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Water Management and Maintenance Plan for Rainwater Harvesting System

Knepp Estate, West Sussex

Background 2

Sampling Plan 2
Sampling Regime and Parameters 2
Sampling Failures 3

System Schematic and Measurement 3
Filter Systems 3

Contingency measures 4

Record Keeping 4

Cleaning 4

Maintenance 5

Continuity of Supply 5

Reactivation Process 5

Regulation 6 Risk Assessment 5

APPROVAL:

For Knepp Estate: [redacted]ich 6/26/2024

For Purple Pepper Partnership: [redacted]5/2024

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Background

Planning has been granted under references DC/22/1050 and DC/21/1931, supported by Section 106 unilateral undertakings requiring the implementation of rainwater harvesting systems at Knepp Estate in West Sussex. The purpose is to offset the new development's water use.
Clause 3.1 of Schedule 1 states that, prior to commencement, the Owner covenants to the Council to submit the Offsetting Site Rainwater Management Plan to the Third Party Owner (Sir Charles Raymond Burrell) for their approval, and once approved by the Third Party Owner to submit the same to the Council for
approval.
This document covers the management plan for the offsetting site rainwater harvesting systems.

Management Plan

Sampling Plan

Note that sampling is only required where water enters the human pathway. Where only toilets and external irrigation use is specified, the system is not classified as private water supply.

Sampling Regime and Parameters

Where a system is classified as private water supply, sampling is to be undertaken by a UKAS accredited laboratory. Many countries, including the UK, have laws and regulations in place that require regular water testing to ensure compliance with safety standards.
Relevant British Standards: BS EN ISO 9308-1:2014 – Microbiology of water. Enumeration of Legionella bacteria. Part 1: Detection and enumeration of Legionella pneumophila BS 8558:2015 – Legionella control. Code of practice ACOP L8: Legionnaires' disease: The control of legionella bacteria in water systems

The current proposed test system will test for:
Microbiological, culture testing:
Legionella
Indicator Parameters & Pathogens:
Colony count 22°, Colony count 36°, coliforms
Microbiological Parameters (Water Supply Regulations) & Pathogens:
E.coli, Enterococci
Metals and heavy metals:
Aluminium, Arsenic, Barium, Bismuth, Cadmium, Chromium, Cobalt, Copper, Gadolinium, Gallium, Lead, Nickel, Palladium, Scandium, Selenium, Silver, Strontium, Thallium, Uranium, Yttrium, Zinc
Minerals and substances causing hardness:
Beryllium, Boron, Calcium, Chloride, Iron, Lithium, Magnesium, Manganese, Sodium, Potassium, Phosphorus (Orthophosphate), Sulphate, Water hardness (mg/l calcium carbonate)
Nitrogen compounds:
Ammonium, Nitrite, Nitrate, Total nitrite/nitrate

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Salts and Esters:
Bromide, Fluoride, Phosphate
Other values tested:
Total anions, pH value, electrical conductivity

It should be done by a DWI certified sampler and analysed by a UKAS accredited lab for example:

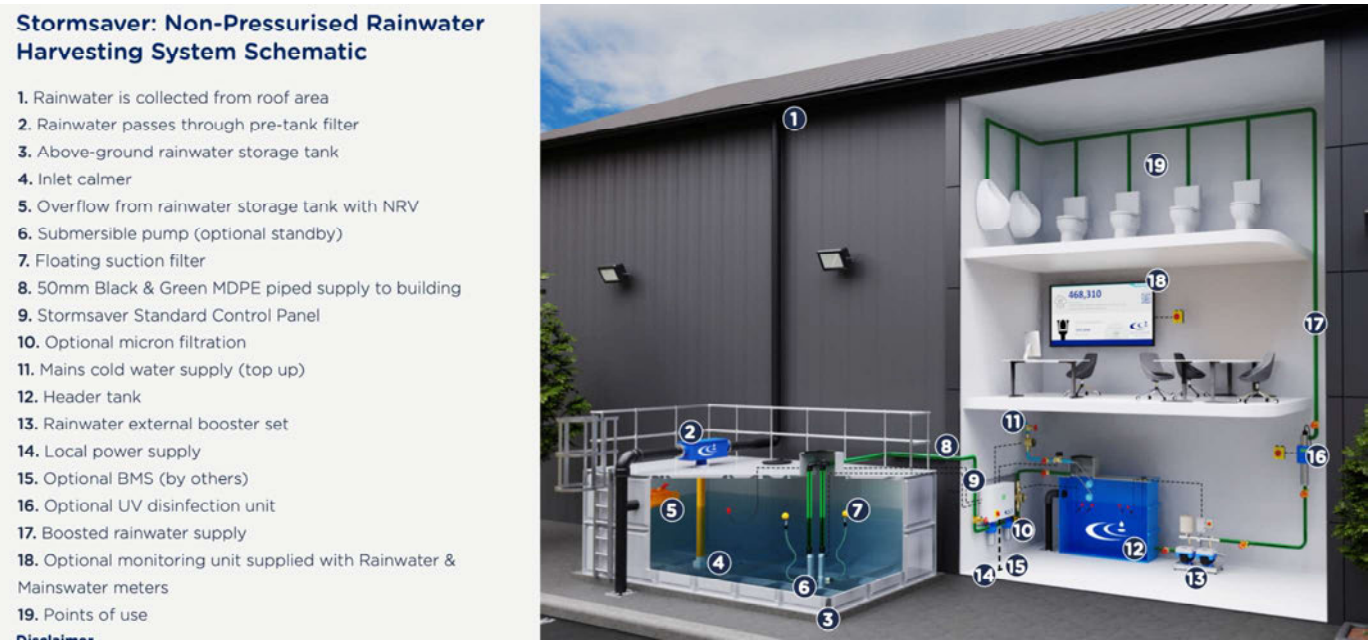
https://ivario-lab.co.uk/products/water-test-kit-premium

