Moreland City Council

Westbreen Creek Conservation and Development Plan

FINAL

Prepared by

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Notes:

1. Analysis and evaluation of existing conditions/facilities/structures in the report are for the purpose of planning only and will require further detailed evaluation prior to implementation of recommended actions.
2. Due to the limited survey information available, site specific recommendations for works require further detailed investigation, survey, structural/hydraulic/traffic engineering where appropriate and detailed design prior to implementation.
3. All built works require structural and/or civil engineering design and certification to Australian Standards. All works with a hydraulic engineering component require design and documentation to ensure compliance with relevant Australian Standards.
4. Preliminary opinion of probable cost and implementation priorities are preliminary planning estimates only. The preliminary estimate has been prepared without detailed feature and level survey and is not a quantity survey. A further stage of design development will be required in order to finalise cost estimates.

REVISION	DATE	AMENDMENT
F	27/03/2019	Final for Council adoption April 2019
E	13/03/2019	Final Draft V5 incorporating Community Consultation feedback
D	12/12/2018	Revised Draft V4 incorporating updated Detail Plans Figure 9 and 13
C	30/11/2018	Revised Draft V3 incorporating Council Project Reference Group comments and updated Austin Crescent Reserve Playground and Wetland Concept
B	06/09/2018	Revised Draft V2 incorporating Council Project Reference Group comments
A	05/07/2018	Draft Report V1 for internal Council Project Reference Group comment

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APPENDICES

1. Introduction

1.1 Project scope

The Westbreen Creek Conservation and Development Plan has been prepared to identify, protect and enhance the environmental, cultural heritage and community open space values along the Westbreen Creek open space corridor. The study area extends from KW Joyce Reserve to the confluence with Moonee Ponds Creek in Pascoe Vale and includes, Gavin Park, Austin Crescent Reserve and Payne Reserve. The plan seeks to balance the role of the creek as a primary waterway biodiversity corridor with the need to maintain drainage and key service easement functionality whilst meeting the increasing needs of the local community for open space and recreational access. The draft plan has been developed by Moreland City Council in consultation with Melbourne Water. Following discussion and refinement of priorities and actions in consultation with key stakeholders and the local community the final plan will be used to guide strategic planning and management actions, capital works and implementation priorities over the next ten years along the creek and open space corridor.

1.2 Study Area

Westbreen Creek is a tributary of Moonee Ponds Creek. The creek originally flowed from Glenroy, west of the Northern Golf Course through the steep valleys of Pascoe Vale to join with the Moonee Ponds Creek just north of what is now the Tullamarine Freeway near Bell Street. Westbreen Creek was neglected for many years with sections used as a military landfill during the Second World War and afterwards a Council tip. As the surrounding area was developed for housing the flow and velocity of stormwater runoff in the lower section of the creek increased and the channel became badly eroded. An underground drain was installed by Melbourne Metropolitan Board of Works in the late 1970's and the natural sections of the creek were filled in as was the usual practice at this time. The northern section of the creek has also been modified by sewer and other works but has an open channel between Northumberland Road and Zenith Street including KW Joyce Reserve and the northern end of Gavin Park. This area has been enhanced by

areas of indigenous revegetation, walking /cycling trails and areas of adjoining open space provide significant environmental, open space and recreation highly valued by local residents.

1.3 Project Objectives

The following objectives have been identified in the project brief:

- Celebrate and enhance the natural bushland character of the corridor
- Strengthen the habitat corridor and connections with adjoining open space
- Protect and manage cultural heritage values
- Enhance social value and use through renewal of aging open space infrastructure and exploration of new opportunities including playgrounds, fencing and park facilities
- Facilitate pedestrian and cycling movement including improving connections with public transport and the wider transport network
- Investigate Water Sensitive Urban Design (WSUD) opportunities to treat and improve stormwater quality and waterway health
- Maintain serviceability and function of infrastructure assets, service and easements running through the reserve
- Implement design and development principles which consider the long-term sustainable management of the reserves and resource use for maintenance activities

1.4 Strategic Context

Moreland Open Space Strategy 2012-2022

Map 2 from the *Moreland Open Space Strategy* identifies the primary function type for the majority of the corridor as Conservation parkland except for Payne Reserve and HM Dowd Reserve (social/family) and the Northern Golf Course (sport).

Urban Forest Strategy 2017-2027

Moreland's *Urban Forest Strategy* aims to protect and enhance Moreland's natural assets on public and private land, including street trees, significant trees, areas of conservation value and habitat corridors. It seeks to turn around the decline in overall vegetation in Moreland with ambitious targets to double public realm canopy by 2030 through a range of greening operations. One of the key objectives as it relates to this plan is to create a diverse urban forest of trees and other vegetation that will enhance urban ecology.

Chain of Ponds – Moonee Ponds Creek

The Chain of Ponds plan is a high-level strategic plan prepared by Melbourne Water, Moreland and Moonee Valley City Councils for the Moonee Ponds Creek of which the Westbreen Creek is a tributary. It highlights the need to manage stormwater at a catchment level, retaining and treating it before it enters the Moonee Ponds Creek to reduce pressures on the Moonee Ponds Creek itself and particularly downstream where flooding is a significant issue.

Healthy Waterways Strategy 2013

Melbourne Water's Draft Healthy Waterways Strategy is intended for State Government, Melbourne Water, Parks Victoria, local government, the Environmental Protection Authority (EPA) Victoria, the Port Phillip and Westernport Catchment Management Authority, other regional agencies and authorities and management partners, developers, Traditional Owners, Aboriginal Victorians and landholders or community groups involved in waterway management or activities that may affect waterway condition.

Performance objectives for Moonee Ponds Creek catchment include maintaining high quality vegetation, providing a continuous riparian buffer along waterways, increasing community access and participation and investigate and mitigate threats to physical form (eg erosion).

Figure 1: *Site context*

1.5 Land Management

Public open space along the Westbreen Creek open space corridor including HM Dowd Reserve, KW Joyce Reserve, Gavin Park, Austin Crescent Reserve and Payne Reserve (Social/family recreation) is owned and managed by Moreland City Council. Through the southern piped section of Westbreen Creek, including low lying land along and above the large pipe between Northumberland Road and Moonee Ponds Creek is owned by Melbourne Water with land management by Council. Refer Figure 2.

Melbourne Water maintain the bed and banks of the open section of Westbreen Creek as well as the West Street Drain and Acacia Street Drains.

The Northern Golf Course (sport) is classified as Special Use Zone (SUZ1) and is managed by Northern Golf Club.

Westbreen Creek open space is zoned as Public Park and Recreation Zone (PPRZ). An Erosion Management Overlay (EMO) and a Special Building Overlay (SBO) extend throughout the open space corridor. A Heritage Overlay (HO) covers Gavin Park and KW Joyce Reserve. Refer Figure 3.

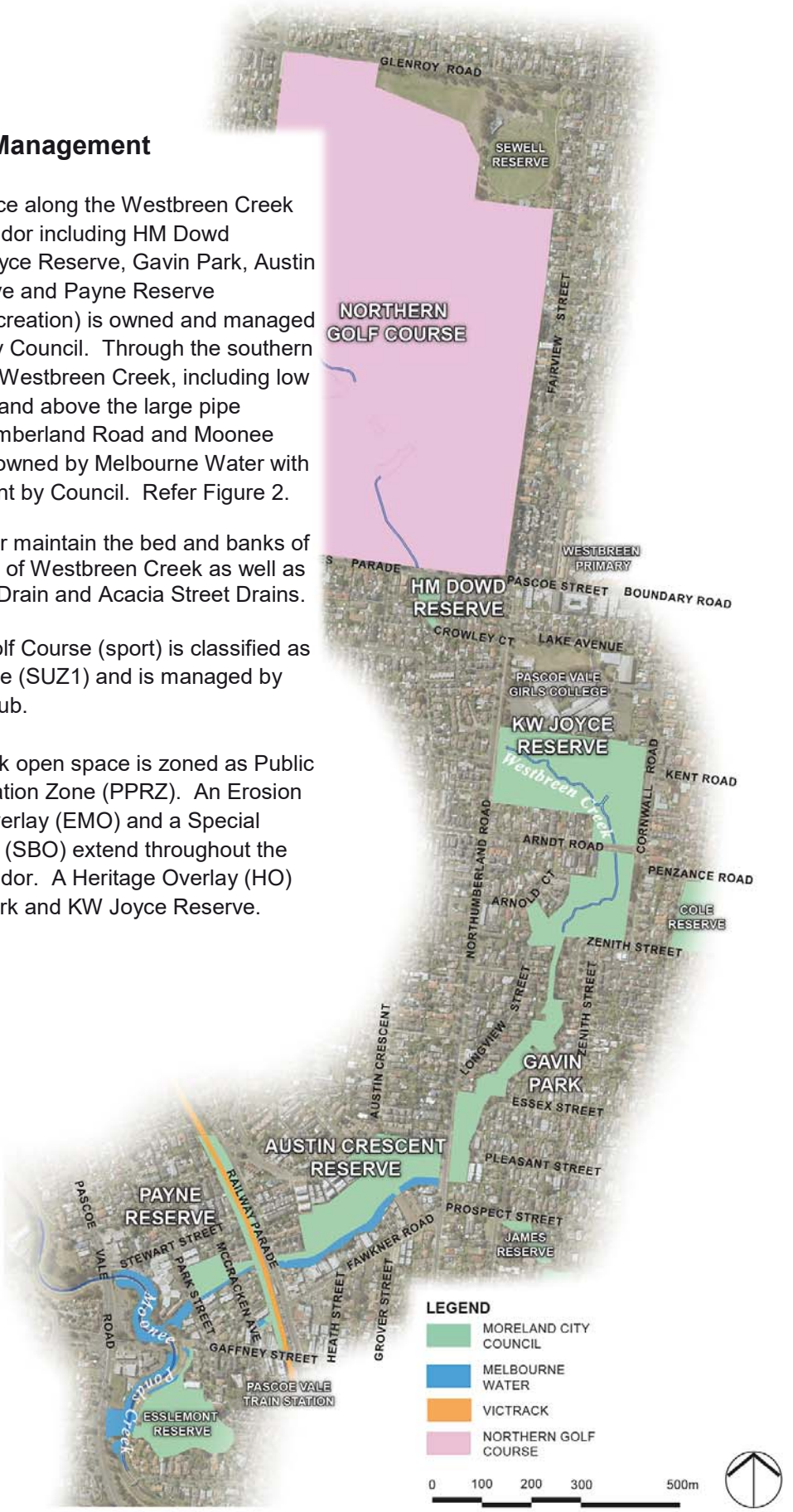


Figure 2. *Existing Land Ownership*

1.6 Community Consultation

Initial consultation with key stakeholders including Melbourne Water, the Northern Golf Course, Pascoe vale Girls College and Friends of Moonee Ponds Creek was completed from May to December 2018.

Broader community consultation on the Westbreen Creek Conservation and Development plan was during December 2018 and January 2019.

There were 37 responses to the online 'Have Your Say' survey and a total of 37 people attended the community information sessions held:

- Saturday 19/01/2019 9:30 - 11:30am
- Thursday 24/01/2019 4:00 - 6:00pm

Key themes arising from the consultation included:

Bins/Rubbish: respondents were concerned about the litter in the creek and park in particular the natural section of the creek north of Arndt Road.

Transport: respondents supported improvements to the pathworks and pedestrian crossing upgrades throughout Westbreen Creek and Moonee Ponds Creek and the closure of Penzance Road to improve open space links to Cole Reserve.

Signage: respondents saw opportunity for interpretative signage about the history of the creek and park.

KW Joyce Reserve: respondents supported the engagement with Pascoe Vale Girls College to improve the park interface and the opportunity to revegetate and tackle erosion at the former quarry site.

Dogs: respondents were concerned on the conflict between dogs/shared path users and playspace users, provision of drinking fountain with dog bowls as well as concerns about dogs entering the waterway and proposed wetland.

Car parks: respondents were concerned about after-hours hoon activities within the existing car parks.

Gavin Park: respondents supported the establishment of the wetland in Gavin Park.

Play Spaces: respondents emphasised the need to protect the vegetation in Austin Crescent Reserve during play space renewal and the importance of retaining the existing clown face swing to be relocated from Gavin Park.

Lighting and safety: respondents suggested improvements to lighting along the path between Railway Parade to Northumberland Rd and would like to see increased safety measures in car parks.

Importance of natural environment of the creek and wildlife: Respondents suggested the enhancement of the natural elements of the creek and restorations and improvements of wildlife habitat.

The suggestions and comments provided have informed the development of the conservation and development plan in this report. Refer to Appendix C for further detail on completed Community Consultation.

2. Existing Conditions

2.1 Cultural Heritage

2.1.1 Aboriginal Heritage

The traditional owners and Registered Aboriginal Party (RAP) for the northern suburbs of Melbourne including Westbreen Creek are the Wurundjeri Land and Compensation Cultural Heritage Council. There is limited information about cultural heritage along the creek and open space corridor. Historical land use including use of the area for landfill and establishment of roads, underground sewerage and drainage has significantly disturbed the natural waterway corridor.

The new *Aboriginal Heritage Regulations 2018* have re-included artificially manipulated channels and underground waterways, like Westbreen Creek to the new definition of a waterway adopted by Aboriginal Victoria. The Wurundjeri Land Council must be consulted on works which involve ground disturbance within areas of Cultural Sensitivity. Refer Figure 3.

2.1.2 Other Heritage

The Gavin Park and KW Joyce Reserve along Westbreen Creek have been identified as being of local historical significance. The overlay in the Moreland Planning Scheme HO81 indicates their significance is as a reminder of the extensive, nationwide public works program associated with the Bicentennial. In 1979 the Melbourne Metropolitan Board of Works agreed to underground the creek via a barrel drain due to the stench offset from the creek and the environs have since been landscaped as part of the Bicentenary program to develop a linear park to include recreational facilities and native vegetation.

Other local heritage areas include:

HO412 – Kent Road Uniting Church and Hall (38-46 Cornwall Road, Pascoe Vale)

HO413 – 24 Fawkner Street, Pascoe Vale, Moreland City. This house is of local historic significance.

2.1.3 Overall Cultural Heritage Recommendations

H1 Liaise with the Office of Aboriginal Affairs (OAAV) and the Wurundjeri to confirm the need for a Cultural Heritage Management Plan (CHMP) for future works that involve ground disturbance along Westbreen Creek.

- As part of developing the CHMP where possible include consideration of both proposed and future works to reduce costs and delays associated with assessment.
- Ensure project timelines take into account the additional time required to complete required cultural heritage assessment.
- Where possible retain flexibility in the siting of paths and other infrastructure to minimise impacts on cultural heritage values and archaeology where identified.
- Liaise with Wurundjeri to identify opportunities for interpretation of local cultural heritage values where appropriate.

H2 Protect the landscape values identified in Heritage Overlay (HO81).

Figure 3. *Areas of Cultural Sensitivity and Heritage*

2.2 Geology and geomorphology

2.2.1 Overview

Pascoe Vale is characterised by its undulating topography and steep slopes. Westbreen Creek runs north south along a continuous gully consisting of recent alluvial deposits of Quarternary gravels, silt, sand and extensive filled materials. The visible sections of open channel through KW Joyce Reserve have cut through tertiary sediments and weathered volcanics some of which are exposed in the creek bed. The natural creek morphology where still visible has however been extensively modified by historical earthworks including road crossings, underground drainage and sewerage construction.

