

# SCOTLAND ISLAND WATER INFRASTRUCTURE

## Case for Investment



TimeOut, 2020

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Scotland Island  
Final  
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# DRAFT FINAL REPORT

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Draft Final Report	NBC review	Angelo Rouggos, Kapil Kulkarni, Luke Brennan	NBC

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## EXECUTIVE SUMMARY

Scotland Island is a large island / village in Pittwater in the Northern Beaches Council located approximately 30 km north of the Sydney Central Business District (CBD). The island has no reticulated potable water supply nor centralised wastewater system connection.

The existing drinking water supply is fed from rainwater tanks. However, the rainwater tanks are not able to supply residents with a constant source of drinking water. A small diameter emergency water supply pipe servicing Scotland Island was constructed extending from Sydney Water towns water supply at Church Point as an emergency water service supplying firefighting water storage tanks. The small diameter pipeline is not a compliant drinking water supply and is clearly distributed as non-potable water. The water is supplied as a non-potable supply by Northern Beaches Council, as detailed in their Scotland Island - Emergency Water Pipeline and Non-Potable Water Supply (2017) Policy. To access the water supply, residents must be a member of the Scotland Island Residents Association (SIRA) and sign an Agreement for Sale of Non-Potable Water from SIRA. When the rainwater tanks do run out of water, the small diameter non potable service is being used as a top up supply. The flow rate from the emergency pipeline is limited, so residents must book with the Scotland Island residents Association for use of the water supply on a rotational basis. The pipeline is in poor condition, with risk of contamination from contact with contaminated ground water. The practice of filling rainwater tanks provides avenues for contamination of the supply because the fill points generally do not have compliant backflow protection, and the fill hoses can have direct contact with contaminated ground water. The non-potable water supply is provided as firefighting water and is therefore without monitoring, and as a result, there is potentially low to zero levels of disinfection. This current practice on the island carries a risk to public health.

Current wastewater systems consist of on-site management systems (i.e. septic tanks and aerated treatment with local on-lot effluent disposal). This solution is generally unsuitable for the topography and geology of the island (PS Solutions, 2019b). In previous monitoring studies, streams have been found to have elevated nutrient, sediment and bacterial concentrations exceeding the ANZECC (1992) guidelines. Moreover, exposure to septic overflow carries public health risks, which in combination with the water supply arrangements are issues of concern to island residents and surrounding communities.

Soil testing in February 2019 indicated high levels of faecal coliforms in the soil in several locations (PS Solutions, 2019b). Other amenity issues that were anecdotally reported included odour and pests (mosquitoes).

A review of environmental factors found a large extent of noxious weeds and poor health of vegetation, which may be explained by excessive nutrient loads, albeit testing data were not available to confirm this conclusion (PS Solutions, 2019a). These impacts are likely due to contaminants accumulating in the soil, with the potential for these contaminants to run-off into the bay.

The community has been actively pursuing water and wastewater services for over 30 years. There have been previous investigations into the potential cost of servicing the island with grid-connected infrastructure (e.g. Sydney Water, 2018), however, these investigations have largely concluded that the cost of such solutions are likely to be prohibitive, and much higher than solutions provided to similar communities. The scope and inclusions in the Sydney Water assessment are not known in detail, but the submitted costs were high compared to other PSP projects.

Northern Beaches Council under a funding arrangement with NSW Government commissioned Pressure System Solutions (PS Solutions) to identify and assess the feasibility of options for water and sewerage servicing. RPS supported PS Solutions in preparing a Commercial Assessment Report, by investigating the investment case for supplying Scotland Island with water and sewerage services (Case for Investment).

This assessment includes:

- a definition of the problem and the project need;
- a presentation of four infrastructure options that address these problems;
- a qualitative assessment of the benefits of supply infrastructure (Benefits Assessment); and
- an analysis of the potential funding models (Funding Analysis).

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It should be noted that water and wastewater services are considered essential services. Moreover, these services are very rarely priced for full cost recovery (i.e. they are not financially self-sufficient), and cost benefit analyses (CBA) often do not always show a favourable economic benefit-cost ratio. However, such services are still provided to communities and considered to be in the public interest. In this case, the investigation of reticulated water and wastewater services responds to three main problems:

- **Problem 1:** Existing infrastructure not fit-for-purpose and failing / non-compliant.
- **Problem 2:** Perception of high cost without sufficient investigation.
- **Problem 3:** Inequity due to comparable services having been provided to similar communities.

