Technical Services Committee

Business Paper for May 2020

Monday, 11 May 2020
Council Chamber, Civic Centre

Councillor Eli Melky
(Chair)

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alicesprings.nt.gov.au

ALICE SPRINGS TOWN COUNCIL

TECHNICAL SERVICES COMMITTEE AGENDA

FOR THE MEETING TO BE HELD ON MONDAY 11 MAY 2020

VIA TELECONFERENCE

1. APOLOGIES
2. WELCOME TO THE PUBLIC AND VISITORS AND PUBLIC QUESTION TIME
3. DISCLOSURE OF INTEREST
4. MINUTES OF THE PREVIOUS MEETING
   - 4.1. UNCONFIRMED Minutes - Technical Services Committee - 14 April 2020
   - 4.2. Business Arising
5. IDENTIFICATION OF ITEMS FOR DISCUSSION
   - 5.1. Identification of items for discussion
   - 5.2. Identification of items to be raised in General Business by Elected Members and Officers
6. DEPUTATIONS
7. PETITIONS
8. NOTICE OF MOTION
9. REPORTS OF OFFICERS
   - 9.1. Technical Services Directorate Update
     Report No: 86 / 20 ts (DTS)
   - 9.2. Cemeteries Advisory Committee - Nominations
     Report No: 87 / 20 ts (MTS)
   - 9.3. Sports Facilities Advisory Committee - Nominations
     Report No: 88 / 20 ts (DTS)
   - 9.4. Alice Springs Town Council - Concrete Crew
     Report No: 89 / 20 ts (DTS)
   - 9.5. Charles Darwin University (CDU) - Oval Agreement
     Report No: 90 / 20 ts (DTS)
   - 9.6. Handover of Infrastructure Assets Package Deal 2
     Report No: 91 / 20 ts (DTS)
10. REPORTS OF ADVISORY AND EXECUTIVE COMMITTEES
    - 10.1. CONFIRMED Minutes - Special Meeting - Sports Facilities Advisory Committee - 23 April 2020

11. GENERAL BUSINESS
12. NEXT MEETING: **Monday 11 May 2020**

CONFIDENTIAL SECTION

13. APOLOGIES - CONFIDENTIAL
14. DISCLOSURE OF INTEREST - CONFIDENTIAL
15. MINUTES OF THE PREVIOUS MEETING – CONFIDENTIAL
    - 15.1. UNCONFIRMED CONFIDENTIAL Minutes - Technical Services Committee - 14 April 2020
    - 15.2. Business Arising
16. IDENTIFICATION OF ITEMS FOR DISCUSSION – CONFIDENTIAL
    - 16.1. Identification of items for discussion
    - 16.2. Identification of items to be raised in General Business by Elected Members and Officers
17. DEPUTATIONS - CONFIDENTIAL
18. PETITIONS - CONFIDENTIAL
19. NOTICE OF MOTION - CONFIDENTIAL
20. REPORTS OF OFFICERS - CONFIDENTIAL
    - 20.1. Road Reseal Program Tender 2020-03ST
      Report No: 101 / 20 ts (DTS)
21. REPORTS OF ADVISORY AND EXECUTIVE COMMITTEES - CONFIDENTIAL
22. GENERAL BUSINESS - CONFIDENTIAL
23. MOVING CONFIDENTIAL ITEMS INTO OPEN
24. CLOSURE OF MEETING

Robert Jennings
CHIEF EXECUTIVE OFFICER
7 May 2020

Note: A recording of the Open section of this Technical Services Committee meeting can be found on Council's website from the Wednesday after the meeting. Go to: www.alicesprings.nt.gov.au then to Council meetings.

MINUTES OF THE MEETING OF THE TECHNICAL SERVICES COMMITTEE HELD ON TUESDAY 14 APRIL 2020, IN THE COUNCIL CHAMBER, CIVIC CENTRE, ALICE SPRINGS

Due to the COVID-19 Pandemic this meeting was held via Zoom

PRESENT: His Worship the Mayor D. Ryan
Councillor G. Auricht
Councillor J. Cocking
Councillor E. Melky (Chair)
Councillor M. Paterson
Councillor J. Price
Councillor M. Banks
Councillor J. de Brenni
Councillor C. Satour

OFFICERS: Mr R. Jennings - Chief Executive Officer
Mr S. Allen - Director Technical Services
Mr S. Duke - Acting Director Community Development
Ms S. Taylor - Director Corporate Services
Ms T. Ociones - Executive Assistant (Minutes)

The meeting was declared open at 8:49pm

1. APOLOGIES

Nil

2. WELCOME TO THE PUBLIC, VISITORS AND PUBLIC QUESTION TIME

Nil

3. DISCLOSURE OF INTEREST

Nil

4. MINUTES OF PREVIOUS MEETING

4.1 Minutes - Technical Services Committee - 16 March 2020

RESOLVED
That it be a recommendation to Council

That the minutes of the open section of the Technical Services Committee meeting held on 16 March 2020 be taken as read and confirmed as a true and correct record of the proceedings of that meeting

(4665 ts)
CARRIED

4.2 Business Arising

4.2.1 Councillor Cocking – Agenda Item 9.1, Directorate Update

Councillor Cocking asked if the Director Technical Services engaged a company in February to crush steel?

The Director Technical Services advised that Council engaged the services of Sims Metal for this work.

4.2.2 Councillor Cocking – Agenda Item 9.5, Handover of Infrastructure Assets Package Deal

Councillor Cocking asked if the adapted letter to reflect stronger language than 'satisfaction' has been sent to DIPL.

The Chief Executive Officer advised that the letter with stronger wording has been sent after the meeting. There has been some follow up conversations, but delayed due to the COVID-19 situation, will come back to Council in due course. A phone call meeting has been set up with a DIPL officer for tomorrow.

5. IDENTIFICATION OF ITEMS FOR DISCUSSION

5.1 Identification of items for discussion

The following items were withdrawn for discussion:

9.2, 9.3, 9.4, 10.3

5.2 Identification of items to be raised in General Business by Elected Members and Officers

- Councillor Auricht – correspondence from Minister Wakefield and Minister Moss
- Councillor Banks – correspondence from Netball Association

6. DEPUTATIONS

Nil

7. PETITIONS

Nil

8. NOTICE OF MOTIONS

Nil

9. REPORTS OF OFFICERS

9.1 Technical Services Directorate Update
Report No. 57 / 20ts (DTS)

This report provides an update of current Technical Services projects, programs and events.

RESOLVED
That it be a recommendation to Council

That the April 2020 Technical Services Directorate Update be received and noted.

(4666 ts)

3 – TS COMMITTEE – 14/04/20

9.2 Proposed Extension to the Skate Park at Speed Street
Report No. 58/20 ts (PAO)

This report is submitted to Council in regard to the proposed extension to the existing Skate Park at Speed Street.

RESOLVED
That it be a recommendation to Council

1. **That Council approves the Skate Park plans in principal**
2. **That Council tables Report No. 58/20 ts regarding the proposed extension to the Skate Park at the 2020 / 2021 budget discussions**
3. **That Council identify funding opportunities for the Skate Park extension project**

(4667 ts)

Councillor Paterson referred to the estimated costs of the Skate Park upgrade of $617,300. The report mentioned two stages of the design. Is the cost referring to Stage 1 or Stage 2?

The Director Technical Services advised that the total cost is for both stages of the design. Council officers will take direction from Council on how the cost will be broken down.

Councillor Cocking referred to the design and asked if the contained area is to separate the beginners from the skilled skaters. Councillor Cocking asked if the design has gone back to the skaters after the community consultation.

The Director Technical Services advised that the bowl was put in the design for the novices as well as to add to the flow. Once Council approved the project, it will go back to the skating community.

Councillor Banks thanked the Council officers and Council for seeing this project come to fruition and for supporting the youth of Alice Springs.

Councillor Banks left the meeting at 9:05pm

9.3 Sporting Facility Infrastructure
Report No. 59/20 ts (DTS)

This report is in response to a request from the Sports Facilities Advisory Committee to provide Council and the Committee with an update on the current infrastructure at each of its sporting venues.

RESOLVED
That it be a recommendation to Council

That this report is noted by Council and referred to the Sports Facilities Advisory Committee for their information and consideration.

(4668 ts)
UNANIMOUS

Deputy Mayor Paterson would like to add to the recommendation, that Council tables this report at the 2020 / 2021 budget discussions. Discussions ensued whether to add this or amend the proposed recommendation.

Mayor Ryan expressed concerns that this report is still to go to SFAC and SFAC meetings may not be convened for some time, as it is waiting for membership from different sporting bodies. The Committee needs to convene a special meeting to discuss this or put some of these proposals forward for Council budget discussion.

4 – TS COMMITTEE – 14/04/20

The Director Technical Services advised that SFAC is awaiting some membership nominations due to the change of Charter. At this stage there could be a special SFAC meeting of the existing members, but there has to be a recommendation from Council or the sports bodies could be invited to consult on which projects are considered priorities.

Council acknowledges the NT Government for the $6.2M invested into the community. The money went a long way to resolving a lot of concerns but there are still a few concerns from sports about some of the projects that could happen. The last time Council undertook consultation on how the $6.2M funding will be used, the first identified project was the Anzac oval lighting upgrade. The Director suggested that this should still be the first priority to consider.

Councillor Price would like some clarification about the Anzac oval score board. The report stated that the replacement of the score board would be a medium priority but it is listed in the table as high priority. Councillor Price asked when was the last time it was replaced.

The Director Technical Services advised that the replacement of the score board should be changed to high priority. The Director took on notice the date of its last replacement.

ACTION:
Reconvene SFAC at the earliest time convenient to determine what commitments should be considered by Elected Members through the budget process.

ACTION:
Director Technical Services to report on the date the Anzac Oval Scoreboard was last replaced.

Councillor Banks returned to the meeting at 9:20pm

Note: The Elected Members voted unanimously upon Councillor Banks returning to the meeting.

9.4 Illegal Rubbish Dumping
Report No. 60/20 ts (DTS)

This report outlines a proposal for Council to partner with the Northern Territory Government (NTG) to provide a reward to those who assist NT Police / Council Rangers in the conviction of a person who has committed an offense of illegal dumping.

RESOLVED
That it be a recommendation to Council

That Council endorses Officers to negotiate with NTG to create a partnership that offers financial incentives for the successful prosecution of illegal dumping.

(4669 ts)

5 – TS COMMITTEE – 14/04/20

9.5 Sporting Oval Closure and Opening Procedures
Report No. 61/20 ts (DTS)

This report provides Council with an update on the current and proposed oval closing and opening procedures.

RESOLVED
That it be a recommendation to Council

1. **That Officers make the decision in regard to the closure and opening of Council sporting ovals in regard to rainfall events**
2. **That Council endorse the proposed closing and opening procedures**

(4670 ts)

9.6 Cemeteries Advisory Committee – Nominations
Report No. 62/20 ts (DTS)

This report is to provide Council with information on membership nominations received for the Cemeteries Advisory Committee under the new Terms of Reference, and requests endorsement of these nominations as per Section 54 (2) of the Local Government Act.

RESOLVED
That it be a recommendation to Council

1. **That Council endorse the following nominations for the Cemeteries Advisory Committee to apply from the next Committee meeting through until (and including any meeting in) August 2021:**

National Trust NT - David Hewitt
Expires 31 August 2021

Alice Springs Christian Ministers Association (Fellowship) - Pastor Rod Holmes
Expires 31 August 2021

2. **That the section in the Terms of Reference in regard to the number of Elected Members, *three (3) plus the Mayor* on the Committee, applies after the August 2020 *Representative***

(4671 ts)

6 – TS COMMITTEE – 14/04/20

9.7 Sports Facilities Advisory Committee - Nominations
Report No. 63/20 ts (DTS)

This report is to provide Council with information on nominations that Officers have received for the Sports Facilities Advisory Committee under the new Terms of Reference, and requests endorsement these nominations as per Section 54 (2) of the Local Government Act.

RESOLVED
That it be a recommendation to Council

1. That Council endorse the following nominations for the Sports Facilities Advisory Committee to apply from the next Committee meeting through until the date of expiry (2 years - unless extended to meet the Summer / Winter Sport terms):

AFL Northern Territory - Daryll Griffiths
Winter Sport - 2-year term, expires 31/03/2022

Alice Springs Basketball Association - Phillip Preece
Winter Sport - 2-year term, expires 31/03/2022

Alice Springs Touch Association - Tim Pearson
Summer Sport - 2-year term (extended), expires 30/09/2022

Central Australian Rugby Football League - Dennis Sawtell
Summer Sport - 2-year term (extended), expires 30/09/2022

(4672 ts)

2. That Council postpone all SFAC meetings until nominations from all Sports Facility Fund Members have been received to ensure effective function of the Committee, and so, a quorum can be reached.

(4673 ts)

10. REPORTS OF ADVISORY & EXECUTIVE COMMITTEES

10.1 Minutes - Access Advisory Committee - 10 March 2020

RESOLVED
That it be a recommendation to Council

That the minutes from the Access Advisory Committee meeting held 10 March 2020 be received and noted.

(4674 ts)

10.2 Minutes - Environment Advisory Committee - 6 April 2020

RESOLVED
That it be a recommendation to Council

That the minutes from the Environment Advisory Committee meeting held 6 April 2020 be received and noted.

(4675 ts)

7 – TS COMMITTEE – 14/04/20

10.3 Minutes - Cemeteries Advisory Committee - 7 April 2020

RESOLVED
That it be a recommendation to Council

That the minutes from the Cemeteries Advisory Committee meeting held 7 April 2020 be received and noted.

(4676 ts)

10.3.1 Impact of COVID-19 on Funeral Attendance - Director Technical Services (Agenda Item 7.1)

RESOLVED:
That it be a recommendation from the Cemeteries Advisory Committee to Council

That Council Officers spend up to $20,000 including GST (42) from the Cemeteries budget for live streaming in the Chapel to allow the public to access funerals remotely due to the impact of COVID-19

(4677 ts)

Councillor Cocking clarified if the digital infrastructure investment in the chapel will be ongoing for remote participation in funerals beyond COVID-19 or is Council looking to install live streaming in the chapel until social distancing restrictions are lifted.

The Director Technical Services advised that initially the thought was just to go through COVID-19 but in the current environment there is no certainty of what will happen post COVID-19. It is the opinion of Council officers that the infrastructure will continue post COVID-19 to enable interstate people to attend funerals via live streaming.

Councillor Cocking proposed to add the word 'remotely' to the recommendation.

11. GENERAL BUSINESS

11.1 Councillor Auricht – Correspondence from Minister Wakefield and Minister Moss

Councillor Auricht put forward for discussion a letter from Minister Wakefield and Minister Moss urging the Alice Springs Town Council to endorse the use of the Anzac Precinct for the National Aboriginal Art Gallery project, including the Anzac High school site and Anzac oval.

Discussion ensued about Council's position and the statement of the Minister in the letter that 32 traditional owners strongly endorsed the project to be built on this site. Council's decision from 9 December 2019 Ordinary meeting states that *"That ASTC negotiate the southern portion of the Council managed Anzac oval site, once the NTG provide ASTC evidence of custodian support of the location."*

Councillor Price encouraged Council to have a separate meeting with the traditional owners and hear their opinions.

Councillor Satour had conversations with various traditional owners. Some have strong support and some are strongly against while some explained that they are not receiving or not fully understanding the information.

Elected Members agreed that Council respond to the Minister stating Council's current position and seek clarity around the design, what portion of the oval NTG would like to take

and evidence of support from traditional owners. The letter should have a clear wording that would not lock Council in and allow Council to progress to the next step.

ACTION:
The Chief Executive Officer to write a letter of response to Minister Wakefield with clear wording stating Council's current position on the project and seeking clarity regarding the design, extent of the existing oval intended for use and requesting evidence of support from traditional owners.

11.2 Councillor Banks - Correspondence from Netball Association

Councillor Banks submitted a letter from Mr Gaynor on behalf of Netball Association for discussion.

The Director Technical Services advised that the letter was sent to Elected Members and only forwarded to senior officers this morning. A meeting with senior officers and the Netball Association has been set up and Elected Members will be informed of the outcome accordingly.

Councillor Banks asked if there was any feedback from SFAC on Council's decision on 26 March 2020 about waiving of SFAC participation levy until 30 June 2020. How was this communicated to different sporting bodies?

The Director Technical Services took the question on notice.

Councillor Cocking advised that Council need to consider how this will impact on sports as a whole and look at some budget/income implications across the board. The Director Technical Services advised that there will be different responses as some sports will be greatly impacted and some will not. All this information will be communicated as soon as a meeting of SFAC is convened.

Deputy Mayor Paterson pointed out that the Sports Participation Levy is only payable if a sports participant plays 3 competition rounds. At this stage, the sports fund contribution will be down approximately of $17,000 if Netball do not play three rounds this year as the levy will not be payable.

ACTION:
Director Technical Services to ensure communication was made with sporting bodies in regard to waiving SFAC participation levy until 30 June 2020.

12. NEXT MEETING: **Monday, 11 May 2020**

The meeting stands adjourned and resumes in the Confidential Section.

The meeting adjourned at 10:03 pm

Confirmed on _____

CHAIRPERSON _____

Date _____

Agenda Item 9.1

REPORT

Report No 86 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **TECHNICAL SERVICES DIRECTORATE UPDATE**

AUTHOR: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

EXECUTIVE SUMMARY

This report provides an update of current Technical Services Directorate programs, projects and events.

RECOMMENDATION

That it be a recommendation to Council

That the May 2020 Technical Services Directorate Update be received and noted.

REPORT

1. DISCUSSION

The attached reports summarise activities that occurred within the Technical Services Department for the month of April 2020

1.1 SUMMARY OF BUSINESS ARISING FROM PREVIOUS MINUTES OF THE ORDINARY COUNCIL 27 APRIL 2020

All matters actioned.

2. POLICY IMPACTS

All projects relate to and reflect the appropriate policies and components of the ***Alice Springs Town Council Strategic Plan 2018 - 2021***

3. FINANCIAL IMPACTS

All committed projects are working within their approved budget and funding agreements

4. SOCIAL IMPACTS

As per individual projects and plans

5. ENVIRONMENTAL IMPACTS

As per the projects and relevant plans

6. PUBLIC RELATIONS

As per individual projects and plans

Report No 86 / 20 ts

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7. ATTACHMENTS

Attachment A: Manager Infrastructure Report
Attachment B: Sports Officer Report
Attachment C: Manager Works Report
Attachment D: Manager Regional Waste Management Facility Report
Attachment E: Manager Developments Report
Attachment F: Environment Officer Report

Scott Allen
DIRECTOR TECHNICAL SERVICES

ATTACHMENT A

TO: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

AUTHOR: **MANAGER INFRASTRUCTURE - STEPHEN BALOBAN**

SUBJECT: **REPORT FROM INFRASTRUCTURE UNIT FOR THE MONTH OF APRIL 2020**

This report provides an update of current infrastructure and engineering projects for April 2020

1. PROJECTS:

PROJECT	LOCATION	STATUS	COMPLETION DATE
A. Informal Crossing in Hartley Street	Hartley Street	Works 50% complete poles going up	May 2020
B. Railway Crossing Audit	Alice Springs	The Interface Agreement document is with the Railway Authority for final additions Report to Council when interface agreement is signed by all parties	June 2020
C. CCTV	CBD	Works 99% complete. Waiting on optic fibre cable from Traeger Park to Civic Centre	May 2020
D. New Solar System at ASALC Stormwater Compliance	ASALC	Depot Staff have commenced earthworks	May 2020
E. Sport Lighting Upgrade Albrecht Oval	Albrecht Oval	Winning Tender notified, works program being obtained	August 2020
F. ASALC Refurbishment	ASALC	Tender 2020-06ST opens 30/04/20 closes 30/05/20.	September 2020
G. Albrecht Oval	New toilets, change rooms and grand stand	Construction completed. Waiting on Part 5 clearance from PowerWater	July 2020
H. Skate Park Repairs	Test products for repairing Skate park	Painting to be completed	May 2020
I. Cromwell Drive Road Failure	Cromwell Drive	Tender no 2020-05ST Open 30/40/20 closes 28/05/20	August 2020
J. 4 New 33kw Solar Systems to be installed at the 4 New Sporting Facilities	Ross Park, Jim McConville, Flynn Drive & Albrecht Oval	Winning tender notified, works program being obtained	August 2020
K. Fence in Front of Rock Bar & Bojangles	Todd Street	Under design	September 2020
L. Rhonda Diano Athletics Facilities Upgrades	Design of the synthetic running track	Part of the $6.2M Facilities Upgrades - 50%. Concrete complete waiting for synthetic track to be laid Delay due to COVID-19	August 2020

Attachment A

M. Install Electrical Vehicle Charging Stations	Various locations	Options being investigated	October 2020

Stephen Baloban
MANAGER INFRASTRUCTURE

ATTACHMENT B

TO: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

AUTHOR: **SPORTS OFFICER - TAMA WAKELIN**

SUBJECT: **REPORT FROM SPORTS DEPARTMENT FOR MAY 2020**

This report provides an update of current sport activities:

1. **Sporting Bodies**

- Sporting Participation Levies' deferral of payment until June 2020.
- Peak Sporting Seasons (AFL, Athletics, CARFL, Netball) postponed as per COVID19 restrictions

2. **Events** - *Cancelled and/or Postponed due to COVID19*

2 April - 14 April 2020
Parrtjima Festival - Cancelled

27 June - 28 June 2020
Cancer Council relay for life at Albrecht oval - Cancelled

1 July - 7 July 2020
Alice Springs Show - To be confirmed

3. **Sporting Facilities**

- Weekly/monthly facility inspections completed
- Hand-over of the Netball Stadium from NTG to ASTC - discussions ongoing
- Rhonda Diano works for Athletics Track - on hold due to COVID19
- Albrecht Oval Cricket Nets - under construction

4. **Reviews and Reports**

- Sports Facility Fund membership forms and Sports Facilities Advisory Committee nomination forms, 6 SFAC members endorsed, 1 in report to Council this month, awaiting remaining responses from sports
- Alice Springs Netball Association - Deed of Licence - discussions ongoing
- Paul Fitzsimmons / CDU Oval agreement - report to Council this month

5. **Endorsed new members to SFAC**

- AFL Northern Territory - Daryll Griffiths
- Alice Springs Basketball Association - Phillip Preece
- Alice Springs Touch Association - Tim Pearson
- Central Australian Rugby Football League - Dennis Sawtell
- Alice Springs Netball Association Inc - John Gaynor
- Central Australian Rugby Union - Aaron Blacker

Tama Wakelin
SPORTS OFFICER

ATTACHMENT C

TO: DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN

AUTHOR: MANAGER WORKS - BEN FITZGERALD

SUBJECT: WORKS DEPARTMENT REPORT - APRIL 2020

This report provides an update of some of the completed and current Depot works projects:

1. REACTIVE WORKS

COVID-19 reactive works completed by Depot teams:

- Park Sanitation
- CBD Sanitation
- Extra Facilities Cleaning
- Regular Staff Meetings

2. PROJECTS

- Ilparpa Road Footpath - 800m of Stage 1 completed
- CBD Pram Ramps - 68 to be completed (4 completed in April)
- Hartley Street Path - 60% completed

3. DEPOT IN KIND SUPPORT OF EVENTS - April 2020

EVENT	COST of SUPPORT
No events in April	Nil
TOTAL COST:	

4. STAFF TRAINING - April 2020

- Prevention Bullying and Harassment Training

5. LITTER / KIDDIE SCRIBBLE / GRAFFITI REMOVAL / VANDALISM

- **Litter -** litter stream was above average
- **Kiddie Scribble -** texta scribble is above average throughout the municipality
- **Graffiti Removal -** above average graffiti throughout municipality
- **Vandalism -** average throughout the municipality
  - » **Irrigation Infrastructure:** vandalism on irrigation infrastructure was average
  - » **Sprinklers:** 2 kick offs reported

- **Facilities -**
  - Anzac Oval - Average
  - Traeger Complex - Average
  - Jim McConville Complex - Average
  - Albrecht Oval - Average

  - » **Infrastructure:** Sign vandalism in CBD - average
  - » **Playgrounds:** Average vandalism recorded

Attachment C

6. NEAT STREETS

- **Notifications:** 112 Neat Street notifications were received in April 2020 with 63 completed.
  - ❖ **80** ASTC Depot Responsibility
  - ❖ **19** Ranger Responsibility
  - ❖ **12** NT Government Responsibility
  - ❖ **0** Telstra Responsibility
  - ❖ **1** Power & Water
  - ❖ **0** Private Property

7. VEHICLE PLANT REPLACEMENT

53106 - Hyundai Santa Fe Elite (TBA - Director Community Services commences)
52775 - Wood-chipper Bandit 250 XP - Quotes received

8. TREES - April 2020

- 20 trees were removed throughout the municipality
- 6 trees planted - Planting numbers are low in April with staff numbers being low due to Easter leave and COVID-19 prioritisation

Ben Fitzgerald
MANAGER WORKS

ATTACHMENT D

TO: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

AUTHOR: **MANAGER REGIONAL WASTE MANAGEMENT FACILITY - OLIVER ECLIPSE**

SUBJECT: **REGIONAL WASTE MANAGEMENT FACILITY REPORT - APRIL 2020**

This report provides an update of current waste management initiatives and projects.

Voucher system:

494 vouchers were redeemed in April 2020 at a cost of $11,632.27 to Council (Table 1).

Table 1: Total monthly vouchers redeemed

Month	*Voucher*	*Cost*
April 2020 (*Cars non-weighted)*	***37***	***$ 139.00***
April 2020 (*Utes non-weighted)*	***196***	***$ 2,300.50***
April 2020 (*Utes weighted)*	***261***	***$ 9,192.77***

Recycling Initiatives:

A comparison of recycling initiatives, by financial year and month.

Cardboard:

Table 2: Total year to date and financial year recycled cardboard

Year to Date	*Total Cardboard*
July 2019 to April 2020 (YTD)	***225.10 Tonnes***
Income received from cardboard (YTD)	***Total***
Orora Recycling*	***$11,225.00***

** Payments received as at 31/03/20*

Steel:

Table 3: Total financial year recycled steel

Month	*Total Steel*
July 2019 to April 2020 (YTD)	***1159.48 Tonnes***
Income received from Steel (YTD)	***Total***
Sims Metal*	***$58,359.00***

** Payments received as at 01/05/20*

Envirobank:

Table 4: Total monthly and financial year recycled 10c containers

Month	*Total 10c Containers*
April 2020	***1.00 Tonnes***
July 2019 to April 2020 (YTD)	***34.69 Tonnes***
Income received from Envirobank (April)	***Total***
$103/tonne	***$103.00***

Tube Terminator:

Table 5: Total monthly recycled fluorescent lights

Month	*Total Tubes*
April 2020	***276 Tubes***
July 2019 to April 2020 (YTD)	***4084 Tubes***

Weighbridge Waste and Recycling Totals – Monthly Data:

Table 8: Accumulated data for July / April 2019 in comparison July / April 2020

	July 2018-April 2019		July 2019-April 2020	
	Tonnes IN	Tonnes OUT	Tonnes IN	Tonnes OUT
Animal Carcass	6.31	0.00	7.83	0.00
Asbestos	95.92	0.00	416.63	0.00
Building Material	0.00	88.52	0.00	99.61
Cardboard & Paper	235.64	19.99	474.29	225.10
Chemical	0.00	8.86	0.00	0.00
Clean Fill	8402.42	44.90	25,443.25	5,780.98
Concrete	2571.71	605.89	2,108.86	3,472.20
Container Deposit	590.96	304.82	0.00	34.69
Council Supported	1.36	0.00	0.14	0.00
Demolition Materials	4989.51	0.06	5,172.02	0.00
Domestic Bins	5703.74	0.00	5,844.52	0.00
Drop off Zone*	7.57	105.91	0.00	98.17
Electronic waste	46.76	27.78	99.74	24.04
Glass **	79.75	35.98	100.55	61.16
Green Waste	1949.66	985.22	1,865.56	207.18
Household Goods	0.00	66.17	0.00	65.01
Liquid Waste	959.18	204.08	992.89	0.00
Mattresses	904.73	36.99	187.41	0.00
Metals ***	519.13	79.15	547.06	1,159.48
Mixed Waste ****	11198.87	3346.83	10,697.72	0.00
Timber & Pallets	410.93	2.34	628.88	1,553.55
Tyres	57.02	0.00	22.44	1.17
Total	**38,731.17**	**5,963.49**	54,609.79	12,782.34
Total minus clean fill	**30,328.75**		29,166.54	
Percentage recycled		**19.66%**		43.83%

Key:

* Drop off Zone - Goods dropped off by the public at the Rediscovery Centre

** Glass categories

*** Metal categories - include other categories (e.g. whitegoods etc.)

**** Mixed Waste - includes other categories (e.g. confidential burial; food surrender; transfer station, general waste; street clean, contaminated rocks)

Weighbridge Waste and Recycling Totals – Financial Year:

A total of 29,166.54 tonnes of waste (excluding clean fill) was collected at the RWMF for the period of July 2019 to April 2020 (Tables 8). A total of 12,782.34 tonnes was recycled out (Table 8).

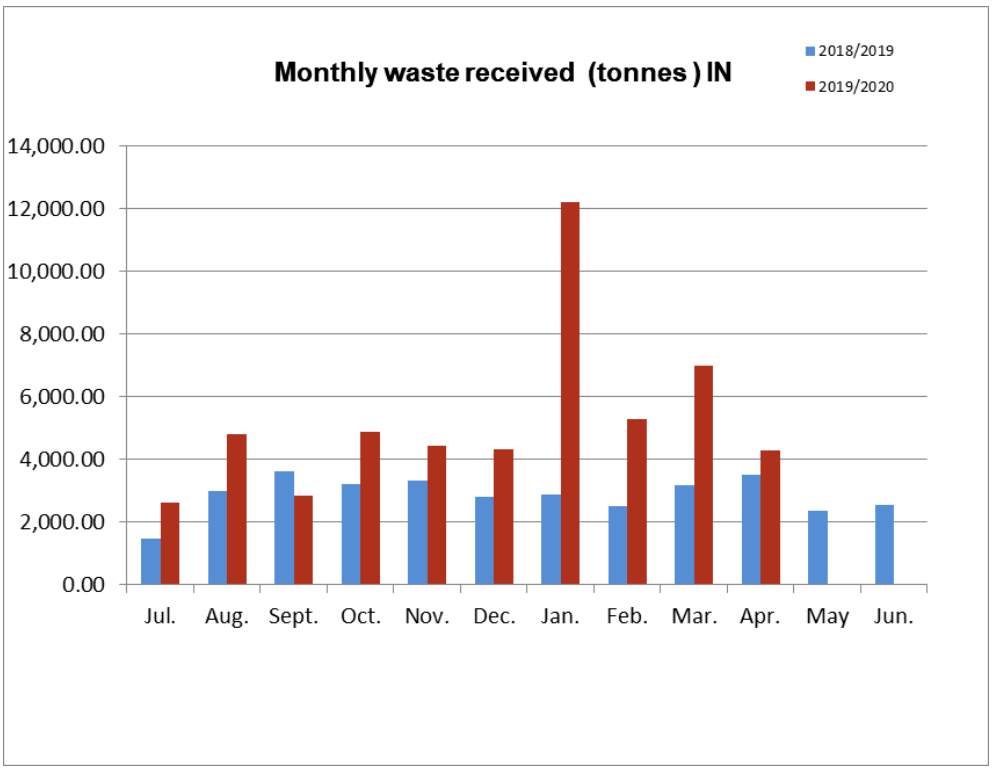
Table 6: Waste totals through the weighbridge (not including clean fill) during the financial year (See Figure 1)

Month	*Tonnes*
***July 2018 to April* 2019**	**30,328.75**
***July 2019 to April* 2020**	**29,166.54**

Table 7: Recycling totals through the weighbridge during the financial year (see also Figure 2)

Month	*Tonnes*
***July 2018 to* April 2019**	**5,963.49**
***July 2019 to* April 2020**	**12,782.34**

Figure 1: Monthly waste comparison by financial year (tonnes) received (IN)

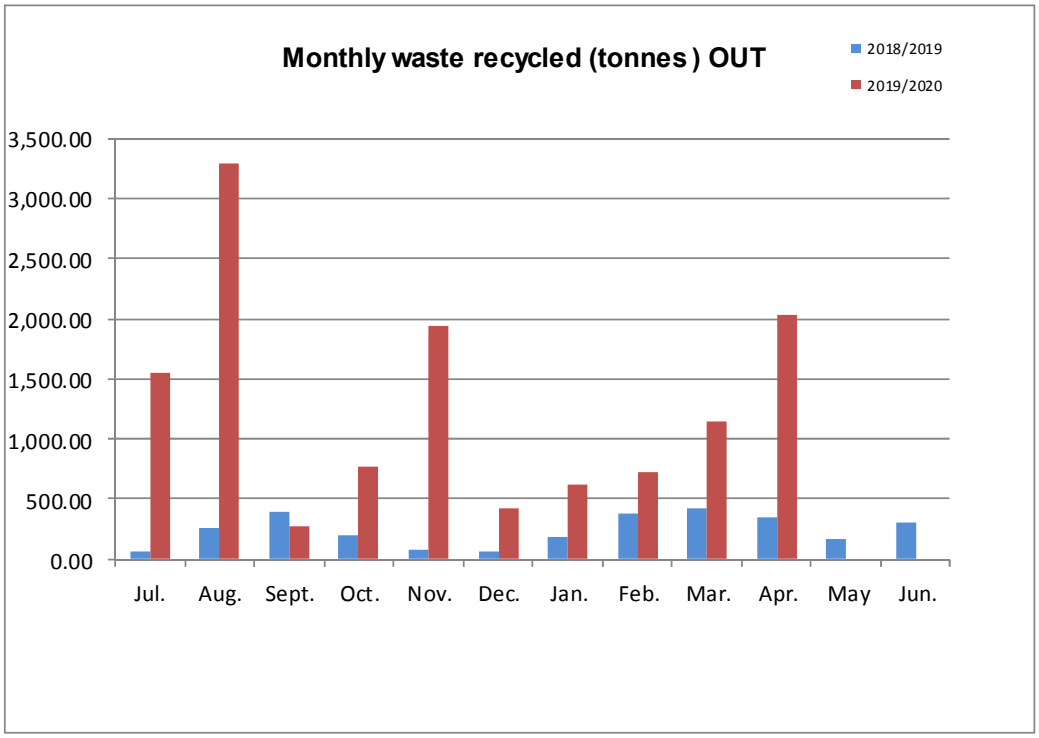


Year	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
2018/2019	1,460.80	2,975.40	3,629.13	3,205.74	3,324.48	2,820.97	2,893.79	2,518.22	3,192.13	3,517.19	2,343.98	2,552.37
2019/2020	2,621.74	4,789.72	2,837.04	4,889.56	4437.63	4,309.37	12,226.80	5,280.30	6,974.51	4,292.22		

Monthly waste received IN (year to date):

2018 /19 34,434.20 tonnes
2019 /20 52,609.79 tonnes

Figure 2: Monthly waste comparison by financial year (tonnes) recycled (OUT)



Year	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
2018/2019	68.60	259.74	390.74	197.85	80.15	59.84	188.50	385.91	421.92	342.20	165.08	301.93
2019/2020	1,558.13	3,288.76	272.77	774.47	1944.96	430.48	617.12	724.39	1141.59	2039.69		

Monthly waste recycled OUT (year to date): 2018 / 19 3,442.60 tonnes
2019 / 20 12,782.34 tonnes

Table 9: Monthly comparison of waste totals April 2019 and April 2020.

A total of 4,292.22 tonnes of waste (including clean fill) was collected, of which 71.20% of waste was recycled out in April 2020 (Table 9).

	Apr-19		Apr-20	
	Tonnes IN	**Tonnes OUT**	**Tonnes IN**	**Tonnes OUT**
Animal Carcass	0.75		0.47	
Asbestos	7.62		2.98	
Building Material		5.08		12.85
Cardboard & Paper	19.67		46.50	19.92
Chemicals		8.86		
Clean Fill	849.73	8.70	1,427.40	1,480.36
Concrete	209.22	227.98	154.66	
Container Deposit				1.00
Council Supported				
Demolition Materials	311.65		582.96	
Domestic Bins	588.76		618.96	
Drop off Zone* (Shop)		11.21		10.63
Electronic waste	2.41		12.91	10.52
Glass **	1.86	7.50	8.36	
Green Waste	160.43	61.64	209.49	
Household Goods		8.60		5.91
Liquid Waste	75.48		81.26	
Mattresses	10.63		26.73	
Metals ***	29.17	1.85	99.60	
Mixed Waste ****	2,065.26		940.33	
Timber & Pallets	32.93	0.78	73.87	497.94
Tyres	1.35		5.74	0.56
Total	**4,366.92**	**342.20**	4,292.22	2,039.69
Total minus clean fill	**3,517.19**		2,864.82	
Percentage recycled		**9.73%**		71.20%

Key:

* Drop off Zone - Goods dropped off by the public at the Rediscovery Centre

** Glass categories

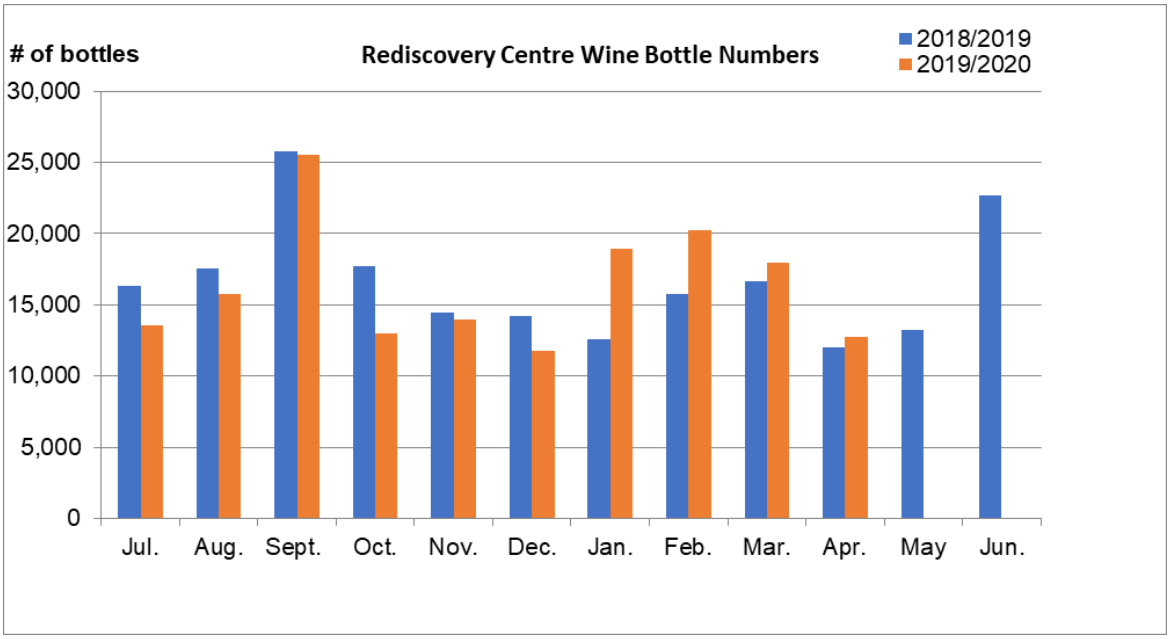
*** Metal categories - include other categories (e.g. whitegoods etc.)

**** Mixed Waste - includes other categories (e.g. confidential burial; food surrender; transfer station, general waste; street clean, contaminated rocks)

Cash-for-Containers total:

A total of 163,246 bottles were collected from July 2019 to April 2020 (Figure 3). The bottles are crushed at the Regional Waste Management Facility and are used as part of Council's projects.

Figure 3: Monthly totals of wine and spirit bottles collected at the Regional Waste Management Facility



Year	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
2018/2019	16,352	17,531	25,752	17,732	14,438	14,189	12,596	15,782	16,611	12,002	13,200	22,692
2019/2020	13,540	15,720	25,497	12,960	13,960	11,750	18,909	20,227	17,983	12,700		

Bottles Collected (year to date):

2018 / 19 198,876 Bottles
2019 / 20 163,246 Bottles

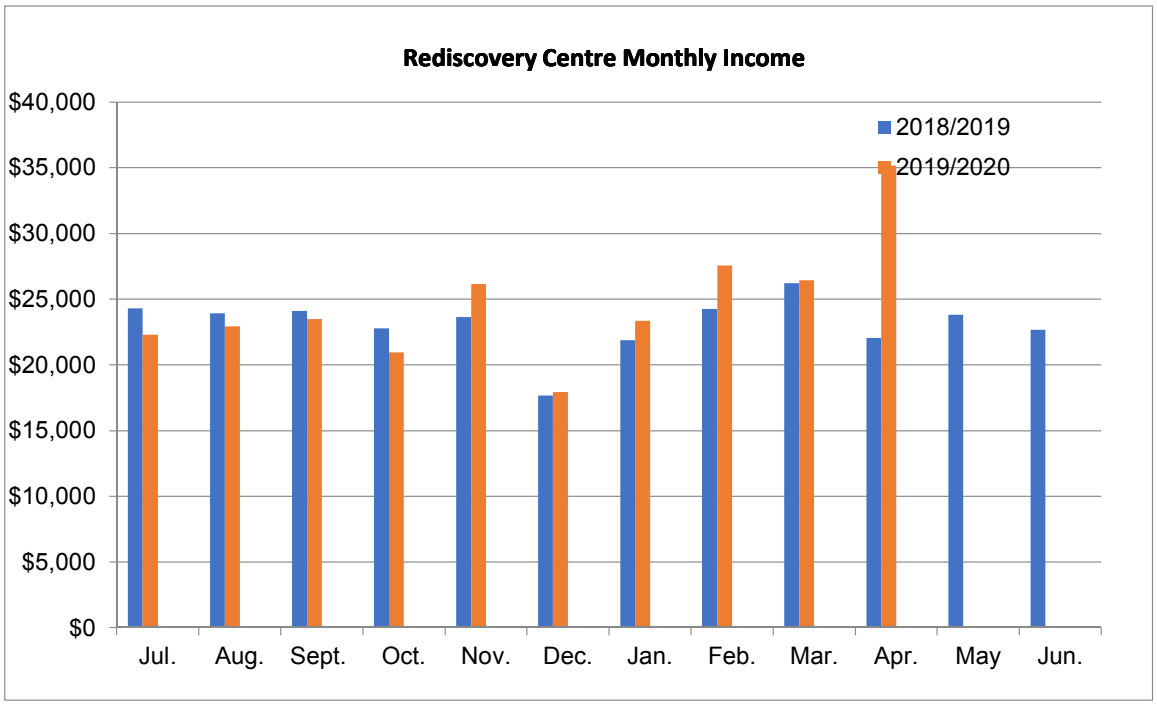
Rediscovery Centre:

For the period July 2019 to April 2020, the total stock intake at the Rediscovery Centre was 264.96 tonnes.

Rediscovery Centre Income:

During April 2020, The Rediscovery Centre had $ 35,167 income, compared to $22,051 in April 2019 (Figure 4).

Figure 4: Income from the Rediscovery Centre



Year	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
2018/2019	$24,299	$23,923	$24,098	$22,778	$23,631	$17,656	$21,879	$24,257	$26,219	$22,051	$23,823	$22,674
2019/2020	$22,294	$22,934	$21,834	$20,951	$26,149	$17,915	$23,344	$27,577	$26,447	$35,167		

Increase in sale due to closed boarders and Covid-19

Income from the Rediscovery Centre (year to date): 2018 / 19 $ 277,288
2019 / 20 $ 244,612

Oliver Eclipse
MANAGER REGIONAL WASTE MANAGEMENT FACILITY

ATTACHMENT E

TO: DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN

AUTHOR: MANAGER DEVELOPMENTS - DILIP NELLIKAT

SUBJECT: DEVELOPMENT REPORT FOR APRIL 2020

This report provides an update of current development activity.

1. Correspondence

Development Applications	6
Exceptional Development Applications	0
Development Permits	5
Exceptional Development Permits	1
Part 5 Clearances	6
Proposed Planning Scheme Amendments	0
Certificate of Compliance	5
Deferred, Refused, Concurrent/ Others	0

2. Major Development Works - currently under construction

2.1 Ilpeye Ilpeye Subdivision - Greenhills have highlighted a number of issues in the Stormwater report from SDA endorsed by BTO on behalf of DIPL, in addition to defects identified in February 2017 which cannot be rectified. Further to a report on the expected lifespan of the compromised assets, Council has negotiated a proposal with conditional acceptance of some of these assets with DIPL. Council is reviewing the response from DIPL.

2.2 Kilgariff Subdivision - Stage 1B work is complete and 1C is negotiated as a part of the Kilgariff Masterplan. Future work on the improvement of the Norris Bell intersection to prevent flooding at the Cemetery is being considered by DIPL. Since July 2019, Council officers and consultants are continually meeting with DIPL, to discuss outstanding issues expected to be fixed prior to handover. Negotiations are underway.

2.3 Lot 288, 69 Ross Highway - To use and develop the land for the purpose of a motel with 76 single rooms and caravan park with 25 two bedroom self-contained cabins and 6 camping sites including a communal kitchen, dining area, ablutions, laundry, recreation area and office. Part 5 has been issued for Stage 1 and 2. Awaiting overall completion.

2.4 Lot 4565, 10 Speed Street - Construct solar array (including associated land-filling) within a Defined Flood Area. The array installation is complete. Stormwater works is being undertaken by Council's Depot.

2.5 Lot 666, 667, 668 - 43, 45, 47 Gap Road - 36 x 2 bed room multiple dwellings in 6 x 3 storey buildings to be constructed in 2 stages

2.6 Lot 2663 – 19 South Terrace - Revised application for 30 x 3 bedroom multiple dwellings in 1 and 2 storey townhouses in 3 stages. Construction is yet to commence.

3. Major Development Works - completed recently

3.1 Lot 766, 8 Harvey Place - The building has an OP. Defective works are still being rectified by Dep. of Sports and Recreation, before handover can be considered complete.

All the above developments have been discussed in past Development Committee meetings. This advice is for the information of Council.

Dilip Nellikat
MANAGER DEVELOPMENTS

ATTACHMENT F

TO: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

AUTHOR: **ENVIRONMENT OFFICER - CHARLOTTE KLEMPIN**

SUBJECT: **REPORT FROM ENVIRONMENT OFFFICER FOR THE MONTH OF APRIL**

This report provides an update on environmental projects for the month of April 2020.

Waste Management

Recycling	Total
Household Batteries	12.8 kg
Cartridge recycling	81.9 kg
Mobile Phones	0.2 kg
Tubes	276
Bottles	8.36 tonnes

School Tours	Total
NONE DUE TO COVID19	

Cities Power Partnership

Pledge	Action	Progress	CAP Actions
Energy Policy	Climate Action Plan	Implementing and monitoring CAP	5.1.1 5.2.1
Renewable Energy	Increasing solar across all of Council's facilities	Energy Efficiency Grant application successful, 4 new PV systems on sports change rooms	5.1.1
Education Program	FOGO Trial	External trial to start June	5.4.1 5.4.16 5.4.18 6.3.34
Land Use	Open up land at the land fill and road reserves for renewable energy		
Fast charging infrastructure	Purchase electric vehicle	1 slow and 1 fast (50%)	5.3.10

Climate Action Plan

11 actions in progress

5 actions to be completed prior to June 2020

16.67% of CAP completed

Action #	Action	Progress
5.2.9	Install pool blanket	**100%**
5.3.12	Ensure bicycles and electric bicycles are available for transport during work hours	**100%**
5.3.13	Reduce fuel use at landfill by adopting GPS monitoring for compactor at landfill	**100%**
5.4.18	Identify cost-effective measures to reduce food waste and garden waste going to landfill.	**100%**
5.5.21	Collaborate with other Councils to share and contribute advice through the Cities Power Partnership.	**100%**
6.4.36	Lobby Power Water Corporation to reduce emissions from wastewater by investigating water	**100%**
6.5.40	Establish an environmental grant under Council's Community Grants Program.	**100%**
In Progress		
5.1.1	Source 50% of renewable energy by 2021	**50%**
5.1.4	Replace all inefficient lights in Council buildings with LEDs.	**15%**
5.3.10	Replace one Council vehicle with an electric vehicle per year (when vehicles are due for renewal). Provide a charge point for the electric vehicle.	**25%**
5.4.16	Trial commercial food waste composting systems.	**30%**
6.1.23	Lead, advocate for or assist with community-owned solar.	**5%**
6.1.26	Engage with and lobby the Northern Territory Government, electricity generators and retailers and other relevant stakeholders to ensure a smooth transition to a renewable energy powered network is feasible. Transition to include innovative technologies to support renewable energy such as peer to peer trading.	**10%**
6.2.32	Install electric vehicle charging stations in a central location.	**50%**
6.3.34	Pending outcome of business case (action item 3), implement a food and garden organics kerbside collection service.	**30%**
6.5.37	Lobby the NT Government to provide strong leadership on climate action.	**33%**
6.5.38	Partner with key local organisations to develop or progress action on climate change initiatives.	**50%**
6.5.39	Engage with and support the community on climate change issues through the arts and through community events.	**75%**
Actions to be completed prior to June 2020		
5.1.1	Source 50% of renewable energy by 2021	
5.1.8	Establish a rolling fund for financing energy efficiency projects and renewable energy.	
5.3.11	Introduce an active transport policy for Council staff. Incentivize active transport	
6.1.24	Provide information on household and business solar.	**25%**
6.3.35	Home composting program implemented.	**25%**

FOGO Weights

Month	Weight (tonnes)
April 2020	0.26

9.1

Energy

Graphs showing the energy use and solar produced at **ASALC, Civic Centre, Depot, RWMF and Library**. In March, 33% of the energy use from these facilities was provided by rooftop solar.

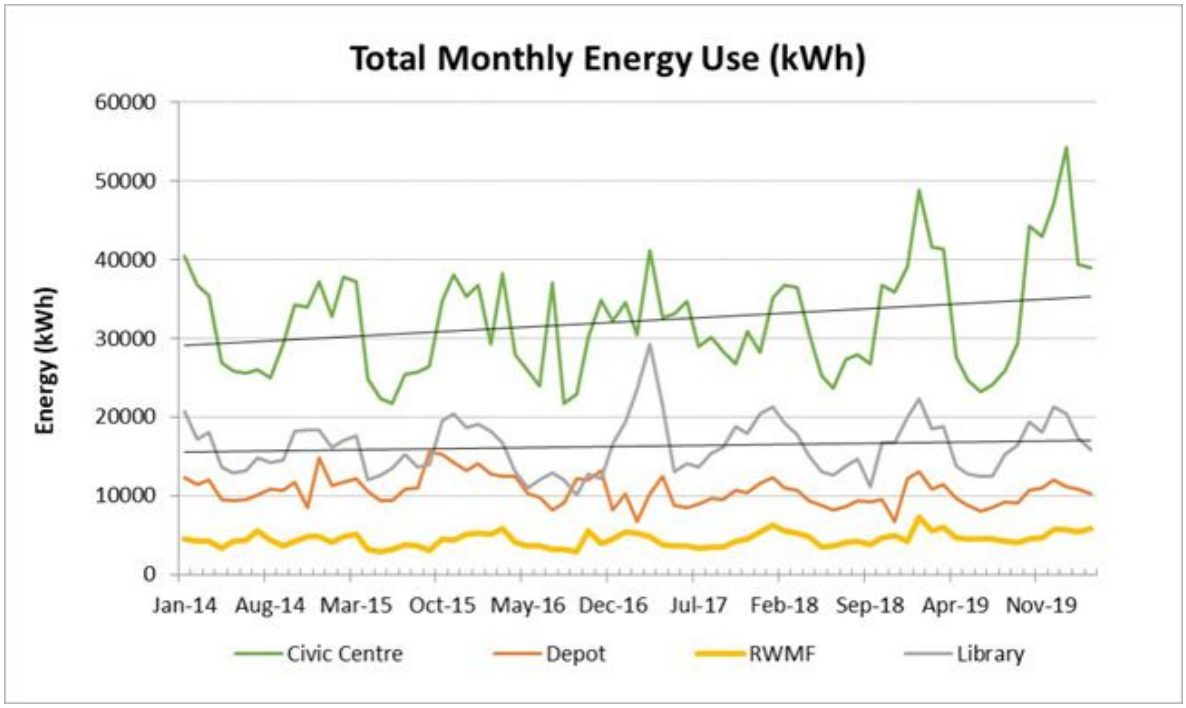


Figure 1. Monthly grid-supplied energy (kWh) for the Civic Centre, Depot, RWMF and Library

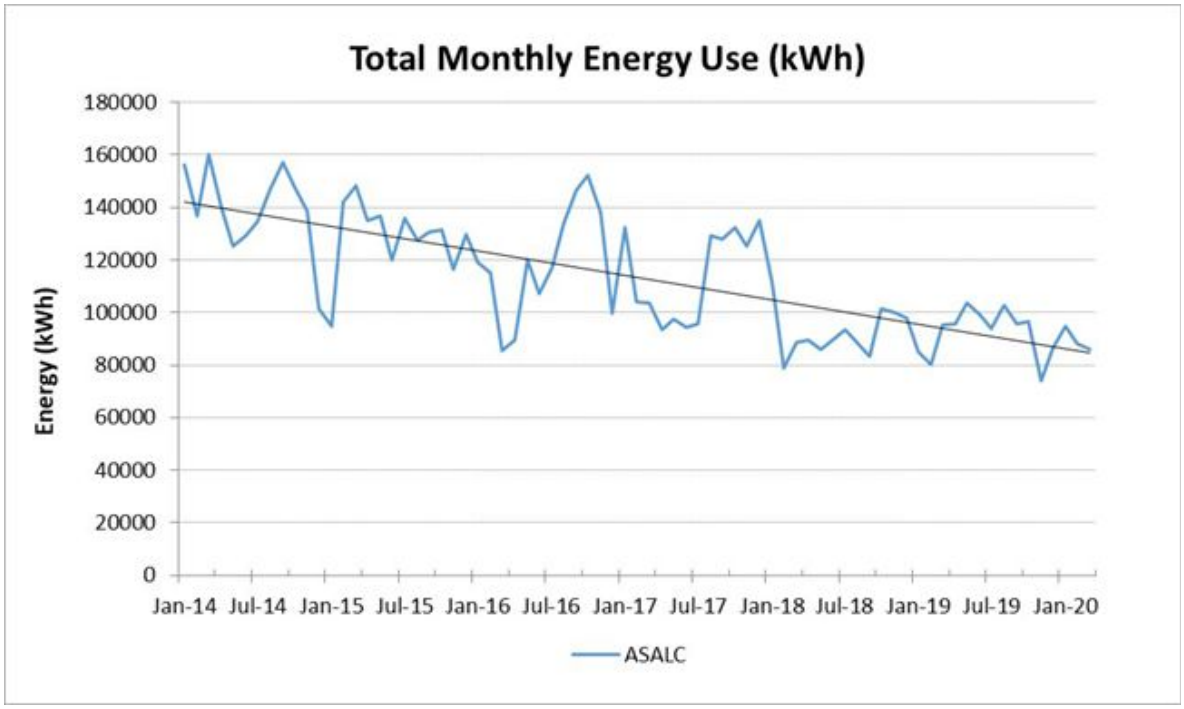


Figure 2. Monthly grid-supplied energy (kWh) for ASALC

Note: VSDs were installed mid-January 2018.
All previous major drops in energy use at ASALC were due to indoor pool closure.

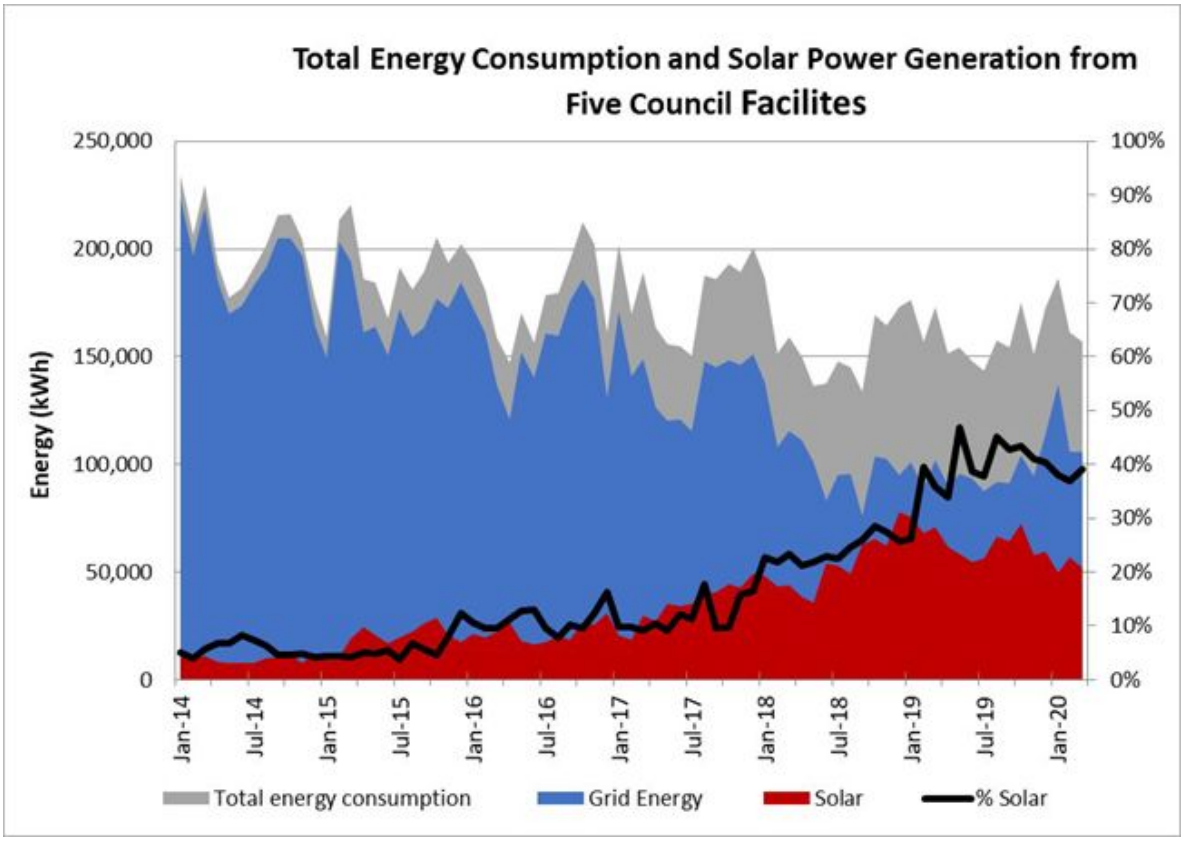


Figure 3. Total energy consumption, grid energy supplied, and solar energy produced combined for the ASALC, Civic Centre, Depot, RWMF and Library

C. Klempin

Charlotte Klempin
ENVIRONMENT OFFICER

Agenda Item 9.2

REPORT

Report No. 87 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **CEMETERIES ADVISORY COMMITTEE - NOMINATIONS**

AUTHOR: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

EXECUTIVE SUMMARY

This report is to provide Council with information on nominations that Officers have received for the Cemeteries Advisory Committee under the new Terms of Reference, and provide Council the opportunity to endorse these nominations as per Section 54 (2) of the Local Government Act.