Photo 1: Typical open channel through KW Joyce Reserve (2007)

Photo 2: Eroding fill embankment upstream West Street Drain (2007)

Photo 3: West Street Drain outfall (2007)

Photo 4: Upstream Arndt Road (2007)

The Westbreen Creek valley is covered by an Erosion Management Overlay (EMO) in the Moreland Planning Scheme. It includes the objective to protect areas prone to erosion, landslip or other land degradation processes, by minimising land disturbance and inappropriate development. This overlay outlines the requirements and conditions for new buildings, roadworks and vegetation works within the areas identified in the Erosion Management Overlay. Refer Figure 4.

Photo 5: Downstream Arndt Road (2007)

Photo 6: Gavin Park North sewer crossing (2007)

Figure 4. *Topography and Erosion Management Overlay*

2.2.2 Overall geology and geomorphology recommendations

G1 Ensure set back of new infrastructure including paths allow natural erosion/deposition processes to continue within the natural Westbreen Creek channel and flood plain where possible.

G2 Utilise soft engineering principles where possible to stabilise areas of erosion and threats to existing underground infrastructure such as sewer pipes and drain outlets.

G3 Ensure new development sites adopt best practice stormwater management practices.

G4 Moreland City Council to work with Melbourne Water and the Northern Golf Course to address potential drainage and water quality improvement opportunities.

2.3 Drainage and water quality

2.3.1 Overview

The Westbreen Creek catchment is predominantly residential. Upstream of Rhodes Parade the creek is contained within an open but highly modified channel through the Northern Golf Course fed by flows from Glenroy via the Melbourne Water Acacia Street Drain and Cardinal Street Drains.

South of the golf course the creek is again piped under Rhodes Parade through to Northumberland Road before outletting to the last open section of channel at KW Joyce Reserve. The Melbourne Water West Street drain runs through the eastern side of the Pascoe Vale Girls School and also connects into the creek and open channel at KW Joyce Reserve. Refer Figure 5.

Photo 7: Acacia Street drain outfall at KW Joyce Reserve

Photo 8: Arndt Road culvert

Recent works have been undertaken by Melbourne Water to mitigate flow velocities on the Acacia Street Drain to increase the volume of the pipes to take more water off the street into the waterway sections of Westbreen Creek at KW Joyce Reserve. Assessment by WaterTechnology 2016 indicates that in both the 5 year ARI and 100 year ARI velocities remain greater than 2m/s and are mostly contained within the open channel through KW Joyce Reserve and through the northern section of Gavin Park before entering the barrel drain at Zenith Street.

Velocities for overland flows are also greater than 2m/s on the steep bank adjoining Cornwall Road and the overland flowpath connection back to the creek immediately upstream and downstream of Arndt Road on the east bank.

Westbreen Creek between Zenith Street and the outfall to Moonee Ponds Creek is contained in an underground pipe ranging between 1950-2700mm diameter. The creek was piped by the Melbourne Metropolitan Board of Works (MMBW) in the late 1970's in

response to erosion issues in the natural channel caused by the expansion of housing development and hardening of the catchment leading to increased volume and velocity of stormwater runoff.

Figure 5. *Drainage*

Figure 6. *Flooding*

Photo 9: Westbreen Creek upstream of Zenith Street

Photo 10: Pipe inlet at Zenith Street

An assessment by Alluvium completed as part of this project (refer Appendix A) confirms that removing the pipe and restoring an open creek channel in the lower sections of Westbreen Creek is not possible. The volume of water, size/depth of the pipe and high flow velocity mean the open space corridor available is not wide enough to consider this approach.

When flows exceed capacity of the underground pipe stormwater is surcharged and flows overland through the open space corridor through Gavin Park, Austin Crescent Reserve and Payne Reserve. Through the narrow Gavin Park open space corridor there is incursion of flood flows into rear of properties along Zenith and Longview Streets and at the end of Essex and Pleasant Street. Refer Figure 6.

Photo 11: Narrow overland path in Gavin Park south of Zenith Street

Photo 12: Existing retarding basin east of Northumberland Road

The steep local topography through Pascoe Vale has resulted in Council typically allowing legal point of discharge for house roof and pavement stormwater runoff to be directed into the open space corridor.

Increasing urban density and the reduction in porous surfaces within adjoining residential areas is increasing these local discharge volumes after rainfall and in low lying areas paths and grass areas are becoming more difficult to manage.

Through Austin Crescent Reserve the high flow channel is broader but there is still incursion of flood flows to the rear of properties along Fawkner Road and at Railway Parade.

The railway embankment directs overland flows south to Gaffney Street and large areas east of the railway line through to Moonee Ponds Creek are subject to flooding in a major rainfall event. Refer Figure 6.

Photo 13: Overland flow path through Austin Crescent Reserve

Photo 14: Westbreen Creek outfall to Moonee Ponds Creek

There is a Gross Pollutant Trap (GPT) on the West Street Drain in KW Joyce Reserve but no other water quality treatment or stormwater harvesting assets within the Reserve.

Opportunities for retardation of flood flows, stormwater harvesting and water quality treatment are currently being considered by Melbourne Water within in Northern Golf Course. Further information on these works is not available at this time.

2.3.2 Drainage and water quality recommendations

The existing drain outfalls into Westbreen Creek present opportunities to install Water Sensitive Urban Design (WSUD) assets to treat and improve the quality of stormwater before it enters the pipe and connects to Moonee Ponds Creek and Port Phillip Bay. Other benefits include encouraging flood water detention to reduce downstream flood volumes and allow infiltration into the landscape, improved greening, urban cooling and soil health improvements for Westbreen Creek.

The current Melbourne Water Works on Acacia street main drain present opportunities to work with Melbourne Water and the Northern Golf Course to address the high velocities in the creek downstream and improve safety and creek stability.

The proposed new wetlands (WSUD) systems will also improve biodiversity and habitat values especially for the Growling Grass Frog, restoring areas of indigenous vegetation and instream aquatic and ephemeral habitats lost from both piped and modified open water channel areas.

The technical feasibility of constructing these assets is dependent on the available space within the open space corridor without the need for removal of significant indigenous trees, the location and depth of underground services and the existing topography and location of drainage assets and overland flow paths. The construction of wetland and bioretention systems will also improve biodiversity and habitat values.

An assessment based on this criteria identified four wetland WSUD opportunities for this section of Westbreen Creek:

Wetland 1

Located in Gavin Park (off Zenith Street) there is an opportunity to construct a wetland system to treat stormwater runoff from a 12.2 ha urbanised catchment located east of Cornwall Road. The wetland will divert stormwater from existing pits located on Cornwall Road near Penzance Road and will return treated stormwater to the creek near the pipe inlet at Zenith Street. There is an underground sewer located adjoining the proposed wetland area and a low bund (<0.5m high) will be needed to minimise excavation depth over the sewer.

Five existing trees will need to be removed with harvested logs reused to provide habitat within the new wetland. Refer Figures 10 and 11. Existing indigenous vegetation along the open creek section will be retained with a new unsealed walking path to be located on the east side of the new wetland as part of the works to improve access between Arndt Road, Penzance Road and Zenith Street. The new wetland will not impact on local flooding.

Wetland 2

Located in Gavin Park (below Arnold Court) there is an opportunity to construct a small bioretention basin to treat stormwater runoff from a 1.4 ha urbanised catchment located west of Arnold Court. The bioretention basin will divert stormwater from an existing pit below Cornwall Road and will return treated stormwater to the creek near the pipe inlet at Zenith Street. Refer Figure 12. Existing indigenous vegetation along the open creek section will be retained with a new graded walking path connection from Longview Street – Arnold Ct established using the construction access constructed to complete the works.

Wetland 3

Located in Gavin Park on the east side of Northumberland Road there is an opportunity to construct a large sediment basin and bioretention system to treat a 16.1ha catchment from the north and provide pre-treatment for a larger 63.6ha catchment connecting in from the south and east. A new gross pollutant trap GPT could also be installed in James Reserve at the corner of Prospect Street and Archibald Street. The northern sediment pond and bioretention system would be excavated on land currently occupied by the existing Gavin Park playspace. This playspace will be removed and incorporated into the proposed major upgrade at the adjoining Austin Crescent playspace. The existing concrete shared path will be removed and reconstructed around the new WSUD system. The existing picnic and BBQ area will be retained overlooking the new wetland. Refer Figure 15.

The existing grass retarding basin will be reset as a new sediment pond to be constructed within the existing depression. Existing path access through to Pleasant Street will be retained via a new low boardwalk constructed across the creek overland flow path and a minimum 4m wide maintenance access path will be retained along the adjoining fencelines around the new sediment pond. Several existing trees will be removed however the larger group close to Northumberland Road will be retained and new planting will be undertaken around the wetland. The new wetland will not impact on local flooding and the existing underground pipe will be retained. Refer Figure 14.

Wetland 4

Located in Austin Crescent Reserve there is an opportunity to utilise the existing broad shallow grass overland flow path channel running along the southern reserve boundary between Northumberland Road and Railway Parade to provide secondary treatment of flows discharging from the wetland 3 sediment pond. A new pipe is to be installed under Northumberland Road and through the unsealed car park to connect the new wetland 3 sediment pond to the grass overland flow path channel. The existing grass channel will be slightly modified to contain flows, retain maintenance access along the fence line and allow low indigenous planting and infiltration without impacting on existing flooding. The existing underground pipe will be retained. Refer Figure 16.

Vegetation and habitat protection associated with the proposed wetland works will be reviewed as part of detailed design and further consultation.

Refer to Appendix A for further information.

2.4 Underground services

There are existing underground sewerage and water assets through the study area. Where located within the Westbreen Creek floodplain pit levels are set above the 100 year Average Recurrence Interval (ARI) level to reduce potential for spills. This means some pits are visually exposed, however the steep topography and constraints within the open space corridor mean there are limited options for modification or removal of this intrusive infrastructure other than improved screening with vegetation.

Photo 15: Exposed sewer pit Gavin Park North

Photo 16: Exposed pit below Cornwall Road

2.5 Flora and Fauna

2.5.1 Flora

The Westbreen Creek is located in the Victorian Volcanic Plain Bioregion and forms part of the Port Phillip and Western Port Catchment Management Authority Area. Mapping of pre-1750 vegetation for the region indicates that the study area would have predominantly supported Creekline Grassy Woodland (EVC 68), Grassy Woodland (EVC 175) and Escarpment Shrubland (EVC 895), which are all listed as Endangered within the Victorian Volcanic Plain Bioregion (DSE 2012). Much of the vegetation was predominantly cleared for farming and later, urban development.

The Moreland Indigenous Vegetation Assessment (Moreland City Council and Merri Creek Management Committee 2011) was reviewed and mapping and recommendations have informed priorities for works along the creek and open space corridor. The existing vegetation condition in the study area was rated as highly modified with a predominantly indigenous overstorey and scattered remnant understorey layer. Much of the existing vegetation consists of planted trees and shrubs of indigenous and native origin, with an understorey dominated by introduced grass species. No threatened flora species have been recorded according to the Victorian Biodiversity Atlas. The assessment identified four large River Red-Gums *Eucalyptus camaldulensis* on the west bank of KW Joyce Reserve upstream of Arndt Road. These old indigenous trees are significant for their age, size, and habitat values and are the most significant trees in the open space corridor and must be protected.

The Moreland Indigenous Vegetation Assessment also identified the Northern Golf Course to contain highly significant remnant vegetation and habitat due to large amount of hollow bearing trees. There is currently no vegetation protection on the vegetation in the golf course.

Photo 17: Mature River Red Gums KW Joyce Reserve

Photo 18: Indigenous creek revegetation downstream Arndt Road

The State Planning Policy Framework 15.01-2 includes a provision that natural drainage corridors should have vegetated buffer zones of at least 30m wide along waterways to maintain the natural drainage function, stream habitat, wildlife corridors and landscape values.

Council and Melbourne Water revegetation sites in open sections of creek upstream and downstream of Arndt Road have successfully established overstorey consisting predominantly of River Red-Gum and scattered Blackwood, Lightwood, Bursaria and Tree Violet. Along the open sections of creek Council revegetation works along the creek banks through KW Joyce Reserve are in good condition with an established indigenous sedge and groundcover layer in most locations. The drier slopes and escarpments along the creek, include scattered Yellow Box, Yellow Gum, Sheoak and Hedge Wattle.

Photo 19: Indigenous revegetation at KW Joyce Reserve

Photo 20: Non-indigenous Ironbark trees in Gavin Reserve

Overstorey planting along the Westbreen Creek were predominantly completed by the Pascoe Vale Naturalist Group in the 1980s and built on by Council Melbourne Water and Friends group with understorey plantings mostly since the early 2000s. The Bicentennial Plantings undertaken in the late 1980's through Gavin Park included a mix of non-indigenous native species including Ironbark and Spotted Gum. While not indigenous to this area of Melbourne these established trees provide an important contribution to landscape character where present along the open space corridor.

Increasing urban density including larger houses, apartment and multi-unit developments have led to the loss of trees and garden space from the local area reducing landscape amenity and habitat values along Westbreen Creek. The steep topography and proximity of urban development to the narrow open space reserve means that large mature trees in adjoining private property both native and exotic, make an important contribution to landscape character and habitat values along the corridor.

2.5.2 Fauna

The existing vegetation and remaining open sections of creek along in the open space corridor provide an important habitat refuge and corridor link through the urban areas for a range of native birds and other wildlife. There has been no recent formal site-specific fauna assessment and no record of State or Regional listed significant fauna species in the study area. Local volunteers have recently established a project site for Westbreen Creek on Bowerbird, a national citizen science web-based program, and have recorded has number of sightings. Refer Appendix B.

The established overstorey, planted over 30 years ago, provides valuable perching and nesting places for a range of animal and bird species, often restricted in the urban landscape. Council has also created artificial nesting hollows and stags using dead trees which had been pegged for removal. The mid-storey, dense in some areas, provides important protection for smaller birds such as the Scarlet Robin and Blue Wren and the diverse, grassy understorey supports a range of reptiles, insects and butterflies.

Terrestrial habitat (logs and rocks), vegetation along the creek banks, mats of floating vegetation and submerged plants provide optimal habitat for frogs and other aquatic species. Several species of frogs can be found along Westbreen Creek including Southern Brown Tree Frog, Eastern Common Froglet, Spotted Marsh Frog, Pobblebonk/Banjo Frog, Peron's Tree Frog, but of particular significance is the Growling Grass Frog. Although it has not been identified in any formal study, a number of unofficial sightings have been made. Deep pools of water, particularly during the warmer months, are important for this species to breed.

There is an Environmental Significance Overlay (ESO) along Moonee Ponds Creek but no formal planning scheme protection of environmental values along the Westbreen Creek.

2.5.3 Weeds

As with most urban waterway corridors weed infestation is an ongoing management issue along Westbreen Creek. The corridor has largely been cleared of woody weeds with the exception of a large Weeping Willow and row of Lombardy Poplar south of Arndt Road. A row of planted Cypress row along the Pascoe Vale Girls School boundary and Peppercorn and Pine trees in Payne Reserve still remain in the study area. The riparian and surrounding zones are dominated by weed species including Kikuyu, Perennial Rye-grass, Ox-tongue, Toowoomba Canary-grass and Couch. Several noxious weeds have been identified within the study area, including Chilean Needle Grass, Fennel and Soursob.

