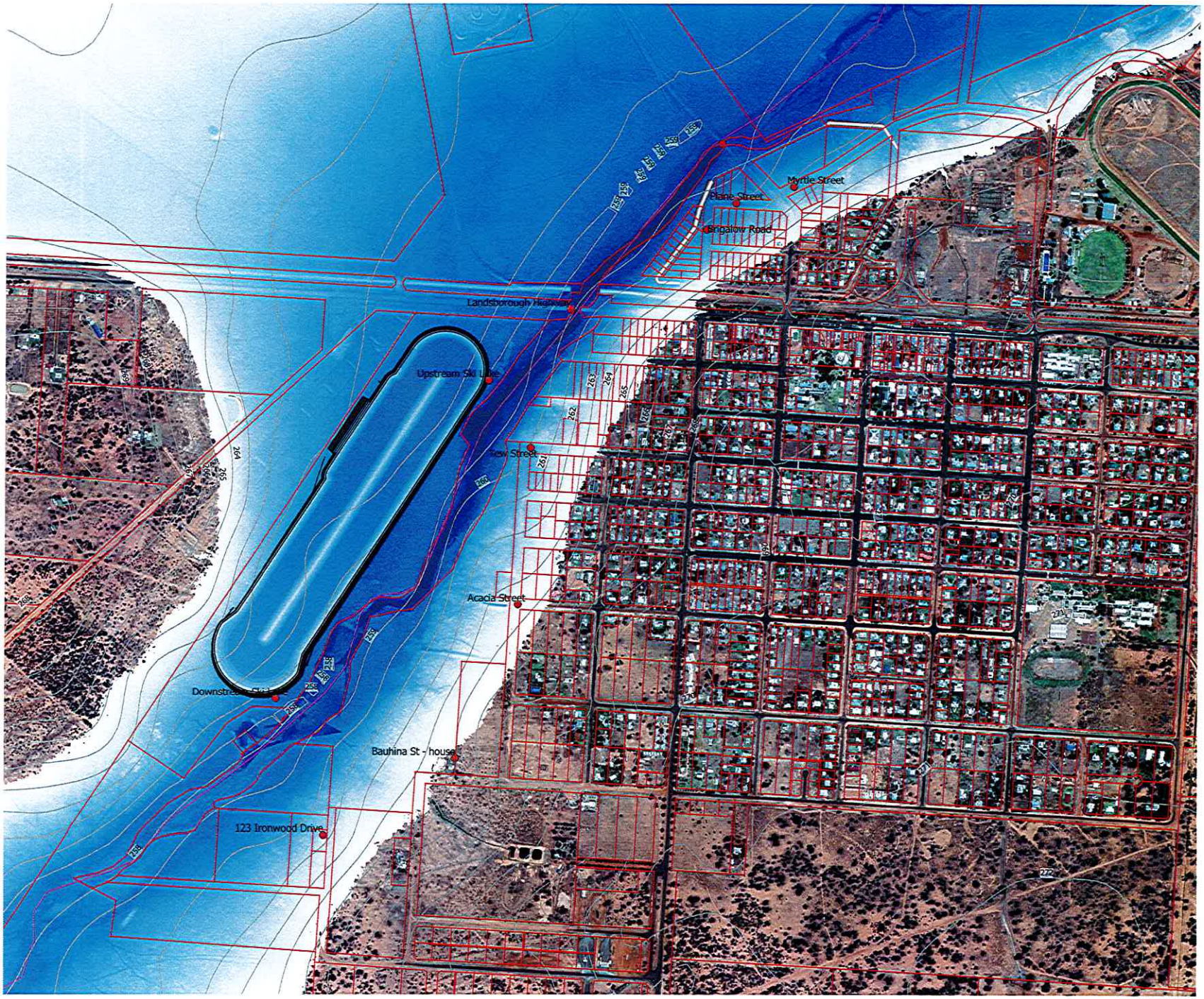


ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 33 of 40.
Flood Innundation Mapping
Scenario 3 - Pmf

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-contour
- Surface HydroLines National

Depth (Max) m

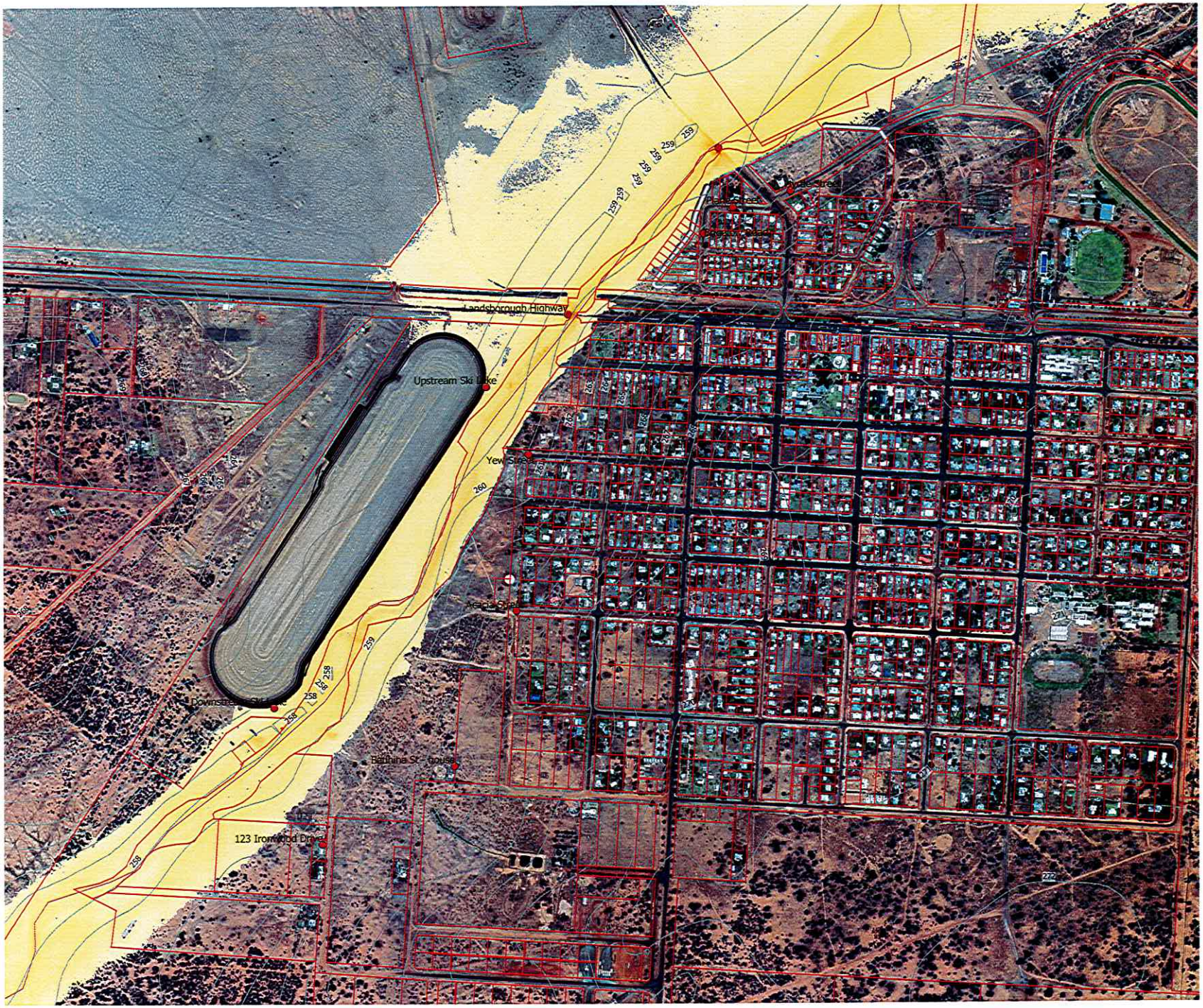
- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m



ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 34 of 40.
Flood Innundation Mapping
Scenario 3 - 50% Aep Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-contour
- Surface HydroLines National

Velocity (Max) m/s

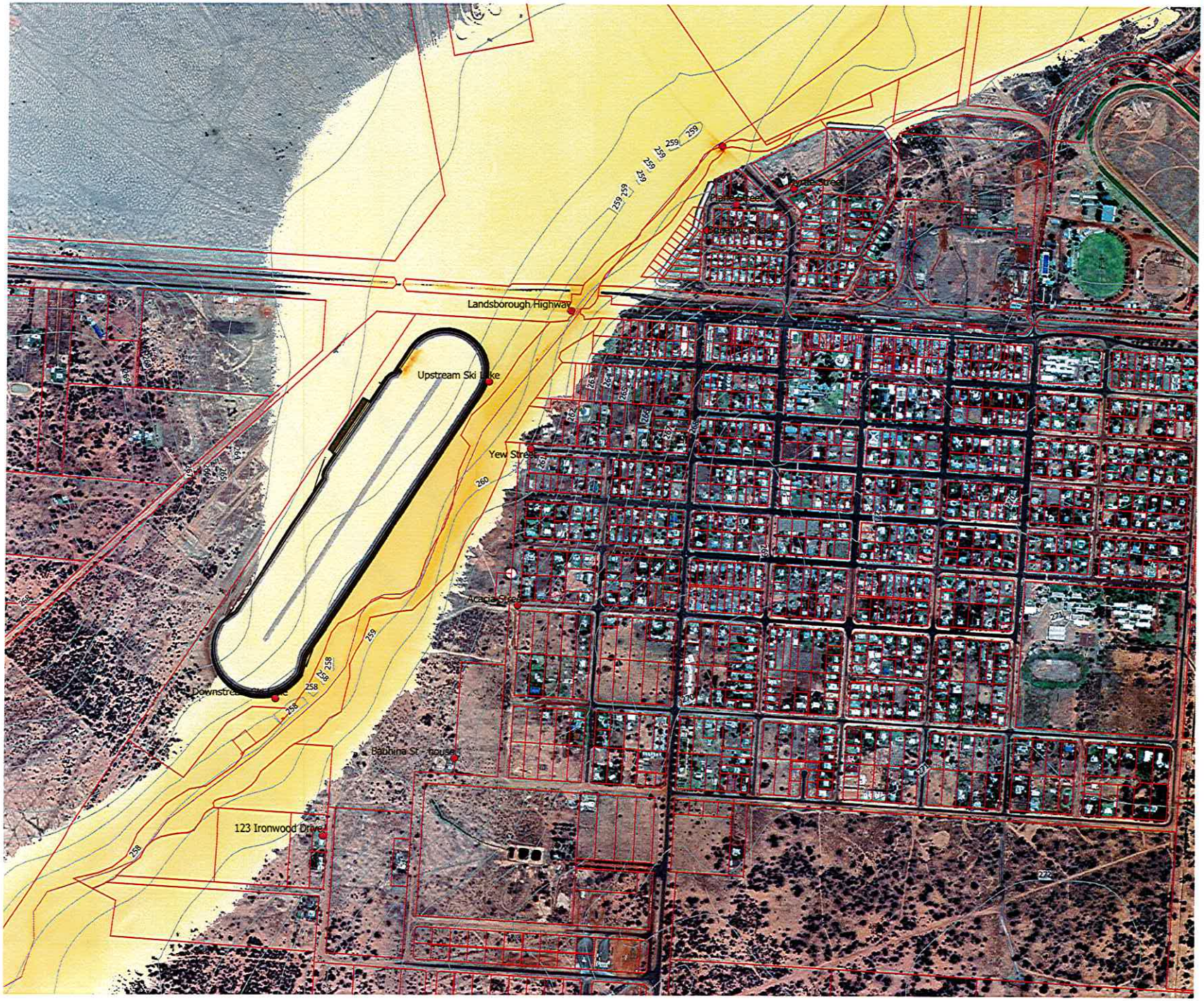
- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m



ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 35 of 40.
Flood Innundation Mapping
Scenario 3 - 10% Aep Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-
- contour
- Surface HydroLines National

Velocity (Max) m/s

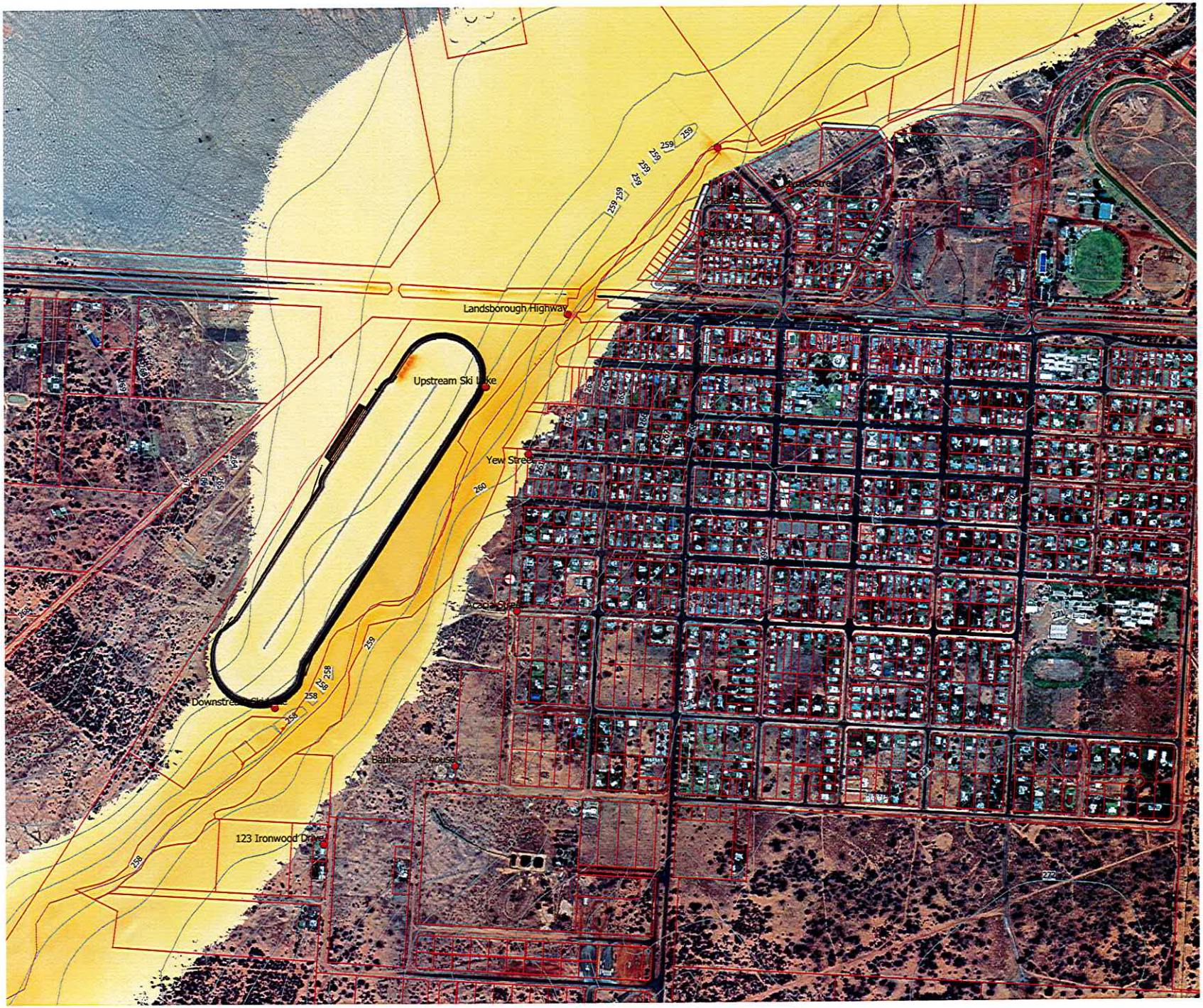
- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m



ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

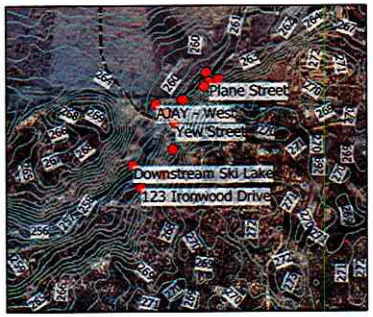
Figure 36 of 40.
Flood Innundation Mapping
Scenario 3 - 5% Aep Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-
- contour
- Surface HydroLines National

Velocity (Max) m/s

- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6



A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m

ACS Engineers

CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT

(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

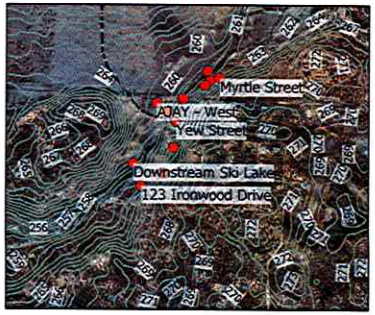
Figure 37 of 40.
Flood Innundation Mapping
Scenario 3 - 1% Aep Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-
- contour
- Surface HydroLines National

Velocity (Max) m/s

- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

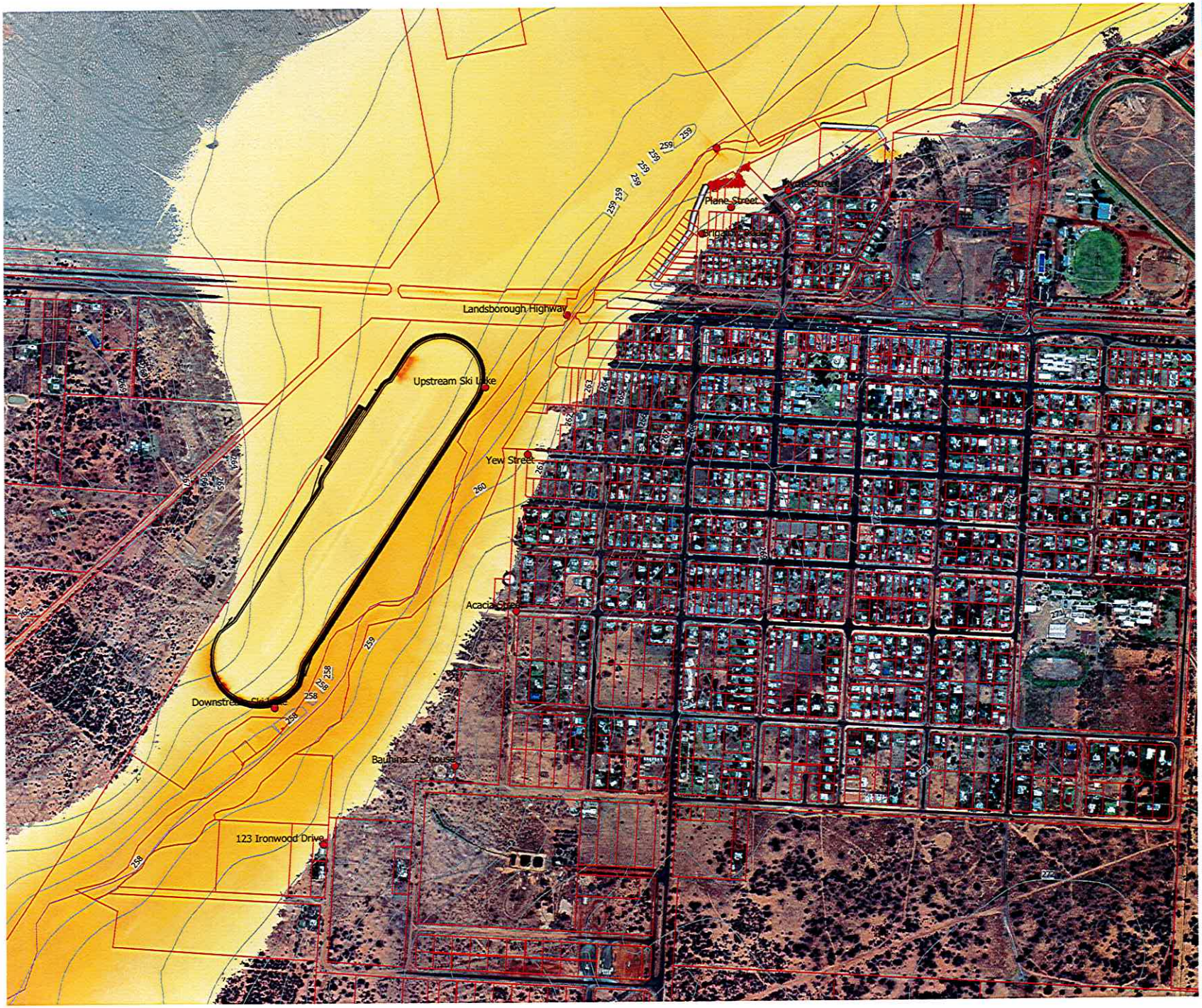


A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m



ACS Engineers

CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT

(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 38 of 40.
Flood Innundation Mapping
Scenario 3 - 0.2% Aep Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-
- contour
- Surface HydroLines National

Velocity (Max) m/s

- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m

ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 39 of 40.
Flood Innundation Mapping
Scenario 3 - Pmf Velocity

Legend

- SMK Design cont contour LineString
- Cadastral_data_LOTBDY
- Flood innundation_Critical Points-
- contour
- Surface HydroLines National

