmental Protection and Biodiversity Conservation referral should not be required for this project, though independent specialist advice should be sought for confirmation.

If required, an EPBC assessment process would vary depending on the nature of the referral (statutory maximum timeframes are not always relevant). *Dirt Art* estimates that if a referral is required, a resolution time of 20 weeks should be expected.

TOTAL TIME REQUIRED- 20 Weeks

8.5.4 Council Development Application

Dirt Art suggest a development application (DA) approval window greater than the statutory approvals timeframe. This extended timeframe allows for delays due to request for information (RFI) requests, and responses to negative representations.

Notably, the project has at the potential to receive a number of negative representations through the development application phase. There is potential that these representations may lead to an appeal in the event of an approved DA. In the event of a DA appeal, the timeframes suggested would no longer apply.

TOTAL TIME REQUIRED- 16 Weeks

8.5.5 Summary of timeframes

TASK / APPROVAL	TIME REQUIRED
Detailed Trail Design	6 weeks
Natural Values Assessment	8 weeks
EPBC Referral	N/A
Council DA	16 weeks
TOTAL =	30 weeks

Dirt Art suggests that with parallel works, the above could be completed within 6 months, potentially less with streamlined processes.

8.6 ENGAGING A SUITABLE CONSTRUCTION PROVIDER

Unlike a commercial or residential construction project, there is only so much design detail that can be given in a trail design process. The natural environment poses many unique challenges that will often dictate a change in trail alignment that could never have been anticipated during the design process. Buried bedrock, animal habitats and underground springs are all examples of factors that will force a change in trail alignment should they appear during construction. Additionally, the 'flow' of a trail that is critical to user enjoyment, and the trail drainage measures that are critical to sustainability typically require many adjustments during construction. For these reasons, it is essential that mountain bike trails and facilities are built by highly experienced, specialist construction companies, with significant experience building mountain bike trails.

The final character and style of a trail is entirely dictated by the construction team and particularly the machine operator involved in the construction process. A mountain bike trail has an absolute reliance on developing a riding 'flow', where braking is

minimised and the trail carries a rider along in a smooth, undulating fashion. Unlike a walking trail, which typically relies on a flat, even surface, a mountain bike trail is about creating a landscape. This again is an essential reason for engaging a suitable construction company to complete the project.

A suitable construction company will also hold appropriate public liability and professional indemnity insurance and have extensive experience in trail design and construction; important considerations in managing risk and liability. Unless a provider has mountain bike trail design and construction specifically noted in their insurance terms, there is a very high likelihood that their cover will be forfeited should an incident proceed to legal action.

A number of avenues are available for involving trainees, volunteers and/or retrained workers, but this should be as part of a professionally managed trail team.

8.7 CONSTRUCTION METHODS- PROFESSIONAL

8.7.1 Overview

Currently the majority of professionally built mountain bike trails are completed utilising machinery, in most cases a small excavator. A mini-excavator, if professionally driven is a fast, economical and ultimately optimal method of building most mountain bike trails. These machines allow for simple construction of a variety of trail features, rock walls, TTF's, rolling terrain, drainage, bermed corners and jumps, all features that consume significant time if hand built. Ultimately in most cases machinery allows for construction of a much more exciting, engaging and sustainable trail experience.

8.7.2 General Team Configurations

All excavation work should be followed with extensive hand finishing. *Dirt Art* typically compose project teams in the following make up;

Management Team

- (x1) Project Manager
- (x1) Office Support/logistics Team

Construction Team (1-2 teams)

- (x1) Machine Operator
- (x2) Trail Crew/Finishing Team

Typically, projects are conducted with more than one machine operator, in most cases utilising two finishing/trail crew members behind each piece of machinery.

8.8 CONSTRUCTION METHODS- VOLUNTEER

8.8.1 Overview

Given the bike park style of the project, *Dirt Art* suggests that the construction work is undertaken professionally. There may be limited scope to involve volunteers in some aspects of the construction process. However, this will likely be focused on training local volunteers to undertake a regular trail maintenance program.

8.8.2 Recommendations for managing volunteers during trail maintenance

Dirt Art suggests that the following management principles are enacted;

- All volunteers to undergo a formal trail maintenance training program
- All volunteers to agree to follow a basic set of workplace health and safety (WHS) guidelines, and to operate under an agreed safe work method statement/s (SWMS) for all construction activity in the area
- Volunteers to work on agreed, professionally designed projects only
- Trail construction to follow agreed standards, based upon the IMBA trail construction guidelines
- All volunteer projects to be regularly assessed during construction to ensure compliance (assessment by third party and/or land management agencies)
- All completed volunteer projects to be formally assessed and signed off prior to opening for public use (assessment by third party and/or land management agencies).

