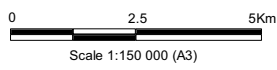
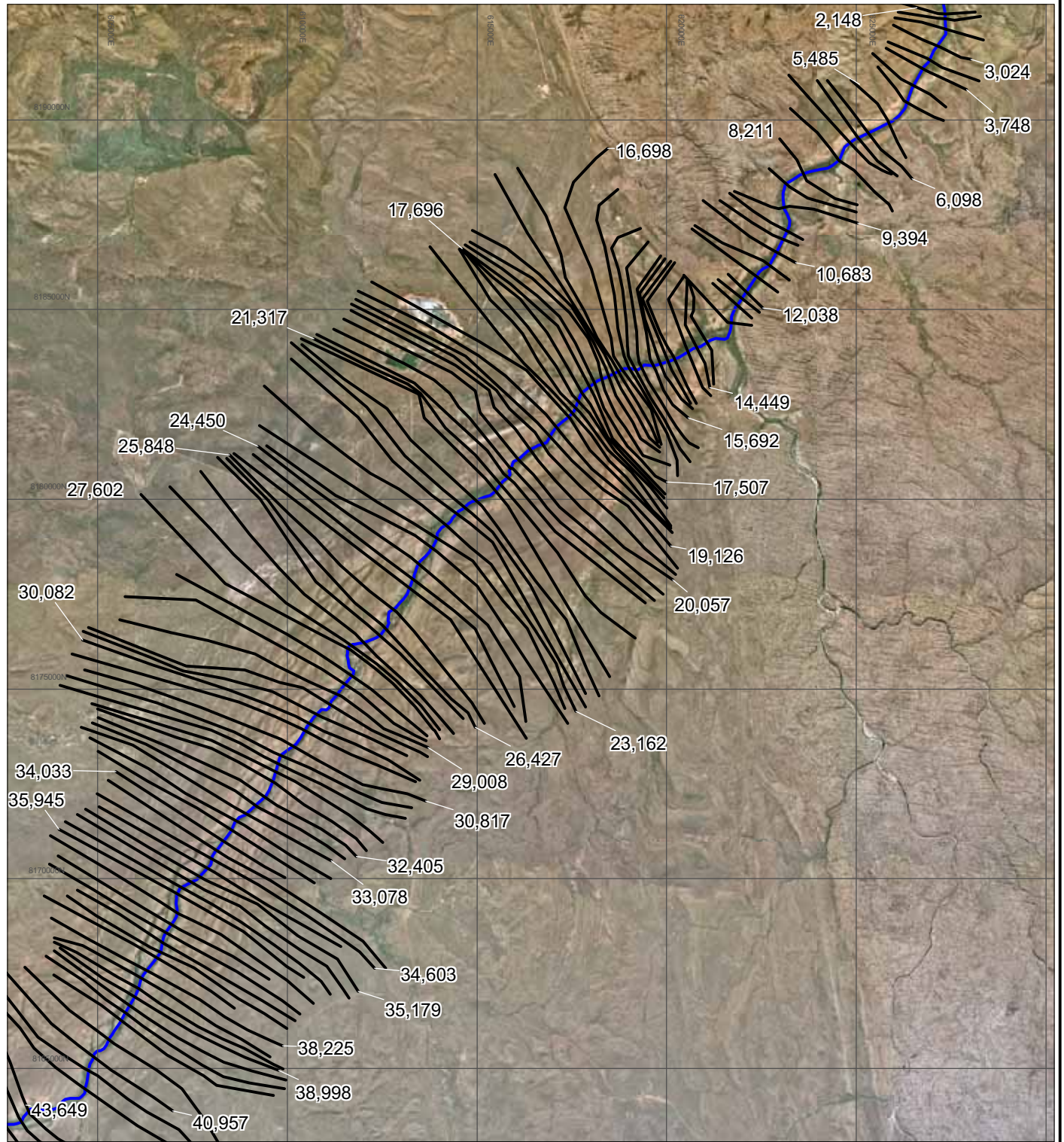


Appendix F.1

McArthur River Hydraulic Modelling Results



Horizontal Datum: AGD84, Zone 53

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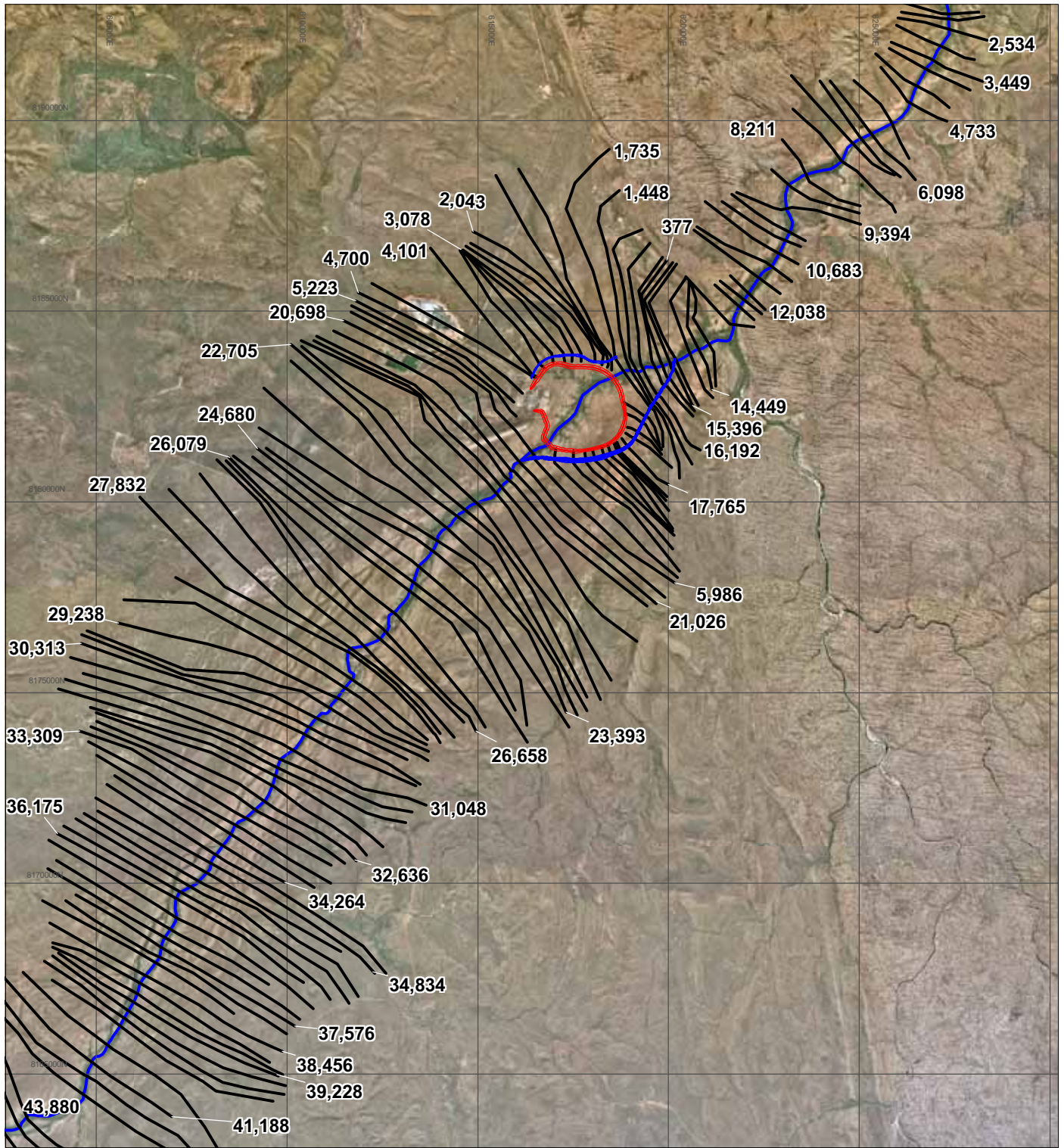
McARTHUR RIVER MINE
OPEN CUT PROJECT
ENVIRONMENTAL IMPACT STATEMENT

HEC-RAS HYDRAULIC MODEL
CROSS-SECTION LAYOUT
EXISTING CONDITIONS

Drawn: VH	Approved: CMP	Date: 27-06-2006
Job No: 42625552	File No: 42625552-g-189.wor	

Figure: F1a

Rev: A
A4



0 2.5 5Km
Scale 1:150 000 (A4)

Horizontal Datum: AGD84, Zone 53



McARTHUR RIVER MINE
OPEN CUT PROJECT
ENVIRONMENTAL IMPACT STATEMENT

HEC-RAS HYDRAULIC MODEL
CROSS-SECTION LAYOUT
OPEN CUT PIT MINE EXPANSION

Drawn: VH	Approved: CMP	Date: 27-06-2006
Job No: 42625552	File No: 42625552-g-190.wor	

Figure: F1b

Rev: A
A4

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

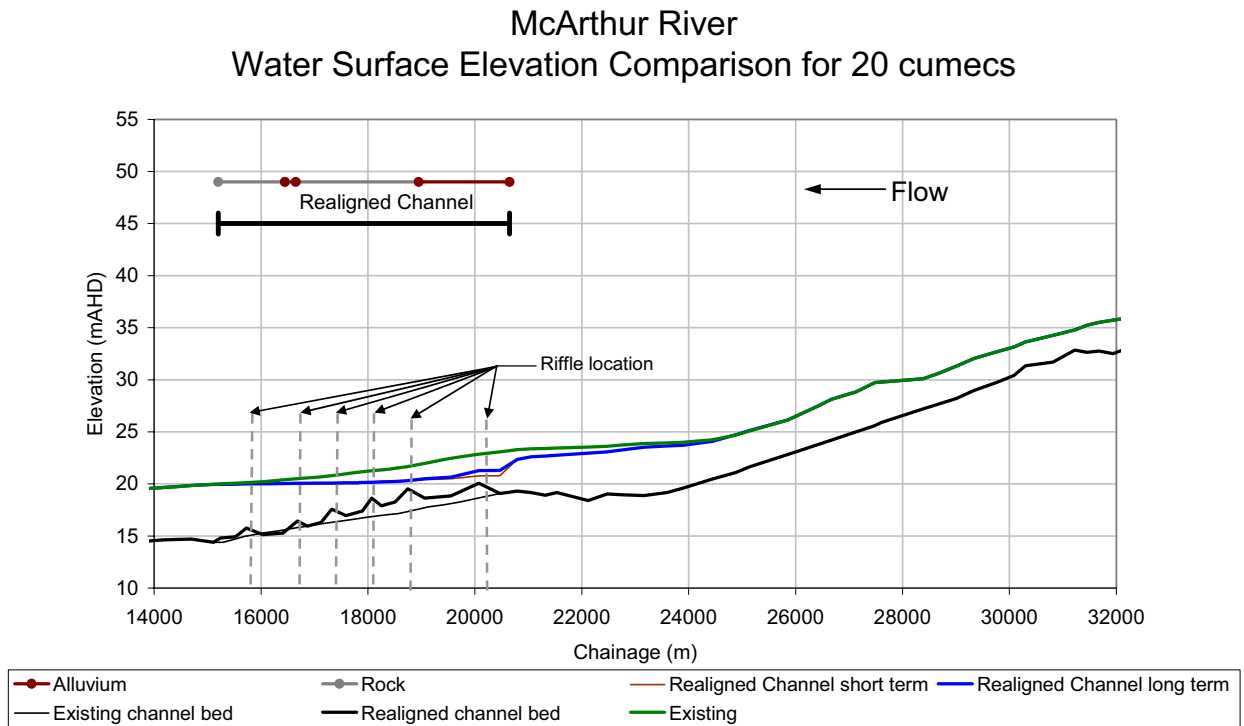
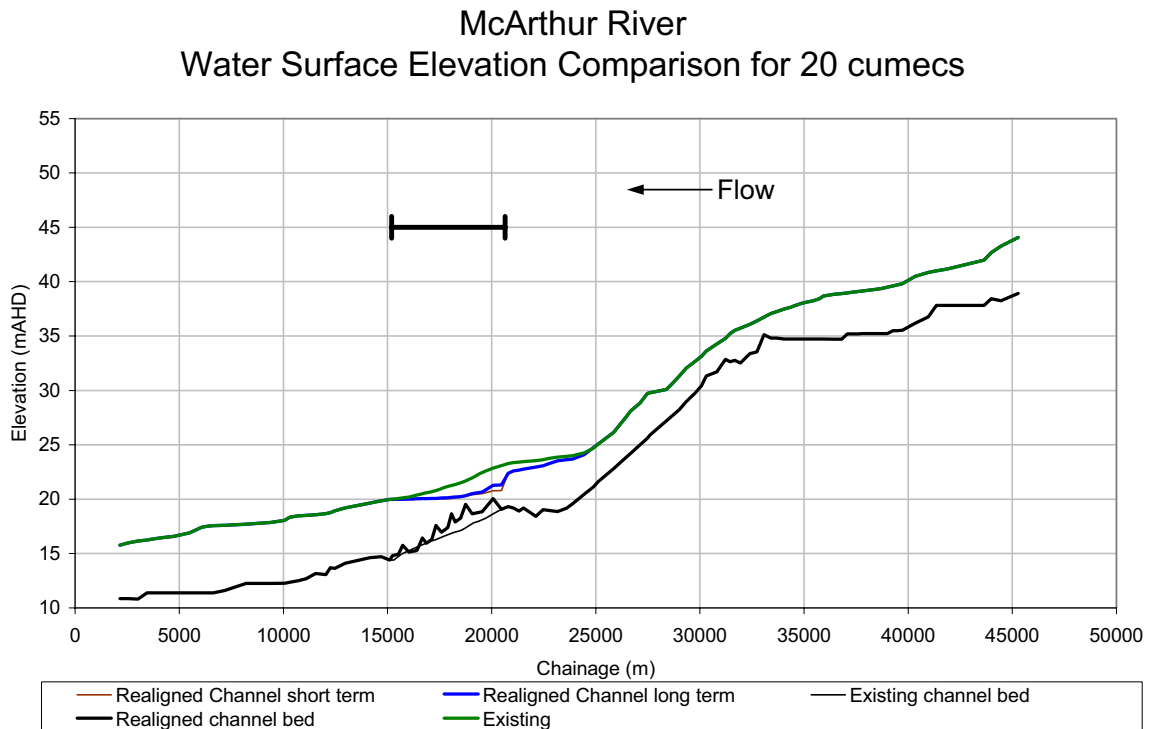


Figure F.1.1 - Water Surface Elevation Comparison for 20 m³/s



Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

Figure F.1.2 - Water Surface Elevation Comparison for 20 m³/s (Overall)

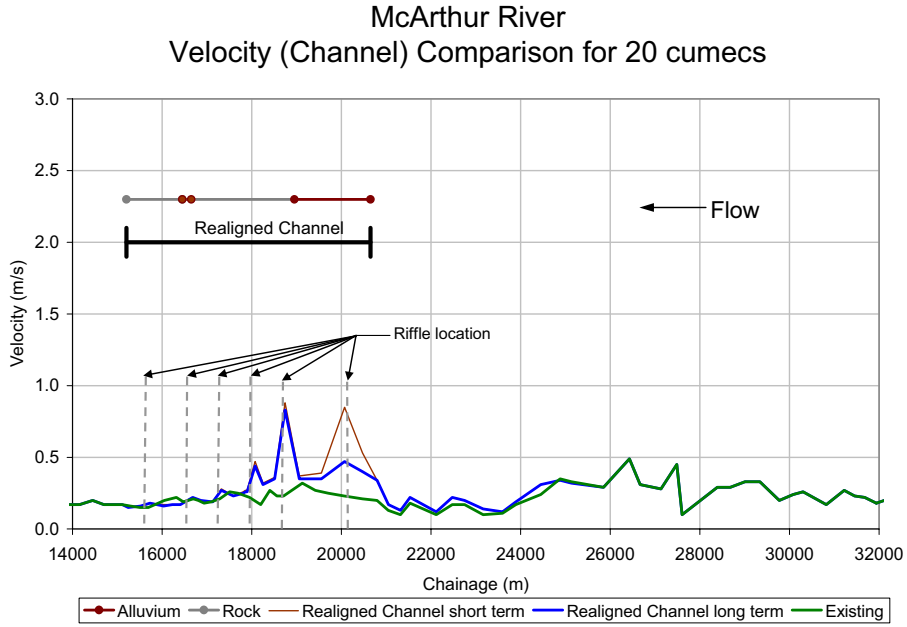


Figure F.1.3 – Velocity (Channel) for 20 m³/s

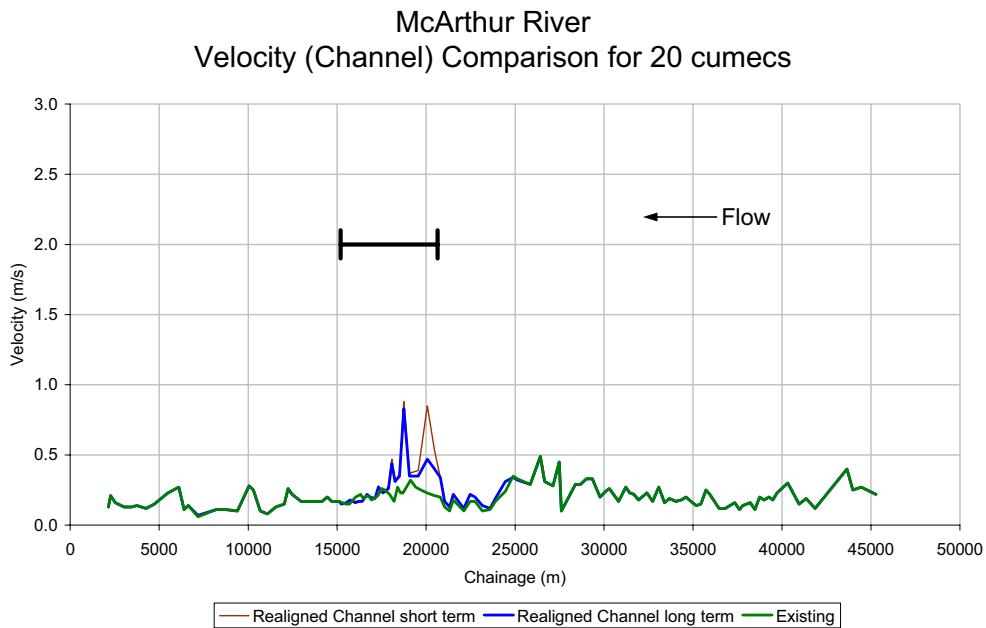


Figure F.1.4 – Velocity (Channel) for 20 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

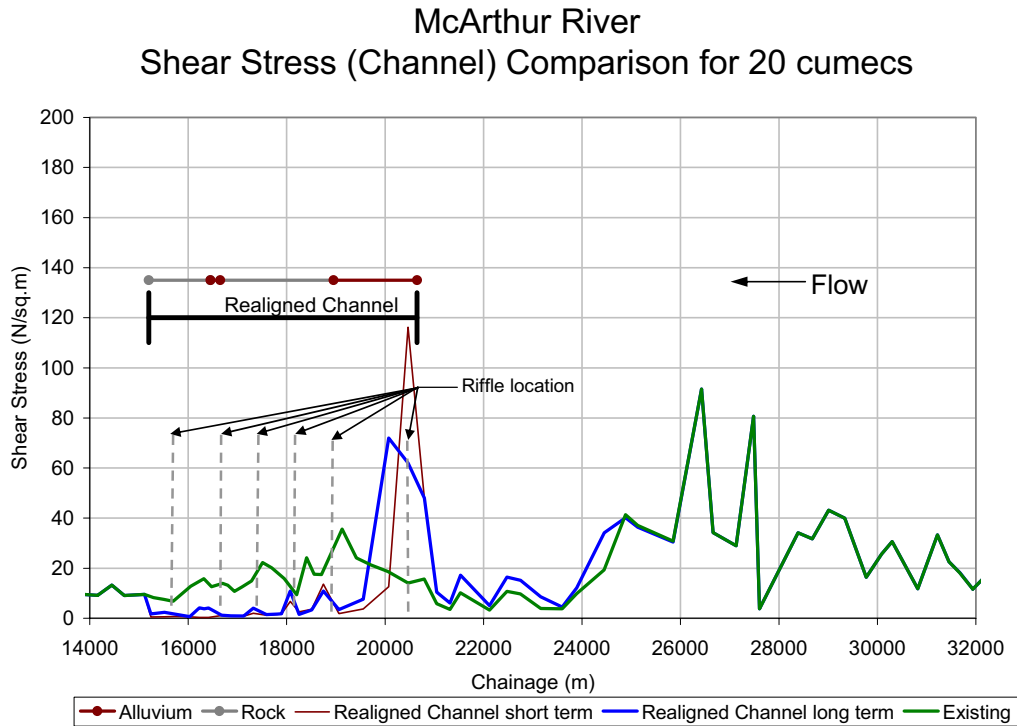


Figure F.1.5 – Shear Stress (Channel) for 20 m³/s

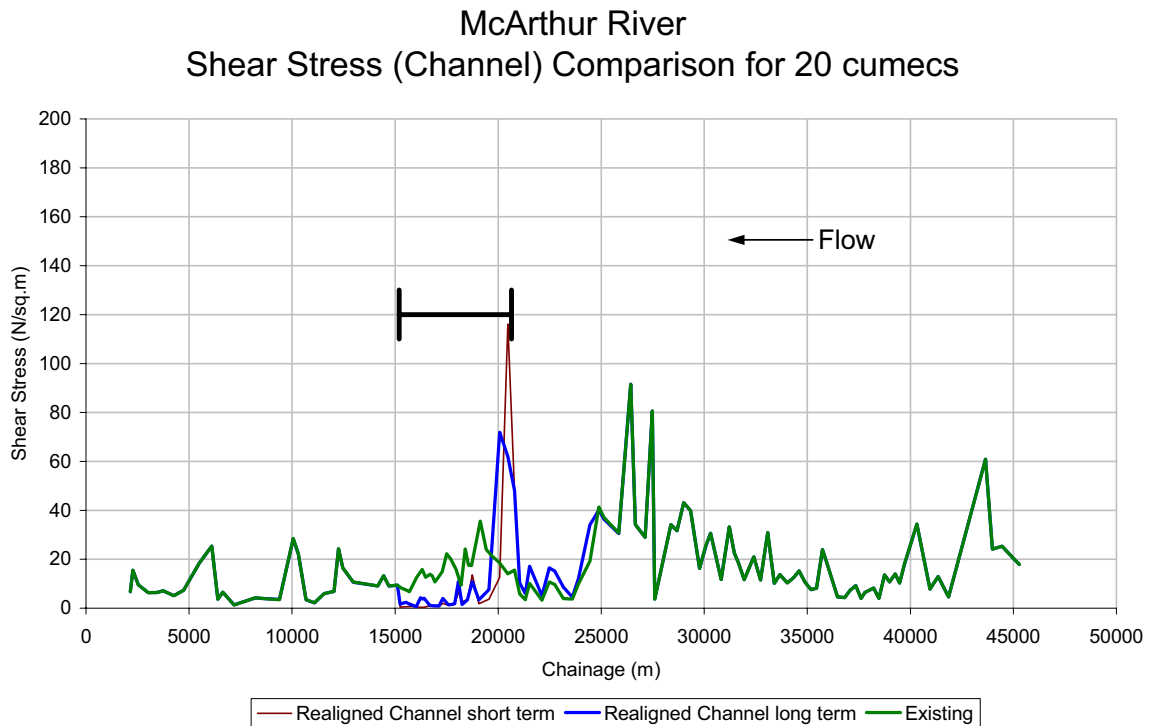


Figure F.1.6 – Shear Stress (Channel) for 20 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

