Camden Council
Attachments

Ordinary Council Meeting
27 May 2014

Camden Civic Centre
Oxley Street
Camden

ORDINARY COUNCIL

ATTACHMENTS - ORDINARY COUNCIL

ORD01

Attachment 1

CAMDEN COUNCIL

SEKISUI HOUSE

THE HERMITAGE - WESTERN PRECINCT

BULK EARTHWORKS PLAN

DEVELOPMENT APPLICATION

BULK EARTHWORKS GENERAL NOTES:

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH CAMDEN COUNCILS ENGINEERING STANDARDS, SPECIFICATIONS AND THE REQUIREMENTS OF COUNCIL ENGINEER AS DIRECTED BY SUPERINTENDENT.
2. SURVEY MARKS:- a) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERVISING SURVEYOR MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES, OUT-HOUSES, CAR BODIES AND DEBRIS ETC.
7. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
8. EXISTING DAM, SCOURS AND WATERCOURSES SHALL BE DEWATERED AND DESILTED. LEVELS SHALL BE OBTAINED ON SOUND MATERIAL PRIOR TO FILLING.
9. SITE FILL AREAS - THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
10. ALL SITE FILLING TO BE COMPACTED TO 98% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S WORKS SPECIFICATION.
11. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEER'S REQUIREMENTS, OR AS SHOWN ON THE PLANS.
12. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
13. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
14. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.

LOCALITY SKETCH

PLAN NUMBER	PLAN TITLE	REVISION
9553/DA600	COVER SHEET	A
9553/DA601	LAYOUT SHEET	A
9553/DA602	DETAIL PLAN SHEET 1	A
9553/DA603	DETAIL PLAN SHEET 2	A
9553/DA604	DEPTH RANGE PLAN	A
9553/DA605	SITE SECTIONS A & B	A
9553/DA606	SITE SECTION C	A
9553/DA607	SITE SECTIONS D, E & F	A
9553/DA608	SOIL, WATER & TREE MANAGEMENT PLAN	A

LEGEND

PROPOSED	DESCRIPTION	EXISTING
101.0	CONTOURS	108.0
	EXTENT OF WORKS	
	STAGE BOUNDARY	
	FILL AREA	
	CUT AREA	
	TREES TO BE REMOVED	
	TREES TO BE RETAINED	

Survey By:

YSCO Geomatics
Land Resource Consultants

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Artarmon NSW, 2064
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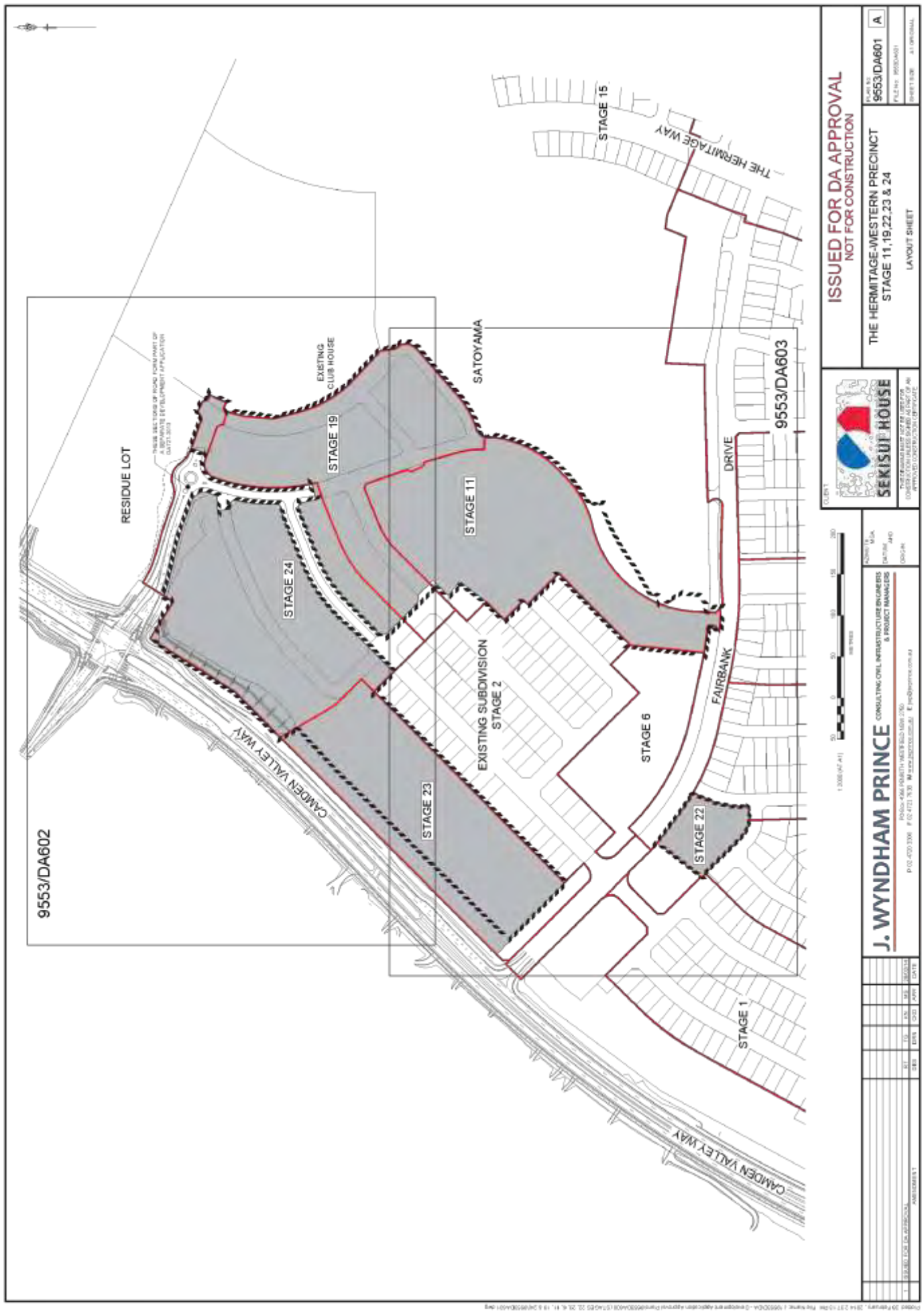
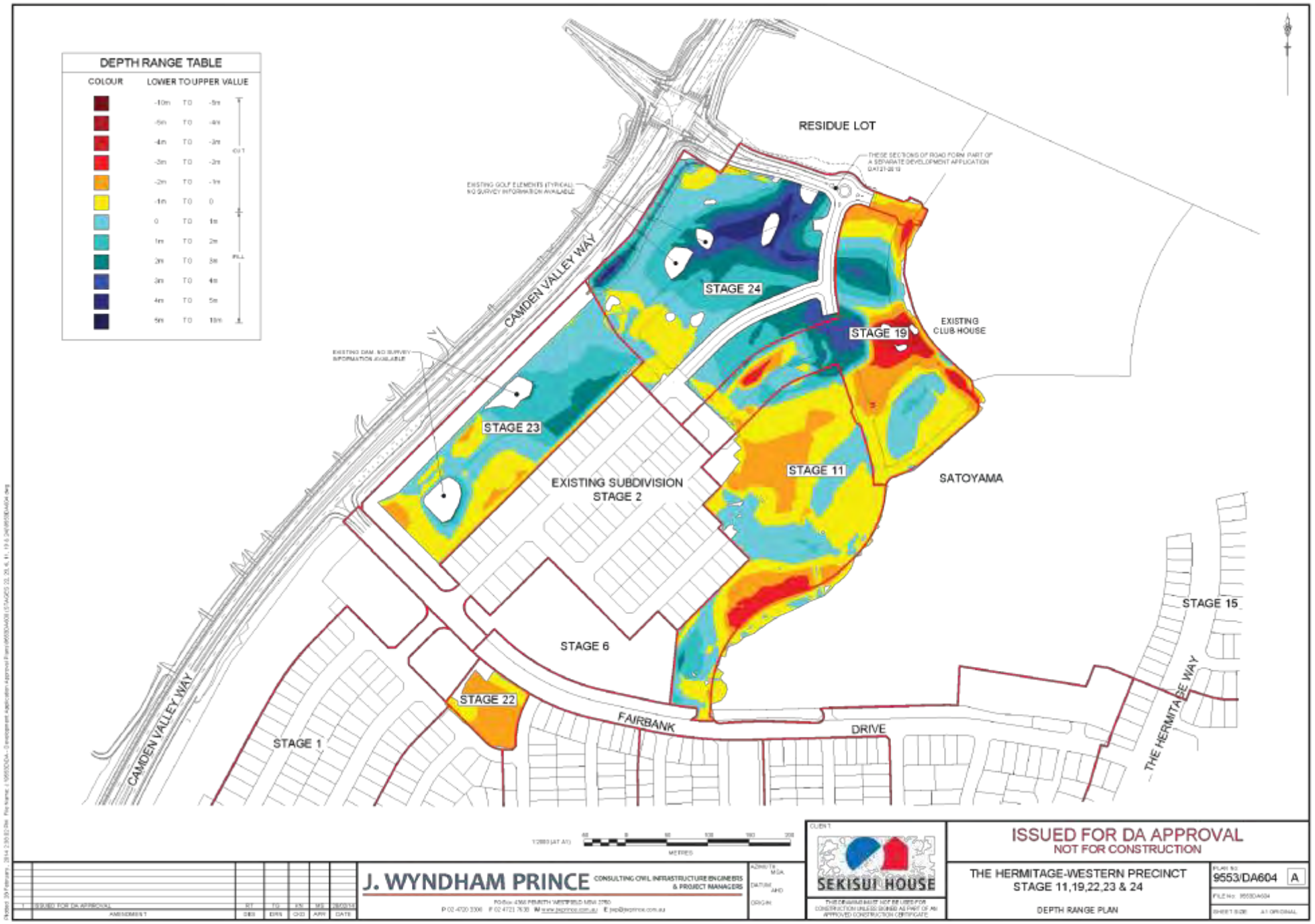
ISSUED FOR DA APPROVAL
NOT FOR CONSTRUCTION

PLAN No 9553/DA600 A

ORD01

Attachment 1




DEPTH RANGE TABLE
COLOUR
LOWER TO UPPER VALUE
-10m TO -5m
-5m TO -4m
-4m TO -3m
-3m TO -2m
-2m TO -1m
-1m TO 0
0 TO 1m
1m TO 2m
2m TO 3m
3m TO 4m
4m TO 5m
5m TO 10m
CUT
FILL
RESIDUE LOT
THESE SECTIONS OF ROAD FORM PART OF A SEPARATE DEVELOPMENT APPLICATION DA121-2013
EXISTING GOLF ELEMENTS (TYPICAL) NO SURVEY INFORMATION AVAILABLE
CAMDEN VALLEY WAY
EXISTING DAM. NO SURVEY INFORMATION AVAILABLE
STAGE 24
STAGE 19
EXISTING CLUB HOUSE
STAGE 23
STAGE 11
SATOYAMA
EXISTING SUBDIVISION STAGE 2
STAGE 15
STAGE 6
STAGE 22
FAIRBANK
DRIVE
THE HERMITAGE WAY
STAGE 1
CAMDEN VALLEY WAY
METRES
J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
SEKISUI HOUSE
ISSUED FOR DA APPROVAL
NOT FOR CONSTRUCTION
THE HERMITAGE-WESTERN PRECINCT
STAGE 11,19,22,23 & 24
DEPTH RANGE PLAN
9553/DA604
A

CAMDEN COUNCIL

DRAFT PLANNING PROPOSAL

Amendment No. 33 – Amendment to rezone Canal Land Gregory Hills – Amendment to Camden Local Environmental Plan 2010

Date: April 2014 (Version C)

ORD02

Attachment 1

Contents

BACKGROUND

This Planning Proposal has been prepared on behalf of Dart West Developments in relation to a parcel of land which forms part of the Marist Brothers land holding, directly adjoining the Gregory Hills development. The parcel of land is identified as Lot 51 in DP1134649, which sits between the existing residential zoned land within the Turner Road Precinct West and the Sydney Catchment Authority Upper Sydney Canal land holding to the east.

The land ownership details of the subject site had not been confirmed during the rezoning of the Turner Road Precinct, and as such, the subject land was inadvertently not included in the Turner Road Precinct.

As a result, the land is currently incorrectly zoned as infrastructure land associated with the Sydney Catchment Authority Upper Sydney Canal. The subject site does not form part of the Upper Sydney Canal lands, and is therefore required to be rezoned to correct this anomaly.

The site is located within the Camden Council Local Government area approximately 6km northeast of the Camden town site, 20km southwest of the Liverpool CBD and 50km southwest of the Sydney CBD. The future South West Growth Centre regional centre of Leppington is approximately 7.5km to the northeast.

This lot has an area of 15,137m^2 and is generally 445m in length and has a varying width of between 30 and 60m. The lot is currently zoned SP2 under the Camden LEP 2010 as it had previously been identified as part of the Upper Sydney Canal land.

This Planning Proposal seeks to amend the land use controls and zoning mapping under the Camden Local Environmental Plan 2010, to be generally consistent with those in the adjoining residential lands which form the Turner Road Precinct. Without proceeding with this proposed rezoning, the land would become an isolated and unusable pocket of land between Gregory Hills and the Canal. The rezoning of the land to facilitate residential development would ensure orderly planning of the Gregory Hills project. The zoning of the canal lands would remain unchanged, ensuring that the statutory land use arrangements correctly reflect the land ownership pattern. It is proposed to rezone the land from SP2 Infrastructure to R1 General Residential to be consistent with the adjoining land use.

The following chapters in this Planning Proposal report provide a more detailed justification of the proposal, and expand on the matters outlined above.

ORD02

Attachment 1

Locality Plan

Site Plan


LEGEND
Planning Proposal Area
Gregory Hills Project Boundary

PART 1 – OBJECTIVES OR INTENDED OUTCOMES

As discussed in the introduction, the subject site (Lot 51, DP 1134649) is currently zoned as infrastructure land under the Camden Local Environmental Plan 2010 and has been incorrectly associated with the Upper Sydney Canal.

The subject site was not re-zoned under the Turner Road Precinct Plan Sydney Growth Centres SEPP as the land ownership was unclear at this point in time, and the land area was located outside of the Growth Centres Precinct boundary.

Following the rezoning of the Turner Road Precinct, further detailed investigations have been undertaken which confirmed that the subject lot forms part of the land which is owned by the Marist Brothers, and which is logically included in the Gregory Hills development, rather than being retained as part of the school operational land.

Given that the land area does not form part of the Sydney Canal lands, the objective of this Planning Proposal is to amend the zoning and land use controls to reflect the zoning adopted for the adjoining residential land within the Turner Road Precinct.

If Council receives a favourable gateway determination, amendments to the Turner Road DCP and the VPA will be made to give effect to the proposed additional public open space and development contributions.

PART 2 – EXPLANATION OF PROVISIONS

The objectives of this Planning Proposal are to be achieved by amending the Camden Local Environmental Plan (LEP) 2010 mapping as described below and in the maps accompanying this planning proposal.

Copies of the existing LEP Maps relevant to this Planning Proposal are included in Attachment 4. The specific amendments to the LEP Maps are included in Attachments 1 to 3 and a summary of the Maps to be amended under this proposal are outlined below.

1. **Amendment to the following Camden LEP Zoning Map :**

   Land Zoning Map - Sheet LZN_017

2. **Amendment to the following Camden LEP Lot Size Map:**

   Lot Size Map - Sheet LSZ_017

3. **Amendment to the following Camden LEP Height of Building Map:**

   Height of Buildings Map - Sheet HOB_017

It is proposed to zone the land R1 – Residential and provide for a minimum lot size of 450 square metres and a maximum building height of 9.5 metres reflecting the nature of the development adjoining this land.

PART 3 – JUSTIFICATION

Section A – Need for the Planning Proposal

1. Is the planning proposal a result of any strategic study or report?

This Planning Proposal has been prepared on behalf of Dart West Developments in relation to land within the Marist Brothers Land holding that was previously incorrectly identified as infrastructure land associated with the Upper Sydney Canal.

While the Planning Proposal has not been prepared as a direct result of a strategic study, the rezoning of the Turner Road Precinct has identified this land ownership/zoning anomaly.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The modifications sought in this Planning Proposal are the best means of achieving the objectives and intended outcomes. Given the proposed amendments relate to statutory land use mapping outcomes contained in the LEP, other available processes are not considered an appropriate means of achieving the objectives and intended outcomes promoted by this Planning Proposal.

The Planning Proposal seeks amendment to the current Camden LEP 2010, rather than seek modification of the South West Growth Centre boundary to include the land. This is reflective of recent decisions by the Department of Planning & Infrastructure and current rezoning proposals within the region adjoining the Growth Centre.

3. Is there a net community benefit?

As suggested in the Department's Local Plan-Making Guidelines, the Evaluation Criteria to undertake a Net Community Benefit analysis has been adapted from the Draft Centres Policy (April 2009). In some cases the Evaluation Criteria have been modified or removed to ensure the criteria are meaningful to this Planning Proposal.

The Canal Land Planning Proposal generates a need for an additional 2,055m^2 of open space based on a provision rate of 2.83ha/1000 people, which is consistent with the Growth Centres Development Code. The Turner Road DCP 2007 and Dart West (Gregory Hills) VPA will be amended to include this additional open space provision which will benefit the local community. The Turner Road DCP will be updated as part of a future 'housekeeping' review of the document.

The discussion below demonstrates that there is significant net community benefit resulting from the Planning Proposal.

Net Community Benefit Evaluation Criteria	Response
Will the LEP be compatible with agreed State and regional strategic direction for development in the area (e.g. land release, strategic corridors, development within 800 metres of a transit node)?	The proposal is consistent with the State and regional strategic direction for development relating to housing growth in the area. The subject land will form part of an identified urban growth area.

Net Community Benefit Evaluation Criteria	Response
Is the LEP located in a global/regional city, strategic centre or corridor nominated within the Metropolitan Strategy or other regional/ subregional strategy?	The subject site for this Planning Proposal is not located in a global/ regional city, strategic centre of corridor nominated within the Metropolitan Strategy or other regional / subregional strategy. The land is however located adjacent to the Turner Road Precinct of the South West Growth Centre.
Is the LEP likely to create a precedent or create or change the expectations of the landowner or other landholders?	The proposal will not create a precedent or change land owner expectations of development.
Will the LEP facilitate a permanent employment generating activity or result in a loss of employment lands?	The proposal will not result in any increase, or decrease in existing zoned employment lands within the Camden LEP.
Will the LEP impact upon the supply of residential land and therefore housing supply and affordability?	The Planning Proposal will facilitate a minor increase in the supply of residential land within the locality and therefore enhance affordability within the region.
Is the existing public infrastructure (roads, rail, and utilities) capable of servicing the proposed site? Is there good pedestrian and cycling access? Is public transport currently available or is there infrastructure capacity to support future public transport?	The subject site adjoins the Turner Road Precinct release area of the South West Growth Centre. Detailed planning and provision of public infrastructure has been undertaken as part of the rezoning process and the wider Growth Centres release area. The proposed road and public transport infrastructure network will adequately accommodate the minor increase in developable land associated with this proposal.
Will the proposal result in changes to the car distances travelled by customers, employees and suppliers? If so, what are the likely impacts in terms of greenhouse gas emissions, operating costs and road safety?	The proposal will not result in any modifications to the planned road network and travel distances, times and road safety matters. The proposal does facilitate the provision of residential housing in an area which has high levels of planned access to local educational, retail and open space facilities within the Gregory Hills project. The land is also well located in terms of access to future planned public transport networks.

Net Community Benefit Evaluation Criteria	Response
Are there significant Government investments in infrastructure or services in the area whose patronage will be affected by the proposal? If so, what is the expected impact?	There are significant investments occurring in public infrastructure within the locality associated with development of the Growth Centre. The rezoning of land proposed will have a positive benefit in supporting the viability of these investments through enhanced patronage of public transport, schools and other infrastructure.
Will the proposal impact on land that the Government has identified a need to protect (e.g. land with high biodiversity values) or have other environmental impacts? Is the land constrained by environmental factors such as flooding?	There are no environmental constraints associated with the subject land or this proposal.
Will the LEP be compatible / complementary with surrounding land uses? What is the impact on amenity in the location and wider community? Will the public domain improve?	The proposal is compatible and complementary with adjacent proposed residential land development. The rezoning of the land will facilitate the orderly development of the Gregory Hills project. There will be no impact on the operational or zoning arrangements of the adjoining Sydney Catchment Authority land. The Planning Proposal will not impact on water quality associated with the Canal.
Will the proposal increase choice and competition by increasing the number of retail and commercial premises operating in the area?	The proposal does not incorporate any modifications to retail or commercial land uses in the area.
What are the public interest reasons for preparing the draft plan? What are the implications of not proceeding at that time?	The public has an interest in this proposal progressing as it will allow for the facilitation of increased housing development which will provide housing choice and affordability. This Planning Proposal also provides clarity for the land owners regarding the extent of the Upper Sydney Canal lands and associated infrastructure zonings.

Section B – Relationship to strategic planning framework.

3. Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

Draft Metropolitan Strategy for Sydney 2031

The NSW Government released the draft Metropolitan Strategy for Sydney 2031 in March 2013. This Metropolitan Strategy sets the framework for Sydney's growth and prosperity to 2031 and beyond.

The draft Metropolitan Strategy for Sydney 2031 sets down ambitious housing delivery targets across the Sydney Metropolitan region of 545,000 new dwellings, with 64,000 being delivered within the South West sub-region.

The South West Subregion Plan identifies the subject site as being adjacent to the South West Growth Centre. The Growth Centre has been established to provide for urban growth and work is currently being undertaken to deliver residential and employment development.

The Planning Proposal is consistent with the objectives and direction of the draft Metropolitan Strategy for Sydney 2031 as it will support the balanced growth of Sydney, ensure housing growth can meet market demand, and provide for housing opportunities in an area with high levels of access to planned employment, transport and infrastructure.

The proposed amendments to Camden Council LEP are relatively minor in nature, and will not adversely impact on the objectives and actions of any strategy.

This Planning Proposal will assist in the on-going delivery of housing in the South West subregion in a project which is well located relative to infrastructure being provided to service growth.

4. Is the planning proposal consistent with the local Council's Community Strategic Plan, or other local strategic plan?

Camden Council's endorsed local strategic plan is 'Camden 2040 - Working Together to Achieve the Community's Vision for the Future'.

Camden 2040 has a vision to effectively manage its growth whilst promoting a prosperous local economy, with thriving local businesses and local employment. Part of successfully managing growth is to overcome a key challenge of "Achieving a balance between large population increases and keeping the valued characteristics of Camden as it is now will be an ongoing tension and challenge over the coming decades."

The specific key challenges for growing the Camden Area which relate to the Proposal include:

- Creating good quality, liveable urban environments with a greater density than is currently available in the Camden area, including providing a range of efficient, affordable and innovative housing styles and public urban and open spaces.

- The importance of building and maintaining certainty and investment confidence within the area through efficient and stable strategic planning and development control processes.

The key strategies to meet the above challenges include:

- Learning from and improving the urban planning process over time so that lessons learned from each precinct planning process, as well as industry best practice, are used in subsequent precincts to ensure improved outcomes over time
- Prioritising environmental outcomes through the planning and development process to maximise improvement and restoration opportunities and to minimise the ecological impacts of increased urban form, economic activity, and people and lifestyles.
- Ensuring greater choice and diversity in housing to meet a range of existing and future community needs

This Planning Proposal will fulfil these key strategies through ensuring that there is certainty and consistency in the delivery of urban growth areas within Camden and delivering further choice in housing diversity.

5. Is the planning proposal consistent with applicable state environmental planning policies?

The State Environmental Planning Policies (SEPPs) that are relevant to this Planning Proposal are identified below.

State Environmental Planning Policy	Applicable	Comment	Consistent
Standard Instrument (Local Environmental Plans) Order 2006	Y	The land subject to this Planning Proposal is not located within the Growth Centres SEPP boundary, but does directly adjoins land rezoned under Appendix 1 of the SEPP, being the Oran Park & Turner Road Precinct Plan. The objective of this Planning Proposal is to amend the zoning and land use controls to reflect the zoning adopted for the adjoining residential land within the Turner Road Precinct. This will ensure consistency in the character of development with the adjoining Turner Road Precinct.	Y

Standard Instrument—Principal Local Environmental Plan	n/a		
State Environmental Planning Policy No 1—Development Standards	n/a		
State Environmental Planning Policy No 4—Development Without Consent and Miscellaneous Exempt and Complying Development	n/a		
State Environmental Planning Policy No 6—Number of Storeys in a Building	n/a		
State Environmental Planning Policy No 14—Coastal Wetlands	n/a		
State Environmental Planning Policy No 15—Rural Landsharing Communities	n/a		
State Environmental Planning Policy No 19—Bushland in Urban Areas	Y	The land subject to this Planning Proposal is subject to the provisions of SEPP 19. The land does not contain any bushland or vegetation, and is therefore consistent with the objectives of the SEPP.	Y
State Environmental Planning Policy No 21—Caravan Parks	n/a		
State Environmental Planning Policy No 22—Shops and Commercial Premises	n/a		
State Environmental Planning Policy No 26—Littoral Rainforests	n/a		
State Environmental Planning Policy No 29—Western Sydney Recreation Area	n/a		
State Environmental Planning Policy No 30—Intensive Agriculture	n/a		
State Environmental Planning Policy No 32—Urban Consolidation (Redevelopment of Urban Land)	n/a		
State Environmental Planning Policy No 33—Hazardous and Offensive Development	n/a		

State Environmental Planning Policy No 36—Manufactured Home Estates	n/a		
State Environmental Planning Policy No 39—Spit Island Bird Habitat	n/a		
State Environmental Planning Policy No 44—Koala Habitat Protection	n/a		
State Environmental Planning Policy No 47—Moore Park Showground	n/a		
State Environmental Planning Policy No 50—Canal Estate Development	n/a		
State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas	n/a		
State Environmental Planning Policy No 55—Remediation of Land	n/a		
State Environmental Planning Policy No 59—Central Western Sydney Regional Open Space and Residential	n/a		
State Environmental Planning Policy No 60—Exempt and Complying Development	n/a		
State Environmental Planning Policy No 62—Sustainable Aquaculture	n/a		
State Environmental Planning Policy No 64—Advertising and Signage	n/a		
State Environmental Planning Policy No 65—Design Quality of Residential Flat Development	n/a		
State Environmental Planning Policy No 70—Affordable Housing (Revised Schemes)	n/a		
State Environmental Planning Policy No 71—Coastal Protection	n/a		
State Environmental Planning Policy (Affordable Rental Housing) 2009	n/a		
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	n/a		
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	n/a		

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	n/a		
State Environmental Planning Policy (Infrastructure) 2007	n/a		
State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007	n/a		
State Environmental Planning Policy (Kurnell Peninsula) 1989	n/a		
State Environmental Planning Policy (Major Development) 2005	n/a		
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	n/a		
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	n/a		
State Environmental Planning Policy (Rural Lands) 2008	n/a		
State Environmental Planning Policy (SEPP 53 Transitional Provisions) 2011	n/a		
State Environmental Planning Policy (State and Regional Development) 2011	n/a		
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	n/a		
State Environmental Planning Policy (Sydney Region Growth Centres) 2006	n/a		
State Environmental Planning Policy (Temporary Structures) 2007	n/a		
State Environmental Planning Policy (Urban Renewal) 2010	n/a		
State Environmental Planning Policy (Western Sydney Employment Area) 2009	n/a		
State Environmental Planning Policy (Western Sydney Parklands) 2009	n/a		
Sydney Regional Environmental Plan No 8 (Central Coast Plateau Areas)	n/a		
Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995)	n/a		
Sydney Regional Environmental Plan No 16—Walsh Bay	n/a		

Sydney Regional Environmental Plan No 18—Public Transport Corridors	n/a		
Sydney Regional Environmental Plan No 19—Rouse Hill Development Area	n/a		
Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997)	Y	The land subject to this Planning Proposal is within the SREP No 20 applicable area. Future detailed development proposals will comprehensively consider the requirements of SREP No 20 to ensure appropriate environmental considerations to water quality, heritage, flora and fauna, etc. are undertaken. Existing controls relating to Environmental Management in Section B1 the Camden DCP 2011 will ensure that water quality targets are achieved. Accordingly, the Planning Proposal is consistent with SREP No 20.	Y
Sydney Regional Environmental Plan No 24—Homebush Bay Area	n/a		
Sydney Regional Environmental Plan No 25—Orchard Hills	n/a		
Sydney Regional Environmental Plan No 26—City West	n/a		
Sydney Regional Environmental Plan No 28—Parramatta	n/a		
Sydney Regional Environmental Plan No 30—St Marys	n/a		
Sydney Regional Environmental Plan No 33—Cooks Cove	n/a		
Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005	n/a		

6. Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

Each s117 Ministerial Direction is listed below with an annotation stating whether it is relevant to the Planning Proposal and confirming its consistency.

s.117 Direction Title	Applies	Consistency of Planning Proposal
1.1 Business and Industrial Zones	NA	This direction does not apply as the planning proposal does not affect land within an existing or proposed Business or Industrial zone.
1.2 Rural Zones	NA	This direction does not apply as the planning proposal does not affect land within an existing or proposed rural zone.
1.3 Mining, Petroleum Production and Extractive Industries	NA	This direction does not apply as the planning proposal does not propose any modification to the permissibility or operational restrictions relating to extractive industries.
1.4 Oyster Aquaculture	NA	This direction does not apply as the planning proposal does not incorporate any land within a Priority Oyster Aquaculture Areas and oyster aquaculture outside such an area as identified in the NSW Oyster Industry Sustainable Aquaculture Strategy (2006) ("the Strategy").
1.5 Rural Lands	NA	This direction does not apply as the planning proposal does not affect land within an existing or proposed rural or environmental protection zone.
2.1 Environment Protection Zones	NA	This direction does not apply as the planning proposal does not affect land within an existing or proposed Environmental Protection zone.
2.2 Coastal Protection	NA	This direction is does not apply as the planning proposal does not affect land within a coastal zone.
2.3 Heritage Conservation	Y	The Planning Proposal is consistent with this direction as the Heritage Conservation provisions will be retained within the LEP. The impact on heritage items is discussed further below.
2.4 Recreation Vehicle Areas	NA	This direction does not apply as the planning proposal does not seek to develop land for the purpose of a recreation vehicle area.

s.117 Direction Title	Applies	Consistency of Planning Proposal
3.1 Residential Zones	Y	The Planning Proposal is consistent with this Ministerial Direction as the proposal will allow for the provision of a variety and housing types make the best use of existing infrastructure and will not impact on the environment or resource lands.
3.2 Caravan Parks and Manufactured Home Estates	Y	The planning proposal is consistent with this direction as it does not modify provisions relating to the permissibility of caravan parks and the like.
3.3 Home Occupations	Y	The planning proposal is consistent with this direction as it does not modify provisions relating to the permissibility of home occupations within dwellings.
3.4 Integrating Land Use and Transport	Y	The Planning Proposal is consistent with this Ministerial Direction. The design and zoning controls of the site, adjoining the Turner Road Precinct will facilitate the State Governments Integrated Land Use Policies.
3.5 Development Near Licensed Aerodromes	N/A	This direction is not applicable as the planning proposal will not create, alter or remove a zone or a provision relating to land in the vicinity of a licensed aerodrome.
3.5 Shooting Ranges	N/A	This direction is not applicable as the planning proposal will not affect, create, alter or remove a zone or a provision relating to land adjacent to and/ or adjoining an existing shooting range.
4.1 Acid Sulphate Soils	NA	This direction is not applicable as the land has not been identified as acid sulphate soils under the Standard Instrument Camden LEP 2010.
4.2 Mine Subsidence and Unstable Land	NA	This direction is not applicable as the land is not identified as being within a Mine Subsidence area.
4.3 Flood Prone Land	NA	This direction is not applicable as the planning proposal does not remove or alter provisions relating to flood prone land.

s.117 Direction Title	Applies	Consistency of Planning Proposal
4.4 Planning for Bushfire Protection	Y	The upper north-western corner of the subject land is identified as being Bush Fire Prone Land – Vegetation Buffer under the Camden Council Bushfire Prone Land Map 2009. As required by the direction consultation with the Rural Fire Service is to be undertaken.
5.1 Implementation of Regional Strategies	NA	This direction is not applicable as the planning proposal does not fall under any specific regional strategy.
5.2 Sydney Drinking Water Catchments	NA	This direction does not apply to the Camden Council Area, therefore is not applicable to the land.
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	NA	This direction is not applicable to the subject land.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	NA	This direction is not applicable to the subject land.
5.8 Second Sydney Airport: Badgerys Creek	NA	This direction is not applicable to the subject land.
6.1 Approval and Referral Requirements	Y	The Planning Proposal is consistent with this direction as it does not alter any approval or referral requirements.
6.2 Reserving Land for Public Purposes	Y	The Planning Proposal is inconsistent with the direction as it seeks to rezone land previously identified as SP2 Infrastructure land as part of the Upper Sydney Canal. However, the land does not form part of the Canal.
6.3 Site Specific Provisions	Y	The Planning Proposal is consistent with this direction as does not seek to insert any additional site specific provisions within the Camden LEP 2010.
7.1 Implementation of the Metropolitan Strategy	Y	The Planning Proposal is consistent with this direction as it meets objectives of the Metropolitan Plan.