RECOMMENDATIONS

That it be a recommendation to Council:

That Council endorse the following nominations for the Cemeteries Advisory Committee to apply from the next Committee meeting through until (and including any meeting in) August 2021:

Australian Funeral Directors Association - Mark Mossop
Expires 31 August 2021

REPORT

1. BACKGROUND

Following a report to the April Technical Services Committee, Council received correspondence from the Australian Funeral Directors Association with their nomination for the Cemeteries Advisory Committee.

The following nominations were included in the *Cemeteries Advisory Committee – Nominations report 62/20ts,* included in the Technical Services Committee meeting papers for the meeting held 14 April 2020:

National Trust NT - David Hewitt
Expires 31 August 2021

Alice Springs Christian Ministers Association (Fellowship) - Pastor Rod Holmes
Expires 31 August 2021

An additional nomination was received on 24 April 2020 by the Australian Funeral Directors Association:

Australian Funeral Directors Association - Mark Mossop
Expires 31 August 2021

Council Officers recommend this additional nomination is endorsed.

2. DISCUSSION

In the new Terms of Reference, Cemeteries Advisory Committee membership has been aligned to better represent relevant industry professionals, peak bodies, and the constitution of a board as per the Northern Territory of Australia - Cemeteries Act 1952:

Northern Territory of Australia - Cemeteries Act 1952

9 Constitution of a Board (excerpt)

(3) Where a portion of a public cemetery has been set apart for the burial of deceased persons of a religious denomination, the recognized head thereof may nominate a person for appointment to the Board.

(4) Where a portion of a public cemetery has been set apart for the burial of deceased persons of a group of religious denominations, the recognized head thereof may nominate a person for appointment to the Board.

(5) Where a portion of a public cemetery has been set apart for the burial of deceased persons who are described in section 7(1)(b) or (c), the sub-branch of the organization known as the Returned Cemeteries Act 1952 5 Sailors', Soldiers' and Airmen's Imperial League of Australia situated nearest to the cemetery may nominate a person for appointment to the Board.

Membership is now a representative nomination process rather than a broader open expression of interest, reducing the administration by Council Officers and ensuring relevant experience and input aligned to the purpose.

Cemeteries Advisory Committee - Terms of Reference (extract)

Term of Office

***Membership to the committee is for 12 months**, in line with Council Committee elections (in August) for Elected Members and the annual AGM cycle for associations.*

Membership of the committee ceases upon the completion of 12 months; unless renominated, or sooner if the person no longer holds office by virtue of which the person became a member.

Renomination is limited to 2 consecutive terms, unless available representation is limited.

3. POLICY IMPACTS

Alice Springs Town Council Strategic Plan 2018 to 2021:

Objective 1: a dynamic community

1.1 Inclusiveness and support

Objective 2: a great place to live

2.1: Community life, promoting a healthy, vibrant culture

4. FINANCIAL IMPACTS

Nil

5. SOCIAL IMPACTS

Nil

6. ENVIRONMENTAL IMPACTS

Nil

Report No. 87 / 20 ts

7. PUBLIC RELATIONS

Nominations from relevant industry professionals and peak bodies will ensure relevant experience and input are aligned to the purpose of the Committee.

8. ATTACHMENTS

Attachment A: Cemeteries Advisory Committee - Terms of Reference
Attachment B: Letter from Australian Funeral Directors Association - Nomination

Scott Allen
DIRECTOR TECHNICAL SERVICES

ATTACHMENT A

TERMS OF REFERENCE
Cemeteries Advisory Committee

Committee Type

Advisory Committee

Purpose

The purpose and function of the Cemeteries Advisory Committee (the Committee) is to:

- Oversee the development and implementation progress of a Garden Cemetery Master Plan (long-term) and Annual Plan including design, infrastructure and services.
- Provide policy advice to Council in regard to planning and management of Alice Springs public cemeteries which include:
  - Alice Springs Garden Cemetery, Norris Bell Avenue
  - Stuart Town (Alice Springs pioneer) Cemetery, George Crescent
  - Alice Springs General (Memorial) Cemetery, Memorial Drive
- Provide advice on council's community engagement and external communication including clarity and accessibility of website information, processes and fees in regard to Alice Springs public cemeteries.
- Monitor legislative compliance annually

Powers of the Committee

The Committee provides advice and makes recommendations to Council in regard to policy, compliance and planning in relation to the management of public cemeteries in Alice Springs.

Membership

Committee Members (voting)

3 Elected Members and the Mayor

1 Member representing each of the following:

- Alice Springs Christian Ministers Association
- Alice Springs Islamic Society
- Alice Springs RSL
- Australian Funeral Directors Association
- National Trust (NT)
- Relevant professional of non-denomination (e.g. a Celebrant)

Ex-Officio Members (non-voting)

Senior Records Officer

Director Technical Services (Curator) as the CEO's delegated officer or the CEO

Executive Assistant to Director Technical Services or Administration officer (minutes)

Term of Office

Membership to the committee is for 12 months, in line with Council Committee elections (in August) for Elected Members and the annual AGM cycle for associations.

Membership of the committee ceases upon the completion of 12 months; unless renominated, or sooner if the person no longer holds office by virtue of which the person became a member.

Renomination is limited to 2 consecutive terms, unless available representation is limited.

Termination of membership

Membership may be terminated if a member is absent for 3 consecutive meetings, as determined by the CEO.

Chair

The position of Chair is to be held by a nominated Elected Member as determined at the August Ordinary Council Representative Elections to Committees each year.

Quorum requirements

A quorum is achieved by:

a) Attendance by at least one nominated Elected Member

b) Attendance by the Director Technical Services or CEO

c) Attendance by over 50% of the appointed voting members (including the Elected Member/s)

Meeting Frequency

The committee will meet 4 times per year

Applicable Legislation, Council Policies and/or Guidelines

Local Government Act NT

Cemeteries Act NT

Heritage Act

Responsible Officer

Director Technical Services

Reporting to

Ordinary Council

Adopted by Council - Date	24 February 2020	***Resolution #***	20808
Document Owner	Chief Executive Officer	***Controller***	Governance Unit

ATTACHMENT B

9.2

AUSTRALIAN FUNERAL DIRECTORS ASSOCIATION

24 April 2020

Chief Executive Officer
Alice Springs Town Council
93 Todd Street
ALICE SPRINGS NT 0871

By email: astc@astc.nt.gov.au

Dear Sir

Alice Springs Town Council – Cemeteries Advisory Committee Nomination.

Thank you for your recent request to the Australian Funeral Directors Association (AFDA) for nomination on the Alice Springs Town Council's Cemeteries Advisory Committee.

As your Cemeteries Advisory Committee would be aware, the current AFDA representative on this Committee is Mark Mossop, Operations Manager of Centre Funeral Services, in Alice Springs. As such, the SA/NT Divisional Council wish to continue to Mark as the nominate representative on Alice Springs Town Councils Cemeteries Advisory Committee. Centre Funerals have been accredited members of our Association since 1997.

I would also like to extend my thanks to Mr. Scott Allen, Director of Technical Services for affording the SA/NT Council a four (4) week extension for our nomination, while our funeral homes readied ourselves for the various issues surrounding COVID-19. This extension was greatly appreciated.

Please feel free to contact the SA/NT Divisional Executive Officer Colleen Falconer at divisions@afda.org.au if you have any further queries in relation to this nomination.

Yours Sincerely

Andrew Kleemann
SA/NT Divisional President

Promoting

professional

funeral standards

Australian Funeral Directors Association Limited
Level 1, 700 High Street
(PO Box 291)
KEW EAST VIC 3102

ABN 33 007 331 580
Phone: (03) 9859 9966
Fax: (03) 9819 7390
Email: divisions@afda.org.au
www.afda.org.au

Agenda Item 9.3

Report No. 88 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **SPORTS FACILITIES ADVISORY COMMITTEE - NOMINATIONS**

AUTHOR: **SPORTS AND RECREATION OFFICER - TAMA WAKELIN**

EXECUTIVE SUMMARY

This report is to provide Council with information on nominations that Officers have received for the Sports Facilities Advisory Committee under the new Terms of Reference, and provide Council the opportunity to endorse these nominations as per Section 54 (2) of the Local Government Act.

RECOMMENDATIONS

That it be a recommendation to Council:

That Council endorse the following nominations for the Sports Facilities Advisory Committee to apply from the next Committee meeting through until the date of expiry (2 years - unless extended to meet the Summer / Winter Sport terms):

Alice Springs Baseball Association - Lachlan Modrzynski
Summer Sport - 2-year term (extended), expires 30/09/2022

Alice Springs Hockey Association - Anne Davey-Smith
Summer Sport - 2-year term (extended), expires 30/09/2022

REPORT

1. BACKGROUND

After considerable consultation and feedback from the Sports Facilities Advisory Committee (SFAC) with draft documents reviewed and discussion held at meetings on the 29 August 2019, 31 October 2019 and 28 November 2019 (Special Meeting), a new Terms of Reference was drafted and sent to the February Ordinary Council meeting where it was endorsed by Council (resolution 20809).

Ordinary Council Meeting - 24 February 2020

13.1.4 Sports Facilities Fund and Advisory Committee (Agenda Item 9.3)
Report No. 22/20 cs (GM)

This report presents revised governance documents for the Sports Facilities Fund and Advisory Committee for Council's consideration and endorsement.

That Council adopt the revised Sports Facilities Fund Guidelines and Advisory Committee Terms of Reference.

(4 cs)
CARRIED (20809)

2. DISCUSSION

In the new Terms of Reference, SFAC membership has been aligned to the Sports Facilities Fund membership and now supports better local representation of the main sports utilising Council facilities.

Report No. 88 / 20 ts

Membership is now a representative nomination process rather than an open expression of interest, reducing the administration by Council Officers and ensuring relevant experience and input aligned to the purpose.

After the Terms of Reference were endorsed, on 5 March 2020 Council distributed the four (4) new documents to Sport Facility Fund Members via email:

- 1. Sports Facilities Fund Guidelines,
- 2. Sports Facilities Fund Membership Agreement,
- 3. SFAC - Terms of Reference, and
- 4. SFAC - Representative Nomination Form

Council requested appropriate documents be returned by the 20 March 2020 to enable nominations to be endorsed by Council and prompt implementation.

To date, Council has received and endorsed the following nominations at the Ordinary Council meeting held 27 April 2020:

AFL Northern Territory - Daryll Griffiths
Winter Sport - 2-year term, expires 31/03/2022

Alice Springs Basketball Association - Phillip Preece
Winter Sport - 2-year term, expires 31/03/2022

Alice Springs Touch Association - Tim Pearson
Summer Sport - 2-year term (extended), expires 30/09/2022

Central Australian Rugby Football League - Dennis Sawtell
Summer Sport - 2-year term (extended), expires 30/09/2022

Alice Springs Netball Association Inc - John Gaynor
Winter Sport - 2-year term, expires 31/03/2022

Central Australian Rugby Union - Aaron Blacker
Summer Sport - 2-year term (extended), expires 30/09/2022

These members now form part of the new SFAC committee.

Council followed up with Sport Facility Fund members on the 24 March 2020, 27 March 2020 and 27 April 2020 to encourage the return of nominations and will continue to follow up with all outstanding fund members to ensure all nominations can be endorsed by Council.

Due to the timing of the adoption of the new SFAC Terms of Reference, terms of appointment will be 2 years (or extended to meet the winter of summer sport representative terms - *as appropriate*). Council will work to ensure following years nominations better align to the Winter and Summer sport terms.

SFAC Terms of Reference (extract)

Term of Office

Membership to the committee is for 2 years.

Representation is determined through endorsed local nominations from each Sports Facilities Fund member association.

Winter Sport representative terms - 1 April through to 31 March
Summer Sport representative terms - 1 October through to 30 September

Membership of the committee ceases upon the completion of 2 years; unless renominated, or sooner if the person is no longer an endorsed nominee by virtue of which the person became a member.

Where a vacancy is for more than 6 months of the 2-year term, a new person meeting the membership requirements will be elected to fill the vacancy.

Quorum Requirements

A quorum is achieved by:
a) Attendance by at least one nominated Elected Member
b) Attendance by the Manager or Director Technical Services
c) Attendance by over 50% of the appointed voting members (including nominated Elected Members)

3. POLICY IMPACTS

Alice Springs Town Council Strategic Plan: 2018 to 2021

Objective 1: a dynamic community

1.3: Safe and reliable public infrastructure

Objective 2: a great place to live

2.1: Community life, promoting a healthy, vibrant culture

4. SOCIAL IMPACTS

Nominations from Sport Facility Fund Members will ensure relevant experience and input are aligned to the purpose of the Committee, and better local representation of the main sports utilising Council facilities is maintained.

5. PUBLIC RELATIONS

Alice Springs Town Council is practising good governance by reviewing Council committees against Northern Territory Government compliance.

8. ATTACHMENTS

Attachment A: Sports Facilities Advisory Facilities - Terms of Reference
Attachment B: Alice Springs Baseball Association - Nomination.
Attachment C: Alice Springs Hockey Association - Nomination.

Tama Wakelin
SPORTS OFFICER

ATTACHMENT A

TERMS OF REFERENCE
Sports Facilities Advisory Committee

Committee Type

Advisory Committee

Public

Purpose

To advise Council in relation to investment in sustainable quality sporting facilities which enhance sporting performance and contribute to the ongoing health, well-being and economic strength in the Alice Springs community.

Function

The functions of the Sports Facilities Advisory Committee (the Committee) are to:

- develop and oversee implementation of a 10 year Sports Facilities Master Plan;
- develop and oversee implementation of Sports Facilities Annual Plans;
- oversee the management of the Sports Facilities Fund as per the Sports Facilities Fund Guidelines;
- advise and make formal recommendations to Council in matters relating to the development and sustainable management of the sporting facilities in the municipality of Alice Springs;
- identify strategies that assist Council in achieving its 5% annual sports participation increase as per the ASTC Strategic Plan; and
- create a forum for collaboration and coordination across sports to address issues that impact on efficient use of facilities, maximum participation, volunteer and spectator support.

Powers of the Committee

The Committee provides advice and makes recommendations to Council.

Membership

Committee Members (voting)

3 Elected Members and the Mayor
1 Local representative from each Sports Facilities Fund member association

Committee Members (non-voting)

Department of Sports and Recreation representative

Council Officers

Sports Officer
Manager or Director Technical Services
Executive Assistant to Director Technical Services or Administration officer (minutes)

Term of Office

Membership to the committee is for 2 years.

Representation is determined through endorsed local nominations from each Sports Facilities Fund member association.

Winter Sport representative terms – 1 April through to 31 March
Summer Sport representative terms – 1 October through to 30 September

Membership of the committee ceases upon the completion of 2 years; unless renominated, or sooner if the person is no longer an endorsed nominee by virtue of which the person became a member.

Where a vacancy is for more than 6 months of the 2-year term, a new person meeting the membership requirements will be elected to fill the vacancy.

Termination of membership

Membership may be terminated if a member is absent for 3 consecutive meetings, as determined by the CEO.

Chair

The position of Chair is to be held by a nominated Elected Member as determined at the August Ordinary Council Representative Elections to Committees each year.

Quorum requirements

A quorum is achieved by:

a) Attendance by at least one nominated Elected Member
b) Attendance by the Director Technical Services or CEO
c) Attendance by over 50% of the appointed voting members (including the Elected Member/s)

Meeting Frequency

The committee will meet bi-monthly, 6 times per year

Applicable Legislation, Council Policies and/or Guidelines

Local Government Act
ASTC Sports Facilities Fund Guidelines 2019
ASTC Committees Charter

Responsible Officer

Director Technical Services

Reporting to

Ordinary Council

Adopted by Council - Date	24 February 2020	***Resolution #***	20808
Document Owner	Chief Executive Officer	***Controller***	Governance Unit

ATTACHMENT B

SPORTS FACILITIES ADVISORY COMMITTEE
Representative Nomination form

As a member of the Alice Springs Town Council's (ASTC) Sports Facilities Fund (SFF) your sporting association is entitled to nominate one local representative to the ASTC's Sports Facilities Advisory Committee (SFAC). SFAC Terms of Reference are attached at Appendix 1.

Sports Facilities Fund Association Member	Alice Springs Baseball Association
Sporting Association Contact	Lachlan J. Modrzynski, 32 The Links, Desert Springs 0434 078 471>
Sports Facilities Advisory Committee Representative Nominee	Lachlan J. Modrzynski, 32 The Links, Desert Springs 0434 078 471>
Endorsement	☒ We confirm that our nominee has the appropriate knowledge and experience to effectively contribute to the purpose and functions of SFAC as detailed in the terms of reference provided. Approved by the Alice Springs Baseball Committee on <date>. *Please attach an approved copy of the minutes.*
Signed on behalf of the Association: *To be signed by two current committee members on behalf of the Association*	Name: Lachlan J. Modrzynski Position Held: President Signature: *LJModrzynski* Date: 27/04/2020
	Name: Mez Kattenhorn Position Held: Treasurer Signature: *MKattenhorn* Date: 27/04/2020

Appointment to the SFAC committee is subject to approval of Council. Once appointed the nominee will be contacted and provided with committee induction documentation.

Please submit this nomination to the ASTC Sports Officer at info@astc.nt.gov.au or hand deliver in a sealed envelope, addressed to the 'Sports Officer' to ASTC Civic Centre.

If you have any queries please contact the Sports Officer on 8950 0563.

APPENDIX 1 – SFAC Terms of Reference

ATTACHMENT C

SPORTS FACILITIES ADVISORY COMMITTEE

Representative Nomination form

As a member of the Alice Springs Town Council's (ASTC) Sports Facilities Fund (SFF) your sporting association is entitled to nominate one local representative to the ASTC's Sports Facilities Advisory Committee (SFAC). SFAC Terms of Reference are attached at Appendix 1.

Sports Facilities Fund Association Member	Alice Springs Hockey Association Inc.
Sporting Association Contact	Lyn Hocking (Secretary), alicespringshockey@outlook.com, 0409254554
Sports Facilities Advisory Committee Representative Nominee	ANNE DAVEY-SMITH 25 MADIGAN ST BRAITLING NT 0427555766 absolutanne@hotmail.com
Endorsement	☑ We confirm that our nominee has the appropriate knowledge and experience to effectively contribute to the purpose and functions of SFAC as detailed in the terms of reference provided. Approved by the Alice Springs Hockey Association Inc. Committee on Click here to enter text. 02/05/2020 *Please attach an approved copy of the minutes.*
Signed on behalf of the Association: *To be signed by two current committee members on behalf of the Association*	Name: Lyn Hocking Position Held: Secretary Signature: _____ Date: 2/5/20
	Name: ANNE DAVEY-SMITH Position Held: TREASURER Signature: _____ Date: 2/5/2020

Appointment to the SFAC committee is subject to approval of Council. Once appointed the nominee will be contacted and provided with committee induction documentation.

Please submit this nomination to the ASTC Sports Officer at info@astc.nt.gov.au or hand deliver in a sealed envelope, addressed to the 'Sports Officer' to ASTC Civic Centre.

If you have any queries please contact the Sports Officer on 8950 0563.

Agenda Item 9.4

Report No. 89 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **ALICE SPRINGS TOWN COUNCIL - CONCRETE CREW**

AUTHOR: **SCOTT ALLEN - DIRECTOR TECHNICAL SERVICES**

EXECUTIVE SUMMARY

This report is to provide Council with information regarding the viability of the Concrete Crew

RECOMMENDATIONS

That it be a recommendation to Council:

That Council continue to employ the full contingent of the Concrete Crew (7 employees)

REPORT

1. BACKGROUND

The existing Concrete Crew has seven (7) full time employees dedicated to the maintenance of the footpaths and side entry pits. Below are the positions of the Concrete Crew:

1. Team Leader - Concrete
2. Concrete Finisher
3. Concrete Finisher
4. Concrete Finisher
5. Concrete Labourer
6. Concrete Labourer
7. Concrete Labourer

The Concrete Crew employees are responsible for the following tasks:

- Maintain Council's Footpath Network
  - New Footpath Installs
  - Repairing Damaged Footpaths
  - Replacing Damaged Footpaths
  - Pavers
  - Grinding Trip Hazards
  - Risk Mitigation
- Replacing Side Entry Pits
- Maintaining plant and equipment
- Construction of Cemetery plinths
- Construction of slabs
- Providing advice to Depot Management

The Concrete section is responsible for the maintenance of all footpaths and side entry pits within all ASTC controlled verges, sporting ovals, parks, gardens, surrounds of sporting ovals and facilities within the municipality.

Report No. 89 / 20 ts

2. DISCUSSION

Council Officers were tasked with providing a report on the viability of the Concrete Crew. The 7 staff members also enable the crew to cover the leave entitlements of employees.

Council Officers recommend to continue to employ the Concrete Crew in its entirety.

3. POLICY IMPACTS

Alice Springs Town Council Strategic Plan 2018 to 2021:

Objective 1: A dynamic community

1.2 Safe and reliable public infrastructure

1.2.1 - Maintain and improve local footpaths and cycle networks

4. FINANCIAL IMPACTS

The Concrete Crew has been employed by Council for the past 24 months

Following an internal audit on the Concrete Crew, they are undertaking the work required assigned

The budget position on the Concrete Crew can be better determined during the budget process

5. SOCIAL IMPACTS

Council would be internally responsible for the footpath program

6. ENVIRONMENTAL IMPACTS

The Concrete Crew has a minimal effect on the environment

7. PUBLIC RELATIONS

Continuation of this crew will enhance public relations within the community

Scott Allen
DIRECTOR TECHNICAL SERVICES

Agenda Item 9.5

Report No. 90 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **ALICE SPRINGS TOWN COUNCIL - CDU OVAL AGREEMENT**

AUTHOR: **MANAGER TECHNICAL SERVICES - TAKUDZWA CHARLIE**

EXECUTIVE SUMMARY

This report provides Council with a draft copy of the updated proposed 5-year Oval Agreement between Alice Springs Town Council (ASTC) and Charles Darwin University (CDU)

RECOMMENDATION:

That it be a recommendation to Council:

That Council endorse the CDU Oval Management Agreement for Paul Fitzsimons Oval

REPORT

1. BACKGROUND

Alice Springs Town Council (ASTC) and formerly named Sadadeen Secondary College (Charles Darwin University) have had a longstanding partnership over the oval management and use of the Oval which is now named Paul Fitzsimmons Oval. The current agreement was signed by both parties in May 1990 for a period of 10 years.

The oval management agreement was in effect from 1990 to 2000. Within this time period both organisations experienced staff turnovers.

The original core parameters of the agreement were:

- ASTC to manage the oval
- ASTC to be responsible for all oval maintenance (renovations, fertilizing, mowing, watering)
- ASTC to own all irrigation infrastructures
- CDU to reimburse 50% of fertilizing costs to ASTC
- CDU to pay all utility related expenses from the oval
- CDU was to approve and own any significant infrastructure works around the Oval unless stated otherwise.

In 2004 both parties agreed to have a 2-year interim period agreement while negotiations for a long-term agreement were on-going. CDU and ASTC agreed to a 6-year oval management agreement with an amended clause which removed the 50% reimbursement of fertilizing costs CDU was to pay to ASTC. The other parameters of the agreement remained the same.

2. DISCUSSION

Officers from Technical Services Directorate, in line with good governance procedures, are reviewing key facility agreements within its directorate.

This agreement has been identified for renewal and a meeting has taken place between Council and CDU representatives. CDU and Council both have agreed this successful partnership should continue under a new 5-year agreement.

Report No. 90 / 20 ts

The core parameters of the new proposed agreement are as follow:

ASTC will:

- Manage the oval (Permits and conditions of use, Oval closures in line with ASTC operations)
- Oval maintenance (Oval renovations, Fertilizing, Mowing, Watering) and any other oval rehabilitation works required to have the oval healthy and ready for use
- Infrastructure (management, ownership and use of installed irrigation infrastructure)
- ASTC will have unlimited access to the oval under the management agreement and will have right to refuse access to the oval to other parties as oval managers
- ASTC will maintain public amenities should they be erected near the oval
- ASTC will have right to refuse management of other areas outside of this original management agreement

CDU will:

- Pay for all utility costs (water and electricity)
- As asset owners have the right to approve, or not approve, any infrastructure upgrades and or erection of any temporary infrastructure

Alice Springs Town Council as with all their lease agreements will include a termination clause for both parties should the parameters considerably change for either party.

3. POLICY IMPACTS

Alice Springs Town Council Strategic Plan 2018 to 2021:

Objective 2: A great place to live

2.1: Community life, promoting a healthy, vibrant culture

2.1.1: Provide sport, recreation and leisure opportunities, which maximise social capital

4. FINANCIAL IMPACTS

The financial impacts associated with this agreement are factored in the annual budget considerations. Income derived from oval hires goes into the facility maintenance budget line.

5. SOCIAL IMPACTS

The continued partnership between ASTC and CDU provides the community with another high-quality green space for use.

6. PUBLIC RELATIONS

Alice Springs Town Council continues to achieve good governance by continuing productive working agreements with local stakeholders.

7. ATTACHMENTS

Attachment A: Expired CDU Agreement
Attachment B: Draft CDU Oval Management Agreement

Takudzwa Charlie
MANAGER TECHNICAL SERVICES

CDU.

ATTACHMENT A

9001395

COMMISSIONER OF TAXES PENALTY HAS BEEN PAID.

THIS DEED is made on the 28 of May 1989

27.6.90

BETWEEN:

NORTHERN TERRITORY OF AUSTRALIA a Body Politic established pursuant to Section 5 of the Northern Territory (Self-Government) Act of the Commonwealth of Australia (hereinafter referred to as "the Licensor") of the one part

AND:

ALICE SPRINGS TOWN COUNCIL a Body Corporate established pursuant to the Local Government Act of Council Chambers, Todd Street, Alice Springs in the Northern Territory of Australia (hereinafter referred to as "the Licensee")

WHEREAS:

The Licensor is the proprietor of all that piece of land being Lot 6392 Town of Alice Springs in the Northern Territory of Australia as delineated in Survey Plan S82/020 upon part of which is situate a sports oval presently utilised by the Northern Territory Department of Education for the purposes of the Sadadeen Secondary College

AND WHEREAS:

The Licensor has agreed to make available the use of the said oval to the Licencee for the performance of its functions of Local Government upon the terms covenants and conditions hereinafter appearing.

NOW THIS DEED WITNESSETH AS FOLLOWS:

1. The Licensor hereby grants the Licensee ~~to~~ authority right and licence during the continuance of this Deed and subject to the compliance by the Licencee with the provisions hereof to enter upon the said licensed premises by its agents servants workmen architects and other persons authorised by the Licencee with or without motor and other vehicles plant equipment and apparatus for the purpose of maintenance and use as hereinafter permitted or prescribed of the licensed premises.

2. The Licensee shall maintain the said licensed premises as a sporting oval and for this purpose shall at such times as the Licensor is not actually using the licensed premises maintain the said licensed premises in accordance with the Licensees

standard practices and procedures from time to time for the maintenance of parks gardens and recreational facilities within the municipality of Alice Springs including but without limiting the generality of the following to regularly mow water top dress fertilise seed and keep the licensed premises clean and free of rubbish or other waste products.

3. The Licensee will from time to time and at all times take and exercise proper and sufficient care and precautions in the performance of its maintenance and use of the licensed premises to prevent the occurance of accident injury or damage to any person or persons or to the property of the Licensor or of any person or persons.

4. In consideration of the Licensee's covenants hereinbefore contained the Licensor shall pay to the Licensee fifty (50%) per centum of annual fertilising costs incurred by the Licensee in maintaining the said licensed premises when demanded by the Licensee and shall pay and discharge all water charges raised or assessed by the Power and Water Authority in respect of water consumed in the maintenance of the said licensed premises by the Licensee.

5. Subject to clause 7 hereof, the Licensee shall be entitled to allow the public or any part thereof including the Licensor and any sporting bodies associations clubs or other organisations or any members thereof the right to use the said licensed premises at such time or times as the Licensee shall in its absolute discretion think fit and upon such terms and conditions as may be specified by the Licensee.

6. The Licensee shall advise the Licensor from time to time of the public use of the said licensed premises.

7. Notwithstanding the provisions of clause 5 hereof the Licensor shall be entitled to and retain the exclusive occupation and use of the licensed premises during normal hours of school tuition by the Sadadeen Secondary College and shall ensure that the licensed premises are cleaned and kept free of rubbish or other waste products at all times after use by the Sadadeen Secondary College.

8. In the event that either party shall make default in the observance compliance and performance of all or any part of the convenants terms or conditions herein contained or implied to be observed or performed on that party's part then the other party may terminate this licence but without prejudice to any right of action or remedy that such party has or may have in respect of any antecedent breach of any of the covenants terms or conditions herein contained or implied by the other party

to be served by notice in writing to the other party provided always that the party wishing to exercise its rights or termination pursuant to this clause shall give to the other party written notice specifying the default and stating the party's intentions to enforce its rights and remedies unless such default is made good within the period stipulated in the notice and the other party's in that period fails to remedy such default. For the purposes of this clause the period stipulated in the notice shall not be less than thirty (30) days.

9. Subject to the provisions hereof this licence shall commence on the date of this deed, and expire at such date being a date ten (10) years from the date hereof.

10. The licence shall not confer upon the Licensee any tenancy or other right in the nature of a tenancy or any right to the exclusive occupation of any part of the licensed premises and the rights of the Licensee shall be those of a Licensee only and shall not comprise or include any further or other rights.

11. Any notice communication or other document authorised required or permitted to be given or served pursuant to this Deed (hereinafter referred to as "a communication") shall unless otherwise specifically provided by this Deed be in writing addressed as appropriate to the relevant party at its address set out in this clause or to such other address as shall be notified by that party to the other party hereto from time to time and shall be signed by a duly authorised officer of the party giving or serving the communication.

11.1. A communication shall be delivered by hand or sent by certified mail or sent by telex or facsimile and in the latter cases only in the event that the recipient of the said communication shall have a telex or facsimile facility for receiving such communications.

11.2. A communication which is hand delivered before 4.00 p.m. in the place in which it is delivered shall be deemed to be received on that day and in any other case a hand delivery shall be deemed to be received the following day.

11.3. Communications sent by certified mail shall be deemed to have been received by the party it is addressed to forty-eight (48) hours after it was posted.

11.4. The address of the Licensor for the purposes of this Deed is as follows:-

Sadadeen Secondary College,
Grevillea Drive,
P.O. Box 1219,
ALICE SPRINGS, N.T., 0871.

The address, telex and facsimile number of the Licensee is as follows:-

Alice Springs Town Council,
Council Chambers,
Todd Street,
ALICE SPRINGS, N.T., 0870.

Telex No: AA81352
Facsimile No: (089) 530558

Postal address:-

P.O. Box 1071,
ALICE SPRINGS, N.T., 0871.

12. If it is held by any Court of competent jurisdiction that any part of this Deed is void voidable, illegal or unenforceable or that this Deed would be void voidable illegal or unenforceable unless any part of this Deed was severed from this Deed that part shall be severable from and shall not effect the continued operation of the rest of this Deed.

13. This Deed shall be governed by and construed with reference to the laws of the Northern Territory of Australia notwithstanding the principles if any that would otherwise govern the choice of applicable law in the absence of the parties selection of the laws of the Northern Territory of Australia. Each of the parties hereto submits to the jurisdiction of the Courts of the said Territory in conjunction with its determination of the rights and remedies of either of the parties hereto under this Deed.

14. For the purposes of this Deed - "the licensed premises" shall mean that part of the said Lot 6392 Town of Alice Springs including a sports oval more commonly known as Sadadeen Secondary College Oval and as is more specifically delineated in red on the plan annexed hereto.

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IN WITNESS WHEREOF the parties hereto have hereunto signed sealed and delivered this Deed onthe day and year first hereinbefore written.

SIGNED SEALED AND DELIVERED BY)
Geoffrey James Spring)
Secretary, Department of Education)
~~Crown Solicitor~~ for and on behalf of)
the Northern Territory of Australia)
pursuant to a Delegation by the)
Minister pursuant to Section 7 of)
the Contracts Act in the presence of:)

A Bajcar (witness)

GIVEN under the Common Seal of the)
ALICE SPRINGS TOWN COUNCIL)
by authority of a resolution of the)
Council in the presence of:)

Leslie Oldfield The Mayor

The Town Clerk

100

DATED 8. MAY 1990. ~~1989~~

THE NORTHERN TERRITORY OF AUSTRALIA
"The Licensor"

ALICE SPRINGS TOWN COUNCIL
"The Licensee"

LICENCE AGREEMENT

POVEYS

Barristers and Solicitors
Suite 6,
Lindsay Place,
15 Leichhardt Terrace,
ALICE SPRINGS, N.T. 0870

Tel: 52 4266
Ref: PS:HR:(HPAG0410-3)

9.5

Alice Springs
TOWN COUNCIL

Ref: GE 1042

Enquires: Dale McIver

COPY

9.5

8th July 2004

Mr Lyle Mellors
Campus Manager
Charles Darwin University
PO Box 795
ALICE SPRINGS NT 0871

Dear Lyle

Re: Campus Oval usage

I would firstly like to thank you and your colleagues for taking the time to meet with myself and Dale McIver last week regarding the management and use of the University oval facility.

As you are aware a deed of agreement was signed in 1990 as part of a management agreement between the NT Government and the Alice Springs Town Council (a copy is enclosed for your information). As discussed at our meeting last week, both parties are in favour of this agreement to continue in the interim while a long term plan is worked out. Please find enclosed (*) an agreement extending the current agreement for two (2) years. Could you please read and sign and post back to Council for our records.

We look forward to working with you to develop a longer term strategy for the usage of the facility. As mentioned at our meeting last week, Council is currently looking into options for a soccer playing precinct in the eastside area tying in with Ross Park, the Assembly of God Church and at the Charles Darwin University Oval. At this stage this option is in a preliminary phase.

Users of the University oval have indicated that the oval requires some basic facilities to be installed. Facilities including shade, toilets and seating are required at this facility as a basic necessity. As the oval is not owned by Council, Council funding is not available to build any infrastructure. We are also unable to apply for any grant funding for facility improvements. It may be an option that the University applies for grant funding for these infrastructure works.

Cnr Todd Street and Gregory Terrace • PO Box 1071 Alice Springs NT 0871
Tel: (08) 89 500 500 • Fax: (08) 89 530 558 • Email: astc@astc.nt.gov.au • Web: www.alicesprings.nt.gov.au

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We the undersigned agree that the Deed of Agreement between the Alice Springs Town Council and NT of Australia/Charles Darwin University will be extended for a period of two (2) years to allow discussions to take place with regards to the longer term use and development and management of the Charles Darwin University Oval.

9.5

.....

Signed by .....
On behalf of Charles Darwin University – Alice Springs Campus

Date: .....

.....

Signed by .....
On behalf of Alice Springs Town Council

Date: .....

Charles Darwin
UNIVERSITY
Australia

Charles Darwin University
Darwin, NT 0909 Australia
www.cdu.edu.au
ABN 54 093 513 649
CRICOS 00300K

Ref: GE 1042

Mr Henry Szczypiorski
A/Director Technical Services
Alice Springs Town Council
PO Box 1071
ALICE SPRINGS NT 0871

Dear Henry

RE: Campus Oval usage.

Further to your letter of 8 July, the University agrees to the 6-year extension to the 1990 agreement, subject to the understanding that the University will not be asked to contribute the 50% of the fertiliser costs as identified in paragraph 4 of the original agreement. This is in line with the existing arrangement.

Regarding the request for the installation of infrastructure facilities of shade, toilets and seating, the University is unable to provide these facilities from within its resources. The University is willing to make application for any grant funding that may be available, however, as we have neither the knowledge or background of this type of grant funding, we would require that the Council did the majority of the grant research and preparation to enable the University to make the submission. The University would also expect the Council to actively assist in the arranging and management of any project that is undertaken as a result of receiving grant funding.

Could you please confirm that this arrangement is acceptable to council? Upon confirmation, we will sign the agreement to extend the previous arrangement, and forward it to you for signing.

Yours sincerely

Lyle Mellors
Campus Leader.

30th August 2004.

Office of the Alice Springs Campus Leader
Telephone: 08 8959 5291 Facsimile: 08 8959 5305
Postal address: PO Box 795 Alice Springs NT 0871
Email: lyle.mellors@cdu.edu.au

Ref: GE 1042

Enquires: Dale McIver

3rd September 2004

Mr Lyle Mellors
Campus Manager
Charles Darwin University
PO Box 795
ALICE SPRINGS NT 0871

Dear Lyle

Re: Campus Oval usage

I refer to your letter dated 30th August 2004 regarding the above matter.

The Alice Springs Town Council will be happy to work with you to apply for grant funding for a facility upgrade. Councils Sport and Recreation Officer, Ms Dale McIver will contact you regarding this later in the year, closer to the grant application closing date. Council will also be able to provide assistance for any projects undertaken at the oval facility. For future reference it would be useful to know how the land arrangement now works with the University and the NT Government.

Please find enclosed (*) a signed agreement from Council regarding the extension of the Deed of Agreement. Could you please sign and return a copy to Council for our records.

Should you wish to discuss this matter further please do not hesitate to contact Councils Sport and Recreation Officer Ms Dale McIver on 89 500 563.

Yours sincerely,

Henry Szczypiorski
A/DIRECTOR TECHNICAL SERVICES

* Enclosed

ATTACHMENT B

AGREEMENT made this day of 2020

BETWEEN: **ALICE SPRINGS TOWN COUNCIL**, a municipal Council constituted pursuant to the *Local Government Act* of Council Chambers, Todd Street, Alice Springs in the Northern Territory of Australia ('**Council**') of the one part

AND: **CHARLES DARWIN UNIVERSITY** (ACN 059 501 165) a body corporate established by the *Charles Darwin University Act* 2003 of care of Ellengowan Drive, Casuarina in the said Territory ('**CDU'**) of the other part

RECITALS:

A. CDU is the registered proprietor of the whole of the land being Lot 10042 Town of Alice Springs situated at Alice Springs campus of Charles Darwin University and known as Paul Fitzsimmons Oval ('**the grounds**');

B. Council has agreed with CDU to maintain and manage the grounds and for this purpose CDU has agreed to grant a licence to Council; and

C. The parties hereto wish to record the terms and conditions of their agreement on the terms and conditions hereinafter contained.

OPERATIVE PART:

1. Grant of licence

In consideration of the terms of this Agreement CDU grants to Council a licence to manage and maintain the grounds on the terms and conditions contained in this Agreement.

2. Term of licence

The term of the licence shall be for five (5) years commencing on 1 July 2020

and expiring on 30 June 2025.

3. Council's responsibilities

Council shall for the term of the licence be responsible for:

(a) maintenance of the grounds including mowing, fertilising and treatments

(b) watering including maintenance of irrigation infrastructure

(c) managing the grounds including permit issue, events and access.

4. Power and water costs

CDU shall for the term of the licence be responsible for all power and water costs in relation to the grounds.

5. Infrastructure upgrades

Should Council propose any infrastructure upgrade or the erection of any temporary upgrade on the grounds, it shall first obtain the approval of CDU.

6. Management committee

A management committee, consisting of a representative of Council and CDU, shall met at least twice in any year of the term of the licence to review the operation of this Agreement.

7. Early termination

Notwithstanding clause 2, either Council or CDU may at any time terminate this Agreement by notice in writing to the other.

EXECUTED as an agreement.

EXECUTED for and on behalf of the)
ALICE SPRINGS TOWN COUNCIL)
by its Mayor and Chief Executive Officer)
)

……..
Damien Ryan

……..
Robert Jennings

SIGNED for and on behalf of **CHARLES**)
DARWIN UNIVERSITY by an officer)
duly authorised to sign on its behalf in)
the presence of:

……..

……
Witness

Agenda Item 9.6

Report No. 91 / 20 ts

TO: **TECHNICAL SERVICES COMMITTEE - MONDAY 11 MAY 2020**

SUBJECT: **HANDOVER OF INFRASTRUCTURE ASSETS PACKAGE DEAL 2**

AUTHOR: **DIRECTOR TECHNICAL SERVICES - SCOTT ALLEN**

EXECUTIVE SUMMARY

This report is to provide Council with an update on the negotiations with NTG Officers regarding the handover of Kilgariff Estate, Ilpeye Ilpeye Town Camp and the Boardwalk

RECOMMENDATIONS

That it be a recommendation to Council

That Council endorse the changes to the Handover of Infrastructure Assets Package Deal

REPORT

1. BACKGROUND

Since the construction of Kilgariff Estate in 2012, Council has had ongoing requests from the NT Government to assume ownership of the infrastructure. Council has been negotiating with NTG Officers in regards to a package deal to assume ownership of the following infrastructure:

- Kilgariff Estate
- Ilpeye Ilpeye Town Camp
- The Boardwalk

2. DISCUSSION

Council and NTG have been meeting regularly to finalise a deal for the handover of infrastructure assets to Council. Council is proposing three infrastructure items be handed over that includes a remuneration component to offset the infrastructure standards shortfall as identified by Council.

Below is a summary of correspondence between Council and NTG:

Council wrote to NTG on 19 March 2020 (Attachment A).

Council received a response from NTG on 27 April 2020 (Attachment B).

NTG clarified the response via email on 1 May 2020 (Attachment C).

If the Handover of Infrastructure Assets Package Deal Letter is approved by Council, the letter will be forwarded to the NTG for endorsement by the Minister.

Report No. 91 / 20 ts

KILGARIFF ESTATE:

ISSUE	DESCRIPTION	REMEDY	NTG RESPONSE	COUNCIL OFFICERS RECOMMENDATION
Asphalt	An assessment identified that the asphalt surface is unlikely to meet the 25 year pavement design life standard and will require a financial investment from Council earlier than would otherwise have been necessary to re-construct the asphalt seal.	A monetary contribution in lieu of the defects identified resulting from this compromised infrastructure of $429,592.80 (excluding GST).	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed
Main Open Unlined Drain which traverses the Stuart Highway and Colonel Rose Road	The drain is non-compliant and has a gradient of 0%	Council recommends to not accept ownership of the open unlined drainage network	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed
Storm Water Infrastructure	Due to the flat nature of the site, there are no pit and pipes infrastructure within the sub-division	Council recommends to monitor the efficiency of the road and internal stormwater network for a period of 18 months	However, there is one element of the proposal relating to the Kilgariff Stage 1 subdivision that requires further resolution, this being your proposal that the Kilgariff Stage 1 storm water infrastructure remains under the care and control of the NTG until such time that monitoring of the infrastructure can take place during 1 in 5 year storm event and any rectification works are undertaken, if required.	Council has continually raised its concerns with the internal drainage network of the estate. Council's consulting engineers Greenhills, have undertaken an assessment and determine that the repairs required to complete the works are in the vicinity of $650,000.00. Council Officers recommend to extend the moratorium and for the internal drainage network to remain under the care and control of the NTG until the estate can be assessed following a 1 in 5 year rain event.

Report No. 91 / 20 ts

Norris Bell Avenue	Concerns with the pooling of water on the corner of Stuart Highway and Norris Bell Avenue	Whilst Council is not currently seeking the immediate remedial action on this issue, Council would accept, under a signed deed that NT Government will rectify the issue should the Industrial land project not progress or 3 years have elapsed since handover of Kilgariff Estate.	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed
Colonel Rose Road Causeway Crossover	Concerns with the flooding of Colonel Rose Road.	Whilst Council is not currently seeking immediate remedial action on this issue, Council would accept, under a signed deed that NT Government will rectify the issue upon the commencement of the access road into Kilgariff Estate from Colonel Rose Drive.	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed

ILPEYE ILPEYE:

ISSUE	DESCRIPTION	REMEDY	NTG RESPONSE	COUNCIL OFFICERS RECOMMENDATION
Asphalt	An assessment identified that the asphalt surface is unlikely to meet the 25 year pavement design life standard and will require a financial investment from Council earlier than would otherwise have been necessary to re-construct the asphalt seal.	A monetary contribution in lieu of the defects identified resulting from this compromised infrastructure of $283,920.00 (excluding GST).	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed
Stone Pitched Drain and Open Unlined Drains	The stone pitched drain is non-compliant and a major hazard	Council recommends to not accept ownership of the stone pitched drain and open unlined drainage network	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed

Storm Water Underground Infrastructure	A number of deficiencies have been identified within the underground storm water infrastructure and not all of the pipework has been surveyed	A monetary contribution in lieu of the defects identified resulting from this compromised infrastructure of $150,000.00 (excluding GST).	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed
Playground Infrastructure	Concerns with the compliance with the Australian Standards for Playgrounds	Council will accept ownership of the playground with a contribution of $50,000.00 excluding GST to allow the defects identified above, to be fixed or to install compliant equipment where required.	NTG accepts the recommendation of Council	Through the acceptance of NTG to this point, Council considers this matter finalised and recommends to proceed

THE BOARDWALK:

Council requests a structural review of the boardwalk following a significant flow event. Council is willing to accept ownership and ongoing responsibility for the maintenance of the boardwalk.

3. POLICY IMPACTS

Alice Springs Town Council Strategic Plan: 2018 to 2021

OBJECTIVE 1: A DYNAMIC COMMUNITY

1.3: Safe and reliable public infrastructure

1.3.1: Maintain and improve local road network

1.3.2: Maintain and improve local footpaths and cycle networks

4. FINANCIAL IMPACTS

Below is the combined cost for Council to accept ownership of the projects.

PROJECT	COSTINGS
1. Kilgariff Estate	$429,592.80 excluding GST
2. Ilpeye Ilpeye Town Camp	$571,025.60 excluding GST
3. Todd River Boardwalk	NIL
TOTAL	**$1,000,618.40**

Report No. 91 / 20 ts

5. SOCIAL IMPACTS

Council has an obligation to take over ownership of Ilpeye Ilpeye Town Camp and Kilgariff Estate but it also has the same obligation to take over ownership of infrastructure that is acceptable to Council standards

6. ENVIRONMENTAL IMPACTS

The environmental impacts from the storm water drainage network need to be clarified

7. PUBLIC RELATIONS

Council has an obligation to take over ownership of Ilpeye Ilpeye Town Camp and Kilgariff Estate but it also has the same obligation to take over ownership of infrastructure that is acceptable to Council standards

8. ATTACHMENTS

Attachment A: Handover of Infrastructure Assets Package Deal Letter
Attachment B: Response from NTG dated 27 April 2020
Attachment C: Clarification email from NTG date 1 May 2020

Scott Allen
DIRECTOR TECHNICAL SERVICES

ATTACHMENT A

9.6

Alice Springs TOWN COUNCIL

Chief Executive's Office

19 March 2020

Ms. Sarah Fairhead
Senior Director - Southern Region
Department of Infrastructure, Planning and Logistics
Northern Territory Government
GPO Box 2130
Alice Springs NT 0871

Dear Sarah,

HANDOVER OF INFRASTRUCTURE ASSETS PACKAGE DEAL

Further to our ongoing meetings dealing with various projects located in Alice Springs that are relevant to both the Department of Infrastructure, Planning & Logistics (DIPL) and Alice Springs Town Council (Council), I refer to the ongoing and latest discussions between both parties on Thursday 27 February 2020, around the requirement for a clear process on the handover of Kilgariff Estate, Ilpeye Ilpeye Town Camp and the Boardwalk to Council.

This letter identifies the proposed items for handover, the defects identified, and a breakdown of the proposed costs to rectify each defect. These defects are proposed to be addressed through a monetary contribution or handover of new assets from NT Government to Council as identified in this letter, subject to further negotiation.

Below are the proposed assets for handover to Council from DIPL:

1. Kilgariff Estate
2. Ilpeye Ilpeye Town Camp
3. Todd River Boardwalk
4. Community purpose land at Kilgariff Estate
5. Sporting / recreation land at Kilgariff Estate
6. Depot use land in the new Arumbera Industrial Estate
7. A multi-use parcel of land for future land development

We understand that in normal circumstances a portion of community purpose and recreational land would be granted to Council as part of any major development.

The above items will have specific matters that will need to be addressed to Council's satisfaction, as part of a holistic handover and acceptance by Council of the listed items.

1. **Kilgariff Estate:**
    a. Asphalt
    b. Open Unlined Drain
    c. Storm Water Infrastructure
    d. Norris Bell Avenue
    e. Colonel Rose Road Causeway Crossover

a. Asphalt - An assessment into the service life expectancy of the asphalt was undertaken by Greenhill Engineers and has been an agenda item with Council previously raising a number of

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concerns pertaining to the quality of construction for the Kilgariff Estate, with particular concern in relation to the asphalt surface.

DIPL have also previously stated that the works undertaken by the contractor did not comply with NT Government standards.

In accordance with the Alice Springs Town Council Subdivision Guidelines (2012) at the time of construction of the Kilgariff Estate asphalt, a design service life of 25 years was required. This requirement was advised to be met by the design engineers (CARDNO) as shown in the pavement design calculations provided at the time of the engineering approval.

The report by Pavement Asset Services notes that the asphalt surface is unlikely to meet the 25-year pavement design life standard and will require a financial investment from Council earlier than would otherwise have been necessary to re-construct the asphalt seal.

A high air voids ratio in asphalt will accelerate the deterioration of the surface resulting in a reduced asset life and increased maintenance costs. The results of the investigation by Pavement Asset Services suggest that the asphalt installed at the Kilgariff Estate will have a service life of 15 years.

b. It has been established that the Kilgariff Estate consists of approximately 1967 lineal metres of sealed carriageway, with approximately 17,570 sq. m of asphalt. The monetary contribution in lieu of the defects identified resulting from this compromised infrastructure of $429,592.80 (excluding GST).

c. Open Unlined Drain – further to the continuous concerns expressed by Council with regard to the non-compliant open drains, it must be noted that Council will not accept ownership of the open unlined drainage network.

d. Storm Water Infrastructure – Council has stated previously that it understands the complexities surrounding the site and its non-compliance with Council guidelines. Due to the inability of both parties to reach a resolution on this matter, Council is proposing that the internal storm water network remains under the care and control of the NTG.

   Council recommends that a monitoring clause be written into the agreement with a view to determining a long-term outcome for both parties. This will enable the handover of the sub-division to be completed whilst ensuring this matter remains on the table for finalisation. The monitoring is to be undertaken until a 1:5 years storm event has occurred at which time a review of the impact will be completed to Council's approval, with ongoing discussions related to the rectification of the drainage throughout that period.

e. Norris Bell Avenue – Council has stated previously that it has concerns with the pooling of water on the corner of Stuart Highway and Norris Bell Avenue. Council agrees that with the potential industrial land proposal for Arumbera, the works would form part of the intersection upgrade.

   Whilst Council is not currently seeking the immediate remedial action on this issue, Council would accept, under a signed deed that NT Government will rectify the issue should the Industrial land project not progress or 3 years have elapsed since handover of Kilgariff Estate. The remedial works would need to be to the approval of Council.

f. Colonel Rose Road Causeway Crossover – Council has stated previously that it has concerns with the flooding of Colonel Rose Road. Council agrees that with future development within the Kilgariff Estate, Council reserves the right to accept the road way in its current form.

Whilst Council is not currently seeking immediate remedial action on this issue, Council would accept, under a signed deed that NT Government will rectify the issue upon the commencement of the access road into Kilgariff Estate from Colonel Rose Drive. The remedial works would need to be to the approval of Council.

2. Ilpeye Ilpeye Town Camp:

I refer to the recent discussion between DIPL and Council on 5 November 2019, around the government's requirement for a clear explanation on the defects identified, and a breakdown of the proposed costs to rectify each defect. These defects are proposed to be addressed through a monetary contribution/handover of new assets to Council subject to negotiation.

The previous letters from Council sent to your office dated 30 May 2019 and 7 May 2019, identify the following assets for handover to Council through DIPL:

a. Asphalt/Pavement
b. Stone Pitched Drain (Open drains)
c. Storm Water underground Infrastructure
d. Playground Infrastructure

Please find below a justification of costs under each listed item.

a. Asphalt / Pavement - an assessment into the service life expectancy of the asphalt was undertaken by Greenhill Engineers in January 2019.

Council have previously raised a number of concerns with the quality of construction of the infrastructure for the Kilgariff Estate, with particular concern in relation to the asphalt surface. Concerns have been raised due to inadequate testing results being provided by the contractor. Visual inspections of the asphalt since the construction indicated that the surface was showing signs of premature wear and damage.

Methodology of Investigation: Twenty cores of the asphalt surface were taken to a NATA accredited asphalt testing laboratory for analysis, where results for the following asphalt properties were undertaken:

- Asphalt particle grading
- Binder Content
- Air Voids percentage
- Asphalt layer thickness

A visual inspection of the surface was also carried out in November 2018 with notes made on the surface texture, extent of cracking and condition of the seal. The results of the visual inspection and asphalt properties were assessed, to determine the expected life of the asphalt as installed.

It was established that, the Kilgariff Estate consists of approximately 1,300 lineal metres of sealed carriageway, with approximately 10,920 sq. m of asphalt. The asphalt had been in place for approximately 2 years at the time of the inspection. The asphalt as installed at Kilgariff Estate appears to have a higher air voids ratio than would typically be expected, in order to achieve a design life of 25 years. The air voids ratio for the samples was higher than that reported by BTO/ DIPL at the time of construction.

In accordance with the Alice Springs Town Council Subdivision Guidelines at the time of construction of the Kilgariff Estate asphalt, a design service life of 25 years was required. This requirement was advised to be met by the design engineers (CARDNO) as shown in the pavement design calculations provided at the time of the engineering approval.

The report by Pavement Asset Services notes that the asphalt surface is unlikely to meet the 25-year pavement design life standard and will require a financial investment from ASTC earlier than would otherwise have been necessary to re-construct the asphalt seal.

A high air voids ratio in asphalt will accelerate the deterioration of the surface resulting in a reduced asset life and increased maintenance costs. The results of the investigation by Pavement Asset Services suggest that the asphalt installed at the Kilgariff Estate will have a service life of 15 years.

The monetary contribution in lieu of the defects identified resulting from this compromised infrastructure is $283,920.00 (excluding GST).

b. Stone Pitched Drain and Open Unlined Drains - further to the continuous concerns expressed by Council with regard to the non-compliant open drains, it must be noted that Council is unable to accept ownership of the open unlined drainage network and stone pitched drain in its current state. As identified in the meeting held on 5 November 2019 this matter can be discussed separately along with the other open drains.

c. Storm Water Underground Infrastructure - the latest review of the Stormwater CCTV by Greenhill Engineers provided to NTG on 11 April 2018 had identified a number of deficiencies. The defects include cracks, holes in the top of pipes, inappropriate pipe connections, exposed rubber ring joints, missing lifting lugs, pipe sections that had not been pushed home adequately etc.

   There were missing sections of the CCTV as the entire pipe length had not been surveyed. It is expected that internal pipe re-lining might resolve most of the known defects. Based on the known defects it is estimated that the repairs could amount to $150,000.00 (excluding GST). Please note that this amount does not take into consideration any of the missing sections.

d. Playground Infrastructure - previously Council had required certification of the playground infrastructure to Australian Standards. During recent inspections, the state of equipment within the playground has been found to be in an unacceptable condition.

   Council will accept ownership of the playground with a contribution of $50,000.00 to allow the defects identified above, to be fixed or to install compliant equipment where required.

   In addition to the above water ponding has been observed at a number of locations in this subdivision. Such defects will also necessitate substantial reconstruction costs when damage occurs earlier than predicted in future. Please note that the above costs have not been included in the assessment of the asset life reduction.

   It must be noted that, a thorough assessment has not been undertaken to determine the extent of overall defects. This is due to the lack of information provided to Council in relation to the subdivision. As-Constructed information has not been provided for infrastructure such as footpaths, pram ramps, road and kerb surface levels, etc. Engaging in the exercise of cost substantiation also has the potential for added expense to Council and can cause further loss of time in investigations on both sides.

The overall monetary contribution resulting from the known defects listed above has been estimated at $571,025.60 (excluding GST). This includes an administration fee of 18% to cover costs of investigation through consultants.

Further to this contribution and conditions outlined in relation to the identified assets, Council is willing to accept ownership of these assets from the date of handover.

3. Todd River Boardwalk:

Council is willing to accept ownership and ongoing responsibility for the maintenance of the boardwalk. Please supply all as constructed drawing and certification documentation as part of the package deal. Council requests a structural review of the boardwalk following a significant flow event.

FINANCIAL BREAKDOWN:

Below is the combined cost for Council to accept ownership of the projects.

PROJECT	COSTINGS
1. Kilgariff Estate	$429,592.80 excluding GST
2. Ilpeye Ilpeye Town Camp	$571,025.60 excluding GST
3. Todd River Boardwalk	NIL
TOTAL	**$1,000,618.40**

4. Community Purpose Land at Kilgariff Estate:

The usage community purpose land for this space is still to be determined by Council. Potential sites could include a satellite library or town hall. The land is part of a previous agreement to provide community purpose land, free of charge to Council. The land size required would be approximately 11,000m².

5. Sporting / Recreation Land at Kilgariff Estate:

Council is requesting land for sporting facilities to be constructed at Kilgariff Estate. The exact location would need to be determined as there is some further discussion required on the appropriate locations. The land could be dual purpose with the proposed school. Council is requesting the following:

- 2 x playing fields (2 x ovals @ 2Ha each – fields lit to 750LUX)
- Sporting Facility including:
  - change rooms
  - medical room
  - officials room
  - club house
  - public toilets
  - shade structures
  - car park

6. Depot Land in the new Arumbera Industrial Estate:

Council is requesting land to accommodate a Council satellite depot. The depot will be used for truck access and regress, stockpiling and storage of materials, storage of machinery, mechanical workshop and tree nursery. The land size required would be approximately 15,000m².

7. Multi-Use Block of Land for Future Land Development:

Council is considering this space for a family housing / affordable / lifestyle village. The creation of Council owned land to be rented out for community benefit. The affordable housing would be at

the lesser end of the size range and the lifestyle village needs a minimum of 120 homes to allow efficiencies. The land size required would be approximately 75,000 - 120,000m².

Further to this contribution, whether it be monetary (from DIPL or Council depending on the final package) or in the land packages numbered 1 to 7 identified earlier in the letter, and the accompanying conditions outlined in relation to the identified assets, Council is willing to consider acceptance of these assets from the date of handover.

It must be noted that this proposal and any eventual agreement identified will require Council endorsement and that statutory approval is conditional on this letter of offer being accepted.

Council is committed to working with the NT Government and appreciates your ongoing effort in working through these outstanding matters.

Yours sincerely,

Robert Jennings
CHIEF EXECUTIVE OFFICER

NORTHERN TERRITORY GOVERNMENT

DEPARTMENT OF
INFRASTRUCTURE, PLANNING
AND LOGISTICS

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50 Bath Street
ALICE SPRINGS NT 0870

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E sarah.fairhead@nt.gov.au

Mr Robert Jennings
Chief Executive Officer
Alice Springs Town Council
PO Box 1071
ALICE SPRINGS NT 0871

Dear Robert,

Re: Handover of infrastructure assets proposal

I refer to your letter dated 19 March 2020 outlining a proposal for the handover of infrastructure in Alice Springs from the Northern Territory Government (NTG) to the Alice Springs Town Council (ASTC). This infrastructure includes the Kilgariff Stage 1 subdivision, the Ilpeye Ilpeye subdivision, the Todd River boardwalk and a number of parcels of land for future ASTC developments.

I acknowledge that the proposal outlined in your letter represents to outcome of over a year of negotiations between our agencies and I sincerely thank you and your team for the positive spirit of these negotiations.

