Grid Service Charges 2012-2013

PHASE 1 – 2011/12 FIXED AND VARIABLE OPERATING EXPENDITURE BENCHMARK REVIEW – LINKWATER

- Rev 3
- Draft
- 1 May 2012

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Sinclair Knight Merz
ABN 37 001 024 095
Cnr of Cordelia and Russell Street
South Brisbane QLD 4101 Australia
PO Box 3848
South Brisbane QLD 4101 Australia
Tel: +61 7 3026 7100
Fax: +61 7 3026 7300
Web: www.skmconsulting.com

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Limitation statement

The sole purpose of this report and the associated services performed by Sinclair Knight Merz Pty Ltd (SKM) is to assist the Queensland Competition Authority (the Authority) in its review of Grid Service Charges for the SEQ Water Grid in accordance with the scope of services set out in the contract between SKM and the Authority. That scope of services, as described in this report, was developed with the Authority.

In preparing this report, SKM has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Authority, the Grid Service Providers and/or from other sources. Except as otherwise stated in the report, SKM has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

SKM derived the data in this report from information sourced from the Authority, the Grid Service Providers and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. SKM has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by SKM for use of any part of this report in any other context.

This report has been prepared within the time restraints imposed by the project program. These time restraints have imposed constraints on SKM's ability to obtain and review information from the Entities.

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1. Executive summary

The Queensland Competition Authority (the Authority) commissioned Sinclair Knight Merz Pty Ltd (SKM) to undertake a benchmarking review of the 2011/12 fixed and variable operating expenditure of the two Grid Service Providers (GSPs) - Seqwater and LinkWater. In addition, SKM has been commissioned to identify potential duplications of effort relating to fixed operating costs between GSPs, their contractors and the SEQ Water Grid Manager and to identify any potential efficiency improvements and areas for potential operating cost savings as a result of the Seqwater-WaterSecure merger on 1 July 2011.

This review forms part of the Authority's process to undertake interim price monitoring for these monopoly utilities. SKM's review of the (two utilities) prudency and efficiency of capital expenditure and operating expenditure (of the two utilities) is documented in separate reports to the benchmarking review reports.

This report pertains to the benchmarking review of 2011/12 fixed and variable operating expenditure of LinkWater and the analysis the potential duplication of effort between LinkWater, its contractors and the SEQ Water Grid Manager.

1.1. Background

On 1 July 2008, the Queensland Government implemented a series of reforms in the SEQ water industry by establishing new bulk water entities, Seqwater, WaterSecure and LinkWater that together owned and operated the SEQ Water Grid. On 1 July 2011 WaterSecure merged with Seqwater to form a single bulk water supply authority called Seqwater. The bulk water transmission system is owned and operated by LinkWater.

1.2. Benchmarking Methodology

Information provided by LinkWater for the 2011/12 price monitoring was reviewed and benchmarking metrics were developed. To gather information on comparator water utilities a number of approaches were adopted including: approaching the regulator within other jurisdictions; approaching water utilities owning and operating similar assets in other jurisdictions via their regulator; approaching water utilities directly; accessing public domain data/information; and drawing on SKM in house data/information. The benchmarking was broken down into three sections – corporate level, asset group level and asset specific level.

A number of issues were encountered during this process including a lack of availability of data and coarseness of data from reference water utilities. In contrast SKM appreciates the support provided by LinkWater and its staff in responding to our requests for information. For the corporate level, information was gathered from a number of national and international water utilities. Asset

specific information from external water utilities was only provided by Ben Lomond Water in Tasmania for two reservoirs and two bulk transmission schemes. Due to the limited information obtained on comparator organisations in the time available to conduct this exercise, at the time of production of this draft report, limited conclusions can be drawn.

SKM notes that the majority of the organisations approached expressed an interest in participating in the benchmarking process and it is SKM's opinion that if additional time was allowed for the organisations to respond and additional effort is put into progressing responses from the organisations, then a more robust benchmarking exercise will be capable of being undertaken.

1.3. Corporate level benchmarking

The corporate level benchmarking undertaken has been undertaken for LinkWater as a whole. Information available for LinkWater included total expenditure, total operating costs, total variable costs and number of FTEs employed. Information collected from other national and international water utilities to allow comparable metrics to be developed included:

- Total operating expenditure ($)
- Water supplied (ML)
- Employee costs ($)
- Total revenue ($)
- Number of full-time equivalents
- Non-current asset value ($)
- Length of mains (km)

Making use of the above information the following metrics were developed for each of the national and international water utilities and the values compared to that of LinkWater:

- Total operating expenditure as a proportion of total water supplied
- Total operating expenditure as a proportion of non-current assets
- Total employee cost as a proportion of total operating expenditure
- Total operating expenditure as a proportion of total revenue
- Total revenue as a proportion of total full-time equivalents
- Total full-time equivalents as a proportion of non-current assets
- Total water supplied as a proportion of the total full-time equivalents
- Total employee cost as a proportion of the total full-time equivalents
- Total operating expenditure as a proportion of mains length

The majority of the comparator utilities have a larger suite of water and wastewater services than LinkWater offers. Where possible, this has been taken into consideration when comparing the various metrics developed in the narrative of this report.

The conclusion from this study is that LinkWater is efficient in organisational issues and spending, has an effective workforce and utilises its asset efficiently. In short, the benchmarks indicate that LinkWater's business operations, as a whole, are in keeping with what would be expected of an efficient operator undertaking bulk water transport.

SKM notes that the majority of the organisations approached expressed an interest in participating in the benchmarking process and it is SKM's opinion that if additional time was allowed for the organisations to respond and additional effort is put into progressing responses from the organisations, a more robust benchmarking exercise will be capable of being undertaken.

1.4. Benchmarking by asset grouping

The asset group benchmarking covers water quality facilities, reservoirs, water pump stations and bulk transmission schemes. Metrics were developed for all of LinkWater's asset groups however a benchmarking comparison was only undertaken for reservoirs. No reference utility information was available on water quality facilities or pump stations as an asset group at the time of writing this draft report. The information available on bulk transmission schemes was limited and was not directly comparable with that provided by LinkWater. The operating costs per ML for the Ben Lomond Water reservoirs ($2,797/ML) and the LinkWater reservoirs ($2,877/ML) are not materially dissimilar. However SKM considers that the high operating cost per km of linear asset (trunk main) exhibited by LinkWater compared to the majority of the comparator utilities indicates that LinkWater is not an efficient operator in this respect.

1.5. Asset specific benchmarking

The asset specific benchmarking covers agreed and selected water quality facilities, reservoirs, water pump stations and bulk transmission schemes. Metrics were developed for all selected LinkWater assets however a benchmarking comparison was only undertaken for reservoirs. No reference utility information was available on water quality facilities or pump station assets at the time of writing this draft report and the reference utility information available on bulk transmission schemes directly comparable with that provided by LinkWater was limited.

The operating costs per ML for Stapylton Reservoir (LinkWater) were compared to operating costs per ML for Rocherlea complex reservoirs and Distillery Creek complex reservoirs (Ben Lomond Water). The comparison indicates that the operating costs per ML storage capacity for Stapylton Reservoir ($11,523/ML) is significantly higher than those of Rocherlea Complex reservoirs ($2,672/ML) and Distillery Creek Complex reservoirs ($2,954/ML). It is suggested that further

investigation be undertaken to determine why the operating costs per ML are so much higher for Stapylton Reservoir than Rocherlea complex reservoirs and Distillery Creek complex reservoirs. No definitive conclusions can be drawn from the comparison due to limited being information available on the breakdown of costs within the operating expenditure of Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs nor on the type of construction of the dams to determine if these costs are, in fact, comparable.

1.6. Duplication of effort – LinkWater, contractors and SEQ Water Grid Manager

A review of the roles and responsibilities of LinkWater, its alliance contractors and the SEQ Water Grid Manager was conducted to identify potential areas of duplication of effort. Organisational charts and descriptions of objectives and responsibilities for each of the positions were provided for review. This data was analysed for common objectives roles and responsibilities.

SKM identified a number of activities where sufficient potential duplication of effort exists between LinkWater, their contractors and the SEQ Water Grid Manager to warrant further investigation as set out in **Table 1**. SKM has also undertaken a subjective analysis as to the level of potential duplication of effort and hence likely cost savings arising from removal of that duplication of effort. SKM has represented this assessment by using the legend 'L', 'M' and 'H' to represent low, medium or high levels of duplication and hence levels of potential cost savings. This same legend may also be read as a recommended order of priority for any future investigation into actual cost savings that may be achieved through removal of any duplication of effort.

Table 1 Summary of areas of potential duplication of effort

Activity	SEQ Water Grid Manager	LinkWater	United Utilities & Transfield Services	Potential cost saving
Administration	✓	✓	✓	L
Agency Contract Management	✓	✓		M
Asset Maintenance I&C	✓	✓		M
Asset Planning Capital		✓	✓	M
Asset Planning Strategic	✓	✓		M
Compliance Management and Regulation	✓	✓		L
Corporate Governance	✓	✓		L
Corporate Knowledge Management	✓	✓		M
Corporate Support	✓	✓	✓	M
Finance	✓	✓	✓	M
Human Resource Management	✓	✓	✓	M

Activity	SEQ Water Grid Manager	LinkWater	United Utilities & Transfield Services	Potential cost saving
Information and Communication Technology (ICT)	✓	✓		M
Legal Services	✓	✓		L
Project Delivery		✓	✓	M
Relationship management	✓	✓		M
Risk Management	✓	✓	✓	L
Water Quality Management	✓	✓		M
Work Place Health and Safety		✓	✓	L

1.7. Summary and conclusions

SKM has conducted benchmarking of LinkWater's 2011/12 fixed and variable operating expenditure against comparator water utilities in so far as is possible with the information available at the time of writing this draft report. The information provided by LinkWater was sufficient to develop the proposed metrics however, for comparator organisations, the limited information available restricted the metrics that could be developed for the benchmarking exercise. To support further analysis it is recommended that an extended benchmarking study is conducted over a longer duration than the current study to allow the capture of relevant information from other water utilities to enable the development of relevant comparator metrics. Nevertheless, SKM considers that LinkWater's costs, as a whole are in keeping with those that would be expected of an efficient operator. However, SKM considers that the high operating cost per km of linear asset (trunk main) exhibited by LinkWater compared to the majority of the comparator utilities indicates that LinkWater is not an efficient operator in this respect.

SKM has reviewed the roles and responsibilities for LinkWater, their major contractors and the SEQ Water Grid Manager to identify potential areas of duplication of effort. A number of areas have been identified where there is considered to be duplication of effort including asset planning strategic and water quality management of sufficient magnitude to warrant further and more detailed investigation. Areas assessed as having greatest potential for efficiency gains through removal of duplication of effort are: Asset Planning Capital, Asset Planning Strategic; and Relationship Management.

2. Introduction

The Queensland Competition Authority (the Authority) is required to recommend the Grid Service Charges (GSCs) to be applied in 2012/13. GSCs represent the amount payable by the South East Queensland Water Grid Manager (SEQ Water Grid Manager) to the two separate Grid Service Providers (GSPs): Seqwater and LinkWater; for declared water services.

To assist it in this process, the Authority has appointed SKM to:

- Conduct a review of available information on operating cost categories for functional and corporate cost centres and for specific asset operation and maintenance, benchmark costs using benchmark metrics such as $/ML storage against similar entities with similar assets
- investigate for any duplication of effort and investigate for any potential efficiency gains from the Seqwater-WaterSecure merger
- Conduct a review of available information, undertake a gap analyses, conduct interviews with the GSPs, prepare information requests, undertake a review of policies and procedures and standards of service, undertake assessments of prudency and efficiency of capital and operating expenditure and conduct a review of allocation of overhead costs

The consultancy consists of two phases:

- Phase 1:
  - Fixed and variable OPEX review – SKM has been requested to review available information on operating cost categories for functional and corporate cost centres and for specific asset operation and maintenance costs. SKM has also been requested to benchmark costs using benchmark metrics such as $/ML storage against similar entities with similar assets as well as to, investigate for any duplication of effort and identify areas for potential efficiency gains
- Phase 2:
  - Component 1: Operational Expenditure – SKM has been requested to undertake a review of policies and procedures and standards of service, undertake assessments of prudency and efficiency of operating expenditure and conduct a review of allocation of overhead costs
  - Component 2: 2011-12 Estimated Actual Capital Expenditure – SKM has been requested to undertake a review of supporting documentation and undertake assessments of prudency and efficiency of selected capital expenditure projects
  - Component 3: 2012-13 Forecast Operational Expenditure – SKM has been requested to undertake a review of policies and procedures, undertake assessments of prudency and

efficiency of selected capital expenditure projects and conduct a review of allocation of overhead costs

2.1. Terms of reference

The full terms of reference are included in **Appendix A.**

2.1.1. Scope exclusions

The following items are outside of the scope of SKM's review:

- Costs associated with capital repayment/depreciation have been excluded from this review
- Quantification of potential duplication of effort between the SEQ Water Grid Manager, the entities and their alliance contractors and estimate of any potential savings arising from removal of those areas of duplication of effort

2.2. Report overview

This report addresses the benchmarking review and duplication of effort (between LinkWater, the SEQ Water Grid Manager and LinkWater's alliance contractor's) review for LinkWater (phase 1). The benchmarking review, duplication of effort review and potential merger efficiency gains for Seqwater is contained in a separate report[1].

This report is structured as follows:

- Background
- Benchmarking methodology
- Corporate level benchmarking
- Benchmarking by asset grouping
- Asset specific benchmarking
- Duplication of effort – LinkWater, contractors and SEQ Water Grid Manager
- Summary and conclusions

[1] Grid Service Charges 2012-2013: Phase 1 – 2011/12 Fixed and Variable Operating Expenditure Review – Seqwater, Draft v1, SKM, April 2012

3. Background

3.1. Water Reform and Grid Entities

On 1 July 2008, the Queensland Government implemented a series of reforms in the South East Queensland (SEQ) water industry by establishing new bulk water entities that own and operate the SEQ Water Grid. Seqwater owns all dams, groundwater infrastructure and water treatment plants in the SEQ Water Grid in SEQ while WaterSecure owned the desalination plant at the Gold Coast and the Western Corridor Recycled Water Scheme.

On 1 July 2011 Seqwater and WaterSecure merged with Seqwater to form a single bulk water supply authority. The bulk water transmission system is owned by LinkWater.

In addition to the bulk water entities, 10 regional council water utilities were amalgamated into three larger retail distribution entities. These entities now own the water and sewerage distribution infrastructure and sell water and wastewater disposal services to customers in their respective areas.

Finally, the reforms also established the roles of the Authority in respect of regulating prices and the SEQ Water Grid Manager.

3.2. The role of the Authority

The Authority is an independent Statutory Authority established by the Queensland Competition Authority Act 1997 and is given the task of regulating prices, access and other matters relating to regulated industries in Queensland.

Under the South East Queensland Water Market Rules (the Market Rules), the Authority is required to recommend the Grid Service Charges (GSCs) for the period from 1 July 2012 until 30 June 2013. The Authority is required to provide a report to the Price Regulator setting out its recommendations on GSCs and such information as is reasonably required, to support its recommendations, by no later than 30 June 2012.

GSCs are paid by the SEQ Water Grid Manager to the two GSPs, for the provision of declared water services. Declared water services relate to the storage, production, treatment and transport of water to retailer-distributors and other Grid Customers, such as power stations and irrigators in South East Queensland. A single GSC is applied for each GSP.

3.3. Role of the SEQ Water Grid Manager

The SEQ Water Grid Manager is responsible for directing the physical operation of the SEQ Water Grid and, by acting as the single buyer of bulk water services and as the single seller of bulk water for urban purposes, provides a mechanism to share the costs of the SEQ Water Grid. It sells a

wholesale "pool" product, which reflects the portfolio cost of supplying retailers with a defined security and quality of supply at a defined bulk supply node.

The SEQ Water Grid Manager sells potable water to the three council-owned retail-distributors at a price determined under the SEQ Bulk Water Price Path. A 10-year price path has been projected for bulk water prices, based on assumed interest rates and consumption patterns by the Queensland Government. The Bulk Water Price Path is intended to reach full cost recovery by 2017/18. The bulk water prices are different from the grid service charges payable by the SEQ Water Grid Manager.

3.4. Background to LinkWater

LinkWater owns, operates and maintains of potable bulk water pipelines and related infrastructure throughout SEQ.

LinkWater was established to:

- improve the regional water supply network in SEQ
- improve regional coordination and management of water supply
- provide more efficient delivery of water services
- enhance customer service for water consumers
- give a clear accountability framework for water supply security

Assets that form LinkWater's network include bulk transmission mains, pump stations, reservoirs and water quality facilities. LinkWater owns, operates and maintains approximately 530 km of water mains, 22 pump stations, 28 reservoirs and seven water quality facilities.

4. Benchmarking Methodology

This section of the report describes the process that SKM undertook to identify and benchmark the corporate wide costs (based on the 2011/12 price determination approved costs) of LinkWater against key cost parameters at relevant comparator water utilities and good industry practice.

To identify expenditure areas and assets to benchmark, initially, the previous benchmarking study[2] was reviewed. Areas to benchmark were identified as a disaggregation of high level benchmarks previously reviewed, together with new corporate cost areas, asset grouping (ie all water pump stations) and individual asset (ie Bundamba Pump Station).

An internal brainstorming exercise was undertaken to determine the information requirements and potential metrics. A comprehensive list of benchmarking metrics was developed and put to the Authority and LinkWater for consideration and comment. Benchmarks suggested included total fixed costs (asset management)/ML water delivered and energy cost/ML water produced. A reduced list of benchmarking metrics was subsequently identified and agreed and is set out in **Table 2**.

- **Table 2 Agreed metrics**

Metrics	
Corporate	Total fixed costs (administrative/functional)/ML water delivered
	Total fixed costs (administrative/functional)/ML water stored
	Total Corporate Overhead (administration/functional)/ML produced/delivered/stored
	Corporate (administration and functional) costs by asset type and by major asset
	Contractor costs by asset type and by major asset
	FTE(administrative/functional)/ML water delivered
	FTE(administrative/functional)/FTE(total)
	FTE(administrative/functional)/km linear asset
	FTE(administrative/functional)/total asset value
	FTE(administrative/functional)/GL storage capacity (total)
	And as above for each administrative/functional activity eg FTE(HR)/FTE(total)
Operational	Operational costs/total corporate (overhead costs)
	Major asset operating costs/asset value by asset type (storage, treatment, transportation) and by major asset
	Total O&M costs/ML produced/delivered
	Total O&M costs/ML stored
	Energy cost/ML water produced/delivered
	Energy cost/ML water stored

[2] Grid Service Charges 2011-2012: Assessment of Capital and Operating Expenditure, Grid Service Provider: LinkWater, SKM, July 2011

Metrics	
	Chemical cost/ML water produced/delivered
	Chemical cost/ML water stored
	Sludge handling/disposal/ML water produced/delivered
	Sludge handling/disposal/ML water stored
	Total maintenance costs/total asset value
	Major asset maintenance costs/asset value by asset type and by major asset
	Planned maintenance costs/unplanned maintenance costs by major asset

The benchmarking has been conducted at three levels: corporate level, asset group level and specific asset level. The corporate level benchmarking looks at LinkWater as a whole, the asset group level benchmarking looks at the asset groups as a whole ie water quality facilities, water pump stations, reservoirs and trunk mains, and the asset specific benchmarking looks at a number of selected individual assets from each of the asset groups. The assets selected were submitted to the Authority and LinkWater for comment and approval.

A review of all provided information and information submitted to the Authority by LinkWater for the 2011/12 period for fixed and variable operating expenditure was completed and information gaps identified. To address the information gaps, information requests were sent to LinkWater. The information received from LinkWater was reviewed and metrics developed. The identified information requirements are outlined below in **Table 3**.

- **Table 3 Information requirements**

Assets	Information Requested	Information Received
Whole of business	Organisational structure	✓
	Description of roles and responsibilities of all business units	✓
	FTEs and expenditure per business unit	✓
	Total value of all assets	✓
	Fleet costs allocated to business unit	Costs not allocated
Water Pump Stations		
Cameron's Hill	ML/year pumped	✓
North Pine	ML/year pumping capacity	✓
Bundamba	Asset Value (replacement)	✓
Trinder Park	Asset age	✓
Mudgeeraba	FTE staff allocated to asset	FTEs not allocated
All others	FTE contractors allocated to asset	Hours only allocated
	Planned and unplanned maintenance costs	✓
	Variable costs – electricity	✓
	Allocation of corporate costs to asset	Costs not allocated

Assets	Information Requested	Information Received
Reservoirs		✓
Green Hill	ML stored	✓
Aspley	Asset Value (replacement)	✓
Narangba	Asset age	✓
Stapylton	FTE staff allocated to asset	FTEs not allocated
All others	FTE contractors allocated to asset	Hours only allocated
	Planned and unplanned maintenance costs	✓
	Variable costs – electricity	✓
	Allocation of corporate costs to asset	Costs not allocated
Trunk Mains		
NIP	ML/year transported	✓
Anstead to Runcorn	ML/year transported capacity	✓
Mt Crosby to Wellers Hill	Asset Value (replacement)	✓
North Pine WTP to Aspley	Asset age	✓
Ipswich Central Main	FTE staff allocated to asset	FTEs not allocated
Tarrant Drive to Elanora	FTE contractors allocated to asset	Hours only allocated
Logan Central Supplies	Planned and unplanned maintenance costs	✓
	Variable costs – electricity	✓
Narangba to North Pine WTP	Allocation of corporate costs to asset	Costs not allocated
Heinemann Rd to Alex Hills		
All others		
Water Quality Facilities		
Chambers Flat	ML/year treated	✓
Alexander Hills	ML/year treated capacity	✓
	Asset Value (replacement)	✓
	Asset age	✓
	FTE staff allocated to asset	FTEs not allocated
	FTE contractors allocated to asset	Hours only allocated
	Planned and unplanned maintenance costs	✓
	Variable costs – electricity, chemical	✓
	Allocation of corporate costs to asset	Costs not allocated
Major Contractors	Contract (if appropriate)	✓
	Organisational structure/description of department roles and responsibilities for contractors (eg, alliance contractors)	✓
	Activities related to fixing operating costs activities of each contractor, ie asset management, planning, capital project business case development, engineering design, project management, operation and maintenance activities	✓
	Total FTE's	✓
	FTE's per activity	✓

LinkWater does not currently have a comprehensive cost allocation method by which to allocate FTEs to assets or corporate costs to assets and as such was unable to provide this information. LinkWater indicated that:

> *"This is largely a result of the requirement of the Water Market Rules to report cost information according to Fixed; Variable and Capital. Within this format the Fixed Costs represent LinkWater's corporate, operational and maintenance costs. Historically these costs have been reported discretely with no subsequent allocation to asset or activity. LinkWater has continued this approach in 2011-12 and 2012-13."*

LinkWater discussed the issue of cost allocation in its 2011/12 Grid Service Charges Submission[3]. LinkWater suggested that consultation would need to occur with the Authority to develop a cost allocation methodology. Where no information has been provided on the FTEs allocated to an asset no FTEs have been included. For the planned and unplanned maintenance of assets, which has been provided as a number of hours, the number of FTEs has been calculated on the basis of 38 hour weeks for 48 working weeks each year.

For future investigations, to facilitate the capture of benchmarking information in relation to the allocation of overheads and FTEs to assets, there would be merit in the Authority agreeing with LinkWater and Seqwater the data to be captured and mechanism for apportionment of costs.[4]

4.1. Comparator water utility metrics

To develop metrics for comparator water utilities a number of approaches were adopted. These included approaching the regulator within other jurisdictions such as the South Australia Essential Services Commission and the Independent Pricing and Regulator Tribunal of New South Wales, approaching water utilities owning and operating similar assets in other jurisdictions via their regulator, approaching the water utilities directly, accessing public domain data/information and drawing on in house data/information.

4.1.1. Water utilities approached

Regulators in other Australian states were approached regarding their willingness and ability to provide information on assets similar to those selected to be reviewed for LinkWater. The response was generally positive however not all of the regulators had relevant information that could be provided. Following discussion and receipt of advice from the Authority only asset specific information was requested from regulators and water utilities outside SEQ. Water utilities to be approached were determined on the basis of the type of assets they own, operate and maintain. In

[3] LinkWater Regulatory Submission to the Queensland Competition Authority, 31 March 2011
[4] SKM considers that the structure and format of this FTE and component cost breakdown allocation would need to be discussed and agreed between the Authority and GSPs before LinkWater could develop systems to achieve this.

this respect whether the water utility provided bulk services or water and wastewater direct to customers was not relevant. Requests for information were sent to:

- the Independent Pricing and Regulatory Tribunal of New South Wales (IPART)
- the Essential Services Commission Victoria (ESA VIC)
- the Office of the Tasmanian Economic Regulator (OTTER)
- South Australia Water
- Economic Regulatory Authority Western Australia (ERA WA)
- Melbourne Water

Water utilities approached directly (for example where its relevant regulator was unable to assist) included the Sydney Catchment Authority, the Northern Territory Power and Water Corporation and the Western Australian Water Corporation. Requests for information have also been sent to Queensland's Wide Bay Water and the Gladstone Area Water Board (GAWB).

Additionally a review of information available in the public domain from regulators and water utilities, both nationally and internationally, was conducted. However it should be noted that there is limited publicly available information that is relevant and that can be used to support this exercise. Information in the public domain, particularly information provided in regulator's reports, relates more to standards of service than operating expenditure and asset specific information.

4.1.2. Response to information requests

At the time of writing of the draft report, information was received from the Office of the Tasmanian Energy Regulator for Ben Lomond Water only. Ben Lomond Water provides water and wastewater services to the northern region of Tasmania. It owns, operates and maintains all assets within the water and wastewater network including dams, water treatment plants, reservoirs, trunk mains and wastewater treatment plants.

Assets that information was provided on were the Rocherlea Complex Reservoirs, Distillery Creek Complex Reservoirs, the West Tamar pipeline scheme and the North Esk pipeline scheme. An overview of the information provided is outlined below in **Table 4**.

- **Table 4 Ben Lomond Water information**

Asset	Capacity	FTEs	Total OPEX ($m)	Overhead costs ($m)	Asset value ($)
Rocherlea Complex Reservoirs	23 ML	0.5	60,170	39,375	3,374,533
Distillery Creek Complex Reservoirs	18 ML	0.5	53,170	23,985	1,231,218
West Tamar pipeline scheme	46 km	1.5	-	141,185	7,225,000
North Esk pipeline scheme	108 km	1.5	-	491,266	25,140,000

The information received on Ben Lomond Water assets was at a relatively high level and therefore the metrics able to be developed were limited.

No other information has been provided from other regulators and water utilities as at the date of issue of this draft report.

4.1.3. Other information sources

Information and comparative data has been obtained from a number of other sources. The majority of this data is publicly available information from local, interstate and some international sources.

The comparative data and information was compiled from numerous sources, including:

- Sydney Water - Annual Report 2001 (Sydney Water, 2011) <http://www.sydneywater.com.au/Publications/Reports/AnnualReport/2011/downloads/_download.cfm?DownloadFile=../pdf_files/full_annual_report.pdf>
- South Australian Water Corporation Annual Report: For the year ending 30 June 2011 (SA Water , 2011) <http://www.sawater.com.au/NR/rdonlyres/47D668BC-2489-4514-ADB4-FA1A6E9B9E89/0/SAWaterAnnualReport1011.pdf>
- Metropolitan Melbourne Water Price Review 2009: Melbourne Water Determination – Services Other Than Metropolitan Drainage and Diversion Services, 1 July 2009 – 30 June 2013 (Essential Services Commission, June 2009) < http://www.esc.vic.gov.au/NR/rdonlyres/3ACADDA8-E633-4728-97DC-339E3988514B/0/DTRMWDeterminationMetropolitanMelbournewaterpricereview2009_20090625.pdf>
- Tasmanian Water and Sewerage State of the Industry Report 2009-10 (Office of the Tasmanian Economic Regulator, March 2011) < http://www.economicregulator.tas.gov.au/domino/otter.nsf/LookupFiles/11949_Tasmanian_Water_and_Sewerage_State_of_the_Industry_Report_2009-10_110415.pdf/$file/11949_Tasmanian_Water_and_Sewerage_State_of_the_Industry_Report_2009-10_110415.pdf>
- Water Corporation Annual Report 2011 (Water Corporation, 2011) <http://www.watercorporation.com.au/_files/PublicationsRegister/6/2011_Annual_Report.pdf >
- June Return 2011 (Dee Valley Water, 2011) <http://www.deevalleywater.co.uk/article.php?id=154 >
- Annual Report and Financial Statements 2011, (South West Water, 2011) <http://www.southwestwater.co.uk/media/pdf/j/q/110634_SWW_AR_2011_10.pdf>

- Thames Water Utilities Finance Limited: Annual Report & Financial Statements for the Period ended 31 March 2011, (Thames Water Utilities Limited, June 2011) <http://www.thameswater.co.uk/cps/rde/xbcr/corp/2011-twul-financials-full-year-statements-31-mar.pdf>
- Dŵr Cymru Cyfyngedig Annual report and financial statements for the year ended 31 March 2011, (Dŵr Cymru Cyfyngedig, June 2011) <http://www.dwrcymru.com/eng/library/company_reports/2011/dcc_statutory_accounts_2011.pdf>
- 2011 Annual Review (Wessex Water, 2011) <http://www.wessexwater.co.uk/WorkArea//DownloadAsset.aspx?id=7449>
- Annual Report & Accounts 2011 (Bristol Water, May 2011) <http://www.bristolwater.co.uk/pdf/aboutUs/companyReports/bwAnnualReport11.pdf>
- Comprehensive Budget Report Fiscal Year 2011: Portland, Maine (Portland Water District, 2011) <http://www.pwd.org/pdf/2011%20Final%20Budget.pdf>

4.1.4. Incomplete data and information

Prior to the development of the metrics a review of the data was undertaken. From this review, the following issues were identified:

- Incomplete Data – not all information requested from LinkWater has been received. This is due to limitations on the data able to be supplied, ie the information has not been collected before and hence LinkWater has no mechanism to collect and collate this data in the time available. This limits the extent of the metrics able to be developed
- Inconsistent Data – the additional information provided by the LinkWater is not consistent with information provided for the 2011/12 review. As SKM's review is based on the information received during the 2011/12 review this constrains the effectiveness of comparisons
- Coarseness of Data – the Authority instructed SKM to request information at the asset level, ie site-by-site information, rather than at LinkWater's corporate or asset group level, from water utilities beyond LinkWater and LinkWater. This has limited the effectiveness of any comparison SKM was able to undertake on asset grouping basis and on a whole of organisation basis

5. Corporate level benchmarking

For the corporate level benchmarking exercise the information received as part of the 2011-12 assessment and responses to requests for information were reviewed. The information received previously and in response to the information requests were complied to allow for the development of metrics and their analysis. The complete data set is provided in **Appendix A**.

A sample of the information used in the development of metrics is included below in **Table 5**.

Table 5 Sample information

Data	Value	Unit
Total operating expenditure	45,121,492	$
Total fixed operating costs	42,621,492	$
Corporate fixed operating costs	14180035	$
Operational fixed operating costs	9965241	$
Maintenance fixed operating costs	18476216	$
Total variable operating costs	2,500,000	$
Total water supplied	223,944	ML
Total staff employed	284	FTE
Total staff employed - Administration	67	FTE
Total staff employed - Functional	217	FTE

Note: The administration staff group relates to those staff that are employed within the Business Services, CEO Services, Corporate Services and Legal Services business units within LinkWater, while the functional staff group relates to those staff that are employed within the Operational Services and Project Services business units.

Metrics developed

A number of corporate level benchmarks were developed based on the information available. These relate to FTEs, fixed operating costs and variable costs. The fixed operating cost activities identified by the Authority; asset management, capital planning, engineering services, planned and unplanned maintenance and administration; have been aligned with appropriate business units within LinkWater, and are described below in **Table 6**.

Table 6 Alignment of fixed operating cost activities

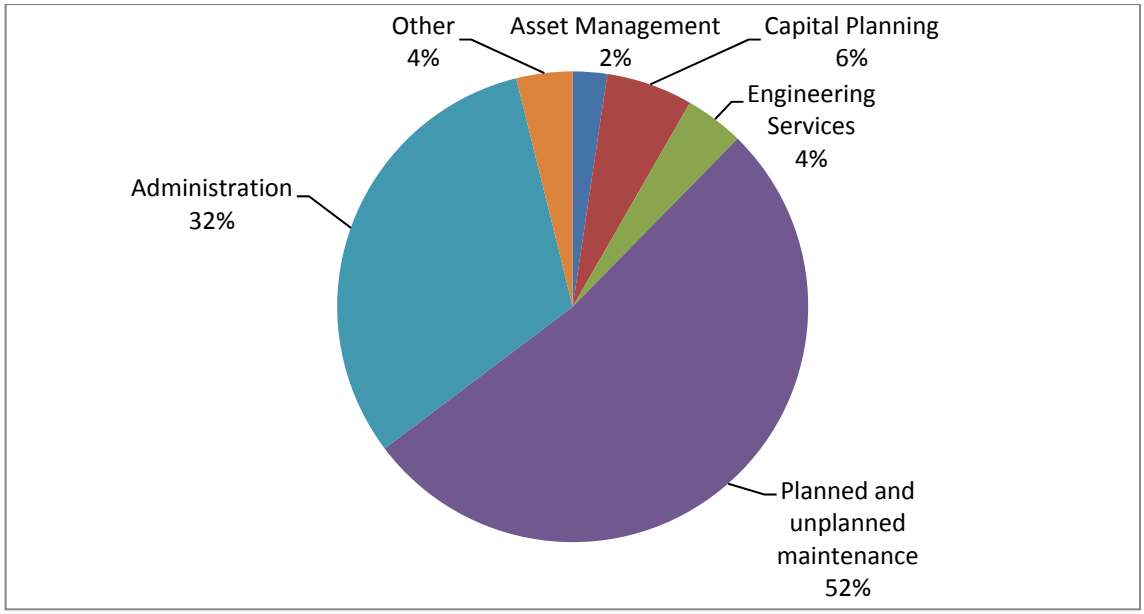
Fixed operating cost activity	LinkWater business unit
Asset management	Strategic Asset Management
Capital planning	Infrastructure Planning
Engineering services	Project Services
Planned and unplanned maintenance	Service Delivery
Administration	Business Services, CEO Services, Corporate Services and Legal Services units
Other	Operational Services GM

The corporate metrics developed are outlined below in **Table 7**. The total fixed costs are the costs associated with all aspects of the business excluding operational costs while the total corporate costs are the costs associated with administration, IT and leasing premises together with operational and operational staff costs.

Table 7 Corporate metrics for LinkWater

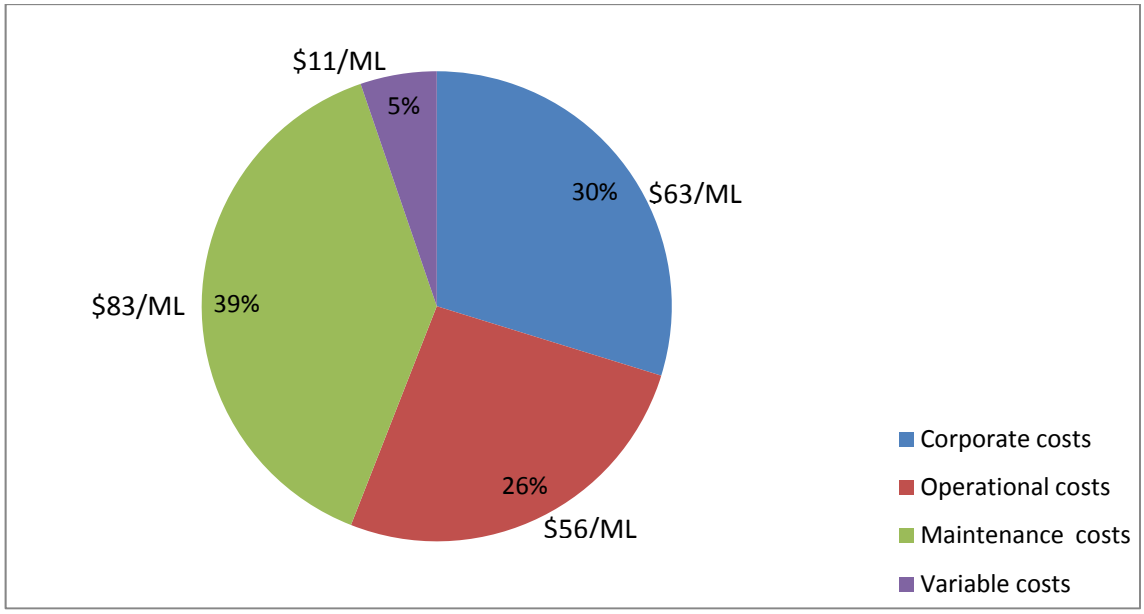
Metric	Component 1	Component 2	Value	Unit
Total operating expenditure/ML water supplied	$45,121,492	223,944	201.49	$/ML
Total fixed costs/ML water supplied	$42,621,492	223,944	190.32	$/ML
Corporate costs/ML water supplied	$14,180,035	223,944	63.32	$/ML
Operational costs/ML water supplied	$9,965,241	223,944	55.66	$/ML
Maintenance costs/ML water supplied	$18,476,216	223,944	82.50	$/ML
Total variable costs/ML water supplied	$2,500,000	223,944	11.16	$/ML
FTE (total)/ML water supplied	284.0	223,944	0.0013	FTE/ML
FTE (Asset Management)/ML water supplied	6.0	223,944	0.000027	FTE/ML
FTE (Asset Management)/FTE (total)	6.0	284	0.021	Ratio
FTE (Capital Planning)/ML water supplied	15.0	223,944	0.000067	FTE/ML
FTE (Capital Planning)/FTE (total)	15.0	284	0.053	Ratio
FTE (Engineering Services)/ML water supplied	33.0	223,944	0.00015	FTE/ML
FTE (Engineering Services)/FTE (total)	33.0	284	0.12	Ratio
FTE (Maintenance)/ML water supplied	160.9	223,944	0.00072	FTE/ML
FTE (Maintenance)/FTE (total)	160.9	284	0.5665	Ratio
FTE (Administration)/ML water supplied	67.1	223,944	0.00030	FTE/ML
FTE (Administration)/FTE (total)	67.1	284	0.24	Ratio
FTE (Other)/ML water supplied	2.0	223,944	0.0000089	FTE/ML
FTE (Other)/FTE (total)	2.0	284	0.0070	Ratio

Figure 1 indicates that the total costs associated with planned and unplanned maintenance account for approximately 52% of all costs with administration the next highest at over 32%.