Section 117 Directions - 2.3 Heritage Conservation

Upper Sydney Canal

Item (4) of Section 117 Direction 2.3 – Heritage conservation requires that a planning proposal must contain provisions that facilitate the conservation of:

> *(a) items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area,*

As described above, following the rezoning of the Turner Road Precinct, further detailed investigations have been undertaken which confirmed that the subject lot forms part of the Marist Brothers land holding, and does not include any part of the Upper Sydney Canal Sydney Catchment Authority land.

Notwithstanding, Section 5.10 - Heritage Conservation of the Camden LEP outlines the objectives to protect heritage items in the Camden Local Government Area. No modifications to Section 5.10 of the LEP are sought under this Planning Proposal.

Therefore, the Planning Proposal is considered to be consistent with Section 117 Direction - 2.3 Heritage Conservation.

Remnant Bunya Pine

The GCC Turner Road Precinct Heritage Assessment prepared by Godden Mackay Logan in 2007 identified that an existing remnant Bunya Pine located on the southern boundary of the subject land marked the location of the former St Gregory's Cottage adjoining the Upper Sydney Canal.

While the Bunya Pine is not a listed Heritage Item, it was recommended that the tree be retained for the purposes of interpreting this remnant cultural planting as a landscape element associated with the former cottage.

The retention of the Bunya Pine will be addressed as part of the detailed design for the surrounding residential development.

Section C – Environmental, social and economic impact.

7. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

As identified in the subject site photo in Section 1.2 of this proposal, the land area is predominantly cleared and has been subject to grazing and agricultural activities associated with the St Gregory's College.

Camden Council's Environmentally Sensitive Land Map 2013 does not identify any endangered or core habitat vegetation within the subject land.

It is therefore not expected that the Planning Proposal will adversely impact on any critical habitat or threatened species, populations or ecological communities, or their habitats, environmental values or matters of environmental significance.

8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

The subject land has been cleared and does not contain and environmentally significant features.

Existing controls relating to Environmental Management in Section B1 the Camden DCP 2011 will ensure that environmental impacts associated with the development of the site for residential purposes will be ameliorated.

9. How has the planning proposal adequately addressed any social and economic affects?

The planning proposal seeks to amend the zoning of the subject site zoned SP2 Infrastructure as part of the Upper Sydney Canal land.

The site adjoins the canal, however, should the proposal be accepted by the Gateway and the amendments take place there should be no social or economic effects on the canal.

Section D – State and Commonwealth interests.

10. Is there adequate public infrastructure for the planning proposal?

The subject site is adjacent to a major urban growth area of South West Sydney. A comprehensive assessment on infrastructure needs was undertaken at the Precinct Planning stages of planning for the Turner Road Precinct and public infrastructure needs to accommodate the demands of an increased urban development have been determined.

The Planning Proposal seeks to allow for the facilitation of general residential development which is likely to accommodate up to 22 additional dwellings. This is a very minor increase in the total dwelling yield of the Turner Road Precinct which is approximately 4,400 dwellings.

As such, the proposal will not create any additional needs for public infrastructure for the locality.

11. What are the views of state and Commonwealth public authorities consulted in accordance with the gateway determination?

Given the minor nature of this Planning Proposal no State or Commonwealth public authorities have been consulted.

PART 4 – MAPS

The specific amendments to the LEP Maps are included in Attachments 1 to 3 and a summary of the Maps to be amended under this proposal are outlined below.

4. **Amendment to the following Camden LEP Zoning Map :**

   Land Zoning Map - Sheet LZN_017

5. **Amendment to the following Camden LEP Lot Size Map:**

   Lot Size Map - Sheet LSZ_017

6. **Amendment to the following Camden LEP Height of Building Map:**

   Height of Buildings Map - Sheet HOB_017

PART 5 – COMMUNITY CONSULTATION

The Planning Proposal is considered to be "low impact" as it is consistent with surrounding land uses and the strategic planning framework, and presents no infrastructure issues. Accordingly, an exhibition period of the amended SEPP documentation should extend for a maximum of 28 days. It is likely that an amendment to the Dart West (Gregory Hills) VPA will be exhibited concurrently with the Planning Proposal as this will facilitate the dedication and embellishment of open space to meet the demand generated by the proposed development.

Community consultation will be commenced by giving notice of the public exhibition of the Planning Proposal:

1. in a newspaper that circulates in the area affected by the Planning Proposal;
2. on the Camden Council website; and
3. in writing to adjoining landowners.

PART 6 – PROJECT TIMELINE

Anticipated commencement date (date of Gateway determination)	**May 2014**
Anticipated timeframe for the completion of required technical information	**N/A**
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	**June/July 2014**
Commencement and completion dates for	**June/July 2014**

public exhibition period	
Dates for public hearing (if required)	N/A
Timeframe for consideration of submissions	**August 2014**
Timeframe for the consideration of a proposal post exhibition	**August 2014**
Date of submission to the department to finalise the LEP	**September 2014**
Anticipated date RPA will make the plan (if delegated)	**1 October 2014**
Anticipated date RPA will forward to the department for notification	**1 October 2014**

CONCLUSION

As discussed in detail above, this Planning Proposal has been prepared on behalf of Dart West Developments in relation to land within the Marist Brothers land holding that was previously identified as infrastructure land associated with the Sydney Catchment Authority Upper Sydney Canal.

As such, this Planning Proposal seeks to amend the land use controls and zoning mapping under the Camden Local Environmental Plan 2010, to be generally consistent with those in the adjoining residential lands which form the Turner Road Precinct. A minimum lot size of 450 square metres and maximum height of buildings of 9.5 metres is proposed, which will result in a built form that is consistent with the adjacent residential development.

An amendment to the Camden LEP Maps through the Gateway Process is the most appropriate method to affect the intended outcome of this proposal. In addition, the proposal will have a positive community benefit outcomes and is supported by Section 117 Directions and State Environmental Planning Policies.

Accordingly, progression of the proposal to the LEP Gateway is sought.

SCHEDULE OF ATTACHMENTS

Attachment 1: Proposed Amendments to Camden Local Environmental Plan 2010 Land Zoning Map

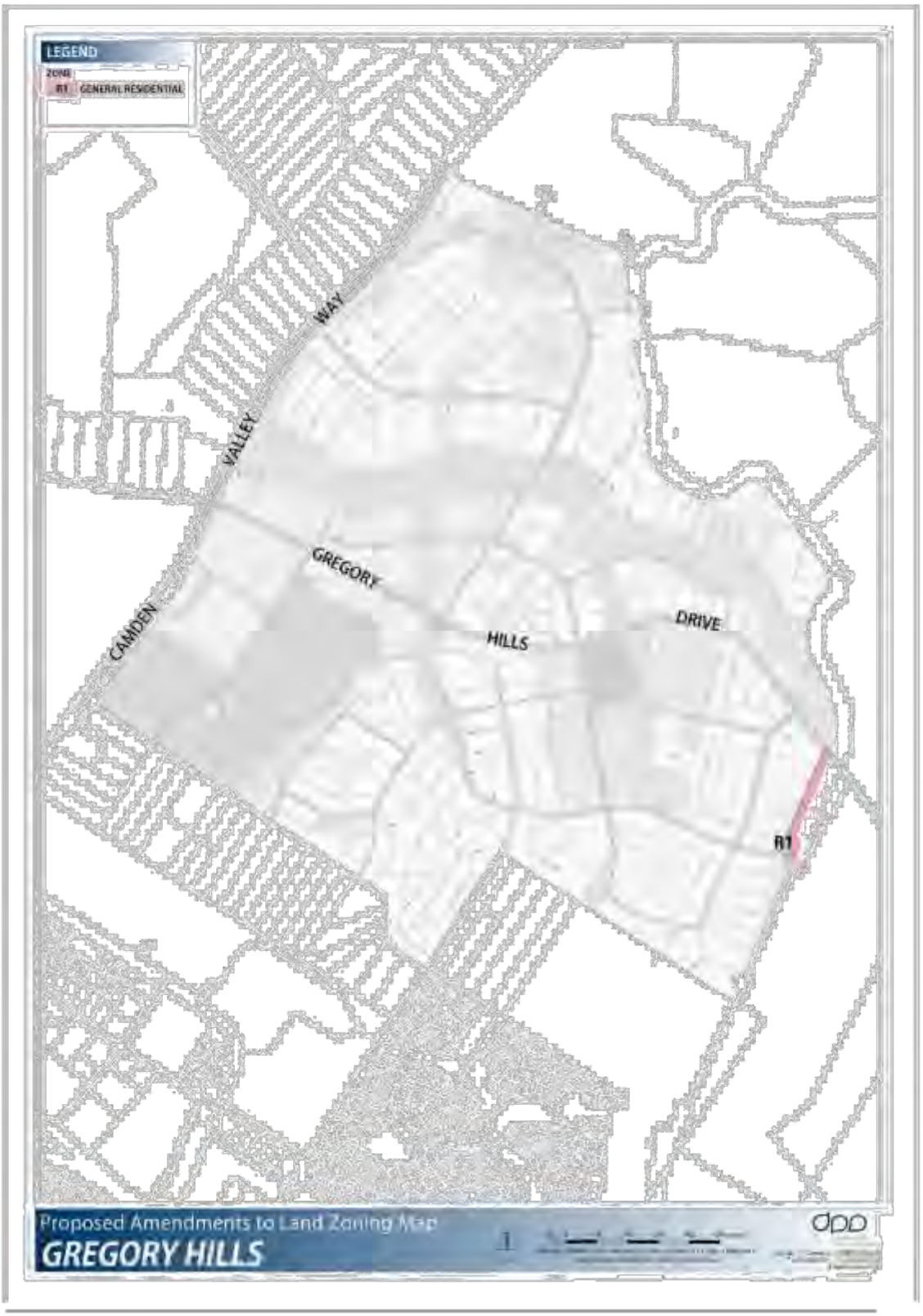
Attachment 2: Proposed Amendments to Camden Local Environmental Plan 2010 Lot Size Map

Attachment 3: Proposed Amendments to Camden Local Environmental Plan 2010 Height of Building Map

Attachment 4: Existing Camden Local Environmental Plan 2010 Maps

Attachment 1

Proposed Amendments to Camden Local Environmental Plan 2010 Land Zoning Map

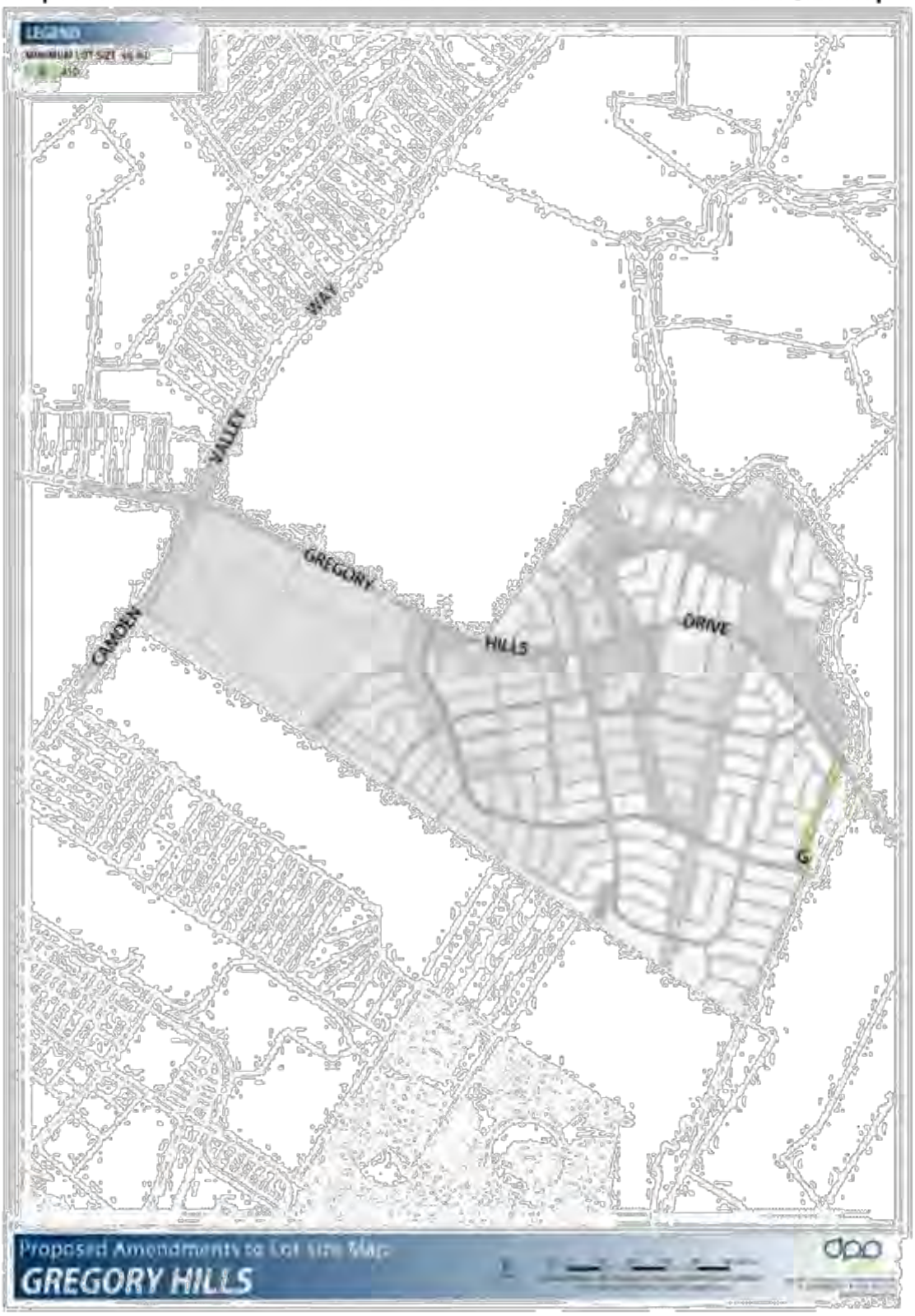


ORD02

Attachment 1

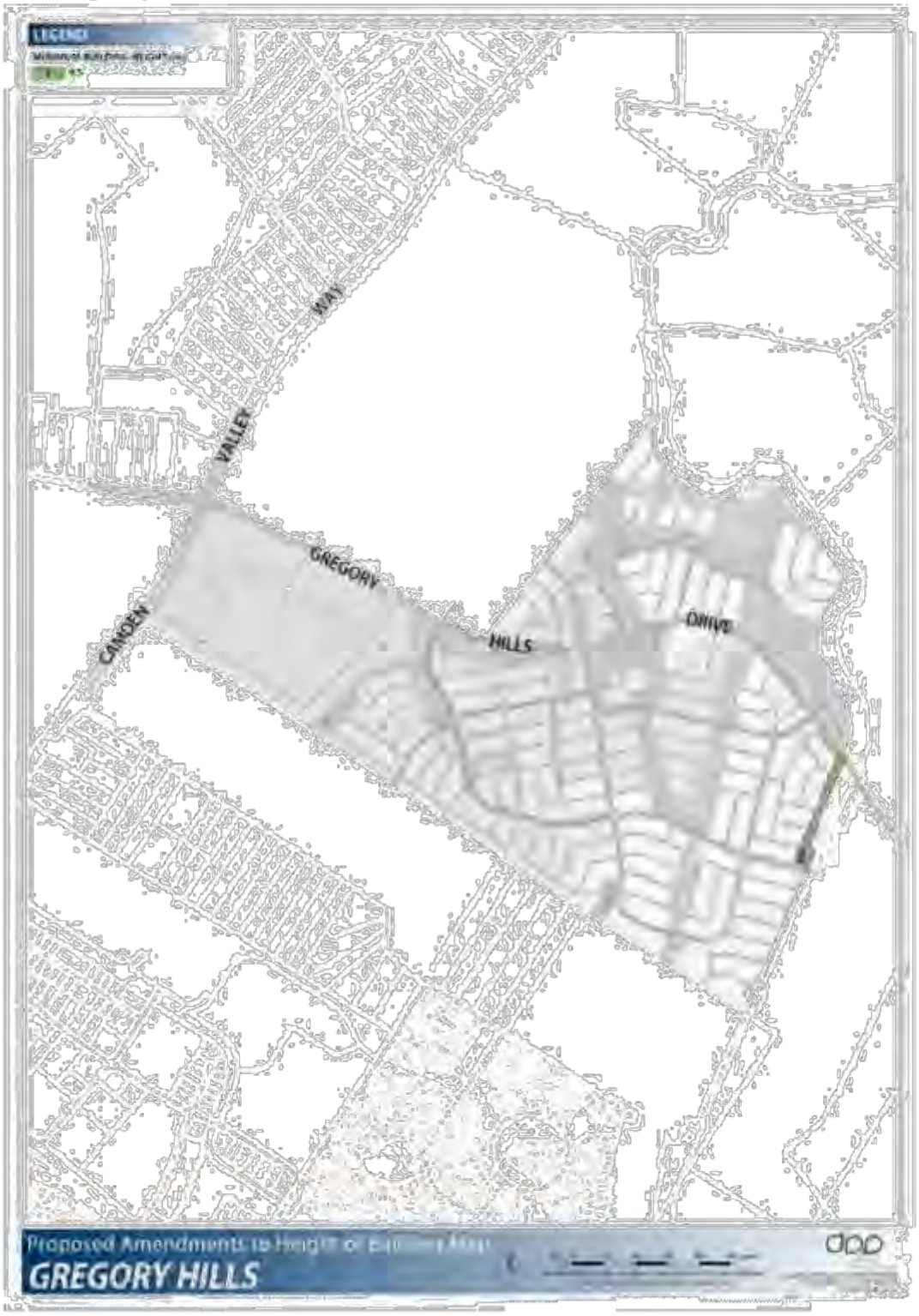
Attachment 2

Proposed Amendments to Camden Local Environmental Plan 2010 Lot Size Map



Attachment 3

Proposed Amendments to Camden Local Environmental Plan 2010 Height of Building Map

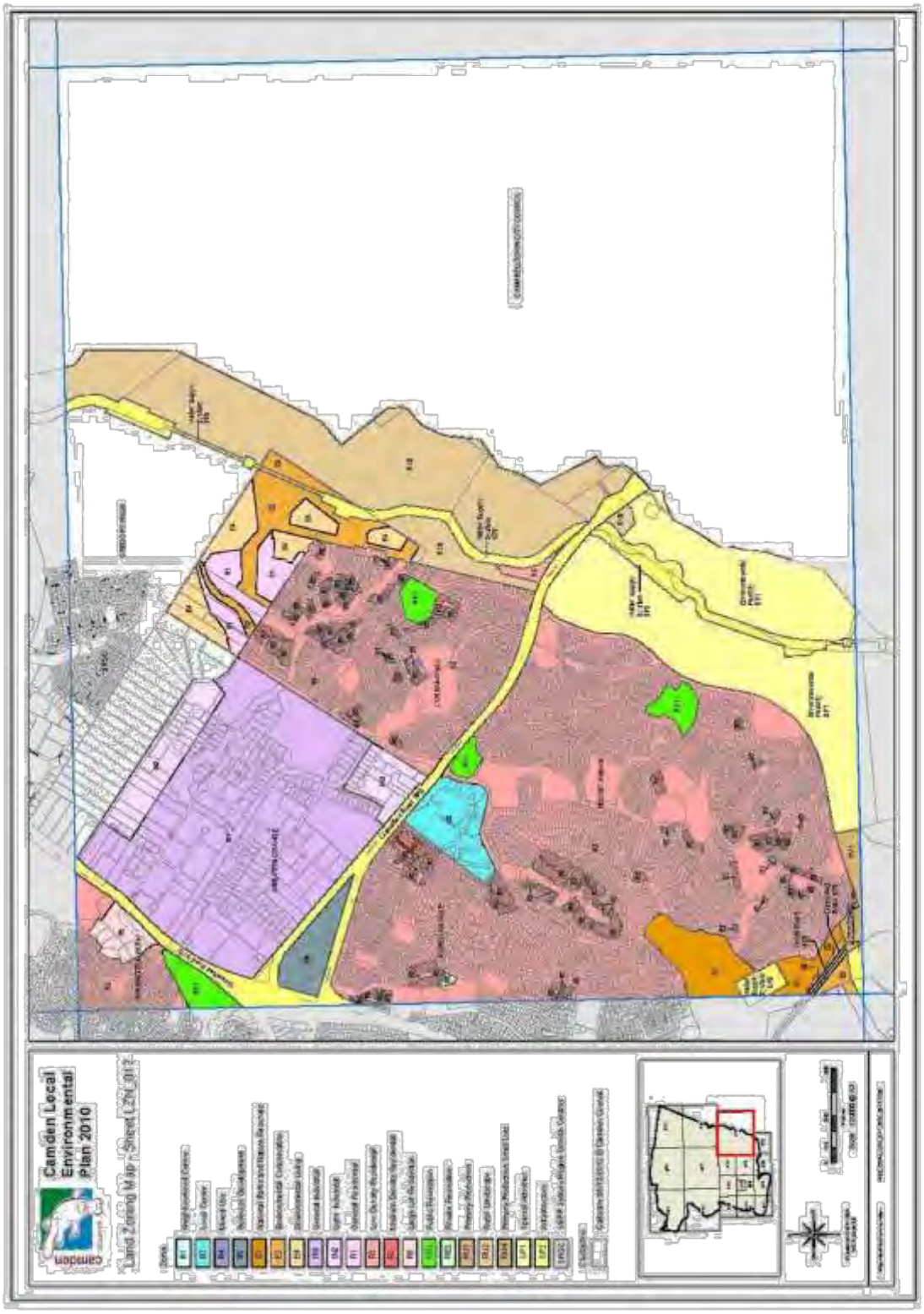


ORD02

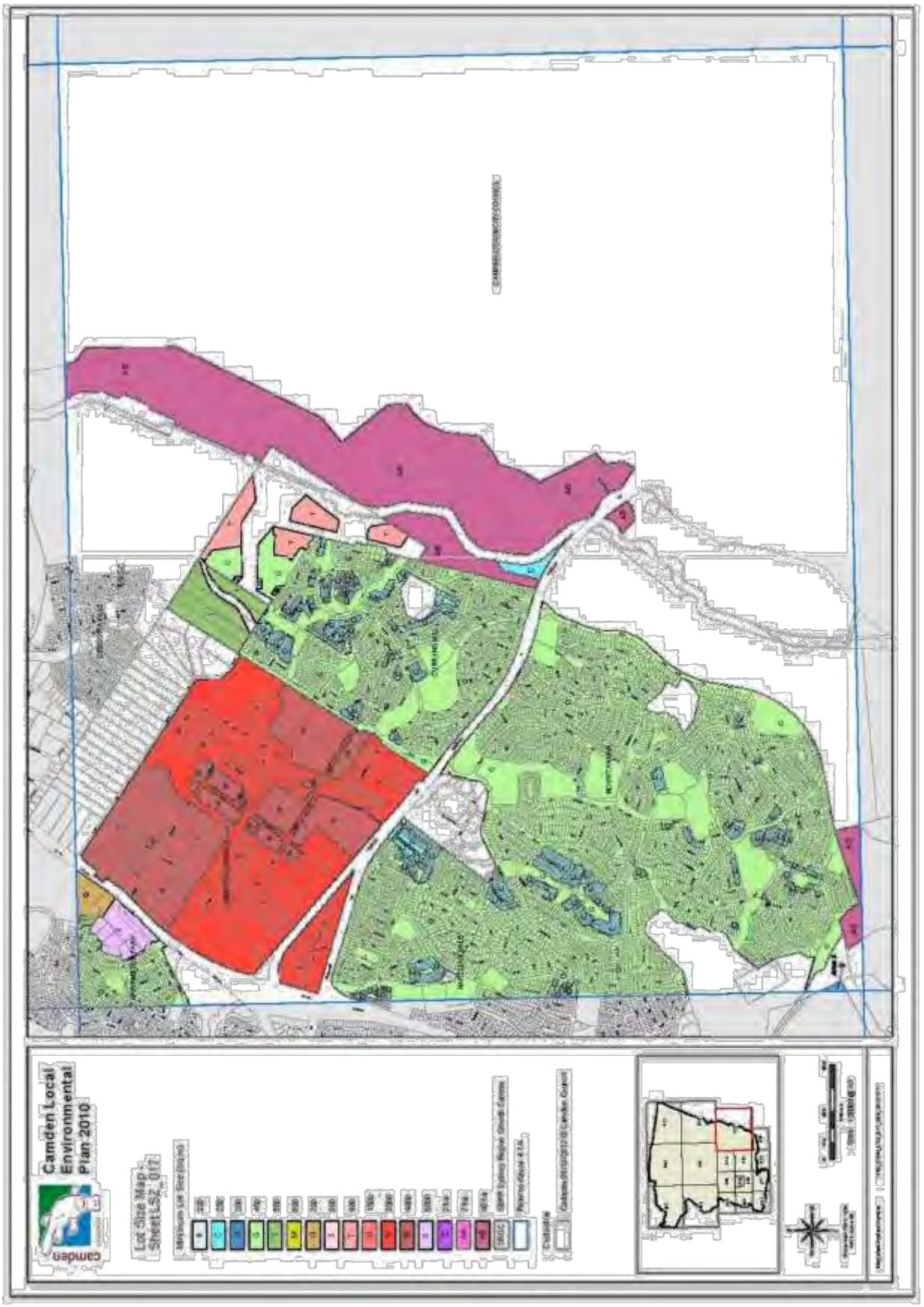
Attachment 1

Attachment 4

Existing Camden Local Environmental Plan 2010 Maps



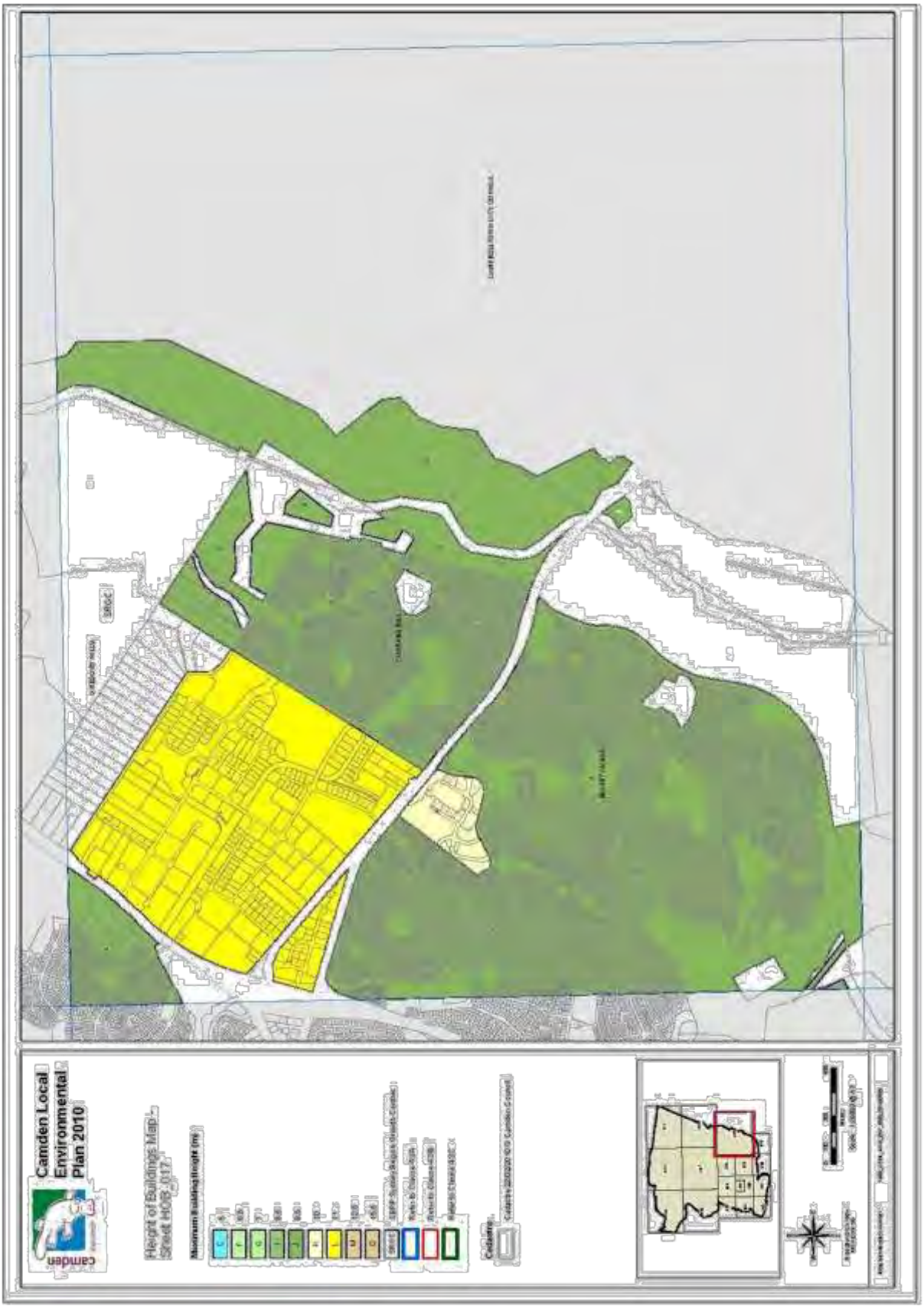
Amendment No. 33 – Canal Land Gregory Hills – Amendment to Camden Local Environmental Plan 2010



ORD02

Attachment 1

Amendment No. 33 – Canal Land Gregory Hills – Amendment to Camden Local Environmental Plan 2010



ORD03

Attachment 1

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote			Description	Comments
Expense $	Income $	Totals $		
Note:	INCOME - Increases are shown as positives figures. Reductions are shown as negative figures EXPENDITURE - Increases are shown as positive figures. Reductions are shown as negative figures			
1) Proposed Budget Variations Proposed variations to the 2013/14 Budget based on income received and expenditure payments to date are as follows:				
28,509	**853,311**	**824,802**	**Surplus / (Deficit) - Approved Budget Variations September 2013/14 Review**	
25,504	**741,604**	**716,100**	**Surplus / (Deficit) - Proposed Budget Variations December 2013/14 Review**	
-	317,000	317,000	Development - Fees & Charges Income	Development income continues to exceed budget expectations during 2013/14. This is due to the high volume and high value of Development Applications received during the third quarter of 2013/14. This increase reflects the ongoing high development activity in the release areas of Spring Farm, Elderslie, Oran Park and Gregory Hills. The level of income received from development activity is primarily dependent on the receipt of applications from developers, and as such is somewhat difficult to project given the unprecedented growth Council is experiencing.
-	166,000	166,000	Governance - Electricity Easement Compensation	At its meeting on 25 March 2014, Council endorsed the creation of easements across 4 parcels of Council owned land in relation to the Lodges Road to Oran Park electricity upgrade. The easements will allow for transmission lines to be installed servicing the Oran Park development. The total compensation to be received for the approval of these easements is $166,000.
-	70,000	70,000	Corporate Management - General Fund Interest on Investments	The third quarter performance of Council's investment portfolio has exceeded budget expectations. Although the increase in income is a good result, it is expected that returns will reduce as long-term investments are re-invested at much lower interest rates. The impact of lower interest rates on Council's budget has already been factored into the projected return on investments for 2013/14. Council's weighted return on investments for April 2014 was 4.04% which is significantly higher than the industry average of 2.68%.
-	60,000	60,000	Risk Management - WHS Performance Incentive Rebate	Council has recently completed a desktop audit of its workers compensation initiatives and met all KPI's required by its insurers. As a result Council has received a WHS performance incentive of $60,000.
(45,000)	-	45,000	Park Improvements - Kirkham Netball Courts Pavement Rehabilitation	Rehabilitation works at Kirkham Netball courts are nearing completion. Savings have been realised against original budget projections.
(38,836)	-	38,836	Councillors Program - MACROC Contribution	A review of annual operating expenditure was recently completed by member Councils of MACROC. This review has resulted in a decrease in the expected contribution amount required from Council in 2013/14.
-	33,366	33,366	Risk Management - Motor Vehicle Insurance Refund	Council has received an insurance premium refund in relation to its motor vehicle insurance for 2012/13. Council pays a set premium each year for its motor vehicles (based on an agreed claims figure with its insurer). Claims made during the 2012/13 year were below the agreed figure with Councils insurer and as such, a partial refund of the premium was received in March 2014.
29,127	-	(29,127)	Council Properties - Building Water Charges	Water charges for Council owned buildings have exceeded budget projections. This is a result of additional buildings and facilities handed over to Council in growth areas and a range of expenditure increases across Council's properties.
15,000	-	(15,000)	Community Events - Camden Council 125 Year Anniversary	Council celebrated its 125 year anniversary in April 2014. To mark this occasion Council held a community event at Chellaston Park (in conjunction with the formal opening of Little Sandy Bridge).
30,745	52,163	21,418	Variations under $15,000	
(8,964)	**698,529**	**707,493**	**Surplus / (Deficit) - Proposed Budget Variations March 2013/14 Review**	
45,049	**2,293,444**	**2,248,395**	**Surplus / (Deficit) - Net Impact of Variations 2013/14**	