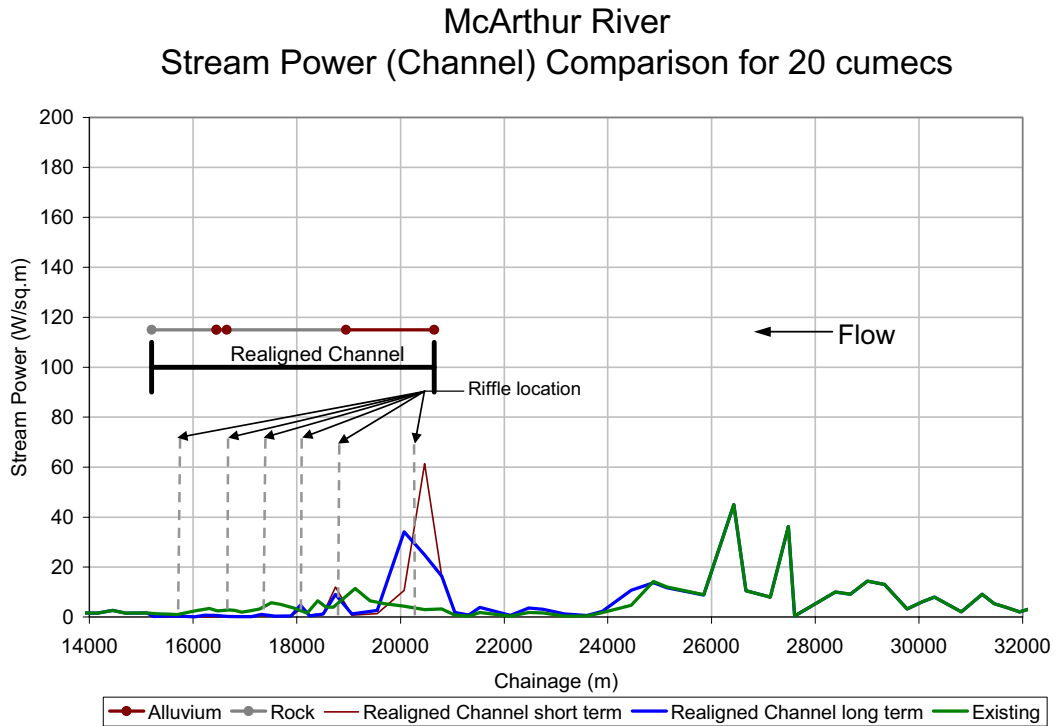


Figure F.1.7 – Stream Power (Channel) for 20 m³/s

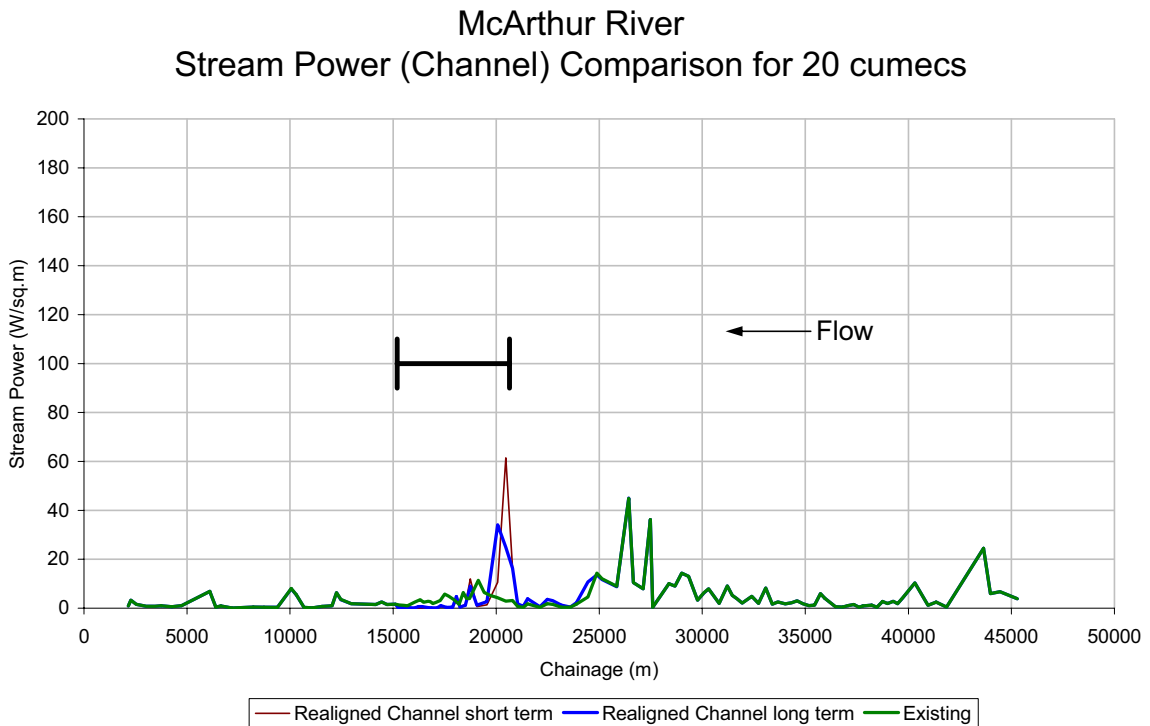


Figure F.1.8 – Velocity (Channel) for 20 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

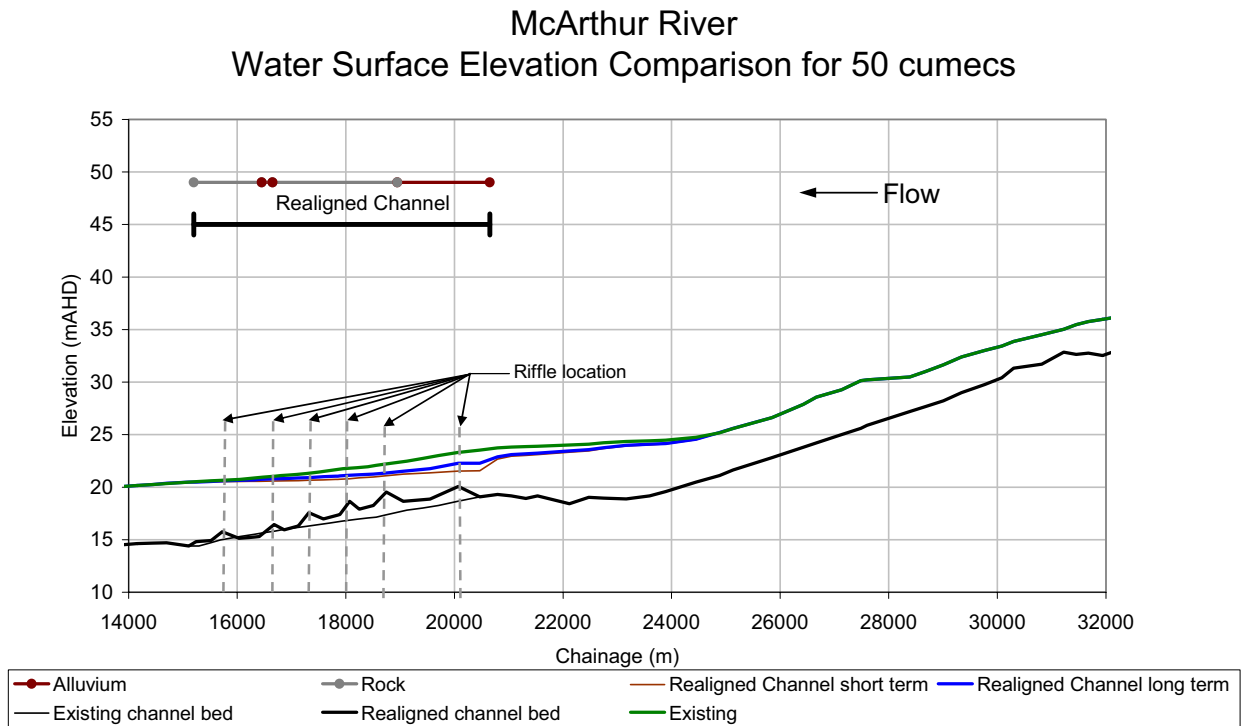


Figure F.1.9 – Water Surface Elevation for 50 m³/s

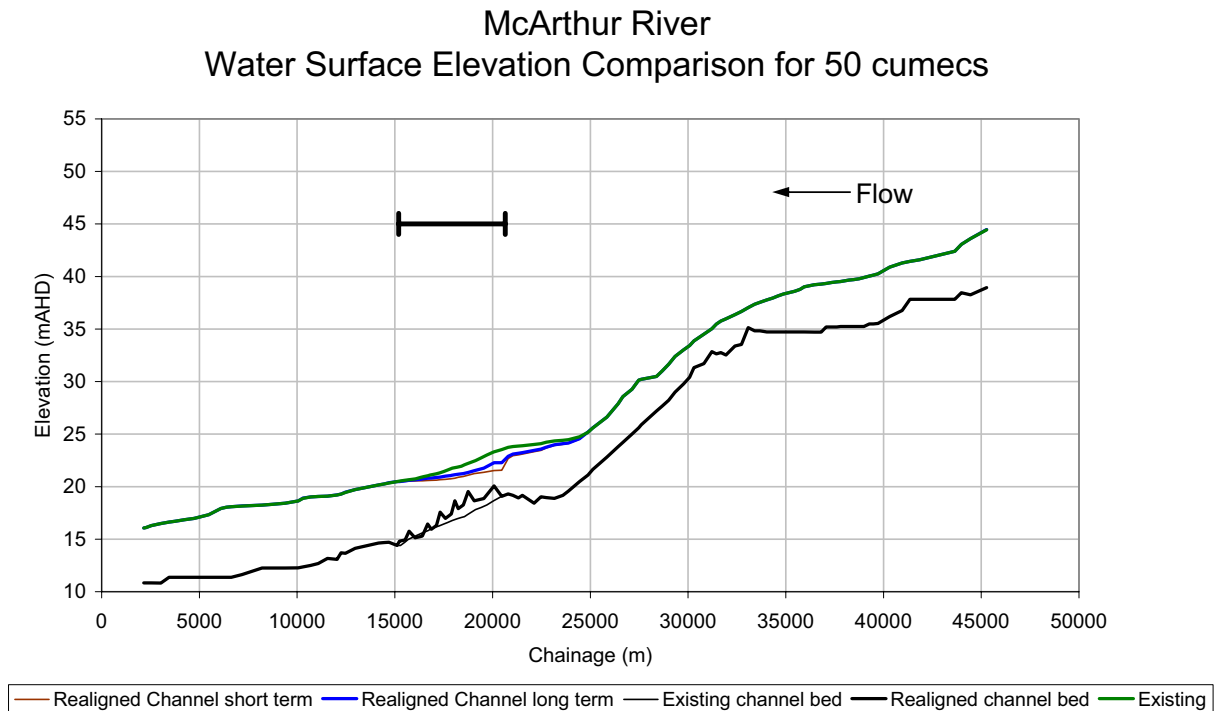


Figure F.1.10 – Water Surface Elevation for 50 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

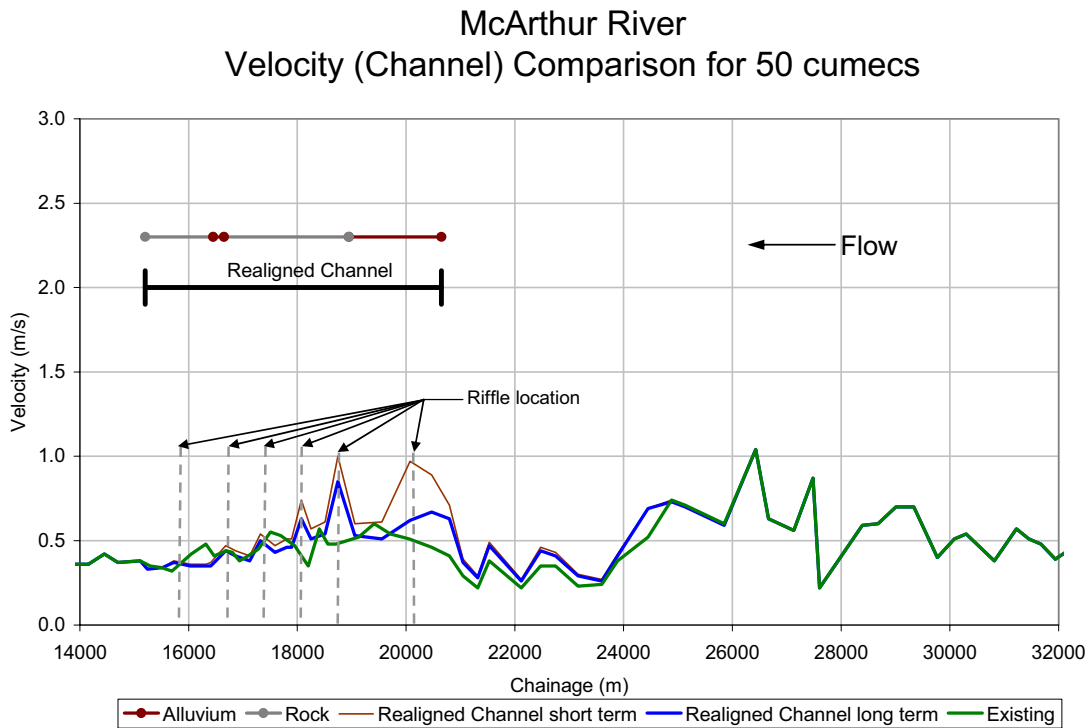


Figure F.1.11 – Velocity (Channel) for 50 m³/s

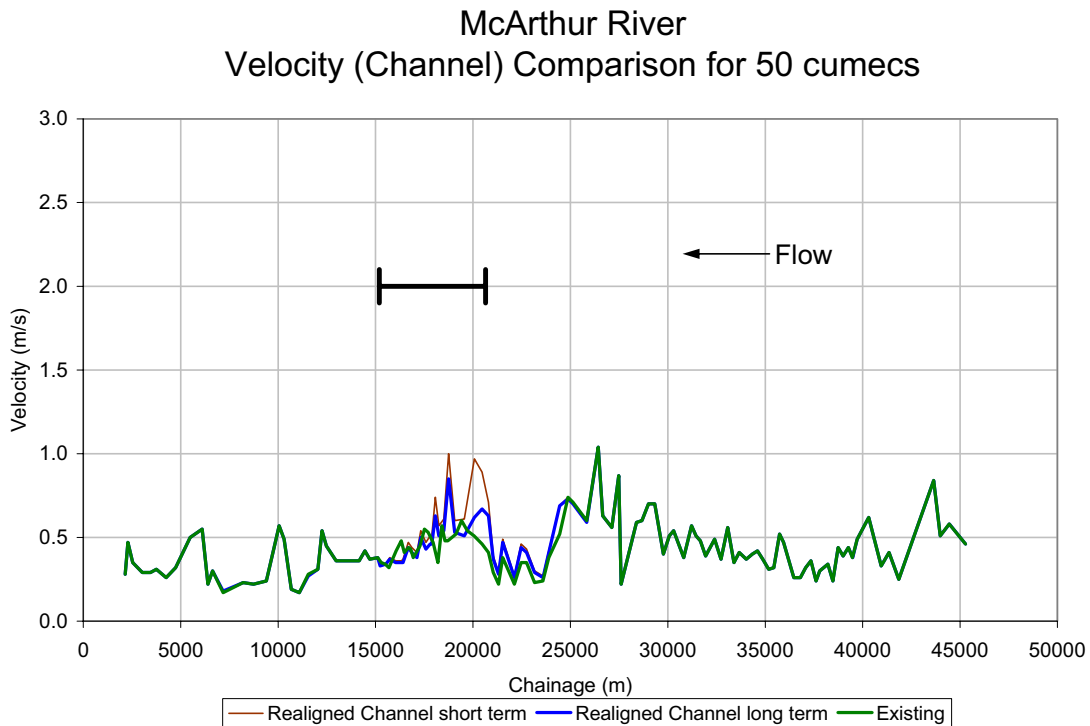


Figure F.1.12 – Velocity (Channel) for 50 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

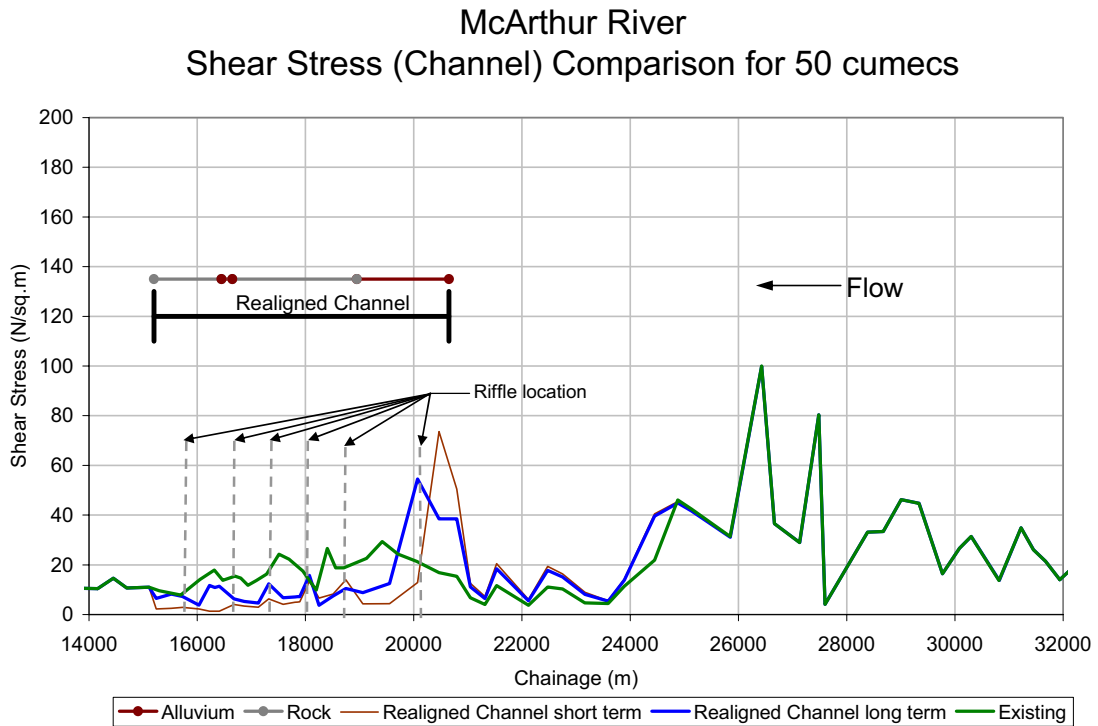


Figure F.1.13 – Shear Stress (Channel) for 50 m³/s

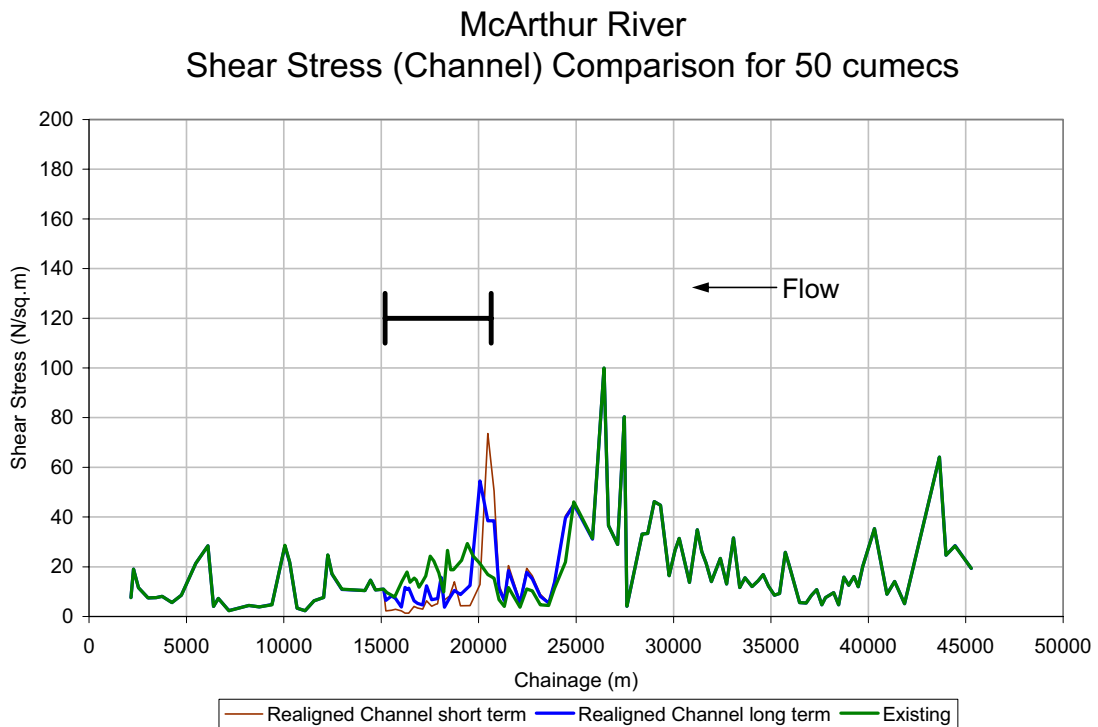


Figure F.1.14 – Shear Stress (Channel) for 50 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

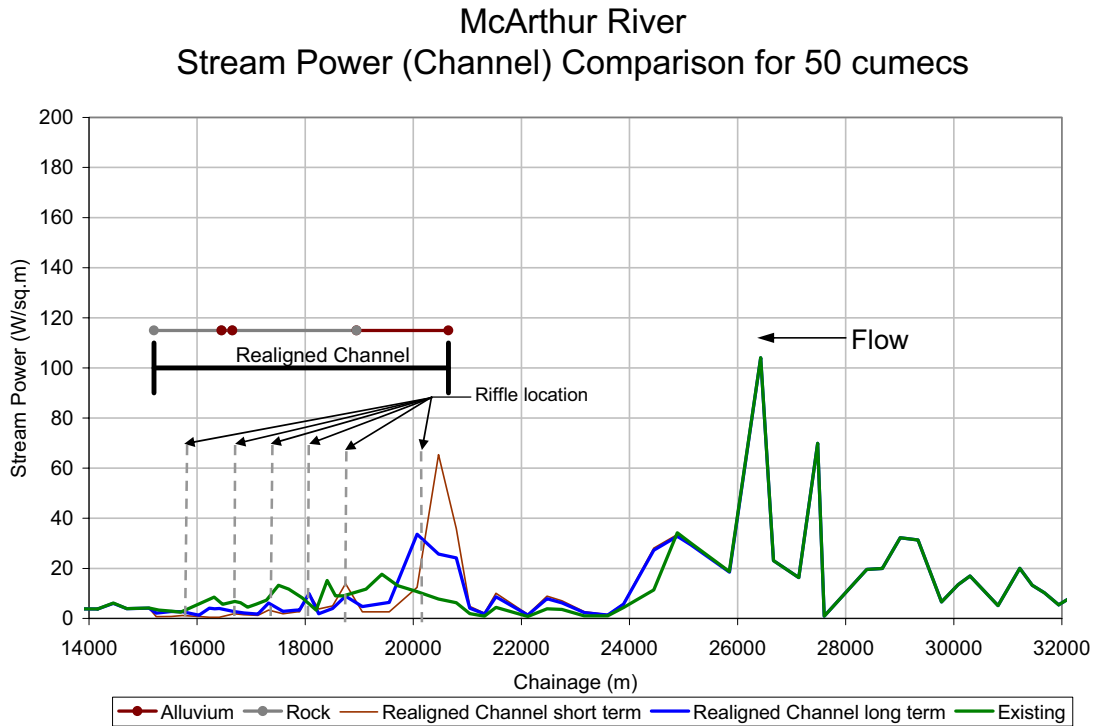


Figure F.1.15 – Stream Power (Channel) for 50 m³/s

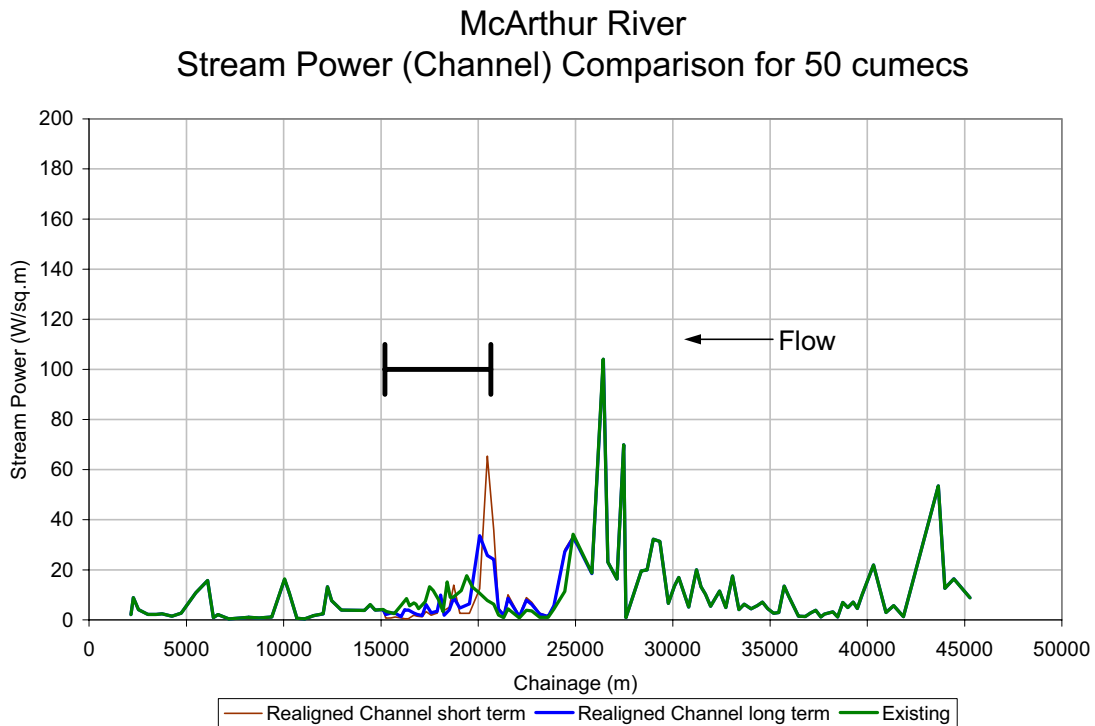


Figure F.1.16 – Stream Power (Channel) for 50 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

