

Water Supply

Quality Assurance Program

**This program has been prepared by:**

(Insert name)

**This program is for:**

(Insert business name and address)

(Rainwater)

**Date:** Insert date

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Background

The [*Public Health Act 2010* (NSW)](https://www.legislation.nsw.gov.au/#/view/act/2010/127) is applied to Norfolk Island under the *Norfolk Island Applied Law Ordinance 2016*. Section 25 of the [*Public Health Act 2010* (NSW)](https://www.legislation.nsw.gov.au/#/view/act/2010/127) requires that all suppliers of drinking water establish and adhere to a Quality Assurance Program (QAP). This template will help private water suppliers develop a QAP and can be altered to ensure it is relevant to each water supply system.

A QAP must address the Framework for Management of Drinking Water Quality set out in the *Australian Drinking Water Guidelines* (ADWG 2011), in a way that is appropriate to each water supply. The *Australian Drinking Water Guidelines* are available at:

<http://www.nhmrc.gov.au/guidelines/publications/eh52>

The *NSW Private Water Supply Guidelines* provide additional guidance for private water suppliers to develop a QAP (the guidelines are for an Act that is identically worded to the Norfolk Island Public Health Act) and are available at:

<http://www.health.nsw.gov.au/environment/water/Documents/NSW-Private-Water-Supply-Guidelines.pdf>.

Further information can be found by contacting Norfolk Island Regional Council.

Water Supply Quality Assurance Program

This template document is based on the NSW Health private water supplier template and has been modified for use on Norfolk Island.

A water supply system includes everything from the collection of the source water through to the point of use. When developing a Quality Assurance Program (QAP) for a water supply system an operator should ask three questions:

What problems could occur between the water source and the point of use?

How can they be prevented or fixed?

How do you know that the problem has been prevented or fixed?

The answers to these questions will help determine how to:

Assess and protect the quality of the source water

Make sure treatment processes are appropriate, maintained and working properly

Regularly test the water quality

Make the water supply safe if contamination has occurred

Make sure that water users are warned and/or provided with safe drinking water if the normal supply is found to be unsatisfactory or the quality cannot be guaranteed.

Keeping the water supply system safe involves:

Identifying who is responsible for the system and who will respond to issues

Understanding hazards to your water sources

Making sure the water is stored and distributed safely

Treating the water to remove or control any contamination

Monitoring the quality of the water and the integrity of the water supply system

Planning how to respond to problems in the water supply system.

Your QAP should reflect the type of water supply system you manage, especially the water source and its end uses.

While it is recommended that water supplies be monitored regularly, operators may choose not to monitor water quality. If the water supply is not monitored or treated and is not required to be of drinking water quality (water used in food preparation must be drinking water quality), operators may choose to manage their risk by placing signs at outlets to warn consumers not to consume the water.

See the *NSW Private Water Supply Guidelines* for information on signage. A QAP must still be developed and should include details on all signage.

If you use water to prepare food under the *Sale of Food Act 1950 (NI)* (i.e. hold a current Norfolk Island sale of food license appropriate) water treatment must be installed.

What to do with the QAP

You must provide a copy of the completed QAP to Council via email to customercare@nirc.gov.nf .

The QAP should be a living document that is reviewed regularly. Any changes that occur to the water supply system or any new hazards that are identified from observations, equipment checks, incidents or monitoring should be added to the relevant section of the program.

Your QAP should be kept in a central place that is easily accessible to staff and others who may need to view it, such as officers of the Norfolk Island Regional Council.

**The activities in this QAP are undertaken by this business to ensure safe drinking water and to protect public health.**

# Basic Information

## Private water supplier’s details

|  |  |
| --- | --- |
| **Property/business name** |  |
| **Owner/occupier name** |  |
| **Owner /occupier contact details** | Phone:Mobile Phone:Email:Address: |
| **Business after-hours / emergency contact** | Name:Phone:Mobile Phone:Email:Address: |

## Water supply system monitoring and maintenance personnel details (if different from above)

|  |  |
| --- | --- |
|  **Role** | **Contact details** |
| E.g. Routine maintenance/plumber | Name:Phone:Email: |
| E.g. Water testing | Name:Phone:Email: |
| Add more rows as required |  |

# Description of the water supply system

Describe the details of your water system from source to use (Delete any that are not relevant and modify or add text as required, tick where appropriate).