Velocity (Max) m/s

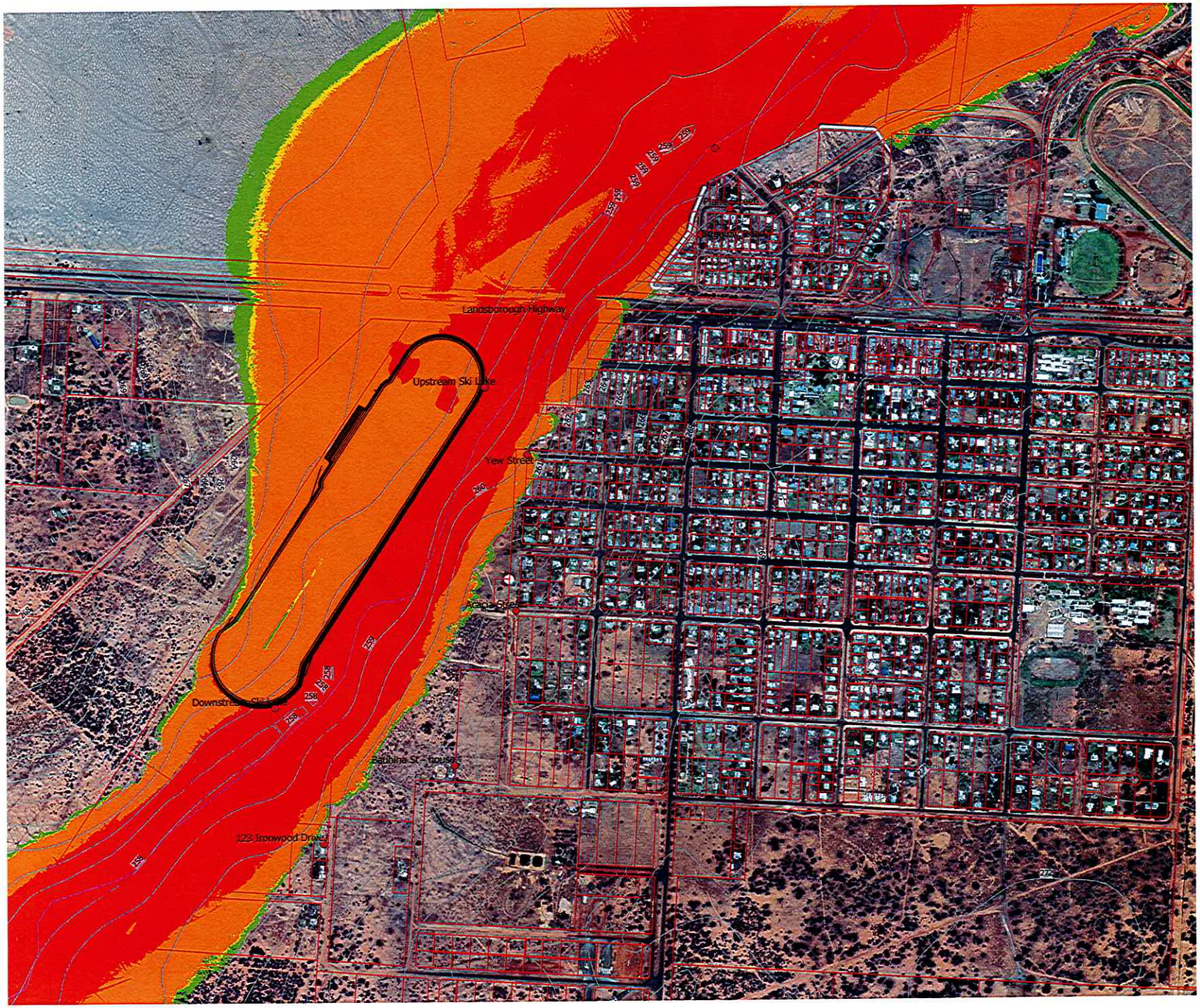
- 0
- 0.5
- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m



ACS Engineers
CIVIL | ENVIRONMENTAL | PROJECT MANAGEMENT
(07) 5541 3500
www.acsengineers.com.au

Barcaldine Recreation Park Flood Impact Assessment

Figure 40 of 40.
Flood Innundation Mapping
Scenario 3: 1% Aep D * V

Legend

- Cadastral_data_LOTBDY
- contour
- SMK Design cont contour LineString
- Flood innundation_Critical Points-
- Surface HydroLines National
- LOW (<0.6)
- SIGNIFICANT (0.6 to <0.8)
- HIGH (0.8 to <1.2)
- EXTREME (>1.2)

A3 Scale: 1:10000
GDA 1994 / MGA Zone 55

Job ID: 190005
23/07/2020

N

0 100 200 300 400 m

Barcaldine Regional Council

BRC Levee Construction

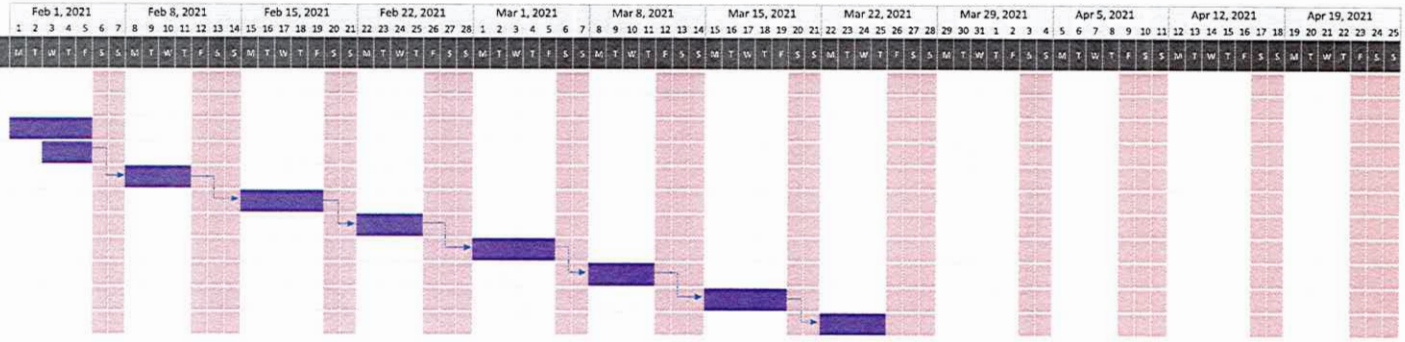
Assumes: 4 x Scrapers, 3 x Semi Water carts, 2 x graders and 2 x Padfoot rollers

Project Start: 1-Feb-21

Display Week: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Levee Construction				
Site Establishment and Survey	BRC & GBA	0%	1-Feb-21	5-Feb-21
Win, Load and Cart, Roll and Trim.	BRC	0%	3-Feb-21	5-Feb-21
Win, Load and Cart, Roll and Trim.	BRC	0%	8-Feb-21	11-Feb-21
Win, Load and Cart, Roll and Trim.	BRC	0%	15-Feb-21	19-Feb-21
Win, Load and Cart, Roll and Trim.	BRC	0%	22-Feb-21	25-Feb-21
Win, Load and Cart, Roll and Trim.	BRC	0%	1-Mar-21	5-Mar-21
Win, Load and Cart, Roll and Trim.	BRC	0%	8-Mar-21	11-Mar-21
Win, Load and Cart, Roll and Trim.	BRC	0%	15-Mar-21	19-Mar-21
Win, Load and Cart, Roll and Trim.	BRC	0%	22-Mar-21	25-Mar-21

Insert new rows ABOVE this one



SIMPLE GANTT CHART by Vertex42.com
https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

About This Template

This template provides a simple way to create a Gantt chart to help visualize and track your project. Simply enter your tasks and start and end dates - no formulas required. The bars in the Gantt chart represent the duration of the task and are displayed using conditional formatting. Insert new tasks by inserting new rows.

Additional Help

Click on the link below to visit vertex42.com and learn more about how to use this template, such as how to calculate days and work days, create task dependencies, change the colors of the bars, add a scroll bar to make it easier to change the display week, extend the date range displayed in the chart, etc.