- **Figure 1 Total costs by activity for LinkWater**

Figure 2 presents the breakdown of total costs (corporate, operational, maintenance and variable) as a percentage per ML water supplied. The figure indicates that the operational costs are the largest costs associated with the organisation comprising some 30% of overall costs of LinkWater.



- **Figure 2 Percentage breakdown of costs per ML water supplied**

5.1.1. Comparator water utility metrics

The publicly available information is limited to relatively high level information published in regulatory reviews and utility annual reports. Due to limited information there are "gaps" in the benchmarking information. It should also be noted that the comparison entities have different business models (range of services provided and hence assets owned and operated) to that of LinkWater. It is therefore anticipated that although a comparison can be made that it will require the reader to take into consideration the business model of the comparator entity and how this relates to the business model of LinkWater in order to appreciate the relevance of the comparison. SKM has based its interpretation of the data on the differences within the business model of LinkWater and those of the comparator entities.

5.1.2. Benchmark comparison and discussion – Australian Entities

Information for a number of water utilities within other Australian states and territories were gathered, these included Melbourne Water, Ben Lomond Water, Sydney Water, the South Australian Water Corporation and WA Water Corporation. Information collected included:

- Total operating expenditure ($)
- Water supplied (ML)
- Employee costs ($)
- Total revenue ($)
- Number of full-time equivalents

- Non-current asset value ($)
- Length of mains (km)

The services provided by each of the utilities are outlined in **Table 8**. As all of the water utilities provide a different suite of services to their customers, the services provide by other utilities do not necessarily directly align with those provided by LinkWater. As such the metrics should not be considered as directly comparable.

Table 8 Services provided by utilities

Service	Water Utility															
	LinkWater	Sydney Water	Hunter Water	Melbourne Water	SA Water Corporation	Ben Lomond Water	Southern Water	Cradle Mountain Water	WA Water Corporation	Aqwest	Busselton Water	Power and Water	ACTEW	City West Water	South East Water	Yarra Valley Water
Water storage		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Water treatment		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Bulk transmission	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Re-chlorination	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Distribution		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Retail		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wastewater collection		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Wastewater treatment		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Advanced water treatment		✓		✓									✓	✓	✓	✓
Desalination		✓							✓							
Other services (eg electricity)												✓	✓			

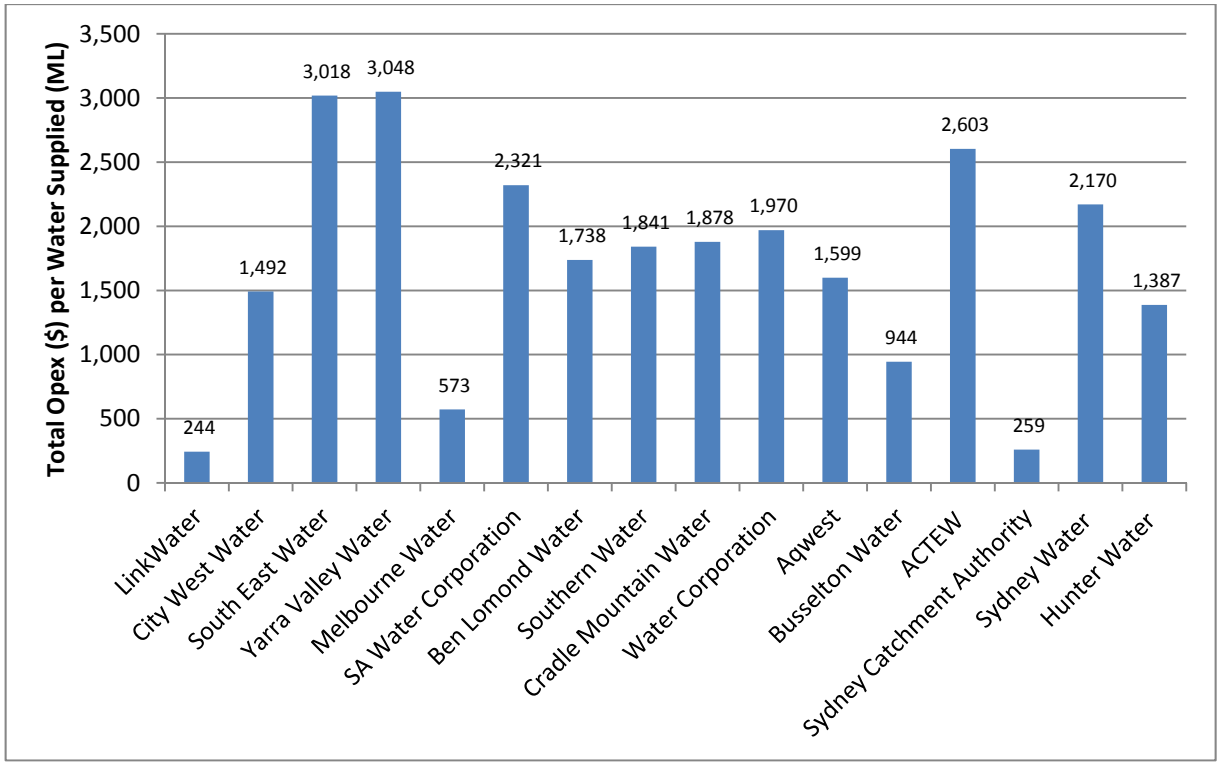
5.1.2.1. Total operating expenditure as a proportion of water supplied

SKM has developed a metric that details the proportion of the total operating expenditure to the water supplied. **Table 9** below presents the information used to develop the metric.

- **Table 9 Total operating expenditure as a proportion of water supplied data**

Water utility	State	Total operating expenditure ($)	Water supplied (ML)
LinkWater	QLD	54,591,979	223,944
City West Water	Vic	134,113,000	89,875
South East Water	Vic	372,000,000	123,251
Yarra Valley Water	Vic	376,400,000	123,476
Melbourne Water	Vic	201,400,000	351,761
SA Water Corporation	SA	456,393,000	196,666
Ben Lomond Water	Tas	33,297,000	19,158
Southern Water	Tas	76,436,000	41,517
Cradle Mountain Water	Tas	30,549,000	16,265
Water Corporation	WA	707,128,000	358,995
Aqwest	WA	9,097,909	5,690
Busselton Water	WA	3,988,073	4,222
ACTEW	ACT	106,509,000	40,914
Sydney Catchment Authority	NSW	107,992,000	416,944
Sydney Water	NSW	1,119,653,000	515,903
Hunter Water	NSW	101,910,000	73,449

The values of these metrics are visually represented in **Figure 3**. This metric provides a high-level indication to the efficiency of the various entities in respect of total costs incurred in the supply of water. In interpreting the result for LinkWater and comparing it with the metrics of the other Australian entities, a lower proportion of operating expenditure to water supplied indicates, broadly, that the entity is more efficient.



- **Figure 3 Total operating expenditure as a proportion of water supplied - National**

Figure 3 indicates that the overall operating expenditure per ML for LinkWater is substantially lower than the majority of the comparator utilities, with the exception of Melbourne Water and the Sydney Catchment Authority. It is not unexpected that the costs per ML supplied for LinkWater are be substantially lower than those of the majority of the comparator utilities given that the water services that LinkWater provides are materially less than those of the majority of the comparator utilities.

The overall cost per ML for the Sydney Catchment Authority is within the same range as that for LinkWater and this can be attributed to the fact that the Sydney Catchment Authority supplies untreated water to utilities, such as Sydney Water, for treatment and distribution to consumers and hence does not incur the costs associated with treatment and distribution which is comparable to LinkWater only providing bulk water distribution. SKM notes that the cost/ML ratio for Melbourne Water is much lower than the majority of the comparator utilities. This may be attributed to the low energy use water supply system in Melbourne, ie the vast majority of the water supply system is gravity fed, and therefore requires less energy and a resulting lower operating expenditure than for the other utilities.

SKM notes that the comparator water entities excluding Sydney Catchment Authority have a full suite of water services as indicated in **Table 8** and it is therefore expected that the proportion of total operating expenditure to water supplied should be proportionally higher than for an entity

such as LinkWater which provides only bulk water. Apart from Melbourne Water and Sydney Catchment Authority the operating cost per ML metric developed for LinkWater is lower than the other comparator entities.

SKM considers that, based on the above information, LinkWater's total operating expenditure as a proportion of water supplied is consistent with that of an efficient operator.

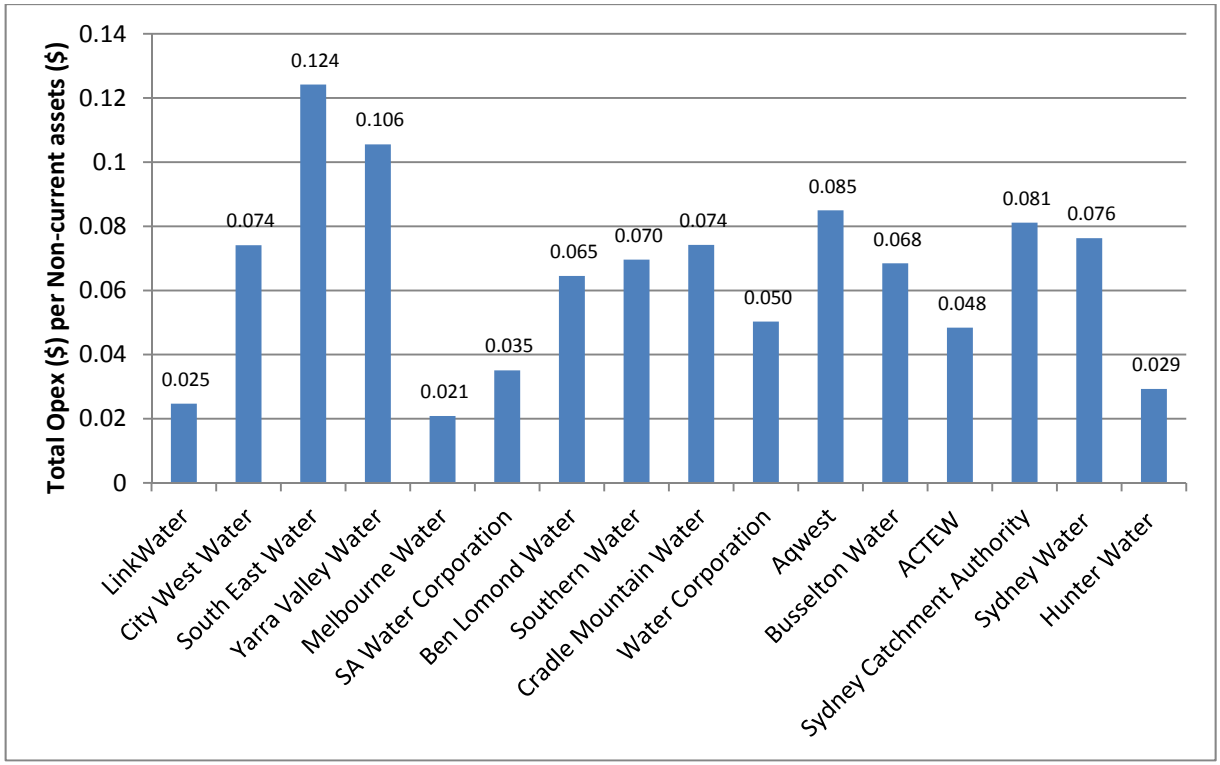
5.1.2.2. Total operating expenditure as a proportion of non-current assets

SKM has developed a metric that compares the proportion of the total operating expenditure to the non-current assets (as represented by property, plant and equipment). **Table 10**, below, presents the information used to develop this metric.

Table 10 Total operating expenditure as a proportion of non-current assets data

Water utility	State	Total operating expenditure ($)	Non-current assets ($)
LinkWater	QLD	54,591,979	2,208,600,000
City West Water	Vic	134,113,000	1,809,910,000
South East Water	Vic	372,000,000	2,995,095,000
Yarra Valley Water	Vic	376,400,000	3,566,300,000
Melbourne Water	Vic	201,400,000	9,644,800,000
SA Water Corporation	SA	456,393,000	13,004,403,000
Ben Lomond Water	Tas	33,297,000	516,218,000
Southern Water	Tas	76,436,000	1,098,503,000
Cradle Mountain Water	Tas	30,549,000	411,763,000
Water Corporation	WA	707,128,000	14,060,000,000
Aqwest	WA	9,097,909	107,058,158
Busselton Water	WA	3,988,073	58,263,514
ACTEW	ACT	106,509,000	2,199,941,000
Sydney Catchment Authority	NSW	107,992,000	1,330,920,000
Sydney Water	NSW	1,119,653,000	14,675,087,000
Hunter Water	NSW	101,910,000	3,481,657,000

The values of these metrics are visually represented in **Figure 4**. The metric provides a high-level indication of the operating expenditure efficiency of the various entities in maintaining their assets. In interpreting the result for LinkWater and comparing it with the metrics of the other Australian entities, a lower proportion of operating expenditure to non-current-assets indicates, broadly, that the entity is more efficient in maintaining its assets (assuming that that level to which assets are maintained is consistent, that the assets are being maintained correctly and not simply being allowed to decline in condition).



- **Figure 4 Total operating expenditure as a proportion of non-current assets - National**

Figure 4 indicates that LinkWater's total operating expenditure as a proportion of non-current asset value is the second lowest of the comparator utilities. SKM considers the result to be as expected due to the relative low operation cost required for bulk water distribution in relation to that required for treatment and distribution and wastewater collection and treatment.

SKM notes that the total operating expenditure to asset value ratio for Melbourne Water is much lower than the majority of the reference utilities. This may be attributed, in part, to the low energy use water supply system in Melbourne, ie the vast majority of the water supply system is gravity fed, and therefore has a lower energy requirement and a resulting lower operating expenditure arising from lower electricity costs than the other utilities.

SKM considers that, based on the above information, LinkWater's total operating expenditure as a proportion of non-current asset value is consistent with that expected of an efficient operator.

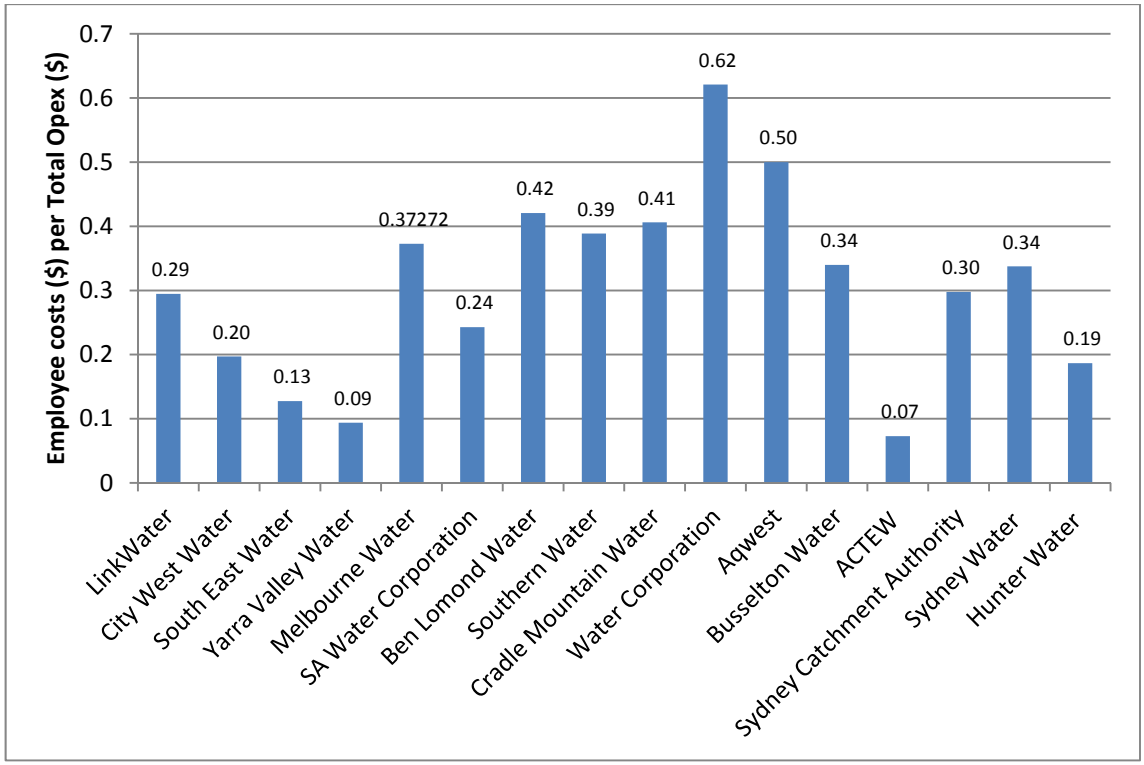
5.1.2.3. Total employee cost as a proportion of total operating expenditure

SKM has developed a metric that compares the proportion of the total employee cost to the total operating expenditure. **Table 11**, below, presents the information used to develop the metric.

- **Table 11 Total employee cost as a proportion of total operating expenditure data**

Water utility	State	Employee costs ($)	Total operating expenditure ($)
LinkWater	QLD	16,088,627	54,591,979
City West Water	Vic	26,441,000	134,113,000
South East Water	Vic	47,465,000	372,000,000
Yarra Valley Water	Vic	35,345,000	376,400,000
Melbourne Water	Vic	75,065,000	201,400,000
SA Water Corporation	SA	110,773,000	456,393,000
Ben Lomond Water	Tas	14,003,000	33,297,000
Southern Water	Tas	29,718,000	76,436,000
Cradle Mountain Water	Tas	12,408,000	30,549,000
Water Corporation	WA	439,000,000	707,128,000
Aqwest	WA	3,226,154	9,097,909
Busselton Water	WA	1,355,160	3,988,073
ACTEW	ACT	7,770,000	106,509,000
Sydney Catchment Authority	NSW	32,149,000	107,992,000
Sydney Water	NSW	377,906,000	1,119,653,000
Hunter Water	NSW	19,010,000	101,910,000

The values of these metrics are visually represented in **Figure 5**. This metric provides a high-level indication to the productivity of the staff employed of the various entities. In interpreting the result for LinkWater and comparing it with metrics derived for the other Australian entities, a lower proportion of employee cost to operating expenditure indicates, broadly, that the entity is more efficient and its staff more highly utilised and hence productive.



- **Figure 5 Total employee cost as a proportion of total operating expenditure - National**

Figure 5 indicates that LinkWater's total employee costs to total operating expenditure is comparable to the majority of the comparator utilities.

The relative high value for Melbourne Water is as expected since the operational expenditure is lower due to the vast majority of their water supply system being gravity fed. SKM has no explanation for the exceptional high value for Water Corporation (Western Australia) except that staff salaries and employment costs may be higher than in Eastern States as a result of the mining boom.

SKM considers that, based on the above information, LinkWater's total employee cost as a proportion of total operating expenditure is consistent with that of an efficient operator.

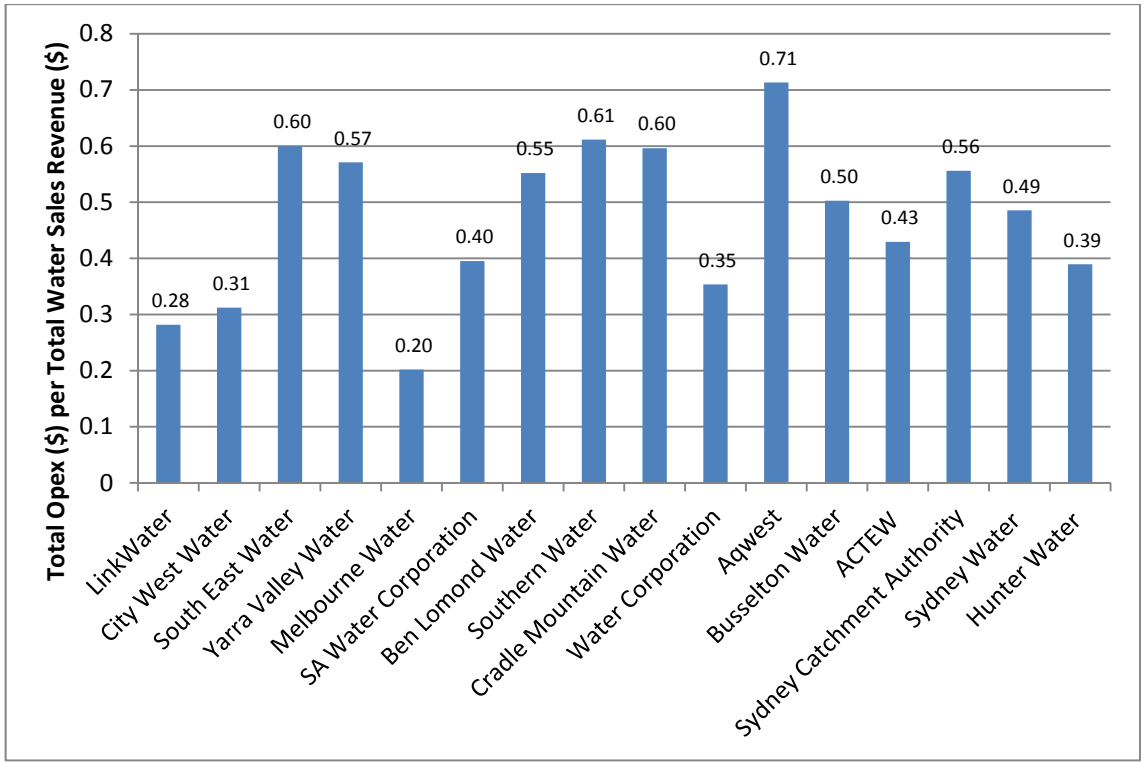
5.1.2.4. Total operating expenditure as a proportion of total revenue

SKM has developed a metric that compares the proportion of the total operating expenditure to the total revenue. **Table 12**, below, presents the information used to develop the metric.

- **Table 12 Total operating expenditure as a proportion of total revenue data**

Water utility	State	Total operating expenditure ($)	Total Revenue ($)
LinkWater	QLD	54,591,979	193,746,000
City West Water	Vic	134,113,000	429,667,000
South East Water	Vic	372,000,000	620,055,000
Yarra Valley Water	Vic	376,400,000	659,130,000
Melbourne Water	Vic	201,400,000	997,300,000
SA Water Corporation	SA	456,393,000	1,154,703,000
Ben Lomond Water	Tas	33,297,000	60,338,000
Southern Water	Tas	76,436,000	124,989,000
Cradle Mountain Water	Tas	30,549,000	51,249,000
Water Corporation	WA	707,128,000	1,999,330,000
Aqwest	WA	9,097,909	9,046,131
Busselton Water	WA	3,988,073	7,932,726
ACTEW	ACT	106,509,000	248,000,000
Sydney Catchment Authority	NSW	107,992,000	194,218,000
Sydney Water	NSW	1,119,653,000	2,305,962,000
Hunter Water	NSW	101,910,000	261,707,000

The values of these metrics are visually represented in **Figure 6**. This metric provides a high-level indication to the efficiency of the various entities in delivering water. In interpreting the results for LinkWater and comparing it with the metrics of the other Australian entities, a lower proportion of operating expenditure to total revenue indicates, broadly, that the entity is more efficient.



- **Figure 6 Total operating expenditure as a proportion of total revenue - National**

Figure 6 indicates that LinkWater's operating expenditure to total revenue ratio is the second lowest of all the comparator utilities. This may be attributed to the relatively low operating expenditure required for operating a bulk water distribution network as compared to the entities that operate water treatment plants, wastewater services and water distribution networks.

Melbourne Water has the lowest operating expenditure to total revenue ratio and this is attributed to the vast majority of their water supply system being gravity fed, and therefore has a lower energy requirement and resulting lower operating expenditure arising from lower electricity costs.

SKM considers that, based on the above information, LinkWater's total operating expenditure as a proportion of total revenue is consistent with that of an efficient operator.

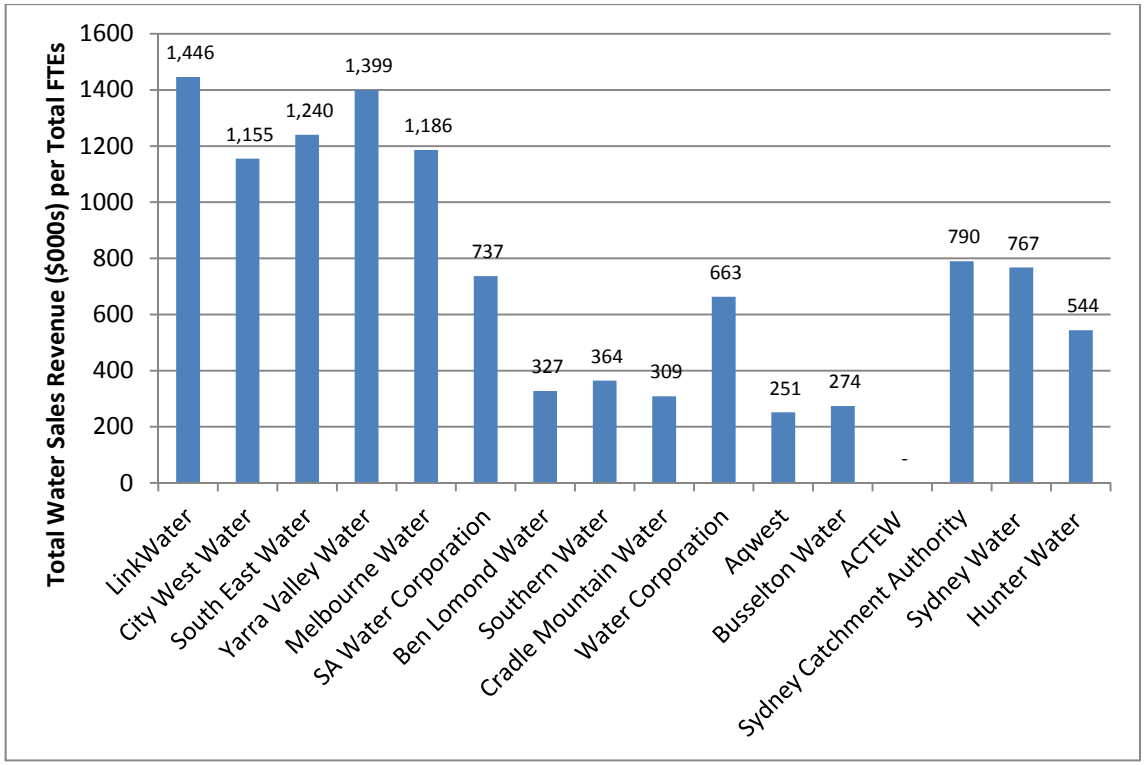
5.1.2.5. Total revenue as a proportion of total full-time equivalents

SKM has developed a metric that details the proportion of the total revenue to the total full-time equivalents. **Table 13**, below, presents the information used to develop the metric.

- **Table 13 Total revenue as a proportion of total full-time equivalents data**

Water utility	State	Total Revenue ($)	Total FTEs
LinkWater	QLD	193,746,000	134
City West Water	Vic	429,667,000	372
South East Water	Vic	620,055,000	500
Yarra Valley Water	Vic	659,130,000	471
Melbourne Water	Vic	997,300,000	841
SA Water Corporation	SA	1,154,703,000	1,567
Ben Lomond Water	Tas	60,338,000	184
Southern Water	Tas	124,989,000	343
Cradle Mountain Water	Tas	51,249,000	166
Water Corporation	WA	1,999,330,000	3,015
Aqwest	WA	9,046,131	36
Busselton Water	WA	7,932,726	29
ACTEW	ACT	248,000,000	-
Sydney Catchment Authority	NSW	194,218,000	246
Sydney Water	NSW	2,305,962,000	3,005
Hunter Water	NSW	261,707,000	481

The values of these metrics are visually represented in **Figure 7**. This metric provides a high-level indication to the efficiency of the various entities in terms of staff productivity. In interpreting the result for LinkWater and comparing it result with the metrics of the other Australian entities, a higher proportion of the total revenue to total full-time equivalents indicates, broadly, that the entity is more efficient and that staff have a higher degree of utilisation and hence are more productive.



- **Figure 7 Total revenue as a proportion of total full-time equivalents - National**

Figure 7 indicates that LinkWater's ratio of total revenue to total full-time equivalents is the highest of the comparator utilities. This may be attributed to the nature of the services provided by LinkWater compared to the reference utilities, ie water treatment and manufactured water services with staff only associated with these functions compared with water treatment, water mains distribution, wastewater collection and wastewater treatment services with staff associated with all aspects. Analysis of the values of the total revenue ratio to total full-time equivalents reveals that the higher values are within the well populated areas (Brisbane, Melbourne, Perth, Adelaide and Sydney) and that the lower values are within the less populated areas (parts of Western Australia, Hunter Valley and Tasmania). This is as expected since less full-time equivalents are required to undertake the operations and maintenance for a water system that has a compact footprint.

SKM considers that, based on the above information, LinkWater's total revenue as a proportion of total full-time equivalents is consistent with that of an efficient operator.

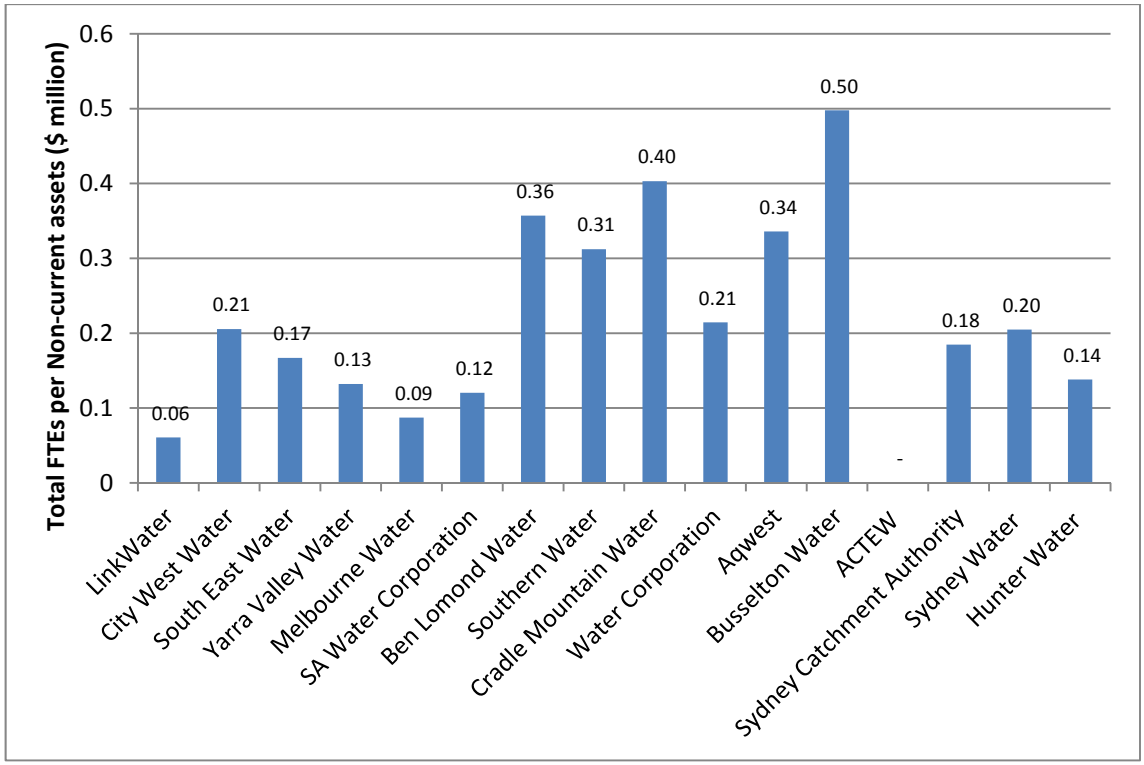
5.1.2.6. Total full-time equivalents as a proportion of non-current assets

SKM has developed a metric that contrasts the proportion of the total full time equivalents to the non-current assets (as represented by property, plant and equipment). **Table 14**, below, presents the information used to develop the metric.

- **Table 14 Total full-time equivalents as a proportion of non-current assets data**

Water utility	State	Total FTEs	Non-current assets ($)
LinkWater	QLD	134	2,208,600,000
City West Water	Vic	372	1,809,910,000
South East Water	Vic	500	2,995,095,000
Yarra Valley Water	Vic	471	3,566,300,000
Melbourne Water	Vic	841	9,644,800,000
SA Water Corporation	SA	1,567	13,004,403,000
Ben Lomond Water	Tas	184	516,218,000
Southern Water	Tas	343	1,098,503,000
Cradle Mountain Water	Tas	166	411,763,000
Water Corporation	WA	3,015	14,060,000,000
Aqwest	WA	36	107,058,158
Busselton Water	WA	29	58,263,514
ACTEW	ACT	-	2,199,941,000
Sydney Catchment Authority	NSW	246	1,330,920,000
Sydney Water	NSW	3,005	14,675,087,000
Hunter Water	NSW	481	3,481,657,000

The values of these metrics are visually represented in **Figure 8**. This metric provides a high-level indication to the efficiency of the workforce and effectiveness of asset utilisation. In interpreting the results and comparing the metric for LinkWater with those of the other Australian entities, a lower proportion of total full time equivalents to non-current assets indicates, broadly, that the entity has small number of staff relative to the size of the entity.



- **Figure 8 Total full-time equivalents as a proportion of non-current assets - National**

Figure 8 indicates that the full time equivalents as a proportion of non-current assets metric for LinkWater are comparable to and lower than the equivalent metrics of the comparator utilities. This can be attributed to LinkWater's high value asset base and the relatively low number of full-time equivalents required to undertake the operations and maintenance of the infrastructure.

The three water entities (Ben Lomond Water, Southern Water and Cradle Mountain Water) are both within Tasmania and the higher metric value could be ascribed to the terrain operated in by these utilities and the associated additional cost arising from such.

SKM considers that, based on the above information, LinkWater's total full-time equivalent as a proportion of non-current assets metric is consistent with that of an efficient operator.

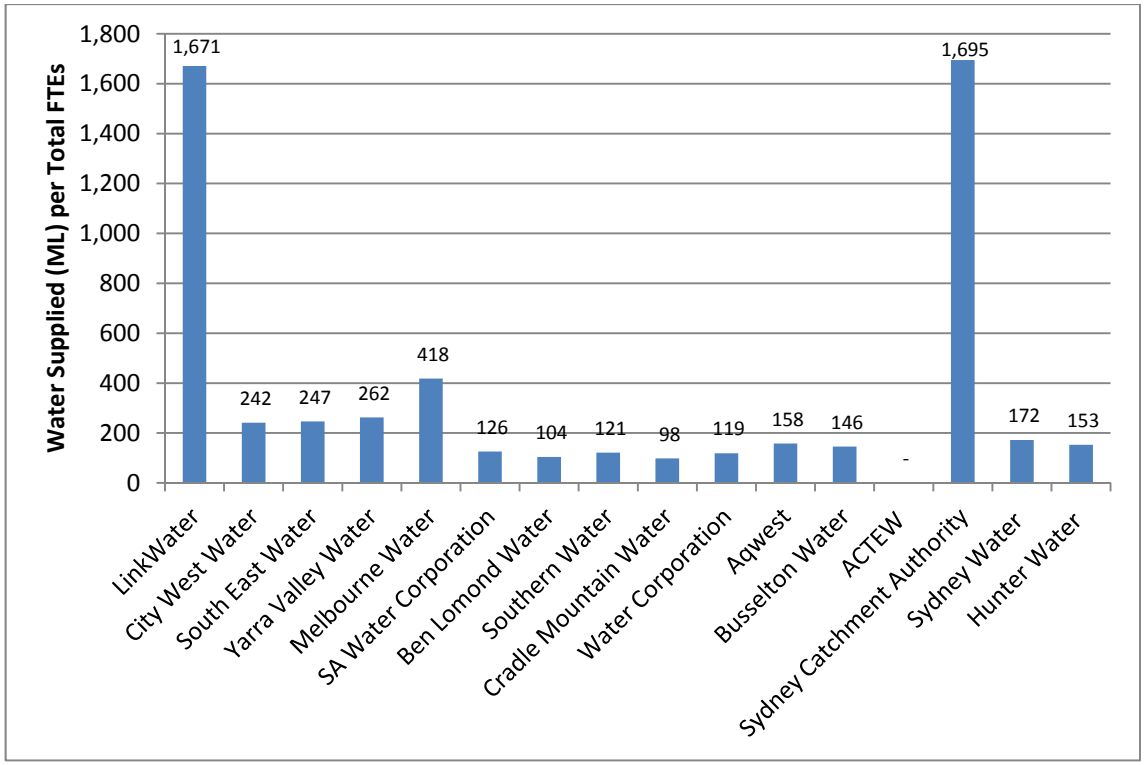
5.1.2.7. Water supplied as a proportion of total full-time equivalents

SKM has developed a metric that contrasts the proportion of the water supplied to the total full time equivalents. **Table 15**, below, presents the information used to develop the metric.