|  |  |  |
| --- | --- | --- |
| **Tick** | **Component** | **Description** |
| **Water sources** |
|  | Groundwater (bore) |  |
| ✓ | Rainwater (roof water) | Untreated rainwater from building roofs |
| ✓ | Carted water | Available as a backup if required |
| **Treatment** |
|  | Filtration | Filtration {include filtration system details} |
|  | UV disinfection | UV treatment {Include UV system details here} |
|  | Chlorination |  |
|  | First flush diverter (rainwater tanks) | First flush diverter |
|  | Other | Strainer at entrance of storage tank |
| **Distribution** |
|  | Storage/header tank | 1 x storage tank receiving water from roof & water carter{Describe tank material, size, lining, covering}First flush device |
|  | Pipes | {Describe pipe material) |
|  | Pumps | 1 x distribution pump |
| **Uses** |
|  | Drinking | Tank water used for drinking for XX people {Include number of people who would use the drinking water} |
|  | Food preparation (including washing of produce and cleaning of utensils and equipment) | Tank water used for food preparation, water supply to coffee machine, and for washing and cleaning of utensils and equipment. |
|  | Personal hygiene (showers, toilets etc.) | Tank water used for toilets and hand washing. |
|  | Clothes washing | Tank water used for washing of clothes and linen |
|  | Other | IrrigationTank water used for general cleaning |
| ✓ | Vulnerable populations | Children, elderly, pregnant, immunocompromised |

## Process flow diagram

Draw a simple diagram of your water supply system. Show the water source, pumps, storage, treatment, pipelines and uses. Include the location of wastewater systems (for example, septic tanks), any possible sources of contamination and the location of physical control measures such as fences, signs, etc. The diagram must reflect the details of the water supply system but does not need to be to scale.

Key for drawings

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Icon** | **Item** | **Icon** |
| Building or structure (with roof)  |  | Hotel / cabins |  |
| Tank |  | Water carter |  |
| Bore |  | First flush device |  |
| Filter |  | Valve (back-flow prevention device) |  |
| Pump |  | UV disinfection |  |
| Septic tank |  | Agricultural or other customers |  |
| Pipes |  | Chlorine dosing | Cl |

Example rainwater water system diagram {Update with your system details}

Uses of rainwater:

* Drinking water
* Hand washing
* Toilet flushing
* Food preparation

Consumer

First flush device

20 kL Reservoir

Outlet

filter

UV

disinfection

Consumer

First flush device

20 kL Reservoir

Filter

Cl

## Equipment and chemical details

Details of pumps, parts, treatment systems and chemicals are recorded in this section. The manufacturer’s instructions are attached to the QAP {Attach manufacturer’s instructions or reference location}.

Check all chemicals are suitable for potable water use.

### Equipment and chemical records

| **Part / Equipment** | **Manufacturer** | **Supplier/Repairer Contact Details** | **Manufacturers instruction location** | **Critical spares (held on site)** |
| --- | --- | --- | --- | --- |
| Water pumps |  |  |  |  |
| Filters |  |  |  |  |
| UV system |  |  |  |  |
| Chemical |  |  |  |  |
| *Add extra lines as required* |  |  |  |  |

# Risk Assessment of the Water Supply System

Understanding the risks to your water supply is a crucial step in ensuring its safety. Actions should be prioritised on the basis of level of risk.

The hazards to the water supply are considered and rated following the advice in the QAP template, examples are included in Appendix A. The *NSW Private Water Supplies* *Guidelines* can also be used for guidance. Note all controls which are in place to address the hazards, and actions required to ensure the ongoing protection of water quality. Use the following risk assessment process.

Document your risk assessment in the next template table, using the following steps. Create as many pages as required. It is important to review your risk assessment regularly to ensure any new risks are identified.

**Step 1:** Identify particular hazards in the water supply in the risk assessment template.

The table in Appendix A gives examples of some hazards and is provided to assist in completing the “Hazard” column of the Risk Assessment.

**Step 2:** Assign risk rankings.

Once all possible hazards are listed, assign a risk ranking to each hazard of low, medium or high in the risk assessment template. Consider the likelihood of the hazard occurring and, if it does, the severity of the consequence. The table in Appendix B may assist in ranking risks.

**Step 3:** Identify controls.

Decide whether the hazards identified in the system have controls in place and describe these controls in the risk assessment template. Controls are the ways that risks will be managed, for example excluding animals from dams used for human drinking water, regular inspection and maintenance programs or water treatment. The table in Appendix A gives some more examples of possible controls for various hazards.

Decide whether the controls used are adequate for the identified risk (Step 1).

**Step 4:** Monitoring of controls is important to ensure they are working effectively.

Describe in the risk assessment template how, when and where monitoring will occur, who is responsible, how and where records will be kept and by whom. Consult the *NSW Private Water Supply Guidelines* for information on monitoring.