McArthur River
Water Surface Elevation Comparison for 100 cumecs

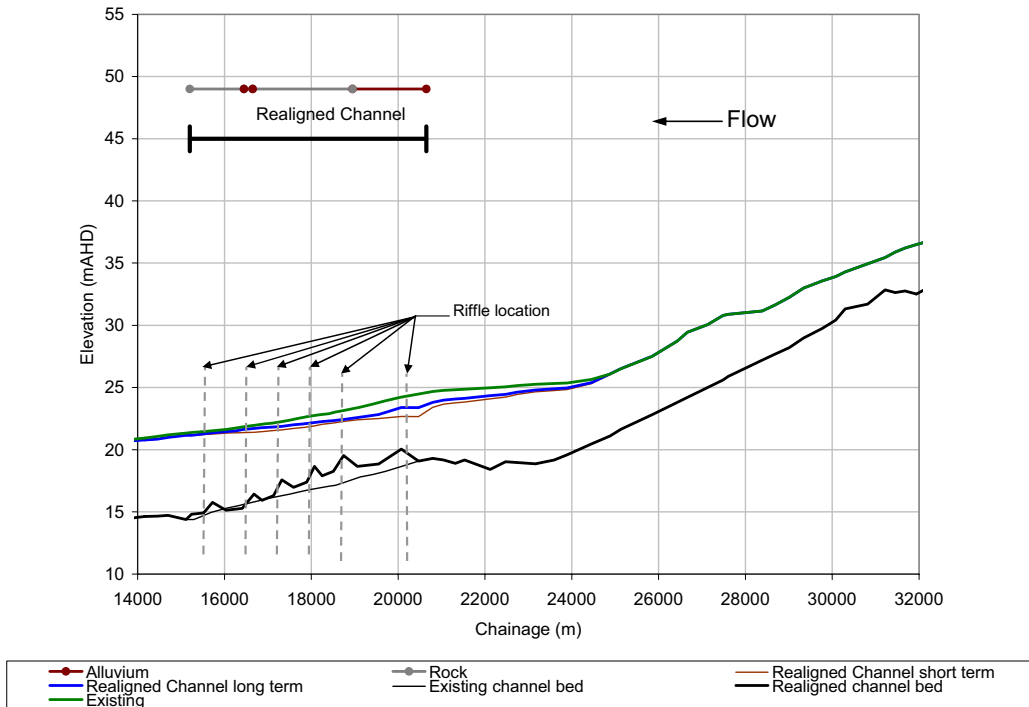


Figure F.1.17 –Water Surface Elevation for 100 m³/s

McArthur River
Water Surface Elevation Comparison for 100 cumecs

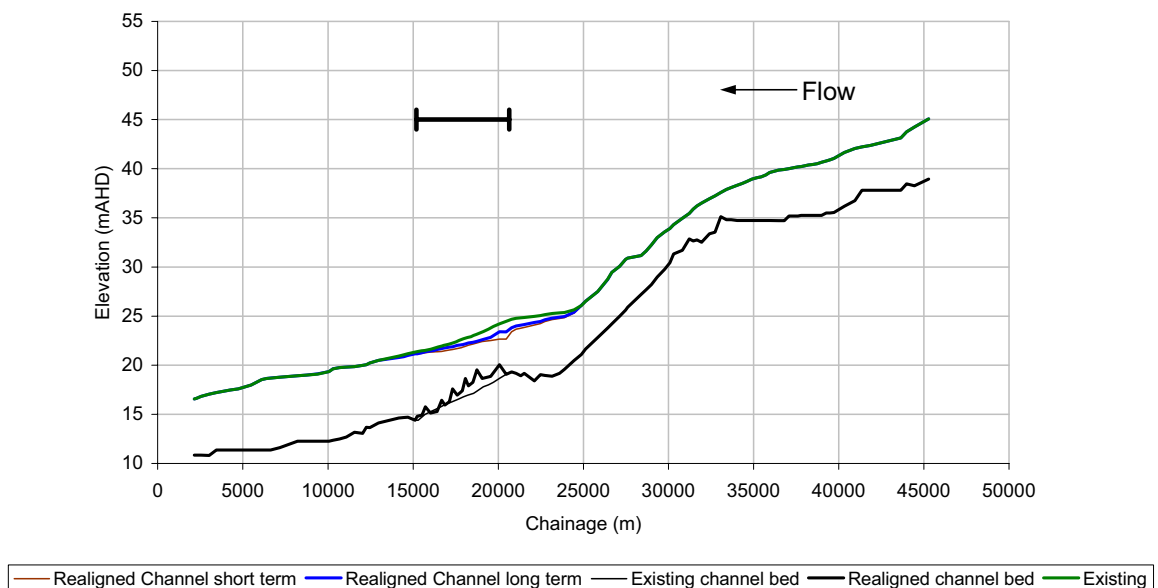


Figure F.1.18 –Water Surface Elevation for 100 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

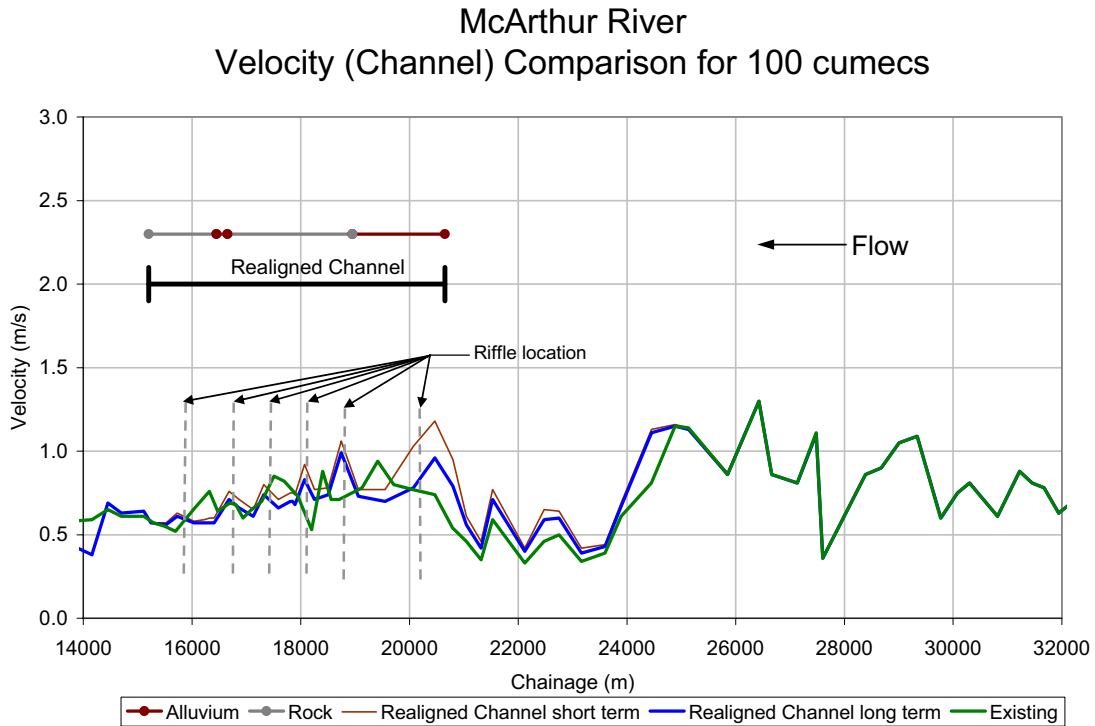


Figure F.1.19 – Velocity (Channel) for 100 m³/s

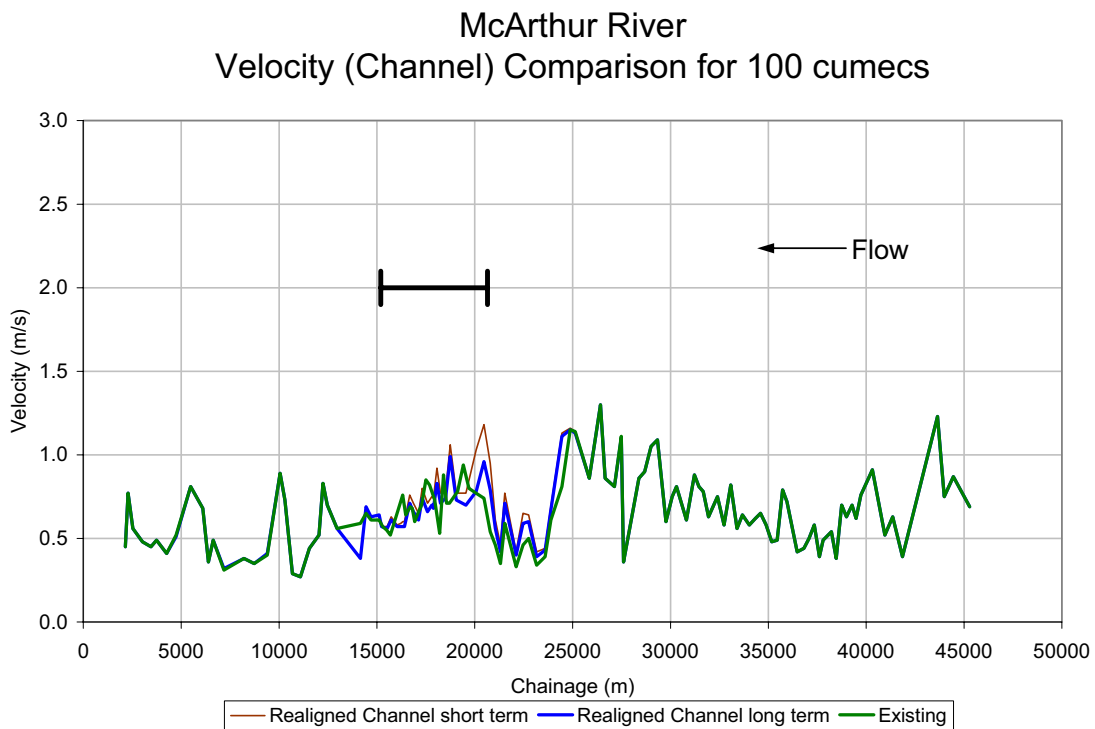


Figure F.1.20 – Velocity (Channel) for 100 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

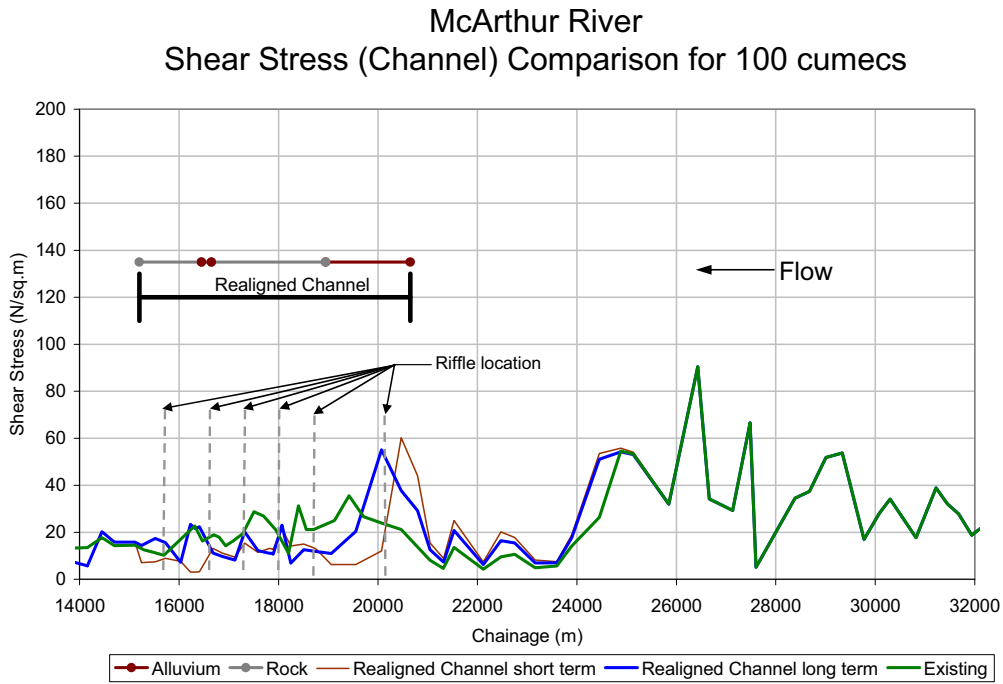


Figure F.1.21 – Shear Stress (Channel) for 100 m³/s

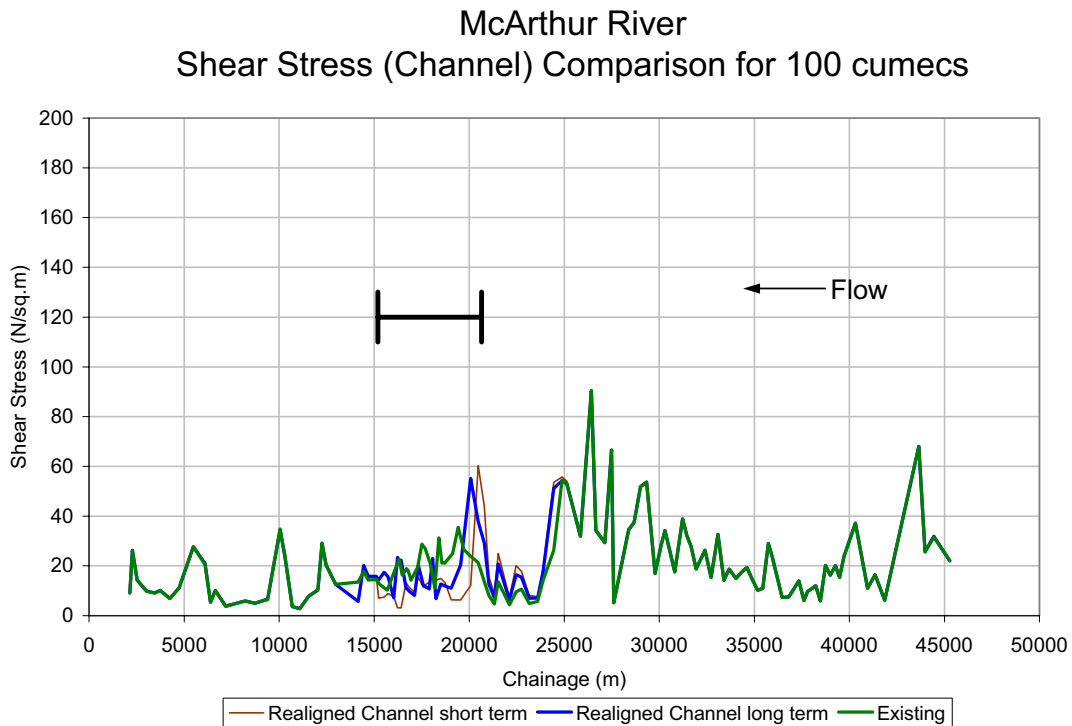


Figure F.1.22 – Shear Stress (Channel) for 100 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

McArthur River
Stream Power (Channel) Comparison for 100 cumecs

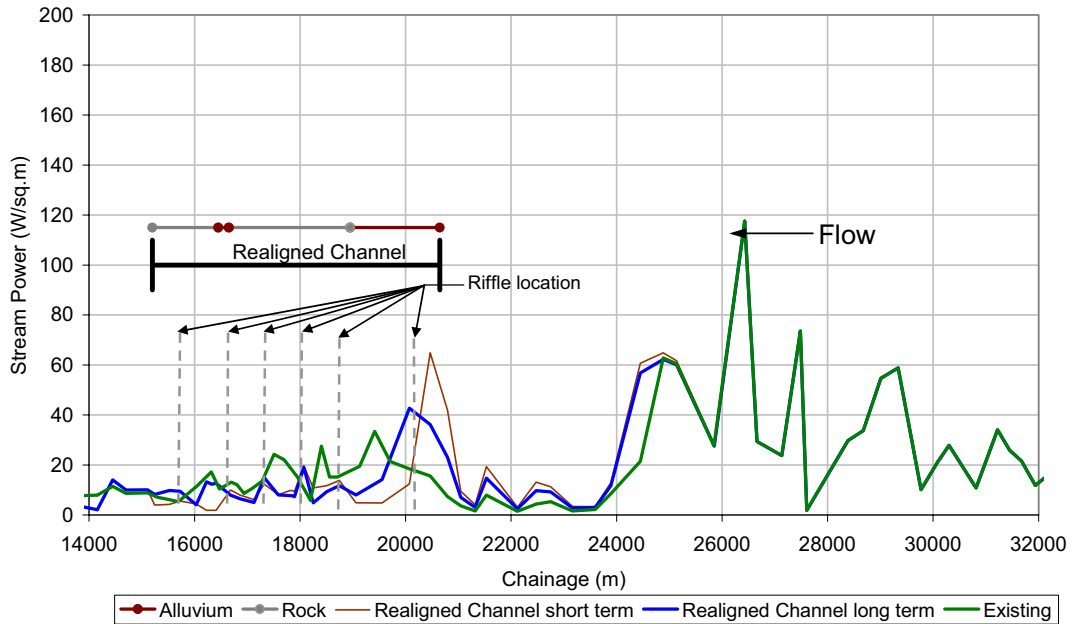


Figure F.1.23 – Stream Power (Channel) for 100 m³/s

McArthur River
Stream Power (Channel) Comparison for 100 cumecs

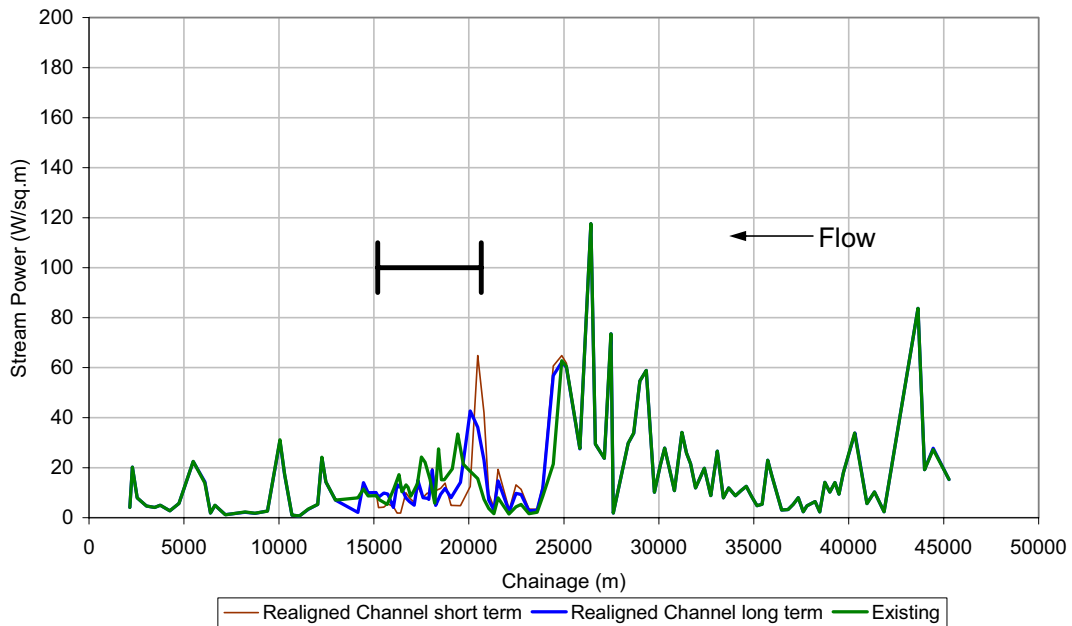


Figure F.1.24 – Stream Power (Channel) for 100 m³/s (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

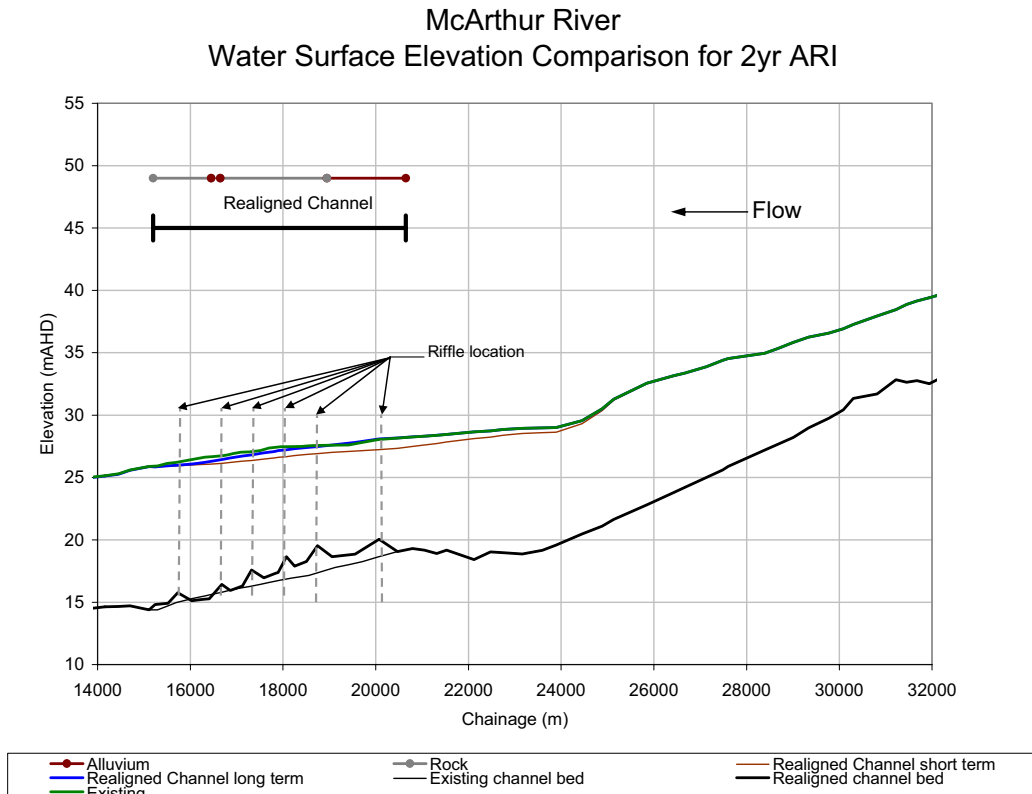


Figure F.1.25 – Water Surface Elevation for 2 year ARI

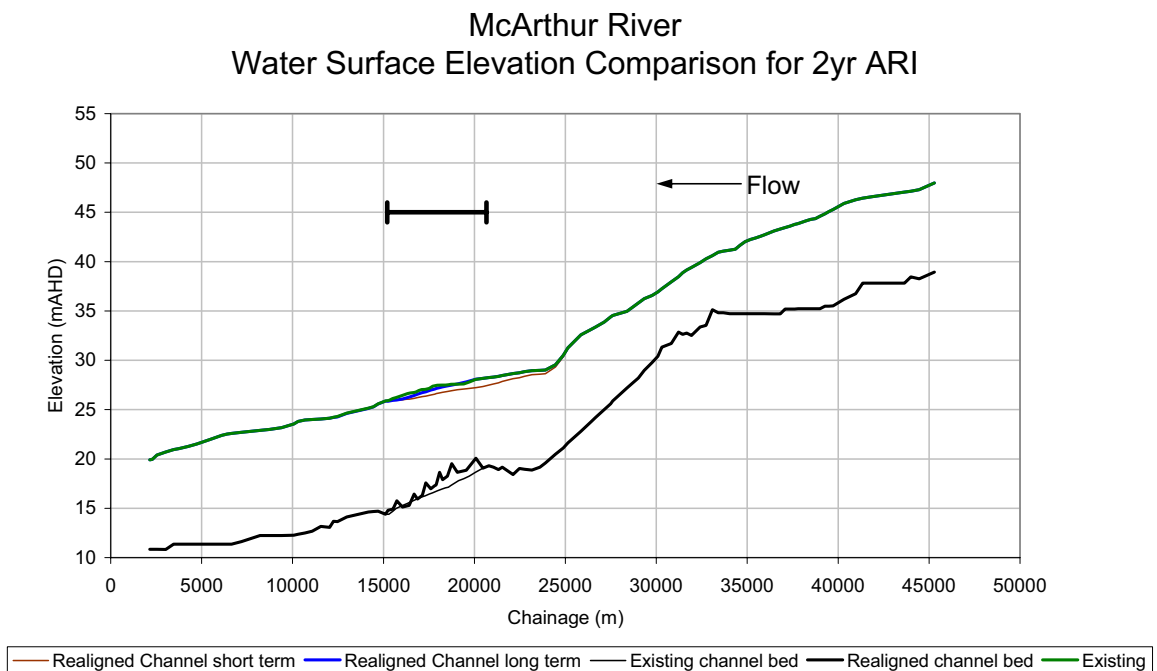


Figure F.1.26 – Water Surface Elevation for 2 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

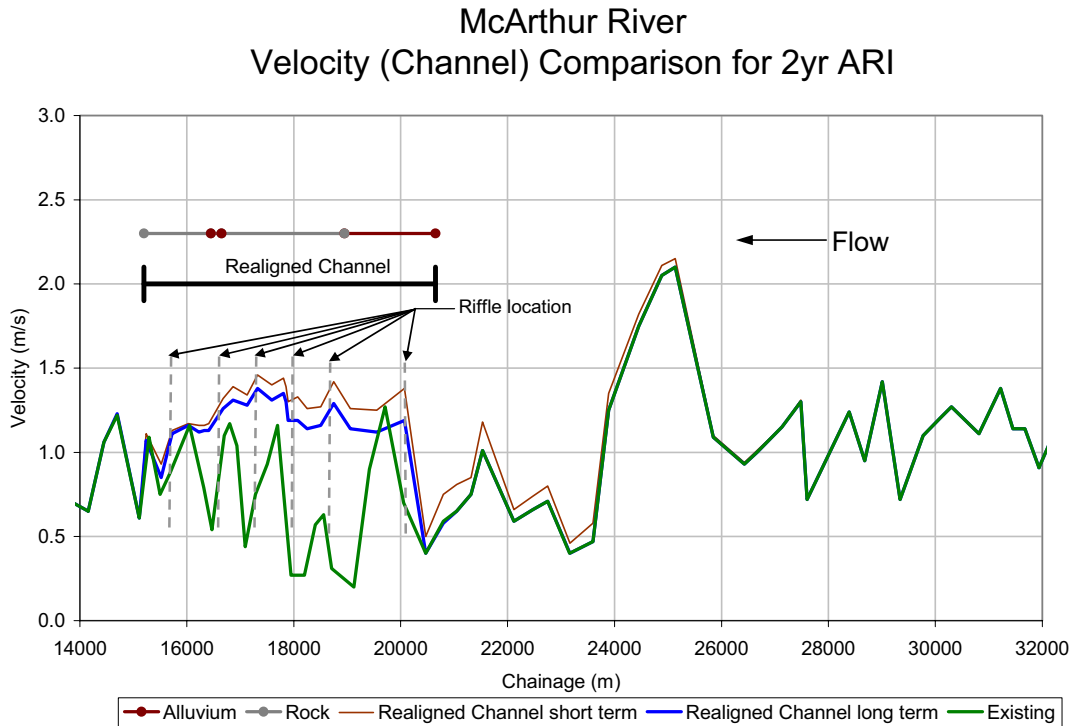


Figure F.1.27 – Velocity (Channel) for 2 year ARI

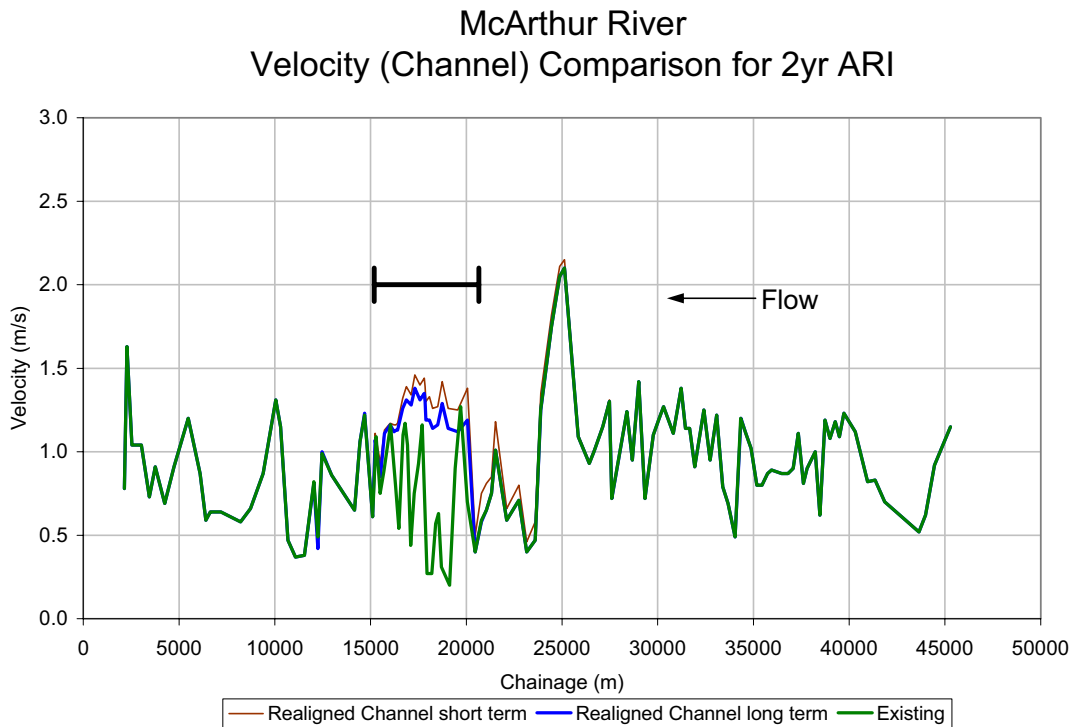


Figure F.128 – Velocity (Channel) for 2 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

