Water Management Plan 2025/26

Executive Summary

This document reviews the current performance against the University target to reduce water consumption and sets out a plan for water management for the current and forth coming year. The format of the plan and level of detail covered has been updated to better align with the requirements of ISO 14001 section 6.2.

The University environmental target for water is to reduce Cranfield University Estate water consumption by 50% by the end of 2030 from a 2010 baseline by floor area.

A number of large steps have been made towards reducing consumption, such as improving our pipe work, resolving leaks, finding alternatives to tap water for irrigation, reducing flows in some urinals and encouraging behaviour change. Unfortunately, our ability to properly quantify our progress is currently hampered by constraints in metering and monitoring.

There are significant opportunities for improving water efficiency and reducing water consumption within the university estate even though the main campus continues to grow. To achieve our target, however, significant investment in the development and installation of a robust metering and monitoring system and water saving technologies is essential.

Recommendation to prioritise the following objectives:

1. Seek to improve metering, monitoring and analysis to track performance and inform targeted action.
2. Encourage better use of water through design and behaviour change.
3. Reduce water leakage.
4. Find alternatives to tap water where appropriate.

Water Planning

The University has an environmental target to reduce water consumption by 50% by the end of 2030 from a 2010 baseline by floor area. The target applies to the Cranfield campus and to COTEC. It does not include operations on the Shrivenham campus.

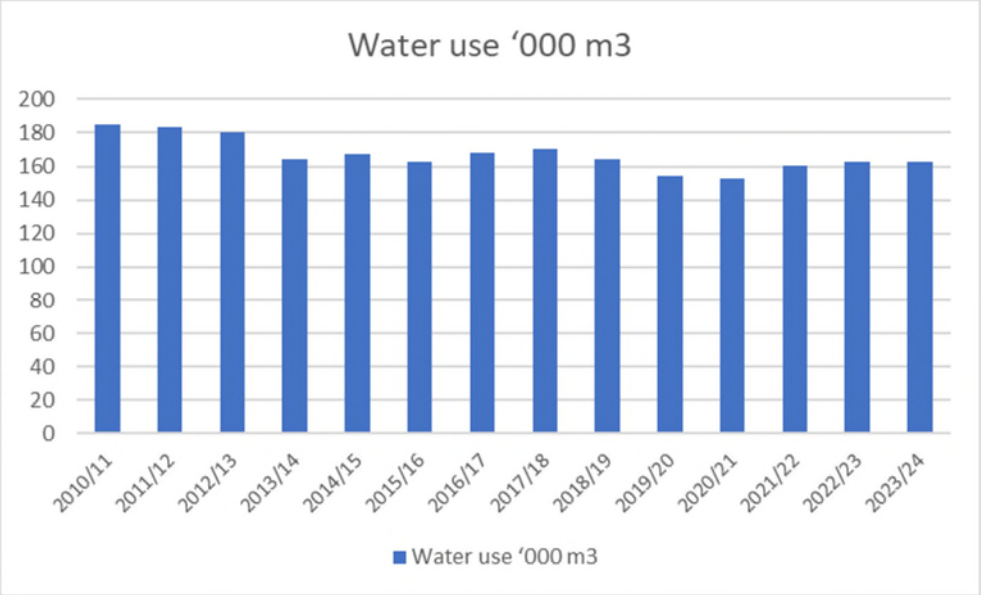
A detailed Water Management Review has been undertaken to highlight key issues which have an impact on water management across the university estate. It describes their associated risks and opportunities for the university, actions which can be taken and progress to date, and forms the basis for this Water Management Plan.

Previous versions of the university Water Management Plan were not fully aligned with the requirements of ISO 14001 Section 6.2. This version of the plan has been updated to give greater clarity.

Current progress towards the target

With the exception of some outlying buildings which have their own fiscal metered supply, the university has one main incoming supply to its Cranfield campus from which water is distributed, via its' own private network, to the technical buildings and residential properties. Repeated meter failures on this incoming supply over recent years and issues with metering across the site network have made it more challenging to determine site usage.

Whilst the general trend in consumption of mains water is down, there is an element of estimation in the most recent figures shown below, which could be as much as a 10% underestimate.



A large investment was made in the campus water pipe network in 2012/13. This reduced leaks and had a noticeable impact on campus mains water consumption. The increase in 2017 coincides with a very hot, dry summer. During this period, there was greater use of irrigation and the pond at Martell House was topped up with mains water on a regular basis.