**Step 5:** Where hazards are identified, consider what could be done to improve safety, reduce the risk of those hazards or improve water quality.

List any shortcomings in your water supply system and its management and identify what improvements should be made. Document these improvements in your risk assessment template.

**Step 6:** Prioritise actions that need to be taken to protect the water supply and give them a priority number or time frame in the risk assessment template.

## Risk Assessment Template (Example risks and controls included below)

## See Appendix A for more possible controls and update with your program

| **Step 1** | **Step 2** | **Step 3** | **Step 4** | **Step 5** | **Step 6** |
| --- | --- | --- | --- | --- | --- |
| **Hazard** | **Risk Rank** |  **What controls are in place?** | **Is the Hazard adequately controlled?** | **How is this control monitored?** | **What could be done to reduce risk or further improve water quality?** | **Timeframe for action** |
| Contamination from roof material (e.g. lead-based paint, lead flashing, bitumen-containing products, treated timber, peeling paint) | Medium | Water not collected from roofs coated or painted with substances that may leach hazardous materialsRemove or treat lead flashingSeal any exposed treated timber |  |  |  |  |
| Organic matter, bird faecal contamination or animal carcasses being washed into the tank from roof and gutters | High | First flush deviceRegular cleaning of roof and guttersRemoval of overhanging branchesRegular inspectionsWater treatment (disinfection) |  |  |  |  |
| Contamination from insects, birds and animals entering the storage tank | Medium | Screen all inlets and outlets to the tankRegular inspections of tank, roof and gutters |  |  |  |  |
| Low pH of water corroding plumbing fittings when the taps haven’t been used so water sits in pipes  | Low | All materials in contact with water comply with AS/NZS 4020:2005 |  |  |  |  |
| Corrosion of metal plumbing fittings by soft water e.g. copper from pipes resulting in blue water | Low | All materials in contact with water comply with AS/NZS 4020:2005 |  |  |  |  |
| Contamination from sediment / sludge accumulation in tank | Medium | Regular inspection, cleaning and maintenance program |  |  |  |  |
| Dirt in inlet strainers or insect screens entering water supply | Low | Regular inspection, cleaning and maintenance program |  |  |  |  |
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# Management Actions and Record Keeping

Document all activities required to manage the water supply including inspections, maintenance, signage, monitoring, and incident management.

Records should be kept for:

All inspections, maintenance, carted water or incidents/emergencies. These records include system inspections

All results of microbial and chemical testing, and chlorine levels (where applicable)

Maintenance to the water system such as tank cleaning, filter change, chlorination

Incidents and corrective actions e.g. dead animal in tank, storms, treatment breakdown

Deliveries of carted water, including date and name of supplier

* The placement and checking of warning signs

Records should be kept in a logsheet or diary, example record tables are included in Appendix D.

## Planned water supply system inspection and maintenance program

An inspection regime should address all aspects of the water supply system. Regular inspection and maintenance is essential to maintaining a well-functioning and safe water supply.

Consult the equipment instruction manuals for the frequency of inspection and maintenance activities required.

Record maintenance and inspection activities in a log sheet or diary (example included in Appendix D).

### Planned inspection and maintenance program (examples included)

| **What is to be inspected/maintained** | **How often it is to be inspected/maintained (frequency or dates)** | **Who should conduct the inspection/maintenance** | **Any equipment or procedures needed** |
| --- | --- | --- | --- |
| Empty first flush device | After every rainfall event |  |  |
| Strainer (mesh on rainwater tank) clear of debris | Every 2 weeks or after heavy rain |  |  |
| Tank visual inspection (including hatches) | 3 monthly |  |  |
| Clean gutters | As required  |  |  |
| Check for potential contamination by birds on roof through overhanging branches | 3 monthly  |  |  |
| Trim overhanging branches | As required |  |  |
| Check presence of mosquito larvae in tank water | 3 monthly |  |  |
| Structural condition of tank | Annually |  |  |
| Drain tank to remove sludge build-up | Every 2 years or as required |  |  |
| System (pump, piping) is fully operational and maintained | Annually |  |  |
| Clean filters | Monthly |  |  |
| Check UV system is operating correctly | Weekly |  |  |
|  |  |  |  |

## Water quality monitoring program

Water quality monitoring is important in ensuring controls are effective and in response to concerns. Adverse water quality results to be immediately notified to Council.

Following four *E. coli* non-detects, water quality monitoring frequency may be reviewed with council.

Record water quality results in a log sheet or diary (example included in Appendix D).