In line with our discussions on these matters, this Department's response to the overall proposal is positive. However, there is one element of the proposal relating to the Kilgariff Stage 1 subdivision that requires further resolution, this being your proposal that the Kilgariff Stage 1 storm water infrastructure remains under the care and control of the NTG until such time that monitoring of the infrastructure can take place during 1 in 5 year storm event and any rectification works are undertaken, if required.

As the maintenance and operation of the storm water infrastructure is inextricably linked to the road infrastructure it is not practical for the management of these infrastructure elements to be undertaken by different agencies. I am therefore seeking your support for an alternative proposal, outlined below.

Further, I suggest that, if it is not possible to resolve this issue in the short term, we should proceed to progress the handover of the Ilpeye Ilpeye subdivision separately to the Kilgariff Stage 1 subdivision. This would progress the clearance of the Ilpeye Ilpeye subdivision under Part 5 of the *Planning Act*, and prevent any further delay to the development opportunities for the Ilpeye Ilpeye Housing Association.

In relation to the Kilgariff Stage 1 stormwater infrastructure, I note that the ASTC is concerned that the storm water infrastructure has not been 'tested', due to limited rainfall events occurring following the completion of the subdivision. While I would point out that it is not usual practice for subdivisions to be 'tested' prior to handover to relevant municipal authorities, I do note that the ASTC has consistently expressed concerns that there may be performance issues with the stormwater infrastructure during low level rainfall events, thereby causing nuisance flooding, hence the desire to monitor the infrastructure in a 1 in 5 year (low level) rainfall event.

Following the resolution of the ASTC Ordinary Council meeting on 29 January 2019 that "it will not accept transfer until such time as the projects comply with National Standards applicable to these developments", our joint negotiations have focused on identifying the standard/s against which the ASTC believes the infrastructure is defective. This approach has led to our general agreement on the proposal to resolve these issues and has provided the necessary justification (with reference to the relevant standards at the time of construction) for the proposed monetary contributions identified against all other elements of the package.

For the Kilgariff Stage 1 stormwater infrastructure, the ASTC had not provided clear advice on what the defects identified against the appropriate standards are, in order to enable the inclusion of the value of these potential defects in the proposal.

In order to resolve on this element of our negotiations, this Department engaged our consultant engineers, Jacobs, to model the stormwater drainage in Kilgariff Stage 1 against the design guidelines and agreed standards adopted at the time of the subdivision design (refer Appendix A of Attachment A). The analysis indicated the drainage as constructed adequately complies with these standards.

Subsequently, on 25 March 2020, this Department received an analysis of the Jacobs report from your consultant engineers, Greenhill (refer Appendix B of Attachment A). I note that Greenhill's analysis was based on a 2016 update to the relevant standards' rainfall design parameters which recommends the use of higher intensity rainfall events for Alice Springs than those recommended for use when the design was undertaken in 2012.

While this Department maintains its position that the drainage in Kilgariff Stage 1 adequately complies with the appropriate standards in place at the time of the subdivision's design and construction, in order to achieve a compromise that we hope will enable handover of the subdivision, we have engaged Jacobs to develop a scope that addresses the concerns Greenhill have identified against the 2016 standards, and to develop a cost estimate for the rectification of these concerns. A preliminary assessment of scope has been prepared to address the concerns identified by Greenhill and the cost to address these concerns has been assessed as $232,760 (refer pps 1-5 of Attachment A).

This Department proposes that an additional sum in the amount of $232,760 is incorporated into the proposal to make provision for ASTC to upgrade the drainage to the current (2016) standards and that this amount is offset through an increase in the value of the proposed land transfer. This offer is made on the proviso that the ASTC accept all drains within Kilgariff Stage 1 (excluding only the large open unlined drain along the Stuart Highway and Colonel Rose Drive).

I hope that this amendment to the proposal outlined in your letter is considered suitable for progressing in the drafting of the formal deed of agreement, and I look forward to your response.

Yours sincerely,

Sarah Fairhead
Senior Director Southern Region
27 April 2020

ATTACHMENT B

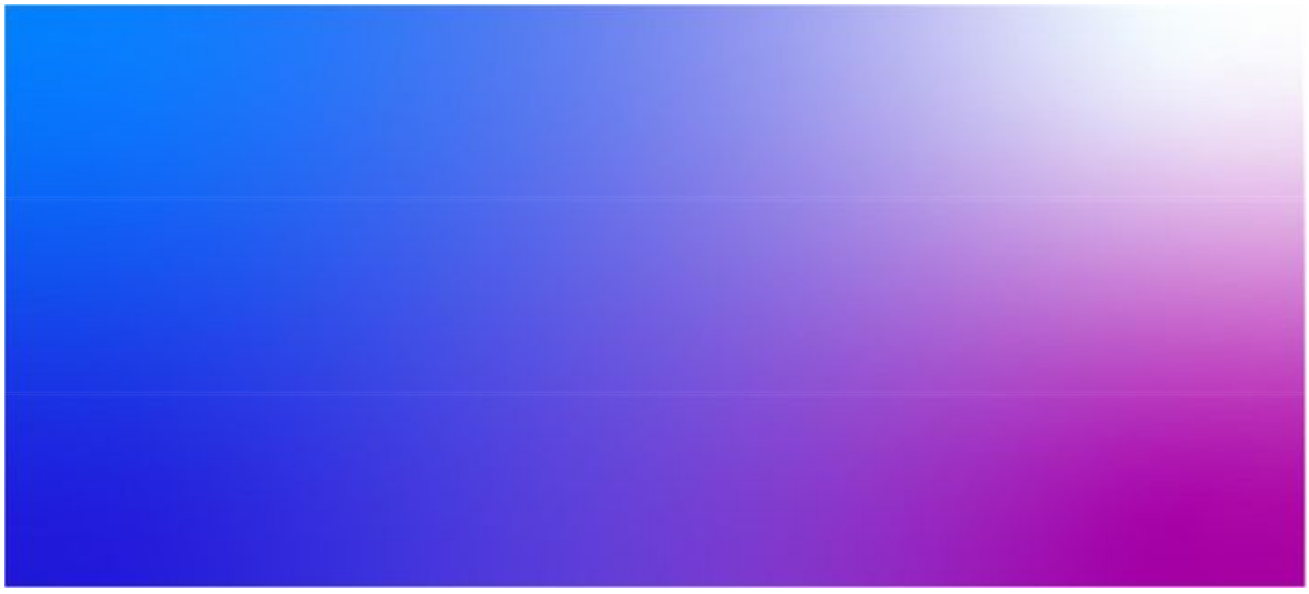
9.6

Kilgariff Stage 1

Drainage Assessment

IW203700-001-ECC-RPT-001 | 0

15 April 2020



Kilgariff Stage 1

Project No:	IW203700
Document Title:	Drainage Assessment
Document No:	IW203700-001-ECC-RPT-001
Revision:	0
Document Status	
Date:	15 April 2020
Project Manager:	Ashaar Nawaz
Author:	Ryan Krake
File Name:	IW203700-001-ECC-RPT-001.docx

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Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	15/4/20		RK	CC	RK	RK

Contents

1.1 Summary

Jacobs was engaged by NTG to model the stormwater drainage of Kilgariff Stage 1 Subdivision against the Alice Springs Town Council Subdivision design guidelines and agreed standards adopted at the time of the subdivision design (report dated 22 November 2019).

This assessment considered a number of drainage scenarios and drainage criteria including the following;

Scenario No.	Minor Storm	Major Storm	Design Criteria	Driver for Design Criteria
1	5 Year ARI 2012 IFD Data	100 Year ARI 2012 IFD Data	Minor Storm - Flow shall not overtop crown of road Max depth in road crossing inverts <100 mm* Major Storm – Flow may spread to road reserve boundary. Max Depth does not exceed 300 mm. DxV<0.4m^2/s	Draft ASTC Subdivision Guidelines 2012. Original basis of Design
2	50% AEP 2016 IFD Data	1% AEP 2016 IFD Data	Minor Storm - 2.5 m max flow width in carriageway Major Storm – Flow may spread to road reserve boundary. Max Depth does not exceed 300 mm. DxV<0.4m^2/s	NT SDG Design Criteria and current day IFD data
3	20% AEP 2016 IFD Data	1% AEP 2016 IFD Data	Minor Storm - 2.5 m max flow width in carriageway	ASTC Request with current IFD data
4	20% AEP 2016 IFD Data	1% AEP 2016 IFD Data	Minor Storm - Flow shall not overtop crown of road Max depth in road crossing inverts <100 mm* Major Storm – Flow may spread to road reserve boundary. Max Depth does not exceed 300 mm. DxV<0.4m^2/s	Assessed by Greenhill for current conformance for Stage 1 with current day IFD data

*Criteria was negotiated at the time of design

The analysis indicated the drainage as constructed adequately complied with scenario 1 (refer Appendix A & D).

In response to the Jacobs report, the Territory received an analysis from Greenhill, through ASTC, on 25 March 2020 (Appendix B), which was based on scenario 4 and recommends the use of higher intensity rainfall events for Alice Springs than those recommended for use when the design was undertaken in 2012. This assessment identified eight specific drainage issues.

Five of these issues related to Hanrahan Street / Miethke Street intersection and were in part due to an error in the model that adopted a culvert size less than that constructed. The existing network was remodelled with the results provided in Appendix C.

Despite the update to the model, some of the highlighted issues remained and therefore, a scope of works has been proposed to address the non-conformances. The scope of works includes the construction of some underground drainage works at an estimated cost of $234,080 (refer Section 1.3).

1.2 Proposed Scope

The following table summarises the drainage issues identified, how DIPL has proposed to address these issues and the modelling results following implementation of the actions.

Table 1- Response to Drainage Issues Identified

Item	Location	Model Node Reference	Greenhill/ASTC Assessment for ARR, 2016 20% AEP	DIPL Proposal	Revised Assessment for ARR 2016, 20% AEP
1	Western Kerb, Hanrahan Street, Nth of Miethke Intersection	OF152	Flow Depth - 0.143 m Flow Width - 4.6 m	Install 2 bay SEP on Hanrahan Street at Miethke St and at Burrows Street. Install DN375 RCP along Hanrahan St. Install DN450 RCP, Single Bay SEP in Miethke Street and Discharge to OUD. Refer Figure 1	Flow Depth - 0.109 m Flow Width – 3.38 m
2	Spoon Drain across Miethke Street (nth)	OF169	Flow Depth – 0.119 m (100mm limit through intersection) Flow Width – Exceeds 4 m	Underground drainage Proposed as per Item 1. Refer Figure 1	Flow Depth - 0.034 m Flow Width – 4.0 m
3	North side Kerb of Cramer Street	0F108	Flow Depth 0.122 Flow Width – 3.9 m	NA – Exceedance in depth is 2 mm and flow does not overtop crown of road.	Flow Depth 0.122 Flow Width – 3.9 m
4	Flow through invert at end of Fadelli Street	OF182	Flow Width – Exceeds 4 m	SEP and DN375 RCP proposed to discharge to OUD. Refer Figure 2.	Flow Width – 0.85 m
5	Flow through intersection of Hanrahan Street at Cawood Street	OF192	Flow Width – Exceeds 4 m	2 x SEP in Cawood Street upstream of Hanrahan Street and DN37 RCP discharge to OUD. Refer figure 3.	Flow Width – Exceeds 2.99 m

Item	Location	Model Node Reference	Greenhill/ASTC Assessment for ARR, 2016 20% AEP	DIPL Proposal	Revised Assessment for ARR 2016, 20% AEP
6	Spoon Drain across Miethke Street (Sth)	0173	Flow Width – Exceeds 4 m	Install SEP and DN375 RCP across Miethke Street (Sth). Refer Figure 1.	Flow Width – Exceeds 1.45 m
7	Hanrahan Street at OUD Culvert.	0F337	OUD overtopping Hanrahan Street	System remodelled with correct as constructed culvert size RBCB 900mm x 450 mm.	No Overtopping of OUD
8	Inlet pit at Sag Point on East Side of Hanrahan Street at OUD.	1/2-1	Ponding of 150 mm depth due to steep HGL.	System remodelled with correct as constructed culvert size RBCB 900mm x 450 mm.	No Ponding (Approx 400 mm reduction in HGL.)

Figure 1 - Hanrahan / Miethke Intersection

Proposal to address item No's 1, 2, 6, 7 & 8.

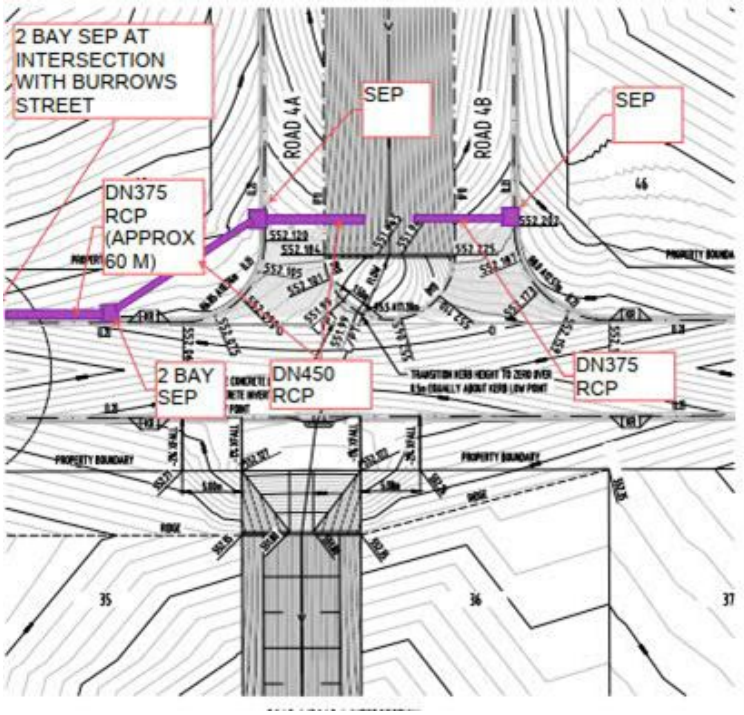


Figure 2 - Western End of Cramer Street

Proposal to address Item 4.

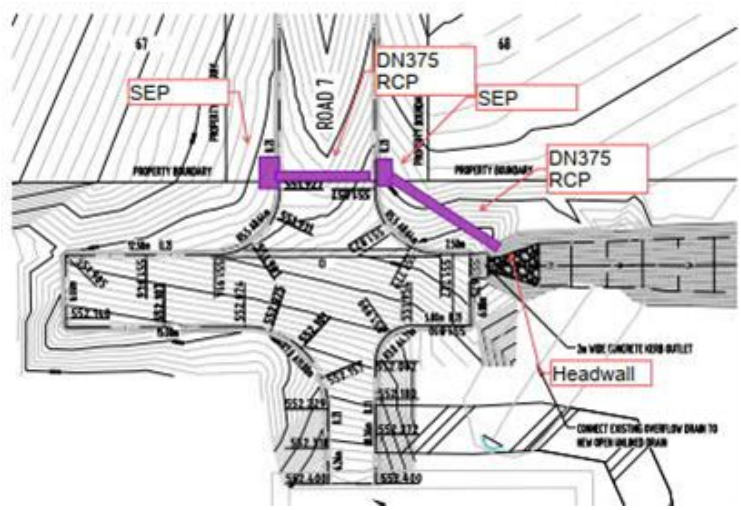
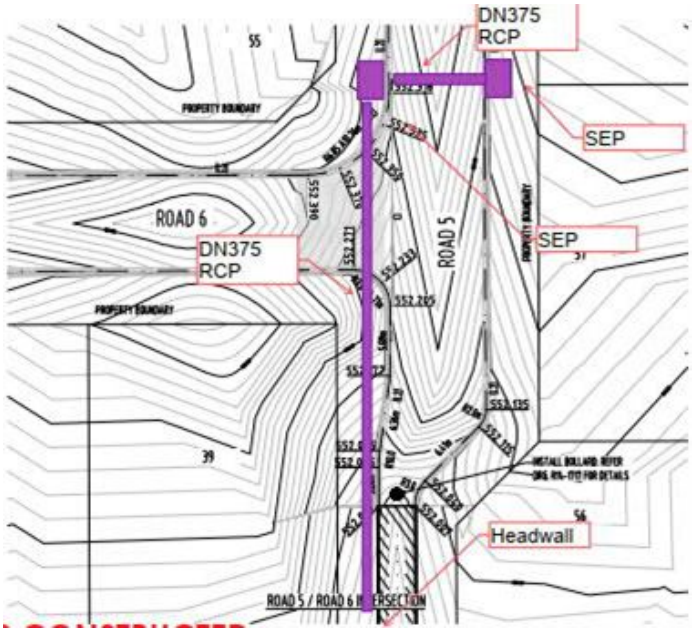


Figure 3 - Hanrahan / Cawood Intersection

Proposal to address Item 5.



1.3 Cost Estimate

The following cost estimate has been produced for the proposed scope of works.

NORTHERN TERRITORY **DEPARTMENT OF INFRASTRUCTURE, PLANNING AND LOGISTICS**	**Prepared By** **Reviewed by** **Project No.**	TG RK IW203700

REGION: Alice Springs

DESCRIPTION: Kilgariff Stormwater Rectification to Conform to ARR2016 20% AEP

COST ESTIMATE

Retro-fit Stormwater	**Unit**	**Rate**	**Quantity**	**Amount**
Preliminaries	Item	$ 21,280	1	$ 21,280
Establishment, Insurnces, Contract Adminstration, Survey Setout				$ -
(10% of Construction Cost)				$ -
Service Location and Depthing	Item	$ 15,000	1	$ 15,000
Traffic Management	Item	$ 15,000	1	$ 15,000
Relocation of Existing Services	Item	$ 30,000	1	$ 30,000
				$ -
Construction				$ -
Demolish and remove kerb at SEP locaitons	Item	$ 1,200	8	$ 9,600
Sawcut and remove asphalt/spoon drain	Lin.m	$ 35	10	$ 350
Demolish existing Concrete Spillway	Lin.m	$ 100		$ -
Side Entry Pit	Item	$ 5,000	8	$ 40,000
Junction Box	Item	$ 3,500	0	$ -
375 mm RCP	Lin.m	$ 300	142	$ 42,600
450 mm RCP	Lin.m	$ 450	8	$ 3,600
Box Culvert	Lin.m	$ 600	0	$ -
Concrete Headwall	Item	$ 5,000	4	$ 20,000
Connect to Exisitng Pit	Item	$ 1,500	0	$ -
Reinstate Spoon Drain	Lin.m	$ 150	10	$ 1,500
Reinstate Kerb	Lin.m	$ 110	60	$ 6,600
Reinstate Pavement	Lin.m	$ 100	90	$ 9,000
Reinstate Concrete Spillway	Lin.m	$ 180	45	$ 8,100
Reinstate Kerb Ramp	Item	$ 1,500	2	$ 3,000
Reinsatate Driveway	Item	$ 1,500	0	$ -
Compaction Testing	Item	$ 3,200	1	$ 3,200
As-constructed Survey	Lin.m	$ 15	150	$ 2,250
CCTV Inspection	Lin.m	$ 20	150	$ 3,000
Total				**$ 234,080**

Notes
Rates are as per Greenhills estimates for comparative purposes
Fixed Price Preliminaries have bee reduced to 3/4 of Greenhills estimate based on reduced scope

Appendix A. Drainage Modelling Report

Kilgariff Stage 1A, 1B & 2 Drainage Analysis

Kilgariff Subdivision Drainage Review

IW203700-100-ECC-RPT-0001 | 1

22 November 2019

Department of Infrastructure, Planning and Logistics

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	01.10.19	Final	SZ	CC	CC	RK
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Kilgariff Stage 1A, 1B & 2 Drainage Analysis

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Contents

1. Introduction

The Kilgariff Subdivision is a residential development area south of Alice Springs, initially designed by Jacobs (SKM at the time) in 2014. The purpose of this report is to provide a review of the drainage design to confirm its conformance to the standards and guidelines applicable at the time of design, as well as checking the drainage design against current standards and guidelines.

The development is divided into a series of stages – this report covers the drainage design for Stages 1A and 1B – shown below in Figure 1.1, as well as Stage 2 (Harris Avenue) – shown below in Figure 1.2:

Figure 1.1: Kilgariff Subdivision Stages 1A and 1B

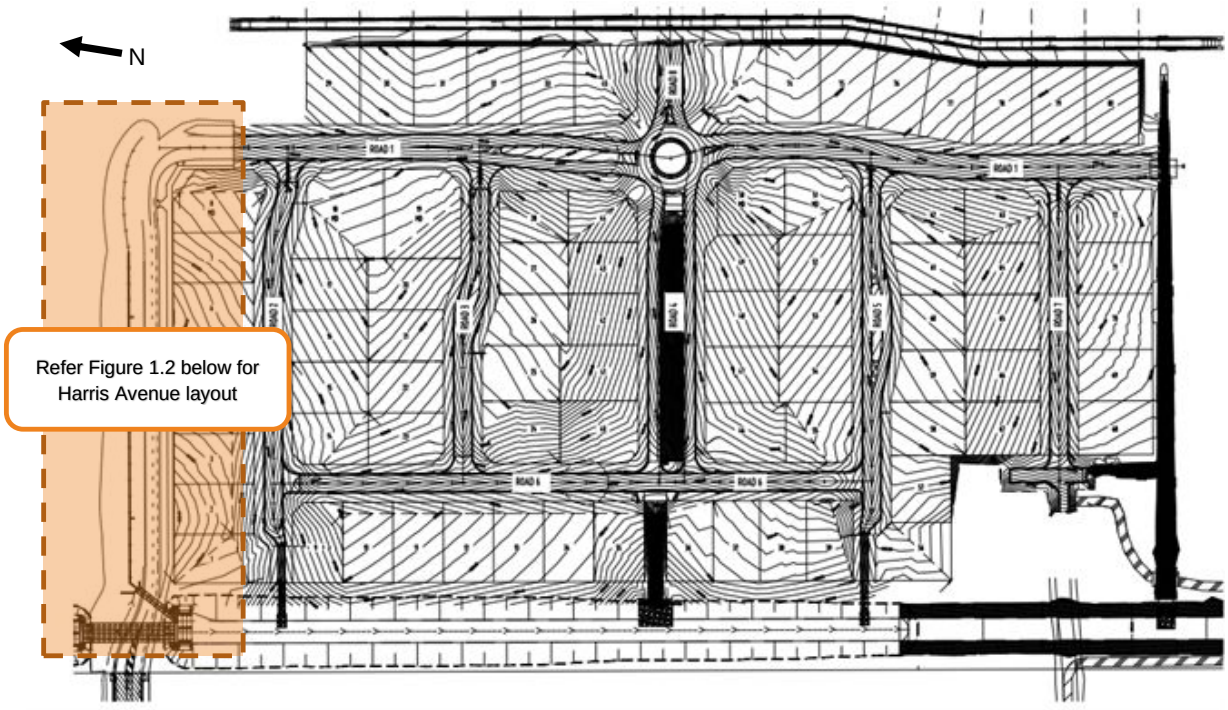
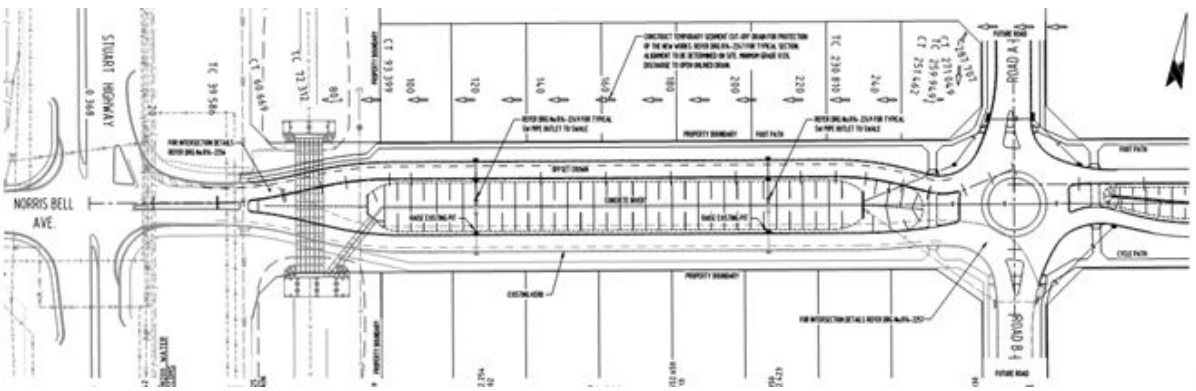


Figure 1.2: Kilgariff Subdivision Stages 2 – Harris Avenue



The drainage design of Stages 1A and 1B is predominantly surface flow contained within the road extents (kerb and gutter arrangement) with the exception of a small pit and pipe network from the roundabout intersection of Road 1 and Road 4A/B and an open channel in the centre of Road 4A/4B. For Stage 2, there is a small pit and pipe network which predominantly routes into a channel within the Harris Avenue median.

Generally, the site drains to the West where road runoff is directed into open drains which then outlet to a trunk perimeter open unlined drain.

This report is to be read in conjunction with “Kilgariff Stormwater Strategy and Trunk Drain Extension Works Design and Masterplan Report” to gain an understanding for the history of the development.

The scope of this report is limited to the following:

- Checking the compliance of the design against ASTC Subdivision & Development Guidelines (November 2012) using the same data and parameters as per original analysis (refer 3.1);
- Completing a sensitivity analysis against the new Northern Territory Subdivision Guidelines (June 2019) using updated IFD data in line with Australian Rainfall and Runoff (AR&R) 2016 (refer 1.1); and
- A sensitivity analysis for maximum flow widths on all roads based on the 20% AEP event – using new AR&R 2016 rainfall data (refer 3.3).

1.1 Changes Since Previous Revision

The following changes have been made in response to comments received on Rev 0 of this report:

- Inclusion of Harris Avenue in the analysis;
- Revision of catchments to align with property boundaries;
- Refinement of report to clarify analysis criteria; and
- Modelling amendments in DRAINS.

2. Model Development

To assess the conformance of the system for the previous criteria and the new criteria, a DRAINS model has been developed. As the design has not been modified, the only required change in the analysis of the system for each criterion is the Rainfall Intensity-Frequency-Duration (IFD) data pertaining to the respective criteria. All other elements of the analysis have been maintained.

2.1 Inputs and Assumptions for the DRAINS Model

2.1.1 ILSAX Model

As discussed in the original design report, the design catered for an ILSAX model developed on a soil type 3 for the considered minor event, and soil type 4 for the considered major event. As advised by Alice Springs Town Council Guidelines (2012), the minor event for single dwelling residential areas shall be taken as 5-year ARI and a major event of 100-year ARI. Assumptions as per Figure 2.1 have been adopted for the analysis. Note the soil type for each analysis is accounted for the in the Rainfall data input.

Figure 2.1: ILSAX Hydrological Model Inputs

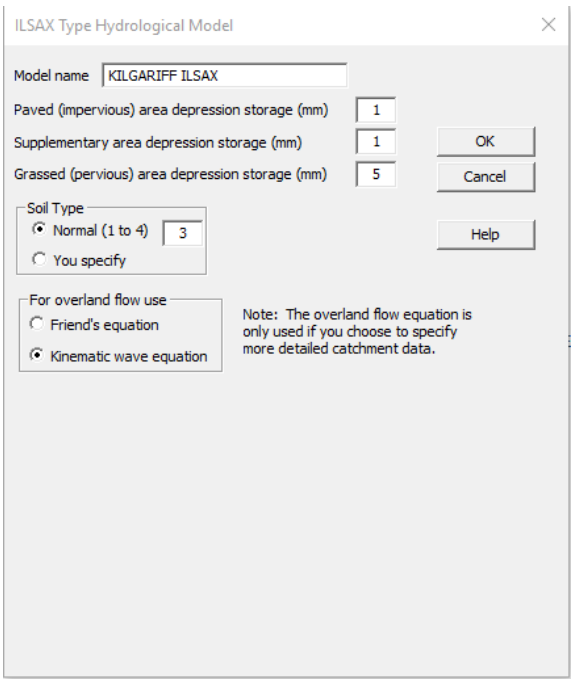


Figure 2.2: Table 15 Extract from ASTC Subdivision & Development Guidelines (November 2012 – unchanged in 2018)

Table 15: Storm Intensity Recurrence Interval (ARI in Years)

Catchment Zone	Minor Storm	Major Storm
Central Business and Commercial	10	100
Industrial	5	100
Multiple Dwelling / Medium Density Residential	10	100
Single Dwelling Residential	5	100
Public Open Space and Drainage Reserves	5	100
Rural Residential	5	100
Rural Living and Rural Access Roads (Crossroad culverts)	10	100
Collector/Arterial Roads (Crossroad Culverts)	50	100

2.1.2 Rainfall Data

Refer to sections 3.1 and 3.2 for respective Rainfall Data Inputs.

2.1.3 Drainage Design Setout for the DRAINS model

Most finished surface levels, lengths and drainage structure inverts have been derived from the design and as-constructed documentation. In the absence of this data on design documentation, the 12d model has been interrogated for the necessary values. Appendix A shows all data adopted for the nodes and pits across Stages 1A, 1B and 2 of the project.

The node placement within the drains model is dictated by the changing road profiles, road intersections, high points, outlets and points of interest (e.g. kerb ramps). Descriptions of the node and pit identifiers are provided in Appendix A.

2.1.4 Road Profiles

Stages 1A and 1B have differing road profiles which can affect their ability to comply with flow width requirements of each criteria. In addition to this, Harris Avenue presents a road cross section with an offset crest which will affect compliance to the minor event criteria (overtopping of the road crest). Five road profiles have been developed for the site based on the design documentation and kerb and gutter details from the Northern Territory Government Standard Drawing for Standard Kerb Profiles (CS1203).

Figure 2.3: Road Profile for Road 1 and Road 8 – Stages 1A and 1B

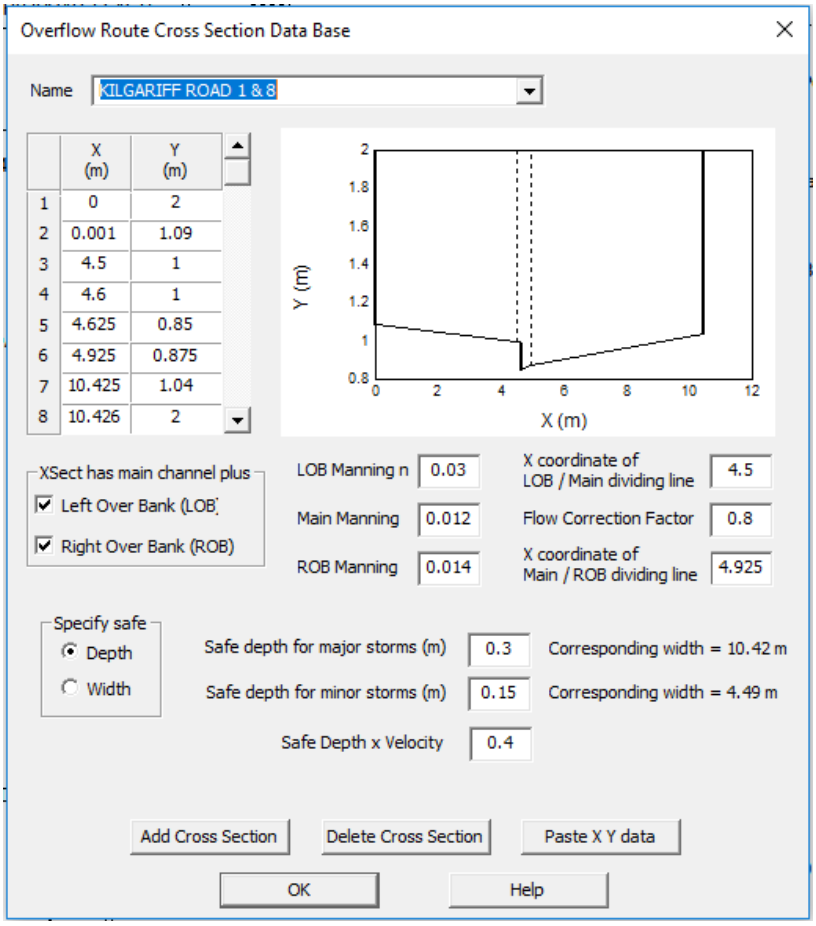
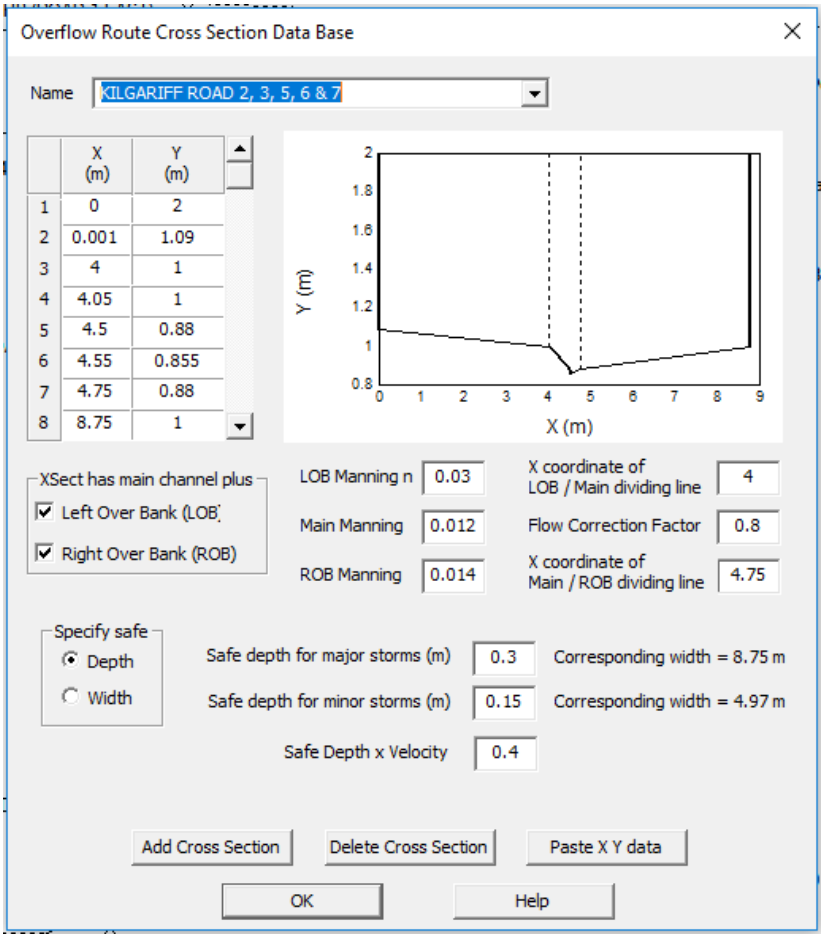
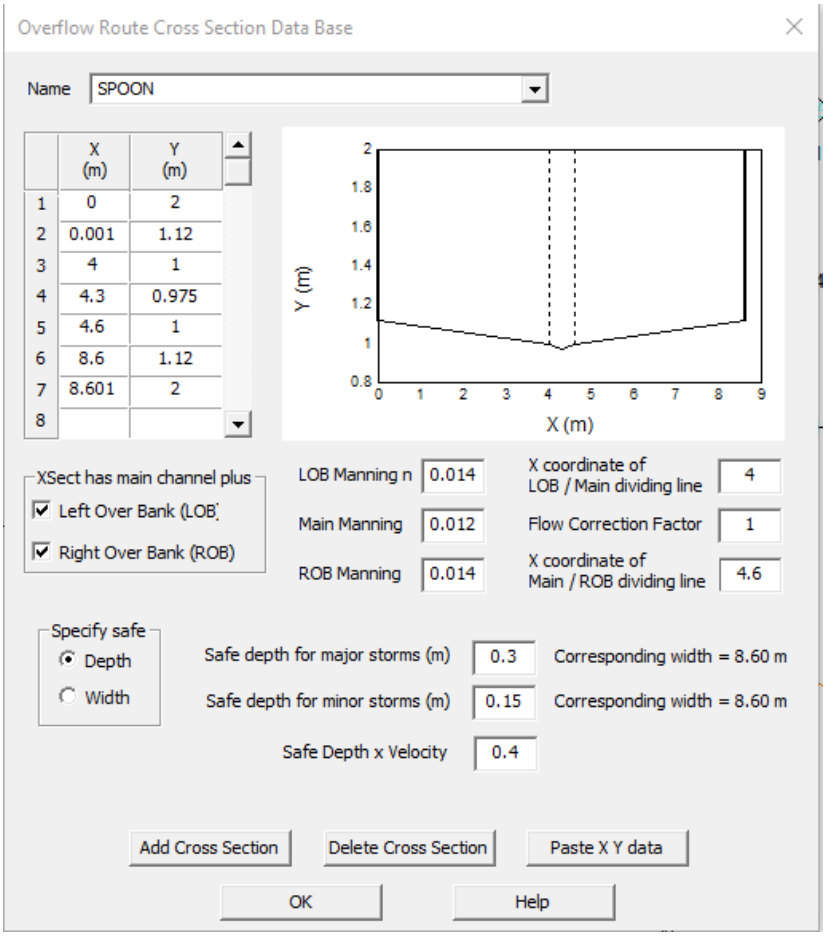


Figure 2.4: Road Profile for Road 2, Road 3, Road 5, Road 6 and Road 7 – Stages 1A and 1B



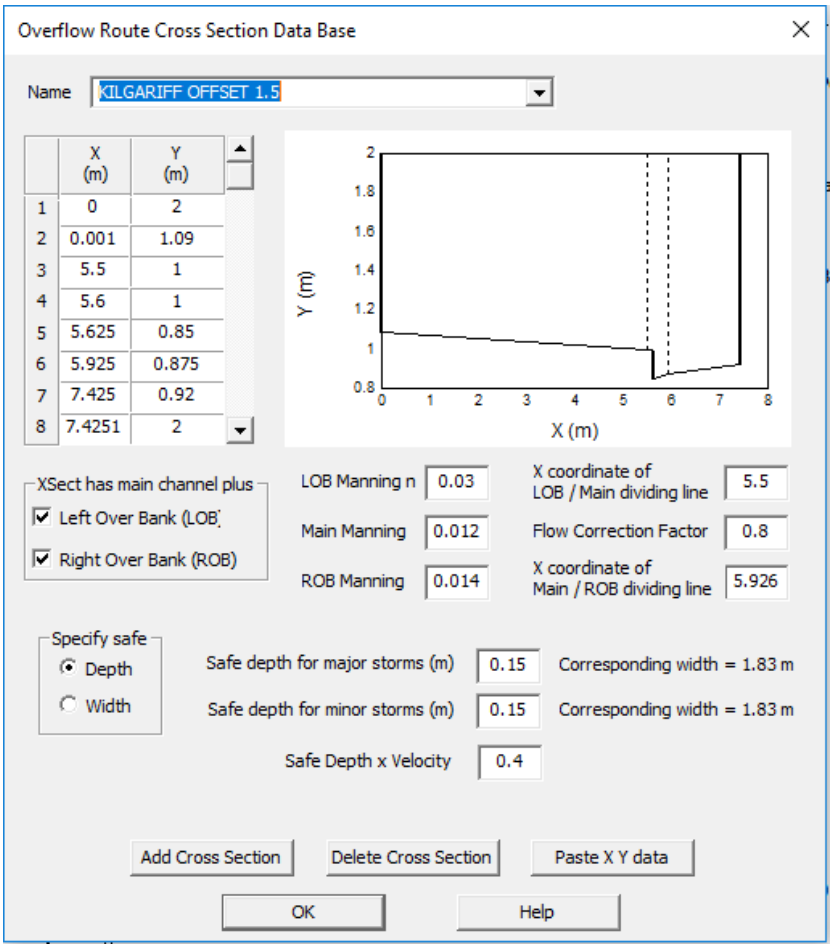
9.6

Figure 2.5: Road Profile for Kilgariff Spoon Drains



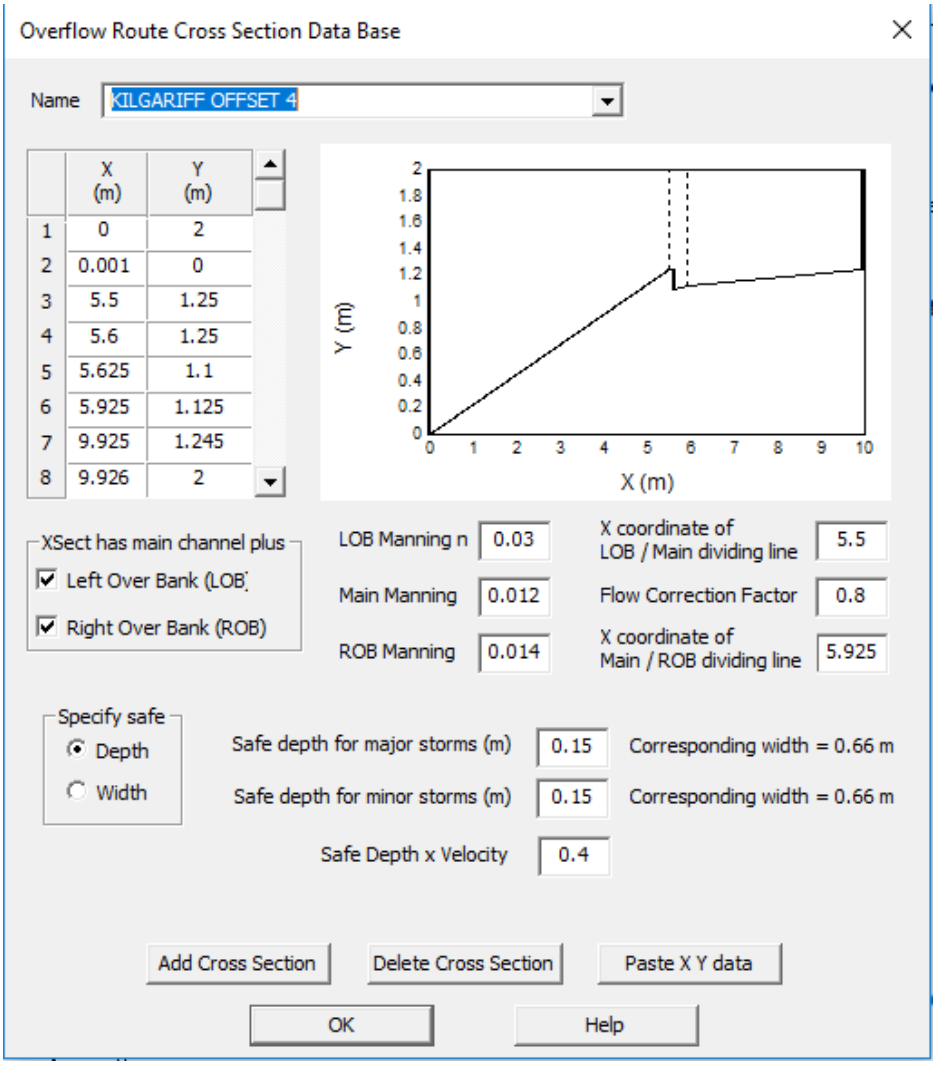
9.6

Figure 2.6: Road Profile for 1.5m side of Harris Avenue crest



9.6

Figure 2.7: Road Profile for 4m side of Harris Avenue crest



2.1.5 Sub-catchment Type Allocations

The sub-catchments for the DRAINS model have been determined using finished surface levels within the 12d/CAD models for the respective stages. Appendix B contains the catchment plan adopted for the analyses. Table 2.1 shows the sub-catchment areas in plan view:

Table 2.1: Sub-catchment Areas

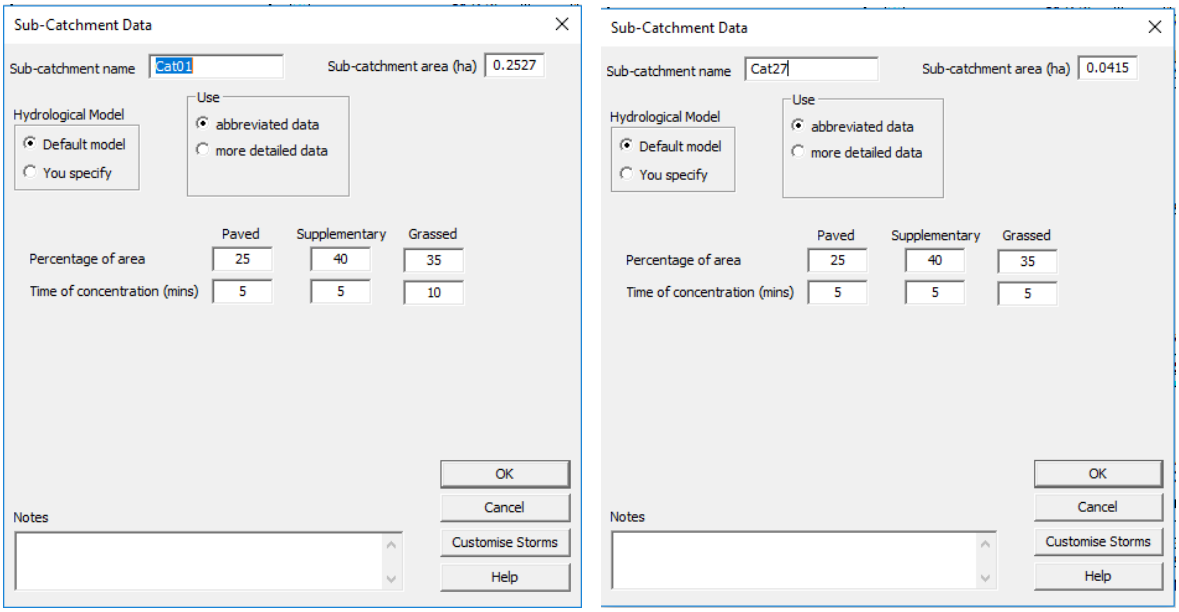
Node/Pit Identifier	Catchment Identifier	Sub-catchment Area (ha)
1 (ROAD 1 OUT PIT)	Cat01	0.5273
2 (ROAD 1 OUT PIT)	Cat02	0.0360
3 (ROAD 1 SPOON)	Cat03	0.0510
4 (ROAD 1 SPOON)	Cat04	0.0509

Node/Pit Identifier	Catchment Identifier	Sub-catchment Area (ha)
5 (ROAD 1 SPOON)	Cat05	0.0088
6 (ROAD 1 SPOON)	Cat06	0.055
7 (4/2)	Cat07	0.3876
8 (4/1)	Cat08	0.1219
9 (2/4)	Cat09	0.1157
10 (2/3)	Cat10	0.0654
11 (ROAD 4A EAST)	Cat11	0.0098
12 (ROAD 4B EAST)	Cat12	0.0206
13 (3/1)	Cat13	0.0511
14 (3/2)	Cat14	0.1942
15 (ID reserved)		
16 (ROAD 1 SPOON)	Cat16	0.0203
17 (ROAD 1 SPOON)	Cat17	0.0493
18 (ROAD 1 SPOON)	Cat18	0.0625
19 (ROAD 1 SPOON)	Cat19	0.1290
20 (ROAD 1 OUT)	Cat20	0.0334
21 (ROAD 1 OUT)	Cat21	0.7133
22 (ROAD 2 WEST)	Cat22	0.7191
23 (ROAD 2 SPOON)	Cat23	0.5717
24 (ROAD 2 SPOON)	Cat24	0.0261
25 (ROAD 2 WEST)	Cat25	0.0116
26 (ROAD 2 OUT)	Cat26	0.1055
27 (ROAD 6 SPOON)	Cat27	0.0415
28 (ROAD 3 WEST)	Cat28	0.5557
29 (ROAD 3 WEST)	Cat29	0.5129
30 (ROAD 6 SPOON)	Cat30	0.0313
31 (ROAD 6 KR)	Cat31	0.5953
32 (ROAD 6 KR)	Cat32	0.053
33 (ROAD 4A WEST)	Cat33	0.5133
34 (ROAD 4A WEST)	Cat34	0.5533
35 (ROAD 6 KR)	Cat35	0.0421
36 (ROAD 6 KR)	Cat36	0.193

Node/Pit Identifier	Catchment Identifier	Sub-catchment Area (ha)
37 (1/3)	Cat37	0.1757
39 (1/2)	Cat39	0.1013
40 (ROAD 5 SPOON)	Cat40	0.5122
41 (ROAD 5 SPOON)	Cat41	0.1131
42 (ROAD 5 WEST)	Cat42	0.5078
43 (ROAD 5 OUT)	Cat43	0.1072
44 (ROAD 7 SPOON)	Cat44	0.0147
45 (ROAD 7 WEST)	Cat45	0.4090
46 (ROAD 7 WEST)	Cat46	0.4872
47 (ROAD 7 SPOON)	Cat47	0.0283
48 (ROAD 7 OUT)	Cat48	0.0054
H01 (403)	Cat H01	0.0721
H02 (601)	Cat H02	0.1956
H03 (305)	Cat H03	0.1157
H04 (304)	Cat H04	0.0721
H05 (303)	Cat H05	0.048
H06 (109)	Cat H06	0.0919
H07 (108)	Cat H07	0.0334
H08 (111)	Cat H08	0.0324
H09 (112)	Cat H09	0.0926
H10 (103)	Cat H10	0.1094
H11 (102)	Cat H11	0.0791
H12 (105)	Cat H12	0.0335
H13 (106)	Cat H13	0.1208
H14 (SWALE)	Cat H14	0.3286

The percentage split of paved/supplementary/grassed areas for the sub-catchments were considered as a site-wide split. To approximate this, the total area of Stages 1A and 1B was split between road and path areas, approximate future roofed areas (extrapolating based on current developed sites) and residual grassed areas. Figure 2.8 shows the results of this percentage split:

Figure 2.8: Sub-Catchment Data examples



The below breakdown is reflective of areas highlighted in the Catchment Percentage Plan (Appendix C). Note the percentages for Stage 1A and 1B have been used for Harris Avenue.

Table 2.2: Sub-catchment Area Percentages

Section	Area	Area Designations	Area Percentages
Housing (60% Impervious, 40% Grassed)	= 7,723 + 10,380 + 8,586 + 8,804 + 10,437 + 4,204 + 11,066 + 5,280 + 8,823 **= 75,303m^2**	Supplementary: 45182m^2	~40% - Supplementary
		Grassed: 30121m^2	~35% - Grassed
Road Reserve (70% Paved, 30% Grassed)	= 114,354 – 73,766 = **39,051m^2**	Grassed: 11715m^2	
		Paved: 27336m^2	~25% - Paved
		TOTAL 114,354m^2	

In revising the catchments, it was deemed that a t_c value of 5 minutes for grassed areas is far too conservative for all catchments and does not reflect the appropriate overland flow travel times for the subdivision. Equation 5.8 from ARRB SR 34: Storm Drainage Design in Small Urban Catchments by Argue (1986) provides a formula to calculate overland travel time. This is reinforced in DRAINS:

Figure 2.9: ARRB SR 34: Storm Drainage Design in Small Urban Catchments by Argue (1986) t_c calculation

Overland Flow

The kinematic wave formulation for runoff overland travel time t_c developed by Ragan and Duru (1972) is recommended. Appropriate values for the parameter Manning's 'n' enable travel times to be computed for paved surfaces and for two categories of grassed surfaces:

$$t_c = 6.94 \frac{(ln)^{0.6}}{i^{0.4} S^{0.3}} \text{ minutes} \qquad (5.8)$$

where t_c = overland travel time (minutes)
l = travel distance (metres)
n = 0.015 for paved surfaces
n = 0.25 for lawn surfaces
n = 0.50 for thickly grassed surfaces
i = rainfall intensity (mm/h)
S = surface slope (m/m)

Figure 2.10: DRAINS t_c calculation

The formula used to calculate times of travel or of concentration, is:

$$t = \frac{6.94 (L.n^*)^{0.6}}{I^{0.4} . S^{0.3}}$$

where t is the overland flow travel time (minutes)
L is the flow path length (m)
n* is a surface roughness or retardance factor
I is rainfall intensity (mm/h), and
S is the surface slope (m/m).

Argue suggests adopting a storm duration of 15 – 30 minutes in the 10-year event. In lieu of a 15-minute storm from the 2012 IFD data, the more conservative 10-minute storm duration has been adopted. Using an approximate property length of 30m and a maximum slope of 2%, t_c is calculated to be 12.65 seconds. When adopting a higher rainfall intensity of 125mm as used for nomographs in ARRB SR 34, a t_c of 10.89 seconds is achieved. To maintain a level of conservativeness in analysis, a t_c of 10 seconds has been adopted for grassed areas. Note that only catchments with runoff from the Kilgariff properties have this time of concentration applied.

3. Design Criteria

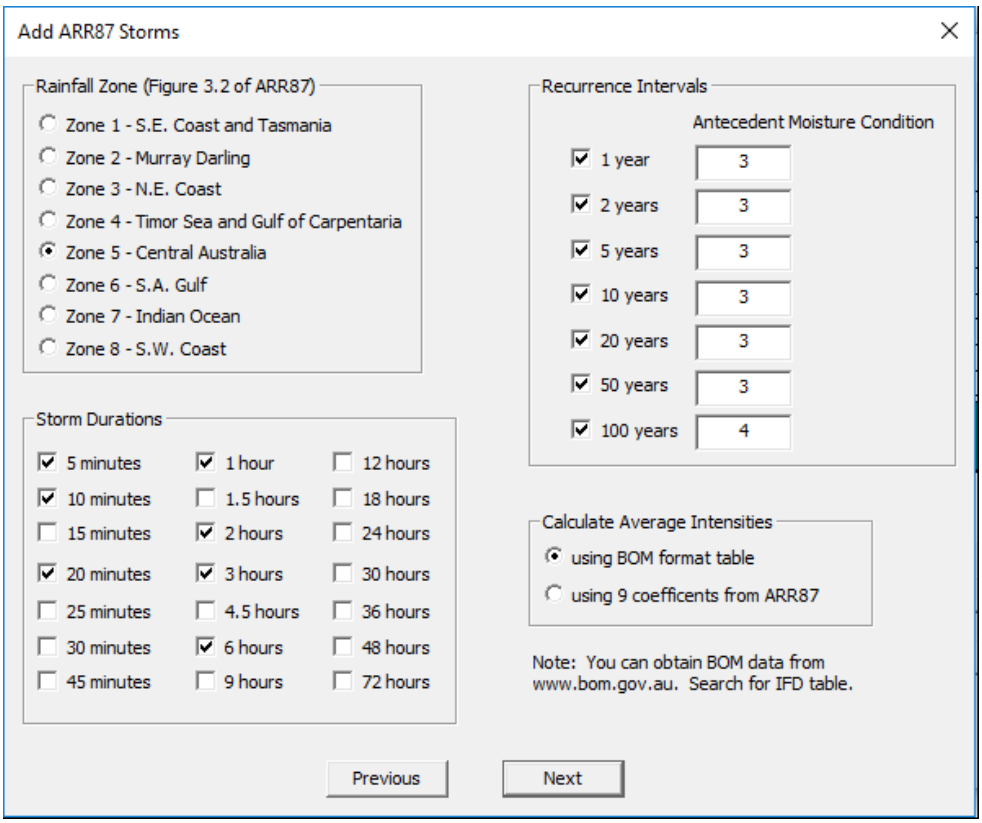
3.1 Original Design Criteria Conformance

The drainage for Stage 1A, Stage 1B and Harris Avenue was designed to comply with the ASTC Subdivision & Development Guidelines (November 2012) which refers to the 1987 Edition of Australian Rainfall and Runoff (AR&R 1987).

The IFD data at the time of design is shown below in Table 3.1.

Table 3.1: IFD Data (2012) and respective DRAINS input

	Average Recurrence Interval (ARI)						
Duration (minutes)	**1**	**2**	**5**	**10**	**20**	**50**	**100**
5	44	59.9	89.9	110	135	171	200
10	34	46.4	70.1	86.1	106	134	157
20	25.6	35	53.4	65.8	81.5	104	121
30	21.1	28.9	44.3	54.7	67.9	86.5	102
60	14.4	19.8	30.5	37.8	47	60	70.7
120	9.42	12.9	19.9	24.6	30.6	39	45.9
180	7.25	9.95	15.2	18.8	23.3	29.7	35
360	4.59	6.29	9.55	11.8	14.5	18.5	21.7
720	2.87	3.92	5.97	7.36	9.1	11.6	13.6
1440	1.74	2.39	3.7	4.6	5.74	7.34	8.66
2880	1	1.39	2.22	2.8	3.54	4.6	5.48
4320	0.7	0.98	1.59	2.02	2.57	3.36	4.01



At the time of the design the applicable guideline was ASTC Subdivision & Development Guidelines (November 2012), minor and major design events prescribed in this guideline were as follows:

Figure 3.1: Table 16 Extract from ASTC Subdivision & Development Guidelines (November 2012)

Table 16: Road Stormwater Limits

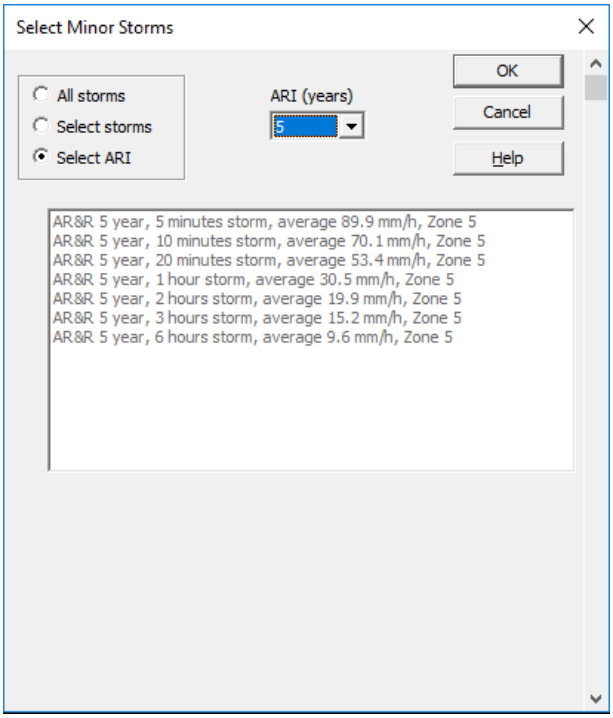
	Minor Storm	Major Storm
Urban Residential and Rural Residential		
Cul-de-sac Road	Flow may spread to crown of road for two-way cross-fall or road centreline for one-way cross-fall or to flush kerbs in dished drains	Flow may spread to road reserve boundary but maximum depth in roadway is not to exceed 300 mm with D x V less than 0.4 where D = depth (m) and V = velocity (m/s)
Access Roads	Flow shall not overtop crown of road or kerbs.	Flow may spread to road reserve boundary but maximum depth in roadway is not to exceed 300 mm with D x V less than 0.4 where D = depth (m) and V = velocity (m/s)
11m Collector Roads or Arterial Road	Flow shall not overtop kerbs and shall leave at least 3.0m width of roadway free of water.	Flow may spread to road reserve boundary but maximum depth in roadway is not to exceed 300 mm with D x V less than 0.4 where D = depth (m) and V = velocity (m/s)
Open Space & Drainage Reserves		Flow to be contained within boundaries of the public open space. Velocities not to exceed scour velocity (1.5 m/s in open unlined drains)
Commercial / Industrial		
All Roads	Flow shall not overtop kerbs and shall leave at least 3.0m width of roadway free of water.	Flow may spread to road reserve boundary but maximum depth in roadway is not to exceed 300 mm with D x V less than 0.4 where D = depth (m) and V = velocity (m/s)
Rural Living and Rural		
All Roads	Flow shall not encroach on the pavement	Flow may spread to the road reserve boundary and the road to be available for emergency vehicles (i.e. maximum depth of 300 mm) with D x V less than 0.4 where D = depth (m) and V = velocity (m/s)

The following sections discuss the conformance of the design to the minor and major event. The base case DRAINS model as well as the results for each simulated event are shown in Appendix D.