There have been several consecutive hot summers where irrigation of trees has been necessary, including the relocated orchard and trees on the northern cycle path. Mains water was used on a regular basis for this, however, in summer 2022, enabling works were undertaken to facilitate the use of collected rainwater from B54 and treated water from the sewerage works. Use of such sources is to be prioritised over the use of mains water for irrigation going forwards, whilst complying with Government rules on abstraction.

Several large halls of residence (including a laundry), and new technical buildings have come on-line since the target was set. This will have had a knock-on impact on site demand for water.

Since 2022, there have been a number of substantial leaks / water losses across the main campus water network and from the District Heating network, which it supplies. The main causes of these losses have been:

- Degradation of buried pipes.
- Frost damage.
- Valve failures in cisterns.
- Excessively high flow in urinals (detected by sensors during a research trial).
- Seized fittings, and failure to report when disconnecting appliances.
- Unauthorised abstraction from campus fire hydrants.

All were dealt with promptly after being detected, however, they would have been detected much more swiftly if the university had an effective metering and monitoring system in place.

Buildings and Significant Water Use

Mains water is used across the university in a number of applications including:

- research facilities (rainfall simulators, wave tanks, cooling towers, RO and de-ionised water production, Hydrogen generation etc..)
- Manufacturing facilities (e.g. water cutting)
- toilets, showers and bathrooms,
- laundries,
- kitchens,
- drinking water fountains
- heating systems,
- grounds maintenance (ponds and irrigation),
- building maintenance (e.g.cleaning of windows, paving and solar panels, water system flushing),
- Bus washing,
- process cooling,

At the present time, metering and monitoring capability across the Cranfield campus is insufficient to quantify which are the most significant users, or to de-couple research use from normal building use. Going forward, both will be important in guiding efforts to meet the water reduction target, and to meet the needs of stakeholders.

Water Costs

Water costs increased in 2023/24 due to new supplies being added to the university account, actual meter readings being submitted (where the supplier had previously been estimating for billing), and due to a number of leaks in buildings and on the District Heating system. We have continued to experience leaks in 2024/25, and OFWAT have increased the price cap, so costs continue to increase. There is scope to change our water service provider and contract. Options are being explored, with access to support with water efficiency measures, and quality of customer service being key considerations.

Water Saving Opportunities

Toilets, showers and kitchens are the main users of water in the majority of university buildings, so ensuring that refurbishments and new developments include technologies which help save water in these areas (e.g. aeration taps and shower heads, presence detection sensors, dual flush capability on toilets, waterless or low flow urinals), will go a long way to reducing site consumption. Adding the capability to automatically monitor individual building use and set trigger limits, will further reduce wastage by rapidly aiding identification of leaks, which might otherwise go un-noticed for months. Where possible, choice of fittings should be standardised, and reliability, maintenance and replacement costs considered when setting specifications.

With new developments, there is greater scope to incorporate water capture, treatment and re-use technologies, and planting which has a reduced water requirement.

Whilst there are mechanisms for identifying that a leak exists on the District Heating network, such as pressure drops, noticeable water usage, and increase in pump energy usage and heat demand, finding the leaks underground can be extremely challenging and time consuming. Identifying a mechanism which can help locate the leaks quickly and effectively,

will allow affected sections to be isolated and repaired more promptly, reducing water loss, energy loss, and minimising impact on affected buildings.

Having access to technology which could be used to proactively check for and pin-point leaks on our main water distribution pipework, as part of a planned maintenance regime, would also reduce losses.

Trials of a device, principally designed for detecting leaks on water mains, is being tested for suitability on the district heating network. Initial results have been encouraging.

Behaviour change

The university has issued a Water Policy which has been cascaded to all staff and students.

Staff and students are given environmental awareness raising training, which includes water use. For students, this training takes the form of an induction presentation and a Canvas module. For staff, it is completed via the on-line training platform (CUTE).

In 2023, a “Water Champions Network” was formed on the Cranfield campus. Members help to detect leaks and identify opportunities for reducing wastage across the site. Several roadshow events were held in Induction week and Green week to recruit Water Champions, share water saving tips, raise awareness of how to identify leaks and how to report them. This has been repeated in 2024.

In Spring 2024, trials took place in some of the halls of residence to see if provision of washing up bowls could help reduce water use in this setting. Unfortunately, it was unsuccessful.

Water Campaign

Discussions have been held with Technical Managers, the Mechanical Engineering Team, cleaning management, Facilities Managers, the grounds contractor, academics, and sustainability colleagues from other universities, which have helped to identify opportunities to reduce mains water use without affecting operations.