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote Expense $	Change in Vote Income $	Change in Vote Totals $	Description	Comments
Note:	INCOME - Increases are shown as positives figures. Reductions are shown as negative figures EXPENDITURE - Increases are shown as positive figures. Reductions are shown as negative figures			
2) Council Approved Budget Variations Since adopting the 2013/14 Budget, Council has authorised the following changes to the budget:				
3,251,135	**2,426,333**	**(824,802)**	**Surplus / (Deficit) - Authorised Variations September 2013/14 Budget Review**	
1,333,850	**617,750**	**(716,100)**	**Surplus / (Deficit) - Authorised Variations December 2013/14 Budget Review**	
41,820	-	-	Environmental Education - Wood Smoke Reduction Program	Authorised Council Resolution 15/14 - 28/01/2014
-	41,820		Grant Income - EPA Wood Smoke Reduction	
40,000	-	-	Recreation Admin - Nepean River Recreation Feasibility Study	Authorised Council Resolution 19/14 - 11/02/2014
-	20,000		Grant Income - NSW Maritime Better Boating Program	
-	20,000		Capital Works Reserve - Transfer from Reserve	
10,000	-	39,000	Bridge Replacement - Little Sandy Bridge	Authorised Council Resolution 69/14 - 25/03/2014
-	49,000		Grant Income - RMS Cycleways Program Grant	
91,820	**130,820**	**39,000**	**Surplus / (Deficit) - Authorised Variations March 2013/14 Budget Review**	
4,676,805	**3,174,903**	**(1,501,902)**	**Surplus / (Deficit) - Council Approved Variations 2013/14**	
3) Contra Adjustments Contra adjustments that have a NIL impact on Council's Budget:				
8,386,583	**8,386,583**	**-**	**September 2013/14 Contra Adjustments**	
777,911	**777,911**	**-**	**December 2013/14 Contra Adjustments**	
(637,800)	-	-	Additional Plant Requirement - Drainage Truck	Council has undertaken a review of the drainage maintenance and cleaning works required throughout the LGA. This review has led to the recommended deletion of this plant purchase from the 2013/14 budget. Savings as a result of the deletion of this item will be used to part-fund the 2014/15 budget.
-	(150,000)		Capital Works Reserve - Transfer from Reserve	
487,800	-		Working Funds Reserve - Transfer to Reserve	
(339,000)	-	-	Drainage Improvements - Oxley Rivulet (Elderslie)	There have been delays in the commencement of drainage works required within the Elderslie release area. The delays are due to the approval of the design plans by the Office of Water and land purchases. Detailed design works have recently been completed and has resulted in a significant reduction in the funding required to complete the works.
(147,000)	-		Drainage Improvements - Herbert Rivulet (Elderslie)	
-	(486,000)		Section 94 Developer Contributions - Transfer from Reserve	
(555,200)	(12,000)	-	Corporate Salaries & Overheads - Staff Vacancies	Savings primarily reflect vacancies within Council's staffing structure. Savings from vacant positions are used to fund Council's vacancy provision target and recruitment related advertising. Savings from vacant positions will also be used to fund additional staffing and contractors required as a result of these vacancies. Savings from staff vacancies have been allocated to the working funds reserve to part fund the 2014/15 budget.
(365,300)	-		Corporate Management - Staff Vacancy Provision	
135,500	-		Corporate Staffing - Additional Staffing & Contractors	
50,000	-		Corporate Staffing - Recruitment Advertising	
43,000	-		Corporate Staffing - Higher Grade Payments	
580,000	-		Working Funds Reserve - Transfer to Reserve	
(280,000)	-	-	Plant Replacement Program - Front End Loader	A detailed review of Council's plant requirements has led to the deletion of several items of plant from this years replacement program. The funds allocated for these items in the 2013/14 budget will be returned to the Plant Replacement Reserve.
(95,000)	-		Plant Replacement Program - Bobcat	
(55,000)	-		Plant Replacement Program - Survey Van	
-	(200,000)		Plant Replacement Program - Plant Sales Income	
-	(230,000)		Plant Replacement Reserve - Transfer from Reserve	
78,991	-	-	Corporate Salaries - Termination Payments	This increase reflects payments made to employees on resignation, retirement and extended leave payments. Payments made to employees on retirement, resignation and for extended leave are funded from Council's ELE Reserve.
56,040	-		Corporate Salaries - Leave Payments	
8,086	-		Corporate Salaries - Transfers to/from Councils	
-	143,117		Corporate Management - ELE Reserve Funding	
-	135,000	-	Grant Income - RFS Capital Subsidy Income	In August 2013 Council approved the forward funding of the shortfall for the construction of Camden West Rural Fire Service Station. Council has since received advice from the Rural Fire Service that the funding shortfall has now been allocated within the 2013/14 Rural Fire Fighting Fund.
-	(135,000)		Capital Works Reserve - Transfer from Reserve	
(70,000)	-	-	Park Improvements - Kirkham Lighting	Park improvement lighting projects at Kirkham Park and Liquidamber Reserve is nearing completion. Savings have been realised against original budget projections and funds returned to the S94 developer contributions reserve.
(60,000)	-		Park Improvements - Liquidamber Lighting	
-	(130,000)		Section 94 Developer Contributions - Transfer to Reserve	
120,979	-	-	Road Improvements - Richardson Road Restoration	A range of restoration works along Richardson Road have been completed by Council. These restoration works were required as a result of water main construction for the Oran Park transfer main on behalf of a public authority. These works have been fully funded by the public authority.
-	120,979		Road Improvements - Capital Contribution Income	

ORD03

Attachment 1

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote			Description	Comments
Expense $	Income $	Totals $		
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75,000	-		Strategic Planning - Narellan Planning & Development Review	Council intends on commissioning an urban design audit and a review of the Narellan planning and development controls during the fourth quarter of 2013/14. Funding for these reviews is available from allocations for rezoning and planning studies throughout the LGA.
70,000	-		Strategic Planning - Urban Design Audit	
(35,000)	-	-	Strategic Planning - Infrastructure Studies	
(110,000)	-		Strategic Planning - Rezoning Studies	
-	78,000		Section 94 Developer Contributions - Interest on Investments	Revenue projections for Section 94 investment income continue to be above budget expectations. This is primarily due to delays in the completion of major infrastructure works (e.g. Camden Bypass intersection), the proposed revotes of works to the 2014/15 budget, and developer cash contributions received to date. Investment income is restricted to reserve for the purpose of funding future infrastructure costs within new release areas.
78,000	-	-	Section 94 Developer Contributions - Transfer to Reserve	
33,588	-		Domestic Waste - Bin Purchases	Service growth calculations for Council's waste management service have exceeded budget expectations for 2013/14. This is a result of the higher than anticipated development activity within Elderslie, Spring Farm, Oran Park and Gregory Hills. As a result of this growth, additional expenditure has been required for new bin purchases. The increase in expenditure is offset against additional fees and charges income, with the balance transferred to the domestic waste operational reserve.
(5,357)	-		Domestic Waste - Other Expenditure	
-	58,500	-	Domestic Waste - Fees and Charges Income	
30,269	-		Domestic Waste - Transfer to Reserve	
35,000	-		Road Maintenance - Street Pavement Cleansing	Additional expenditure has been identified in the street-sweeping program primarily as a result of an increase in labour and plant related expenses. Additional costs for the footpath construction at Tramway Drive is due to the removal of asbestos material. These increases have been offset against the provision established as part of the 2013/14 budget for the expected increase in maintenance requirements.
17,417	-	-	Footpath Construction - Tramway Drive	
(52,417)	-		Road Maintenance - Provision for Growth	
(50,000)	-		Stormwater Systems - Camden Drainage Design	Council is currently preparing a masterplan for the Camden Town Centre. Design works have been deferred until the results of the study are finalised. It is recommended that the allocation for this project be returned to the stormwater levy reserve until the priorities from the masterplan are known.
-	(50,000)	-	Stormwater Levy Reserve - Transfer from Reserve	
-	30,500		DOP Lodges Road Loan - Investment Income	Under the funding conditions of the Interest Free Loan Agreement for the upgrade of Lodges Road and Hilder Street, Council must restrict any interest income generated from the investment of the funds for the purpose of the project. This adjustment reflects interest earned on the unspent loan funds during the third quarter of 2013/14.
30,500	-	-	DOP Lodges Road Loan - Transfer to Reserve	
30,000	-		Development - Legal Expenditure	Council has incurred additional legal expenditure during 2013/14. This expenditure relates to legal action taken in the Land and Environment Court for Development issues. This has been offset against development income which is higher than budget expectations during the third quarter of 2013/14.
-	30,000	-	Development - Fees and Charges Income	
4,729	-		Commercial Waste - Bin Purchases	Income from commercial waste services is below budget expectations. As a result the estimated surplus to be transferred to the commercial waste operational reserve has been reduced.
-	(19,444)	-	Commercial Waste - Fees and Charges Income	
(24,173)	-		Commercial Waste Reserve - Transfer to Reserve	
(35,298)	-		Stormwater Systems - Aquatic Plant Maintenance	Under the funding principles of the Stormwater Management Levy, Council is required to maintain its level of expenditure on stormwater related activities from General Fund. Council will be unable to complete maintenance works required across a range of stormwater lakes due to the unavailability of suitable contractors. These funds will be transferred to the general fund stormwater reserve.
35,298	-	-	General Fund Stormwater Reserve - Transfer to Reserve	
15,005	-		Strategic Planning - Temporary Staffing	Temporary contract staff have been required to complete development agreement related work during the year. This is to be funded from the Section 94 developer contributions reserve.
-	15,005	-	Section 94 Developer Contributions - Transfer from Reserve	
(801,343)	**(801,343)**	-	**March 2013/14 Contra Adjustments**	
8,363,151	**8,363,151**	-	**Total Contra Variations 2013/14**	

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote Expense $	Change in Vote Income $	Change in Vote Totals $	Description	Comments
Note:	INCOME - Increases are shown as positives figures. Reductions are shown as negative figures EXPENDITURE - Increases are shown as positive figures. Reductions are shown as negative figures			
4) Revotes for the 2013/14 Year to be included in the 2014/15 Budget Budget adjustments which have are proposed to be carried forward into the 2014/15 Budget:				
(810,000)	(810,000)	-	**Total Revotes Identified for September Period**	
(2,150,000)	(2,150,000)	-	**Total Revotes Identified for December Period**	
(1,429,600)	-	-	Road Improvements - Camden Bypass Intersection	In 2012, Council entered into a funding agreement for the construction of the Camden Bypass intersection and Spring Farm link road. Council's contribution towards the construction of the intersection is $4,429,600. Council has recently been advised that this project will not be completed this current financial year, and as such, Council's remaining contribution will not be required until 2014/15.
-	(1,429,600)		Section 94 Developer Contributions - Transfer from Reserve	
(1,250,000)	-	-	Road Improvements - Springs Road Urban Upgrade	The continuation of upgrade works along Springs Road to urban pavement standard cannot proceed until the opening of the Camden Bypass Intersection. The intersection is required to allow for residents to use this traffic route whilst Springs Road is temporally closed.
-	(1,250,000)		Section 94 Developer Contributions - Transfer from Reserve	
(500,000)	-	-	Drainage Improvements - Oxley Rivulet (Elderslie)	There have been delays in the commencement of drainage works required within the Elderslie release area. The delays are due to the approval of the design plans by the Office of Water and land purchases. Detailed design works have recently been completed and the tender process for the construction can now commence. It is not expected that the project will commence before June 2014.
(400,000)	-		Drainage Improvements - Herbert Rivulet (Elderslie)	
-	(900,000)		Section 94 Developer Contributions - Transfer from Reserve	
(170,000)	-	-	Plant Replacement Program - Water Tanker	A detailed review of Council's plant requirements has led to delays in placing orders for the replacement of these plant items. There is a significant lead time required between order placement and delivery of these vehicles. It is not expected that these items will be delivered by June 2014.
(165,000)	-		Plant Replacement Program - Asphalt Single Cab Truck	
(115,000)	-		Plant Replacement Program - Tractor	
(75,000)	-		Plant Replacement Program - Premium Dual Cab	
(70,000)	-		Plant Replacement Program - Tandem Roller	
(25,000)	-		Plant Replacement Program - Folding Wing Mower	
(20,000)	-		Plant Replacement Program - Radio Base Station	
-	(182,000)		Plant Replacement Program - Plant Sales Income	
-	(458,000)		Plant Replacement Reserve - Transfer from Reserve	
(630,000)	-	-	Road Improvements - Cobbitty Road Reconstruction	There have been delays in the project associated with the design process. Works are unlikely to commence prior to June 2014.
630,000	-		Revote Reserve - Transfer to Reserve	
(455,000)	-	-	Park Improvements - Regional Recreation Trail	Council accepted a grant from the Metropolitan Greenspace Program in December 2013. The grant was for the development of the Macarthur Regional Recreation Trail. The works are to be completed by Urban Growth, Campbelltown and Camden Councils. Camden is coordinating these works and is in the process of preparing a memorandum of understanding with the relevant parties. This has led to delays in the commencement of works.
-	(455,000)		Grant Income - Metropolitan Greenspace	
(300,000)	-	-	Drainage Improvements - Lake Annan GPT Installation	There have been delays in the project associated with the design process. Works are unlikely to commence prior to June 2014.
-	(158,643)		General Fund Stormwater Reserve - Transfer from Reserve	
-	(141,357)		Stormwater Levy Reserve - Transfer from Reserve	
(200,000)	-	-	Mount Annan Leisure Centre Stage 2 Design	Funds will not be expended in 2013/14 due to delays associated with the finalisation of Stage 2 concept designs.
-	(200,000)		Section 94 Developer Contributions - Transfer from Reserve	
(145,200)	-	-	Road Improvements - John St / Mitchell St Roundabout	Council is currently preparing a masterplan for the Camden Town Centre. Works have been deferred until the results of the study are finalised. It is recommended that the allocation for this project be revoted to 2014/15 until the priorities from the masterplan are known.
-	(145,200)		Revotes Reserve - Transfer from Reserve	
(120,000)	-	-	Road Improvements - Merino Drive Roundabout	There are delays in the construction of a new roundabout at the Macarthur Road / Merino Drive intersection at Elderslie. The delays are primarily due to the design process and the essential services relocation.
-	(120,000)		Section 94 Developer Contributions - Transfer from Reserve	
(100,000)	-	-	Road Improvements - Elderslie Pedestrian Bridge	Preliminary investigation and design works for the proposed overhead pedestrian bridge have been re-prioritised and funding is not required in 2013/14. These investigation and design works will be completed in 2014/15.
-	(100,000)		Section 94 Developer Contributions - Transfer from Reserve	
(80,000)	-	-	Risk Management - WHS Systems Review	There has been delays in appointing a suitable consultant for this project. Funds will not be required until 2014/15.
80,000	-		Revotes Reserve - Transfer to Reserve	
(65,000)	-	-	Road Improvements - CVW / Macarthur Road Intersection	There have been delays in delivering this project due to required traffic analysis and preparation of concept designs for the intersection. Funds will not be required until 2014/15.
-	(65,000)		Section 94 Developer Contributions - Transfer from Reserve	

ORD03

Attachment 1

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote			Description	Comments
Expense $	Income $	Totals $		
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(50,000)	-	-	Park Improvements - Eldersle Park (Adjacent Liz Kernohan Dr.)	Council officers are currently determining the scope and requirements for this new park (including community consultation). The total funding for this project is $700,000 and is allocated over the next two financial years.
-	(50,000)		Section 94 Developer Contributions - Transfer from Reserve	
(47,000)	-	-	Domestic Waste - Greenwaste Review	Preliminary data collection has been completed by Council officers. A consultant is expected to be engaged and the review completed by October 2014.
-	(47,000)		Domestic Waste - Transfer from Reserve	
(40,000)	-	-	Camden Cemetery - Columbarium Construction	There has been delays associated with the Development Application requirements for this project. Funds will not be required until 2014/15.
-	(40,000)		Revotes Reserve - Transfer from Reserve	
(20,000)	-	-	Community Engagement - Strategy Implementation	Council has been unable to commence the implementation of its community engagement strategy due to staff vacancies. It is recommended these funds are carried forward to 2014/15.
20,000	-		Revotes Reserve - Transfer to Reserve	
(17,000)	-	-	Strategic Planning - Service Review	Council has been unable to complete its service level review due to staff vacancies. It is recommended these funds are carried forward to 2014/15.
5,000	-		Revotes Reserve - Transfer to Reserve	
-	(12,000)		Revotes Reserve - Transfer from Reserve	
(5,753,800)	**(5,753,800)**	-	**Total Revotes Identified for March Period**	
(735,000)	(735,000)		Less: Revotes Shown as Expenses	
(6,488,800)	**(6,488,800)**	-	**Total Revotes Approved from March Period**	
(9,448,800)	**(9,448,800)**	-	**Total Revotes Proposed 2013/14**	

Summary of Budget Review Variations Greater Than $15,000
March Review of the 2013/14 Budget

Change in Vote			Description	Comments
Expense $	Income $	Totals $		
Note: INCOME - Increases are shown as positives figures. Reductions are shown as negative figures EXPENDITURE - Increases are shown as positive figures. Reductions are shown as negative figures				

Reconciliation to 'March Review of the 2013/14 Budget'

2012/13 Carried Forward Working Funds Balance	1,000,000	
2013/14 Adopted Budget Surplus	-	
Available Working Funds 01/07/13	**1,000,000**	
Less:		
Minimum Desired Level	(1,000,000)	
Total Funds Available	-	**Total Available Working Funds as at 01/07/2013**
September Review	824,802	Significant Budget Variations
	(824,802)	Council Approved Variations
	-	Budget Contra Variations
	-	Budget Revotes (Carry-Overs)
	-	**Sub Total - September Review Variations**
	-	**Total Available Working Funds as at 30/09/2013**
December Review	716,100	Significant Budget Variations
	(716,100)	Council Approved Variations
	-	Budget Contra Variations
	-	Budget Revotes (Carry-Overs)
	-	**Sub Total - December Review Variations**
	-	**Total Available Working Funds as at 31/12/2013**
March Review	707,493	Significant Budget Variations
	39,000	Council Approved Variations
	-	Budget Contra Variations
	-	Budget Revotes (Carry-Overs)
	746,493	**Sub Total - March Review Variations**
	746,493	**Total Available Working Funds as at 31/03/2014**

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Attachment 2

Camden Council
Quarterly Budget Review Statement
For the period ending 31 March 2014

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Camden Council
Income & Expenses Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Income & Expenses Review

	Original Budget 2013/14	Approved Changes: Revotes	Approved Changes: Other than by QBRS	Approved Changes: Sep QBRS	Approved Changes: Dec QBRS	Revised Budget 2013/14	Variations for this Mar Qtr	Notes	Projected Year End Result
Operating Income									
Actively Managing Camden's Growth	9,595,400	-	-	6,638,800	765,064	16,999,264	423,000	1	17,424,264
Healthy Urban and Natural Environment	27,664,800	176,030	67,331	116,207	53,160	28,077,528	(384,125)	2	27,693,403
A Prosperous Economy	8,500	-	-	-	35,525	44,025		-	44,025
Effective and Sustainable Transport	22,249,400	25,215	416,050	38,996	-	22,729,661	125,154	3	22,854,815
An Enriched and Connected Community	6,783,900	56,956	475,000	158,682	25,010	7,499,548	32,849	4	7,532,397
Strong Local Leadership	40,881,000	197,941	50,000	(1,015,408)	241,352	40,354,885	499,298	5	40,854,183
	107,183,000	**456,142**	**1,008,381**	**5,937,277**	**1,120,111**	**115,704,911**	**698,176**		**116,403,087**
Operating Expenses									
Actively Managing Camden's Growth	7,535,800	422,833	-	61,596	102,790	8,123,019	(84,163)	6	8,038,856
Healthy Urban and Natural Environment	19,842,600	801,303	65,276	(584,121)	4,564	20,129,622	(552,467)	7	19,577,155
A Prosperous Economy	544,600	-	-	1,866	(947)	545,519	793	-	546,312
Effective and Sustainable Transport	15,399,900	49,069	2,700	734,486	(51,413)	16,134,742	48,221	8	16,182,963
An Enriched and Connected Community	10,617,400	10,000	571,876	40,212	(6,009)	11,233,479	(1,670)	-	11,231,809
Strong Local Leadership	16,210,700	154,483	(10,192)	564,878	522,878	17,442,747	(339,778)	9	17,102,969
	70,151,000	**1,437,688**	**629,660**	**818,917**	**571,863**	**73,609,128**	**(929,064)**		**72,680,064**
Net Operating Surplus / (Deficit)	**37,032,000**	**(981,546)**	**378,721**	**5,118,360**	**548,248**	**42,095,783**	**1,627,240**		**43,723,023**
Add:									
Non Cash Funded Depreciation	15,599,500	-	-	216,286	-	15,815,786			15,815,786
Funds from the Sale of Assets	377,100	353,500	-	(62,500)	-	668,100	(382,000)		286,100
Loan Borrowings	3,350,000	-	1,300,000	-	-	4,650,000	-		4,650,000
Transfer from Restricted Assets	13,342,800	12,838,300	866,522	2,374,319	(1,684,248)	27,737,693	(6,119,949)		21,617,744
	32,669,400	**13,191,800**	**2,166,522**	**2,528,105**	**(1,684,248)**	**48,871,579**	**(6,501,949)**		**42,369,630**
Less:									
Capital Purchases & Acquisitions	56,948,300	12,210,254	1,207,343	(877,075)	(2,129,500)	67,359,322	(7,554,590)		59,805,732
Borrowing Expense (Principal)	2,189,000	-	-	(145,638)	-	2,043,362	-		2,043,362
Transfer to Restricted Assets	10,564,100	-	1,300,000	8,669,178	992,400	21,525,678	1,971,388		23,497,066
Proposed - Transfer to Restricted Assets	-	-	-	-	-	-	746,493		746,493
	69,701,400	**12,210,254**	**2,507,343**	**7,646,465**	**(1,137,100)**	**90,928,362**	**(4,835,709)**		**86,092,653**
Net Budget Position Surplus / (Deficit)	-	-	**37,900**	-	**1,100**	**39,000**	**(39,000)**		-

This statement forms part of Council's Quarterly Budget Review Statement (QBRS) for the quarter ended 31/03/2014 and should be read in conjunction with the total QBRS report

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Attachment 2

Camden Council
Income & Expenses Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Recommended changes to revised budget

Budget Variations being recommended include the following material items (Greater than $15,000):

Notes	Movement	Description
1	425,000	**Actively Managing Camden's Growth - Increase in Income** This adjustment relates to an increase in development income due to ongoing housing development ($347K) and additional Section 94 investment income due to a higher than expected investment balance ($78K).
2	(384,125)	**Healthy Urban and Natural Environments - Decrease in Income** A range of income adjustments were required at this review including an increase in domestic waste income due to ongoing housing development ($59K) and a decrease in expected grant income due to the revote of the Macarthur regional recreation trail project to 2014/15 ($455K). A range of other minor adjustments were also required as part of this review ($12K).
3	125,154	**Effective and Sustainable Transport - Increase in Income** This adjustment relates to income received for restoration works completed along Richardson Rd Narellan ($121K). Other minor adjustments have also been required during this review ($4K).
4	32,849	**An Enriched and Connected Community - Increase in Income** This adjustment relates primarily to the increase in revenue from family day care operations year to date ($17K). A number of minor adjustments have also been required which have increased revenue forecasts ($16K).
5	499,298	**Strong Local Leadership - Increase in Income** A range of income adjustments have been required at this review including; additional income received as compensation for the creation of electricity easements ($168K), additional income from Council's insurer for achieving a range of WHS initiatives ($60K) and prior year adjustments to motor vehicle insurance policies ($33K). Council has also realised an increase in general fund investment income ($70K) and additional investment income for the Department of Planning interest free loan ($31K). Council has also recently been advised of an increase in the level of funding for the construction of the Camden West RFS Station ($135K). A range of other minor adjustments have been required at this review ($4K).
6	(84,163)	**Actively Managing Camden's Growth - Decrease in Expense** This decrease primarily relates to a reduction in expenditure due to staff vacancies ($152K) which has been offset against the vacancy discount factor. There has been an increase in development legal expenditure costs due to legal action in the Land & Environment Court ($30K) and additional contract expenditure to assist in processing development applications due to staff vacancies ($37K). A number of minor adjustments were required at this review ($1K).
7	(552,467)	**Healthy Urban and Natural Environment - Decrease in Expense** This decrease in expenditure is primarily a result of delays in the Macarthur regional recreation trail project ($455K), delays in the completion of the Greenwaste service review ($47K) and savings from the review of drainage infrastructure in the Camden town centre ($50K). There have also been savings from staff vacancies ($46K) which have been offset against other staff costs ($35K) and the vacancy discount factor. A range of minor expenditure increases were also required at this review ($11K).

Camden Council
Income & Expenses Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Recommended changes to revised budget

Budget Variations being recommended include the following material items (Greater than $15,000):

Notes	Movement	Description
8	48,221	**Effective and Sustainable Transport - Increase in Expense** This adjustment primarily relates to an increase in expenditure due to the transfer of capital expenditure allocations for kerb and gutter works to maintenance allocations ($80K) and payments made to employees upon resignation and retirement ($21K) which is funded through the ELE Reserve. There has been a decrease in expenditure as a result of staff vacancies ($61K) which has been offset against the vacancy discount factor. A range of minor expenditure adjustments were also required ($8K).
	(339,770)	**Strong Local Leadership - Decrease in Expense** Major budget variations at this review include a reduction in Council's vacancy provision target as a result of vacant positions ($265K), delays in the in the implementation of a new WHS System ($80K) and delays in the completion of the service level review and implementation of the community engagement strategy due to staff vacancies ($37K). There has also been savings through staff vacancies ($249K) which have been offset against the vacancy discount factor. There has been an increase in expenditure due to additional recruitment costs ($50K) and additional staffing expenditure which has been required due to staff vacancies ($76K). Additional expenditure has also been realised due to payments made to employees upon resignation and retirement ($90K) which is funded through the ELE Reserve, building water charges based on expenditure payments made year to date ($29K) and an increase in corporate administration expenditure ($25K). A range of other minor adjustments were also required at this review ($21K).

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Attachment 2

Camden Council
Capital Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Capital Expenditure Review

	Original Budget 2013/14	Approved Changes: Revotes	Approved Changes: Other than by QBRS	Approved Changes: Sep QBRS	Approved Changes: Dec QBRS	Revised Budget 2013/14	Variations for this Mar Qtr	Notes	Projected Year End Result
Capital Expenditure									
New Assets (Council Delivery)									
Transport & Road Infrastructure	1,123,400	6,650,974	7,750	(292,725)	(700,000)	6,789,399	(3,077,306)	1	3,712,093
Community Facilities	550,000	1,732,360	33,100	85,000	(350,000)	2,050,460	(200,000)	2	1,850,460
Parks & Recreation	2,256,000	349,630	24,643	277,059	-	2,907,332	(180,000)	3	2,727,332
Stormwater & Drainage	2,486,000	229,215	-	-	(1,000,000)	1,715,215	(1,686,000)	4	29,215
Council Properties	2,558,000	239,960	185,000	-	-	2,982,960	10,200	-	2,993,160
Plant & Equipment	920,000	504,686	-	(410,000)	-	1,014,686	(637,800)	5	376,886
Other	428,900	103,515	-	2,750	-	535,165	(1,683)	-	533,482
New Assets (Works In Kind)									
Transport & Road Infrastructure	21,288,000	-	-	-	-	21,288,000		-	21,288,000
Recreation & Community Facilities	3,525,400	-	-	-	-	3,525,400		-	3,525,400
Stormwater & Drainage	15,591,200	-	-	-	-	15,591,200	-	-	15,591,200
Asset Renewal (Replacement)									
Transport & Road Infrastructure	3,664,800	663,760	805,000	(103,605)	(98,900)	4,931,055	(637,021)	6	4,294,034
Community Facilities	134,000	34,318	26,000	-	-	194,318		-	194,318
Parks & Recreation	399,400	259,353	121,000	53,987	41,000	874,740	(45,000)	7	829,740
Stormwater & Drainage	77,200	20,000	-	-	-	97,200	-	-	97,200
Council Properties	52,000	52,283	-	-	-	104,283	-	-	104,283
Plant & Equipment	1,449,200	1,174,500	4,850	(448,455)	-	2,180,095	(1,070,000)	8	1,110,095
Information Technology Upgrades	444,800	195,700	-	(41,086)	(21,600)	577,814	(28,980)	9	548,834
Other	-	-	-	-	-	-	-		-
Total Capital Expenditure	**56,948,300**	**12,210,254**	**1,207,343**	**(877,075)**	**(2,129,500)**	**67,359,322**	**(7,553,590)**		**59,805,732**
Capital Funding									
Rates & Other Untied Funding	3,037,400	-	33,100	61,560	(120,500)	3,011,560	(758,363)		2,253,197
Capital Grants & Contributions	839,100	190,060	392,350	25,546	-	1,447,056	-		1,447,056
Reserves:									
External Restrictions	6,916,700	8,788,588	58,393	(990,267)	(2,058,643)	12,714,771	(4,821,563)		7,893,208
Internal Restrictions	4,023,400	2,878,106	723,500	88,586	49,643	7,763,235	(1,713,643)		6,050,592
S94 Works in Kind Income (Non Cash)	40,404,600	-	-		-	40,404,600			40,404,600
New Loans	1,350,000	-	-		-	1,350,000			1,350,000
Receipts from Sale of Assets									
Plant & Equipment	377,100	353,500	-	(62,500)	-	668,100	(382,000)		286,100
Land & Buildings	-	-	-	-	-	-			-
Other Funding	-	-	-	-	-	-	120,979		120,979
Total Capital Funding	**56,948,300**	**12,210,254**	**1,207,343**	**(877,075)**	**(2,129,500)**	**67,359,322**	**(7,553,590)**		**59,805,732**
Net Capital Funding	-	-	-	-	-	-	-		-

Camden Council
Capital Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Recommended changes to revised budget

Budget Variations being recommended include the following material items (Greater than $15,000):

Notes	Movement	Description
1	(3,077,306)	**Transport & Road Infrastructure (New Assets) - Decrease in Expense** This decrease primarily relates to the revote of the Camden Bypass intersection ($1.429M), the urban upgrade of Springs Road ($1.250M), the construction of a roundabout at the John Street and Mitchell Street intersection in Camden ($145K) and a number of roadwork projects funded from Section 94 ($285K). Additional funding was required for footpath improvements along Tramway Drive ($17K). Other minor adjustments were also required as part of this review ($15K).
2	(200,000)	**Community Facilities (New Assets) - Decrease in Expense** There have been delays in the finalisation of the Stage 2 concept designs for the Mount Annan Leisure Centre ($200K). This amount is to be revoted to the 2014/15 financial year.
3	(180,000)	**Parks & Recreation (New Assets) - Decrease in Expense** This decrease primarily relates to the revote of the design estimate for the new park to be located in the Elderslie release area ($50K) and the expected savings identified in the installation of sports lighting at Kirkham and Liquidamber Reserve ($130K).
4	(1,686,000)	**Stormwater & Drainage (New Assets) - Decrease in Expense** There have been delays in the commencement of drainage works required along Oxley and Herbert Rivulets in Elderslie ($900K). In addition to the delays in commencing works, revised design estimates have identified expected project savings($486K). The construction of the Lake Annan GPT has also been revoted to 2014/15 ($300K).
5	(637,800)	**Plant & Equipment (New Assets) - Decrease in Expense** Council has undertaken a review of the drainage maintenance and cleaning works required throughout the LGA. As a result of this review, Council officers recommend that this purchase be deleted from the 2013/14 budget ($638K). Council has endorsed the use of this savings to part-fund the 2014/15 budget.
6	(637,021)	**Transport & Road Infrastructure (Asset Renewal) - Decrease in Expense** This decrease primarily relates to the revote of the Cobbitty Road Reconstruction ($630K), and the transfer of funding from capital renewal accounts for kerb and gutter to maintenance works ($130K). This review also includes an increase in expenditure for restoration works completed along Richardson Rd Narellan ($121K). Other minor adjustments have also been required during this review ($2K).
7	(45,000)	**Parks & Recreation (Asset Renewal) - Decrease in Expense** Rehabilitation works at Kirkham Netball courts are nearing completion. There are expected savings when compared against original budget projection ($45K).
8	(1,070,000)	**Plant & Equipment (Asset Renewal) - Decrease in Expense** A detailed review of Council's plant replacement program for 2012/13 has led to the revote of several items of plant which are scheduled for replacement to 2014/15 ($640K) and the deletion of a number of plant items which are no longer required to be replaced ($430K). Council officers are currently undertaking a detailed operational review of all of Council's plant and machinery.
9	(28,980)	**Information Technology (Upgrades) - Decrease in Expense** Funds have been redirected from capital allocations to commence the roll out of a number of information technology operational program ($29K).