Table 15 Water supplied as a proportion of total full-time equivalents data

Water utility	State	ML water supplied	Total FTEs
LinkWater	QLD	223,944	134
City West Water	Vic	89,875	372
South East Water	Vic	123,251	500
Yarra Valley Water	Vic	123,476	471
Melbourne Water	Vic	351,761	841
SA Water Corporation	SA	196,666	1,567
Ben Lomond Water	Tas	19,158	184
Southern Water	Tas	41,517	343
Cradle Mountain Water	Tas	16,265	166
Water Corporation	WA	358,995	3,015
Aqwest	WA	5,690	36
Busselton Water	WA	4,222	29
ACTEW	ACT	40,914	-
Sydney Catchment Authority	NSW	416,944	246
Sydney Water	NSW	515,903	3,005
Hunter Water	NSW	73,449	481

The values of these metrics are visually represented in **Figure 9**. In interpreting the result for LinkWater and comparing it with the metrics of the other Australian water entities, a higher proportion of water supplied to the total full time equivalents indicates, broadly, that the entity is more efficient.



- **Figure 9 Water supplied as a proportion of total full-time equivalents**

Figure 9 indicates that LinkWater has the second highest ratio of total water supplied to total full-time equivalents. This is attributed to the nature of the services provided by the comparator utilities, ie water treatment, manufactured water, wastewater services, etc.

SKM notes that the metric for the Sydney Catchment Authority is significantly higher than the other reference utilities. This is attributed to the fact that a significant quantity of water is supplied by the Sydney Catchment Authority with a relatively small number of employees as no treatment of the water is conducted.

SKM notes that the water supplied as a proportion of total full-time equivalents for a number of utilities, such as Cradle Mountain Water and Sydney Water, are less than 200. This is attributed to the utilities providing both water and wastewater services to their customers and as such the total full-time equivalents includes staff associated with both water and wastewater services.

SKM considers that, based on the above information, LinkWater's total water supplied as a proportion of total full-time equivalents is consistent with that of an efficient operator.

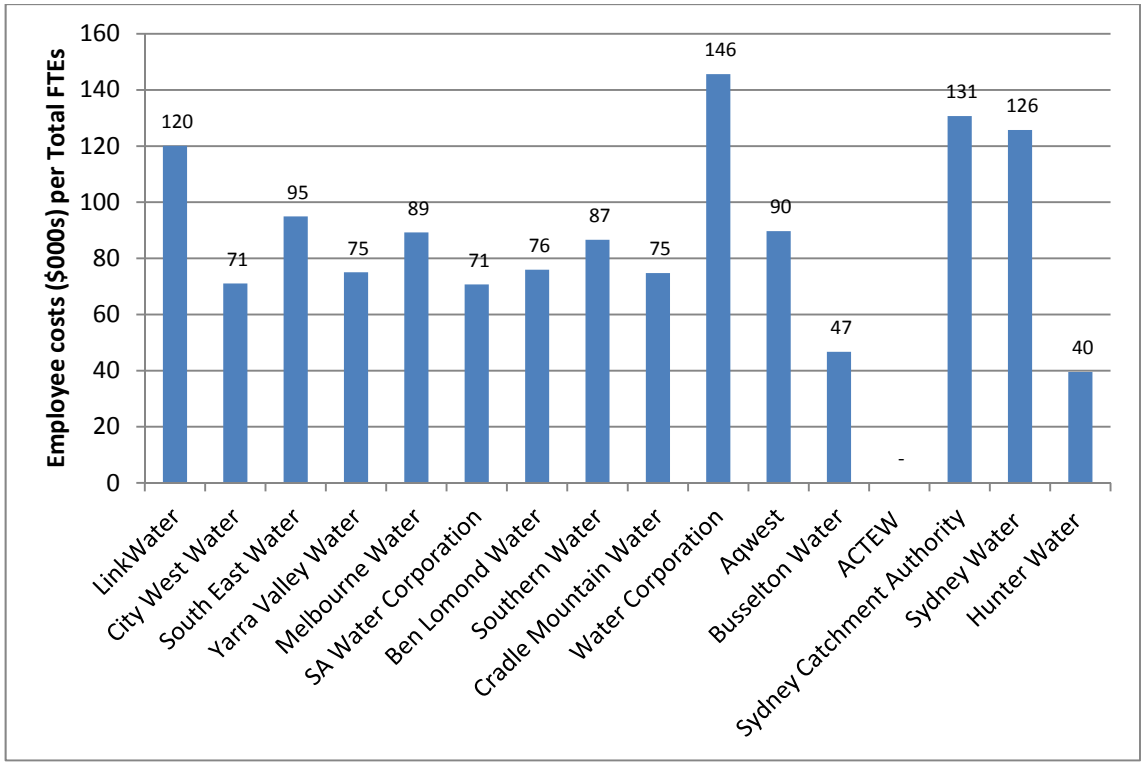
5.1.2.8. Total employee cost as a proportion of total full-time equivalents

SKM has developed a metric that contrasts the proportion of the total employee cost to the total of full-time equivalents. **Table 16**, below, presents the information used to develop the metric.

- **Table 16 Total employee cost as a proportion of total full-time equivalents data**

Water utility	State	Employee costs ($)	Total FTEs
LinkWater	QLD	16,088,627	134
City West Water	Vic	26,441,000	372
South East Water	Vic	47,465,000	500
Yarra Valley Water	Vic	35,345,000	471
Melbourne Water	Vic	75,065,000	841
SA Water Corporation	SA	110,773,000	1,567
Ben Lomond Water	Tas	14,003,000	184
Southern Water	Tas	29,718,000	343
Cradle Mountain Water	Tas	12,408,000	166
Water Corporation	WA	439,000,000	3,015
Aqwest	WA	3,226,154	36
Busselton Water	WA	1,355,160	29
ACTEW	ACT	7,770,000	-
Sydney Catchment Authority	NSW	32,149,000	246
Sydney Water	NSW	377,906,000	3,005
Hunter Water	NSW	19,010,000	481

The values of these metrics are visually represented in **Figure 10**. In interpreting the result for LinkWater and comparing it with the metrics of the other Australian water entities, a lower proportion of total employee cost to total full-time equivalents indicates, broadly, that the entity is more efficient.



- **Figure 10 Total employee cost as a proportion of total full-time equivalents**

Figure 10 indicates that LinkWater's total employee cost to total full-time equivalents is comparable with the majority of the reference utilities.

SKM notes that the metrics for Busselton Water and Hunter Water are significantly lower than the reference utilities potentially indicating relative lower salaries for employees in these areas. However SKM has not been able to determine, definitively, the reason for the lower than expected value for the metrics for Busselton Water and Hunter Water.

SKM notes that the total employee cost as a proportion of total full-time equivalents for Water Corporation (Western Australia), Sydney Catchment Authority and Sydney Water are significantly higher than the other comparator utilities. SKM considers that this could be attributed to higher cost of living of the centrums, Sydney and Perth and hence relatively higher salaries in those areas.

SKM considers that, based on the above information, LinkWater's total employee cost as a proportion of total full-time equivalents is consistent with that of an efficient operator.

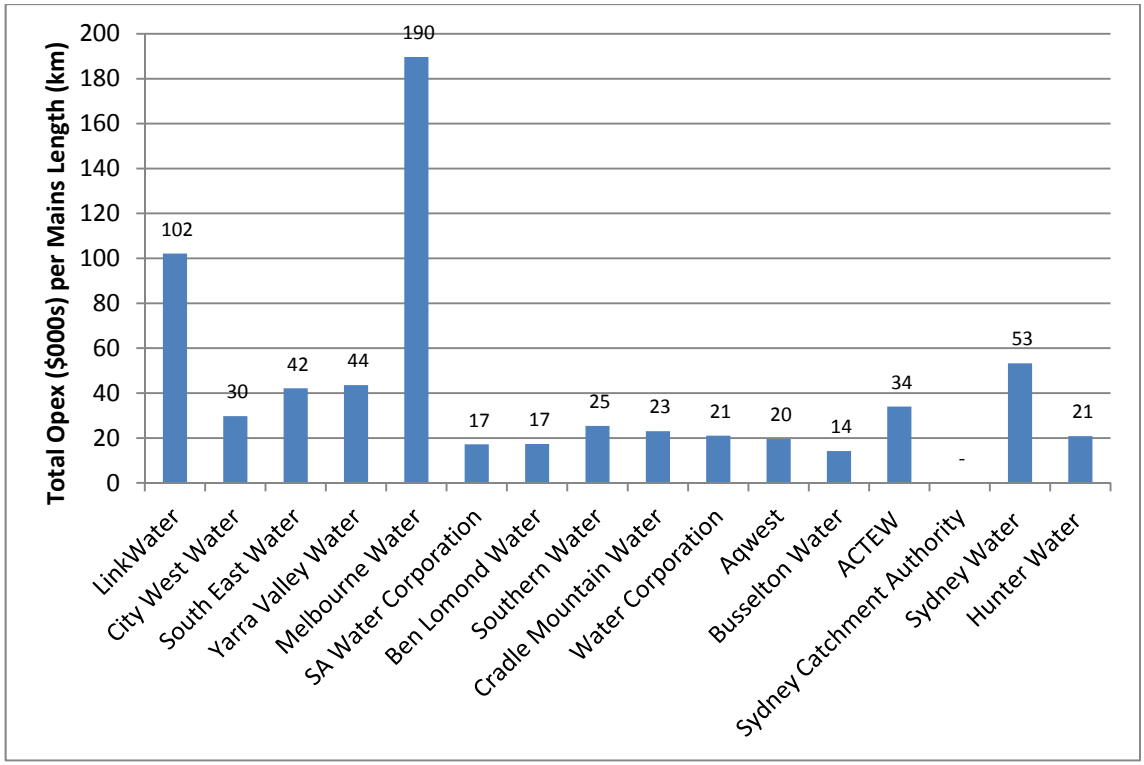
5.1.2.9. Total operating expenditure as a proportion of mains length

SKM has developed a metric that details the proportion of the total operating expenditure to the length of mains. **Table 17**, below, presents the information used to develop the metrics.

- **Table 17 Total operating expenditure as a proportion of mains length data**

Water utility	State	Total operating expenditure ($)	Mains Length (km)
LinkWater	QLD	54,591,979	534
City West Water	Vic	134,113,000	4,506
South East Water	Vic	372,000,000	8,830
Yarra Valley Water	Vic	376,400,000	8,643
Melbourne Water	Vic	201,400,000	1,062
SA Water Corporation	SA	456,393,000	26,552
Ben Lomond Water	Tas	33,297,000	1,925
Southern Water	Tas	76,436,000	3,008
Cradle Mountain Water	Tas	30,549,000	1,328
Water Corporation	WA	707,128,000	33,566
Aqwest	WA	9,097,909	330
Busselton Water	WA	3,988,073	281
ACTEW	ACT	106,509,000	3,134
Sydney Catchment Authority	NSW	107,992,000	-
Sydney Water	NSW	1,119,653,000	21,015
Hunter Water	NSW	101,910,000	4,898

The values of these metrics are visually represented in **Figure 11**. This metric provides a high-level indication to the efficiency of the various entities in operating its assets. In interpreting the result for LinkWater and comparing it with the other Australian entities, a lower proportion of operating expenditure to total revenue indicates, broadly, that the entity is more efficient.



- **Figure 11 Total operating expenditure as a proportion of mains length**

Figure 11 indicates that LinkWater's ratio of total operating expenditure to mains length is the second highest of all the comparator utilities. It is to note that most, except for Melbourne Water, of the comparator utilities have extensive water distributions mains to supply water as part of their distribution and retail business. The public domain information does not draw a distinction between the length of mains for bulk distribution and reticulation.

Although, given the different nature of the assets (trunk mains and distribution) of the comparator utilities, the metrics on the water main assets of the comparator utilities may not be taken as absolute comparators, SKM considers that the high operating cost per km of linear asset (trunk main) exhibited by LinkWater compared to the majority of the comparator utilities indicates that LinkWater is not an efficient operator in this respect.

5.1.3. Benchmark comparison and discussion – International Entities

Information for a number of water utilities within other Australian states and territories was gathered, these included Anglian Water Services, Bristol Water, Portsmouth Water and Dee Valley in the United Kingdom; Emerald Coast Utilities Authority and Portland Water District in the United States of America. Information collected included:

- Total operating expenditure ($)

- Water supplied (ML)
- Employee costs ($)
- Total revenue ($)
- Number of full-time equivalents
- Non-current asset value ($)
- Length of mains (km)

Exchange rates of 1 GBP = 1.48 AUD, 1 USD = 0.9 AUD and 1 CAD = 0.9 AUD (as at 28/02/2012) were used for the conversion of Great British Pounds, American dollars and Canadian dollars to Australian dollars.

The services provided by each of the utilities are outlined in **Table 18**. As all of the water utilities provide a different suite of services to their customers which do not align directly with those provided by LinkWater the metrics developed should not be considered as directly comparable.

- **Table 18 Services provided by utilities**

Service	Water Utility															
	LinkWater	Anglian Water Services	Bristol Water	Portsmouth Water	Dee Valley	Northumbrian Water	Yorkshire Water	United Utilities	Severn Trent Water	Dwr Cymru Welsh Water	Thames Water	Wessex Water	South West Water	Southern Water	Emerald Coast Utilities Authority	Portland Water District
Water storage		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water treatment		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bulk transmission	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chemical dosing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Distribution		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Retail		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wastewater collection		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wastewater treatment		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Desalination											✓					
Other - Electricity								✓								

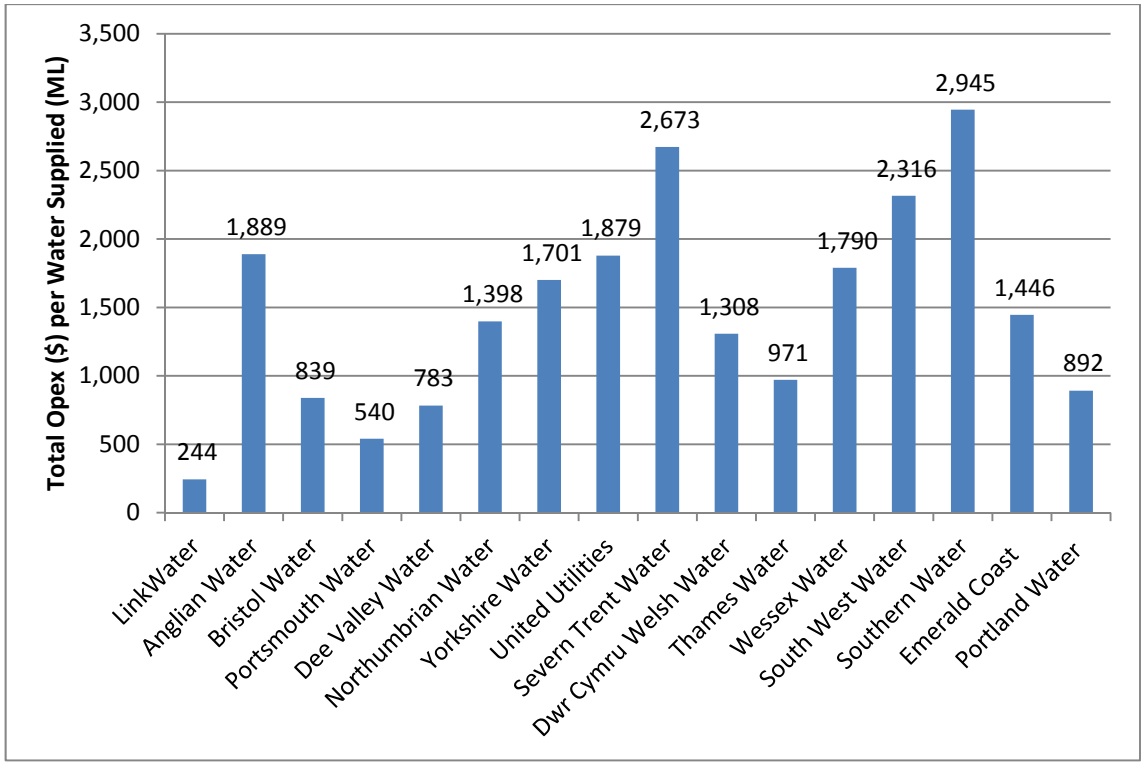
5.1.3.1. Total operating expenditure as a proportion of water supplied

SKM has developed a metric that details the proportion of the total operating expenditure to the water supplied. **Table 19**, below, presents the information used to develop the metrics.

- **Table 19 Total operating expenditure as a proportion of water supplied data**

Water utility	State	Total operating expenditure ($)	Water supplied (ML)
LinkWater	Aus - QLD	54,591,979	223,944
Anglian Water	UK	682,481,310	361,324
Bristol Water	UK	73,103,100	87,147
Portsmouth Water	UK	31,119,900	57,612
Dee Valley	UK	16,944,690	21,637
Northumbrian Water	UK	637,833,000	456,250
Yorkshire Water	UK	814,086,000	478,628
United Utilities	UK	1,371,657,000	730,000
Severn Trent	UK	1,756,356,000	657,000
Dwr Cymru Welsh Water	UK	388,962,000	297,475
Thames Water	UK	921,837,000	949,000
Wessex Water	UK	185,514,000	103,660
South West Water	UK	381,318,000	164,611
Southern Water	UK	619,164,000	210,240
Emerald Coast	USA	57,543,750	39,788
Portland Water	USA	30,290,058	25,686

The values of these metrics are visually represented in **Figure 12**. This metric provides a high-level indication to the efficiency of the various entities in respect of total costs incurred in the supply of water. In interpreting the result for LinkWater and comparing it with the metrics of the other international entities, a lower proportion of operating expenditure to water supplied indicates, broadly, that the entity is more efficient.



- **Figure 12 Total operating expenditure proportional to total water supplied - International**

Figure 12 indicates that the overall operating expenditure per ML for LinkWater is substantially lower than the majority of the comparator utilities. It is not unexpected that the costs per ML supplied metric for LinkWater be substantially lower than that for comparator utilities given that the water services that LinkWater provides is limited to bulk distribution and therefore is less than the services provided by the comparator utilities.

SKM considers that, based on the above information, LinkWater total operating expenditure as a proportion of water supplied is consistent with that of an efficient operator.

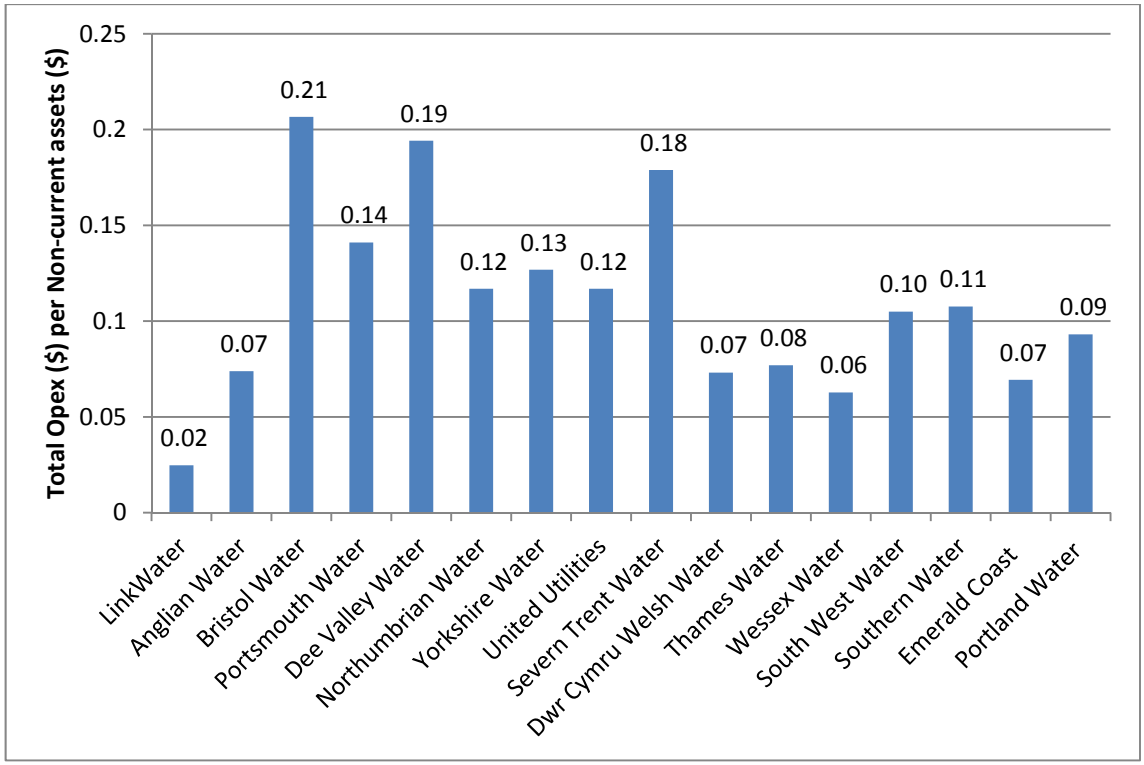
5.1.3.2. Total operating expenditure as a proportion of non-current assets

SKM has developed a metric that compares the proportion of the total operating expenditure to the non-current assets (as represented by property, plant and equipment). **Table 20**, below, presents the information used to develop the metrics.

Table 20 Total operating expenditure as a proportion of non-current assets data

Water utility	State	Total operating expenditure ($)	Non-current assets ($)
LinkWater	Aus - QLD	54,591,979	2,208,600,000
Anglian Water	UK	682,481,310	9,243,213,000
Bristol Water	UK	73,103,100	353,829,000
Portsmouth Water	UK	31,119,900	220,689,630
Dee Valley	UK	16,944,690	87,273,900
Northumbrian Water	UK	637,833,000	5,457,081,000
Yorkshire Water	UK	814,086,000	6,417,285,000
United Utilities	UK	1,371,657,000	11,736,804,870
Severn Trent	UK	1,756,356,000	9,817,248,000
Dwr Cymru Welsh Water	UK	388,962,000	5,317,872,000
Thames Water	UK	921,837,000	11,973,591,000
Wessex Water	UK	185,514,000	2,956,023,000
South West Water	UK	381,318,000	3,633,546,000
Southern Water	UK	619,164,000	5,751,081,000
Emerald Coast	USA	57,543,750	830,045,899
Portland Water	USA	30,290,058	246,034,142

The values of these metrics are visually represented in **Figure 13**. This metric provides a high-level indication of the efficiency of the various entities in maintaining their assets. In interpreting the result for LinkWater and comparing it with the metrics of the other international entities, a lower proportion of operating expenditure to non-current-assets indicates, broadly, that the entity is more efficient in maintaining those assets (assuming that that the assets are being maintained correctly and not simply being allowed to decline in condition).



- **Figure 13 Total operating expenditure as a proportion of non-current assets - International**

Figure 13 indicates that LinkWater has the lowest total operating expenditure to non-current assets ratio compared to all the comparator utilities. The non-current asset value of bulk distribution is comparatively large in relation to the operations and maintenance required and therefore this result is as expected. SKM therefore considers that the low ratio does not necessarily indicate that LinkWater is more efficient than the comparator utilities but that it is comparable to the other utilities.

SKM considers that, based on the above information LinkWater's total operating expenditure as a proportion of non-current assets is consistent with that of an efficient operator.

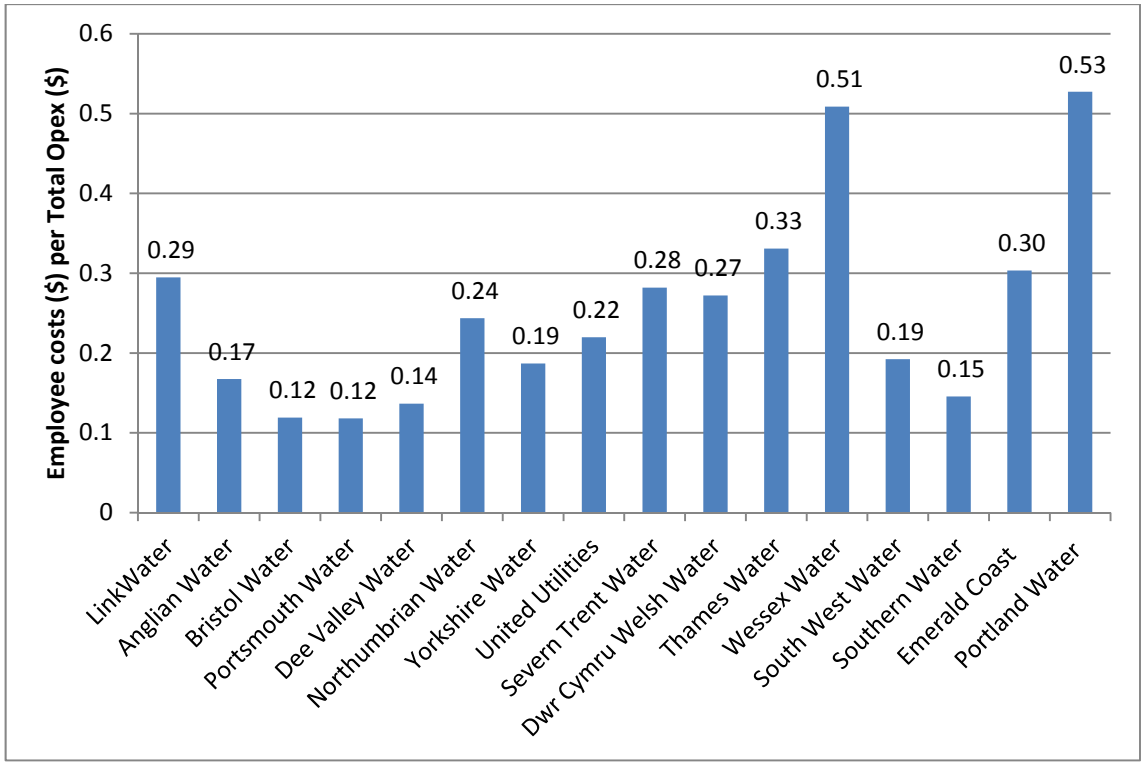
5.1.3.3. Total employee cost as a proportion of total operating expenditure

SKM has developed a metric that details the proportion of the total employee cost to the total operating expenditure. **Table 21**, below, presents the information used to develop the metric for LinkWater and each of the comparator utilities.

- **Table 21 Total employee cost as a proportion of total operating expenditure data**

Water utility	State	Employee costs ($)	Total operating expenditure ($)
LinkWater	Aus - QLD	12,512,000	54,591,979
Anglian Water	UK	114,351,300	682,481,310
Bristol Water	UK	8,711,220	73,103,100
Portsmouth Water	UK	3,676,470	31,119,900
Dee Valley	UK	2,313,780	16,944,690
Northumbrian Water	UK	155,379,000	637,833,000
Yorkshire Water	UK	152,145,000	814,086,000
United Utilities	UK	301,497,000	1,371,657,000
Severn Trent	UK	495,390,000	1,756,356,000
Dwr Cymru Welsh Water	UK	105,840,000	388,962,000
Thames Water	UK	305,025,000	921,837,000
Wessex Water	UK	94,374,000	185,514,000
South West Water	UK	73,353,000	381,318,000
Southern Water	UK	90,111,000	619,164,000
Emerald Coast	USA	17,463,914	57,543,750
Portland Water	USA	12,081,735	30,290,058

The values of these metrics are visually represented in **Figure 14**. This metric provides a high-level indication to the productivity of the staff employed by the various entities. In interpreting the result for LinkWater and comparing it with the metrics for the other international entities, a lower proportion of employee cost to operating expenditure indicates, broadly, that the entity is more efficient and its staff more highly utilised and hence productive.



- **Figure 14 Total employee cost as a proportion of the total operating expenditure - International**

Figure 14 indicates that LinkWater's total employee cost to total operating expenditure ratio is comparable to the majority of the comparator organisations. SKM does however note that the data used in comparing the organisations does not reflect the percentage of cost that each utility spend on outsourcing.

SKM considers that, based on the above information LinkWater's total employee costs as a proportion of total operating expenditure are consistent with those of an efficient operator.

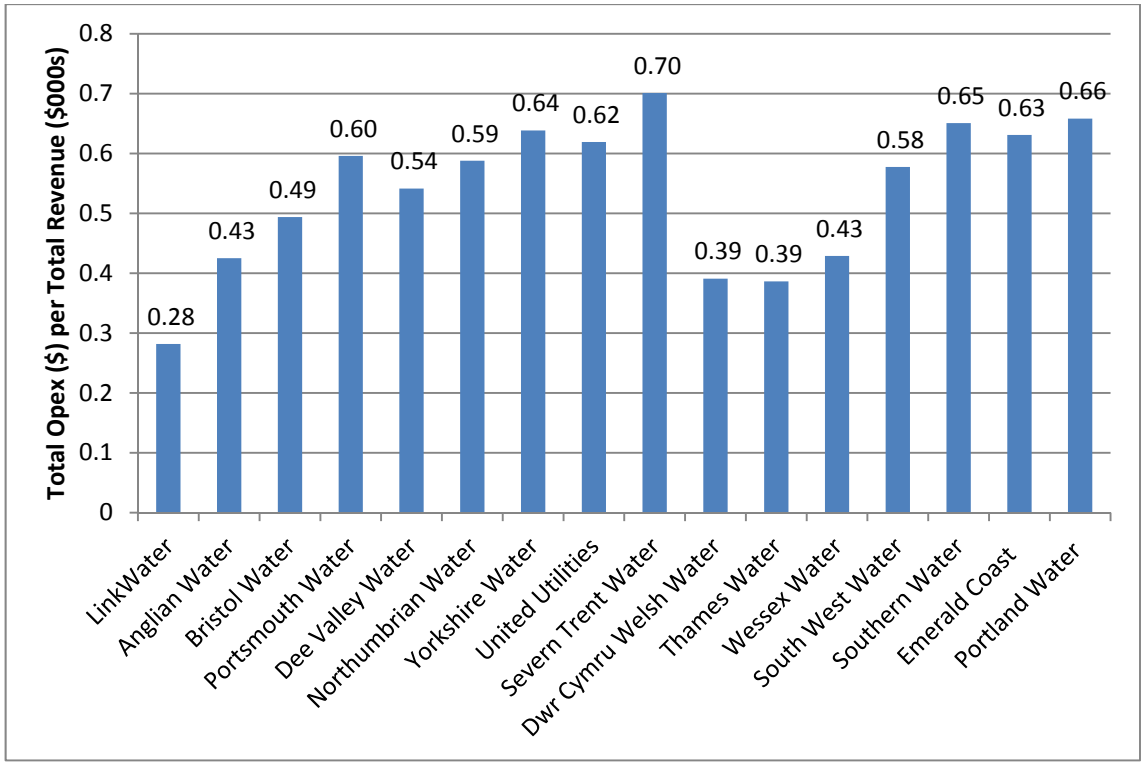
5.1.3.4. Total operating expenditure as a proportion of total revenue

SKM has developed a metric that details the proportion of the total operating expenditure to the total revenue. **Table 22**, below, presents the information used to develop the metrics.

Table 22 Total operating expenditure as a proportion of total revenue data

Water utility	State	Total operating expenditure ($)	Total Revenue ($)
LinkWater	Aus - QLD	54,591,979	193,746,000
Anglian Water	UK	682,481,310	1,605,681,000
Bristol Water	UK	73,103,100	148,029,000
Portsmouth Water	UK	31,119,900	52,207,050
Dee Valley	UK	16,944,690	31,299,240
Northumbrian Water	UK	637,833,000	2,214,654,960
Yorkshire Water	UK	814,086,000	2,504,733,000
United Utilities	UK	1,371,657,000	994,749,000
Severn Trent	UK	1,756,356,000	2,385,957,000
Dwr Cymru Welsh Water	UK	388,962,000	432,474,000
Thames Water	UK	921,837,000	660,177,000
Wessex Water	UK	185,514,000	951,237,000
South West Water	UK	381,318,000	91,207,212
Southern Water	UK	619,164,000	34,804,193
Emerald Coast	USA	57,543,750	1,085,007,000
Portland Water	USA	30,290,058	994,749,000

The values of these metrics are visually represented in **Figure 15**. This metric provides a high-level indication to the efficiency of the various entities in delivering water. In interpreting the result for LinkWater and comparing it with the metrics of the other international entities, a lower proportion of operating expenditure to total revenue indicates, broadly, that the entity is more efficient.



- **Figure 15 Total operating expenditure proportional to total revenue - International**

Figure 15 indicates that LinkWater has the lowest operating expenditure to total revenue ratio of all the utilities and is considerably less than the average. This may be attributed to the nature of the services provided by LinkWater compared to the comparator utilities, ie bulk distribution compared to water treatment, water distribution, wastewater collection and wastewater treatment. SKM does not consider that this metric indicates that LinkWater is more efficient materially than the comparator utilities.

SKM considers that, based on the above information LinkWater's total operating expenditure as a proportion of total revenue is consistent with that of an efficient operator.

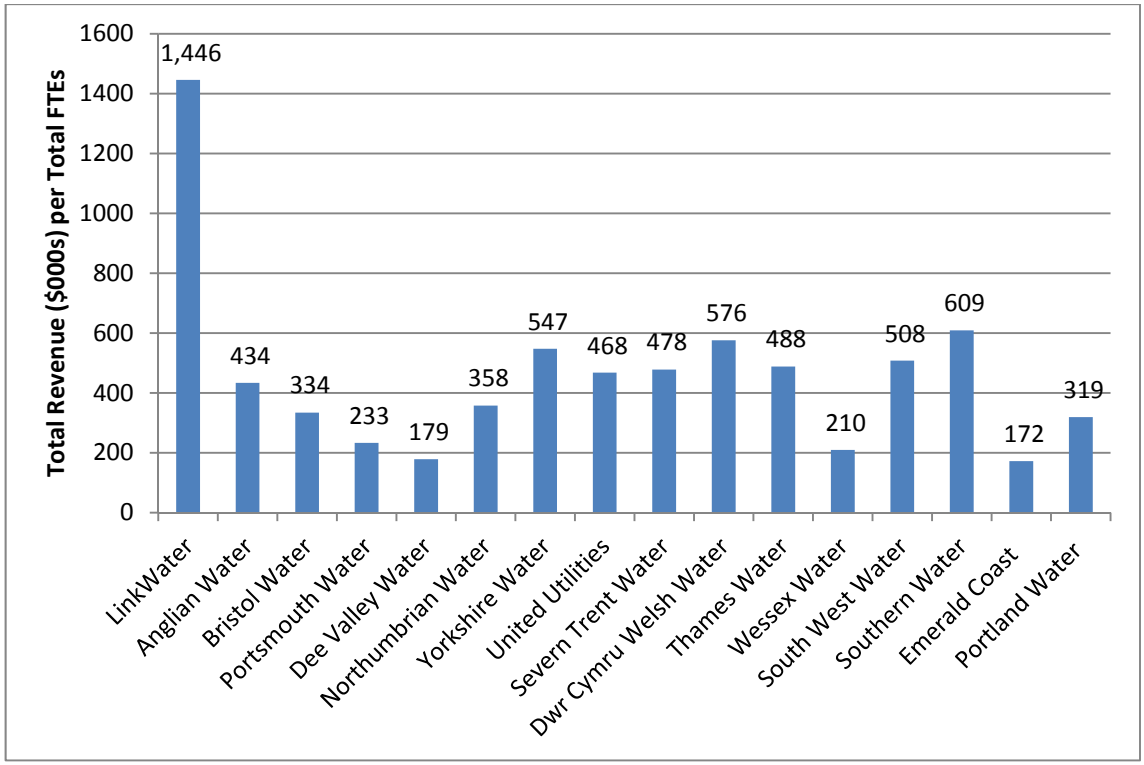
5.1.3.5. Total revenue as a proportion of total full-time equivalents

SKM has developed a metric that details the proportion of the total revenue to the total full-time equivalents. **Table 23**, below, presents the information used to develop the metrics.

- **Table 23 Total revenue as a proportion of total full-time equivalents data**

Water utility	State	Total Revenue ($)	Total FTEs
LinkWater	Aus - QLD	193,746,000	284
Anglian Water	UK	1,605,681,000	3,700
Bristol Water	UK	148,029,000	443
Portsmouth Water	UK	52,207,050	224
Dee Valley	UK	31,299,240	175
Northumbrian Water	UK	2,214,654,960	3,031
Yorkshire Water	UK	2,504,733,000	2,329
United Utilities	UK	994,749,000	4,735
Severn Trent	UK	2,385,957,000	5,237
Dwr Cymru Welsh Water	UK	432,474,000	1,727
Thames Water	UK	660,177,000	4,886
Wessex Water	UK	951,237,000	2,061
South West Water	UK	91,207,212	1,300
Southern Water	UK	34,804,193	1,562
Emerald Coast	USA	1,085,007,000	530
Portland Water	USA	994,749,000	109

The values of these metrics are visually represented in **Figure 16**. This metric provides a high-level indication to the efficiency of the various entities in terms of staff productivity. In interpreting the result for LinkWater and comparing it with the other international water entities, a higher proportion of the total revenue to total full-time equivalents indicates, broadly, that the entity is more efficient and that staff have a higher degree of utilisation and hence is more productive.



