Gilbert River Irrigation Scheme Preliminary Findings Report: Economic & Financial Assessment

27 March 2017

Context

- The Gilbert River located in the Gulf Savannah region of Northern Queensland has long been identified as having irrigation potential

- The GRIS consists of the Middle and Lower Gilbert and has the potential to irrigate 45,000 ha utilising some of the 467,000 ML allocation set by the Queensland Government for the Gilbert River

Gilbert River Irrigation Scheme location

Scheme Overview

- GRIS is designed to utilise 200,000 ML annually of the 467,000 ML allocation for the Gilbert River set by the Queensland Government
- This allocation is assumed to be at the off-take from the weir on the Donnelly River
- Development of the dam and scheme infrastructure is estimated to take 5 years:
  - 2 years for planning and approvals, 2 years construction and 1 year to fill
  - Irrigation deliveries therefore would commence in Year 6
- A preliminary range of enterprises have been identified for the scheme with cotton being the principal crop in terms of area and total water allocation

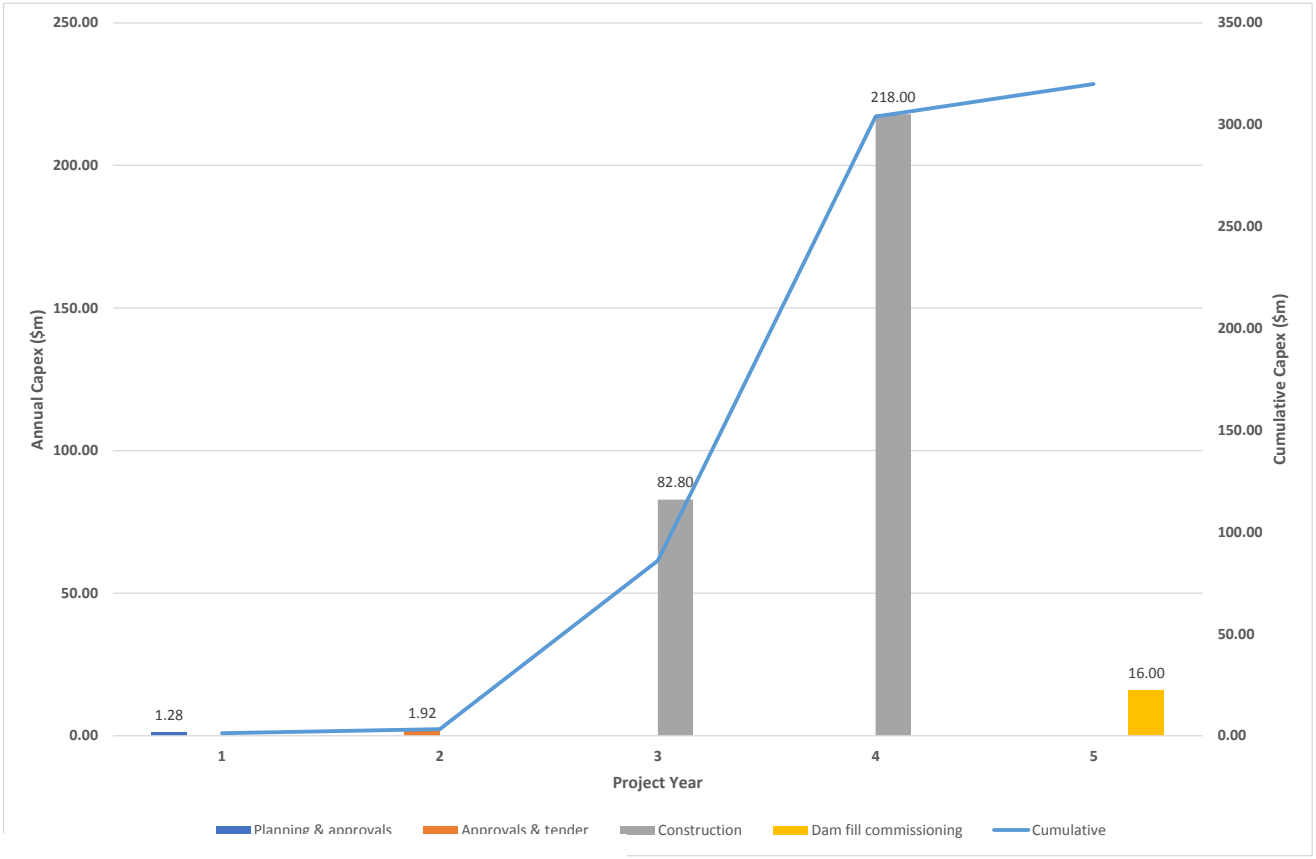
Scheme Overview: Costs