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Attachment 2

Camden Council
Cash & Investments Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Projected Year End Cash Position ending 30 June 2014
Cash & Investments Review

	Original Budget 2013/14	Approved Changes: Revotes	Approved Changes: Other than by QBRS	Approved Changes: Sep QBRS	Approved Changes: Dec QBRS	Revised Budget 2013/14	Variations for this Mar Qtr	Notes	Projected Year End Result
Externally Restricted									
Section 94 Developer Contributions	10,913,668	-	3,224,336	6,376,453	2,383,200	22,897,657	4,788,057	1	27,685,714
Infrastructure Loan (Lodges Road)	2,829,566	-	(10,709)	161,951	31,600	3,012,408	28,287	2	3,040,695
Domestic Waste Management	3,858,035		(137,996)	952,420	24,200	4,696,659	75,099	3	4,771,758
Specific Purpose Grants	2,975		333,078	(333,078)	-	2,975	-	-	2,975
Stormwater Management Levy	197,431	-	95,675	(8,772)	(91,357)	192,977	191,357	4	384,334
Other Restricted Contributions	54,669	-	10,029	(14,096)	-	50,602	4,753	-	55,355
Total Externally Restricted	**17,856,344**	**-**	**3,514,413**	**7,134,878**	**2,347,643**	**30,853,278**	**5,087,553**		**35,940,831**
Internally Restricted									
Employee Leave Entitlements	2,377,732	-	(82,988)	(175,831)	(328,152)	1,790,761	(143,095)	5	1,647,666
Expenditure Revotes	-	-	-	-	-	-	932,200	6	932,200
Stormwater Works (General Fund)	253,516		29,099	-	(16,843)	265,772	183,941	7	449,713
Capital Works Reserve*	1,772,618		145,950	(667,672)	-	1,250,896	284,000	8	1,535,896
Infrastructure Loan - Repayment Fund	3,156,300	-	-	-	-	3,156,300		-	3,156,300
Central Administration Building	1,611,507	-	482,418	(175,198)	715,000	2,633,727		-	2,633,727
Camden Town Centre Improvements	1,044,500	-	-	-	-	1,044,500		-	1,044,500
Water Savings Action Plan	59,297	-	-	-	-	59,297		-	59,297
Cemetery Improvements	585,787	-	17,569	(3,076)	-	600,280	1,118	-	601,398
Section 355 Management Committees	184,412	-	96,536	-	-	280,948		-	280,948
Camden Carparking	120,578	-	-	-	-	120,578		-	120,578
Risk Management	242,599	-	-	-	-	242,599		-	242,599
Working Funds Surplus	11,800	-	1,336,981	(1,336,981)	-	11,800	1,067,800	9	1,079,600
Plant Replacement Reserve	720,612	-	91,346	38,000	-	849,958	686,000	10	1,537,958
Information Technology Reserve	-	-	152,157	(1,880)	-	150,277	-	-	150,277
Commercial Waste Management	1,243,405	-	28,467	(13,468)	-	1,258,404	(28,843)	11	1,229,561
Council Elections	73,800	-	-	-	-	73,800	-	-	73,800
2010-2013 CIRP Reserve	-	-	18,579	(18,579)	-	-	-	-	-
2014-2019 CIRP Reserve	1,401,700	-	(121,000)	1,556,797	(41,000)	2,796,497	(2,000)	-	2,794,497
Asset Renewal Reserve	232,917	-	89,471	-	-	322,388		-	322,388
Family Day Care Reserve	100,625	-	(46,805)	(42,132)	-	11,688	19,792	12	31,480
Public Appeals Reserve	35,974	-	-	-	-	35,974		-	35,974
Engineering Deposits	165,165	-	-	-	-	165,165	(129)	-	165,036
Total Internally Restricted	**15,394,844**	**-**	**2,237,780**	**(840,020)**	**329,005**	**17,121,609**	**3,003,784**		**20,125,393**
Unrestricted (i.e. available after the above Restrictions)	9,325,566	-	-	-	-	9,325,566	746,494		10,072,059
Total Cash & Investments	**42,576,754**	**-**	**5,752,193**	**6,294,858**	**2,676,648**	**57,300,453**	**8,837,830**		**66,138,283**

* The proposed uncommitted balance of the Capital Works Reserve is $1,263,211

Cash & Investments Statement

Investments have been invested in accordance with Council's Investment Policy.
The Cash at Bank amount for this period has been reconciled to Council's physical Bank Statements. The date of completion of this bank reconciliation is 31/03/2014

Camden Council
Cash & Investments Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Recommended changes to revised budget

Budget Variations being recommended include the following material items (Greater than $15,000):

Notes	Movement	Description
1	4,788,057	**Section 94 Developer Contributions - Net Decrease in Transfer from Reserve** The balance of Council's Section 94 reserve has increased primarily as a result of a number of projects which have been nominated as revotes as part of the March Review including: the Camden Bypass intersection ($1.430M), Springs Road urban upgrade ($1.250M), drainage works along the Hebert and Oxley rivulets ($900K), delays in the commencement of a number of roadwork projects funded from Section 94 ($285K) and the stage 2 design of the Mount Annan Leisure Centre ($200K). There has also been savings identified in a range of projects including the installation of sports lights at Kirkham and Liquidamber Reserve ($130K) and savings in the expected cost of drainage works along the Herbert and Oxley rivulets ($486K). There has also been an increase in income from interest on investments during the third quarter ($79K). A range of minor adjustments were also made at this review ($29K).
2	28,287	**Dept. of Planning Infrastructure Loan - Net Increase in Transfer to Reserve** The reserve balance has increased due to additional investment income ($28K) which under the funding conditions of the interest free loan, must be restricted for the purpose of the project.
3	75,099	**Domestic Waste Management - Increase in Transfer to Reserve** The balance of Council's waste management reserve has increase due to additional (net) operational income ($28K) which is a result of ongoing housing development. Funds to complete the greenwaste service review have also been returned to the reserve ($47K) as the project will not be completed until 2014/15.
4	191,357	**Stormwater Management Levy Reserve - Decrease in Transfer from Reserve** There have been a number of adjustments made to the stormwater management levy reserve as part of this review. These include the revote of construction of the Lake Annan GPT installation to 2014/15 ($141K) and savings from the review of drainage infrastructure in the Camden town centre ($57K). Other minor adjustments were also required as part of this review ($7K).
5	(143,095)	**Employee Leave Entitlements Reserve - Increase in Transfer from Reserve** Payments made to employees on resignation or retirement are funded from Council's ELE Reserve. Payments funded from the ELE Reserve during the third quarter of 2012/13 total $135K. Leave entitlements are also transferable between Council's. Transfers to other Council's are funded from the Reserve, and payments received are restricted to the Reserve. The net effect of these transfers is $8K.
6	932,200	**Expenditure Revotes Reserve - Increase in Transfer to Reserve** There have been a number of projects which are funded from general revenue which have been identified as revotes to be carried forward to the 2014/15 financial year as part of this review. These include; completion of the work health and safety review ($80K), the implementation of the community engagement strategy ($20K), the completion of the corporate planning service level reviews ($17K), construction of a new columbarium at the Camden Cemetery ($40K), road reconstruction works along Cobbitty Road ($630K) and the construction of a roundabout at the John Street and Mitchell Street Intersection in Camden ($145K).
7	183,941	**Stormwater Mgmt. Reserve (General Fund) - Net Decrease in Transfer from Reserve** The increase in this reserve balance relates to the revote of the Lake Annan GPT Installation to 2014/15 ($158K) and savings expected in the maintenance of lake systems throughout the LGA ($35K). Other minor adjustments were also required at this review ($9K).

ORD03

Attachment 2

Camden Council
Cash & Investments Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Recommended changes to revised budget

Budget Variations being recommended include the following material items (Greater than $15,000):

Notes	Movement	Description
8	285,000	**Capital Works Reserve - Decrease in Transfer from Reserve** In August 2013 Council approved the forward funding of the shortfall for the construction of Camden West Rural Fire Service Station. Council has since received advice from the RFS that the funding of this shortfall has now been allocated in the Rural Fire Fighting Fund. This amount ($135K) can be returned to the capital works reserve. In addition to the RFS adjustment, Council has undertaken a review of the drainage maintenance and cleaning works required throughout the LGA. This review has led to the recommended deletion of this plant purchase from the 2013/14 budget. This has resulted in savings being returned to the Capital Works Reserve ($150K).
9	1,067,800	**Working Funds Reserve - Increase in Transfer to Reserve** As part of the 2014/15 draft budget Council has endorsed the use of salary savings (which are a result of staff vacancies) to part-fund the 2014/15 budget ($580K). In addition to the savings from vacant positions, Council has also undertaken a review of the drainage maintenance and cleaning works required throughout the LGA. This review has led to the recommended deletion of this plant purchase from the 2013/14 budget ($488K). Council has also endorsed the use of this savings to part-fund the 2014/15 budget.
10	688,000	**Plant Replacement Reserve - Decrease in Transfer from Reserve** The increase in this reserve balance is primarily due to the revote of several items of plant scheduled for replacement to 2014/15 ($458K) and the deletion of a number of plant items which are no longer required to be replaced ($230K). Council officers are currently undertaking a detailed operational review of all of Council's plant and machinery.
11	(28,843)	**Commercial Waste Reserve - Decrease in Transfer to Reserve** Income from commercial waste services is below budget expectations. As a result the estimated surplus to be transferred to the commercial waste operational reserve has been reduced ($28K).
12	19,792	**Family Day Care Reserve - Increase in Transfer to Reserve** A number of operational revenues increases have resulted in an increase in the reserve balance held for the Family Day Care Section (20K). This income is restricted for the purpose of future expenditure relating to the Family Day Care service.

Camden Council
Contracts Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Contracts Budget Review (Greater than $50,000)

Contractor	Contract detail & purpose	Contract Value	Start Date	Budgeted (Y/N)
Axis Construction	Cut Hill Reserve - Amenities Building Construction	189,498	Dec-13	Y
Floodlighting Australia	Kirkham Park Floodlighting	104,000	Feb-14	Y
Eco-Logical Australia	Assessment and Mapping of Remnant Vegetation - Open Space Areas	57,980	Feb-14	Y

Notes:

1. Contracts listed are those entered into through a tender process during the quarter being reported and exclude contractors on Council's Preferred Supplier list.
2. Contracts for employment are not included in this list.

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Attachment 2

Camden Council
Consultancy & Legal Expenses Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014
Consultancy & Legal Expenses Overview

Expense	YTD Expense	Budgeted (Y/N)
Consultancies	246,062	Y
Legal Fees	408,097	Y

Definition of a consultant:

A consultant is a person or organisation engaged under contract on a temporary basis to provide recommendations or high level specialist or professional advice to assist decision making by management. Generally it is the advisory nature of the work that differentiates a consultant from other contractors.

Comments

Council has engaged specialist consultants to assist in the planning and design of the new administration building. Council has also required specialist advice regarding a number of strategic property acquisitions, governance and rezoning matters. Costs associated with these matters have been included in the expenditure totals above.

Camden Council
Key Performance Indicators Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014

($000's)	Actuals Prior Periods 2011/12	2012/13	Original Budget 13/14	Current Projections Amounts 13/14	Indicator 13/14
1. Operating Result					
Total Operating Revenue	71,097	58,103	37,032	116,403	43,723
Less: Total Operating Expenditure				72,680	

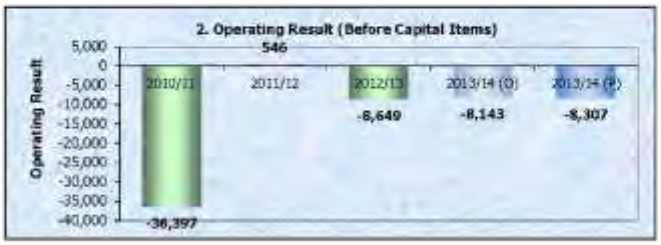
What is Being Measured?

Council's ability to fund operations including assets renewal (depreciation) including all sources of income.
The industry benchmark is an operating surplus of greater than zero.

2. Operating Result (Before Capital Items)					
Total Operating Revenue (Before Capital)	546	(8,649)	(8,143)	64,373	(8,307)
Less: Total Operating Expenditure				72,680	

What is Being Measured?

Council's ability to fund operations including assets renewal (depreciation) excluding grants and contributions for Capital Purposes.



3. Unrestricted Current Ratio					
Current Assets less all External Restrictions	2.51	2.87	2.75	25,644	1.94
Current Liabilities less Specific Purpose Liabilities				13,236	

What is Being Measured?

The ability to meet short term financial obligations such as loans, payroll and leave entitlements.

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Attachment 2

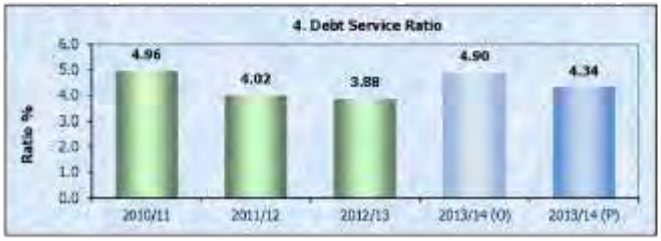
Camden Council
Key Performance Indicators Budget Review Statement

Quarterly Budget Review Statement
for the period 01/01/14 to 31/03/14

Budget review for the quarter ended 31 March 2014

($000's)	Actuals Prior Periods 2011/12	Actuals Prior Periods 2012/13	Original Budget 13/14	Current Projections Amounts 13/14	Current Projections Indicator 13/14
4. Debt Service Ratio					
Debt Service Cost / Income from Operations (Excl. Specific Grants)	4.02	3.88	4.90	2,657 / 61,210	4.34

What is Being Measured?
What percentage of Council's revenue is being used to service debt.



5. Rates and Annual Charges Coverage Ratio					
Rates & Annual Charges / Income from Continuing Operations	27.05	30.43	39.06	43,389 / 116,403	37.27

What is Being Measured?
How reliant is Council on rate revenue to fund operations.

6. Building & Infrastructure Renewals Ratio					
Asset Renewal (Building & Infrastructure) / Depreciation, Amortisation & Impairment	54.70	31.69	41.13	4,678 / 12,026	38.90

What is Being Measured?
How quickly assets are being replaced compared to their consumption.

Monthly Report

Camden Council

April 2014

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Attachment 1

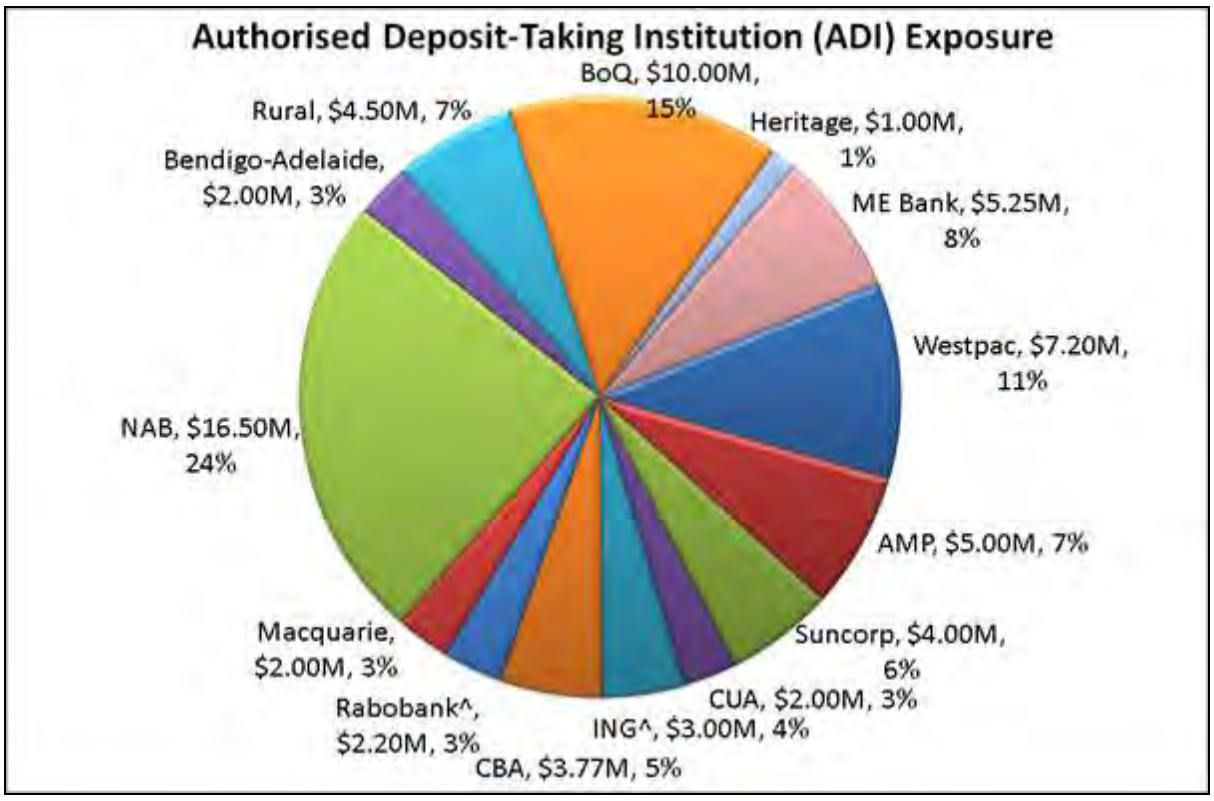
Investment Exposure

Council is at reaching capacity limits with ING, NAB and BoQ. Council will continue to diversify the investment portfolio across the investment credit spectrum.

ADI	Exposure $M	Rating	Policy Limit	Actual	Capacity
Westpac	$7.20M	A1+	25%	11%	$9.91M
AMP	$5.00M	A1	15%	7%	$5.26M
Suncorp	$4.00M	A1	15%	6%	$6.26M
CUA	$2.00M	A2	10%	3%	$4.84M
ING^	$3.00M	A1	5%	4%	$0.42M
CBA	$3.77M	A1+	25%	5%	$13.68M
Rabobank^	$2.20M	A1+	5%	3%	$1.22M
Macquarie	$2.00M	A1	15%	3%	$8.26M
NAB	$16.50M	A1+	25%	24%	$0.61M
Bendigo-Adelaide	$2.00M	A1	15%	3%	$8.26M
Rural	$4.50M	A1	15%	7%	$5.76M
BoQ	$10.00M	A1	15%	15%	$0.26M
Heritage	$1.00M	A2	10%	1%	$5.84M
ME Bank	$5.25M	A2	10%	8%	$1.59M
Total	**$68.42M**			**100%**	

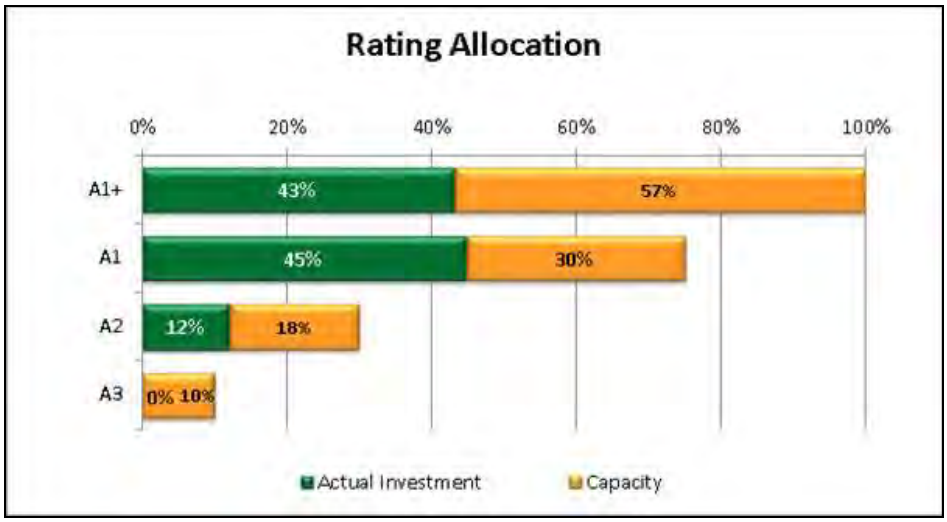
^Foreign subsidiary banks are limited to 5% of the total investment portfolio as per Council's investment policy.

Apart from investments with the regional ADIs, the investment portfolio is predominately directed to the higher rated entities with NAB and Westpac.



Credit Quality

A-1+ (the domestic majors) and A-1 (the high rated regionals) rated ADIs are the largest share of Council's investments. All of these comply with the Policy. It is Council's intention to run down the A-2 investments and redirect assets to the A-1 or higher rated ADIs.



Term to Maturity

The portfolio remains highly liquid with 2% of investments at-call and a further 34% of assets maturing within 3 months. There is substantial capacity to invest in terms greater than 1 year. In consultation with its investment advisors, Council has strategically lengthened its deposit portfolio to diversify across various maturities up to 5 years.

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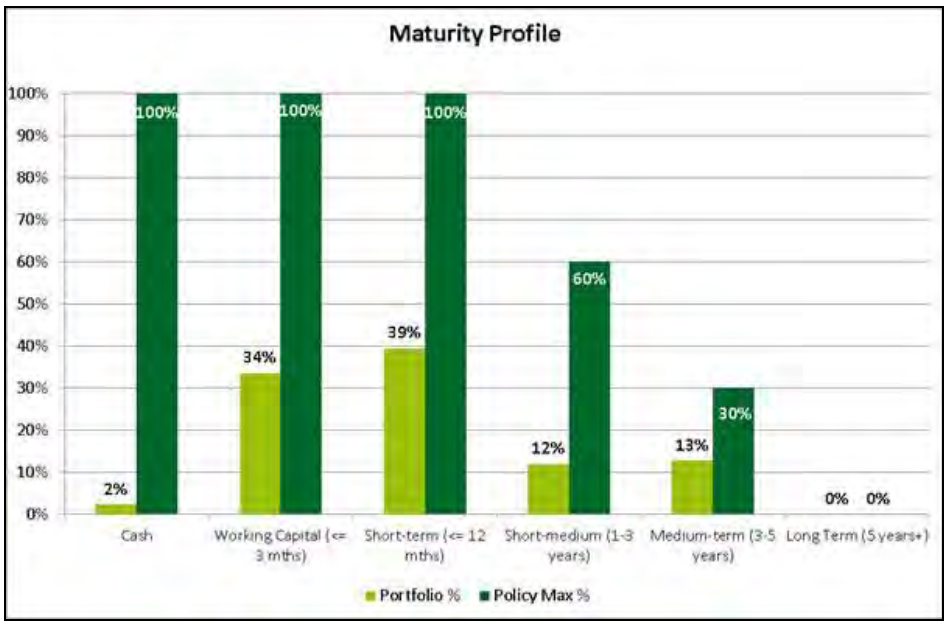
Attachment 1



In the current low interest rate environment, as existing deposits mature, they will generally be reinvested at much lower rates than preceding years. A larger spread of maturities up to 5 years would help income pressures over future financial years.

2013-14 Budget

Current Budget Rate	3.75%
Source of Funds Invested	**April**
Section 94 Developer Contributions	$31,533,300
Restricted Grant Income	$1,646,700
Externally Restricted Reserves	$7,128,600
Internally Restricted Reserves	$21,802,100
General Fund	$6,309,300
Total Funds Invested	**$68,420,000**
Council's investment portfolio has decreased by $20,000 since the March reporting period. The decrease in investment funds relates to operating payments made for Council's operations and services. This however has largely been offset against developer contributions received during April.	

INTEREST RECEIVED DURING 2013/14 FINANCIAL YEAR				
	April	**Cumulative**	**Projected Interest**	**Original Budget**
General Fund	$118,914	$974,456	$1,095,100	$981,800
Restricted	$126,437	$1,203,505	$1,401,600	$751,800
Total	**$245,351**	**$2,177,961**	**$2,496,700**	**$1,733,600**

Interest Summary

The portfolio's interest summary as at 30 April 2014 is as follows:

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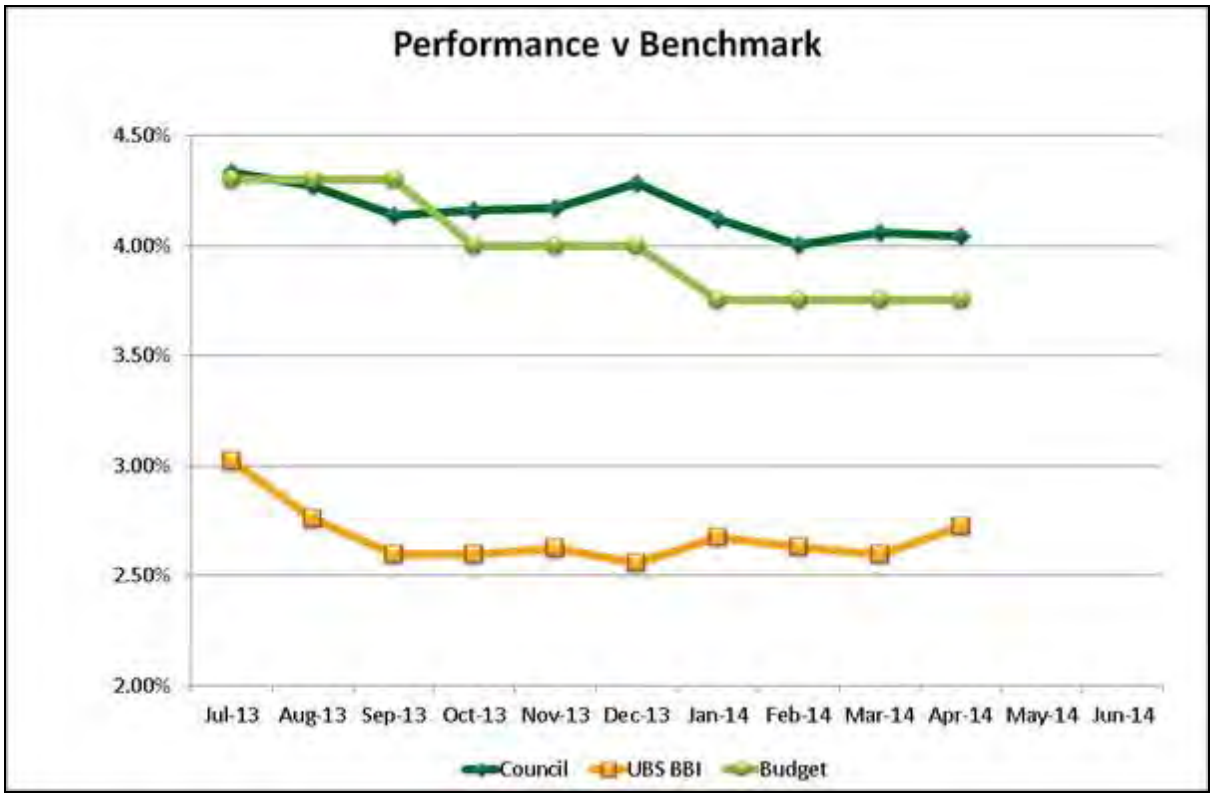
NUMBER OF INVESTMENTS	59
AVERAGE DAYS TO MATURITY	350
AVERAGE PERCENTAGE	4.05% p.a.
WEIGHTED PORTFOLIO RETURN	4.04% p.a.
CBA CALL ACCOUNT *	2.70% p.a.
HIGHEST RATE	5.95% p.a.
LOWEST RATE	3.50% p.a.
BUDGET RATE	3.75% p.a.
AVERAGE BBSW (30 Day)	2.65% p.a.
AVERAGE BBSW (90 Day)	2.68% p.a.
AVERAGE BBSW (180 Day)	2.72% p.a.
UBS BANK BILL INDEX	2.73% p.a.

*Note: CBA call account is not included in the investment performance calculations

Attachment 1



Outperformance over benchmark (UBS Bank Bill Index) continues to be attributed to the longer-dated deposits in the portfolio (particularly early investments placed above 4.5%). As existing deposits mature, performance will inevitably fall as deposits will be reinvested at much lower prevailing rates.

The revised budgeted return of 3.75% is likely to be achieved over the 2013/14 financial year with the adoption of a longer term strategy.

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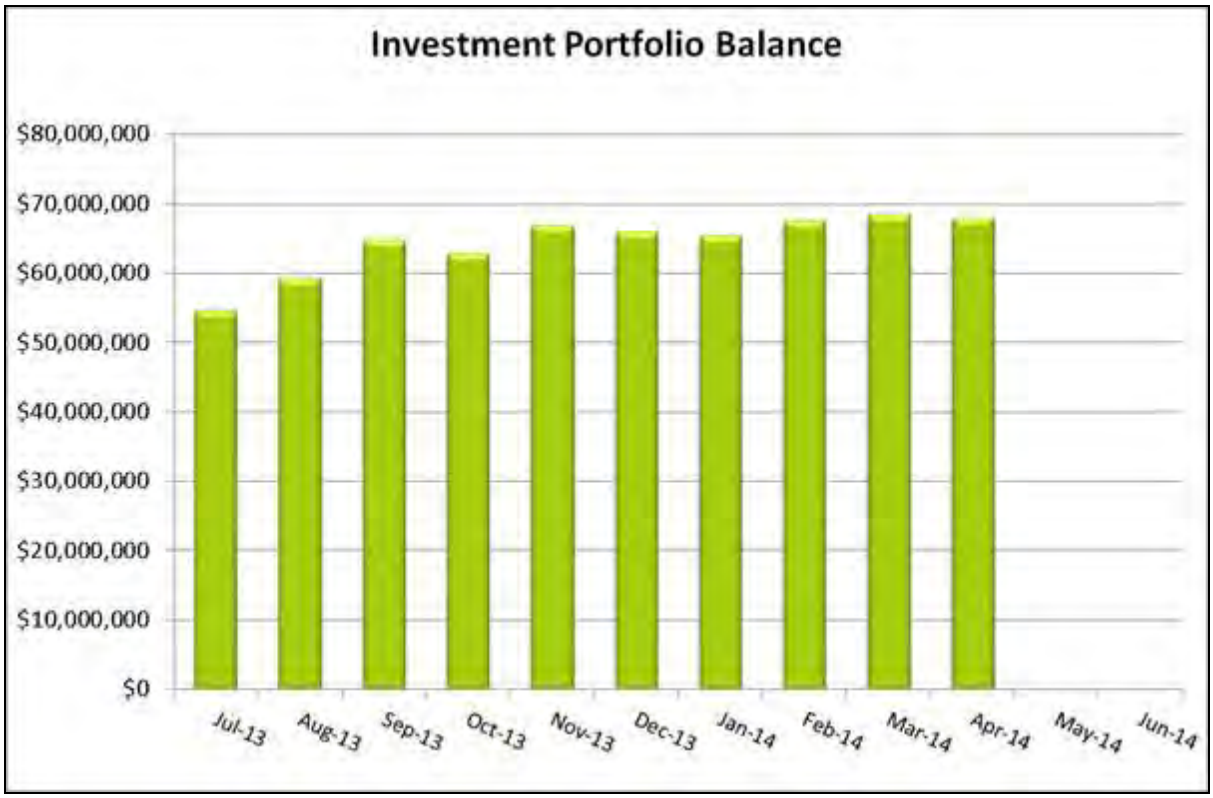
Attachment 1

Appendix A – List of Investments

Camden Council Investment Portfolio as at 30 April 2014							
Institution	Type	Amount	Interest Rate	Date Invested	Maturity Date	Original Term of Investment (days)	Interest Accrued as at 30/04/2014
CUA	TD	$1,000,000.00	5.95%	3/05/2013	1/05/2014	363	$59,173.97
CUA	TD	$1,000,000.00	5.95%	3/05/2013	8/05/2014	370	$59,173.97
Suncorp Metway	TD	$1,000,000.00	5.14%	27/07/2013	31/07/2014	369	$39,148.49
NAB	TD	$500,000.00	4.50%	7/02/2014	5/02/2015	363	$5,116.44
Westpac	TD	$700,000.00	4.35%	1/05/2013	7/05/2015	736	$30,450.00
Westpac	TD	$2,000,000.00	4.35%	6/05/2013	14/05/2015	738	$85,808.22
Westpac	TD	$500,000.00	4.35%	17/05/2013	21/05/2015	734	$20,796.58
Westpac	TD	$500,000.00	4.55%	17/05/2013	19/05/2016	1098	$21,752.74
ME Bank	TD	$750,000.00	4.15%	30/07/2013	31/07/2014	366	$23,450.34
CBA	TD	$1,200,000.00	4.00%	7/08/2013	7/08/2014	365	$35,769.86
NAB	TD	$1,000,000.00	3.91%	7/08/2013	24/07/2014	351	$28,601.92
BOQ	TD	$2,500,000.00	5.05%	4/11/2013	1/11/2018	1823	$61,568.49
BOQ	TD	$1,500,000.00	4.50%	7/11/2013	2/11/2016	1091	$32,363.01
AMP	TD	$1,900,000.00	3.80%	13/11/2013	13/11/2014	365	$17,594.52
BOQ	TD	$1,000,000.00	5.10%	25/11/2013	22/11/2018	1823	$21,936.99
ING Bank	TD	$1,000,000.00	4.63%	28/11/2013	23/11/2017	1456	$19,534.79
BOQ	TD	$1,000,000.00	4.85%	28/11/2013	23/11/2017	1456	$20,463.01
AMP	TD	$2,000,000.00	3.80%	28/11/2013	28/11/2014	365	$32,065.75
BOQ	TD	$1,000,000.00	4.50%	28/11/2013	24/11/2016	1092	$18,986.30
ME Bank	TD	$1,000,000.00	3.90%	2/12/2013	20/11/2014	353	$16,027.40
CBA	TD	$1,000,000.00	4.00%	2/12/2013	2/12/2015	730	$16,438.36
AMP	TD	$1,000,000.00	3.80%	5/12/2013	4/12/2014	364	$15,304.11
Suncorp Metway	TD	$1,500,000.00	3.65%	12/12/2013	15/05/2014	154	$21,000.00
Suncorp Metway	TD	$500,000.00	3.65%	12/12/2013	22/05/2014	161	$7,000.00
ME Bank	TD	$1,500,000.00	3.90%	12/12/2013	18/12/2014	371	$22,438.36
AMP Bank	TD	$1,000,000.00	3.80%	12/12/2013	11/12/2014	364	$14,575.34
Macquarie Bank	TD	$1,000,000.00	3.59%	19/12/2013	19/12/2014	365	$14,210.96
Westpac	TD	$1,000,000.00	3.61%	19/12/2013	19/12/2014	365	$13,154.25
NAB	TD	$1,000,000.00	3.74%	24/12/2013	12/06/2014	170	$13,115.62
NAB	TD	$1,500,000.00	3.75%	2/01/2014	19/06/2014	168	$19,339.04
Rural Bank	TD	$1,000,000.00	3.50%	9/01/2014	29/05/2014	140	$10,739.73
ME Bank	TD	$1,000,000.00	3.70%	9/01/2014	22/05/2014	133	$11,353.42
ME Bank	TD	$1,000,000.00	3.70%	9/01/2014	5/06/2014	147	$11,353.42
NAB	TD	$2,000,000.00	3.70%	9/01/2014	5/06/2014	147	$22,706.85
NAB	TD	$3,000,000.00	3.68%	16/01/2014	26/06/2014	161	$31,758.90
Bendigo Adelaide Bank	TD	$1,000,000.00	3.60%	16/01/2014	3/07/2014	168	$10,356.16
Macquarie Bank	TD	$1,000,000.00	4.15%	20/01/2014	20/01/2016	730	$11,483.56
ING Bank	TD	$1,000,000.00	3.55%	23/01/2014	10/07/2014	168	$9,531.51
Westpac	TD	$1,000,000.00	3.58%	29/01/2014	14/05/2014	105	$9,023.56
Westpac	TD	$1,500,000.00	3.58%	29/01/2014	21/05/2014	112	$13,535.34
Heritage Bank	TD	$1,000,000.00	3.80%	31/01/2014	16/07/2014	166	$9,369.86

Camden Council Investment Portfolio as at 30 April 2014							
Institution	**Type**	**Amount**	**Interest Rate**	**Date Invested**	**Maturity Date**	**Original Term of Investment (days)**	**Interest Accrued as at 30/04/2014**
ING Bank	TD	$1,000,000.00	3.66%	7/02/2014	6/08/2014	180	$8,322.74
BOQ	TD	$1,000,000.00	3.70%	13/02/2014	13/08/2014	181	$7,805.48
NAB	TD	$500,000.00	3.70%	20/02/2014	20/08/2014	181	$3,547.95
Rural Bank	TD	$1,000,000.00	3.55%	21/02/2014	20/08/2014	180	$6,710.96
Rural Bank	TD	$1,500,000.00	3.55%	25/02/2014	27/08/2014	183	$9,482.88
BOQ	TD	$1,000,000.00	4.65%	27/02/2014	22/02/2018	1456	$8,026.03
Rabobank	TD	$1,000,000.00	5.00%	28/02/2014	28/02/2019	1826	$8,493.15
Rabobank	TD	$1,200,000.00	5.00%	3/03/2014	6/03/2019	1829	$9,698.63
NAB	TD	$1,500,000.00	3.65%	6/03/2014	3/09/2014	181	$8,400.00
Rural Bank	TD	$1,000,000.00	3.75%	13/03/2014	10/09/2014	181	$5,034.25
NAB	TD	$1,000,000.00	3.65%	20/03/2014	17/09/2014	181	$4,200.00
NAB	TD	$1,000,000.00	3.65%	27/03/2014	24/09/2014	181	$3,500.00
NAB	TD	$1,000,000.00	3.58%	3/04/2014	18/06/2014	76	$2,746.30
NAB	TD	$1,000,000.00	3.60%	10/04/2014	23/07/2014	104	$2,071.23
Suncorp Metway	TD	$1,000,000.00	3.60%	10/04/2014	1/10/2014	174	$2,071.23
BOQ	TD	$1,000,000.00	3.70%	17/04/2014	15/10/2014	181	$1,419.18
NAB	TD	$1,500,000.00	3.65%	17/04/2014	8/10/2014	174	$2,100.00
Bendigo Adelaide Bank	TD	$1,000,000.00	3.50%	24/04/2014	22/10/2014	181	$671.23
# TD Investments	**59**	**$66,850,000.00**	**4.04%**				**$1,050,872.38**
CBA	Call Account	$1,570,000.00	2.70%				
		$68,420,000.00					



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Attachment 1

Appendix B – Ratings Definitions

Standard & Poor's Ratings Description

Standard & Poor's (S&P) is a professional organisation that provides analytical services. An S&P rating is an opinion of the general credit worthiness of an obligor with respect to particular debt security or other financial obligation – based on relevant risk factors.