The Case for Investment considered the following four potential infrastructure options:

- **Infrastructure Option 1:** Fully reticulated water supply with a pressure sewerage system that discharges to Sydney Water sewerage infrastructure located at Church Point.
- **Infrastructure Option 2:** Low flow reticulated water supply with a hybrid sewer system (pressure and gravity sewerage systems) that discharges to Sydney Water sewerage infrastructure located at Church Point.
- **Infrastructure Option 3:** Fully reticulated water supply with a hybrid sewer system that discharges to Sydney Water sewerage infrastructure located at Church Point.
- **Infrastructure Option 4:** Fully reticulated water supply with on island treatment for sewage and effluent discharging to Pittwater.

The Benefits Assessment shows that the options for water and sewerage servicing for the residents of Scotland Island:

- will significantly reduce health risks;
- Provide equity by addressing a long-standing community need for the services, which have been provided to similar communities in the past, and at a cost that is comparable to similar schemes;
- improve the quality of service for island residents; and
- significantly improve the local environment, both on and off the island.

These benefits accrue to a broad range of stakeholders including island residents and visitors, the Council, the local environment and recreational users of the Pittwater Bay.

Importantly, all infrastructure options were found to address problems 1-3, by providing water and wastewater services that are reliable and compliant with the required standards (addressing Problem 1), providing these at a cost comparable to previous schemes (addressing Problem 2), and resolving the inequity currently felt by the residents of Scotland Island (addressing Problem 3).

Among the four options, Infrastructure Option 1 is the most cost effective and is therefore the recommended option.

The Funding Analysis investigated how the cost of the scheme could be recovered through funding from SWC / the NSW Government.

Funding contributions by Northern Beaches Council and/or island residents was considered but was not investigated due to being unacceptable to the Council, and unfeasible and inequitable for residents.

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## 1 INTRODUCTION

### 1.1 Background

Scotland Island is one of the largest villages in greater Sydney without a reticulated potable water supply or wastewater service. Scotland Island lies in close proximity to urban Sydney. Scotland Island has 370 lots, is densely populated and has little growth potential. The drinking water supply consists of household rainwater tanks and an emergency pipeline, intended for firefighting purposes. The pipeline supplies non-potable water and is now used by the majority of residents.

This current arrangement on the island carries a risk to public health. The rainwater tanks are not able to supply residents with a constant source of drinking water. A small diameter emergency water supply pipe servicing Scotland Island is not a compliant drinking water supply. Because the rainwater tanks do run out of water, the small diameter non potable service is being used as a top up supply. The pipeline is in poor condition, with risk of contamination from contact with contaminated ground water. During increased flow in the pipeline sections of the pipe can experience negative pressure, and a fault within the pipe can provide an intake point for contaminated ground water. The process of filling rainwater tanks provides avenues for contamination of the supply because the fill points generally do not have compliant backflow protection, and the fill hoses can have direct contact with contaminated ground water. The flow rate from the emergency pipeline is limited, so residents must book for use of water supply on a rotational basis. Use of the water supply for frinking is not consistent with primary agreement for the supply of non-potable water to Scotland Island which is between the Scotland Island Residents' Association (SIRA) and Sydney Water ('Scotland Island – Emergency Water Pipeline & Non-Potable Water Supply 2017'), nor SIRA's Agreement for Sale of Non-Potable Water, which must be signed by all members accessing the water supply.

Current wastewater systems consist of on-site management systems that are generally unsuitable for the topography and geology of the island. In previous monitoring studies, streams have been found to have elevated nutrient, sediment and bacterial concentrations exceeding the ANZECC (1992) guidelines. Moreover, exposure to septic overflow carries public health risks, which in combination with the water supply arrangements are issues of concern to island residents and surrounding communities.

To investigate potential solutions to these issues, Northern Beaches Council commissioned Pressure System Solutions (PS Solutions) to identify and assess the feasibility of options for water and sewerage servicing.