Facilities and activities thought to be significant users of water have been identified, and these, along with key zone meters and building incomers, will be a priority for automatic metering and monitoring going forwards.

Work is underway to bring an old surface water tank, originally built as a firefighting reservoir for the RAF base, into service for grounds maintenance. Suitable locations for additional rainwater harvesting tanks are also being explored.

There has been an increase in the manual reading of the fiscal meters (when working), to gain a more accurate understanding of usage. This has proved useful in detecting leaks on some of the smaller supplies.

Overall progress towards the delivery of actions to aid in the reduction of mains water use has been hampered significantly by resource constraints.

Action Plan

Action	Resources required	Measure(s) of success	Who	By When
Improve water metering and monitoring capability across the Cranfield campus.	- Dedicated staff / consultant time to finalise and cost strategy, - Procurement support (tender process) - Funding for implementation and ongoing service contract / maintenance, - External service provider to install and maintain metering and monitoring system. - Staff time to review data, set targets and investigate anomalies (E&E team, Mechanical Engineering team, Maintenance team) - Water service provider support (re 3rd party connections and fiscal meters)	- Water use at site level, zone level, building level, research facility level and other Significant User level can be determined, as well as 3rd party usage. - Progress against the water reduction target can be more accurately measured. - Significant research facility use can be de-coupled from normal building use which will help meet stakeholder requirements and facilitate the ranking of building performance, setting of benchmarks, identification of potential leaks, and targeting of water reduction efforts.	PM & MR & CD & GE	July 2026
Review and update the university Design Standard	- Dedicated staff / consultant time. - Maintenance team input, - Residential Services team input, - Grounds Team input, - Water Sciences Team input,	- An updated version of the university's Design Standard is published, which incorporates water saving, water re-use and water treatment technologies, and planting / landscaping which is more sustainable.	CD & GF	July 2026
Identify, test and procure leak detection equipment which can be used to pinpoint leaks on both the main private water network and the district heating system network	- Dedicated staff time, - Maintenance team input, - Funding for purchase and training, - Procurement support	- A regime of regular checking across the main site network and DH network can be implemented as part of an infrastructure monitoring and maintenance programme. - Time taken to locate leaks can be greatly reduced, thereby reducing associated cost and disruption.	CD & MR	July 2025

Action	Resources required	Measure(s) of success	Who	By When
Seek alternatives to tap water for processes where quality of water is less important / use of water can be substituted for an alternative solution	- Dedicated staff time, - Mechanical team input, - Funding to implement alternatives	- Appropriate end uses are identified, where use of mains water is not essential. - Alternative solutions are identified, costed, and where possible, implemented, with water re-use quantified.	CD & MR and GE	July 2026
Further reduce building water wastage via water saving campaign activities	- Monitoring capability (staff & infrastructure) - Staff time to drive water campaign through meetings, training, roadshows, and messaging, and record and follow up on actions	- Water saving ideas and progress with actions recorded. - Data analysis and/or feedback from building users and Facilities Managers indicating success of actions	CD, BW, Water Champions	July 2025
Modify the procurement process so that water efficiency is a criterion on score sheet when purchasing equipment & services linked to significant water use	- Dedicated staff time to update and implement procedure.	- Audit of procurement process shows water efficiency is used as a scoring criterion.	CD and CP	July 2025

Conclusions and Recommendations

Progress against the water reduction target is currently difficult to determine due to issues with metering and monitoring. Resolution of the metering and monitoring issue has been hampered by a lack of available staff resource. There are significant opportunities to reduce water consumption across the university estate if sufficient resource can be made available to progress them.

Recommendation to prioritise the following objectives:

1. Seek to improve metering, monitoring and analysis to track performance and inform targeted action.
2. Encourage better use of water through design and behaviour change.
3. Reduce water leakage.
4. Find alternatives to tap water where appropriate.

Document Control

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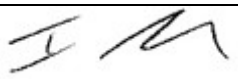
Signature	
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Document Review			
Version	**Amendment**	**By**	**Date**
1	Initial draft version of original Water Management Plan	Gareth Ellis and Angus Murchie	June 2019
1.1	New format as Water Management Plan	Ceri Dawson and Gareth Ellis	March 2023
2	Revision of document and alignment with requirements of ISO14001	Ceri Dawson and Gareth Ellis	May 2024
3	Update of water use table, water costs section, and action plan	Ceri Dawson	March 2025