Credit ratings are based, in varying degrees, on the following considerations:

- Likelihood of payment
- Nature and provisions of the obligation
- Protection afforded by, and relative position of, the obligation in the event of bankruptcy, reorganisation or other laws affecting creditors' rights
- The issue rating definitions are expressed in terms of default risk.

S&P Short-Term Obligation Ratings are:

- **A-1**: This is the highest short-term category used by S&P. The obligor's capacity to meet its financial commitment on the obligation is strong. Within this category, certain obligations are designated with a plus sign (+). This indicates that the obligor's capacity to meet its financial commitment on these obligations is extremely strong.
- **A-2**: A short-term obligation rated A-2 is somewhat more susceptible to the adverse changes in circumstances and economic conditions than obligations in higher rating categories. However the obligor's capacity to meet its financial commitment on the obligation is satisfactory.
- **A-3**: A short-term obligation rated A-3 exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.

S&P Long-Term Obligations Ratings are:

- **AAA**: An obligation/obligor rated AAA has the highest rating assigned by S&P. The obligor's capacity to meet its financial commitment on the obligation is extremely strong.
- **AA**: An obligation/obligor rated AA differs from the highest rated obligations only in small degree. The obligor's capacity to meet its financial commitment on the obligations is very strong.
- **A**: An obligation/obligor rated A is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations/obligors in higher rated categories. However the obligor's capacity to meet its financial commitment on the obligation is strong.
- **BBB**: A short-term obligation rated BBB exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.
- **Unrated**: Financial Institutions do not necessarily require a credit rating from the various ratings agencies such as Standard & Poor's and these institutions are classed as "Unrated". Most Credit Unions and Building societies fall into this category. These institutions nonetheless must adhere to the capital maintenance requirements of the Australian Prudential Regulatory Authority (APRA) in line with all authorised Deposit Taking Institutions (Banks, Building societies and Credit Unions).
- **Plus (+) or Minus(-)**: The ratings from "AA" to "BBB" may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories

Fitch and Moody's have similar classifications.

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Attachment 1

Appendix C – Recently Invested ADIs

Rural Bank

Historically, the Bank was formed as Elders Rural Bank and received its banking licence in 2000. In August 2009, Elders Rural Bank Limited changed its name to Rural Bank Limited and, in December 2010, Rural Bank became a fully-owned subsidiary of the Bendigo and Adelaide Bank Group.

In December 2010, Bendigo and Adelaide Bank announced that it would increase its shareholding in Rural Bank from 60% to 100% for $165m, or approximately 1.2 times book value. As such, Rural Bank takes on its parent's company's long-term credit rating of A- by S&P.

Over the years, the bank's business model has expanded, but its core business has not changed. They specialise in lending to the agricultural sector in rural and regional centres across the country. Rural Bank's products and services are now available at more than 400 locations nationally.

Financial Results

As at 31 December 2013, Rural Bank's Tier 1 Capital Ratio stood at 11.73% and it's Total Capital Ratio at 13.26%, well above Basel III minimum capital requirements.

At a group level, Bendigo-Adelaide Bank Ltd announced a statutory profit after tax of $180.7 million for the 6 months ending 31 December 2013, a 4.6% decrease on the prior corresponding period. The cash earnings result is $185.9 million for the 6 months ending 31 December 2013, a 9.5% increase on the prior corresponding period. Retail deposits stood at $42.65 billion (up from $42.25 billion in June 2013), an increase of 1.0%.

Heritage Bank

In 1981 Toowoomba Permanent Building Society (est. 1875) and the Darling Downs Building Society (est. 1897) merged and became Heritage Building Society. In December 2011, Heritage Building Society officially changed its name to Heritage Bank.

Heritage Bank is Australia's largest mutual bank with $8.5 billion in total assets. It is owned by customers, not shareholders. Heritage does not pay dividends so all profits are reinvested in the business. Heritage now has 61 branches in southern Queensland and 39 mini branch outlets. They offer a full suite of banking products, including savings and transaction accounts, term deposits, home loans, personal loans, business banking, credit and debit cards, retirement savings accounts, financial planning, insurance and foreign currency and travel finance products.

Financial Results

The operating profit of the Group for FY13 after income tax was $37.052 million, an 18.5% increase compared to the previous year (FY12 was $31.272 million). The Group reported a 3.5% increase in total consolidated assets to a total of $8.507 billion for FY13 (up from $8.221 billion in FY12).

As at 31 December 2013, Heritage Bank's Tier 1 Capital Ratio stood at 11.69% and it's Total Capital Ratio at 13.37%, well above Basel III minimum capital requirements.

Rabobank Australia

With over 110 years of history, the Rabobank Group is a leading provider of financial services around the world and has a strong historical presence for the global food and agriculture industry. Headquartered in Utrecht, the Netherlands, Rabobank is a cooperative bank with over AUD$926.4 billion in assets (€732 billion)[1], approximately 10 million clients, more than 59,000 employees, and a presence in 48 countries. Rabobank is one of the 30 largest financial institutions in the world based on Tier 1 Capital.

Rabobank established an office in Australia in 1990 and acquired the Primary Industry Bank of Australia (PIBA) operating in Australia and New Zealand in 1994. With headquarters in Sydney, Rabobank has 61 branches throughout Australia and 32 branches in New Zealand. As at December 2011, the Group employed more than 1,000 people in Australia and New Zealand, with more than half based in regional locations.

Financial Results

The latest Prudential Standards of Rabobank Australia Ltd as at 31 December 2013 is summarised as follows:

- Cash and liquid assets were $173.3m (Q4 2013)
- Impaired loans down to $302.1m (Q4 2013) from $313.3m (Q2 2013)
- Tier one capital ratio of 10.81%, well in excess of Basel III regulatory requirements

[1] As a comparison, CBA has approximately AUD$750 billion in total assets and 45,000 employees

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Attachment 1

DRAFT LAKE ANNAN SPECIFIC AREA PLAN OF MANAGEMENT

Revised and Amended by
Camden Council
February 2014

13/23573

EXECUTIVE SUMMARY

Background

As with many riparian areas in Camden, Lake Annan is currently under stress from the impacts of surrounding urban land use and the development of urban release areas in the catchment. Active management is required to improve the ecological, aesthetic and recreation functions of the Lake.

The main concern for management is the quality of water discharging to Lake Annan. The existing gross pollutant trap (GPT) is not fulfilling its design objectives in providing adequate treatment of stormwater runoff to the Lake. This in combination with recent development in the catchment has placed additional pressure on the system.

The Vision

The Strategic Plan for Camden Council sets out a vision for what Camden will be like in the year 2040.

'*Camden will be a place that enjoys healthy urban and natural environments where the natural environment is protected and enhanced, open space is visible and accessible, public places and local neighbourhoods are attractive and vibrant places and the built and natural environment in the area complement and support one another.*' (refer Page 20)

'*Our community is able to access, enjoy and appreciate local natural assets and open spaces in a sustainable way, and these assets continue to be nurtured for future generations. In addition, our lifestyles and behaviours are improving not degrading our environment, and there is a high level of community involvement in environmental initiatives.*' (refer Page 22)

'*In 2040 our physical environment – both natural and built supports all aspects of our life in Camden. This will mean our natural systems are resilient and fully functional, and as a result provide for the health and wellbeing of the current and future populations through clean air, water, natural systems and diverse ecosystems.*' (refer Page 32)

'*The outcomes for Healthy Urban and Natural Environments will be achieved by focussing on:*

- *Improving the quality of our local rivers and waterways, and actively managing water throughout the area, including stormwater*' (refer Strategy 2.1.2, Page 34)
- *Provision and management of parks and natural open spaces which are accessible, connected and well-maintained to enhance community and environmental health, recreation and leisure opportunities, and appreciation of the local environment.*' (refer Strategy 2.4.1, Page 35)

Management Objectives

Objectives for the management of the Lake and its surrounding riparian environment are:

- To protect and enhance the biodiversity and ecological values of the lake, particularly in relation to water quality, native vegetation, and fauna habitat.
- To minimise long term maintenance costs.
- To maintain and enhance opportunities for passive recreational, cultural, social and educational pastimes and activities, without compromising ecological values.

- To conserve and enhance the scenic landscape qualities of the Lake.
- To encourage community involvement in the on-going management of the Lake and improve awareness of its existing potential ecological values.
- To promote monitoring of the Lake to evaluate and improve environmental outcomes.

Land to which this Plan Applies

This plan applies to Lake Annan and the surrounding riparian land and parkland, and incorporates the inlet and outlet structures of the Lake. The land parcels that fall under this plan are identified in Table 5 (Appendix 1) and shown in Map 2.

Plan Structure

The structure of this Plan of Management follows the provisions set out in the *Local Government Act 1993* for plans of management for 'community land'.

The management of Lake Annan will be in accordance with the specific management strategies that have been prescribed within this Plan.

The Lake and riparian buffer zone covered by this Plan were categorised 'natural area' and subcategory of 'wetland' when the original Plan of Management was adopted by Council on 28 July 2003 (refer Map 3, Appendix 1). The remainder of the land covered by this Plan was categorised 'park' (refer Appendix 1).

Scope

This Plan of Management specifies the manner in which Lake Annan and the associated riparian areas will be used and managed, and the objectives for that use and management. It also includes amendments to the original Plan of Management. The Plan may also be used to determine priorities for the use of resources and funds, and to guide the carrying out of works.

The major issues identified and addressed by this Plan are:

- Lake design;
- Water quality;
- Vegetation management;
- Erosion;
- Maintenance;
- Pest fauna;
- Recreation; and
- Community issues.

The Plan provides:

- a background to Lake Annan including an overview of the area, design intent of the Lake, past studies of the Lake and legislative context for the management of Lake Annan (Section 1);
- a vision and objectives for Lake Annan (Section 2);

- a discussion of the major issues identified for the management of Lake Annan (Section 3) and strategies developed to address each issue (Section 4);
- a masterplan prepared for improvement works at Lake Annan (Section 5); and
- an action plan for the implementation of management strategies. Performance measures have been identified for each action and actions have been categorised as low, medium or high priority to guide allocation of resources and funding (Section 6).

A Concept Maintenance Plan is provided in the report '*Concept designs for water quality treatment at Lake Annan*' prepared for Camden Council by Storm Consulting (Appendix 2).It sets out procedures by which Lake Annan can be maintained to a standard that ensures that it remains operational in accordance with the objectives of this Plan.

Recommendations

To maintain Lake Annan such that it functions in accordance with the objections of this Plan, appropriate stormwater treatment within the catchment is essential. Given the Lake is considered undersized relative to its catchment, the following management actions are considered essential:

1. Construction of water quality treatment devices including a constructed wetland within the Lake;
2. Replace the existing main Gross Pollutant Trap (GPT) so that it achieves optimum treatment of gross pollutants;
3. Install an appropriate water level control structure for maintenance requirements within the Lake;
4. Initiate and adhere to an appropriate maintenance regime, and allocate responsibility sand sufficient funding for this;
5. Develop a community education program for local residents;
6. Undertake bush regeneration to the island and native planting to enhance, and create additional riparian vegetation surrounding the Lake (which will also delineate between the open space 'park' area and the riparian 'natural area' buffer zone; and
7. Encourage and support education/interpretative and passive recreational activities by maintaining strategically placed signage and seating.

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Attachment 1

CONTENTS

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Attachment 1

Concept designs for water quality treatment at Lake Annan

Report Prepared for:
Camden council

Project No. 1485

Prepared by:
Storm Consulting Pty Ltd

[redacted]

[redacted]

[redacted]

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LAKE ANNAN SPECIFIC AREA PLAN OF MANAGEMENT

BASIS FOR MANAGEMENT

SECTION ONE: INTRODUCTION

1.1 PURPOSE OF THE PLAN

Like many riparian areas in Camden, Lake Annan is currently under stress from the impacts of surrounding urban land use and the development of urban release areas in the catchment. Active management is required to improve the ecological, aesthetic and recreation functions of the Lake.

This Plan of Management specifies the manner in which Lake Annan and the associated riparian areas will be used and managed, and the objectives for that use and management. It provides amendments to the original Plan of Management adopted on 28 July 2003. The Plan may also be used to determine priorities for the use of resources and funds, and to guide the carrying out of works.

1.2 STRUCTURE OF THE PLAN

The structure of this Plan of Management follows the provisions set out in the *Local Government Act 1993* for plans of management for 'community land'.

The management of Lake Annan will be in accordance with the specific management strategies that have been prescribed within this Plan.

1.3 CATEGORISATION

For the purposes of use and management, Lake Annan has been categorised as 'natural area' and 'park' according to provisions of the *Local Government Act 1993*. The Lake and riparian buffer zone fall under the category of 'natural area – wetland' and the land covered by this Plan which lies outside the riparian buffer zone falls under the category 'park' (refer Map 3).

The Lake and riparian buffer zone of Lake Annan is categorised for the purpose of this Plan as a constructed wetland.

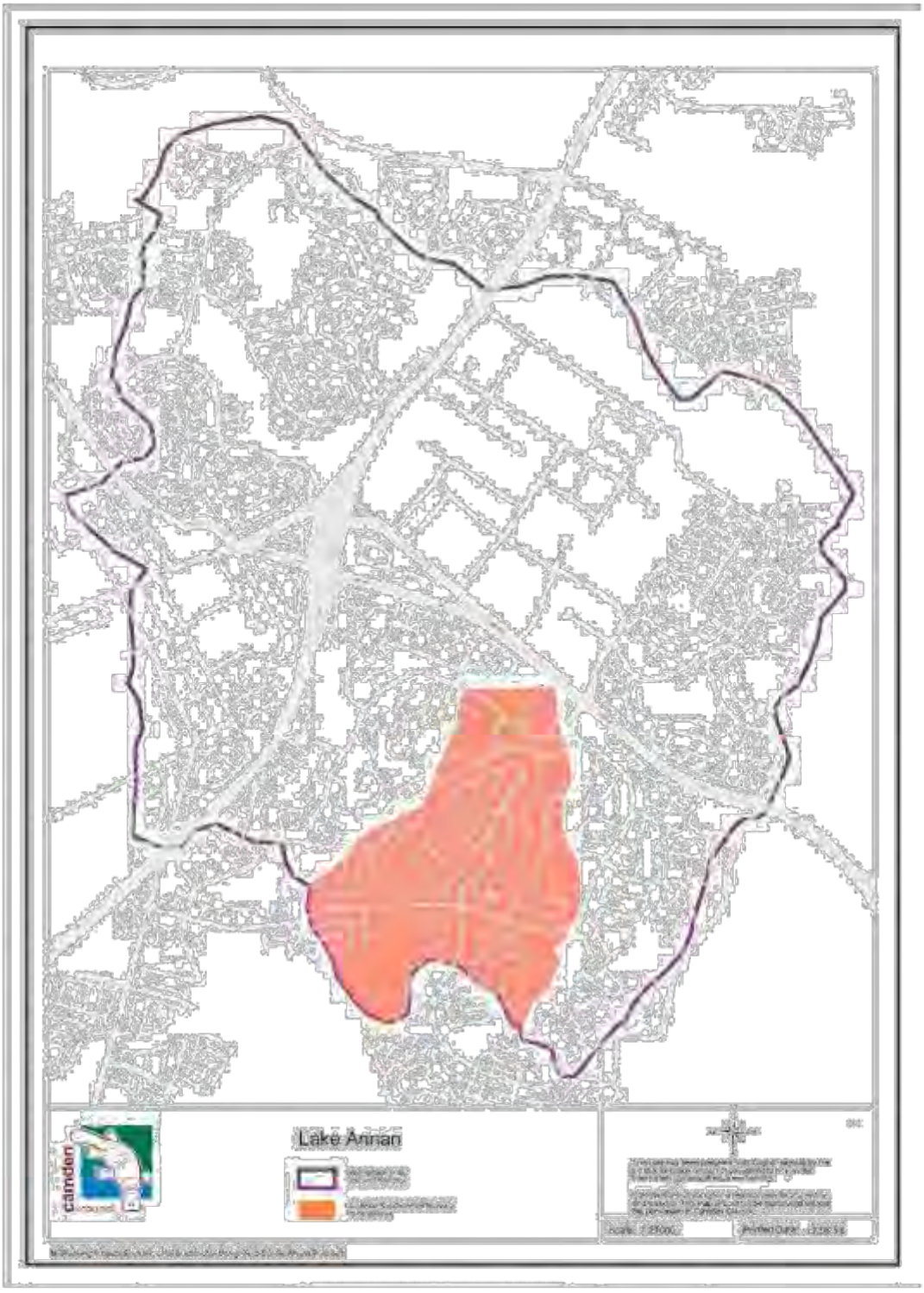
1.4 LAND TO WHICH THE PLAN APPLIES

This plan applies to Lake Annan and the surrounding riparian land and park land, and incorporates the inlet and outlet structures of the Lake. The land parcels that fall under this plan are identified in Table 2A (Appendix 2) and shown in Map 2. It should be noted that this plan, in some cases, covers only part of these land parcels (see Map 2).

1.5 MANAGEMENT AUTHORITY, TENURE AND OWNERSHIP

The land is owned by Camden Council. For the purposes of this plan, the management authority is Camden Council.

MAP 1: LAKE ANNAN CATCHMENT



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MAP 2: AREA COVERED BY THIS PLAN

1.6 BACKGROUND INFORMATION

1.6.1 Site and Surrounds

Lake Annan is located in the suburb of Mount Annan in the Camden Council LGA, approximately 52km South West of the Sydney CBD. Lake Annan is surrounded by residential housing and forms part of a public open space and drainage reserve (see Map 2).

1.6.2 Catchment Context

Lake Annan is located in the upper reaches of the Narellan Creek catchment (see Map 1) and is one of the most heavily urbanised sub-catchment of the Upper Nepean River. Remaining rural areas are rapidly being developed for residential, industrial and commercial land uses.

1.6.3 Soils and Geology

The catchment area of the lake is dominated by red and brown podzolic soils of the Blacktown soil landscape (Hazelton and Tillie, 1990). These soils are characterised by low fertility, low to moderate water holding capacity and low cationic exchange capacities. They are strongly acidic, with a high potential aluminium toxicity, dispersive and easily eroded.

1.6.4 Lake Annan Overview

The Lake is 2.7 hectares in size, which equates to 1% of its catchment area.

1.6.4.1 Design

Lake Annan was constructed in 1988 as a combined sedimentation and part macrophyte Water Quality Control Pond (WQCP) as part of a pilot scheme for reducing pollutant loads from stormwater runoff. Lake Annan has been constructed as an in-line water quality control pond within Narellan Creek. The lake was designed with the following components:

- basin storage volume of 55 ML;
- surface area of 2.7 hectares (approximately 1% of the total catchment area);
- average depth of 2 metres, maximum depth of 3.5 metres;
- a central island placed directly in line with the inflow to disperse the flow and reduce short-circuiting. The island also provides a refuge for native fauna and an additional lake edge for macrophytes;
- a Gross Pollutant Trap (GPT) located upstream of the Lake, designed to remove course sediment for floods up to the 3 month ARI flood event and so that velocities of floods up to the 1 year ARI event would not be sufficient to re-suspend sediment; and
- a spillway and trash rack at the downstream outflow of the Lake.

The Lake system has five inflows and one outflow point, as follows:

- main inflow (from Narellan Creek) with a large GPT consisting of a permanently ponded sedimentation basin and trash rack;
- secondary inflow (from end of Hogan Place) fitted with a continuous deflective separation (CDS) unit;
- secondary inflow from the 'T' junction of Dunbar Place fitted with a CDS unit;

- two minor inflows (from the dead end of Dunbar Place and off Birriwa Circuit near the end of Hogan Place) that are not fitted with stormwater proprietary devices; and
- outflow (to Narellan Creek) with a large spillway and trash rack.

Additionally, macrophytes have sporadically established in a band approximately 2 metres wide around the perimeter, largely through natural processes and without deliberate planting (main species being Cumbungi, *Typha sp.* and Common Rush, *Juncus usitatus*).

1.6.5.2 Design Problems

Since construction (1988), Lake Annan has experienced a number of problems, which include:

- high nutrient loads contributing to algal blooms and odour in the warmer months;
- operation and maintenance of the upstream GPT;
- poor water clarity due to high turbidity;
- widespread loss of macrophyte plants;
- sediment build up;
- localised areas of erosion and bank scalding; and
- additional nutrient loads due to a large population of Australian White Ibis using the Island for breeding.

In addition, the Lake is considered undersized relative to its catchment.

1.6.5.3 Previous Studies

Lake Annan was the subject of a study concerning the performance of the Water Quality Control Pond (along with Currans Hill Pond) in the Upper Narellan catchment, commissioned by Camden Council (SMEC 1998). This study also identified measures that might readily and economically be adopted to improve water quality treatment, and was used to assess any savings that could be achieved in the proposed Harrington Park Water Quality Management System. Issues determined as a result of this study are summarised below:

- Operational problems of the major GPT which has been installed on-line of the major inflow to the Lake, as follows:
  - The GPT was installed on-line and due to concrete walls surrounding the GPT and housing the trash rack, the GPT has a permanent ponded area which has regularly become anaerobic, causing odour problems;
  - Pet animals have drowned in the permanently ponded area, which has raised safety concerns;
  - Stormwater spills over the trash rack causing the collected trash to be washed into Lake Annan and it is suspected that re-suspension of collected sediment also occurs on these occasions;
  - The low flow pipe that feeds the GPT has an invert level well below the permanent pond level. Consequently the low flow pipe is permanently inundated and during low flows this has resulted in sediment accumulating within the pipe, eventually blocking the pipe, which has caused ongoing maintenance problems. To help reduce this problem Council has cut a notch into the weir that controls the pool level in the GPT.

This has reduced the pool level so that only the bottom portion of the low flow pipe is permanently inundated. Sediment still settles in the bottom portion of the pipe.

- Macrophyte coverage is less than the design target of 30%, which was attributed to high turbidity. Turbidity was attributed to the predominance of dispersive clays in the catchment area, so that flows to the Lake contain high concentrations of colloidal particles that will not settle; and

- Elevated groundwater tables causing salinity problems observed around the perimeter of the pond.

Water Quality monitoring at the inlet and outlet structures of the Lake prior to May 2003 indicated that Lake Annan removes approximately 60% of the annual load of suspended solids and faecal coliforms and approximately 40% of total phosphorus and total nitrogen.

Management options recommended within the SMEC (1998) report were:

1. Increasing macrophyte zone; it was considered that the Lake's performance could be improved by increasing the coverage of macrophytes. Recommendations were to carry out earthworks to establish shallow zones between the existing island and the Lake perimeter. However, the expansion of macrophytes was not modelled to assess improvements in water quality from the proposed option.
2. Replacement of the GPT with a CDS unit to overcome all of the existing operational problems at an estimated cost of $150,000.
3. Alternatively, improve the existing GPT by constructing a bypass channel to effectively put the GPT offline, thus preventing re-suspension of sediment and spill of litter in large events. A small pump could also be installed to drain the GPT after flood events in order to reduce the tendency for sediment to accumulate in the upstream flow pipe.
4. Install a re-circulation system to improve the performance of the Lake and dosing with flocculants such as gypsum to assist in the settling out of fine colloids.
5. Planting trees and other suitable vegetation around the perimeter to maintain a lower groundwater table.

1.6.5.4 Community Consultation prior to the preparation of the original PoM

The following issues were raised during community consultation held in August 2001:

- Littering and dumping of grass clippings, shopping trolleys, etc;
- Vandalism and graffiti;
- Faeces not removed by owners of dogs using the area;
- Odours and aesthetics;
- Lack of linkage with pathways and formalised open space areas for use by visitors and Council contractors causing further degradation of lake verges;
- Lack of formal parking bays and unauthorised vehicular access;
- Lack of community education;
- Lack of water quality monitoring program;

- Lack of general maintenance, but in particular with regard to removal of trash and debris from GPTs and trash racks; and
- Ongoing impacts to water quality due to development in catchment and apparent lack of policing and enforcement of adequate sediment and erosion controls by developers.

1.6.5 Current Water Quality and Quantity Issues

1.6.5.1 Sediment

The sediment and lake bathymetric analysis which was undertaken in 2010 identified that the sediment is not contaminated, and that it could be re-used rather than disposed as landfill. While the bathymetric survey found there were 12,530 cubic metres of sediment, only 5,000 cubic metres of the sediment is solid sediment, the remainder being basically sludge. Therefore, potentially the 5,000 cubic metres of solid sediment can be used for benching in a constructed wetland or Water Sensitive Urban Design (WSUD) treatment where appropriate.

The sediment was also identified to contain high levels of phosphorus and nitrogen which would contribute to the outbreak of Blue-Green Algae during warm weather and dry periods.

1.6.5.2 Blue-Green Algae

Blue-Green Algae (*Cyano bacteria*) is present at Lake Annan in the warmer months and can build to a level that is toxic to humans and can be fatal to animals. A Blue-Green Algae outbreak can result from nutrient build-up in the Lake.

Camden Council has undertaken water quality testing of the Lake for Blue-Green Algae since February 2003 in the warmer months. There were 5 minor green alert periods in regards to the levels of toxic Blue-Green Algae in the initial period of testing in February/March 2003. In January and March 2009, and February 2010 there were major red alert periods in which the public was notified by signage and adjoining residents by letter, to not have contact with the water because of the potential for skin irritation and infection.

Consultants, GHD Pty Ltd, have undertaken water quality sampling, analysis and reporting in regards to stormwater entering and leaving Lake Annan since 2011. Results for Total nitrogen and Total phosphorus have been quite high and algal blooms observed.

1.6.5.3 Lake Y'andelora

A small part of the upper catchment of Lake Annan has had water quality issues partially addressed through the development in 2006 of Lake Y'andelora. The planting of macrophytes in Lake Y'andelora and the inclusion of an adjoining low flow in-stream swale to treat nutrients appear to be inadequate in treating the poor water quality issue.

There is also erosion at the in-stream swale on the upstream side of the Lake and there are no GPTs upstream of the Lake, which means there is excessive siltation of the Lake.

1.6.5.4 Pest Fauna

In the past pest fauna including Purple Swamp Hen, domestic ducts, carp and mosquito fish (Gambusia) have had a detrimental impact on the water quality and native fauna of the Lake. Since July 2006, poor water quality of Lake Annan has been exacerbated by the breeding colony of Australian White Ibis (Ibis) on the island at Lake Annan. The colony is also likely

adding to the high phosphorus and nitrogen and is a public nuisance because of the size of the colony and the noise and odour generated.

Camden Council commenced detailed ibis population counts on 25 August 2009 with a population count of 1,109 Ibis (including chicks). Jacks Gully became a covered Waste Facility in late 2008, and the landfill was closed to putrescible wastes in 2009. The Ibis population subsequently dropped to an average peak of 700 birds in 2010, 2011 and 2012.

Camden Council developed a Management Plan for Australian White Ibis at Lake Annan to manage the Ibis population at Lake Annan and mitigate the public nuisance concerns. In accordance with the Management Plan, Council has undertaken oiling of the Ibis eggs and an ecological burn of abandoned nests.

Periodically there has been large numbers of Corellas (Cacatua sp.) at Lake Annan and they are presently in large numbers roosting on the island at night. They may at times also contribute to high phosphorus and nitrogen levels at the Lake.

1.6.5.5 Gross Pollutant Trap

Council engaged consultants, Optimal Stormwater, in early 2013 to investigate the retrofit of the existing main GPT or the installation of a new GPT to replace the existing main GPT at the inlet of Lake Annan. The proposed GPT was to be assessed on the following basis:

- Reliability of the solution;
- Available space for installation;
- Hydraulics of the solution;
- Suitability based on diversion chambers and depth to invert;
- Ease of maintenance and operation;
- Estimated cleaning frequency; and
- Capital and life cycle cost.

The GPT was to meet the minimum pollutant retention criteria provided in Table 1:

POLLUTANT	PERCENTAGE RETAINED
Gross Pollutants	80-100%
Coarse Sediment (> 0.5mm)	60-80%
Medium Sediment (0.1mm to 0.5mm)	50-70%
Fine Sediment (< 0.1mm)	40-60%

Table 1: Minimum Pollutant Retention Criteria

It is recommended that the GPT is to be moved further upstream to the existing GPT which will improve the function of the GPT and resolve most of the issues experienced with the existing GPT. This will also require the removal of the existing GPT.

1.6.5.6 Stormwater Harvesting

Council currently draws water from Lake Annan to irrigate Birriwa Reserve, Mount Annan. The average amount of water drawn over the last 12 months is:

- Spring/Summer – 127,500 litres/week x 27 weeks = 3,442,500 litres
- Autumn/Winter – 63,750 litres/week x 25 weeks = 1,593,750 litres
- Total per annum = 5,036,250 litres

Council has also connected Wandarrah Reserve, Mount Annan to Lake Annan for the purposes of irrigation, but at present the water from Lake Annan is not being utilised.

1.6.6 Requirements of Study to Prepare Concept Designs for Water Quality Treatment Devices at Lake Annan

Council engaged consultants, Storm Consulting, in May 2013 to prepare three concept designs for Water Quality Treatment Devices that addressed the water quality issued and in particular, reduced the concentration of fine particulate and dissolved pollutants in Lake Annan. The three concept designs were to incorporate water control treatments that include Water Sensitive Urban Design (WSUD) and Constructed Wetland Principles.

