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SOP: Measuring, Monitoring and Managing Water Use in Hotels with Meters and Sub-Meters

Monitoring is the first step toward reducing water use in your hotel. It helps you see which parts of your operations use the most water and where savings might be easiest to achieve. It also gives you a clear view of whether your water-saving initiatives are making a difference and to what extent. Importantly, regular monitoring can quickly highlight unexpected leaks, which are often responsible for significant water loss..



Purpose: To establish a systematic approach for tracking water consumption across all hotel operations, identifying high-consumption areas, promptly detecting leaks, and reducing unnecessary water consumption and related costs.

Good to Know:

A standard cold water meter will cost between 20–100 €, depending on the size, while hot water meters are slightly more expensive. A manual metering system for an entire hotel, covering the most important areas, costs around 1,000 €, while the automatic wireless alternative is likely to be more costly at 6,000 €.

Step 1: Install Water Meters for All Water Sources



1.1 identify all water sources entering the property:

- Start by mapping out every source of water used on the property. This may include:
 - Municipal mains supply
 - Boreholes or wells
 - Rainwater harvesting systems
 - Greywater reuse
 - Tanker-delivered water (if applicable)



1.2 Install individual meters for each source:

To get a full picture of total water input and monitor each source individually, install a separate meter on each supply line **as close as possible to the point where water enters the system**. This is essential for understanding how much you're using from each source and for spotting any discrepancies. Consider if two meters – one for hot and one for cold water would be appropriate to allow for more detailed measuring.

1.3 Select appropriate meters:

- Select **mechanical or digital volumetric water meters** that:
 - Are suitable for the flow rate and pipe size
 - Provide readings in cubic metres or litres (to match billing or other monitoring tools)
 - Are durable and corrosion-resistant, especially for borehole or rainwater systems
 - Ideally have the option to connect to a data logger or remote monitoring system (for future upgrades)

1.4 Plan for easy access and protection:

- Install meters in a location where they can be safely and easily read – avoid cramped or flood-prone spaces.
- Protect meters from direct sun, rain, tampering, or accidental damage (e.g. using meter boxes or covers).
- Label each meter clearly with its water source and location to avoid confusion during readings or inspections.

1.5 Document the set-up:

- Keep a simple water meter map or chart showing the location and purpose of each meter. This helps with staff training and simplifies ongoing monitoring.

Step 2: Install Sub-Meters in Key Consumption Areas

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2.1 Use plumbing diagrams to determine ideal meter locations:

- Consult your pipework drawings to identify logical breakpoints where water consumption can be tracked by area or function. Prioritise areas with high or variable use.

Target the following areas:

- Guest room blocks (combined or by floor/wing) Consider the possibility of individual meters for each guest room, particularly if planning a refurbishment. This may already be the case in apartment complexes or complexes that were originally designed as residential housing and have subsequently transitioned into tourism accommodation.
- Kitchens
- Laundry
- Swimming pools
- Pool showers
- Garden irrigation
- Spas (if applicable)
- Staff showers, toilets, and sinks

2.2 Determine hot and cold separation needs:

- In some areas, such as kitchens or showers, installing separate meters for hot and cold water will provide a more accurate picture of use.

2.3 Install and label meters clearly:

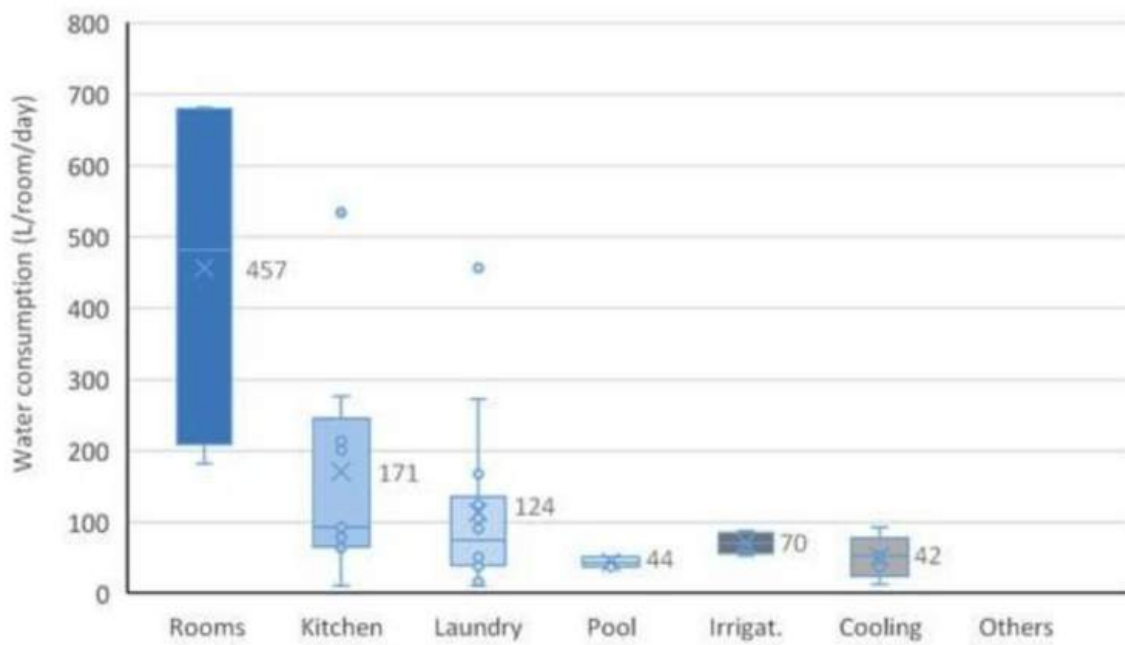
- Ensure meters are:
 - Installed by a qualified technician
 - Positioned for easy access and safe reading
 - Clearly labelled with the zone name and unique meter ID

