STATE OF ORIGIN: SOURCE WATER PROTECTION
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ABSTRACT
Seqwater is one of Australia’s largest water businesses with the most geographically spread and diverse asset base of any capital city water authority. In preparation for its 2014 price path submission to the Queensland Competition Authority, Seqwater benchmarked its 2014/15 financial year source water protection activities against other bulk water providers. This was the first time that such an activity had been undertaken by the newly formed Seqwater and was indicative of its commitment to building a best practice program over time. To undertake the benchmarking required determining the attributes relevant to source water protection, identification of comparator bulk water providers, and understanding of the limitations of benchmarking. The exercise identified Water NSW (formerly Sydney Catchment Authority) as Seqwater’s best available comparator. In making the comparison it is important to consider the various factors that impact on the risk profiles facing both organisations including the arrangement of the water supply system, nature of land use, control over land use and development and historical catchment management arrangements.

Seqwater’s 2014/15 level of expenditure on source water protection activities at the catchment level was lower than comparator bulk water providers. Seqwater’s best comparator Water NSW’s level of expenditure was almost three times that of Seqwater. This result needs to be considered in the context of the development of the organisation’s source water protection programs; Seqwater has only just begun its journey whereas Water NSW is more mature. While in isolation benchmarking cannot inform what is the correct level of source water protection expenditure for Seqwater (this requires a comprehensive bottom up assessment of expenditure requirements performed on a catchment-by-catchment basis), it is a useful tool for comparing planned expenditure and providing confidence in the preparation of regulatory submissions. The benchmarking results were used in the development of Seqwater’s 2014 submission to the Queensland Competition Authority. The proposal sees a staged increase in Seqwater’s expenditure bringing it more in line with that of Water NSW over time. Water NSW’s source water protection program is recognised as an example of best practice.

BACKGROUND
Seqwater’s role is to ensure a safe, secure and reliable water supply for South East Queensland (SEQ), as well as providing essential flood mitigation services. It also provides irrigation services to about 1,200 rural customers and lakeside recreation facilities to the community.

Seqwater is one of Australia’s largest water businesses with the most geographically spread and diverse asset base of any capital city water authority. Operations extend from the New South Wales border to the base of the Toowoomba ranges and north to Gympie.

The business manages more than $11 billion of water supply assets. This includes dams, weirs, conventional water treatment plants and climate resilient sources of water through the Gold Coast Desalination Plant and the Western Corridor Recycled Water Scheme. A 600 kilometre reverse flow pipeline network enables drinking water to be transported to where it is needed most, from the Sunshine Coast to Greater Brisbane, to Redlands and south to the Gold Coast.

Seqwater was formed on 1 January 2013 through a merger of three State-owned water businesses, the SEQ Water Grid Manager, LinkWater and the former Seqwater. It is also now responsible for the long term planning of the region’s future water needs, a function that was formerly undertaken by the Queensland Water Commission.

Source water protection, that is activities aimed primarily at addressing risks to source water quality, has an important role to play in delivering water security to the region.

In 2014 Seqwater prepared a 15 year price path submission for consideration by Queensland Competition Authority (QCA). This is the first review of Seqwater’s bulk water prices conducted by the QCA since Seqwater was established in its current form. As part of the development of the source water protection component of the submission, a benchmarking exercise was undertaken to compare Seqwater’s activity to that of similar organisations. This was the first time that such an exercise had been undertaken by the newly formed Seqwater and was indicative of its commitment to building a best practice program over time. This paper provides an overview of some of the findings from that exercise as they related to Seqwater’s best available comparator, Water NSW, specifically their activities in the Sydney drinking water catchment. The findings were used in combination with a
comprehensive bottom up assessment of risk and mitigation options on a catchment by catchment basis to develop the submission. Overall an expenditure on source water protection activities of $115 million over 15 years is proposed which will bring Seqwater’s program more into line with that of Water NSW. In addition to an increased expenditure, Seqwater has also restructured its operations to better provide source water and land management outcomes for water security.

Water NSW was formed on 1 January 2015 by bringing together Sydney Catchment Authority and State Water. Water NSW’s aim is to deliver the most efficient service to its customers and community.

Water NSW is responsible for developing infrastructure solutions for improved water supply and reliability, protecting water quality in its designated catchments, catchment protection in the Greater Sydney drinking water catchments, asset management, and flood operations and mitigation.