McArthur River
Shear Stress (Channel) Comparison for 2yr ARI

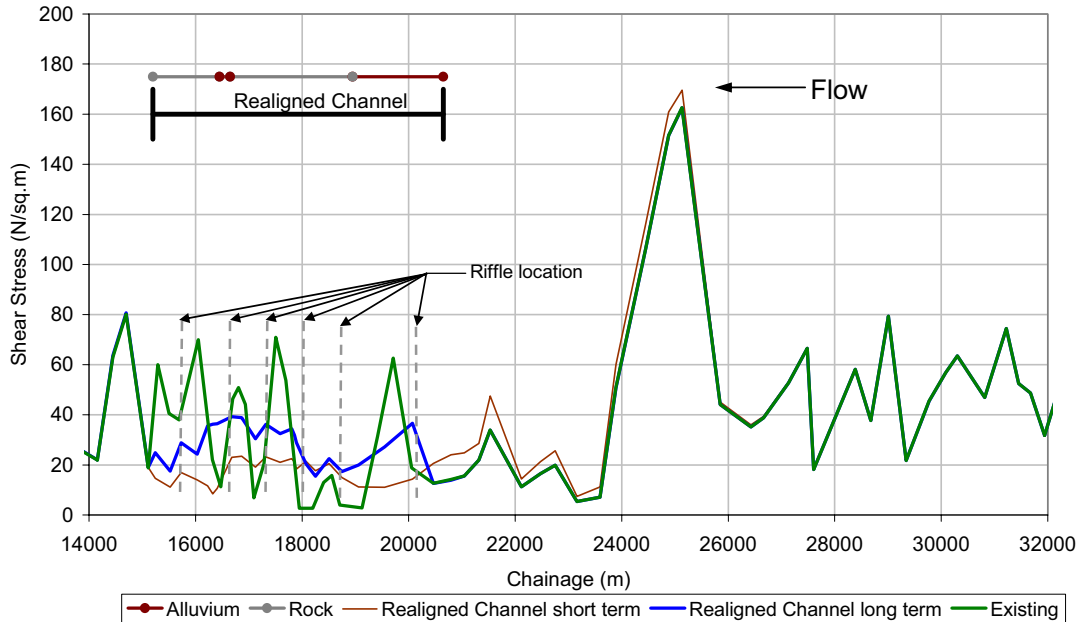


Figure F.1.29 – Shear Stress (Channel) for 2 year ARI

McArthur River
Shear Stress (Channel) Comparison for 2yr ARI

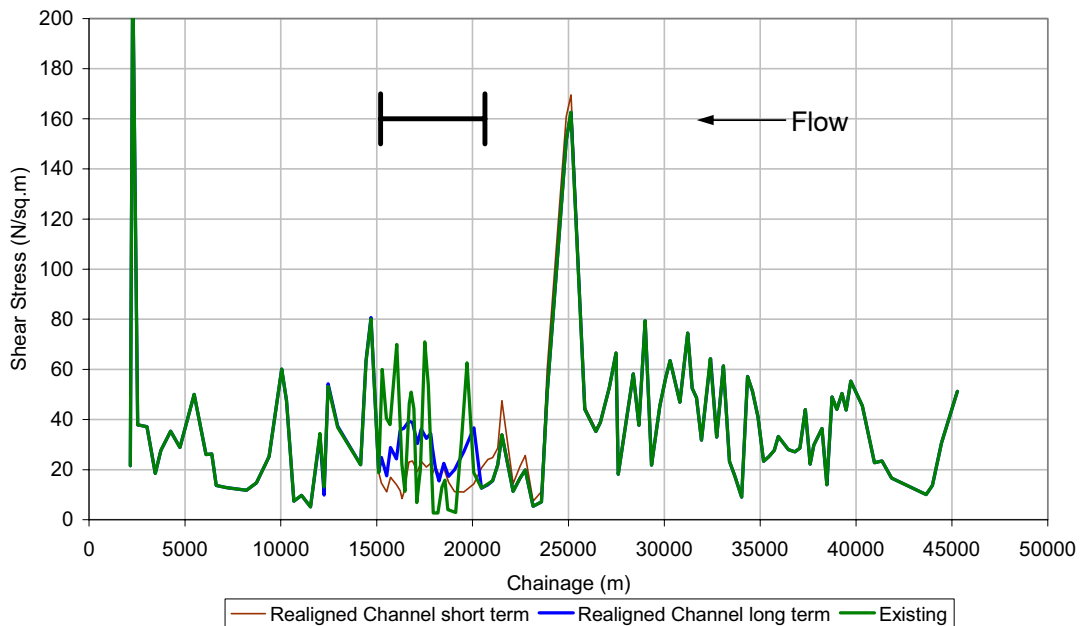


Figure F.1.30 – Shear Stress (Channel) for 2 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

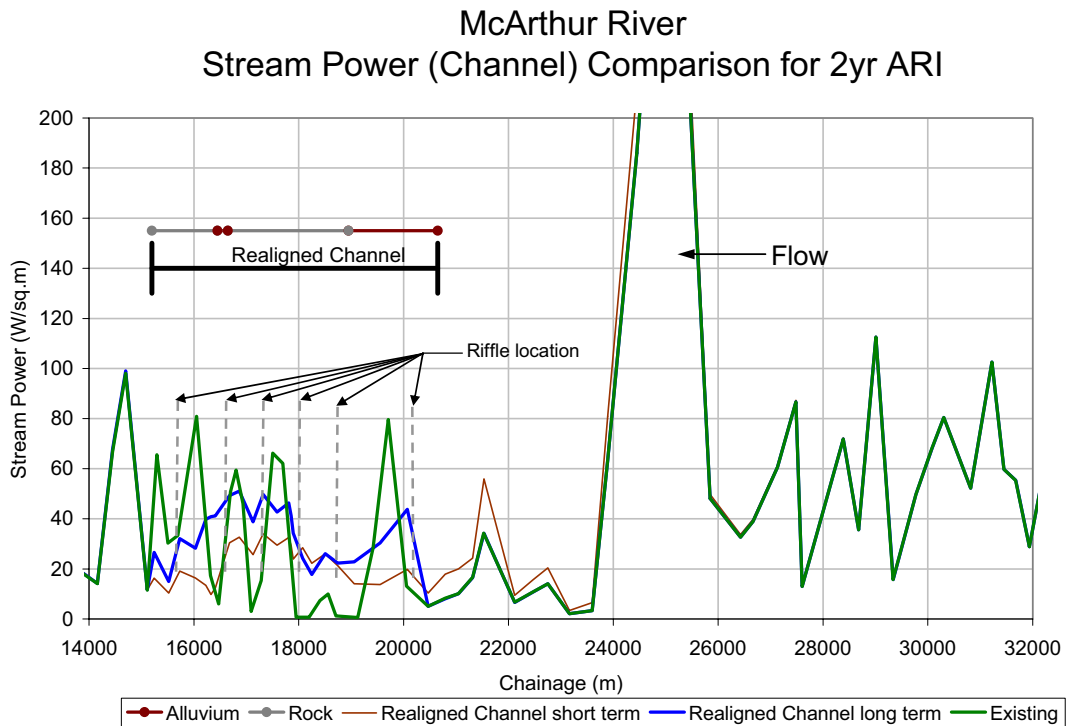


Figure F.1.31 – Stream Power (Channel) for 2 year ARI

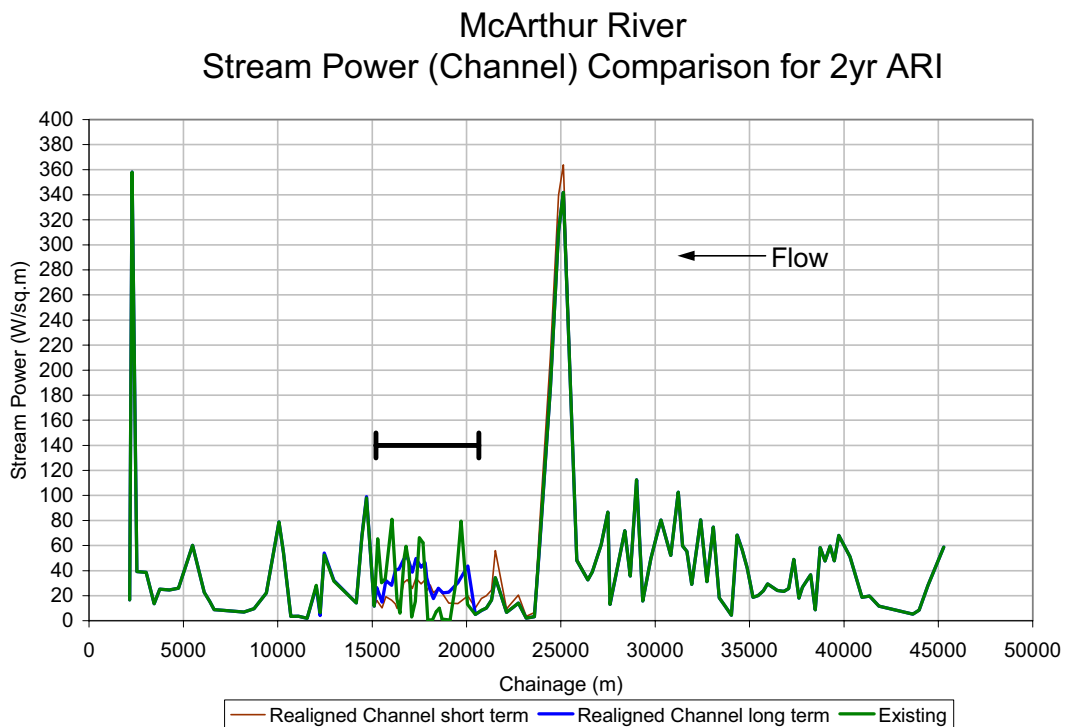


Figure F.1.32 – Stream Power (Channel) for 2 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

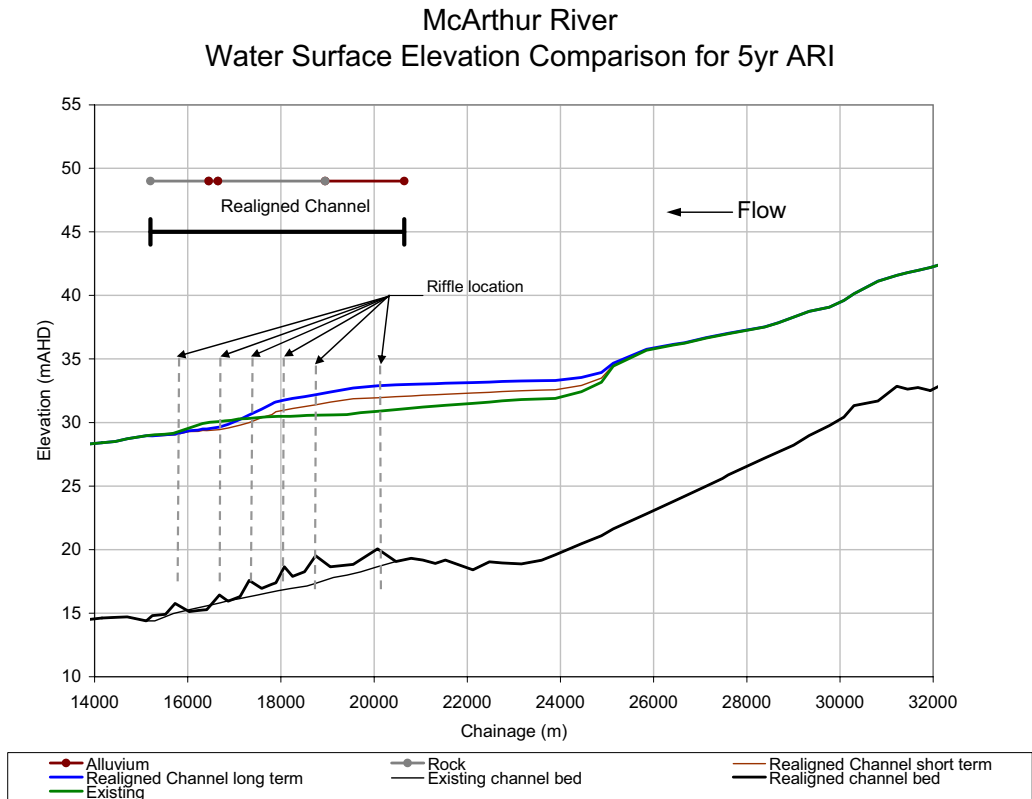


Figure F.1.33 – Water Surface Elevation for 5 year ARI

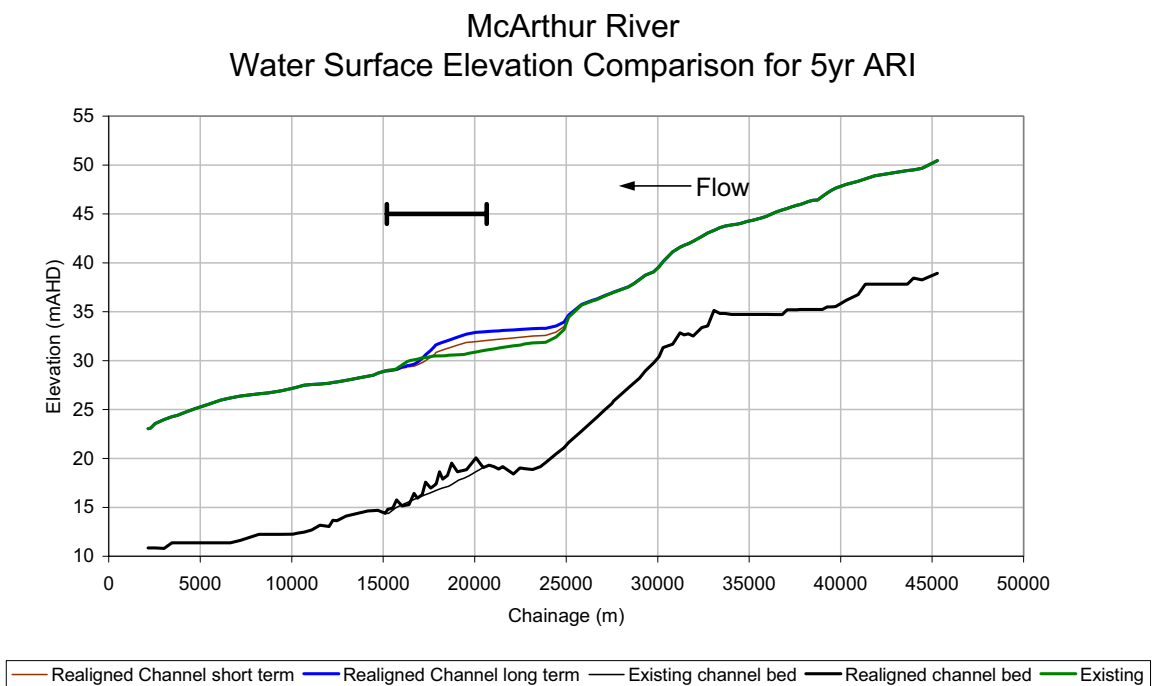


Figure F.1.33 – Water Surface Elevation for 5 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

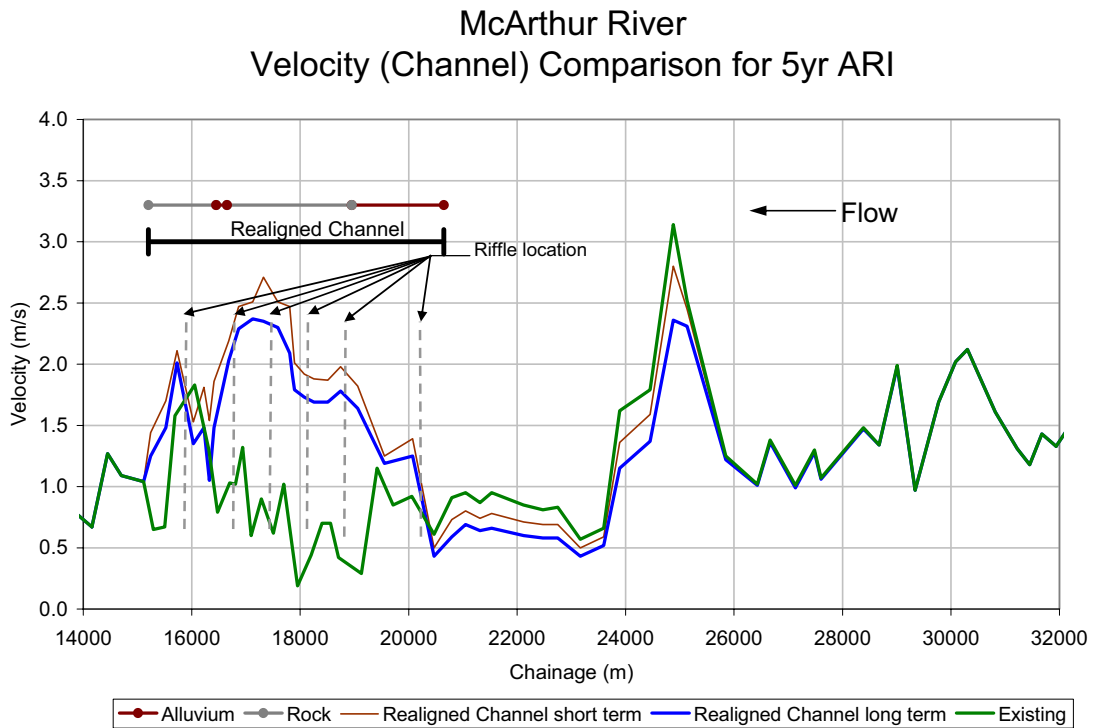


Figure F.1.34 – Velocity (Channel) for 5 year ARI

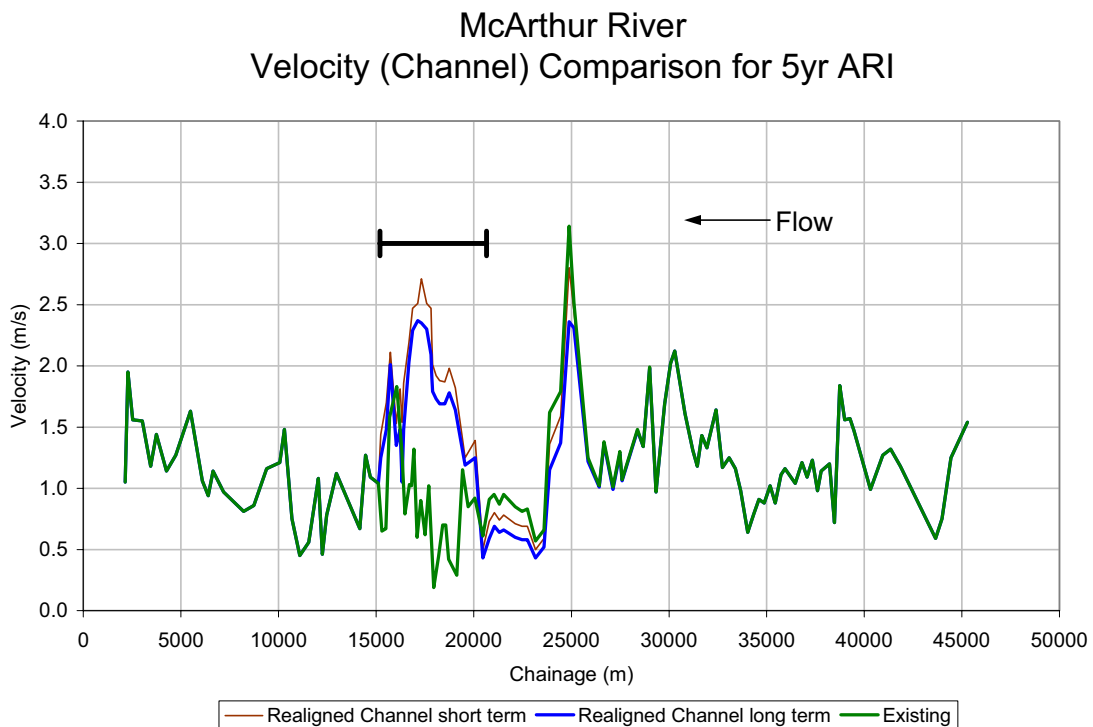


Figure F.1.35 – Velocity (Channel) for 5 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

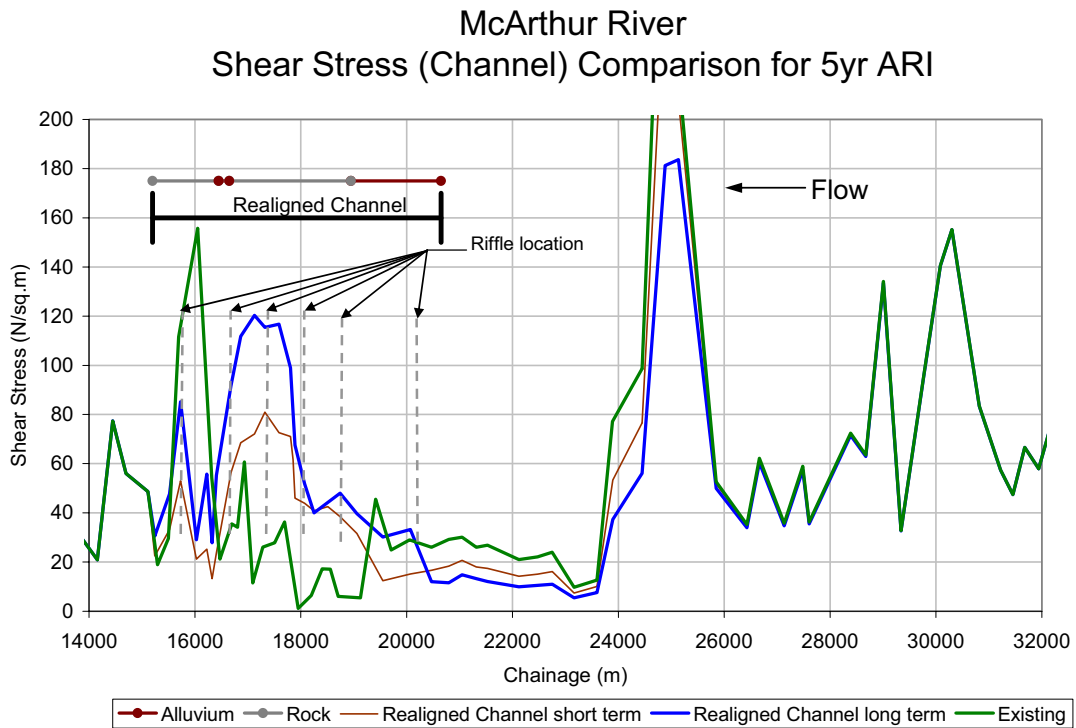


Figure F.1.36 – Shear Stress (Channel) for 5 year ARI

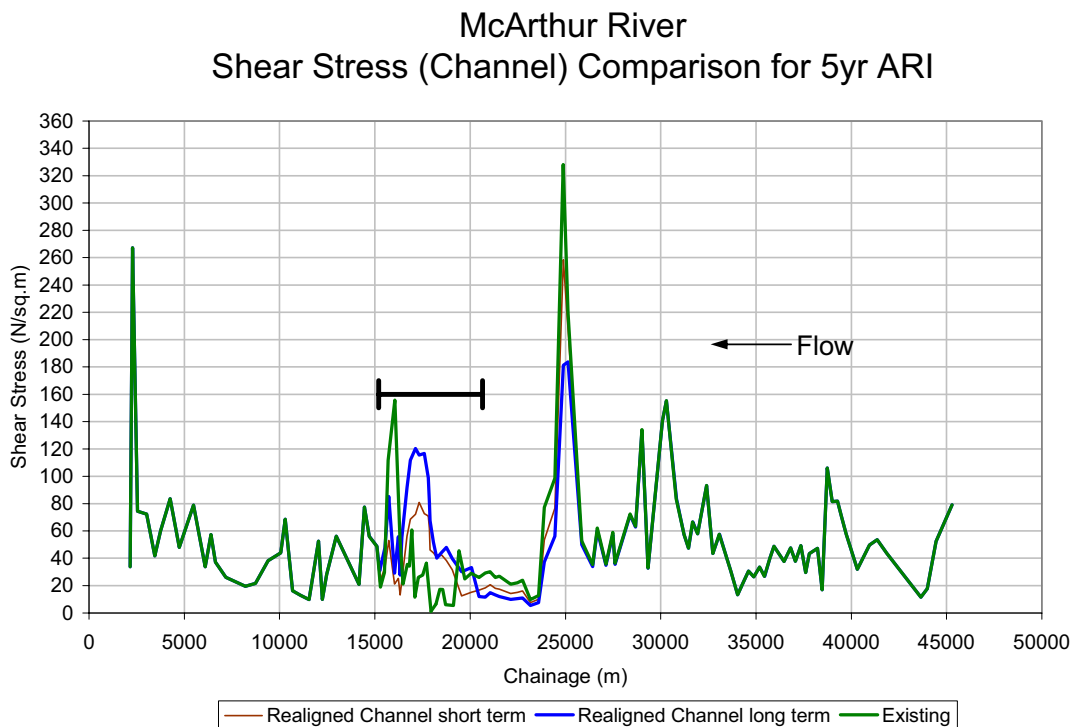


Figure F.1.37 – Shear Stress (Channel) for 5 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

