

13.0 ECONOMIC ANALYSES

13.1 Capital Costs

Where infrastructure is common to each option (eg. expansion and augmentation of the Emu Park distribution system to Keppel Sands) details of this infrastructure has not been included in the subsequent discussion or costings.

Tables 13.1 and 13.2 summarise the capital costs of all schemes. The schemes presented in Table 13.1 are based on the development of Waterpark Creek only and a maximum diversion of 17ML/d. Table 13.2 presents the capital costs of schemes which include the development of Sandy Creek. These schemes are based on a maximum diversion of 35ML/d.

The costs given in Tables 13.1 and 13.2 for schemes which include construction of a pipeline from the Fitzroy River Barrage assume that the supply will be obtained from Fitzroy River Water's Glenmore Treatment Plant.

Detailed capital cost estimates are provided in Appendix C.

Table 13.1
Scheme Capital Costs
Based on Waterpark Creek with a Diversion of 17ML/d

Scheme Designation	Yield from Waterpark Creek or Waterpark and Sandy Creeks (ML/a)	Desalination Plant Year 2056 Capacity (ML/a)	Pipeline from Barrage Year 2056 Capacity*	Capital Cost \$M (Year 2004)
WP17-1-D	2,400	11,550	nil	151.6
WP17-2-D	4,100	10,000	nil	137.0
WP17-1-1A	2,400	Nil	10,750	70.9
WP17-1-2A	2,400	Nil	10,750	68.0
WP17-1-3A	2,400	Nil	10,750	80.0
WP17-1-4A	2,400	Nil	10,750	78.5
WP17-1-5A	2,400	Nil	10,750	86.2
WP17-2-1A	4,100	Nil	9,000	70.6
WP17-2-2A	4,100	Nil	9,000	73.3
WP17-2-3A	4,100	Nil	9,000	77.1
WP17-2-4A	4,100	Nil	9,000	72.5
WP17-2-5A	4,100	Nil	9,000	79.0

* Capricorn Coast only

Table 13.2
Scheme Capital Costs
Based on Waterpark Creek and Sandy Creek with a Diversion of 35ML/d

Scheme Designation	Yield from Waterpark Creek or Waterpark and Sandy Creeks (ML/a)	Desalination Plant Year 2056 Capacity (ML/a)	Pipeline from Barrage Year 2056 Capacity*	Capital Cost \$M (Year 2004)
WPS35-1-D	2,620	11,550	nil	150.0
WPS35-2-D	4,790	10,000	nil	142.6
WPS35-3-D	8,630	6,000	nil	115.8
WPS35-1-1A	2,620	nil	10,500	72.8
WPS35-1-2A	2,620	nil	10,500	70.7
WPS35-1-3A	2,620	nil	10,500	80.1
WPS35-1-4A	2,620	nil	10,500	80.7
WPS35-1-5A	2,620	nil	10,500	83.5
WPS35-2-1A	4,790	nil	8,350	83.8
WPS35-2-2A	4,790	nil	8,350	76.4
WPS35-2-3A	4,790	nil	8,350	83.1
WPS35-2-4A	4,790	nil	8,350	78.4
WPS35-2-5A	4,790	nil	8,350	83.8
WPS35-3-1A	8,630	nil	4,500	91.6
WPS35-3-2A	8,630	nil	4,500	86.0
WPS35-3-3A	8,630	nil	4,500	84.8
WPS35-3-4A	8,630	nil	4,500	82.0
WPS35-3-5A	8,630	nil	4,500	77.8

* Capricorn Coast only

Should it be necessary for Livingstone Shire Council to construct its own intake and treatment plant to draw supplies and treat raw water obtained from the Barrage the additional cost to provide these facilities is estimated at \$21M.

In assessing capital costs allowance has been made for the replacement of the pipeline to 'The Caves' in the year 2026. It is presumed that the existing pipeline condition can be retained until that time.