Additionally the design concepts were required to provide a design that retains a sufficient volume of water within Lake Annan during drought periods to allow the continued harvesting of water for irrigation Birriwa and Wandarrah Reserves. An option to be investigated and considered included the retention of significant areas of open water for aesthetic reasons, but the removal of the island.

The specific objectives for the original Lake Annan Plan of Management were required to be addressed in the concept designs an the constructed wetland was to be designed to retain nutrients, heavy metals, bacteria and other pollutants. The components of the constructed wetland were to include energy dissipation and sediment removal, flow spreader, macrophyte vegetation bans, open water and outlet control.

The above treatments needed to be considered for removal efficiency, maintenance requirements, social requirements, impacts and costs. Water quality and environmental flow standards to be met in regards to constructed wetlands are as per Council's Engineering Specifications.

To determine the expected performance of the water quality control treatment devices in each conceptual design, Storm Consulting was to undertake Model Urban Stormwater Improvement Conceptualisation (MUSIC) modelling incorporating the Lake Annan Catchment, including the Lake Y'andelora sub catchment. A comparative analysis of the Water Quality Treatment Devices was to be undertaken addressing the following criteria:

- The expected performance of each water quality control device to the catchment area and types of pollutant loads;
- The ease of access to and from each water quality control device for construction and maintenance purposes;
- The projected detail engineering design costs for each water quality control device;
- The projected capital and construction costs for each water quality control device;
- The projected landscaping costs for each water quality control device;
- A Concept Maintenance Plan for each water quality control device;
- The projected ongoing maintenance cost for each water quality control device; and
- A preliminary report recommending the optimum water quality treatment at Lake Annan.

SECTION TWO: STRATEGIC FRAMEWORK

Lake Annan was originally developed for scenic purposes but has been impacted by a range of issues including low water quality. To regain the scenic qualities of the Lake, a diverse and sustainable approach to design management is required.

2.1 THE VISION

The specific vision for Lake Annan is:

To create a sustainable, ecologically diverse aquatic and riparian environment that successfully integrates with the adjoining park areas and surrounding urban environment.

2.2 MANAGEMENT OBJECTIVES

Specific objectives for the management of Lake Annan and its surrounding riparian environment and parkland have been developed from and in addition to the core objectives for management of community land under the *Local Government Act 1993* (included in the Camden Riparian Areas Plan). These are:

- To protect and enhance the biodiversity and ecological values of the Lake, particularly in relation to water quality, native vegetation, and fauna habitat.
- To minimise long-term maintenance costs.
- To maintain and enhance opportunities for passive recreational, cultural, social and educational pastimes and activities, without compromising ecological values.
- To conserve and enhance the scenic landscape qualities of the Lake.
- To encourage community involvement in the on-going management of the Lake and improve awareness of its existing and potential ecological values.
- To promote monitoring of the Lake to evaluate and improve environmental outcomes.

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Attachment 1

LAKE ANNAN SPECIFIC AREA PLAN OF MANAGEMENT

ISSUES AND STRATEGIES

SECTION THREE: MANAGEMENT ISSUES

Management of the land must take into account the Plan's objectives, that is, to manage the land in a way that protects the natural values of Lake Annan.

3.1 LAKE DESIGN

The initial design of Lake Annan has led to many of the problems inhibiting the function of the Lake. Such issues identified are as follows:

- Lake Annan is considered undersized to effectively undertake water quality control functions for the catchment it services, at only 1% of the catchment size.
- Catchment impacts of water quality and sedimentation are adversely affecting the Lake. Development in the upper catchment has exacerbated these problems.
- The Lake and inlet structure are built in-line to the drainage system, which affects the water quality control functions. The GPT is inefficient due to overtopping and remobilisation of nutrients/pollutants and collected sediment in high flows (see Section 1.6).
- The GPT design is poor and ineffective, with particular problems including the permanent pool, position of the low flow pipe, and no high flow bypass (see Section 1.6).

The design of Lake Annan and the GPT limit the effectiveness of the Lake as a water quality control pond for the catchment upstream. Additionally, there is an inherent conflict between the two functions of the Lake, as a water quality control pond and as an aesthetic element in the landscape.

Optimal Stormwater investigated the replacement of the GPT in June 2013 and identified that Council should take the GPT upgrading opportunity, to install a more effective, more reliable underground GPT that will not have the aesthetic and work, health and safety issues of a trap similar to the existing GPT.

It has been recommended by Optimal Stormwater that Council install a single P2018 CDS unit. It is also recommended for ease of construction, ease of cleaning, and the highest levels of functionality, the GPT should be moved upstream of the existing location.

Storm Consulting prepared a report in June 2013 that provided three Concept Design Options for water quality control treatment which included:

- Water Sensitive Urban Design treatment devices;
- A volume of water that is accessible for irrigation purposes; and
- One option which retained significant areas of open water for aesthetic reasons, and also the removal of the island.

The design components of the three Concept Designs, A, B and C are summarised below:

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	DESIGN INTENT AND COMPONENTS	SIZE	COSTINGS
Concept A	Max flow path through reed bed. Open water retained. Island retained. Inlet zone for sedimentation.	9,228 m^2 12,442m^2 2,702m^2	Capital Investment: $695,000 20 Year Maintenance: $237,600 **Total Cost: $932,600**
Concept B	Island utilised as reed bed. Open Water retained. Inlet zone for sedimentation.	1,880m^2 20,645m^2 4,030m^2	Capital Investment: $481,000 20 Year Maintenance: $207,600 **Total Cost: $688,000**
Concept C	Three floating wetland substrates, one positioned at inlet, protected by cage. Most of open water retained (visuals retained). Island retained. Inlet zone for sedimentation. Permeable Reactive Barriers (flow filters through).	320m^2 2,702m^2	Capital Investment: $360,000 20 Year Maintenance: $287,600 **Total Cost: $647,000**

Table 2: Summary of Concept Designs

Capital cost is made up of detailed design cost, capital and construction cost, and landscaping cost.

The full report by Storm Consulting is provided in Section 8, Appendix 3 – Concept Designs for Water Quality at Lake Annan. A comparison and recommendation by Storm Consulting of the functionality of the Three Concept Design is as follows:

Concept Option A: Maximum Reed Bed - provides the best water quality improvement performance. However, it also has the highest cost of the three options and the additional cost does not appear to provide good value for money in relation to the additional treatment provided. It will also transform the Lake visually and have other associated risks. Storm Consulting do not recommend this option because of the design.

Concept Option B: Replace Island with Reed Bed - is a good option if removing the island is a preferred strategy. Storm Consulting note that without a large ibis population that the

island could be revegetated to make it more attractive, so the issue is whether the bird population can be controlled. The bird population is created by the operation of open landfills in the Sydney region. All landfills are identified to close within a few years.

Concept Option C: Floating Wetlands; has the least impact on visual quality of the lake while also providing relatively good water quality improvement. The reported water quality improvement is understated because Storm Consulting have not factored in the ongoing effect of the Permeable Reactive barrier to lock up Phosphorus over time, thereby preventing algal blooms in the lake. This option is somewhat experimental, but there is research and applications in Australia to be guided by.

The key risk factors identified by Strom Consulting that ought to inform a decision to select an option are as follows:

- **Climate Resilience;** will fluctuating water levels affect the viability of the reed beds, especially if water levels drop below the reed bed base for extended periods. The other issue is in a general sense, will fluctuating water levels be too much for the reed bed plants to bear.
- **Reed Bed Resilience;** will sediment carry over from the inlet sediment zones clog up the reed beds, particularly at their leading edge, which would require clean-out periodically. Note the water quality modelling shows that only about half the sediment load is retained in the inlet sediment zones, and so the remainder would travel through the reed beds.
- **Bird Predation of Planted Reed Beds;** waterfowl have a habit of preferring small plants and they can devastate planted areas. There are two typical ways to prevent this from occurring, i.e. bird netting and planting more mature plants which the birds do not prefer. Neither cost is included in the cost estimates.

These three risk factors apply to Concepts A and B only. Option C is immune to each issue because the reed beds are supported by a floating substrate and protected by a bird cage.

Recommended Option

Storm Consulting has recommended Option C for implementation based on the following summary of findings:

- Minor Impact on the visual appearance of the lake;
- Retention of the island and its biodiversity (which can be enhanced);
- Lowest capital cost;
- Lowest cost over 20 years of operation (includes construction);
- Not affected by fluctuating water levels;
- Not affected by sediment overloading;
- Not affected by bird predation of planted areas; and
- Ability to be easily retrofitted with additional water quality improvement in a staged manner.

The preferred Water Quality Treatment Concept C is provided in Section 5: Masterplan.

3.2 WATER QUALITY

Lake Annan faces the following water quality issues:

- Sedimentation of unknown quantities impacts on the storage volume and water quality as a result of on-going development in the catchment. A potential further loss in water volumes is yet to occur (from further upstream development planned).
- Nutrients are remobilised in the current GPT because of the wet bottom design and are being fed into the Lake in soluble form. Nutrients are also being fed into the Lake attached to sediment remobilised by storm events.
- Turbidity has resulted in poor water clarity caused by fine colloidal material from catchment soils.
- Algal growth in the form of filamentous green algae and blue-green algae indicate excess nutrient levels in the Lake.

Excess sediment and nutrients in the Lake are resulting in poor water quality and algal growth. Actions to improve water quality must be implemented in order to enhance environmental values e.g. habitat provision, and aesthetic amenity of the Lake.

Optimal Stormwater utilised MUSIC modelling to determine pollutant removal with the CDS Unit P3018. The modelling identified the following pollutant removal.

	TOTAL SUSPENDED SOLIDS	GROSS POLLUTANTS	TOTAL NITROGEN	TOTAL PHOSPHOROUS
% Removal	78%	92%	0%	57%
Load Removed (kg/year)	82000	23000	0	162

Table 3: Pollutant Removal Expected with the CDS Unit P3018

Taking into account the characteristics of the catchment and the interactions between flow and pollution transport, Optimal Stormwater is of the opinion the actual removal for gross pollutants would be expected to be 80% to 85% and around 60% to 70% for total suspended solids. The installation of a second similar CDS unit would expect an additional 5% to 10% increase in pollution removal outcomes and a 70% increase in cost. This is considered a poor cost benefit outcome to Council.

The Concept Designs for Water Quality Treatment at Lake Annan prepared by Storm Consulting in June 2013 assumed the effective trapping of gross pollutants in the upstream catchment and their routine removal to ensure ongoing removal efficiency remains high.

Storm Consulting found that widespread removal of the existing sediments from the lake is considered unfeasible. Where earthworks are proposed, lake sediments may be capped with imported sandy soil / spoil. Where sediments remain exposed on the lake bed, chemical stabilisation is required to prevent ongoing release of phosphorus.

In respect of the three Concept Designs for Water Quality Treatment, the following reductions in pollutants were identified:

	% REDUCTION		
POLLUTANT	Concept A	Concept B	Concept C
Total Suspended Solids	67%	58 %	55%
Total Phosphorus	45%	39%	28%
Total Nitrogen	15%	11%	2%
Gross Pollutants	55%	54%	55%

Table 4: Water Quality Performance of Water Quality Treatment Options

Storm Consulting has indicated that literature on the performance of floating wetlands is scarce but they can be up to ten times more effective than a conventional reed bed for the same unit area based on increased density of the root system, increased surface area contact of the roots in the water and "biofilms" on the roots that promote bacteria which improves water quality. For the purpose of the study, Storm Consulting adopted an efficiency of five times (5X) that of reed beds and also identified the following matters for consideration in dealing with water quality in the Lake Annan Catchment.

MUSIC modelling is not fully applicable to floating wetlands as it does not perceive there to be shallow water levels as occurs in a reed bed. The 2% reduction indicated for Total nitrogen may therefore be conservative. However the target pollutant is phosphorous, with nitrogen levels not being as important in the development of algal blooms. There is the potential to incorporate additional floating wetlands subject to monitoring and assessment of the initial installed floating wetlands.

Lake Annan (2.7 ha) and Lake Y'andelora (1.8 ha approx. area) represent 1.7% of the contributing catchment and to achieve best practice water quality performance, a constructed wetland should be 3% of the catchment.

Lake Annan and Lake Y'andelora is therefore highly unlikely to achieve best practice water quality treatment. In this regard Council may need to look at additional water quality treatment options in the catchment such as rain gardens in some of the existing drainage swales in the catchment.

3.3 VEGETATION MANAGEMENT

Native vegetation and aquatic macrophytes perform roles in water quality control, fauna habitat and visual amenity of the lake. Issues are as follows:

- Macrophyte coverage in the Lake is sparse and does not achieve the design intent of 30%. In addition, die off of macrophytes has been observed. Impaired light penetration as a result of high turbidity is believed to have been the reason for loss of macrophytes. Waterfowl was thought to have contributed to the suppression of growth by feeding on any new green shoots as they emerge.
- Terrestrial weeds such as Kikuyu (*Pennisetum clandestinum*) encroach into the macrophytes at the edge of the Lake and competes with our natives.
- Aquatic weeds (noxious and other serious weeds) have the potential to dominate open water and marsh zones of the Lake. These are potentially insurmountable to control both economically and physically if a large infestation occurs.

- The island and its bushland remnant with supplementary planting potentially provided valuable fauna habitat. However, the flora and fauna of this island has been impacted heavily since July 2006 by the Ibis population. Approximately 50% of the vegetation has died and the Australian White Ibis population has generally excluded other fauna utilising the island to habitat.
- The riparian zone around Lake Annan lacks a substantial native riparian edge vegetation community as required by the objectives for the management of this zone.

Aquatic macrophytes in the past been under stress die to impacts from water quality and water birds in the Lake, and coverage is well below the design intent of 30% if the Lakes surface. The buffer zone around Lake Annan lacks a substantial native riparian edge vegetation community to function in water quality protection, erosion control, habitat provision, aesthetic amenity and education in accordance with the objectives of this Plan and management of wetlands under the Local Government Act.

3.4 EROSION

The lake shores have minor erosion in the form of scalds and sheet runoff leading into the Lake, and undercutting of the bank. The erosion is pronounced on the south and east banks. The island is displaying active erosion on the northern bank which requires repair. Erosion of the southern and eastern banks is not serious enough to warrant repair in isolation. Erosion should be repaired concurrently with earthworks in these locations. The northern bank of the island requires repair to arrest erosion that is occurring.

3.5 MAINTENANCE

Wetlands constructed and occurring naturally within an urban environment suffer from a number of constraints placed upon them by disturbance within the contributing catchment. Consequently a wetland in an urban environment cannot be expected to perform as a natural system without regular maintenance. Operation and maintenance must ensure that:

- The wetland operates as designed and the objectives are met;
- The active lifespan of the wetland is extended, delaying the need for a major retrofit or decommissioning;
- Operational staff are allowed to make informed decisions and ensure new staff can effectively manage the wetland; and
- Money is saved by providing the mechanism through which problems such as weed infestations can be detected in the early stages. This often results in solutions that are much cheaper and simpler to implement that later remedial action (DLWC 1998).

Maintenance issues for Lake Annan include the following:

- Maintenance is currently limited to mowing, litter collection, removal of rubbish and removal of dead Ibis from the island.
- Mowing is undertaken close to the edge of the Lake in some sections and native plantings on the edge of the Lake in other sections are not maintained.
- Council outsources the design and determination of maintenance of the wetland.
- GPT maintenance and inspections are scheduled and undertaken every 3 months; however there has not been consistent auditing to see if the schedule achieves optimum results.

- In high flow rain events the trash rack at the main inlet of the main GPT overtops and trapped litter is released into the Lake.
- There will be some continued sedimentation of the Lake and it will be required to be surveyed in the future to determine if and what level of de-silting is required.

Additionally the redesign and construction of a constructed wetland will require general maintenance to be undertaken, including:

- Removal of accumulated sediment and debris from inlet sediment zones.
- Replanting of denuded areas of macrophyte planting.
- Repair of erosion/scour of embankments, or undermining of rockwork.
- Replacement of permeable reactive barrier in Concept C.

A wetland in an urban environment cannot be expected to perform as a natural system, without regular maintenance, due to the ongoing catchment impacts. Current maintenance practices at Lake Annan are currently limited and not in accordance with the objectives for the management of the Lake in terms of enhancing native vegetation, habitat provision and water quality functions. Clear delineation of maintenance responsibilities and adequate resources are required to effectively manage Lake Annan, so as to enhance its environmental and parkland functions.

3.6 PEST FAUNA

Pest fauna likely to impact on the various ecological and aesthetic functions of Lake Annan are as follows:

- Purple swamp hen *(Porphyrio porphyrio)* nesting and feeding activities have substantially damage aquatic macrophytes in the past when the macrophytes were being established.
- Domestic ducks in large number have in the past had an impact on the performance of the Lake, in particular water quality functions.
- Carp *(Cyprinus carpio)*; anecdotal evidence in the past indicated the presence of Carp in Lake Annan, however it is considered that there are no carp present in the Lake due to low water quality. Carp are suspected of generating high turbidity when food in the water column is scarce (i.e. winter) by sucking soft plant matter and detritus from the substratum. An investigation is required to confirm whether carp are present in the Lake.
- Mosquito fish *(Gambusia holbrook)* is virtually impossible to control/eradicate in an open space system such as Lake Annan but is classified as a *Threatening Process under the Threatened Species Conservation Act 1995*. It is considered that there are no Mosquito fish present in the Lake due to low water quality. An investigation is required to confirm whether Mosquito fish are present in the Lake.
- Mosquitoes are a potential public health issue in constructed wetlands such as Lake Annan.
- Companion animals such as dogs and cats may have an impact on native fauna and their habitat and there are also potential water quality issues from dog faeces.
- Feral animals such as foxes and cats may also be present and potentially impacting on the use of the site by native fauna.
- Australian White Ibis will continue to impact on water quality and vegetation on the island whilst numbers are high.

Pest fauna in Lake Annan and the surrounding riparian areas may be having a detrimental impact on the water quality and native fauna use of the Lake.

3.7 RECREATION

Recreational use of Lake Annan is predominantly passive and includes picnicking, walking dogs, cycling, walking, and children's' free play. The Lake's amenities are mostly used by local residents and generally meet current recreational uses. It is not expected the Lake will be suitable for primary contact after the proposed measures are undertaken.

The path at Lake Annan is not continuous so people are unable to do a complete walk around the Lake other than having to use part of the road system.

3.8 COMMUNITY ISSUES

Community awareness is vital for the ongoing success and functioning of Lake Annan. Currently there are a number of obstacles preventing this and issues were raised by concerned residents during the community consultation process prior to the adoption of the original Plan of Management on 28 July 2003:

- Lack of understanding of catchment issues and impacts; ecological processes, values and functions amongst the community. In particular, many residents are not aware of the weed and nutrient issues related to residential gardening practices, and the tipping of grass clippings.
- Community perception; a proportion of the community appear to place no value or are unaware of the values of Lake Annan, which is observed, for example, by littering and vandalism.
- The aesthetic amenity of Lake Annan is compromised by various things such as odours from stagnant water, poor water quality, dog faeces and unsightly stormwater infrastructure.
- Views onto the Lake are important to residents and extensive planting has been undertaken with no shrub planting in order to maintain views.

Lake Annan is valued greatly by much of the community as an open space resource. However, lack of awareness of the ecological values and the adverse effects that human activities in the catchment may have on the wetland and waterways in general has contributed to compromise of the visual amenity and ecological functioning of the wetland.

SECTION FOUR: MANAGEMENT STRATEGIES

A range of clearly defined strategies are required to address the diverse range of issues. The three principal strategies relate to Lake Design, Water Quality and Vegetation Management. All strategies have detailed actions set out in Section Six.

4.1 LAKE DESIGN

To improve functioning of the Lake, the following design issues need to be addressed:

- **Concept Designs for Water Quality Treatment**

Construct Water Treatment Concept Design – Option C as prepared and recommended by Storm Consulting.

- **Replace GPT**

Install a single P3018 CDS (Continuous Deflective Separator) Unit as recommended by the consultant Optimal Stormwater. The P3018 is the largest diameter CDS Unit available.

- **Remove Existing GPT**

After the replacement GPT is installed, remove the existing GPT prior to the installation of the floating wetlands and associated water quality treatment devices.

- **Water Level Control**

Install water level control mechanism for the purpose of aquatic plant establishment, water quality and regular maintenance (macrophyte maintenance, required weed removal, wetting and drying cycle which assists in natural regeneration) and infrequent maintenance (sediment removal, major noxious weed infestations and any infrastructure repair).

4.2 WATER QUALITY

Undertake monitoring of the constructed wetlands developed as per Option C to ensure they meet the Total phosphorous removal as per Table 3.1 (Water Quality Performance of Options – Storm Consulting) refer Appendix 2.

Undertake monitoring of the newly constructed GPT to ensure it is removing 80% to 90% of the mean annual load of total gross pollutants at this source as per the findings of Optimal Stormwater (24 June 2013).

Undertake maintenance of Lake Annan, the constructed wetlands and the GPT (see section 4.5).

Investigate the feasibility of implementing water quality treatment upstream of Lake Annan.

4.3 VEGETATION MANAGEMENT

- **Terrestrial Weeds**

Incorporate weed eradication as part the riparian landscaping and incorporate in the Council's annual Bush Regeneration program.

- **Aquatic Weeds**

Monitor weeds regularly as part of maintenance inspections. If they occur develop a site specific aquatic weed removal program and incorporate in the Council's overall aquatic weed program.

- **Island Bushland Refuge**

When the population of Australian White Ibis is below 50 birds, undertake enhancement of the vegetation to maximise biodiversity and habitat/refuge.

- **Riparian Edge Zone**

Complete and maintain a full planting of a 3 metre wide strip of native grasses and forbs around the edge of the Lake.

4.4 EROSION

Undertake rehabilitation of erosion of the southern and eastern banks concurrently with the earthworks in these locations when the constructed wetlands works are undertaken.

4.5 MAINTENANCE

- **Maintenance Regime**

Implement a regular maintenance regime for Lake Annan and the constructed wetland following the maintenance manual developed by Storm Consulting (refer Appendix 2).

- **Maintenance Responsibility and Staff Skills**

Identify Maintenance Responsibility and required Staff Skills, including training.

- **Maintenance Practices**

Formalise open space (park) and riparian (natural area) zones and develop a maintenance plan for the riparian zone and implement appropriate maintenance. This will also prevent mowing of native grasses and macrophytes growing around the Lake edge.

- **GPT Maintenance**

Implement a maintenance plans for the main GPT and the two minor GPTs.

- **Litter Collection**

Prevent litter entering Lake Annan via stormwater. Remove litter regularly from the GPT.

4.6 PEST FAUNA

- **Purple Swamp Hen**

If Purple Swamp Hen numbers are high and causing excessive environmental damage liaise with the NSW National Parks and Wildlife Service (NPWS) with regard to limiting Purple Swamp Hen numbers. Develop an agreed policy and process for management of the

species. If any adverse impacts on macrophyte establishment and growth is observed, trapping and relocation may need to be undertaken in consultation with the NPWS.

- **Australian White Ibis**

Council continue to implement the Management Plan for Australian White Ibis (AWI) at Lake Annan, including monitoring a potential population that may shift to the island at Lake Y'andelora within the Lake Annan catchment or to the island at Harrington Park Lake. Additionally the population should be monitored regularly at Lake Annan as there is a tendency for the AWI to return to their original breeding site within 2 to 3 years of original dispersal.

- **Domestic Ducks**

Discourage the release of domestic water fowl and feeding of ducks. Impounding of domestic ducks may need to be considered, followed by destruction if not claimed.

- **Carp and Mosquito Fish**

Undertake an investigation to confirm whether Mosquito fish or Carp are present in the Lake when the Lake is drained at the time of the construction of wetlands and associated works. If present consult Fisheries NSW and develop an eradication program prior to construction being undertaken. After the construction of wetlands, undertake monitoring program to determine whether the population of the species still exist or has re-established. If species repopulate the Lake, develop an eradication program in consultation with the NSW Fisheries.

- **Mosquitoes**

Promote diverse habitats for predators and seed predators into the system (e.g. larvivorous fish), and retrofit with water level control device.

- **Companion Animals**

Educate residents on responsible pet ownership and the potential impacts of companion animals on the ecological functions of riparian systems.

- **Feral Animals**

Assess as required presence and abundance of feral foxes, cats and rabbits and assess impacts. Where rabbits and feral cats reach problematic numbers, put suppression measures in place.

4.7 RECREATION

Develop a continuous path system to create a loop around the lake.

4.8 COMMUNITY ISSUES

- **Community Awareness**

Develop a community education program and facilitate local community involvement to develop a sense of ownership and understanding of catchment management issues such as pollution and sediment reduction.

- **Signage**

Maintain signage to:

- Improve safety; and
- Inform users of prohibited activities e.g. dumping of litter, garden rubbish, grass clippings and appropriate behaviour (e.g. removal of dog faeces).

Install signage to:

- Interpret the environmental values and functionality of the Lake, and surrounding riparian environment.

- **Community Perceptions**

Establish Lake Annan Community Working Group, develop liaison with Council, and develop Community Education Program and undertake a field day to present the Concept Design for Water Quality Treatment – Option C to the community. In addition undertake regular policing of the area to deal with issues as they arise.

LAKE ANNAN SPECIFIC AREA PLAN OF MANAGEMENT

IMPLEMENTATION

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SECTION FIVE: MASTERPLAN

FIGURE 1: MASTERPLAN

SECTION SIX: ACTION PLAN

6.1 APPLICATION OF MANAGEMENT POLICIES AND GUIDELINES

The management strategies and actions specified by this Plan are to be taken into consideration by Council when making management decisions. Council is responsible for implementing and reviewing the provisions of this Plan.

6.2 ACTION PLAN SCOPE

This plan (overleaf) specifies:

- Actions specific to each strategy;
- Performance measures for which the action can be measured; and
- Priorities for actions.

Priorities have been set according to Council's 2040 plan and associated Delivery Program.

6.3 PERFORMANCE TARGETS AND PRIORITIES

The Plan establishes a performance regime that sets strategic action and tracks progress over an initial 5 year period.

The basis of performance monitoring is the extent to which strategic actions are implemented and whether they are undertaken according to the priority of the plan.

- High Priority Actions should be commenced within 1 year from the adoption of this plan and completed within 2 years.
- Medium Priority Actions should be commenced within 2 years from the adoption of this plan and completed within 3 years.
- Low Priority Actions should be commenced within 4 years of the adoption of this plan and completed within 5 years.

Evaluation of achievement of the Action Plan is to be undertaken by Council's Environmentally Sustainable Design section on an annual basis. Performance of the Plan in relation to Lake Annan will be based on the extent to which the implementation of the strategic actions actually achieve the stated outcomes and meet the objectives and performance criteria identified in the Plan.

6.4 REVIEW OF PLAN

The Plan of Management applies for a period of five (5) years commencing on the date of its adoption by Council, after which period the Plan must be reviewed and updated.

Council should commence a review of the Plan at least one year prior to the date on which it lapses. The review is to include all relevant background information, including updated ecological information and details of proposed works and expenditure.

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6.5 ENDORSED ACTIVITIES

In accordance with the provisions of s. 36 of the *Local Government Act 1993*, the activities and improvements endorsed under this Plan include:

- Detailed design and installation of Water Quality Treatment Devices including constructed wetland at Lake Annan;
- Replacement of the main GPT;
- Installation of interpretive and other signage;
- Macrophyte planting;
- Other recommendations noted on the Masterplan; and
- Those items listed in the Action Plan.

STRATEGY: LAKE DESIGN

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
1	**Mitigate Catchment Impacts**		
1a	Commission detailed design for Water Quality Treatment Devices as per Option C prepared by Storm Consulting Pty Ltd.	Design commissioned, undertaken, put to Council for approval.	H
1b	Undertake a Review of Environmental Factors and seek all necessary licences.	Review of Environmental Factor completed, amelioration measures adopted, necessary licences obtained and Water Quality Treatment Devices including Constructed Wetland approved.	H
1c	Construct Water Quality Treatment Devices as per detailed designs.	Water Quality Treatment Devices including Constructed Wetland constructed.	H
1d	Investigate feasibility of implementing water quality treatment upstream of the Lake, e.g. Rain Gardens in existing drainage swales, Water Sensitive Urban Design embellishment of inlets to Lake Y'andelora.	Where feasible Water Quality Treatment Devices, designed, assessed, approved and installed upstream of Lake Annan.	M
1e	Investigate feasibility of installing additional floating wetlands.	Monitoring, assessment and adequate performance of existing installed floating wetlands.	L
2	**Replace Main GPT at Lake Annan**		
2a	Commission detailed designs for replacement of main GPT.	Design commissioned, undertaken, put to Council for approval.	H
2b	Undertake a Review of Environmental Factors and seek all necessary licences.	Review of Environmental Factor completed, amelioration measures adopted, and necessary licences obtained and GPT approved.	H
2c	Install new main GPT as per detailed design.	GPT installed.	H
2d	Remove existing GPT and reconstruct the inlet zone to the Lake.	Existing GPT removed.	H

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3	**Water Level Controls**		
3a	Prepare designs for an adjustable control weir and outlet pipe to allow water level to be controlled for maintenance purposes. Pipeline could be routed around the ends of the abutments if it is not feasible to construct through the main embankment.	Design commissioned, undertaken, put to Council for approval, and changes put into place.	H

STRATEGY: WATER QUALITY

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
4	**Assess Sediment Volume and Quantity**		
4a	Undertake annual sediment survey of inlet sediment zone.	Survey commissioned and undertaken.	M
4b	Remove sediment when it accumulates to average depth of 0.5 metre across sediment deposition zone.	Sediment removed.	M
4c	Undertake bathymetric survey in 2018.	Survey commissioned and undertaken.	L
4d	Obtain sediment core samples and analyse for sediment grading, phosphorus, metals and level of contamination.	Survey commissioned and undertaken.	L
5	**Algae**		
5a	Undertake weekly monitoring algae in warmer months.	Monitoring undertaken.	M
6	**Water Quality Monitoring**		
6a	Maintain water quality testing on a regular basis using physiochemical and undertake biological monitoring using macro invertebrates.	Physiochemical testing maintained. Detailed water quality monitoring records compiled and available for use to guide management decisions.	M

STRATEGY: VEGETATION MANAGEMENT

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
7	**Macrophytes**		
7a	Prepare a macrophyte planting plan. Note: Positioning and extent of coverage to be informed by storm standards.	Plan prepared for macrophyte planting to areas designated in the Masterplan.	H
7b	Undertake plantings of macrophytes and underwater plants.	Plantings in place, monitored, maintained and replaced as required.	H
8	**Terrestrial Weeds**		
8a	Undertake weed removal/eradication on riparian edge.	Weeds eradicated as per Council's annual Bush Regeneration program.	M
9	**Aquatic Weed**		
9a	Monthly inspections as per maintenance regime.	No aquatic weeds present.	M
10	**Island Bushland Refuge**		
10a	Undertake enhancement of the vegetation on the island when the Australian White Ibis population is at a manageable level.	Vegetation restored, regular bushland maintenance carried out on the island as per Council annual Bush Regeneration Program.	L
11	**Riparian Edge Zone**		
11a	Undertake native grass and forb planting on 3 metre strip edge of the lake.	Native vegetation buffer established in the riparian zone for full edge of the Lake.	M

STRATEGY: EROSION

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
12	Undertake rehabilitation of the eroded northern, southern and eastern banks concurrently with the earthworks in these locations when the constructed wetland works are undertaken.	Eroded banks rehabilitated upon completion of the constructed wetlands.	M

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STRATEGY: MAINTENANCE

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
13	**Maintenance Plan**		
13a	Formalise open space and riparian zones as per Masterplan to designate zones for maintenance.	Clear delineation between open space and riparian zones. Edge clearly defined.	M
13b	Develop detailed Maintenance Plan for the Lake based on the Concept Maintenance Plan developed by Storm Consulting and the detailed design.	Lake being maintained to optimum level.	M
14	**GPT Maintenance and Inspections**		
14a	Develop a maintenance and monitoring plan for the main GPT and the two minor GPTs.	GPTs being cleaned and maintained to optimum level.	M
15	**Maintenance Responsibility and Staff Skills**		
15a	Identify maintenance responsibilities of staff and undertake training for all current maintenance and management staff with regard to management of riparian areas.	Training undertaken.	M
16	**Lake Maintenance Regime**		
16a	Implement maintenance regime and allocate responsibility, funds and equipment required for maintenance as per maintenance manual.	Regular maintenance and inspection regime in place.	M
17	**Litter Collection**		
17a	Refer to Actions 2, 4 and 17.	Litter and debris absent from the Lake and surroundings.	M

STRATEGY: PEST FAUNA

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
18	**Purple Swamp Hen**		
18a	Monitor bird impacts during macrophyte establishment and take actions to minimise impact on macrophyte establishment as required.	Monitoring in place; impacts on macrophytes minimised.	M
19	**Domestic Ducks**		
19a	As per Action 21 above.	Monitoring in place; impacts on macrophytes and water quality minimised.	L
20	**Australian White Ibis**		
20a	Continue to implement the Management Plan for AWI, including a potential population shift to Lake Y'andelora.	The population of Australian White Ibis at Lake Annan and its catchment is decreasing.	H
21	**Carp Monitoring**		
21a	At time of draining Lake for construction of wetland, undertake a baseline fish survey to determine Carp population size.	Baseline fish survey completed.	H
22	**Carp Management**		
22a	If present develop and implement an eradication and monitoring program.	Carp removed from the Lake. and being monitored.	H
23	**Mosquito Fish**		
23a	At time of draining Lake for construction of wetland, undertake a baseline fish survey to determine Mosquito fish population size.	Baseline fish survey completed.	M
23b	If present develop and implement an eradication and monitoring program.	Mosquito fish removed from the Lake. and being monitored.	M
23c	After constructed wetland is completed, introduce native predators of Gambusia, to offer some control.	Native Gambusia predators introduced to the Lake.	M

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24	**Mosquitoes**		
24a	Control if present in nuisance numbers at Lake Annan.	No mosquito pest problem evident.	L
25	**Companion Animals**		
25a	Educate residents on responsible pet ownership.	Education program in place.	L
26	**Feral Animals**		
26a	Control if present.	No feral animal problem evident.	L

STRATEGY: RECREATION

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
27	Maintain recreation facilities.	Facilities are usable.	M
28	Complete path system to create a loop.	Community satisfaction.	L

STRATEGY: COMMUNITY ISSUES

NO.	ACTION	PERFORMANCE MEASURE	PRIORITY
29	**Community Awareness/Perceptions**		
29a	Establish 'Lake Annan' Community Working Group.	Working Group established.	M
29b	Incorporate Working Group into development of Community Education Program and develop liaison with Council.	Improved communication and relations between the local community and Council.	M
29c	Develop Community Education Program.	Community awareness of environmental issues improved.	H
29d	Organise field day to present the Concept Plan for Water Quality Treatment to the community.	Field day presentation carried out.	H
29e	Install interpretive and other signage as necessary.	Signage installed.	M
29f	Council officers to regularly police the area in order to discourage littering, rubbish dumping and vandalism. Enforce with appropriate penalties.	Fines issued for illegal rubbish dumping, littering, vandalism. The above actions become less prevalent.	M

LAKE ANNAN
SPECIFIC AREA PLAN OF MANAGEMENT
SUPPLEMENTARY INFORMATION

ORD06

Attachment 1

SECTION SEVEN: BIBLIOGRAPHY

Boyden & Partners (1999) Stormwater Management Plan for the Upper Nepean River Catchment. Final Report prepared by Boyden and Partners Pty Ltd, Thornleigh NSW.