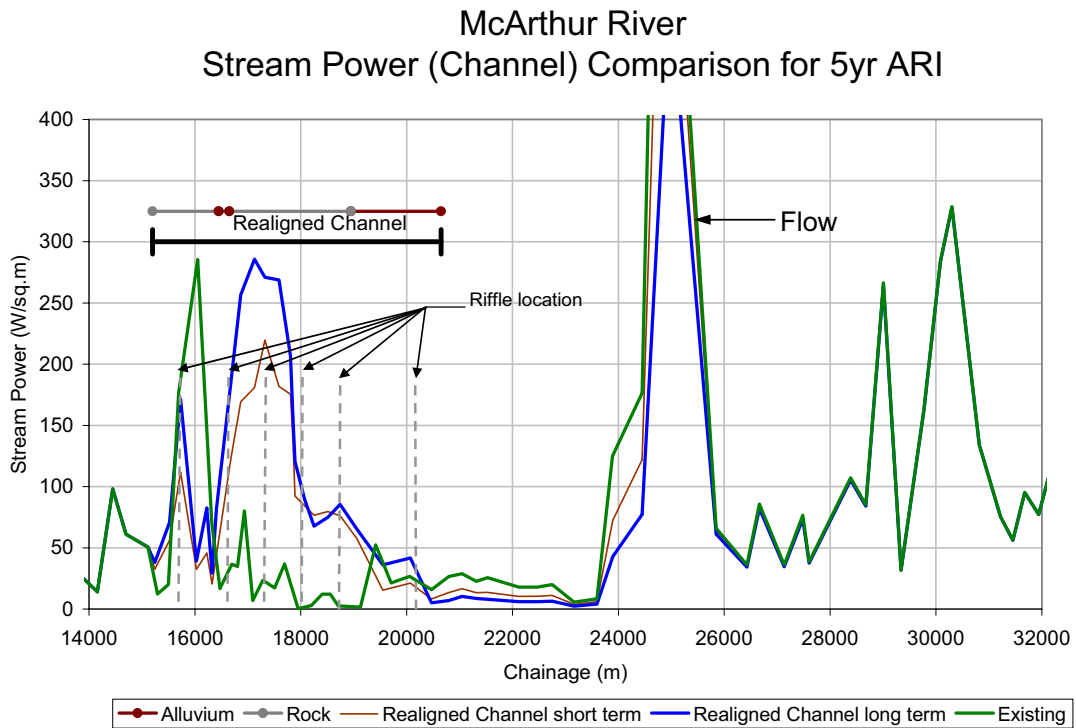


Figure F.1.38 – Stream Power (Channel) for 5 year ARI

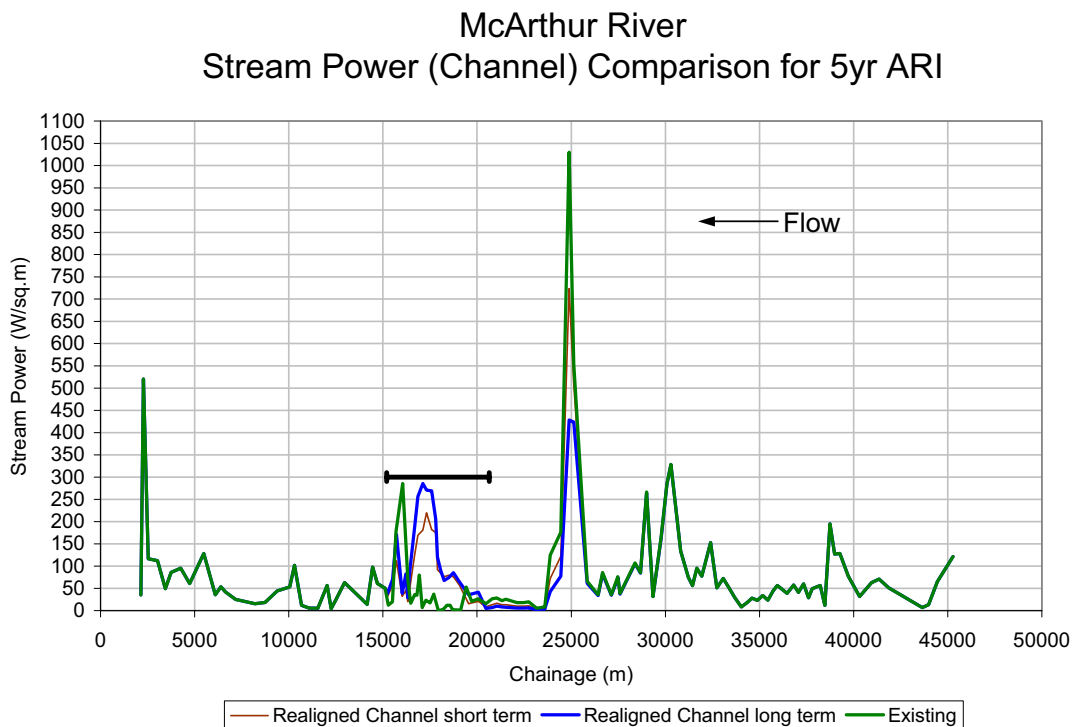


Figure F.1.39 – Stream Power (Channel) for 5 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

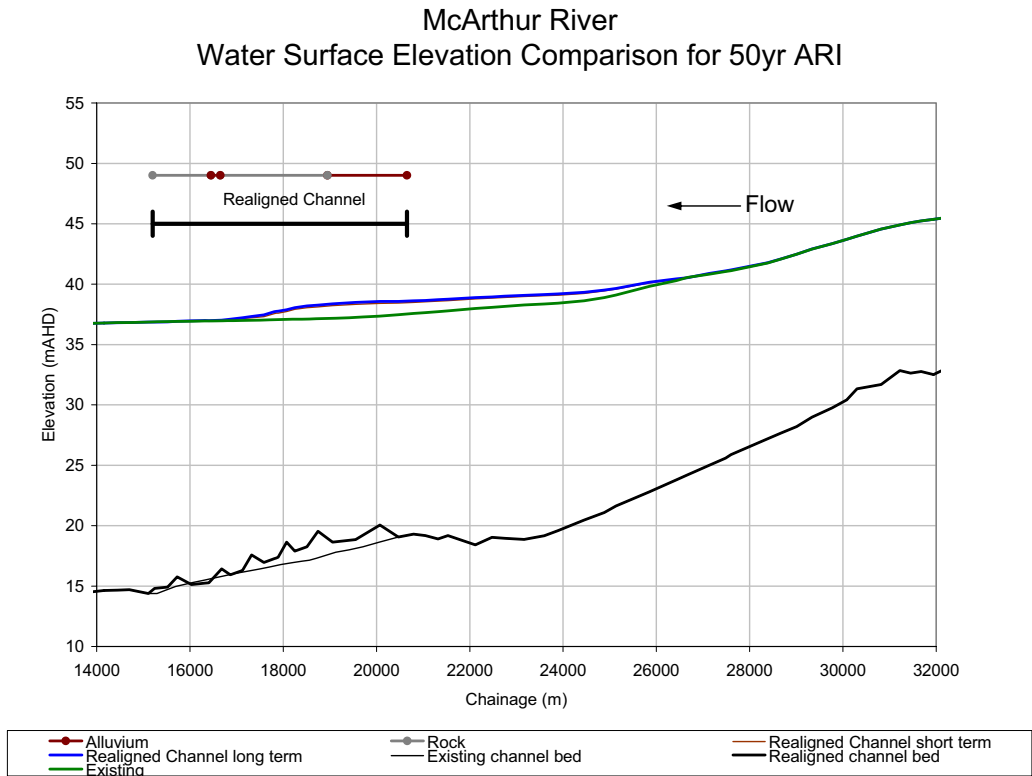


Figure F.1.40 – Velocity (Channel) for 50 year ARI

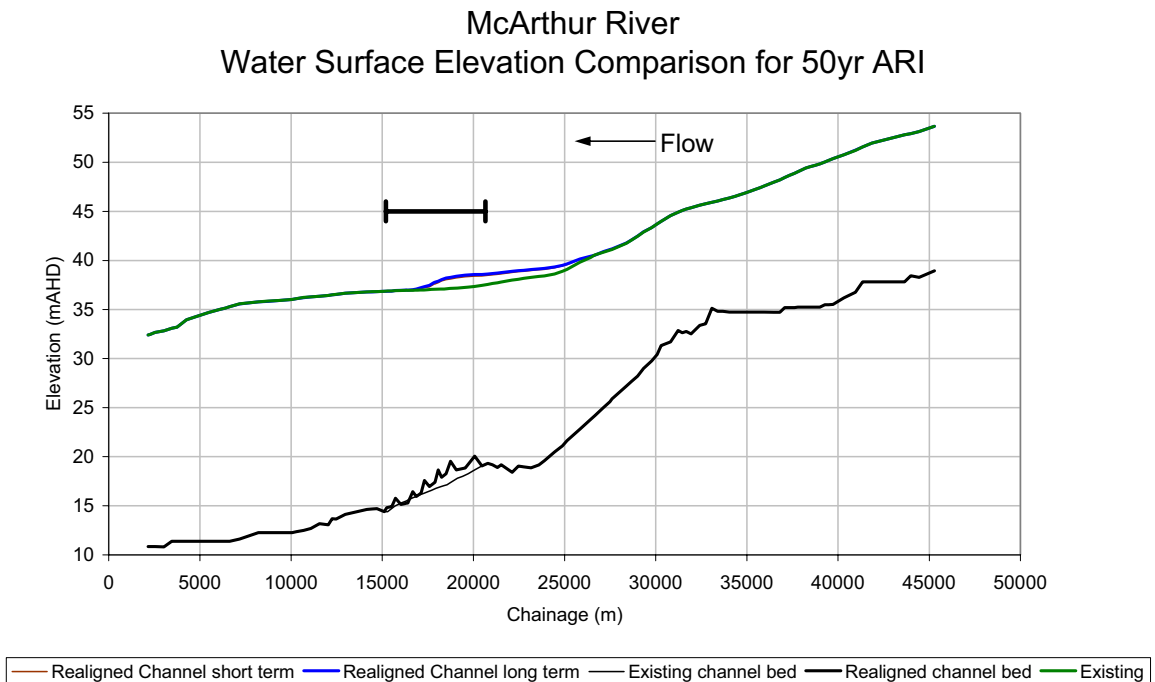


Figure F.1.41 – Velocity (Channel) for 50 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

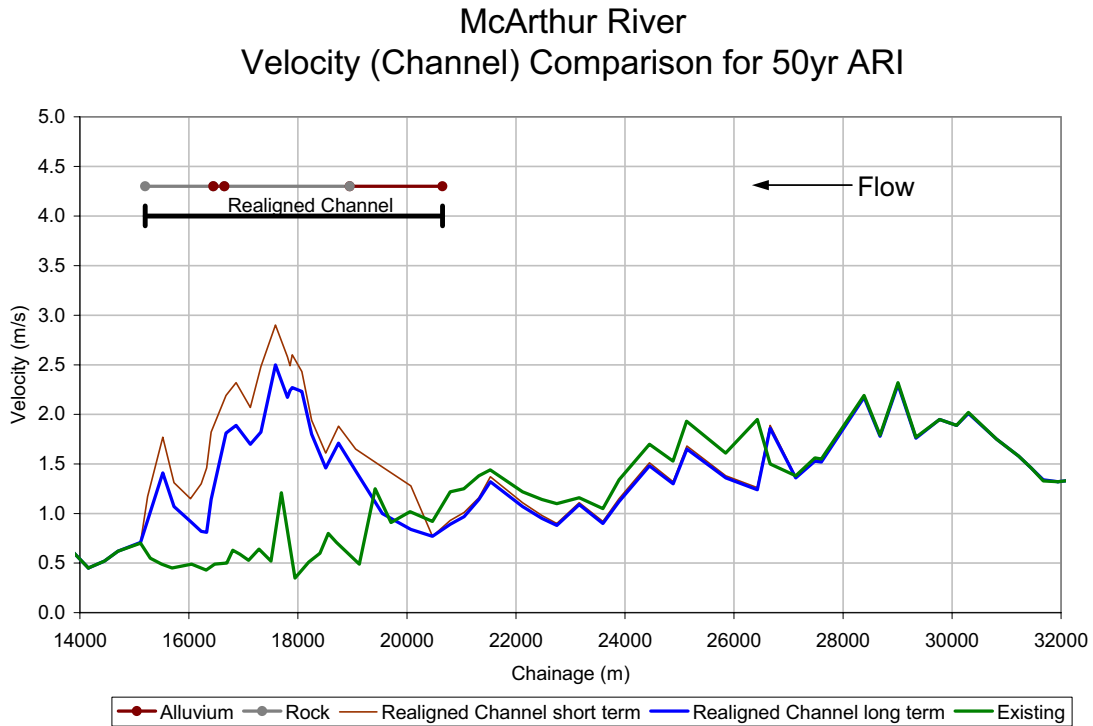


Figure F.1.42 – Velocity (Channel) for 50 year ARI

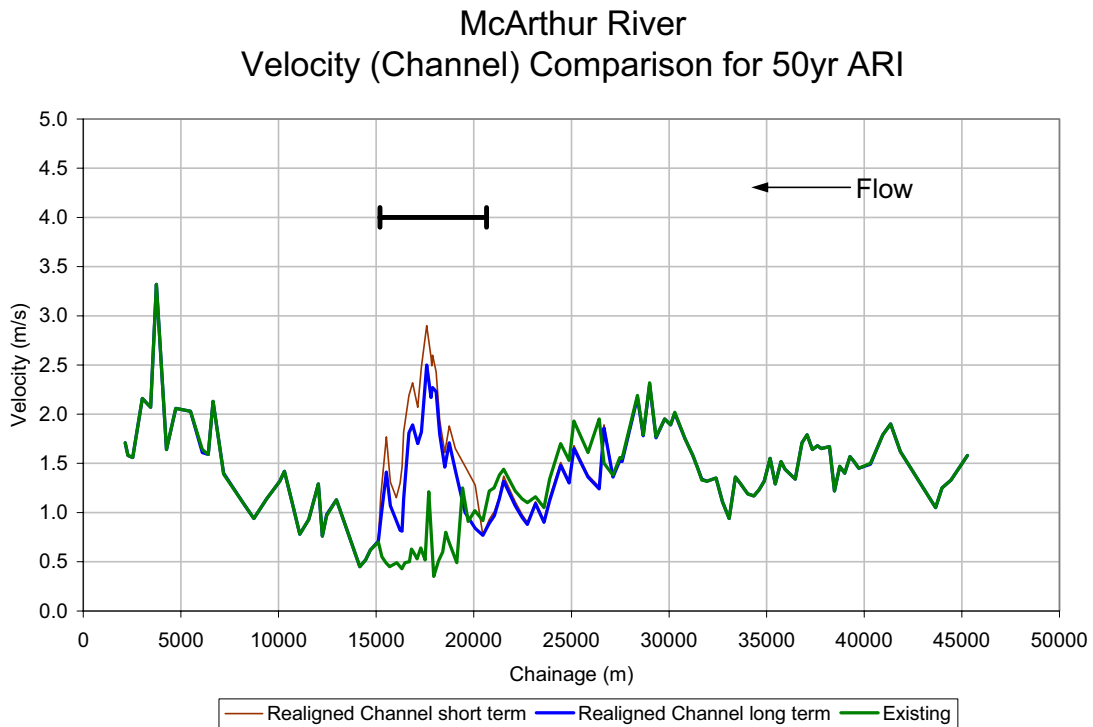


Figure F.1.43 – Velocity (Channel) for 50 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

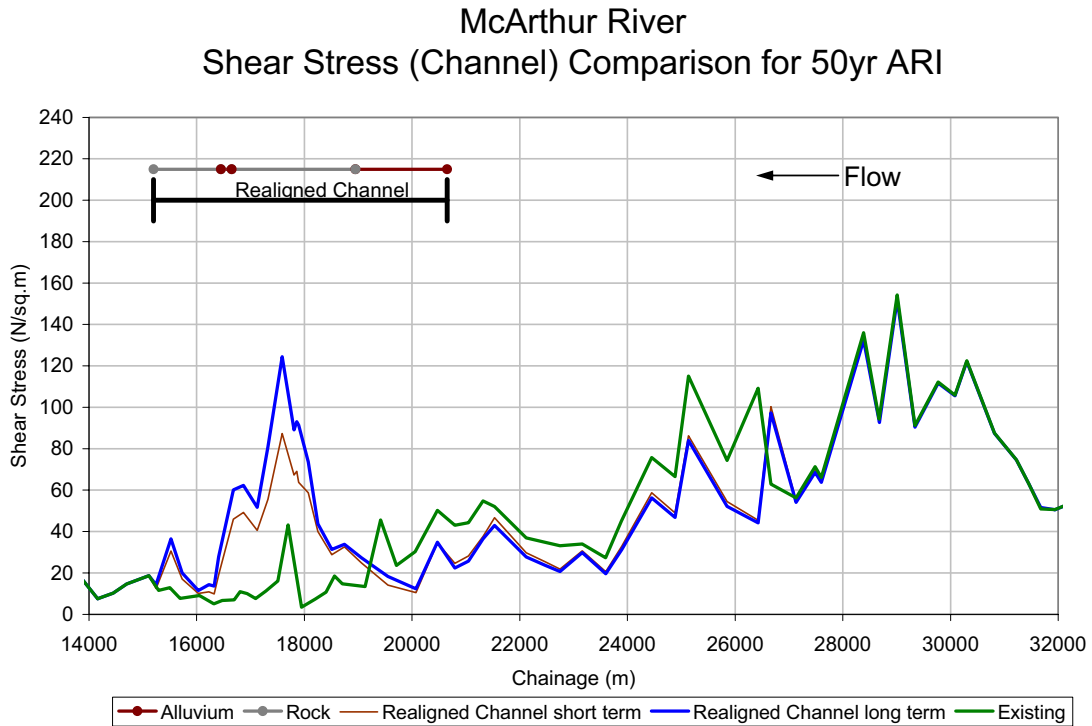


Figure F.1.44 – Shear Stress (Channel) for 50 year ARI

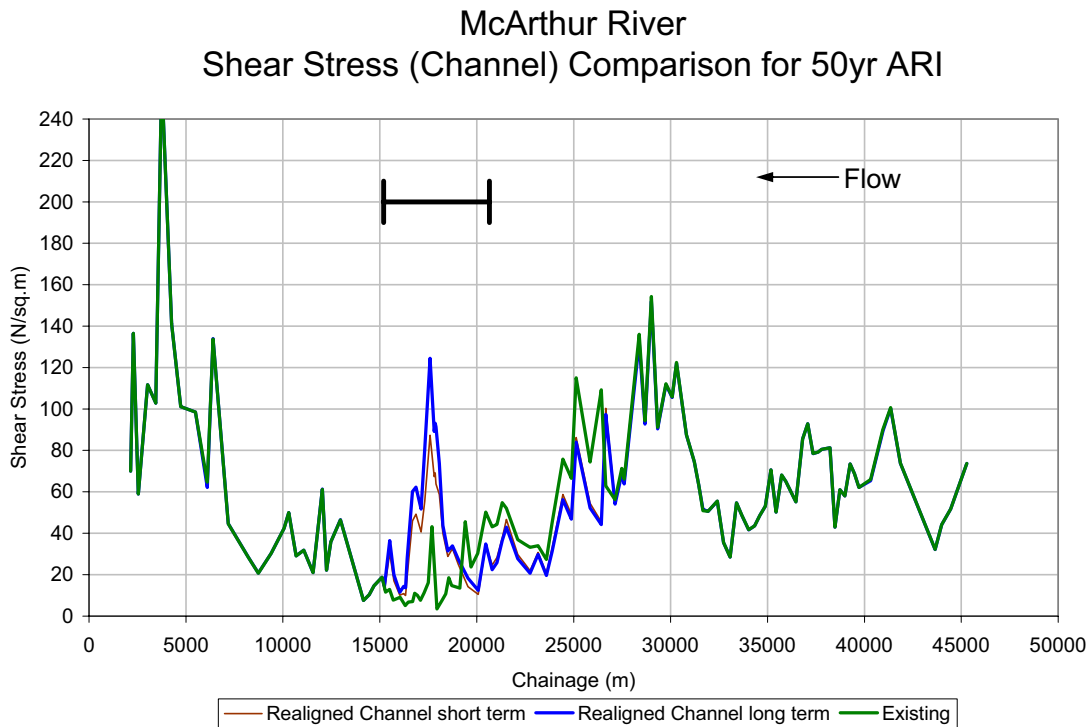


Figure F.1.45 – Shear Stress (Channel) for 50 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

McArthur River
Stream Power (Channel) Comparison for 50yr ARI

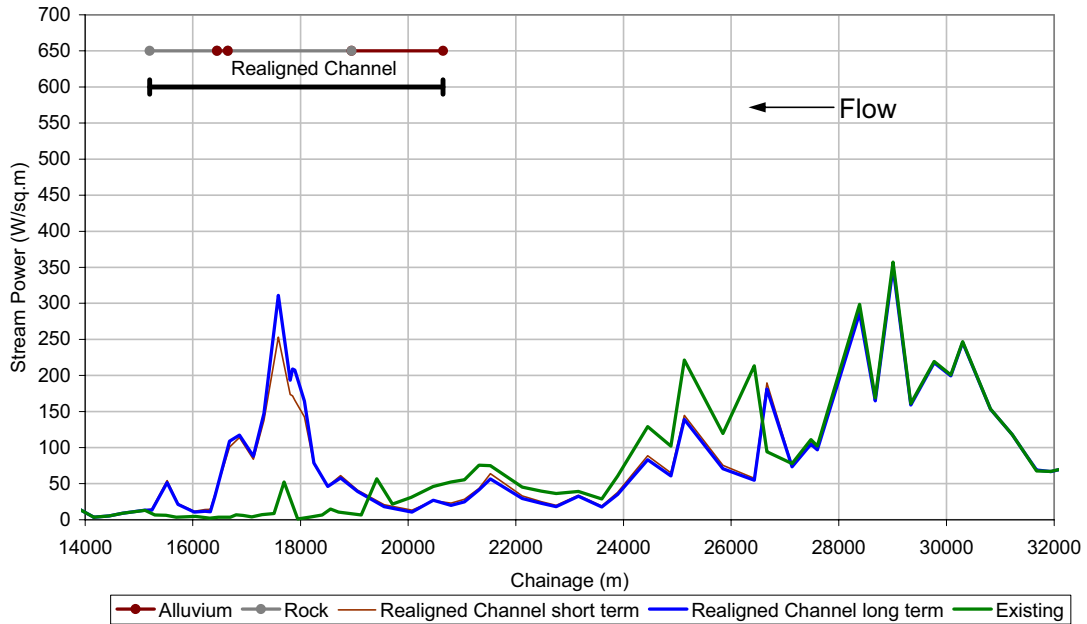


Figure F.1.46 – Stream Power (Channel) for 50 year ARI

McArthur River
Stream Power (Channel) Comparison for 50yr ARI

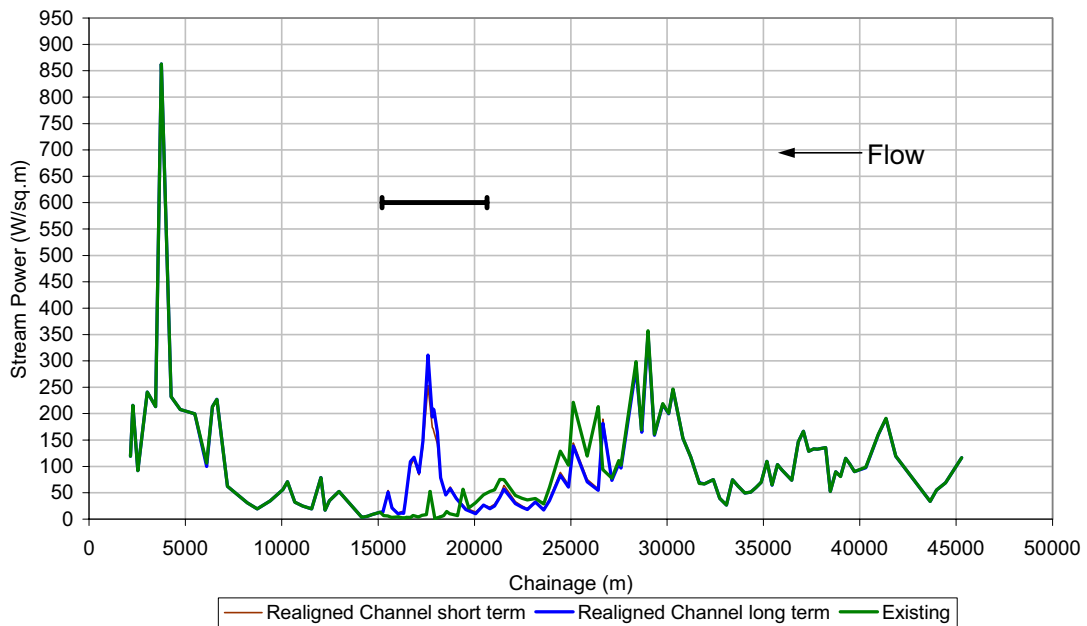


Figure F.1.47 – Stream Power (Channel) for 50 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