### Water quality monitoring {Example provided, update with your program}

| **What is to be monitored** | **How often are tests to be taken(frequency or dates)** | **Location of tests** | **Who should perform the test** | **Equipment needed and procedures for performing the test** |
| --- | --- | --- | --- | --- |
| Water quality | Daily | Kitchen | Manager | Taste & odour |
| *E. coli* | Three monthly | Kitchen | Council |  |
| Chemical | Annually | Kitchen | Council |  |
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## Records of water purchased from a water carter

A record of drinking water purchased from a water carter and added into the water supply system should be recorded below.

Record details in a log sheet or diary (example included in Appendix D).

## Chlorination records

For guidance on the safe use of chlorine see Chapter 5 of the *NSW Private Water Supply Guidelines.*

If chlorine is used, record details in a log sheet or diary (example included in Appendix D).

## Sign posting

All taps where untreated rainwater is supplied must be identified as ‘RAINWATER’ with a label. All other non-potable water taps should be labelled “Water not suitable for drinking”.

Warning signs should comply with Australian Standard AS 1319 *Safety Signs in an Occupational Environment*. Their location should be recorded in the signs table. Example of signage is shown in Figure 1.

Figure 1. Example of a rainwater sign

 

### Signs

| **Sign location** | **Sign wording** | **Permanent or Temporary** | **Inspection Date** | **Any action taken** |
| --- | --- | --- | --- | --- |
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# Contingency and Emergency Planning

Document what to do:

If there is a problem with an important part of the water supply system

In response to a failed water quality test

To ensure all people responsible for the water supply system have the knowledge and skills to run the system, e.g. training temporary managers

In response to customer complaints regarding water quality

In response to any other issue

## Contingency plan (example text included, update with what you would do)

|  |  |
| --- | --- |
| **Issue** | **Likely actions that could be taken** |
| Dirty or smelly water | * Flush lines
* Check water quality in tank
* Use bottled water for drinking, food preparation, cleaning teeth
 |
| Unpleasant taste to water | * Flush lines
* Check water quality in tank
* Use bottled water for drinking, food preparation, cleaning
 |
| Positive *E. coli* test | * Contact Norfolk Island Regional Council for advice
* Sign post all outlets that water supply is contaminated and not to be used for drinking, food preparation or consumed when cleaning teeth
* Use bottled water for drinking, food preparation, cleaning teeth
* Treat and disinfect the water (For guidance on the safe use of chlorine see Chapter 5 of the NSW Private Water Supply Guidelines.
* If chlorine is used, record the details in the table below)
* Re test water for *E. coli*
 |
| UV lamp no available for replacement | * Sign post all outlets that water supply is contaminated and not to be used for drinking, food preparation or consumed when cleaning teeth
* Use bottled water for drinking, food preparation, cleaning teeth
* Contact plumber to acquire spare lamp
 |
| Vermin (birds, rats, etc.) found in tank | * Sign post all outlets that water supply is ‘Water not suitable for drinking’
* Use bottled water for drinking, food preparation, cleaning
* Contact Norfolk Island Regional Council for advice
* Drain and clean tank
* Test water for *E. coli* prior to resupply
 |

## Incident records

If incidents, issues or emergencies occur that impact on the water quality, record what happened and what was done to rectify the situation. Include any customer complaints about water quality.

Record details in a log sheet or diary (example included in Appendix D).

## Emergency contacts

Keep details of who to contact in an emergency, who to call for advice and important local contractors. Keep these details in an easily accessible place.

| **Contact** | **Name** | **Contact Details** |
| --- | --- | --- |
| Norfolk Regional Council |  |  |
| Plumber |  |  |
| Water Carter |  |  |
| Chlorine Supplier |  |  |
| Electrician |  |  |

###### APPENDIX A Common sources of contamination (hazards) and suggested control measures

| **Component** | **Potential source of contamination** | **Control measures** |
| --- | --- | --- |
| Water Source | Rain water Roof and gutters (e.g. build-up of leaves, dirt and animal droppings) | * First flush device
* Regular cleaning of roof and gutters
* Removal of overhanging branches
* Regular inspections
* Water treatment (disinfection)
 |
| Rain water Roof material (e.g. lead-based paint, lead flashing, bitumen-containing products, treated timber, peeling paint) | * Water not collected from roofs coated or painted with substances that may leach hazardous materials
* Remove or treat lead flashing
* Seal any exposed treated timber
 |
| Water Storage  | Insect, birds and animals in system | * Screen all inlets and outlets to the tank
* Regular inspections of tank, roof and gutters
 |
| Build up of sludge in tank, dirt in inlet strainers or insect screens | * Regular inspection, cleaning and maintenance program
 |
| Tank materials (e.g. pH of water in concrete tanks, high metals from metallic tanks) | * Materials in contact with water comply with relevant Australian Standards
* Chemical adjustment of pH in new concrete tanks may be necessary
 |
| Backflow water (e.g. from animal water troughs) | * Backflow prevention device
 |
| Distribution system | Pump and plumbing materials | * All materials in contact with water comply with AS/NZS 4020:2005
 |
| Leaching from bore casings, pipes or plumbing materials | * All materials in contact with water comply with AS/NZS 4020:2005
* Flush standing water at irregularly used fixtures
 |