- **Figure 16 Total revenue proportional to full-time equivalent staff**

Figure 16 indicates that LinkWater has the highest total revenue to full-time equivalent staff ratio of the utilities. SKM is unable to draw any comparison due to limited information being available on the business models of the international utilities to establish their policy in regard to outsourcing.

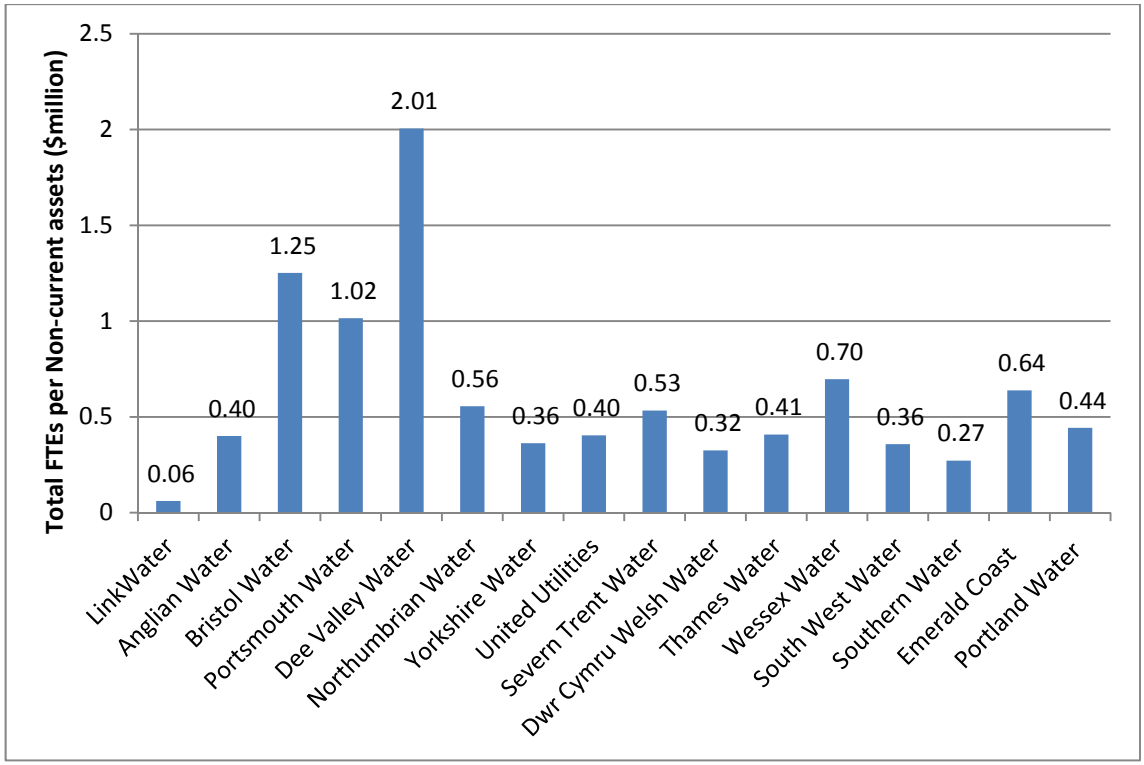
5.1.3.6. Total full-time equivalents as a proportion of non-current assets

SKM has developed a metric that details the proportion of the total full time equivalents to the non-current assets. **Table 24**, below, presents the information used to develop the metrics.

Table 24 Total full-time equivalents as a proportion of non-current assets data

Water utility	State	Total FTEs	Non-current assets ($)
LinkWater	Aus - QLD	284	2,208,600,000
Anglian Water	UK	3,700	9,243,213,000
Bristol Water	UK	443	353,829,000
Portsmouth Water	UK	224	220,689,630
Dee Valley	UK	175	87,273,900
Northumbrian Water	UK	3,031	5,457,081,000
Yorkshire Water	UK	2,329	6,417,285,000
United Utilities	UK	4,735	11,736,804,870
Severn Trent	UK	5,237	9,817,248,000
Dwr Cymru Welsh Water	UK	1,727	5,317,872,000
Thames Water	UK	4,886	11,973,591,000
Wessex Water	UK	2,061	2,956,023,000
South West Water	UK	1,300	3,633,546,000
Southern Water	UK	1,562	5,751,081,000
Emerald Coast	USA	530	830,045,899
Portland Water	USA	109	246,034,142

The values of these metrics are visually represented in **Figure 17**. This metric provides a high-level indication of the efficiency of the workforce and asset utilisation. In interpreting the result for LinkWater and comparing it with the metrics for the other international entities, a lower proportion of total full time equivalents to non-current assets indicates, broadly, that the entity has small number of staff relative to the size of the entity and therefore may be considered as utilising its staff efficiently.



- **Figure 17 Full-time equivalents proportional to the non-current asset value**

Figure 17 indicates that LinkWater has a comparative low ratio of full-time equivalent to non-current asset value.

The service lines of a utility have a significant impact in determining the number of staff required to undertake operations and maintenance activities. Another factor that impacts on the full-time equivalent to non-current asset value ratio is the extent to which the utility relies on outsourcing of tasks. This information is not typically available in the public domain and therefore has not been taken into consideration. SKM is unable to comment on the efficiency of LinkWater in relation to the full-time equivalent to non-current asset ratio in benchmarking to the international comparator utilities other than that the data does indicate that LinkWater is an efficient operator in this respect.

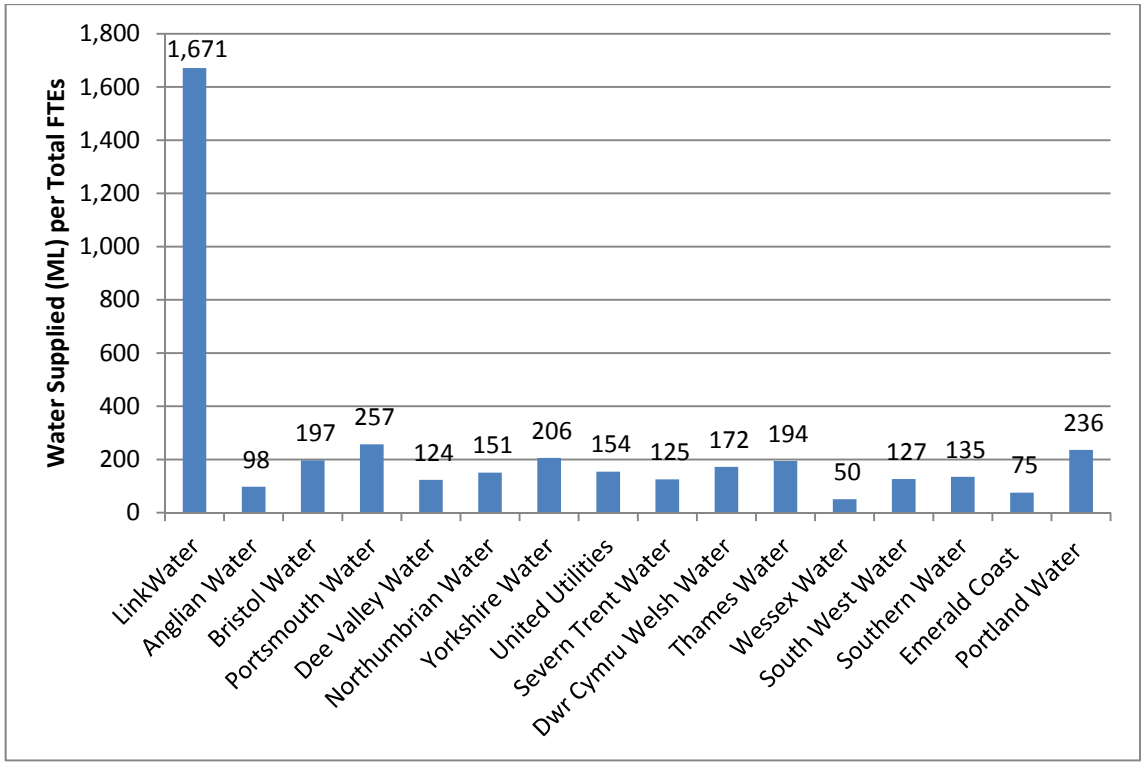
5.1.3.7. Water supplied as a proportion of total full-time equivalents

SKM has developed a metric that details the proportion of the water supplied to the total full time equivalents. **Table 25**, below, presents the information used to develop the metrics.

- **Table 25 Water supplied as a proportion of total full-time equivalents data**

Water utility	State	Water supplied (ML)	Total FTEs
LinkWater	Aus - QLD	223,944	284
Anglian Water	UK	361,324	3,700
Bristol Water	UK	87,147	443
Portsmouth Water	UK	57,612	224
Dee Valley	UK	21,637	175
Northumbrian Water	UK	456,250	3,031
Yorkshire Water	UK	478,628	2,329
United Utilities	UK	730,000	4,735
Severn Trent	UK	657,000	5,237
Dwr Cymru Welsh Water	UK	297,475	1,727
Thames Water	UK	949,000	4,886
Wessex Water	UK	103,660	2,061
South West Water	UK	164,611	1,300
Southern Water	UK	210,240	1,562
Emerald Coast	USA	39,788	530
Portland Water	USA	25,686	109

The values of these metrics are visually represented in **Figure 18**. In interpreting the result for LinkWater and comparing it with the metrics of the other international water entities, a higher proportion of water supplied to the total full time equivalents indicates, broadly, that the entity is more efficient.



- **Figure 18 Total water supplied proportional to total full-time equivalents - International**

Figure 18 indicates LinkWater has an order of magnitude higher total water supplied to full-time equivalents metric compared to those of the comparator utilities. This is as expected since the comparator utilities have additional service lines to those of LinkWater.

SKM considers that, based on the above information, the LinkWater total water supplied as a proportion of total full-time equivalents metric is consistent with that of an efficient operator.

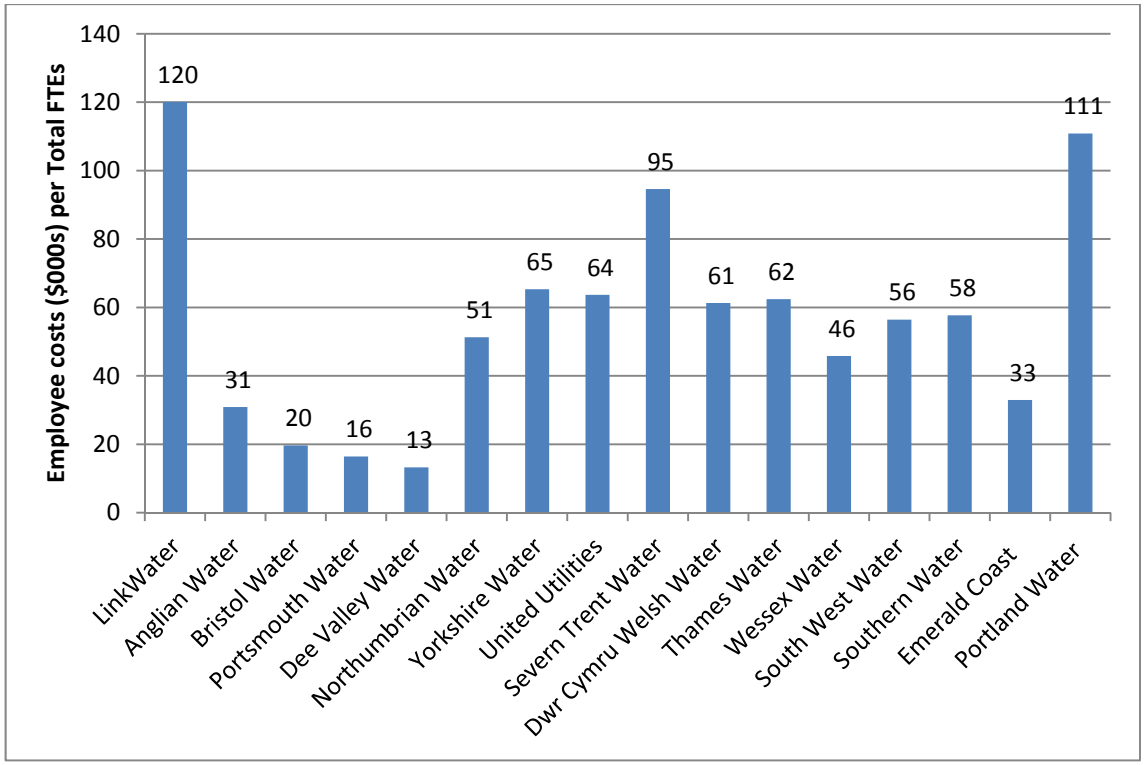
5.1.3.8. Total employee cost as a proportion of total full-time equivalents

SKM has developed a metric that details the proportion of the total employee cost to the total full-time equivalent. **Table 26**, below, presents the information used to develop the metric.

Table 26 Total employee cost as a proportion of total full-time equivalents data

Water utility	State	Employee costs ($)	Total FTEs
LinkWater	Aus - QLD	12,512,000	284
Anglian Water	UK	114,351,300	3,700
Bristol Water	UK	8,711,220	443
Portsmouth Water	UK	3,676,470	224
Dee Valley	UK	2,313,780	175
Northumbrian Water	UK	155,379,000	3,031
Yorkshire Water	UK	152,145,000	2,329
United Utilities	UK	301,497,000	4,735
Severn Trent	UK	495,390,000	5,237
Dwr Cymru Welsh Water	UK	105,840,000	1,727
Thames Water	UK	305,025,000	4,886
Wessex Water	UK	94,374,000	2,061
South West Water	UK	73,353,000	1,300
Southern Water	UK	90,111,000	1,562
Emerald Coast	USA	17,463,914	530
Portland Water	USA	12,081,735	109

The values of these metrics are visually represented in **Figure 19**. In interpreting the result for LinkWater and comparing it with the metrics for the other international water entities, a lower proportion of total employee cost to total full-time equivalents indicates, broadly, that the entity is more efficient.



- **Figure 19 Total employee cost proportional to total full-time equivalents**

Figure 19 indicates that:

- The values for the UK water entities vary significantly, however they are all lower than the metric for LinkWater
- The values for the USA water entities vary significantly with one being significantly lower and the other comparable to but lower than the metric for LinkWater

From the data available SKM concludes that in respect of total employee costs as a ratio to total full time equivalents, LinkWater's costs are higher than would be expected for an efficient operator.

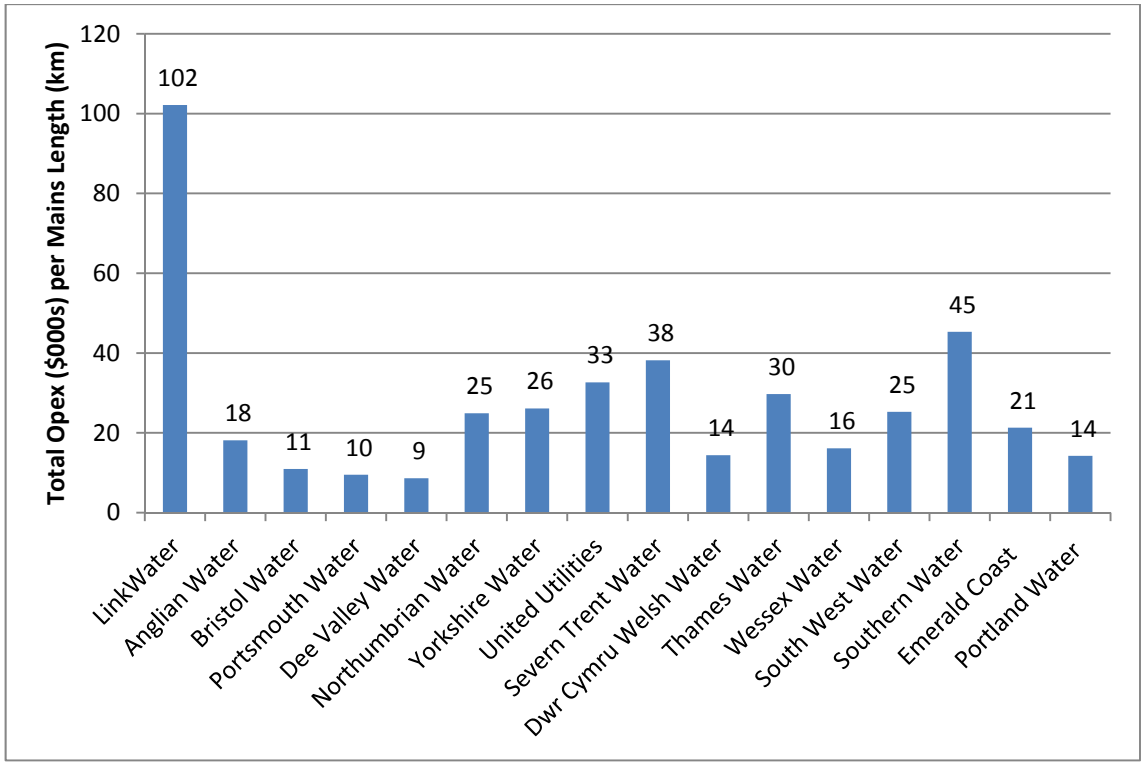
5.1.3.9. Total operating expenditure as a proportion of mains length

SKM has developed a metric that details the proportion of the total operating expenditure to the length of mains. **Table 27**, below, presents the information used to develop the metrics.

- **Table 27 Total operating expenditure as a proportion of mains length data**

Water utility	State	Total operating expenditure ($)	Mains Length (km)
LinkWater	Aus - QLD	54,591,979	534
Anglian Water	UK	682,481,310	37,633
Bristol Water	UK	73,103,100	6,670
Portsmouth Water	UK	31,119,900	3,270
Dee Valley	UK	16,944,690	1,966
Northumbrian Water	UK	637,833,000	25,624
Yorkshire Water	UK	814,086,000	31,154
United Utilities	UK	1,371,657,000	42,000
Severn Trent	UK	1,756,356,000	46,000
Dwr Cymru Welsh Water	UK	388,962,000	27,000
Thames Water	UK	921,837,000	31,000
Wessex Water	UK	185,514,000	11,509
South West Water	UK	381,318,000	15,101
Southern Water	UK	619,164,000	13,658
Emerald Coast	USA	57,543,750	2,700
Portland Water	USA	30,290,058	1,608

The values of these metrics are visually represented in **Figure 20**. This metric provides a high-level indication to the effectiveness of the various entities in operating and maintaining linear assets such as water trunk mains. In interpreting the result for LinkWater and comparing it with the metrics for the other international bulk water entities, a lower proportion of operating expenditure to total revenue indicates, broadly, that the entity is more effective.



- **Figure 20 Total operating expenditure as a proportion of mains length**

Figure 20 indicates that LinkWater has the highest total operating expenditure to mains length ratio of all the utilities. It is to note that most of the comparator utilities have extensive water distributions mains to supply water to customers as part of their distribution and retail business. The public domain information does not draw a distinction between the length of mains for bulk distribution and reticulation.

SKM is unable to determine whether the total operating cost per linear kilometre of trunk mains is within the same range as other comparable organisations. However the significant difference (ie order of magnitude difference) between the metric for LinkWater and the metrics for the comparator utilities suggests that Link Water is operating at an operating expenditure level per km of trunk mains above that which would be expected of an efficient operator.

5.1.4. Conclusions on corporate level benchmarking

The robustness of the benchmarking undertaken in the previous sections is limited by the difficulty in identifying suitable comparable organisations and the availability of sufficiently detailed information that is consistent with the data obtained from LinkWater and with LinkWater's business and a bulk water transportation utility.

There are a number of variables that impact on the effectiveness of the comparisons between the different utilities. These include not only differences in services provided but also differences in: operating environments; regulatory approaches; geographies; climatic conditions; and water resource management issues. The comparator utilities that were identified by SKM vary appreciably in size, roles, responsibilities and customer bases.

Nonetheless, SKM has been able to establish a range of reasonable "high level" operating expenditure benchmarks to enable a comparison to be drawn between LinkWater and the comparator utilities both nationally and internationally. These comparisons generally indicate that LinkWater's performance in relation to organisational efficiency, spend efficiency, workforce effectiveness and asset utilisation are broadly within the same range as the comparator utilities, as summarised below **Table 28**.

Table 28 Summary of benchmarking

Metric	National organisations	International organisations
Total operating expenditure as a proportion of water supplied	Consistent with that expected of an efficient operator	Consistent with that expected of an efficient operator
Total operating expenditure as a proportion of non-current assets	Consistent with that expected of an efficient operator	Consistent with that expected of an efficient operator
Total employee cost as a proportion of total operating expenditure	Consistent with that expected of an efficient operator	Consistent with that expected of an efficient operator
Total operating expenditure as a proportion of total revenue	Consistent with that expected of an efficient operator	Consistent with that expected of an efficient operator
Total revenue as a proportion of total full-time equivalents	Consistent with that expected of an efficient operator	Insufficient information
Total full-time equivalents as a proportion of non-current assets	Consistent with that expected of an efficient operator	Insufficient information
Water supplied as a proportion of total full-time equivalents	Consistent with that expected of an efficient operator	Consistent with that expected of an efficient operator
Total employee cost as a proportion of total full-time equivalents	Consistent with that expected of an efficient operator	Not consistent with an efficient operator
Total operating expenditure as a proportion of mains length	Not consistent with an efficient operator	Not consistent with an efficient operator

The information used for the comparator utilities was sourced from public domain. The most commonly sourced documents were annual reports and regulator price reviews.

6. Benchmarking by Asset Grouping

This section addresses benchmarking at an asset group level for water quality facilities, reservoirs, pump stations and bulk transfer pipelines.

6.1. Water quality facilities

This section covers the benchmarking of LinkWater's water quality facilities as an asset group. Water quality facilities serve the primary purpose of maintaining chlorine residual within the trunk mains network.

6.1.1. LinkWater metrics

LinkWater owns, operates and maintains seven water quality facilities. Each facility contains chemical storage, dosing pumps and monitoring equipment. An overview of the information provided on the LinkWater water quality facilities asset group is outlined below in **Table 29**.

- **Table 29 Water quality facility asset group information**

Capacity (ML/d)	Water treated (ML)	Average age (Yrs)	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
54,345	18,769	7	919,463	3,484,518	1,000,464	6,550,506

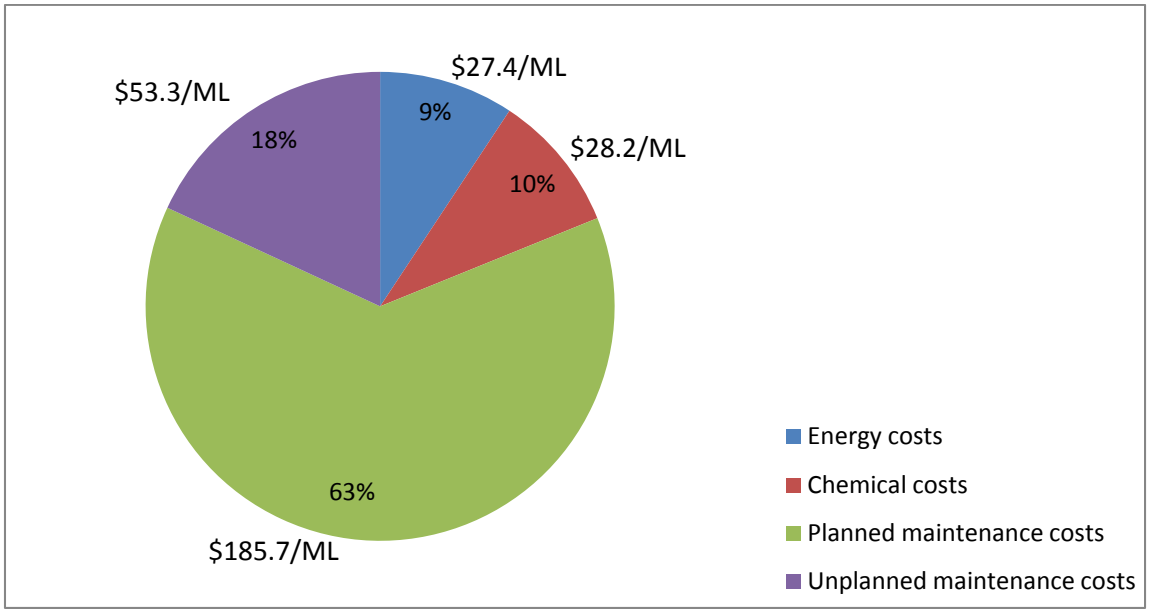
Metrics developed for water quality facilities are outlined below in **Table 30**.

- **Table 30 Water quality facility metrics**

Metric	Metric	Unit
Variable operating costs/Variable operating costs (total)	0.32	Ratio
Energy costs/Energy costs (total)	0.19	Ratio
Chemical costs/Chemical costs (total)	1.00	Ratio
Variable operating costs/Asset value	0.019	Ratio
Variable operating costs/ML water treated	55.87	$/ML
Energy costs/ML water treated	27.40	$/ML
Chemical costs/ML water treated	28.16	$/ML
Planned maintenance costs/Asset value	0.063	Ratio
Planned maintenance costs/ML water treated	185.65	$/ML
Unplanned maintenance costs/Asset value	0.018	Ratio
Unplanned maintenance costs/ML water treated	53.30	$/ML
Total maintenance costs/Asset value	0.081	Ratio
Total maintenance costs/ML water treated	238.96	$/ML
Planned maintenance costs/Unplanned maintenance costs	3.48	Ratio
(Total maintenance costs/Age)/ML water treated	36.76	$/ML

Metric	Metric	Unit
Total variable operating & maintenance costs/Asset value	0.099	Ratio
Total variable operating & maintenance costs/ML water treated	294.52	$/ML

LinkWater does not allocate corporate overhead costs to assets as it has not been required to do so in the past and doesn't have an agreed mechanism to enable allocation of such costs in the time available for this review. As such a breakdown of expenditure within the asset grouping can only be determined for operational expenditure, as presented below in **Figure 21**. The figure indicates that the planned maintenance costs associated with the operation of water quality facilities comprises the most significant portion of the operational costs.



- **Figure 21 Percentage breakdown of operational costs per ML water treated for water quality facilities**

6.1.2. Comparator water utility asset group metrics

No information on water quality facilities had been provided by interstate regulators or water utilities at the time of drafting of this report; as such no benchmarking has been undertaken in this area.

6.2. Water pump stations

This section covers the metrics of LinkWater's pumping station facilities as an asset group. Water pumping stations serve the primary purpose of transporting water from one place to another within the trunk mains network.

6.2.1. LinkWater metrics

LinkWater owns, operates and maintains 22 water pump stations. The stations vary in age and capacity. Eight of the pump stations were developed in response to the drought with 15 of the stations being non-drought assets. It should be noted that a number of pump stations within the LinkWater network are non-operational as required by the SEQ Water Grid Manager operating plan. An overview of the information provided on the LinkWater water pump station asset group is outlined below in **Table 31**.

- **Table 31 Water pump station asset group information**

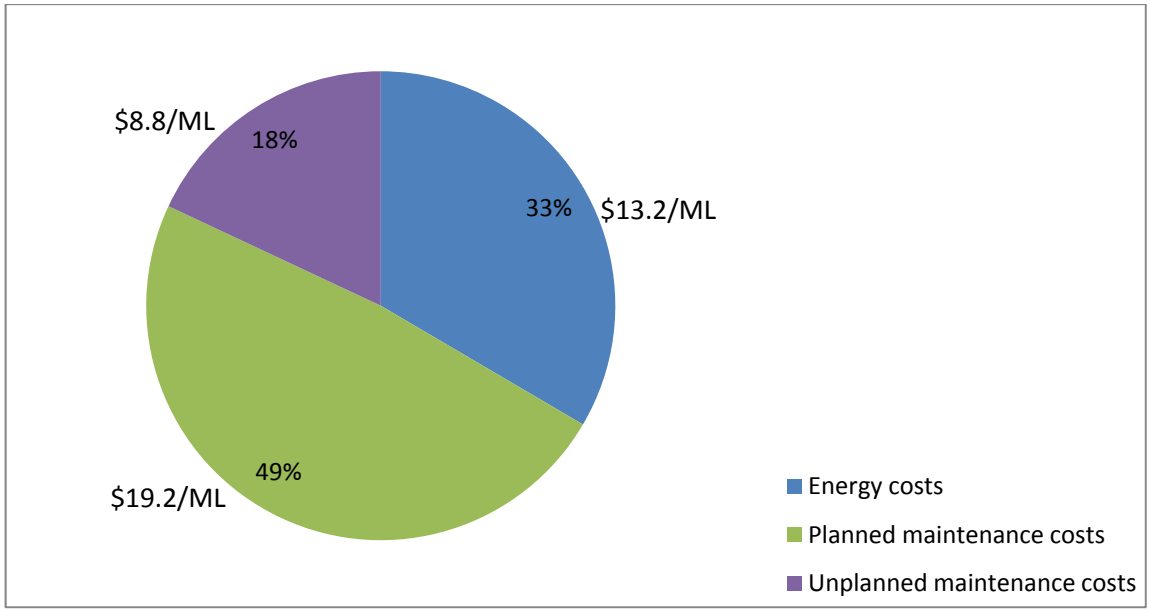
Capacity (ML/annum)	Water transported (ML)	Average age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
1,178,633	153,315	25	2,030,139	2,944,998	2,040,116	192,604,217

Metrics developed for water pumping stations are outlined below in **Table 32**.

- **Table 32 Water pumping station metrics**

Metric	Value	Unit
Variable operating costs/Variable operating costs (total)	0.61	Ratio
Energy costs/Energy costs (total)	0.73	$
Energy costs/ML water transported	13.24	$/ML
Energy costs/Capacity (ML/yr)	1.72	$/ML
Planned maintenance costs/Asset value	0.02	Ratio
Planned maintenance costs/ML water transported	19.21	$/ML
Unplanned maintenance costs/Asset value	0.01	Ratio
Unplanned maintenance costs/ML water transported	8.81	$/ML
Total maintenance costs/Asset value	0.02	Ratio
Total maintenance costs/ML water transported	28.02	$/ML
Planned maintenance costs/Unplanned maintenance costs	2.18	Ratio
(Total maintenance costs/Age)/ML water transported	1.11	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.14	$/ML
Total variable operating & maintenance costs/Asset value	0.03	Ratio
Total variable operating & maintenance costs/ML water transported	41.26	$/ML
Total variable operating & maintenance costs/Capacity (ML/yr)	5.37	$/ML

As mentioned earlier LinkWater does not allocate corporate overhead costs to assets. As such a breakdown of expenditure within the asset grouping can only be determined for operational expenditure, as presented below in **Figure 22**. This figure indicates that the planned maintenance costs associated with the operation of water quality facilities comprises the most significant portion of the operational costs.



- **Figure 22 Percentage breakdown of operational costs per ML water treated for pump stations**

6.2.2. Comparator water utility asset group metrics

No information on water pump stations had been provided by interstate regulators or water utilities at the time of drafting this report. As such no benchmarking has been undertaken in this area.

6.3. Reservoirs

This section covers the metrics of LinkWater's reservoirs as an asset group. Reservoirs serve the primary purpose of storing water at location until is required within the trunk mains network.

6.3.1. LinkWater metrics

LinkWater owns, operates and maintains 26 reservoirs. The reservoirs vary in age, capacity, turnover frequency, design and purpose. An overview of the information provided on the LinkWater reservoir asset group is outlined below in **Table 33**.

- **Table 33 Reservoir asset group information**

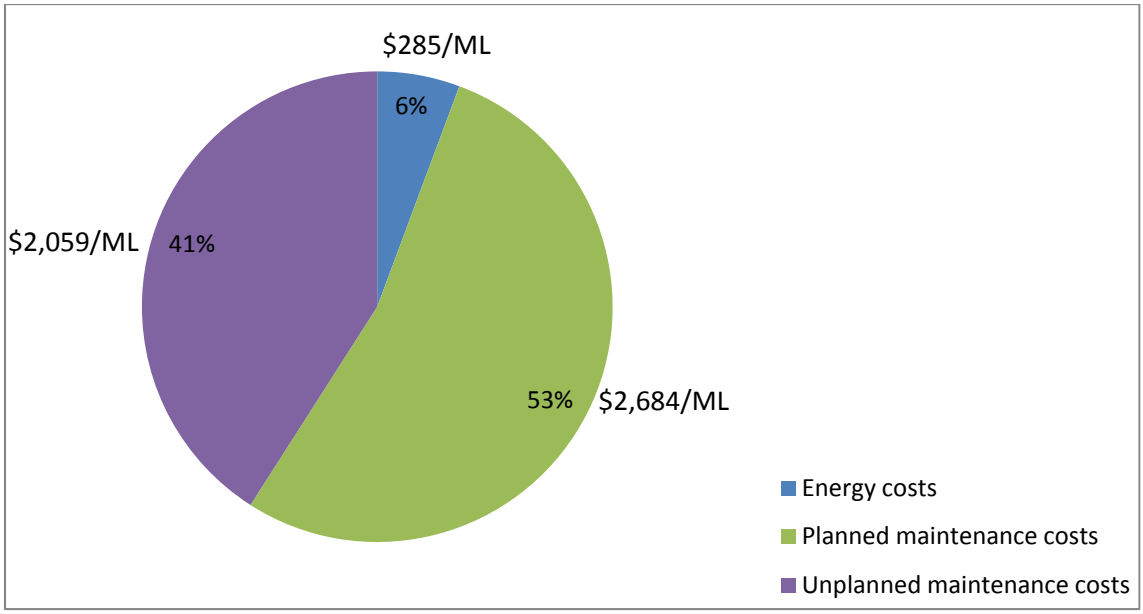
Capacity (ML)	Water stored (ML)	Average age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
970	729	26	146,765,544	1,895,011	1,689,181	146,765,544

Metrics developed for reservoirs are outlined below in **Table 34**.

Table 34 Reservoir metrics

Metric	Value	Unit
Variable operating costs/Variable operating costs (total)	0.02	Ratio
Energy costs/Energy costs (total)	0.02	Ratio
Energy costs/ML water stored	285.47	$/ML
Planned maintenance costs/Asset value	0.01	Ratio
Planned maintenance costs/ML water stored	2683.92	$/ML
Unplanned maintenance costs/Asset value	0.01	Ratio
Unplanned maintenance costs/ML water stored	2059.04	$/ML
Total maintenance costs/Asset value	0.01	$/ML
Total maintenance costs/ML water stored	4742.96	$/ML
Planned maintenance costs/Unplanned maintenance costs	1.30	Ratio
(Total maintenance costs/Age)/ML water stored	176.76	$/ML
Total operating & maintenance costs/Asset value	0.01	Ratio
Total operating & maintenance costs/ML water stored	5028.44	$/ML
Total operating & maintenance costs/Capacity (ML)	2876.61	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs to assets, as presented below in **Figure 23**. The figure indicates that the planned maintenance costs associated with the operation of reservoirs comprises the most significant portion of the operational costs.



- **Figure 23 Percentage breakdown of operational costs per ML water treated for reservoirs**

6.3.2. Comparator water utility asset group metrics

Information to develop comparator water utility metrics for the asset grouping of reservoirs has been provided by the Office of the Tasmanian Economic Regulator for Ben Lomond Water for two reservoirs. The information provided on the reservoirs is relatively high level, as outlined below in **Table 35**.

- **Table 35 Ben Lomond Water reservoir information**

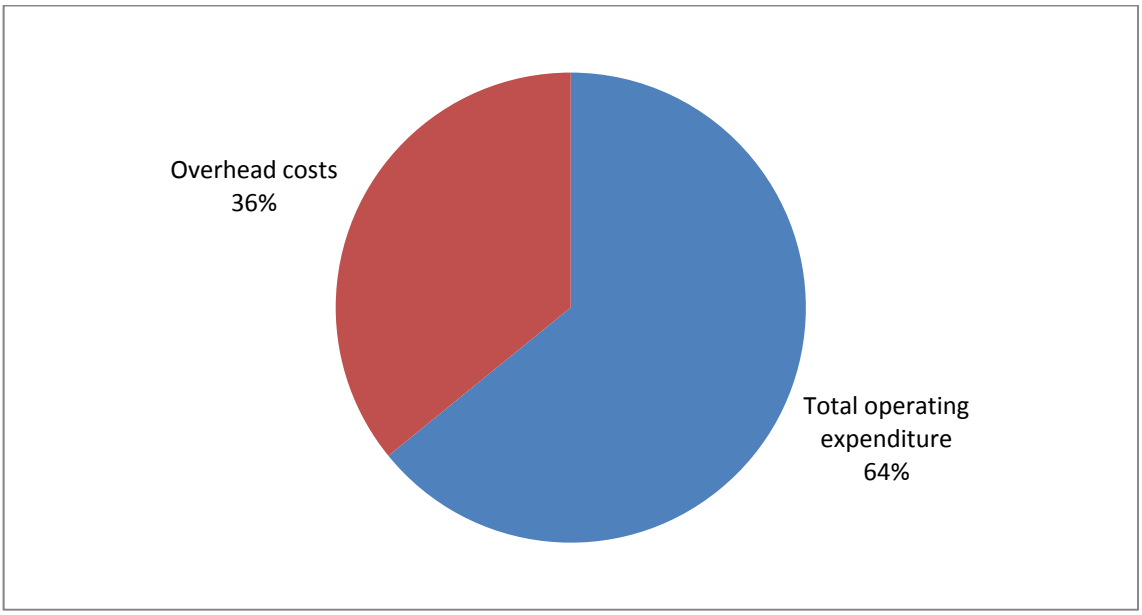
Capacity (ML)	FTE	Electricity cost ($)	Total OPEX ($)	Overhead cost ($)	Asset value ($)
41	1	10,000	113,340,000	63,359,438	4,605,751

The limited data provided restricts the metrics which can be developed and their comparability to the metrics developed for the LinkWater reservoirs. The metrics developed for reservoirs are outlined below in **Table 36**.