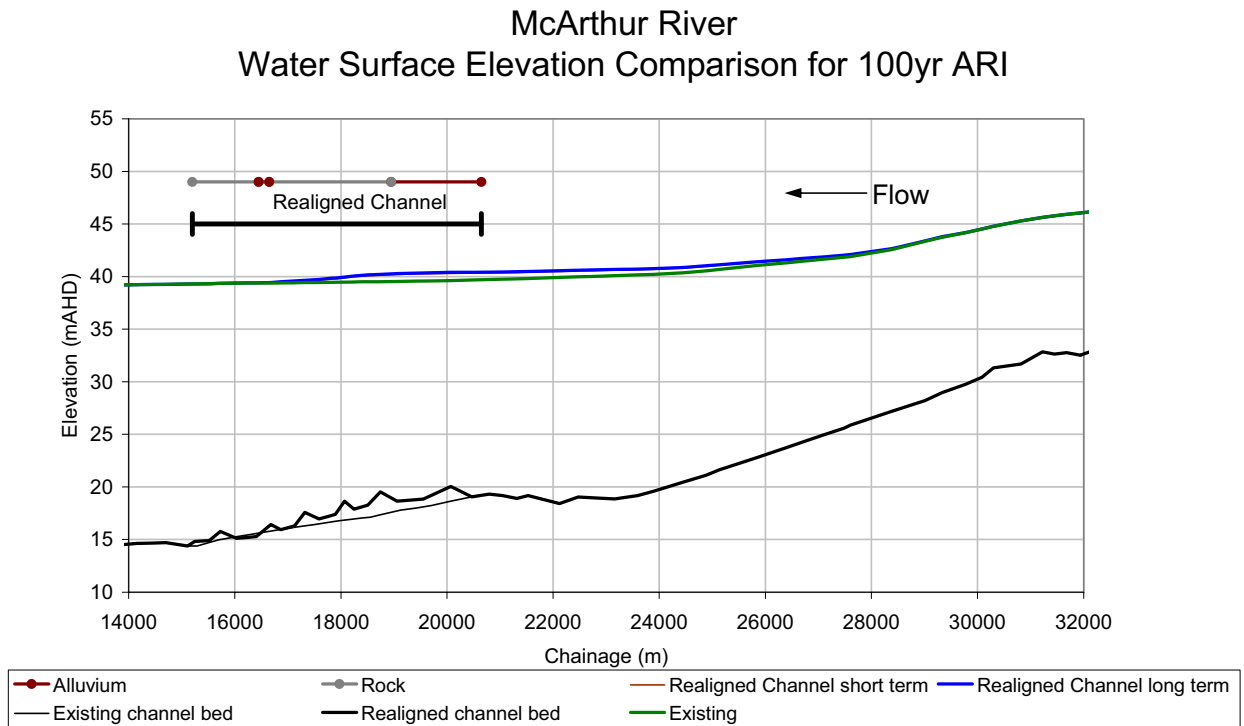


Figure F.1.48 – Water Surface Elevation for 100 year ARI

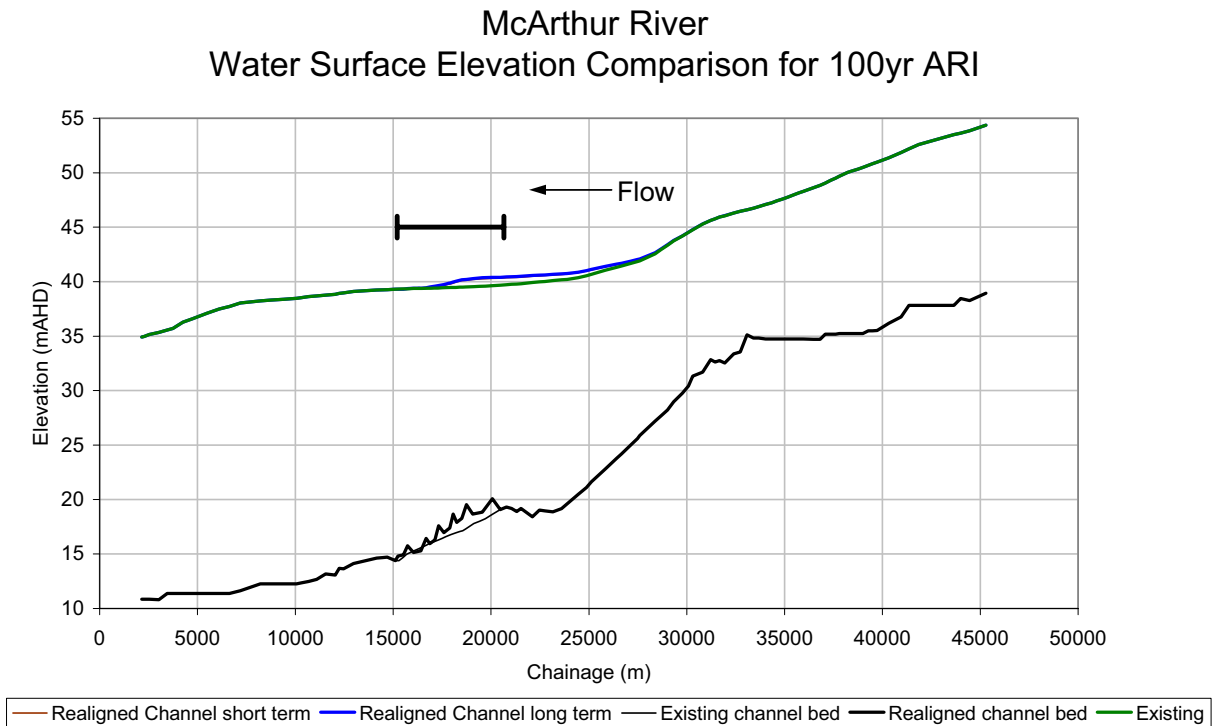


Figure F.1.49 – Water Surface Elevation for 100 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

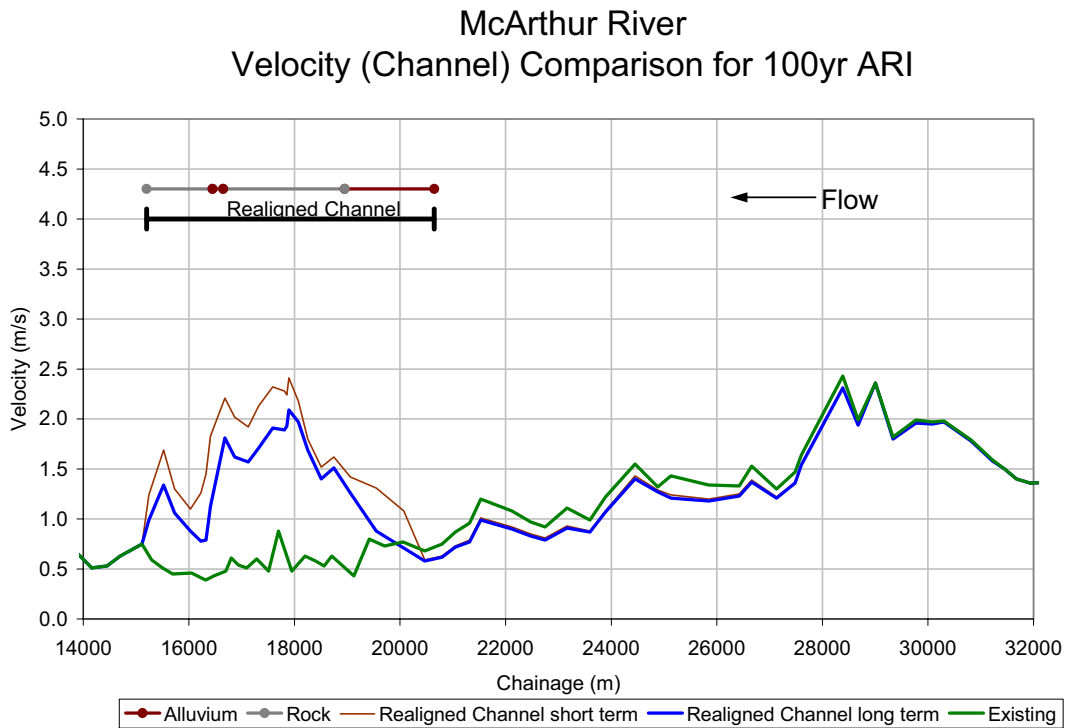


Figure F.1.50 – Velocity (Channel) for 100 year ARI

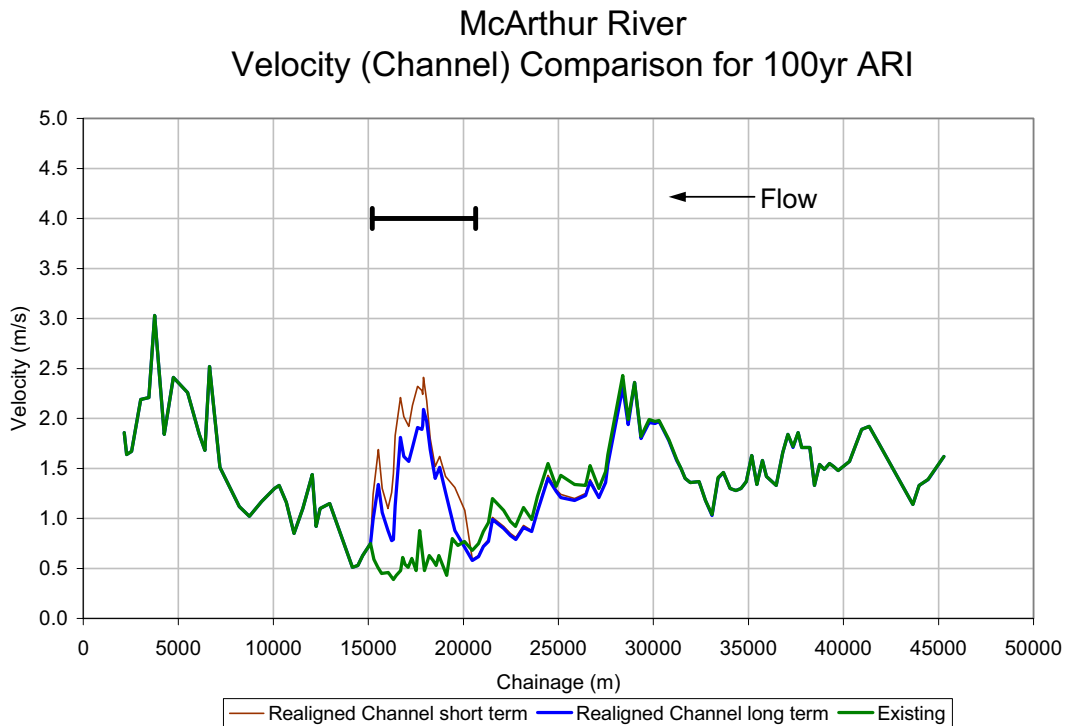


Figure F.1.51 – Velocity (Channel) for 100 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

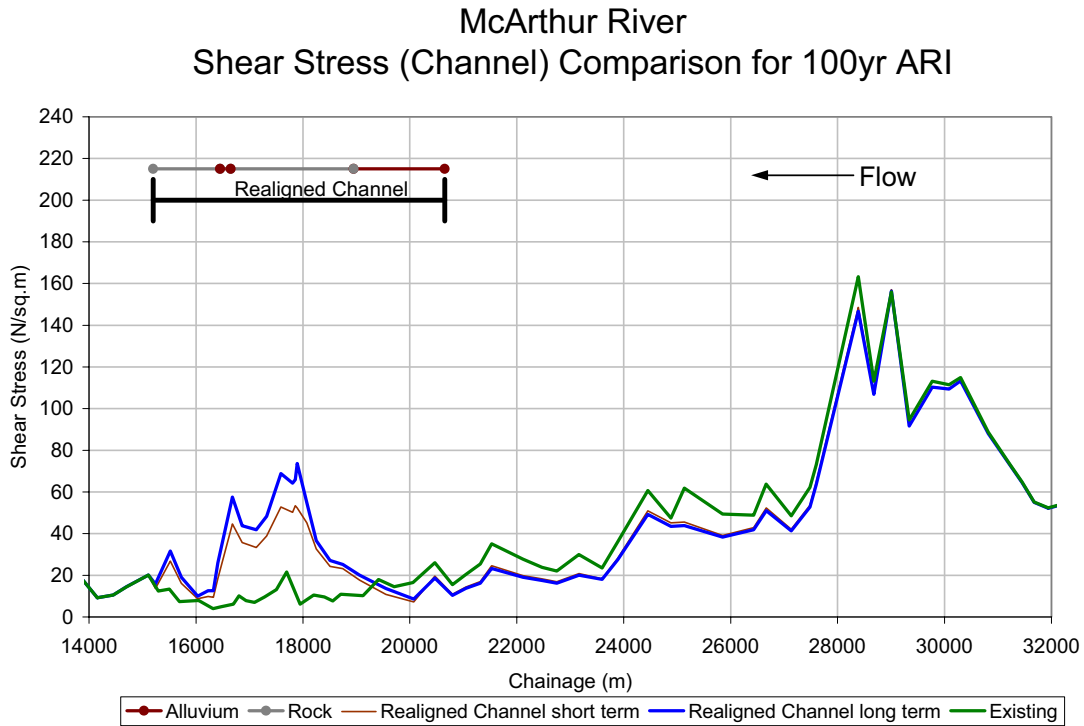


Figure F.1.52 – Shear Stress (Channel) for 100 year ARI

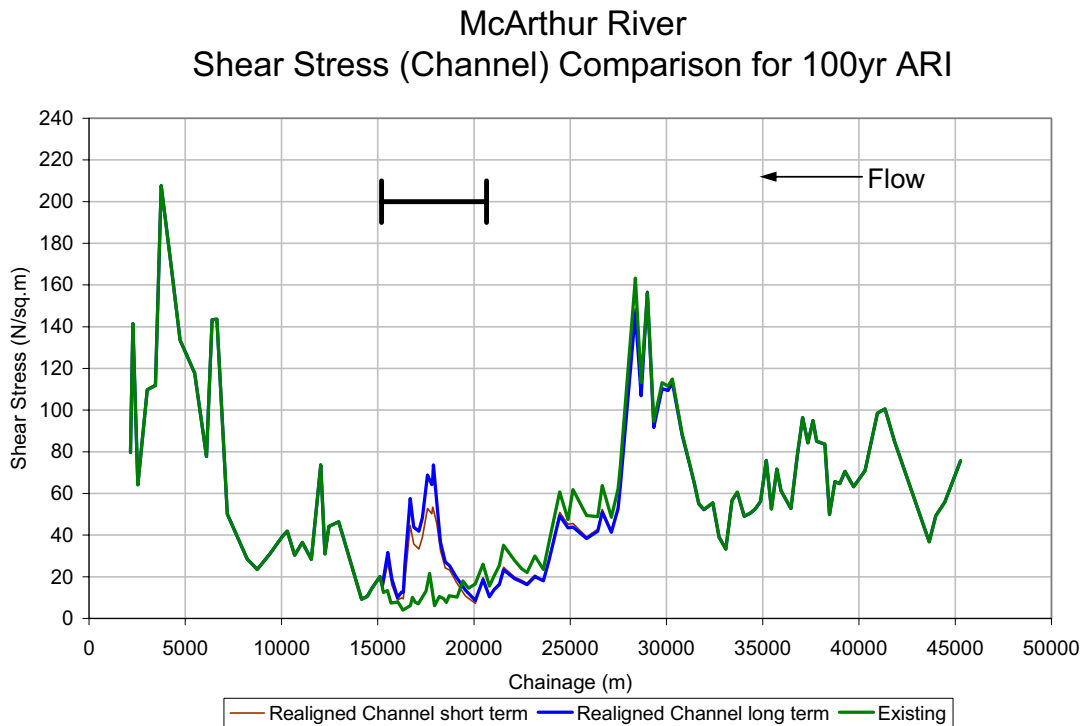


Figure F.1.53 – Shear Stress (Channel) for 100 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

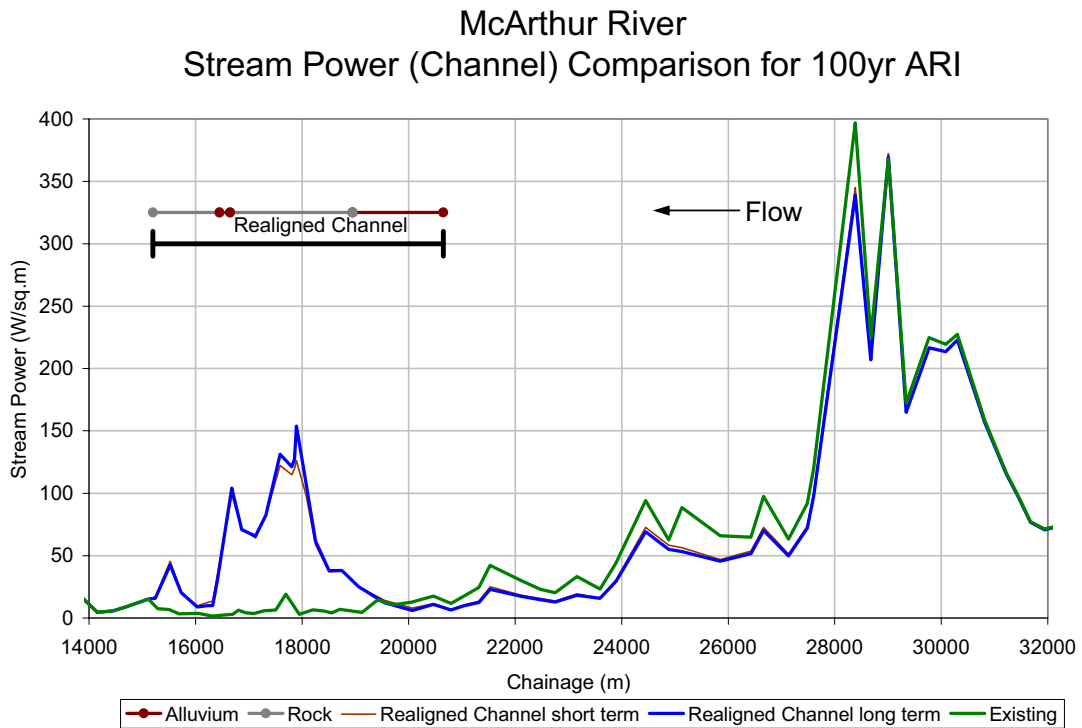


Figure F.1.54 – Stream Power (Channel) for 100 year ARI

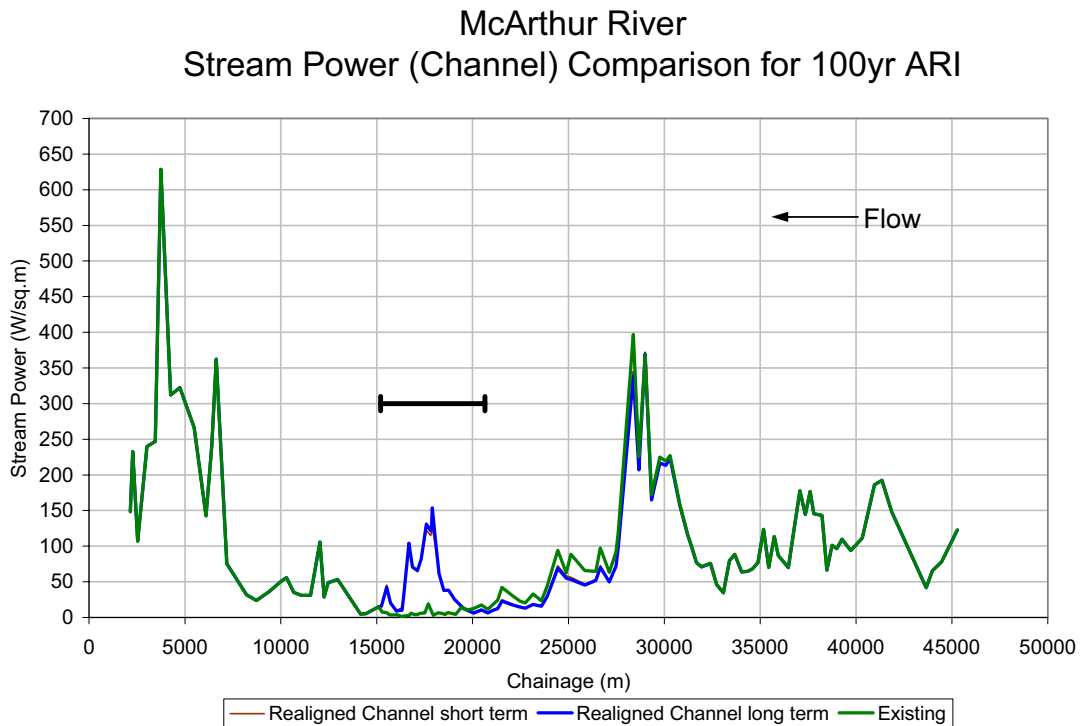


Figure F.1.55 – Stream Power (Channel) for 100 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

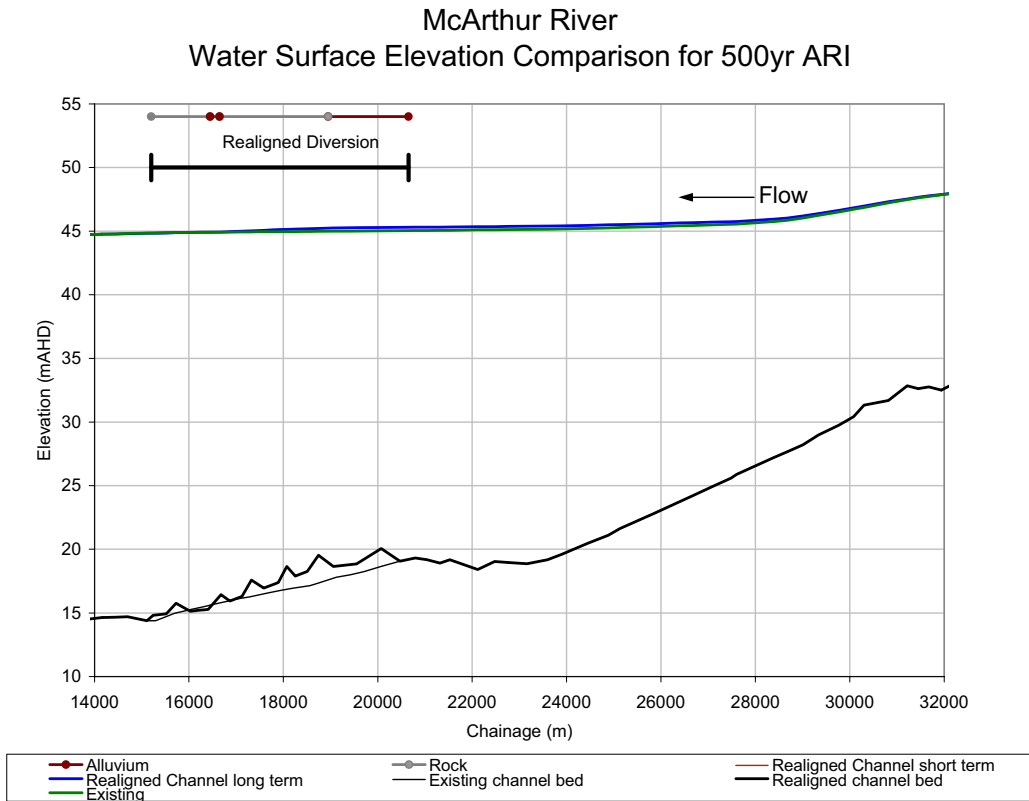


Figure F.1.56 – Water Surface Elevation for 500 year ARI

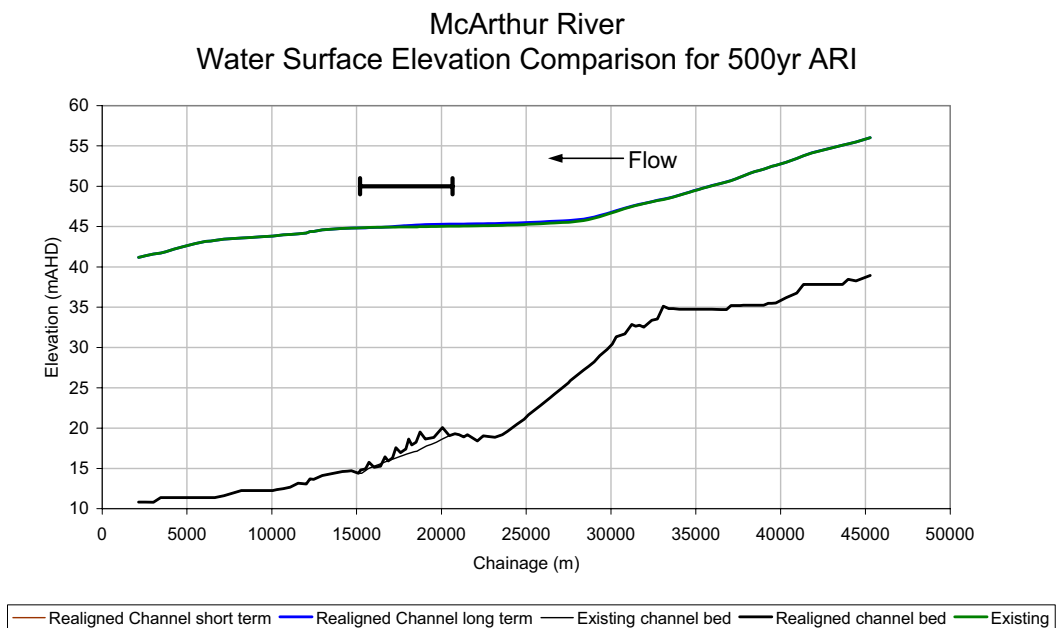


Figure F.1.57 – Water Surface Elevation for 500 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