INTRODUCTION
The purpose of benchmarking is to identify and compare the price or cost of comparable service offerings. In this case, the purpose is to compare investment commitment by bulk water providers in land management expenditure in catchment areas. There are two types of benchmarking:

- Simple benchmarking – comparison of the price or cost of the comparable service offerings without considering any specific attributes of the service offering; or
- Complex benchmarking – comparison of the price or cost of the comparable service offerings is supplemented with a comparison of the attributes of the service offerings.

Simple benchmarking is appropriate where both the service offering and the factors that impact on the cost or price of the service offering are similar across service providers. In this analysis, simple benchmarking was not appropriate as several factors had a significant impact on the type and/or level of source water protection expenditure undertaken. Complex benchmarking was used for this analysis and required the identification of attributes relevant to the variable being benchmarked - source water protection expenditure. In this case, the following factors were identified as the most relevant:

- The extent to which the catchment is open to third party land use
- The size of the drinking water catchments
- The area of land “owned” by the bulk water provider, compared to third parties.

Selection of comparator bulk water providers
Seqwater is exposed to significant water quality risks from third party land use in its catchment area i.e. its catchments are “open”. Bulk water providers with catchments that are not open to third party land use have “closed” catchments and are significantly different in terms of their risk profiles and operating factors. For this reason they were not appropriate comparators for the benchmarking exercise. The following organisations were identified as having “closed” catchments:

- Water Corporation – protected drinking water catchments;
- Melbourne Water – protected drinking water catchments. While Melbourne Water plays a significant role in waterway protection initiatives in its operating area, this is a result of its legislative responsibilities under the Water Act 1989, which are not relevant to Seqwater;
- Power and Water Corporation – major source of drinking water supply (the Darwin River Reservoir) is a protected catchment; and
- TasWater – drinking water catchments that supply major urbanised areas in Tasmania are protected.

Bulk water providers that were identified as having “open” catchments included Water NSW, Hunter Water Corporation and SA Water. Of these Water NSW, specifically its activities in the Sydney drinking water catchment, was identified as the best available comparator. Table 1 sets out the attributes of Seqwater and Water NSW included in the analysis.

<table>
<thead>
<tr>
<th>Bulk water provider</th>
<th>Total catch. area (km²)</th>
<th>Land “owned” by provider (km²) (%)</th>
<th>Land owned by third parties (km²)</th>
<th>Main types of land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seqwater</td>
<td>16,600</td>
<td>735 (4.4%)</td>
<td>15,865</td>
<td>Agriculture (including grazing), industrial activity, urban development</td>
</tr>
<tr>
<td>Water NSW</td>
<td>16,000</td>
<td>3,359 (21.0%)</td>
<td>7,216</td>
<td>Agriculture (including grazing), forestry, urban development</td>
</tr>
</tbody>
</table>

1 For the purpose of this analysis, the term “owned” refers to any parcels of land within the catchment area that are under the control (either through direct ownership or management prescribed by legislation) of the bulk water provider or another aligned government entity (i.e. not available for third party use).

2 Water Act 1989, Division 2.
Role of the benchmarking analysis

While benchmarking is a very useful tool as it enables a top down comparison of costs, expenditure, or prices across service providers, it is important the outcomes of the benchmarking analysis are considered in context. This means taking into consideration the ‘bottom up’ factors that may impact on the appropriate expenditure or price level including those risks or factors that are specific to each service provider. In this analysis, the authors considered relevant factors that impacted on the risk profile of bulk water providers in relation to the protection of source water quality. See Discussion (p6).

Defining land management expenditure

To effectively benchmark source water protection expenditure across bulk water providers, it is necessary to define the expenditure to be included in the analysis and how to treat different types of expenditure. Expenditure was categorised as follows:

- Land management activities in catchment areas required for statutory and legislative compliance including aquatic and terrestrial pest and weed management, feral animal control, vegetation management, fire management, recreational area and general infrastructure maintenance

- Source water protection activities that address risks to source water quality, including:
  - projects that improve agricultural practices such as stock management, revegetation, gully / riverbank / channel rehabilitation and restoration
  - land management practices such as contaminated land management, weed control, pest and feral animal control, fire management, etc.).