- 3 scenarios for capital scheme development costs have been assessed:

Scenario	Dam $m	Scheme $m	Total $m
Low	120	100	220
Medium	220	100	320
High	220	140	360

- Fixed costs assumed to be equivalent to $20/ML of entitlement i.e., $4 million per annum
- Variable costs associated with pumping are assumed to be $15/ML delivered

Construction Cost Profile: High Capex Scenario



Enterprise Areas, Water Use and Margins

Enterprise	Area (ha)	Water Use (ML/ha)	Total Water Use (ML)	Gross Margin ($/ha)
Cotton	13,000	8	104,000	2,372
Legumes	Part of cotton rotation	5	65,000	950
Mangos	133	15	2,000	7,079
Avocados	667	15	10,000	10,582
Bananas	600	20	12,000	11,611
Melons & pumpkins	167	6	1,000	10,910
Citrus	185	12	2,220	18,770
Fodder	600	5	3,000	3,593
Peanuts	200	4	800	1,362
Total	**15,552**		**200,020**	

Enterprise Development Profile

- Irrigation deliveries assumed to commence in Year 6
- Enterprises are assumed to develop and be ready to irrigate per following table

Project Year	Cotton	Legumes	Mangos	Avocados	Bananas	Melons	Citrus	Fodder	Peanuts
6	20%	20%	20%	20%	33.3%	50%	20%	100%	50%
7	20%	20%	20%	20%	33.3%	50%	20%		50%
8	20%	20%	20%	20%	33.3%		20%		
9	20%	20%	20%	20%			20%		
10	20%	20%	20%	20%			20%		