13.2 Operating & Maintenance Costs

Operating and Maintenance Costs have been determined based on the following criteria:

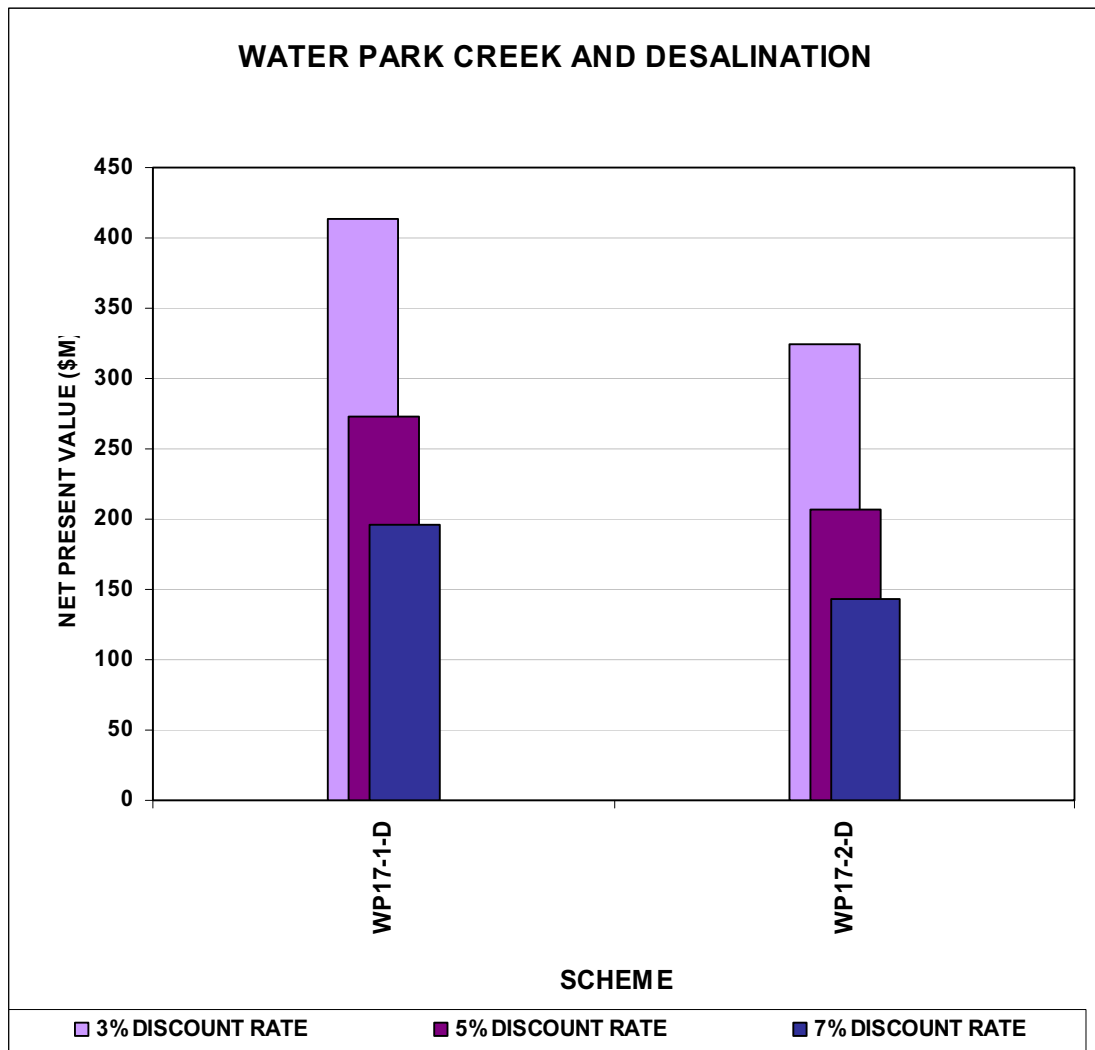
1. All pumping units have an efficiency of 70%;
2. Power costs - \$0.10 per kW/hr;
3. An initial allocation of 1,000ML of high priority water will be obtained from Rockhampton City Council at a cost of \$412 per ML; and
4. Infrastructure maintenance costs are assessed as a percentage of the capital cost.

13.3 Economic Analyses

Net Present Value (NPV) analyses have been undertaken to compare the various scheme options. The timing of works has been based on the adoption of the safe yield as the basis for augmentation.