To account for these two distinct categories of catchment-related activities, in terms of both the nature and drivers of the works, the benchmarking exercise was been performed at two levels:

1) Based on the entire portfolio of land management activities in catchment areas for Seqwater and the comparator bulk water providers.

2) Source water protection works related specifically to source water quality activities.

The purpose of removing the general land management activities is to obtain an understanding of the level of expenditure on source water protection, as opposed to those works which would be required, regardless of water quality concerns. Furthermore, there is an additional category of work within the source water protection activities that is of interest for this analysis – source water protection works that relate to pathogen control.

The nature of source water protection expenditure means that the categorisation of expenditure can be subject to interpretation. One service provider may view an activity as being primarily for source water protection while another may consider it to be general land management. For this analysis, the expenditure categorisations were provided by Seqwater and Water NSW.

RESULTS

Seqwater’s 2014/15 source water protection expenditure

Seqwater’s allocation for all land management activities in catchment areas for 2014/15 was $9,371,570. Of the total expenditure, $5,139,570 attributable to land management activities performed on catchment land and $4,232,000 attributable to source water protection works, including $1,206,000 for the maintenance of previous projects aimed at protecting source water quality. Of the total budget for source water protection works, $518,000 related primarily to pathogen control.

Water NSW

Water NSW, as stated above, was identified as the best available comparator. Water NSW is responsible for the management of Sydney’s drinking water catchment covering approximately 16,000 km². Of this total, 3,359 km² (910 km² or 21%) is either owned or managed by Water NSW or the National Parks and Wildlife Service (2,449 km²). The main third party activities undertaken within the drinking water catchment are agriculture, which accounts for approximately one third of the catchment area, industrial activity and residential use. The water sourced from Sydney’s drinking water catchment area is used to provide water to approximately 4.5 million people. These characteristics make Water NSW a good comparator for Seqwater, noting however the significant difference in land ownership and management. Seqwater only has control over 4.3% of its catchment area, while 22.8% of Water NSW’s...

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3 It is important to recognise that there are potential differences in terms of the categorisation of land management activities by bulk water providers. While one provider may consider a land management activity (e.g. terrestrial weed control) to be primarily related to addressing source water quality concerns, another provider may consider compliance with legislative obligations to be the primary driver of these works. Representatives from other bulk water providers were consulted with on this issue.

4 Source water protection projects often require an implementation period (e.g. riverbank restoration works require a four year implementation period) over which the restoration works need to be maintained in order for the benefits to be achieved. The expenditure estimate for 2014/15 therefore includes expenditure relating to projects that were commenced over the previous three years.
drinking water catchment area is protected as Special Area, with public access restricted by the Sydney Water Catchment Management Regulation (SWCM Regulation)).

To understand the level of commitment from the Water NSW in source water protection, it is important to understand the context surrounding the establishment of the former Sydney Catchment Authority and the 1988 Sydney Water Crisis. The outbreak of Cryptosporidium and Giardia in the Sydney water supply resulted in ‘boil water’ alerts being put in place for 35 days. A total abatement behaviour cost study undertaken in 2004 estimated the total cost of the crisis at $308 million (in 2004 dollars). The 1998 Sydney Water Inquiry investigated the incident and made recommendations on the future management of Sydney’s water supply and catchments. One of these recommendations was for the establishment of an independent authority to manage the catchments. Shortly after this, the Sydney Water Catchment Management Act 1998 was introduced, under which the Sydney Catchment Authority was created in 1999.

In its most recent review of prices, the Independent Pricing and Regulatory Tribunal (IPART) noted the significant level of expenditure on source water protection by the Sydney Catchment Authority and also the importance of this expenditure in order for Sydney Catchment Authority to meet its requirements:

We note that a large proportion of SCA’s operating expenditure is the Healthy Catchment Strategy (about $19.6 million per year), as well as management of Special Areas, controlled and freehold lands (about $5.8 million per year). It is important that our pricing decisions do not adversely affect the standards of service delivered to customers. For SCA’s customers, service standards primarily relate to catchment management, bulk water quality, and security and reliability of water supply.

