

# Infrastructure self-audit checklist

## Critical Spares

- **Do you have any duty/standby paired equipment, and if so, do both pieces of equipment work? Do auto change-overs work appropriately?**

Regularly test your equipment so you know it will operate as designed, when needed. If you have a local isolator switch (power supply) this could be as simple as switching off the power to the duty pump while it is running, and ensuring that the standby pump starts and supply is maintained. If you do not have local isolator switch, use a licenced electrician or suitably experienced engineer to assist in the testing and help resolve any issues.

- **Have you checked or serviced your equipment within the last 12 months? Is it due for a service prior to the busy season?**

Assets and equipment have a funny habit of failing right when you need them most. If your equipment has not been tested in the last 12 months, ensure that all assets are in an operable and serviceable state, especially before any peak demand period.

- **Do you have basic spare parts for minor equipment servicing (e.g. seal kits, grease, oil, drive belts, air-filters, etc.)?**

Your Operators will be a valuable source of information on what general items are needed when emergency corrective maintenance is required. Use their experience to build a list of parts that may be required for those emergencies and arm your support staff with the tools and equipment to reduce the down-time if something does fail at the worst possible time.

- **Do you have a critical spares list from your O&M manual?**

Suppliers will generally have a reasonably well-developed list of critical spares, but if not your Operators will be the next best source of information.

- **If so, are all those listed spare parts available?**

This is particularly important for “special” items likely to have long lead times when ordered. If you know you have duty (only) pump that presents a single point of failure for your system then holding a spare on the shelf may be the best way to cover the risk of this pump failing (and suppliers telling you they cannot get a replacement to you for 8-10 weeks!) You may want to consider having a dedicated online standby pump, but the cost of this upgrade may be too high in the short term, and a “cold” standby pump may only result in a short downtime (e.g. changed within 1 hour). This may be more acceptable for the immediate future.

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- Sampling, Testing & Monitoring
- Planning & Development Support
- Environmental Assessment & Analysis
- Start-Up & Commissioning
- Design Solutions

#### Operator Training

- Qualifications, Courses and Workshops for:*
- Treatment Plant Operators
  - Environmental Officers, Engineers & Scientists
  - Network Operators

#### Operations & Maintenance

- Turn key Plant Operations
- Plant Operate & Maintain
- Repairs, Optimisation & Refits
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## Health Compliance



**Are you a registered Water Service Provider (WSP) and if so, do you have a current and fit-for-purpose public health risk assessment and Drinking Water Quality Management Plan (DWQMP)?**

This document is critical to demonstrating to a public health regulatory body that you can understand and manage the public health risks in relation to your business and have adequate provisions in place to appropriately manage them.



**If you are not a WSP, do you understand your general obligations under the Water Supply (Safety and Reliability) Act?**

Most likely you are responsible for a regular water quality test for *E.coli* (an enteric pathogen) in your water supply. Understand your businesses obligations and appropriately plan for them especially in relation to any peak demand period.



**Do you have a response plan or work procedures in place for a potential public health-based incident?**

If an incident occurs, not having a plan not only exposes you to risk; it may demonstrate to regulators that you are not serious about protecting public health and safety, which can lead to a more serious response.

A typical response plan for a public health related water quality incident or detection could include, but might not be limited to:

- Appropriate measures for validating the detection. For instance, ruling out issues such as obvious laboratory errors e.g. a pH value that does not make practical sense.
- Follow up validation testing if this is appropriate.
- Corrective actions for the water distribution network such network flushing, network “super-chlorination”, etc.
- Back up plans for incidents where the risk may still be apparent e.g. have a properly considered and internally approved customer/guest incident notification process ready to go and for the worst case scenario, have a properly considered and internally approved “Boil Water” notice or “Do Not Drink” notice ready to deploy.