Enterprise Development Costs

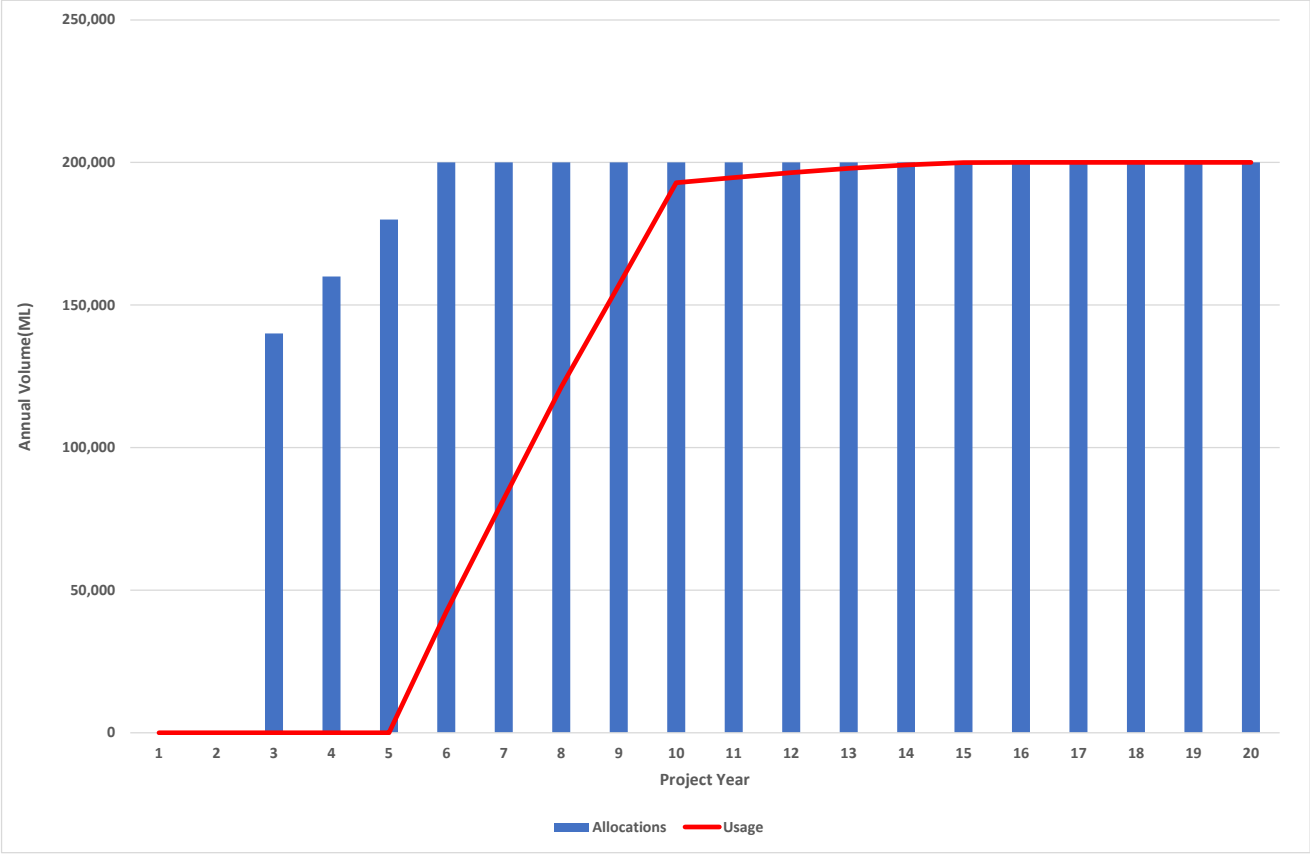
- Land and irrigation development costs and enterprise establishment costs for the permanent planting enterprises are set out below

Enterprise	Land Development ($/ha)	Enterprise Establishment ($/ha)
Cotton	12,130	-
Legumes	Included in above	-
Mangos	11,562	15,200
Avocados	11,562	30,000
Bananas	11,562	10,500
Melons & pumpkins	10,362	-
Citrus	11,562	30,000
Fodder	12,130	-
Peanuts	10,362	-

Water Entitlement and Usage Profiles

- Scheme is assumed to be delivered whereby contractual commitments are required upfront from irrigators before construction commences
- A threshold of 70% of total scheme entitlement i.e., 140,000 ML is assumed, commencing in Year 3 before construction is assumed to start, with remaining 30% of entitlements (allocations) sold by the end of Year 6
- Usage has been modelled based on:
  - Assumed development profiles for the different enterprises; and
  - Water use requirements of crops during development stage until full maturity

Water Entitlement and Usage Profiles



Model Assumptions

- The evaluation assumptions are consistent with the requirements set by the Australian Government for major infrastructure projects
- Base analyses undertaken assuming a real discount rate of 7%, with sensitivity analyses undertaken assuming 4% and 10%
- Evaluation period undertaken over 35 years, comprising 5 years of construction and dam fill and 30 years of operations
- A residual value based on the net benefit stream over a period of 70 years has been assumed
- Sensitivity analyses undertaken for:
  - +/- 10% capex and opex
  - +/- 10% gross margins (enterprise returns)
- Results presented in terms of net economic benefit; benefit cost ratio (BCR) and internal rate of return (IRR)