###### APPENDIX B Identification of risk

|  |  |
| --- | --- |
|  | Consequence |
| Likelihood | Minor | Moderate | Major |
| Rare | Low Risk | Low Risk | Medium Risk |
| Possible | Low Risk | Medium Risk | High Risk |
| Likely | Low Risk | Medium Risk | High Risk |

To identify a risk as low, medium or high, use the above matrix of likelihood and consequence. As an example: A hazard with rare likelihood but major consequence will be assigned a medium risk. Events that may cause sickness would be assigned a major consequence, for example bacterial contamination of a dam or rainwater tank, or an algal bloom in a dam.

**Likelihood** can be assessed as

Rare: the hazard may only occur in exceptional circumstances, for example every 2 to 5 years

Possible: the hazard might occur or should occur at some time, for example 2 to 4 times per year

Likely: the hazard will probably occur in most circumstances, for example every month

**Consequence** can be assessed as

Minor: causing a minor impact on a small number of people, some manageable operation disruption, or some increase in operating costs, for example consequences which can be managed by normal operations

Moderate: causing a minor impact on more people, significant modification to normal operations but manageable, operation costs increased, or increased monitoring, for example consequences that may involve additional time and expense to manage

Major: causing a major impact for any number of people, system significantly compromised, operation abnormal if operating at all, high level of monitoring required. Any consequence involving consumers falling ill should be considered major

###### APPENDIX C Possible water supply system inspections

A range of inspections may need to be conducted on various aspects of the water supply system. Possible inspections include:

Water source–– rainwater

* Check upstream for contamination (monthly or after heavy rains)
* Check the fenced livestock area (monthly)
* Check well head is secure and free from water (monthly or after heavy rains)
* Check maintenance and operation of pump (annually)

Tank

* Check inlet and outlet screens (3 monthly)
* Check access covers (3 monthly)
* Clear strainer for debris (3 monthly and after heavy rains)
* Check presence of mosquito larvae in tank water (3 monthly)
* Check structural condition (annually)
* Check sludge level and internal cleanliness (every 2 years or as required)
* Check roof condition and ensure no overhanging trees (3 monthly)

Treatment & distribution system

* Check plumbing/piping is fully operational and well-maintained (annually)
* Check treatment system is operating as per manufacturers advice
* Replace filters (as per manufacturer’s advice or earlier if a decrease in water flow is noticed)
* Test chlorine level is at or above 0.5 mg/L (regularly as per Private Water Supply Guidelines)
* Check UV light is operating (daily)
* Check UV light is visually free from scum (as per manufacturer’s advice)
* Replace UV light source (as per manufacturer’s advice)
* Other treatment (as per manufacturer’s advice)

###### APPENDIX D Record sheets

### Water supply system inspection and maintenance record (planned and reactive)

| **Date** | **What was inspected** | **Notes** | **Actions to be taken** | **Person Responsible** |
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Make a record every time the water is tested, detailing what was tested, when, results and actions.

### Water testing results

| **Date** | **Where test was taken from** | **Type of test taken** | **Test Result** | **Any action taken** | **Person Responsible** |
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### Purchased water

| **Date** | **Name and details of Water Carter** | **Volume of water purchased** |
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### Chlorination records

| **Date** | **Volume of water treated (litres)** | **Amount of chlorine added** | **Free chlorine test result (mg/L)** | **Person responsible** |
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mg/L = milligrams per litre, this is the same as ppm (parts per million)

### Incident records

| **Date** | **Incident** | **Notes and corrective actions** | **Person Responsible** |
| --- | --- | --- | --- |
|  | e.g. Dirty water noticed coming from tap | e.g. Heavy rains after dry spell washed dirt into rainwater tank and resuspended sludge as tank level was low. Potential for bacterial contamination. Tank has not been cleaned recently. Advised customer to boil water before use and supplied bottled water to rooms. Booked tank cleaner and water carter to refill tank. Checked roof and gutters. Checked first flush diverter. |  |
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