How to Use the Simple Gantt Chart

More Project Management Templates

Visit Vertex42.com to download other project management templates, including different types of project schedules, Gantt charts, tasks lists, etc.
Project Management Templates

About Vertex42

Vertex42.com provides over 300 professionally designed spreadsheet templates for business, home, and education - most of which are free to download. Their collection includes a variety of calendars, planners, and schedules as well as personal finance spreadsheets for budgeting, debt reduction, and loan amortization.

Businesses will find invoices, time sheets, inventory trackers, financial statements, and project planning templates. Teachers and students will find resources such as class schedules, grade books, and attendance sheets. Organize your family life with meal planners, checklists, and exercise logs. Each template is thoroughly researched, refined, and improved over time through feedback from thousands of users.

DRAWING REGISTER

ISSUE 01

DRAWING No.	REVISION	DATE	DRAWING SHEET DESCRIPTION
200181-1/01	A	27/08/2020	PLAN VIEW
200181-1/02	A	27/08/2020	NOTES

ALL DIMENSIONS ARE TO BE CONFIRMED ON SITE PRIOR TO COMMENCING ANY WORKS

Rev.	Revision Description	By	Date
A	ORIGINAL ISSUE	MN	27/08/2020

GBA CONSULTING ENGINEERS
George Bourne & Associates
73 Elm Street, Barcaldine Q 4725 Ph 07 4651 5177
Unit 4/5 Church Lane, Emerald Q 4720 Ph 07 4982 1826
Email: admin@gbassoc.com.au

Drawn: Matthew Newton
Designed: Matthew Newton
Checked: Zach Richardson
Survey: --

APPROVED
FOR CONSTRUCTION
KR Luckhurst
RPEQ No. 6952
Date: 27 August 2020

Client: BARCALDINE REGIONAL COUNCIL
Project: 200181 BRC BARCALDINE - LEVEE
Title: BARCALDINE LEVEE SEDIMENT FENCE PLAN VIEW

Category: WATER
Drawing No. 200181-1/01
Rev. A
Units: mm (UNO)
Scale: AS SHOWN
Size: A3

Date Printed: 27/08/2020 17:00:58 M-Files ID: 358343

ALL INFORMATION WITHIN THESE EROSION AND SEDIMENT CONTROL NOTES HAVE BEEN SOURCED FROM THE INTERNAL EROSION CONTROL ASSOCIATION (AUSTRALIA) (IECA) BEST PRACTICE EROSION AND SEDIMENT CONTROL - 2008. THIS DOCUMENT IS ALSO REFERRED TO AS THE IECA GUIDELINES WITHIN THIS DOCUMENT.

SEDIMENT FENCE - GENERAL NOTES

GENERALNOTES

SEDIMENT FENCES ARE USED TO MANAGE SHEET FLOW I.E. WATER FLOWING UNIFORMLY DOWN A LOW TO MEDIUM SLOPE GRADIENT, AND ARE NOT RECOMMENDED IN AREAS OF CONCENTRATED FLOW E.G. DRAINAGE CHANNELS OR CHUTES.

SEDIMENT FENCES ARE RELATIVELY EFFECTIVE IN TRAPPING OR RETAINING SAND AND SILT SIZE PARTICLES, HOWEVER ARE LIMITED IN CAPTURING CLAY SIZED PARTICLES THAT INCREASE THE COLOURAND TURBIDITY OF WATER PASSING THROUGH THE FENCE. AS THE VOIDS WITHIN THE SEDIMENT FENCE ARE MUCH LARGER THAN TYPICAL CLAY SOIL PARTICLES, THEY DO NOT PROVID EEFFECTIVE SEDIMENTATION FOR DISPERSIVE SOILS.

SEDIMENT COLLECTION UTILIZING SEDIMENT FENCES IS ACHIEVED THROUGH GRAVITY INDUCED SEDIMENTATION AS A RESULT OF WATER TEMPORARILY BEING PONDED OR RETAINED ON THE UP-SLOPE SIDE OF THE SEDIMENT FENCE. THE SURFACE AREA OF THE UP-SLOPE PONDED AREA CREATED DURING THE CONSTRUCTION AND POSITIONING OF THE SEDIMENT FENCE AND OR RETURNS IS CRITICAL TOWARDS MAXIMIZING SEDIMENT COLLECTION I.E. THE GREATER PONDED SURFACE AREA, THE GREATER POTENTIAL FOR SEDIMENT COLLECTION. FILTRATION OF WATER THROUGH THE FABRIC PROVIDES LIMITED OR SECONDARY SEDIMENT COLLECTION. TO ENSURE ADEQUATE STRUCTURAL CAPACITY OF THE SEDIMENT FENCE, RETURNS MUST BE PLACED AT APPROPRIATE INTERVALS.

FILTER FENCES, ALTHOUGH CONSTRUCTED SIMILARLY TO A SEDIMENT FENCES ARE NOT CONSIDER AN ACCEPTABLE REPLACEMENT FOR SEDIMENT FENCES UNLESS CONSTRUCTED DIRECTLY DOWN-SLOPE OF EARTH STOCKPILES. FILTER FENCES ARE USED TO MANAGE COARSE GRAINED RUNOFF FROM STOCKPILES AND RELY ON FILTRATION AS THE PRIMARY TREATMENT MECHANISM. FILTER FENCES ALSO CANNOT BE RELIED UPON IN CONCENTRATED FLOWS.

NOTE: APPROPRIATELY CONSTRUCTED AND MAINTAINED SEDIMENT FENCES ARE CLASSED AS A TYPE 3 SEDIMENT CONTROL, HOWEVER ARE TO BE DOWNGRADED IF INAPPROPRIATELY MAINTAINED.

MATERIALS

FABRIC IS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE. IF SPECIFIED, FABRIC REINFORCEMENT WIRE OR STEEL SUPPORT MESH, MINIMUM 14 GAUGE (APPROX. 2.0 MM) WITH A MAXIMUM MESH SPACING OF 200MM.

SUPPORT POSTS/STAKES:

- 1500MM2 (E.Γ. 30MM Ξ 50 MM) (MIN) ΗΑΡΔΩΟΟΑ,
- 2500MM2 (E.Γ. 30MM Ξ 50 MM) (MIN) ΣΟΦΤΩΟΟΑ, ΟΡ
- 1.5ΚΓ/Μ (MIN) ΣΤΕΕΛ ΣΤΑΡ ΠΙΧΚΕΤΣ ΣΥΙΤΑΒΑΕ ΦΟΡ ΑΤΤΑΧΗΙΝΓ ΦΑΒΡΙΧ.

INSTALLATION

DELAY CLEARING OR PLACING ERODIBLE MATERIAL UP- SLOPE OF THE AREA UNTIL THE SEDIMENT FENCE IS CONSTRUCTED AND IS ABLE TO ACT AS A SUITABLE SEDIMENT CONTROL.