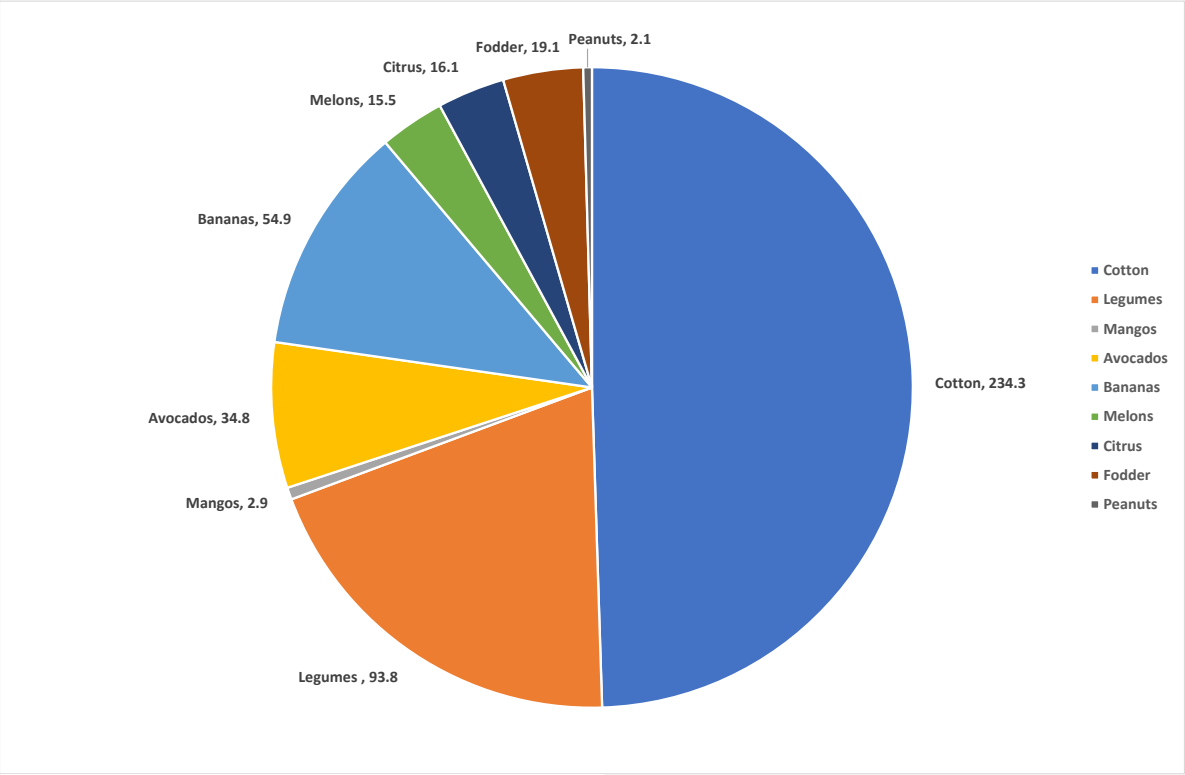
Results: Economic Analyses

- Table below sets out the main results for the three Capex scenarios, expressed as net present values at 7% real

Item/ Scenario	Low Capex	Base Case Capex	High Capex
Scheme Capex ($m)	170.46	248.18	279.06
Farm Capex ($m)	139.76	139.76	139.76
Total Capex ($m)	310.22	387.94	418.82
Opex ($m)	58.08	58.08	58.08
Total Costs ($m)	368.30	446.03	476.90
Benefits ($m)	535.73	535.73	535.73
Net Benefit ($m)	**167.42**	**89.70**	**58.82**
BCR	1.5	1.2	1.1
IRR (%)	10.5	8.5	8.0

Composition of Benefits

- The chart below shows the relative net benefits in $m contributed by each of the assumed enterprises