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## Risk Exposure



### Have you identified and documented the risks that matter to your business?

These could include, but might not be limited to:

- General business risks such as ability to trade or grow/expand your business.
- General operational risks such as availability and access to suppliers, materials, service providers, etc. e.g. will you be able to access greater volumes of treatment chemicals when you need them?
- Specific operational risks such as impact to water and sewerage services in extreme weather events or other abnormal operational environments (Operator needs to unexpectedly go on immediate compassionate leave).
- Public Health risks such as the risk of a major outbreak (e.g. gastro outbreak), customer complaints about aesthetic water quality (e.g. taste, odours, appearance), etc.
- Environmental risks such as the risk of tanks overflowing, uncontrolled releases of treated effluent.
- Any other risks with the ability to interfere with your ability to supply water and sewerage services to your customers and guests.

sewerage services to your customers. Some examples:

- Possible single points of failure, e.g. a duty only pump in the key location in the sewerage network. If this pump fails it could take out an entire block of guest houses. (The treatment/control of the risk may be as complex as designing and installing a dedicated standby pump that comes on automatically if the duty pump fails, or as simple as keeping a “cold stand-by” pump on the shelf that can be changed over in a couple of hours.)
- A highly complex piece of equipment or asset that requires specialist support that could be in high demand, e.g. this could be your control system that only one or two specialist sub-contractors know how it works. Have contingencies in place should these resources not be available to immediately respond to your crisis.
- A key service that you cannot afford to have delayed. This could be chemical suppliers and the lag time in ordering a higher quantity of chemical supply or a contractor that carts sludge or provides some other niche service. Make sure these suppliers are ready to respond to increased activity or more frequent service during the busy season.
- Natural events like flood or bushfire.



### Do you use your risk assessment, equipment, asset service history and other operational documents to understand your “weak points”?

These will be the risks that have the highest chance of preventing you from providing uninterrupted, quality water and



### Do you use your risk assessment to develop a sound and sensible maintenance plan for your assets?

Plan to upgrade, replace or repair your assets based on the relative risk to your business so you can prioritise.

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# Infrastructure self-audit checklist

## Water Supply

### Do you monitor water consumption?

Doing so can help you save money and identify issues in your supply network. Consider implementing regular monitoring of network flows and pressures, storage levels, and any other locations that will help track water consumption (including water treatment plant production).

### Does your water supply distribution network have branches that have not been used for some weeks?

Pipework branches and network zones that have been stagnant should be flushed to allow any biological growth (biogrowth) to be completely flushed and replaced with properly chlorinated water prior to bringing back online.

### Are your assets able to provide uninterrupted supply?

Maintaining critical assets like distribution pumps is necessary for continuous uninterrupted supply, but the instrumentation that controls these pumps is just as critical and can fail at the most inopportune times. Consider performing some "critical function" testing of key equipment, for instance switching off power to a duty pump and seeing that the standby pump automatically starts, or lifting a level sensor (if a float type) to see that it stops/starts a pump at high level. Always keep safety front of mind. If it can't be done safely then have a licenced plumber or electrician (depending on the test) carry these tests out on your behalf

and provide you with a report that details what is working and what needs work.

### If you have a water treatment plant or rechlorination systems, refreshing chemical stocks is critical to ensuring good quality water and possible health risks.

Sodium hypochlorite will degrade to water and salt with drastically reduced disinfection properties. Chlorate is also a by-product of this degradation so rather than just topping up the same day tank, make a point of emptying the old residual chemical prior to the busy season, give the day tank a good clean (as appropriate and safely), and provide fresh chemical to your water treatment plant or disinfection system.

### Do you have seasonal water quality issues that will be more challenging for your WTP Operators e.g. high turbidity in the raw water?

Prepare you and your operators for more challenging raw water quality conditions that may apply to the busy season. Review previous operational history (e.g. last season's raw water quality and chemical dose rates) and update your procedures and work instructions accordingly. Have contingency plans in place if historical experience highlights any risk (e.g. tanker potable water supply in if the raw water quality becomes too challenging and the WTPs "safe operating envelope" is breached).

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## Sewerage

- **Are some of your network pumping stations showing signs of wear or failure, guide rails showing signs of significant corrosion, or other potential issues?**

Consider lifting and checking pumps prior to the busy season! If the pumps cannot be rapidly and safely removed in controlled conditions, then consider and plan for how this could be done in more difficult conditions under time pressures (e.g. design back-up solutions or specialist contractors if necessary).