While the above management principles may represent a culture change in current practices, they ensure that ultimately the area will benefit from safe, well-organised and sustainable trail network. There remains significant scope within this management model for individuals and groups to develop their own 'style' of trail and to work independently while doing so.

The notion of a diverse style of volunteer developed trails is very valuable, but it must occur in an organised and sustainable fashion to ensure user safety and ongoing trail sustainability.

8.9 CONSTRUCTION CONSIDERATIONS

8.9.1 Seasonal construction considerations

Dirt Art suggest that sustainable trail construction should be possible in the bike park year-round, with optimal construction seasons being spring and autumn.

8.9.2 Watercourses / Wet Areas

Several active and non-active watercourses were identified during the design process. Trails concepts have been designed to minimize the number of crossings necessary and the proposed corridors have allowed some flexibility to re-route alignments on the ground as required during the detailed design / ground-truthing stage. Notwithstanding, during the detailed design stage, it will be important to identify the specific crossing points and implement the most effective treatment type for each site. More often than not, a crossing may be avoided through a simple realignment of the trail to avoid the low-lying area or gully.
When a crossing is deemed necessary, the following treatment types may be employed (listed in order of their preference):

1. Rock-paved crossing
    - Rideable Surface:
        - Local onsite rock
        - Imported rock
    - Structure:
        - Rock
2. Raised boardwalk / platform
    - Rideable Surface:
        - Fibre-reinforced Plastic (FRP)

        - Timber
        - Steel Mesh
    - Structure:
        - Timber
        - Steel
        - Plastic
3. Bridge
    - Rideable Surface:
        - Fibre-reinforced Plastic (FRP)
        - Timber
        - Steel Mesh
    - Structure:
        - Timber
        - Steel
        - Plastic

8.9.2.1 Example Images

Example – Paved drainage culvert

Example – FRP / Steel raised platform

Example – FRP / Steel bridge over watercourse

8.9.2.2 Potential Watercourse Crossings

8.10 OTHER CONSIDERATIONS

8.10.1 Trail Safety / Filters

The proposed network of mountain bike and walking trails have been designed to optimize the potential of the given site and naturally undulating terrain. The network has been configured in a 'stacked loop' configuration to promote a natural filter for trail users. As the trails travel further away from the main trailheads, the difficulty and physicality of the trails increase accordingly. Of note, the western trail zone contains the park's most isolated trails as well as most physically demanding given the steeper/undulating terrain akin to this sector of the site.

8.10.2 Emergency Access Points

The following preliminary emergency access points have been identified for the site with their relative levels of accessibility noted below:

			EMERGENCY ACCESS TYPE	
ID	TRAIL ZONE	ACCESS STREET / ROAD	VEHICLE	PEDESTRIAN
E1	WESTERN	Heron Place	Limited – End of cul-de-sac	Limited – No existing track
E2	WESTERN	Ibis Place	Limited – End of cul-de-sac	Limited – No existing track
E3	WESTERN	Shearwater Drive	Limited – Proposed track	Yes – Proposed track
E4	CENTRAL	Shearwater Drive	Yes	Yes
E5	CENTRAL	Lockwood Street	Yes	Yes
E6	NORTHERN	Lackawanna Street	Yes	Yes
E7	NORTHERN	Jarvie Road	Yes	Yes

8.10.3 Emergency Access Map

8.11 MARKETING

Dirt Art suggest a marketing budget of 2.5% of construction capital expenditure in year one, and an annual expenditure of 0.5% of capital expenditure every year for a minimum of five years thereafter.

Effective marketing is absolutely critical to the success of any mountain bike destination. While word-of-mouth has traditionally been the most commonly utilised approach for promoting trails, this approach in isolation is no longer adequate for promoting nationally significant destinations. *Dirt Art* suggest a multi-faceted marketing approach, which includes;

- Destination digital media marketing: Utilisation of providers such as Flow Mountain Bike to undertake digital destination marketing. The creation of high-quality content during these visits can be recycled throughout ongoing marketing campaigns.
- Social media: Social media is an excellent platform for targeting the broadest section of the mountain bike market. Key platforms are Facebook and Instagram, followed by Snapchat and Twitter. *Dirt Art* suggest creating and utilising platforms during the construction process, which allows for a greater potential to build an audience, while also bringing followers 'along for the ride' during construction. A focus should be made on delivering high-quality, regular content, and where possible frequently engaging with the audience.
- Merchandise: Quality merchandise is an excellent way for visitors to contribute revenue back to the trails, but more importantly act as advocates for the destination upon their departure.
- Events: Events are a powerful marketing tool, which can have a profound impact on elevating the profile of a destination.

