Heat Pump Assessment & Technical Report

1. Executive Summary

Based on the analysis of your current boiler cycling and annual gas consumption, your property is highly suitable for a heat pump conversion. The existing flow temperatures (<45C) indicate that no radiator upgrades are likely needed.

Key Recommendations:

- Heat Pump Size: 5 kW (Monobloc)
- Hydraulics: Parallel Buffer Tank (50 Litres)
- Target Flow Temp: 35-38C Weather Compensated
- Expected Efficiency (SCOP): 4.4

2. Heat Loss & Sizing Calculation

We calculated the heat loss using real-world duty cycle data at -3C outside temperature. Standard software estimates often oversize units, leading to inefficiency. Your data provides a precise peak load.

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Data Point: Boiler runs 25 mins/hr @ -3C (7kW limit)
Duty Cycle: 25 / 60 = 41.6%
Heat Load: 7 kW x 0.416 = 2.91 kW

Verification via Annual Gas:
6200 kWh / 2000 hours (heating season factor) = 3.1 kW

Result: A 5kW unit covers the load down to -10C with margin.
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3. Hydraulic Strategy: Microbore Safety

The property uses 8mm microbore pipework upstairs. Heat pumps require high flow rates (low Delta T), while microbore requires low flow rates (high Delta T). Direct connection is NOT recommended as it may cause velocity noise or flow errors.

Recommendation: 4-Port Parallel Buffer Tank (50L)

This decouples the Heat Pump flow from the House flow. The HP can run at its required 15 L/min into the buffer, while the central heating pump draws water at a slower rate suitable for the 8mm pipes.

4. Flow Rate Comparison

Metric	Current Boiler (Stage 1)	Heat Pump (Required)
Flow Temperature	45 C	35 C - 40 C
Delta T	10 C	5 C

Estimated Flow Rate	~10 L/min	~14.3 L/min
Operating Mode	Cycling (On/Off)	Continuous (Modulating)

Note: The boiler's Stage 2 flow (20 L/min) confirms the pipework CAN physically handle the Heat Pump's required 14.3 L/min, but the buffer is safer for acoustic comfort.

5. Efficiency (SCOP) & Next Steps

With a flow temperature of 35C, a modern R290 (Propane) heat pump will achieve a Seasonal Coefficient of Performance (SCOP) of approx. 4.4.

This means for every 1 unit of electricity bought, 4.4 units of heat are generated.

Next Action:

Proceed with a 5kW Monobloc Heat Pump quote. Ensure the installer specifies a 50L Buffer Tank or Volumiser to handle the microbore piping.