Photo 21: Poplars and Weeping Willow at Arndt Road

Photo 22: Mature Peppercorn in Payne Reserve

2.5.4 Vegetation Management

The majority of maintenance required along the corridor is mowing of grassed areas which is undertaken ion a two-week rotation in all reserves. Ongoing weed control is critical to the protection and success of vegetated areas. Council engages specialist bushland contractors to implement a range of management techniques including brush cutting, slashing, flame weeding and hand weeding in a timely manner to avoid seed set. These methods are selected for both improved ecological results and to reduce the use of herbicides.

2.5.5 Overall vegetation management recommendations:

V1 Investigate opportunities to link the existing open sections of Westbreen Creek with new WSUD wetlands and bioretention systems using targeted planting of the overland flow paths and legal point of discharge drainage lines with indigenous sedges, rushes and groundlayer species to restore a continuous creek corridor and maximise habit links. Refer to detailed plans

V2 Protect and enhance existing areas of indigenous vegetation as identified in the Moreland Indigenous Vegetation Assessment 2012 and revegetation completed subsequently. Undertake weed control, extend buffer zones and improve habitat linkages through targeted revegetation. Refer detailed plans for mapping and site-specific draft recommendations.

V3 The steep topography and often narrow open space corridor limit opportunities for additional planting along exposed adjoining residential property fence lines. Where possible maintain a 4m wide slashed grass maintenance and fire access to rear boundary fencelines. Where this is not possible liaise with adjoining landholders to coordinate weed control and revegetation projects including:

- Development of agreements for maintenance access through private property in difficult to access areas.
- Use a modified Escarpment Shrubland EVC species mix to screen rear boundary fencelines and extend habitat links while minimising maintenance and fire risk.

V4 Maintain genetic biodiversity and ecological sustainability for revegetation projects within the Westbreen Creek open space corridor including:

- Use of plants propagated only from local provenance seed sources, in particular the Westbreen Creek and Moonee Ponds Creek catchment and surrounding areas.
- Document remnant populations and seed provenance for historical and current revegetation works to inform local seed collections activities.
- Ensure seed is harvested in accordance with current legislation and DSE protocols to maintain sustainability of the source population.
- Facilitate seed collection in the Northern Golf Course to obtain local genetic material for revegetation.

V5 Review maintenance responsibilities for Natural Resource Management and Open Space Maintenance and ensure appropriate agreements, responsibilities and performance targets are to be developed for all revegetation projects and any major weed control initiatives.

V6 Protect mature established trees in private property where visible from the Westbreen Creek corridor to maintain landscape character and habitat values. Investigate municipal wide tree protection measures through the planning scheme including Vegetation Protection overlay (VPO), Environmental Significance Overlay (ESO), Significant Landscape Overlay (SLO) and/or Significant Tree Register.

V7 Undertake habitat street tree planting and encourage residents to convert naturestrips to indigenous ground storey plantings alongside the corridor and connecting to adjoining parks.

V8 Engage with residents to encourage planting of habitat vegetation on private land.

V9 Investigate protection and enhancement of vegetation through Westbreen Creek corridor through the planning scheme including Environmental Significance Overlay (ESO).

2.6 Access

2.6.1 Shared Path Access

The Westbreen Creek Trail is a 2.5m wide concrete shared path used for recreational walking and cycling. The shared trail begins at Northumberland Road and extends along the western bank of Westbreen Creek through KW Joyce Reserve and then links through open space at Gavin Park and Austin Crescent Reserve to Railway Parade. The trail provides continuous all ability access for almost 1.5km through the very steep topography of Pascoe Vale with only two road crossing points at Arndt Road and Northumberland Road.

Photo 23: Shared path KW Joyce Reserve

Photo 24: Shared path Gavin Reserve

The shared path is located within five metres of the creek bank along the open waterway sections and ongoing maintenance of adjoining riparian vegetation is required to maintain clear sightlines for safety. There are however are few alternatives for realignment given the steep topography.

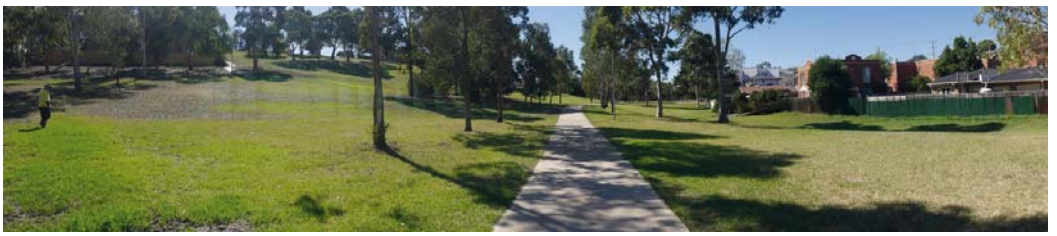


Photo 25: Shared Path Austin Crescent Reserve

There is no off road shared path link from the southern end at Railway Parade to the Pascoe Vale Station or on to the Moonee Ponds Creek Trail. Currently pedestrians and cyclists have to travel on road along Railway Parade and then along Gaffney Street. Council is currently planning upgrades to lighting along the shared path through Austin Crescent Reserve which will increase accessibility and safety for path users in this section. Opportunities to improve walkability in the area and access to the station and broader cycling network are a key objective for the plan.

2.6.2 Walking Path Access

There is a sealed footpath in HM Dowd Reserve which provides connection between Crowley Court and Rhoades Parade. There is no off road shared path link from HM Dowd Reserve to KW Joyce Reserve. Users will need to use on road footpath from Crowley

Court then onto Northumberland Road to access the Westbreen Creek Trail at KW Joyce Reserve.

There is an unsealed walking path running east west along the northern escarpment at KW Joyce Reserve and a well-worn informal walking track along the lower bank on the north and east side of the creek used by pedestrians and dog walkers to complete the popular circuit walk from Northumberland Road to Zenith Street.

Figure 7. *Existing Vegetation*

Photo 26: Informal track and shared path KW Joyce Reserve

In some areas the informal walking track is located directly adjoining the creek. This limits opportunity for riparian revegetation and given the close proximity of the concrete shared path on the opposite bank and dog off lead use impacts on habitat values within the creek corridor. In some areas the track is significantly undercut by erosion in the creek channel.

Photo 27: Informal track along east bank Gavin Park

Photo 28: Unsealed path Payne Reserve

Walking access from adjoining streets into the Westbreen Creek corridor is constrained by steep topography. In some areas residents have rear access gates directly connected to the open space corridor. Direct access into open space can have potential issues for Council, however, there are benefits in areas such as these through increase activation, surveillance and connection with the open space. The provision of design guidelines within the planning framework would help to guide the management of interfaces with the park to ensure a positive outcome for the open space.

There are two sealed and one informal path along the north - west bank of Austin Crescent Reserve. These paths provide important access points for residents living along Austin Crescent into the Reserve.

There are sealed and unsealed walking paths through Payne Reserve and these form an important local link between Park Street and McCracken Avenue for local residents.

2.6.3 Public Transport Access

The Moreland Integrated Transport Strategy 2010-19 identified areas west of Westbreen Creek as having poor connection to public transport. This is defined as being greater than 400m from a tram or bus route and greater than 800m for a railway station. In Pascoe Vale the steep topography and convoluted street network also place significant barriers to residents accessing public transport.

The 542 bus service runs along Northumberland Road between Oak Park Station and Pascoe Vale Station on the west bank of the creek corridor and the 513 bus service runs along Cumberland Road between Oak Park Station and Coburg Station on the west bank of the creek.

2.6.4 Car parking

There is no off street public car parking at K.W Joyce Reserve with visitors utilising on street parking along Northumberland Road or Cornwall Road when visiting the park by car. Existing off-street car parking (approx. 20-25 spaces) is available at Gavin Park next to the existing picnic area, playground and public toilets. The sealed car park was recently resurfaced but does not contain any designated accessible parking spaces.

The unsealed informal car park within Austin Crescent is located on Melbourne Water land and provides approximately 25-30 spaces for visitors to Austin Crescent Reserve picnic, BBQ and playground facilities.

There is 90 degree on street parking along the VicTrack railway reserve at Railway Parade. This parking is used by rail commuters and there is a small Council managed car park on Moonee Ponds Creek at the western end of Gaffney Street.

The level of existing off street and on road car parking is considered sufficient for existing levels of use and to cater for any increased demand as a result of park improvements and population change.

Photo 29: Gavin Park car park Essex Street

Photo 30: Austin Crescent Reserve car park

2.7 Recreational Facilities

2.7.1 Playgrounds

There are existing playgrounds on either side of Northumberland Road within both Gavin Park and Austin Crescent Reserve. This is a consequence of these reserve being under separate Council management prior to amalgamation in the 1990s. The Moreland Play Strategy 2016-2020 has identified these playgrounds for replacement in 2018-19. Consolidation of these playspaces into one area (Austin Crescent Reserve) allows for a higher level of play experience and allows space in Gavin Park for the proposed wetland opportunities and a greater diversity of park use (including nature play) within the wider open space corridor.

There is a small local playground in Payne Reserve and HM Dowd Reserve and no existing play facilities in KW Joyce Reserve. Refer photo 22 Payne Reserve.

Photo 31: Gavin Park Playground

Photo 32: Austin Crescent Reserve Playground

2.7.2 Picnic facilities and furniture

There are existing barbeque and picnic facilities in the existing playgrounds at Gavin Park and Austin Crescent Reserve. As part of upgrading and consolidating playground facilities at Austin Crescent Reserve picnic facilities will also be upgraded including provision of a new picnic shelter.

Photo 33: Gavin Park picnic area

Picnic 34: Austin Crescent Reserve Picnic area

Existing picnic and barbeque facilities at Gavin Park will be retained with refurbishment undertaken as part of future development of new wetland areas east of Northumberland Road, to maintain both a family orientated picnic area and a quieter environmentally focused picnic area within the corridor.

2.7.3 Public Toilets

There are two public toilets within the Westbreen Creek open space reserve. The Payne Reserve facility is an older brick building providing both male and female cubicles which are scheduled for refurbishment in 2022-23 in accordance with the Public Toilet Strategy (2012).

The Gavin Park public toilet facility was recently replaced and is a fully accessible facility.

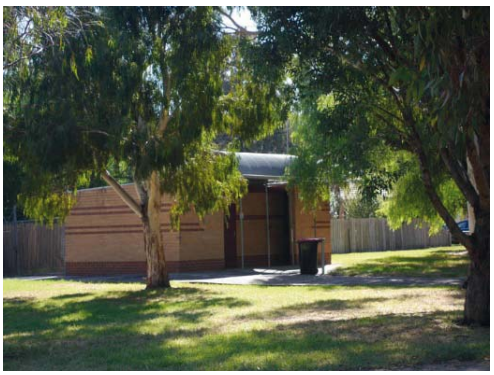


Photo 35: Payne Reserve public toilets

Photo 36: Gavin Park public toilets

The current amount of facilities provided is sufficient for the space and there is no need for any additional public toilets within the study area.

2.7.4 Dog off lead Areas

K.W Joyce Reserve and Austin Crescent Reserve are designated as dog off lead areas. Councils Local Laws govern the use of off lead areas according to the following conditions:

- The owner must carry a chain, cord or leash sufficient to bring the dog under effective control if the dog behaves in a manner which threatens any person or animal.
- The owner must remain in effective voice or hand control of the dog, to be able to promptly bring the dog under effective control by placing the dog on a chain, cord or leash if that becomes necessary.
- The owner must not allow the dog to attack, rush at or threaten any person or animal.

Dogs must be kept on leash at all times within 15 metres of:

- Any playground or children's play equipment.
- The principal location of an organised sporting or community event or festival.
- The principal location of an organised public meeting.
- A permanent barbecue or picnic area when in use.

Dogs must be under effective control within 1 metre of:

- A shared pathway (and at all times while on the shared pathway).

Dogs are prohibited within:

- The immediate perimeter of any playground at all times.
- Any creeks and waterways at all times.

Gavin Park and Payne Reserve are dog on lead areas. No change to existing dog regulations is proposed as part of this plan. Potential conflicts between dog off leash areas and wildlife/wetland zones may need to be managed through effective design such as dense planting and/or fencing where appropriate.

2.7.4 Community and demographics

The parks along the Westbreen Creek corridor are well used by neighbouring residents and the school. An extensive amount of dog walkers utilises the circuit loop around KW Joyce Reserve. Pascoe Vale Girls College also uses the grounds for outdoor educational programs and cross country running. There is also a large number of commuters utilising the park corridor daily.

Figure 8 *Existing recreation facilities*

3. Detail Plan

3.1 Detail Plan A – KW Joyce Reserve and Gavin Park North

3.1.1 Overview

Westbreen Creek is contained within an open channel between Northumberland Road and Zenith Street. The creek channel has been historically modified with a road bridge culvert and drop structure at Arndt Road and exposed sewer crossing immediately south of Penzance Road. The West Street Main Drain connects in below Cornwall Road and there is a gross pollutant trap (GPT) accessed from Cornwall Road at the end of Kent Road. There is a significant volume of rubbish collected by the GPT from the surrounding areas, in particular the West Street shopping precinct and adjoining schools. At times volumes exceed capacity under current clearance rates and increased frequency of maintenance is required. Review frequency of maintenance to reduce rubbish build up and minimise overflow events into the creek.

The majority of flood flows are contained within the existing bank and despite flow mitigation works on the upstream Acacia Street drain this section of creek is subject to flows of greater than 2m/s in the 5 year and 100-year event and there is evidence of bank erosion, especially on the northern outside bend radius. Downstream of Zenith Street the creek is contained in a large underground drainage pipe and the narrow open space corridor functions as the overland flow path for flood waters when the pipe exceeds capacity.

Melbourne Water manage the creek bed and banks as well as the West Street and Acacia Street Main Drains. Council own and manage the open space corridor. Residential properties mostly adjoin the open space corridor with rear boundary backing onto and overlooking the reserve on the west bank. There is road frontage on the east bank however downstream of Zenith Street the narrow open space corridor has rear boundary fences on both sides and restricted passive surveillance.

Rear title of properties at No. 22 Longview Street and No. 7 Zenith Street were not acquired as part of the public reserve when the creek was piped in the late 1970's. The fencelines of these properties protrude more than 20m into the open space corridor obstructing flood flows and sightlines reducing safety for the public using the path and open space corridor.

The concrete shared path is located on the west bank, typically within 5m of the creek in the open section and beside the underground drain through the narrow section south of Zenith Street. The gently graded shared path provides a critical link for both cyclists and pedestrians through the steep topography of Pascoe Vale. There is no existing lighting along the shared path and provision lighting in KW Joyce Reserve is not recommended due to impacts on wildlife given the proximity of the path to the creek.

There are no formal playground facilities within KW Joyce Reserve with the nearest playgrounds at Dowd Reserve and Cole Reserve. The distance from adjoining residential areas to these playgrounds exceeds the 500m recommended in the Moreland Play Strategy 2016 – 2012. Provision of a new local playspace within KW Joyce Reserve would fill this gap.

There is no formal path on the east bank however an informal walking track located near the top of bank on flatter areas of the steep bank that enables completion of a popular walking and dog walking circuit. This informal track is however being eroded in several areas and further formalisation of this east bank route is not possible without compromising the ability to revegetate and stabilise eroding sections of the creek bank. There is a lack of all weather-all ability pedestrian access into the reserve from the east side and no open space connection through to nearby Cole Reserve.

Penzance Street has only two driveways and could be closed to through traffic to improve pedestrian links between Cole Reserve and Westbreen Creek. The road is considered too steep for development of new WSUD systems.

There are several large remnant River Red Gums on the east bank and there has been extensive indigenous revegetation undertaken by both Melbourne Water and Council along the creek over the last ten years. This has combined with older native and indigenous tree planting from the late 1980s-early 1990's to restore an enclosed bushland character which provides important habitat for wildlife and relief from the surrounding urban environment. Refer Detail Plan A for further information.