13.3.1 Waterpark Creek and Desalination

Graph 13.1 shows the NPV to the two schemes designated **WP17-1-D** and **WP17-2-D** based on the construction of a desalination plant to augment supplies obtained from Waterpark Creek.



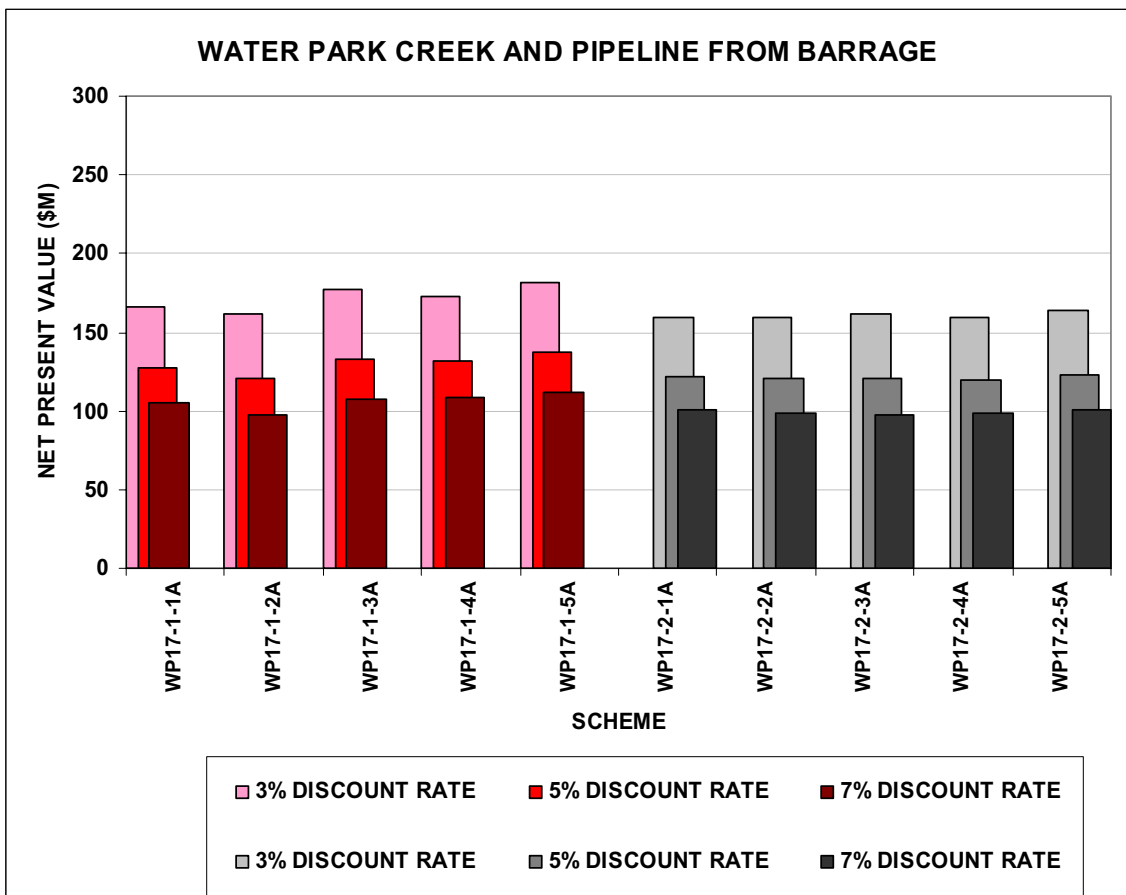
Graph 13.1

From this graph it can be concluded that increasing the yield of the existing Waterpark Creek scheme by construction a further stage of Kellys Offstream Storage reduces the overall cost of meeting the Capricorn Coast's water needs. Construction of Kelly Storage has the effect of reducing the capacity of the desalination plant required by 1,500ML. It also delays the need for the desalination plant.

13.3.2 Waterpark Creek and Pipeline from Fitzroy River Barrage

Graph 13.2 shows the NPV applying to two schemes based on the construction of a pipeline from the Fitzroy River Barrage to augment supplies drawn from Waterpark Creek. Five different pipeline routes are considered and the maximum diversion from Waterpark Creek is maintained at 17ML/d. Schemes considered in Graph 13.2 are designated as follows.