3.1.1 Minor Event (5-year ARI)

The 2012 data produce a series of 5-year ARI storms to simulate the minor storm event. A snippet of this is shown in Figure 3.2.

Figure 3.2: 5-year ARI Storm Series



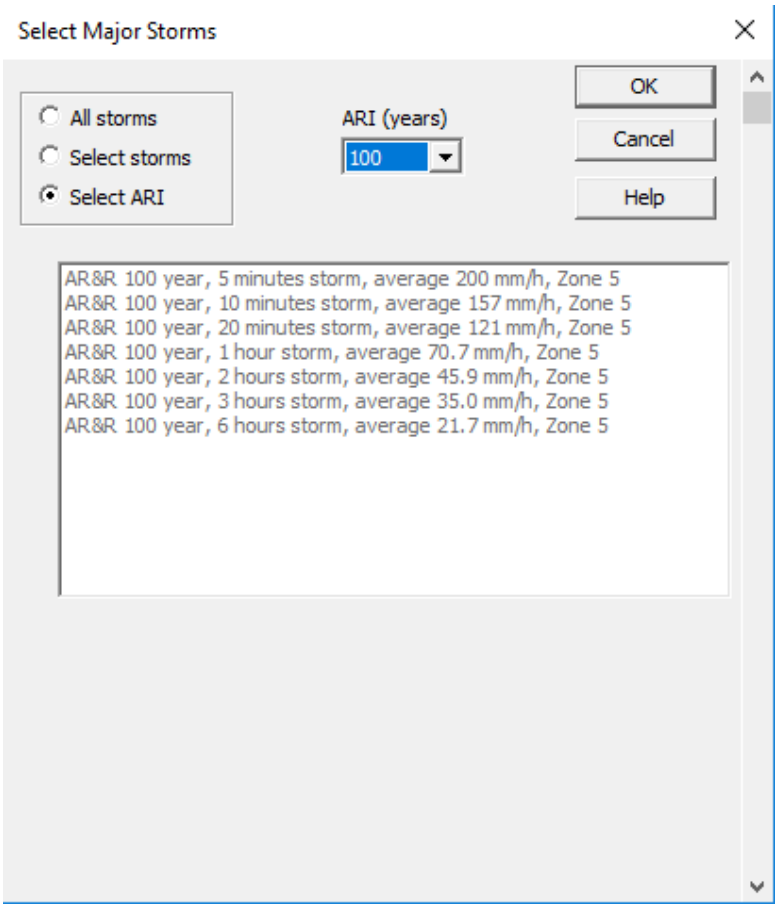
By running all storms for the 5-year event, DRAINS can produce the worst-case scenario for all factors of compliance.

The results indicate that for all worst possible scenarios for overland flows within Stage 1A, 1B and Harris Avenue, there is no flow overtopping the road crown in any cases and confirming the design is compliant for the minor event for Single Dwelling Residential subdivisions.

3.1.2 Major Event (100-year ARI)

The 2012 data produce a series of 100-year ARI storms to simulate the major storm event. A snippet of this is shown in Figure 3.3.

Figure 3.3: 100-year ARI Storm Series



The analysis shows excessive flow widths in some areas where the flow is likely to overtop the road crest and utilise some of the surplus channel capacity on the other side of the road. In all areas of the subdivision, the property boundary is offset from the road by a minimum of ~5m which provides additional capacity should the flow overtop the kerb in the major event. As shown in Appendix D, the largest flow width expected from the 100-year ARI event is 6.86m on Road 6. Even if this flow was to overtop the kerb, the flow would still be contained within the road reserve. This suggests that the drainage has been designed adequately for compliance with the Single Dwelling Residential subdivision requirements set by council guidelines.

In addition, all flow depths were found to be less than 0.3m and all Depth x Velocity (DV) values were found to be less than 0.4 m^2/s.

3.2 Sensitivity Analysis Against Updated Design Criteria

The second analysis conducted for Kilgariff is a sensitivity check for the performance of the subdivision under the new Northern Territory Subdivision Guidelines (June 2019) criteria.

With the new AR&R data in mind, it is beneficial to understand how the drainage design performs under today's rainfall conditions. The following IFD data has been produced from the BoM website:

Table 3.2: IFD Data from the Bureau of Meteorology (in line with AR&R 2016)

	Annual Exceedance Possibility (AEP)						
Duration (minutes)	63.20%	50%	20%	10%	5%	2%	1%
1	79.4	96.5	153	193	234	292	338
2	69.5	84.9	136	175	214	271	318
3	64.3	78.4	125	160	196	247	288
4	60.1	73.2	117	148	181	227	264
5	56.6	68.8	109	138	168	210	244
10	44.2	53.7	84.6	107	129	160	185
15	36.7	44.5	70.2	88.6	107	133	154
20	31.5	38.3	60.6	76.5	92.7	115	133
25	27.8	33.8	53.5	67.7	82.1	102	118
30	25	30.4	48.2	61	74.1	92.3	107
45	19.4	23.6	37.5	47.6	58.1	72.7	84.6
60	16	19.5	31.1	39.6	48.4	60.8	70.9
90	12.2	14.8	23.6	30.1	36.9	46.6	54.6
120	9.95	12.1	19.3	24.6	30.2	38.3	44.9
180	7.48	9.06	14.4	18.4	22.7	28.8	33.9
270	5.62	6.79	10.8	13.8	16.9	21.5	25.4
360	4.58	5.53	8.76	11.2	13.8	17.5	20.6
540	3.44	4.15	6.56	8.37	10.3	13.1	15.4
720	2.81	3.39	5.35	6.84	8.42	10.7	12.6
1080	2.11	2.54	4.03	5.16	6.37	8.1	9.55
1440	1.72	2.07	3.3	4.24	5.24	6.67	7.87
1800	1.46	1.77	2.83	3.64	4.52	5.76	6.79
2160	1.28	1.55	2.5	3.22	4	5.1	6.03
2880	1.03	1.26	2.04	2.64	3.29	4.22	4.99
4320	0.752	0.924	1.52	1.98	2.48	3.2	3.8
5760	0.598	0.737	1.22	1.6	2	2.59	3.08
7200	0.499	0.615	1.02	1.34	1.67	2.17	2.59

	Annual Exceedance Possibility (AEP)						
Duration (minutes)	63.20%	50%	20%	10%	5%	2%	1%
8640	0.429	0.529	0.876	1.14	1.43	1.85	2.21
10080	0.377	0.464	0.764	0.992	1.24	1.6	1.91

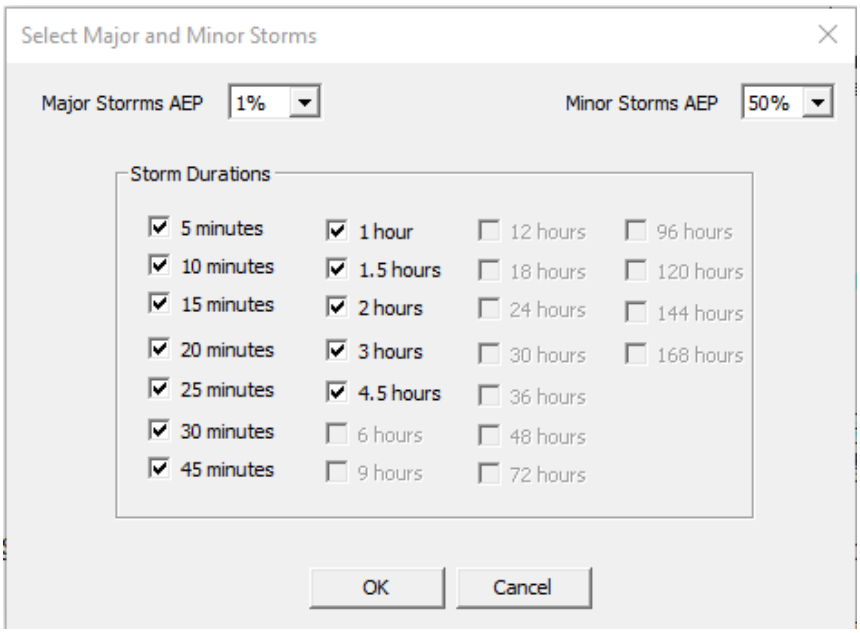
The NT Subdivision Guidelines suggest Minor and major events for residential areas as 50% and 1% AEP respectively.

Figure 3.4: Table 19 Extract from the Northern Territory Subdivision Development Guidelines (June 2019)

Table 19 — Design Storm Events for Residential/Mixed Use and Industrial Zones

Application	Annual Exceedance Probability (AEP)	
	Minor Storm	Major Storm
Residential Zones (excl. HR)	50%	1%
Commercial and HR Zones	10%	1%
Industrial Zones	20%	1%
All Other Land Use Zones	50%	1%
Areas of Significance (See Definitions)	1%	0.2%

Figure 3.5: Major and Minor Storm Allocation Using 2016 AEPs



3.2.1 50% AEP Event

Table 21 from the NT Subdivision Guidelines highlights the criteria for the 50% AEP minor storm event. Kilgariff is deemed as minor roads/access streets:

Figure 3.6: Table 21 Extract from the Northern Territory Subdivision Development Guidelines (June 2019)

Table 21 — Minor Storm Flow Criteria		
Drainage Public Infrastructure		**Minor Storm Criteria**
Kerb and Gutter Flow	Laneway Minor Street Access Street	Flows must not overtop kerb Flow width ≤ 2.5m from Kerb
	Secondary Collector Primary Collector	Flows must not overtop kerb Flow width ≤ 2.5m from Kerb Minimum 3m street pavement free of inundation
Table Drains		Flows contained in table drains and meeting the following: Minimum 200mm freeboard to edge of street shoulder. Flow depth ≤ 750mm Flow velocity < Scour velocity Product of depth (m) and velocity (m/s) ≤ 0.40m2/s
Culverts under Driveway Crossovers		Headwaters satisfy table drain flow criteria. Headwaters provide minimum 150mm freeboard to edge of shoulder on driveway crossover. Flow velocity < Scour velocity
Cross Road Culverts		Headwaters satisfy Table Drain flow criteria. Headwaters provide minimum 200mm freeboard to edge of street shoulder. Flow velocity < Scour Velocity
Open Space and Drainage Reserves		Flow to be contained in formal drain section Flow velocity < Scour Velocity
Pedestrian Linkages		Pathways to be free of Inundation Minimum 1.0m width next to boundaries free of inundation

From the analysis, it was determined that in the 50% AEP event the drainage exceeds the 2.5m flow width requirement in two locations. As shown in Appendix D, there are 4 sections where the flow width is marginally larger than 2.5m and OF152 (Road 6) is shown to carry a maximum flow width of 3.52m.

The flows do not overtop the kerb in any locations. Results are shown in Appendix D.

3.2.2 1% AEP Event

Table 22 from the NT Subdivision Guidelines highlights the criteria for the 1% AEP minor storm event.

Figure 3.7: Table 22 Extract from the Northern Territory Subdivision Development Guidelines (June 2019)

Table 22 — Major Storm Flow Criteria

Application	Major Storm Criteria
Streets with Underground Pipe Systems	Flow contained in Road Reserve boundaries Longitudinal flows to meet the following criteria: • Depth ≤ 300mm • Product of depth (m) and velocity (m/s) ≤ 0.40m2/s Transverse flows to meet the following criteria: • Depth ≤ 200mm in roadway and max 150mm above crown • Product of depth (m) and velocity (m/s) ≤ 0.30m2/s
Streets with Table Drains	Longitudinal flows in Road Reserve to meet the following criteria: • Depth ≤ 300mm in roadway • Flow velocity < Scour velocity • Product of depth (m) and velocity (m/s) ≤ 0.40m2/s Transverse flows in Road Reserve, including flows overtopping roadways, to meet the following criteria: • Depth ≤ 200mm in roadway and max 150mm above crown • Flow velocity < Scour velocity • Product of depth (m) and velocity (m/s) ≤ 0.30m2/s Extent of flooding (or flow spread) during the Major Storm must be assessed and illustrated on Design Drawings, with flooding over proposed Lots identified as Constrained Land. Total areas of Constrained Land must be illustrated on the Design Drawings, demonstrating compliance with Planning Scheme requirements for unconstrained land.
Open Space and Drainage Reserves	Flow to be contained in formal drain section Flow velocity < Scour Velocity Min 300mm Freeboard to Allotment Boundaries Open Spaces (e.g. recreational ovals) can be used to attenuate flows and/or convey major flows.
Pedestrian Linkages	Pathways do not have to be free of Inundation; however, min freeboard of 300mm to allotment boundaries must be achieved. Minimum 1.0m width next to boundaries free of inundation

Similar to the 2012 data analysis, the investigation using updated data shows excessive flows in some areas of the design which cannot be fully contained within the carriageway (kerb to road crest); however the maximum kerbed flow width (OF152 – 6.59m) is still contained within the road reserve and does not flood adjoining properties.

In addition, all flow depths were found to be less than 0.3m and all Depth x Velocity (DV) values were found to be less than 0.4 m^2/s. Results are shown in Appendix D.

3.3 Sensitivity Analysis Against 20% AEP event

In addition to the sensitivity check completed in 3.2, it has also been requested by Northern Territory Government (NTG) that a check be undertaken for a 20% AEP to determine flow widths for each road in the subdivision (Stages 1a, 1B and Harris Avenue). Using the new IFD data, the maximum flow widths for each road for the 20% AEP event are shown below in Table 3.3:

Table 3.3: Maximum Flow Widths in the 20% AEP Storm Event

Road	Maximum Flow Width (m)
Road 1	3.6
Road 2	3.85
Road 3	3.46
Road 4	3.54
Road 5	3.25
Road 6	4.62
Road 7	3.17
Road 8	1.56
Harris Avenue	1.49

4. Summary

From the DRAINS modelling completed, it can be confirmed that the Kilgariff drainage design for Stages 1A, 1B and 2 (Harris Avenue) are compliant to the 2012 ASTC Guidelines – based on the IFD data from 2012.

Using the new data (in line with AR&R 2016) and adopting the NT Subdivision Guidelines, the minor event criteria is marginally exceeded in some occasions – with Road 6 hosting the largest flow width of 3.52m. The major event criteria are still satisfied by the design.

The 2.5m flow width check completed using the new IFD data for the 20% AEP event is exceeded for roads 1, 2, 3, 4, 5, 6 and 7.

All of the above results are summarized in the following table:

Table 4.1: Compliance Summary Against ASTC Subdivision & Development Guidelines (November 2012)

	2012 IFD Data		2016 AR&R IFD Data		
	5-Year ARI	100-Year ARI	50% AEP	1% AEP	20% AEP
CRITERIA / **ROAD**	• Flows do not overtop crest of road	• Flows contained within road reserve. • Max depth in roadway < 300mm • dV < 0.4	• Flow widths no greater than 2.5m	• Flows contained within road reserve. • Max depth in roadway < 300mm • dV < 0.4	• Sensitivity check against 2.5m flow widths
Road 1	Complies	Complies	Marginally exceeding 2.5m	Complies	Exceeds
Road 2	Complies	Complies	Marginally exceeding 2.5m	Complies	Exceeds
Road 3	Complies	Complies	Complies	Complies	Exceeds
Road 4	Complies	Complies	Marginally exceeding 2.5m	Complies	Exceeds
Road 5	Complies	Complies	Complies	Complies	Exceeds
Road 6	Complies	Complies	Flow width greater than 2.5m (OF152 from model – 3.52m)	Complies	Exceeds
Road 7	Complies	Complies	Complies	Complies	Exceeds
Road 8	Complies	Complies	Complies	Complies	Does not exceed
Harris Avenue	Complies	Complies	Complies	Complies	Does not exceed

Appendix A. Node/Pit Data within the DRAINS Model

KILGARIFF - Pit and Node Table

KILGARIFF DRAINAGE ANALYSIS

Node/Pit and Catchment Inputs

PIT / NODE DETAILS			Version 13																			
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph							
01 (ROAD 1 OUT PIT)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.819	0.15	0	0	297.5	-90	No	777023	1 x Ku	No							
02 (ROAD 1 OUT PIT)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.843	0.15	0	0	297.5	-144.167	No	777028	1 x Ku	No							
03 (ROAD 1 SPOON)	Node					552.8506		0		388	-141		105		No							
04 (ROAD 1 SPOON)	Node					552.9956		0		539.554	-141.294		114		No							
05 (ROAD 1 SPOON)	Node					553.2074		0		829	-139		162		No							
06 (ROAD 1 SPOON)	Node					553.1514		0		949	-141		178		No							
07 (4/2)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.971	0.15	0	0	1073.333	-89.167	No	170	1 x Ku	No							
08 (4/1)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.923	0.15	0	0	1071	-140	No	173	1 x Ku	No							
09 (2/4)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.891	0.15	0	0	1141.667	12.5	No	200	1 x Ku	No							
10 (2/3)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.886	0.15	0	0	1200.833	12.5	No	207	1 x Ku	No							
11 (ROAD 4A EAST)	Node					552.8016		0		1143.333	-265		218		No							
12 (ROAD 4B EAST)	Node					552.8221		0		1204.167	-265		225		No							
13 (3/1)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.969	0.15	0	0	1266	-145.833	No	212	1 x Ku	No							
14 (3/2)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.968	0.15	0	0	1268.056	-82.639	No	210	1 x Ku	No							
16 (ROAD 1 SPOON)	Node					552.8835		0		1412.5	-148.333		311		No							
17 (ROAD 1 SPOON)	Node					552.7318		0		1493	-148		313		No							
18 (ROAD 1 SPOON)	Node					552.4574		0		1652	-153		316		No							
19 (ROAD 1 SPOON)	Node					552.3131		0		1757	-154		318		No							
20 (ROAD 1 OUT)	Node					552.1494		0		1852.5	-153.333		320		No							
21 (ROAD 1 OUT)	Node					552.274		0		1848.333	-80.833		322		No							
22 (ROAD 2 WEST)	Node					552.3907		0		458	-629		345		No							
23 (ROAD 2 SPOON)	Node					552.539		0		490	-482.5		339		No							
24 (ROAD 2 SPOON)	Node					552.4395		0		494	-576		343		No							
25 (ROAD 2 WEST)	Node					552.5051		0		491	-630		349		No							
26 (ROAD 2 OUT)	Node					552.314		0		483	-683		352		No							
27 (ROAD 6 SPOON)	Node					552.5014		0		843	-514		373		No							
28 (ROAD 3 WEST)	Node					552.5487		0		863	-452		383		No							
29 (ROAD 3 WEST)	Node					552.5107		0		904	-453		385		No							
30 (ROAD 6 SPOON)	Node					552.3815		0		924	-515		376		No							
31 (ROAD 6 KR)	Node					552.074		0		1090.972	-569.444		389		No							
32 (ROAD 6 KR)	Node					552.0743		0		1093	-510		388		No							
33 (ROAD 4A WEST)	Node							0		1136	-467		392		No							
34 (ROAD 4A WEST)	Node					552.2003		0		1214	-467		397		No							
35 (ROAD 6 KR)	Node					552.1539		0		1254	-505		401		No							
36 (ROAD 6 KR)	Node					552.1538		0		1256	-558		403		No							
37 (1/3)	Headwall				0.5	552		0		1179.634	-450.393		338									
39 (1/2)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.0337	0.15	0	0	1168.85	-565.918	No	575	1 x Ku	No							
40 (ROAD 5 SPOON)	Node					552.3242		0		1438	-450		449		No							
41 (ROAD 5 SPOON)	Node					552.2087		0		1441	-609		451		No							
42 (ROAD 5 WEST)	Node					552.2087		0		1481	-609		454		No							
43 (ROAD 5 OUT)	Node							0		1449	-666		456		No							
44 (ROAD 7 SPOON)	Node					551.8895		0		1647	-510		478		No							
45 (ROAD 7 WEST)	Node					551.9267		0		1687	-479		480		No							
46 (ROAD 7 WEST)	Node					551.8565		0		1721	-479		482		No							
47 (ROAD 7 SPOON)	Node					551.741		0		1758	-512		484		No							
48 (ROAD 7 OUT)	Node					551.6511		0		1802	-514		488		No							
DN1	Node					551.66		0		1166.238	-188.057		1191		No							
DN2	Node					551.66		0		1174.889	-186.661		1193		No							
DN3	Node					551.6		0		1175.448	-199.22		1093		No							
DN4	Node					551.2451		0		1179.41	-437.277		1226		No							
DN5	Node					551		0		1161.259	-617.921		1106		No							
DNH1	Node					553		0		183.893	-31.983		922655		No							
DNH2	Node					551.65		0		164.433	-294.5		776999		No							
DNH3	Node					551.65		0		179.861	-277.083		777019		No							
DNH4	Node					551.65		0		195.139	-293.75		777000		No							
H01 (403)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.984	0.15	0	0	217.361	-39.583	No	776981	1 x Ku	No							
H02 (601)	OnGrade	City of Adelaide Pits, 3% crossfall, sag			1.5	555		0	0	170.009	7.207	No	777016	1 x Ku	No							
H03 (305)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	553.062	0.15	0	0	126.389	-38.194	No	776983	1 x Ku	No							
H04 (304)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.94	0.15	0	0	64.333	-80.167	No	776984	1 x Ku	No							
H05 (303)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.923	0.15	0	0	59.333	-141.167	No	776985	1 x Ku	No							
H06 (109)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.628	0.15	0	0	46.133	-357.967	No	776987	1 x Ku	No							
H07 (108)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.541	0.15	0	0	103.733	-356.767	No	776988	1 x Ku	No							
H08 (111)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.541	0.15	0	0	255.762	-355.561	No	777197	1 x Ku	No							
H09 (112)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.628	0.15	0	0	314.583	-354.514	No	777192	1 x Ku	No							
H10 (103)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.459	0.15	0	0	48.533	-481.567	No	776991	1 x Ku	No							
H11 (102)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.371	0.15	0	0	110.933	-487.567	No	776992	1 x Ku	No							
H12 (105)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.371	0.15	0	0	268.851	-495.139	No	777203	1 x Ku	No							
H13 (106)	Sag	City of Adelaide Pits, 3% crossfall, sag		2	1.5	552.459	0.15	0	0	328.77	-492.535	No	777199	1 x Ku	No							
H14 (SWALE)	Node					551.401		0		195.592	-564.91		777403		No							
HARRIS CHANNEL	Node					551.649		0		179.073	-311.54		776998		No							
HARRIS OUT	Node					552.798		0		280	-671.2		777007		No							
HARRIS WEST 1	Node					552.798		0		7.388	-80.208		777031		No							
HARRIS WEST 2	Node					552.798		0		7.388	-139.525		777032		No							
H-MH (302)	Sag	Junction Pit or Manhole (sealed)		2	1.5	553.101	0.15	0	0	93.091	-212.058	No	777182	1 x Ku	No							
HP (ROAD 1 EAST 2)	Node					553.005		0		1338.194	-81.944		238		No							
HP (ROAD 1 EAST)	Node					553.209		0		625.694	-86.111		143		No							
HP (ROAD 1 WEST 2)	Node					553.005		0		1336.111	-146.528		242		No							
HP (ROAD 1 WEST)	Node					553.209		0		626.389	-138.889		141		No							
HP (ROAD 2 NORTH)	Node					553.139		0		452.315	-253.819		120		No							
HP (ROAD 2 SOUTH)	Node					553.16		0		489	-252		123		No							

KILGARIFF - Pit and Node Table

KILGARIFF DRAINAGE ANALYSIS

Node/Pit and Catchment Inputs

PIT / NODE DETAILS			Version 13																			
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph							
HP (ROAD 3 NORTH)	Node					553.37		0		861	-230		354		No							
HP (ROAD 3 SOUTH)	Node					553.364		0		901.244	-230.511		358		No							
HP (ROAD 5 NORTH)	Node					553.014		0		1439	-235		415		No							
HP (ROAD 5 SOUTH)	Node					552.995		0		1470	-235		418		No							
HP (ROAD 6 EAST 2)	Node					552.3896		0		1396	-499		442		No							
HP (ROAD 6 EAST)	Node					552.765		0		589	-507		421		No							
HP (ROAD 6 WEST 2)	Node					552.3896		0		1395	-561		444		No							
HP (ROAD 6 WEST)	Node					552.765		0		589.167	-563.333		423		No							
HP (ROAD 7 NORTH)	Node					552.639		0		1687	-248		460		No							
HP (ROAD 7 SOUTH)	Node					552.6		0		1726	-249		458		No							
HP (ROUNABOUT 2)	Node					552.961		0		1202.083	-57.639		254		No							
HP (ROUNDABOUT 1)	Node					552.985		0		1143.056	-59.028		258		No							
HP (ROUNDABOUT 3)	Node					553.126		0		1136.667	-148.333		281		No							
HP (ROUNDABOUT 4)	Node					553.25		0		1207.5	-150		283		No							
HP01 (HARRIS)	Node					552.798		0		121.473	-66.74		776996		No							
HP02 (HARRIS)	Node					552.798		0		220.833	-72.5		776971		No							
HP03 (HARRIS)	Node					553.3		0		50.134	-293.27		1132913		No							
HP04 (HARRIS)	Node					553.3		0		109.411	-290.926		1132915		No							
HP05 (HARRIS)	Node					553.3		0		262.125	-290.256		1132917		No							
HP06 (HARRIS)	Node					553.3		0		320.933	-288.381		1067797		No							
HP07 (HARRIS)	Node					552.8		0		57.639	-418.056		777132		No							
HP08 (HARRIS)	Node					552.6		0		115.105	-415.508		777443		No							
HP09 (HARRIS)	Node					552.6		0		266.758	-415.229		777469		No							
HP10 (HARRIS)	Node					552.8		0		326.202	-413.834		777473		No							
HP11 (HARRIS)	Node					552.8		0		39.583	-426.389		777005		No							
HP12 (HARRIS)	Node					552.6		0		101.654	-433.709		777454		No							
HP13 (HARRIS)	Node					552.6		0		258.943	-439.788		777467		No							
HP14 (HARRIS)	Node					552.8		0		319.225	-437.277		777471		No							
HP15 (HARRIS)	Node					553.273		0		45.004	-581.269		1132867		No							
HP16 (HARRIS)	Node					553.273		0		110.88	-586.574		1132878		No							
HP17 (HARRIS)	Node					553.273		0		266.84	-596.701		1132882		No							
HP18 (HARRIS)	Node					553.273		0		326.64	-592.843		1132884		No							
HPN1	Node					553.209		0		630.115	-73.251		1115		No							
HPN10	Node					552.3896		0		1391.316	-548.609		1145		No							
HPN2	Node					553.209		0		626.505	-151.968		1117		No							
HPN3	Node					553.005		0		1337.357	-88.921		1122		No							
HPN4	Node					553.005		0		1336.111	-156.296		1126		No							
HPN5	Node					553.139		0		461.574	-253.241		1129		No							
HPN6	Node					553.364		0		894.01	-230.109		1132		No							
HPN7	Node					552.995		0		1458.613	-223.613		1135		No							
HPN8	Node					552.6		0		1712.604	-245.093		1138		No							
HPN9	Node					552.765		0		587.5	-575.833		1142		No							
HW3	Headwall				0.5	552.5		0		196.277	-577.065		776995									
MH (2/2)	OnGrade	Junction Pit or Manhole (sealed)			1.5	553.6		0	0	1176.389	-117.361	No	732	1 x Ku	No							
SWALE 1	Node					551.707		0		148.833	-354.5		777001		No							
SWALE 2	Node					551.707		0		228.033	-354.5		777002		No							
SWALE 3	Node					551.513		0		154.833	-481.7		777003		No							
SWALE 4	Node					551.513		0		234.033	-485.3		777004		No							

DETENTION BASIN DETAILS																						
Name	Elev	Surf. Area		Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id							

SUB-CATCHMENT DETAILS																						
Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter FlowFacto	Rainfall Multiplier
Cat H01	H01 (403)	0.0721	25	35	40	5	10	5										0				1
Cat H02	H02 (601)	0.1956	30	20	50	5	5	5										0				1
Cat H03	H03 (305)	0.1157	25	35	40	5	10	5										0				1
Cat H04	H04 (304)	0.0721	25	35	40	5	5	5										0				1
Cat H05	H05 (303)	0.048	25	35	40	5	5	5										0				1
Cat H06	H06 (109)	0.0919	25	35	40	5	5	5										0				1
Cat H07	H07 (108)	0.0334	25	35	40	5	5	5										0				1
Cat H08	H08 (111)	0.0324	25	35	40	5	5	5										0				1
Cat H09	H09 (112)	0.0926	25	35	40	5	5	5										0				1
Cat H10	H10 (103)	0.1094	25	35	40	5	5	5										0				1
Cat H11	H11 (102)	0.0791	25	35	40	5	5	5										0				1
Cat H12	H12 (105)	0.0335	25	35	40	5	5	5										0				1
Cat H13	H13 (106)	0.1208	25	35	40	5	5	5										0				1
Cat H14	H14 (SWALE)	0.3286	25	35	40	5	5	5										0				1
Cat01	01 (ROAD 1 OUT PIT)	0.2527	25	35	40	5	10	5										0				1
Cat02	02 (ROAD 1 OUT PIT)	0.036	25	35	40	5	5	5										0				1
Cat03	03 (ROAD 1 SPOON)	0.051	25	35	40	5	10	5										0				1
Cat04	04 (ROAD 1 SPOON)	0.0509	25	35	40	5	5	5										0				1
Cat05	05 (ROAD 1 SPOON)	0.0088	25	35	40	5	5	5										0				1
Cat06	06 (ROAD 1 SPOON)	0.055	25	35	40	5	5	5										0				1
Cat07	07 (4/2)	0.3876	25	35	40	5	5	5										0				1
Cat08	08 (4/1)	0.1219	25	35	40	5	5	5										0				1
Cat09	09 (2/4)	0.1157	25	35	40	5	5	5										0				1
Cat10	10 (2/3)	0.0654	25	35	40	5	5	5										0				1

KILGARIFF - Pit and Node Table

KILGARIFF DRAINAGE ANALYSIS

Node/Pit and Catchment Inputs

PIT / NODE DETAILS			Version 13																				
Name	Type	Family	Size	Ponding Volume	Pressure Change	Surface Elev (m)	Max Pond Depth (m)	Base Inflow	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph								
				(cu.m)	Coeff. Ku			(cu.m/s)															
Cat11	11 (ROAD 4A EAST)	0.0098	30	20	50	5	5	5												0			1
Cat12	12 (ROAD 4B EAST)	0.0206	30	20	50	5	5	5												0			1
Cat13	13 (3/1)	0.0511	25	35	40	5	5	5												0			1
Cat14	14 (3/2)	0.1942	25	35	40	5	10	5												0			1
Cat16	16 (ROAD 1 SPOON)	0.0203	25	35	40	5	5	5												0			1
Cat17	17 (ROAD 1 SPOON)	0.0493	25	35	40	5	5	5												0			1
Cat18	18 (ROAD 1 SPOON)	0.0625	25	35	40	5	5	5												0			1
Cat19	19 (ROAD 1 SPOON)	0.129	25	35	40	5	5	5												0			1
Cat20	20 (ROAD 1 OUT)	0.0334	25	35	40	5	5	5												0			1
Cat21	21 (ROAD 1 OUT)	0.7133	25	35	40	5	10	5												0			1
Cat22	22 (ROAD 2 WEST)	0.7191	25	35	40	5	10	5												0			1
Cat23	23 (ROAD 2 SPOON)	0.5717	25	35	40	5	10	5												0			1
Cat24	24 (ROAD 2 SPOON)	0.0261	25	35	40	5	5	5												0			1
Cat25	25 (ROAD 2 WEST)	0.0116	25	35	40	5	5	5												0			1
Cat26	26 (ROAD 2 OUT)	0.1055	25	35	40	5	5	5												0			1
Cat27	27 (ROAD 6 SPOON)	0.0415	25	35	40	5	5	5												0			1
Cat28	28 (ROAD 3 WEST)	0.5557	25	35	40	5	10	5												0			1
Cat29	29 (ROAD 3 WEST)	0.5129	25	35	40	5	10	5												0			1
Cat30	30 (ROAD 6 SPOON)	0.0313	25	35	40	5	10	5												0			1
Cat31	31 (ROAD 6 KR)	0.5953	25	35	40	5	10	5												0			1
Cat32	32 (ROAD 6 KR)	0.0053	25	35	40	5	5	5												0			1
Cat33	33 (ROAD 4A WEST)	0.5133	25	35	40	5	10	5												0			1
Cat34	34 (ROAD 4A WEST)	0.5533	25	35	40	5	10	5												0			1
Cat35	35 (ROAD 6 KR)	0.0421	25	35	40	5	5	5												0			1
Cat36	36 (ROAD 6 KR)	0.193	25	35	40	5	10	5												0			1
Cat37	37 (1/3)	0.1757	25	35	40	5	5	5												0			1
Cat39	39 (1/2)	0.1013	30	20	50	5	5	5												0			1
Cat40	40 (ROAD 5 SPOON)	0.5122	25	35	40	5	10	5												0			1
Cat41	41 (ROAD 5 SPOON)	0.1131	25	35	40	5	5	5												0			1
Cat42	42 (ROAD 5 WEST)	0.5078	25	35	40	5	10	5												0			1
Cat43	43 (ROAD 5 OUT)	0.1072	25	35	40	5	10	5												0			1
Cat44	44 (ROAD 7 SPOON)	0.0147	25	35	40	5	10	5												0			1
Cat45	45 (ROAD 7 WEST)	0.409	25	35	40	5	10	5												0			1
Cat46	46 (ROAD 7 WEST)	0.4872	25	35	40	5	10	5												0			1
Cat47	47 (ROAD 7 SPOON)	0.0283	25	35	40	5	5	5												0			1
Cat48	48 (ROAD 7 OUT)	0.0054	25	35	40	5	5	5												0			1

PIPE DETAILS																						
Name	From	To	Length	U/S IL	D/S IL	Slope	Type	Dia	I.D.	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg	Rl	Chg	RL	etc			
			(m)	(m)	(m)	(%)		(mm)	(mm)						(m)	(m)	(m)	(m)	(m)			
1/3-2	37 (1/3)	39 (1/2)	15.456	551.245	551.168	0.5	Concrete,	450	450	0.3	NewFixed	1	37 (1/3)	0								
1/2-1	39 (1/2)	DN5	9.512	551.148	551.1	0.5	Concrete,	450	450	0.3	Existing	1	39 (1/2)	0								
4/2-1	07 (4/2)	08 (4/1)	15.084	551.945	551.865	0.53	Concrete,	375	375	0.3	Existing	1	07 (4/2)	0								
4/1-2/1	08 (4/1)	DN1	36.434	551.845	551.66	0.51	Concrete,	375	375	0.3	Existing	1	08 (4/1)	0								
2/4-3	09 (2/4)	10 (2/3)	11.256	552.09	552.03	0.53	Concrete,	300	300	0.3	Existing	1	09 (2/4)	0								
2/3-1	10 (2/3)	MH (2/2)	38.225	552.01	551.815	0.51	Concrete,	375	375	0.3	Existing	1	10 (2/3)	0								
2/2-1	MH (2/2)	DN2	26.338	551.795	551.66	0.51	Concrete,	375	375	0.3	Existing	1	MH (2/2)	0								
3/2-1	14 (3/2)	13 (3/1)	11.303	552.03	551.97	0.53	Concrete,	300	300	0.3	Existing	1	14 (3/2)	0								
3/1-2/2	13 (3/1)	MH (2/2)	25.938	551.95	551.815	0.52	Concrete,	300	300	0.3	Existing	1	13 (3/1)	0								
PS820	H01 (403)	01 (ROAD 1 OUT PIT)	33.218	552.27	552.02	0.75	Concrete,	300	300	0.3	Existing	1	H01 (403)	0								
PS823	01 (ROAD 1 OUT PIT)	02 (ROAD 1 OUT PIT)	12.69	552	551.9	0.79	Concrete,	375	375	0.3	Existing	1	01 (ROAD 1	0								
PS826	02 (ROAD 1 OUT PIT)	DNH4	49.992	551.88	551.65	0.46	Concrete,	375	375	0.3	Existing	1	02 (ROAD 1	0								
PS832	H03 (305)	H04 (304)	19.972	552.248	552.169	0.4	Concrete,	300	300	0.3	Existing	1	H03 (305)	0								
PS835	H04 (304)	H05 (303)	13.971	552.019	551.949	0.5	Box culver	0.9W x 0.45H		0.3	Existing	1	H04 (304)	0								
PS836	H05 (303)	H-MH (302)	17.287	551.919	551.832	0.5	Box culver	0.9W x 0.45H		0.3	Existing	1	H05 (303)	0								
PS859	H-MH (302)	DNH2	30.45	551.802	551.65	0.5	Box culver	0.9W x 0.45H		0.3	Existing	1	H-MH (302	0								
PS844	H06 (109)	H07 (108)	6.25	551.82	551.755	1.04	Concrete,	300	300	0.3	Existing	1	H06 (109)	0								
PS873	H07 (108)	SWALE 1	5.625	551.735	551.707	0.5	Concrete,	300	300	0.3	Existing	1	H07 (108)	0								
PS848	H10 (103)	H11 (102)	6.25	551.625	551.562	1.01	Concrete,	300	300	0.3	Existing	1	H10 (103)	0								
PS870	H11 (102)	SWALE 3	5.625	551.542	551.513	0.52	Concrete,	300	300	0.3	Existing	1	H11 (102)	0								
PS996	HW3	HARRIS OUT	20	551.4	551.296	0.52	Box culver	1.2W x 0.9H		0.3	Existing	1	HW3	0								
PS829	H02 (601)	DNH3	103.729	552.15	551.65	0.48	Box culver	0.9W x 0.45H		0.3	Existing	1	H02 (601)	0								
PS923	H09 (112)	H08 (111)	6.25	551.82	551.755	1.04	Concrete,	300	300	0.3	Existing	1	H09 (112)	0								
PS919	H08 (111)	SWALE 2	5.625	551.735	551.707	0.5	Concrete,	300	300	0.3	Existing	1	H08 (111)	0								
PS944	H13 (106)	H12 (105)	6.25	551.625	551.562	1.01	Concrete,	300	300	0.3	Existing	1	H13 (106)	0								
PS941	H12 (105)	SWALE 4	5.625	551.542	551.513	0.52	Concrete,	300	300	0.3	Existing	1	H12 (105)	0								

DETAILS of SERVICES CROSSING PIPES																						
Pipe	Chg	Bottom	Height of Service	Chg	Bottom	Height of S	Chg	Bottom	Height of S	etc												
	(m)	Elev (m)	(m)	(m)	Elev (m)	(m)	(m)	Elev (m)	(m)	etc												

CHANNEL DETAILS																						
Name	From	To	Type	Length	U/S IL	D/S IL	Slope	Base Width	L.B. Slope	R.B. Slope	Manning	Depth	Roofed									
				(m)	(m)	(m)	(%)	(m)	(1:?)	(1:?)	n	(m)										
2/1-1/3	DN3	DN4	Prismatic	237.741	551.826	551.245	0.24	0	4.5	4.5	0.15	0.8	No									

OVERFLOW ROUTE DETAILS																						
Name	From	To	Travel	Spill	Crest	Weir	Cross	Safe Depth	SafeDepth	Safe	Bed	D/S Area		id								
			Time	Level	Length	Coeff. C	Section	Major Stor	Minor Stor	DxV	Slope	Contributing										
			(min)	(m)	(m)			(m)	(m)	(sq.m/sec)	(%)	%										

KILGARIFF - Pit and Node Table

KILGARIFF DRAINAGE ANALYSIS

Node/Pit and Catchment Inputs

PIT / NODE DETAILS			Version 13																				
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph								
OF82	03 (ROAD 1 SPOON)	02 (ROAD 1 OUT PIT)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		265			22						
OF81	04 (ROAD 1 SPOON)	03 (ROAD 1 SPOON)	0.3				SPOON	0.3	0.15	0.4	0.52	80		264			27.3						
OF43	05 (ROAD 1 SPOON)	06 (ROAD 1 SPOON)	0.3				SPOON	0.3	0.15	0.4	0.51	80		177			26						
OF50	06 (ROAD 1 SPOON)	08 (4/1)	0.7				KILGARIFF	0.3	0.15	0.4	0.51	100		194			46.4						
OF167	11 (ROAD 4A EAST)	33 (ROAD 4A WEST)	1.7				KILGARIFF	0.3	0.15	0.4	0.5	100		539			114						
OF168	12 (ROAD 4B EAST)	34 (ROAD 4A WEST)	1.7				KILGARIFF	0.3	0.15	0.4	0.5	100		540			114.8						
OF96	16 (ROAD 1 SPOON)	17 (ROAD 1 SPOON)	0.3				SPOON	0.3	0.15	0.4	0.52	80		326			29.4						
OF97	17 (ROAD 1 SPOON)	18 (ROAD 1 SPOON)	0.9				KILGARIFF	0.3	0.15	0.4	0.52	100		327			62.7						
OF98	18 (ROAD 1 SPOON)	19 (ROAD 1 SPOON)	0.3				SPOON	0.3	0.15	0.4	0.52	80		328			26.7						
OF99	19 (ROAD 1 SPOON)	20 (ROAD 1 OUT)	0.5				KILGARIFF	0.3	0.15	0.4	0.52	100		329			30						
OF109	22 (ROAD 2 WEST)	26 (ROAD 2 OUT)	0.1				KILGARIFF	0.3	0.15	0.4	2.2	40		363			10.5						
OF111	23 (ROAD 2 SPOON)	24 (ROAD 2 SPOON)	1.2				SPOON	0.3	0.15	0.4	0.52	80		365			118.2						
OF112	24 (ROAD 2 SPOON)	25 (ROAD 2 WEST)	0.2				KILGARIFF	0.3	0.15	0.4	0.52	100		366			11.4						
OF110	25 (ROAD 2 WEST)	26 (ROAD 2 OUT)	0.1				KILGARIFF	0.3	0.15	0.4	2.2	60		364			10						
OF213	27 (ROAD 6 SPOON)	30 (ROAD 6 SPOON)	0.3				SPOON	0.3	0.15	0.4	0.5	25		637			25.3						
OF322	28 (ROAD 3 WEST)	30 (ROAD 6 SPOON)	0.1				SPOON	0.3	0.15	0.4	1.93	50		904			16						
OF151	29 (ROAD 3 WEST)	30 (ROAD 6 SPOON)	0.1				KILGARIFF	0.3	0.15	0.4	2.41	25		514			11.9						
OF152	30 (ROAD 6 SPOON)	32 (ROAD 6 KR)	0.9				KILGARIFF	0.3	0.15	0.4	0.5	100		515			61.5						
OF174	31 (ROAD 6 KR)	39 (1/2)	0.2				KILGARIFF	0.3	0.15	0.4	0.5	40		551			14.4						
OF170	32 (ROAD 6 KR)	DN4	0.2				SPOON	0.3	0.15	0.4	0.5	25		542			20.1						
OF169	33 (ROAD 4A WEST)	DN4	0.1				4 m wide g	0.3	0.15	0.4	0.5	25		541			14						
OF171	34 (ROAD 4A WEST)	DN4	0.1				4 m wide g	0.3	0.15	0.4	25	25		543			14						
OF173	35 (ROAD 6 KR)	DN4	0.2				SPOON	0.3	0.15	0.4	0.5	25		545			19.6						
OF175	36 (ROAD 6 KR)	39 (1/2)	0.4				KILGARIFF	0.3	0.15	0.4	0.5	60		552			27.3						
OF337	37 (1/3)	39 (1/2)	0.1	552	5	1.7	4 m wide g	0.3	0.15	0.4	3	100		1088			20						
OF380	39 (1/2)	DN5	0.2				Channel se	0.09	0.03	1	0.5	100		3856			10						
OF192	40 (ROAD 5 SPOON)	41 (ROAD 5 SPOON)	0.2				SPOON	0.3	0.15	0.4	0.6	80		569			20.2						
OF187	41 (ROAD 5 SPOON)	43 (ROAD 5 OUT)	0.1				KILGARIFF	0.3	0.15	0.4	3.26	60		564			16.6						
OF186	42 (ROAD 5 WEST)	43 (ROAD 5 OUT)	0.2				KILGARIFF	0.3	0.15	0.4	3.26	40		563			20						
OF182	44 (ROAD 7 SPOON)	47 (ROAD 7 SPOON)	0.2				SPOON	0.3	0.15	0.4	0.825	50		559			17.7						
OF185	45 (ROAD 7 WEST)	47 (ROAD 7 SPOON)	0.1				4 m wide g	0.3	0.15	0.4	2.61	25		562			12.7						
OF184	46 (ROAD 7 WEST)	47 (ROAD 7 SPOON)	0.1				KILGARIFF	0.3	0.15	0.4	2.61	25		561			16.1						
OF183	47 (ROAD 7 SPOON)	48 (ROAD 7 OUT)	0.1				7.5 m road	0.3	0.15	0.4	1.356	100		560			4.1						
OF363	DN1	DN3	0.1				4 m wide g	0.3	0.15	0.4	0.5	100		1206			5						
OF364	DN2	DN3	0.1				4 m wide g	0.3	0.15	0.4	0.5	100		1207			5						
OF378	DN4	37 (1/3)	0.2				Swale with	0.45	0.3	1	0.5	100		1239			10						
OF43356	DNH1	H02 (601)	0.3				Swale with	0.15	0.1	1	0.52	100		922639			10						
OF41882	DNH2	HARRIS CHANNEL	0.1				4 m wide g	0.3	0.15	0.4	0.52	100		777083			1						
OF41885	DNH3	HARRIS CHANNEL	0.1				4 m wide g	0.3	0.15	0.4	0.52	100		777086			1						
OF41888	DNH4	HARRIS CHANNEL	0.1				4 m wide g	0.3	0.15	0.4	0.52	100		777089			1						
OF41982	H14 (SWALE)	HW3	0.1				Swale with	0.15	0.1	1	0.52	100		777414			1						
OF41891	HARRIS CHANNEL	H14 (SWALE)	5.5				Swale with	0.15	0.1	1	0.52	60		777092			141						
OF41874	HARRIS WEST 1	H04 (304)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		777075			25						
OF41877	HARRIS WEST 2	H05 (303)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		777078			25						
OF94	HP (ROAD 1 EAST 2)	21 (ROAD 1 OUT)	2.5				KILGARIFF	0.3	0.15	0.4	0.52	100		324			163						
OF27	HP (ROAD 1 EAST)	01 (ROAD 1 OUT PIT)	1.5				KILGARIFF	0.3	0.15	0.4	0.52	100		146			102						
OF95	HP (ROAD 1 WEST 2)	16 (ROAD 1 SPOON)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		325			23.1						
OF80	HP (ROAD 1 WEST)	04 (ROAD 1 SPOON)	0.7				KILGARIFF	0.3	0.15	0.4	0.52	100		263			47.8						
OF108	HP (ROAD 2 NORTH)	22 (ROAD 2 WEST)	2.1				KILGARIFF	0.3	0.15	0.4	0.51	100		362			147						
OF107	HP (ROAD 2 SOUTH)	23 (ROAD 2 SPOON)	1.7				KILGARIFF	0.3	0.15	0.4	0.51	100		361			116						
OF149	HP (ROAD 3 NORTH)	28 (ROAD 3 WEST)	1.7				KILGARIFF	0.3	0.15	0.4	0.52	100		512			117.6						
OF150	HP (ROAD 3 SOUTH)	29 (ROAD 3 WEST)	1.6				KILGARIFF	0.3	0.15	0.4	0.52	100		513			115.7						
OF190	HP (ROAD 5 NORTH)	40 (ROAD 5 SPOON)	1.5				KILGARIFF	0.3	0.15	0.4	0.6	100		567			115.6						
OF191	HP (ROAD 5 SOUTH)	42 (ROAD 5 WEST)	1.7				KILGARIFF	0.3	0.15	0.4	0.6	100		568			133.1						
OF176	HP (ROAD 6 EAST 2)	35 (ROAD 6 KR)	0.7				KILGARIFF	0.3	0.15	0.4	0.6	100		553			49.9						
OF145	HP (ROAD 6 EAST)	27 (ROAD 6 SPOON)	0.7				KILGARIFF	0.3	0.15	0.4	0.5	100		506			49.6						
OF193	HP (ROAD 6 WEST 2)	41 (ROAD 5 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	2.33	20		570			20.9						
OF144	HP (ROAD 6 WEST)	24 (ROAD 2 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	2.77	20		505			22						
OF180	HP (ROAD 7 NORTH)	45 (ROAD 7 WEST)	1.4				KILGARIFF	0.3	0.15	0.4	0.63	100		557			107.8						
OF181	HP (ROAD 7 SOUTH)	46 (ROAD 7 WEST)	1.4				KILGARIFF	0.3	0.15	0.4	0.63	100		558			108.1						
OF74	HP (ROUNABOUT 2)	10 (2/3)	0.1				KILGARIFF	0.3	0.15	0.4	1.24	100		251			12.5						
OF79	HP (ROUNDABOUT 1)	09 (2/4)	0.1				KILGARIFF	0.3	0.15	0.4	1.24	100		261			12						
OF53	HP (ROUNDABOUT 3)	11 (ROAD 4A EAST)	0.1				KILGARIFF	0.3	0.15	0.4	1	100		197			14.5						
OF61	HP (ROUNDABOUT 4)	12 (ROAD 4B EAST)	0.1				KILGARIFF	0.3	0.15	0.4	1	100		228			14.5						
OF41867	HP01 (HARRIS)	H03 (305)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		777060			30						
OF41863	HP02 (HARRIS)	H01 (403)	0.3				KILGARIFF	0.3	0.15	0.4	0.52	100		777034			30						
OF45600	HP03 (HARRIS)	H06 (109)	0.8				KILGARIFF	0.15	0.15	0.4	1.112	50		1132909			60						
OF45598	HP04 (HARRIS)	H07 (108)	0.8				KILGARIFF	0.15	0.15	0.4	1.112	50		1132907			45						
OF45596	HP05 (HARRIS)	H08 (111)	0.8				KILGARIFF	0.15	0.15	0.4	1.112	50		1132905			45						
OF45587	HP06 (HARRIS)	H09 (112)	0.8				KILGARIFF	0.15	0.15	0.4	1.112	50		1132896			60						
OF41939	HP07 (HARRIS)	H06 (109)	0.8				KILGARIFF	0.15	0.15	0.4	1.29	50		777158			60						
OF42005	HP08 (HARRIS)	H07 (108)	0.8				KILGARIFF	0.15	0.15	0.4	1.29	50		777441			60						
OF42017	HP09 (HARRIS)	H08 (111)	0.8				KILGARIFF	0.15	0.15	0.4	1.29	50		777461			60						
OF42015	HP10 (HARRIS)	H09 (112)	0.8				KILGARIFF	0.15	0.15	0.4	1.29	50		777459			60						
OF41936	HP11 (HARRIS)	H10 (103)	0.9				KILGARIFF	0.15	0.15	0.4	0.859	30		777155			60						
OF45550	HP12 (HARRIS)	H11 (102)	2.6				KILGARIFF	0.15	0.15	0.4	0.859	30		1132846			60						
OF45552	HP13 (HARRIS)	H12 (105)	2.6				KILGARIFF	0.15	0.15	0.4	0.859	30		1132848			60						
OF45554	HP14 (HARRIS)	H13 (106)	0.9				KILGARIFF	0.15	0.15	0.4	0.859	30		1132850			60						
OF45560	HP15 (HARRIS)	H10 (103)	1.8				KILGARIFF	0.15	0.15	0.4	0.793	70		1132857			120						
OF45571	HP16 (HARRIS)	H11 (102)	5.5				KILGARIFF	0.15	0.15	0.4	0.793	70		1132871			120						

KILGARIFF - Pit and Node Table

KILGARIFF DRAINAGE ANALYSIS

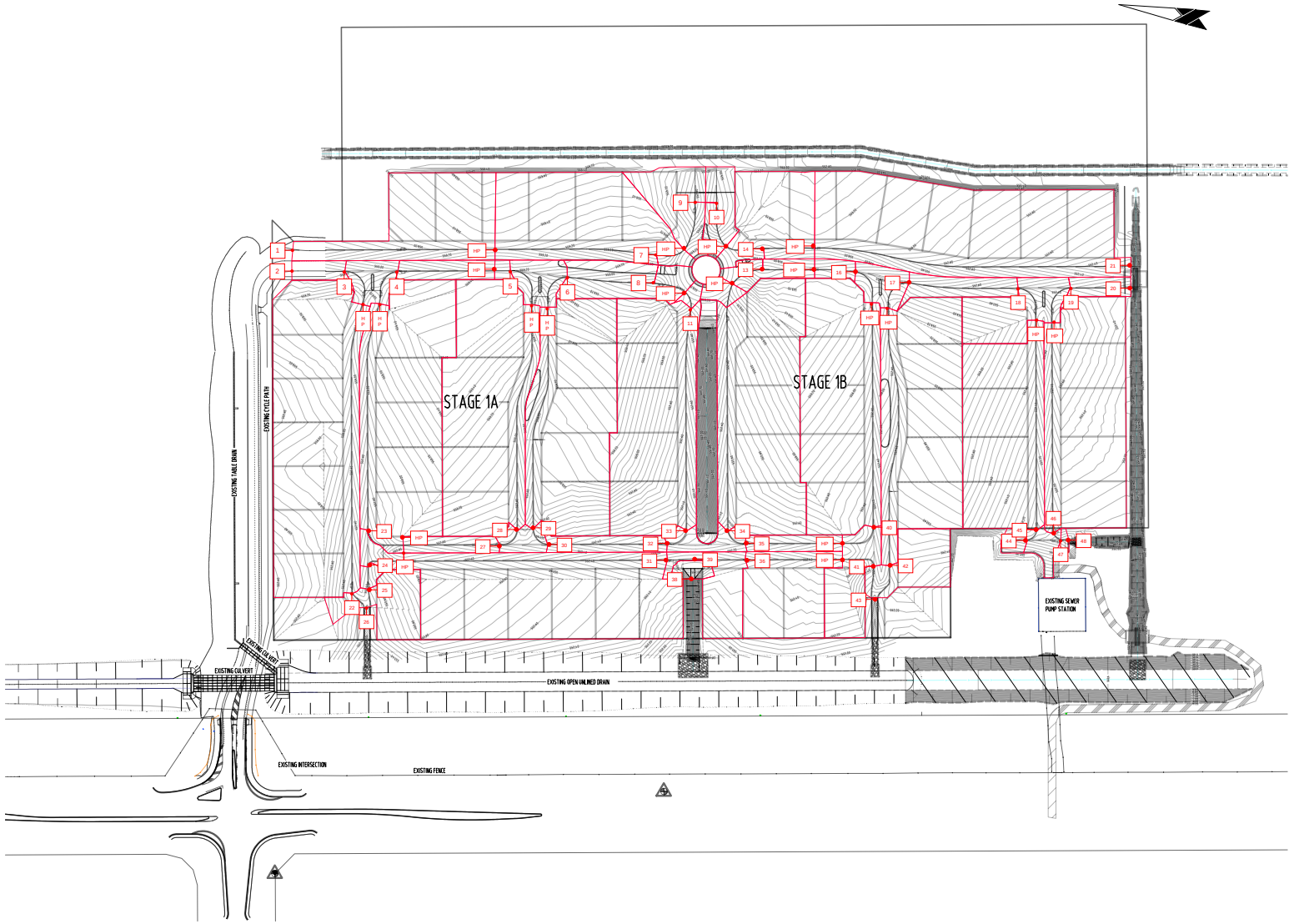
Node/Pit and Catchment Inputs

PIT / NODE DETAILS			Version 13																				
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph								
OF45574	HP17 (HARRIS)	H12 (105)	5.5				KILGARIFF	0.15	0.15	0.4	0.793	70		1132874			120						
OF45576	HP18 (HARRIS)	H13 (106)	1.8				KILGARIFF	0.15	0.15	0.4	0.793	70		1132876			120						
OF36	HPN1	07 (4/2)	1.3				KILGARIFF	0.3	0.15	0.4	0.51	100		157			85						
OF177	HPN10	36 (ROAD 6 KR)	0.7				KILGARIFF	0.3	0.15	0.4	0.6	100		554			50						
OF37	HPN2	05 (ROAD 1 SPOON)	0.1				KILGARIFF	0.3	0.15	0.4	0.51	100		158			8.5						
OF71	HPN3	14 (3/2)	0.3				KILGARIFF	0.3	0.15	0.4	0.72	100		248			25.8						
OF62	HPN4	13 (3/1)	0.3				KILGARIFF	0.3	0.15	0.4	0.72	100		229			26.4						
OF30	HPN5	03 (ROAD 1 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	3.02	20		150			27						
OF148	HPN6	06 (ROAD 1 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	2.39	20		511			24.5						
OF189	HPN7	17 (ROAD 1 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	2.49	20		566			23.2						
OF179	HPN8	19 (ROAD 1 SPOON)	0.2				KILGARIFF	0.3	0.15	0.4	2.42	20		556			28.2						
OF166	HPN9	31 (ROAD 6 KR)	1.9				KILGARIFF	0.3	0.15	0.4	0.5	100		538			135.5						
OF42022	HW3	HARRIS OUT	0.2	552.5	10	2	4 m wide g	0.3	0.15	0.4	0.5	100		777475			20						
OF41895	SWALE 1	H14 (SWALE)	4.9				Swale with	0.15	0.1	1	0.52	10		777096			125						
OF41899	SWALE 2	H14 (SWALE)	4.9				Swale with	0.15	0.1	1	0.52	10		777100			125						
OF41905	SWALE 3	H14 (SWALE)	1.4				Swale with	0.15	0.1	1	0.52	10		777106			37						
OF41902	SWALE 4	H14 (SWALE)	1.4				Swale with	0.15	0.1	1	0.52	10		777103			37						

PIPE COVER DETAILS						
Name	Type	Dia (mm)	Safe Cover (m)	Cover (m)		
1/3-2	Concrete, under roads, 0.5% minimum slope	450	0.6	0.26	Unsafe	
1/2-1	Concrete, under roads, 0.5% minimum slope	450	0.6	-0.59	Unsafe	
4/2-1	Concrete, under roads, 0.5% minimum slope	375	0.6	0.62		
4/1-2/1	Concrete, under roads, 0.5% minimum slope	375	0.6	-0.41	Unsafe	
2/4-3	Concrete, under roads, 0.5% minimum slope	300	0.6	0.47	Unsafe	
2/3-1	Concrete, under roads, 0.5% minimum slope	375	0.6	0.47	Unsafe	
2/2-1	Concrete, under roads, 0.5% minimum slope	375	0.6	-0.41	Unsafe	
3/2-1	Concrete, under roads, 0.5% minimum slope	300	0.6	0.61		
3/1-2/2	Concrete, under roads, 0.5% minimum slope	300	0.6	0.69		
P5820	Concrete, under roads, 0.5% minimum slope	300	0.6	0.38	Unsafe	
P5823	Concrete, under roads, 0.5% minimum slope	375	0.6	0.41	Unsafe	
P5826	Concrete, under roads, 0.5% minimum slope	375	0.6	-0.41	Unsafe	
P5832	Concrete, under roads, 0.5% minimum slope	300	0.6	0.44	Unsafe	
P5835	Box culverts (samples)	0	0.6	0.46	Unsafe	
P5836	Box culverts (samples)	0	0.6	0.54	Unsafe	
P5859	Box culverts (samples)	0	0.6	-0.46	Unsafe	
P5844	Concrete, under roads, 0.5% minimum slope	300	0.6	0.46	Unsafe	
P5873	Concrete, under roads, 0.5% minimum slope	300	0.6	-0.33	Unsafe	
P5848	Concrete, under roads, 0.5% minimum slope	300	0.6	0.48	Unsafe	
P5870	Concrete, under roads, 0.5% minimum slope	300	0.6	-0.33	Unsafe	
P5996	Box culverts (samples)	0	0.6	0.07	Unsafe	
P5829	Box culverts (samples)	0	0.6	-0.46	Unsafe	
P5923	Concrete, under roads, 0.5% minimum slope	300	0.6	0.46	Unsafe	
P5919	Concrete, under roads, 0.5% minimum slope	300	0.6	-0.33	Unsafe	
P5944	Concrete, under roads, 0.5% minimum slope	300	0.6	0.48	Unsafe	
P5941	Concrete, under roads, 0.5% minimum slope	300	0.6	-0.33	Unsafe	