3.1.2 Overall objectives

Refer Figure 9 Detail Plan A – KW Joyce Reserve and Gavin Park North

- Establish an all-weather, unsealed walking path link on the east bank to improve access to the popular circuit walk and enable further revegetation along the creek bank to improve stability and habitat values.
- Protect and enhance indigenous bushland vegetation and character while maintaining clear sightlines along the shared path for safety.
- Investigate the establishment of new wetlands within Gavin Park to improve water quality and enhance biodiversity and habitat values.
- Restore a continuous habitat corridor along Westbreen Creek linking open sections of creek and proposed new wetlands with low indigenous planting along the former creek channel alignment.
- Investigate opportunities for public acquisitions of rear private properties on Zenith and Longview Street where they obstruct the open space corridor or potentially impact on flooding. Further investigation to be undertaken.
- Investigate establishment of a potential future play space in KW Joyce Reserve focusing on nature-based play consistent with the bushland character of the reserve.
- Investigate options to improve off road pedestrian and cycle links to adjoining open space, schools and shops where possible.
- Undertake staged removal of aging pine log vehicle barriers, reinstating only where needed to restrict illegal vehicle access along the path system. Use vegetation and good design as alternative to fencing where possible.
- Provide additional seats and drinking fountains with dog bowl along the existing and new path network.
- Retain existing dog off lead areas in KW Joyce Reserve located away from the shared path and creek.
- Investigate developing a waste management program with Westbreen Primary School and Pascoe Vale Girls College to minimise the volume of rubbish created.
- Investigate road closure of Penzance Road to through traffic to create a habitat connection and linking the two dog off leash parks between Cole Reserve and Gavin Park. Works. Works involved will include detailed design and community consultation.
- Upgrade existing unsealed path on the north bank through KW Joyce to a sealed shared path between Northumberland Road and Cornwall Road.

- Investigate pedestrian safety improvements to Arndt Road crossing and consult with residents on any proposed design.

- Investigate opportunity to improve pedestrian access from Zenith Street and potential to improve open space.

- Upgrade existing signage to include historical details of Westbreen Creek.

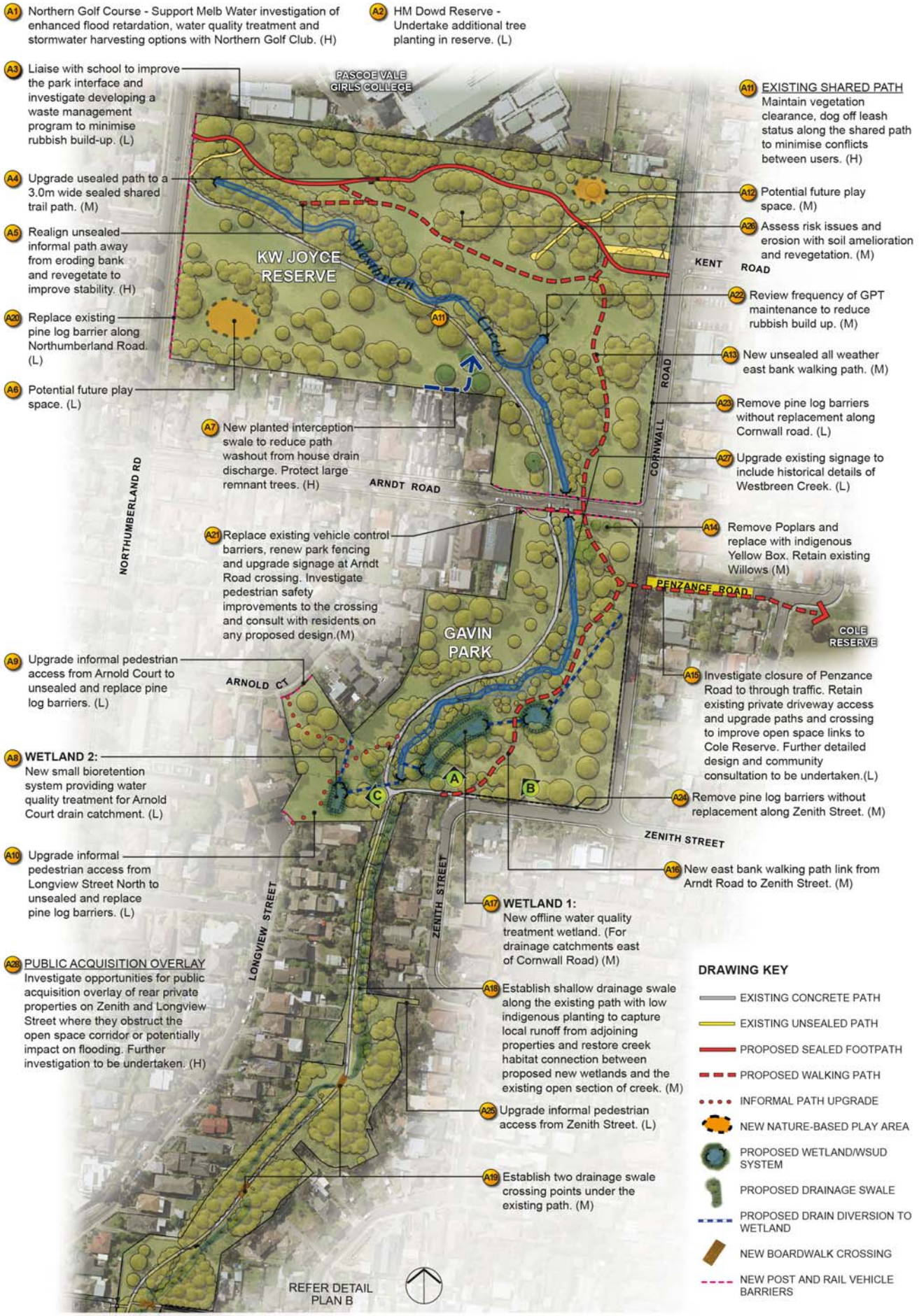


Figure 9: *Detail Plan A – KW Joyce Reserve and Gavin Park North*

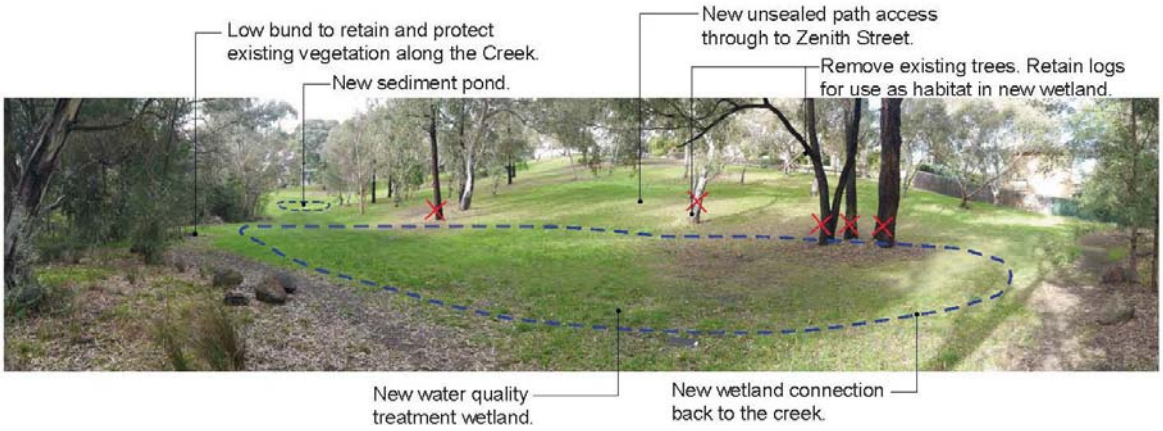


Figure 10: *Proposed Wetland 1 View A*

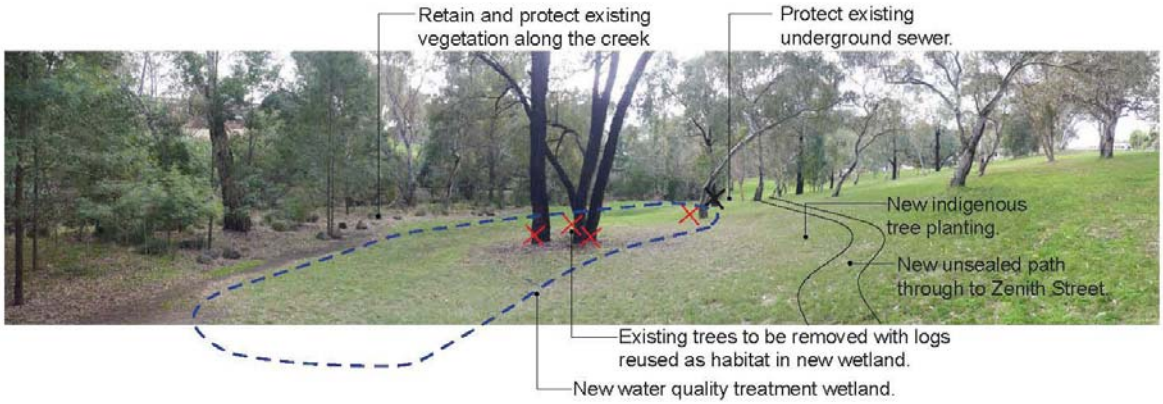


Figure 11: *Proposed Wetland 1 View B*

Figure 12: *Proposed Wetland 2 View C*

3.2 Detail Plan B – Gavin Park South and Austin Crescent Reserve

3.2.1 Overview

Westbreen Creek is contained within a large underground pipe between Zenith Street and the Moonee Ponds Creek outfall. East of Northumberland Road in the southern end of Gavin Park is a small retarding basin with surcharge pit. The majority of flood flows are contained within the pipe however overland flows from adjoining properties and surcharging local drainage pits is directed to the retarding basin via a shallow grass overland flow path located east of the existing playground. West of Northumberland Road the grass overland flow path continues along the southern boundary of Austin Crescent Reserve approximately along the line of the underground pipe.

Moreland City Council undertakes maintenance on Melbourne Water's pipe and drainage reserve located along the southern boundary of Austin Crescent Reserve, including the unsealed car park. Council own and manage the remaining open space corridor. Adjoining open space is predominantly residential with mostly rear boundary fences backing onto and overlooking the reserve on both sides. There is road frontage at Northumberland Road provides frontage to both Gavin Park and Austin Crescent Reserve and both parks have adequate off-street car parking. The 513 bus route also has stops along Northumberland Road.

Northumberland Road was the former municipal boundary and historically there were playgrounds and toilets located on both sides of the road. Council has already replaced and upgraded the toilet facility in Gavin Park and as part of future works the playgrounds will be combined into one upgraded playspace with improved picnic and barbeque facilities at Austin Crescent Reserve. Existing picnic facilities will also be retained in Gavin Park, away from the upgraded playground to provide a diversity of facilities for other park users. Refer to Detail Plan D.

The relatively flat concrete shared path provides a critical link for both cyclists and pedestrians along the open space corridor through the steep topography of Pascoe Vale. There is some existing lighting along the path through Austin crescent Reserve which improves safety for commuters accessing the station and bus and for other evening walkers/cyclists. Council are planning to upgrade lighting in this section and future extension of lighting through Gavin Park would significantly improve safety and access for commuters to the station.

There majority of planting in the open space corridor consists of older native and indigenous tree planting from the late 1980's and early 1990's with a mown grass understorey.

3.2.2 Overall Objectives.

Refer Figure 13 Detail Plan B – Gavin Park South and Austin Crescent Reserve

- Protect open parkland character with trees, grass and low indigenous groundcover planting. Investigate revegetation opportunities in the reserve to achieve clear sightlines and safety along the shared path.

- Investigate establishment of new wetlands and planted overland flow path channels within Gavin Park South and Austin Crescent Reserve to improve water quality and enhance biodiversity and habitat values.

- Restore a continuous habitat corridor along Westbreen Creek linking open sections of creek and proposed new wetlands with low indigenous planting along the former creek channel alignment.

- Consolidate the two local playspace areas into one single upgraded facility in Austin Crescent Reserve.

- Retain and enhance existing barbeque and picnic facilities.

- Retain existing off-street car parking with provision of additional tree planting and integrated stormwater runoff treatment systems.

- Upgrade and extend public lighting along the shared path (to Essex Street) to improve safety and links for commuters to bus routes and the railway station at night.

- Replace aging pine log vehicle barriers to restrict illegal vehicle access into the reserve and along the path system.

- Retain existing dog off lead areas in Austin Crescent Reserve located away from the shared path and playground.

- Investigate pedestrian safety improvements to the Northumberland Road crossing and consult with residents on any proposed design.

- Investigate locking gates in car parks in the evenings. Works to be assessed as part of Austin Crescent Reserve car park renewal.

- Protect and maintain existing open grass space for informal play.

Figure 13 *Detail Plan B – Gavin Park South and Austin Crescent Reserve*

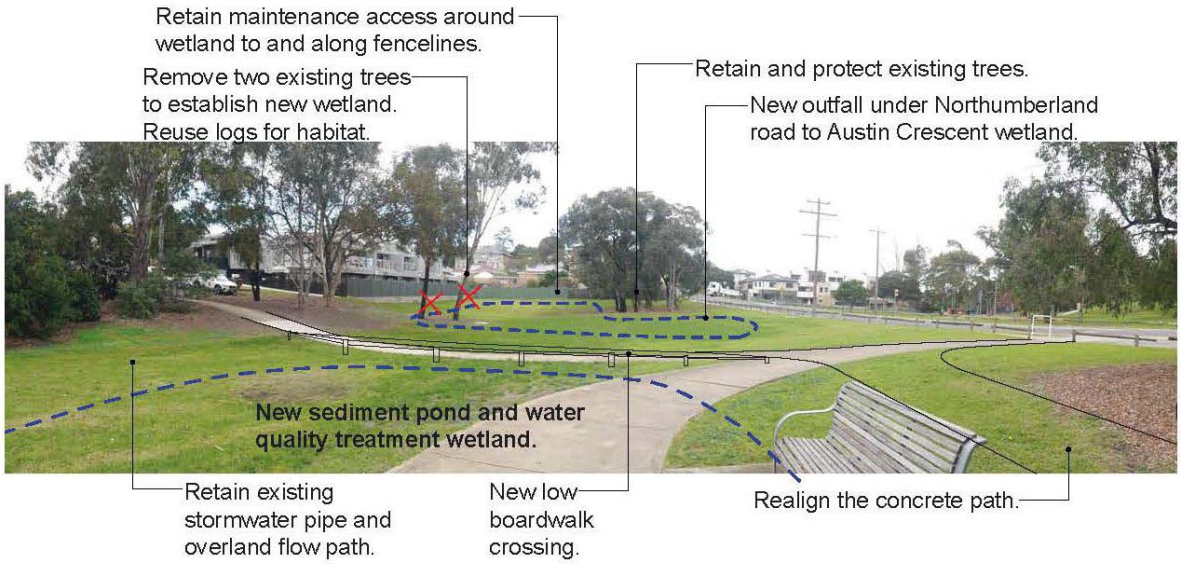


Figure 14: *Proposed Wetland 3 View E*

Figure 15: *Proposed Wetland 3 View D*

Figure 16: *Proposed Wetland 4 View F*

***Figure 17**: Detail Plan D Austin Crescent Reserve – Gavin Park Playground and Wetland Concept*

3.3 Detail Plan C – Railway Parade to Payne Reserve and Moonee Ponds Creek

3.3.1 Overview

Westbreen Creek is contained within a large underground pipe between Railway Parade and the Moonee Ponds Creek outfall. The pipe passes under the railway embankment however when the flows exceed capacity overland flows surcharge and are directed south along Railway Parade to Gaffney Street and on to Moonee Ponds Creek with localised flooding in this area more common.