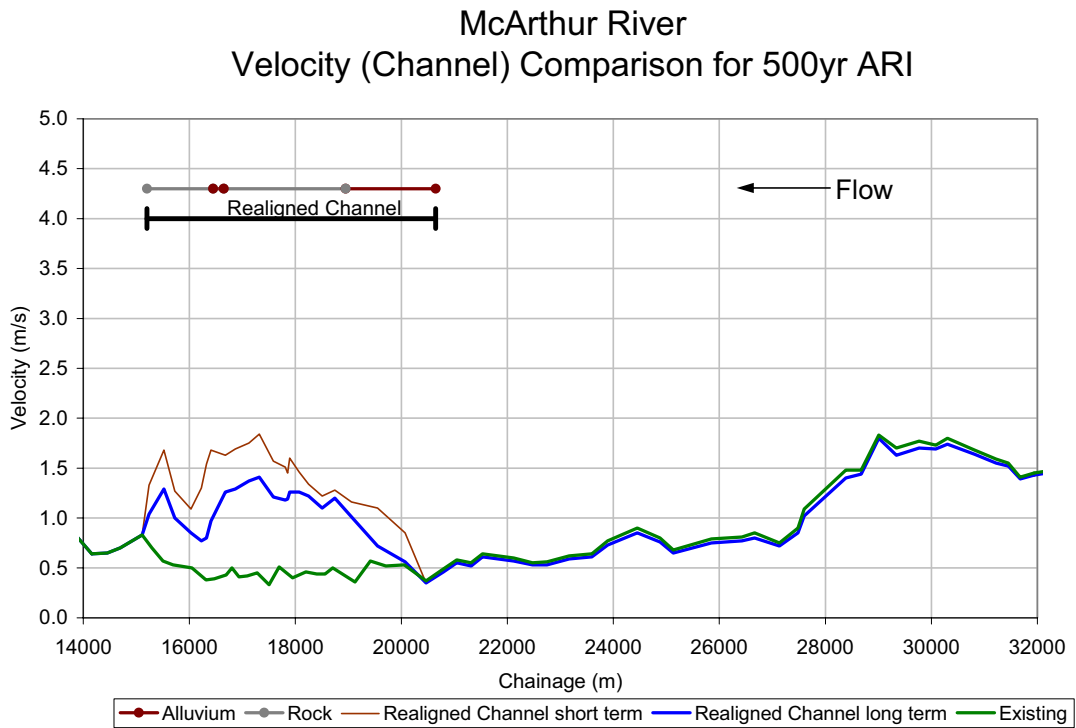


Figure F.1.58 – Velocity (Channel) for 500 year ARI

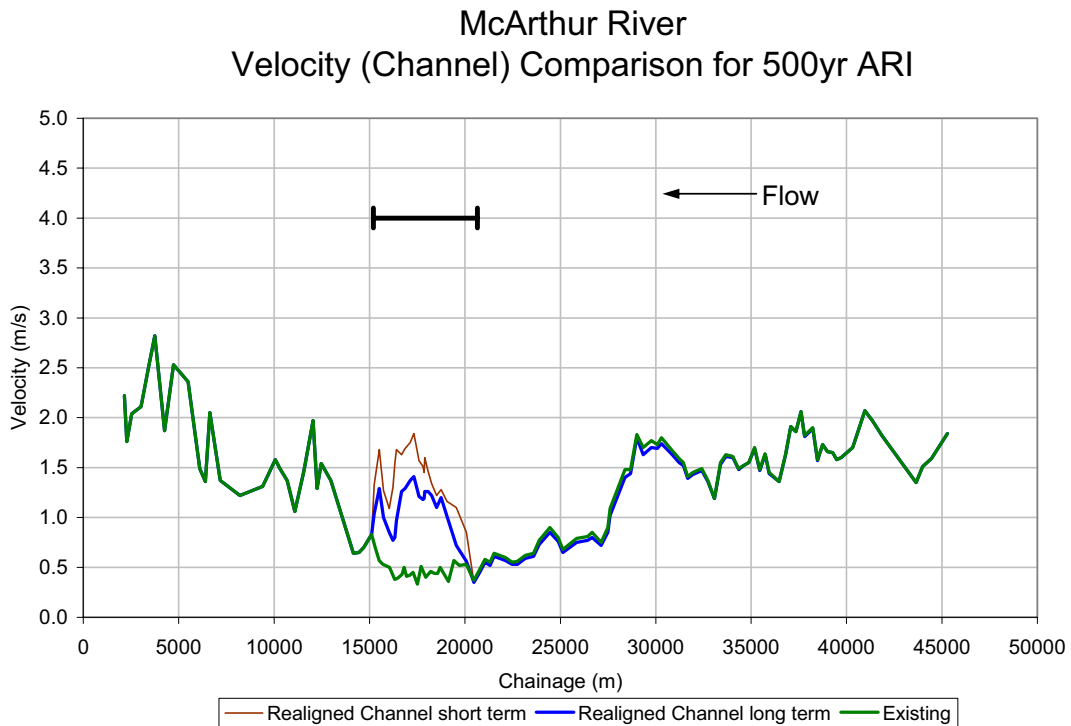


Figure F.1.59 – Velocity (Channel) for 500 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

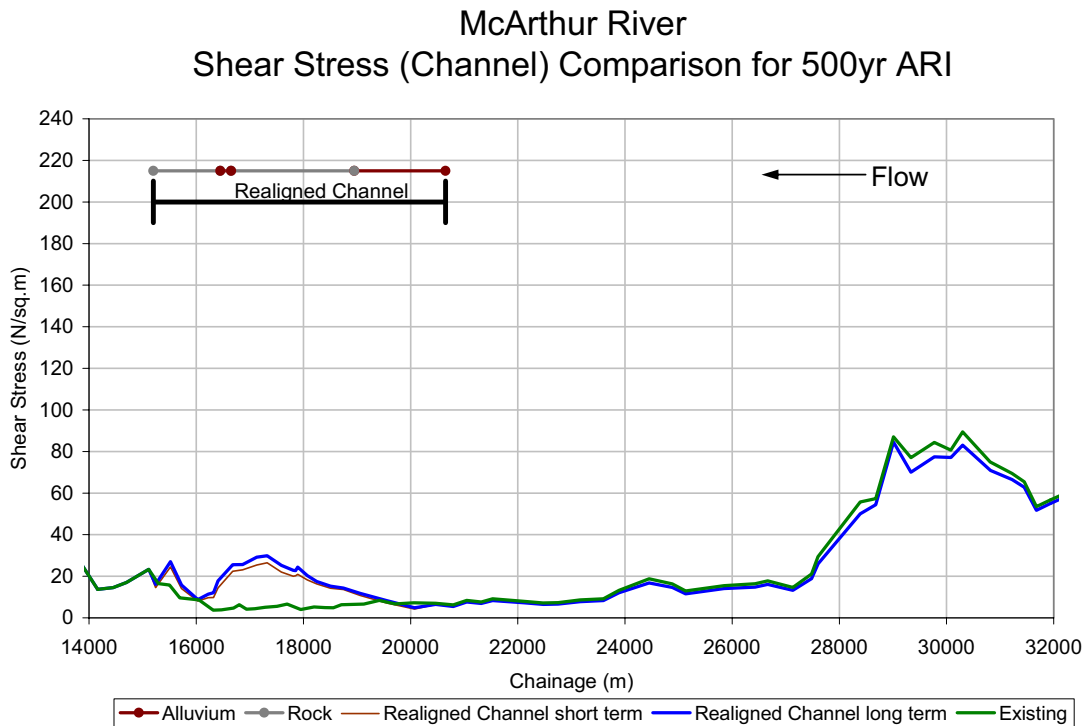


Figure F.1.60 – Shear Stress (Channel) for 500 year ARI

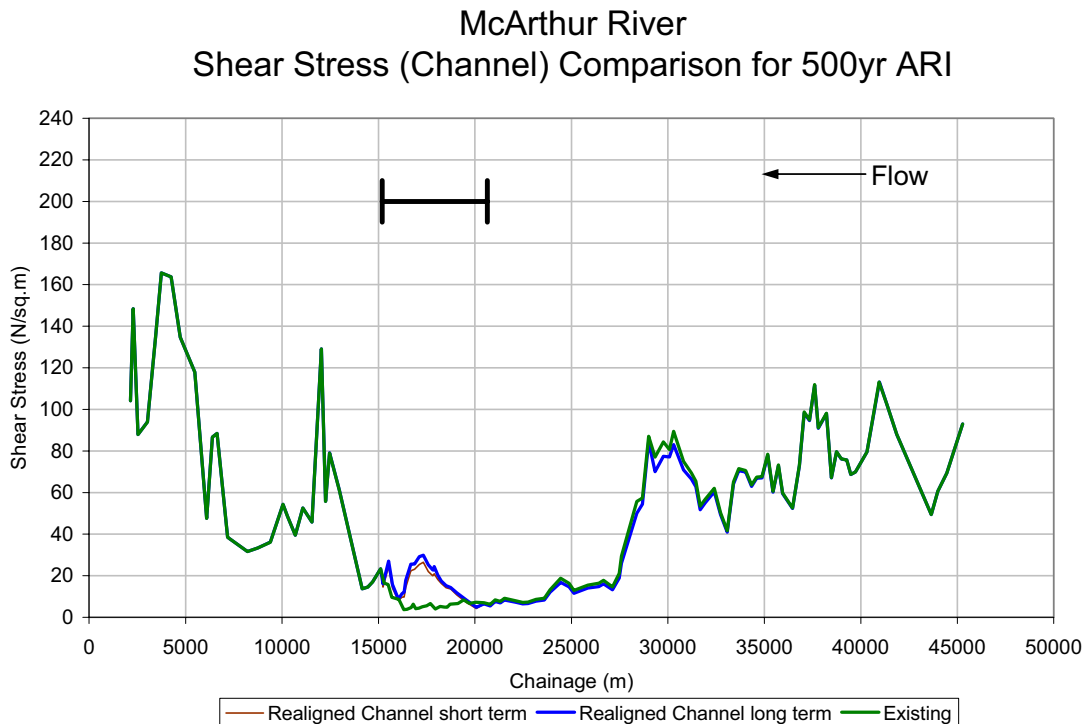


Figure F.1.61 – Shear Stress (Channel) for 500 year ARI (Overall)

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

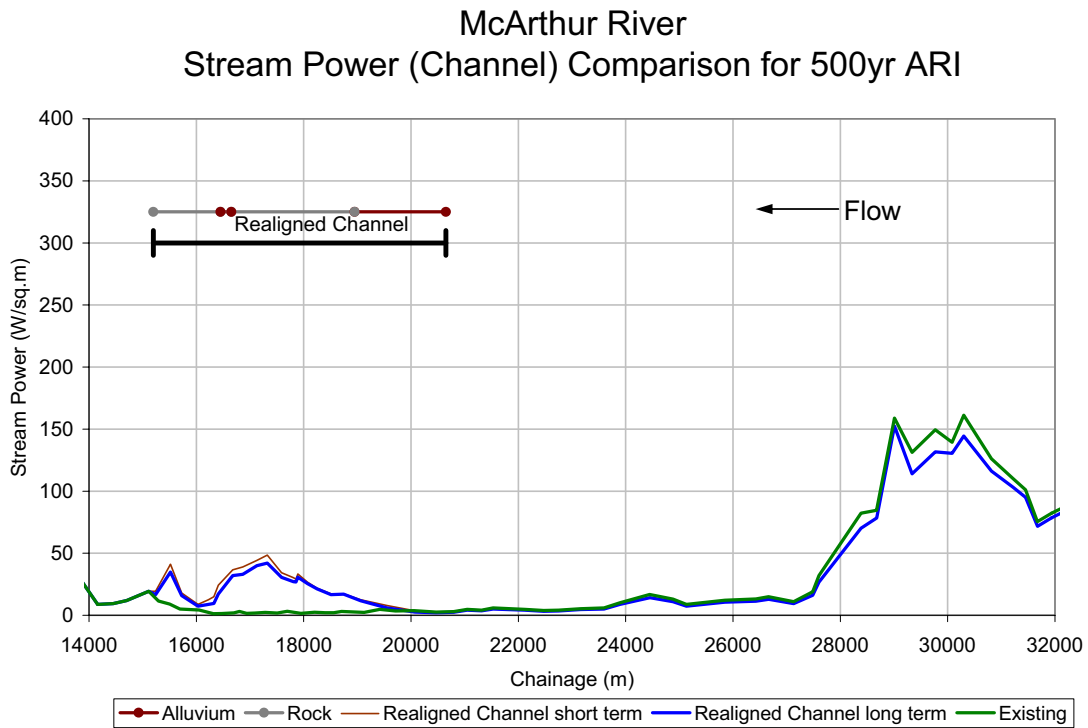


Figure F.1.62 – Stream Power (Channel) for 500 year ARI

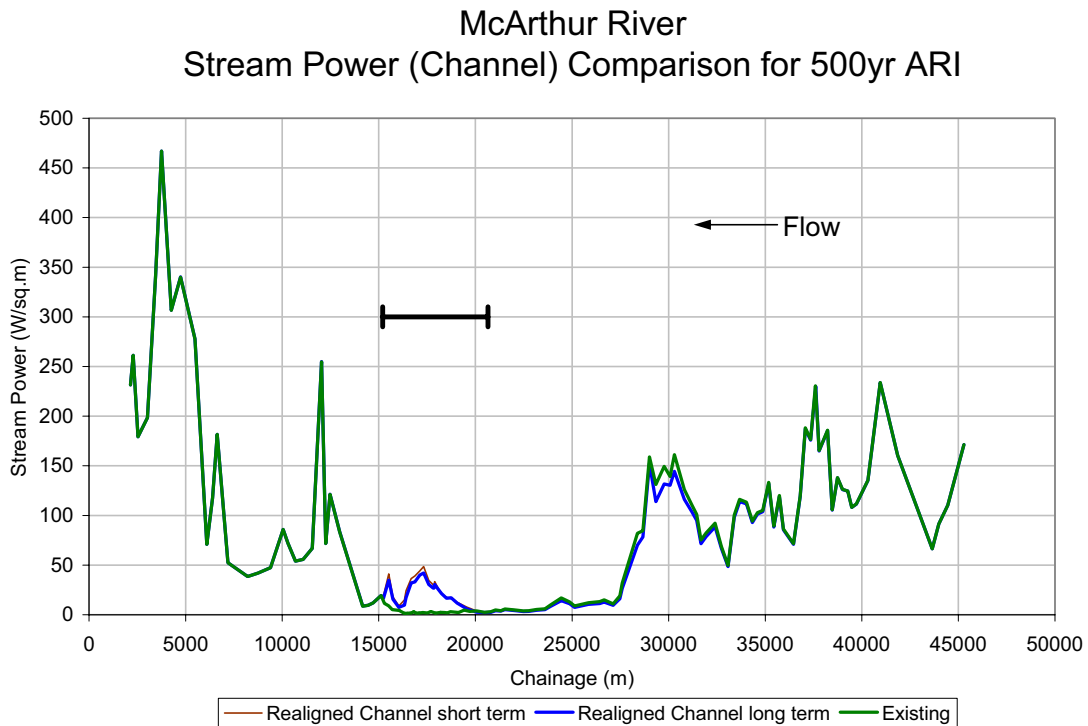
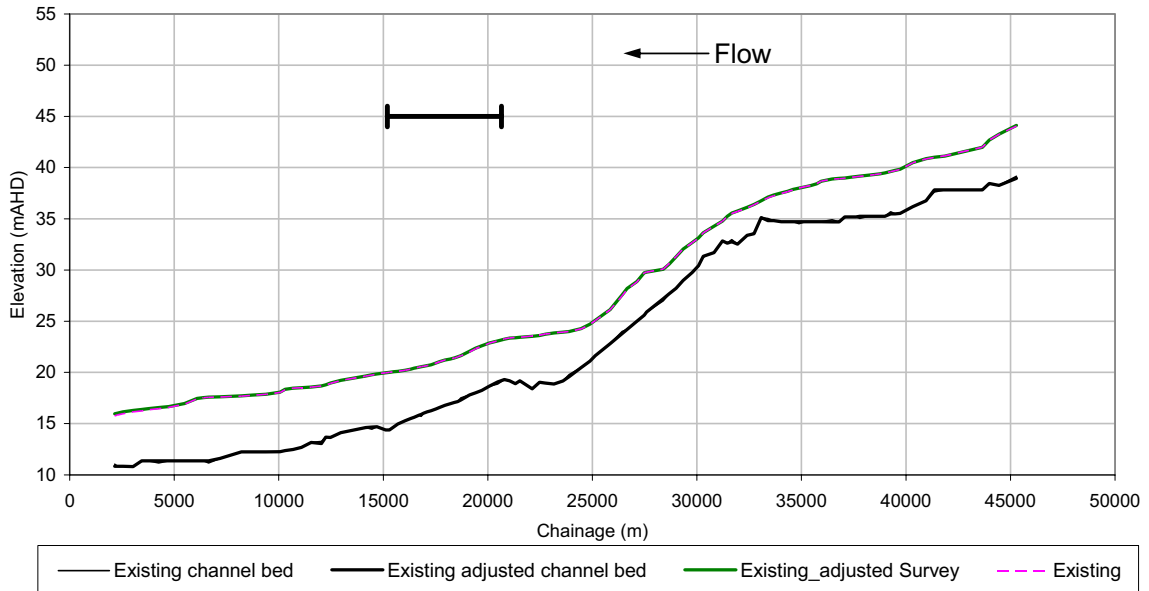


Figure F.1.63 – Stream Power (Channel) for 500 year ARI (Overall)

Appendix F.1

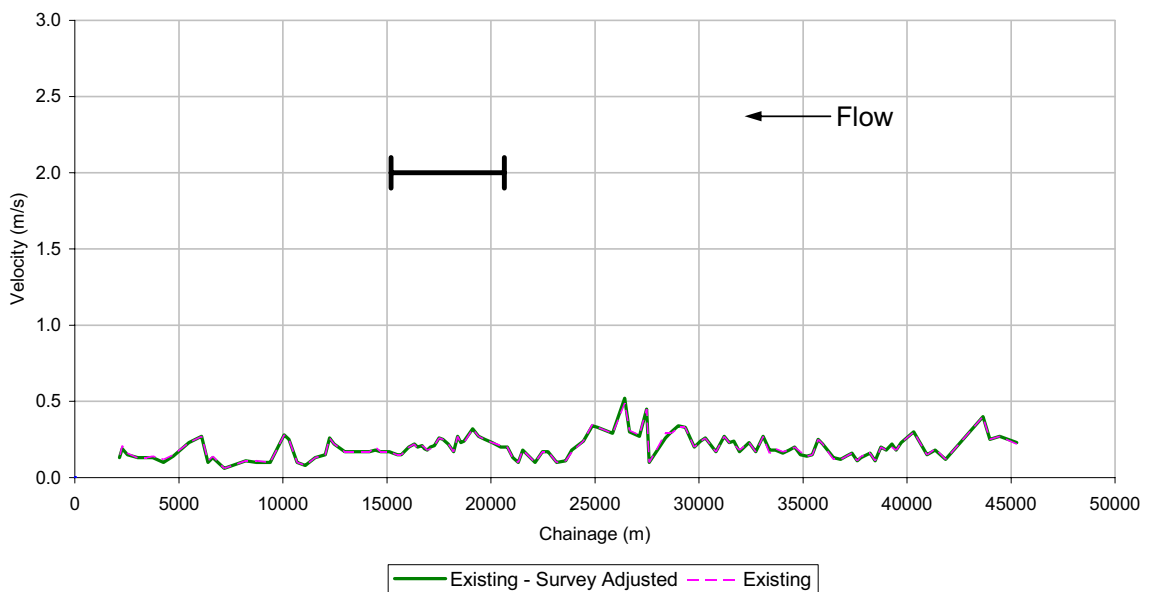
McArthur River Surface Water Assessment Hydraulic Modelling Results

McArthur River
Water Surface Elevation Comparison for 20 cumecs
Survey Accuracy Sensitivity Analysis



**Figure F.64. – Survey Accuracy Sensitivity Analysis -
Water Surface Elevation for 20 m³/s**

McArthur River
Velocity (Channel) Comparison for 20 cumecs
Survey Accuracy Sensitivity Analysis



**Figure F.65. – Survey Accuracy Sensitivity Analysis -
Velocity (Channel) for 20 m³/s**

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

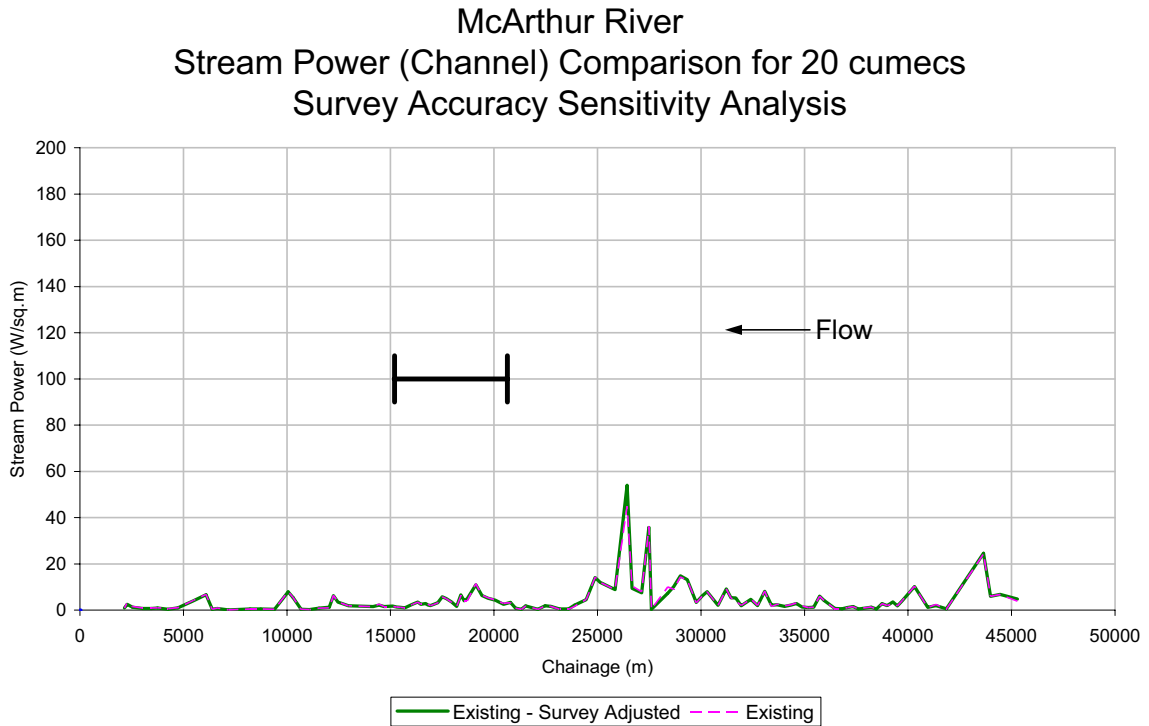


Figure F.1.66 – Survey Accuracy Sensitivity Analysis - Stream Power (Channel) for 20 m³/s

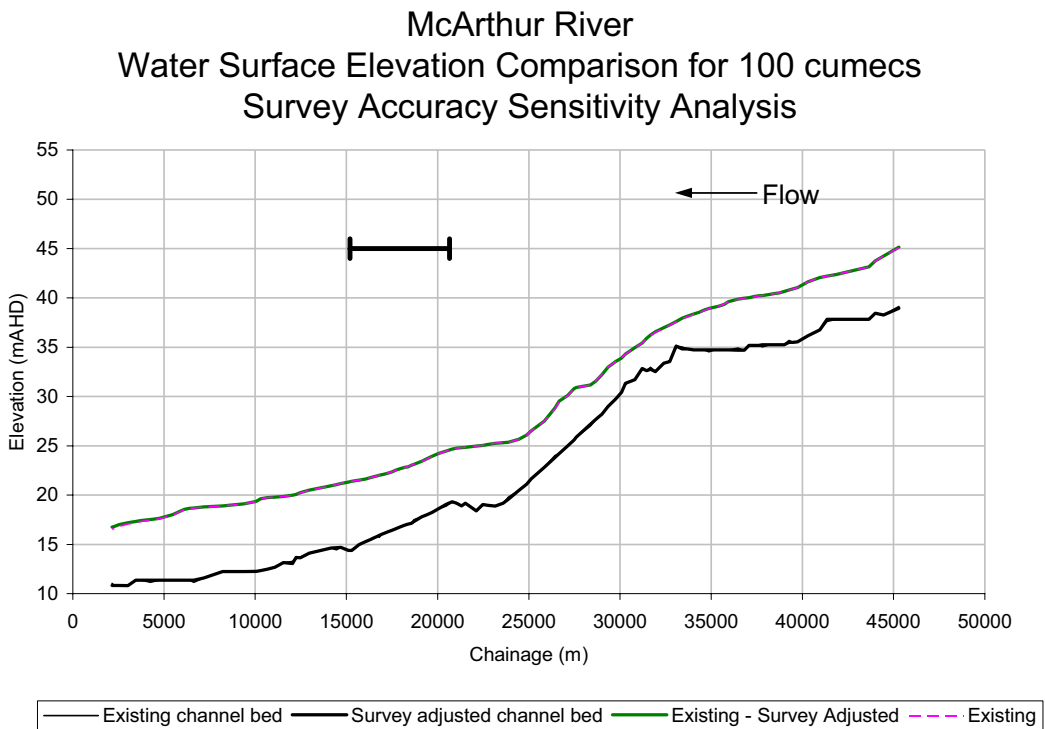


Figure F.1.67 – Survey Accuracy Sensitivity Analysis - Water Surface Elevation for 100 m³/s

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

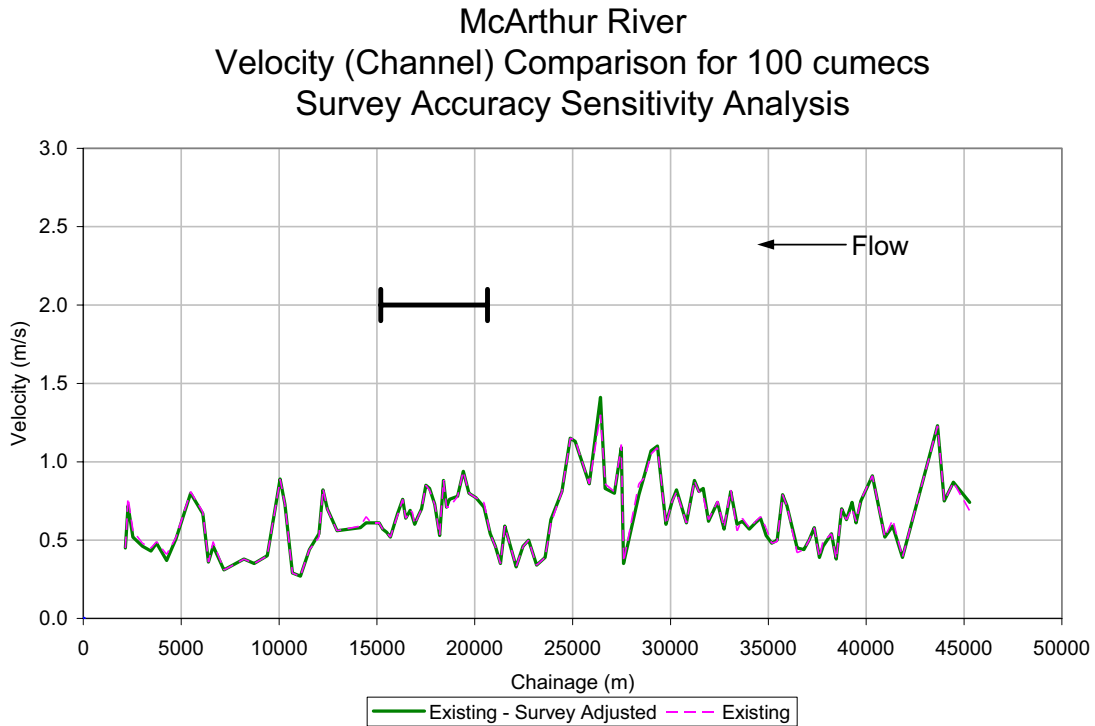


Figure F.1.68 – Survey Accuracy Sensitivity Analysis - Velocity (Channel) for 100 m³/s