In December 2012, Sydney Catchment Authority released its latest ‘Healthy Catchments Strategy 2012-16’. The strategy, provides the framework for actions to reduce water quality risks in the catchments over this period as part of its catchment to tap approach to water management. It takes an integrated approach to catchment management in order to deliver a better outcome than the sum of individual initiatives. Sydney Catchment Authority also released an annual report – the Healthy Catchments Program – which provided detail on its annual work program and published its Annual Catchment Management Report (ACMR) in November each year. The ACMR reports on performance against its Healthy Catchments Program.

It is important to note that the Healthy Catchments Program was developed to address the key risks identified in the catchment through the use of its Pollution Source Assessment Tool (PSAT). PSAT identified the key risks to water quality and catchment programs were then developed to address these risks by working with the partners best placed to make improvements. The improvement programs focussed both on the water quality issues and the needs of the key stakeholders. By finding common ground Sydney Catchment Authority have been able to work with others to better manage for water quality while improving other outcomes. Many of the catchment initiatives would not be possible without identifying win-win solutions.

For 2013/14, source water protection expenditure was categorised under six initiatives. These initiatives and the associated programs and expenditure levels are set out in Table 2.

Furthermore in its 2013/14 Operating Licence audit the Sydney Catchment Authority received “Full Compliance” for its catchment management actions. In the commentary the auditor stated:

The auditor found that SCA had an extensive suite of programs, monitoring and reporting requirements in place. In particular, the auditor noted that SCA’s Healthy Catchments Strategy (HCS) outlined its catchment initiatives and how these were being implemented. The auditor noted that the catchment management activities outlined in SCA’s HCS aligned with objectives and functions set out in the Act. The auditor also noted that the programs and budget allocations are as expected of an organisation like SCA. The auditor found that that the SCA had made information available on its website. Further, the auditor noted that the SCA had made information available to the public upon information requests. As a result, the auditor awarded Full Compliance for clauses 4.1.1 and 4.1.2 and no recommendations were identified. The auditor also provided one opportunity for improvement for clause 4.1.1. This opportunity addressed the potential for further assessment and quantification of SCA’s catchment mitigation measures.

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Table 2: Overview of Healthy Catchments Program for 2013/14

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Program works</th>
<th>Planned expenditure (13/14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Maintaining a catchment science and evidence base</td>
<td>Capturing key catchment information; Understanding catchment risks; Scientific evaluation of catchment actions</td>
<td>$2,577,000</td>
</tr>
<tr>
<td>2) Active communities</td>
<td>Capacity building; School education; Community information and involvement</td>
<td>$2,040,000</td>
</tr>
<tr>
<td>3) Setting the example</td>
<td>Fire management; Unsealed roads; Pests and weeds; Soil erosion; Recreation areas; Barriers and fencing; Cultural heritage; Reserve management</td>
<td>$10,824,000</td>
</tr>
<tr>
<td>4) Ensuring legislation protects our catchments</td>
<td>Targeted inspection program; Special Areas enforcement</td>
<td>$691,000</td>
</tr>
<tr>
<td>5) Maintaining sustainable catchments</td>
<td>Development and activities; Land use planning; Mining</td>
<td>$1,577,000</td>
</tr>
<tr>
<td>6) Targeting high risk pollution sources</td>
<td>Rural Landscape Program; Priority Pollutant Program</td>
<td>$3,617,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$21,326,000</strong></td>
</tr>
</tbody>
</table>

Table 3 presents a breakdown of the Healthy Catchments Program total source water protection expenditure for 2013/14 in the categories relevant to this benchmarking analysis.

Based on consultation with Water NSW, it is understood that of the $11,702,000 per annum invested in source water quality protection, a minimum of $3 million is attributable to pathogen control.9

It is also important to note that Water NSW has protected catchments denoted as Special and Controlled Areas, with access to the drinking water storages and land immediately surrounding them restricted by the SWCM Regulation. The management of these Special Areas is an integral part of Water NSW's source water protection regime.