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SECTION EIGHT: APPENDICES

APPENDIX 1: SCHEDULE OF LAND PARCELS

This plan of management applies to part or all of the following parcels of land. The area of land to which the plan applies in indicated in Map 3. The following information has been obtained from the Council of Camden – Land Register (Section 53 if the *Local Government Act 1993*).

Table 5: Schedule of Land Parcels

NAME	LOCATION	LOT NO.	DP NO.	LAND DESCRIPTION	USES[2] (CURRENT)	CATEGORY[1]	SUB-CATEGORY	ZONING	CERTIFICATE OF TITLE
Lake Annan	**MOUNT ANNAN**								
	O'Dea Road	9000	827294	Public Reserve	Open Space, Playing Fields, Drainage	Park, Natural Area	Wetland		C250
	McEwan Circuit	3088	793606	Public Reserve	Open Space, Drainage	Park			C098
	Dunbar Place	4083	802800	Public Reserve	Open Space, Drainage	Natural Area	Wetland		
	Dunbar Place	4091	809964	Public Reserve	Open Space, Playing Fields, Drainage	Natural Area	Wetland		C260
	Sheridan Way	2100	792463	Public Reserve	Open Space, Drainage	Natural Area	Wetland		C097

[1]Note: Categorisation applies only to whole or part of lots that fall within the area to which this Plan applies. Refer to Map 3 for boundaries.

[2]Uses for categorised land is to be "open space" and "drainage", except Lot 3088 DP 793606 which is to be open space only.

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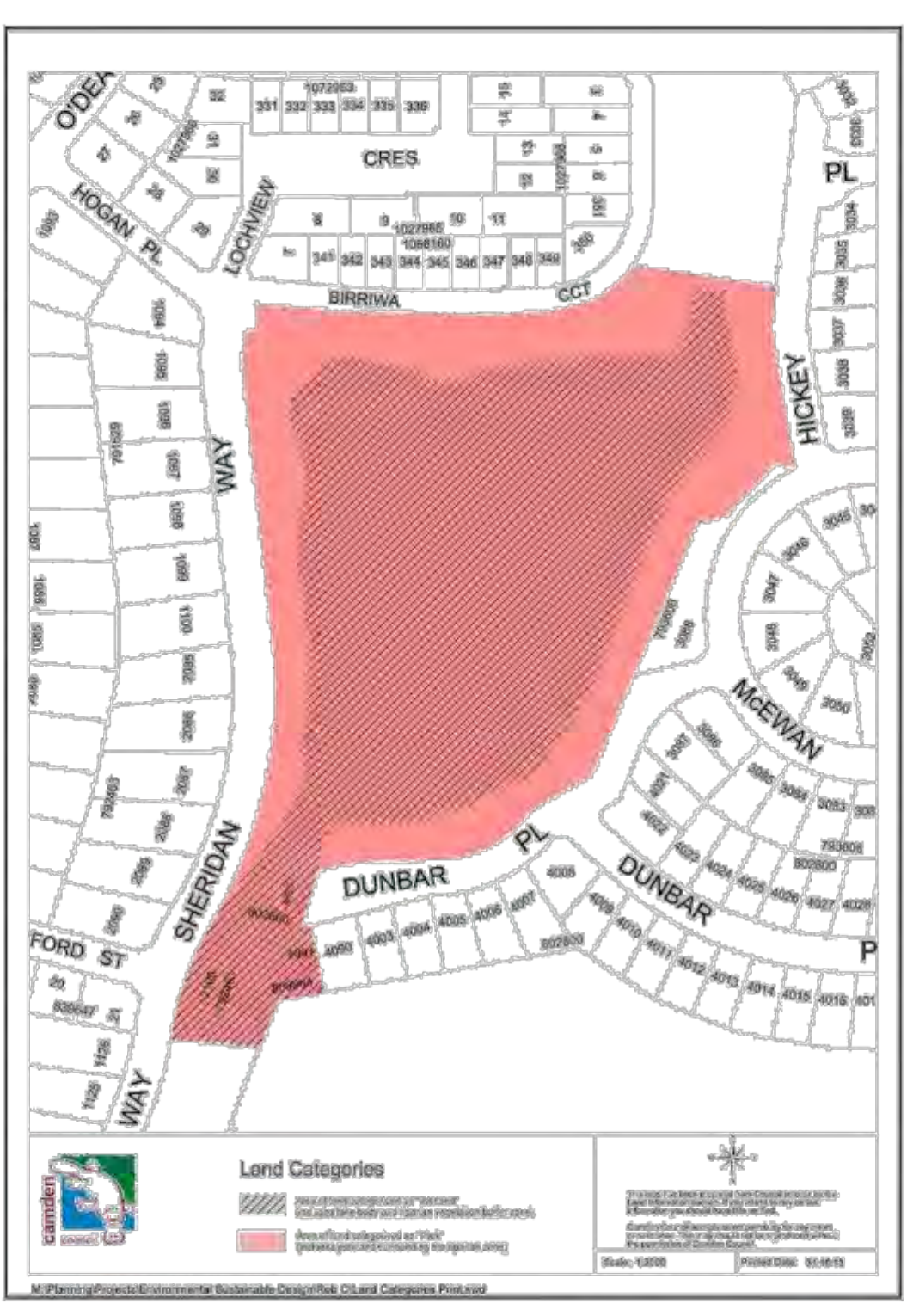
MAP 3: LAND CATEGORISATION PLAN



APPENDIX 2: CONCEPT DESIGNS FOR WATER TREATMENT AT LAKE ANNAN

REPORT PREPARED FOR CAMDEN COUNCIL

BY STORM CONSULTING PTY LTD

DATED 26 JUNE 2013

(INCLUDES SECTION 3.7 CONCEPT MAINTENANCE MANUAL)

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Attachment 1

Concept designs for water quality treatment at Lake Annan

Report Prepared for:
Camden council

Project No. 1485

Prepared by:
Storm Consulting Pty Ltd

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1. Background

Lake Annan is a purpose-built urban lake in the suburb of Mt Annan South in Camden local government area. The lake was designed to provide an ornamental backdrop to a residential subdivision. While the Lake is still attractive and provides amenity, it also experiences water quality problems and these contribute to a loss of amenity of residents and users of the lake.

This report summarises the findings of a project which seeks to address the water quality problems in Lake Annan to restore or improve its amenity.

1.2. Context

Lake Annan has a catchment area of 270Ha and the Lake is 2.7Ha in area, i.e. the lake represents 1% of catchment area. In the centre of the lake is a 0.3Ha refuge island which is inhabited by birds – dominated by white ibis at the time of writing.

Council on 28 July 2003 adopted a Specific Plan of Management for Lake Annan (PoM). The Plan of Management applied for a period of 5 years and according to its recommendations, is due for revision in 2012-13.

Design problems identified by Lake Annan at the time of adoption of the PoM included:

- The lake is undersized according to its catchment size
- The operation and maintenance of the upstream Gross Pollutant Trap is difficult (primarily because no access provision was made into the GPT)
- Poor water quality due to high turbidity
- Widespread loss of macrophyte plants.
- Sediment builds up within the lake
- Localised areas of erosion and bank scalding around the embankments of the lake
- Excess sediment and nutrient in the lake

Various actions recommended in the PoM have been implemented, including the following key items and activities:

- Installation of 2 small CDS units on smaller stormwater inlets to the lake
- A study to retrofit/replace the upstream GPT
- Ongoing water quality testing, including algal levels
- Lake bed bathymetry and sediment layer bathymetry

Despite this, water quality and amenity problems remain in Lake Annan.

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1.3. Objectives

The findings of this report are intended to provide the basis for updating the Lake Annan PoM. A Plan of Management will incorporate water quality recommendations which show a concept design and other related works and investigations required to advance or implement it. Costings of the works and activities is provided, including maintenance requirements.

In addition, Council will need to consult with the community about the recommendations that are to feature in the revised PoM. In order to consult with the community, Council requires the development of three different concept designs that will enable the community to provide comment on.

The concept designs are intended to address water quality treatment and to reduce the concentration of fine particulate and dissolved pollutants in Lake Annan. The proposed concepts cannot impede the continued use of water from Lake Annan for irrigation purposes in downstream Council Reserves.

In developing concept designs, the specific objectives of the PoM need to be addressed, including:

To protect and enhance biodiversity and ecological values

- Minimise long term maintenance costs
- Maintain or enhance recreational, cultural, educational and amenity opportunities
- Conserve or enhance scenic landscape outcomes
- Promote monitoring to evaluate and improve environmental outcomes

1.4. Scope

The scope of work conducted in undertaking this project includes the following:

- Desktop investigations – reviews of background material and data supplied by Council for Lake Annan. This includes Lake and sediment bathymetry, water quality results, stormwater network diagram, previous PoM, and a range of other resources.
- Site – investigations – a site and catchment inspection with Council staff to discuss issues, constraints and opportunities for Lake Annan.
- Discussions with suppliers of water and sediment treatment technologies
- Discussions with a construction contractor experienced in lake works to discuss construction methodologies
- Discussions between consultant and Council staff to discuss various issues and constraints

All this background information has been collated and processed prior to undertaking a critical analysis, leading to the development of concepts.

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2.0 KEY FINDINGS

Table 2.1 provides a summary of the key water quality related findings and their implications for Lake Annan.

Table 2.1: Key findings influencing the improvement of water quality in Lake Annan

Findings	Implications
Gross pollutant trapping strategy Two minor inflows to the lake have CDS GPTs fitted to them which are effective at trapping coarse pollutants. The major inflow to the Lake has a poorly functioning GPT and this has resulted in the ongoing release of pollution to the lake. Council is seeking to retrofit or replace this GPT.	All concept designs have been developed assuming the effective trapping of gross pollutants in the upstream catchment, and their routine removal to ensure ongoing removal efficiency remains high.
Lake Sediments The lake has accumulated sediments on its bed over years of operation. The sediments are a source of Phosphorus in the lake and this drives algal growth and water quality problems. There is about 12,530m3 of sediment on the base of the pond. At least 7,500m3 of this is classified as sludge, which is typically encountered in urban lakes. This sludge is impossible to work with in an engineering sense (i.e. earthworks). It is also difficult to separate the sludge from other more useful sediments. The accumulation of sediments in the Lake is demonstrated in Figure 2.1 (over page) showing how sediments enter principally at the main inflow and they are mixed and distributed through the lake.	Widespread removal of sediments from the lake is considered unfeasible. Where earthworks are proposed, lake sediments may be capped with imported sandy soil/spoil. Where sediments remain exposed on the lake bed, chemical stabilisation is required to prevent ongoing release of Phosphorus. Promotion of sedimentation and its ongoing removal should be a key feature of the main inflow to the lake.
Lake water level The lake has a single outlet in the north-eastern end. Essentially the lake overflows when full. Therefore the lake has a variable level depending on inflows, outflows and evaporation. Council draws 3,000-6,000m^3 of water from the lake each year, depending on need. Council advises that typical water level variability is in a range of 200-300mm below the top water level for the lake. Note that previous macrophyte plantings have been lost from the lake. If this was caused in part by fluctuating water levels, then the adoption of reed beds as a solution may not be feasible. Bird predation is also an issue.	This range of water level fluctuation makes it feasible to introduce reed beds to the lake, and the ideal depth of water in reed beds is 300mm. The ongoing use of the Lake for irrigation water has little noticeable impact on lake water levels, e.g. a 200m^3 irrigation event would result in a fall in water level of ~1mm across the lake.
Island and birds The island in the lake is vegetated and a colony of white ibis is present in numbers up to 1100. This is damaging the vegetation on the island, and the birds are contributing high amounts of faecal matter to the. The faecal matter is high in Phosphorus and in a soluble form which is perfect for stimulating algal growth. Council are actively reducing ibis numbers through egg manipulation (under licence).	Numbers of ibis [or other avifauna] need to be kept at manageable levels as per recommendations of Plan of Management

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Finding	Implication
Bank erosion The lake shores have minor erosion in the form of scalds and sheet runoff leading into the Lake, and undercutting of the bank. This erosion is pronounced on the south and east banks. The island is displaying active erosion on the northern bank which requires repair	Erosion of the southern & eastern banks is not serious enough to warrant repair in isolation. However, if earthworks are proposed in these locations then this erosion should be repaired concurrently. The northern bank of the island requires repair to arrest the erosion that is occurring.
Carp Council's brief states that carp have been known to inhabit the lake. Carp have a type of feeding behaviour that dislodges sediment and associated Phosphorous, thereby promoting algal blooms.	Investigation required to confirm presence of carp in the lake – feeding bread or meat at the water's edge may confirm this. All carp should be removed from the lake when lake works occur.

Figure 2.1 Lake inflow sediment plume distribution behaviour. Note how sediments enter primarily from the main inflow and the flows move this sediment through the lake. Note also the presence of submerged plants in the northern section of the lake – conferring water quality improvement (this should be retained).

3.0 CONCEPT DESIGN OPTIONS

3.1. Design criteria

The Brief states that the concept designs developed need to comply with the following:

1. For Constructed wetlands:
   - *Australian Runoff Quality*
   - *The Constructed Wetlands Manual* (DLWC 1998)
   - *Managing urban stormwater using constructed wetlands* (CRC for Catchment Hydrology)
2. Camden Council Design Specifications:
   - Designed to retain nutrients, heavy metals, bacteria and other pollutants
   - Components to include: energy dissipation, sediment removal, flow spreader, macrophyte vegetation bands, open water, outlet control.
   - Consideration given to pollution removal efficiency, maintenance requirements, social requirements, impacts and costs

Council has also set design criteria for the water quality treatments. However, this project seeks to retrofit an existing pond and the water quality benefit derived will be reported for what it can achieve, and not necessarily comply with any design criteria.

3.2. Description of concept options

Three concept options have been devised for consideration by Council and the community. The options are in Appendix A as annotated design drawings. The options are listed and described as follows:

Concept A: Maximum Reed Bed	Design intent – provide maximum flow path through reed bed to polish flows. Open water retained in northern Lake. Island retained. Components – inlet zone for sedimentation, reed bed for filtering

Reed bed

Sediment pond

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Concept B: Reed Bed to Replace Island	Design intent – take advantage of the opportunity afforded by the island to create a reed bed with minimal earthworks, balanced with flow polishing and retention of open water Components – inlet zone for sedimentation, reed bed for filtering

Sediment pond

Island reed bed (ours set below water level, and much larger)

Concept C: Floating Wetlands	Design intent – provide intensive treatment at the main stormwater inlet where sediments accumulate, and independent of lake water levels. Largely retains the existing (open water) visual qualities of the lake. Plants protected from bird predation (bird cage barrier supplied). Island retained. Components – inlet zone demarcated. Permeable Reactive Barrier (flow filters through), floating wetland substrates tethered to lake and planted out.

Sediment pond

Permeable Reactive Barrier

Floating wetland

Bird cage to protect plants

3.3. Water quality performance of options

The modelling software used to determine the water quality performance of each of the proposed options is MUSIC v5 (the Model for Urban Stormwater Improvement Conceptualisation). This model was developed by the Cooperative Research Centre for Catchment Hydrology (CRCCH) and is a standard industry model for this purpose.

The adopted modelling approach compares the residual pollutant load being discharged into the open water of the lake, rather than at the receiving node (lake outlet). This approach has been adopted as the objective of these concept designs is to address the water quality and reduce the concentration of fine particulate and dissolved pollutants in Lake Annan.

The MUSIC modeling has been undertaken in accordance with the Draft NSW Design Guidelines and Council's modelling criteria.

Table 3.1 summaries the performance of the three water quality options. Note that the % reduction shown for each concept is a comparison of the residual pollutant load being discharged into the lake. Therefore, it shows the impact of the proposed in-lake structures only.

Table 3.1: Water quality performance of options

Pollutant	Existing	Concept A		Concept B		Concept C*	
		Residual load (kg/year)	% reduction	Residual load (kg/year)	% reduction	Residual load (kg/year)	% reduction
Total Suspended Solids	149,000	49,600	(67%)	49,100	(68%)	66,900	(55%)
Total Phosphorus	277	151	(45%)	169	(39%)	199	(28%)
Total Nitrogen	2,250	1,920	(15%)	2,010	(11%)	2,210	(2%)
Gross Pollutants	5,410	2,430	(55%)	2,470	(54%)	2,430	(55%)

* **Important information on the performance of Option C (floating wetlands).** Option C was modelled for the combined performance of the sediment inlet zone plus the effect of floating wetlands. Literature on the performance of floating wetlands is scarce and is reported that they can be up to ten times more effective than a conventional reed bed for the same unit area. For the sake of conservatism, we have adopted an efficiency of five times (5x) that of reed beds. The enhanced performance per unit area is based on several factors, including:

- The increased density of the root system
- The increased surface area of contact of the roots in the water – acting as a hydroponic system
- The growth of "biofilms" on the roots causing "biological seeding" of the lake with bacteria that promote water quality improvement and pond health

The low performance for Total Nitrogen reduction is because the MUSIC model perceives there to be no shallow water level as occurs in a reed bed. Therefore, this aspect of treatment is excluded, however, in reality it is probably much higher than the 2% retention indicated. Note also, that the target pollutant is Phosphorus, with Nitrogen levels not being as important in the development of algal blooms.

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The performance of the Permeable Reactive Barrier (PRB) is not included in the modelling. PRBs comprise blast furnace waste material (slag) which is very high in calcium and semi-porous in nature with high surface area of contact. As water permeates through it, calcium is dissolved from the slag and this forms a strong bond with available (dissolved) Phosphorus and Calcium phosphate ($Ca_3(PO_4)_2$) is formed. This precipitates to the lake bottom.

Most of the Australian research on PRBs is being conducted by Dr Iradg Yassini, University of Wollongong. Dr Yassini has worked on the installation at Catalina Golf Course in Batemans Bay in which a PRB + $50m^2$ floating wetland was introduced to reduce the amount of Phosphorus entering a 1Ha reservoir. Early results show Total Phosphorus in the reservoir has reduced by 68%. In addition, the Australasian (Iron and Steel) Slag Association produced an industry funded report titled *An assessment of iron and steel slag for treatment of stormwater pollution* (Matthew Taylor, 2006). It discusses: types of slag (with recommendations); the trace levels of impurities (which he says are not leachable and so would have little or no impact on the lake ecosystem); and the fact that they alter pH (which occurs now in Lake Annan with algal blooms).

Because PRBs results in enhanced sedimentation and precipitation of Phosphorus, they are an effective measure to make Phosphorus entering the lake unavailable to algae. Note, however, that the slag actually dissolves in the process of water passing through it, and needs to be replaced after a 10 year period. The presence of the PRB also "doses" the lake with Calcium as it dissolves all the time, and this will have the effect of binding dissolved Phosphorus in the lake over the medium-long term. We consider that the effect of the PRB will enhance the performance of this option such that the assumed 5x performance ratio (as compared to typical reed beds) is highly conservative for Phosphorus in particular.

Note PRBs are known to cause pH rises by one pH unit in water bodies. This represents no harm to lake biota.

3.4. Comparison of results to best Practice standards

The Draft NSW water quality criteria for pollutant retention are as follows:

- Total Suspended Solids (TSS): 85% retention
- Total Phosphorus (TP): 65% retention
- Total Nitrogen (TN): 45% retention

The modelled performance of the three options falls well short of these criteria, with Concept Option A performing the best of the three at 67/45/15% respectively for TSS, TP and TN.

Together, Lake Annan (2.7Ha in area) and Lake Y'Andalora (1.8Ha approx. area) represent 1.7% of the contributing catchment area. The rule of thumb for a constructed wetland in a catchment to achieve best practice water quality performance is 3%. Therefore, Lake Annan can never achieve best practice with a typical retrofit of wetland features.

Therefore, designs have not sought balance water quality treatment performance with the practicalities of construction and issues of lake aesthetics.

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3.5. Cost and performance analysis of options

Table 3.2 shows a comparison of the three concept options for Lake Annan.

Table 3.2: Comparative analysis of options

Criteria	Concept Options		
	A: [illegible] Reed Bed	B: [illegible] Reed Bed	C: Floating Wetlands
Key design factors	Max flow path through wetland Reed bed area = 9,228m² Open water retained = 12,442m² Inlet zone for sedimentation = 2,702m²	Island utilised as reed bed Reed bed area = 1,880m² Open water retained = 20,645m² Inlet zone for sedimentation = 4,030m²	Three floating wetland substrates (320m²) Most open water retained (2.4Ha) Island retained = 1,880m² Inlet zone (defined by Permeable Reactive Barrier) for sedimentation = 2,702m²
Water quality performance (% retention of pollutant)	TSS: 67% TN: 15% TP: 45%	TSS: 58% TN: 11% TP: 39%	TSS*: 55% TN*: 2% TP*: 28%
Construction access[2]	Most difficult	Moderately difficult	Easiest
Maintenance access	Inlet zone access is easy Access to extensive reed bed is on foot	Inlet zone access is easy Access to moderately sized reed bed is on foot	Inlet zone access is easy Access to floating wetlands is by canoe (easy)
Detailed Design Cost	$50,000	$50,000	$35,000 ([illegible])
Capital & Construction Cost	$405,000[2] Small water level control structure in weir $15,000 Erosion repair on north shore of island $15,000 Phoslock application 10,000 Civil/earthworks for sed zone and reed bed $400,000	$341,000[3] Small water level control structure in weir $15,000 Phoslock application $20,000 Create inlet swale from old GPT to lake edge $30,000 Civil/earthworks for sed zone and reed bed $276,000	$226,000[4] Small water level control structure in weir $15,000 Erosion repair on north shore of island $15,000 South/Inlet permeable reactive barrier $40,000 Civil/earthworks for sed zone $156,000
Landscaping Cost	$240,000 (9,000m² reed bed, plants @ 8/m² = $116,000; plus other general landscaping)	$90,000 (1,880m² reed bed, plants @ 6/m² = $67,900, plus inlet swale $10,000, plus other general landscaping)	$100,000 (320m² floating wetland = $85,300, plus other general landscaping)

* TSS= Total Suspended Solids; TN=Total Nitrogen; TP=Total Phosphorus. [2] Access within lake to create inlet zone & reed bed limited by sludge consistence of sediments, as more area of sediments affected results in increased difficulty. [3] Assumes no cut is removed from site, is incorporated into earthworks, or onto banks of lake. [4] Floating wetland quote by [illegible] Environmental Consulting. [illegible] composting cost used for sediment disposal – will be more if landfilling is required, refer Table 3.5.

Option	Concept Options		
	A Max. Reed Bed	B Deepen Lake Bed	C Protect Shoreline
Total Capital investment	$695,000	$481,000	$360,000
20 yr maintenance cost [see Table 3.6]	$237,600 $120,000 general maintenance $117,600 sediment composing (2 episodes)	$207,600 $90,000 general maintenance $117,600 sediment composing (1 episode)	$287,600 $80,000 general maintenance $117,600 sediment composing (2 episodes) $40,000 replace geotextile material barrier (2 episodes)
Total cost over 20 yrs	$932,600	688,600	$647,600

All costs ex gst and subject to contingency -10%-+20%

3.6. Constructability issues

When assessing each concept design option for the lake, it is important to consider issues of constructability. The following tables describe the construction sequencing and methods for each of the options.

Table 3.3: Concept A - Maximum Reed Bed construction

Sequence of works	Works	Comment
Install temporary water diversions in lake. Work initially to create the reed bed on the eastern side of the island, followed by the inlet zone then western reed bed.	Construct temporary earthworks, use pumps as required, install erosion and sediment controls.	Sections of the lake can be isolated such that works can occur within them. The most difficult challenge will be working at the major stormwater inlet where flows are high.
Drain area of works Manage aquatic fauna	Use pumps to keep the works area relatively dry. Use sump drainage points within the works area where rainfall runoff can flow to	Important to select drier periods to conduct works, if possible. As water levels fall, the collected water may contain concentrated nutrients. This water could be run over a grassed area to filter it before it runs back into the lake. Any stranded aquatic fauna as a result of water drawdown will need to be relocated into the main body of the lake.
Allow time for sediments to dry out	Use pumps to keep the sediment layer dry.	Continue to maintain dry work space with pumps.
Import earth/spoil to create earthworks	Earthmoving equipment; trucks and excavators, etc.	Continue to maintain dry work space with pumps.
Import rock to provide scour protection	Earthmoving equipment; trucks and excavators, etc.	Continue to maintain dry work space with pumps.
Import and place planting media to create reed beds and other planted areas	Earthmoving equipment; trucks and excavators, etc.	Continue to maintain dry work space with pumps.

Plant reed bed zones and other planted areas	By hand	Irrigate the plants until established (can use pumped lake water for this purpose) Raise water levels to max 1/3 height of the smallest stems until established. Note: Timing of planting is very important with best results resulting from spring planting. Therefore, construction should be scheduled for completion in mid-September. Note also that pre-ordering and growing of plants is required – allow a lead time of one year for plant ordering.
Remove temporary earthworks and connect works back to the lake	Earthmoving equipment	Rehabilitate all temporary works, as required

Table 3.4: Concept B – Reed Bed to Replace Island construction

Reed bed		
Install temporary earthworks to gain access to island.	Construct temporary earthworks, using earthmoving equipment, trucks and excavators, etc.	Ensure works are outside the main inlet flows
Clear and grub vegetation from the island	Earthmoving and tree grubbing machinery	Potential to mulch the vegetation for use in landscaping around the lake. Otherwise remove to waste disposal or recycling facility
Earthworks to create reed bed, including temporary earthworks to isolate reed bed from lake	Earthmoving equipment, trucks and excavators, etc.	Retain useful spoil for other earthworks at the inlet zone as required. Recycle excess spoil off site. Maintain dry work space with pumps.
Import rock to provide scour protection	Earthmoving equipment, trucks and excavators, etc.	Continue to maintain dry work space with pumps.
Import and place planting media to create reed beds and other planted areas	Earthmoving equipment, trucks and excavators, etc.	Continue to maintain dry work space with pumps.
Plant reed bed zones and other planted areas	By hand	Irrigate the plants until established (can use pumped lake water for this purpose) Raise water levels to max 1/3 height of the smallest stems until established Note: Timing of planting is very important with best results resulting from spring planting. Therefore, construction should be scheduled for completion in mid-September. Note also that pre-ordering and growing of plants is required – allow a lead time of one year for plant ordering.

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Description of works	Method	Comment
Inlet zone		
Install temporary water diversions at inlet	Construct temporary earthworks, install erosion and sediment controls.	
Earthworks to create inlet zone	Earthmoving equipment, trucks and excavators, etc.	Remove sediments from inlet zone footprint. Reuse if possible, or remove for disposal Cut to create bed levels Use spoil, from removal of island to create embankments, if suitable.
Import rock to provide scour protection	Earthmoving equipment, trucks and excavators, etc.	
Import and place planting media for planted areas	Earthmoving equipment, trucks & excavators, etc.	Continue to maintain dry work space with pumps.
Plant out planted areas	By hand	Irrigate the plants until established (can use pumped lake water for this purpose) Raise water levels to 1/3 height of the smallest stems.
Remove temporary water diversion and connect works between inlet zone and reed bed	Earthmoving equipment	Rehabilitate all temporary works, as required

Table 3.5: Concept C – Floating Wetland construction

Description of works	Method	Comment
Inlet zone		
Install temporary water diversions at inlet	Construct temporary earthworks, install erosion and sediment controls.	Create cofferdam to enable a dry working site.
Earthworks to create inlet zone	Earthmoving equipment, trucks and excavators, etc.	Remove sediments from inlet zone footprint. Reuse if possible, or remove for disposal Cut to create bed levels
Install Permeable Reactive Barrier	Earthmoving equipment, trucks and small excavators, etc.	
Remove temporary water diversion and connect works between inlet zone and reed bed	Earthmoving equipment	Rehabilitate all temporary works, as required
Floating wetlands	Manually on banks	
Supply to site, and assemble	Manually on banks	

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3.7. Concept Maintenance Plans

Table 3.6 shows the maintenance requirements with associated costings for each of the three Concept options.

The largest cost is sediment removal which we have assumed will cost: 1. $100/m³ for handling and processing (recycling); or 2. $250/m³ for removal and landfilling (plus $5,000 each episode for testing and lab analysis).

It is likely that disposal of the removed sediments at landfill will be required at some time. In this eventuality, testing of the material will be required and an assessment is made against the *Classification of Liquid and Non-liquid Wastes* Guideline by the Environment Protection Authority. The cost supplied in Table 3.6 for landfilling assumes the wastes are classified as General Solid Waste, or better.

Table 3.6: Concept Maintenance Plan for the three Lake Annan water quality improvement options

Activity	Method	Frequency	Cost
Remove accumulated sediment and debris from inlet sediment zones	Remove when sediment accumulates to Ave depth of 0.5m across Sediment deposition Zone. Commence works in a dry period with low/no inflows to lake Lower lake water levels to below that of inlet zone embankment. Pump water out of inlet zone and into Lake to expose sediments. Install erosion and sediment controls. Excavator enters the sediment zone on a stabilised access ramp (rip-rap). Remove and stockpile sediments within inlet zone (at edges). Wait to dry. Using excavator, transfer dried sediments into trucks for disposal	**Concept A:** [illegible] **cleaned out once every 8 years** **Concept C: cleaned out once every 7 years**, based on same volume as Concept A but [illegible]	**Composting:** $58,800 per clean-out, (based on 420t @ [illegible]) **Landfilling:** $80,600 per clean-out, (based on 420t @ [illegible] + lab testing of sediments ($5,000))
		Concept B: [illegible] **cleaned out once every 15 years** Note the volume of sediment accumulation in Concept B is twice that of Concepts A & C.	**Composting:** $117,600 per clean-out, (based on 840t @ [illegible]) **Landfilling:** $159,200 per clean-out, (based on 840t @ [illegible] + lab testing of sediments ($5,000))
General maintenance of works	Replant denuded areas of plantings – lower lake water levels to do so. Weeding occurs while doing this. Repair erosion/scour of embankments, or undermining of rockwork.	Annually Concept A: Concept B: Concept C:	 $6,000 $4,500 $3,000

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Attachment 1

Activity	Method	Frequency	Cost*
Replace Permeable Reactive barrier	Lower lake water level Import slag to site. Create Barrier using small earthmoving machinery.	Concept C only, every 10 years	$40,000 each time

[a]Costs of sediment composting and landfill disposal supplied by Envirocivil (Peter Day, 0412 232859).
*all costs ex gst
[b]Transport cost for sediment disposal is set at $20/tonne throughout. This may vary.

3.8. Non-structural options for managing water quality

The design options will provide treatment of lake inflows to varying degrees based on the effectiveness of the inlet sediment zones and reed beds/wetlands. However, a key issue for the lake is the accumulation of vast quantities of sediment across the entire lake bed.

During dry sequences, and especially in warm conditions, the sediments can give up their Phosphorus to the water column. This occurs via a complex suite of chemical processes occurring in the lake and sediments. The result is that algae are able to take advantage of this released Phosphorus and algal blooms result. This makes the lake unsightly, and leads to odours, and conditions unfavourable to other fauna and plants. Certain blue-green algae can also release toxins into the water when they die.