1. THE FENCE IS TO BE LOCATED:
   a. WITHIN THE PROPERTY BOUNDARIES;
   b. ALONG A LINE OF CONSTANT ELEVATION OR CONTOUR WHERE POSSIBLE;
   c. A MINIMUM OF 2M FROM THE TOE OF ANY FILL BATTERS OR EARTHWORKS TO PREVENT DAMAGE TO THE FENCE.
2. INSTALL RETURNS WITHIN THE FENCE AT A MAXIMUM OF:
   a. 20M INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR;
   b. 5 TO 10M MAXIMUM SPACING (DEPENDANT ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR.
3. THE RETURNS CAN BE CONSTRUCTED USING:
   a. V-SHAPED SECTION EXTENDING AT LEAST 1.5M UP-SLOPE (PREFERRED METHOD); OR
   b. SANDBAG OR ROCK/AGGREGATE CHECK DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5M UP-SLOPE.
4. EXTREME ENDS OF THE FENCE ARE TO BE TURNED UP-SLOPE AT LEAST 1.5M OR AS NECESSARY TO MINIMISE WATER BYPASSING AROUND THE FENCE.
5. AVOID CONCENTRATION OF FLOW ALONG THE FENCE AND OR DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.
6. PROTECT EXISTING TREES AND ROOT SYSTEMS AND DO NOT UTILISE VEGETATION TO SUPPORT FABRIC.
7. UNLESS OTHERWISE DIRECTED OR NOMINATED ON THE APPROVED PLANS, EXCAVATE A 200MM WIDE BY 200MM DEEP ANCHOR TRENCH ALONG THE PROPOSED FENCE ALIGNMENT AND PLACE THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.
8. ON THE LOWER SIDE OF THE ANCHOR TRENCH SECURE THE SUPPORT POSTS INTO THE GROUND AT THE FOLLOWING SPACING:
   a. NO GREATER THAN 2M
   b. NO GREATER THAN 3M IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING
9. SECURELY ATTACH THE SUPPORT WIRE (OR MESH WHERE SPECIFIED) TO THE UP-SLOPE SIDE OF THE SUPPORT POSTS. SUPPORT MESH TO EXTEND A MINIMUM OF 200MM INTO THE ANCHOR TRENCH.
10. FABRIC (AND MESH WHERE SPECIFIED) IS TO BE ATTACHED TO THE UP-SLOPE SIDE OF THE SUPPORT POSTS.
11. JOIN ENDS OF FABRIC BY OVERLAPPING TO THE NEXT SUPPORT POST.
12. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS, MAXIMUM FIXING SPACING OF 150MM.
13. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (WHERE SPECIFIED) AT A MAXIMUM FIXING SPACING OF 1M.
14. THE COMPLETED FENCE IS TO BE A MINIMUM OF 450MM, BUT NO GREATER THAN 700MM HIGH FROM THE FINISHED UP-SLOPE SURFACE. IF A SPILL-THOUGH WEIR IS INSTALLED ENSURE THE CREST OF THE WEIR IS A MINIMUM OF 300MM ABOVE THE FINISHED UPSLOPE SURFACE.
15. BACKFILL AND COMPACT THE ANCHOR TRENCH TO FIRMLY SECURE THE ENTIRE LENGTH OF THE FABRIC (AND MESH WHERE SPECIFIED) AND ENSURE UP-SLOPE WATER WILL NOT UNDERCUT, UNDERMINE, FLOW UNDER THE FENCE.
16. SEEK CLARIFICATION IF ANY ASPECT OF THE CONSTRUCTION OF THE SEDIMENT TRAP IS IN QUESTION.

WHERE LARGE FLOWS ARE EXPECTED ALONG THE SEDIMENT FENCE, THE INSTALLATION OF A SPILL THROUGH WEIR MAY BE REQUIRED

1. CONSTRUCT THE WEIR CREST:
   a. LOWER THAN THE GROUND LEVEL AT ENDS OF THE FENCE;
   b. A MINIMUM OF 300MM HIGH FROM THE FINISHED UP-SLOPE SURFACE
2. SECURELY ATTACHED A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS POSITIONED ON EITHER SIDE OF THE WEIR.

   CUT THE FABRIC DOWN THE SIDE OF EACH SUPPORT POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.

   INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL THROUGH WEIR TO CONTROL DISCHARGES PASSING OVER THE WEIR AND SOIL EROSION BELOW THE SPILL-THROUGH WEIR.

OPERATION, MONITORING AND MAINTENANCE

INSPECT SEDIMENT FENCES WEEKLY AND AFTER RAINFALL EVENTS PRODUCING RUNOFF TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF THE SEDIMENT CONTROL.

CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY I.E. PRIOR TO RAINFALL EVENTS.

ADDITIONAL MONITORING AND MAINTENANCE SHOULD BE CONDUCTED WITHIN 12 HOURS OF A FORECAST RAINFALL EVENT THAT WOULD PRODUCE RUNOFF.

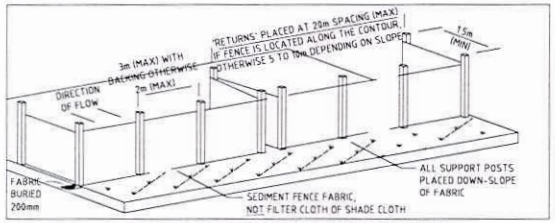
GENERAL INSPECTION CONSIDERATIONS INCLUDE:

1. UNDERCUTTING, UNDERMINING, FLOW UNDER THE FENCE.
2. DAMAGE FROM OVERTOPPING FLOWS.
3. DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR.
4. EXCESSIVE SEDIMENTATION TO BE REMOVED APPROPRIATELY I.E. GREATER THAN THE 1/3 OF THE HEIGHT OF THE SEDIMENT FENCE. REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
5. RECTIFICATION OF IMPROPER INSTALLATION.

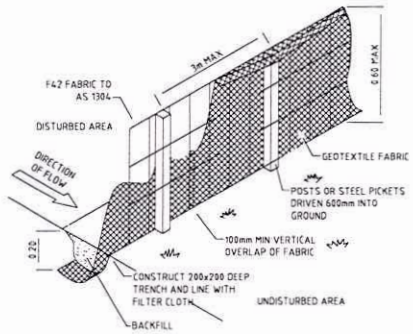
DECOMMISSIONING

WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN ASSESSED AND APPROVED AS BEING SATISFACTORILY STABILISED, THE SEDIMENT CONTROL MAY BE DECOMMISSIONED. GENERAL CONSIDERATIONS INCLUDE:

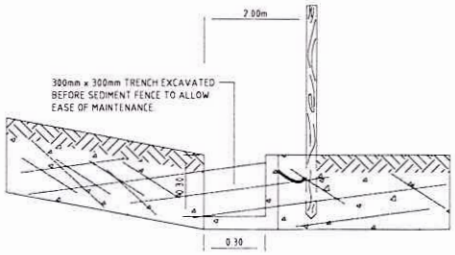
1. WATER OR SEDIMENT WITHIN THE SEDIMENT CONTROL SHOULD BE MANAGED AND DISPOSED OF APPROPRIATELY AS NECESSARY.
2. DISTURBED AREAS ASSOCIATED WITH THE SEDIMENT CONTROL ARE TO BE REINSTATED AND REHABILITATED TO CONFORM TO THE ADJOINING LAND FEATURES, E.G. COMPACTION, SLOPE, VEGETATION.
3. DECOMMISSIONING IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD IN THE DIRECT OR ADJOINING AREAS ASSOCIATED WITH THE SEDIMENT CONTROL.