Table 3: Summary of source water protection and land management expenditure of the Healthy Catchments Program

<table>
<thead>
<tr>
<th>Expenditure type</th>
<th>Details</th>
<th>Annual expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source water protection expenditure</td>
<td>Includes all expenditure under initiatives 1), 2), 4), 5) and 6) as well as $1.2 million of expenditure under initiative 3), which SCA advises in a reasonable approximation for land management expenditure that is driven primarily by source water protection</td>
<td>$11,702,000</td>
</tr>
<tr>
<td>Land management expenditure not driven by source water protection</td>
<td>Remaining expenditure under initiative 3) that does not relate primarily to source water protection (noting that these activities often have secondary water quality benefits)</td>
<td>$9,624,000</td>
</tr>
<tr>
<td><strong>Total expenditure</strong></td>
<td><strong>Total expenditure on all land management activities undertaken within catchment area</strong></td>
<td><strong>$21,326,000</strong></td>
</tr>
</tbody>
</table>

The total catchment area for Seqwater and Water NSW's Sydney drinking water catchment and the split in terms of area owned by water providers and the area owned by third parties are provided in Table 4. This information plays an important role in the interpretation of the results presented below. In doing so it is important to note however the need to account for a detailed understanding of the relevant risk factors in each area as well.

Table 4: Details on catchment area across bulk water providers

<table>
<thead>
<tr>
<th>Bulk water provider</th>
<th>Catch. area</th>
<th>Area “owned”</th>
<th>Area owned by third parties</th>
<th>Proportion of catchment area “owned” (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seqwater</td>
<td>16,600</td>
<td>735</td>
<td>15,865</td>
<td>4.4%</td>
</tr>
<tr>
<td>Water NSW</td>
<td>16,000</td>
<td>3,359</td>
<td>7,216</td>
<td>21.0%</td>
</tr>
</tbody>
</table>

Table 5 contains the key results from the analysis in terms of the expenditure on source water protection activities, with a particular focus on expenditure relating primarily to pathogen risk. It shows that, on a per km² basis Water NSW's level of source water protection.

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9 It is noted that the accuracy of this estimate is constrained by the fact that there are several drivers associated with a large proportion of Water NSW’s expenditure program, one of which is pathogen protection.

10 In providing this estimate, Water NSW noted that $1.2 million is an approximation of the level of expenditure associated with programs under initiative 3) that would be considered in excess of the activities strictly required to meet Water NSW’s land management responsibilities.
proximity to these WTPs. This is attributable to the significant proportion of Seqwater’s smaller WTPs that do not give Seqwater the ability to prevent activities that constitute a significant water quality risk. Some examples of land uses that constitute a significant water quality risk include:

- Cattle watering in the offtake pool at Rathdowney and along much of the Mid Brisbane River;
- Widespread, intensive horticultural production in Lockyer Creek and on the Mid Brisbane River;
- Deteriorating bank and channel stability in many locations resulting from historic gravel extraction and waterway management practices; and
- A large dairy farm located directly opposite the offtake for the Lake Macdonald WTP on the Mary River.

Nature of land use

The nature of land use within catchment areas is a key driver of source water quality risk. As Seqwater owns a very small proportion of its catchment land (4.3%), its source waters are heavily exposed to the impacts of third party land use. A significant proportion of Seqwater’s catchment water quality risk assessments have identified high and extreme water quality risks. The majority relate to pathogens however others include: erosion, uncontrolled fire, contaminants, cyanobacteria associated with the use of land by third parties, particularly as a result of livestock management. Some examples of land uses that constitute a significant water quality risk include:

- Deteriorating bank and channel stability in many locations resulting from historic gravel extraction and waterway management practices; and
- A large dairy farm located directly opposite the offtake for the Lake Macdonald WTP on the Mary River.

Control over land use and development

Source water quality risks are exacerbated by Seqwater’s historically limited control over the nature of land use and development activities in catchment areas. In addition to owning less than 5% of total catchment land, Seqwater’s ability to impose conditions on development, influence the nature of land use or enforce compliance with water supply objectives has previously been very limited under the legislative framework. There has been a recent significant advance in December 2012, when the Single State Planning Policy (SPP) adopted Seqwater’s development guidelines which provide guidance on how development can proceed, however there will be a transition period of a number of years as they are incorporated into local planning schemes currently under development across the region. Following this transition period there will be an ongoing need to monitor and support their implementation as well as regularly update the guidelines based on best available knowledge. Until that time there are Interim Development Assessment Requirements that must be applied which also recognise Seqwater’s development guidelines. The guidelines provide guidance on how development can be undertaken to minimise any impact on water quality, however do not give Seqwater the ability to prevent activities before they get to the development stage. It is also important to note that Seqwater does not have influence over the Mineral Resources Act 1989.