### 1.2 Scope of services

RPS was tasked with assessing the investment case for supplying Scotland Island with water and sewerage services. The results are documented in this report (Case for Investment).

This assessment includes:

- a qualitative assessment of the benefits of supply infrastructure (Benefits Assessment)
- an analysis of the potential funding models (Funding Analysis).

### Benefits Assessment

The Benefits Assessment characterises the benefits of water and sewerage services. The assessment considered the benefits that would accrue to a range of stakeholders including island residents and visitors, the Council, the local environment and recreational users of the Pittwater estuary, which the island is located in.

The assessment discusses the benefits accruing to these stakeholders but does not provide a quantitative estimate of the benefit.

### Funding Analysis

The funding analysis explores how the costs of options are paid for (i.e. who ultimately pays for the costs).

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Each of the options will result in incremental capital and operating costs of new water infrastructure. Most water infrastructure in Sydney Water's area of operations is paid for through charges applied by Sydney Water Corporation (SWC). In simple terms, in most cases, augmentations to Sydney's water infrastructure are paid for by SWC, who in turn recovers these costs through charges they apply to all their customers. All previous Backlog and Priority Sewerage Program (PSP) schemes have been delivered in this way and date back to the late 1990's. In addition, the nearby Brooklyn Dangar Island sewerage scheme was delivered as part of the PSP and completed in 2006.

The Independent Pricing and Regulatory Tribunal (IPART) determines the amount of capital and operating expenditure that SWC is allowed to recover through charges. SWC is a government owned corporation and returns dividends to government from the profit they earn through their operations.

The Funding Analysis tests the SWC / Government model as one funding option. For this funding option, the analysis estimates the additional capital and operating expenditures required to be made by SWC. Other options include:

- Funding of the infrastructure through contributions from SWC and the residents of Scotland Island.
- Funding of the infrastructure completely by the residents of Scotland Island, either directly or through a special charge.

Note that the funding models should be distinguished from financing models and delivery models.

**Financing** considers where the capital to pay for infrastructure is sourced from. For example, the infrastructure could be financed through commercial bank debt, NSW Government bonds, NSW Government general revenue, equity from superannuation funds or SWC's cash reserves. Each of these sources of financing will have a different 'cost of capital' (i.e. the rate of return the investors expects to make on their investment, such as the rate of interest). Financing is distinguished from funding because the financiers ultimately need to be repaid by those that ultimately bear the costs / fund the infrastructure.

**Delivery** considers who builds and operates the infrastructure. The delivery business or agency is responsible for constructing the infrastructure. They can also choose to operate the infrastructure or equally, transfer ownership to a separate business or agency to operate it once commissioned. In some cases, the delivery business or agency can also be the financier. For example, a business or agency can use their own cash reserves to fund infrastructure. However, they expect to recover that investment through charges they apply to others (e.g. the users of the service), or amounts they receive from others (e.g. greenfield property developers).

This report focuses on funding models, as the issue of funding needs to be addressed before potential financing or delivery models can be determined.

Many of the funding assumptions have been estimated through desktop research using data provided to RPS and other publicly available sources / published guidelines. Some of the assumptions are uncertain. Sensitivity Analysis was used to assess the impact of uncertain assumptions that are material to the analysis (i.e. likely to affect the key findings).

## 1.3 Limitations

This Case for Investment report provides qualitative data about the benefits of supply infrastructure and a summary analysis of hypothetical funding models. The report is not intended as a CBA or Business Case for government investment in supply infrastructure.

## 1.4 Structure of report

The remainder of this report is structured as follows:

- Section 2 summarises the problems that the supply infrastructure is addressing
- Section 3 outlines potential infrastructure options

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- Section 4 provides a qualitative assessment of the benefits from investment
- Section 5 analyses potential funding models
- Section 6 provides conclusions.

## 2 PROBLEM AND PROJECT NEED

Understanding the problem to be addressed is an important first step when investigating the case for infrastructure investment. In this case, the issues that have driven this investigation are that:

- the existing infrastructure is not fit-for-purpose, is failing, and results in poor amenity and local environmental impacts
- previous investigations into infrastructure solutions have not been progressed due to the perception that solutions are likely to be cost prohibitive, when this may not necessarily be the case
- island residents have expressed a strong preference for a fit-for-purpose infrastructure solution and note that other similar communities have been provided one.