This model has no pipes with non-return valves

Appendix B. Sub-Catchment Allocation



WARNING
BEWARE OF SERVICES
The locations of all existing services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

0 10 20 30 40 50

AS CONSTRUCTED

No.	DESCRIPTION	DATE	INIT.	DEPT/COMPANY
1	AS CONSTRUCTED	9/01/2015	RK	SKM

AMENDMENTS

SKM

A.C.N 001 024 095
Sinclair Knight Merz Pty. Ltd.
Level 2, 23-25 Parap Road
Parap, Darwin
NT 0820 AUSTRALIA

DB05922
Tel: +61 8 8982 4800
Fax: +61 8 8982 4840
Web: www.skmconsulting.com

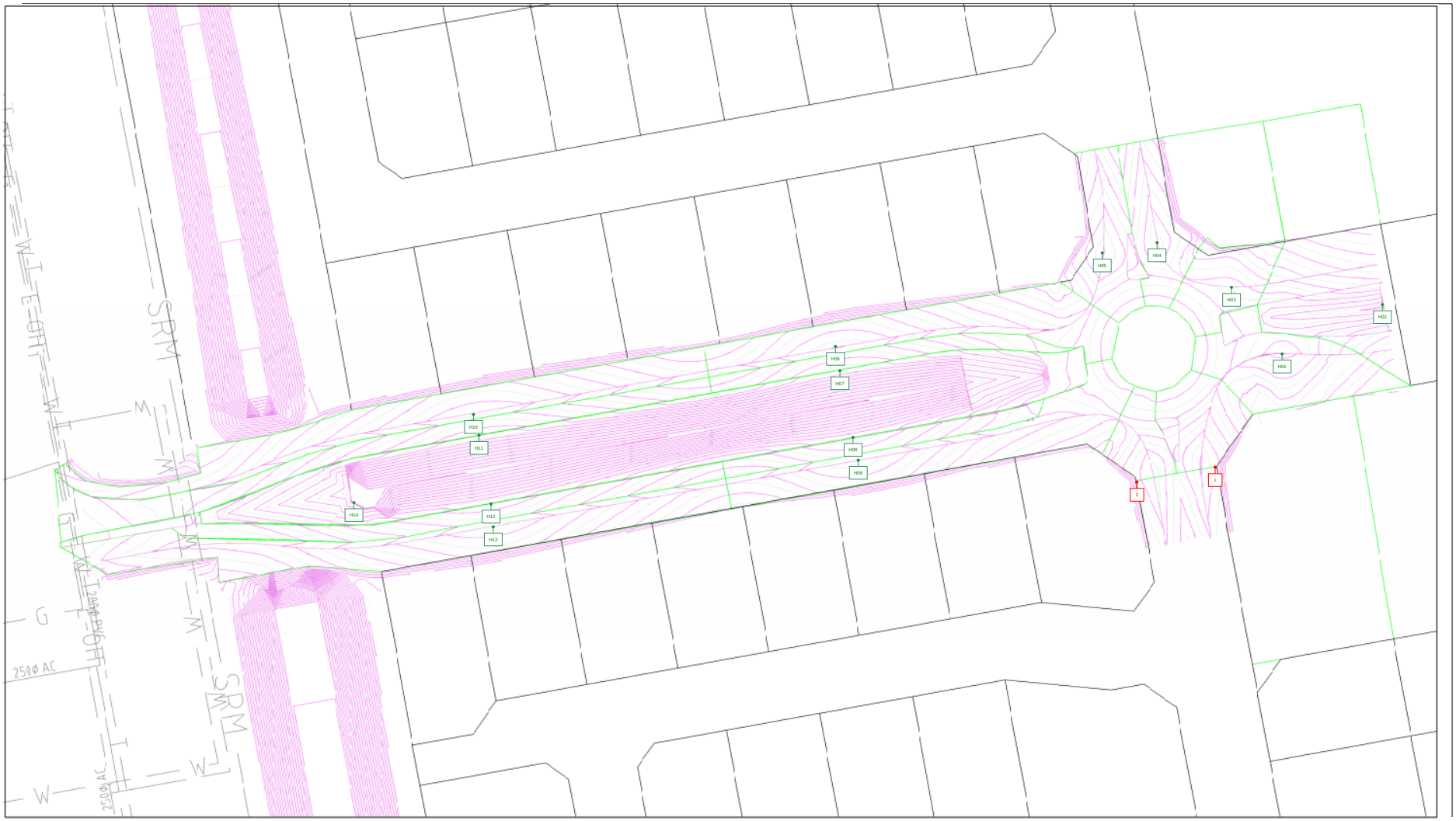
DRAWN KH	CHECKED
DATE 21/03/2014	DATE
DESIGNED RP	CHECKED
DATE 21/03/2014	DATE
DESIGN PROJECT LEADER	PROJECT OFFICER
DATE	DATE

\\Reference Stage TLDC Logo_Mono.tif

SOUTHERN REGION - ALICE SPRINGS
KILGARIFF SUBDIVISION STAGE 1A

GENERAL ARRANGEMENT PLAN

FILE No.	ASSET No.	SHEET No.	DRAWING No.	AMEND.	SHEET SIZE
		3 OF 59	R13-2897	1	A1



KILGARIFF CATCHMENT PLAN
STAGE2 - HARRIS AVENUE

Appendix C. Catchment Percentage Plan


G
5,280.3 sq m
G
8,823.5 sq m
Welton Parade
Welton Parade
Welton Parade
Welton Parade
Cawood Street
Cawood Street
Facelli Street
G
4,204.7 sq m
G
8,804.4 sq m
G
10,437.2 sq m
Harris Avenue
Harris Avenue
Harris Avenue
Cramer Street
Cramer Street
Burrows Street
G
10,380 sq m
G
8,586.8 sq m
Miethke Street
Hanrahan Street
Hanrahan Street
Hanrahan Street
G
7,728.4 sq m
G
11,066.1 sq m
G
114,354.8 sq m

9.6

Appendix D. Analysis Results

KILGARIFF SUBDIVISION ANALYSIS

IFD DATA USED: 2012

ARI/AEP: 5 Year

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
01 (ROAD 1 OUT PIT)	552.2	552.93		0.042	0.9	0.62	Inlet Capacity
02 (ROAD 1 OUT PIT)	552.1	552.92		0.026	0.6	0.74	Inlet Capacity
07 (4/2)	552.18	553.12		0.081	1.7	0.79	Inlet Capacity
08 (4/1)	552.11	553.02		0.039	0.8	0.81	Inlet Capacity
09 (2/4)	552.24	552.97		0.024	0.6	0.66	Inlet Capacity
10 (2/3)	552.18	552.94		0.014	0.3	0.71	Inlet Capacity
13 (3/1)	552.15	553.01		0.011	0.3	0.82	Inlet Capacity
14 (3/2)	552.21	553.06		0.032	0.7	0.76	Inlet Capacity
37 (1/3)	552.07			0.432		-0.07	0.164 Headwall height/system capacity
39 (1/2)	551.91	552.18		0.306	1.7	0.12	0.245 Inlet Capacity
DN1	551.88			0			
DN2	551.85			0			
DN3	552.32			0.177			
DN4	551.39			0.4			
DN5	551.5			0.245			
DNH2	551.7			0			
DNH3	551.65			0			
DNH4	551.85			0			
H01 (403)	552.37	553.03		0.012	0.3	0.62	Inlet Capacity
H02 (601)	552.15			0.042		2.85	None
H03 (305)	552.37	553.13		0.019	0.5	0.7	Inlet Capacity
H04 (304)	552.08	553		0.015	0.4	0.86	Inlet Capacity
H05 (303)	551.99	552.96		0.01	0.2	0.93	Inlet Capacity
H06 (109)	551.94	552.69		0.019	0.5	0.69	Inlet Capacity
H07 (108)	551.88	552.57		0.007	0.2	0.66	Inlet Capacity
H08 (111)	551.88	552.57		0.007	0.2	0.66	Inlet Capacity
H09 (112)	551.94	552.7		0.019	0.5	0.69	Inlet Capacity
H10 (103)	551.77	552.53		0.023	0.5	0.69	Inlet Capacity
H11 (102)	551.72	552.43		0.016	0.4	0.65	Inlet Capacity
H12 (105)	551.7	552.4		0.007	0.2	0.67	Inlet Capacity
H13 (106)	551.76	552.54		0.025	0.6	0.7	Inlet Capacity
HARRIS OUT	551.43			0			
H-MH (302)	551.87	553.1		0	0	1.23	None
HW3	551.64			0.241		0.86	0 None
MH (2/2)	552.02			0		1.58	None
SWALE 1	551.82			0			
SWALE 2	551.82			0			
SWALE 3	551.65			0			
SWALE 4	551.64			0			

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat H01	0.012	0.004	0.008	5		10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat H02	0.042	0.014	0.028	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H03	0.019	0.007	0.013	5		10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat H04	0.015	0.004	0.011	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H05	0.01	0.003	0.007	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H06	0.019	0.006	0.014	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H07	0.007	0.002	0.005	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H08	0.007	0.002	0.005	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H09	0.019	0.006	0.014	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H10	0.023	0.007	0.016	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H11	0.016	0.005	0.012	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H12	0.007	0.002	0.005	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H13	0.025	0.007	0.018	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat H14	0.068	0.02	0.048	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat01	0.042	0.015	0.028	5		10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat02	0.007	0.002	0.005	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat03	0.008	0.003	0.006	5		10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat04	0.011	0.003	0.007	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat05	0.002	0.001	0.001	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat06	0.011	0.003	0.008	5		5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

Kilgariff - Analysis Results

Cat07	0.081	0.024	0.057	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat08	0.025	0.007	0.018	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat09	0.024	0.007	0.017	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat10	0.014	0.004	0.01	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat11	0.002	0.001	0.001	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat12	0.004	0.002	0.003	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat13	0.011	0.003	0.008	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat14	0.032	0.011	0.022	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat16	0.004	0.001	0.003	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat17	0.01	0.003	0.007	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat18	0.013	0.004	0.009	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat19	0.027	0.008	0.019	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat20	0.007	0.002	0.005	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat21	0.118	0.042	0.079	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat22	0.119	0.042	0.08	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat23	0.095	0.034	0.063	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat24	0.005	0.002	0.004	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat25	0.002	0.001	0.002	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat26	0.022	0.006	0.016	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat27	0.009	0.003	0.006	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat28	0.092	0.033	0.062	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat29	0.085	0.03	0.057	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat30	0.005	0.002	0.003	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat31	0.098	0.035	0.066	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat32	0.001	0	0.001	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat33	0.085	0.03	0.057	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat34	0.092	0.033	0.061	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat35	0.009	0.003	0.006	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat36	0.032	0.011	0.021	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat37	0.037	0.011	0.026	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat39	0.022	0.007	0.014	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat40	0.085	0.03	0.057	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat41	0.024	0.007	0.017	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat42	0.084	0.03	0.056	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat43	0.018	0.006	0.012	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat44	0.002	0.001	0.002	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat45	0.068	0.024	0.045	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat46	0.081	0.029	0.054	5	10	5 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
Cat47	0.006	0.002	0.004	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
Cat48	0.001	0	0.001	5	5	5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

Outflow Volumes for Total Catchment (7.06 impervious + 3.73 pervious = 10.8 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 5 year, 5 minutes storr	808.6	348.33 (43.1%)	176.23 (33.3%)	172.10 (61.6%)
AR&R 5 year, 10 minutes sto	1261.02	733.50 (58.2%)	290.02 (35.1%)	443.49 (101.8%)
AR&R 5 year, 20 minutes sto	1921.21	1290.38 (67.2%)	456.07 (36.3%)	834.31 (125.7%)
AR&R 5 year, 30 minutes sto	2390.72	1654.80 (69.2%)	574.16 (36.7%)	1080.65 (130.8%)
AR&R 5 year, 1 hour storm, a	3291.96	2362.21 (71.8%)	800.83 (37.2%)	1561.38 (137.3%)
AR&R 5 year, 2 hours storm,	4295.46	3101.32 (72.2%)	1053.23 (37.5%)	2048.09 (138.0%)
AR&R 5 year, 3 hours storm,	4921.75	3495.90 (71.0%)	1210.76 (37.6%)	2285.14 (134.4%)
AR&R 5 year, 6 hours storm,	6185.1	4174.35 (67.5%)	1528.49 (37.8%)	2645.85 (123.8%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.268	1.68	552	551.909	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
1/2-1	0.33	2.23	551.595	551.496	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
4/2-1	0.062	1.14	552.131	552.109	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
4/1-2/1	0.099	2.32	551.999	551.879	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
2/4-3	0.024	1.04	552.198	552.179	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
2/3-1	0.037	1.15	552.134	552.023	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
2/2-1	0.078	2.18	551.93	551.848	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
3/2-1	0.032	1	552.169	552.151	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
3/1-2/2	0.042	1.22	552.097	552.023	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5820	0.012	0.98	552.338	552.197	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5823	0.053	1.49	552.135	552.105	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5826	0.079	2.4	552.006	551.846	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5832	0.019	1.36	552.324	552.272	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5835	0.034	1.07	552.054	551.994	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5836	0.043	1.14	551.961	551.884	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5859	0.043	1.16	551.843	551.702	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5844	0.019	1.26	551.899	551.879	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5873	0.026	1.26	551.834	551.822	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

Kilgariff - Analysis Results

P5848	0.022	0.99	551.732	551.724	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5870	0.039	1.37	551.668	551.654	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5996	0.241	1.55	551.53	551.425	AR&R 5 year, 2 hours storm, average 19.9 mm/h, Zone 5
P5829	0	0	552.151	551.651	AR&R 5 year, 20 minutes storm, average 53.4 mm/h, Zone 5
P5923	0.019	1.26	551.9	551.878	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5919	0.026	1.26	551.834	551.821	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5944	0.025	1.34	551.717	551.703	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
P5941	0.032	1.33	551.653	551.639	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.103	1.26	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5

OVERFLOW ROUTE DETAILS

conditionally formatted for flow width > 4.5m

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm	
OF107	0	0.095	0	0.112	0.06	3.48	0.57	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF108	0	0.119	0	0.121	0.07	3.81	0.6	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF109	0.119	0.127	0	0.098	0.1	2.94	1.07	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF110	0.101	0.113	0	0.094	0.1	2.8	1.05	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF111	0.095	0.098	0	0.083	0.05	4.49	0.63	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF112	0.099	0.101	0	0.114	0.07	3.56	0.58	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF144	0	0.001	0	0.02	0.01	0.2	0.52	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF145	0	0.009	0	0.053	0.02	1.3	0.34	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF148	0	0.002	0	0.028	0.02	0.35	0.58	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF149	0	0.092	0	0.111	0.06	3.44	0.57	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF150	0	0.085	0	0.108	0.06	3.33	0.56	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF151	0.085	0.086	0	0.085	0.09	2.46	1.02	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF152	0.19	0.191	0	0.142	0.09	4.6	0.66	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	Including layback kerb capacity flow does not overtop.
OF166	0	0.098	0	0.114	0.06	3.56	0.57	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF167	0.002	0.087	0	0.109	0.06	3.38	0.56	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF168	0.004	0.096	0	0.113	0.06	3.52	0.56	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF169	0.087	0.087	0	0.055	0.03	4	0.55	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF170	0.191	0.191	0	0.105	0.07	5.92	0.71	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	spoon drain - no issue
OF171	0.095	0.095	0	0.028	0.05	4	1.82	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF173	0.009	0.009	0	0.038	0.02	1.45	0.42	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF174	0.098	0.107	0	0.117	0.07	3.67	0.58	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF175	0.032	0.045	0	0.088	0.04	2.59	0.48	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF176	0	0.009	0	0.052	0.02	1.24	0.38	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF177	0	0.032	0	0.077	0.04	2.19	0.48	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF179	0	0.005	0	0.036	0.02	0.66	0.66	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF180	0	0.068	0	0.098	0.06	2.94	0.57	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF181	0	0.081	0	0.103	0.06	3.15	0.59	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF182	0.002	0.005	0	0.03	0.01	0.92	0.48	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF183	0.156	0.157	0	0.122	0.12	3.19	0.99	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF184	0.081	0.082	0	0.082	0.09	2.38	1.04	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF185	0.068	0.069	0	0.036	0.03	4	0.82	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF186	0.084	0.091	0	0.082	0.1	2.38	1.16	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF187	0.107	0.118	0	0.089	0.11	2.63	1.23	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF189	0	0.002	0	0.027	0.02	0.31	0.58	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF190	0	0.085	0	0.105	0.06	3.23	0.59	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF191	0	0.084	0	0.105	0.06	3.23	0.59	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF192	0.085	0.103	0	0.082	0.06	4.42	0.68	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF193	0	0.005	0	0.035	0.02	0.62	0.63	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF213	0.009	0.01	0	0.039	0.02	1.55	0.43	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF27	0	0.042	1.81799E+31	0.086	0.04	2.35	0.49	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF30	0	0.002	0	0.024	0.01	0.24	0.6	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF322	0.092	0.094	0	0.066	0.07	3.32	1.08	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF337	0.164	0.183	0	0.052	0.06	4	1.24	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF36	0	0.081	0	0.108	0.06	3.09	0.56	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF363	0.099	0.099	0	0.059	0.03	4	0.57	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF364	0.078	0.078	0	0.053	0.03	4	0.52	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF37	0	0.002	0	0.031	0.01	0.51	0.29	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF378	0.401	0.432	0	0.377	0.29	3.02	0.76	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF380	0.245	0.245	0	0.107	0.08	6.39	0.79	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	dummy overland flow from outlet - no issue
OF41863	0	0.012	0	0.057	0.02	1.38	0.39	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF41867	0	0.019	0	0.067	0.03	1.7	0.42	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF41874	0	0.015	0	0.061	0.02	1.53	0.4	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF41877	0	0.01	0	0.054	0.02	1.26	0.38	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF41882	0.043	0.043	0	0.041	0.02	4	0.42	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF41885	0	0	0	0	0	0	0		
OF41888	0.079	0.079	0	0.052	0.03	4	0.54	AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5	
OF41891	0.122	0.137	0	0.16	0.07	3.83	0.45	AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5	
OF41895	0.026	0.028	0	0.089	0.03	2.13	0.3	AR&R 5 year, 20 minutes storm, average 53.4 mm/h, Zone 5	
OF41899	0.026	0.028	0	0.089	0.03	2.13	0.3	AR&R 5 year, 20 minutes storm, average 53.4 mm/h, Zone 5	

OF41902	0.032	0.037	0	0.098	0.03	2.35	0.32 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF41905	0.039	0.044	0	0.105	0.04	2.51	0.34 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF41936	0	0.007	0	0.044	0.02	0.94	0.43 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF41939	0	0.01	0	0.046	0.03	1	0.55 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF41982	0.241	0.241	0	0.167	0.12	4	0.72 AR&R 5 year, 2 hours storm, average 19.9 mm/h, Zone 5
OF42005	0	0.003	0	0.074	0.02	0.32	0.29 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF42015	0	0.01	0	0.046	0.03	1	0.56 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF42017	0	0.003	0	0.073	0.02	0.32	0.29 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF42022	0	0	0	0	0	0	0
OF43	0.002	0.011	0	0.041	0.02	1.65	0.43 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF43356	0	0.042	0	0.103	0.03	2.46	0.33 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45550	0	0.005	0	0.091	0.02	0.4	0.27 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45552	0	0.002	0	0.066	0.01	0.29	0.22 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45554	0	0.008	0	0.045	0.02	0.98	0.45 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45560	0	0.016	0	0.059	0.03	1.43	0.48 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45571	0	0.012	0	0.126	0.04	0.56	0.33 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45574	0	0.005	0	0.092	0.02	0.41	0.26 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45576	0	0.018	0	0.06	0.03	1.49	0.5 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45587	0	0.01	0	0.047	0.02	1.04	0.52 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45596	0	0.003	0	0.075	0.02	0.33	0.27 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45598	0	0.003	0	0.076	0.02	0.33	0.28 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF45600	0	0.01	0	0.047	0.02	1.04	0.52 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF50	0.013	0.038	0	0.084	0.04	2.28	0.48 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF53	0	0.002	0	0.031	0.01	0.47	0.4 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF61	0	0.004	0	0.039	0.02	0.76	0.44 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF62	0	0.011	0	0.052	0.02	1.21	0.44 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF71	0	0.032	0	0.075	0.04	1.98	0.53 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
OF74	0	0.014	0	0.052	0.03	1.21	0.56 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF79	0	0.024	0	0.062	0.04	1.55	0.63 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF80	0	0.011	0	0.055	0.02	1.3	0.38 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF81	0.011	0.017	0	0.047	0.02	2.09	0.46 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF82	0.019	0.026	0	0.074	0.03	1.94	0.44 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF94	0	0.118	9.00731E+15	0.123	0.07	3.58	0.61 AR&R 5 year, 1 hour storm, average 30.5 mm/h, Zone 5
OF95	0	0.004	0	0.041	0.01	0.83	0.33 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF96	0.004	0.012	0.45	0.042	0.02	1.75	0.44 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF97	0.014	0.027	0	0.074	0.03	1.96	0.45 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF98	0.027	0.047	#NAME?	0.065	0.04	3.29	0.55 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5
OF99	0.053	0.059	0	0.097	0.05	2.71	0.53 AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

CONTINUITY CHECK for AR&R 5 year, 30 minutes storm, average 44.3 mm/h, Zone 5

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
03 (ROAD 1 SPOON)	15.57	15.57	0	0
HP (ROAD 2 NORTH)	0	0	0	0
HP (ROAD 2 SOUTH)	0	0	0	0
HP (ROAD 1 WEST)	0	0	0	0
HP (ROAD 1 EAST)	0	0	0	0
05 (ROAD 1 SPOON)	1.35	1.35	0	0
06 (ROAD 1 SPOON)	9.78	9.78	0	0
11 (ROAD 4A EAST)	1.74	1.74	0	0
12 (ROAD 4B EAST)	3.66	3.66	0	0
HP (ROAD 1 EAST 2)	0	0	0	0
HP (ROAD 1 WEST 2)	0	0	0	0
16 (ROAD 1 SPOON)	3.11	3.11	0	0
17 (ROAD 1 SPOON)	10.67	10.67	0	0
18 (ROAD 1 SPOON)	20.25	20.25	0	0
19 (ROAD 1 SPOON)	40.02	40.02	0	0
20 (ROAD 1 OUT)	45.14	45.14	0	0
21 (ROAD 1 OUT)	108.63	108.63	0	0
37 (1/3)	505.85	504.78	0	0.2
39 (1/2)	642.83	642.32	0	0.1
DN5	642.32	642.32	0	0
23 (ROAD 2 SPOON)	87.07	87.07	0	0
24 (ROAD 2 SPOON)	91.07	91.07	0	0
22 (ROAD 2 WEST)	109.52	109.52	0	0
25 (ROAD 2 WEST)	92.85	92.85	0	0
26 (ROAD 2 OUT)	218.53	218.53	0	0
HP (ROAD 3 NORTH)	0	0	0	0
HP (ROAD 3 SOUTH)	0	0	0	0
27 (ROAD 6 SPOON)	6.36	6.36	0	0

30 (ROAD 6 SPOON)	173.87	173.87	0	0
28 (ROAD 3 WEST)	84.63	84.63	0	0
29 (ROAD 3 WEST)	78.11	78.11	0	0
32 (ROAD 6 KR)	174.68	174.68	0	0
31 (ROAD 6 KR)	90.66	90.66	0	0
33 (ROAD 4A WEST)	79.91	79.91	0	0
34 (ROAD 4A WEST)	87.92	87.92	0	0
35 (ROAD 6 KR)	6.45	6.45	0	0
36 (ROAD 6 KR)	29.39	29.39	0	0
HP (ROAD 5 NORTH)	0	0	0	0
HP (ROAD 5 SOUTH)	0	0	0	0
HP (ROAD 6 EAST)	0	0	0	0
HP (ROAD 6 WEST)	0	0	0	0
HP (ROAD 6 EAST 2)	0	0	0	0
HP (ROAD 6 WEST 2)	0	0	0	0
40 (ROAD 5 SPOON)	78.01	78.01	0	0
41 (ROAD 5 SPOON)	95.34	95.34	0	0
42 (ROAD 5 WEST)	77.34	77.34	0	0
43 (ROAD 5 OUT)	189	189	0	0
HP (ROAD 7 SOUTH)	0	0	0	0
HP (ROAD 7 NORTH)	0	0	0	0
44 (ROAD 7 SPOON)	2.24	2.24	0	0
45 (ROAD 7 WEST)	62.29	62.29	0	0
46 (ROAD 7 WEST)	74.2	74.2	0	0
47 (ROAD 7 SPOON)	143.06	143.06	0	0
48 (ROAD 7 OUT)	143.89	143.89	0	0
HPN1	0	0	0	0
HPN2	0	0	0	0
HPN3	0	0	0	0
HPN4	0	0	0	0
HPN5	0	0	0	0
HPN6	0	0	0	0
HPN7	0	0	0	0
HPN8	0	0	0	0
HPN9	0	0	0	0
HPN10	0	0	0	0
07 (4/2)	59.41	55.74	0	6.2
08 (4/1)	84.21	83.9	0	0.4
DN1	83.9	83.9	0	0
09 (2/4)	17.74	17.55	0	1.1
10 (2/3)	27.57	27.35	0	0.8
MH (2/2)	64.43	64.5	0	-0.1
DN2	64.5	64.5	0	0
14 (3/2)	29.58	29.49	0	0.3
13 (3/1)	37.33	37.08	0	0.6
HP (ROUNABOUT 2)	0	0	0	0
HP (ROUNDABOUT 1)	0	0	0	0
HP (ROUNDABOUT 3)	0	0	0	0
HP (ROUNDABOUT 4)	0	0	0	0
DN3	148.4	130.13	0	12.3
DN4	479.11	478.91	0	0
HP02 (HARRIS)	0	0	0	0
H01 (403)	10.98	10.97	0	0.1
01 (ROAD 1 OUT PIT)	49.46	49.26	0	0.4
02 (ROAD 1 OUT PIT)	70.35	70.21	0	0.2
DNH4	70.21	70.21	0	0
H03 (305)	17.62	17.56	0	0.3
H04 (304)	28.61	28.48	0	0.5
H05 (303)	35.84	35.74	0	0.3
H-MH (302)	35.74	35.67	0	0.2
DNH2	35.67	35.67	0	0
H06 (109)	14.09	13.97	0	0.8
H07 (108)	19.09	19.07	0	0.1
SWALE 1	19.07	19.07	0	0
H10 (103)	16.77	16.67	0	0.6
H11 (102)	28.8	28.71	0	0.3
SWALE 3	28.71	28.71	0	0
HW3	246.69	246.76	0	0
HARRIS OUT	246.76	246.76	0	0
HP01 (HARRIS)	0	0	0	0
HARRIS CHANNEL	106.11	106.11	0	0
HP11 (HARRIS)	0	0	0	0
H02 (601)	34.73	0.24	0	99.3
DNH3	0.24	0.24	0	0.2
HARRIS WEST 1	0	0	0	0

HARRIS WEST 2	0	0	0	0
HP07 (HARRIS)	0	0	0	0
H09 (112)	14.19	14.1	0	0.7
H08 (111)	19.06	19.03	0	0.2
SWALE 2	19.03	19.03	0	0
H13 (106)	18.52	18.42	0	0.5
H12 (105)	23.56	23.5	0	0.3
SWALE 4	23.5	23.5	0	0
H14 (SWALE)	246.78	246.69	0	0
HP08 (HARRIS)	0	0	0	0
HP12 (HARRIS)	0	0	0	0
HP13 (HARRIS)	0	0	0	0
HP09 (HARRIS)	0	0	0	0
HP14 (HARRIS)	0	0	0	0
HP10 (HARRIS)	0	0	0	0
DNH1	0	0	0	0
HP06 (HARRIS)	0	0	0	0
HP15 (HARRIS)	0	0	0	0
HP16 (HARRIS)	0	0	0	0
HP17 (HARRIS)	0	0	0	0
HP18 (HARRIS)	0	0	0	0
HP03 (HARRIS)	0	0	0	0
HP04 (HARRIS)	0	0	0	0
HP05 (HARRIS)	0	0	0	0
04 (ROAD 1 SPOON)	7.8	7.8	0	0

Run Log for KILGARIFF_2012_IFD.drn run at 11:01:03 on 22/11/2019

KILGARIFF SUBDIVISION ANALYSIS

IFD DATA USED: 2012

ARI/AEP: 100 Year

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
01 (ROAD 1 OUT PIT)	552.43	552.97	0.111	1.7	0.39		Inlet Capacity
02 (ROAD 1 OUT PIT)	552.35	552.99	0.064	1.7	0.49		Inlet Capacity
07 (4/2)	552.22	553.12	0.187	1.7	0.76		Inlet Capacity
08 (4/1)	552.16	553.07	0.09	1.7	0.76		Inlet Capacity
09 (2/4)	552.53	553.02	0.056	1.3	0.36		Inlet Capacity
10 (2/3)	552.47	552.98	0.032	0.7	0.42		Inlet Capacity
13 (3/1)	552.59	553.05	0.025	0.6	0.38		Inlet Capacity
14 (3/2)	552.68	553.12	0.086	1.7	0.28		Inlet Capacity
37 (1/3)	552.22		1.181		-0.22	0.877	Headwall height/system capacity
39 (1/2)	552.01	552.18	1.241	1.7	0.02	1.181	Inlet Capacity
DN1	551.91		0				
DN2	551.97		0				
DN3	552.44		0.298				
DN4	551.46		1.103				
DN5	551.51		1.181				
DNH2	551.74		0				
DNH3	551.65		0				
DNH4	551.94		0				
H01 (403)	552.48	553.07	0.032	0.7	0.51		Inlet Capacity
H02 (601)	552.15		0.094		2.85		None
H03 (305)	552.46	553.18	0.051	1.1	0.6		Inlet Capacity
H04 (304)	552.13	553.04	0.035	0.8	0.81		Inlet Capacity
H05 (303)	552.05	553	0.023	0.6	0.88		Inlet Capacity
H06 (109)	552.04	552.74	0.044	1	0.59		Inlet Capacity
H07 (108)	551.98	552.6	0.016	0.4	0.56		Inlet Capacity
H08 (111)	551.98	552.6	0.016	0.4	0.56		Inlet Capacity
H09 (112)	552.04	552.74	0.045	1	0.59		Inlet Capacity
H10 (103)	551.96	552.58	0.053	1.2	0.5		Inlet Capacity
H11 (102)	551.9	552.47	0.038	0.8	0.47		Inlet Capacity
H12 (105)	551.83	552.43	0.016	0.4	0.54		Inlet Capacity
H13 (106)	551.9	552.6	0.058	1.4	0.56		Inlet Capacity
HARRIS OUT	551.54		0				
H-MH (302)	551.94	553.1	0	0	1.16		None
HW3	551.85		0.614		0.65	0	None
MH (2/2)	552.33		0		1.27		None
SWALE 1	551.89		0				
SWALE 2	551.89		0				
SWALE 3	551.75		0				
SWALE 4	551.72		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat H01	0.032	0.009	0.023	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H02	0.094	0.03	0.064	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H03	0.051	0.015	0.036	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H04	0.035	0.009	0.026	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H05	0.023	0.006	0.017	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H06	0.044	0.012	0.033	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H07	0.016	0.004	0.012	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H08	0.016	0.004	0.012	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H09	0.045	0.012	0.033	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H10	0.053	0.014	0.039	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H11	0.038	0.01	0.028	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H12	0.016	0.004	0.012	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H13	0.058	0.015	0.043	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat H14	0.159	0.042	0.117	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat01	0.111	0.032	0.079	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat02	0.017	0.005	0.013	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat03	0.022	0.007	0.016	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat04	0.025	0.006	0.018	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat05	0.004	0.001	0.003	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat06	0.027	0.007	0.02	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat07	0.187	0.049	0.138	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat08	0.059	0.016	0.043	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5

Cat09	0.056	0.015	0.041	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat10	0.032	0.008	0.023	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat11	0.005	0.001	0.003	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat12	0.01	0.003	0.007	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat13	0.025	0.007	0.018	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat14	0.086	0.025	0.061	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat16	0.01	0.003	0.007	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat17	0.024	0.006	0.018	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat18	0.03	0.008	0.022	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat19	0.062	0.016	0.046	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat20	0.016	0.004	0.012	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat21	0.314	0.091	0.224	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat22	0.317	0.092	0.226	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat23	0.252	0.073	0.179	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat24	0.013	0.003	0.009	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat25	0.006	0.001	0.004	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat26	0.051	0.013	0.038	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat27	0.02	0.005	0.015	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat28	0.245	0.071	0.174	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat29	0.226	0.065	0.161	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat30	0.014	0.004	0.01	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat31	0.262	0.076	0.187	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat32	0.003	0.001	0.002	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat33	0.226	0.065	0.161	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat34	0.244	0.071	0.174	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat35	0.02	0.005	0.015	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat36	0.085	0.025	0.061	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat37	0.085	0.022	0.062	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat39	0.049	0.015	0.033	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat40	0.226	0.065	0.161	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat41	0.055	0.014	0.04	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat42	0.224	0.065	0.159	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat43	0.047	0.014	0.034	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat44	0.006	0.002	0.005	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat45	0.18	0.052	0.128	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat46	0.215	0.062	0.153	5	10	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat47	0.014	0.004	0.01	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
Cat48	0.003	0.001	0.002	5	5	5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5

Outflow Volumes for Total Catchment (7.06 impervious + 3.73 pervious = 10.8 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 100 year, 5 minutes sto	1798.88	1488.03 (82.7%)	425.30 (36.1%)	1062.73 (171.0%)
AR&R 100 year, 10 minutes st	2824.25	2494.31 (88.3%)	683.20 (37.0%)	1811.11 (185.6%)
AR&R 100 year, 20 minutes st	4353.3	3987.61 (91.6%)	1067.78 (37.5%)	2919.83 (194.2%)
AR&R 100 year, 30 minutes st	5504.58	5100.20 (92.7%)	1357.34 (37.7%)	3742.86 (196.8%)
AR&R 100 year, 1 hour storm,	7630.68	7116.69 (93.3%)	1892.09 (37.9%)	5224.60 (198.2%)
AR&R 100 year, 2 hours storm	9907.98	9200.88 (92.9%)	2464.88 (38.0%)	6736.00 (196.8%)
AR&R 100 year, 3 hours storm	11332.96	10375.39 (91.6%)	2823.22 (38.1%)	7552.17 (192.9%)
AR&R 100 year, 6 hours storm	14052.88	12426.51 (88.4%)	3507.35 (38.1%)	8919.17 (183.7%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.302	1.9	552.128	552.012	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
1/2-1	0.364	2.4	551.611	551.508	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
4/2-1	0.063	0.89	552.175	552.161	AR&R 100 year, 5 minutes storm, average 200 mm/h, Zone 5
4/1-2/1	0.124	2.69	552.008	551.917	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
2/4-3	0.055	0.78	552.491	552.466	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
2/3-1	0.087	0.79	552.418	552.333	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
2/2-1	0.174	1.8	552.168	551.966	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
3/2-1	0.063	0.89	552.626	552.594	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
3/1-2/2	0.088	1.24	552.479	552.333	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5820	0.031	0.71	552.449	552.431	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5823	0.093	0.85	552.377	552.353	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5826	0.155	1.69	552.253	551.94	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
P5832	0.05	1.45	552.396	552.343	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
P5835	0.085	1.72	552.074	552.046	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
P5836	0.108	1.72	551.989	551.937	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
P5859	0.109	1.5	551.882	551.743	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
P5844	0.044	1.06	551.991	551.981	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5873	0.06	1.51	551.899	551.893	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5848	0.052	0.74	551.921	551.903	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5870	0.09	1.53	551.84	551.746	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5996	0.614	2.13	551.64	551.536	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5

Kilgariff - Analysis Results

P5829	0	0	552.151	551.651	AR&R 100 year, 10 minutes storm, average 157 mm/h, Zone 5
P5923	0.044	1.07	551.991	551.98	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5919	0.06	1.51	551.899	551.893	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5944	0.057	1.19	551.818	551.829	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
P5941	0.073	1.54	551.734	551.724	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.233	1.4	AR&R 100 year, 1 hour storm, average 70.7 mm/h, Zone 5

OVERFLOW ROUTE DETAILS

conditional formatting for w > 4.5, dV > 0.4 and d>0.3m

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm	
OF107	0	0.252	0	0.154	0.11	5.15	0.73	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF108	0	0.317	0	0.165	0.13	5.62	0.79	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF109	0.317	0.337	0	0.134	0.18	4.31	1.33	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF110	0.268	0.295	0	0.128	0.17	4.08	1.3	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF111	0.252	0.261	0	0.116	0.09	6.66	0.77	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF112	0.263	0.268	0	0.156	0.12	5.25	0.75	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF144	0	0.003	0	0.028	0.02	0.35	0.64	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF145	0	0.02	0	0.069	0.03	1.88	0.4	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF148	0	0.005	0	0.036	0.02	0.66	0.65	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF149	0	0.245	0	0.152	0.11	5.08	0.73	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF150	0	0.226	0	0.149	0.11	4.93	0.71	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF151	0.226	0.229	0	0.117	0.15	3.65	1.26	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF152	0.505	0.507	0	0.193	0.17	6.86	0.88	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF166	0	0.262	0	0.156	0.12	5.25	0.74	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF167	0.005	0.231	0	0.152	0.1	5.28	0.69	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF168	0.01	0.253	0	0.156	0.11	5.62	0.71	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF169	0.231	0.231	0	0.087	0.07	4	0.8	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF170	0.507	0.507	0	0.146	0.13	8.6	0.89	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	largest overland flow width does not breach the road reserve
OF171	0.253	0.253	0	0.038	0.1	4	2.75	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF173	0.02	0.02	0	0.05	0.02	2.25	0.47	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF174	0.262	0.282	0	0.16	0.12	5.4	0.75	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF175	0.085	0.114	0	0.119	0.07	3.75	0.59	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF176	0	0.02	0	0.067	0.03	1.82	0.43	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF177	0	0.085	0	0.105	0.06	3.23	0.59	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF179	0	0.012	0	0.047	0.03	1.05	0.72	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF180	0	0.18	0	0.134	0.1	4.29	0.72	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF181	0	0.215	0	0.142	0.11	4.6	0.75	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF182	0.006	0.013	0	0.04	0.02	1.59	0.56	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF183	0.415	0.417	0	0.167	0.21	4.78	1.23	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF184	0.215	0.218	0	0.113	0.15	3.52	1.29	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF185	0.18	0.184	0	0.053	0.06	4	1.22	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF186	0.224	0.243	0	0.113	0.16	3.5	1.45	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF187	0.279	0.307	0	0.122	0.19	3.85	1.52	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF189	0	0.005	0	0.035	0.02	0.62	0.64	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF190	0	0.226	0	0.146	0.11	4.8	0.74	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF191	0	0.224	0	0.146	0.11	4.78	0.74	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF192	0.226	0.269	0	0.114	0.09	6.52	0.83	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF193	0	0.011	0	0.045	0.03	0.99	0.7	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF213	0.02	0.023	0	0.052	0.03	2.42	0.48	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF27	0	0.111	2.87917E+32	0.12	0.07	3.5	0.6	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF30	0	0.004	0	0.033	0.02	0.56	0.7	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF322	0.245	0.252	0	0.091	0.12	5.02	1.3	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF337	0.877	0.919	0	0.112	0.27	4	2.37	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF36	0	0.187	0	0.144	0.1	4.29	0.68	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF363	0.124	0.124	0	0.065	0.04	4	0.63	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF364	0.174	0.174	0	0.075	0.05	4	0.72	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF37	0	0.004	0	0.041	0.01	0.83	0.33	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF378	1.106	1.18	0	0.5	0.59	4	1.18	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	dummy overland flow at headwall, no issue
OF380	1.181	1.181	0	0.11	0.39	6.6	3.58	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41863	0	0.032	0	0.079	0.04	2.11	0.46	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41867	0	0.051	0	0.092	0.05	2.56	0.51	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41874	0	0.035	0	0.081	0.04	2.18	0.47	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41877	0	0.023	0	0.071	0.03	1.85	0.44	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41882	0.109	0.109	0	0.061	0.04	4	0.6	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41885	0	0	0	0	0	0	0		
OF41888	0.155	0.155	0	0.071	0.05	4	0.7	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41891	0.263	0.304	0	0.167	0.15	4	0.91	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF41895	0.06	0.072	0	0.126	0.05	3.02	0.38	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF41899	0.06	0.072	0	0.126	0.05	3.02	0.38	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF41902	0.073	0.088	0	0.136	0.05	3.26	0.4	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF41905	0.09	0.105	0	0.145	0.06	3.47	0.42	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5	
OF41936	0	0.016	0	0.058	0.03	1.39	0.5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	
OF41939	0	0.022	0	0.06	0.04	1.49	0.63	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5	

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OF41982	0.614	0.614	0	0.167	0.31	4	1.84	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
OF42005	0	0.008	0	0.101	0.04	0.44	0.36	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF42015	0	0.022	0	0.06	0.04	1.49	0.63	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF42017	0	0.008	0	0.1	0.04	0.44	0.36	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF42022	0	0	0	0	0	0	0	
OF43	0.004	0.025	0	0.053	0.03	2.49	0.5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF43356	0	0.094	0	0.139	0.06	3.33	0.41	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45550	0	0.011	0	0.125	0.04	0.55	0.34	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45552	0	0.005	0	0.09	0.02	0.4	0.27	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45554	0	0.018	0	0.06	0.03	1.47	0.5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45560	0	0.037	0	0.077	0.04	1.81	0.58	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45571	0	0.027	0	0.174	0.07	0.77	0.4	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45574	0	0.011	0	0.126	0.04	0.56	0.32	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45576	0	0.041	0	0.079	0.05	1.81	0.6	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45587	0	0.022	0	0.062	0.04	1.55	0.59	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45596	0	0.008	0	0.103	0.03	0.45	0.34	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45598	0	0.008	0	0.104	0.04	0.46	0.34	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF45600	0	0.022	0	0.062	0.04	1.55	0.58	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF50	0.031	0.089	206886080	0.111	0.06	3.2	0.57	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
OF53	0	0.005	0	0.04	0.02	0.81	0.43	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF61	0	0.01	0	0.05	0.02	1.18	0.47	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF62	0	0.025	0	0.069	0.03	1.77	0.5	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF71	0	0.086	0	0.104	0.07	2.96	0.64	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF74	0	0.032	0	0.068	0.04	1.75	0.65	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF79	0	0.056	0	0.082	0.06	2.22	0.73	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF80	0	0.025	0	0.072	0.03	1.88	0.44	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF81	0.025	0.042	0	0.063	0.03	3.12	0.54	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF82	0.047	0.064	0	0.1	0.05	2.81	0.53	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF94	0	0.314	1.84909E+31	0.172	0.13	6.43	0.74	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF95	0	0.01	0	0.054	0.02	1.26	0.37	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF96	0.01	0.029	0.4	0.055	0.03	2.62	0.51	AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5
OF97	0.033	0.063	0	0.099	0.05	2.79	0.53	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
OF98	0.063	0.112	0	0.087	0.06	4.72	0.65	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5
OF99	0.125	0.14	0	0.13	0.08	3.82	0.64	AR&R 100 year, 20 minutes storm, average 121 mm/h, Zone 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

CONTINUITY CHECK for AR&R 100 year, 30 minutes storm, average 102 mm/h, Zone 5

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
03 (ROAD 1 SPOON)	48.13	48.13	0	0
HP (ROAD 2 NORTH)	0	0	0	0
HP (ROAD 2 SOUTH)	0	0	0	0
HP (ROAD 1 WEST)	0	0	0	0
HP (ROAD 1 EAST)	0	0	0	0
05 (ROAD 1 SPOON)	4.16	4.16	0	0
06 (ROAD 1 SPOON)	30.16	30.16	0	0
11 (ROAD 4A EAST)	4.75	4.75	0	0
12 (ROAD 4B EAST)	9.98	9.98	0	0
HP (ROAD 1 EAST 2)	0	0	0	0
HP (ROAD 1 WEST 2)	0	0	0	0
16 (ROAD 1 SPOON)	9.59	9.59	0	0
17 (ROAD 1 SPOON)	32.9	32.9	0	0
18 (ROAD 1 SPOON)	62.44	62.44	0	0
19 (ROAD 1 SPOON)	123.41	123.41	0	0
20 (ROAD 1 OUT)	139.2	139.2	0	0
21 (ROAD 1 OUT)	336.67	336.67	0	0
37 (1/3)	1508.06	1506.3	0	0.1
39 (1/2)	1927.42	1926.48	0	0
DN5	1926.48	1926.48	0	0
23 (ROAD 2 SPOON)	269.84	269.84	0	0
24 (ROAD 2 SPOON)	282.17	282.17	0	0
22 (ROAD 2 WEST)	339.41	339.41	0	0
25 (ROAD 2 WEST)	287.66	287.66	0	0
26 (ROAD 2 OUT)	676.93	676.93	0	0
HP (ROAD 3 NORTH)	0	0	0	0
HP (ROAD 3 SOUTH)	0	0	0	0
27 (ROAD 6 SPOON)	19.62	19.62	0	0
30 (ROAD 6 SPOON)	538.76	538.76	0	0
28 (ROAD 3 WEST)	262.29	262.29	0	0
29 (ROAD 3 WEST)	242.08	242.08	0	0
32 (ROAD 6 KR)	541.26	541.26	0	0
31 (ROAD 6 KR)	280.98	280.98	0	0

33 (ROAD 4A WEST)	247.02	247.02	0	0
34 (ROAD 4A WEST)	271.13	271.13	0	0
35 (ROAD 6 KR)	19.9	19.9	0	0
36 (ROAD 6 KR)	91.09	91.09	0	0
HP (ROAD 5 NORTH)	0	0	0	0
HP (ROAD 5 SOUTH)	0	0	0	0
HP (ROAD 6 EAST)	0	0	0	0
HP (ROAD 6 WEST)	0	0	0	0
HP (ROAD 6 EAST 2)	0	0	0	0
HP (ROAD 6 WEST 2)	0	0	0	0
40 (ROAD 5 SPOON)	241.75	241.75	0	0
41 (ROAD 5 SPOON)	295.21	295.21	0	0
42 (ROAD 5 WEST)	239.68	239.68	0	0
43 (ROAD 5 OUT)	585.49	585.49	0	0
HP (ROAD 7 SOUTH)	0	0	0	0
HP (ROAD 7 NORTH)	0	0	0	0
44 (ROAD 7 SPOON)	6.94	6.94	0	0
45 (ROAD 7 WEST)	193.04	193.04	0	0
46 (ROAD 7 WEST)	229.95	229.95	0	0
47 (ROAD 7 SPOON)	443.31	443.31	0	0
48 (ROAD 7 OUT)	445.87	445.87	0	0
HPN1	0	0	0	0
HPN2	0	0	0	0
HPN3	0	0	0	0
HPN4	0	0	0	0
HPN5	0	0	0	0
HPN6	0	0	0	0
HPN7	0	0	0	0
HPN8	0	0	0	0
HPN9	0	0	0	0
HPN10	0	0	0	0
07 (4/2)	183.2	107.67	0	41.2
08 (4/1)	195.44	186.58	0	4.5
DN1	186.58	186.58	0	0
09 (2/4)	54.69	54.4	0	0.5
10 (2/3)	85.31	85	0	0.4
MH (2/2)	193.73	193.79	0	0
DN2	193.79	193.79	0	0
14 (3/2)	91.66	84.77	0	7.5
13 (3/1)	108.93	108.73	0	0.2
HP (ROUNABOUT 2)	0	0	0	0
HP (ROUNDABOUT 1)	0	0	0	0
HP (ROUNDABOUT 3)	0	0	0	0
HP (ROUNDABOUT 4)	0	0	0	0
DN3	380.37	346.09	0	9
DN4	1425.39	1425.02	0	0
HP02 (HARRIS)	0	0	0	0
H01 (403)	34.03	34	0	0.1
01 (ROAD 1 OUT PIT)	153.27	131.22	0	14.4
02 (ROAD 1 OUT PIT)	196.36	196.21	0	0.1
DNH4	196.21	196.21	0	0
H03 (305)	54.61	54.51	0	0.2
H04 (304)	88.59	88.48	0	0.1
H05 (303)	111.16	111.28	0	-0.1
H-MH (302)	111.28	111.04	0	0.2
DNH2	111.04	111.04	0	0
H06 (109)	43.44	43.33	0	0.3
H07 (108)	59.11	59.04	0	0.1
SWALE 1	59.04	59.04	0	0
H10 (103)	51.71	51.58	0	0.2
H11 (102)	88.97	88.84	0	0.2
SWALE 3	88.84	88.84	0	0
HW3	742.13	742.3	0	0
HARRIS OUT	742.3	742.3	0	0
HP01 (HARRIS)	0	0	0	0
HARRIS CHANNEL	307.5	307.49	0	0
HP11 (HARRIS)	0	0	0	0
H02 (601)	94.72	0.25	0	99.7
DNH3	0.25	0.25	0	0.2
HARRIS WEST 1	0	0	0	0
HARRIS WEST 2	0	0	0	0
HP07 (HARRIS)	0	0	0	0
H09 (112)	43.77	43.64	0	0.3
H08 (111)	58.95	58.9	0	0.1
SWALE 2	58.9	58.9	0	0
H13 (106)	57.1	56.97	0	0.2

H12 (105)	72.81	72.71	0	0.1
SWALE 4	72.71	72.71	0	0
H14 (SWALE)	742.31	742.13	0	0
HP08 (HARRIS)	0	0	0	0
HP12 (HARRIS)	0	0	0	0
HP13 (HARRIS)	0	0	0	0
HP09 (HARRIS)	0	0	0	0
HP14 (HARRIS)	0	0	0	0
HP10 (HARRIS)	0	0	0	0
DNH1	0	0	0	0
HP06 (HARRIS)	0	0	0	0
HP15 (HARRIS)	0	0	0	0
HP16 (HARRIS)	0	0	0	0
HP17 (HARRIS)	0	0	0	0
HP18 (HARRIS)	0	0	0	0
HP03 (HARRIS)	0	0	0	0
HP04 (HARRIS)	0	0	0	0
HP05 (HARRIS)	0	0	0	0
04 (ROAD 1 SPOON)	24.06	24.06	0	0

Run Log for KILGARIFF_2012_IFD.drn run at 11:13:27 on 22/11/2019

KILGARIFF SUBDIVISION ANALYSIS
IFD DATA USED: 2016
ARI/AEP: 50% AEP

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)		Constraint
01 (ROAD 1 OUT PIT)	552.12	552.89		0.029	0.6	0.7		Inlet Capacity
02 (ROAD 1 OUT PIT)	552.02	552.89		0.018	0.4	0.82		Inlet Capacity
07 (4/2)	552.12	553.08		0.06	1.4	0.86		Inlet Capacity
08 (4/1)	552.03	552.99		0.028	0.6	0.89		Inlet Capacity
09 (2/4)	552.19	552.94		0.018	0.4	0.7		Inlet Capacity
10 (2/3)	552.13	552.91		0.01	0.2	0.76		Inlet Capacity
13 (3/1)	552.07	552.99		0.008	0.2	0.89		Inlet Capacity
14 (3/2)	552.14	553.03		0.022	0.5	0.83		Inlet Capacity
37 (1/3)	551.73			0.248		0.27	0	None
39 (1/2)	551.66	552.18		0.105	1.7	0.37	0.012	Inlet Capacity
DN1	551.82			0				
DN2	551.78			0				
DN3	552.2			0.132				
DN4	551.34			0.242				
DN5	551.44			0.041				
DNH2	551.68			0				
DNH3	551.65			0				
DNH4	551.78			0				
H01 (403)	552.34	553.01		0.008	0.2	0.65		Inlet Capacity
H02 (601)	552.15			0.029		2.85		None
H03 (305)	552.33	553.1		0.013	0.3	0.73		Inlet Capacity
H04 (304)	552.05	552.97		0.011	0.3	0.89		Inlet Capacity
H05 (303)	551.96	552.94		0.007	0.2	0.96		Inlet Capacity
H06 (109)	551.9	552.67		0.014	0.4	0.73		Inlet Capacity
H07 (108)	551.83	552.56		0.005	0.1	0.71		Inlet Capacity
H08 (111)	551.83	552.56		0.005	0.1	0.71		Inlet Capacity
H09 (112)	551.9	552.67		0.014	0.4	0.73		Inlet Capacity
H10 (103)	551.72	552.51		0.017	0.4	0.74		Inlet Capacity
H11 (102)	551.66	552.41		0.012	0.3	0.71		Inlet Capacity
H12 (105)	551.65	552.39		0.005	0.1	0.72		Inlet Capacity
H13 (106)	551.72	552.51		0.019	0.4	0.74		Inlet Capacity
HARRIS OUT	551.37			0				
H-MH (302)	551.84	553.1		0	0	1.26		None
HW3	551.53			0.124		0.97	0	None
MH (2/2)	551.94			0		1.66		None
SWALE 1	551.79			0				
SWALE 2	551.79			0				
SWALE 3	551.61			0				
SWALE 4	551.6			0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)		Due to Storm
Cat H01	0.006	0.002	0.004	5		10	5	50% AEP, 20 min burst, Storm 2
Cat H02	0.025	0.009	0.016	5		5	5	50% AEP, 10 min burst, Storm 2
Cat H03	0.01	0.003	0.007	5		10	5	50% AEP, 20 min burst, Storm 2
Cat H04	0.008	0.003	0.005	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H05	0.005	0.002	0.004	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H06	0.01	0.004	0.007	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H07	0.004	0.001	0.003	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H08	0.003	0.001	0.002	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H09	0.01	0.004	0.007	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H10	0.012	0.004	0.008	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H11	0.008	0.003	0.006	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H12	0.004	0.001	0.003	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H13	0.013	0.005	0.009	5		5	5	50% AEP, 15 min burst, Storm 9
Cat H14	0.035	0.013	0.025	5		5	5	50% AEP, 15 min burst, Storm 9
Cat01	0.021	0.007	0.015	5		10	5	50% AEP, 20 min burst, Storm 2
Cat02	0.004	0.001	0.003	5		5	5	50% AEP, 15 min burst, Storm 9
Cat03	0.004	0.001	0.003	5		10	5	50% AEP, 20 min burst, Storm 2
Cat04	0.005	0.002	0.004	5		5	5	50% AEP, 15 min burst, Storm 9
Cat05	0.001	0	0.001	5		5	5	50% AEP, 15 min burst, Storm 9
Cat06	0.006	0.002	0.004	5		5	5	50% AEP, 15 min burst, Storm 9
Cat07	0.041	0.016	0.029	5		5	5	50% AEP, 15 min burst, Storm 9
Cat08	0.013	0.005	0.009	5		5	5	50% AEP, 15 min burst, Storm 9
Cat09	0.012	0.005	0.009	5		5	5	50% AEP, 15 min burst, Storm 9
Cat10	0.007	0.003	0.005	5		5	5	50% AEP, 15 min burst, Storm 9
Cat11	0.001	0	0.001	5		5	5	50% AEP, 10 min burst, Storm 2
Cat12	0.003	0.001	0.002	5		5	5	50% AEP, 10 min burst, Storm 2
Cat13	0.005	0.002	0.004	5		5	5	50% AEP, 15 min burst, Storm 9

Cat14	0.016	0.006	0.011	5	10	5	50% AEP, 20 min burst, Storm 2
Cat16	0.002	0.001	0.002	5	5	5	50% AEP, 15 min burst, Storm 9
Cat17	0.005	0.002	0.004	5	5	5	50% AEP, 15 min burst, Storm 9
Cat18	0.007	0.003	0.005	5	5	5	50% AEP, 15 min burst, Storm 9
Cat19	0.014	0.005	0.01	5	5	5	50% AEP, 15 min burst, Storm 9
Cat20	0.004	0.001	0.003	5	5	5	50% AEP, 15 min burst, Storm 9
Cat21	0.06	0.021	0.041	5	10	5	50% AEP, 20 min burst, Storm 2
Cat22	0.061	0.021	0.042	5	10	5	50% AEP, 20 min burst, Storm 2
Cat23	0.048	0.017	0.033	5	10	5	50% AEP, 20 min burst, Storm 2
Cat24	0.003	0.001	0.002	5	5	5	50% AEP, 15 min burst, Storm 9
Cat25	0.001	0	0.001	5	5	5	50% AEP, 15 min burst, Storm 9
Cat26	0.011	0.004	0.008	5	5	5	50% AEP, 15 min burst, Storm 9
Cat27	0.004	0.002	0.003	5	5	5	50% AEP, 15 min burst, Storm 9
Cat28	0.047	0.016	0.032	5	10	5	50% AEP, 20 min burst, Storm 2
Cat29	0.043	0.015	0.03	5	10	5	50% AEP, 20 min burst, Storm 2
Cat30	0.003	0.001	0.002	5	10	5	50% AEP, 20 min burst, Storm 2
Cat31	0.05	0.017	0.035	5	10	5	50% AEP, 20 min burst, Storm 2
Cat32	0.001	0	0	5	5	5	50% AEP, 15 min burst, Storm 9
Cat33	0.043	0.015	0.03	5	10	5	50% AEP, 20 min burst, Storm 2
Cat34	0.047	0.016	0.032	5	10	5	50% AEP, 20 min burst, Storm 2
Cat35	0.004	0.002	0.003	5	5	5	50% AEP, 15 min burst, Storm 9
Cat36	0.016	0.006	0.011	5	10	5	50% AEP, 20 min burst, Storm 2
Cat37	0.019	0.007	0.013	5	5	5	50% AEP, 15 min burst, Storm 9
Cat39	0.013	0.005	0.008	5	5	5	50% AEP, 10 min burst, Storm 6
Cat40	0.043	0.015	0.03	5	10	5	50% AEP, 20 min burst, Storm 2
Cat41	0.012	0.005	0.009	5	5	5	50% AEP, 15 min burst, Storm 9
Cat42	0.043	0.015	0.029	5	10	5	50% AEP, 20 min burst, Storm 2
Cat43	0.009	0.003	0.006	5	10	5	50% AEP, 20 min burst, Storm 2
Cat44	0.001	0	0.001	5	10	5	50% AEP, 20 min burst, Storm 2
Cat45	0.034	0.012	0.024	5	10	5	50% AEP, 20 min burst, Storm 2
Cat46	0.041	0.014	0.028	5	10	5	50% AEP, 20 min burst, Storm 2
Cat47	0.003	0.001	0.002	5	5	5	50% AEP, 15 min burst, Storm 9
Cat48	0.001	0	0	5	5	5	50% AEP, 15 min burst, Storm 9