- **Maintain a sub-meter location record:**

Document all meter locations and associated zones. Keep this record alongside your main water source map

Figure 1 provides a great visual representation of how easy it is to identify the most water thirsty areas of an operation when sub-metering is carried out.

Figure 1



https://www.mdpi.com/water/water-14-03828/article_deploy/html/images/water-14-03828-g002-550.jpg

Step 3: Establish a Monitoring System and Data Collection System

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3.1 Choose your monitoring method:

- Manual: Staff take and log readings at defined intervals (daily or weekly). Use a consistent recording format.
- Automated: If using digital meters, readings can be collected via data loggers or remote monitoring systems. Ensure data is backed up and reviewed.

3.2 Choose or create a tracking tool:

Use the [Hotel Water Measurement Initiative spreadsheet](#) which includes:

- A blank log
- Instructions for use
- Example data for reference

3.3 Train staff on logging procedures:

- Designate specific team members (e.g. maintenance, sustainability officer) to be responsible for taking readings. Provide training and update them when systems or SOPs change.

3.4 Define a logging routine:

- Daily: Recommended for main supply meters and high-variability areas
- Weekly or bi-weekly: Suitable for sub-meters in lower-use areas

3.5 Store and analyse data securely:

- Keep logs in both digital and physical formats (if needed), and review data at least monthly to detect trends or anomalies..

Step 4: Take Flow Rate Measurements in Guest Rooms & Public Bathroom Facilities

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4.1 Measure key fixtures in a sample of rooms and spaces:

- Taps in handwashing basins and bidets (Ideal 5 litres or less per minute)
- Showers (Ideal 10 litres or less per minute)
- Toilet flushes (Ideal is no more than 6.5 per full flush)
- Urinals (Ideal is 2 litres per flush or less)

Note: Bath taps aren't usually worth measuring, as most guests who decide to take a bath will fill it regardless of the flow rate. That said, if the flow is especially slow, it might discourage some guests from running a bath at all.

4.2 If you do not have a flow-rate measurer, use a flow rate testing method instead:

- Use a container of known volume (e.g. 1-litre jug)
- Time how long it takes (in seconds) to fill the container from each water outlet
- Convert the results to litres per minute (litres/min) (*e.g. if the 1-litre jug fills in 10 seconds, then the flow rate would be 6 litres per minute.*)

4.3 Document flow rates by room type or zone:

- Compare across different rooms and fixture types to spot unusually high rates or inconsistencies. Sometimes due to pressure, the flow rate can be higher from outlets that are situated close to water tanks as the water has less distance to travel. Depending on where water tanks are situated, gravity may also impact the flows as will the location of supporting water pumps.
- Document flows regularly, at least annually as some aerators and flow restrictors become less efficient over time and need removal for cleaning or replacement.

4.4 Take corrective action:

- Adjust flows by opening or closing the water shut-off valves located underneath the sink
- Install aerators or flow restrictors
- Replace or repair high-flow fixtures
- Monitor for improvements after the intervention

Step 5: Analyse and Interpret Water Use Data

Collecting data is only valuable if it's used to guide decision-making. Whether you're using a basic manual system or an advanced digital platform that provides usage data down to the hour, the goal should be the same: to understand trends, identify anomalies, and inform actions.