Dirt Art recommend developing a formal marketing plan for the project, ensuring that the project will be at the centre of riders' decision making when they plan their next holiday.


CONCLUSION

9 CONCLUSION

The Cringila Hills Bike Park project offers strong potential to add to Wollongong's growing network of mountain bike experiences, providing a new and exciting public facility that would provide recreational riding opportunities for a diverse market. Currently, the Illawarra Escarpment contains the majority of informal trail riding offerings in the region. However, as often is the case, these user and enthusiast-built trails cater for the upper echelon of advanced riders, which is in part due to the steeper terrain found along the Escarpment. Thus, an opportunity exists to provide a formalised network of trails on a unique piece of land that is currently underutilised.

The concept design for the Cringila Hill utilises existing access points and amenities and provides a series of trail offerings to activate and redefine the site. A total of twenty trails are proposed in the park with the addition of a mountain bike skills park and adjoining pump track. The northern entrance to the site via Lackawanna Street and represents the primary trailhead in conjunction with the proposed carpark and adjoining facilities. This sector is home to the skills park and pump track area; there is a specific focus on beginner and family friendly riding options here. A central trail zone is located to the southern portion of the site, which houses the greatest density of trails in the proposal and targets beginner to intermediate riders with options for a multitude of shorter or longer rides. A secondary access point utilises the existing Cringila Community Park as pedal-access for local riders. Lastly, the western trail zone offers a series of more challenging trails with steeper and more undulating terrain to test riders' skill and fitness.

All three trail zones target specific user groups and offer a variety of trail styles and difficulties to suit a range of riders. A 'stacked loop' configuration encourages creativity and diversity by allowing riders to choose multiple descents, which are generally linked with a universal climbing trail. Two linking trails, Trails 4 and 5, act as north-south connectors and create options to shorten, lengthen, or repeat certain sections of trail.

The proposed peri-urban bike park would be an immensely popular facility given its proximity to an established contingent of mountain bikers (as evidenced in the extensive network of informal trails in the region) as well as the broader community and

densely populated suburb of Cringila. Furthermore, the project is sited directly adjacent to Cringila Public School with two high schools located nearby: Warrawong High School and Illawarra Sports High School. The area is well-serviced with local shops and a nearby railway station. The bike park presents a fantastic opportunity to transform an underutilised parcel of land into a community asset.

The Cringila Hill Bike Park proposes development of 11.5km of quality mountain bike trails and 3.1km of walking trails, which capitalise on the natural assets of the site to create a unique peri-urban mountain bike facility to cater for a range of rider styles and abilities.

10 APPENDIX TWO- MOUNTAIN BIKING MARKET SEGMENTS AND RIDING STYLES

10.1 OVERVIEW

The mountain bike market is divided into various groups of riding activity, with bicycles themselves developed to meet the needs of these market sectors. While the below outlines the main categories of mountain bike activity, it must be acknowledged that this is by no means an exhaustive list. In recent years, there has also been significant advancements in bicycle technology, which is resulting in many riders choosing one bicycle to engage in multiple styles of riding. This market sector is broadly referred to as all mountain riding, and typically involved a dual suspension bicycle with 5-7 inches of front and rear suspension travel.

10.2 ENDURO AND ALL MOUNTAIN

Enduro and all mountain is the largest and fastest growing category of riders in the industry, making up approximately 60% of all riders. This style of riding typically involves longer travel dual suspension bikes, which have a gravity focus, but are also capable climbers. Generally speaking, this style of riding involves less focus on climbing, and more focus on descending. Riders will either climb to the top of a trail or use a chairlift or vehicle uplift.

10.3 CROSS-COUNTRY AND TRAIL RIDING

Cross-country and is the second largest sector of the mountain bike market and is the mountain bike discipline included in the Olympic Games. This style of riding typically involves front suspension bikes or shorter travel dual suspension bikes. Cross-

country riding involves an equal focus on climbing and descending, with riders climbing to the top of any descents they encounter.

10.4 DOWNHILL

Downhill mountain biking typically refers to purely descending riding, where riders utilise a course of between 2-5 minutes in length. This market segment typically involves more robust bicycles with greater suspension travel (8-10 inches front and rear). Downhill riders typically utilise a chairlift or vehicle shuttle to deliver them to the trail head, as downhill-specific bicycles are not designed for uphill riding.

Downhill mountain biking typically involves more challenging riding terrain and steeper trail gradients, though the emergence of all mountain riding has brought more downhill trail elements into every-day mountain biking.

10.5 DIRT JUMPING

Dirt jumping is widely considered as a market segment only populated by younger riders, and while these users may make up the dominant demographic in this style of riding there is a broad cross section of riders who engage in dirt jump riding.

