

Water Audit

Why do a water audit?

Are you worried about how much water we are all using? Would you like to inspire your students to use water wisely? And save some money for your school?

Then a water audit will help you achieve these goals. This guide has been developed to help you step through the process of a water audit. It is designed to be done in bite-sized pieces so that it is achievable in any timeframe. It will lead you through an analysis of the electricity bills and the walk-through audit and help you develop action plans to implement in your school.

Before you start the audit process introduce students to the concept of water, the water cycle, reticulated water, water providers, catchments, stormwater and wise use of resources.



Establishing base-line data

Find the water meter

The water meter is usually located near the main entrance of the school. If your school is on tank water then should work out a way to measure the water in each tank. Some tanks have floats to show water level.

Identify the information shown on the meter.

Learn about the units that your water meter measures and teach the students how to extract the information they need from the meter.

Read water meter before and after school for at least a week

This information will help you work out if there are any leaks in the system. If your school is using water overnight and there are no night-users then you can reasonably assume that there must be a leak. This will need to be fixed by your local water supplier.

Calculate water use for each day and over the weekend

This calculation is made by simply reading the meter and subtracting the previous reading. If you have determined that there are no leaks then it is easier to calculate this amount for each day (rather than each day/night).



Graph results

Graphing the results will help you see any patterns and is also a good maths activity. There are many ways of presenting this information so that the students can see it easily.

Analyse results

As the results are graphed there may be some clear patterns emerging. For example, water use may be higher on Wednesdays or weekends.

Investigate anomalies

Students will be able to offer reasons (or predictions) about any patterns in the results. For example, Wednesdays may be sport days.

Get water bills for last 12 months

Gather some base-line data in order to calculate the current water use in the school.

Most bills are either quarterly or half yearly. If it is difficult to get the bills it is possible to gather the same information from the school's accounts. However, you will need at least one bill to calculate the cost of the water per unit (usually kilolitres).

The bills will tell you how much water the school used in the last quarter (water usage) and the cost of that water. It will also tell you the sewerage charge and the amount of water used in the previous bill and the same period last year. All this information can be helpful in determining the amount and rate of water usage in the school.

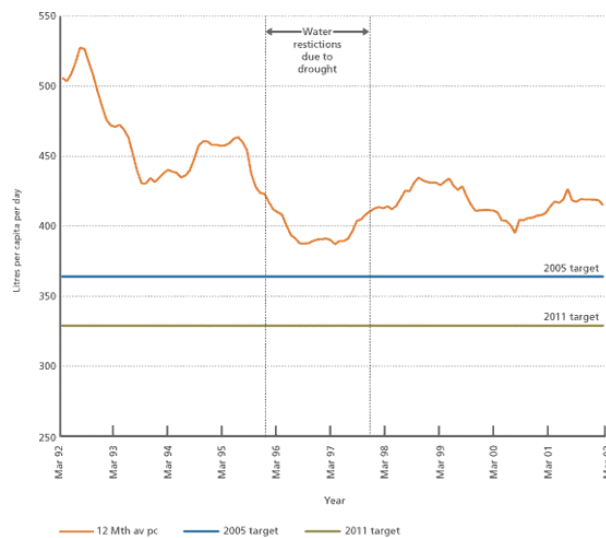


Calculate water usage over twelve month period

Only use the water usage amounts (not sewerage use – it is a set amount and doesn't vary). If you don't have the bills but have a report showing the cost of the water you can still work out the amount of water used, by dividing it by the cost per kilolitre.

Graph water use against billing periods

Create a bar graph to show water use on the vertical axis and time on the horizontal axis. This will enable you to add to it as more information becomes available.



Investigate any patterns

These patterns may be harder to identify (and explain) since they may be a while ago, but high uses of water may be due to hot weather, a new gardening project, a leak, running toilets etc. The water audit will help explain these patterns. Note down any after-school users

Calculate water use per student

Simply divide the amount of water used in each billing period by the number of enrolled students. Keep this information and use it to compare water use over the years (when school enrolments may vary).