Sensitivity Analysis: Medium Capex

Scenario	Capex $m	Opex $m	Total Cost $m	Benefits $m	Net Benefits $m	BCR	IRR %
Base Case	**387.94**	**58.08**	**446.03**	**535.73**	**89.70**	**1.2**	**8.5**
+10% Capex	426.74	58.08	484.82	535.73	50.91	1.1	7.8
-10% Capex	349.15	58.08	407.23	535.73	128.49	1.3	9.4
+10% Opex	387.94	61.62	449.57	535.24	85.68	1.2	8.5
-10% Opex	387.94	52.28	440.22	536.58	96.36	1.2	8.7
+10% Gross Margin	387.94	58.08	446.03	590.15	144.12	1.3	9.4
-10$ Gross Margin	387.94	58.08	446.03	481.31	35.28	1.1	7.6
4% Discount Rate	445.47	94.78	540.25	1039.93	499.68	1.9	8.9
10% Discount Rate	339.92	37.81	377.73	315.81	-61.92	0.8	8.3

Conclusions

- Based on current "base case" assumptions, the project is estimated to generate a net economic benefit of around $89.70m assuming a 7% real discount rate, a 35 year evaluation period and the inclusion of a residual value based on future net benefit stream. The BCR is estimated at 1.2 and the IRR at 8.5%
- The project remains economic (positive net present value) under all sensitivity scenarios apart from 10% real discount rate when the NPV is estimated at -$61.92m
- Cotton is the major source of benefits, accounting for around 49% of the benefit stream with legumes – a part of the cotton rotation – contributing a further 20%. The reliance on cotton for around 70% of total benefits therefore provides a significant risk to the project. Greater enterprise diversification would mitigate this risk.
- Other major contributors include bananas (12%), avocados (7%), fodder (4%), melons (3%) and citrus (3%)

Financial Assessment

- Unlike the economic assessment which assesses the overall direct benefits to the community of the project, the financial assessment examines the commercial viability of the project taking into account the assumed funding and pricing arrangements
- Assessment undertaken for both the High and Low Capex scenarios
- Assessment also examines impact of alternative repayment periods for additional debt funds required to cover any shortfall in revenues or refinancing required for the low interest loan from the Commonwealth
- Financial assessment includes an additional capital cost of land of $15m (12,000 ha) with sale of land assumed at $2,000/ha
- Cost of entitlements (allocations) assumed at:
  - $600/ML for Gilbert River
  - an additional 200,000 ML for Strathmore at $100/ML (sensitivity tested whether included or excluded)
- Annual fixed charge of $20/ML of entitlement and $15/ML delivered