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.178	1.12	551.7	551.661	50% AEP, 1 hour burst, Storm 9
1/2-1	0.238	1.83	551.506	551.443	50% AEP, 25 min burst, Storm 7
4/2-1	0.041	0.86	552.115	552.031	50% AEP, 15 min burst, Storm 9
4/1-2/1	0.059	1.29	552.031	551.821	50% AEP, 15 min burst, Storm 9
2/4-3	0.012	0.61	552.187	552.127	50% AEP, 15 min burst, Storm 9
2/3-1	0.018	0.62	552.127	551.939	50% AEP, 15 min burst, Storm 9
2/2-1	0.037	1.15	551.939	551.785	50% AEP, 15 min burst, Storm 9
3/2-1	0.016	0.74	552.138	552.075	50% AEP, 20 min burst, Storm 2
3/1-2/2	0.021	0.75	552.075	551.939	50% AEP, 20 min burst, Storm 8
PS820	0.006	0.5	552.337	552.123	50% AEP, 20 min burst, Storm 2
PS823	0.027	0.86	552.123	552.022	50% AEP, 20 min burst, Storm 2
PS826	0.037	1.11	552.022	551.779	50% AEP, 20 min burst, Storm 8
PS832	0.009	0.79	552.328	552.237	50% AEP, 20 min burst, Storm 2
PS835	0.016	0.62	552.055	551.977	50% AEP, 15 min burst, Storm 6
PS836	0.021	0.69	551.962	551.865	50% AEP, 15 min burst, Storm 9
PS859	0.021	0.69	551.845	551.683	50% AEP, 15 min burst, Storm 9
PS844	0.01	0.65	551.899	551.833	50% AEP, 15 min burst, Storm 9
PS873	0.013	0.87	551.833	551.787	50% AEP, 15 min burst, Storm 9
PS848	0.011	0.62	551.717	551.665	50% AEP, 15 min burst, Storm 9
PS870	0.02	0.99	551.665	551.61	50% AEP, 15 min burst, Storm 9
PS996	0.094	1.1	551.529	551.367	50% AEP, 30 min burst, Storm 7
PS829	0	0	552.151	551.651	50% AEP, 5 min burst, Storm 1
PS923	0.01	0.66	551.899	551.833	50% AEP, 15 min burst, Storm 10
PS919	0.013	0.87	551.833	551.786	50% AEP, 15 min burst, Storm 9
PS944	0.013	0.71	551.716	551.652	50% AEP, 15 min burst, Storm 9
PS941	0.016	0.94	551.652	551.601	50% AEP, 15 min burst, Storm 9

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.04	2.2	50% AEP, 1 hour burst, Storm 4

OVERFLOW ROUTE DETAILS

Conditional formatting for flow width >2.5m

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm	
OF82	0.009	0.012	0.207	0.058	0.02	1.39	0.39	50% AEP, 15 min burst, Storm 8	
OF108	0	0.061	0.229	0.097	0.05	2.92	0.52	50% AEP, 20 min burst, Storm 2	Marginally exceeding 2.5m flow width, not overtopping kerb
OF107	0	0.048	0.229	0.09	0.04	2.67	0.49	50% AEP, 20 min burst, Storm 2	including kerb capacity <2.5m flow on road
OF80	0	0.005	0.207	0.044	0.02	0.94	0.34	50% AEP, 15 min burst, Storm 9	
OF27	0	0.021	0.207	0.069	0.03	1.77	0.43	50% AEP, 20 min burst, Storm 2	
OF43	0.001	0.006	0.558	0.033	0.01	1.12	0.39	50% AEP, 15 min burst, Storm 9	
OF50	0.007	0.019	0.205	0.067	0.03	1.71	0.42	50% AEP, 15 min burst, Storm 9	
OF167	0.001	0.044	0.223	0.088	0.04	2.59	0.48	50% AEP, 20 min burst, Storm 2	including kerb capacity <2.5m flow on road
OF168	0.002	0.049	0.223	0.091	0.04	2.69	0.49	50% AEP, 20 min burst, Storm 2	including kerb capacity <2.5m flow on road

Kilgariff - Analysis Results

OF94	0	0.06	0.207	0.097	0.05	2.73	0.53	50% AEP, 20 min burst, Storm 2	Marginally exceeding 2.5m flow width, not overtopping kerb
OF95	0	0.002	0.207	0.033	0.01	0.57	0.3	50% AEP, 15 min burst, Storm 9	
OF96	0.002	0.006	0.564	0.034	0.01	1.19	0.41	50% AEP, 15 min burst, Storm 9	
OF97	0.007	0.013	0.207	0.059	0.02	1.45	0.4	50% AEP, 15 min burst, Storm 9	
OF98	0.013	0.023	0.564	0.051	0.02	2.35	0.49	50% AEP, 15 min burst, Storm 8	
OF99	0.023	0.026	0.207	0.074	0.03	1.94	0.45	50% AEP, 15 min burst, Storm 10	
OF337	0	0.013	1.431	0.022	0.01	4	0.44	50% AEP, 10 min burst, Storm 6	spoon drain no issue
OF380	0.012	0.012	0.005	0.04	0.01	1.93	0.37	50% AEP, 20 min burst, Storm 2	
OF111	0.048	0.05	0.564	0.066	0.04	3.35	0.56	50% AEP, 20 min burst, Storm 2	spoon drain no issue
OF112	0.05	0.05	0.231	0.091	0.05	2.71	0.5	50% AEP, 20 min burst, Storm 2	Marginally exceeding 2.5m flow width, not overtopping kerb
OF109	0.061	0.064	0.475	0.078	0.07	2.21	0.93	50% AEP, 20 min burst, Storm 2	
OF110	0.05	0.05	0.475	0.073	0.06	2.03	0.87	50% AEP, 20 min burst, Storm 2	Including kerb capacity <2.5m flow on road
OF149	0	0.047	0.231	0.089	0.04	2.63	0.49	50% AEP, 20 min burst, Storm 2	Including kerb capacity <2.5m flow on road
OF150	0	0.043	0.231	0.087	0.04	2.55	0.48	50% AEP, 20 min burst, Storm 2	
OF213	0.004	0.005	0.553	0.032	0.01	1.05	0.38	50% AEP, 15 min burst, Storm 9	
OF152	0.096	0.096	0.227	0.113	0.06	3.52	0.57	50% AEP, 20 min burst, Storm 2	Exceeding 2.5m flow width, not overtopping kerb
OF322	0.047	0.048	1.086	0.053	0.05	2.45	0.96	50% AEP, 20 min burst, Storm 2	
OF151	0.043	0.044	0.498	0.068	0.06	1.86	0.89	50% AEP, 20 min burst, Storm 2	
OF170	0.096	0.096	0.553	0.083	0.05	4.45	0.62	50% AEP, 20 min burst, Storm 2	dummy overland flow - no issue
OF174	0.05	0.054	0.227	0.094	0.05	2.8	0.5	50% AEP, 20 min burst, Storm 2	Marginally exceeding 2.5m flow width, not overtopping kerb
OF169	0.044	0.044	0.642	0.042	0.02	4	0.41	50% AEP, 20 min burst, Storm 2	dummy overland flow - no issue
OF171	0.049	0.049	1.302	0.023	0.03	4	1.49	50% AEP, 20 min burst, Storm 2	dummy overland flow - no issue
OF173	0.004	0.004	0.553	0.03	0.01	0.95	0.38	50% AEP, 15 min burst, Storm 9	
OF175	0.016	0.021	0.227	0.07	0.03	1.92	0.41	50% AEP, 25 min burst, Storm 1	
OF190	0	0.043	0.248	0.085	0.04	2.48	0.51	50% AEP, 20 min burst, Storm 2	
OF191	0	0.043	0.248	0.085	0.04	2.46	0.51	50% AEP, 20 min burst, Storm 2	
OF145	0	0.004	0.227	0.043	0.01	0.93	0.31	50% AEP, 15 min burst, Storm 9	
OF144	0	0.001	0.534	0.016	0.01	0.16	0.43	50% AEP, 15 min burst, Storm 9	
OF176	0	0.004	0.248	0.042	0.01	0.89	0.34	50% AEP, 15 min burst, Storm 9	
OF193	0	0.002	0.489	0.028	0.02	0.37	0.58	50% AEP, 15 min burst, Storm 9	
OF192	0.043	0.05	0.605	0.065	0.04	3.25	0.59	50% AEP, 25 min burst, Storm 1	spoon drain no issue
OF187	0.05	0.054	0.579	0.07	0.07	1.92	1.04	50% AEP, 25 min burst, Storm 1	
OF186	0.043	0.046	0.579	0.067	0.07	1.8	1	50% AEP, 20 min burst, Storm 2	
OF181	0	0.041	0.254	0.083	0.04	2.4	0.51	50% AEP, 20 min burst, Storm 2	
OF180	0	0.034	0.254	0.079	0.04	2.24	0.5	50% AEP, 20 min burst, Storm 2	
OF182	0.001	0.003	0.71	0.023	0.01	0.56	0.39	50% AEP, 15 min burst, Storm 9	
OF185	0.034	0.035	1.436	0.029	0.02	4	0.62	50% AEP, 20 min burst, Storm 2	dummy overland flow - no issue
OF184	0.041	0.042	0.518	0.067	0.06	1.8	0.9	50% AEP, 20 min burst, Storm 2	
OF183	0.078	0.079	0.297	0.097	0.09	2.36	0.88	50% AEP, 20 min burst, Storm 2	
OF36	0	0.041	0.205	0.086	0.04	2.35	0.48	50% AEP, 15 min burst, Storm 9	
OF37	0	0.001	0.205	0.025	0.01	0.3	0.24	50% AEP, 15 min burst, Storm 9	
OF71	0	0.016	0.243	0.06	0.03	1.47	0.47	50% AEP, 20 min burst, Storm 2	
OF62	0	0.005	0.243	0.042	0.02	0.87	0.4	50% AEP, 15 min burst, Storm 9	
OF30	0	0.001	0.557	0.019	0.01	0.19	0.49	50% AEP, 20 min burst, Storm 2	
OF148	0	0.001	0.496	0.022	0.01	0.22	0.5	50% AEP, 15 min burst, Storm 9	
OF189	0	0.001	0.506	0.02	0.01	0.2	0.5	50% AEP, 15 min burst, Storm 9	
OF179	0	0.003	0.499	0.029	0.02	0.41	0.6	50% AEP, 15 min burst, Storm 9	
OF166	0	0.05	0.227	0.092	0.04	2.73	0.49	50% AEP, 20 min burst, Storm 2	
OF177	0	0.016	0.248	0.063	0.03	1.66	0.42	50% AEP, 20 min burst, Storm 2	
OF363	0.059	0.059	0.642	0.047	0.02	4	0.46	50% AEP, 15 min burst, Storm 9	dummy overland flow - no issue
OF364	0.037	0.037	0.642	0.039	0.01	4	0.38	50% AEP, 15 min burst, Storm 9	dummy overland flow - no issue
OF74	0	0.007	0.319	0.041	0.02	0.85	0.52	50% AEP, 15 min burst, Storm 9	
OF79	0	0.012	0.319	0.05	0.03	1.15	0.55	50% AEP, 15 min burst, Storm 9	
OF53	0	0.001	0.315	0.026	0.01	0.29	0.36	50% AEP, 10 min burst, Storm 2	
OF61	0	0.003	0.315	0.033	0.01	0.56	0.4	50% AEP, 10 min burst, Storm 2	
OF378	0.173	0.18	0.235	0.272	0.17	2.18	0.61	50% AEP, 1 hour burst, Storm 9	
OF41863	0	0.006	0.207	0.046	0.02	1	0.35	50% AEP, 20 min burst, Storm 2	
OF41888	0.037	0.037	0.655	0.039	0.02	4	0.39	50% AEP, 20 min burst, Storm 8	dummy overland flow - no issue
OF41882	0.021	0.021	0.655	0.032	0.01	4	0.3	50% AEP, 15 min burst, Storm 9	dummy overland flow - no issue
OF41895	0.013	0.013	0.039	0.067	0.02	1.6	0.25	50% AEP, 15 min burst, Storm 9	
OF41905	0.02	0.022	0.039	0.081	0.02	1.94	0.28	50% AEP, 15 min burst, Storm 9	
OF42022	0	0	0.642	0	0	0	0		
OF41867	0	0.01	0.207	0.054	0.02	1.26	0.37	50% AEP, 20 min burst, Storm 2	
OF41891	0.05	0.06	0.039	0.118	0.04	2.82	0.36	50% AEP, 30 min burst, Storm 6	Harris Avenue Channel - no issue
OF41936	0	0.003	0.223	0.035	0.01	0.64	0.4	50% AEP, 15 min burst, Storm 9	
OF41885	0	0	0.655	0	0	0	0		
OF41874	0	0.008	0.207	0.049	0.02	1.11	0.36	50% AEP, 15 min burst, Storm 9	
OF41877	0	0.005	0.207	0.044	0.01	0.92	0.33	50% AEP, 15 min burst, Storm 9	
OF41939	0	0.005	0.273	0.037	0.02	0.7	0.5	50% AEP, 15 min burst, Storm 9	
OF41899	0.013	0.013	0.039	0.067	0.02	1.6	0.25	50% AEP, 15 min burst, Storm 9	
OF41902	0.016	0.019	0.039	0.077	0.02	1.83	0.27	50% AEP, 15 min burst, Storm 9	
OF41982	0.094	0.094	0.039	0.139	0.06	3.33	0.41	50% AEP, 30 min burst, Storm 7	dummy overland flow - no issue
OF42005	0	0.002	0.146	0.057	0.01	0.25	0.25	50% AEP, 15 min burst, Storm 9	
OF45550	0	0.003	0.119	0.071	0.02	0.31	0.23	50% AEP, 15 min burst, Storm 9	
OF45552	0	0.001	0.119	0.051	0.01	0.23	0.18	50% AEP, 15 min burst, Storm 9	
OF42017	0	0.002	0.146	0.057	0.01	0.25	0.24	50% AEP, 15 min burst, Storm 9	
OF45554	0	0.004	0.223	0.036	0.01	0.68	0.41	50% AEP, 15 min burst, Storm 9	
OF42015	0	0.005	0.273	0.037	0.02	0.7	0.5	50% AEP, 15 min burst, Storm 9	
OF43356	0	0.025	0.039	0.084	0.02	2.02	0.29	50% AEP, 10 min burst, Storm 2	
OF45587	0	0.006	0.253	0.04	0.02	0.81	0.48	50% AEP, 15 min burst, Storm 9	
OF45560	0	0.008	0.214	0.047	0.02	1.04	0.44	50% AEP, 15 min burst, Storm 9	

2016 - 50% AEP

OF45571	0	0.006	0.114	0.098	0.03	0.43	0.28	50% AEP, 15 min burst, Storm 9
OF45574	0	0.002	0.114	0.072	0.02	0.32	0.22	50% AEP, 15 min burst, Storm 9
OF45576	0	0.009	0.214	0.049	0.02	1.09	0.44	50% AEP, 15 min burst, Storm 9
OF45600	0	0.005	0.253	0.038	0.02	0.74	0.46	50% AEP, 15 min burst, Storm 9
OF45598	0	0.002	0.135	0.059	0.01	0.26	0.23	50% AEP, 15 min burst, Storm 9
OF45596	0	0.002	0.332	0.028	0.01	0.37	0.41	50% AEP, 15 min burst, Storm 9
OF81	0.005	0.009	0.564	0.037	0.02	1.42	0.43	50% AEP, 15 min burst, Storm 9

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for KILGARIFF_2016_IFD run at 13:56:14 on 22/11/2019
Water was lost from the system at: H02 (601). If this water re-enters the system further downstream you should draw an overflow route from this location.

No water upwelling from any pit. Freeboard was adequate at all pits.
The maximum flow in these overflow routes is unsafe: OF380, OF41891, OF41982
These sag pits have unsafe water levels for minor storms: H12 (105), H13 (106), H08 (111), H09 (112), H11 (102), H10 (103), H07 (108), H06 (109), H05 (303), H04 (304), H03 (305), 02 (ROAD 1 OUT PIT), H01 (403), 13 (3/1), 14 (3/2)

IGNORE THESE WARNINGS AT YOUR OWN PERIL.\cf1

KILGARIFF SUBDIVISION ANALYSIS

IFD DATA USED: 2016

ARI/AEP: 1% AEP

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)		Constraint
37 (1/3)	552.19		1.231		-0.19	0.703	Headwall height/system capacity
39 (1/2)	551.99	552.18	1.223	1.7	0.04	0.882	Inlet Capacity
DN5	551.51		1.156				
07 (4/2)	552.22	553.12	0.223	1.7	0.76		Inlet Capacity
08 (4/1)	552.16	553.07	0.105	1.7	0.76		Inlet Capacity
DN1	551.91		0				
09 (2/4)	552.51	553.02	0.066	1.7	0.38		Inlet Capacity
10 (2/3)	552.44	552.98	0.038	0.8	0.45		Inlet Capacity
MH (2/2)	552.33		0		1.27		None
DN2	551.97		0				
14 (3/2)	552.67	553.12	0.092	1.7	0.3		Inlet Capacity
13 (3/1)	552.58	553.05	0.029	0.7	0.39		Inlet Capacity
DN3	552.43		0.314				
DN4	551.45		1.164				
H01 (403)	552.43	553.07	0.034	0.8	0.56		Inlet Capacity
01 (ROAD 1 OUT PIT)	552.37	552.97	0.12	1.7	0.44		Inlet Capacity
02 (ROAD 1 OUT PIT)	552.3	552.97	0.07	1.7	0.54		Inlet Capacity
DNH4	551.93		0				
H03 (305)	552.45	553.18	0.055	1.3	0.61		Inlet Capacity
H04 (304)	552.12	553.04	0.041	0.9	0.82		Inlet Capacity
H05 (303)	552.04	553	0.028	0.6	0.88		Inlet Capacity
H-MH (302)	551.93	553.1	0	0	1.17		None
DNH2	551.74		0				
H06 (109)	552.04	552.74	0.053	1.2	0.59		Inlet Capacity
H07 (108)	551.98	552.6	0.019	0.5	0.56		Inlet Capacity
SWALE 1	551.89		0				
H10 (103)	551.96	552.58	0.063	1.6	0.5		Inlet Capacity
H11 (102)	551.91	552.47	0.045	1	0.46		Inlet Capacity
SWALE 3	551.75		0				
HW3	551.8		0.576		0.7	0	None
HARRIS OUT	551.51		0				
H02 (601)	552.15		0.111		2.85		None
DNH3	551.65		0				
H09 (112)	552.04	552.74	0.053	1.2	0.59		Inlet Capacity
H08 (111)	551.98	552.6	0.019	0.5	0.56		Inlet Capacity
SWALE 2	551.89		0				
H13 (106)	551.9	552.6	0.069	1.7	0.56		Inlet Capacity
H12 (105)	551.83	552.43	0.019	0.5	0.54		Inlet Capacity
SWALE 4	551.72		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat03	0.021	0.006	0.015	5	10	5	1% AEP, 15 min burst, Storm 9
Cat05	0.004	0.001	0.003	5	5	5	1% AEP, 10 min burst, Storm 3
Cat06	0.027	0.007	0.02	5	5	5	1% AEP, 10 min burst, Storm 3
Cat11	0.005	0.002	0.003	5	5	5	1% AEP, 10 min burst, Storm 3
Cat12	0.01	0.003	0.007	5	5	5	1% AEP, 10 min burst, Storm 3
Cat16	0.01	0.003	0.007	5	5	5	1% AEP, 10 min burst, Storm 3
Cat17	0.024	0.006	0.018	5	5	5	1% AEP, 10 min burst, Storm 3
Cat18	0.03	0.008	0.022	5	5	5	1% AEP, 10 min burst, Storm 3
Cat19	0.063	0.017	0.046	5	5	5	1% AEP, 10 min burst, Storm 3
Cat20	0.016	0.004	0.012	5	5	5	1% AEP, 10 min burst, Storm 3
Cat21	0.289	0.078	0.212	5	10	5	1% AEP, 15 min burst, Storm 9
Cat37	0.085	0.023	0.063	5	5	5	1% AEP, 10 min burst, Storm 3
Cat39	0.05	0.016	0.035	5	5	5	1% AEP, 10 min burst, Storm 3
Cat23	0.232	0.063	0.17	5	10	5	1% AEP, 15 min burst, Storm 9
Cat24	0.013	0.003	0.009	5	5	5	1% AEP, 10 min burst, Storm 3

Cat22	0.292	0.079	0.214	5	10	5	1% AEP, 15 min burst, Storm 9
Cat25	0.006	0.001	0.004	5	5	5	1% AEP, 10 min burst, Storm 3
Cat26	0.051	0.014	0.038	5	5	5	1% AEP, 10 min burst, Storm 3
Cat27	0.02	0.005	0.015	5	5	5	1% AEP, 10 min burst, Storm 3
Cat30	0.013	0.003	0.009	5	10	5	1% AEP, 15 min burst, Storm 9
Cat28	0.225	0.061	0.165	5	10	5	1% AEP, 15 min burst, Storm 9
Cat29	0.208	0.056	0.153	5	10	5	1% AEP, 15 min burst, Storm 9
Cat32	0.003	0.001	0.002	5	5	5	1% AEP, 10 min burst, Storm 3
Cat31	0.241	0.065	0.177	5	10	5	1% AEP, 15 min burst, Storm 9
Cat33	0.208	0.056	0.153	5	10	5	1% AEP, 15 min burst, Storm 9
Cat34	0.224	0.061	0.165	5	10	5	1% AEP, 15 min burst, Storm 9
Cat35	0.02	0.005	0.015	5	5	5	1% AEP, 10 min burst, Storm 3
Cat36	0.078	0.021	0.057	5	10	5	1% AEP, 15 min burst, Storm 9
Cat40	0.208	0.056	0.152	5	10	5	1% AEP, 15 min burst, Storm 9
Cat41	0.055	0.015	0.04	5	5	5	1% AEP, 10 min burst, Storm 3
Cat42	0.206	0.056	0.151	5	10	5	1% AEP, 15 min burst, Storm 9
Cat43	0.043	0.012	0.032	5	10	5	1% AEP, 15 min burst, Storm 9
Cat44	0.006	0.002	0.004	5	10	5	1% AEP, 15 min burst, Storm 9
Cat45	0.166	0.045	0.122	5	10	5	1% AEP, 15 min burst, Storm 9
Cat46	0.198	0.053	0.145	5	10	5	1% AEP, 15 min burst, Storm 9
Cat47	0.014	0.004	0.01	5	5	5	1% AEP, 10 min burst, Storm 3
Cat48	0.003	0.001	0.002	5	5	5	1% AEP, 10 min burst, Storm 3
Cat07	0.188	0.05	0.138	5	5	5	1% AEP, 10 min burst, Storm 3
Cat08	0.059	0.016	0.043	5	5	5	1% AEP, 10 min burst, Storm 3
Cat09	0.056	0.015	0.041	5	5	5	1% AEP, 10 min burst, Storm 3
Cat10	0.032	0.008	0.023	5	5	5	1% AEP, 10 min burst, Storm 3
Cat14	0.079	0.021	0.058	5	10	5	1% AEP, 15 min burst, Storm 9
Cat13	0.025	0.007	0.018	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H01	0.029	0.008	0.021	5	10	5	1% AEP, 15 min burst, Storm 9
Cat01	0.103	0.028	0.075	5	10	5	1% AEP, 15 min burst, Storm 9
Cat02	0.017	0.005	0.013	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H03	0.047	0.013	0.034	5	10	5	1% AEP, 15 min burst, Storm 9
Cat H04	0.035	0.009	0.026	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H05	0.023	0.006	0.017	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H06	0.045	0.012	0.033	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H07	0.016	0.004	0.012	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H10	0.053	0.014	0.039	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H11	0.038	0.01	0.028	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H02	0.097	0.03	0.067	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H09	0.045	0.012	0.033	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H08	0.016	0.004	0.012	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H13	0.059	0.016	0.043	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H12	0.016	0.004	0.012	5	5	5	1% AEP, 10 min burst, Storm 3
Cat H14	0.159	0.042	0.117	5	5	5	1% AEP, 10 min burst, Storm 3
Cat04	0.025	0.007	0.018	5	5	5	1% AEP, 10 min burst, Storm 3

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.296	1.86	552.104	551.993	1% AEP, 25 min burst, Storm 3
1/2-1	0.358	2.37	551.606	551.506	1% AEP, 25 min burst, Storm 3
4/2-1	0.062	0.81	552.191	552.161	1% AEP, 15 min burst, Storm 9
4/1-2/1	0.124	1.53	552.103	551.917	1% AEP, 5 min burst, Storm 1
2/4-3	0.055	0.78	552.464	552.439	1% AEP, 10 min burst, Storm 3
2/3-1	0.087	0.79	552.392	552.329	1% AEP, 10 min burst, Storm 3
2/2-1	0.174	1.8	552.17	551.966	1% AEP, 10 min burst, Storm 3
3/2-1	0.062	0.88	552.608	552.578	1% AEP, 10 min burst, Storm 4
3/1-2/2	0.087	1.23	552.464	552.329	1% AEP, 10 min burst, Storm 3
P5820	0.029	0.78	552.425	552.375	1% AEP, 15 min burst, Storm 9
P5823	0.091	0.89	552.324	552.301	1% AEP, 15 min burst, Storm 9
P5826	0.145	1.64	552.187	551.931	1% AEP, 15 min burst, Storm 9
P5832	0.047	1.16	552.417	552.336	1% AEP, 15 min burst, Storm 9
P5835	0.079	0.91	552.125	552.045	1% AEP, 10 min burst, Storm 3
P5836	0.102	1.16	552.045	551.929	1% AEP, 10 min burst, Storm 6
P5859	0.1	1.23	551.929	551.74	1% AEP, 10 min burst, Storm 4
P5844	0.044	0.97	552.005	551.983	1% AEP, 10 min burst, Storm 3
P5873	0.061	1.3	551.925	551.894	1% AEP, 10 min burst, Storm 3
P5848	0.053	0.75	551.921	551.908	1% AEP, 10 min burst, Storm 3
P5870	0.091	1.54	551.842	551.748	1% AEP, 10 min burst, Storm 3

Kilgariff - Analysis Results

P5996	0.51	2.01	551.797	551.507	1% AEP, 25 min burst, Storm 3
P5829	0	0	552.151	551.651	1% AEP, 5 min burst, Storm 1
P5923	0.045	0.98	552.005	551.982	1% AEP, 10 min burst, Storm 3
P5919	0.06	1.3	551.925	551.894	1% AEP, 10 min burst, Storm 3
P5944	0.058	1.02	551.849	551.831	1% AEP, 10 min burst, Storm 3
P5941	0.074	1.38	551.759	551.725	1% AEP, 10 min burst, Storm 3

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.222	1.41	1% AEP, 25 min burst, Storm 9

OVERFLOW ROUTE DETAILS

conditional formatting for w > 4.5, dV > 0.4 and d>0.3m

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF82	0.044	0.058	1.807	0.096	0.05	2.69	0.53	1% AEP, 10 min burst, Storm 3
OF108	0	0.292	1.727	0.161	0.12	5.45	0.77	1% AEP, 15 min burst, Storm 9
OF107	0	0.232	1.727	0.151	0.11	5	0.71	1% AEP, 15 min burst, Storm 9
OF80	0	0.025	1.807	0.073	0.03	1.9	0.44	1% AEP, 10 min burst, Storm 3
OF27	0	0.103	1.807	0.117	0.07	3.39	0.59	1% AEP, 15 min burst, Storm 9
OF43	0.004	0.026	2.355	0.053	0.03	2.49	0.5	1% AEP, 10 min burst, Storm 3
OF50	0.031	0.089	1.789	0.111	0.06	3.2	0.57	1% AEP, 10 min burst, Storm 3
OF167	0.004	0.212	1.851	0.148	0.1	4.97	0.68	1% AEP, 15 min burst, Storm 9
OF168	0.009	0.233	1.851	0.152	0.11	5.32	0.69	1% AEP, 15 min burst, Storm 9
OF94	0	0.289	1.807	0.168	0.12	6.06	0.73	1% AEP, 15 min burst, Storm 9
OF95	0	0.01	1.807	0.054	0.02	1.26	0.38	1% AEP, 10 min burst, Storm 3
OF96	0.01	0.029	2.352	0.055	0.03	2.62	0.51	1% AEP, 10 min burst, Storm 3
OF97	0.033	0.062	1.807	0.099	0.05	2.77	0.53	1% AEP, 10 min burst, Storm 3
OF98	0.06	0.106	2.352	0.085	0.06	4.62	0.65	1% AEP, 10 min burst, Storm 3
OF99	0.113	0.127	1.807	0.125	0.08	3.67	0.62	1% AEP, 10 min burst, Storm 3
OF337	0.703	0.726	1.431	0.099	0.21	4	2.16	1% AEP, 25 min burst, Storm 5
OF380	0.882	0.882	0.146	0.11	0.29	6.6	2.68	1% AEP, 25 min burst, Storm 3
OF111	0.232	0.239	2.352	0.112	0.09	6.42	0.76	1% AEP, 15 min burst, Storm 1
OF112	0.24	0.242	1.744	0.152	0.11	5.05	0.73	1% AEP, 15 min burst, Storm 9
OF109	0.292	0.307	1.315	0.13	0.17	4.14	1.31	1% AEP, 15 min burst, Storm 1
OF110	0.242	0.251	1.315	0.122	0.15	3.83	1.25	1% AEP, 15 min burst, Storm 9
OF149	0	0.225	1.744	0.149	0.11	4.93	0.71	1% AEP, 15 min burst, Storm 9
OF150	0	0.208	1.744	0.146	0.1	4.78	0.69	1% AEP, 15 min burst, Storm 9
OF213	0.02	0.023	2.357	0.052	0.03	2.39	0.49	1% AEP, 10 min burst, Storm 3
OF152	0.461	0.462	1.71	0.186	0.16	6.59	0.86	1% AEP, 15 min burst, Storm 1
OF322	0.225	0.231	1.901	0.089	0.11	4.85	1.27	1% AEP, 15 min burst, Storm 9
OF151	0.208	0.211	1.267	0.113	0.14	3.52	1.25	1% AEP, 15 min burst, Storm 9
OF170	0.461	0.461	2.357	0.142	0.12	8.39	0.87	1% AEP, 15 min burst, Storm 1
OF174	0.242	0.257	1.71	0.155	0.11	5.2	0.73	1% AEP, 15 min burst, Storm 1
OF169	0.212	0.212	1.497	0.083	0.06	4	0.78	1% AEP, 15 min burst, Storm 9
OF171	0.233	0.233	1.302	0.037	0.1	4	2.65	1% AEP, 15 min burst, Storm 9
OF173	0.02	0.02	2.357	0.05	0.02	2.25	0.48	1% AEP, 10 min burst, Storm 3
OF175	0.078	0.103	1.71	0.115	0.07	3.6	0.58	1% AEP, 15 min burst, Storm 9
OF190	0	0.208	1.873	0.142	0.1	4.58	0.73	1% AEP, 15 min burst, Storm 9
OF191	0	0.206	1.873	0.141	0.1	4.56	0.73	1% AEP, 15 min burst, Storm 9
OF145	0	0.02	1.71	0.069	0.03	1.88	0.4	1% AEP, 10 min burst, Storm 3
OF144	0	0.003	1.201	0.028	0.02	0.35	0.64	1% AEP, 10 min burst, Storm 3
OF176	0	0.02	1.873	0.067	0.03	1.82	0.43	1% AEP, 10 min burst, Storm 3
OF193	0	0.011	1.288	0.046	0.03	1.01	0.68	1% AEP, 10 min burst, Storm 3
OF192	0.208	0.241	2.306	0.11	0.09	6.26	0.81	1% AEP, 15 min burst, Storm 9
OF187	0.245	0.269	1.122	0.117	0.17	3.65	1.48	1% AEP, 15 min burst, Storm 9
OF186	0.206	0.222	1.122	0.109	0.16	3.38	1.42	1% AEP, 15 min burst, Storm 9
OF181	0	0.198	1.919	0.138	0.1	4.45	0.73	1% AEP, 15 min burst, Storm 9
OF180	0	0.166	1.919	0.131	0.09	4.16	0.7	1% AEP, 15 min burst, Storm 9
OF182	0.006	0.012	2.217	0.039	0.02	1.52	0.54	1% AEP, 10 min burst, Storm 3
OF185	0.166	0.168	1.436	0.051	0.06	4	1.18	1% AEP, 15 min burst, Storm 1
OF184	0.198	0.2	1.23	0.11	0.14	3.4	1.27	1% AEP, 15 min burst, Storm 1
OF183	0.378	0.379	1.255	0.161	0.2	4.64	1.21	1% AEP, 15 min burst, Storm 1
OF36	0	0.188	1.789	0.145	0.1	4.31	0.67	1% AEP, 10 min burst, Storm 3
OF37	0	0.004	1.789	0.041	0.01	0.85	0.32	1% AEP, 10 min burst, Storm 3
OF71	0	0.079	2.126	0.101	0.06	2.86	0.63	1% AEP, 15 min burst, Storm 9
OF62	0	0.025	2.126	0.069	0.03	1.77	0.5	1% AEP, 10 min burst, Storm 3
OF30	0	0.004	1.165	0.032	0.02	0.51	0.71	1% AEP, 15 min burst, Storm 9
OF148	0	0.005	1.261	0.036	0.02	0.66	0.65	1% AEP, 10 min burst, Storm 3
OF189	0	0.005	1.244	0.035	0.02	0.62	0.64	1% AEP, 10 min burst, Storm 3
OF179	0	0.013	1.269	0.047	0.03	1.05	0.72	1% AEP, 10 min burst, Storm 3

Largest kerb contained flow width does not occupy road reserve.

Kilgariff - Analysis Results

OF166	0	0.241	1.71	0.153	0.11	5.1	0.71	1% AEP, 15 min burst, Storm 9	
OF177	0	0.078	1.873	0.103	0.06	3.13	0.58	1% AEP, 15 min burst, Storm 9	
OF363	0.124	0.124	1.497	0.065	0.04	4	0.63	1% AEP, 5 min burst, Storm 1	
OF364	0.174	0.174	1.497	0.075	0.05	4	0.72	1% AEP, 10 min burst, Storm 3	
OF74	0	0.032	1.888	0.068	0.04	1.75	0.66	1% AEP, 10 min burst, Storm 3	
OF79	0	0.056	1.888	0.082	0.06	2.22	0.74	1% AEP, 10 min burst, Storm 3	
OF53	0	0.005	1.95	0.04	0.02	0.81	0.44	1% AEP, 10 min burst, Storm 3	
OF61	0	0.01	1.95	0.051	0.02	1.2	0.47	1% AEP, 10 min burst, Storm 3	
OF378	0.982	1.022	0.692	0.5	0.51	4	1.02	1% AEP, 25 min burst, Storm 3	dummy overland flow for modelling - no isse
OF41863	0	0.029	1.807	0.077	0.03	2.03	0.46	1% AEP, 15 min burst, Storm 9	
OF41888	0.145	0.145	1.501	0.069	0.05	4	0.68	1% AEP, 15 min burst, Storm 9	
OF41882	0.1	0.1	1.501	0.058	0.03	4	0.59	1% AEP, 10 min burst, Storm 4	
OF41895	0.059	0.066	0.115	0.122	0.05	2.91	0.37	1% AEP, 10 min burst, Storm 9	
OF41905	0.089	0.103	0.115	0.144	0.06	3.44	0.42	1% AEP, 10 min burst, Storm 8	
OF42022	0	0	1.497	0	0	0	0		
OF41867	0	0.047	1.807	0.09	0.05	2.47	0.5	1% AEP, 15 min burst, Storm 9	
OF41891	0.242	0.265	0.115	0.167	0.13	4	0.8	1% AEP, 30 min burst, Storm 1	
OF41936	0	0.016	1.292	0.058	0.03	1.39	0.51	1% AEP, 10 min burst, Storm 3	
OF41885	0	0	1.501	0	0	0	0		
OF41874	0	0.035	1.807	0.081	0.04	2.18	0.47	1% AEP, 10 min burst, Storm 3	
OF41877	0	0.023	1.807	0.071	0.03	1.85	0.44	1% AEP, 10 min burst, Storm 3	
OF41939	0	0.022	1.297	0.06	0.04	1.49	0.63	1% AEP, 10 min burst, Storm 3	
OF41899	0.059	0.066	0.115	0.122	0.05	2.91	0.37	1% AEP, 10 min burst, Storm 9	
OF41902	0.072	0.086	0.115	0.135	0.05	3.22	0.4	1% AEP, 10 min burst, Storm 8	
OF41982	0.51	0.51	0.115	0.167	0.25	4	1.53	1% AEP, 25 min burst, Storm 3	
OF42005	0	0.008	0.146	0.101	0.04	0.44	0.36	1% AEP, 10 min burst, Storm 3	
OF45550	0	0.012	0.119	0.125	0.04	0.55	0.34	1% AEP, 10 min burst, Storm 3	
OF45552	0	0.005	0.119	0.09	0.02	0.4	0.27	1% AEP, 10 min burst, Storm 3	
OF42017	0	0.008	0.146	0.1	0.04	0.44	0.36	1% AEP, 10 min burst, Storm 3	
OF45554	0	0.018	1.292	0.06	0.03	1.47	0.51	1% AEP, 10 min burst, Storm 3	
OF42015	0	0.022	1.297	0.06	0.04	1.49	0.63	1% AEP, 10 min burst, Storm 3	
OF43356	0	0.097	0.115	0.14	0.06	3.37	0.41	1% AEP, 10 min burst, Storm 3	
OF45587	0	0.027	1.373	0.066	0.04	1.68	0.61	1% AEP, 10 min burst, Storm 3	
OF45560	0	0.037	1.241	0.077	0.04	1.81	0.59	1% AEP, 10 min burst, Storm 3	
OF45571	0	0.027	0.114	0.174	0.07	0.77	0.4	1% AEP, 10 min burst, Storm 3	
OF45574	0	0.011	0.114	0.126	0.04	0.56	0.32	1% AEP, 10 min burst, Storm 3	
OF45576	0	0.041	1.241	0.079	0.05	1.81	0.61	1% AEP, 10 min burst, Storm 3	
OF45600	0	0.022	1.373	0.062	0.04	1.55	0.59	1% AEP, 10 min burst, Storm 3	
OF45598	0	0.008	0.135	0.104	0.04	0.46	0.34	1% AEP, 10 min burst, Storm 3	
OF45596	0	0.008	1.885	0.046	0.02	1.01	0.49	1% AEP, 10 min burst, Storm 3	
OF81	0.025	0.04	2.352	0.062	0.03	3.05	0.54	1% AEP, 10 min burst, Storm 3	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for KILGARIFF_2016_IFD run at 14:18:50 on 22/11/2015
Water was lost from the system at: H13 (106), H02 (601), 02 (ROAD 1 OUT PIT), 01 (ROAD 1 OUT PIT), 14 (3/2), 09 (2/4), 08 (4/1), 07 (4/2). If this water re-enters the system further downstream you should draw an overflow route from these locations

No water upwelling from any pit.
Freeboard was less than 0.15m at 39 (1/2)
The maximum flow in these overflow routes is unsafe: OF380, OF378, OF41891, OF41982

IGNORE THESE WARNINGS AT YOUR OWN PERIL.\cf1

2016 - 1% AEP

KILGARIFF SUBDIVISION ANALYSIS

IFD DATA USED: 2016

ARI/AEP: 20 % AEP

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)		Constraint
37 (1/3)	552.05		0.46			-0.05	0.107	Headwall height/system capacity
39 (1/2)	551.9	552.18	0.284	1.7		0.14	0.125	Inlet Capacity
DN5	551.49		0.218					
07 (4/2)	552.18	553.12	0.098	1.7		0.79		Inlet Capacity
08 (4/1)	552.1	553.02	0.046	0.9		0.82		Inlet Capacity
DN1	551.88		0					
09 (2/4)	552.24	552.97	0.029	0.7		0.66		Inlet Capacity
10 (2/3)	552.18	552.94	0.017	0.4		0.71		Inlet Capacity
MH (2/2)	552.01		0			1.59		None
DN2	551.84		0					
14 (3/2)	552.21	553.06	0.037	0.8		0.76		Inlet Capacity
13 (3/1)	552.14	553.01	0.013	0.3		0.82		Inlet Capacity
DN3	552.3		0.191					
DN4	551.38		0.434					
H01 (403)	552.37	553.03	0.014	0.3		0.62		Inlet Capacity
01 (ROAD 1 OUT PIT)	552.19	552.93	0.048	1		0.63		Inlet Capacity
02 (ROAD 1 OUT PIT)	552.09	552.92	0.029	0.6		0.75		Inlet Capacity
DNH4	551.84		0					
H03 (305)	552.37	553.13	0.022	0.5		0.7		Inlet Capacity
H04 (304)	552.08	553	0.018	0.4		0.86		Inlet Capacity
H05 (303)	551.99	552.96	0.012	0.3		0.94		Inlet Capacity
H-MH (302)	551.87	553.1	0	0		1.23		None
DNH2	551.7		0					
H06 (109)	551.94	552.7	0.023	0.6		0.69		Inlet Capacity
H07 (108)	551.88	552.57	0.008	0.2		0.66		Inlet Capacity
SWALE 1	551.82		0					
H10 (103)	551.77	552.54	0.028	0.6		0.69		Inlet Capacity
H11 (102)	551.72	552.43	0.02	0.5		0.65		Inlet Capacity
SWALE 3	551.65		0					
HW3	551.61		0.214			0.89	0	None
HARRIS OUT	551.41		0					
H02 (601)	552.15		0.05			2.85		None
DNH3	551.65		0					
H09 (112)	551.94	552.7	0.023	0.6		0.69		Inlet Capacity
H08 (111)	551.88	552.57	0.008	0.2		0.66		Inlet Capacity
SWALE 2	551.82		0					
H13 (106)	551.76	552.54	0.031	0.7		0.69		Inlet Capacity
H12 (105)	551.7	552.4	0.008	0.2		0.67		Inlet Capacity
SWALE 4	551.64		0					

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)		Due to Storm
Cat03	0.009	0.003	0.006	5		10	5	20% AEP, 15 min burst, Storm 10
Cat05	0.002	0.001	0.001	5		5	5	20% AEP, 10 min burst, Storm 8
Cat06	0.011	0.003	0.008	5		5	5	20% AEP, 10 min burst, Storm 8
Cat11	0.002	0.001	0.001	5		5	5	20% AEP, 10 min burst, Storm 8
Cat12	0.005	0.001	0.003	5		5	5	20% AEP, 10 min burst, Storm 8
Cat16	0.004	0.001	0.003	5		5	5	20% AEP, 10 min burst, Storm 8
Cat17	0.01	0.003	0.007	5		5	5	20% AEP, 10 min burst, Storm 8
Cat18	0.013	0.004	0.009	5		5	5	20% AEP, 10 min burst, Storm 8

Cat19	0.027	0.008	0.019	5	5	5 20% AEP, 10 min burst, Storm 8
Cat20	0.007	0.002	0.005	5	5	5 20% AEP, 10 min burst, Storm 8
Cat21	0.121	0.037	0.084	5	10	5 20% AEP, 15 min burst, Storm 10
Cat37	0.037	0.011	0.026	5	5	5 20% AEP, 10 min burst, Storm 8
Cat39	0.022	0.007	0.015	5	5	5 20% AEP, 10 min burst, Storm 8
Cat23	0.097	0.03	0.067	5	10	5 20% AEP, 15 min burst, Storm 10
Cat24	0.005	0.002	0.004	5	5	5 20% AEP, 10 min burst, Storm 8
Cat22	0.122	0.037	0.084	5	10	5 20% AEP, 15 min burst, Storm 10
Cat25	0.002	0.001	0.002	5	5	5 20% AEP, 10 min burst, Storm 8
Cat26	0.022	0.006	0.016	5	5	5 20% AEP, 10 min burst, Storm 8
Cat27	0.009	0.003	0.006	5	5	5 20% AEP, 10 min burst, Storm 8
Cat30	0.005	0.002	0.004	5	10	5 20% AEP, 15 min burst, Storm 10
Cat28	0.094	0.029	0.065	5	10	5 20% AEP, 15 min burst, Storm 10
Cat29	0.087	0.026	0.06	5	10	5 20% AEP, 15 min burst, Storm 10
Cat32	0.001	0	0.001	5	5	5 20% AEP, 10 min burst, Storm 8
Cat31	0.101	0.031	0.07	5	10	5 20% AEP, 15 min burst, Storm 10
Cat33	0.087	0.026	0.06	5	10	5 20% AEP, 15 min burst, Storm 10
Cat34	0.094	0.029	0.065	5	10	5 20% AEP, 15 min burst, Storm 10
Cat35	0.009	0.003	0.006	5	5	5 20% AEP, 10 min burst, Storm 8
Cat36	0.033	0.01	0.023	5	10	5 20% AEP, 15 min burst, Storm 10
Cat40	0.087	0.026	0.06	5	10	5 20% AEP, 15 min burst, Storm 10
Cat41	0.024	0.007	0.017	5	5	5 20% AEP, 10 min burst, Storm 8
Cat42	0.086	0.026	0.06	5	10	5 20% AEP, 15 min burst, Storm 10
Cat43	0.018	0.006	0.013	5	10	5 20% AEP, 15 min burst, Storm 10
Cat44	0.002	0.001	0.002	5	10	5 20% AEP, 15 min burst, Storm 10
Cat45	0.069	0.021	0.048	5	10	5 20% AEP, 15 min burst, Storm 10
Cat46	0.082	0.025	0.057	5	10	5 20% AEP, 15 min burst, Storm 10
Cat47	0.006	0.002	0.004	5	5	5 20% AEP, 10 min burst, Storm 8
Cat48	0.001	0	0.001	5	5	5 20% AEP, 10 min burst, Storm 8
Cat07	0.081	0.023	0.057	5	5	5 20% AEP, 10 min burst, Storm 8
Cat08	0.025	0.007	0.018	5	5	5 20% AEP, 10 min burst, Storm 8
Cat09	0.024	0.007	0.017	5	5	5 20% AEP, 10 min burst, Storm 8
Cat10	0.014	0.004	0.01	5	5	5 20% AEP, 10 min burst, Storm 8
Cat14	0.033	0.01	0.023	5	10	5 20% AEP, 15 min burst, Storm 10
Cat13	0.011	0.003	0.008	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H01	0.012	0.004	0.008	5	10	5 20% AEP, 15 min burst, Storm 10
Cat01	0.043	0.013	0.03	5	10	5 20% AEP, 15 min burst, Storm 10
Cat02	0.008	0.002	0.005	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H03	0.02	0.006	0.014	5	10	5 20% AEP, 15 min burst, Storm 10
Cat H04	0.015	0.004	0.011	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H05	0.01	0.003	0.007	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H06	0.019	0.006	0.014	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H07	0.007	0.002	0.005	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H10	0.023	0.007	0.016	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H11	0.017	0.005	0.012	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H02	0.043	0.014	0.029	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H09	0.019	0.006	0.014	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H08	0.007	0.002	0.005	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H13	0.025	0.007	0.018	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H12	0.007	0.002	0.005	5	5	5 20% AEP, 10 min burst, Storm 8
Cat H14	0.069	0.02	0.049	5	5	5 20% AEP, 10 min burst, Storm 8
Cat04	0.011	0.003	0.008	5	5	5 20% AEP, 10 min burst, Storm 8

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.263	1.66	551.985	551.896	20% AEP, 20 min burst, Storm 3
1/2-1	0.325	2.21	551.598	551.493	20% AEP, 20 min burst, Storm 3
4/2-1	0.062	0.97	552.156	552.103	20% AEP, 10 min burst, Storm 9
4/1-2/1	0.096	1.47	552.072	551.875	20% AEP, 10 min burst, Storm 8
2/4-3	0.024	0.71	552.235	552.177	20% AEP, 10 min burst, Storm 8

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2/3-1	0.036	0.76	552.177	552.012	20% AEP, 10 min burst, Storm 8
2/2-1	0.072	1.37	551.99	551.84	20% AEP, 15 min burst, Storm 8
3/2-1	0.032	0.83	552.191	552.144	20% AEP, 15 min burst, Storm 8
3/1-2/2	0.041	0.99	552.119	552.012	20% AEP, 15 min burst, Storm 9
P5820	0.012	0.6	552.365	552.194	20% AEP, 15 min burst, Storm 10
P5823	0.052	0.94	552.187	552.094	20% AEP, 15 min burst, Storm 10
P5826	0.074	1.33	552.078	551.839	20% AEP, 15 min burst, Storm 10
P5832	0.019	0.89	552.365	552.272	20% AEP, 15 min burst, Storm 10
P5835	0.032	0.82	552.077	551.992	20% AEP, 15 min burst, Storm 10
P5836	0.04	0.9	551.988	551.881	20% AEP, 10 min burst, Storm 8
P5859	0.039	0.88	551.87	551.7	20% AEP, 15 min burst, Storm 8
P5844	0.019	0.72	551.939	551.879	20% AEP, 10 min burst, Storm 8
P5873	0.026	1.03	551.879	551.822	20% AEP, 10 min burst, Storm 8
P5848	0.023	0.68	551.768	551.725	20% AEP, 10 min burst, Storm 8
P5870	0.039	1.18	551.693	551.654	20% AEP, 10 min burst, Storm 8
P5996	0.192	1.43	551.607	551.408	20% AEP, 20 min burst, Storm 2
P5829	0	0	552.151	551.651	20% AEP, 5 min burst, Storm 1
P5923	0.019	0.72	551.94	551.879	20% AEP, 10 min burst, Storm 8
P5919	0.026	1.03	551.879	551.822	20% AEP, 10 min burst, Storm 8
P5944	0.025	0.78	551.764	551.704	20% AEP, 10 min burst, Storm 8
P5941	0.032	1.12	551.689	551.64	20% AEP, 10 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.091	1.27	20% AEP, 20 min burst, Storm 3

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF82	0.017	0.023	0.207	0.07	0.03	1.83	0.43	20% AEP, 15 min burst, Storm 10
OF108	0	0.122	0.229	0.122	0.07	3.85	0.6	20% AEP, 15 min burst, Storm 10
OF107	0	0.097	0.229	0.113	0.06	3.52	0.57	20% AEP, 15 min burst, Storm 10
OF80	0	0.011	0.207	0.055	0.02	1.3	0.38	20% AEP, 10 min burst, Storm 8
OF27	0	0.043	0.207	0.087	0.04	2.37	0.49	20% AEP, 15 min burst, Storm 10
OF43	0.002	0.011	0.558	0.041	0.02	1.65	0.43	20% AEP, 10 min burst, Storm 8
OF50	0.013	0.037	0.205	0.083	0.04	2.26	0.47	20% AEP, 10 min burst, Storm 8
OF167	0.002	0.088	0.223	0.11	0.06	3.42	0.55	20% AEP, 15 min burst, Storm 8
OF168	0.004	0.097	0.223	0.114	0.06	3.54	0.56	20% AEP, 15 min burst, Storm 8
OF94	0	0.121	0.207	0.123	0.08	3.6	0.62	20% AEP, 15 min burst, Storm 10
OF95	0	0.004	0.207	0.041	0.01	0.83	0.33	20% AEP, 10 min burst, Storm 8
OF96	0.004	0.012	0.564	0.042	0.02	1.72	0.45	20% AEP, 10 min burst, Storm 8
OF97	0.014	0.025	0.207	0.073	0.03	1.92	0.44	20% AEP, 10 min burst, Storm 8
OF98	0.024	0.042	0.564	0.063	0.03	3.12	0.54	20% AEP, 10 min burst, Storm 8
OF99	0.044	0.049	0.207	0.091	0.05	2.52	0.5	20% AEP, 10 min burst, Storm 8
OF337	0.107	0.112	1.431	0.042	0.04	4	1.04	20% AEP, 20 min burst, Storm 6
OF380	0.125	0.125	0.005	0.085	0.06	4.96	0.67	20% AEP, 20 min burst, Storm 2
OF111	0.097	0.1	0.564	0.084	0.05	4.52	0.63	20% AEP, 15 min burst, Storm 10
OF112	0.1	0.101	0.231	0.114	0.07	3.56	0.58	20% AEP, 15 min burst, Storm 10
OF109	0.122	0.128	0.475	0.098	0.11	2.94	1.08	20% AEP, 15 min burst, Storm 10
OF110	0.101	0.103	0.475	0.091	0.09	2.69	1.03	20% AEP, 15 min burst, Storm 10
OF149	0	0.094	0.231	0.112	0.06	3.46	0.57	20% AEP, 15 min burst, Storm 10
OF150	0	0.087	0.231	0.109	0.06	3.36	0.56	20% AEP, 15 min burst, Storm 10
OF213	0.009	0.01	0.553	0.039	0.02	1.55	0.43	20% AEP, 10 min burst, Storm 8
OF152	0.192	0.193	0.227	0.143	0.09	4.62	0.66	20% AEP, 15 min burst, Storm 10
OF322	0.094	0.096	1.086	0.066	0.07	3.35	1.08	20% AEP, 15 min burst, Storm 10
OF151	0.087	0.088	0.498	0.085	0.09	2.48	1.03	20% AEP, 15 min burst, Storm 10
OF170	0.193	0.193	0.553	0.105	0.08	5.92	0.72	20% AEP, 15 min burst, Storm 10
OF174	0.101	0.107	0.227	0.118	0.07	3.69	0.58	20% AEP, 15 min burst, Storm 10
OF169	0.088	0.088	0.642	0.056	0.03	4	0.54	20% AEP, 15 min burst, Storm 8
OF171	0.097	0.097	1.302	0.028	0.05	4	1.84	20% AEP, 15 min burst, Storm 8
OF173	0.009	0.009	0.553	0.038	0.02	1.45	0.43	20% AEP, 10 min burst, Storm 8
OF175	0.033	0.043	0.227	0.087	0.04	2.55	0.48	20% AEP, 15 min burst, Storm 10

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OF190	0	0.087	0.248	0.106	0.06	3.25	0.6	20% AEP, 15 min burst, Storm 10
OF191	0	0.086	0.248	0.106	0.06	3.25	0.59	20% AEP, 15 min burst, Storm 10
OF145	0	0.009	0.227	0.053	0.02	1.3	0.34	20% AEP, 10 min burst, Storm 8
OF144	0	0.001	0.534	0.02	0.01	0.2	0.52	20% AEP, 10 min burst, Storm 8
OF176	0	0.009	0.248	0.052	0.02	1.26	0.37	20% AEP, 10 min burst, Storm 8
OF193	0	0.005	0.489	0.035	0.02	0.62	0.63	20% AEP, 10 min burst, Storm 8
OF192	0.087	0.101	0.605	0.082	0.06	4.39	0.67	20% AEP, 15 min burst, Storm 10
OF187	0.101	0.109	0.579	0.087	0.11	2.55	1.21	20% AEP, 15 min burst, Storm 10
OF186	0.086	0.092	0.579	0.082	0.1	2.38	1.17	20% AEP, 15 min burst, Storm 10
OF181	0	0.082	0.254	0.104	0.06	3.17	0.6	20% AEP, 15 min burst, Storm 10
OF180	0	0.069	0.254	0.098	0.06	2.96	0.57	20% AEP, 15 min burst, Storm 10
OF182	0.002	0.005	0.71	0.029	0.01	0.85	0.47	20% AEP, 10 min burst, Storm 8
OF185	0.069	0.07	1.436	0.036	0.03	4	0.84	20% AEP, 15 min burst, Storm 10
OF184	0.082	0.083	0.518	0.083	0.09	2.4	1.04	20% AEP, 15 min burst, Storm 10
OF183	0.158	0.158	0.297	0.122	0.12	3.19	1	20% AEP, 15 min burst, Storm 10
OF36	0	0.081	0.205	0.108	0.06	3.09	0.56	20% AEP, 10 min burst, Storm 8
OF37	0	0.002	0.205	0.031	0.01	0.51	0.29	20% AEP, 10 min burst, Storm 8
OF71	0	0.033	0.243	0.076	0.04	2	0.53	20% AEP, 15 min burst, Storm 10
OF62	0	0.011	0.243	0.052	0.02	1.21	0.44	20% AEP, 10 min burst, Storm 8
OF30	0	0.002	0.557	0.024	0.01	0.24	0.58	20% AEP, 15 min burst, Storm 10
OF148	0	0.002	0.496	0.028	0.02	0.35	0.58	20% AEP, 10 min burst, Storm 8
OF189	0	0.002	0.506	0.027	0.02	0.31	0.58	20% AEP, 10 min burst, Storm 8
OF179	0	0.005	0.499	0.036	0.02	0.66	0.66	20% AEP, 10 min burst, Storm 8
OF166	0	0.101	0.227	0.115	0.07	3.58	0.57	20% AEP, 15 min burst, Storm 10
OF177	0	0.033	0.248	0.078	0.04	2.21	0.48	20% AEP, 15 min burst, Storm 10
OF363	0.096	0.096	0.642	0.058	0.03	4	0.57	20% AEP, 10 min burst, Storm 8
OF364	0.072	0.072	0.642	0.051	0.03	4	0.5	20% AEP, 15 min burst, Storm 8
OF74	0	0.014	0.319	0.052	0.03	1.21	0.56	20% AEP, 10 min burst, Storm 8
OF79	0	0.024	0.319	0.063	0.04	1.56	0.62	20% AEP, 10 min burst, Storm 8
OF53	0	0.002	0.315	0.031	0.01	0.47	0.4	20% AEP, 10 min burst, Storm 8
OF61	0	0.005	0.315	0.039	0.02	0.78	0.43	20% AEP, 10 min burst, Storm 8
OF378	0.362	0.376	0.235	0.358	0.26	2.86	0.73	20% AEP, 20 min burst, Storm 3
OF41863	0	0.012	0.207	0.058	0.02	1.39	0.39	20% AEP, 15 min burst, Storm 10
OF41888	0.074	0.074	0.655	0.051	0.03	4	0.51	20% AEP, 15 min burst, Storm 10
OF41882	0.039	0.039	0.655	0.04	0.02	4	0.4	20% AEP, 15 min burst, Storm 8
OF41895	0.026	0.026	0.039	0.086	0.03	2.07	0.29	20% AEP, 10 min burst, Storm 8
OF41905	0.039	0.044	0.039	0.105	0.03	2.51	0.33	20% AEP, 10 min burst, Storm 8
OF42022	0	0	0.642	0	0	0	0	
OF41867	0	0.02	0.207	0.067	0.03	1.71	0.42	20% AEP, 15 min burst, Storm 10
OF41891	0.094	0.113	0.039	0.149	0.06	3.57	0.42	20% AEP, 25 min burst, Storm 4
OF41936	0	0.007	0.223	0.044	0.02	0.94	0.44	20% AEP, 10 min burst, Storm 8
OF41885	0	0	0.655	0	0	0	0	
OF41874	0	0.015	0.207	0.061	0.02	1.53	0.4	20% AEP, 10 min burst, Storm 8
OF41877	0	0.01	0.207	0.054	0.02	1.28	0.37	20% AEP, 10 min burst, Storm 8
OF41939	0	0.01	0.273	0.046	0.03	1	0.55	20% AEP, 10 min burst, Storm 8
OF41899	0.026	0.026	0.039	0.086	0.03	2.07	0.29	20% AEP, 10 min burst, Storm 8
OF41902	0.032	0.037	0.039	0.098	0.03	2.35	0.32	20% AEP, 10 min burst, Storm 8
OF41982	0.192	0.192	0.039	0.167	0.1	4	0.58	20% AEP, 20 min burst, Storm 2
OF42005	0	0.003	0.146	0.074	0.02	0.32	0.29	20% AEP, 10 min burst, Storm 8
OF45550	0	0.005	0.119	0.091	0.02	0.4	0.27	20% AEP, 10 min burst, Storm 8
OF45552	0	0.002	0.119	0.066	0.01	0.29	0.22	20% AEP, 10 min burst, Storm 8
OF42017	0	0.003	0.146	0.073	0.02	0.32	0.29	20% AEP, 10 min burst, Storm 8
OF45554	0	0.008	0.223	0.045	0.02	0.98	0.45	20% AEP, 10 min burst, Storm 8
OF42015	0	0.01	0.273	0.046	0.03	1	0.56	20% AEP, 10 min burst, Storm 8
OF43356	0	0.043	0.039	0.103	0.03	2.48	0.33	20% AEP, 10 min burst, Storm 8
OF45587	0	0.012	0.253	0.05	0.03	1.15	0.52	20% AEP, 10 min burst, Storm 8
OF45560	0	0.016	0.214	0.059	0.03	1.43	0.48	20% AEP, 10 min burst, Storm 8
OF45571	0	0.012	0.114	0.127	0.04	0.56	0.32	20% AEP, 10 min burst, Storm 8
OF45574	0	0.005	0.114	0.092	0.02	0.41	0.26	20% AEP, 10 min burst, Storm 8
OF45576	0	0.018	0.214	0.06	0.03	1.49	0.5	20% AEP, 10 min burst, Storm 8
OF45600	0	0.01	0.253	0.047	0.02	1.04	0.52	20% AEP, 10 min burst, Storm 8
OF45598	0	0.003	0.135	0.076	0.02	0.33	0.28	20% AEP, 10 min burst, Storm 8