Melbourne Water own and manage the pipe and drainage reserve between Park Street and Moonee Ponds Creek. This small reserve is leased by Melbourne Water to the adjoining Edith Bendall Lodge who manage the area as part of their outdoor gardens. Council own and manage Payne Reserve and the small open space area east of McCracken Avenue. Adjoining open space is predominantly residential with mostly rear boundary fences backing onto and overlooking the reserve on both sides. There is road frontage at Railway Parade, Park Street and McCracken Avenue. Park Street and Gaffney Street are part of an important east- west collector road carrying significant traffic volumes due to limited access across the railway line between Pascoe Vale Road and Sydney Road.

There is a local playground and public toilet in Payne Reserve. The reserve is used by residents west of the railway line and as a cut through between park and McCracken Avenue. There is no signage at Payne Reserve or Moonee Ponds Creek indicating the connection of these areas to Westbreen Creek.

There is a mix of mature exotic and native trees including Pines, Peppercorns and Eucalypts in Payne Reserve and the local open space off McCracken Avenue. These trees provide an important contribution to the character of the area.

3.3.2 Draft Priority Recommendations

Refer Detail Plan C – Railway Parade to Payne Reserve and Moonee Ponds Creek

- Retain open parkland character of Payne Reserve with a mix of exotic and native trees, grass and low indigenous groundcover planting only.
- Restore a continuous habitat corridor along the Westbreen Creek with low indigenous planting along the former creek channel alignment through Payne Reserve.
- Investigate opportunities to improve pedestrian and cycle access between open space reserves along Westbreen Creek and Pascoe Vale Station and Moonee Ponds Creek.
- Investigate pedestrian safety improvements to the crossing on west of Railway Parade and consult with residents on any proposed design.
- Provide new Westbreen Creek directional signage between Railway Parade and Moonee Ponds Creek.
- Replace aging pine log vehicle barriers to restrict illegal vehicle access into the reserve.

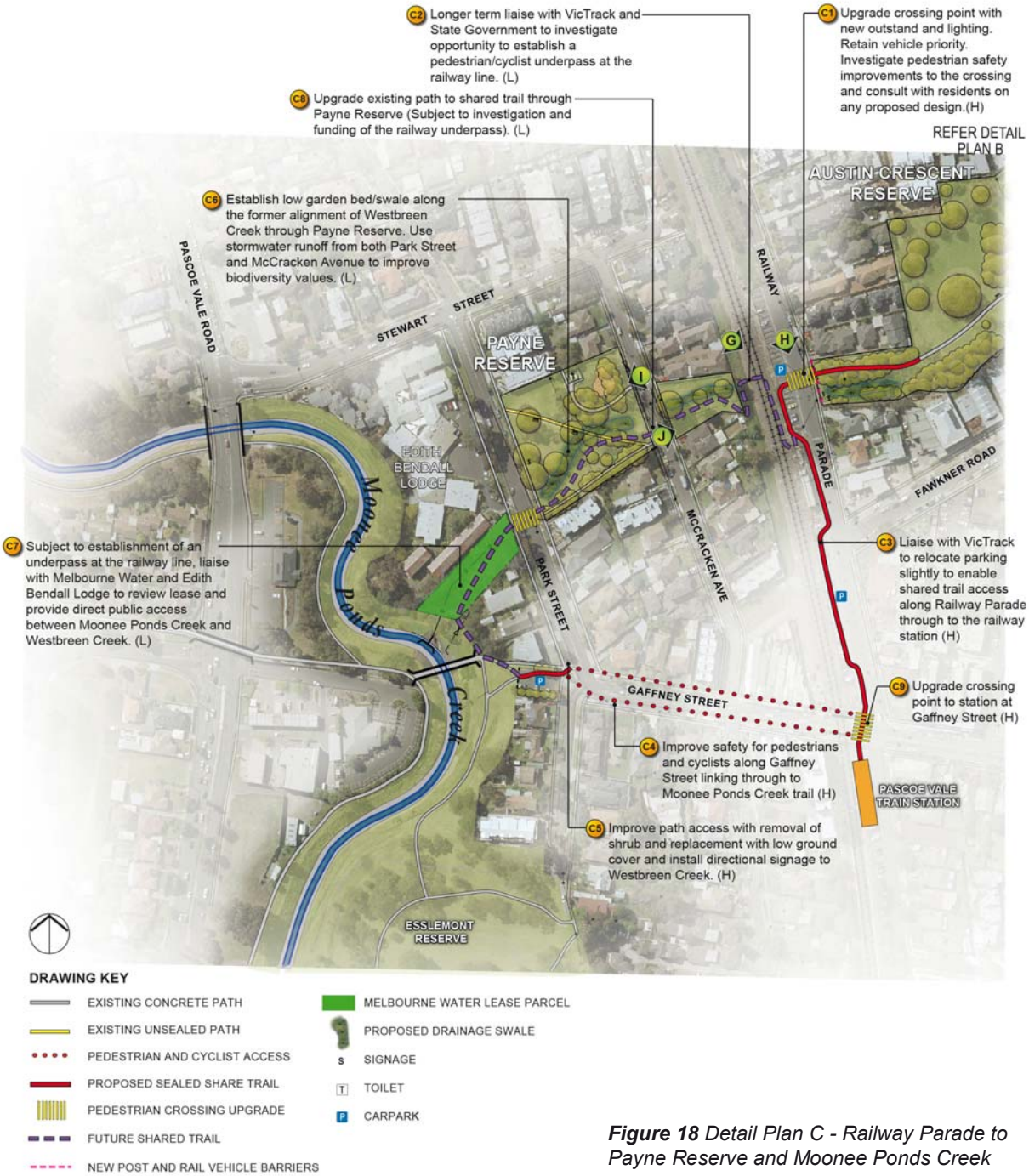


Figure 18 *Detail Plan C - Railway Parade to Payne Reserve and Moonee Ponds Creek*

Figure 19: *Payne Reserve View I*

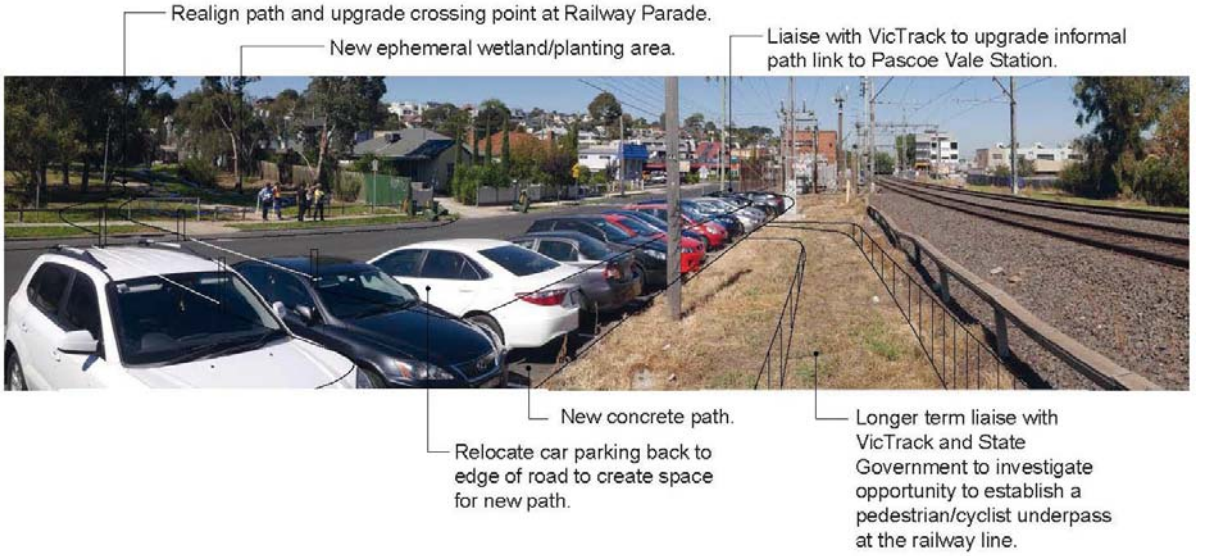


Figure 20: *Railway Parade View G*

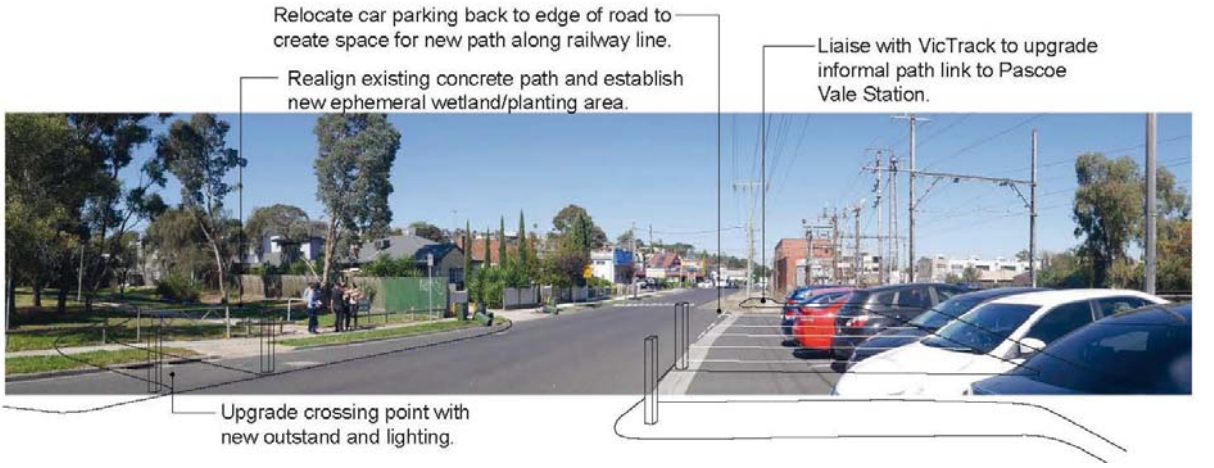


Figure 21: *Railway Parade View H*

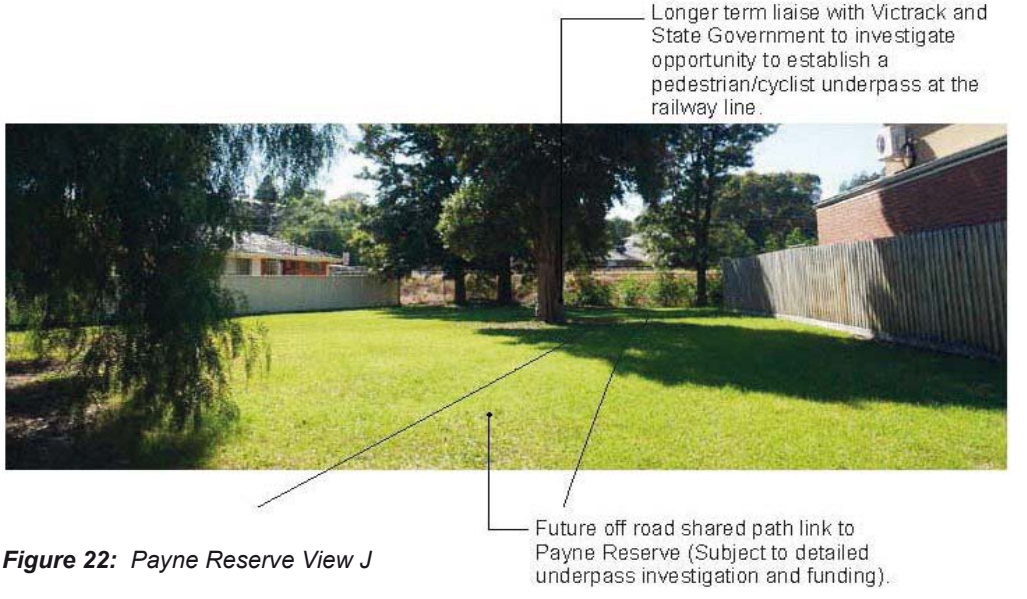


Figure 22: *Payne Reserve View J*

Bibliography

Moreland Play Strategy 2016-2020, Moreland City Council, 2016

Moreland Integrated Transport Strategy 2010-19, Moreland City Council, 2010

Moreland Bicycle Strategy 2011-2021, Moreland City Council, Adopted Nov 2011

Moreland Open Space Strategy 2012-2020, Moreland City Council, 2011

Healthy Waterways Strategy, Melbourne Water, Nov 2013

Moreland Indigenous Vegetation Assessment Final Report, Merri Creek Management Committee, Nov 2011

Moreland Remnant Vegetation Assessment, Merri Creek Management Committee ,1998

Westbreen Creek Parklands 'An Environmental Park', EDGe Environmental Design Group, 1998

Large scale WSUD opportunity and feasibility study across the Moreland municipality, Alluvium Pty Ltd, July 2015

Acacia Street Velocity Check, Water Technology, June 2016

Moreland Watermap 2020 – Moreland's path to a water sensitive city, Moreland City Council, June 2014

Gavin Park and Westbreen Creek Heritage Citation Report, Moreland City Council, 1999

Development of the Moonee Ponds Creek Drainage System, Melbourne and Metropolitan Board of Works, 1981

Cultural Heritage Sensitivity layers, Aboriginal Victoria, June 2018

Melbourne Water- Our space your space interactive map, Melbourne Water, June 2018 <http://melbournewater.maps.arcgis.com/apps/MapJournal/index.html?appid=e60e956c9f304027802e9bef6177fac1>

Appendix

A Westbreen Creek Masterplan WSUD Opportunities, Alluvium September 2018

Memo

Subject	Final report
Distribution	Moreland City Council
Date	23rd October 2018
Project	Westbreen Creek Masterplan WSUD Opportunities

1 Introduction

Alluvium has been engaged by Thompson Berrill Landscape Design (TBLD) to identify stormwater improvement opportunities within the open space corridor along Westbreen Creek in Pascoe Vale to inform the Westbreen Creek Conservation and Development Plan being developed by TBLD for Moreland City Council. The Conservation and Development Plan is proposed to extend along Westbreen Creek from KW Joyce Reserve (off Northumberland Road), through Gavin Park and Austin Crescent Reserve to the confluence with the Moonee Ponds Creek.

2 Relevant studies

Alluvium, in partnership with TBLD and Marsden Jacob Associates, undertook a feasibility study in 2015 to identify potential sites for stormwater quality treatment assets across the Moreland municipality. The investigation identified 16 potential sites for stormwater quality treatment assets which included KW Joyce Reserve and Gavan Park. A large asset in the Northern Golf Course (north of Rhodes Parade) was also identified.

There is a current investigation by the City of Melbourne (Engeny, 2018) underway to investigate the potential of large scale flood storage in the Moonee Ponds Creek Catchment, which includes opportunity in the Northern golf course as part of an offset opportunity for the Arden Macauley precinct development downstream. The findings of this investigation have been shared at the final stages of this project. The implications of the investigation have thus been considered in the final version of this report.

3 Existing site condition

A site visit was undertaken with Moreland City Council officers and TBLD along the length of Westbreen Creek between KW Joyce Reserve and Moonee Ponds Creek in order to better understand the site context, constraints and opportunities, as well as Council's key objectives.