### 2.1 Problem 1: Existing infrastructure not fit-for-purpose and failing

The water and wastewater infrastructure currently servicing the island is not fit-for-purpose in many ways. This is evidenced by the fact that some of the on-site septic tanks either (Council source, email correspondence, 13 November 2018):

- do not have current approval to operate an on-site sewerage management system (around 20 per cent);
- have never received such an approval (around 4 per cent);
- have a history of failure requiring action in 2018 (around 10 per cent); and
- did not pass initial approval to operate on-site (around 33 per cent).

The issues with the sewerage infrastructure that led to these challenges included the unsuitability of the local geology, land reservation requirements, lack of compliance with Australian Standards and island topography.

Similarly, the rainwater tanks run out of water during periods of low rainfall, prompting island residents to use the emergency water supply for potable water. The water supply was not designed as a potable water supply and is not fit-for-purpose for use as a potable water supply, particularly as it does not provide any design components to prevent backflow. A 1997 study found that the non-potable water supply was contaminated with faecal coliforms (Martens and Associates, 1997). Moreover, the same study found that the polyethylene pipe was exposed in many locations, was in poor condition, and was susceptible to puncture, burning, melting and at risk of wastewater infiltration in the event of a leak. The system has since had some repairs.

The results of non-compliant systems and systems that were not designed to be used in the manner that they are being used has impacted on amenity and the local environment. Soil testing in February 2019 indicated high levels of faecal coliforms in the soil in several locations (PS Solutions, 2019b). Other amenity issues that were anecdotally reported included odour and pests (mosquitoes).

A review of environmental factors also found a large extent of noxious weeds and poor health of vegetation, which may be explained by excessive nutrient loads, albeit testing data were not available to confirm this conclusion (PS Solutions, 2019a). These impacts are likely due to contaminants accumulating in the soil, with the potential for these contaminants to run-off into the estuary.

### 2.2 Problem 2: Perception of high cost without sufficient investigation

There have been previous investigations into the potential cost of servicing the island with grid-connected infrastructure (e.g. Sydney Water, 2018), however, these investigations have largely concluded that the cost of such solutions are likely to be prohibitive, and much higher than solutions provided to similar communities. The scope and inclusions in the Sydney Water assessment are not known in detail, but the submitted costs were high compared to other PSP projects.

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However, the design and cost investigations undertaken by PS Solutions as part of the feasibility assessment work suggest that infrastructure can be delivered at costs comparable to other similar infrastructure. The work to identify these costs included functional design solutions, on island investigation, detailed market assessment, price estimation with contractors and peer review risk assessments that include client, contractors and consultants.

A previous cost investigation by Sydney Water (2018) found that a scheme that provides wastewater services to Scotland Island would cost \$252,000 per lot (2017-18 prices), which was reportedly 2-3 times higher than previous Priority Sewerage Program (PSP) schemes.

Cost investigations by PS Solutions have estimated that a scheme that delivers both water and wastewater services would cost approximately \$68 million or \$185,000 per lot (in 2019 prices). Approximately 70% of the cost would be attributable to wastewater services, or approximately \$129,000 per lot.

The estimated cost per lot is much lower than the Sydney Water estimate, which would have equated to approximately \$260,000 per lot (in 2019 prices). The PS Solutions cost estimate is also a similar order of magnitude to previous schemes. For example, PS Solutions estimates the cost per lot of the sewerage infrastructure provided to Brooklyn-Dangar islands at approximately \$150,000 (in 2019 prices).

## **2.3 Problem 3: Inequity as comparable services having been provided to similar communities**

Scotland Island is approximately 30km from the Sydney CBD in one of Sydney's largest council areas. However, the island does not have the same quality of water supply provided to communities that are even further from the CBD, or have fewer residents.

Island residents, who have expressed a strong preference for grid-connected water and sewerage infrastructure, note that similar solutions have been provided to other communities including:

- Picton Regional, Gerringong Gerroa, Brooklyn and Dangar Island, Jamberoo, Stanwell Park, Stanwell Tops & Coalcliff, Oakes & Oakdale, the Villages through the Blue Mountains and many others (delivered by Sydney Water)
- Mooney Mooney and Cheero Point also incorporate similar characteristics (delivered by Gosford Council).