Walk through audit

Approval

Obtain permission from the Principal for a walk-through audit. It involves students being out of class and entering different spaces to do measurements. If necessary get parental permission for the audit.

Safety issues

Discuss safety and appropriate behaviour with the students. Remind them to report any dangerous objects to the teacher or supervisor. Consider doing a risk assessment for the audit procedure.

Divide class into 5 or 6 groups

Allocate groups to areas (eg boys toilets, girls toilets, canteen, staff room, outside, classrooms and bubblers). Follow the steps and record the measurements on the work sheets provided.



Appoint a spokesperson from each group to report back

Ask the students to report back their results. Collate all the information onto one summary page.

Identify any obvious problems eg dripping taps, running cisterns.

This is when the bigger more obvious problems are identified.

Developing solutions

Develop a plan to fix these problems

These problems often require the services of a plumber or you may need to contact your water provider.

The water audit will raise awareness of water and encourage students to think of ways to reduce water use and waste.

List all ideas from students and then prioritise

Students will generate many ideas about ways to save water. List all the ideas. Some ideas will be long term and others short term. Some ideas may not be practical and others will be easy.



Prepare an action plan

Take some of the ideas and turn them into a list of things to do (include short term and long term ideas). Create a time line for these actions and give tasks to specific people. Start with actions that will be easy and then build up to the bigger, more difficult, actions.

Develop strategies to implement action plans

Some actions will be easy and obvious but others may be more difficult but still worthwhile. Some may require a budget that will need funds to be found. This may mean that you will need to have a fund-raising activity or apply for a grant.

Some actions will require outside help, perhaps a working bee or some involvement from parents. You can often get help from community members or government agencies. You may need to liaise with other groups within the school – the SRC or P+F. Perhaps you need an education campaign that will need some imaginative strategy. Involve all school groups in your action plans eg all stages, staff, school assistants, general assistants, canteen staff etc.



Have the plan endorsed by the Principal and the School Environment Committee

Include the Principal or School Executive to make sure that they fit into the whole school plan. The School Executive will have some more ideas or will be in a position to allocate funds to the strategies. It is important that the School Executive is aware of the plans and agrees with the basic principles. The SEC may have other environmental plans that could work in with your ideas eg planting a garden to slow stormwater.

Put action plans into the School Environment Action Plan

Your school will probably have a School Environmental Management Plan (DET Environmental Education Policy 2000). The water audit information will feed into the Plan and become part of the outcomes for the plan.

Implement the action plan

Work through your action plan. You will discover as you do this that issues arise which you had not anticipated. Use this new information to modify the plan. Keep implementing the plan even if it takes a long time.

Link up with key dates

As you implement your action plan link in with some key dates eg National Water Week in October, World Wetlands Day in February, and National Tree day in July. It may be useful to issue a press release for an activity and get some recognition for your school or sponsors.

Report results back to SEC

As you work through your action plan, keep the SEC and School Executive involved in your progress.

Check the next bill and/or water meter

As you implement water saving actions check the water meter and/or bills to see if your actions are making a difference. Consider keeping a graph of daily/weekly water use to keep track of water savings.

Celebrate any achievements

Acknowledge and rejoice in any water savings. Every drop counts and the world is a better place due to your hard work and commitment. Publish savings in the school newsletter or at assemblies. Give prizes/awards to classes/students who 'do the right thing'.

Consider doing a water audit every year to build it into the curriculum and raise awareness.



Work sheet – Boys' toilets

Toilets

Number of toilets _____

Type of toilet single flush ☐ dual flush ☐

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Urinals

Number of urinals _____

Type of urinal ☐ pull chain
☐ motion sensor
☐ continuous flush and fill

Estimated volume of urinal cistern _____

Number of leaking/running urinals _____

Handbasins

Number of taps _____

What is the average tap flowrate* _____

Number of leaking/dripping taps _____

**Measuring flow rates*

It is worth measuring flow rates to show that some taps use more water than others but it is not necessary to measure every tap. One tap in each area is usually sufficient.