WP17-1-1A, WP17-1-2A, WP17-1-3A, WP17-1-4A, WP17-1-5A,
 WP17-2-1A; WP17-2-2A; WP17-2-3A; WP17-2-4A; WP17-2-5A.



Graph 13.2

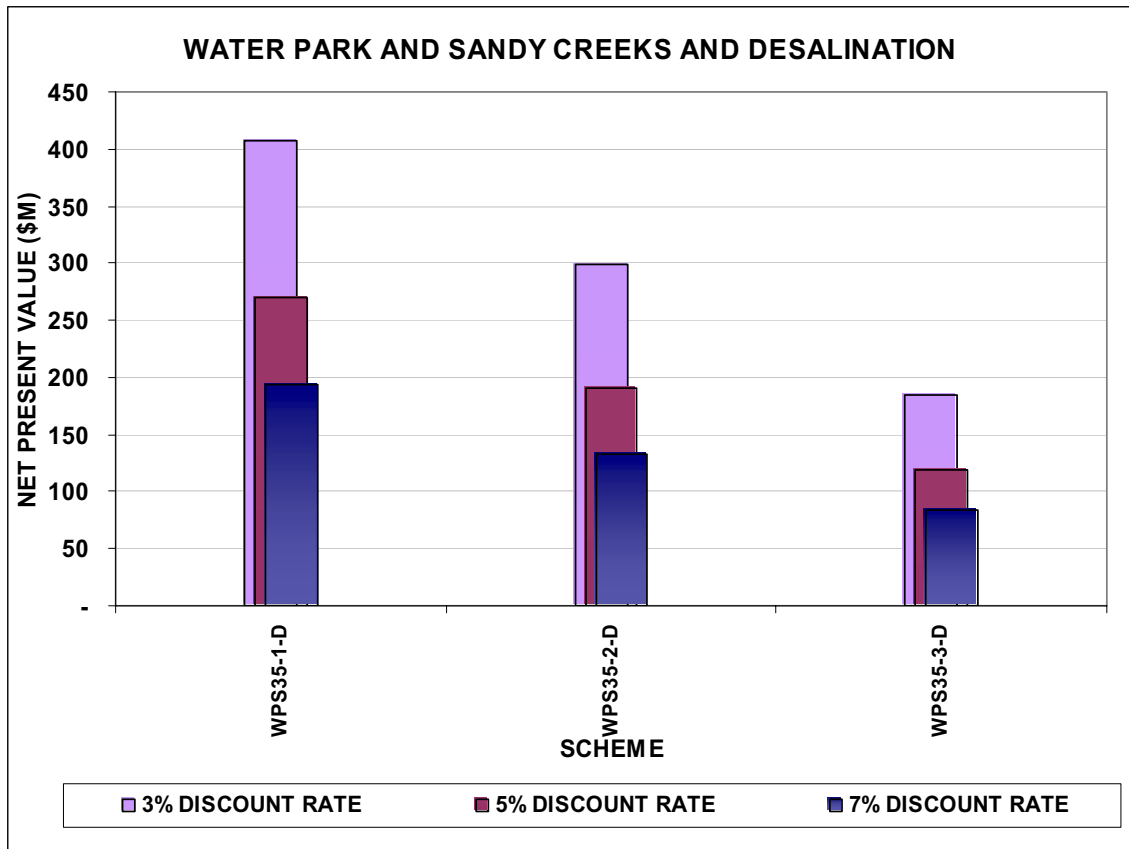
Examination of Graph 13.2 shows that a benefit is obtained from the construction of Stage 2 of Kellys Offstream Storage.

Both Graphs 13.1 and 13.2 indicate that there is not a great difference between the five different pipeline routes. However, in general, Routes 1A and 2A are slightly less expensive.

13.3.3 Waterpark and Sandy Creeks and Desalination

Graph 13.3 shows the NPV of schemes which involve maximising the yield to be obtained from Waterpark Creek and Sandy Creek and augmenting these supplies with a desalination plant. The schemes include not increasing Kellys Storage and constructing stages 2 and 3. Schemes considered in Graph 13.3 are designated as follows.

