

---

*This note provides guidance for development of water treatment options and for preparation of the options report.*

---

## Principles of options assessment

The key principles that underpin the options assessment for any new drinking water supply scheme are:

- Identification of the root cause of issues that require investigation.
- The need to upgrade or build a new water treatment plant (WTP) is typically due to:
  - Intrinsic process design deficiencies to achieve the required treated water quality.
  - Inadequate plant capacity to meet the required demand.
  - Poor structural condition of assets.
- The big-picture of how potable water is supplied is considered.
- Options are fit for purpose.
- Appropriate technologies are used.
- Options are cost effective.
- Options are affordable.
- Options meet the long-term needs of the community and
- Options satisfy regulatory requirements including health and environmental.

## Water treatment plant options report

- The aim of the options assessment is to produce the options report.
- The report includes recommendations for the preferred option(s) and these are clearly justified.
- The options report provides the basis for the concept design report.

The options report must be:

- suitable for the needs of all stakeholders including the community
- tailored for each individual project
- consistent with the IWCM or other relevant report(s).

## Checklist

A checklist is provided to assist with the development and review of options and the options report.

No.	Issue	
1	Have all issues that require capital upgrade/new water treatment plant been assessed and confirmed?	
2	Is comprehensive information available for the quality of raw, settled and filtered water?	
3	Is comprehensive jar test information available?	
4	Is the existing plant operated as designed?	
5	Have intrinsic treatment deficiencies been identified with the existing plant?	
6	Have the root cause(s) of poor plant performance been identified?	
7	Is the design horizon for the works confirmed?	
8	Is information available for right sizing of treatment plant?	
9	Have non-built solution(s) been rigorously evaluated?	
10	Can issues be fixed by optimising treatment processes at the existing plant? Has this been carried out?	
11	Have source water quality improvement been considered?	
12	Have alternative water sources been considered?	
13	Have alternative water supplies been considered?	
14	Is additional treated water storage an option to meet peak demands?	
15	Can the issues be fixed by refurbishment/addition/modification to the existing treatment processes?	
16	Have all suitable upgrade and new water plant build options been considered?	
17	Are options fit for purpose?	
18	Are options cost effective?	
19	Do options use appropriate technologies?	
20	Do options meet the long-term needs of the community?	
21	Do options meet health, economic, social and environmental outcomes?	
22	Have all suitable wastewater management options been considered?	
23	Are the options affordable?	

## Example of an options report table of contents

Section	What is required (not a complete list)
<b>Executive summary</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Introduction/ background</b>	<ul style="list-style-type: none"> <li>• Define the problem (what is being addressed – e.g. capacity, asset condition, performance, complaints, security of supply or emergency).</li> <li>• Objectives of report.</li> <li>• Approval requirements.</li> <li>• Previous studies.</li> </ul>
<b>Existing water supply system</b>	<ul style="list-style-type: none"> <li>• Big picture description of water supply in the region.</li> <li>• Description of the existing treatment process including sludge/waste management.</li> <li>• Relevant drawings and schematics.</li> <li>• Plant performance/water quality, include statistical analysis of water at key locations in the system e.g. raw water, clarified water, filtered water, treated water and distribution system/customer tap.</li> <li>• Water quality data should only be included if they achieve some agreed quality assurance, results from a NATA accredited laboratory are preferred.</li> <li>• Operational data obtained from a non-accredited laboratory may be used provided it can be verified with results from an accredited laboratory.</li> </ul>
<b>Investigations</b>	<ul style="list-style-type: none"> <li>• Examples include: <ul style="list-style-type: none"> <li>○ Jar test results e.g. to determine chemical dose rates, sludge yield and THM formation.</li> <li>○ Asset condition reports, process review reports etc.</li> <li>○ Other investigations, e.g. alternative source water, destratification.</li> <li>○ Wastewater and sludge yield calculations.</li> </ul> </li> </ul>
<b>Basis for options</b>	<ul style="list-style-type: none"> <li>• Planning horizon.</li> <li>• Current and future demand.</li> <li>• Treatment plant capacity.</li> <li>• Security of supply objectives.</li> <li>• Raw water envelope.</li> <li>• Treated water quality targets.</li> <li>• HBT/disinfection requirements.</li> <li>• Wastewater/ sludge treatment objectives.</li> <li>• Fit for purpose treatment process to meet operational needs.</li> </ul>
<b>Options - treatment plant location</b>	<ul style="list-style-type: none"> <li>• Siting alternatives - existing and/or new site?</li> <li>• Flood security.</li> <li>• Site survey – preliminary.</li> <li>• Available footprint/need for land acquisition.</li> <li>• Access/availability of raw water source.</li> </ul>
<b>Options - non-built</b>	<ul style="list-style-type: none"> <li>• Description of options.</li> <li>• Expected performance.</li> <li>• Risks.</li> <li>• OPEX, CAPEX, NPV.</li> </ul>
<b>Options - upgrade to WTP</b>	<ul style="list-style-type: none"> <li>• Description of options.</li> <li>• Expected performance.</li> <li>• Risks.</li> <li>• OPEX, CAPEX, NPV.</li> </ul>
<b>Options - build new WTP</b>	<ul style="list-style-type: none"> <li>• Description of options.</li> <li>• Expected performance.</li> <li>• Risks.</li> <li>• OPEX, CAPEX, NPV.</li> </ul>

# Water Treatment Plant Options Report



## Guidance Note 1

Section	What is required (not a complete list)
<b>Comparison and assessment of options</b>	<ul style="list-style-type: none"><li>• Concise overview of options.</li><li>• Strategic/high level comparison of options (pros and cons).</li><li>• Overall cost comparison and funding impacts of options.</li><li>• Justify assessment criteria and score options.</li></ul>
<b>Conclusions and recommendations</b>	<ul style="list-style-type: none"><li>• Option outcomes.</li><li>• Preferred option.</li><li>• Residual investigations required.</li></ul>

© State of New South Wales through Department of Planning, Industry and Environment 2021. The information contained in this publication is based on knowledge and understanding at the time of writing (April 2021). However, because of advances in knowledge, users should ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate departmental officer or the user's independent adviser.