If you're entering readings manually, try to avoid standalone monthly spreadsheets with no connection between them. At a minimum, use one central document with separate tabs or visual tools like graphs to help spot spikes and patterns. This makes it easier to track progress over time and communicate findings with others.

Wherever possible, aim to express consumption in litres per guest night. This provides the most accurate and comparable insight into how efficiently water is being used, especially when occupancy levels vary.

5.1 Review logged data at least monthly:

- Look for usage spikes, seasonal patterns, or unusually high readings
- Cross-reference with occupancy rates and activity logs (e.g. events, peak laundry days)

Figures 1 to 3 show examples of water consumption analyses using sub-meters across 10 4 star and 5 star hotels in Greece

Which operational areas use the most water always depends on the respective hotel facilities. While in Figure 1 it becomes visible that gardens, pools, and guest rooms are the largest usage factors, Figure 2 shows a hotel with a comparably smaller garden in need of irrigation.

Figure 2: Water use by sub-sector, 5 star hotel, Greece

I like this because it clearly shows where to try to focus the priorities.

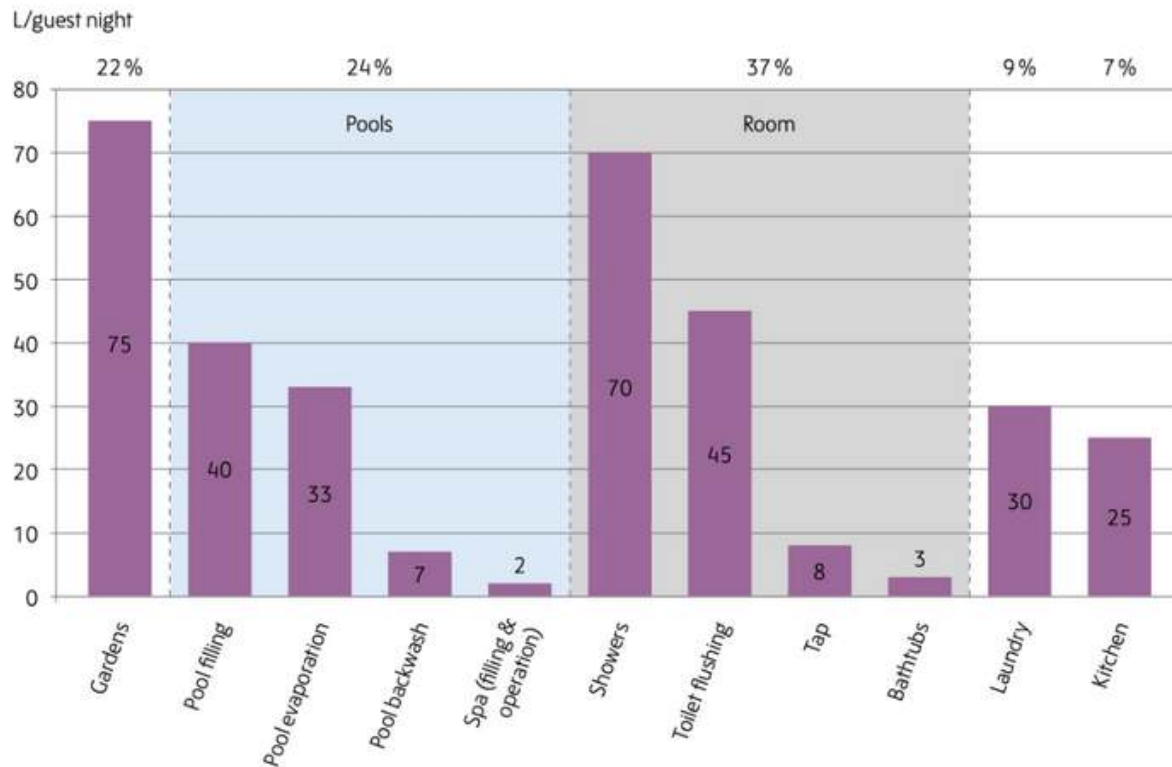


Figure 3: Water use by sub-sector, 4 star hotel, Greece

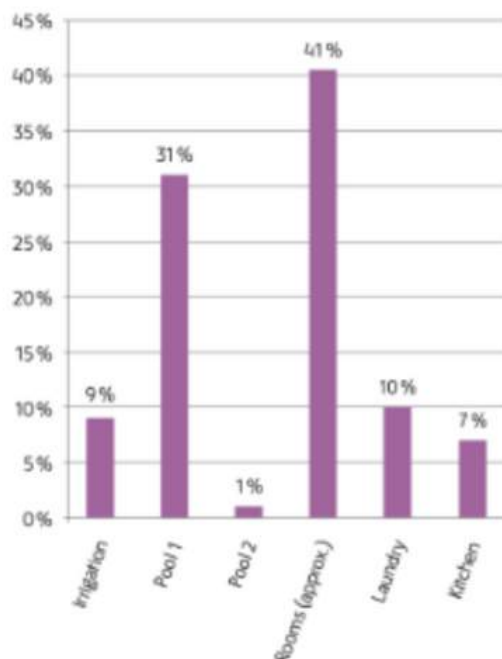
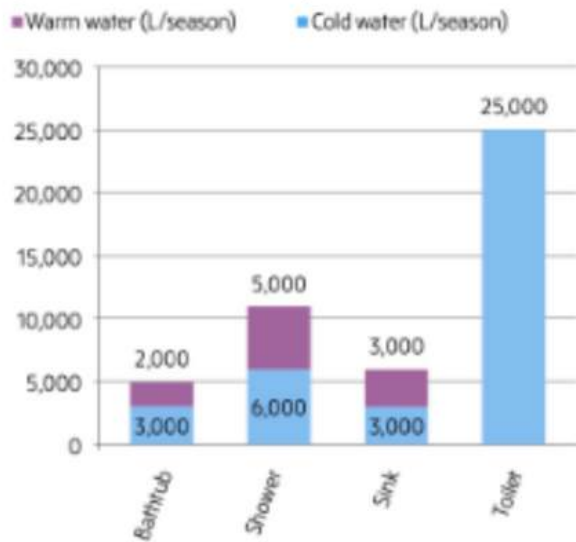


Figure 4 gives more detailed insight into the breakdown of guest room water use. Toilet flushing here was the most important factor in in-room water use (53%), followed by showers (23%) and sinks/bathtubs.

Figure 4: Water use in rooms, 5 star hotel, Greece
(no dual-flush toilets installed)



The high usage volumes of the toilet were mainly due to the fact that no dual-flush system had been installed. An important insight was also that half of the faucet water consumption was hot water, probably as a result of the default mix in the faucet.

GOOD TO KNOW:



New mixer taps, like these from Grohe, are designed to reduce unnecessary energy use from water heating. While guests often open the tap in the middle out of habit, these models are set to default to cold water in that position, helping to avoid drawing hot water unless it's really needed.



Step 6: Leak Detection and Prevention



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6.1 Use long-term data to establish baselines:

- Calculate average use per department or zone if meters have been fitted to allow such insight