Westbreen Creek has open sections e.g. within KW Joyce Reserve up to Zenith Street at Gavan Park, and piped underground sections e.g. between Zenith Street up to Moonee Ponds Creek (Map 1). Westbreen Creek has important values particularly the open sections but over the years sections have been piped, channelised and re-aligned to provide stormwater drainage function for. Between KW Joyce Reserve and the confluence with Moonee Ponds Creek, there are approximately 21 Council pipe outfalls and one Melbourne Water outfall (West Street Drain). The contributing catchment area for the key outfalls is provided in Table 1 and Map 1.

Other observations are outlined below.

- The open waterway section in KW Joyce Reserve is well-defined with relatively steep slopes. Floodwaters is generally contained within the creek line but velocities are relatively high (Watertech, 2016) and flood water depths > 0.5 m. It is possible that these high velocities can contribute to bank erosion over time and are damaging to ecological habitats in the creek.

- Downstream Gavan Park at Zenith Street, the creek is piped underground in a pipe ranging in diameter from 1950 to 2700 mm. Flow exceeding the capacity of the pipe surcharges and travels along the overland flow path through the open space corridor.

- The overland flow path between Zenith Street and Essex Street is relatively narrow between adjoining properties resulting in a few properties impacted by flooding (Map 2). The flow path widens again at Northumberland Road where flood detention is provided by an existing depression in the reserve (Figure 4).

- At Austin Crescent Reserve, the open space corridor is wider. There is a grassed channel at the south boundary of the reserve. However, the flood line for the 1 in 100 year ARI event extends outside of the reserve, resulting in flooding of properties along Fawkner Rd (Map 2).

As far as stormwater management is concerned, several issues are noted:

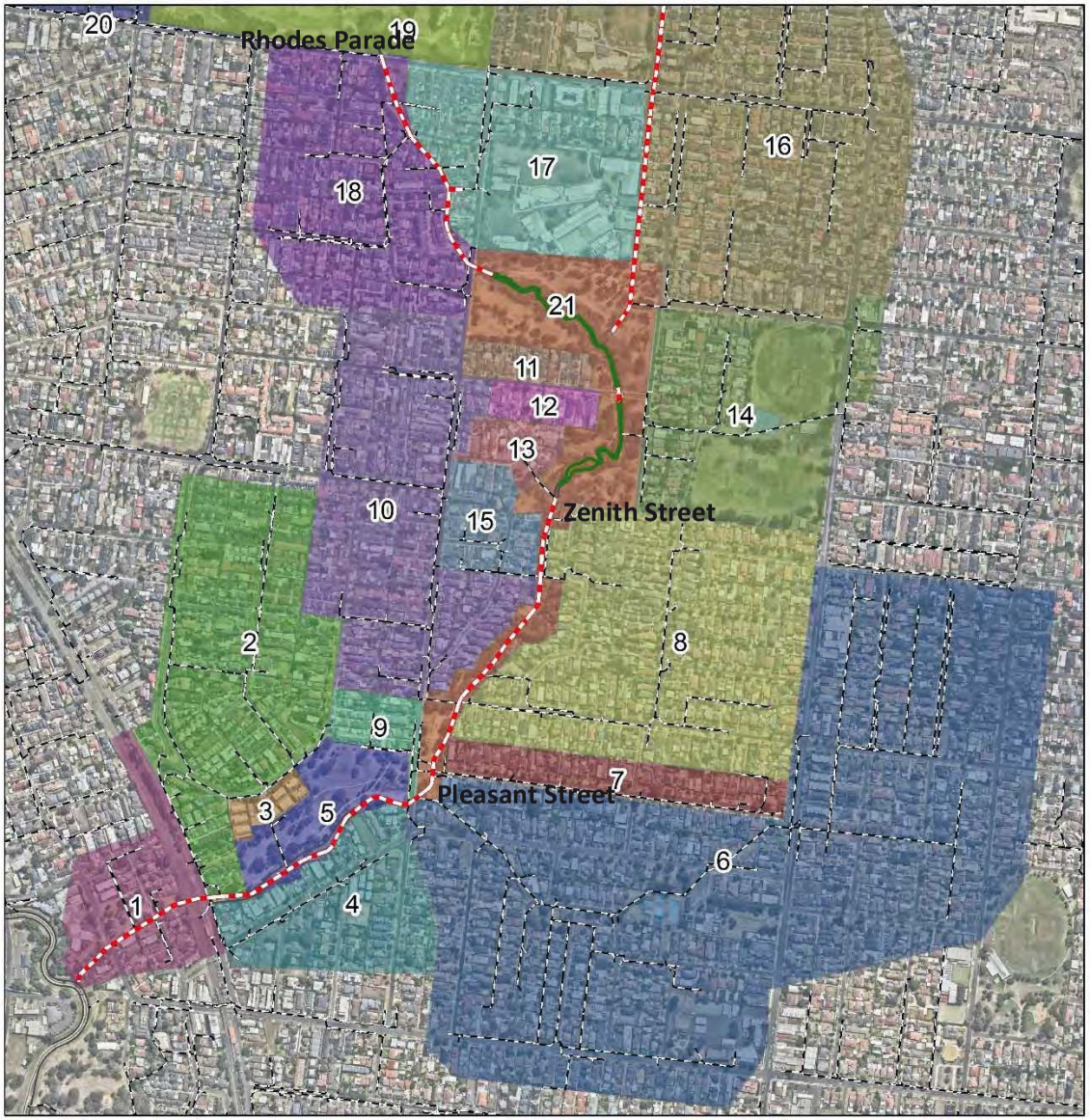
- Stormwater pollution – To the best of our knowledge, there is no stormwater treatment measures within the contributing catchments except for the GPT on the West Street drain. As such, diffuse stormwater pollution enters Westbreen Creek.

- Flooding – The 1 in 100 year ARI flood extent shows a number of affected properties.

- Underground creek section – There is a long section of Westbreen Creek that is currently piped. This represents a loss in amenity and environmental value of the Creek.

Table 1. Catchment land use and area

Outfall #	Contributing catchment land use	Contributing catchment area (ha)
1	Residential	6.1
2	Residential	15.2
3	Residential	0.7
4	Residential	6.9
5	Creek open space corridor	3.7
6	Residential	55.0
7	Residential	3.6
8	Residential	19.8
9	Residential	1.5
10	Residential	16.1
11	Residential	1.3
12	Residential	1.2
13	Residential	1.4
14	Residential and Coles Reserve	12.2
15	Residential	2.6
16	Residential	199.8
17	Residential and Education	10.8
18	Residential	12.8
19	Residential and Northern Golf Course	55.7
20	Residential	215.8
21	Creek open space corridor	10.7

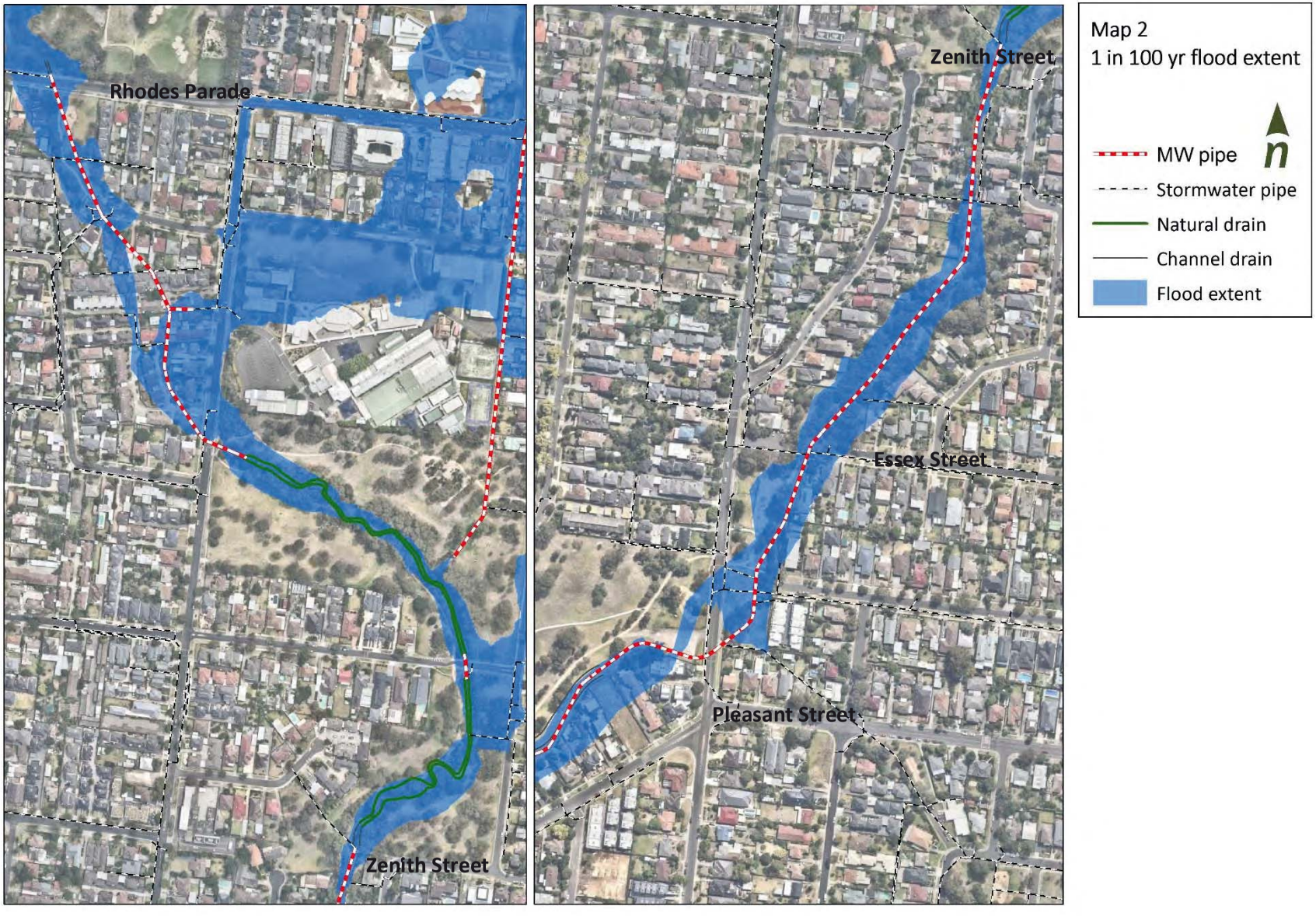


MAP 1 Catchment Plan

- MW pipe
- Stormwater pipe
- Natural drain
- Channel drain

0 125 250 Meters

n


Rhodes Parade
Zenith Street
Zenith Street
Essex Street
Pleasant Street
Map 2
1 in 100 yr flood extent
n
MW pipe
Stormwater pipe
Natural drain
Channel drain
Flood extent

4 WSUD opportunities

The Westbreen Creek Conservation and Development Plan should seek opportunities to address the existing issues around storm water quality, flooding and sections of the creek that has been piped.

However, capital works to improve flooding or "daylighting" the creek (i.e. removing the underground pipe) can be significant. The flood detention opportunity in the Northern Golf course as part of Arden Macauley offset works is a promising future possibility. "Daylighting" the creek will also require significant works and may not be technically feasible given the pipe invert levels although this has not assessed as part of this project. Given these reasons, major works for improving flooding and daylighting the creek are not likely to be feasible as part of the Conservation and Development Plan.

However, improving stormwater quality entering Westbreen Creek through implementation of Water Sensitive Urban Design (WSUD) is an opportunity that is achievable as part of the Conservation and Development Plan. Where possible, these works should provide open water e.g. wetlands, sediments ponds or a source of water along the overland flow paths particularly where the creek line is underground.

The outfalls into Westbreen Creek present opportunities to install WSUD assets to treat and improve the quality of stormwater before it enters the waterway. The technical feasibility of implementing such assets is dependent on:

1. Available space without significantly impacting on tree cover in the open space corridor and requiring service relocation
2. Sufficient fall between inlet and outlets. Whilst invert pipe levels were not available which is critical for WSUD asset requiring stormwater diversion from underground pipes, we relied on contour data to infer if there is sufficient fall.

Based on these two technical criteria alone, WSUD opportunities were limited to three outfalls.

Three WSUD opportunities are therefore proposed for Westbreen Creek Conservation and Development Plan (Table 2). These opportunities align well with those identified in the feasibility study across the Moreland Municipality (Alluvium, 2015). It should be noted that the opportunities proposed provide a stormwater detention benefit (through ponding, extended detention and freeboard). However, from an overall catchment perspective, the impact on stormwater detention from these three opportunities will only be small.

Table 2. WSUD opportunities proposed for the Westbreen Creek Conservation and Development Plan

Opportunity	Outfall	Catchment Contributing (ha)	Catchment fraction imperviousness	Preferred treatment arrangement
1	14	12.2 ha	48 %	Wetland with sediment pond
2	13	1.4 ha	70 %	Bioretention system with sediment forebay
3	10	16.1 ha	10-75%	Bioretention system with sediment pond
	6 + 7	6- 60.0 ha 7-3.6 ha	6- 70 % 7- 70 %	Large sediment pond discharging low flows to existing grassed channel

Details for each opportunity are outlined in the section below as well as Table 3 and the concept plans. Treatment performance for each opportunity are provided in Appendix A.

4.1 Opportunity 1

The area within Gavan Park (off Zenith Street) offers an opportunity for a wetland system to treat stormwater runoff from a 12.2 ha urbanised catchment (Figure 1). The macrophyte zone is proposed to be 48 m long and 12 m wide but will require removal of a few trees (ironbark) and protection to the underground sewer. A wetland asset is preferred given the limited fall to the creek. The outlet of the wetland can essentially be a weir into the creek requiring minimal fall. However, if levels allow, a bioretention system could be installed instead of a wetland which will improve stormwater treatment performance.

Figure 1. *Site for proposed wetland*

4.2 Opportunity 2

The area within Gavan Park off Arnold Court offers an opportunity for a bioretention system to treat stormwater runoff from a 1.4 ha urbanised catchment to best practice (Figure 2). A bioretention is suitable here because of its small footprint in a relatively steep slope. A sediment pond or sediment forebay is not recommended because of the small catchment.

Figure 2. *Site for proposed bioretention system*

4.3 Opportunity 3

The area on the east side Northumberland Rd just upstream of Austin Crescent Reserve (Figure 3) offers an opportunity to treat runoff from catchments 6, 7 and 10. A treatment train is proposed consisting of:

1. A sediment pond and bioretention system to treat runoff from a 16.1 ha catchment (catchment 10). This arrangement is preferred over a wetland given the limited space and opportunity to maximise stormwater treatment. Asset will need to be configured around existing trees and infrastructure.
2. A large sediment pond to act as a pre-treatment for a combined 63.6 ha catchment (6 and 7).
3. The outflow from the sediment pond to flow into the existing grassed channel in Austin Crescent Reserve returning flows back to the surface where the existing creek has been piped underground. The grassed channel provides additional (but small) stormwater treatment (see Appendix 1).

It should be noted that stormwater treatment is only one of several outcomes being sought at this site. The bioretention system itself can be designed with high aesthetic outcomes. The sediment pond receiving flows from catchment 6 and 7 can provide new habitat and can also serve to pass low flows to the downstream swale in Austin Crescent Reserve.

The large sediment pond will need to be configured around existing trees and the underground Melbourne Water pipe without impacting on existing flood storage provided by the reserve (Figure 4). The Top of Extended Detention (TED) in the sediment pond can be set such that there is no net loss in flood storage. Given established catchments, litter can be managed at the sediment pond with no upstream GPT recommended. Should a GPT be required, an ideal location is in James Reserve at the corner of Prospect Street and Archibald Street.