- **Table 36 Ben Lomond Water reservoir metrics**

Metric	Value	Unit
Energy costs/Asset value	0.0022	Ratio
Energy costs/Capacity (ML)	246.79	$/ML
Total OPEX/Asset value	24.61	Ratio
Total OPEX/Capacity (ML)	2797137.22	$/ML
Overhead costs/Asset value	13.76	Ratio
Overhead costs/Capacity (ML)	1563658.40	$/ML
Total costs/Asset value	38.36	Ratio
Total costs/Capacity (ML)	4360795.62	$/ML

The breakdown of the expenditure for the asset group of Ben Lomond Water reservoirs is presented below in **Figure 24**.

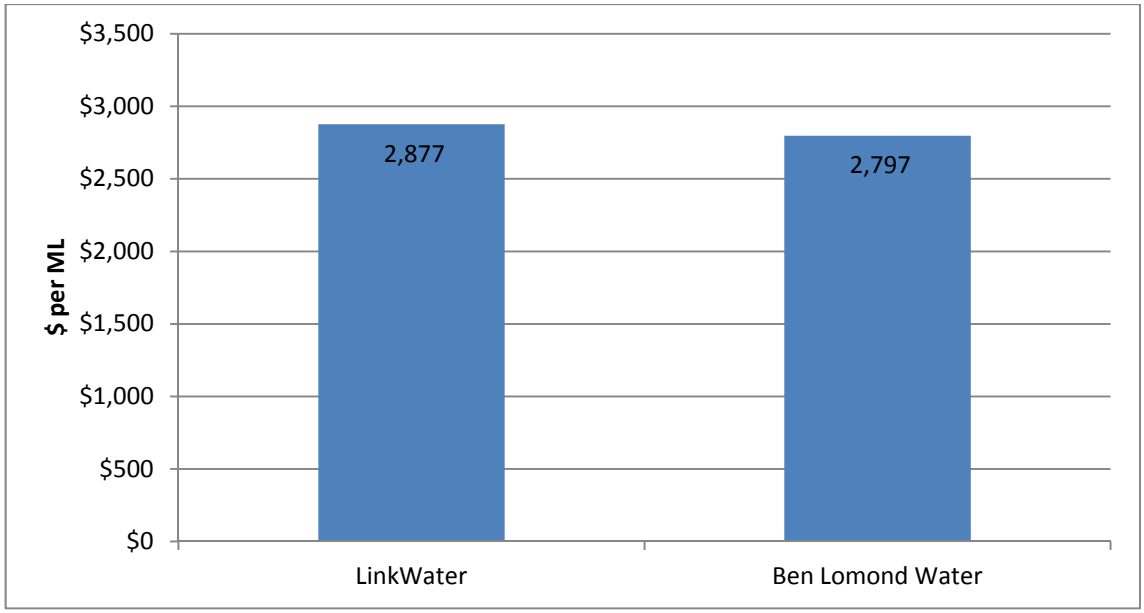


- **Figure 24 Percentage breakdown of total costs per ML water for Ben Lomond Water reservoirs**

6.3.3. Benchmark comparison and discussion

As mentioned, SKM's benchmark comparison has been restricted to comparing LinkWater's reservoir asset grouping with those of Ben Lomond Water.

Figure 25 presents the comparison between the operating costs per ML storage capacity for the reservoir asset group. The figure indicates that for the asset grouping of reservoirs, LinkWater's operating cost per ML capacity is almost the same as that of Ben Lomond Water.



- **Figure 25 Comparison of asset grouping operating expenditure per ML storage capacity**

6.3.4. Conclusions on reservoir costs benchmarking

No definitive conclusions can be drawn from the reservoir benchmarking due to the limited information available to compare the LinkWater metrics to. However, the comparison that can be made indicates that the two water utilities have almost identical operating costs per ML storage capacity for reservoirs as an asset group.

6.4. Bulk transmission schemes

This section will cover the metrics specific to LinkWater's trunk mains as an asset group. Trunk mains serve the primary purpose of transporting water from one location to another within the trunk mains network.

6.4.1. LinkWater metrics

LinkWater owns, operates and maintains a total of 523 km of trunk water mains. These mains are divided into the Brisbane, Ipswich, Gold Coast, Logan, Moreton Bay and Redland bulk transport schemes as well the Southern Regional Pipeline, the Eastern Pipeline Interconnector and the Northern Pipeline Interconnector. The trunk mains vary in length, diameter, material and age. An overview of the information provided on the LinkWater bulk transmission mains asset group is outlined below in **Table 37.**

- **Table 37 Bulk transmission main asset group information**

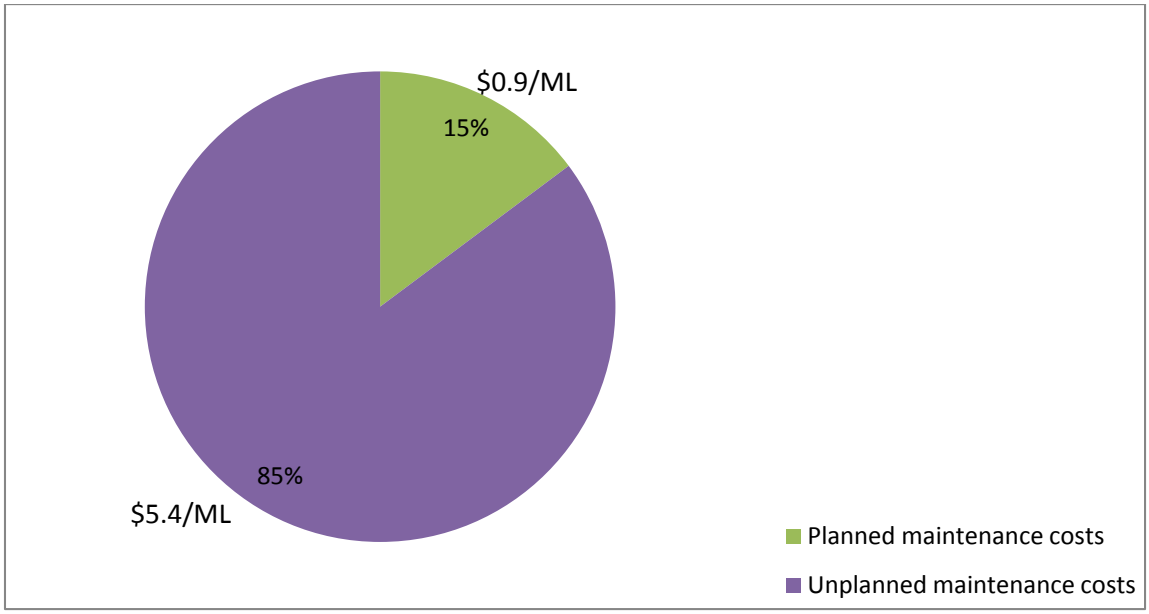
Length (km)	Water transported (ML)	Average diameter (mm)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
457	370,303	963	55	345,336	1,990,151	1,624,480,702

Metrics developed for reservoirs are outlined below in **Table 38**.

- **Table 38 Bulk transmission scheme metrics**

Metric	Value	Unit
Planned maintenance costs/km linear pipeline	756.14	$/km
Planned maintenance costs/ML water transported	0.93	$/ML
Planned maintenance costs/Asset value	0.00021	Ratio
Unplanned maintenance costs/km linear pipeline	4357.58	$/km
Unplanned maintenance costs/ML water transported	5.37	$/ML
Unplanned maintenance costs/Asset value	0.0012	Ratio
Total maintenance costs/Asset value	0.0014	Ratio
Total maintenance costs/ML water transported	6.31	$/ML
Planned maintenance costs/Unplanned maintenance costs	0.17	Ratio
(Total maintenance costs/Age)/km linear pipeline	92.20	$/km
(Total maintenance costs/Age)/ML water transported	0.11	$/ML

As LinkWater does not allocate corporate overhead costs to assets a breakdown of expenditure can only be determined for operational expenditure, as presented below in **Figure 26**. The figure indicates that the unplanned maintenance costs associated with the transportation of water is significantly greater than the planned maintenance costs. This is to be expected due to the passive nature of the assets and the fact that the majority of the assets are below ground and hence frequent visual condition monitoring is not practicable. Unplanned maintenance costs occur when failures of the asset occurs. A risk and condition based approach to assessing potential failures and to enable effective planned maintenance to occur could be undertaken to increase understanding and reduce non-scheduled maintenance.



- **Figure 26 Percentage breakdown of operational costs per ML water transported for bulk transmission schemes**

6.4.2. Comparator water utility asset group metrics

As mentioned, at the time of development of this draft report, information to develop comparator water utility metrics for the asset grouping of reservoirs has been provided by the Office of the Tasmanian Economic Regulator for Ben Lomond Water for two bulk water transmission schemes. The information provided on the bulk water transmission schemes is limited to a relatively high level, as outlined below in **Table 39**.

- **Table 39 Ben Lomond Water bulk water transmission scheme information**

Length (km)	Water transported (ML)	Diameter range (mm)	FTE	Total OPEX ($)	Overhead cost ($)	Asset value ($)
153.27	9,503	150 - 840	3	NA	632,451,223	32,365,000

The limited data provided restricts the metrics which can be developed and their comparability to the metrics developed for the LinkWater bulk water transmission schemes. The metrics developed for bulk water transmission are outlined below in **Table 40**.

- **Table 40 Ben Lomond Water bulk transmission scheme metrics**

Metric	Value	Unit
Overhead costs/Asset value	19.54	Ratio
Overhead costs/ML water transported	66552.80	$/ML
Overhead costs/km linear pipeline	4126332.42	$/km

For the Ben Lomond Water bulk transmission schemes, only overhead costs were provided. SKM therefore assumes from this that Ben Lomond Water does not allocate operating costs to the schemes.

6.4.3. Benchmark comparison and discussion and conclusions

At the time of development of the draft report, benchmark information had only been provided by OTTER for two of the Ben Lomond Water bulk transmission schemes. As such SKM's benchmark comparison has been restricted to comparing LinkWater's bulk transmission scheme asset grouping with those of Ben Lomond Water. No comparison can be conducted with Ben Lomond Water's bulk transmission schemes as only information on overhead costs allocated to the asset group has been provided whereas LinkWater does not allocate overhead costs to assets.

6.5. Asset group benchmarking overall summary

At the time of development of the draft report, benchmark information had only been provided by OTTER for Ben Lomond Water on reservoirs and bulk transmission schemes. As such SKM's benchmark comparison has been restricted to comparing LinkWater's reservoir and bulk transmission scheme asset groupings with those of Ben Lomond Water. This limited information results in no definitive conclusions being able to be drawn from the benchmarking at the time of writing this draft report.

7. Asset specific benchmarking – Water quality facilities

This section addresses benchmarking at an asset specific level of water quality facilities.

7.1. Chambers Flat Water Quality Facility

The Chamber Flat Water Quality Facility was constructed in 2008 and has the capacity to treat 47,450 ML/annum. The primary purpose of the facility is to maintain chlorine level within the trunk mains network. It is co-located with the Chambers Flat Pump Station between the North Beaudesert Reservoir and the Stapylton Reservoir.

7.1.1. LinkWater metrics

An overview of the information provided for Chambers Flat Water Quality Facility is outlined below in **Table 41**.

- **Table 41 Chambers Flat Water Quality Facility information**

Facility	Capacity (ML/annum)	Water treated (ML)	Average age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Chambers Flat	47,450	13,716	4	560,029	529,445	53,950	6,311,428

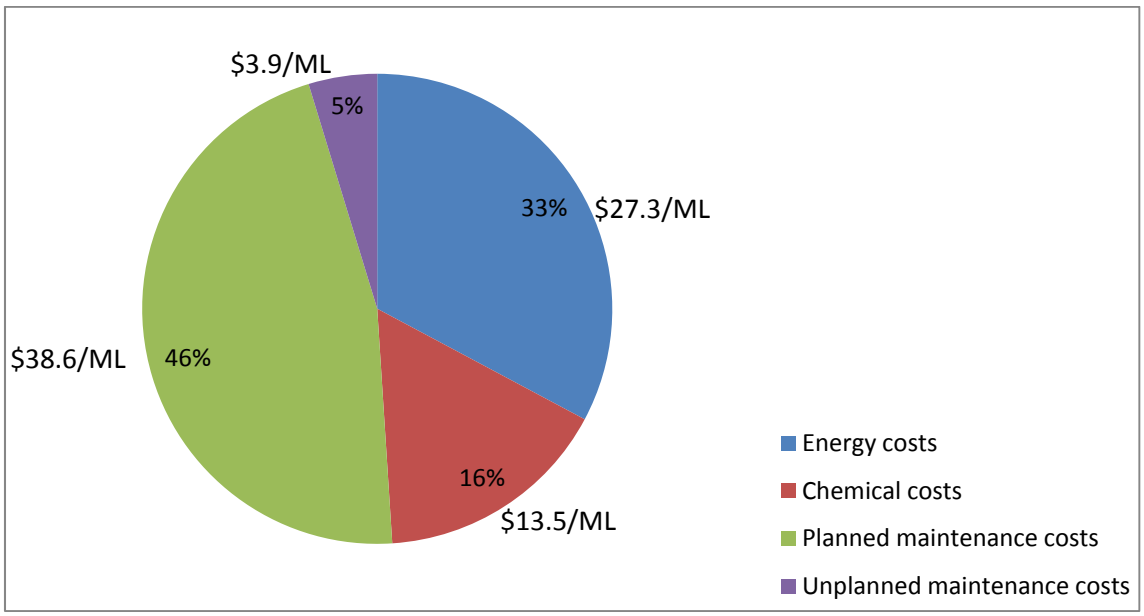
Metrics developed for Chambers Flat Water Quality Facility are outlined below in **Table 42**.

- **Table 42 Chambers Flat Water Quality Facility metrics**

Metric	Value	Unit
Asset value/ML water treated	460.15	$/ML
FTE/ML water treated	0.00017	FTE/ML
FTE/Capacity (ML/day)	0.000048	FTE/ML
Variable operating costs/ML water treated	40.83	$/ML
Variable operating costs/Asset value	0.089	Ratio
Energy costs/ML water treated	27.33	$/ML
Chemical costs/ML water treated	13.50	$/ML
Planned maintenance costs/Asset value	0.084	Ratio
Planned maintenance costs/ML water treated	38.60	$/ML
Unplanned maintenance costs/Asset value	0.01	Ratio
Unplanned maintenance costs/ML water treated	3.93	$/ML
Planned maintenance costs/Unplanned maintenance costs	9.81	Ratio
Total maintenance costs/Asset value	0.09	Ratio
Total maintenance costs/ML water treated	42.53	$/ML

Metric	Value	Unit
(Total maintenance costs/Age)/ML water treated	10.63	$/ML
Total variable operating & maintenance costs/Asset value	0.18	Ratio
Total variable operating & maintenance costs/ML water treated	83.36	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This breakdown is presented below in **Figure 27**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 27 Percentage breakdown of operational costs per ML water treated for Chambers Flat Water Quality Facility**

7.1.2. Comparator water utility asset metrics

No information on water quality facilities had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Chambers Flat Water Quality Facility.

7.2. Alexandra Hills Water Quality Facility

The Alexandra Hills Water Quality Facility has the capacity to treat 6,570 ML/annum. The primary purpose of the facility is to maintain chlorine residual within the trunk mains network.

7.2.1. LinkWater metrics

An overview of the information provided for Alexandra Hills Water Quality Facility is outlined below in **Table 43**.

- **Table 43 Alexandra Hills Water Quality Facility information**

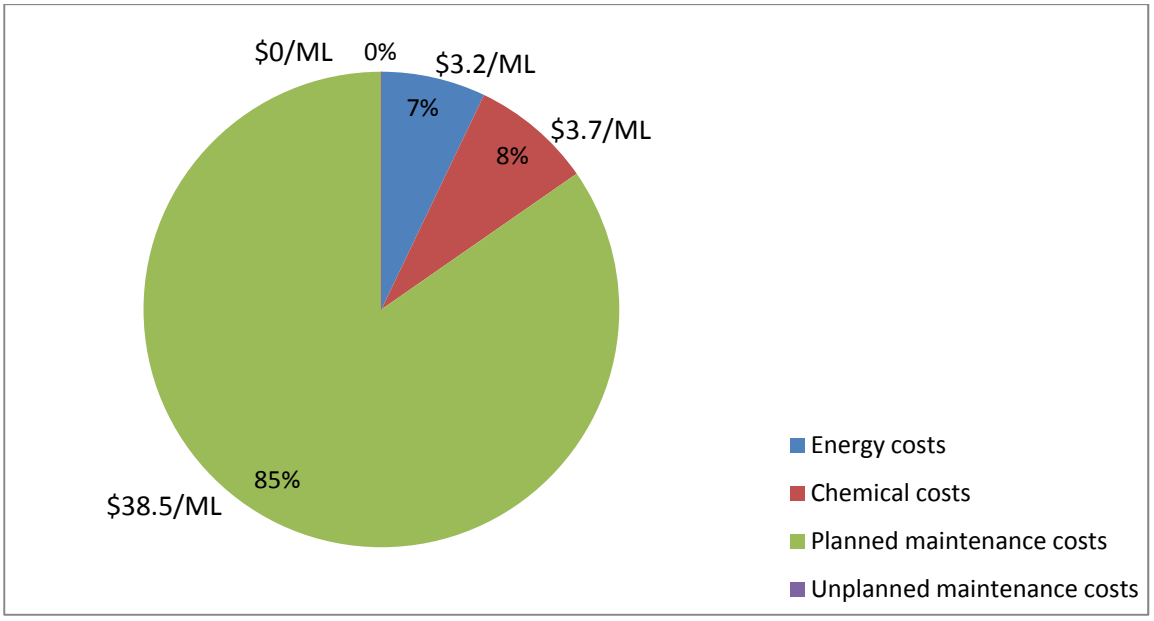
Facility	Capacity (ML/annum)	Water treated (ML)	Average age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Alexandra Hills	6,570	4,948	0	34,434	190,277	0	239,077

Metrics developed for Alexandra Hills Water Quality Facility are outlined below in **Table 44**.

- **Table 44 Alexandra Hills Water Quality Facility metrics**

Metric	Value	Unit
Asset value/ML water treated	48.32	$/ML
FTE/ML water treated	0.00015	FTE/ML
FTE/Capacity (ML/day)	0.00011	FTE/ML
Variable operating costs/ML water treated	6.96	$/ML
Variable operating costs/Asset value	0.14	Ratio
Energy costs/ML water treated	3.23	$/ML
Chemical costs/ML water treated	3.73	$/ML
Planned maintenance costs/Asset value	0.80	Ratio
Planned maintenance costs/ML water treated	38.46	$/ML
Unplanned maintenance costs/Asset value	NA	Ratio
Unplanned maintenance costs/ML water treated	NA	$/ML
Planned maintenance costs/Unplanned maintenance costs	NA	Ratio
Total maintenance costs/Asset value	0.80	Ratio
Total maintenance costs/ML water treated	38.46	$/ML
(Total maintenance costs/Age)/ML water treated	NA	$/ML
Total variable operating & maintenance costs/Asset value	0.94	Ratio
Total variable operating & maintenance costs/ML water treated	45.41	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is as presented below in **Figure 28**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 28 Percentage breakdown of operational costs per ML water treated for Alexandra Hills Water Quality Facility**

7.2.2. Comparator water utility asset metrics

No information on water quality facilities had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Alexandra Hills Water Quality Facility.

7.3. Summary and conclusions on water quality facility benchmarking

At the time of development of this draft report, no benchmark information had been provided on assets comparable to LinkWater water quality facilities. This limited information results in no definitive conclusions being able to be drawn from the benchmarking at the time of writing this draft report.

8. Asset specific benchmarking – Pump stations

This section addresses benchmarking at an asset specific level of pump stations.

8.1. Bundamba Pump Station

The Bundamba Pump Station was constructed in 2009 and has the capacity to pump 60,000 ML/year. The pump station is part of the Southern Regional Water Pipeline network, Northern Leg, which provides bi-directional flow capability between the Gold Coast and Brisbane. The pump station consists of two variable speed drive (VSD) pumps at 1984 L/s each in a duty and standby arrangement and one VSD pump at 900 L/s (duty).

8.1.1. LinkWater metrics

An overview of the information provided for the Bundamba Pump Station is outlined below in **Table 45**. For the 2011/12 period the Bundamba Pump Station was not operational under a proposed mode of operation based on operating strategy as provided by SEQ Water Grid Manager.

Table 45 Bundamba Pump Station information

Pump Station	Capacity (ML/yr)	Water transported (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Bundamba	60,000	0	3	2,167	129,817	9,747	24,901,846

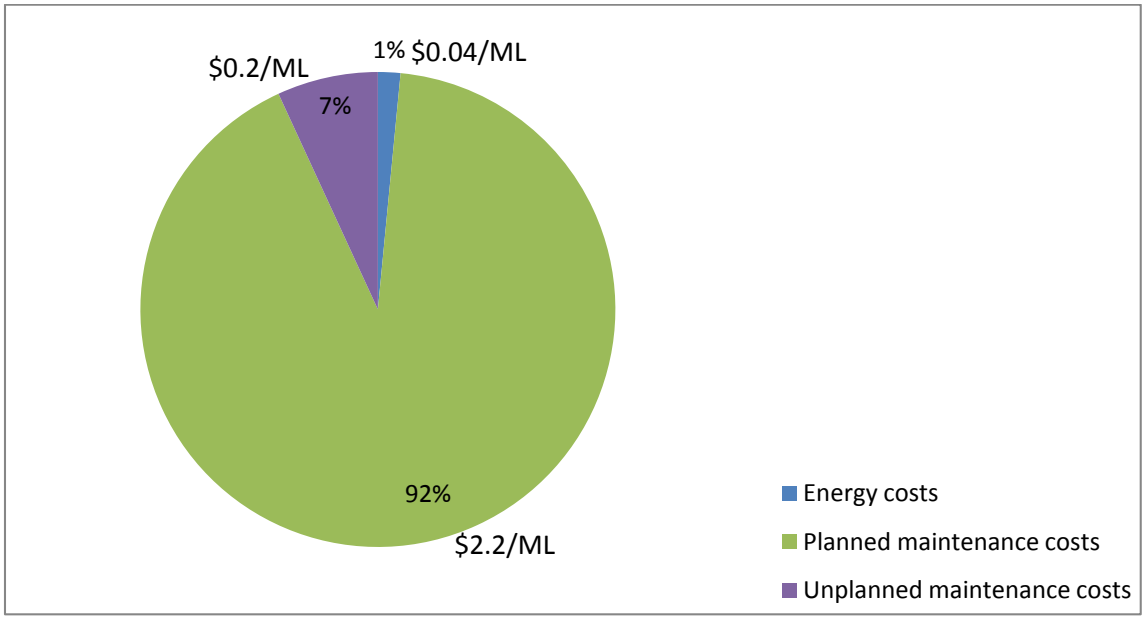
Metrics developed for Bundamba Pump Station are outlined below in **Table 46**.

Table 46 Bundamba Pump Station metrics

Metric	Value	Unit
Asset value/ML water transported	NA	$/ML
Asset value/Capacity (ML/yr)	415.03	$/ML
FTE/ML water transported	NA	FTE/ML
FTE/Capacity (ML/yr)	0.0000074	FTE/ML
Energy costs/ML water transported	NA	$/ML
Energy costs/Capacity (ML/yr)	0.036	$/ML
Planned maintenance costs/Asset value	0.0052	Ratio
Planned maintenance costs/ML water transported	NA	$/ML
Planned maintenance costs/Capacity (ML/yr)	2.16	$/ML
Unplanned maintenance costs/Asset value	0.0004	Ratio
Unplanned maintenance costs/ML water transported	NA	$/ML
Unplanned maintenance costs/Capacity (ML/yr)	0.16	$/ML
Planned maintenance costs/Unplanned maintenance costs	13.32	Ratio
Total maintenance costs/Asset value	0.0056	Ratio

Metric	Value	Unit
Total maintenance costs/ML water transported	NA	$/ML
Total maintenance costs/Capacity (ML/yr)	2.33	$/ML
(Total maintenance costs/Age)/ML water transported	NA	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.78	$/ML
Total variable operating & maintenance costs/Asset value	0.0057	Ratio
Total variable operating & maintenance costs/ML water transported	NA	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 29**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 29 Percentage breakdown of operational costs per ML water transportation capacity for Bundamba Pump Station**

8.1.2. Comparator water utility asset metrics

No information on pump stations had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Bundamba Pump Station.

8.2. Cameron's Hill Pump Station

The Cameron's Hill Pump Station was constructed in 1984 and has the capacity to transport 240,000 ML/year. The pump station is part of the Brisbane – Mount Crosby to Green Hill bulk transport scheme which provides water from the Mount Crosby Water Treatment Plant to the Green

Hill reservoirs. The pump station consists of two direct on line (DOL) pumps at 1800 L/s each in a duty and standby arrangement.

8.2.1. LinkWater metrics

An overview of the information provided for the Cameron's Hill Pump Station is outlined below in **Table 47**. For the 2011/12 period the Cameron's Hill Pump Station was not operational under a proposed mode of operation based on operating strategy as provided by SEQ Water Grid Manager.

- **Table 47 Cameron's Hill Pump Station information**

Pump Station	Capacity (ML/yr)	Water transported (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Cameron's Hill	240,000	0	28	470	26,508	677	957,451

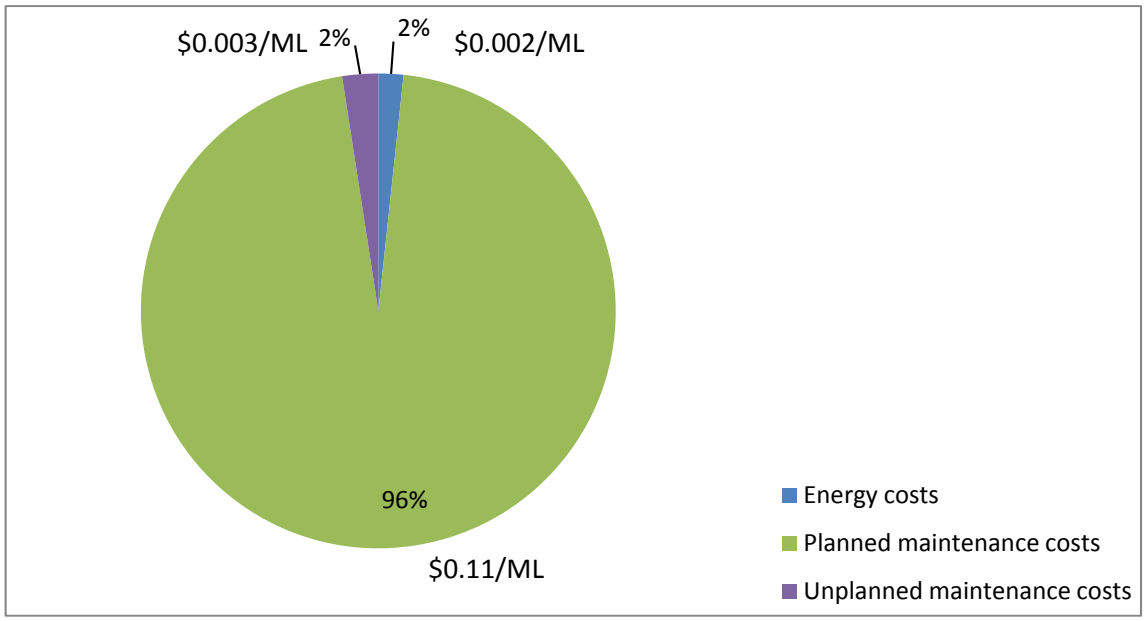
Metrics developed for Cameron's Hill Pump Station are outlined below in **Table 48**.

- **Table 48 Cameron's Hill Pump Station metrics**

Metric	Value	Unit
Asset value/ML water transported	NA	$/ML
Asset value/Capacity (ML/yr)	3.99	$/ML
FTE/ML water transported	NA	FTE/ML
FTE/Capacity (ML/yr)	0.00000030	FTE/ML
Energy costs/ML water transported	NA	$/ML
Energy costs/Capacity (ML/yr)	0.0020	$/ML
Planned maintenance costs/Asset value	0.028	Ratio
Planned maintenance costs/ML water transported	NA	$/ML
Planned maintenance costs/Capacity (ML/yr)	0.110	$/ML
Unplanned maintenance costs/Asset value	0.00	Ratio
Unplanned maintenance costs/ML water transported	NA	$/ML
Unplanned maintenance costs/Capacity (ML/yr)	0.00	$/ML
Planned maintenance costs/Unplanned maintenance costs	39.155	Ratio
Total maintenance costs/Asset value	0.03	Ratio
Total maintenance costs/ML water transported	NA	$/ML
Total maintenance costs/Capacity (ML/yr)	0.11	$/ML
(Total maintenance costs/Age)/ML water transported	NA	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.004	$/ML
Total variable operating & maintenance costs/Asset value	0.03	Ratio
Total variable operating & maintenance costs/ML water transported	NA	$/ML
Total variable operating & maintenance costs/Capacity (ML/yr)	0.12	$/ML

Due to no water being transported through the pump station the metrics have been developed based on the ML per year capacity of the pump station. Even though no water was transported though the station, there are still energy and maintenance costs associated with it due to the need to maintain operability in the event that the SEQ Water Grid Manager operational strategy changes.

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is as presented below in **Figure 30**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs as may be expected for an asset that is not being operated.



- **Figure 30 Percentage breakdown of operational costs per ML water transportation capacity for Cameron's Hill Pump Station**

8.2.2. Comparator water utility asset metrics

No information on pump stations had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Cameron's Hill Pump Station.

8.3. Mudgeeraba Pump Station

The Mudgeeraba Pump Station was constructed in 1977 and has the capacity to transport 35,000 ML/year. The pump station is part of the Gold Coast – Mudgeeraba Supply Main bulk transport scheme which provides water from the Mudgeeraba Water Treatment Plant to Tarrant Drive, which connects to the Tarrant Drive to Elanora bulk transport scheme. The pump station consists of two pumps at 600 L/s each in a duty and standby arrangement.

8.3.1. LinkWater metrics

An overview of the information provided for the Mudgeeraba Pump Station is outlined below in **Table 49**. For the 2011/12 period the Mudgeeraba Pump Station was not operational under proposed mode of operation based on operating strategy as provided by SEQ Water Grid Manager.

- **Table 49 Mudgeeraba Pump Station information**

Pump Station	Capacity (ML/yr)	Water transported (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Mudgeeraba	35,000	0	35	1,348	25,943	475	746,998

Metrics developed for Mudgeeraba Pump Station are outlined below in **Table 50**.

- **Table 50 Mudgeeraba Pump Station metrics**

Metric	Value	Unit
Asset value/ML water transported	NA	$/ML
Asset value/Capacity (ML/yr)	21.34	$/ML
FTE/ML water transported	NA	FTE/ML
FTE/Capacity (ML/yr)	0.0000033	FTE/ML
Energy costs/ML water transported	NA	$/ML
Energy costs/Capacity (ML/yr)	0.039	$/ML
Planned maintenance costs/Asset value	0.035	Ratio
Planned maintenance costs/ML water transported	NA	$/ML
Planned maintenance costs/Capacity (ML/yr)	0.74	$/ML
Unplanned maintenance costs/Asset value	0.00064	Ratio
Unplanned maintenance costs/ML water transported	NA	$/ML
Unplanned maintenance costs/Capacity (ML/yr)	0.014	$/ML
Planned maintenance costs/Unplanned maintenance costs	54.62	Ratio
Total maintenance costs/Asset value	0.035	Ratio
Total maintenance costs/ML water transported	NA	$/ML
Total maintenance costs/Capacity (ML/yr)	0.75	$/ML
(Total maintenance costs/Age)/ML water transported	NA	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.022	$/ML
Total variable operating & maintenance costs/Asset value	0.037	Ratio
Total variable operating & maintenance costs/ML water transported	NA	$/ML
Total variable operating & maintenance costs/Capacity (ML/yr)	0.79	$/ML

Due to no water being transported through the pump station the metrics have been developed based on the ML per year capacity of the pump station. Even though no water was transported though the station, there are still energy and maintenance costs associated with it due to the need maintain operability in the event that the SEQ Water Grid Manager operational strategy changes.

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 31**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.

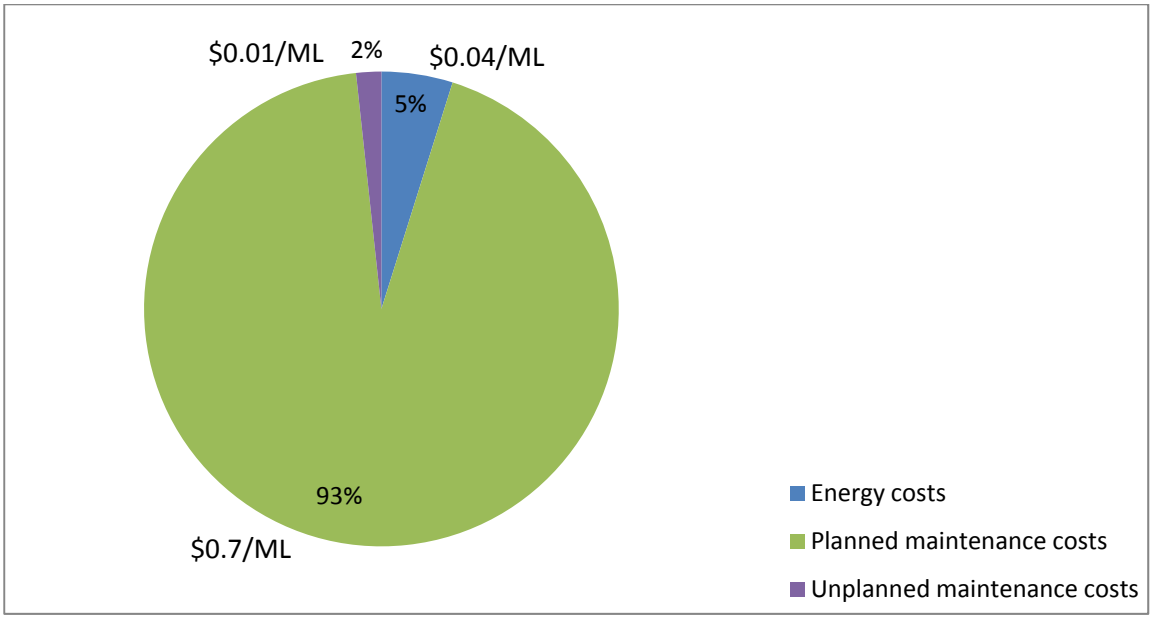


Figure 31 Percentage breakdown of operational costs per ML water transportation capacity for Mudgeeraba Pump Station

8.3.2. Comparator water utility asset metrics

No information on pump stations had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Mudgeeraba Pump Station.

8.4. North Pine Pump Station

The North Pine Pump Station was constructed in 1973 and has the capacity to transport 90,000 ML/year. The pump station is part of the Brisbane – North Pine Water Treatment Plant to Aspley bulk transport scheme which provides water from the North Pine Water Treatment Plant to the Aspley Reservoir. The site has two pump stations with North Pine No. 1 consisting of four pumps at 2000 L/s each in a three pumps duty and one pump standby arrangement and North Pine No. 2 consisting of four pumps at 1500 L/s each in a three pumps duty and one pump standby arrangement.

8.4.1. LinkWater metrics

An overview of the information provided for the North Pine Pump Station is outlined below in **Table 51**.