## **2.4 Project need**

The need for this project is based on the requirement to address the three main problems outlined above. The remainder of this Investment Case briefly discusses the solutions that aim to address these problems, the benefits of these solutions and the potential funding approaches.

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## 3 INFRASTRUCTURE OPTIONS CONSIDERED

### 3.1 Base Case

All options are assessed relative to a base case, which represents the business as usual (BAU) situation for the island including rainwater tanks, septic tanks and the emergency pipe.

The Economic and Funding Analysis do not estimate any costs or benefits for the base case. Instead, the costs and benefits of other options are expressed as incremental to the base case (i.e. benefits and costs include only those that are additional to / not incurred in the base case).

### 3.2 Alternative options

Table 1 summarises the infrastructure options assessed against a BAU base case. These options are discussed in much greater detail in the *Scotland Island Water and Wastewater Feasibility Study Stage 1b Options Report* (PS Solutions, 2019).

**Table 1: Assessed options**

Systems		Infrastructure	Infrastructure	Infrastructure	Infrastructure
		Option 1	Option 2	Option 3	Option 4
<b>Sewer Collection System Options</b>	Pressure Sewerage System	✓			
	Hybrid System		✓	✓	✓
<b>Sewage Treatment Disposal</b>	On Island Treatment System				✓
	Discharge to Sydney Water	✓	✓	✓	
<b>Water Supply</b>	Low Flow Reticulation		✓		
	Full Reticulation	✓		✓	✓

#### Descriptions of the relevant systems:

<b>Pressure Sewerage System</b>	A dedicated pressure sewer pumping unit located on each lot discharging to a common collection main.
<b>Hybrid System</b>	A combination of gravity sewerage and pressure sewerage. Gravity sewerage is provided where the topography is conducive to pipelines installed at grade, including sewage pumping stations, and in constrained areas lots are serviced by pressure sewerage.
<b>On Island Treatment System</b>	A sewage treatment plant located on the Island, treating sewage to a tertiary level, suitable quality for discharge to Pittwater.
<b>Discharge to Sydney Water</b>	Pumping sewage discharge to Sydney Water system on the mainland at Church Point.
<b>Low Flow Reticulation from Sydney Water</b>	Low flow drinking water point within the residence and low flow top up to rainwater tanks.
<b>Full Reticulation from Sydney Water</b>	Full mains pressure supply to residences.

## **4 BENEFITS ASSESSMENT**

By addressing the problems outlined in Section 2, the infrastructure will deliver a wide range benefits to island residents and visitors, the Council, the local environment and recreational users of the Pittwater.

The primary benefits identified in this assessment are:

- the mitigation of stakeholder risks, including health, environmental and property risks;
- meeting the needs of the community, who have been requesting services for over 30 years;
- increasing the quality of service ; and
- improving amenity and the local environment.

Table 2 on the next page summarises each of these benefits including the main beneficiaries and how they benefit.

There are clear benefits in reducing health risks and improvements to the local environment.

Previous investigations have shown that the rainwater supply is susceptible to contamination from foliage and animal droppings from roofs contact of fittings with contaminated soil, and top-ups from the non-potable supply. Similarly, testing has shown elevated faecal coliform in the soil, and evidence of high nutrient loads affecting the local waterways.

Providing reticulated water and wastewater services will likely have a strong benefit in reducing:

- the health risks associated with rainwater tanks identified by both previous Scotland Island investigations and previous published studies (refer to Table 2),
- the health and environmental risks caused by the on-site treatment systems, as evidenced by the previous investigations and Council records on the suitability / compliance of those systems.

The end result is likely to be significantly reduced health risks, and a significantly improved local environment.