TYPICAL INSTALLATION OF A SEDIMENT FENCE
NOT TO SCALE



TYPICAL SEDIMENT FENCE DETAIL
NOT TO SCALE



SEDIMENT TRENCH INSTALLED AT THE BASE OF SEDIMENT FENCE
NOT TO SCALE

ALL DIMENSIONS ARE TO BE CONFIRMED ON SITE PRIOR TO COMMENCING ANY WORKS

Rev.	Revision Description	By	Date
A	ORIGINAL ISSUE	MN	27/08/2020

GBA CONSULTING ENGINEERS
George Bourne & Associates
73 Elm Street, Barcaldine Q 4725 Ph 07 4651 5177
Unit 4/5 Church Lane, Emerald Q 4720 Ph 07 4982 1826
Email: admin@gbassoc.com.au

Drawn: Matthew Newton
Designed: Matthew Newton
Checked: Zach Richardson
Survey: --

APPROVED FOR CONSTRUCTION
KR Luckhurst RPEQ No. 6952
Date: 27 August 2020

Client: BARCALDINE REGIONAL COUNCIL
Project: 200181 BRC BARCALDINE - LEVEE
Title: BARCALDINE LEVEE SEDIMENT FENCE NOTES

Category: WATER
Drawing No. 200181-1/02
Rev. A
Units: mm (UNO)
Scale: AS SHOWN
Size: A3

Date Printed: 27/08/2020 17:00:59 ... M:\Files\ID_356343 ...

DEVELOPMENT APPLICATION

Application for a Development Permit for Operational Works
- Excavating and Filling associated with a Category 2 Levee

"Operational work" where not associated with a *"Material Change of use"*

	Performance Criteria	Acceptable Solution	Comment
Amenity	*PC1 General Design* *"Operational works"* are designed and constructed so that the visual amenity of the Rural *"Zone"* is protected.	No acceptable solution is prescribed.	The operational works have been designed to minimise the impact on visual amenity. Specifically, the proposed levee follows the alignment of Lagoon Creek and for the majority of the alignment is well setback from established residential dwellings.
Environmental	*PC2 Excavation or Filling* Excavating or filling of land: (a) ensures safety and amenity for the users of the *"Premises"* and land in close proximity; and (b) minimises soil erosion.	AS2.1 Batters have a maximum slope of 25%, are terraced at every rise of 1.5 metres and each terrace has a minimum depth of 750mm. AS2.2 Excavation or filling within 1.5 metres of any site boundary is battered or retained by a wall that does not exceed 1 metre in height. AS2.3 Excavation or filling is undertaken in accordance with Schedule 1, Division 1: Standards for Construction Activities, Section 1.1	The levee has a design batter of 1:3 and a maximum height of 3.5m. The levee has been designed by an RPEQ Engineer to ensure it is fit for purpose. The designer has recommended that rock protection be placed on the outer bank of the levee to minimise erosion from flood events over time.
Environmental	*PC3 Construction Activities* Erosion control measures and silt collection measures ensure that environmental values are protected during construction activities.	AS3 During construction soil erosion and sediment is controlled in accordance with standards contained in Schedule 1, Division 1: Standards for Construction Activities, Section 1.1	All construction activities will be carried out under a approved erosion and sediment control plan. Please refer to Appendix A and Appendix B for the erosion and sediment control plan for each construction works.

Environmental	*PC4 "Watercourses" and "Lakes"* *"Development"* ensures the maintenance of riparian areas and water quality including protection from off-site transfer of sediment.	AS4 A minimum 50 metre wide buffer area is provided extending out from the high bank of any *"Watercourse"* or *"Lake".*	The proposed levee is setback greater than 50m from the high bank of Lagoon Creek.
Environmental	*PC5 Vegetation Retention* *"Development"* retains vegetation for the: (a) protection of scenic quality; (b) protection of general habitat; (c) protection of soil quality; and (d) establishment of open space corridors and networks.	AS5 Vegetation comprising 20% of each regional ecosystem type is retained within each lot with retained vegetation made up of woody remnant, regrowth or replanted natural species, excluding deep-rooted crops and clear fell plantation forestry. The shade lines are a minimum of 10 metres in width; clumps have an area greater than 2 hectares.	The levee construction will involve the removal of a small number of trees. This will not compromise the scenic quality of the of the area. Given the sparse nature of the trees, in the present form they are providing no natural habitat or improving soil quality. The proposed development will result in no worsening to the natural environment as a result of the removal of a small number of trees. Further, the community benefit from the levee far outweighs the loss of a couple of trees.
Environmental	*PC6 Cultural Heritage* *"Development" ensures the protection and maintenance of places and items of cultural heritage.*	AS6.1 A separation distance of not less than 50 metres is provided to the "Bed and banks" of "Watercourses" and "Lakes". AS6.2 A minimum separation distance of 50 metres is provided to cemeteries and burial sites as identified in Schedule 2, Division 6: Places and Items of Cultural Heritage, Section 6.1.	All proposed operational works is located greater than 50m from the top of bank of Lagoon Creek. The proposed development is not located within 50m of any cemeteries or known burial sites.

Environmental	*PC7 Water Quality* *The standard of effluent and / or stormwater runoff from "Premises" ensures the quality of surface and underground water is suitable for:* *(a) the biological integrity of aquatic ecosystems;* *(b) recreational use;* *(c) supply as drinking water after minimal treatment;* *(d) agricultural use; or* *(e) industrial use.9*	No acceptable solution is prescribed	Erosion and sediment control plans will be in place at all sites where excavation or filling works are occurring. This will ensure any stormwater runoff during construction is not contaminated with sediment.
Constraint	*PC8 Protected Areas* *"Development" is undertaken to ensure areas of significant biodiversity and habitat value and high scenic quality are protected.*	AS8 A minimum separation distance of 100 metres is provided to Protected Areas as identified on Land Characteristics Map – Features Map and as identified in Schedule 2, Division 8: Artesian Springs, Section 8.1.	All proposed works are located greater than 100m from the identified protected areas.
Constraint	*PC9 Sloping Land* *"Development" is undertaken to ensure:* *(a) vulnerability to landslip, erosion and land degradation is minimised; and* *(b) safety of persons and property is not compromised.*	AS9 "Development" is not undertaken on slopes greater than 15%.	No fill material is been placed on a natural surface which has a slope greater than 15%. It is more than likely the excavation pit will have batters greater than 15% however, this area will be appropriately managed to ensure safety of persons working at the site.

State code 6: Protection of state transport networks

Table 6.2.2: All development

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not result in a worsening of the safety of a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended that a Registered Professional Engineer of Queensland (RPEQ) certified road safety audit or road safety assessment (as applicable) is provided, prepared in accordance with the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017. Section 6 of the Guide To Traffic Impact Assessment, Department of Transport and Main Roads, 2017, provides guidance on how to determine whether a road safety audit or road safety assessment is required.	No acceptable outcome is prescribed.	The proposed levee, has been designed to protect the flood immunity of the town. This in turn will ensure the state-controlled road networks within the town are protected. In a flood event, there may be short periods of time where the state=controlled routes are blocked to protect buildings within the town of Barcaldine.
PO2 Development does not result in a worsening of the infrastructure condition of a state-controlled road or road transport infrastructure. Note: To demonstrate compliance with this performance outcome, it is recommended that a RPEQ certified traffic impact assessment and pavement impact assessment are provided, prepared in accordance with the Guide To Traffic Impact Assessment, Department of Transport and Main Roads, 2017.	No acceptable outcome is prescribed.	Refer above.