Dirt jumping involved a point-to-point or loop course typically populated by a variety of jumps, rollers and bermed corners. Users aim to gain maximum airtime while riding as smoothly as possible. More advanced dirt jump riders complete many different aerial manoeuvres including 360's, back flips and front flips.

Dirt jumping has a direct crossover with BMX riding, with both user groups utilising the same facility type.

10.6 PUMP TRACKS

Pump track riding is a relatively new though fast-growing style of mountain biking, which involves a small, low lying track populated with a variety of rollers and bermed corners. The aim is to 'pump' the bike through the track, gaining momentum without the need for pedalling. These simple, low maintenance facilities have a small footprint and relatively low development costs and are thus perfect for an urban and peri-urban facility setting.

10.7 HEAD-TO-HEAD

Head-to-head mountain biking is predominantly racing-focused discipline, which has seen a variety of different formats over the past ten years. The discipline began with a dual slalom format, whereby two riders raced each other down separate, parallel courses. This format was changed to four cross in 2004, which involved four riders racing down a single, wide course populated by a variety of natural terrain features, jumps and corners.

In 2012 the UCI (Union Cycliste Internationale)[6] removed four cross from its World Cup racing calendar, which resulted in many national federations removing the discipline from their race schedules. A decision has not yet been published regarding four cross racing either in Australia or on the world stage.

[6] The UCI is the international governing body responsible for all cycling disciplines

10.8 MOUNTAIN BIKE RACING FORMATS[7]

10.9 CROSS COUNTRY OLYMPIC (XCO)

XCO is the mountain bike discipline included in the Olympic Games and provides a diverse riding experience including climbing and descending. An XCO course must be between 4km and 6km in length, preferably using the venue in the form of a cloverleaf to provide optimum course contact with the race village. No more than 15% of the course may be on paved or sealed road.

10.10 CROSS COUNTRY ENDURO/TIMED FORMAT (XCEN)

A multi-lap cross country event based on a set time format of 1-24 hours in duration. Riders are judged on the number of laps they complete in the given time frame. Course length should be at least 5km, with a longer course required for larger competitor numbers.

10.11 CROSS COUNTRY POINT-TO-POINT (XCP)

A cross country format event utilising a point-to-point course of between 20-60km in length. Variations to course length may be allowed at the discretion of the Technical Delegate.

10.12 CROSS COUNTRY MARATHON (XCM)

XCM utilises a course of between 60km and 120km. The event can be run in the following formats; single loop, point-to-point, or over a maximum of three laps. In the event of a single lap format no part of the course may be covered twice. In the event of a multi-lap event short cuts for some classes are not permitted.

[7] Information from Mountain Bike Australia (MTBA) 2011 Technical Regulations. www.mtba.asn.au

10.13 CROSS COUNTRY SHORT COURSE (XCC)

XCC utilises a course of up to 800 metres in length, which should allow for passing opportunities throughout the entire course length. The course may have artificial features if they are safe and easily passable by the majority of riders.

10.14 CROSS COUNTRY ELIMINATOR (XCE)

XCE is a short course cross country racing format where riders contest a course up to 1km in length. Riders race in groups of four and are eliminated in a format similar to four cross racing. The course may include a range of natural and artificial obstacles. Qualification rounds will take place in a similar format to a 4X event.

10.15 SUPER D (SD)

A point-to-point event involving a predominantly descending course contested in a mass start, eliminator or time trial format. A Super D requires a course of at least 2.5km in length with multiple passing opportunities. The course length will often dictate the racing format utilised, with longer courses being more suitable for mass start racing.

10.16 GRAVITY ENDURO

Gravity enduro is the newest and fastest growing mountain bike event format, which is exponential growth across the world. The format involves a range of transition stages, with riders racing the descending section of trails. While descending in focus, race stages may include flat sections and short climbs. The format combines the fun and action of downhill with a reduced risk of crash/injury, and the fun of cross-country racing without the strenuous climbing.

10.17 DOWNHILL (DHI)

DHI is a point-to-point format race involving a course of between 1.5km and 3.5 km. Total race time should be between two and five minutes. The course must contain a maximum of 3% paved roads and will consist of a variety of different terrain types. There should be an emphasis on technical skills rather than pedalling.

10.18 FOUR CROSS (4X)

4X involves a descending course of between 30 and 60 seconds in length. The course should involve a variety of terrain including; jumps, banked turns, flat turns and natural terrain features. 4X is a competition that consists of qualifying round/s or timed qualifying, followed by a series of races (motos) where four riders share the one course. The first and second placed riders in each moto advance to the next round.