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**Table 2: Benefits assessment**

Benefit	Beneficiaries	Description of benefits
<b>Mitigation of risks</b>	Residents and visitors, Council, Sydney Water	<p>Providing water and wastewater services will mitigate the following risks:</p> <ul style="list-style-type: none"> <li>• risks to human health (illness);</li> <li>• risks of property and environmental damage on the island if water is unavailable for emergency purposes;</li> </ul> <p><b>Health risks</b></p> <p>Although roof-harvested rainwater is perceived to be safe to drink, published studies have reported the presence of potential pathogens that cause gastrointestinal illnesses in humans (e.g. refer to Ahmed et al, 2010).</p> <p>In the case of Scotland Island, site visits have noted that foliage can fall into the rainwater tanks, and a 1997 study found faecal coliforms present in the tanks, most likely due to animal droppings (Martens and Associates, 1997).</p> <p><b>Property and environmental damage risks</b></p> <p>The emergency water supply may have insufficient capacity or could fail (refer to Section 2.1) in the event of an emergency requiring immediate water supply (e.g. a fire). This poses risks to properties and to the local environment.</p>
<b>Meeting community needs</b>	Residents and visitors	<p>The Scotland Island community has been requesting water and wastewater services for over 30 years (PS Solutions, 2019b). During that time, many other similar communities have been provided wastewater services through Sydney Water's Priority Sewerage Program (PSP), and water services. As is the case with energy infrastructure, water and sewerage are considered essential services. Providing these essential services to Scotland Island will meet community needs, and also improve equity.</p>
<b>Quality of service</b>	Residents and visitors	<p>In 2017, NSW Health declared that the local kindergarten and community hall were no longer permitted to provide or sell food, as it was discovered that non-potable emergency pipeline was being used to top-up rainwater tanks (Northern Beaches Council, 2017). This shows that the rainwater supply is not considered reliable enough to deliver the quantity of water needed to support some desired uses. While the emergency pipeline could and has been used to supplement the rainwater, the quality of that water is not considered safe for some use.</p> <p>Therefore, providing water services will increase the quality and reliability of water supply for a range of uses.</p>
<b>Amenity</b>	Local environment, bay recreational users	<p>Providing reticulated water and wastewater infrastructure would reduce the risks created by relying on rainwater and septic tanks, and therefore reduce contamination in the soil and ultimately the bay. This would contribute to addressing the health risk, odour, pest, noxious weeds and vegetation health issues, and improve the amenity of the estuary for recreational users.</p>

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## 5 FUNDING ANALYSIS

### 5.1 Methodology

The Funding Analysis used two calculation steps:

- a discounted cashflow (DCF) analysis to estimate the annual and total (NPV) costs of the infrastructure based on the likely cost of capital for each funding option;
- calculating the annual funding contribution from each funding party, with the capital either being:
  - funded by the party as a lump sum at the beginning of the modelling horizon; or
  - spread over the modelling horizon (i.e. ‘amortised’) to allow the funder to pay for the infrastructure capital over time.

### 5.2 Assumptions

#### General Assumptions

Table 3 lists the general assumptions applied in the Funding Analysis.

**Table 3: General assumptions**

Assumption	Value
Construction period	One year (assumed to be in 2020)
Funding analysis period	21 years (2020 – 2040, inclusive)
Number of dwellings	370 (377 lots)
Number of residents	579 permanent residents

#### Costs

Table 4 summarises the cost assumptions.

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**Table 4: Cost assumptions**

Cost assumption	Value
Capital cost of upgrade works (taken from Stage 2 Report Cost Plan)	Infrastructure option 1: \$68.4 million Infrastructure option 2: \$76.2 million Infrastructure option 3: \$76.9 million Infrastructure option 4: \$96.3 million
Removal of existing water pipeline that connects to Scotland Island from the Sydney Water main at Church Point	Unquantified <sup>1</sup>
Operating costs associated with new infrastructure (e.g. energy, pipe/pump maintenance etc.)	<b>Infrastructure Options 1 – 3:</b> ~\$362/dwelling/year <b>Infrastructure Options 4:</b> ~\$362/dwelling/year, plus an additional ~\$2,000/dwelling/year due to on-island sewerage treatment costs (Advice from PS Solutions)
Allowance for downstream pumping (Warriewood Wastewater Treatment Plant)	+15% of above on-island operating costs (~\$54/dwelling/year) (advice from PS Solutions)
Local amenity impacts on residents from the construction works	Unquantified <sup>1</sup>

**Note 1:** These costs are not material to the key findings in this report.

## Discount rates

The Funding Analysis applied a cost of capital (i.e. commercial discount rate) to the cashflows for each option, by making an assumption about how the infrastructure is financed in each option.