Sampling Failures

In case a failed test result has been received, the switchover valve should be activated immediately to avoid any failed water entering the property. The only supply in such a condition will be mains water supply.
Professional help should be sought immediately to rectify the situation before the rainwater is used again.
The local authority should be informed as soon as is practical, and kept up to date on rectifying the supply.

System Schematic and Measurement

The system has been designed as follows:



Filter Systems

The Hydra Rainmaster Filter System can filter up to 5,500 litres per hours, significantly more than the system requires.

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Contingency measures

Failure

A valve from the mains supply can replace harvested water after the filter system to ensure continuity of supply during failure or maintenance of the harvesting system.

Concerns

Any concerns about the system should in the first instance be addressed in writing to the Estate Manager.

Reporting

If any laboratory tests (where relevant) fails, the local authority should within reasonable time, but no longer than 28 days after reporting of a concern, be notified in writing of the report, corrective action, and follow up review including possible system improvements.

Management Plan

Training

Designated staff members will receive training from the supplier in operating the system upon installation and commissioning.

Record Keeping

Sampling:

A record should be kept in writing, accessible to any user of the system as well as any maintenance worker, of all samples taken as well as its results.

Results of analysis,

Results should be filed if everything passes. Any failures should be notified to the local authority and rectified immediately.

Inspection,

Annual inspection of the system by a knowledgeable person should be undertaken, including checking for leaks, deterioration, contamination and general condition.

Cleaning, and maintenance.

The tank should be cleaned every 3 years by an suitably knowledgeable person and the record of cleaning be kept. Detailed cleaning procedure will be provided by the manufacturer.

Cleaning

Filters are to be cleaned according to manufacturer recommendation (usually once per year, but repeated after dry running or any maintenance work). Tanks should be cleaned every 3 years.

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Maintenance

Annual inspection of the system by an appropriately knowledgeable person should be undertaken, including checking for leaks, deterioration, contamination and general condition.
The emergency changeover vale to be inspected annually.

Continuity of Supply

An emergency switchover valve is supplied which can replace harvested rainwater in an emergency.

Reactivation Process

If the system has been run dry / deactivated, it should be recommissioned according to the manufacturer instructions, taking note of any new instructions in case parts or elements of the system have been replace.

Regulation 6 Risk Assessment

Each local authority must carry out a risk assessment of each private water supply system in its area1 at least every five years. This is only relevant for private water supplies. Details can be found here:
http://www.dwi.gov.uk/private-water-supply/local-auth/risk-assessment.html
A risk assessment must be completed as soon as is reasonably practicable once any new private water supply has been commissioned.

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Records and Testing Register

Record of Annual Inspections

Date	Done By	No leaks of pipes, gutters or the tank	No malfunction of pump or valves	No loose items / obvious damage to system	Emergency Changeover Valve Tested?

Record of Water sampling

Date	Taken By	Sent to laboratory on	Results received on	If pass = OK, if fail = go to LA records below

Record of notification to LA (Local Authority)

Date of report	Description of issue	System Repaired?	Date Recommissioned

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Filter Replacement Record			
Date	Replaced by	Notes	System OK?
3 yearly tank cleaning			
Date	Cleaned by	Notes	System OK?