WPS35-1-D, WPS35-2-D and WPS35-3-D.



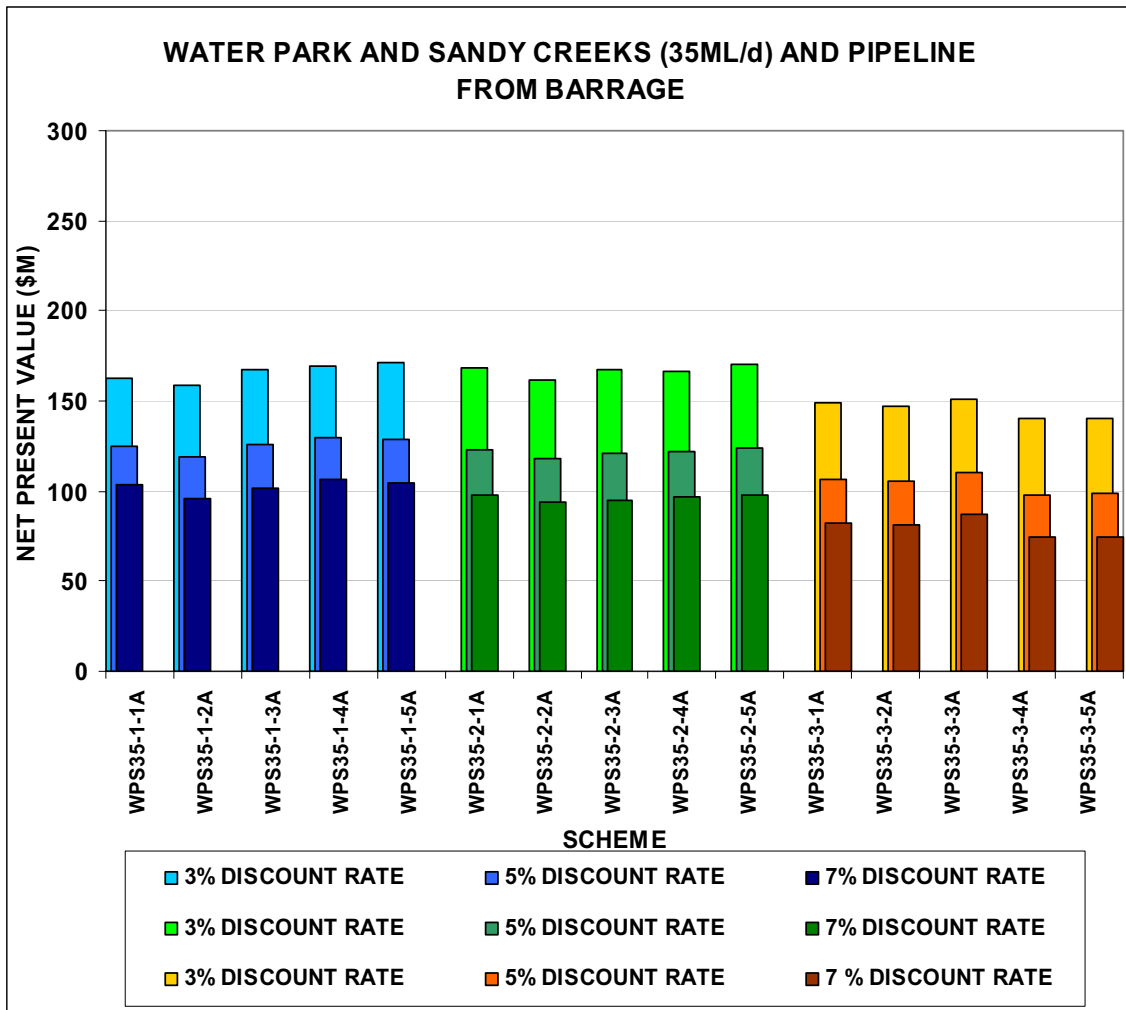
Graph 13.3

Graph 13.3 shows the benefit of constructing Stages 2 and 3 of Kelly Offstream Storage.