Financial Assessment: High Capex Scenario

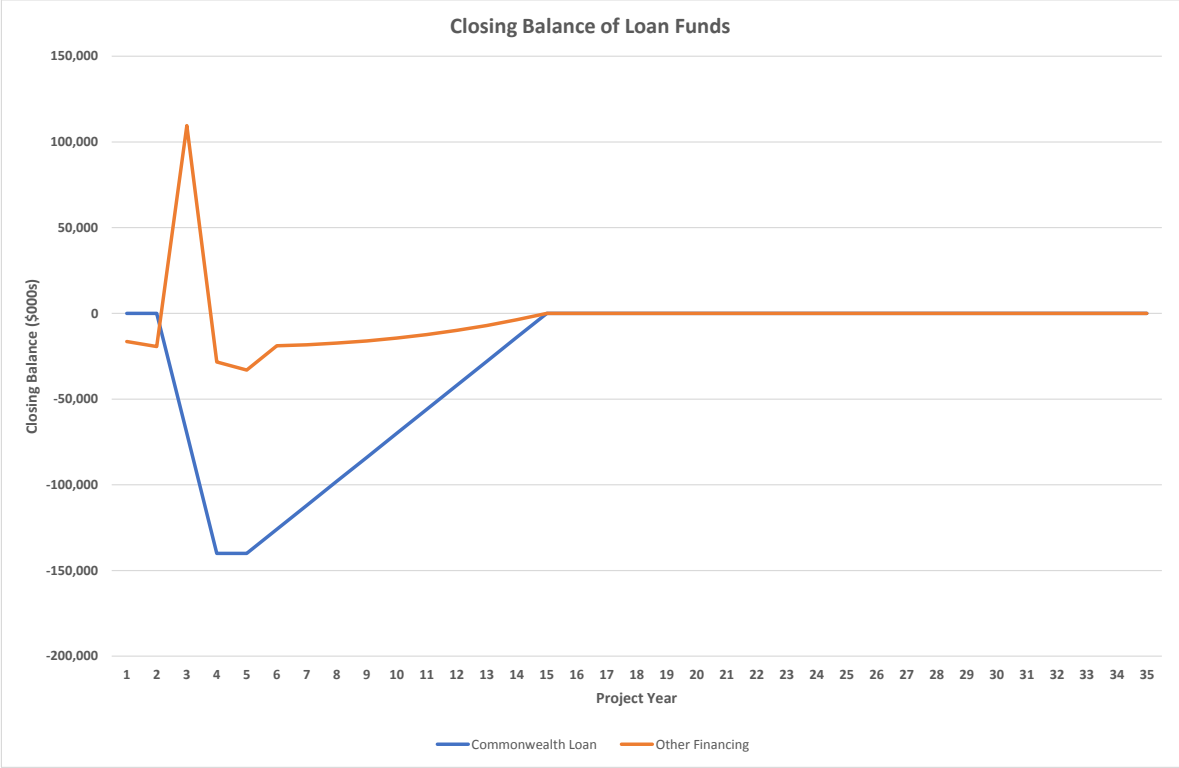
- Key assumptions for the **High Capex** scenario include:
  - Commonwealth grant funds: $40m with 50% in Years 4 and 5
  - State grant funds: $40m with 50% in Years 4 and 5
  - Commonwealth low interest loan: $140m drawn down 50% in Years 4 and 5 with no interest payable until Year 6 and then for 10 years with principal payments commencing in Year 6 through to Year 15
  - Repayments amounts are through an additional fixed charge levied on entitlements with this charge assumed to be repaid by Year 15; Year 25; or Year 35 depending on the scenario
  - Interest rate on Commonwealth loan 2.2%
  - Interest rate on other loan funds (akin to an overdraft facility for the scheme) 4.5% with repayment periods of 10 (Year 15), 20 (Year 25) and 30 (Year 35) years assessed
  - Investment interest rate of 2.5%

Results: High Capex Scenario

	Units	10 Year Repayment	20 Year Repayment	30 Year Repayment
Fixed charge	$/ML allocation	20	20	20
Variable charge	$/ML delivered	15	15	15
Funding charge	$/ML allocation	91	55	44
Total charge (based on 100% of allocation used)	**$/ML allocation**	**126**	**90**	**79**

High Capex: Loan Balances – 10 Year Repayment Schedule

- Chart illustrates profile of closing balances for the two sources of funding assumed i.e., the Commonwealth low interest loan and the additional scheme funding (overdraft)