The existing grassed channel in Austin Crescent reserve is not formalised and will require minor earthworks to contain low flows from the sediment pond (Figure 5). Minor works should have negligible impact on channel flow capacity. It is also recommended that planting remains as mowed grass (see Figure 5) so that flow capacity is not impacted.

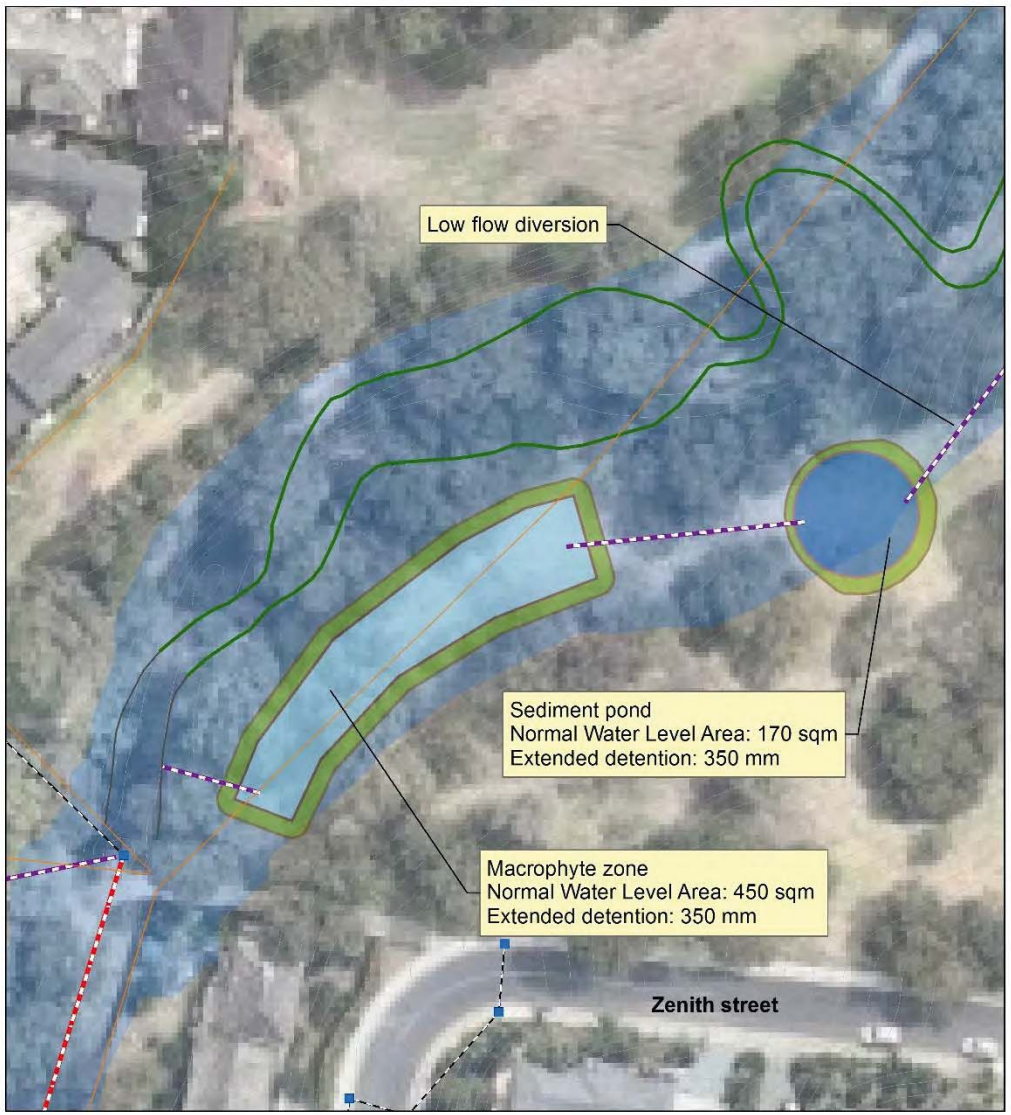
Figure 3. *Site for proposed bioretention system and large sediment pond*

Figure 4. *Existing depression with pit where large sediment pond is proposed*

Figure 5. *Existing grassed channel on the southern boundary of Austin Crescent Reserve*

Table 3. Proposed WSUD asset parameters, design and treatment performance

Oppor-tunity	Asset	Outfall	Area SD – sediment pond MZ – Macrophyte zone BS – Bioretention system	Inflow	Outflow	Treatment performance (annual removal)
1	Wetland with sediment pond	14	SP:170 m^2 MZ: 450 m^2	Low flow piped diversion (e.g. 3 month flows)	Pipe or weir connection to Creek	TSS: 3600 kg TP: 6 kg TN: 25 kg
2	Bioretention with sediment forebay	13	Forebay: 15 m2 BS: 100 m^2	Low flow piped diversion (e.g. 3 month flows)	Pipe connection to Creek	TSS: 1050 kg TP: 1 kg TN: 10 kg
3	Bioretention system with sediment pond	10	SP:155 m^2 BS 330 m^2	Low flow piped diversion (e.g. 3 month flows)	Pipe connection to sediment pond	TSS: 10200 kg TP: 11 kg TN:77 kg
	Sediment pond	6 + 7	SP:800 m^2 Existing grassed channel length 335 m	**Catchment 6**: Low flow piped diversion (e.g. 3 month flows) **Catchment 7**: Redirected pipe flows (5 year)	Pipe connection to existing grassed channel	Treatment train performance: TSS: 33900 kg TP: 49 kg TN:158 kg

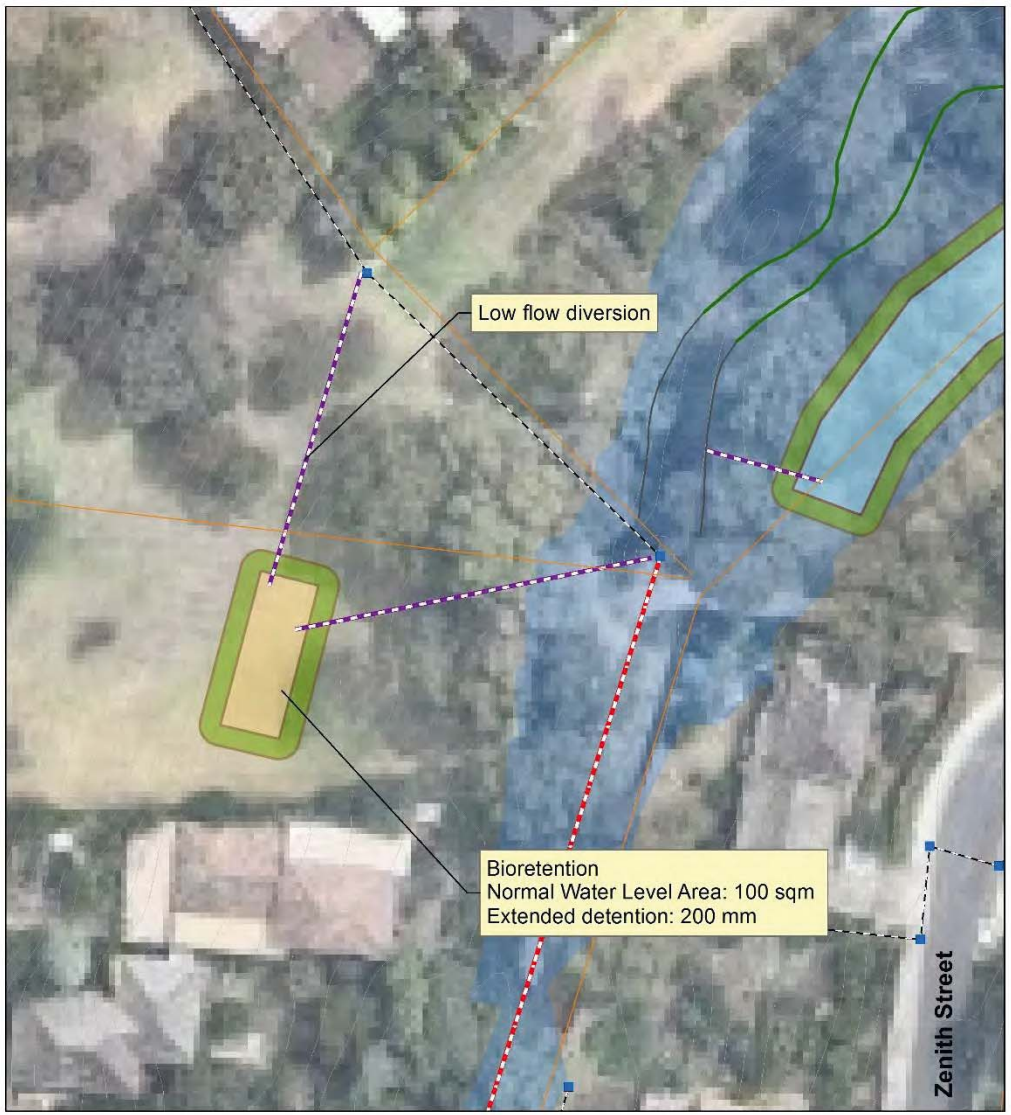


Opportunity 1
Gavan Park
(off Zenith Street)
Wetland

0 5 10 Meters

n

- Pit
- sewer
- MW pipe
- Stormwater pipe
- Natural drain
- Channel drain
- Contours (0.5 m)
- New pipe
- Bioretention
- Extended detention
- Sediment pond
- Wetland
- Flood extent

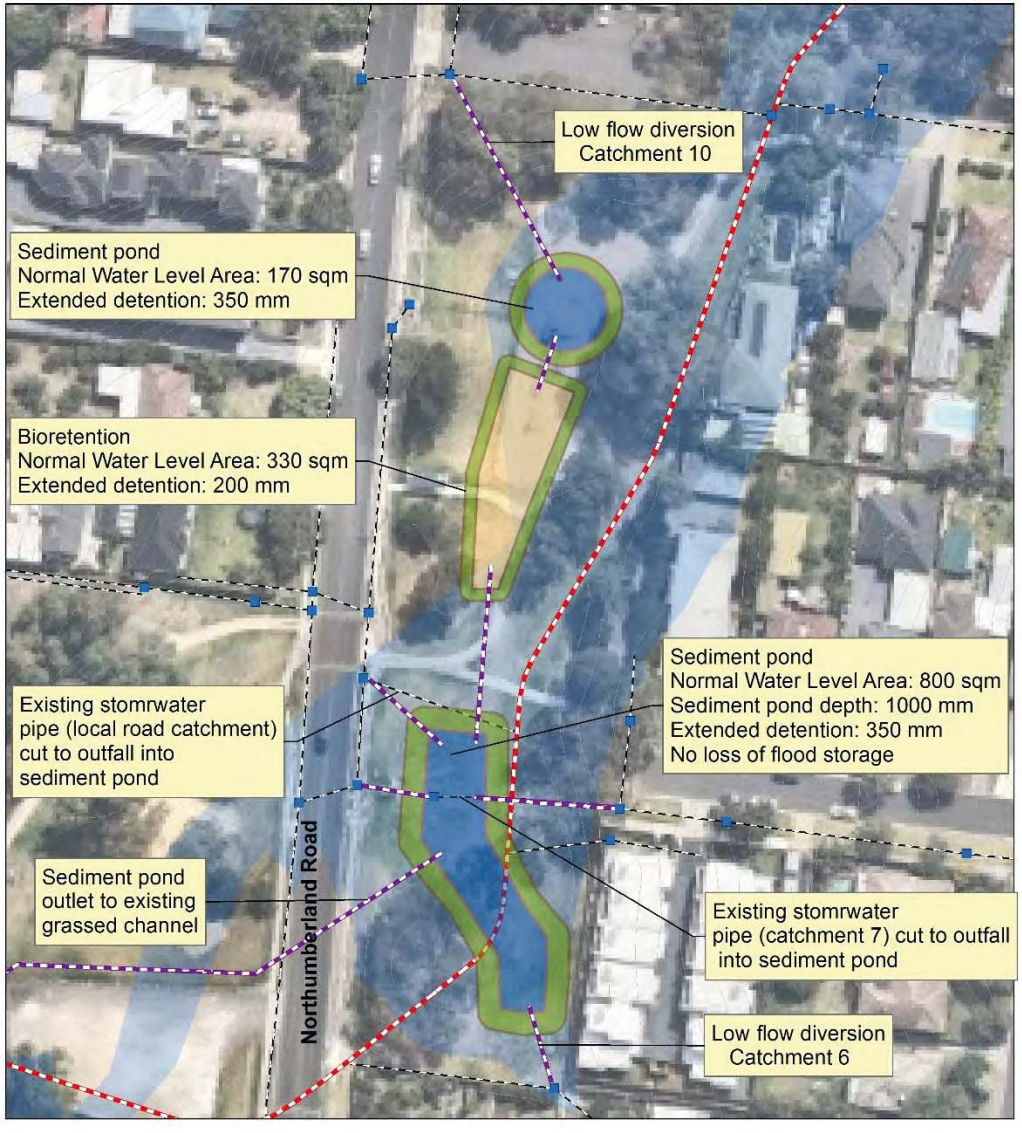


Opportunity 2
Gavan Park
(off Arnold Court)
Bioretention system

0 5 10 Meters

n

- Pit
- sewer
- MW pipe
- Stormwater pipe
- Natural drain
- Channel drain
- Contours (0.5 m)
- New pipe
- Bioretention
- Extended detention
- Sediment pond
- Wetland
- Flood extent

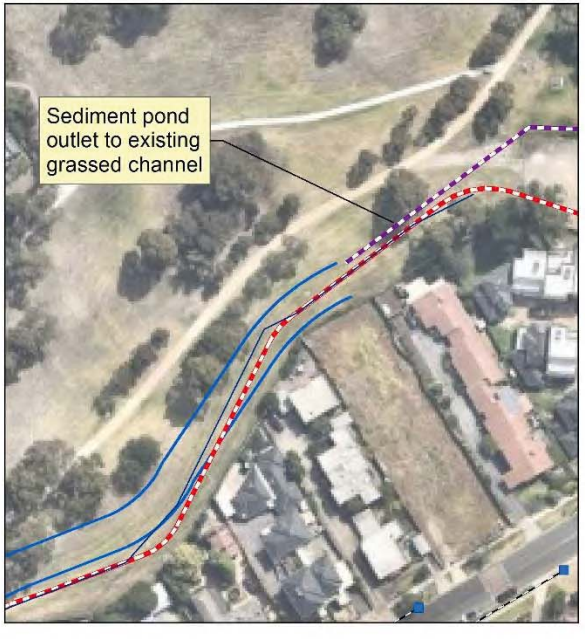


Opportunity 3
Northumberland Rd
Bioretention and
Sediment pond

0 10 20 Meters

n

- Pit
- MW pipe
- Stormwater pipe
- Natural drain
- Channel drain
- Contours (0.5 m)
- New pipe
- Bioretention
- Extended detention
- Sediment pond
- Wetland
- Flood extent



5 Other recommendations

- Other WSUD opportunities were investigated as part of this project. An additional wetland along Westbreen Creek located to the east of Northumberland Rd, supplied by a small sub-catchment, is feasible. However, the site is steep and the stormwater quality benefit small given the small size of the catchment. This opportunity was therefore rated as a low priority.