- Funding Option 1 (SWC / NSW Government Funding) assumes that the infrastructure is financed by SWC cash reserves and potentially corporate debt used to increase those cash reserves, and / or through a NSW Government contribution. Option 1 uses a commercial discount rate equal to SWC's published weighted average cost of capital (WACC) of 5.9 real pre-tax WACC, which is equivalent to an 8.5 per cent nominal pre-tax WACC (IPART, 2016).
- Funding Option 2 (Distributed Funding) assumes that the infrastructure is funded:
  - partly through a 50 per cent capital contribution from island residents;
  - the remaining capital and all operating costs being funded by SWC, financed through its cash reserves and / or additional corporate debt.

A third, somewhat theoretical, option would include the residents of Scotland Island paying entirely for the infrastructure. However, this funding model was not further analysed because it would result in a cost per household of approximately \$200,000-\$300,000, which is not a practicable sum for homeowners to fund. It is also unprecedented for households to directly fund grid connection costs of that magnitude, which in previous similar situations have been funded by developers, water utilities and / or directly by government.

All figures in the Funding Analysis are presented in nominal terms, using an annual inflation rate of 2.5 per cent, which is the mid-range of the Reserve Bank of Australia (RBA) target inflation band.

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### 5.3 Results

The Funding Analysis assumes that Infrastructure Option 1, which is the most cost-effective option, is implemented.

#### Funding Option 1 – SWC / NSW Government Funding

Funding Option 1 would require direct capital expenditure from SWC of **\$68.4 million** in financial year 2020/21. Figure 1 shows the ongoing operating costs to SWC following this capital expenditure. The costs are presented in nominal terms (i.e. including inflation effects) and therefore increase at 2.5 per cent per year.

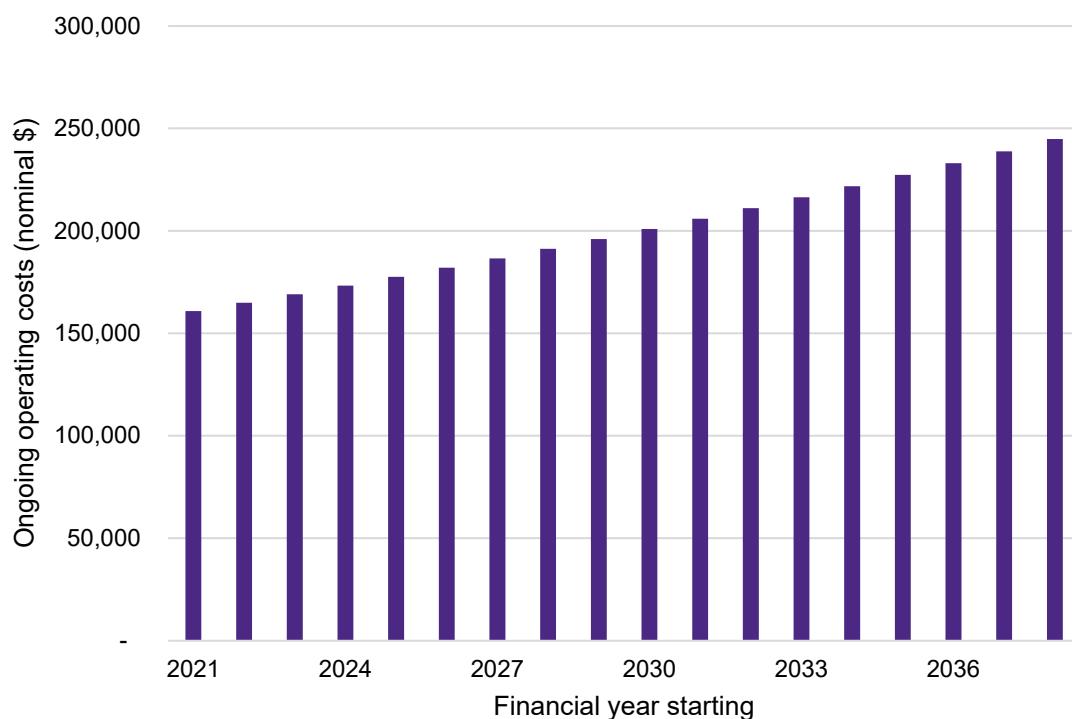


Figure 1 Ongoing costs to SWC 2021 to 2039 (Funding Option 1)

#### Funding Option 2 – Distributed Funding

Funding Option 2 assumes that two entities contribute to the capital expenditure (refer to Table 5).