2016 - 20% AEP

OF45596	0	0.003	0.332	0.035	0.02	0.64	0.43	20% AEP, 10 min burst, Storm 8
OF81	0.011	0.016	0.564	0.046	0.02	2.02	0.46	20% AEP, 10 min burst, Storm 8

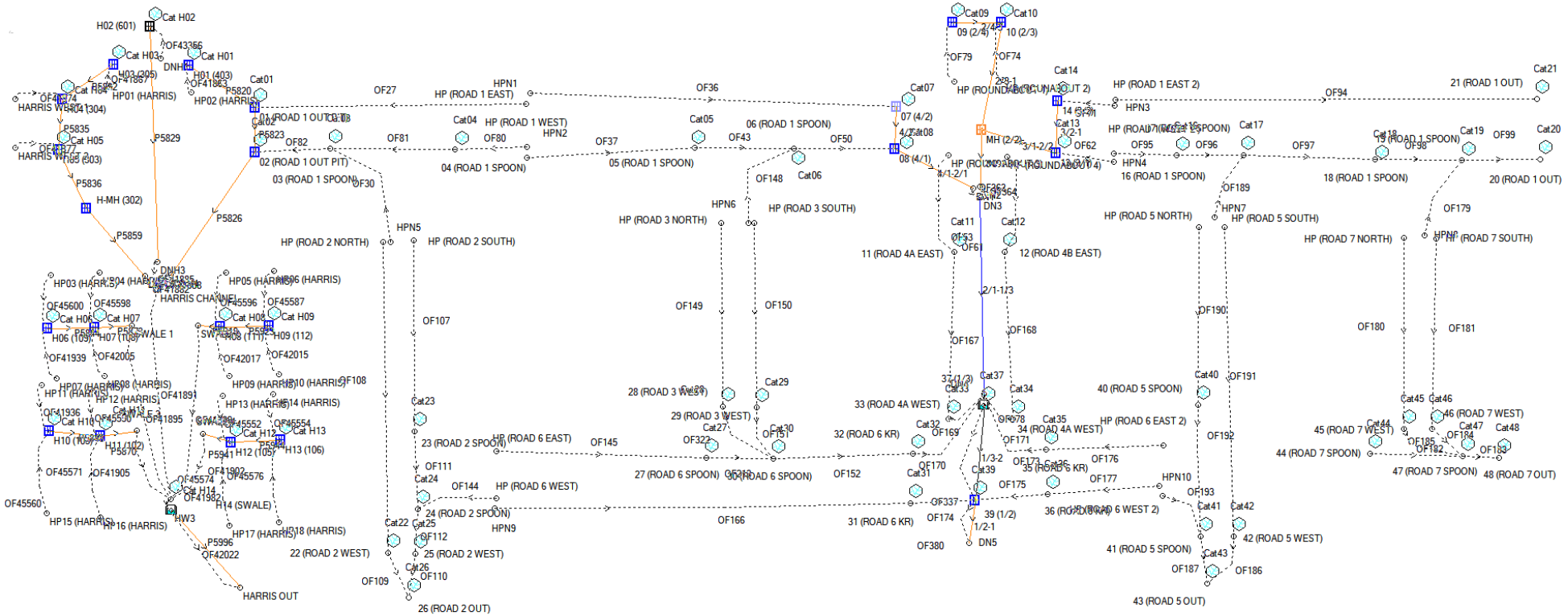
DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

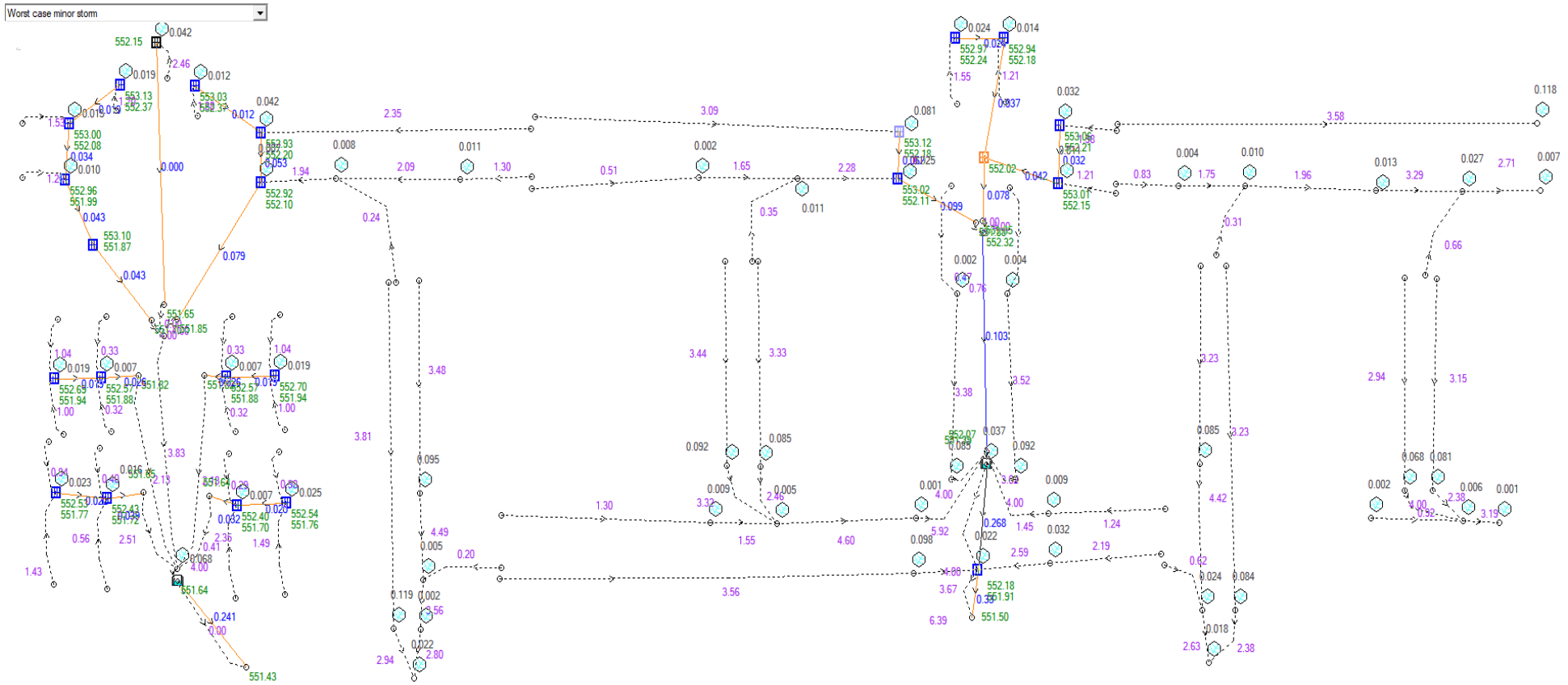
Run Log for KILGARIFF_2016_IFD run at 14:28:42 on 22/11/2019
Water was lost from the system at: H02 (601), 07 (4/2). If this water re-enters the system further downstream you should draw an overflow route from these locations

No water upwelling from any pit.
Freeboard was less than 0.15m at 39 (1/2)
The maximum flow in these overflow routes is unsafe: OF380, OF378, OF41905, OF41891, OF41982, OF4335
These sag pits have unsafe water levels for minor storms: H12 (105), H13 (106), H08 (111), H09 (112), H11 (102), H10 (103), H07 (108), H06 (109), H05 (303), H04 (304), H03 (305), 02 (ROAD 1 OUT PIT), H01 (403), 13 (3/1), 14 (3

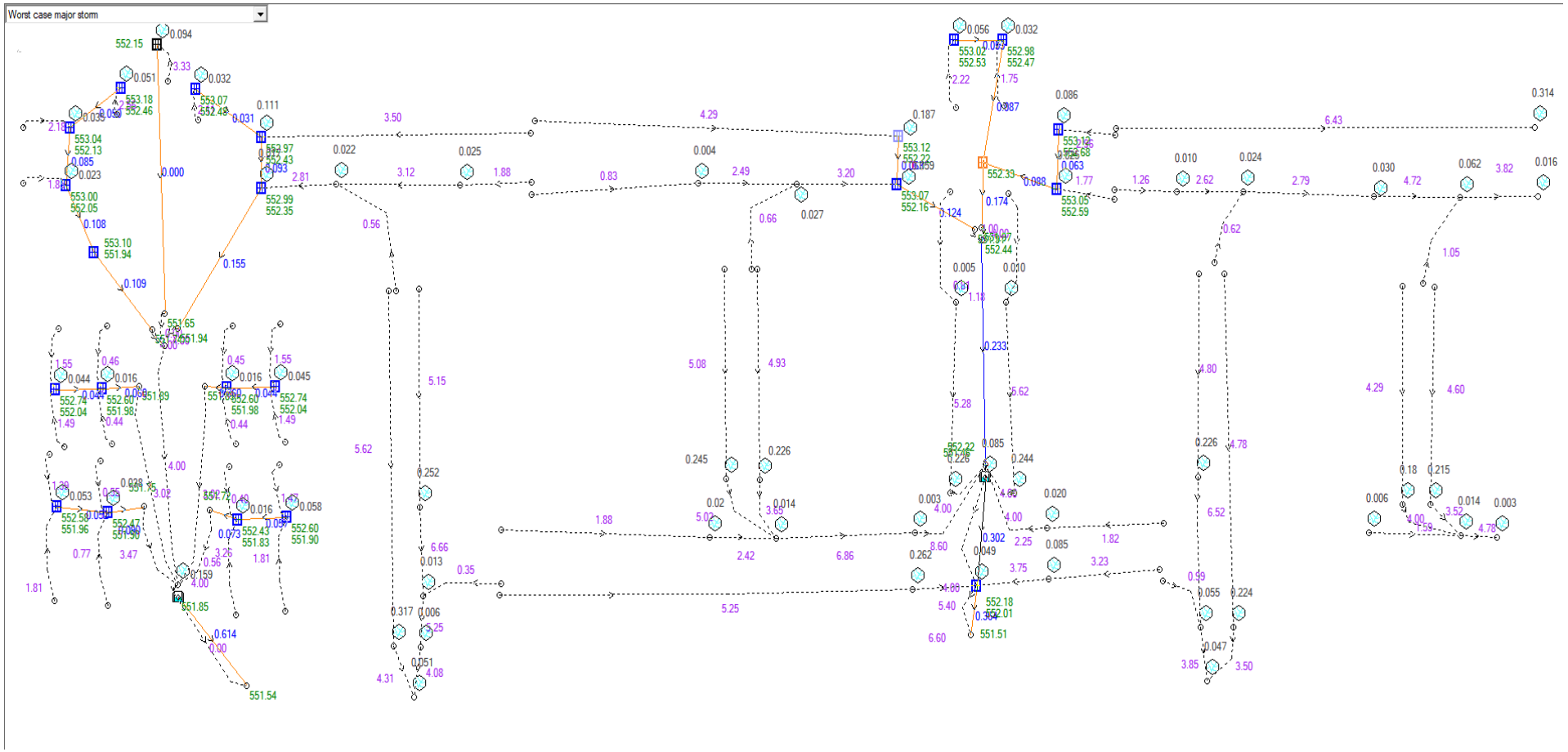
IGNORE THESE WARNINGS AT YOUR OWN PERIL.\cf1



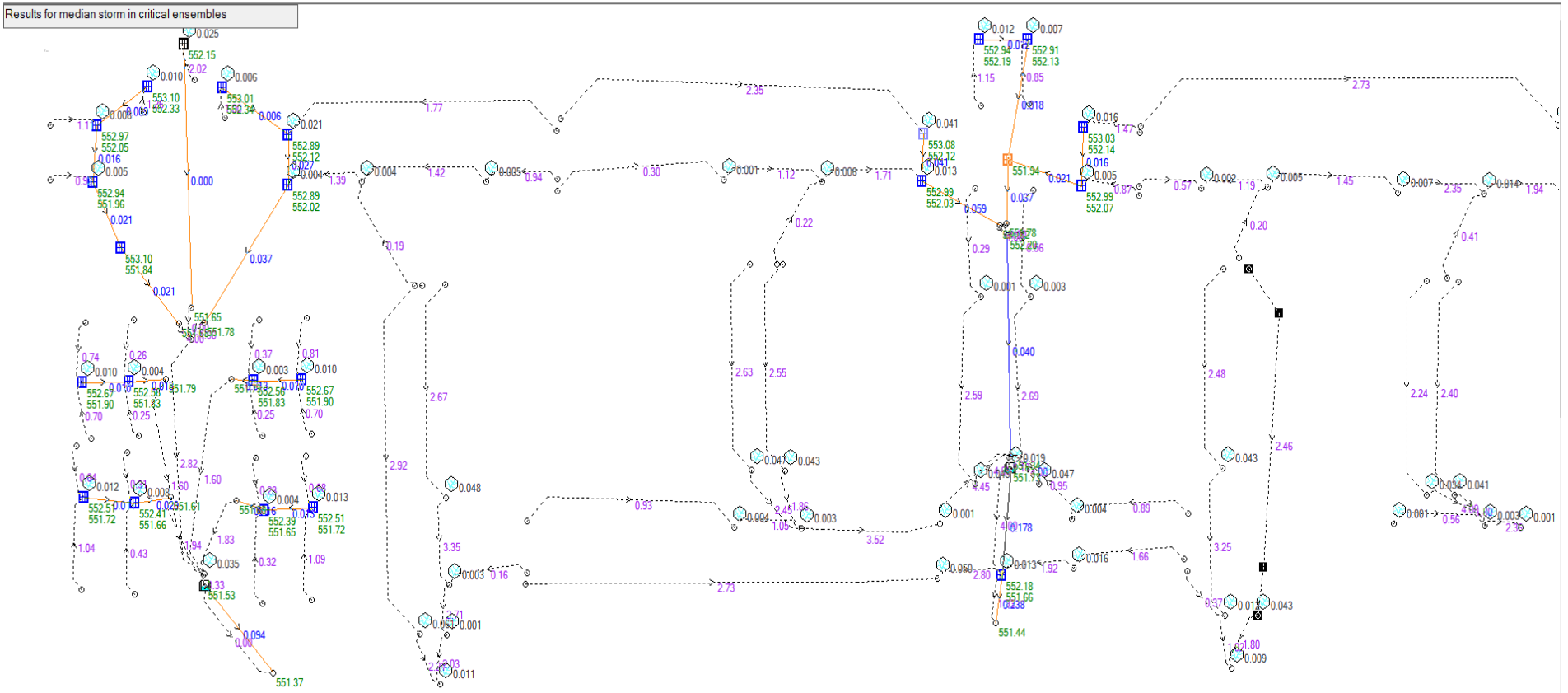
KILGARIFF DRAINS MODEL



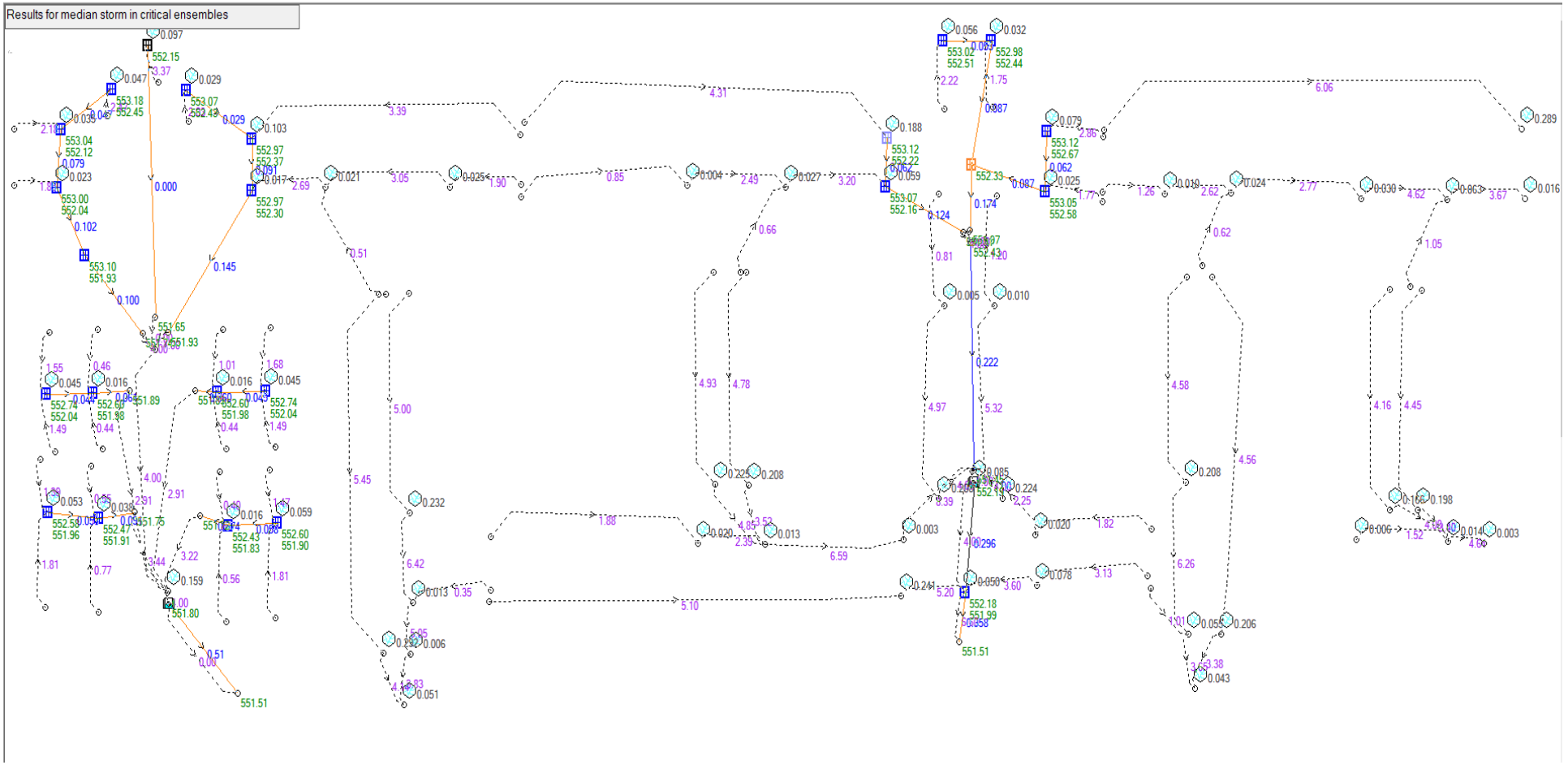
KILGARIFF DRAINS MODEL
5 YEAR RAINFALL EVENT



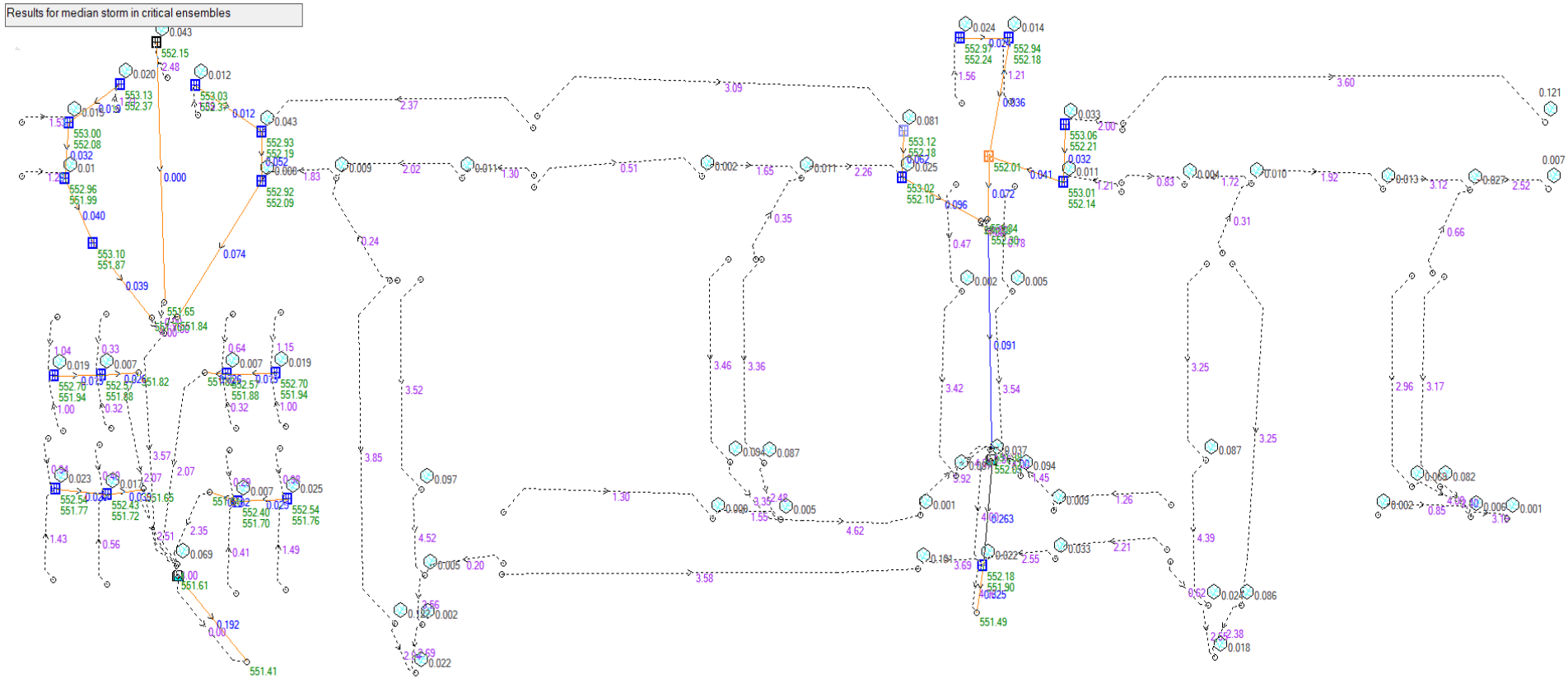
KILGARIFF DRAINS MODEL
100 YEAR RAINFALL EVENT



KILGARIFF DRAINS MODEL
50% AEP RAINFALL EVENT
2016 BOM DATA



KILGARIFF DRAINS MODEL
1%AEP RAINFALL EVENT
2016 BOM DATA



KILGARIFF DRAINS MODEL
20% AEP RAINFALL EVENT
2016 BOM DATA

Appendix B. Greenhill Assessment using 2016 AR&R Data

Review of DRAINS modelling prepared by SKM

DRAINS Model reviewed: KILGARIFF_2016_IFD – Rev 1.drn

Model Received: 29 Nov 2019

Basis of Review:

A Review of the DRAINS model received by SKM has been undertaken in respect to parameters described by Steve Gilmour in email dated 4/3/202. Summary of design parameters are:

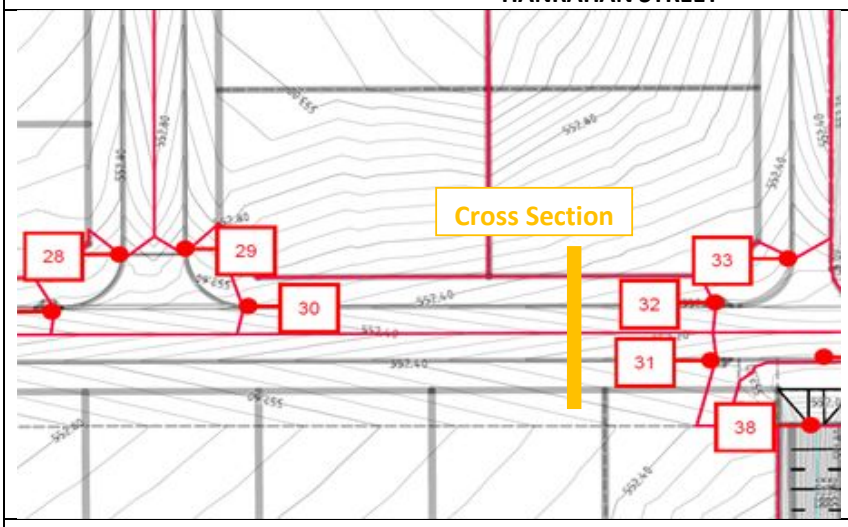
- Minor storm reviewed - 20% AEP
  Note, SKM did not provide a model for the 0.2EY storm as requested by ASTC.
- Flow depth in roads to be less than 120mm deep (approx. 4m in width).
- Flow depth in spoon drains across intersections to be maximum of 100mm
- Flow velocity in spoon drains across intersections to be maximum of 0.75 m/s
- Maximum catchment area contributing to a spoon drain across an intersection to be 1.2 Ha
- Flow in minor storm event to be contained within the road carriageway. Overtopping of kerb not allowed.

It is noted that there were some deficiencies in the DRAINS modelling that were corrected to allow an appropriate review of the flows within the road. These corrections related to the routing of overflow routes only.

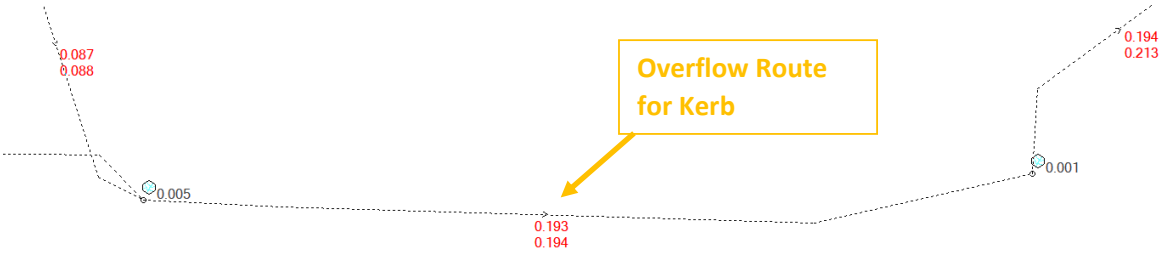
A review or adjustment to catchment parameters, hydrology models, pipe sizes/levels or overflow route data was not undertaken and has been assumed to be reflective of the as constructed site as prepared by SKM.

The following tables highlight the areas of the model that have been shown to exceed the parameters.

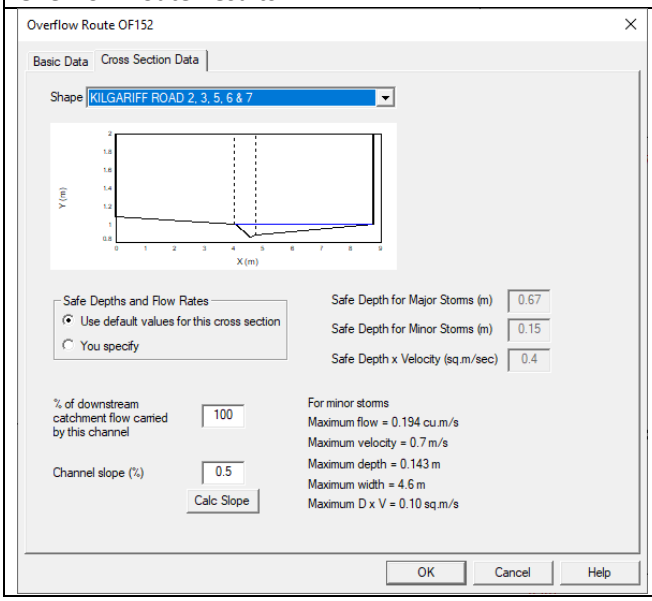
HANRAHAN STREET



DRAINS SCREENSHOT



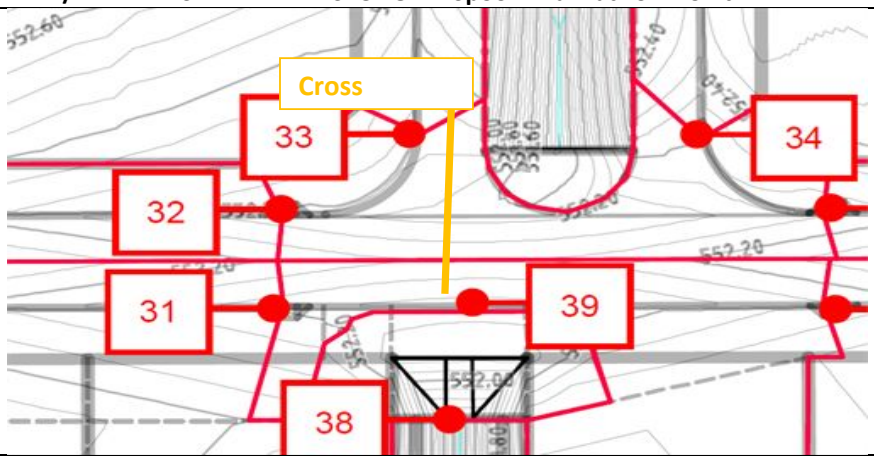
Overflow Route Results



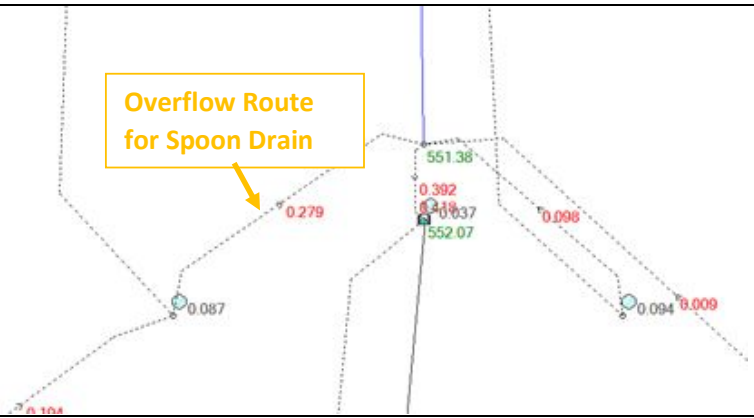
Notes:

- Flow width exceeds 4m
  (Flow width modelled to be 4.6m)
- Flow depth greater than 120mm
  (flow depth modelled to be 143mm)

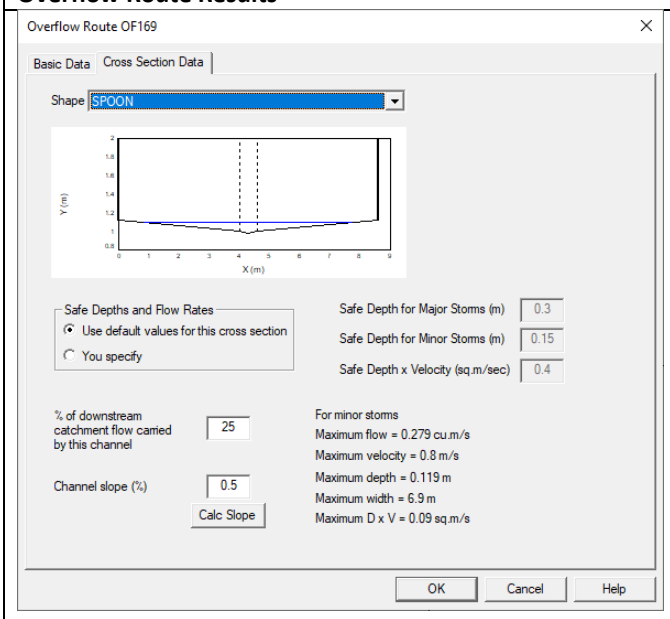
HANRAHAN STREET/MIETHKE STREET INTERSECTION – Spoon Drain at Low Point



DRAINS SCREENSHOT



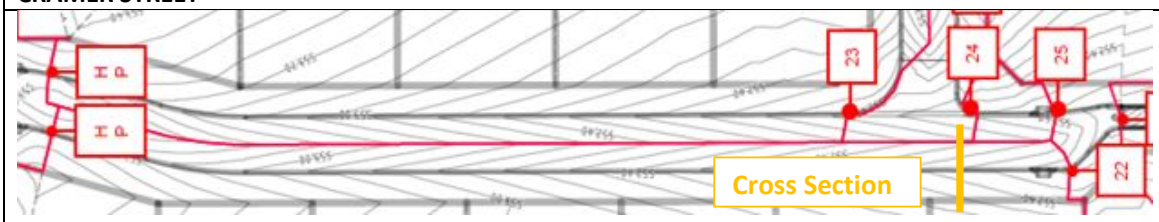
Overflow Route Results



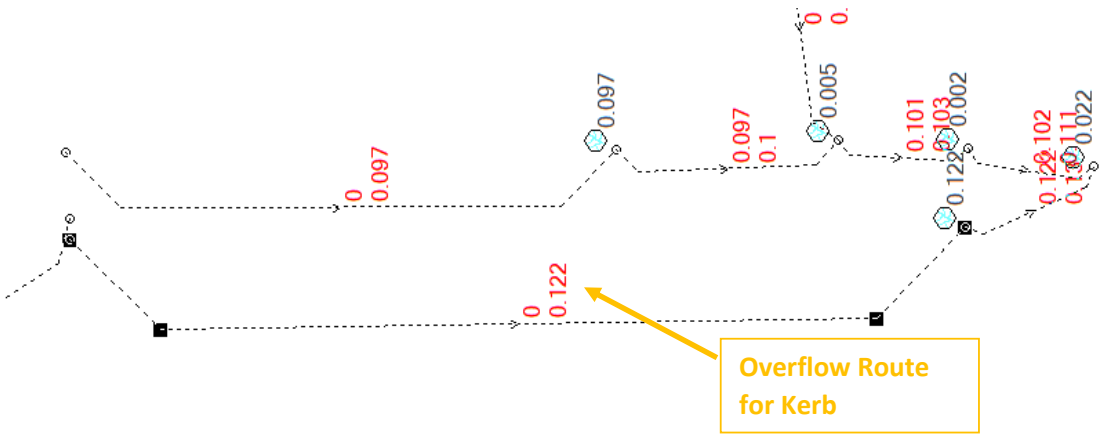
Notes:

- Spoon Drain is located at a low point, and has a contributing catchment of over 1.7 Ha. (exceeds 1.2 Ha as specified as the maximum catchment for a spoon drain across an intersection.
- Flow width exceeds 4m
  (Flow width modelled to be 6.9)
- Flow Depth exceed 100mm
  (Flow depth modelled to be 119mm)
- Flow velocity exceed 0.75m/s
  (Flow velocity modeled to be 0.8 m/s)

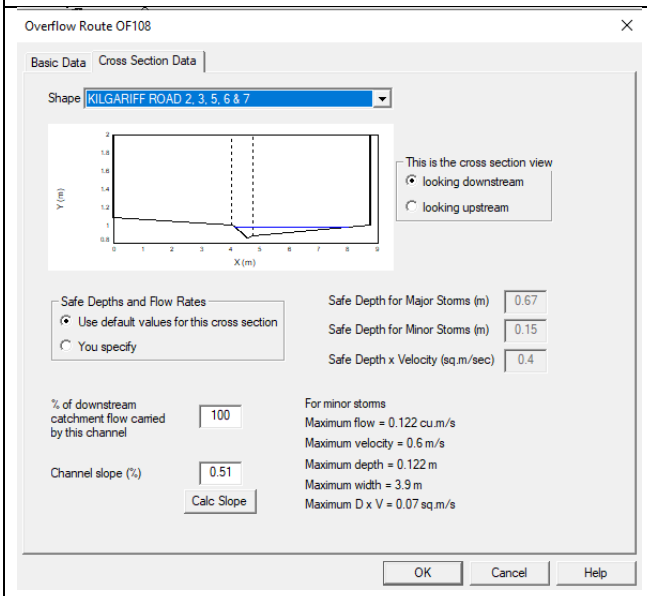
CRAMER STREET



DRAINS SCREENSHOT



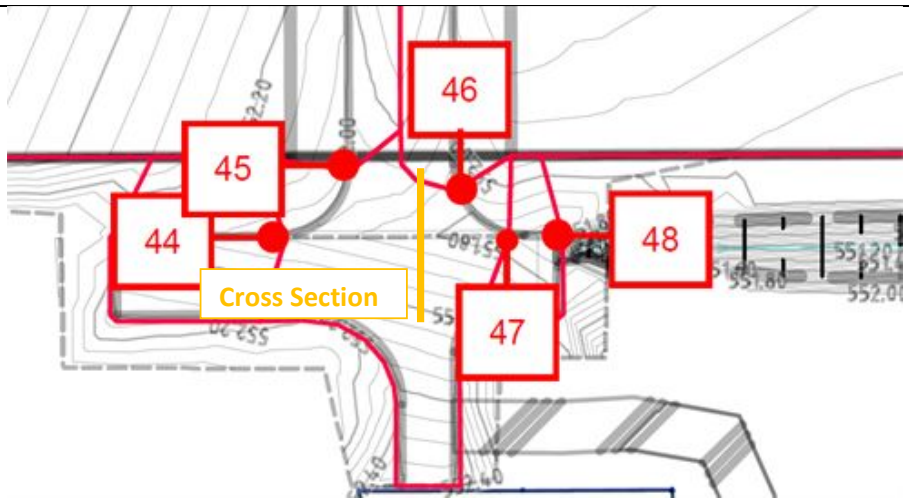
Overflow Route Results



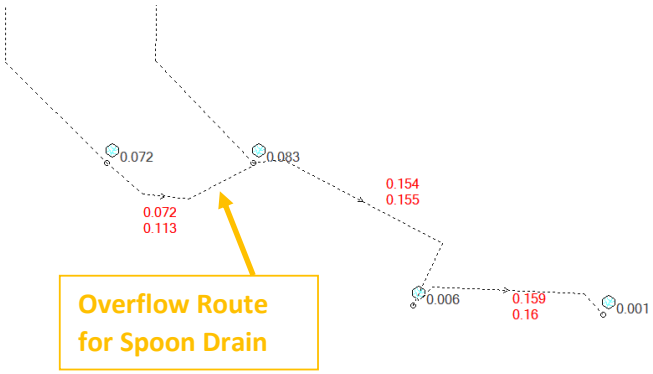
Notes:

- Flow depth greater than 120mm (flow depth modelled to be 122mm)

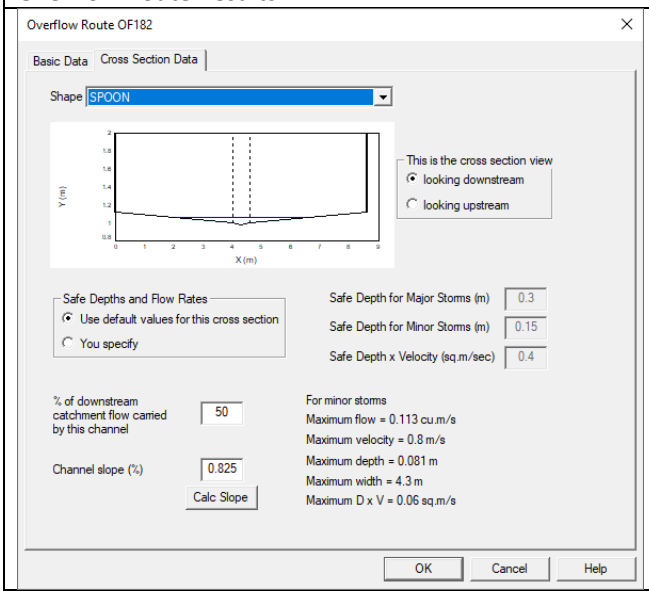
FADELLI STREET



DRAINS SCREENSHOT



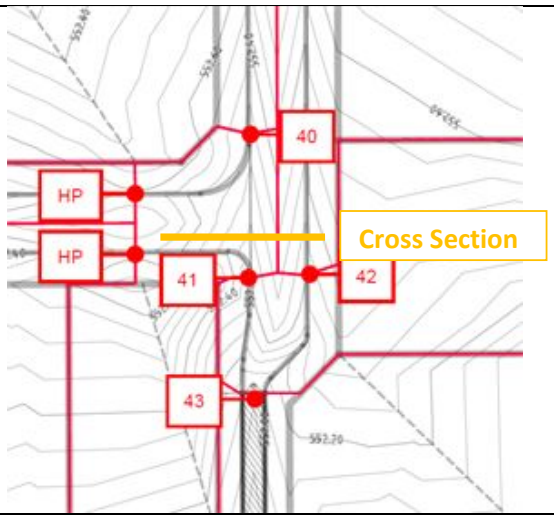
Overflow Route Results



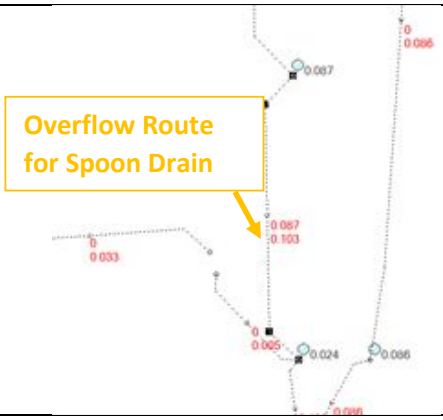
Notes:

- Flow width exceeds 4m
  (Flow width modelled to be 4.3m)
- Flow velocity exceeds 0.75m/s

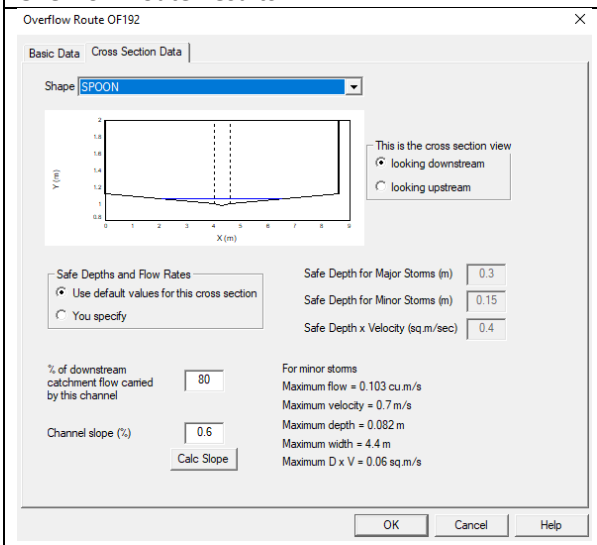
CAWOOD STREET



DRAINS SCREENSHOT



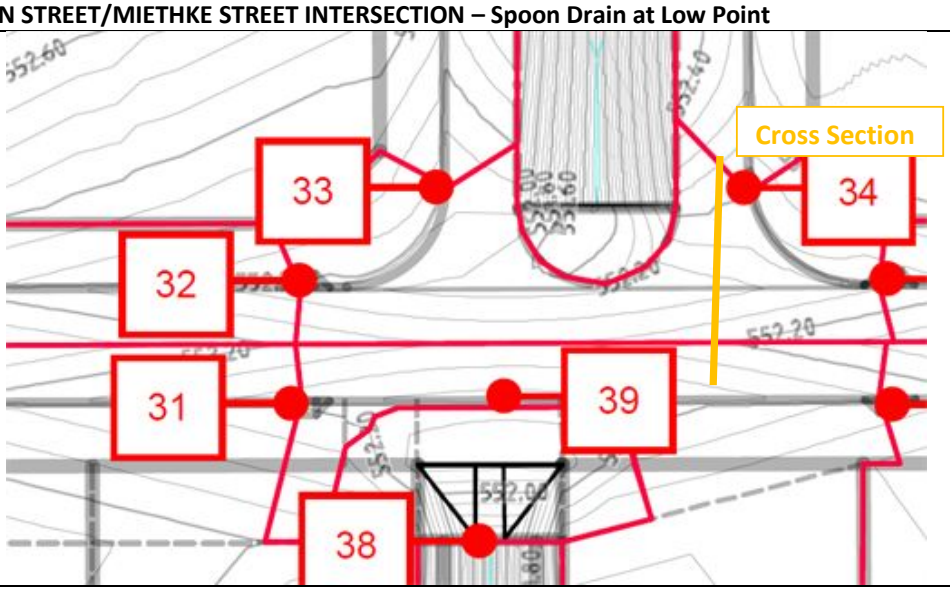
Overflow Route Results



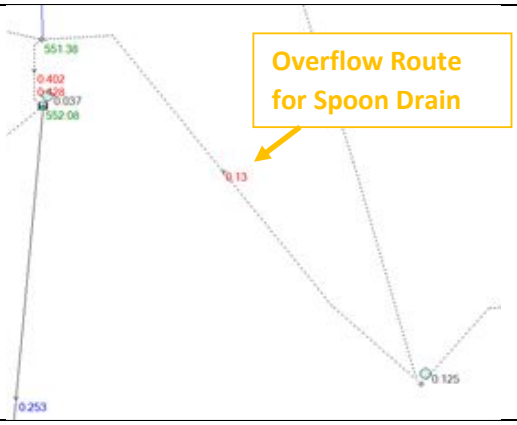
Notes:

- Flow width exceeds 4m
  (Flow width modelled to be 4.4m)

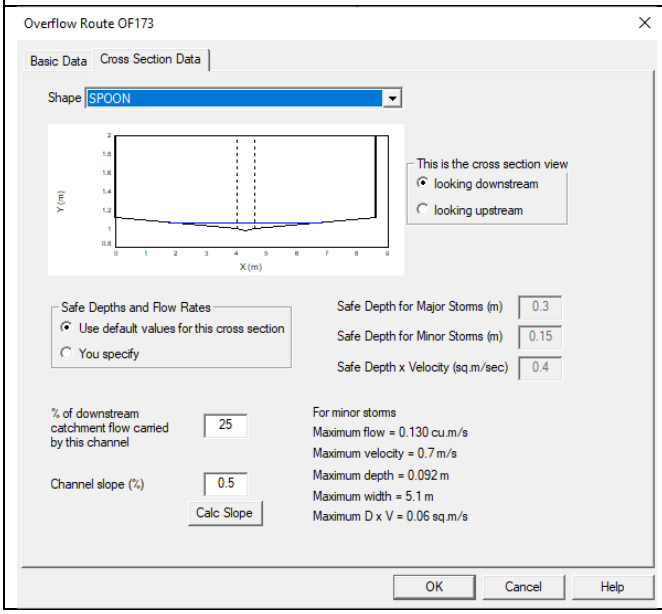
HANRAHAN STREET/MIETHKE STREET INTERSECTION – Spoon Drain at Low Point



DRAINS SCREENSHOT



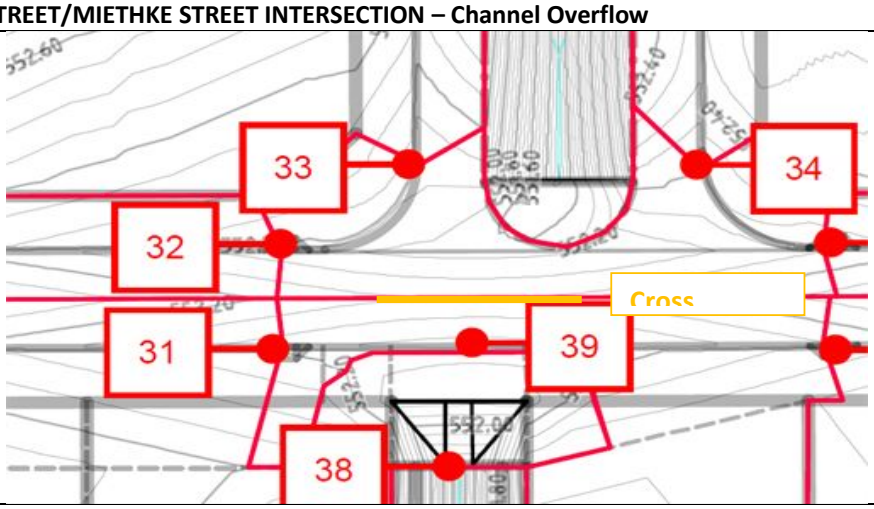
Overflow Route Results



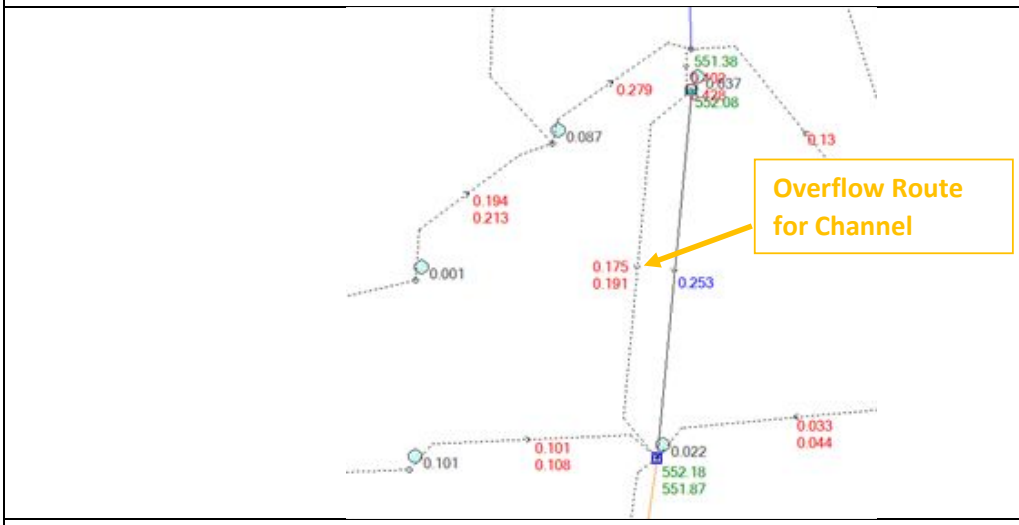
Notes:

- Flow width exceeds 4m
  (Flow width modelled to be 5.1m)

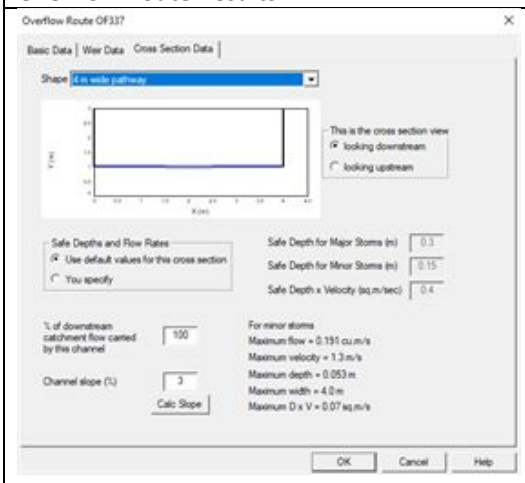
HANRAHAN STREET/MIETHKE STREET INTERSECTION – Channel Overflow



DRAINS SCREENSHOT



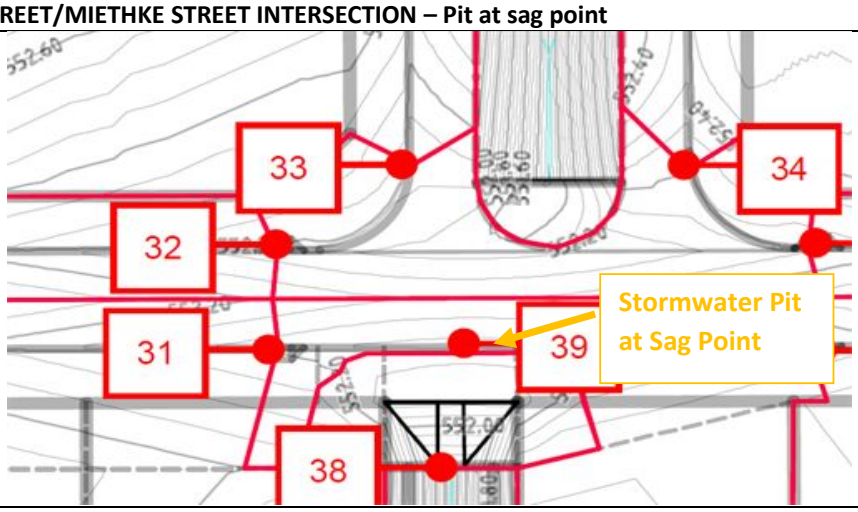
Overflow Route Results



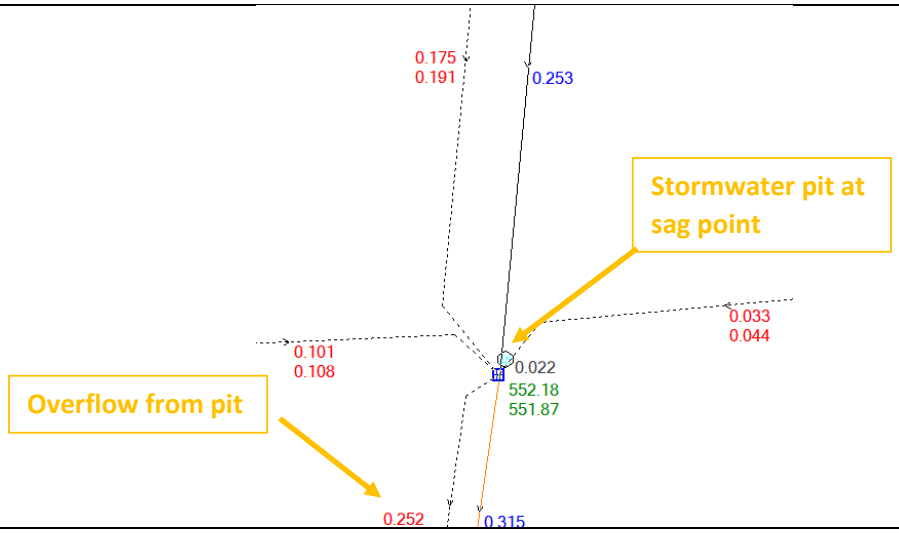
Notes:

- Open Channel is overtopping and flowing across the low point in the road (ie flows are overtopping the crown of the road). Flow depth modelled shows 53mm depth above crown of road.
- Stormwater pipe under the road does not have the capacity to cater for the minor storm event flows.
- Overflow route cross section modelled is not representative of actual cross section on site.
- Intersection will be completely submerged.
- Does not comply with requirement for minor storm event flows to be contained within the road carriageway.

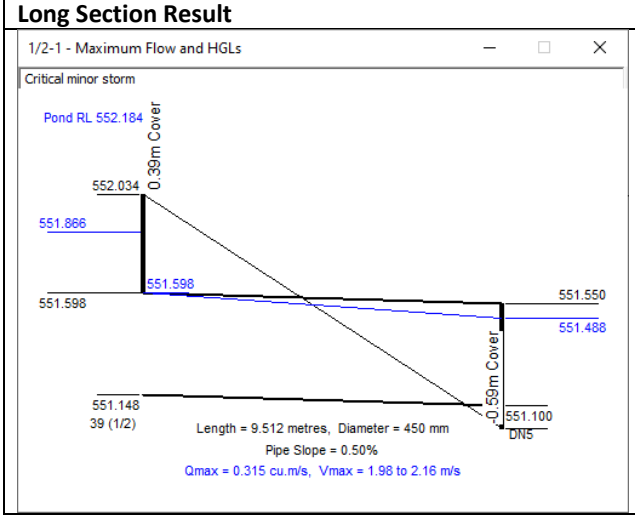
HANRAHAN STREET/MIETHKE STREET INTERSECTION – Pit at sag point



DRAINS SCREENSHOT



Long Section Result



- Pit does not have inlet capacity for incoming flows
- Stormwater modelled to pond to a depth of 150mm before overtopping the kerb and flowing across the verge.
- Ponding depth of 150mm will result in entire road reserve inundated at intersection.
- Does not comply with requirement for minor storm event flows to be contained within the road carriageway.