- **Do you know if there are any leaks in your sewer mains?**

Check your pumping stations for excess flow from areas that shouldn't have any. You can also check your flowmeters and see if they match with pump run times. Any discrepancies should be investigated and addressed if this is impacting the ability to provide sewerage services and a safe customer experience.

- **Are all the major pieces of equipment at your STP functioning properly?**

This includes pumps, blowers, mixers and the automatic control systems e.g. level, pressure and flow transmitters and water quality instruments. Make plans to have a regular inspection by licenced professional trades-people or process/mechanical engineers, so you can identify assets and equipment that are at most risk of failure and plan to replace these, or keep critical spares as most appropriate.

- **Do you have the appropriate Operations & Maintenance Manual?**

Does the plant operate according to this description? If not, does the manual need updating to match changes in the process, or do process upgrades or retrofits need to be conducted to improve plant operation?

- **Does your plant require ramping-up or artificial feeding prior to the busy season?**

An experienced process engineer will be needed to help you determine this but there *are* things you can do to assist them calculate the amount of food required to get your plant ready for the higher loads of a busy season. Gather any data you have on daily flows to the STP and if possible, the population figures to match these periods e.g. daily flow to STP 20 m<sup>3</sup> with resort population of 100 people. If you have raw water quality data for the STP then gather this and include this with your request to S&B to provide you with a feeding program to get your sewage treatment “bugs” up to peak physical condition and match-fit ahead of the busy season.

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## Environmental Compliance

### Is your Environmental Authority current, valid with the right business name listed?

Your EA or environmental “licence” is a critical document and not one for the bottom drawer. Should an environmental incident occur it will look bad for your business if it is not an up-to-date document that your business is clearly referring to and adhering to.

### Are you and your Operators/Maintainers aware of all the reporting requirements of the EA?

Keeping water and sewerage assets operational and available day in day out can be challenging in itself. Ensuring your Operators have clear and accessible EA information is a great way of ensuring the environmental obligations do not get missed. This can be as simple as keeping a laminated A4 Plant Information Sheet in a convenient and accessible location that clearly outlines sampling frequency and quality obligations (water, land, air, etc.).

### Are you compliant with requirements of your EA?

This includes disposal area requirements and effluent discharge requirements listed, such as final effluent (treated wastewater) BOD, TSS, TN, TP and/or free chlorine. You may also be obliged to show records of regular and accurate instrument calibration so having good management systems that ensure this will save potential issues if there is an incident onsite.

### Is the start of the busy period likely to result in a disruption that might threaten compliance?

For instance, does your STP have a “winter feeding program” that will need to transition to a regular operational program, or does your STP need to be

“fed” or “built-up” prior to the busy season to handle the higher loads the plant will experience?

### Are all your disposal systems functioning correctly?

Is there evidence of issues or damage to the disposal areas or infrastructure (e.g. ponding or plant damage, ruptured pipework, leaks, etc.)? Is there routine sampling required that needs to be conducted? An audit of the disposal areas should ideally be conducted when irrigation/disposal is taking place or has just recently finished, but ensure that this is conducted safely, i.e. do not expose you or your staff to unnecessary risks, but do look for evidence of:

- Ponding of irrigated effluent;
- Exposed, kinked or damaged dripper or irrigation spray lines;
- Excessive erosion or evidence of previous erosion; or
- Evidence of possible environmental issues e.g. excessive algae in stormwater retention ponds or downstream environmental receptors (creeks and streams).

### Have you reviewed your internal reporting requirements and are these adequate for reporting purposes?

Maintaining good records is not just critical to reporting to regulators annually, but also allows you to track and identify issues that are likely to become “an emergency” if not planned for. While you have the time make a point of reviewing your previous annual returns and look for feedback on what could be done better. Update your daily operational log sheets and other key internal reporting mechanisms to make future annual returns more comprehensive but easier to complete.