

## CASE STUDY

Holiday Lodges, Inverness, Scottish Highlands



### Overview

Whilst not in a typically hard water area (Scotland), these holiday lodges get their water from a borehole and are a very good example of why postcode hard water checkers can't always be relied upon! The owners had been experiencing issues with scale build-up.

### Key Problems

A site survey was carried out and the following areas were highlighted by the owners as being affected by scale:

- ⦿ Significant historical build-up of limescale throughout the system and equipment
- ⦿ Heating elements in hot tubs
- ⦿ Showerheads, shower screens, kettles
- ⦿ Hot water cylinders and boilers in the lodges
- ⦿ Pumps after the borehole

### Our Solution

In June 2021, we installed an Integro 2 v3 in the pump room to protect the entire system which services the main house and three lodges, all with private hot tubs.

### Water Analysis

An initial water analysis report carried out in May 2021 gave a water hardness as CaCO<sub>3</sub> level of 206.8mg/l.

### Detailed Results

Determinand	Value	Units	Determinand	Value	Units
pH	7.6		Conductivity	442	uS/cm
Nitrate-N	4.4	mg/l	Ammonia-N	< 0.1	mg/l
Chloride	34.8	mg/l	Sulphate as SO <sub>4</sub>	9.2	mg/l
Phosphorus as P	< 0.1	mg/l	Boron	0.01	mg/l
Potassium	2.5	mg/l	Copper	< 0.01	mg/l
Magnesium	6.87	mg/l	Manganese	< 0.01	mg/l
Calcium	71.5	mg/l	Zinc	< 0.01	mg/l
Sodium	19.5	mg/l	Iron	< 0.01	mg/l
Carbonate	< 10	mg/l	Alkalinity as HCO <sub>3</sub>	213	mg/l
Hardness as CaCO <sub>3</sub>	206.8	mg/l	Dissolved Silicon	7.5	mg/l



Integro™ 2 Installed June 2021

### One of the four Hot Tubs

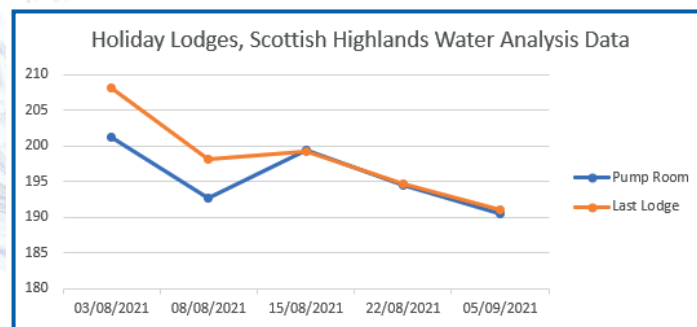


## The Results

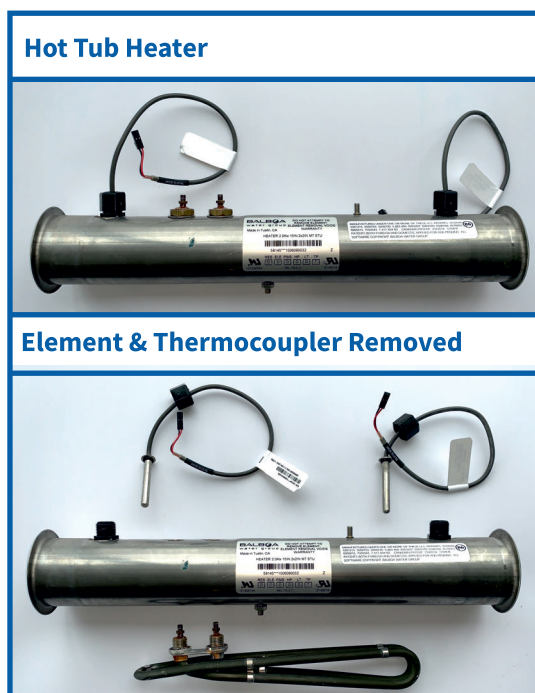
The owners were delighted with what they felt was an almost immediate improvement in the water quality after the Integro™ was installed. Straight away the technology began to remove historical build-up as well as preventing further scale from forming. The owners also observed the following:

- Fittings such as shower heads and screens were easier to clean
- Historical scale build-up (where visible) was being removed
- In December 2021, all showers in the lodges were replaced. Inspection of the old showers and pipework (10 years old) showed all historical scale build-up had been removed and no new scale had formed

As part of this study, in the weeks following installation of the Integro, additional water samples were taken and analysed. The results are shown in the graph below. The blue line shows water samples taken from the point that the Integro is installed in the pump room and the orange line shows water samples taken from the lodge which is at the furthest point from the pump room. As the water source is a borehole, the levels of hardness may vary from day to day. The significant thing to note from this data is the gap between the data points for the first and second set of results compared to that of the subsequent three results. Following installation, the Integro begins to break down historical scale build-up and the minerals dissolve back into the water as it flows through the system, explaining why the hardness level is higher at the furthest point. But it can be clearly seen that following several weeks of operation, historical scale has been removed from the system to the extent that there is no longer a noticeable difference in hardness at the two testing points.



In March 2022, engineers were on site to service the boilers, water cylinders and hot tubs. Inspection revealed that they were completely free of any scale build-up. Specifically, heating elements were removed from one of the hot tubs and one of the water cylinders (10-11 years old), both were completely free from any signs of limescale.





## Environmental Benefits

As well as benefitting from quantifiable savings such as their energy consumption, there are several additional environmental benefits as a result of installing the Integro™ technology:

- Improved water quality and efficiency of hot water equipment
- Extended life of all water related equipment and improved efficiency
- Reduction in scale and corrosion to critical equipment, meaning less engineer visits and reduction in spare parts which would otherwise carry direct and indirect increases in the hotel's carbon footprint
- Reduced chemical use

## Summary

Since the installation of the Integro in June 2021, it has been shown to be effective in removing existing scale throughout the entire water system and water related equipment and preventing any further build-up.

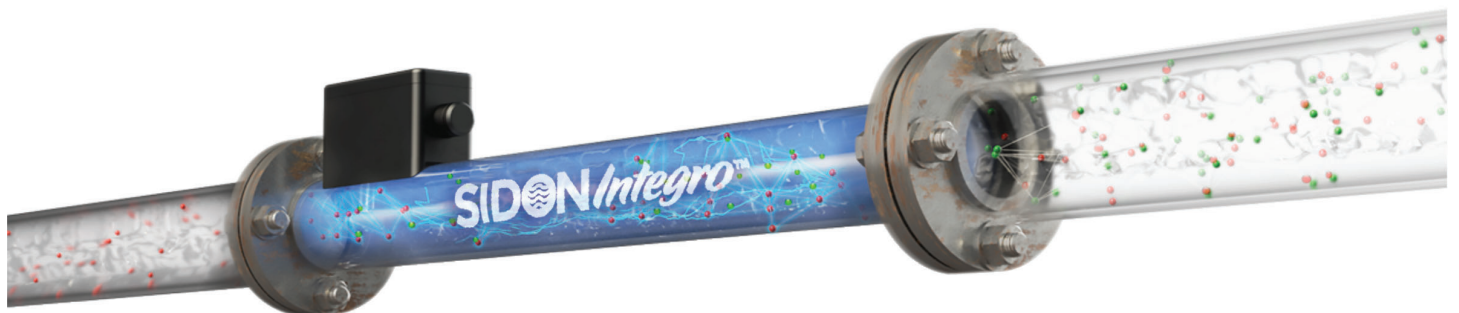
## What the Owners had to say

*'After purchasing our home & holiday let business two years ago we found intense limescale issues. After exploring complicated salt softener systems we came across Sidon Water Ltd and the 'integro' option. Sidon Water Ltd took time to explain all the advantages of the system and answers any queries or concerns we had.*

*Now a year from when we initially spoke with Sidon Water Ltd we are noticing and benefitting from the 'integro' system in many different ways; the main one being our showers are much easier kept clean and in fact the new showers that we replaced at the start of the year show no sign of limescale in the either the new system or its pipework – truly amazing – all done hassle free and with the continued support from all at Sidon Water Ltd. '*

*We can highly recommend the 'integro' system and Sidon Water Ltd as a company*

**Janice & Richard Kessock Highland Lodges**



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