

This example calculation spreadsheet has not been reviewed or approved for wide use. It is provided as informational only. The engineer may use this information, but it should be thoroughly checked.

Pump Station Wetwell Sizing Example

Task: Determine the minimum wet well size for a wastewater pump station, wet pit only configuration, given the following:

Boxed Cells represent data inputted manually

Pumps

2 --	Number of Total Pumps
1 --	Number of Duty Pumps (no staggered cycling - one duty, one standby)
2000 gpm	Pump Design Flow Rate (each)
125 HP	Pump HP (each), from manufacturer's literature

Collection System

1 --	Number of Influent Sewers to Pump Station
6 ft	Influent Sewer Diameter
4800 LF	Sewer length from pump station to existing overflow point (when full)

2006-2007 hourly flow data from identical pump station and collection system

1675 gpm	Average ADF [Average Daily Flow]
2250 gpm	Maximum ADF
1200 gpm	Minimum ADF
2600 gpm	Maximum Peak Hour Flow

Identify Required Wet Well Volume Based on Cycling of Pump Motors

1. Classify the pump station in accordance Section 6.4.2.1

2000 gpm Pump Station Firm Capacity

SMALL -- Pump Station Classification based on Firm Capacity

2. Determine Minimum Motor Cycle Time:

6 --	Maximum Motor Starts per Hour (see Table 6.4.2.4.1-1)
10 min	Motor Cycle Time

3. Calculate Required Wet Well Volume based on Cycle Time:

$$3] = \frac{t[\text{min}] * Q[\text{gpm}]}{30}$$

where:

$$t = 10 \text{ min}$$

$$Q = 2000 \text{ gpm}$$

$$V = 667 \text{ cubic-feet}$$

Identify Required Wet Well Volume Based on Emergency Storage Considerations

1. Determine Emergency Storage Minimum Detention Time:

480 min Based on Pump Station Classification (see Table 6.4.2.4.2-1)

2. Determine ESF (Emergency Storage Flow):

2250 gpm Use Max ADF for one calendar year at identical installation

3. Calculate Emergency Storage Volume:

10,80,000 gallons Emergency Storage Volume (Detention Time x Flow)
1,44,385 cubic-feet Conversion (7.48gal/ft³)

4. Calculate Available Capacity of Collection System for Emergency Storage

1,35,717 cubic-feet Available Volume of Collection System for Emergency Storage (see box sewer info above)

5. Calculate Required Wet Well Volume based on Emergency Storage Requirements

$$V = 8,668 \text{ cubic-feet}$$

Compare Required Wet Well Volumes from Both Methods and Use the Larger Value

8668 cubic-feet >> 667 cubic feet

The required wet volume should be 8668 cubic feet.

Note: Verify that the wet well volume is sufficient to allow for pump movement and equipment access for maintenance.