DISCUSSION

It is important the results of any benchmarking exercise are considered within an appropriate context. For this analysis, it is necessary to consider the various factors that impact on the risk profiles facing the respective bulk water providers in relation to source water quality.

Arrangement of the water supply system

One of the most important factors is the arrangement of the water supply system. Seqwater operates 37 WTPs across SEQ and while several supply communities with relatively small populations, Seqwater’s source water protection obligations with respect to these plants have a significant impact on its overall risk profile. A water quality incident at one of these WTPs as a result of poor source water quality and an inadequate response to identified source water risks would have a significant detrimental impact on Seqwater, in terms of commercial, reputational and potentially legal outcomes. It is therefore necessary for Seqwater to assess and, where feasible, address source water quality risks at these plants or find alternative supply arrangements in these areas. A significant proportion of Seqwater’s smaller WTPs have a categorised extreme pathogen risk in terms of source water quality. This is attributable to the fact there are high risk land use activities such as sewage treatment plants, on-site waste water treatment, dairy farming and grazing in close proximity to these WTPs.12
Due to the lack of land use controls, there are numerous examples where licensed activities are impacting on Seqwater’s source water quality. Examples include the establishment of the Bromelton Development Area including a ‘hard to locate’ industrial area upstream from the Beaudesert WTP and the promotion of intensive and high risk poultry and dairy production and horticulture near a ‘grid connected’ intake as part of the Mary River Economic Recovery Program.

These all create significant current and future risks that will require Seqwater to increase investment in work to promote best practice and to monitor and remediate impacts.

**Historical catchment management arrangements**

In assessing the catchment risk profiles of various bulk water providers, it is also important to consider historical arrangements in each jurisdiction in relation to the management of drinking water catchments. While other jurisdictions took measures several decades ago to protect drinking water catchments,13 no such measures were undertaken in South East Queensland (SEQ). Prior to the establishment of the former Seqwater in 2007, drinking water catchments in SEQ were managed by individual local councils. Many of these councils placed very little emphasis on protecting source water quality and ensuring that land use within catchment areas did not detrimentally impact catchment health or source water quality. As a result, catchment condition in SEQ has deteriorated over several decades to the point where Seqwater is facing extreme water quality risks in the majority of its catchment areas.

**Seqwater’s overall catchment risk profile**

The overall outcome from the combination of factors described in the preceding paragraphs is that Seqwater is exposed to significant water quality risks at the catchment level, with pathogens representing the most significant risk in the majority of cases. Other key risks include stream bank and gully erosion, uncontrolled fire, cyanobacteria, contaminants and exotic weed infestation. The most recent catchment water quality risk assessments have determined at least 15 of Seqwater’s key catchments are yielding extreme risk source waters, the majority of which relate to the presence of pathogens. Those catchments/storages determined to be facing an extreme pathogen risk include several of Seqwater’s major catchments and storages, such as Lake Wivenhoe, Somerset Dam, North Pine Dam, the Mid Brisbane River, the Mary and Logan Rivers and Lake Baroon. This provides a picture of Seqwater’s overall water quality risk profile at the catchment level and demonstrates the need to improve the mechanisms for managing source water quality to achieve compliance with the multi-barrier approach to water treatment as endorsed by the ADWG Framework for the Management of Drinking Water (2011). Due to a lack of available legislative control, Seqwater’s primary mechanism for risk minimisation is in the facilitation and implementation of best practice land uses that pose the highest source water risk.

**Water NSW as the best available comparator**

Based on the information presented in the benchmarking analysis and the factors impacting on Seqwater’s water quality risk profile at the catchment level, it is considered the best available comparator for Seqwater’s level of investment in source water protection is Water NSW, on the basis that:

- Water NSW is responsible for managing a catchment area very similar to Seqwater’s in terms of size;
- Water NSW is exposed to the impact of third party land use on a large area of its catchment land which presents a significant risk to source water quality; and
- Like Seqwater, pathogens present a significant risk to Water NSW’s source water quality.

It is important to consider in assessing Water NSW’s level of expenditure and how this should be applied to Seqwater that a significantly greater proportion of Water NSW’s catchment area is ‘owned’ and that Water NSW has also historically had more control over land use development than Seqwater. Furthermore, the condition of Water NSW’s catchment area has improved significantly over the past 15 years since their establishment.