- Flag increases that are not tied to known events or occupancy changes

6.2 Run night-time leak checks:

- Take meter readings after operational shutdown and before morning startup
- If significant usage is detected, investigate possible leaks

6.3 Train staff to spot and report leaks:

- Instruct all departments to be alert for dripping taps, running toilets, pooled water, or damp areas. Sometimes water is heard before it is seen
- Make leak reporting easy (e.g. digital reporting systems, WhatsApp groups (take care with WhatsApp groups - messages can easily be missed and employees should not receive work-related messages to their personal mobile telephones))

6.4 Schedule regular maintenance walk-throughs:

- Check back-of-house areas at least weekly, but daily if possible
- Focus on plumbing in older sections of the building which is more likely to be problematic

6.5 Prioritise fixing leaking toilets:

- Toilets are often the largest source of hidden water loss. Equip staff and guests to report these issues urgently and ensure prompt repair. The Housekeeping Water Reduction Checklist is quick and easy to implement.
- Use dye tablets or food colouring in cisterns to check if water seeps into the bowl without flushing

Step 7: Review and Report



Monthly:

- Summarise key data from all meters, comparing current readings with previous weeks or months.
- Identify early warning signs of high use or irregularities.
- Update tracking spreadsheets or systems with new data.
- Share concise reports with department heads, highlighting any operational changes or successes.

Quarterly:

- Conduct a more detailed review of water usage trends.
- Evaluate the effectiveness of any water-saving measures implemented.
- Review staff engagement and compliance with monitoring routines.
- Adjust goals or standard operating procedures where needed, based on what's working (or not).
- Discuss findings in management meetings and explore budget allocations for improvements.

Annually:

- Review the full year's water usage data and compare it with previous years to assess progress.
- Recalculate water use per guest night or per operational department.
- Identify long-term patterns and risks (e.g. infrastructure issues, seasonal shortages).
- Set new water-saving targets and integrate them into the following year's sustainability or operations plans.
- Assess the condition and accuracy of existing meters; determine whether upgrades, servicing, or replacements are needed.
- Report results publicly or internally to show accountability and build momentum for continued improvements.