- **Table 51 North Pine Pump Station information**

Pump Station	Capacity (ML/yr)	Water transported (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
North Pine	90,000	31,500	39	342,437	221,427	39,015	1,054,957

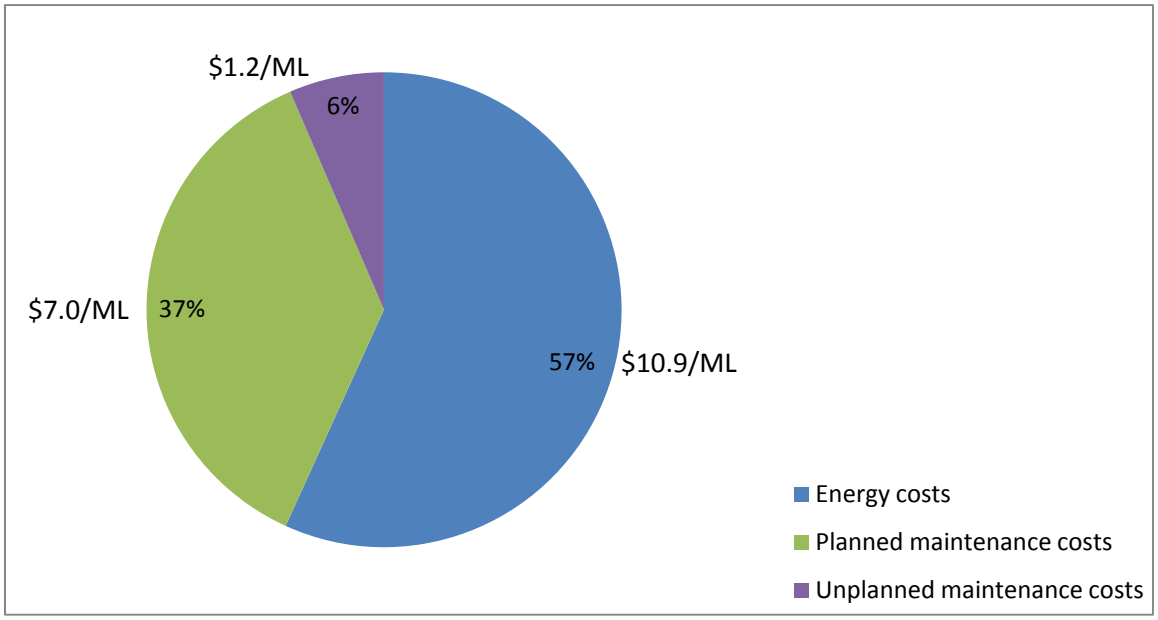
Metrics developed for North Pine Pump Station are outlined below in **Table 52**.

- **Table 52 North Pine Pump Station metrics**

Metric	Value	Unit
Asset value/ML water transported	33.49	$/ML
Asset value/Capacity (ML/yr)	11.72	$/ML
FTE/ML water transported	0.000060	FTE/ML
FTE/Capacity (ML/yr)	0.000021	FTE/ML
Energy costs/ML water transported	10.87	$/ML
Energy costs/Capacity (ML/yr)	3.80	$/ML
Planned maintenance costs/Asset value	0.21	Ratio
Planned maintenance costs/ML water transported	7.03	$/ML
Planned maintenance costs/Capacity (ML/yr)	2.46	$/ML
Unplanned maintenance costs/Asset value	0.04	Ratio
Unplanned maintenance costs/ML water transported	1.24	$/ML
Unplanned maintenance costs/Capacity (ML/yr)	0.43	$/ML
Planned maintenance costs/Unplanned maintenance costs	5.68	Ratio
Total maintenance costs/Asset value	0.25	Ratio
Total maintenance costs/ML water transported	8.27	$/ML
Total maintenance costs/Capacity (ML/yr)	2.89	$/ML
(Total maintenance costs/Age)/ML water transported	0.21	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.07	$/ML
Total variable operating & maintenance costs/Asset value	0.57	Ratio
Total variable operating & maintenance costs/ML water transported	19.14	$/ML
Total variable operating & maintenance costs/Capacity (ML/yr)	6.70	$/ML

Due to no water being transported through the pump station the metrics have been developed based on the ML per year capacity of the pump station. Even though no water was transported though the station, there are still energy and maintenance costs associated with it due to the need maintain operability in the event that the SEQ Water Grid Manager operational strategy changes.

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 32**. The figure indicates that the energy costs comprise the most significant portion of the operational costs.



- **Figure 32 Percentage breakdown of operational costs per ML water transported for North Pine Pump Station**

8.4.2. Comparator water utility asset metrics

No information on water quality facilities had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the North Pine Pump Station.

8.5. Trinder Park Pump Station

The Trinder Park Pump Station was constructed in 1983 and has the capacity to transport 40,000 ML/year. The pump station is part of the Logan – Logan Central Supply bulk transport scheme which provides water between the Kuraby Reservoir and the Kimberley Park Reservoir. The pump station consists of three pumps at 900 L/s each in a two pumps duty and one pump standby arrangement.

8.5.1. LinkWater metrics

An overview of the information provided for the Trinder Park Pump Station is outlined below in **Table 53**.

Table 53 Trinder Park Pump Station information

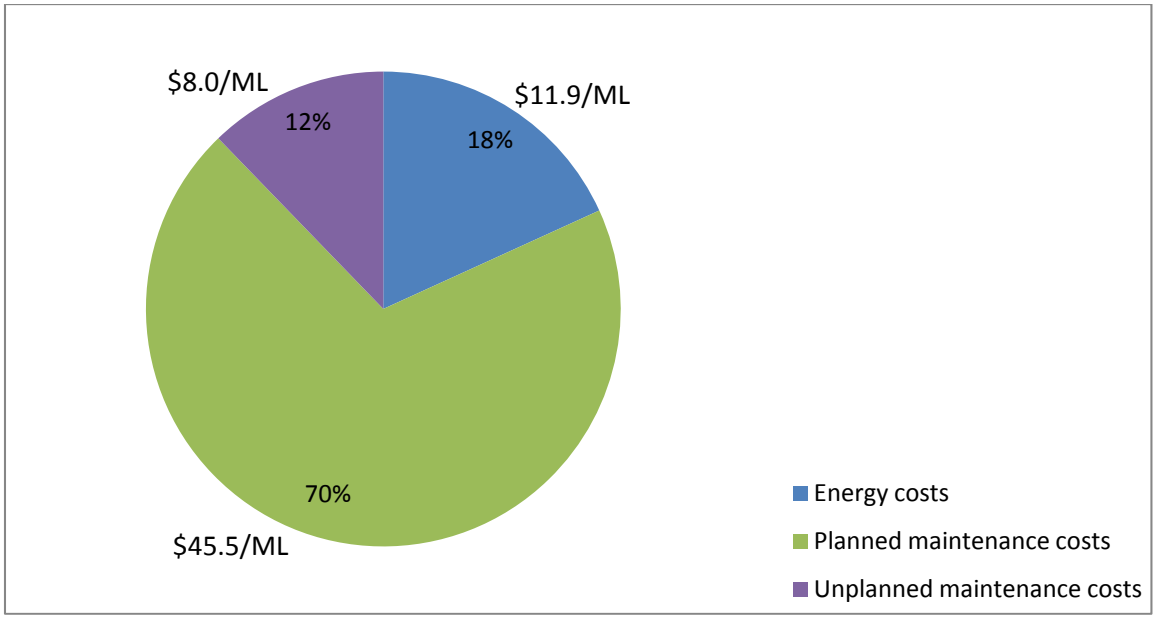
Pump Station	Capacity (ML/yr)	Water transported (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Trinder Park	40,000	3,411	29	40,539	155,116	27,264	1,454,713

Metrics developed for Trinder Park Pump Station are outlined below in **Table 54**.

Table 54 Trinder Park Pump Station metrics

Metric	Value	Unit
Asset value/ML water transported	426.48	$/ML
Asset value/Capacity (ML/yr)	36.37	$/ML
FTE/ML water transported	0.00010	FTE/ML
FTE/Capacity (ML/yr)	0.0000089	FTE/ML
Energy costs/ML water transported	11.88	$/ML
Energy costs/Capacity (ML/yr)	1.01	$/ML
Planned maintenance costs/Asset value	0.107	Ratio
Planned maintenance costs/ML water transported	45.48	$/ML
Planned maintenance costs/Capacity (ML/yr)	3.88	$/ML
Unplanned maintenance costs/Asset value	0.02	Ratio
Unplanned maintenance costs/ML water transported	7.99	$/ML
Unplanned maintenance costs/Capacity (ML/yr)	0.68	$/ML
Planned maintenance costs/Unplanned maintenance costs	5.69	Ratio
Total maintenance costs/Asset value	0.13	Ratio
Total maintenance costs/ML water transported	53.47	$/ML
Total maintenance costs/Capacity (ML/yr)	4.56	$/ML
(Total maintenance costs/Age)/ML water transported	1.84	$/ML
(Total maintenance costs/Age)/Capacity (ML/yr)	0.16	$/ML
Total variable operating & maintenance costs/Asset value	0.15	Ratio
Total variable operating & maintenance costs/ML water transported	65.35	$/ML
Total variable operating & maintenance costs/Capacity (ML/yr)	5.57	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 33**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 33 Percentage breakdown of operational costs per ML water transported for Trinder Park Pump Station**

8.5.2. Comparator water utility asset metrics

No information on pump stations had been provided by interstate regulators or water utilities at the time of drafting of this report. As such no benchmarking has been undertaken for the Trinder Park Pump Station.

8.6. Summary and conclusions on pump station benchmarking

At the time of development of this draft report, no benchmark information had been provided on assets comparable to LinkWater's water pump stations. This limited information results in no definitive conclusions being able to be drawn from the benchmarking.

9. Asset specific benchmarking – Reservoirs

This section will cover benchmarking at an asset specific level of reservoirs. The assets identified and agreed with the Authority have been addressed individually.

9.1. Aspley Reservoir

The Aspley Reservoir was constructed in 1971 and has a capacity of 91 ML. The reservoir is part of the Brisbane bulk transport scheme and is fed from the North Pine Water Treatment Plant.

9.1.1. LinkWater metrics

An overview of the information provided for the Aspley Reservoir is outlined below in **Table 55**.

- **Table 55 Aspley Reservoir information**

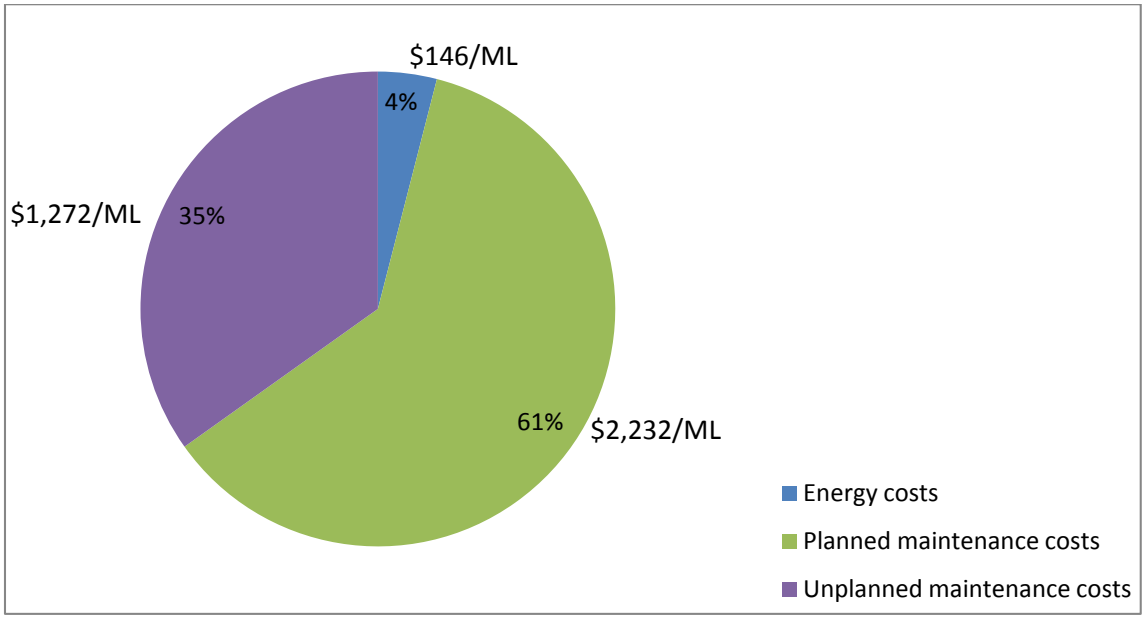
Reservoir	Capacity (ML)	Water stored (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Aspley	91	50	41	7,300	111,575	63,590	10,466,220

Metrics developed for Aspley Reservoir are outlined below in **Table 56**.

- **Table 56 Aspley Reservoir metrics**

Metric	Value	Unit
Asset value/ML water stored	209,324.39	$/ML
FTE/ML water stored	0.0079	FTE/ML
FTE/Capacity (ML)	0.0043	FTE/ML
Variable operating costs/ML water stored	146.00	$/ML
Variable operating costs/Asset value	0.00070	Ratio
Planned maintenance costs/Asset value	0.0107	Ratio
Planned maintenance costs/ML water stored	2,231.50	$/ML
Unplanned maintenance costs/Asset value	0.006	Ratio
Unplanned maintenance costs/ML water stored	1,271.80	$/ML
Total maintenance costs/Asset value	0.017	Ratio
Total maintenance costs/ML water stored	3,503.30	$/ML
Planned maintenance costs/Unplanned maintenance costs	1.75	Ratio
(Total maintenance costs/Age)/ML water stored	85.45	$/ML
Total operating & maintenance costs/Asset value	0.017	Ratio
Total operating & maintenance costs/ML water stored	3,649.30	$/ML
Total operating & maintenance costs/Capacity (ML)	2,005.11	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 34**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 34 Percentage breakdown of operational costs per ML water stored for Aspley Reservoir**

9.1.2. Comparator water utility asset metrics

Information on reservoirs provided by interstate regulators or water utilities at the time of drafting of this report is not comparable to Aspley Reservoir as such no benchmarking comparison has been conducted.

9.2. Green Hill Reservoirs

The Green Hill reservoir complex consists of two reservoirs, both of which were constructed in 1968. Green Hill Reservoir No. 1 has a capacity of 77.3 ML and Green Hill Reservoir No. 2 has a capacity of 95.9 ML. The reservoirs are part of the Brisbane bulk transport scheme and are fed from the Mt Crosby Water Treatment Plant.

9.2.1. LinkWater metrics

An overview of the information provided for the Green Hill reservoir complex is outlined below in **Table 57**.

Table 57 Green Hill reservoir complex information

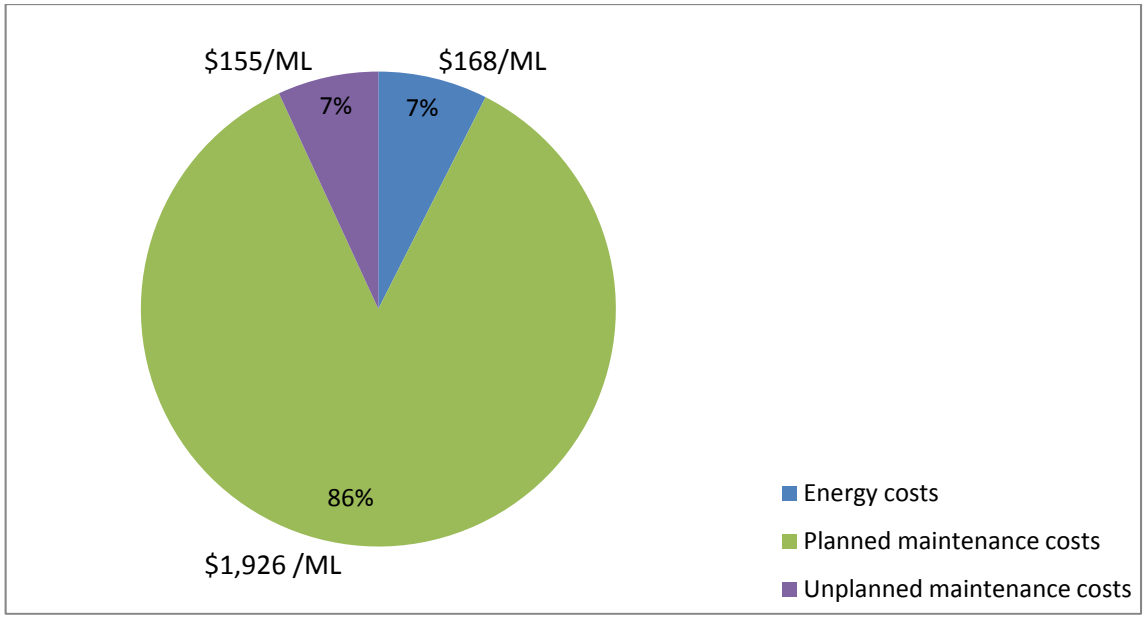
Reservoir	Capacity (ML)	Water stored (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Green Hill	157	87	44	14,600	167,550	13,448	14,586,518

Metrics developed for Green Hill reservoirs are outlined below in **Table 58**.

Table 58 Green Hill reservoir complex metrics

Metric	Value	Unit
Asset value/ML water stored	167,661.13	$/ML
FTE/ML water stored	0.0065	FTE/ML
FTE/Capacity (ML)	0.0036	FTE/ML
Variable operating costs/ML water stored	167.82	$/ML
Variable operating costs/Asset value	0.0010	Ratio
Planned maintenance costs/Asset value	0.0115	Ratio
Planned maintenance costs/ML water stored	1,925.86	$/ML
Unplanned maintenance costs/Asset value	0.00092	Ratio
Unplanned maintenance costs/ML water stored	154.57	$/ML
Total maintenance costs/Asset value	0.012	Ratio
Total maintenance costs/ML water stored	2,080.44	$/ML
Planned maintenance costs/Unplanned maintenance costs	12.46	Ratio
(Total maintenance costs/Age)/ML water stored	47.28	$/ML
Total operating & maintenance costs/Asset value	0.027	Ratio
Total operating & maintenance costs/ML water stored	2,248.25	$/ML
Total operating & maintenance costs/Capacity (ML)	2,530.38	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in Figure 35. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 35 Percentage breakdown of operational costs per ML water stored for Green Hill reservoir complex**

9.2.2. Comparator water utility asset metrics

Information on reservoirs provided by interstate regulators or water utilities at the time of drafting of this report is not comparable to Green Hill reservoir complex as such no benchmarking comparison has been conducted.

9.3. Narangba Reservoirs

The Narangba reservoir complex consists of three reservoirs. Narangba Reservoir No. 1 was constructed in 1977 and has a capacity of 9.1 ML, Narangba Reservoir No. 2 was constructed in 1993 and has a capacity of 16.5 ML and Narangba Reservoir No. 3 was constructed in 1993 and has a capacity of 14.5 ML. The reservoirs are part of the Moreton Bay bulk transport scheme and are fed from the North Pine Water Treatment Plant.

9.3.1. LinkWater metrics

An overview of the information provided for the Narangba reservoir complex is outlined below in **Table 59**.

- **Table 59 Narangba reservoir complex information**

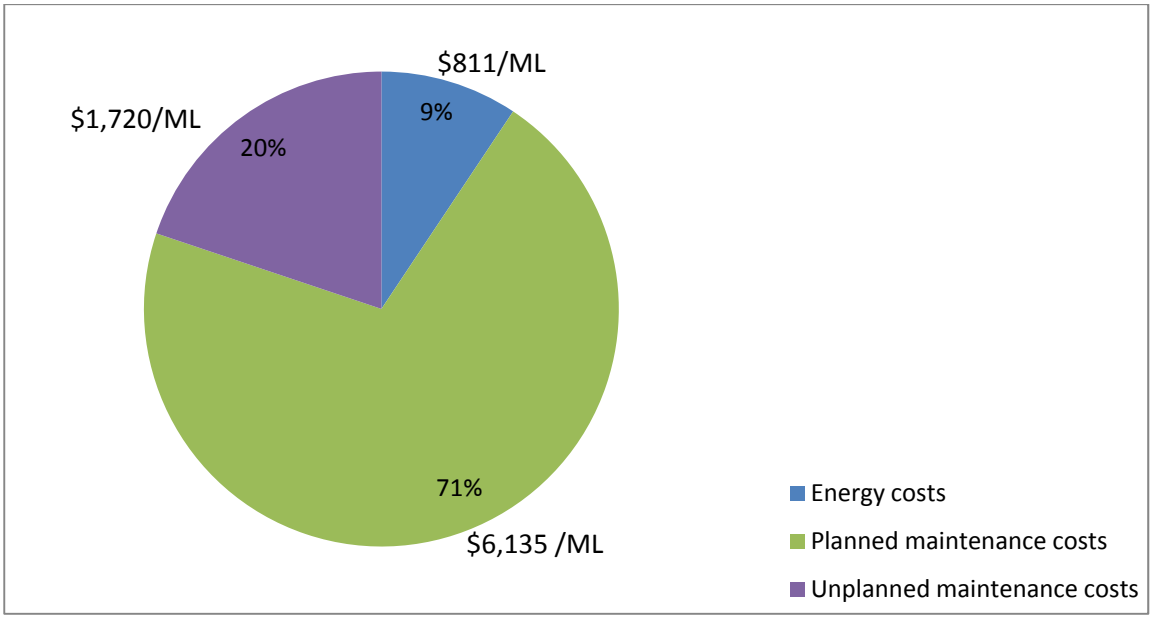
Reservoir	Capacity (ML)	Water stored (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Narangba	40	27	35	21,900	165,635	46,428	7,574,463

Metrics developed for Narangba reservoir complex are outlined below in **Table 60**.

Table 60 Narangba reservoir complex metrics

Metric	Value	Unit
Asset value/ML water stored	280,535.67	$/ML
FTE/ML water stored	0.022	FTE/ML
FTE/Capacity (ML)	0.015	FTE/ML
Variable operating costs/ML water stored	811.11	$/ML
Variable operating costs/Asset value	0.031	Ratio
Planned maintenance costs/Asset value	0.022	Ratio
Planned maintenance costs/ML water stored	6,134.63	$/ML
Unplanned maintenance costs/Asset value	0.0061	Ratio
Unplanned maintenance costs/ML water stored	1,719.56	$/ML
Total maintenance costs/Asset value	0.028	Ratio
Total maintenance costs/ML water stored	7,854.19	$/ML
Planned maintenance costs/Unplanned maintenance costs	3.57	Ratio
(Total maintenance costs/Age)/ML water stored	224.41	$/ML
Total operating & maintenance costs/Asset value	0.12	Ratio
Total operating & maintenance costs/ML water stored	8,665.30	$/ML
Total operating & maintenance costs/Capacity (ML)	25,710.22	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 36**. The figure indicates that the planned maintenance costs comprise the most significant portion of the operational costs.



- **Figure 36 Percentage breakdown of operational costs per ML water stored for Narangba reservoir complex**

9.3.2. Comparator water utility asset metrics

Information on reservoirs provided by interstate regulators or water utilities at the time of drafting of this report is not comparable to Narangba reservoir complex as such no benchmarking comparison has been conducted.

9.4. Stapylton Reservoir

The Stapylton Reservoir was constructed in 2009 and has a capacity of 25 ML. The reservoir is part of the Southern Regional Pipeline – Central Leg which provides bi-directional flow capability between Brisbane and the Gold Coast.

9.4.1. LinkWater metrics

An overview of the information provided for the Stapylton Reservoir is outlined below in **Table 61**.

- **Table 61 Stapylton Reservoir information**

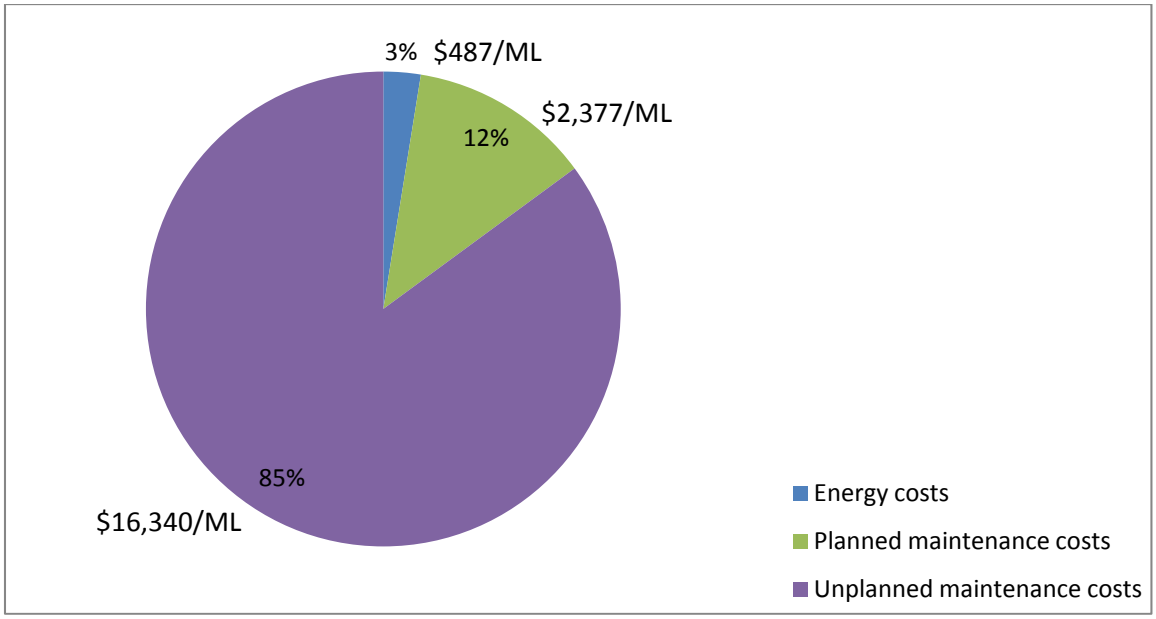
Reservoir	Capacity (ML)	Water stored (ML)	Age	Variable operating costs ($)	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Stapylton	25	15	3	7,300	35,661	245,103	28,311,009

Metrics developed for Stapylton Reservoir are outlined below in **Table 62**.

Table 62 Stapylton Reservoir metrics

Metric	Value	Unit
Asset value/ML water stored	1,887,400.57	$/ML
FTE/ML water stored	0.014	FTE/ML
FTE/Capacity (ML)	0.0083	FTE/ML
Variable operating costs/ML water stored	486.67	$/ML
Variable operating costs/Asset value	0.00026	Ratio
Planned maintenance costs/Asset value	0.0013	Ratio
Planned maintenance costs/ML water stored	2,377.40	$/ML
Unplanned maintenance costs/Asset value	0.0087	Ratio
Unplanned maintenance costs/ML water stored	16,340.20	$/ML
Total maintenance costs/Asset value	0.0099	Ratio
Total maintenance costs/ML water stored	18,717.60	$/ML
Planned maintenance costs/Unplanned maintenance costs	0.15	Ratio
(Total maintenance costs/Age)/ML water stored	6,239.20	$/ML
Total operating & maintenance costs/Asset value	0.0102	Ratio
Total operating & maintenance costs/ML water stored	19,204.27	$/ML
Total operating & maintenance costs/Capacity (ML)	11,522.56	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 36**. The figure indicates that unplanned maintenance costs accounts for the largest portion of operating expenditure, approximately $245,000 which is almost seven times the planned maintenance costs. When compared with the other LinkWater reservoirs, the unplanned maintenance costs are very high.



- **Figure 37 Percentage breakdown of operational costs per ML water stored for Stapylton Reservoir**

9.4.2. Comparator water utility asset metrics

Information to develop comparator water utility metrics for specific assets has been provided by the Office of the Tasmanian Economic Regulator for Ben Lomond Water for two reservoirs, the Rocherlea Complex and the Distillery Creek Complex. The Rocherlea Complex reservoirs have a capacity of 23 ML, while the Distillery Creek Complex reservoirs have a capacity of 18 ML. The information provided on the Rocherlea Complex and the Distillery Creek Complex reservoirs is limited to information of a relatively high level, as outlined below in **Table 63**.

- **Table 63 Rocherlea Complex and Distillery Creek Complex reservoirs information**

Plant	Capacity (ML)	FTEs	Total OPEX ($)	Electricity costs ($)	Overhead cost ($)	Asset value ($)
Rocherlea	23	0.5	60,170	5,000	39,375	3,374,533
Distillery Creek	18	0.5	53,170	5,000	23,985	1,231,218

The limited data provided restricts the metrics which can be developed and how comparable they are to the metrics developed for Stapylton Reservoir. The metrics developed for the reservoirs are outlined below in **Table 64**.

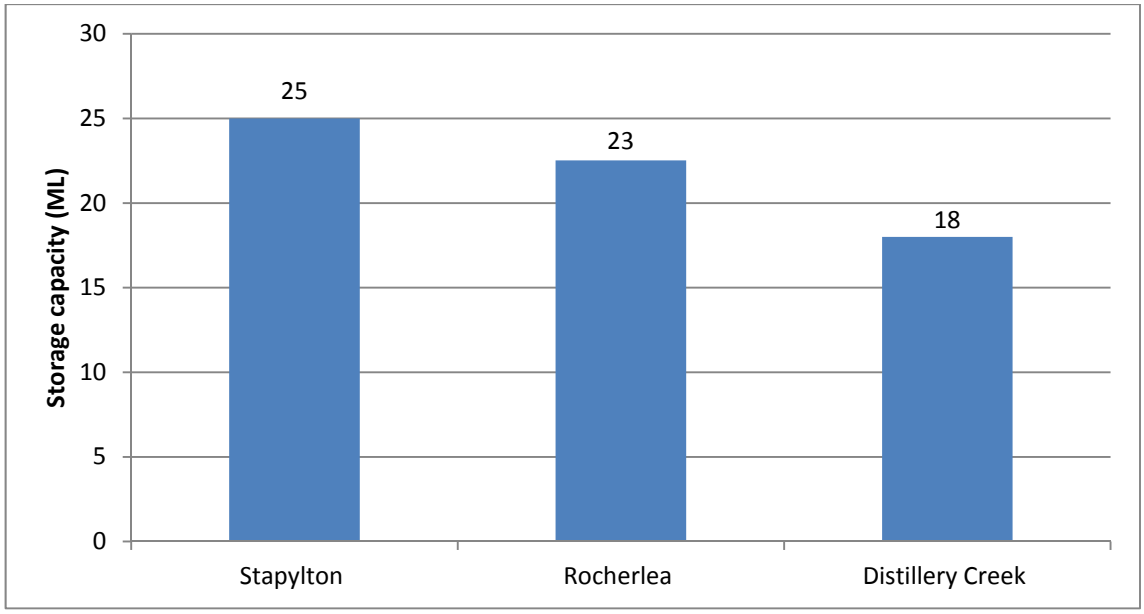
- **Table 64 Ben Lomond Water reservoir metrics**

Metric	Rocherlea Complex	Distillery Creek Complex	Unit
Asset value/Capacity (ML)	149,846.05	68,401.00	$/ML
FTE/Capacity (ML)	0.022	0.028	FTE/ML

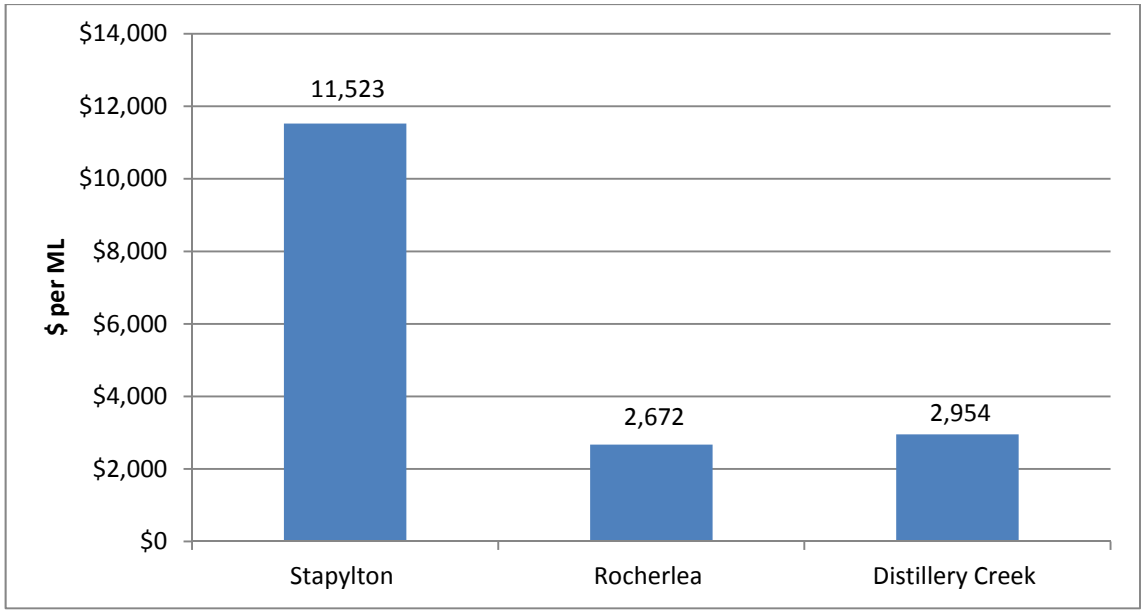
Metric	Rocherlea Complex	Distillery Creek Complex	Unit
Energy costs/Capacity (ML)	222.02	277.78	$/ML
Energy costs/Asset value	0.0015	0.0041	Ratio
Total operating expenditure/Capacity (ML)	2,671.85	2,953.89	$/ML
Total operating expenditure/Asset value	0.018	0.043	Ratio
Overhead costs/Capacity (ML)	1,748.43	1,332.49	$/ML
Overhead costs/Asset value	0.012	0.019	Ratio
Total costs/Capacity (ML)	4,420.27	4,286.38	$/ML
Total costs/Asset value	0.029	0.063	Ratio

9.4.3. Benchmark comparison and discussion

At the time of development of the draft report, benchmark information had only been provided by OTTER, on behalf of Ben Lomond Water, for two comparable reservoir complexes, Rocherlea and Distillery Creek. As such a benchmarking comparison has only been undertaken between Stapylton Reservoir, Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs. **Figure 38** presents the storage capacities of the reservoirs which are comparable in respect to storage volume. There are many other attributes associated with reservoirs which may affect the operational costs including dam wall length, height, construction, dam circumference and managed catchment area. Information on these variables would need to be known to determine if the reservoirs are truly comparable.



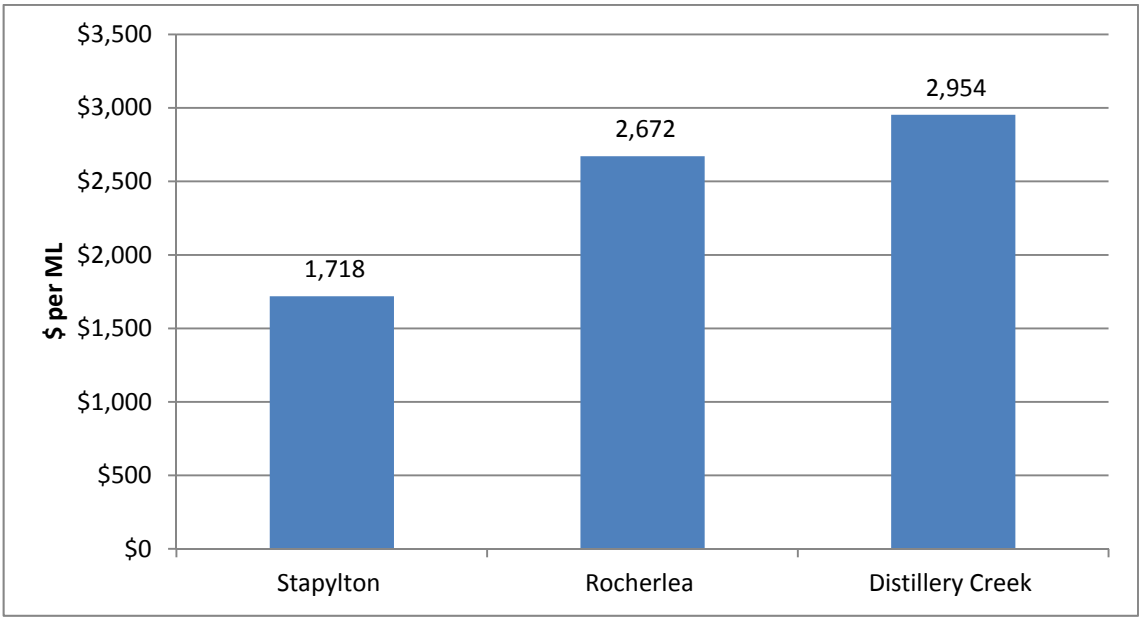
- **Figure 38 Storage capacities for Stapylton Reservoir, Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs**



- **Figure 39 Comparison of operating expenditure per ML water storage capacity**

Figure 39 presents a comparison between the operating costs per ML water storage for Staplyton Reservoir (LinkWater), Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs. The figure indicates that the operating cost per ML water treated for Staplyton Reservoir is significantly higher than both Rocherlea and Distillery Creek reservoirs. As discussed earlier, a significant portion of the Staplyton Reservoir operating costs are associated with unplanned

maintenance. When this is excluded from the analysis, the operating costs per ML stored are comparable, as indicated below in **Figure 40**.



- **Figure 40 Comparison of operating expenditure per ML water storage capacity (excluding unplanned maintenance costs for Stapylton reservoir)**

9.4.4. Conclusions on Stapylton Reservoir costs benchmarking

No definitive conclusions can be drawn from the Stapylton Reservoir costs benchmarking due to limited information available on the breakdown of costs within the operating expenditure of Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs to determine if they are truly comparable. However the comparison indicates that the operating costs per ML storage capacity for Stapylton Reservoir ($11,523/ML) (LinkWater) is significantly higher than those of Rocherlea Complex reservoirs ($2,672/ML) and Distillery Creek Complex reservoirs ($2,954/ML) (Ben Lomond Water). It is suggested that further investigation be undertaken to determine why the operating costs per ML are so much higher.

9.5. Summary and conclusions on reservoir benchmarking

At the time of development of the draft report, benchmark information had only been provided by OTTER for Ben Lomond Water on two reservoirs; Rocherlea Complex reservoirs (23 ML) and Distillery Creek Complex reservoirs (18 ML). As such SKM's benchmark comparison has been restricted to comparing Stapylton Reservoir to Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs. From this limited information SKM concludes that LinkWater's operating costs per ML of water storage are an order of magnitude higher than that for Ben Lomond Water and therefore higher than may be expected for an efficient operator.