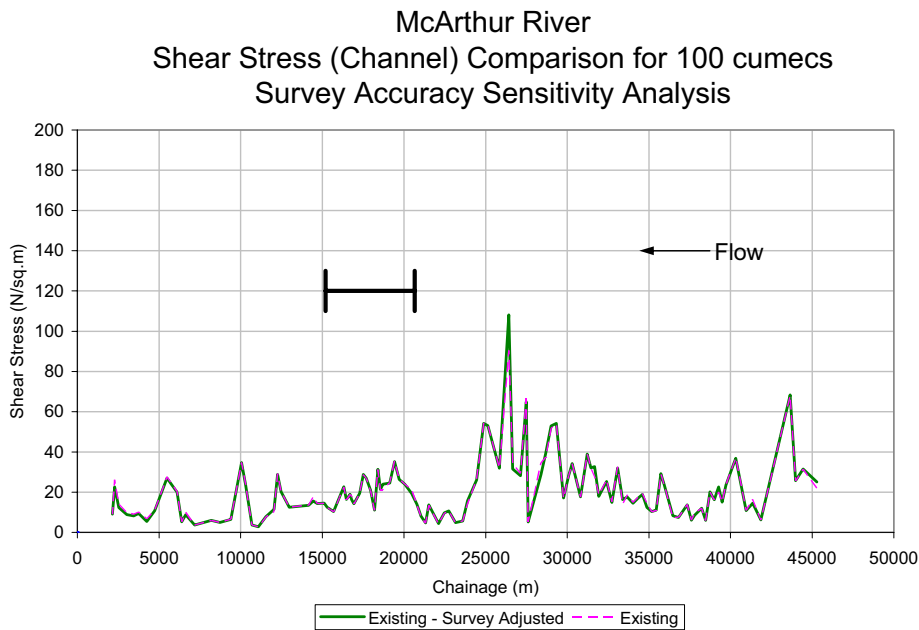


Figure F.1.69 – Survey Accuracy Sensitivity Analysis - Shear Stress (Channel) for 100 m³/s

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

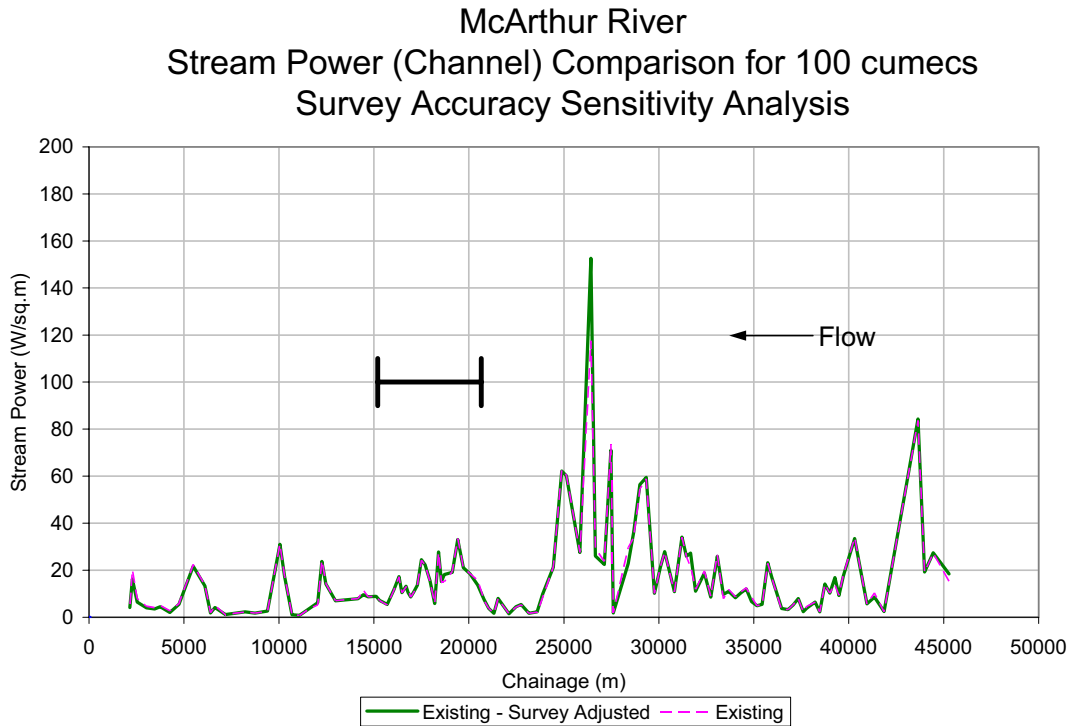


Figure F.1.70 – Survey Accuracy Sensitivity Analysis - Stream Power (Channel) for 100 m³/s

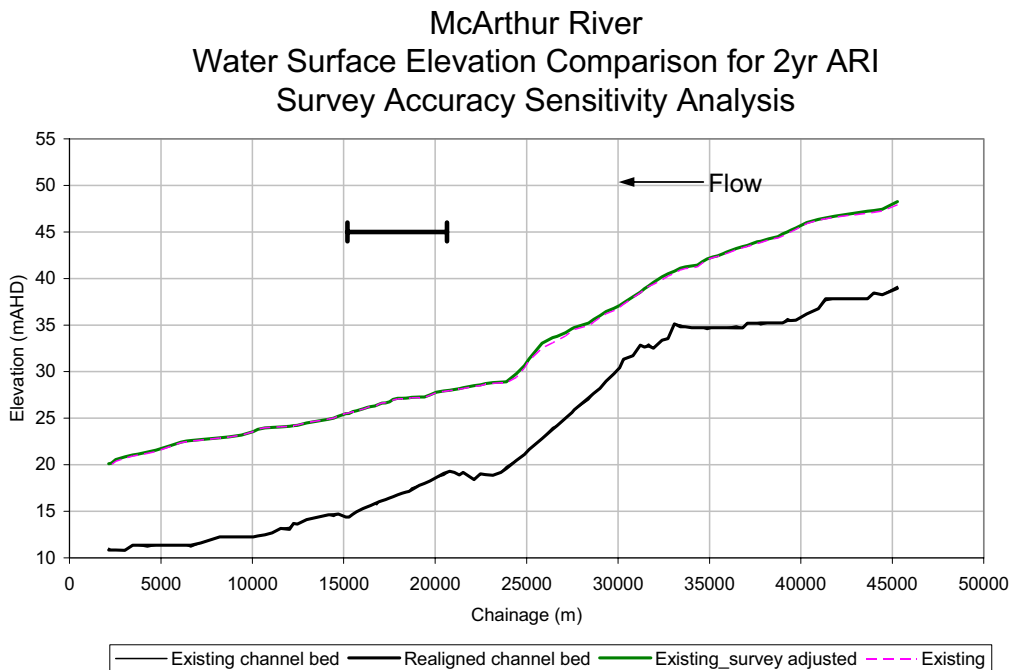
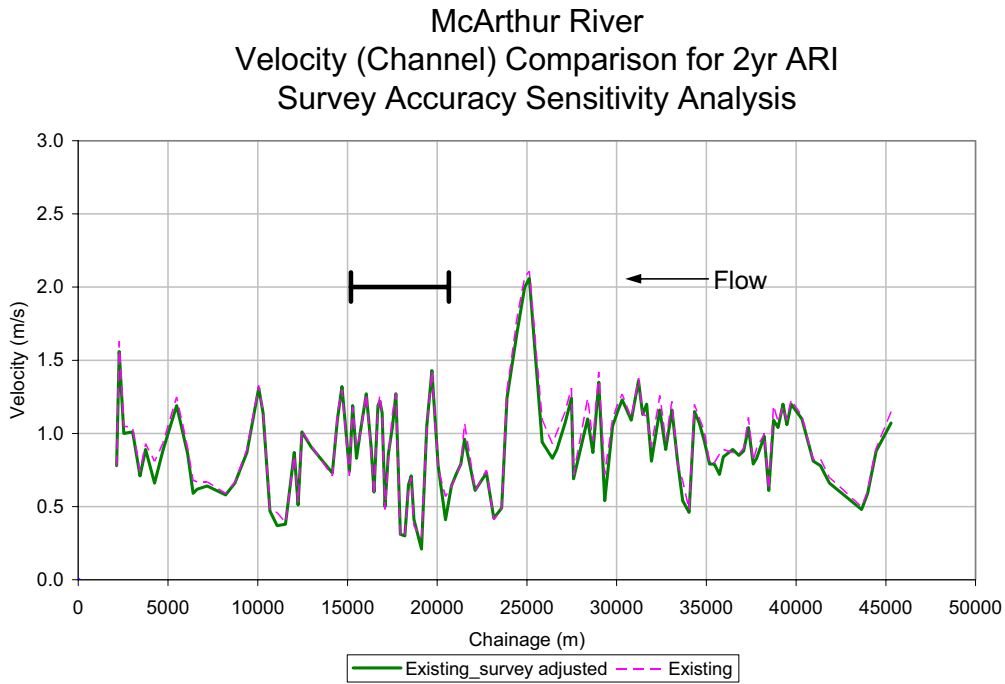


Figure F.1.71 – Survey Accuracy Sensitivity Analysis - Water Surface Elevation for 2 year ARI

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results



Figure

Figure F.1.72 – Survey Accuracy Sensitivity Analysis - Velocity (Channel) for 2 year ARI

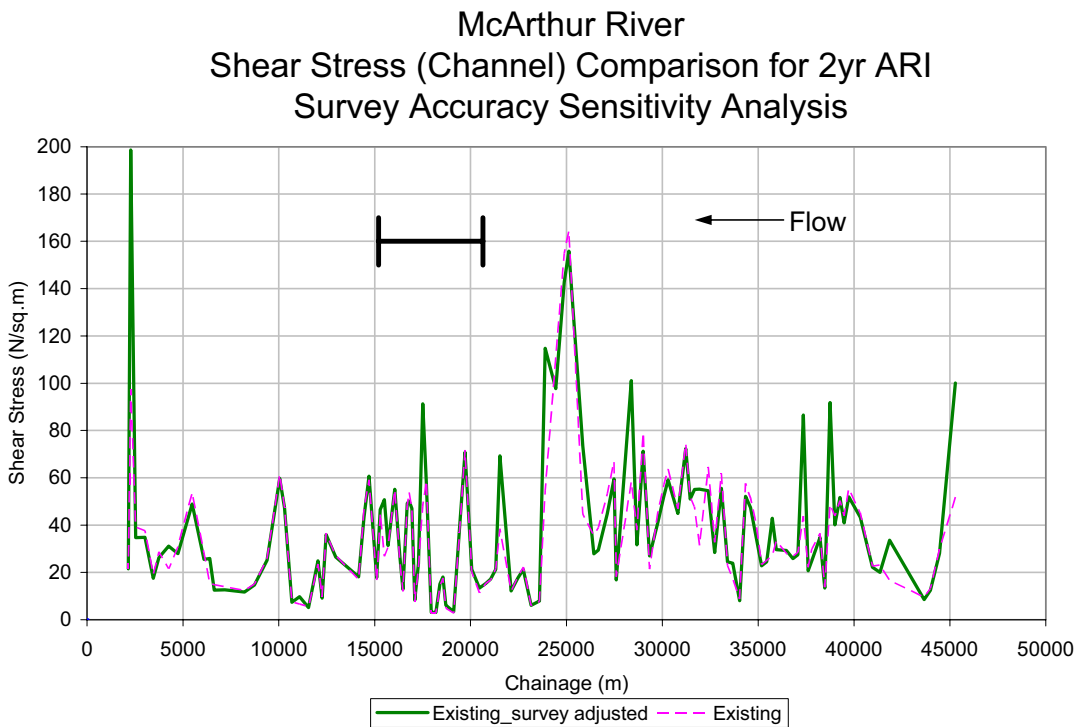


Figure F.1.73 – Survey Accuracy Sensitivity Analysis - Shear Stress (Channel) for 2 Year ARI

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

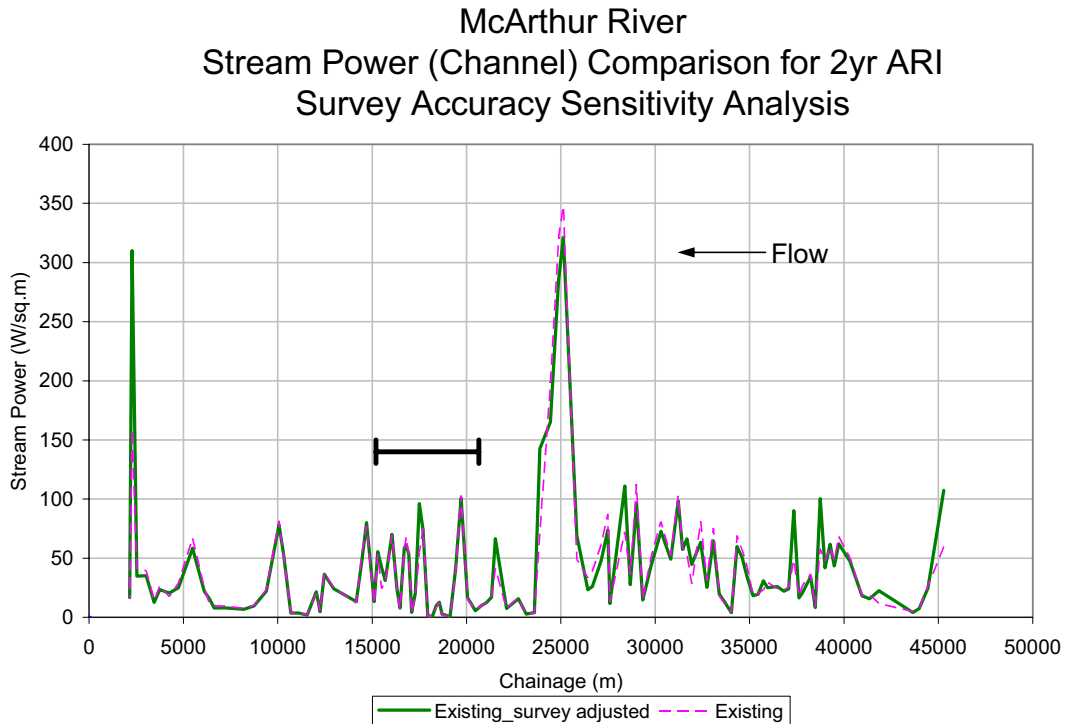


Figure F.1.74 – Survey Accuracy Sensitivity Analysis - Stream Power (Channel) for 2 year ARI

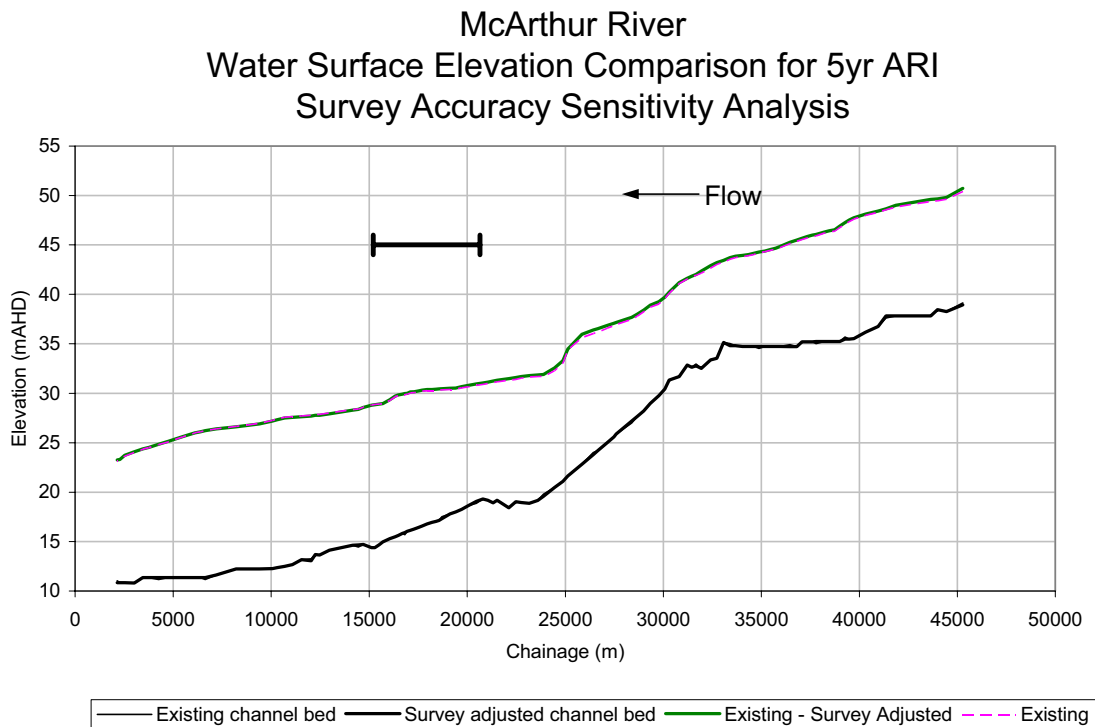


Figure F.1.75 – Survey Accuracy Sensitivity Analysis - Water Surface Elevation for 5 year ARI

Appendix F.1

McArthur River Surface Water Assessment Hydraulic Modelling Results

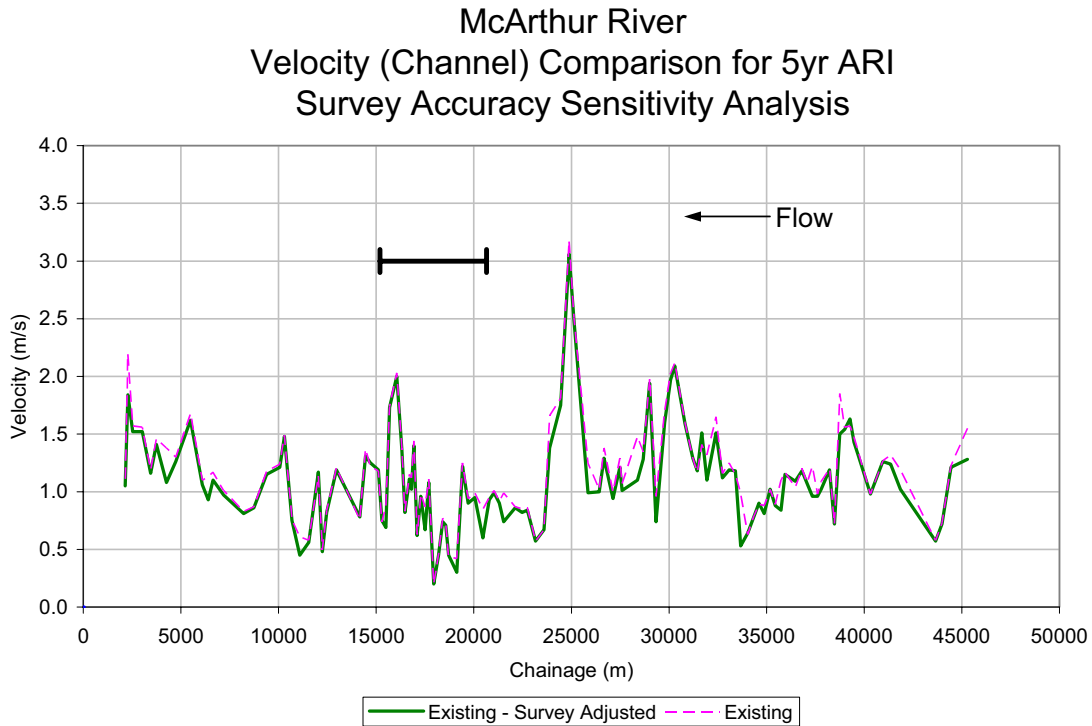


Figure F.1.76 – Survey Accuracy Sensitivity Analysis - Velocity (Channel) for 5 Year ARI

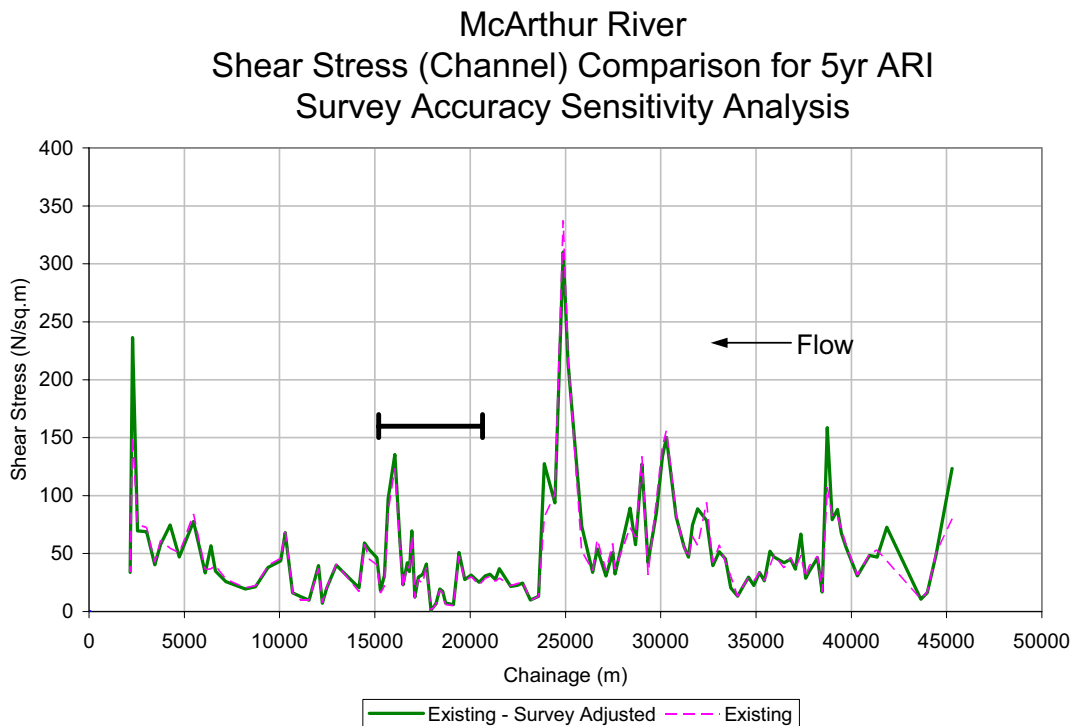
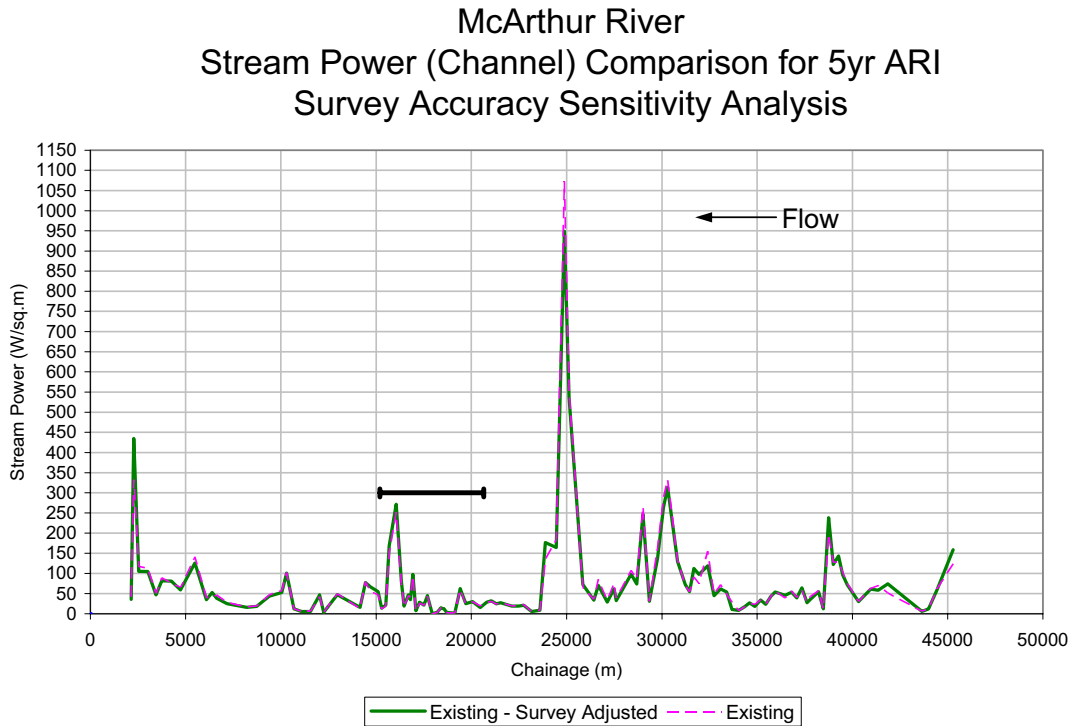


Figure F.1.77 – Survey Accuracy Sensitivity Analysis - Shear Stress (Channel) for 5 year ARI

Appendix F.1 McArthur River Surface Water Assessment Hydraulic Modelling Results



**Figure F.1.78 – Survey Accuracy Sensitivity Analysis -
Stream Power (Channel) for 5 Year ARI**