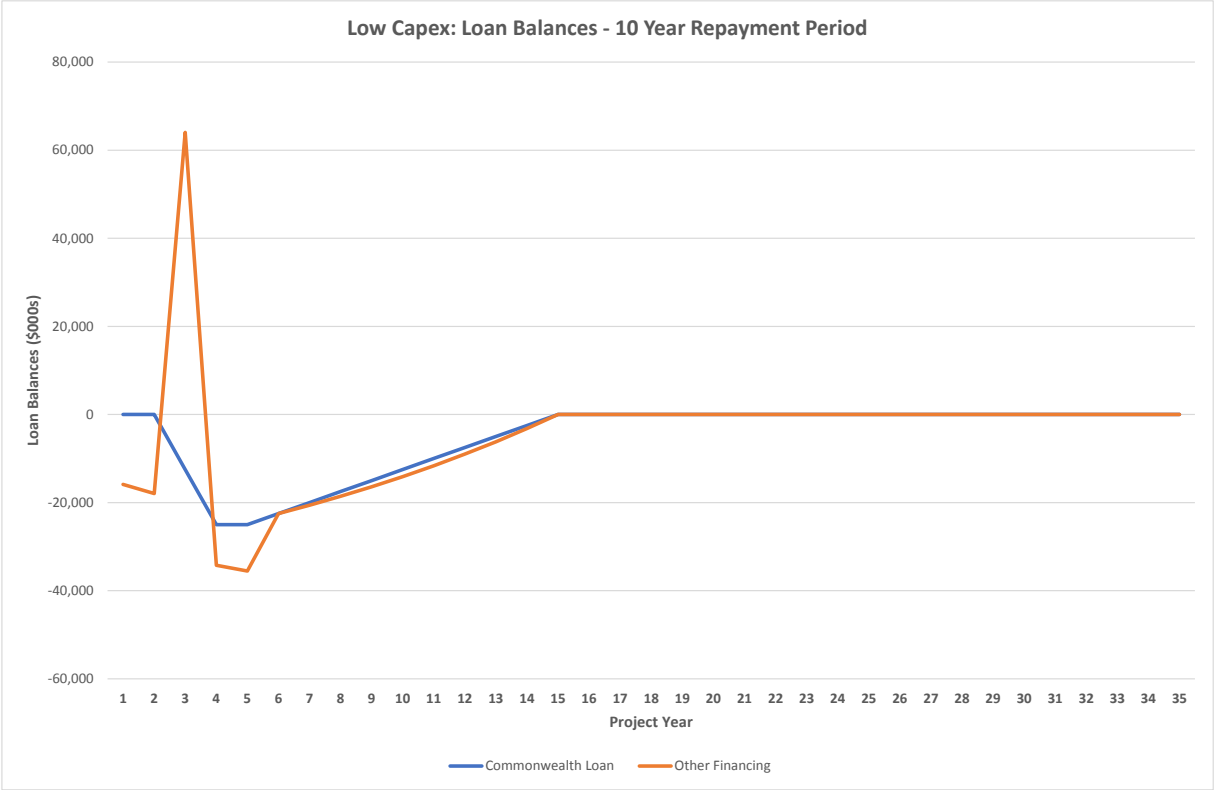


Results: Low Capex Scenario

	Units	10 Year Repayment	20 Year Repayment	30 Year Repayment
Fixed charge	$/ML allocation	20	20	20
Variable charge	$/ML delivered	15	15	15
Funding charge	$/ML allocation	29	18	14
Total charge (based on 100% of allocation used)	**$/ML allocation**	**64**	**53**	**49**

Low Capex: Loan Balances – 10 Year Repayment Schedule

- Chart illustrates profile of closing balances for the two sources of funding assumed



Impact of No Sale of Strathmore Allocations

- Table below shows the impact on the Funding Charge of not being able to retain proceeds of the sale of Strathmore allocations

	10 Years	20 Years	30 Years
High Capex Scenario			
With Strathmore	91	55	44
Without Strathmore	105	63	50
Low Capex Scenario			
With Strathmore	29	18	14
Without Strathmore	43	26	21

Conclusions

- A base water price of $35/ML is assumed to recover the fixed and variable costs associated with operating the scheme
- An additional funding charge, based on allocations, would be required to pay the interest and principal associated with the low interest loan provided by the Australian Government through the NWIDF
  - The cost of this funding charge is estimated to range from $44 (30 years) to $91/ML (10 years) depending on the assumed period for repayments based on the High Capex scenario
  - Under the Low Capex scenario the cost reduces to $14 (30 years) to $29/ML (10 years)
- If the sale of allocations for the Strathmore scheme are excluded, the magnitude of the funding charge would increase by around $7/ML (30 years) to $14/ML (10 years)