Use a measuring cylinder or jug and a stop watch or watch with a second hand. Turn the tap on fully and put the jug under the tap for 5 seconds. Turn the tap off.

Measure the volume (in millilitres) and multiply by 12 to give millilitres per minute.

Generally external taps have a much higher flow rate than internal taps so it is more important that these are managed wisely.

Work sheet – girls' toilets

Toilets

Number of toilets _____

Type of toilet ☐ single flush ☐ dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Handbasins

Number of taps _____

What is the average tap flowrate* _____

Number of leaking/dripping taps _____

**Measuring flow rates*

It is worth measuring flow rates to show that some taps use more water than others but it is not necessary to measure every tap. One tap in each area is usually sufficient.

Use a measuring cylinder or jug and a stop watch or watch with a second hand. Turn the tap on fully and put the jug under the tap for 5 seconds. Turn the tap off.

Measure the volume (in millilitres) and multiply by 12 to give millilitres per minute.

Generally external taps have a much higher flow rate than internal taps so it is more important that these are managed wisely.

Work sheet - Staff Amenities

Toilets

Number of toilets _____

Type of toilet ☐ single flush ☐ dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Urinals

Number of urinals _____

Type of urinal ☐ pull chain

☐ motion sensor

☐ continuous flush and fill

Estimated volume of urinal cistern _____

Number of leaking/running urinals _____

Handbasins (including staffroom)

Number of taps _____

What is the average tap flowrate* _____

Number of leaking/dripping taps _____

Showers

Number of showers _____

What is the average flowrate* _____

Number of leaks _____

**Measuring flow rates*

It is worth measuring flow rates to show that some taps use more water than others but it is not necessary to measure every tap. One tap in each area is usually sufficient.

Use a measuring cylinder or jug and a stop watch or watch with a second hand. Turn the tap on fully and put the jug under the tap for 5 seconds. Turn the tap off.

Measure the volume (in millilitres) and multiply by 12 to give millilitres per minute.

Generally external taps have a much higher flow rate than internal taps so it is more important that these are managed wisely.

Work sheet – Classrooms/Hallways and other inside areas

Toilets

Number of toilets _____

Type of toilet ☐ single flush ☐ dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Urinals

Number of urinals _____

Type of urinal ☐ pull chain
☐ motion sensor
☐ continuous flush and fill

Estimated volume of urinal cistern _____

Number of leaking/running urinals _____

Handbasins/taps

Number of taps _____

What is the average tap flowrate* _____

Number of leaking/dripping taps _____

Showers

Number of showers _____

What is the average flowrate* _____

Number of leaks _____

**Measuring flow rates*

It is worth measuring flow rates to show that some taps use more water than others but it is not necessary to measure every tap. One tap in each area is usually sufficient.

Use a measuring cylinder or jug and a stop watch or watch with a second hand. Turn the tap on fully and put the jug under the tap for 5 seconds. Turn the tap off.

Measure the volume (in millilitres) and multiply by 12 to give millilitres per minute.

Generally external taps have a much higher flow rate than internal taps so it is more important that these are managed wisely.

Work sheet – Outside taps

Taps

Number of taps _____

What is the average tap flowrate* _____

Number of leaking/dripping taps _____

**Measuring flow rates*

It is worth measuring flow rates to show that some taps use more water than others but it is not necessary to measure every tap. One tap in each area is usually sufficient.

Use a measuring cylinder or jug and a stop watch or watch with a second hand. Turn the tap on fully and put the jug under the tap for 5 seconds. Turn the tap off.

Measure the volume (in millilitres) and multiply by 12 to give millilitres per minute.

Generally external taps have a much higher flow rate than internal taps so it is more important that these are managed wisely.