Performance outcomes	Acceptable outcomes	Response
PO3 Development does not result in a worsening of operating conditions on a state-controlled road or the surrounding road network. To demonstrate compliance with this performance outcome, it is recommended that an RPEQ certified traffic impact assessment, prepared in accordance with the Guide To Traffic Impact Assessment, Department of Transport and Main Roads, 2017, is provided.	No acceptable outcome is prescribed.	Refer above. A Traffic Impact Assessment is unnecessary.
PO4 Development does not impose traffic loadings on a state-controlled road which could be accommodated on the local road network.	**AO4.1** The layout and design of the development directs traffic generated by the development to the local road network.	The development will rely on the state-controlled road network for its haulage route for the construction of the levee. The construction will occur over an 8-week period. The haul route to the construction site will be: - Yellowjack Drive – 900m - Landsborough Highway/Box Street – 3.9km (State-controlled) - Oak Street – 240m (State-controlled) - Beech Street/Barcaldine Aramac Road - 470m (depending on dump point) (State-controlled)
PO5 Upgrade works on, or associated with, a state-controlled road are built in accordance with relevant design standards.	**AO5.1** Upgrade works on a state-controlled road are designed and constructed in accordance with the Road Planning and Design Manual, 2nd edition, Department of Transport and Main Roads, 2016.	Not applicable, no access works are warranted for the operational works.
PO6 Development involving the haulage of fill, extracted material or excavated spoil material exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road.	**AO6.1** Fill, extracted material and spoil material is not transported to or from the development site on a state-controlled road.	The applicant has no other option than to transport material on the State-controlled road network.

Performance outcomes	Acceptable outcomes	Response
Note: It is recommended that a transport infrastructure impact assessment and pavement impact assessment are provided, prepared in accordance with the Guide To Traffic Impact Assessment, Department of Transport and Main Roads, 2017.		Both of the routes been used are major freight and transport routes for the central west. The vehicles and tonnage carted will be consistent with other vehicles using the road network on a daily basis. The proposed development will not result in any additional pavement damage to the state-controlled road network.
PO7 Development does not adversely impact on the safety of a railway crossing. Note: It is recommended that a traffic impact assessment be prepared to demonstrate compliance with this performance outcome. An impact on a level crossing may require an Australian Level Crossing Assessment Model (ALCAM) assessment to be undertaken. Section 2.2 – Railway crossing safety of the Guide to Development in a Transport Environment: Rail, Department of Transport and Main Roads, 2015, provides guidance on how to comply with this performance outcome.	**AO7.1** Development does not require a new railway crossing. OR	The haulage route will cross the railway crossing on Beech Street. The development however, does not involve the construction of a new railway crossing.
	AO7.2 A new railway crossing is grade separated.	Not applicable.
	OR all of the following acceptable outcomes apply: **AO7.3** Upgrades to a level crossing are designed and constructed in accordance with AS1742.7 – Manual of uniform traffic control devices, Part 7: Railway crossings and applicable rail manager standard drawings. Note: It is recommended a traffic impact assessment be prepared to demonstrate compliance with this acceptable outcome. An impact on a level crossing may require an Australian Level Crossing Assessment Model (ALCAM) assessment to be undertaken. Section 2.2 – Railway crossing safety of the Guide to Development in a Transport Environment: Rail, Department of Transport and Main	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	Roads, 2015, provides guidance on how to comply with this acceptable outcome AND	
	AO7.4 Access points achieve sufficient clearance from a level crossing in accordance with AS1742.7 – Manual of uniform traffic control devices, Part 7: Railway crossings by providing a minimum clearance of 5 metres from the edge running rail (outer rail) plus the length of the largest vehicle anticipated on-site. Note: Section 2.2 of the Guide to Development in a Transport Environment: Rail, Department of Transport and Main Roads, 2015, provides guidance on how to comply with this acceptable outcome. AND	Not applicable.
	AO7.5 On-site vehicle circulation is designed to give priority to entering vehicles at all times.	Not applicable.
PO8 Development does not result in a worsening of the infrastructure condition of a railway or rail transport infrastructure.	No acceptable outcome is prescribed.	As demonstrated by the FIR, the proposed levee will not result in an increase in velocity or depth on the railway infrastructure.
PO9 Development does not result in a worsening of operating conditions of a railway	No acceptable outcome is prescribed.	Refer above.
PO10 Development does not damage or interfere with public passenger transport infrastructure, public passenger services or pedestrian or cycle access to public passenger transport infrastructure and public passenger services.	**AO10.1** Vehicular access and associated road access works are not located within five metres of public passenger transport infrastructure. AND	Refer above.
	AO10.2 Development does not necessitate the relocation of existing public passenger transport infrastructure. AND	Refer above.
	AO10.3 Development does not obstruct pedestrian or cyclist access to public passenger	Refer above.

Performance outcomes	Acceptable outcomes	Response
	transport infrastructure or public passenger services. AND	
	AO10.4 The normal operation of public passenger transport infrastructure or public passenger services is not interrupted during construction of the development.	Refer above.
Stormwater and drainage		
PO11 Development does not result in an actionable nuisance, or worsening of, stormwater, flooding or drainage impacts in a state transport corridor.	No acceptable outcome is prescribed.	As demonstrated by the FIR, the proposed levee will not result in an increase in velocity or depth on the railway infrastructure.
PO12 Run-off from the development site is not unlawfully discharged to a state transport corridor.	**AO12.1** Development does not create any new points of discharge to a state transport corridor. AND	Not applicable. The proposed development is for Operational Works for the construction of a levee. One-way drainage infrastructure through the levee must be incorporated to allow stormwater collected behind the levee to be drained to Lagoon Creek. This location is recommended to be coincident with the current stormwater drain on crown land on the corner of Plane and Brigalow St.
	AO12.2 Stormwater run-off is discharged to a lawful point of discharge. Note: Section 3.4 of the Queensland Urban Drainage Manual, Department of Energy and Water Supply, 2013, provides further information on lawful points of discharge. AND	Not applicable. The proposed development is for Operational Works for the construction of a levee.

Performance outcomes	Acceptable outcomes	Response
	AO12.3 Development does not worsen the condition of an existing lawful point of discharge to a state transport corridor.	Not applicable. The proposed development is for Operational Works for the construction of a levee.
PO13 Run-off from the development site does not cause siltation of stormwater infrastructure affecting a state transport corridor.	**AO13.1** Run-off from the development site is not discharged to stormwater infrastructure for a state transport corridor.	Not applicable. The proposed development is for Operational Works for the construction of a levee.
Planned upgrades		
PO14 Development does not impede delivery of planned upgrades of state transport infrastructure.	**AO14.1** Development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure. Note: Land required for the planned upgrade of state transport infrastructure is identified in the DA mapping system. OR	Not applicable.
	AO14.2 Development is sited and designed so that permanent buildings, structures, infrastructure, services or utilities are not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure.	Not applicable.
	OR all of the following acceptable outcomes apply: **AO14.3** Structures and infrastructure located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of state transport infrastructure are able to be readily relocated or removed without materially affecting the viability or functionality of the development.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	AND	
	AO14.4 Vehicular access for the development is consistent with the function and design of the planned upgrade of state transport infrastructure. AND	Not applicable.
	AO14.5 Development does not involve filling and excavation of, or material changes to, land required for a planned upgrade to a state transport infrastructure. AND	Not applicable.
	AO14.6 Land is able to be reinstated to the pre-development condition at the completion of the use.	Not applicable.