Therefore, despite any works at inlets to control ongoing treatment, the sediments can still cause water quality problems in the lake. There are several options available to manage this, including:

- **Submerged aerators** – these cause mixing of the water column and provide oxygen to the water to prevent chemical processes that lead to algal blooms. They are devices that sit on the bottom of the lake and compressed air is supplied to them from the lake bank via a conduit. These have a high capital costs and a power source would be required to run the air compressors and pumps. One of these is present in Lake Annan, but anecdotally it is not very effective. Their use is not recommended and the existing system in the Lake could be decommissioned after any of the design options are implemented.
- **Surface aerators** – there are two types designed to provide aeration of the water, i.e. surface agitators (e.g. like those used in rice paddies and fish farms in Asia), or fountains/water features where the water used for the jet may be sourced from a stagnant part of the lake. A fountain would add significant visual appeal to the lake and could be considered if other measures are only partially effective.

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- **Stabilisation of sediments** – this is where chemicals or mineral materials are broadcast over the lake or sediments with the intent of binding Phosphorus such that it is not released into the water column. One commercially available product is Phoslock which is applied as slurry to the water. Another option is to apply Iron Sulphate with lime. Both of these solutions rely on the application of chemicals to a water body, and this would be considered an activity that requires a license under NSW law. It is recommended to proceed with Phoslock application if Concept Options A or B are selected for implementation. This option is not considered necessary for Option C because it will provide ongoing dosing of the lake with calcium which binds with Phosphorus and makes it unavailable to algae.

ORD06

Attachment 1

4.0 SUMMARY AND CONCLUSION

4.1. Summary of findings

The analysis of options provided in Section 3 provides relatively reliable feedback to Council and the community upon which to base a decision of which Concept option to proceed with. Table 4.1 presents a summary of several key issues that will facilitate the decision-making process.

Table 4.1: Comparative analysis of options

Criteria	Concept Options		
	A. Maintained Bed	B. Replace Island with Reed Bed	C. Floating Wetlands
Total cost over 20 yrs	$932,600	$686,600	$647,600
Key Pollution Retention	TSS: 67% TP: 45%	TSS: 59% TP: 39%	TSS: 59% TP[1]: 26% *ignores ongoing effect of PRB to lock up Phosphorus
Impact on visual appearance of Lake	**Huge impact** – complete transformation	**Major impact** – island lost and significant transformation	**Relatively minor impact**
Safety for lake users	**Potential for people to access the lake on earthworks used to create inlet zones.** Typically these are submerged which would prevent access. Also a rip-rap scour protection is shown on some of these batters. When water levels in the lake fall in drought, some areas of exposed rip-rap could result. The intent is to use a soil/rock matrix into which plants would be grown to prevent access.		
Irrigation water availability	**In any of the options, water availability for irrigation from the lake is unaffected**		
Requirement for non structural options	**Yes**, sediment stabilisation required (Phoslock).	Yes, sediment stabilisation required (Phoslock).	**No**
Permits from OEH required for construction	Yes, for Phoslock application (see row above)	Yes, for Phoslock application (see row above)	Yes, for addition of Permeable Reactive Barrier
Climate resilience	**Risk** of drought sequences resulting in drying out of reed beds	**Risk** of drought sequences resulting in drying out of reed beds	**No issues**, floating wetlands unaffected by water level changes
Reed bed resilience	**Risk** of sediment carry-over to reed beds, requiring clean-out and re-planting	**Risk** of sediment carry-over to reed beds, requiring clean-out and re-planting	**No issues**, floating wetlands unaffected
Bird resilience	**Risk** of birds eating planted wetland plants	**Risk** of birds eating planted wetland plants	**No issues**, built-in bird protection.
Experimental approach	**No**	**No**	**Somewhat**, but based on scientific principles with several Australian applications (Dr Iradj Yassini, University of Wollongong)

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4.2. Ability to amend or combine options

While every effort has been made to quantify and qualify the performance of the options in relation to their water quality performance, the fact remains we are dealing with a natural system that is highly variable in its performance in space and time. The lake responds to what is occurring in its catchment which a water quality model may not always be able to account for. Therefore, if an option is selected and implemented, there is still a chance that water quality problems will remain within Lake Annan. This would be easily recognised by the presence of ongoing algal blooms.

Similarly, Council may wish to adopt a staged or optimised approach to works in any given option to gauge the success.

Therefore, Council needs to know what options they have to, a) provide enhanced performance after an option has been implemented, or b) stage works. Table 4.2 shows how this may be approached by Council.

Table 4.2: Ways to amend, stage or combine options

Concept	Amend	Combine
Option A	Only create sediment zone on main stormwater inlet, consider adding the northern one later Reduce area of reed bed Install fountain in northern end of lake	Floating wetland in inlet sediment zone Permeable Reactive Barrier in inlet zone
Option B	Exclude minor inflow (Dunbar Place) from inlet sediment zone to make it smaller Install fountain in northern end of lake	Floating wetland in inlet sediment zone Permeable Reactive Barrier in inlet zone
Option C	Increased area of floating wetland Install fountain in northern end of lake	Add a reed bed after inlet sediment zone

4.3. Conclusions

It is very clear that **Concept Option A: Maximum Reed Red** provides the best water quality improvement performance. However, it also has the highest cost of the three options and the additional cost does not appear to provide good value for money in relation to the additional treatment provided. The fact that it will also transform the lake visually and have other associated risks means that we do not recommend this option. If Council were to proceed with Option A, we recommend amending the design to omit the inlet zone and wetland at the northern inflow, and reducing the area of reed bed coverage. Both these amendments will save costs while balancing water quality performance.

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Attachment 1

Concept Option B: Replace Island with Reed Bed is a good option if removing the island is a preferred strategy. We note that without a large Ibis population that the island could be revegetated to make it more attractive, so the issue is whether the bird population can be controlled. Council advise that the bird population is created by the operation of nearby landfills which are due for closure in the medium-long term. If Council were to proceed with Concept Option B, we recommend reducing the size of the inlet zone by removing the inflow from Dunbar Place. This will save costs while not greatly affecting water quality performance.

Concept Option C: Floating Wetlands has the least impact on visual quality of the lake while also providing relatively good water quality improvement. The reported water quality improvement is understated because we have not factored in the ongoing effect of the Permeable Reactive barrier to lock up Phosphorus over time, thereby preventing algal blooms in the lake. This option is somewhat experimental in nature, but there is research and applications in Australia to be guided by.

The **key risk factors** that ought to inform a decision to select an option are as follows:

- **Climate resilience** – will fluctuating water levels affect the viability of the reed beds, especially if water levels drop below the reed bed base for extended periods. The other issue is in a general sense, will fluctuating water levels be too much for the reed bed plants to bear.
- **Reed bed resilience** – will sediment carryover from the inlet sediment zones clog up the reed beds, particularly at their leading edge, which would require clean-out periodically. Note the water quality modelling shows that only about half the sediment load is retained in the inlet sediment zones, and so the remainder would travel through the reed beds.
- **Bird predation of planted reed beds** – waterfowl have a habit of preferring small plants and they can devastate planted areas. There are two typical ways to prevent this from occurring, i.e. bird netting and planting more mature plants which the birds do not prefer. Neither cost is included in the cost estimates.

These three risk factors apply to **Concepts A and B only.** Option C is immune to each issue because the reed beds are supported by a floating substrate, protected by a bird cage.

4.4. Recommendation

We recommend Option C for implementation based on the following summary of findings:

- Minor impact on the visual appearance of the lake
- Retention of island and its biodiversity (which can be enhanced)
- Lowest capital cost
- Lowest cost over 20 years of operation (includes construction)
- Not affected by fluctuating water levels
- Not affected by sediment overloading
- Not affected by bird predation of planted areas
- Ability to be easily retrofitted with additional water quality improvement in a staged manner

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APPENDIX A

Concept Option Drawings

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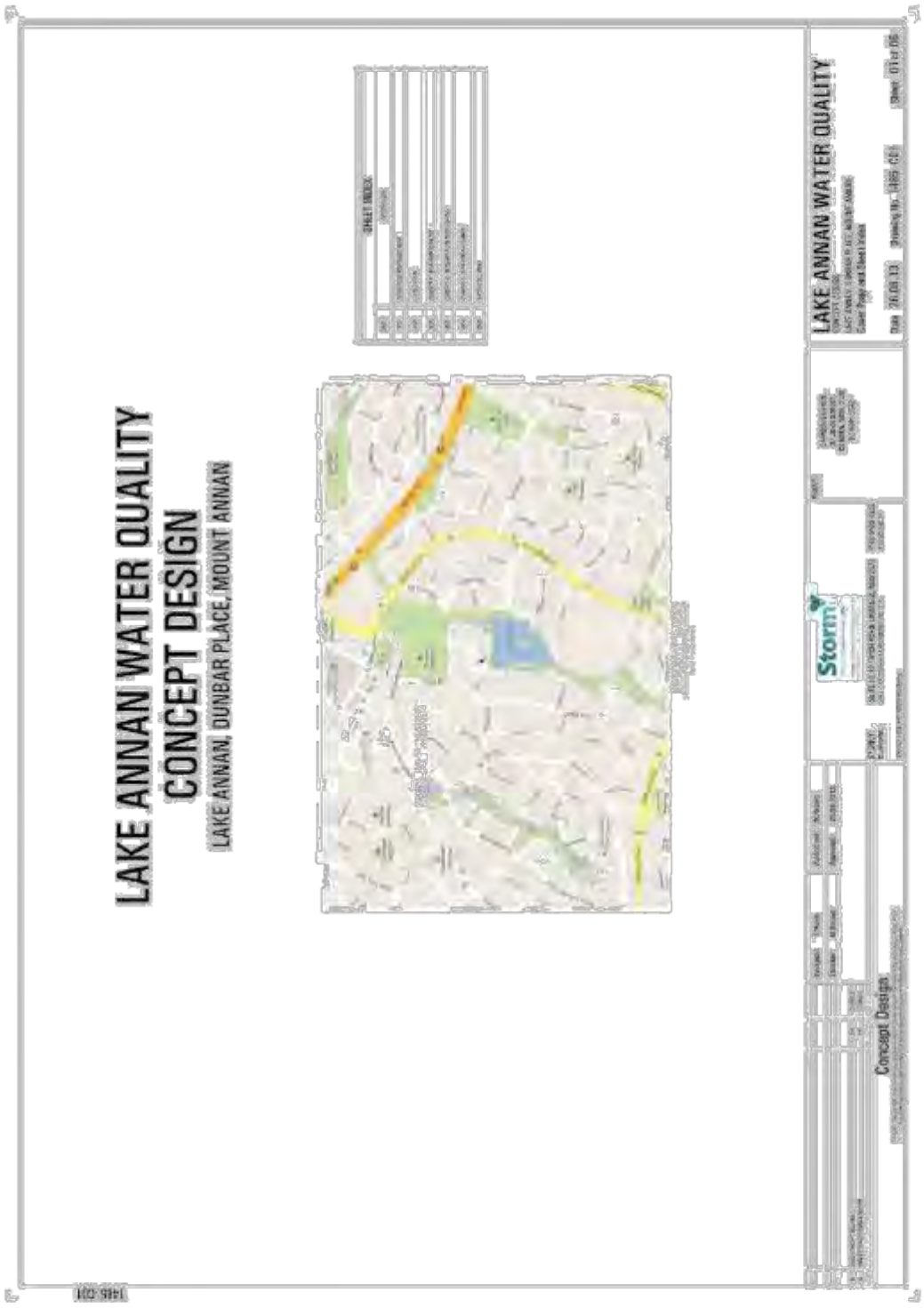
Attachment 1




LAKE ANNAN WATER QUALITY
Storm
Concept Design

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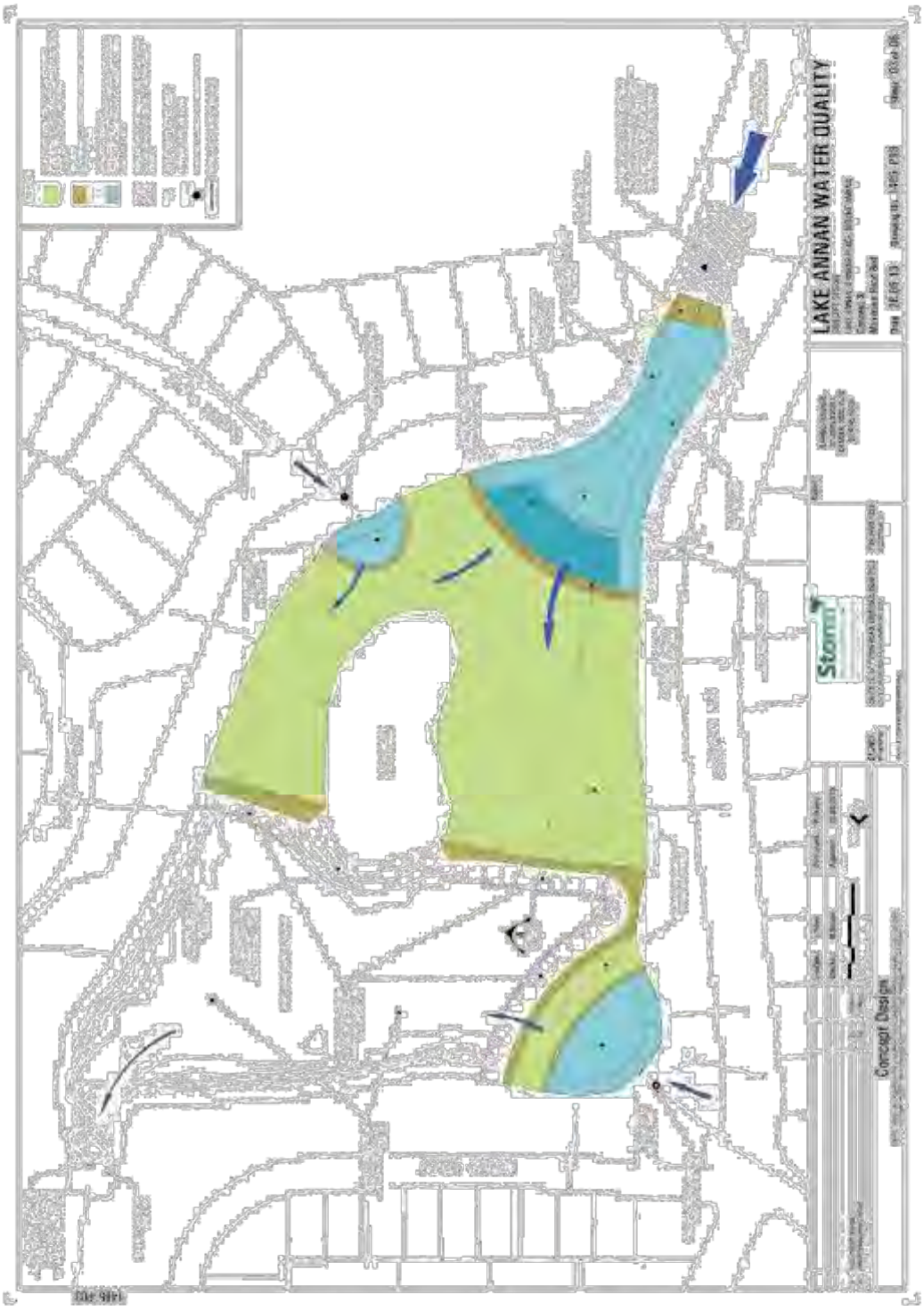

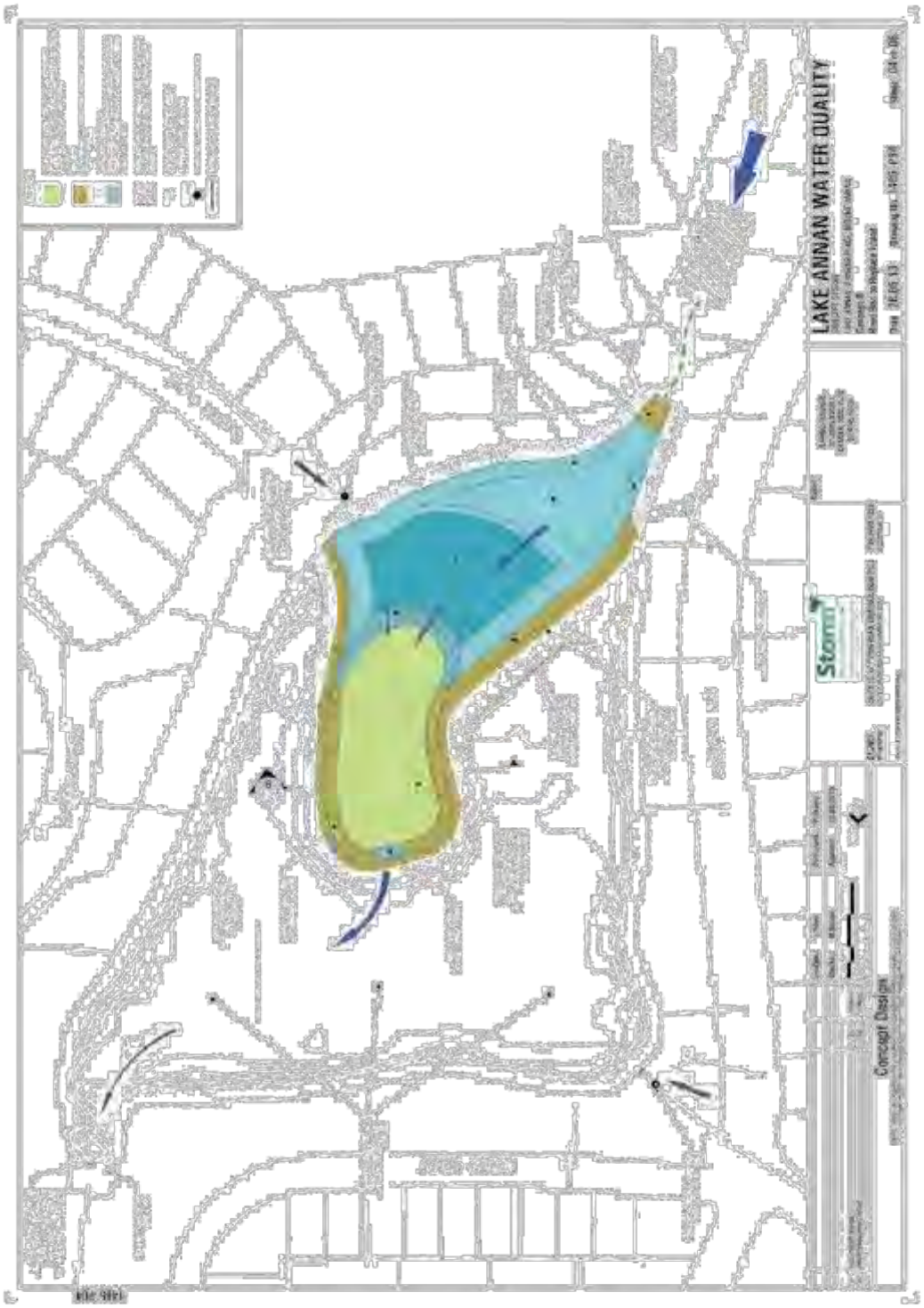
LAKE ANNAN WATER QUALITY
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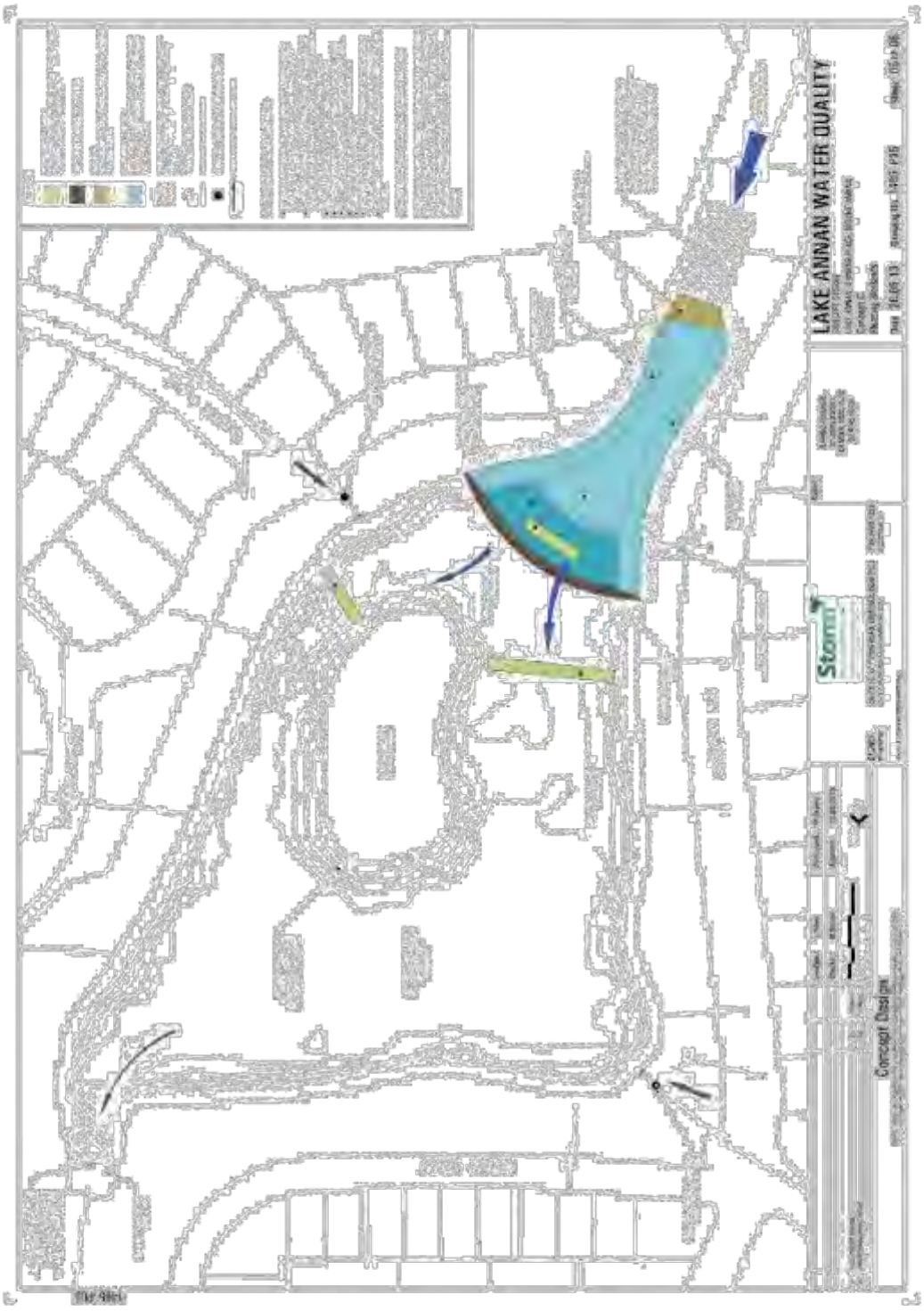

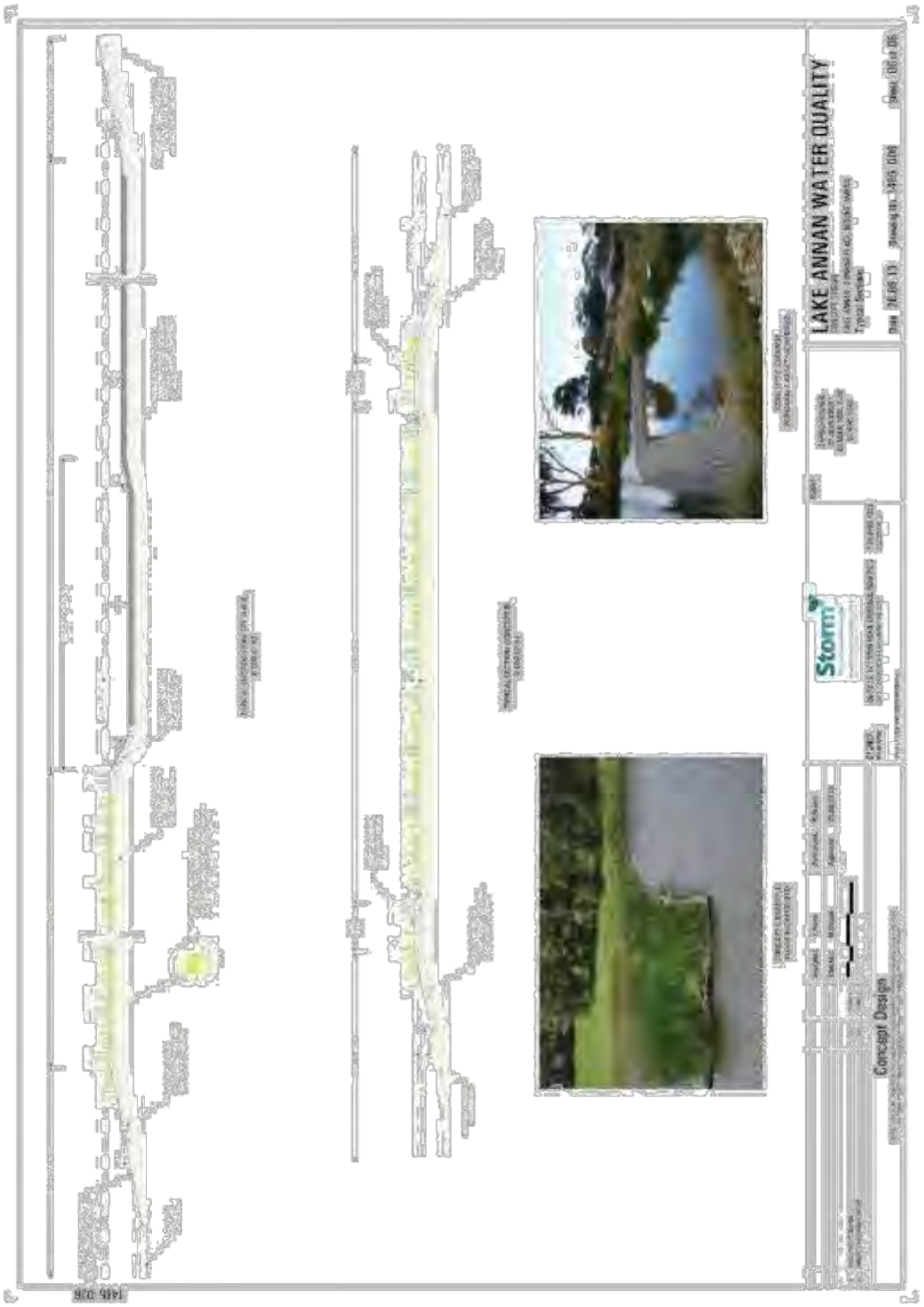
LAKE ANNAN WATER QUALITY
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Concept Design

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Attachment 2

Response to Questions canvassed at Public Meeting

Draft Amended Lake Annan Specific Area Plan of Management

Wednesday 12 March 2014, 6 pm – 7.30 pm, Redgum Room, Narellan Library

Rainfall event which would reduce the efficiency of the new GPT at Lake Annan

The amount of rainfall for such a rainfall event is based on the Average Recurrence Interval in the Sydney region. It is expected to occur every 3 months which equates to the most common storm event for an urban environment. It can be described as basically the average flow rate for 25 minutes which is equal to 20 mm of rain in 1 hour.

Examples of each of the 3 proposed concepts for Lake Annan

Concept A - Maximum Reed Construction

De Freitas wetland, Fairfield Municipality

Tiger Bay Wetland, Warren, NSW

Harrington Park Lake 3c, Lakelands, Harrington Park.

Concept B – Reed Bed to Replace Island Construction

Primbee Lake, Grand Pacific Drive, Primbee (Wollongong). These reed beds have not replaced an island, but are located in the middle of the lake.

Concept C – Floating Wetlands

Eagle Vale Pond, Eaglevale Rd, Eaglevale (Campbelltown)

Park Central, Campbelltown.

Penrith Regatta Centre.

Depth of Permeable Reactive Barrier below the water level

It was conveyed to the consultant from Storm Consulting who developed the Concept Designs for water quality treatment at Lake Annan that a permeable reactive barrier above water would be visually obtrusive and appealing to children to walk across.

This issue would be addressed at the design stage. The original consultant who developed the Concept Designs has left Storm Consulting. Another consultant from the company has advised me that it would most probably be designed about 300 mm below the water level, but will also need to take into account the drop in water level during drought times.

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Attachment 2

Response to questions canvassed by Jill Smith 24 March 2014

Draft Amended Lake Annan Specific Area Plan of Management

What is the minimum distance required between a sedimentation pond and residential premises

The distance between a sediment pond and residential premises is dealt with at the residential subdivision design stage. There is no identified minimum distance.

Will the construction of the GPT change the flow of the stormwater?

The stormwater flow will not be affected by the construction of the GPT.

How will sediment and litter be treated at the inlet to the lake (after the GPT)?

The inlet zone in preferred Concept C is 2,702 m^2 in area and is defined by the Permeable Reactive Barrier (PRB) to the lake. Sediment which bypasses the GPT will be deposited in the inlet zone.

The inlet zone will also provide a sedimentation zone for the small drainage lines that are located below the location of the new GPT. These include the existing drain at Rigelsford St which drains below the existing GPT and the drain from James Way which drains just above the exsiting GPT.

The Concept Maintenance Plan proposes to remove sediment and debris from the inlet sediment zone when sediment accumulates to an average depth of 0.5 metres across the Sediment Deposition Zone. It anticipated that the removal of this sediment will need to done every 7 years.

The PRB is proposed to be constructed with slag. It will need to be replaced every 10 years. Storm Consulting notes in its report (Concept designs for water quality treatment at Lake Annan) that "As water permeates through it, calcium is dissolved from the slag and forms a strong bond with

available (dissolved) Phosphorous and Calcium phosphate is formed. This precipitates to the lake bottom."

If the PRB is designed and constructed below the lake level it will affect the efficiency of the inlet zone to trap litter and very sediment that may bypass the new GPT in major stormwater events. The GPT is designed to have 95 % efficiency rate.

Where do the drainage line /s from Mount Annan High School enter the lake?

The drainage line from Mount Annan High School enters the drain above the location of the new GPT. This drain feeds into the new GPT which is upstream of the lake.

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Attachment 2

Response to questions canvassed by Jill Smith 28 March 2014

Draft Amended Lake Annan Specific Area Plan of Management

How many properties are in the subcatchments that will enter the lake inlet zone downstream of the new GPT?

Eighteen properties along Fryer Street, Rigelsford Street, O'Dea Road and James Way will bypassing the new GPT unit and discharging straight into the inlet of Lake Annan. These 18 properties include part of Mount Annan High School along Welling Drive (further discussed in the question below).

It must be noted that all three concept designs for water quality treatment of Lake Annan include some sort of sediment fore-bay at the Lake inlet. This fore-bay will remove sediment generated from these 18 properties that bypass the GPT unit prior to water treatment within the lake. Furthermore, given the inefficiency of the existing GPT unit, the treatment of upstream flows will greatly outweigh the performance of the existing GPT system (even though 18 properties will now bypass the GPT system).

Where does the overland flow from Mount Annan High School enter the drainage system? Will changes occur to this overland flow as a result of the works being undertaken?

The overland flows from Mount Annan High School do not enter the drainage system at a singular defined point, rather they are spread along the western school boundary upstream of the existing GPT. Current works in constructing a new GPT will not affect the way this overland flow behaves.

GPT's are designed to treat relatively small and frequent rainfall events (eg a 1 in 3 month rainfall event). Larger rainfall and flooding events will effectively bypass the GPT treatment. A rainfall event large enough to create substantial overland flow from Mount Annan High School would most likely bypass the GPT, regardless of its location.

Will the construction of the new GPT change the flow of water entering the lake in high rain events.

No. In large rainfall events, flows will bypass the new GPT, just as they bypass the existing GPT. No extra water is being generated within the catchment and therefore the flow of water entering the lake will be unchanged.

Lean Lackenby & Hayward Liverpool

Camden Council

GROUPGSA

CAMDEN CEMETERY

MASTER PLAN

S10-255 L-0002 C

Camden General Cemetery Upgrade Masterplan – Staging

Description	
Stage 1 • Additional columbarium walls and courtyard with seating and planting; • New carpark layout adjacent to the columbarium walls and Camden War Cemetery; • Separated bitumen maintenance area with fencing and storage space; • Water reticulation system to new taps; • Realignment of existing east-west road with new concrete footpath; • Tree planting to the realigned east-west road; • New planting, road widening and gates at the entrance; • A Family Rose Garden; • Paved plaza area with dedicated memorial trees replacing existing carpark; • Native screen planting to maintenance area; and • Landscaping to all associated garden beds	
Stage 2 • North-south road widening and resurfacing; • Concrete footpath adjacent widened road; • Tree planting and landscaping to widened road; • Round-about adjacent maintenance area' • Parallel parking and tree pits with filter media; • Bio-retention basin and planting to eastern boundary; and • Native tree and shrub planting to east, south and western boundaries.	

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Attachment 2

Camden General Cemetery Upgrade Masterplan – Staging

Description	
Stage 3 • Rationalisation of existing carpark and vehicle circulation near entrance; • New road linking north-south road and carpark; • Concrete footpath adjacent to new carpark and road; • Tree planting and landscaping to new carpark and road; • Bio retention basin and planting to northern boundary; and • Native tree and shrub planting to northern boundary.	
Stage 4 • Concrete footpaths to areas of cemetery with existing grave sites; and • Children's Memorial Garden including niche walls, garden plots for ashes and burial plot set out.