- Another opportunity is a stormwater harvesting scheme diverting water from the West Street Main Drain to irrigate Cole Reserve. A suitable approach would be to divert and pump low flows from downstream of the existing GPT to Cole Reserve for treatment, storage and reuse. Whilst flow diversion can occur off West Street Main drain, it is best for the stormwater harvesting treatment and storage facilities to be located at Cole Reserve where the irrigation operations will take place.

- The City of Melbourne investigation into large scale flood storage in the Moonee Ponds Creek Catchment identified flood storage and flow retardation in the Northern Golf course upstream of Westbreen Creek as a "high" priority opportunity for the catchment. The investigation shows that large scale flood storage in the Golf course will significantly reduce peak flows in Westbreen Creek. Lower flow velocities can be expected in the open waterway section in KW Joyce Reserve which will reduce the risk of erosion and help protect ecological habitat. Given the benefits to Westbreen Creek, flow retardation in the Northern Golf course, coupled with stormwater treatment and harvesting is highly recommended.

- Opportunities to include very low flows along the sections of the Westbreen Creek reserve that are currently piped has been explored.

    - Low flows are proposed along the existing swale in Austin Crescent from the WSUD assets along Northumberland Road. It is likely that the swale will be ephemeral in nature as it is will not hold water because of the high permeability created by the backfill material surrounding the Melbourne Water pipe. Given that permeability is unknown and potentially highly variable, a water balance assessment to inform planting strategy for the swale is difficult at this stage. The aim will be to fully plant out this swale. However initially we recommend that wet and dry zones are more observed with the wet zones planted first and drier areas retained as grass until additional budget was available to add these areas into the overall system. This will save costs and avoid potential large-scale planting failure.

    - It is impractical to divert low flows from the proposed WSUD into the upstream sections of the reserve in Gavan Park given the narrow reserve, presence of trees, and similarly high permeability created by the backfill material. Hence a sustainable indigenous design that represents a restored creek and provide habitat links – without adding more water to these zones which are already fed by legal point of discharge and the natural run off from the path and open space – is a more practical solution in Gavan Park. Similarly, in Payne reserve it may be possible to direct stormwater from the roadside into an elongated raingarden. Survey will be needed to confirm technical feasibility of this proposal, otherwise a similar solution to Gavan Park is recommended.

- A potential solution for improving flooding at the Gaffney Street intersection is to include a large culvert type arrangement under the railway track in a way that it could be used as an underpass. A flood modelling study would be required to assess feasibility of such a proposal, particularly to ensure new properties do not become flood affected.

APPENDIX 1 – ASSET TREATMENT PERFORMANCE

Opportunity 1 – Wetland (off Zenith Street)

Table 4. Treatment performance (Wetland – Catchment 14)

	Sources	Residual load	% Reduction	Best practice target
Total Suspended Solids (kg/yr)	7290	3690	49.4 %	80 %
Total Phosphorus (kg/yr)	16	10	38.3 %	45 %
Total Nitrogen (kg/yr)	117	92	20.9 %	45 %
Gross Pollutants (kg/yr)	1570	0	100 %	70 %

Opportunity 2 – Bioretention system (Gavan Park)

Table 5. Treatment performance (Bioretention system – Catchment 13)

	Sources	Residual load	% Reduction	Best practice target
Total Suspended Solids (kg/yr)	1180	131	88.9	80 %
Total Phosphorus (kg/yr)	2	1	45.1	45 %
Total Nitrogen (kg/yr)	18	7	59.5	45 %
Gross Pollutants (kg/yr)	233	0	100	70 %

Opportunity 3 – Treatment train consisting of bioretention system, large sediment pond and existing grassed channel

Table 6. Treatment performance (bioretention system – catchment 10)

	Sources	Residual load	% Reduction	Best practice target
Total Suspended Solids (kg/yr)	14700	4510	69.3 %	80 %
Total Phosphorus (kg/yr)	30	19	37.6 %	45 %
Total Nitrogen (kg/yr)	215	138	36.0 %	45 %
Gross Pollutants (kg/yr)	2850	138	95.1 %	70 %

Table 7. Treatment performance (bioretention system and large sediment pond – catchment 6, 7 and 10)

	Sources	Residual load	% Reduction	Best practice target
Total Suspended Solids (kg/yr)	68800	34900	49.3 %	80 %
Total Phosphorus (kg/yr)	143	94	34.5 %	45 %
Total Nitrogen (kg/yr)	1020	862	15.6 %	45 %
Gross Pollutants (kg/yr)	13600	667	95.1 %	70 %

Table 8. Treatment performance (bioretention system and large sediment pond and existing grassed channel)

	Sources	Residual load	% Reduction	Best practice target
Total Suspended Solids (kg/yr)	68800	33800	50.9 %	80 %
Total Phosphorus (kg/yr)	143	92	35.7 %	45 %
Total Nitrogen (kg/yr)	1020	831	18.6 %	45 %
Gross Pollutants (kg/yr)	13600	667	95.1 %	70 %

Appendix

B Westbreen Creek Birds Reporting Rate, Birdata, August 2018

Westbreen Creek – Joyce Reserve - Gavin Park – combined with number of times seen by Anna Lanigan and reporting rate. **Source: Birdata**

Common Name	Scientific Name	Count	Reporting Rate
Australian Magpie	Gymnorhina tibicen	29	96.67%
Australian Wood Duck	Chenonetta jubata	2	6.67%
Collared Sparrowhawk	Accipiter cirrocephalus	1	3.33%
Common Blackbird	Turdus merula	23	76.67%
Common Myna	Acridotheres tristis	29	96.67%
Common Starling	Sturnus vulgaris	4	13.33%
Crested Pigeon	Ocyphaps lophotes	5	16.67%
Eastern Rosella	Platycercus eximius	5	16.67%
Eastern Spinebill	Acanthorhynchus tenuirostris	2	6.67%
Galah	Eolophus roseicapilla	4	13.33%
Golden Whistler	Pachycephala pectoralis	1	3.33%
Grey Butcherbird	Cracticus torquatus	15	50.00%
Grey Fantail	Rhipidura fuliginosa	2	6.67%
House Sparrow	Passer domesticus	2	6.67%
Laughing Kookaburra	Dacelo novaeguineae	1	3.33%
Little Corella	Cacatua sanguinea	1	3.33%
Little Raven	Corvus mellori	16	53.33%
Little Wattlebird	Anthochaera chrysoptera	8	26.67%
Magpie-lark	Grallina cyanoleuca	16	53.33%
Musk Lorikeet	Glossopsitta concinna	1	3.33%
New Holland Honeyeater	Phylidonyris novaehollandiae	1	3.33%
Noisy Miner	Manorina melanocephala	16	53.33%
Pacific Black Duck	Anas superciliosa	8	26.67%
Pied Currawong	Strepera graculina	7	23.33%
Rainbow Lorikeet	Trichoglossus moluccanus	28	93.33%
Red Wattlebird	Anthochaera carunculata	30	100.00%
Red-rumped Parrot	Psephotus haematonotus	1	3.33%
Scarlet Robin	Petroica multicolor	1	3.33%
Silver Gull	Chroicocephalus novaehollandiae	1	3.33%
Spotted Dove	Streptopelia chinensis	24	80.00%
Spotted Pardalote	Pardalotus punctatus	2	6.67%
Sulphur-crested Cockatoo	Cacatua galerita	6	20.00%
Tawny Frogmouth	Podargus strigoides	3	10.00%
Welcome Swallow	Hirundo neoxena	1	3.33%
White-browed Scrubwren	Sericornis frontalis	1	3.33%
White-faced Heron	Egretta novaehollandiae	1	3.33%
White-plumed Honeyeater	Ptilotula penicillata	15	50.00%
Willie Wagtail	Rhipidura leucophrys	7	23.33%
Yellow-rumped Thornbill	Acanthiza chrysorrhoa	1	3.33%

Appendix

C Westbreen Creek Community Consultation Summary, Moreland City Council, Feb 2019

WESTBREEN CREEK CONSERVATION AND DEVELOPMENT PLAN CONSULTATION SUMMARY

Theme and community comments & questions	Recommendations
BINS / RUBBISH	
What is being done to clean up the natural section of the creek north of Arndt Road?	There is an existing Gross Pollutant Trap which takes rubbish from the West Street Drain that enters the creek in KW Joyce Reserve. However, a large amount of rubbish still enters the waterway through here which suggests the servicing levels on the GPT are insufficient. The Plan recommends a review of the servicing level and making sure this meets demand. This action is also picked up in Council's recent Waste and Litter Strategy and reviewing GPTs more generally. the WLS also provides further recommendations on ways to address litter issues at the source to reduce the potential of it getting into the stormwater network. The plan also recommends Council supporting the adjacent PVGS with their litter management programs to reduce surface litter blowing into the reserve.
Concern about litter in the creek and park	Review of servicing levels
More rubbish bins	Will be considered as part of the review
TRANSPORT	
Could a safer crossing be established at Arndt Road? Consider pedestrian priority?	Will be considered as part of the detailed design and consultation
Could a safer crossing be established at Northumberland Road? Consider pedestrian priority?	Will be considered as part of the detailed design and consultation
Support for extended linear path connection through to Moonee Ponds Creek	Remains in Plan
Support for safe pedestrian path on west side of Railway Pde	Remains in Plan
More detail on vehicle control barriers and signage at Arndt are crossing	Will be considered as part of the detailed design and consultation
Crossing at Gaffney St/Railway Parade - connections to the station - can it be made safer?	Council is working with VicRoads and VicTrack on pedestrian improvements as part of a current renewal of the precinct
Reduce speeds on Gaffney Street and improve pedestrian safety	May be considered as part of current Council renewal project
Support for Council advocacy on level crossing removal for Gaffney Street - new open space and improved, safe connection to Moonee Ponds Creek	To be forwarded on to Transport and Places team
Support for closure of Penzance Rd	Remains in Plan; detailed design and community consultation will follow
Support and one objection to east west shared path in Joyce Reserve	Will be considered as part of the detailed design and consultation
Require more details around Penzance Rd closure and pedestrian upgrades to Arndt Rd and Northumberland Rd	Will be considered as part of the detailed design and consultation
Strong objections to opening up pedestrian path at rear of Cornwall Rd on safety and privacy grounds	Removed from the Plan

Concern about 'highway' shared path in the park/busy	Retain existing hierarchy of paths with the exception of new east west shared path link in Joyce Reserve
SIGNAGE	
"This is our park. Pick up your rubbish"	Local Law enforcement is often more effective
History of the parks and land	Interpretative signage is considered in the Plan
Joyce Reserve	
Need to tackle litter problem from the school	Engage school and discuss litter awareness and clean-up activities
Improve interface between school and park	Engage school to review options
Revegetate and tackle erosion of former quarry	Assess risk issues and erosion with soil amelioration and revegetation
DOGS	
Ongoing conflict between dogs / shared path users / playspace	Local Law Enforcement campaign with some subtle signage in bollards
Concerns about dogs entering the waterway / proposed wetland	Local Law Enforcement campaign with some subtle signage in bollards
Enforce dog on leash local law	Local Law Enforcement campaign with some subtle signage in bollards
Retain dog off leash status and spaces	No changes proposed
Expand dog off leash area to Austin Crescent Reserve	No changes proposed
More dog bowls on drinking fountains	Dog bowls shall be included in all new drinking fountains unless within play space
CAR PARKS	
Lock gates on car parks in the evenings	To be assessed
Seal Austin Crescent car park with landscaping to reduce hoon behaviour	Remains in Plan
Introduce parking restrictions around Gaffney Pascoe Vale retail area	Forwarded to Transport Unit for response
GAVIN PARK	
Existing small timber shelter leaks	Renewal of park will include shelter
Gavin Park is the main destination / play / picnic area.	Noted
Support for conversion of play space to wetland	Remains in Plan
Request for some fitness stations like the ones at Coburg lake	Remains in Plan
Request to maintain grass space for informal/ball play etc and amenities	Remains in Plan
Recommend formalising path between 25 & 27 Zenith St	To be reviewed
AUSTIN CRESCENT RESERVE	
Late night use of car park / antisocial behaviour	Review potential to lock car park gates in the evening in Austin Crescent
Car park being used by residents due to overdevelopment / not enough parking per dwelling	Review potential to lock car park gates in the evening in Austin Crescent
Include one more toilet	Not supported with improved pedestrian safety works to crossing on Northumberland Rd
Concerns about b/ball and fitness equipment being too close to residents	Reviewed and redesigned

PLAY SPACES	
Reconsider community need for new play space in Joyce Reserve	Play space to be built based on review of demographics and play space gap analysis
Protect vegetation around Austin Crescent Reserve play space renewal	Noted
Retain clown face swing with 1 request to remove	Detailed design and community consultation to follow
Objections to basketball half court with concerns about noise and anti-social behaviour	Detailed design and community consultation to follow
Include toilet in play space renewal	Not supported with improved pedestrian safety works to crossing on Northumberland Rd
LIGHTING AND SAFETY	
Request to improve lighting along length of walking path from Railway Parade to Northumberland Rd in Joyce Reserve	Lighting will be extended through to Essex St but not supported by Council's Lighting in Open Space Policy
Include CCTV in car parks if not closed	Review potential to lock car park gates in the evening in Austin Crescent
NATURE & VEGETATION	
Love the natural landscape/shade provided by all the trees - more trees	Noted
Introduce ESO for vegetation protection in and abutting the Westbreen Creek through to golf course	To be forwarded to Strategic Planning for review
Community clean ups/planting days etc	Noted and in the Plan
Concerned by lack of understorey vegetation for habitat	To be forwarded to Open Space Maintenance Unit and in the Plan
Increase shade tree planting	To be forwarded to Open Space Maintenance Unit and in the Plan
Retain Willow and Poplar trees	Willow should be retained but Poplars will be removed
WETLAND	
Support for wetlands and daylighting	Noted
Concern about impact of wetlands on flooding	Will be considered as part of the detailed design and consultation
will people be locked out (habitat only zone)?	Will be considered as part of the detailed design and consultation
concern about 'swamp'/mozzies/snakes	Will be considered as part of the detailed design and consultation
Wetland needs fencing to keep dogs out	Will be considered as part of the detailed design and consultation
What is the cost of the wetland construction	Will be considered as part of the detailed design and consultation
Try and retain existing vegetation as part of wetland works	Will be considered as part of the detailed design and consultation
OPEN SPACE	
Include provision for the acquisition of rear of properties on Longview and Zenith Streets	To be reviewed by Open Space Planner and Property Unit in line with existing recommendations
Protect topography of hilly open space	In the Plan
Acquire land to improve open space corridor	To be reviewed by Open Space Planner and Property Unit
Increase open space maintenance intervention levels	To be forwarded to Open Space Maintenance Unit for review

Reduce erosion by formalising goat tracks with unsealed path	In the Plan
Maintain paths and hierarchy	In the Plan
OTHER ISSUES	
Concern about state of Raeburn Reserve	Raeburn Reserve currently undergoing sportsfield renewal with play space renewal planned for 2020
Renew James Reserve and Bocce courts	To be forwarded to Open Space Maintenance Unit for review
Concern about over development and loss of vegetation	Council have recently reviewed medium density and are proposing amendments to the Planning Scheme to improve the provision of vegetation
Concern about poor development outcomes which exacerbate flooding	To be forwarded to Engineering Unit of Council for comment
Call for ESO to protect vegetation through Westbreen Creek corridor	To be forwarded to Strategic Planning for review
Concern about sewer, drainage infrastructure requirements with development in the area	To be forwarded to Engineering Unit of Council for comment
Edits to the document	Include in final Plan