10. Asset specific benchmarking – Bulk transmission schemes

This section addresses benchmarking at an asset specific level of bulk transmission mains. The assets identified and agreed with the Authority have been addressed individually.

10.1. Northern Interconnector Pipeline (NPI) scheme

Stage 1 of the Northern Pipeline Interconnector (NPI Stage 1) scheme connects Landers Shute Water Treatment Plant within Sunshine Coast region to Morayfield Reservoirs within Moreton Bay region and on to North Pine Water Treatment Plant clear water pumps to feed Aspley Reservoir in the Brisbane region. The scheme consists of approximately 58 km of trunk main, with approximately 47 km at 1200 mm diameter and approximately 11 km at 750 mm diameter, and transports approximately 10,500 ML/year.

10.1.1. LinkWater metrics

For the Northern Pipeline Interconnector scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Northern Pipeline Interconnector scheme is outlined below in **Table 65**.

Table 65 Northern Pipeline Interconnector scheme information

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
NPI	57.6	750-1200	10,500	8	33,870	57,060	183,656,387

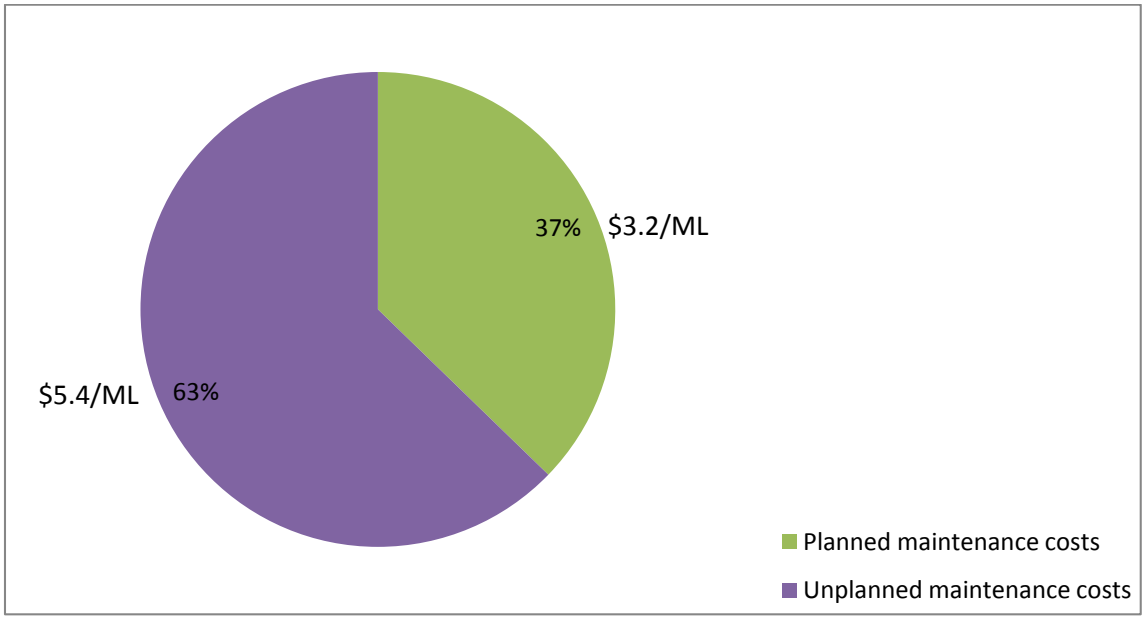
Metrics developed for Northern Pipeline Interconnector are outlined below in **Table 66**.

Table 66 Northern Pipeline Interconnector scheme metrics

Metric	Value	Unit
Asset value/km linear pipeline	3,188,478.94	$/km
Asset value/ML water transported	17,491.08	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	588.02	$/km
Planned maintenance costs/ML water transported	3.23	$/ML
Planned maintenance costs/Asset value	0.00018	Ratio
Unplanned maintenance costs/km linear pipeline	990.63	$/km
Unplanned maintenance costs/ML water transported	5.43	$/ML
Unplanned maintenance costs/Asset value	0.00031	Ratio

Metric	Value	Unit
Total maintenance costs/km linear pipeline	1,578.65	$/km
Total maintenance costs/ML water transported	8.66	$/ML
Total maintenance costs/Asset value	0.00050	Ratio
Planned maintenance costs/Unplanned maintenance costs	0.59	Ratio
(Total maintenance costs/Age)/km linear pipeline	315.73	$/km
(Total maintenance costs/Age)/ML water transported	1.73	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 41**. The figure indicates that unplanned maintenance costs associated with the scheme accounts for the largest portion of expenditure.



- **Figure 41 Percentage breakdown of operational costs per ML water transported for the Northern Pipeline Interconnector scheme**

10.1.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Northern Pipeline Interconnector scheme as such no benchmarking comparison has been conducted.

10.2. Anstead to Runcorn scheme

The Anstead to Runcorn scheme connects the Mount Crosby Water Treatment Plant to Green Hill and Rocklea to Kuraby schemes. The scheme includes twin 1350 mm mains crossing the Brisbane River, dual mains through Darra and the Learoyd Road pump station. The scheme consists of

approximately 24.4 km of trunk main, with diameters ranging between 900 mm and 1650 mm, and transports approximately 23,574 ML/year.

10.2.1. LinkWater metrics

For the Anstead to Runcorn scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Anstead to Runcorn scheme is outlined below in **Table 67**.

- **Table 67 Anstead to Runcorn scheme information**

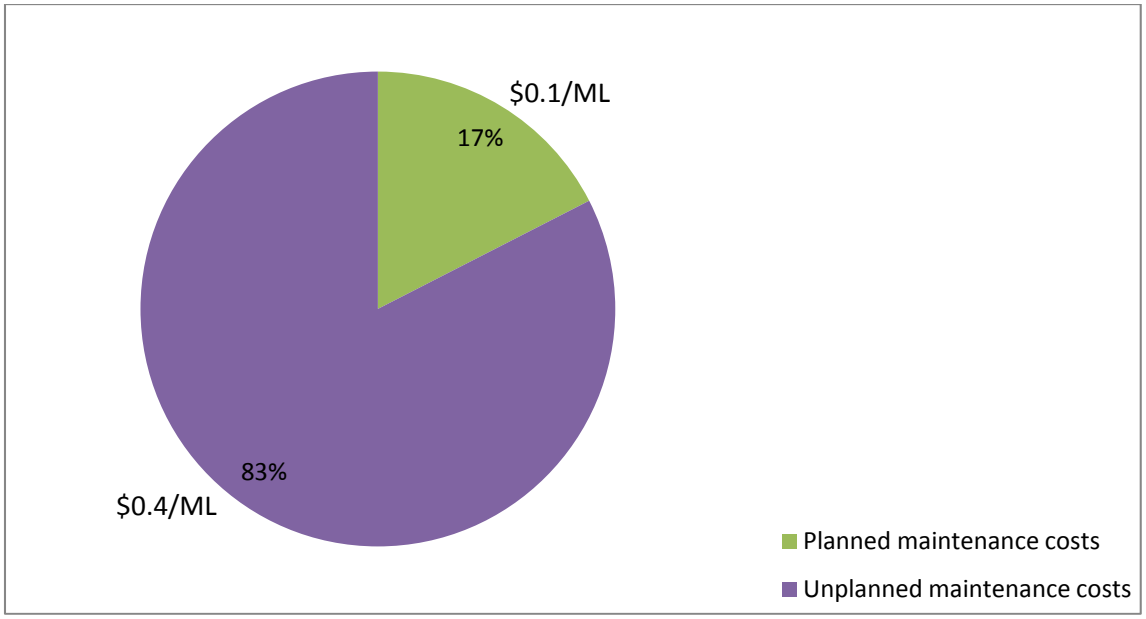
Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Anstead to Runcorn	24.4	900-1650	23,574	22	1,841	8,700	91,653,290

Metrics developed for Anstead to Runcorn scheme are outlined below in **Table 68**.

- **Table 68 Anstead to Runcorn scheme metrics**

Metric	Value	Unit
Asset value/km linear pipeline	3,756,282.37	$/km
Asset value/ML water transported	3,887.83	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	75.45	$/km
Planned maintenance costs/ML water transported	0.078	$/ML
Planned maintenance costs/Asset value	0.000020	Ratio
Unplanned maintenance costs/km linear pipeline	356.56	$/km
Unplanned maintenance costs/ML water transported	0.37	$/ML
Unplanned maintenance costs/Asset value	0.000095	Ratio
Total maintenance costs/km linear pipeline	432.01	$/km
Total maintenance costs/ML water transported	0.45	$/ML
Total maintenance costs/Asset value	0.00012	Ratio
Planned maintenance costs/Unplanned maintenance costs	0.21	Ratio
(Total maintenance costs/Age)/km linear pipeline	18.00	$/km
(Total maintenance costs/Age)/ML water transported	0.019	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 42**. The figure indicates that unplanned maintenance costs associated with the scheme accounts for the largest portion of expenditure.



- **Figure 42 Percentage breakdown of operational costs per ML water transported for the Anstead to Runcorn scheme**

10.2.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Anstead to Runcorn scheme as such no benchmarking comparison has been conducted.

10.3. Mt Crosby to Wellers Hill scheme

The Mt Crosby to Wellers Hill scheme consists of two schemes the Green Hill to Wellers Hill scheme and the Mount Crosby to Green Hill scheme. The Green Hill to Wellers Hill scheme connects Green Hill to the Wellers Hill reservoirs. The Mount Crosby to Green Hill scheme connects Mount Crosby Water Treatment Plant to the Green Hill reservoir complex. The entire scheme consists of approximately 29.4 km of trunk main, with diameters ranging between 900 mm and 1650 mm, and transports approximately 21,146 ML/year.

10.3.1. LinkWater metrics

For the Mt Crosby to Wellers Hill scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Mt Crosby to Wellers Hill scheme is outlined below in **Table 69**.

Table 69 Mt Crosby to Wellers Hill scheme information

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Mt Crosby to Wellers Hill	29.4	900-1650	21,146	52	84,485	8,700	24,239,081

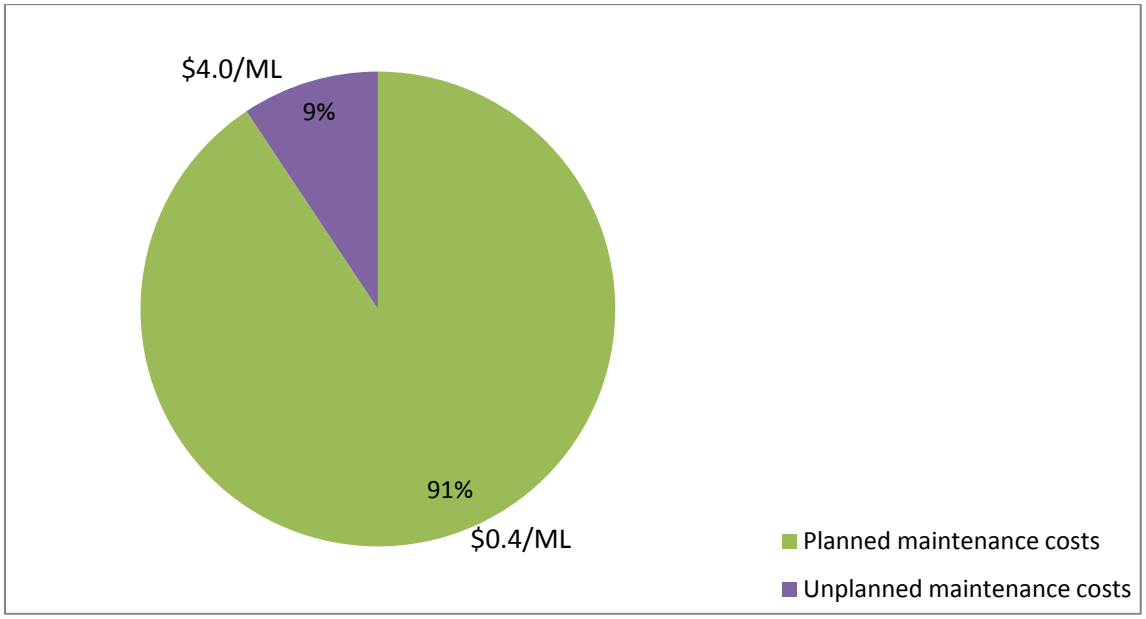
Metrics developed for Mt Crosby to Wellers Hill scheme are outlined below in **Table 70**.

Table 70 Mt Crosby to Wellers Hill scheme metrics

Metric	Value	Unit
Asset value/km linear pipeline	3,284,572.65	$/km
Asset value/ML water transported	4,566.55	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	2,873.64	$/km
Planned maintenance costs/ML water transported	4.00	$/ML
Planned maintenance costs/Asset value	0.00087	Ratio
Unplanned maintenance costs/km linear pipeline	295.92	$/km
Unplanned maintenance costs/ML water transported	0.41	$/ML
Unplanned maintenance costs/Asset value	0.00009	Ratio
Total maintenance costs/km linear pipeline	3,169.56	$/km
Total maintenance costs/ML water transported	4.41	$/ML
Total maintenance costs/Asset value	0.00096	Ratio
Planned maintenance costs/Unplanned maintenance costs	9.71	Ratio
(Total maintenance costs/Age)/km linear pipeline	58.70	$/km
(Total maintenance costs/Age)/ML water transported	0.082	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 43**. The figure indicates that planned maintenance costs associated with the scheme accounts for the largest portion of expenditure.

The ratio of planned maintenance cost to unplanned maintenance cost indicates that 9% of all maintenance costs are as a result of a failure or significant deterioration of an item that results in maintenance being undertaken that has not been scheduled. The relatively low portion of costs associate with unplanned maintenance indicates that the planned maintenance activities are effective.



- **Figure 43 Percentage breakdown of operational costs per ML water transported for the Mt Crosby to Wellers Hill scheme**

10.3.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Mt Crosby to Wellers Hill scheme as such no benchmarking comparison has been conducted.

10.4. North Pine Water Treatment Plant to Aspley scheme

The North Pine Water Treatment Plant to Aspley scheme supplies water from the North Pine Water Treatment Plant to the Aspley Reservoir via the North Pine pump station. It consists of approximately17.5 km of trunk main, with diameters ranging between 1050 mm and 1600 mm, and transports approximately 31,500 ML/year.

10.4.1. LinkWater metrics

For the North Pine Water Treatment Plant to Aspley scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the North Pine Water Treatment Plant to Aspley scheme is outlined below in **Table 71**.

Table 71 North Pine Water Treatment Plant to Aspley scheme information

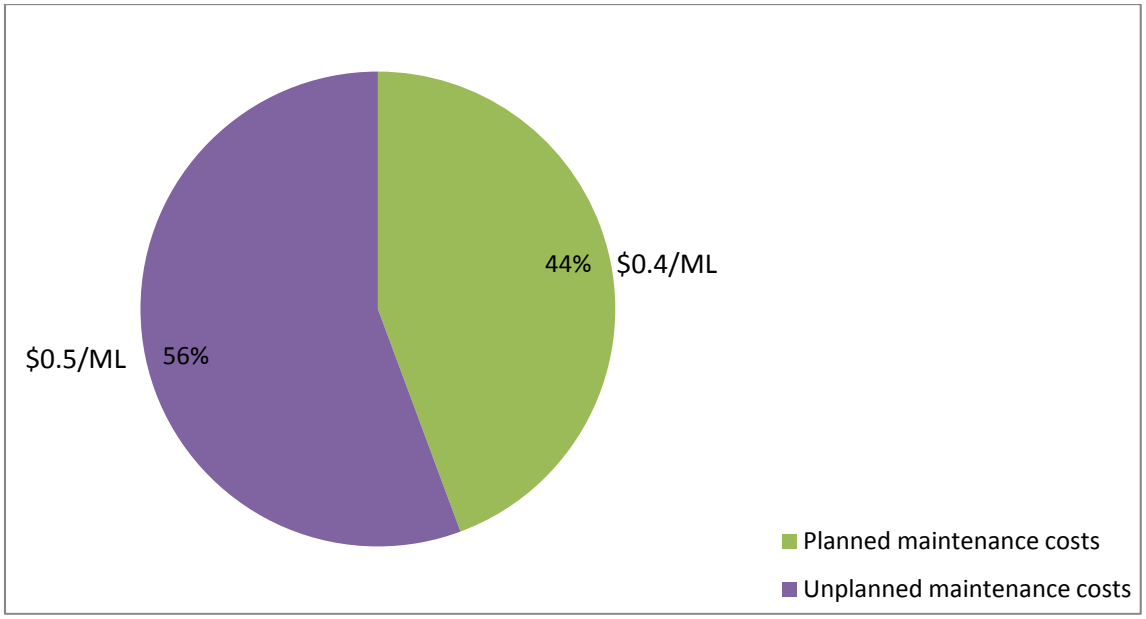
Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
North Pine WTP to Aspley	17.5	1050-1600	31,500	41	12,890	16,180	34,526,966

Metrics developed for North Pine Water Treatment Plant to Aspley scheme are outlined below in **Table 72**.

Table 72 North Pine Water Treatment Plant to Aspley scheme metrics

Metric	Value	Unit
Asset value/km linear pipeline	1,972,969.46	$/km
Asset value/ML water transported	1,096.09	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	736.57	$/km
Planned maintenance costs/ML water transported	0.41	$/ML
Planned maintenance costs/Asset value	0.00037	Ratio
Unplanned maintenance costs/km linear pipeline	924.57	$/km
Unplanned maintenance costs/ML water transported	0.51	$/ML
Unplanned maintenance costs/Asset value	0.00047	Ratio
Total maintenance costs/km linear pipeline	1,661.14	$/km
Total maintenance costs/ML water transported	0.92	$/ML
Total maintenance costs/Asset value	0.00084	Ratio
Planned maintenance costs/Unplanned maintenance costs	0.80	Ratio
(Total maintenance costs/Age)/km linear pipeline	40.52	$/km
(Total maintenance costs/Age)/ML water transported	0.023	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 44**. The figure indicates that unplanned maintenance costs associated with the scheme are higher than planned maintenance costs. This suggests that planned maintenance activities are not as effective as may be expected for an efficient operator.



- **Figure 44 Percentage breakdown of operational costs per ML water transported for the North Pine Water Treatment Plant to Aspley scheme**

10.4.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to North Pine Water Treatment Plant to Aspley scheme as such no benchmarking comparison has been conducted.

10.5. Ipswich Central Main scheme

The Ipswich Central Main scheme connects the Mount Crosby to Green Hill Scheme south to the Brisbane River near Colleges Crossing, where it connects with Queensland Urban Utilities infrastructure. The scheme consists of approximately 3.9 km of trunk main, with diameters ranging between 500 mm and 600 mm, and transports approximately 850 ML/year.

10.5.1. LinkWater metrics

For the Ipswich Central Main scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Ipswich Central Main scheme is outlined below in **Table 73**.

Table 73 Ipswich Central Main scheme information

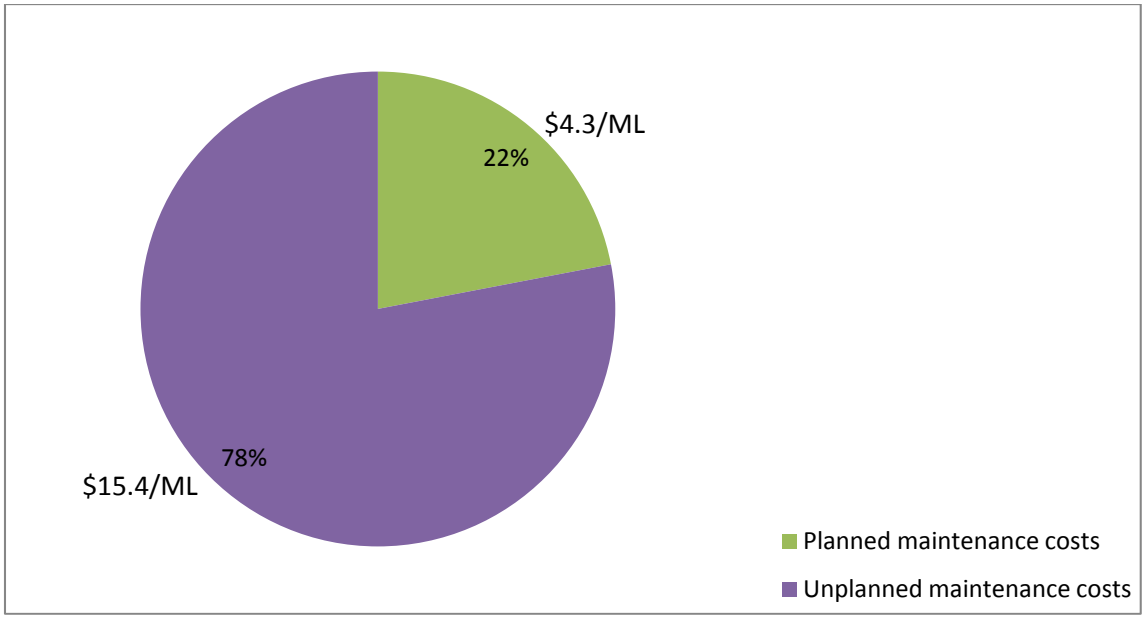
Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Ipswich Central Main	3.9	500-600	850	66	3,688	13,090	2,213,056

Metrics developed for Ipswich Central Main scheme are outlined below in **Table 74**.

Table 74 Ipswich Central Main scheme metrics

Metric	Value	Unit
Asset value/km linear pipeline	567,450.14	$/km
Asset value/ML water transported	2,603.59	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	945.64	$/km
Planned maintenance costs/ML water transported	4.34	$/ML
Planned maintenance costs/Asset value	0.00167	Ratio
Unplanned maintenance costs/km linear pipeline	3,356.41	$/km
Unplanned maintenance costs/ML water transported	15.40	$/ML
Unplanned maintenance costs/Asset value	0.00591	Ratio
Total maintenance costs/km linear pipeline	4,302.05	$/km
Total maintenance costs/ML water transported	19.74	$/ML
Total maintenance costs/Asset value	0.00758	Ratio
Planned maintenance costs/Unplanned maintenance costs	0.28	Ratio
(Total maintenance costs/Age)/km linear pipeline	57.36	$/km
(Total maintenance costs/Age)/ML water transported	0.26	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 45**. The figure indicates that the unplanned maintenance costs associated with the scheme accounts for the largest portion of expenditure. SKM considers that the scheduled maintenance plan is not performing as expected or that a single incident has caused the fairly high unplanned cost to incur.



- **Figure 45 Percentage breakdown of operational costs per ML water transported for the Ipswich Central Main scheme**

10.5.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Ipswich Central Main scheme as such no benchmarking comparison has been conducted.

10.6. Tarrant Drive to Elanora scheme

The Tarrant Drive to Elanora scheme connects to the Mudgeeraba Supply Main scheme near Tarrant Drive and runs in a south-east direction to Elanora break of head tank. It consists of approximately 12.6 km of trunk main, with diameters ranging between 600 mm and 960 mm, and transports approximately 21,007 ML/year.

10.6.1. LinkWater metrics

For the Tarrant Drive to Elanora scheme no information was provided on FTEs allocated to the scheme or planned and unplanned maintenance costs. An overview of the information provided for the Tarrant Drive to Elanora scheme is outlined below in **Table 75**.

- **Table 75 Tarrant Drive to Elanora scheme information**

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Tarrant Drive to Elanora	12.6	600-960	21,007	19	-	-	9,235,776

Metrics developed for Tarrant Drive to Elanora scheme are outlined below in **Table 76**.

- **Table 76 Tarrant Drive to Elanora scheme metrics**

Metric	Value	Unit
Asset value/km linear pipeline	732,998.13	$/km
Asset value/ML water transported	439.65	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	NA	$/km
Planned maintenance costs/ML water transported	NA	$/ML
Planned maintenance costs/Asset value	NA	Ratio
Unplanned maintenance costs/km linear pipeline	NA	$/km
Unplanned maintenance costs/ML water transported	NA	$/ML
Unplanned maintenance costs/Asset value	NA	Ratio
Total maintenance costs/km linear pipeline	NA	$/km
Total maintenance costs/ML water transported	NA	$/ML
Total maintenance costs/Asset value	NA	Ratio
Planned maintenance costs/Unplanned maintenance costs	NA	Ratio
(Total maintenance costs/Age)/km linear pipeline	NA	$/km
(Total maintenance costs/Age)/ML water transported	NA	$/ML

10.6.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Tarrant Drive to Elanora scheme.

10.6.3. Benchmark comparison and discussion

At the time of development of the draft report, the benchmark information provided is not comparable to Tarrant Drive to Elanora scheme; as such no benchmarking comparison has been conducted.

10.6.4. Conclusions on Tarrant Drive to Elanora trunk main costs benchmarking

No conclusions can be drawn from the benchmarking Tarrant Drive to Elanora scheme due to no comparable information being available at the time of writing this draft report.

10.7. Logan Central Supply scheme

The Logan Central Supply scheme connects the Kuraby and Kimberley Park reservoirs. It consists of approximately14.2 km of trunk main, with diameters ranging between 600 mm and 1250 mm, and transports approximately 13,917 ML/year.

10.7.1. LinkWater metrics

For the Logan Central Supply scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Logan Central Supply scheme is outlined below in **Table 77**.

- **Table 77 Logan Central Supply scheme information**

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Logan Central Supply	14.2	600-1250	13,917	28	7,352	5,433	26,984,013

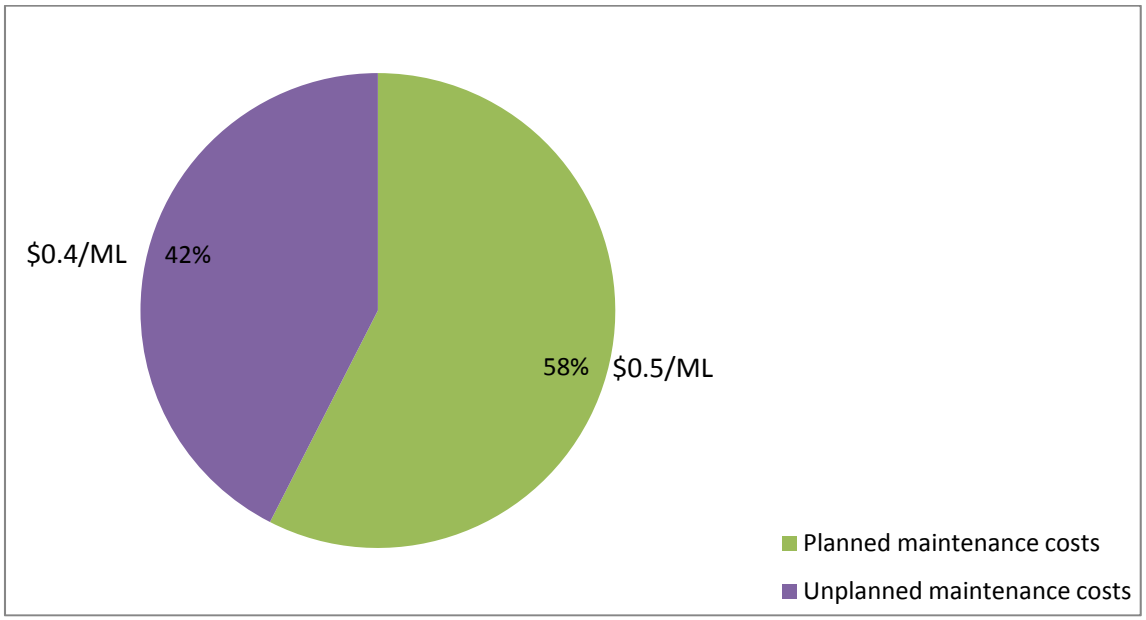
Metrics developed for Logan Central Supply scheme are outlined below in **Table 78**.

- **Table 78 Logan Central Supply scheme metrics**

Metric	Value	Unit
Asset value/km linear pipeline	1,900,282.59	$/km
Asset value/ML water transported	1,938.96	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	517.75	$/km
Planned maintenance costs/ML water transported	0.53	$/ML
Planned maintenance costs/Asset value	0.00027	Ratio
Unplanned maintenance costs/km linear pipeline	382.61	$/km
Unplanned maintenance costs/ML water transported	0.39	$/ML
Unplanned maintenance costs/Asset value	0.00020	Ratio
Total maintenance costs/km linear pipeline	900.35	$/km
Total maintenance costs/ML water transported	0.92	$/ML
Total maintenance costs/Asset value	0.00047	Ratio
Planned maintenance costs/Unplanned maintenance costs	1.35	Ratio

Metric	Value	Unit
(Total maintenance costs/Age)/km linear pipeline	26.48	$/km
(Total maintenance costs/Age)/ML water transported	0.027	$/ML

As LinkWater does not allocate corporate overhead costs to assets, a breakdown of expenditure can only be determined for operational expenditure. This is presented below in **Figure 46**. The figure indicates that planned and unplanned maintenance costs associated with the scheme accounts are fairly equal suggesting that planned maintenance activities are not as effective as may be expected of an efficient operator.



- **Figure 46 Percentage breakdown of operational costs per ML water transported for the Logan Central Supply scheme**

10.7.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Logan Central Supply scheme as such no benchmarking comparison has been conducted.

10.8. Narangba to North Pine Water Treatment Plant scheme

This Narangba to North Pine Water Treatment Plant scheme transports water between the Narangba Reservoirs and the North Pine pump station. The scheme consists of approximately 18 km of trunk main, with approximately 9 km at 750 mm diameter and approximately 9 km at 500 mm diameter, and transports approximately 2,600 ML/year.

10.8.1. LinkWater metrics

For the Narangba to North Pine Water Treatment Plant scheme no information was provided on FTEs allocated to the scheme. An overview of the information provided for the Narangba to North Pine Water Treatment Plant scheme is outlined below in **Table 79**.

- **Table 79 Narangba to North Pine Water Treatment Plant scheme information**

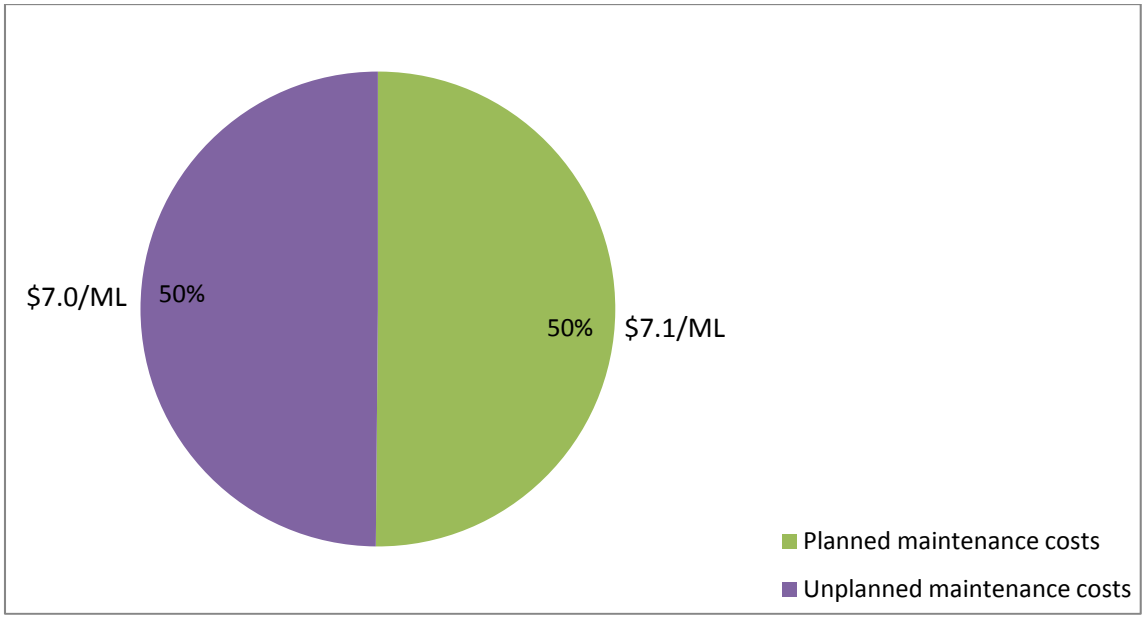
Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Narangba to North Pine WTP	18.0	500-750	2,600	23	18,416	18,317	95,534,902

Metrics developed for Narangba to North Pine Water Treatment Plant scheme are outlined below in **Table 80**.

- **Table 80 Narangba to North Pine Water Treatment Plant scheme metrics**

Metric	Value	Unit
Asset value/km linear pipeline	5,307,494.55	$/km
Asset value/ML water transported	36,744.19	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	1,023.11	$/km
Planned maintenance costs/ML water transported	7.08	$/ML
Planned maintenance costs/Asset value	0.00019	Ratio
Unplanned maintenance costs/km linear pipeline	1,017.61	$/km
Unplanned maintenance costs/ML water transported	7.05	$/ML
Unplanned maintenance costs/Asset value	0.00019	Ratio
Total maintenance costs/km linear pipeline	2,040.72	$/km
Total maintenance costs/ML water transported	14.13	$/ML
Total maintenance costs/Asset value	0.00038	Ratio
Planned maintenance costs/Unplanned maintenance costs	1.01	Ratio
(Total maintenance costs/Age)/km linear pipeline	1,27.55	$/km
(Total maintenance costs/Age)/ML water transported	0.88	$/ML

A breakdown of expenditure within the asset grouping can only be determined for operational expenditure as LinkWater does not allocate corporate costs. This is presented below in **Figure 47**. The figure indicates that planned and unplanned maintenance costs associated with the scheme accounts are equal suggesting that planned maintenance activities are not as effective as may be expected of an efficient operator.



- **Figure 47 Percentage breakdown of operational costs per ML water transported for the Narangba to North Pine Water Treatment Plant scheme**

10.8.2. Comparator water utility asset metrics

Information on bulk transport schemes provided by interstate regulators or water utilities at the time of drafting of this report are not comparable to Narangba to North Pine Water Treatment Plant scheme as such no benchmarking comparison has been conducted.

10.9. Heinemann Rd to Alex Hills trunk main

The Heinemann Road to Alex Hills scheme connects the Heinemann Road Reservoirs to Alex Hills Reservoirs and facilitates bidirectional flow and supply to Mount Cotton Reservoir. The scheme consists of approximately 12 km of trunk main, with diameter ranging between 300 mm and 450 mm diameter, and transports approximately 1,800 ML/year.

10.9.1. LinkWater metrics

For the Heinemann Road to Alex Hills scheme no information was provided on FTEs allocated to the scheme or planned and unplanned maintenance costs. An overview of the information provided for the Heinemann Road to Alex Hills scheme is outlined below in **Table 81**.

- **Table 81 Heinemann Road to Alex Hills scheme information**

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	Average age	Planned maintenance costs ($)	Unplanned maintenance costs ($)	Asset value ($)
Heinemann Road to Alex Hills	12.0	300-450	1,800	33	NA	NA	10,029,226

Metrics developed for Heinemann Road to Alex Hills scheme are outlined below in **Table 82**.

- **Table 82 Heinemann Road to Alex Hills scheme metrics**

Metric	Value	Unit
Asset value/km linear pipeline	835,768.87	$/km
Asset value/ML water transported	5,571.79	$/ML
FTE/km linear pipeline	NA	FTE/km
FTE/ML water transported	NA	FTE/ML
Planned maintenance costs/km linear pipeline	NA	$/km
Planned maintenance costs/ML water transported	NA	$/ML
Planned maintenance costs/Asset value	NA	Ratio
Unplanned maintenance costs/km linear pipeline	NA	$/km
Unplanned maintenance costs/ML water transported	NA	$/ML
Unplanned maintenance costs/Asset value	NA	Ratio
Total maintenance costs/km linear pipeline	NA	$/km
Total maintenance costs/ML water transported	NA	$/ML
Total maintenance costs/Asset value	NA	Ratio
Planned maintenance costs/Unplanned maintenance costs	NA	Ratio
(Total maintenance costs/Age)/km linear pipeline	NA	$/km
(Total maintenance costs/Age)/ML water transported	NA	$/ML

10.9.2. Comparator water utility asset metrics

Information to develop comparator water utility metrics for specific assets has been provided by the Office of the Tasmanian Economic Regulator for Ben Lomond Water for two bulk water schemes, West Tamar and North Esk. The West Tamar scheme consists of 46 km of pipeline with diameters ranging between 150 mm and 450 mm. The North Esk scheme consists of 108 km of pipeline with diameters ranging between 150 mm and 840 mm (ie comparable to the diameter of the trunk mains for LinkWater). The information provided on the West Tamar and North Esk bulk transmission schemes is limited to a relatively high level, as outlined below in **Table 83**.

- **Table 83 West Tamar Pipeline and North Esk schemes information**

Scheme	Length (km)	Diameter range (mm)	Water transported (ML)	FTE	Total OPEX ($)	Overhead cost ($)	Asset value ($)
West Tamar	43	150-450	2,771	1.5	NA	141,185	7,225,000
North Esk	110	100-840	6,732	1.5	NA	491,266	25,140,000

The limited data provided restricts the metrics which can be developed and their comparability to the metrics developed for Heinemann Road to Alex Hills scheme. For the schemes only overhead costs were provided, this indicates that Ben Lomond Water does not allocate operating costs to the schemes. The metrics developed for the plants are outlined below in **Table 84**.