13.3.4 Waterpark and Sandy Creeks and Pipeline from Fitzroy River Barrage

Graph 13.4 shows the NPV applying to three schemes based on the construction of a pipeline from the Fitzroy River Barrage to augment supplies drawn from both Waterpark and Sandy Creeks. Five different pipeline routes are considered in relation to each scheme. The maximum diversion from Waterpark and Sandy Creeks is 35ML/d. Schemes considered in Graph 13.4 are designated as follows.

- | | | |
|-------------|-------------|-------------|
| WPS35-1-1A, | WPS35-2-1A, | WPS35-2-1A; |
| WPS35-1-2A, | WPS35-2-2A, | WPS35-2-1A; |
| WPS35-1-3A, | WPS35-2-3A, | WPS35-2-1A; |
| WPS35-1-4A, | WPS35-2-4A, | WPS35-2-1A; |
| WPS35-1-5A, | WPS35-2-5A, | WPS35-2-1A. |

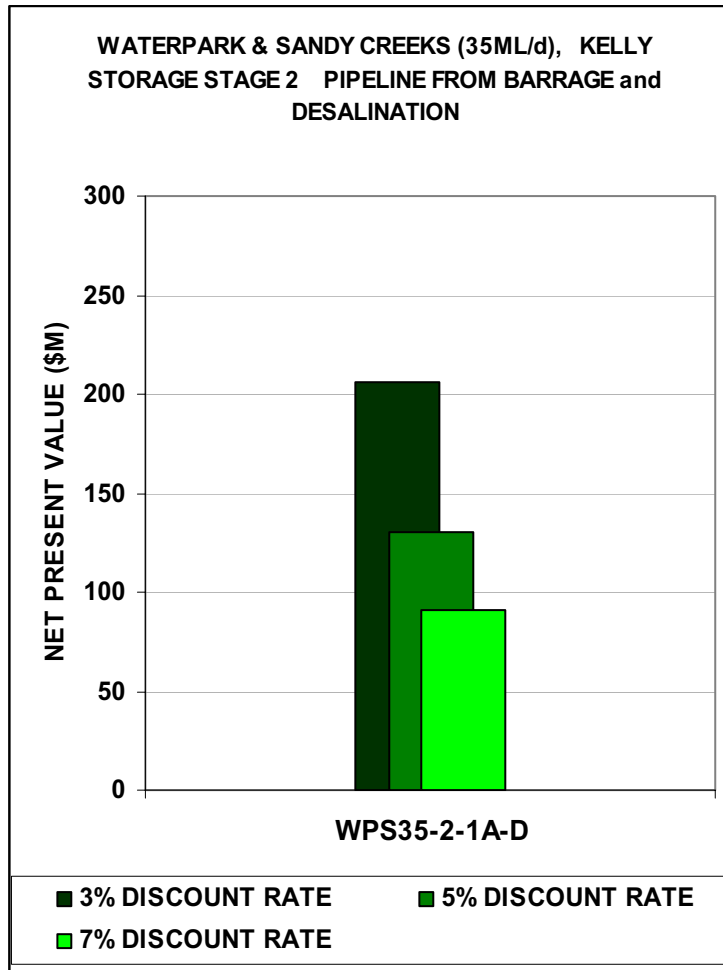


Graph 13.4

Examination of this graph shows that there are benefits from maximising the supply from Waterpark and Sandy Creeks and particularly if Stage 3 of Kellys Offstream Storage is constructed. .

13.3.5 Waterpark and Sandy Creeks, Pipeline from Fitzroy River Barrage and Desalination

Graph 13.5 shows the NPV of a scheme based on augmenting the existing Waterpark Creek scheme with supplies drawn from Sandy Creek, constructing Kellys Offstream Storage Stage 2, a base load pipeline from the Fitzroy River Barrage and eventually the construction of a desalination plant in the year 2024. This scheme is designated **WPS35-2-1A-D**.



Graph 13.5

This option assumes that the maximum flow from the Fitzroy River Barrage is limited to 2,000ML/a and that a desalination plant (or possible Stage 3 of Kelly Offstream Storage and desalination plant) is constructed in about the year 2024.