Table 5: Funding Option 2 capital contributions

Stakeholder group	Total capital contribution	Cost per household <sup>3</sup>
Island residents	\$36.6 million	\$97,082
SWC	\$36.6 million	Negligible / not modelled <sup>1</sup>

Note <sup>1</sup>: SWC would recover this cost by spreading the additional expenditure across all water rate payers. Due to the size of the SWC's customer base, this would be a negligible increment.

Note : Each household will also have connection charges which may require plumbing and electrical upgrades to comply to current Australian standards.

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The remaining ongoing operating costs would be funded by SWC (as per Figure 1).

## Comparison of funding options

Table 6 summarises the advantages and disadvantages associated with each funding option.

**Table 6: Comparison of funding options**

	Funding Option 1 (SWC Funding)	Funding Option 2 (Distributed Funding)
Advantages	<ul style="list-style-type: none"> <li>• Consistent with precedent</li> <li>• Ability to utilise SWC's strong balance sheet</li> <li>• Affordable to island residents</li> </ul>	<ul style="list-style-type: none"> <li>• Spreads costs across the main beneficiaries</li> <li>• Reduces funding commitments from SWC</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>• Requires SWC approval</li> </ul>	<ul style="list-style-type: none"> <li>• Island residents unlikely to agree to funding amount</li> </ul>

Note : SWC would recover this cost by spreading the additional expenditure across all water rate payers. Due to the size of the SWC's customer base, this would be a negligible increment.

Funding Option 1 is consistent with precedent, leverages SWC's strong balance sheet and much more likely to be accepted by the various stakeholders (i.e. SWC, Northern Beaches Council and island residents).

On that basis, this report recommends Funding Option 1 as the preferred funding option.

## Uncertainty in costs and funding requirements

Funding costs in each option are based on capital cost estimates provided to RPS by PS Solutions. Future design work may estimate higher or lower capital costs, and the actual costs of the project may be higher or lower than estimated based upon project delivery model adopted and current market conditions. Funding requirements will scale in direct proportion to costs.

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## 6 CONCLUSIONS

The Benefits Assessment has shown that, by reducing contamination in the water supply and soil, and by providing water supply in accordance with NSW Health standards, the options for water and sewerage servicing for the residents of Scotland Island:

- will significantly reduce health risks;
- address a long-standing community need for the services, which have been provided to similar communities in the past, and at a cost that is comparable to similar schemes;
- improve the quality of service for island residents; and
- significantly improve the local environment.

These benefits accrue to a broad range of stakeholders including island residents and visitors, the Council, the local environment and recreational user of Pittwater.

Importantly, all infrastructure options were found to address problems 1-3, by providing water and wastewater services that are reliable and compliant with the required standards (addressing Problem 1), providing these at a cost comparable to previous schemes (addressing Problem 2), and resolving the inequity currently felt by the residents of Scotland Island (addressing Problem 3).

Among the four options, Infrastructure Option 1 is the most cost effective and is therefore the recommended option.

The cost, which is comparable to previous schemes funded under the Priority Sewerage Program (PSP) program, is most appropriately funded through SWC.

Of the four infrastructure options considered, Infrastructure Option 1, which involves full reticulation of water supply and a pressure sewerage system that transfers and discharges to Sydney Water, is the most cost-effective.

Funding the infrastructure through SWC / NSW Government is the preferred option, as it leverages SWC's strong balance sheet and is much more likely to be accepted by the key stakeholders (i.e. SWC, Northern Beaches Council and island residents). This funding option is also consistent with the implemented SWC Backlog and PSP schemes and is therefore more equitable.

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