- **Table 84 West Tamar Pipeline and North Esk schemes metrics**

Metric	West Tamar	North Esk	Unit
Asset value/km linear pipeline	158,217.45	550,531.04	$/km
Asset value/ML water transported	2,607.36	3,734.40	$/ML
FTE/km linear pipeline	0.033	0.033	FTE/km
FTE/ML water transported	0.00054	0.00022	FTE/ML
Overhead costs/km linear pipeline	3,091,760.29	10,758,042.02	$/km
Overhead costs/ML water transported	50,951.00	72,974.75	$/ML
Overhead costs/Asset value	19.54	19.54	Ratio

10.9.3. Benchmark comparison and discussion

At the time of development of the draft report, benchmark information had only been provided by OTTER, on behalf of Ben Lomond Water, for two comparable bulk transmission schemes, West Tamar and North Esk. The Heinemann Road to Alex Hills scheme was selected as the most comparable scheme based on the diameter of the pipes within the scheme. No comparison can be conducted with Ben Lomond Water's bulk transmission schemes as only information on overhead costs allocated to the asset has been provided whereas LinkWater does not allocate overhead costs to assets and no information has been provided on the planned and unplanned maintenance costs for the Heinemann Road to Alex Hills scheme. As such no conclusion can be drawn from the benchmarking Heinemann Road to Alex Hills scheme due to insufficient information available to compare to at the time of writing this draft report.

10.10. Trunk main asset benchmarking summary

At the time of development of the draft report, benchmark information had only been provided by OTTER for Ben Lomond Water on two bulk transmission schemes; West Tamar and North Esk schemes. As such SKM's benchmark comparison has been restricted to comparing Heinemann Road to Alex Hills scheme to the West Tamar and North Esk schemes. This limited information

results in no definitive conclusions being able to be drawn from the benchmarking at the time of writing this draft report. The only conclusion capable of being drawn from the analysis is that LinkWater's scheduled maintenance activities are not as effective as would be expected when comparing non-scheduled maintenance activities to scheduled maintenance activities for a number of assets. However further analysis into the reasons for such relatively high non-scheduled maintenance costs is required before definitive conclusions may be drawn.

11. Duplication of effort – LinkWater, contractors and SEQ Water Grid Manager

This section deals with the analysis and identification of potential duplication of effort relating to fixed operating costs between LinkWater, its contractors and the Water Grid Manager.

11.1. Methodology

The functions of the utility were characterised by key words and key activities obtained from organisational charts and functional descriptions (since the assets owned and operated by LinkWater are different to those of Seqwater, the list of key activities identified for LinkWater is slightly different to that identified for Seqwater). This information when analysed provided the following list of key activities shown in **Table 85**. These activities were then used to compare effort across LinkWater, LinkWater alliance contractors and the SEQ Water Grid Manager in these areas.

Table 85 Key Activities and Descriptions

Key Activity	Description
Administration	General Administration and other support services
Agency Contract Management	Management of water grid participants contracts
Asset Engineering	Engineering support for assets
Asset maintenance EMC	Maintenance of electrical civil and mechanical (EMC) assets
Asset maintenance I&C	Maintenance & support for SCADA and instrumentation
Asset Planning Capital	Planning and approvals for capital investment for assets
Asset planning Strategic	Management of the asset portfolio with development of long term plans
Compliance Management and Regulation	Management of compliance systems and management of regulatory issues
Corporate Governance	Board support, corporate legal counsel, corporate regulatory support, Office of the CEO
Corporate Knowledge Management	Management of records
Corporate Support	General corporate support.
Environment and Sustainability	Environmental and sustainability services
Facilities Management	Building management, land management.
Finance	Financial management , transaction processing
Fleet	Supply and support for fleet
Human Resource Management	HR and organisational development
Information and Communication Technology	Information and Communication Technology
Legal Services	Legal Services
Operations Pipe Networks	Transport network operations
Procurement	Purchasing contract management

Key Activity	Description
Project Delivery	Delivery of capital projects
Relationship management	Stake holder management& public relations
Risk Management	Risk management, insurance
Water Quality Management	Water quality testing and compliance
Work Place Health and Safety	Organisation safety and compliance

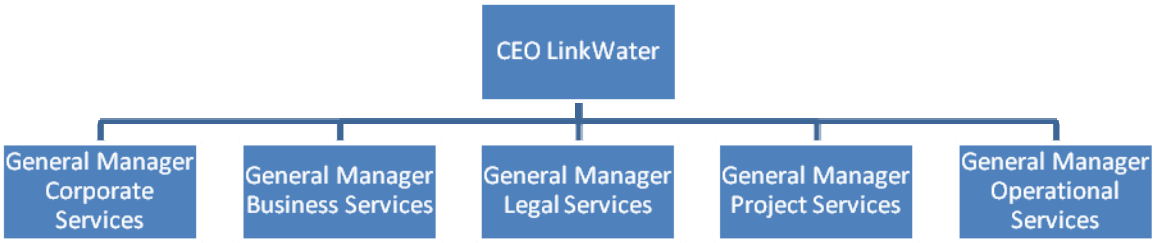
11.2. Overview of LinkWater information

LinkWater operates maintains and develops the bulk water trunk mains facilities in South East Queensland, they provide the link between the bulk water production organisation (Seqwater) and the distribution and retail entities.

The organisation consists of the following departments as is shown in **Figure 48**:

- Corporate Services –Human Resources, Communications, Health and Safety, Environment, Knowledge Management
- Business Services - Finance, Regulation, Business Analysis
- Legal Services - Legal, Governance
- Project Services - Project Delivery, Project Controls
- Operational Services- Infrastructure planning, Strategic Asset management, Service Delivery

LinkWater provided organisational charts showing functions down to level 4 as well as detailed functional descriptions.



- **Figure 48 LinkWater Organisation**

11.3. Overview of Alliance Contractor information

United Utilities with Transfield Services provide Operation and Maintenance services for the LinkWater Assets. No information on the structure of United Utilities has been provided. The Operation and Maintenance Deed is the primary source of information. The interaction with LinkWater is via the Service Contracts Manager.

11.4. Overview of SEQ Water Grid Manager's information

An extract from the SEQ Water Grid Manager's Plans describes the SEQ Water Grid Manager's activities as:

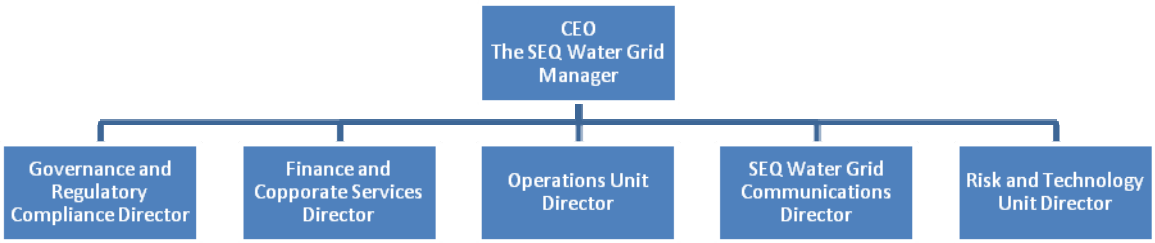
> *"The SEQ Water Grid Manager holistically manages the water supply chain and its capacity to deliver high-quality drinking water to customers. By performing this important role regional water security is maintained for the entire South East Queensland community."*

The SEQ Water Grid Manager is responsible for the establishment of "normal" operational plans and instructing the physical operation of the Grid to ensure water supply security. The SEQ Water Grid Manager also has the lead role in the management of whole of grid emergency situations.

The SEQ Water Grid Manager has a central role in the water market being the sole purchaser of potable bulk water and the sole supplier to water distribution organisations in South East Queensland.

The organisational structure, shown in **Figure 49**, consists of the following departments:

- Governance and Regulatory Compliance - provides business development, legal services, compliance reporting and board support
- Finance and Corporate Services - provides accounting and finance, human resource, administration and records management
- Operations - focuses on water quality, system capacity, policy and economics
- SEQ Water Grid Communications
- Risk and Technology - risk and emergency management, program delivery, ICT support



- **Figure 49 SEQ Water Grid Manager Organisation**

SKM's assessment of the activities, where there is potential for duplication of effort to exist, is provided in the following section (**Section 11.5**).

11.5. Analysis of information and discussion on potential duplication

SKM's assessment of the activities where potential duplication of effort exists is provided in this section. SKM has also undertaken a subjective analysis as to the level of potential duplication of effort and hence likely cost savings arising from removal of that duplication of effort. SKM has represented this assessment in the following table by using the legend 'L', 'M' and 'H' to represent low, medium or high levels of duplication and hence levels of potential cost savings. This same legend may also be read as a recommended order of priority for any future investigation into actual cost savings that may be achieved through removal of any duplication of effort.

- **Table 86 Detailed evaluation of duplication of potential analysis across activity areas and organisational functions**

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Administration	The communication unit and Governance and Regulatory Compliance units have some of the administration staff.	General Manager Corporate Services Administration& Reception	Diverse administration functions	All entities have an administration function dedicated to supporting their respective organisations. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	L
Agency Contract Management	Governance and Regulatory Compliance, Contracts- The function is to **manage standardised contracts between the SEQ Water Grid Manager and Grid Participants and customers to ensure compliance, and manage related issues as they arise**.	Business Services Regulatory Manager contract management with other agencies		Both LinkWater and the SEQ Water Grid Manager have roles to facilitate the management of interagency contract management. LinkWater and WGM have functions on each side of the transaction. WGM develops and issues the instructions or contract, LinkWater takes the contract/instruction and turns this into operational activity. Previous organisations automated this process based on reservoir levels; hence there is a duplication of effort in this area, a manual process versus a semi automated process. The assets for the automation are also now in separate water entities. This function would not be required if the water grid was managed as a whole and not as individual commercial organisations. Effort duplication in this case is an outcome of the water reform process and the contractual nature of the	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
				relationship of the water grid participants.	
Asset Engineering			This function for LinkWater is carried out via the United Utilities Operations and Maintenance Deed.	This function for LinkWater is carried out under the United Utilities Operations and Maintenance Deed. Minor duplication of effort is likely in this arrangement due to the nature of the business process. The interface with LinkWater is with the Service Contract Manager. From the data provided on the organisation structure effort duplication would be minimal if an efficient business process existed	-
Asset maintenance EMC (Electrical, Mechanical and Civil)		General Manager Operational Services Manager Service Delivery Contracted services	Provide maintenance service in accordance with the operations and maintenance deed	United Utilities provide this function for LinkWater under the Operation and Maintenance Deed. No duplication of effort has been identified in this area	-
Asset maintenance I&C	Risk and Technology unit, influence grid wide SCADA and technology adoption	General Manager Operational Services Manager Service delivery SCADA controls and system engineering		LinkWater provides a SCADA development/ network control support function in the Service Delivery Department, The SEQ Water Grid Manager has a role provided in its Risk and Technology Unit influencing the grid wide technology. This activity area would merit further review as some duplication of effort is likely.	L

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Asset Planning Capital		General Manager Operational Services Infrastructure planning Environmental and statutory approvals infrastructure planning	United Utilities is required to provide proposals, scopes and pricing for "additional works "under the Operation and Maintenance deed.	LinkWater provides this activity through the infrastructure planning team in the Operational Services Department. United Utilities is required to provide proposals, scopes and pricing for additional works under the Operation and Maintenance deed. The business process for this function has the planning being done by LinkWater and the result of this planning (depending on value) would be provided to United Utilities to provide pricing. Duplication of effort is likely in this area arising from the need for LinkWater to review and verify the proposals for capital works proposed by United Utilities. As such this area merits further investigation.	M
Asset planning Strategic	The SEQ Water Grid Manager provides **a holistic view to strategic planning** through the policy team of the Operations Department	General Manager Operational Services **infrastructure planning** - **system modelling** **strategic assets management - asset capital planning**		Strategic planning is provided by the Operational Services Department within the Strategic Asset Management department and also the infrastructure team for system modelling. The SEQ Water Grid Manager also provides this capability through the policy team in the operations unit. Duplication of effort is probable in this area between the SEQ Water Grid Manager and LinkWater. This area would merit further investigation.	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Compliance Management and Regulation	Governance and Regulatory Compliance, Business Performance Reporting- **Manage and coordinate compliance reporting across all business units**.	General Manager Business Services Regulatory Manager **Regulatory reporting and compliance**		Compliance and regulatory issues are the responsibility of the Business Services department, Regulation Manager for LinkWater. The SEQ Water grid Manager provides this corporate service through the Governance and Regulatory Compliance unit. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	L
Corporate Governance	The SEQ Water Grid Manager provides this functionality via the Governance and Regulatory Compliance department **for board management functions and operational planning** via the Operations Unit. The Risk and Technology unit provide a **governance function for grid technology coordination**.	General Manager Corporate Services Alliance Stake Holder Manager Alliance management for construction operations and management. **Manage the government and industry relationship** **Government and industry liaison** **Manage the government and industry**		This activity is delivered for LinkWater by Corporate services (Alliance Stakeholder Manager and Governance and Industry Liaison) and the Legal Services Department (Governance Manager). The SEQ Water Grid Manager has a Governance and Regulatory Compliance Department that covers Board Management, Strategic Operational Planning. The Risk and Technology Unit also provide part of this function. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	L

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
		relationship General Manager legal Services Governance management			
Corporate Knowledge Management	Finance and Corporate Services, Knowledge and Records Management	General Manager Business Services SAP business Analyst - corporate information system support General Manager Corporate Services Knowledge Manger, records QES Manager - Management Systems General Manager Operational Services- Infrastructure planning- GIS information management		For LinkWater, service is provided by Business Services -SAP Business Analyst Corporate Services – Knowledge Manager, QES Manager Operational Services – Infrastructure Planning (GIS) For the SEQ Water Grid Manager the service is provides by Financial and Corporate Services – Knowledge and Records Management The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Corporate Support	Finance and Corporate Services-- policy, document and knowledge management, human resources, workforce planning and office administration.	General Manager Corporate Services	Finance and Corporate Services-- policy, document and knowledge management, human resources, workforce planning and office administration.	The SEQ Water Grid Manager's Finance and Corporate Services department provides this service. LinkWater service provision is under the Corporate services department. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M
Environment and Sustainability		General Manager Corporate Services QES Manager Environment and sustainability		LinkWater provides this within the QES Managers role of the Corporate Services department. No effort duplication has been identified for this function	-
Facilities Management		General Manager Operational Services infrastructure planning Network Corridor Property – Management and administration of the Property portfolio on behalf of LinkWater.		LinkWater's Operational Services Department provides facility management for their network corridor. No duplication of effort has been identified for this activity.	-

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Finance	Finance and Corporate Services Providing financial support and operation, encompassing treasury, financial management, management planning, reporting and analysis.	General Manager Business Services financial control Group Accountant Tax Accountant		For LinkWater this service is within the Business Services department. The corresponding service for the SEQ Water Grid Manager is covered in the Finance and Corporate Services department. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M
Fleet	Not Addressed in organisational information - assumed to be by via QFleet			This function has not appeared within information provided by either organisation.	-
Human Resource Management	Finance and Corporate Services - Human Resources	Corporate Services General Manager Human resource Manager		Both LinkWater and the SEQ Water Grid Manager have these services within their respective corporate services groups The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Information and Communication Technology(ICT)	Risk and Technology unit ICT and project delivery services at both an organisational and whole-of-Grid level	General Manager Corporate Services Knowledge Manager IT project Manager IT systems Coordination		For LinkWater the ICT function is supported by Corporate Services – Knowledge Manager, IT projects and IT system coordination The SEQ Water Grid Manager's Risk and Technology unit covers this function. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M
Legal Services	Governance and Regulatory Compliance- Legal- **lead the legal drafting and preparation of a wide range of commercial arrangement**s for the SEQ Water Grid Manager.	General Manager Legal Services Legal Manager		Both organisations have Legal services. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	L
Operations Pipe Networks		General Manager Operational Services Manager Service delivery Network operations Management		LinkWater has an alliance contract with United Utilities for Operation and maintenance services. This is managed by the service delivery team. No effort duplication was identified for this activity.	-
Procurement				No specific functions were identified for the organisations for this activity. This activity will appear in various forms in each department or section; some	-

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
				effort duplication may become evident with further study.	
Project Delivery		Project Services program management Project controls Procurement Project cost control Project systems and quality Contracts	Provide Additional Services - **Supply proposal, scope, time table methods and price for work** on defined assets.	The Project Services Department for LinkWater provides project management, contracts management, cost control, systems and quality and procurement processes. United Utilities has within the Operations and Maintenance deed clause that require them to undertake similar project delivery activities, “Provides Additional Services”. The function of this activity indicates some overlap between LinkWater and the United Utilities contract. This is only likely to be on areas of work associated with the contract. SKM assess the effort duplication to be worthy of further investigation.	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
Relationship management	SEQ Water Grid Communications Unit Media-Providing an effective **media relations function** for SEQ Water Grid Manager. Communications-Providing SEQ Water Grid Manager **branding, marketing and proactive communication activities**.	General Manager Corporate Services Corporate communications Manager Community Stake holder engagement Communications		The corporate communications Manager provides communication and community and stake holder engagement services for LinkWater, A similar service is provided by the Communications unit for the SEQ Water Grid Manager. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	M
Risk Management	The SEQ Water Grid Manager has a risk focus combined with emergency management.	General Manager Operational Services Emergency operations support	Network Operations support	The SEQ Water Grid Manager has a risk focus combined with emergency management provided in the Risk and Technology unit, LinkWater has not specifically identified this function. The existence of these services in each organisation by its nature would suggest that there is a duplication of effort and a duplication of some cost that would not be evident if a whole of grid organisation were to provide the same service.	L
Water Quality Management	Operations unit- Water Quality, Water Quality Monitoring and compliance	General Manager Operational Services Manager Service delivery Water quality and compliance		LinkWater's Operational Services department delivers this function via the service delivery Manager; Also the SEQ Water Grid Manger's Operations Unit provides a similar activity in their Water Quality Team. The existence of these services in	M

Activity key	SEQ Water Grid Manager	LinkWater	LinkWater contracted services (United Utilities/Transfield)	Discussion and Recommendation	Cost Savings Potential
				each organisation by its nature would suggest that there is a duplication of effort. There is merit in investigating this area to confirm the specific nature of the activities for each organisation.	
Work Place Health and Safety		General Manager Corporate Services QES Manager Workplace Health and Safety		LinkWater has WPH&S obligations serviced by the QES Manager. It is expected the United Utilities would perform their duties for WPH&S within their organisation, no information has been provided to identify this function, however SKM considers that because each organisation is obliged to carry out this activity it is inevitable that there will be duplication of effort in the activity.	L

11.6. Summary and conclusions – duplication of effort analysis

A summary of the organisational duplication analysis is provided below in **Table 87** below in which those areas where no appreciable duplication of effort has been identified have been omitted.

- **Table 87 Summary of organisational duplication of effort analysis**

Activity	SEQ Water Grid Manager	LinkWater	United Utilities & Transfield Services	Potential cost saving
Administration	✓	✓	✓	L
Agency Contract Management	✓	✓		M
Asset Maintenance I&C	✓	✓		M
Asset Planning Capital		✓	✓	M
Asset Planning Strategic	✓	✓		M
Compliance Management and Regulation	✓	✓		L
Corporate Governance	✓	✓		L
Corporate Knowledge Management	✓	✓		M
Corporate Support	✓	✓	✓	M
Finance	✓	✓	✓	M
Human Resource Management	✓	✓	✓	M
Information and Communication Technology (ICT)	✓	✓		M
Legal Services	✓	✓		L
Project Delivery		✓	✓	M
Relationship management	✓	✓		M
Risk Management	✓	✓	✓	L
Water Quality Management	✓	✓		M
Work Place Health and Safety		✓	✓	L

SKM has identified a number of key activities that will merit investigation to understand to what degree overlaps may exist. It could be argued that for functions of a corporate nature (finance, human resources etc) there will inevitability be some level of duplication and hence inefficiency arising from having multiple organisational support functions within the water grid. Further there would be an element of the corporate overhead costs arising from this arrangement that would be associated with the areas of functional duplication.

Based on the information provided and SKM's knowledge of the industry the following areas of activity that are undertaken by both LinkWater and the SEQ Water Grid Manager have been identified as those areas that display the highest amount of duplication of effort and hence cost savings potential of all 29 areas assessed. SKM considered these areas to be of highest priority for any future investigation to establish, definitively, the extent of duplication and any corresponding gains in efficiency and hence cost savings that would arise from removal of that duplication.

- Corporate functions such as: Corporate Support; Human Resource Management; Finance exist across both organisations and contain sufficient numbers of full time equivalents as to merit further investigation as a priority area
- Agency Contract Management: Effort duplication in this case is an outcome of the water reform process in that both LinkWater and the SEQ Water Grid Manager have roles to facilitate the management of interagency contracts
- Asset planning with a strategic focus involves the SEQ Water Grid Manager and LinkWater. Both organisations have a very strong need for this function to ensure the appropriate delivery of the water service as a whole and to manage the assets base for that delivery
- Asset maintenance I&C, SCADA systems are important to the overall management of the water network. Link Water has this service provided by staff with in the service delivery team. The Water Grid Manager also has a strong interest in the delivery of appropriate technology supported by the Risk and Technology unit. Link Water has a lead role in the SCADA protocols Project
- Corporate Knowledge Management are areas that exist in both LinkWater and the Water Grid Manager and is, in part, a function of the reporting requirements of both organisations
- Relationship Management: Both LinkWater and the Water Grid Manager have strong relationship management teams. A portion of the LinkWater activity is directed at informing the affected public about planned maintenance activities. The presentation of organisational attributed to the broad public audience is present in both organisations
- Water Quality Management is another area where both organisations have strong teams .Both organisations have a significant need for skills in this area to manage the water quality for the network

Based on the information provided and SKM's knowledge of the industry the following areas of activity that are undertaken by both LinkWater and LinkWater's alliance contractors have been identified as those areas that display the highest amount of duplication of effort and hence cost savings potential of all 29 areas assessed. SKM considered these areas to be of highest priority for

any future investigation to establish, definitively, the extent of duplication and any corresponding gains in efficiency and hence cost savings that would arise from removal of that duplication.

- Asset planning capital: LinkWater has a strong team in the project services department, the service providers are also required by the contract to provide planning scoping and pricing services. It is understood that these services (planning scoping and pricing) are incidental to the main contracted work and relate directly to services provided under the contract and are not related to the delivery of major projects. Duplication of effort is likely to arise from the need for LinkWater to review and analyse the proposals for capital works submitted by its alliance contractors prior to approving such capital works resulting in both organisations undertaking options analysis and ranking of capital works projects
- Corporate functions such as: Corporate Support; Human Resource Management; Finance exist across both organisations. The Corporate Support function contains sufficient numbers of full time equivalents as to merit further investigation as a priority area
- Project delivery: the Operations and Maintenance Deed between LinkWater and United Utilities requires United Utilities to undertake similar project delivery activities to those undertaken by LinkWater's Project Services Department

12. Summary and conclusions

SKM has undertaken a review of the 2011/12 fixed and variable operating expenditure of LinkWater with the aim of benchmarking LinkWater's key cost parameters against relevant comparator water utilities and identifying any potential duplication of effort relating to fixed operating costs between LinkWater, its contractors and the SEQ Water Grid Manager. The following section presents our conclusions from this review.

12.1. Benchmarking Methodology

Benchmarking was undertaken based on the fixed and variable operating expenditure of LinkWater for the 2011/12 period. Information provided by LinkWater was reviewed and benchmarking metrics were developed. Limited information was compiled on national comparator water utilities due to the limited time available for the organisations to respond to requests for information. Similarly, limited public domain information is available for international utilities. This restricted the comparisons that could be made between LinkWater and other similar organisations.

SKM notes that the majority of the organisations approached expressed an interest in participating in the benchmarking process and it is SKM's opinion that if additional time were allowed for the organisations to respond and additional effort is put into progressing responses from the organisations, than a more robust benchmarking exercise will be capable of being undertaken.

The benchmarking was broken down into three sections – corporate level, asset group level and asset specific level. A number of issues were encountered during this process including availability of data and coarseness of data. Due to the limited information obtained, at the time of production of this draft report, limited conclusions can be drawn.

12.2. Corporate level benchmarking

The corporate level benchmarking undertaken has been undertaken for LinkWater as a whole. Information available for LinkWater included total expenditure, total operating costs, total variable costs and number of FTEs employed. Information collected from other national and international water utilities to be able to compare metrics included:

- Total operating expenditure ($)
- Water supplied (ML)
- Employee costs ($)
- Total revenue ($)
- Number of full-time equivalents
- Non-current asset value ($)

- Length of mains (km)

Making use of the above information the following metrics were developed for each of the national and international water utilities and the values compared to that of LinkWater:

- Total operating expenditure as a proportion of total water supplied
- Total operating expenditure as a proportion of non-current assets
- Total employee cost as a proportion of total operating expenditure
- Total operating expenditure as a proportion of total revenue
- Total revenue as a proportion of total full-time equivalents
- Total full-time equivalents as a proportion of non-current assets
- Total water supplied as a proportion of the total full-time equivalents
- Total employee cost as a proportion of the total full-time equivalents
- Total operating expenditure as a proportion of mains length

The majority of the comparator utilities have a larger suite of water and wastewater services that LinkWater provides. This has been taken into consideration when comparing the various metrics developed.

The conclusion from this study is that LinkWater is efficient in organisational issues and spending, has an effective workforce and utilises its asset efficiently. However analysis of planned to unplanned maintenance expenditure ratios suggests that, for some assets, preventative maintenance activities are not as effective as would be expected from an efficient operator.

12.3. Benchmarking by Asset Grouping

Benchmarking was undertaken for reservoirs only due to no information being available on water quality facilities or pump stations as an asset group and due to the information available on bulk transmission schemes being limited and was not comparable with that provided by LinkWater. Nevertheless, benchmarking has shown that the operating costs per ML water storage capacity for the Ben Lomond Water reservoirs and the LinkWater reservoirs are very similar. However, SKM considers that the high operating cost per km of linear asset (trunk main) exhibited by LinkWater compared to the majority of the comparator utilities indicates that LinkWater is not an efficient operator in this respect.

12.4. Asset specific benchmarking

Benchmarking was again only undertaken for reservoirs due to no information being available on individual water quality facilities or pump stations and due to the information available on individual bulk transmission schemes being limited and not comparable with that provided by

LinkWater. The operating costs per ML water storage capacity for Stapylton Reservoir (LinkWater) were compared to that of Rocherlea complex reservoirs and Distillery Creek complex reservoirs (Ben Lomond Water). The comparison indicates that the operating costs per ML storage capacity for Stapylton Reservoir are higher, by an order of magnitude, than those of Rocherlea Complex reservoirs and Distillery Creek Complex reservoirs.

12.5. Duplication of effort – LinkWater, contractors and Water Grid Manager

Areas of potential duplication of effort between LinkWater, its alliance contractors and the SEQ Water Grid Manager were identified through a review of their roles and responsibilities. A number of activities were identified as areas of potential duplication of effort between LinkWater, its alliance contractors and the SEQ Water Grid Manager. These activities need further and detailed review to establish to what extent duplication of effort exists and to assess the resultant costs savings that may be achieved as a result of removal of these areas of duplication.

A summary of the identified areas of potential duplication of effort is provided in **Table 88**.

Table 88 Summary of areas of potential duplication of effort

Activity	SEQ Water Grid Manager	LinkWater	United Utilities & Transfield Services	Potential cost saving
Corporate Support Functions (administration, finance, HR etc.)	✓	✓	✓	M
Agency Contract Management	✓	✓		M
Asset Planning Strategic	✓	✓		M
Asset Planning Capital		✓	✓	M
Asset Maintenance I&C	✓	✓		L
Compliance Management and Regulation	✓	✓		L
Corporate Governance	✓	✓		L
Corporate Knowledge Management	✓	✓		M
Information and Communication Technology (ICT)	✓	✓		M
Project Delivery		✓	✓	M
Relationship management	✓	✓		M
Water Quality Management	✓	✓		L

12.6. Conclusions

SKM has conducted benchmarking of LinkWater's 2011/12 fixed and variable operating expenditure against comparator water utilities in so far as is possible with the information available at the time of writing this draft report. The information provided by LinkWater was sufficient to develop the proposed metrics however the limited information available for comparator organisations restricted the metrics that could be developed for the benchmarking exercise. To support further studies it is recommended that an extended benchmarking study is conducted to allow the capture of relevant information from other water utilities to enable the development of relevant comparator metrics. The benchmarking undertaken, however, suggests that LinkWater's costs are generally comparable to comparator water utilities when taking into account differences in business structure and asset specifications and that LinkWater's costs are generally in keeping with those of an efficient operator. However, SKM considers that the high operating cost per km of linear asset (trunk main) exhibited by LinkWater compared to the majority of the comparator utilities indicates that LinkWater is not an efficient operator in this respect.

In respect to the duplication of effort, SKM has identified a number of areas that warrant further and more detailed investigation of duplication of effort, in particular in the areas of asset planning and water quality management and capital project planning.

Appendix A Terms of Reference

Phase 1 – 2011-12 fixed and variable operating expenditure (Opex) review

The Authority requires a detailed review of the current level of fixed operating costs (including overhead and fixed employee costs) and variable costs incurred by the GSPs. The assessment would be performed on data submitted by the bulk entities for the 2011-12 period, as well as additional data requested from the GSPs as appropriate.

The consultancy is intended to build upon the review of operating costs conducted during the 2011-12 GSC investigation. The consultancy will:

a) benchmark the GSPs against key cost parameters at relevant comparator organisations and good industry practice. Benchmark assessments may include parameters such as FTEs to water volume ratio, FTE to asset capacity ratio, maintenance to asset value ratio, operational costs to overhead costs ratio, total fixed costs to water volume ratio etc;

b) identify any duplication of effort relating to fixed operating costs between GSPs, their contractors and the WGM; and

c) identify any potential efficiency improvements and achievable operating cost (fixed and variable) savings as a result of the Seqwater-Water Secure merger on 1 July 2011.

The consultant will use a bottom up, needs-based assessment of costs on a functional level in order to understand what costs within a function are directed to which activities.

While noting that non-direct (indirect and overhead) cost categories are not standardised across the GSPs, the consultancy will review the following fixed operating cost activities:

a) Asset Management;

b) Capital Planning;

c) Engineering Services;

d) Planned and unplanned maintenance; and

e) Administration.

The consultancy will review all component costs of the above activities including internal and external (contractor's) costs to identify potential efficiency improvements.

In order to establish the basis for an assessment of the GSP's proposed overhead and fixed employee costs, the consultant will need to outline:

a) the services provided by the bulk entities' head offices;

b) major overhead and fixed employee cost categories and their key cost drivers (and how they are tied into the GSP's respective business objectives);

c) high level indicators to assess the relative efficiency of cost components using appropriate comparators, good industry practice and available benchmarking data. Examples of such

indicators could include FTEs as a proportion of overhead costs, overhead costs as a percentage of total operating costs, or proprietary benchmarking tools which establish rates of efficiency; and

d) given constraints related to employee retention, how the Authority could assess the potential for efficiency gains once the GSP's provide their projected expenditure for 2012-13. This could include quantum and timing of any potential efficiency gains.

In regard to variable costs, the consultancy should review potential savings in energy and chemical costs, within the constraints of demand forecasts defined by the Government.

The Authority's objective is to have this phase complete by 29 February 2012.

Phase 2 – 2012-13 GSC Draft Report investigation

The Authority is required to publish a Draft Report detailing recommended Grid Service Charges for 2012-13 by 30 April 2012. The Authority requires assistance in assessing the prudency and efficiency of the GSP's proposed capital and operating costs for 2012-13.

Phase 2 will commence following the receipt of the GSP's information submissions on 29 February 2012, to be completed by 23 March 2012. Phase 2 is comprised of three components.

Component 1 – Prudency and Efficiency of 2012-13 forecast Operating Expenditure

The consultant must assess whether each of the GSPs' submitted operating costs proposed for 2012-13 are prudent and efficient. The assessment of prudency and efficiency of operating expenditure will review a representative sample, to be agreed with the Authority, of each GSP's forecast operating costs. The sample should include the top 10% of operating expenditure items by value and, preferably, at least 50% of the total operating expenditure.

In assessing prudency and efficiency, the consultant must:

a) assess whether the GSPs' policies and procedures for operational expenditure represent good industry practice;

b) assess the standards of service adopted by each GSP and whether these standards have been approved by external agencies. The consultant should where appropriate refer to broader benchmark analysis of Phase 1;

c) assess whether the GSPs' operating expenditure is prudent. Operating expenditure is prudent if it is required to meet the GSP's requirements relating to:

i. its Grid Contract;

ii. the South East Queensland System Operating Plan; and

iii. production forecasts for the regulatory period are to consistent with the grid instructions forecast in the Operating Strategy (or any successor documents) and any relevant information provided to the GSPs in accordance with the system operating plan;

d) assess whether the GSPs' operating expenditure is efficient. Operating expenditure is efficient if it is undertaken in a least-cost manner over the life of the relevant assets and is consistent with relevant benchmarks. In assessing efficiency, the consultant must have regard to the conditions prevailing in relevant markets, historical trends in operating expenditure and the potential for efficiency gains or economies of scale; and

e) assess the appropriateness of any allocation methodology of overhead operating costs.

Component 2 – Prudency and Efficiency of 2011-12 estimated actual Capital Expenditure

The consultant must assess the prudency and efficiency of 2011-12 non-drought[5] capital expenditure for each GSP that:

a) was not submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) is material, where materiality is defined as exceeding $2 million;

The Authority does not expect that this will be a large number of items, but may include some material capital expenditure to rectify damage caused by the January 2011 floods that was not included in the GSPs' 2011-12 submissions.

The consultant must also assess the efficiency only of the 2011-12 non-drought capital expenditure for each GSP that:

a) was submitted to the Authority as part of GSPs' forecast capital expenditure during the 2011-12 GSC investigation; and

b) differs significantly (more than 30%) from the forecast costs submitted by the GSP during the 2011-12 investigation.

Again, the Authority does not expect that this will be a large number of items. If the total number of items to be reviewed exceeds 15, the Authority will agree a representative sample with the consultant.

Component 3 – Prudency and Efficiency of 2012-13 forecast Capital Expenditure

The consultant must assess the prudency and efficiency of a representative sample of 2012-13 forecast non-drought capital expenditure for each GSP. The sample, to be agreed with the Authority, should include all capital expenditure projects exceeding $2 million in value, the top 10% of capital expenditure projects by value and at least 50% of total capital expenditure.

For any capital expenditure project that was commenced in 2011-12, but will incur expenditure during 2012-13, the consultant must take into account the Authority findings in its investigation of 2011-12 GSCs.

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[5] Non-drought capital expenditure refers to capital expenditure that was not required as part of the Water Regulation 2002 or the Regional Water Security Program. As a consequence, it excludes many of the largest capital expenditure projects undertaken by the GSPs, such as the Hinze Dam raising or the Northern Pipeline Interconnector Stage 2.

The definition of prudency and efficiency to be adopted by the consultant are the same as those in Component 2 above.

The consultant must also assess:

a) whether the entities' policies and procedures for forecasting capital expenditure represent good industry practice. In particular, the policies and procedures must reflect strategic development plans, integrate risk and asset management planning, corporate directives, be consistent with external drivers, and incorporated robust procurement practices;

b) whether corporate or overheads costs have been appropriately assigned to capital expenditure projects.

For the purposes of the Phase 2 review, capital expenditure is prudent if it required as a result of a legal obligation, growth in demand (consistent with the grid instructions forecast in the Operating Strategy (or any successor documents) and any relevant information provided to the GSPs in accordance with the system operating plan); renewal of existing infrastructure that is currently used and useful, or it achieves an increase in reliability or quality of supply that is explicitly endorsed or desired by the WGM.

Capital expenditure is efficient if:

a) the scope of the works (which reflects the general characteristics of the capital item) is the best means of achieving the desired outcomes after having regard to the options available, including the substitution possibilities between capex and opex and non-drought network alternatives such as demand management;

b) the standard of the works conforms with technical, design and construction requirements in legislation, industry and other standards, codes and manuals. Compatibility with existing and adjacent infrastructure is relevant as is consideration of modern engineering equivalents and technologies; and

c) the cost of the defined scope and standard of works is consistent with conditions prevailing in the markets for engineering, equipment supply and construction. The consultant must substantiate it view with references to relevant interstate and international benchmarks and information sources. For example, the source of comparable units and indexes must be given and the efficiency of costs justified. The consultant should identify the reasons for any costs higher than normal commercial levels.

Phase 3 – 2012-13 GSC Final Report investigation

Following the publication of the Authority's Draft Report, the Authority will receive submissions from GSPs and other stakeholders. These submissions may include updated information or challenge the technical findings included in the Authority's Draft Report.

The consultant must assist the Authority in responding to stakeholder submissions by:

a) considering its Phase 2 recommendations in light of new information; and

b) responding to technical matters included in stakeholder submissions.

The extent of work required for Phase 3 will depend on the complexity of submissions received from stakeholders.

Phase 3 will commence in May 2012 after the receipt of stakeholder submissions and will be complete by mid-June 2012. More precise dates will be negotiated with the consultant as the project progresses.

Appendix B LinkWater Data