



WASTEWATER LIFT STATION PUMP CALIBRATION CHEAT SHEET (NO FLOW METER, WITH INFLOW)

Purpose: Verify pump performance using wet well water level, time, and inflow estimates.

1. Safety First

- Wear gloves, safety glasses, waterproof boots, and hearing protection.
- Lock out/tag out electrical power before inspections.
- Follow confined space procedures if entering the wet well.

2. Gather Tools

- Stopwatch
- Measuring tape or wet well volume chart
- Calculator or notebook
- Wrenches/basic tools

3. Inspect the Pump

- Check pump, impeller, and discharge for debris or damage.
- Verify check valves and gate valves work properly.
- Ensure floats/level sensors are clean and correctly positioned.

4. Measure Pump Flow (With Inflow)

Step 1: Wet Well Volume

- Calculate volume:
 - ◆ $Volume(gal) = Length(ft) \times Width(ft) \times Depth(ft) \times 7.48$

Step 2: Pump Test

1. Start pump manually.
2. Measure time to lower water from high point to low point.
3. Observe inflow (incoming wastewater) during the test.

Step 3: Calculate Inflow

1. Turn off pump and measure water level rise over a known period.
2. Calculate inflow:
 - ◆ $Inflow(GPM) = \frac{Volume\ of\ water\ rise(gal)}{Time(minutes)}$

Example:

- Wet well area = 100 ft², water rise = 0.5 ft, time = 30 min
- $Volume = 100 \times 0.5 \times 7.48 = 374\text{-gal}$
- $Inflow = 374 / 30 = 12.5\text{ GPM}$
- $Inflow = \{374\} / \{30\} = 12.5\text{ GPM}$

Step 4: Corrected Pump Flow

$Pump\ Flow(GPM) = \frac{Water\ Volume\ Lowered(gal)}{Pump\ Run\ Time(min) + Inflow(GPM)}$

Example:

- Pump lowers 1,000 gallons in 10 minutes, inflow = 12.5 GPM
- ◆ $Pump\ Flow = 1000 / 10 + 12.5 = 112.5\text{ GPM}$

5. Compare to Design

- Check manufacturer specs for expected flow at the measured water level.

If flow is below expected:

- Inspect impeller and suction line for blockages
- Check for pump wear
- Verify control logic and float settings

6. Adjust Pump

- **Variable Speed:** Adjust frequency to achieve target flow.
- **Fixed-Speed:** Adjust float on/off levels to optimize run times.
- Re-measure and recalculate corrected flow until it matches target.

7. Record Keeping

- Water level start → stop
- Pump run time
- Estimated inflow (GPM)
- Corrected pump flow (GPM)
- Adjustments made
- Observations (short cycling, unusual noise, etc.)

8. Post-Calibration

- Return lift station to automatic operation.
- Observe 1–2 cycles to confirm proper operation.
- Secure all covers, valves, and panels.

Tips

- Repeat inflow measurements several times to account for daily variation.
- Use averages for pump calibration if inflow fluctuates.
- Perform periodic calibration, especially after maintenance or wet weather events.