Appendix C. Updated Drains Modelling with Proposed Upgrades

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivir (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
37 (1/3)	551.63		0.443		0.37	0	None
39 (1/2)	551.49	552.18	0.174	1.7	0.54	0.086	Inlet Capacity
DN5	551.33		0.109				
07 (4/2)	552.26	553.12	0.098	1.7	0.71		Inlet Capacity
08 (4/1)	552.13	553.02	0.046	0.9	0.8		Inlet Capacity
DN1	551.88		0				
09 (2/4)	552.26	552.97	0.029	0.7	0.63		Inlet Capacity
10 (2/3)	552.15	552.94	0.017	0.4	0.74		Inlet Capacity
MH (2/2)	552.02		0		1.58		None
DN2	551.84		0				
14 (3/2)	552.26	553.06	0.037	0.8	0.71		Inlet Capacity
13 (3/1)	552.16	553.01	0.013	0.3	0.81		Inlet Capacity
DN3	552.3		0.191				
DN4	551.38		0.419				
H01 (403)	552.4	553.03	0.014	0.3	0.59		Inlet Capacity
01 (ROAD 1 O	552.27	552.93	0.048	1	0.55		Inlet Capacity
02 (ROAD 1 O	552.1	552.92	0.029	0.6	0.74		Inlet Capacity
DNH4	551.84		0				
H03 (305)	552.39	553.13	0.022	0.5	0.67		Inlet Capacity
H04 (304)	552.08	553	0.018	0.4	0.86		Inlet Capacity
H05 (303)	551.99	552.96	0.012	0.3	0.94		Inlet Capacity
H-MH (302)	551.87	553.1	0	0	1.23		None
DNH2	551.7		0				
H06 (109)	551.98	552.7	0.023	0.5	0.65		Inlet Capacity
H07 (108)	551.88	552.57	0.008	0.2	0.66		Inlet Capacity
SWALE 1	551.82		0				
H10 (103)	551.84	552.54	0.028	0.6	0.62		Inlet Capacity
H11 (102)	551.78	552.43	0.02	0.5	0.59		Inlet Capacity
SWALE 3	551.65		0				
HW3	551.61		0.212		0.89	0	None
HARRIS OUT	551.41		0				
H02 (601)	552.15		0.05		2.85		None
DNH3	551.65		0				
H09 (112)	551.98	552.7	0.023	0.6	0.65		Inlet Capacity
H08 (111)	551.88	552.57	0.008	0.2	0.66		Inlet Capacity
SWALE 2	551.82		0				
H13 (106)	551.82	552.54	0.031	0.7	0.64		Inlet Capacity
H12 (105)	551.71	552.4	0.008	0.2	0.66		Inlet Capacity
SWALE 4	551.64		0				
30A (ROAD 6 S	552.1		0.218		0.28	0.086	Inlet Capacity
32A (ROAD 6 I	551.89		0.106		0.18	0.02	Inlet Capacity
33A (ROAD 4A	551.78	552.35	0.099	8.6	0.42	0.026	Inlet Capacity
DN4A	551.58		0				
34A (ROAD 4A	551.61		0.11		0.59	0.034	Inlet Capacity
DN4B	551.25		0				
45A (ROAD 7 \	551.97		0.077		0.03	0.017	Inlet Capacity
46A (ROAD 7 \	551.88		0.092		0.12	0.024	Inlet Capacity
47 (ROAD 7 SE	551.44		0.067				
42A (ROAD 5 \	551.23		0.096		0.98	0.027	Inlet Capacity
40A (ROAD 5 S	551.2		0.097		1.12	0.027	Inlet Capacity
43 (ROAD 5 O	550.85		0.102				

SUB-CATCHMENT DETAILS

Name	Max Flow Q	Paved Max Q	Grassed Max Q	Paved Tc	Grassed Tc	Supp. Tc	Due to Storm

	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat03	0.009	0.003	0.006	5	10	5	20% AEP, 15 min burst, Storm 10
Cat05	0.002	0.001	0.001	5	5	5	20% AEP, 10 min burst, Storm 8
Cat06	0.011	0.003	0.008	5	5	5	20% AEP, 10 min burst, Storm 8
Cat11	0.002	0.001	0.001	5	5	5	20% AEP, 10 min burst, Storm 8
Cat12	0.005	0.001	0.003	5	5	5	20% AEP, 10 min burst, Storm 8
Cat16	0.004	0.001	0.003	5	5	5	20% AEP, 10 min burst, Storm 8
Cat17	0.01	0.003	0.007	5	5	5	20% AEP, 10 min burst, Storm 8
Cat18	0.013	0.004	0.009	5	5	5	20% AEP, 10 min burst, Storm 8
Cat19	0.027	0.008	0.019	5	5	5	20% AEP, 10 min burst, Storm 8
Cat20	0.007	0.002	0.005	5	5	5	20% AEP, 10 min burst, Storm 8
Cat21	0.121	0.037	0.084	5	10	5	20% AEP, 15 min burst, Storm 10
Cat37	0.037	0.011	0.026	5	5	5	20% AEP, 10 min burst, Storm 8
Cat39	0.022	0.007	0.015	5	5	5	20% AEP, 10 min burst, Storm 8
Cat23	0.097	0.03	0.067	5	10	5	20% AEP, 15 min burst, Storm 10
Cat24	0.005	0.002	0.004	5	5	5	20% AEP, 10 min burst, Storm 8
Cat22	0.122	0.037	0.084	5	10	5	20% AEP, 15 min burst, Storm 10
Cat25	0.002	0.001	0.002	5	5	5	20% AEP, 10 min burst, Storm 8
Cat26	0.022	0.006	0.016	5	5	5	20% AEP, 10 min burst, Storm 8
Cat27	0.009	0.003	0.006	5	5	5	20% AEP, 10 min burst, Storm 8
Cat28	0.094	0.029	0.065	5	10	5	20% AEP, 15 min burst, Storm 10
Cat29	0.087	0.026	0.06	5	10	5	20% AEP, 15 min burst, Storm 10
Cat31	0.101	0.031	0.07	5	10	5	20% AEP, 15 min burst, Storm 10
Cat35	0.009	0.003	0.006	5	5	5	20% AEP, 10 min burst, Storm 8
Cat36	0.033	0.01	0.023	5	10	5	20% AEP, 15 min burst, Storm 10
Cat41	0.024	0.007	0.017	5	5	5	20% AEP, 10 min burst, Storm 8
Cat44	0.002	0.001	0.002	5	10	5	20% AEP, 15 min burst, Storm 10
Cat48	0.001	0	0.001	5	5	5	20% AEP, 10 min burst, Storm 8
Cat07	0.081	0.023	0.057	5	5	5	20% AEP, 10 min burst, Storm 8
Cat08	0.025	0.007	0.018	5	5	5	20% AEP, 10 min burst, Storm 8
Cat09	0.024	0.007	0.017	5	5	5	20% AEP, 10 min burst, Storm 8
Cat10	0.014	0.004	0.01	5	5	5	20% AEP, 10 min burst, Storm 8
Cat14	0.033	0.01	0.023	5	10	5	20% AEP, 15 min burst, Storm 10
Cat13	0.011	0.003	0.008	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H01	0.012	0.004	0.008	5	10	5	20% AEP, 15 min burst, Storm 10
Cat01	0.043	0.013	0.03	5	10	5	20% AEP, 15 min burst, Storm 10
Cat02	0.008	0.002	0.005	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H03	0.02	0.006	0.014	5	10	5	20% AEP, 15 min burst, Storm 10
Cat H04	0.015	0.004	0.011	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H05	0.01	0.003	0.007	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H06	0.019	0.006	0.014	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H07	0.007	0.002	0.005	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H10	0.023	0.007	0.016	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H11	0.017	0.005	0.012	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H02	0.043	0.014	0.029	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H09	0.019	0.006	0.014	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H08	0.007	0.002	0.005	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H13	0.025	0.007	0.018	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H12	0.007	0.002	0.005	5	5	5	20% AEP, 10 min burst, Storm 8
Cat H14	0.069	0.02	0.049	5	5	5	20% AEP, 10 min burst, Storm 8
Cat04	0.011	0.003	0.008	5	5	5	20% AEP, 10 min burst, Storm 8
Cat30	0.005	0.002	0.004	5	10	5	20% AEP, 15 min burst, Storm 10
Cat32	0.001	0	0.001	5	5	5	20% AEP, 10 min burst, Storm 8
Cat33	0.087	0.026	0.06	5	10	5	20% AEP, 15 min burst, Storm 10
Cat34	0.094	0.029	0.065	5	10	5	20% AEP, 15 min burst, Storm 10
Cat45	0.069	0.021	0.048	5	10	5	20% AEP, 15 min burst, Storm 10
Cat46	0.082	0.025	0.057	5	10	5	20% AEP, 15 min burst, Storm 10
Cat47	0.006	0.002	0.004	5	5	5	20% AEP, 10 min burst, Storm 8
Cat42	0.086	0.026	0.06	5	10	5	20% AEP, 15 min burst, Storm 10
Cat40	0.087	0.026	0.06	5	10	5	20% AEP, 15 min burst, Storm 10
Cat43	0.018	0.006	0.013	5	10	5	20% AEP, 15 min burst, Storm 10

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.361	1.26	551.562	551.491	20% AEP, 20 min burst, Storm 2
1/2-1	0.421	2.04	551.43	551.329	20% AEP, 20 min burst, Storm 2
4/2-1	0.062	1.01	552.148	552.126	20% AEP, 10 min burst, Storm 9
4/1-2/1	0.096	1.47	552.072	551.875	20% AEP, 10 min burst, Storm 8
2/4-3	0.024	0.92	552.208	552.15	20% AEP, 10 min burst, Storm 8
2/3-1	0.036	0.96	552.15	552.023	20% AEP, 10 min burst, Storm 8
2/2-1	0.072	1.37	551.99	551.84	20% AEP, 15 min burst, Storm 8
3/2-1	0.032	0.9	552.181	552.161	20% AEP, 15 min burst, Storm 8
3/1-2/2	0.041	1.1	552.105	552.023	20% AEP, 15 min burst, Storm 10
P5820	0.012	0.41	552.396	552.27	20% AEP, 15 min burst, Storm 9
P5823	0.053	1.11	552.167	552.105	20% AEP, 15 min burst, Storm 9
P5826	0.075	1.34	552.08	551.841	20% AEP, 15 min burst, Storm 10
P5832	0.019	0.88	552.392	552.271	20% AEP, 15 min burst, Storm 9
P5835	0.032	0.82	552.077	551.992	20% AEP, 15 min burst, Storm 9
P5836	0.04	0.9	551.987	551.881	20% AEP, 15 min burst, Storm 10
P5859	0.04	0.88	551.87	551.7	20% AEP, 15 min burst, Storm 9
P5844	0.019	0.77	551.934	551.88	20% AEP, 10 min burst, Storm 8
P5873	0.026	1.03	551.88	551.822	20% AEP, 10 min burst, Storm 8
P5848	0.022	0.55	551.792	551.783	20% AEP, 10 min burst, Storm 8
P5870	0.039	1.18	551.693	551.654	20% AEP, 10 min burst, Storm 8
P5996	0.192	1.43	551.607	551.408	20% AEP, 25 min burst, Storm 6
P5829	0	0	552.151	551.651	20% AEP, 5 min burst, Storm 1
P5923	0.019	0.79	551.933	551.879	20% AEP, 10 min burst, Storm 8
P5919	0.026	1.03	551.879	551.822	20% AEP, 10 min burst, Storm 8
P5944	0.025	0.94	551.746	551.708	20% AEP, 10 min burst, Storm 8
P5941	0.032	1.12	551.686	551.64	20% AEP, 10 min burst, Storm 8
P152	0.106	0.96	552.031	551.891	20% AEP, 15 min burst, Storm 10
P170	0.163	1.03	551.811	551.779	20% AEP, 15 min burst, Storm 10
P169	0.225	1.78	551.727	551.579	20% AEP, 15 min burst, Storm 10
P171	0.063	1.18	551.571	551.527	20% AEP, 15 min burst, Storm 8
P185	0.052	0.47	551.883	551.876	20% AEP, 15 min burst, Storm 1
P184	0.11	1.45	551.524	551.444	20% AEP, 15 min burst, Storm 10
P186	0.059	0.56	551.208	551.199	20% AEP, 15 min burst, Storm 8
P192	0.117	1.49	551.194	550.851	20% AEP, 15 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.084	1.29	20% AEP, 25 min burst, Storm 7

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF82	0.017	0.023	0.207	0.07	0.03	1.83	0.43	20% AEP, 15 min burst, Storm 10
OF108	0	0.122	0.229	0.122	0.07	3.85	0.6	20% AEP, 15 min burst, Storm 10
OF107	0	0.097	0.229	0.113	0.06	3.52	0.57	20% AEP, 15 min burst, Storm 10
OF80	0	0.011	0.207	0.055	0.02	1.3	0.38	20% AEP, 10 min burst, Storm 8
OF27	0	0.043	0.207	0.087	0.04	2.37	0.49	20% AEP, 15 min burst, Storm 10
OF43	0.002	0.011	0.558	0.041	0.02	1.65	0.43	20% AEP, 10 min burst, Storm 8
OF50	0.013	0.037	0.205	0.083	0.04	2.26	0.47	20% AEP, 10 min burst, Storm 8
OF167	0.002	0.088	0.223	0.11	0.06	3.42	0.55	20% AEP, 15 min burst, Storm 8
OF168	0.004	0.097	0.223	0.114	0.06	3.54	0.56	20% AEP, 15 min burst, Storm 8
OF94	0	0.121	0.207	0.123	0.08	3.6	0.62	20% AEP, 15 min burst, Storm 10
OF95	0	0.004	0.207	0.041	0.01	0.83	0.33	20% AEP, 10 min burst, Storm 8
OF96	0.004	0.012	0.564	0.042	0.02	1.72	0.45	20% AEP, 10 min burst, Storm 8
OF97	0.014	0.025	0.207	0.073	0.03	1.92	0.44	20% AEP, 10 min burst, Storm 8
OF98	0.024	0.042	0.564	0.063	0.03	3.12	0.54	20% AEP, 10 min burst, Storm 8

OF99	0.044	0.049	0.207	0.091	0.05	2.52	0.5	20% AEP, 10 min burst, Storm 8
OF337	0	0	0	0	0	0	0	
OF380	0.086	0.086	0.005	0.075	0.05	4.28	0.61	20% AEP, 15 min burst, Storm 10
OF111	0.097	0.1	0.564	0.084	0.05	4.52	0.63	20% AEP, 15 min burst, Storm 10
OF112	0.1	0.101	0.231	0.114	0.07	3.56	0.58	20% AEP, 15 min burst, Storm 10
OF109	0.122	0.128	0.475	0.098	0.11	2.94	1.08	20% AEP, 15 min burst, Storm 10
OF110	0.101	0.103	0.475	0.091	0.09	2.69	1.03	20% AEP, 15 min burst, Storm 10
OF149	0	0.094	0.231	0.112	0.06	3.46	0.57	20% AEP, 15 min burst, Storm 10
OF150	0	0.087	0.231	0.109	0.06	3.36	0.56	20% AEP, 15 min burst, Storm 10
OF213	0.009	0.01	0.553	0.039	0.02	1.55	0.43	20% AEP, 10 min burst, Storm 8
OF322	0.094	0.096	1.086	0.066	0.07	3.35	1.08	20% AEP, 15 min burst, Storm 10
OF151	0.087	0.088	0.498	0.085	0.09	2.48	1.03	20% AEP, 15 min burst, Storm 10
OF174	0.101	0.107	0.227	0.118	0.07	3.69	0.58	20% AEP, 15 min burst, Storm 10
OF173	0.009	0.009	0.553	0.038	0.02	1.45	0.43	20% AEP, 10 min burst, Storm 8
OF175	0.033	0.043	0.227	0.087	0.04	2.55	0.48	20% AEP, 15 min burst, Storm 10
OF190	0	0.087	0.248	0.106	0.06	3.25	0.6	20% AEP, 15 min burst, Storm 10
OF191	0	0.086	0.248	0.106	0.06	3.25	0.59	20% AEP, 15 min burst, Storm 10
OF145	0	0.009	0.227	0.053	0.02	1.3	0.34	20% AEP, 10 min burst, Storm 8
OF144	0	0.001	0.534	0.02	0.01	0.2	0.52	20% AEP, 10 min burst, Storm 8
OF176	0	0.009	0.248	0.052	0.02	1.26	0.37	20% AEP, 10 min burst, Storm 8
OF193	0	0.005	0.489	0.035	0.02	0.62	0.63	20% AEP, 10 min burst, Storm 8
OF187	0.04	0.051	0.579	0.068	0.07	1.86	1.03	20% AEP, 15 min burst, Storm 9
OF181	0	0.082	0.254	0.104	0.06	3.17	0.6	20% AEP, 15 min burst, Storm 10
OF180	0	0.069	0.254	0.098	0.06	2.96	0.57	20% AEP, 15 min burst, Storm 10
OF182	0.002	0.005	0.71	0.029	0.01	0.85	0.47	20% AEP, 10 min burst, Storm 8
OF36	0	0.081	0.205	0.108	0.06	3.09	0.56	20% AEP, 10 min burst, Storm 8
OF37	0	0.002	0.205	0.031	0.01	0.51	0.29	20% AEP, 10 min burst, Storm 8
OF71	0	0.033	0.243	0.076	0.04	2	0.53	20% AEP, 15 min burst, Storm 10
OF62	0	0.011	0.243	0.052	0.02	1.21	0.44	20% AEP, 10 min burst, Storm 8
OF30	0	0.002	0.557	0.024	0.01	0.24	0.58	20% AEP, 15 min burst, Storm 10
OF148	0	0.002	0.496	0.028	0.02	0.35	0.58	20% AEP, 10 min burst, Storm 8
OF189	0	0.002	0.506	0.027	0.02	0.31	0.58	20% AEP, 10 min burst, Storm 8
OF179	0	0.005	0.499	0.036	0.02	0.66	0.66	20% AEP, 10 min burst, Storm 8
OF166	0	0.101	0.227	0.115	0.07	3.58	0.57	20% AEP, 15 min burst, Storm 10
OF177	0	0.033	0.248	0.078	0.04	2.21	0.48	20% AEP, 15 min burst, Storm 10
OF363	0.096	0.096	0.642	0.058	0.03	4	0.56	20% AEP, 10 min burst, Storm 8
OF364	0.072	0.072	0.642	0.051	0.03	4	0.5	20% AEP, 15 min burst, Storm 8
OF74	0	0.014	0.319	0.052	0.03	1.21	0.56	20% AEP, 10 min burst, Storm 8
OF79	0	0.024	0.319	0.063	0.04	1.56	0.62	20% AEP, 10 min burst, Storm 8
OF53	0	0.002	0.315	0.031	0.01	0.47	0.4	20% AEP, 10 min burst, Storm 8
OF61	0	0.005	0.315	0.039	0.02	0.78	0.43	20% AEP, 10 min burst, Storm 8
OF378	0.351	0.365	0.235	0.354	0.26	2.83	0.73	20% AEP, 20 min burst, Storm 2
OF41863	0	0.012	0.207	0.058	0.02	1.39	0.39	20% AEP, 15 min burst, Storm 10
OF41888	0.075	0.075	0.655	0.051	0.03	4	0.53	20% AEP, 15 min burst, Storm 10
OF41882	0.04	0.04	0.655	0.04	0.02	4	0.4	20% AEP, 15 min burst, Storm 9
OF41895	0.026	0.026	0.039	0.086	0.03	2.07	0.29	20% AEP, 10 min burst, Storm 8
OF41905	0.039	0.044	0.039	0.105	0.03	2.51	0.33	20% AEP, 10 min burst, Storm 8
OF42022	0	0	0.642	0	0	0	0	
OF41867	0	0.02	0.207	0.067	0.03	1.71	0.42	20% AEP, 15 min burst, Storm 10
OF41891	0.115	0.115	0.039	0.15	0.06	3.58	0.43	20% AEP, 15 min burst, Storm 8
OF41936	0	0.007	0.223	0.044	0.02	0.94	0.44	20% AEP, 10 min burst, Storm 8
OF41885	0	0	0.655	0	0	0	0	
OF41874	0	0.015	0.207	0.061	0.02	1.53	0.4	20% AEP, 10 min burst, Storm 8
OF41877	0	0.01	0.207	0.054	0.02	1.28	0.37	20% AEP, 10 min burst, Storm 8
OF41939	0	0.01	0.273	0.046	0.03	1	0.55	20% AEP, 10 min burst, Storm 8
OF41899	0.026	0.026	0.039	0.086	0.03	2.05	0.3	20% AEP, 10 min burst, Storm 8
OF41902	0.032	0.037	0.039	0.098	0.03	2.35	0.32	20% AEP, 10 min burst, Storm 8
OF41982	0.192	0.192	0.039	0.167	0.1	4	0.57	20% AEP, 25 min burst, Storm 6
OF42005	0	0.003	0.146	0.074	0.02	0.32	0.29	20% AEP, 10 min burst, Storm 8
OF45550	0	0.005	0.119	0.091	0.02	0.4	0.27	20% AEP, 10 min burst, Storm 8
OF45552	0	0.002	0.119	0.066	0.01	0.29	0.22	20% AEP, 10 min burst, Storm 8

OF42017	0	0.003	0.146	0.073	0.02	0.32	0.29	20% AEP, 10 min burst, Storm 8
OF45554	0	0.008	0.223	0.045	0.02	0.98	0.45	20% AEP, 10 min burst, Storm 8
OF42015	0	0.01	0.273	0.046	0.03	1	0.56	20% AEP, 10 min burst, Storm 8
OF43356	0	0.043	0.039	0.103	0.03	2.48	0.33	20% AEP, 10 min burst, Storm 8
OF45587	0	0.012	0.253	0.05	0.03	1.15	0.52	20% AEP, 10 min burst, Storm 8
OF45560	0	0.016	0.214	0.059	0.03	1.43	0.48	20% AEP, 10 min burst, Storm 8
OF45571	0	0.012	0.114	0.127	0.04	0.56	0.32	20% AEP, 10 min burst, Storm 8
OF45574	0	0.005	0.114	0.092	0.02	0.41	0.26	20% AEP, 10 min burst, Storm 8
OF45576	0	0.018	0.214	0.06	0.03	1.49	0.5	20% AEP, 10 min burst, Storm 8
OF45600	0	0.01	0.253	0.047	0.02	1.04	0.52	20% AEP, 10 min burst, Storm 8
OF45598	0	0.003	0.135	0.076	0.02	0.33	0.28	20% AEP, 10 min burst, Storm 8
OF45596	0	0.003	0.332	0.035	0.02	0.64	0.43	20% AEP, 10 min burst, Storm 8
OF81	0.011	0.016	0.564	0.046	0.02	2.02	0.46	20% AEP, 10 min burst, Storm 8
OF152	0.086	0.087	0.227	0.109	0.06	3.38	0.56	20% AEP, 15 min burst, Storm 10
OF170	0.02	0.02	0.553	0.049	0.02	2.22	0.48	20% AEP, 15 min burst, Storm 10
OF169	0.026	0.026	0.642	0.034	0.01	4	0.34	20% AEP, 15 min burst, Storm 8
OF4A	0.225	0.225	0.235	0.295	0.19	2.36	0.65	20% AEP, 15 min burst, Storm 10
OF171	0.034	0.034	1.302	0.022	0.03	4	1.17	20% AEP, 15 min burst, Storm 8
OF4B	0.063	0.063	0.235	0.183	0.09	1.46	0.47	20% AEP, 15 min burst, Storm 8
OF185	0.017	0.018	1.436	0.024	0.01	4	0.48	20% AEP, 15 min burst, Storm 10
OF184	0.024	0.025	0.518	0.057	0.05	1.45	0.83	20% AEP, 15 min burst, Storm 10
OF183	0.152	0.153	0.297	0.12	0.12	3.15	0.99	20% AEP, 15 min burst, Storm 9
OF186	0.027	0.033	0.579	0.06	0.06	1.55	0.96	20% AEP, 15 min burst, Storm 10
OF192	0.027	0.041	0.605	0.061	0.03	2.99	0.57	20% AEP, 15 min burst, Storm 10

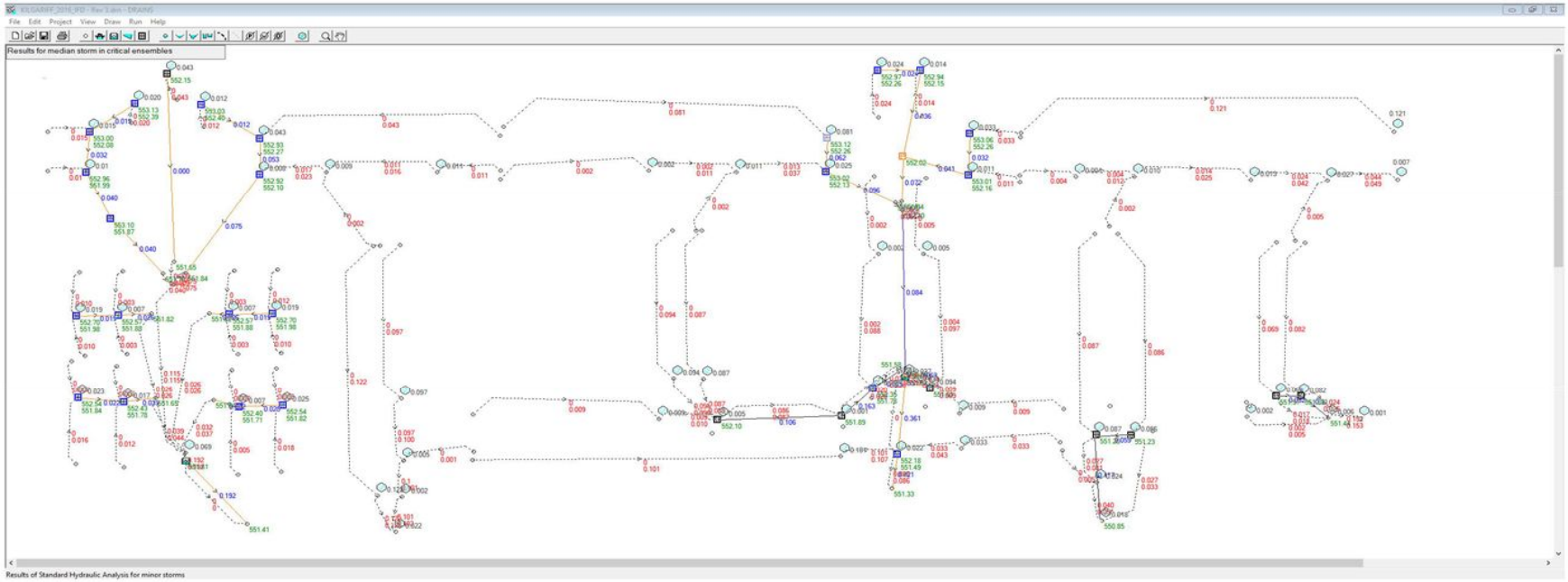
DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for Untitled run at 23:35:33 on 16/4/2020
Water was lost from the system at: H02 (601), 07 (4/2). If this water re-enters the system further downstream you should draw an overflow route from these locations.

No water upwelling from any pit.
Freeboard was less than 0.15m at 46A (ROAD 7 WEST), 45A (ROAD 7 WEST)
The maximum flow in these overflow routes is unsafe: OF380, OF378, OF41905, OF41891, OF41982, OF43356

IGNORE THESE WARNINGS AT YOUR OWN PERIL.\cf1


Results for median storm in critical ensembles
Results of Standard Hydraulic Analysis for minor storms

9.6

Appendix D. Updated Drains Modelling 2012 ARR 1 in 5 year ARI

KILGARIFF SUBDIVISION ANALYSIS

IFD DATA USED: 2012

ARI/AEP: 5 Year

DRAINS results prepared from Version 2018.07

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)		Constraint
37 (1/3)	551.67		0.422		0.33	0	None	
39 (1/2)	551.53	552.18	0.151	1.7	0.51	0.089	Inlet Capacity	
DN5	551.35		0.089					
07 (4/2)	552.18	553.12	0.081	1.7	0.79		Inlet Capacity	
08 (4/1)	552.11	553.02	0.039	0.8	0.81		Inlet Capacity	
DN1	551.88		0					
09 (2/4)	552.23	552.97	0.024	0.6	0.66		Inlet Capacity	
10 (2/3)	552.18	552.94	0.014	0.3	0.71		Inlet Capacity	
MH (2/2)	552.02		0		1.58		None	
DN2	551.85		0					
14 (3/2)	552.21	553.06	0.032	0.7	0.76		Inlet Capacity	
13 (3/1)	552.15	553.01	0.011	0.3	0.82		Inlet Capacity	
DN3	552.31		0.176					
DN4	551.38		0.39					
H01 (403)	552.37	553.03	0.012	0.3	0.62		Inlet Capacity	
01 (ROAD 1 OUT PIT)	552.2	552.93	0.042	0.9	0.62		Inlet Capacity	
02 (ROAD 1 OUT PIT)	552.1	552.92	0.026	0.6	0.74		Inlet Capacity	
DNH4	551.84		0					
H03 (305)	552.37	553.13	0.019	0.5	0.7		Inlet Capacity	
H04 (304)	552.08	553	0.015	0.4	0.86		Inlet Capacity	
H05 (303)	551.99	552.96	0.01	0.2	0.93		Inlet Capacity	
H-MH (302)	551.87	553.1	0	0	1.23		None	
DNH2	551.7		0					
H06 (109)	551.94	552.69	0.019	0.5	0.69		Inlet Capacity	
H07 (108)	551.88	552.57	0.007	0.2	0.66		Inlet Capacity	
SWALE 1	551.82		0					
H10 (103)	551.77	552.53	0.023	0.5	0.69		Inlet Capacity	
H11 (102)	551.72	552.43	0.016	0.4	0.65		Inlet Capacity	
SWALE 3	551.65		0					
HW3	551.64		0.239		0.86	0	None	
HARRIS OUT	551.42		0					
H02 (601)	552.15		0.042		2.85		None	
DNH3	551.65		0					
H09 (112)	551.94	552.7	0.019	0.5	0.69		Inlet Capacity	
H08 (111)	551.88	552.57	0.007	0.2	0.66		Inlet Capacity	
SWALE 2	551.82		0					
H13 (106)	551.76	552.54	0.025	0.6	0.7		Inlet Capacity	
H12 (105)	551.7	552.4	0.007	0.2	0.67		Inlet Capacity	
SWALE 4	551.64		0					

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)		Due to Storm
Cat03	0.008	0.003	0.006	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one	
Cat05	0.002	0.001	0.001	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat06	0.011	0.003	0.008	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat11	0.002	0.001	0.001	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat12	0.004	0.002	0.003	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat16	0.004	0.001	0.003	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat17	0.01	0.003	0.007	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	
Cat18	0.013	0.004	0.009	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one	

Cat19	0.027	0.008	0.019	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat20	0.007	0.002	0.005	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat21	0.118	0.042	0.079	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat37	0.037	0.011	0.026	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat39	0.022	0.007	0.014	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat23	0.095	0.034	0.063	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat24	0.005	0.002	0.004	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat22	0.119	0.042	0.08	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat25	0.002	0.001	0.002	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat26	0.022	0.006	0.016	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat27	0.009	0.003	0.006	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat30	0.005	0.002	0.003	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat28	0.092	0.033	0.062	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat29	0.085	0.03	0.057	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat32	0.001	0	0.001	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat31	0.098	0.035	0.066	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat33	0.085	0.03	0.057	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat34	0.092	0.033	0.061	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat35	0.009	0.003	0.006	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat36	0.032	0.011	0.021	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat40	0.085	0.03	0.057	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat41	0.024	0.007	0.017	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat42	0.084	0.03	0.056	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat43	0.018	0.006	0.012	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat44	0.002	0.001	0.002	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat45	0.068	0.024	0.045	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat46	0.081	0.029	0.054	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat47	0.006	0.002	0.004	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat48	0.001	0	0.001	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat07	0.081	0.024	0.057	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat08	0.025	0.007	0.018	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat09	0.024	0.007	0.017	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat10	0.014	0.004	0.01	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat14	0.032	0.011	0.022	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat13	0.011	0.003	0.008	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H01	0.012	0.004	0.008	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat01	0.042	0.015	0.028	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat02	0.007	0.002	0.005	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H03	0.019	0.007	0.013	5	10	5	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
Cat H04	0.015	0.004	0.011	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H05	0.01	0.003	0.007	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H06	0.019	0.006	0.014	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H07	0.007	0.002	0.005	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H10	0.023	0.007	0.016	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H11	0.016	0.005	0.012	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H02	0.042	0.014	0.028	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H09	0.019	0.006	0.014	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H08	0.007	0.002	0.005	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H13	0.025	0.007	0.018	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H12	0.007	0.002	0.005	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat H14	0.068	0.02	0.048	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
Cat04	0.011	0.003	0.007	5	5	5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

Outflow Volumes for Total Catchment (7.06 impervious + 3.73 pervious = 10.8 total h

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR& R 5 year, 5 minutes stor	808.6	348.33 (43.1%)	176.23 (33.3%)	172.10 (61.6%)
AR& R 5 year, 10 minutes stc	1261.02	733.50 (58.2%)	290.02 (35.1%)	443.49 (101.8%)
AR& R 5 year, 20 minutes stc	1921.21	1290.38 (67.2%)	456.07 (36.3%)	834.31 (125.7%)
AR& R 5 year, 30 minutes stc	2390.72	1654.80 (69.2%)	574.16 (36.7%)	1080.65 (130.8%)
AR& R 5 year, 1 hour storm, a	3291.96	2362.21 (71.8%)	800.83 (37.2%)	1561.38 (137.3%)

AR& R 5 year, 2 hours storm,	4295.46	3101.32 (72.2%)	1053.23 (37.5%)	2048.09 (138.0%)
AR& R 5 year, 3 hours storm,	4921.75	3495.90 (71.0%)	1210.76 (37.6%)	2285.14 (134.4%)
AR& R 5 year, 6 hours storm,	6185.1	4174.35 (67.5%)	1528.49 (37.8%)	2645.85 (123.8%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
1/3-2	0.421	1.52	551.554	551.525	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
1/2-1	0.483	2.74	551.344	551.352	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
4/2-1	0.062	1.14	552.131	552.108	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
4/1-2/1	0.099	2.32	551.999	551.879	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
2/4-3	0.024	1.05	552.197	552.178	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
2/3-1	0.036	1.15	552.134	552.021	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
2/2-1	0.077	2.18	551.929	551.847	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
3/2-1	0.032	1.01	552.168	552.15	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
3/1-2/2	0.042	1.22	552.096	552.021	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5820	0.012	0.98	552.338	552.197	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5823	0.053	1.49	552.135	552.104	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5826	0.078	2.39	552.006	551.845	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5832	0.019	1.36	552.323	552.272	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5835	0.034	1.09	552.053	551.993	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5836	0.043	1.17	551.96	551.884	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5859	0.043	1.15	551.844	551.702	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5844	0.019	1.26	551.899	551.878	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5873	0.025	1.26	551.833	551.821	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5848	0.022	0.99	551.732	551.724	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5870	0.038	1.37	551.667	551.653	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5996	0.239	1.55	551.529	551.425	AR& R 5 year, 2 hours storm, average 19.9 mm/h, Z one
P5829	0	0	552.151	551.651	AR& R 5 year, 3 hours storm, average 15.2 mm/h, Z one
P5923	0.019	1.26	551.899	551.878	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5919	0.025	1.26	551.833	551.821	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5944	0.025	1.34	551.717	551.703	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
P5941	0.031	1.33	551.652	551.639	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
2/1-1/3	0.092	1.28	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF82	0.019	0.026	0.207	0.074	0.03	1.94	0.44	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF108	0	0.119	0.229	0.121	0.07	3.81	0.6	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF107	0	0.095	0.229	0.112	0.06	3.48	0.57	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF80	0	0.011	0.207	0.055	0.02	1.3	0.38	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF27	0	0.042	0.207	0.086	0.04	2.35	0.49	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF43	0.002	0.011	0.558	0.041	0.02	1.65	0.43	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF50	0.013	0.038	0.205	0.084	0.04	2.28	0.48	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF167	0.002	0.087	0.223	0.109	0.06	3.38	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF168	0.004	0.096	0.223	0.113	0.06	3.52	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF94	0	0.118	0.207	0.123	0.07	3.58	0.61	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF95	0	0.004	0.207	0.041	0.01	0.83	0.33	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF96	0.004	0.012	0.564	0.042	0.02	1.75	0.44	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF97	0.014	0.027	0.207	0.074	0.03	1.96	0.45	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF98	0.027	0.047	0.564	0.065	0.04	3.29	0.55	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF99	0.053	0.059	0.207	0.097	0.05	2.71	0.53	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF337	0	0	1.431	0	0	0	0	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
OF380	0.089	0.089	0.005	0.076	0.05	4.33	0.62	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF111	0.095	0.098	0.564	0.083	0.05	4.49	0.63	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF112	0.099	0.101	0.231	0.114	0.07	3.56	0.58	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF109	0.119	0.127	0.475	0.098	0.1	2.94	1.07	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF110	0.101	0.113	0.475	0.094	0.1	2.8	1.05	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

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OF149	0	0.092	0.231	0.111	0.06	3.44	0.57	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF150	0	0.085	0.231	0.108	0.06	3.33	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF213	0.009	0.01	0.553	0.039	0.02	1.55	0.43	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF152	0.19	0.191	0.227	0.142	0.09	4.6	0.66	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF322	0.092	0.094	1.086	0.066	0.07	3.32	1.08	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF151	0.085	0.086	0.498	0.085	0.09	2.46	1.02	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF170	0.191	0.191	0.553	0.105	0.07	5.92	0.71	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF174	0.098	0.107	0.227	0.117	0.07	3.67	0.58	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF169	0.087	0.087	0.642	0.055	0.03	4	0.55	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF171	0.095	0.095	1.302	0.028	0.05	4	1.82	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF173	0.009	0.009	0.553	0.038	0.02	1.45	0.42	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF175	0.032	0.045	0.227	0.088	0.04	2.59	0.48	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF190	0	0.085	0.248	0.105	0.06	3.23	0.59	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF191	0	0.084	0.248	0.105	0.06	3.23	0.59	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF145	0	0.009	0.227	0.053	0.02	1.3	0.34	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF144	0	0.001	0.534	0.02	0.01	0.2	0.52	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF176	0	0.009	0.248	0.052	0.02	1.24	0.38	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF193	0	0.005	0.489	0.035	0.02	0.62	0.63	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF192	0.085	0.103	0.605	0.082	0.06	4.42	0.68	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF187	0.107	0.118	0.579	0.089	0.11	2.63	1.23	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF186	0.084	0.091	0.579	0.082	0.1	2.38	1.16	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF181	0	0.081	0.254	0.103	0.06	3.15	0.59	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF180	0	0.068	0.254	0.098	0.06	2.94	0.57	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF182	0.002	0.005	0.71	0.03	0.01	0.92	0.48	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF185	0.068	0.069	1.436	0.036	0.03	4	0.82	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF184	0.081	0.082	0.518	0.082	0.09	2.38	1.04	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF183	0.156	0.157	0.286	0.122	0.12	3.19	0.99	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF36	0	0.081	0.205	0.108	0.06	3.09	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF37	0	0.002	0.205	0.031	0.01	0.51	0.29	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF71	0	0.032	0.243	0.075	0.04	1.98	0.53	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF62	0	0.011	0.243	0.052	0.02	1.21	0.44	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF30	0	0.002	0.557	0.024	0.01	0.24	0.6	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF148	0	0.002	0.496	0.028	0.02	0.35	0.58	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF189	0	0.002	0.506	0.027	0.02	0.31	0.58	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF179	0	0.005	0.499	0.036	0.02	0.66	0.66	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF166	0	0.098	0.227	0.114	0.06	3.56	0.57	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF177	0	0.032	0.248	0.077	0.04	2.19	0.48	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF363	0.099	0.099	0.642	0.059	0.03	4	0.57	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF364	0.077	0.077	0.642	0.052	0.03	4	0.52	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF74	0	0.014	0.319	0.052	0.03	1.21	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF79	0	0.024	0.319	0.062	0.04	1.55	0.63	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF53	0	0.002	0.315	0.031	0.01	0.47	0.4	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF61	0	0.004	0.315	0.039	0.02	0.76	0.44	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF378	0.39	0.421	0.235	0.373	0.28	2.99	0.76	AR& R 5 year, 1 hour storm, average 30.5 mm/h, Z one
OF41863	0	0.012	0.207	0.057	0.02	1.38	0.39	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41888	0.078	0.078	0.655	0.052	0.03	4	0.53	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41882	0.043	0.043	0.655	0.041	0.02	4	0.41	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41895	0.025	0.028	0.039	0.088	0.03	2.12	0.3	AR& R 5 year, 20 minutes storm, average 53.4 mm/h, Z one
OF41905	0.038	0.044	0.039	0.105	0.04	2.51	0.34	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF42022	0	0	0.642	0	0	0	0	
OF41867	0	0.019	0.207	0.067	0.03	1.7	0.42	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41891	0.121	0.135	0.039	0.159	0.07	3.82	0.45	AR& R 5 year, 20 minutes storm, average 53.4 mm/h, Z one
OF41936	0	0.007	0.223	0.044	0.02	0.94	0.43	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41885	0	0	0.655	0	0	0	0	
OF41874	0	0.015	0.207	0.061	0.02	1.53	0.4	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41877	0	0.01	0.207	0.054	0.02	1.26	0.38	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41939	0	0.01	0.273	0.046	0.03	1	0.55	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41899	0.025	0.028	0.039	0.088	0.03	2.12	0.3	AR& R 5 year, 20 minutes storm, average 53.4 mm/h, Z one
OF41902	0.031	0.037	0.039	0.098	0.03	2.35	0.32	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF41982	0.239	0.239	0.039	0.167	0.12	4	0.72	AR& R 5 year, 20 minutes storm, average 53.4 mm/h, Z one
OF42005	0	0.003	0.023	0.074	0.02	0.32	0.29	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45550	0	0.005	0.019	0.091	0.02	0.4	0.27	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

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OF45552	0	0.002	0.019	0.066	0.01	0.29	0.22	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF42017	0	0.003	0.023	0.073	0.02	0.32	0.29	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45554	0	0.008	0.223	0.045	0.02	0.98	0.45	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF42015	0	0.01	0.273	0.046	0.03	1	0.56	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF43356	0	0.042	0.039	0.103	0.03	2.46	0.33	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45587	0	0.01	0.253	0.047	0.02	1.04	0.52	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45560	0	0.016	0.214	0.059	0.03	1.43	0.48	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45571	0	0.012	0.018	0.126	0.04	0.56	0.33	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45574	0	0.005	0.018	0.092	0.02	0.41	0.26	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45576	0	0.018	0.214	0.06	0.03	1.49	0.5	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45600	0	0.01	0.253	0.047	0.02	1.04	0.52	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45598	0	0.003	0.021	0.076	0.02	0.33	0.28	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF45596	0	0.003	0.021	0.075	0.02	0.33	0.27	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one
OF81	0.011	0.017	0.564	0.047	0.02	2.09	0.46	AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

CONTINUITY CHECK for AR& R 5 year, 30 minutes storm, average 44.3 mm/h, Z one

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Change (cu.m)	Difference %
03 (ROAD 1 SPOON)	15.57	15.57	0	0
HP (ROAD 2 NORTH)	0	0	0	0
HP (ROAD 2 SOUTH)	0	0	0	0
HP (ROAD 1 WEST)	0	0	0	0
HP (ROAD 1 EAST)	0	0	0	0
05 (ROAD 1 SPOON)	1.35	1.35	0	0
06 (ROAD 1 SPOON)	9.78	9.78	0	0
11 (ROAD 4A EAST)	1.74	1.74	0	0
12 (ROAD 4B EAST)	3.66	3.66	0	0
HP (ROAD 1 EAST 2)	0	0	0	0
HP (ROAD 1 WEST 2)	0	0	0	0
16 (ROAD 1 SPOON)	3.11	3.11	0	0
17 (ROAD 1 SPOON)	10.67	10.67	0	0
18 (ROAD 1 SPOON)	20.25	20.25	0	0
19 (ROAD 1 SPOON)	40.02	40.02	0	0
20 (ROAD 1 OUT)	45.14	45.14	0	0
21 (ROAD 1 OUT)	108.63	108.63	0	0
37 (1/3)	485.85	484.6	0	0.3
39 (1/2)	622.65	622.37	0	0
DN5	622.37	622.37	0	0
23 (ROAD 2 SPOON)	87.07	87.07	0	0
24 (ROAD 2 SPOON)	91.07	91.07	0	0
22 (ROAD 2 WEST)	109.52	109.52	0	0
25 (ROAD 2 WEST)	92.85	92.85	0	0
26 (ROAD 2 OUT)	218.53	218.53	0	0
HP (ROAD 3 NORTH)	0	0	0	0
HP (ROAD 3 SOUTH)	0	0	0	0
27 (ROAD 6 SPOON)	6.36	6.36	0	0
30 (ROAD 6 SPOON)	173.87	173.87	0	0
28 (ROAD 3 WEST)	84.63	84.63	0	0
29 (ROAD 3 WEST)	78.11	78.11	0	0
32 (ROAD 6 KR)	174.68	174.68	0	0
31 (ROAD 6 KR)	90.66	90.66	0	0
33 (ROAD 4A WEST)	79.91	79.91	0	0
34 (ROAD 4A WEST)	87.92	87.92	0	0
35 (ROAD 6 KR)	6.45	6.45	0	0
36 (ROAD 6 KR)	29.39	29.39	0	0
HP (ROAD 5 NORTH)	0	0	0	0
HP (ROAD 5 SOUTH)	0	0	0	0

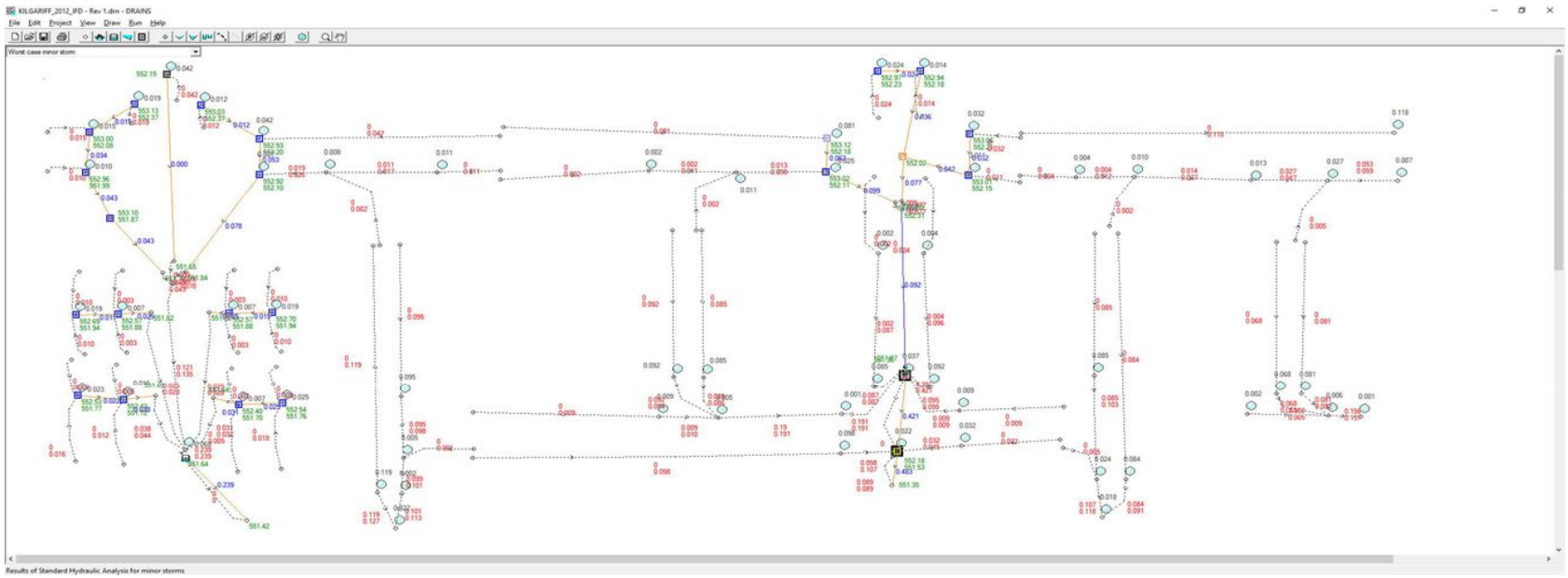
HP (ROAD 6 EAST)	0	0	0	0
HP (ROAD 6 WEST)	0	0	0	0
HP (ROAD 6 EAST 2)	0	0	0	0
HP (ROAD 6 WEST 2)	0	0	0	0
40 (ROAD 5 SPOON)	78.01	78.01	0	0
41 (ROAD 5 SPOON)	95.34	95.34	0	0
42 (ROAD 5 WEST)	77.34	77.34	0	0
43 (ROAD 5 OUT)	189	189	0	0
HP (ROAD 7 SOUTH)	0	0	0	0
HP (ROAD 7 NORTH)	0	0	0	0
44 (ROAD 7 SPOON)	2.24	2.24	0	0
45 (ROAD 7 WEST)	62.29	62.29	0	0
46 (ROAD 7 WEST)	74.2	74.2	0	0
47 (ROAD 7 SPOON)	143.06	143.06	0	0
48 (ROAD 7 OUT)	143.89	143.89	0	0
HPN1	0	0	0	0
HPN2	0	0	0	0
HPN3	0	0	0	0
HPN4	0	0	0	0
HPN5	0	0	0	0
HPN6	0	0	0	0
HPN7	0	0	0	0
HPN8	0	0	0	0
HPN9	0	0	0	0
HPN10	0	0	0	0
07 (4/2)	59.41	56.18	0	5.4
08 (4/1)	84.64	84.72	0	-0.1
DN1	84.72	84.72	0	0
09 (2/4)	17.74	17.65	0	0.5
10 (2/3)	27.68	27.62	0	0.2
MH (2/2)	64.95	65.11	0	-0.3
DN2	65.11	65.11	0	0
14 (3/2)	29.58	29.56	0	0.1
13 (3/1)	37.39	37.34	0	0.2
HP (ROUNABOUT 2)	0	0	0	0
HP (ROUNDABOUT 1)	0	0	0	0
HP (ROUNDABOUT 3)	0	0	0	0
HP (ROUNDABOUT 4)	0	0	0	0
DN3	149.83	110.13	0	26.5
DN4	459.1	458.92	0	0
HP02 (HARRIS)	0	0	0	0
H01 (403)	10.98	11.01	0	-0.2
01 (ROAD 1 OUT PIT)	49.49	49.42	0	0.1
02 (ROAD 1 OUT PIT)	70.51	70.53	0	0
DNH4	70.53	70.53	0	0
H03 (305)	17.62	17.62	0	0
H04 (304)	28.67	28.67	0	0
H05 (303)	36.03	36.28	0	-0.7
H-MH (302)	36.28	35.91	0	1
DNH2	35.91	35.91	0	0
H06 (109)	14.09	14.06	0	0.2
H07 (108)	19.18	19.21	0	-0.2
SWALE 1	19.21	19.21	0	0
H10 (103)	16.77	16.77	0	0
H11 (102)	28.9	28.9	0	0
SWALE 3	28.9	28.9	0	0
HW3	247.88	247.82	0	0
HARRIS OUT	247.82	247.82	0	0
HP01 (HARRIS)	0	0	0	0
HARRIS CHANNEL	106.67	106.67	0	0
HP11 (HARRIS)	0	0	0	0
H02 (601)	34.73	0.23	0	99.3

DNH3	0.23	0.23	0	0.3
HARRIS WEST 1	0	0	0	0
HARRIS WEST 2	0	0	0	0
HP07 (HARRIS)	0	0	0	0
H09 (112)	14.19	14.19	0	0
H08 (111)	19.16	19.16	0	0
SWALE 2	19.16	19.16	0	0
H13 (106)	18.52	18.52	0	0
H12 (105)	23.65	23.66	0	0
SWALE 4	23.66	23.66	0	0
H14 (SWALE)	247.97	247.88	0	0
HP08 (HARRIS)	0	0	0	0
HP12 (HARRIS)	0	0	0	0
HP13 (HARRIS)	0	0	0	0
HP09 (HARRIS)	0	0	0	0
HP14 (HARRIS)	0	0	0	0
HP10 (HARRIS)	0	0	0	0
DNH1	0	0	0	0
HP06 (HARRIS)	0	0	0	0
HP15 (HARRIS)	0	0	0	0
HP16 (HARRIS)	0	0	0	0
HP17 (HARRIS)	0	0	0	0
HP18 (HARRIS)	0	0	0	0
HP03 (HARRIS)	0	0	0	0
HP04 (HARRIS)	0	0	0	0
HP05 (HARRIS)	0	0	0	0
04 (ROAD 1 SPOON)	7.8	7.8	0	0

Run Log for KILGARIFF_ 2012_ IFD run at 17:01:14 on 8/4/20
Water was lost from the system at: H02 (601), 07 (4/2). If this water re-enters the system further downstream you should draw an overflow route from these locations.

No water upwelling from any pit. Freeboard was adeq uate at all pits
The maximum flow in these overflow routes is unsafe: OF43356, OF41905, OF41891, OF41982, OF380, OF378

IGNORE THESE WARNINGS AT YOUR OWN PERIL.\cf1


KILGARIFF_2012_IFD - Rev 1.drn - DRAINS
File Edit Project View Draw Run Help
Worst case minor storm
Results of Standard Hydraulic Analysis for minor storms

ATTACHMENT C

From: Sarah Fairhead <Sarah.Fairhead@nt.gov.au>
Sent: Friday, 1 May 2020 1:51 PM
To: EA TO MAYOR AND CEO <EAEXECUTIVE@astc.nt.gov.au>
Cc: Robert Jennings <RJennings@astc.nt.gov.au>; Scott Allen <SAllen@astc.nt.gov.au>
Subject: RE: Letter from Robert Jennings to Sarah Fairhead DIPL re Asset Package Deal

Hi Scott

Just confirming that the following paragraph in my letter to Robert of 27 April 2020 should be read as confirmation that the NTG is happy with all details of the proposal outlined in Robert's letter of 19 March 2020, with the exception of the one issue of the handover of the stormwater infrastructure in Kilgariff Stage 1:

In line with our discussions on these matters, this Department's response to the overall proposal is positive. However, there is one element of the proposal relating to the Kilgariff Stage 1 subdivision that requires further resolution, this being your proposal that the Kilgariff Stage 1 storm water infrastructure remains under the care and control of the NTG until such time that monitoring of the infrastructure can take place during 1 in 5 year storm event and any rectification works are undertaken, if required.

If Council is happy to proceed with my proposal regarding stormwater infrastructure in Kilgariff Stage 1, we would proceed to seek formal approval from our Minister to instruct our solicitors to draft a formal Deed in line with the contents of Robert's letter of 19 March and my letter of 27 April.

Regards

Sarah Fairhead
Senior Director Southern Region
Department of Infrastructure, Planning and Logistics
Northern Territory Government

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MINUTES OF THE SPECIAL MEETING OF THE SPORTS FACILITIES ADVISORY COMMITTEE (SFAC) HELD ON THURSDAY 23 APRIL 2020

Due to the COVID-19 pandemic, this meeting was held via Zoom teleconference

PRESENT

Mayor Damien Ryan
Deputy Mayor Matt Paterson
Councillor Marli Banks
Councillor Eli Melky
Bruce Walker (Chair)
Mr Aaron Blacker
Ms Ann Jacobs
Mr Lachlan Modrzynski
Mr Anthony Murphy
Mr Tim Pearson
Mr Phillip Preece
Mr Jim Rebbechi

OFFICERS IN ATTENDANCE

Mr Scott Allen - Director Technical Services
Mr Takudzwa Charlie - Manager Technical Services
Mr Tama Wakelin - Sports Officer
Ms Stephanie Dominguez - Executive Assistant (Minutes)

13th Alice Springs Town Council
Sport Facility Advisory Committee - Attendance List 2019/2020

	29 Aug 19	12 Sept 19 **Special Meeting**	31 Oct 19	28 Nov 19 **Special Meeting**	27 Feb 20	23 Apr 20 **Special Meeting**	7 May 20	25 Jun 20
Mayor Damien Ryan	✓	A	✓	✓	✓	✓		
Deputy Mayor Matt Paterson	✓	✓	✓	✓	✓	✓		
Councillor Marli Banks	✓	✓	✓	✓	✓	✓		
Councillor Eli Melky	✓	✓	✓	✓	✓	✓		
Dr Bruce Walker	A	✓ **Phone**	A	✓	✓	✓		
Mr Aaron Blacker	✓	✓	✓	✓	✓	✓		
Ms Ann Jacobs	✓	✓	✓	✓	✓	✓		
Mr Lachlan Modrzynski	✓	A	--	A	A	✓		
Mr Anthony Murphy	✓	✓	✓	✓	✓	✓		
Mr Jamie Orr	✓	✓	A	A	A	A		
Mr Tim Pearson	✓	✓	✓	A	✓	✓		
Mr Phillip Preece	✓	--	✓	A	✓	✓		
Mr Jim Rebbechi	A	--	✓	✓	✓	✓		

✓	Attended
✓ **Proxy**	Proxy attended in place of committee member
A	Apology received
--	No attendance and no apology recorded

The meeting opened at 2:03 pm.

1. APOLOGIES

Mr Jamie Orr

2. DISCLOSURE OF INTEREST

Nil

3. CORRESPONDENCE

Each sport was given the opportunity to provide their top five priorities for discussion at this meeting. The Sports Officer summarised and circulated these responses as a document titled *Sports Priorities List Updated FINAL* prior to the meeting. This document was received and noted.

No other correspondence was circulated.

4. GENERAL BUSINESS

4.1 Projects to be funded through the Council Reserves

The Director Technical Services addressed the purpose of today's meeting, that it was in response to requests of Council and the Sports Facilities Advisory Committee to provide a report on Council Facilities and potential priority projects. Additionally, at the Technical Services Committee meeting held 14 April 2020 Council requested a Special SFAC Meeting be convened to seek the Committee's input on the top five (5) priorities which could be considered by Council in budget discussions to assist in the community's recovery due to the impact of the COVID-19 pandemic.

The Director noted that Council Officers recommend these projects are funded through sources other than SFAC funds, noting Council reserves, grants, Northern Territory Government, or Commonwealth Government funding sources as preferred options. He highlighted that today's discussion was to identify the Committee's priorities and Council Officers would investigate costs and funding.

The Director noted that three (3) of the ten (10) priorities identified during the NTG $6.2M Sporting Facility Upgrade projects did not make the final list for advancement, these were:

1. Sports Master Plan (this project completed and funded through Council)
2. Anzac Power Upgrades
3. Additional Sporting Oval at Desert Life Church.

The Director Technical Services advised that short-term projects were being sought that would help support and stimulate the local economy. He suggested projects similar to those recommended in the $6.2M Facility Upgrades may be suitable.

The Chair summarized the responses received from members of the Committee which included:

6 responses in support of Anzac Oval Power Upgrades
4 responses in support of Netball Courts
3 responses in support of Netball Facilities and Clubrooms
3 responses in support of Lights Larapinta Oval
3 responses in support of Baseball lighting

Discussion ensued regarding support for a power upgrade at Anzac Oval after it missed out on support during the $6.2M sporting upgrades and the necessity for a full replacement of the netball courts at an estimated cost of $1M, as opposed to just resurfacing.

The Committee discussed the benefit of installing lights on facilities in attracting national sporting events. The Committees' priority of Jim McConville Oval and the need for lights, at a minimum for training, was also discussed.

The Committee discussed the impact of upgrading the lights at Lyle Kempster Baseball Diamond with a benefit identified as the potential to attract national sporting events. Maintenance to the field was also discussed to bring it up to national standards, with the Director acknowledging the minor works identified such as field levelling, adjustment of the fence line and pitch correction could be undertaken operationally through the Council Depot.

The Mayor noted all projects would require some community consultation.

Discussion ensued regarding scoreboard upgrades and replacements with the Committee concurring this could be considered at the following SFAC meeting to be funded through the SFAC budget.

Tim Pearson left the meeting at 2:53 pm

Jim Rebbechi enquired if security concerns previously raised about Anzac Oval had been rectified. The Director Technical Services took the question on notice to report back to the next Committee meeting.

Discussion ensued regarding the Netball Courts and Changerooms being separate priorities for the Committee.

The Committee discussed a new shed at Hockey and construction of Changerooms as potential projects. The Director Technical Services suggested a replacement shed could be considered to be funded through the SFAC budget while construction of a changeroom was more appropriate to identify as a priority for this list.

The Committee identified Hockey changeroom construction and the upgrade of lights at Traeger Park Oval as their alternate priorities.

The Director Technical Services left the meeting at 2:58 pm

RESOLVED
That it be a recommendation from the Sports Facilities Advisory Committee to Council

That Council considers the Sports Facilities Advisory Committee's top five priorities of in their future budget discussions in response to COVID recovery:

1. **Anzac Oval power upgrades**
2. **Full replacement of the Outdoor Netball Courts**
3. **Installation of lights at Jim McConville Oval**
4. **Replacement of Netball Changerooms and Clubroom Facilities**
5. **Upgrade of lights at the Lyle Kempster Baseball Diamond**

That Council considers the following alternate priorities from the Sports Facilities Advisory Committee:

6. **Replacement of Hockey Changerooms and Facilities**
7. **Upgrade of lights at Traeger Park Oval**

Unanimous support was gained for this recommendation from all meeting attendees.

5. NEXT MEETING:

Thursday, 7 May 2020 at 2pm.
Via Teleconference - details to follow.

The meeting concluded at 3:03pm.