The significance of pathogen risk to Water NSW’s operations is demonstrated by the Cryptosporidium event that was encountered by Sydney Water in 1998 which led to the formation of the former Sydney Catchment Authority and a significant increase in the level of investment allocated to source water protection.

While Water NSW is considered to be the best available comparator to Seqwater for the purpose of this benchmarking exercise, this is not reflected in Seqwater’s 2014/15 expenditure. Water NSW spent approx. $11.7 million on source water protection activities compared to Seqwater’s $4.2 million. On a per km² basis, Water NSW was

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13 For example, many of Melbourne Water’s drinking water catchments are located in national parks and state forests. Public access to these areas, which were set aside exclusively for harvesting water over 100 years ago, is limited. In Western Australia, drinking water catchments are gazetted and protected under the Metropolitan Water Supply, Sewerage and Drainage Act 1909 or the Country Areas Water Supply Act 1947. This legislation includes provisions for the establishment of a 2km exclusion area around metropolitan surface water sources and either 300 or 500 metres around drinking water production bores.
investing almost two and a half times more than Seqwater, in protecting source water quality ($731/km² versus $255/km²). Applying Water NSW’s per km² expenditure to Seqwater’s total catchment area results in a total level of source water protection expenditure of approximately $12.1 million.

See Table 6 for the level of expenditure on source water protection activities by each of the bulk water providers on a per individual basis.

### Table 6: Source water protection expenditure on per individual basis

<table>
<thead>
<tr>
<th>Bulk water provider</th>
<th>Source water protection ($ / year)</th>
<th>Population serviced (No. individuals)</th>
<th>Source water protection per individual ($ / individual / year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seqwater</td>
<td>$4,232,000</td>
<td>3,600,000</td>
<td>$1.18</td>
</tr>
<tr>
<td>Water NSW</td>
<td>$11,702,000</td>
<td>4,500,000</td>
<td>$2.60</td>
</tr>
</tbody>
</table>

In terms of expenditure on pathogen control activities at the catchment level, Water NSW has advised a minimum of $3 million of its total expenditure is primarily directed at pathogen protection ($188 per km²), compared to Seqwater’s total of $518,000 ($31 per km²). Again, Seqwater’s effort was not commensurate with the similarities between Seqwater and Water NSW in relation to key characteristics in terms of total catchment area, the impacts of third party land use and the magnitude of pathogen risk facing the respective bulk water providers. Applying Water NSW’s per km² expenditure on pathogen control to Seqwater’s catchment area results in a total of $3.12 million. However, as discussed above, Seqwater and Water NSW face different risk profiles at the catchment level. This can be demonstrated through the Health Based Targets (HBT) approach for pathogens. The HBT approach is widely accepted in Australia for the management and use of recycled water and is currently accepted for chemical and radiological parameters in the ADWG. The HBT approach is currently in development for assessing pathogen risk to either challenge or support the more qualitative Tier 1 assessment.

The assessment is typically represented by the treatment requirements (expressed as Log values) to reduce the source water pathogen risk to the tolerable risk target. Work is currently ongoing to accurately quantify the HBT source water risk level at Seqwater’s major WTPs and also to compare this with source water risk in other jurisdictions, including New South Wales.

### CONCLUSION

While in isolation benchmarking cannot inform what is the correct level of source water protection expenditure for Seqwater, it is a useful tool for comparing Seqwater’s expenditure to other comparable bulk water providers. Based on a review of the factors relevant to the magnitude of water quality risk at the catchment level, it is considered that Water NSW represents the best available comparator to Seqwater. The results of the benchmarking analysis show that Seqwater’s 2014/15 level of expenditure on source water protection activities, including activities driven primarily by pathogen risk, was well below that of Water NSW. If Water NSW’s per km² expenditure on source water protection activities were to be applied to Seqwater’s catchment area, Seqwater’s level of investment in these activities would total $12.1 million per annum, almost three times the level of expenditure allocated to these activities in 2014/15. This result needs to be considered in the context of the development of the organisations where Seqwater is only beginning its source water protection journey whereas Water NSW is more mature. The information was used in the development of Seqwater’s recent price path submission to the Queensland Competition Authority. The proposed price path brings Seqwater’s expenditure more into line with that of Water NSW and is indicative of Seqwater’s commitment to building a best practice program over time. Water NSW’s source water protection program is recognised as an example of best practice.

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