# LIFT STATION DESIGN - WORKSHEET

**Project Name:** _____ **Date:** _____

**Project Location:** _____ **By:** _____

**REQUIRED CALCULATIONS FOR WET WELL DESIGN:**

1. Estimate average daily flow (ADF):

Initial (first year) $(\_\_\_\_ERC + \_\_\_\_Acre\ X\ \_\_\_\_\frac{ERC}{AC})\ X\ \frac{240}{1440} = \_\_\_\_\_GPM$

Intermediate (this project) $(\_\_\_\_ERC + \_\_\_\_Acre\ X\ \_\_\_\_\frac{ERC}{AC})\ X\ \frac{240}{1440} = \_\_\_\_\_GPM$

Ultimate (build-out of lift station coverage area) $(\_\_\_\_ERC + \_\_\_\_Acre\ X\ \_\_\_\_\frac{ERC}{AC})\ X\ \frac{240}{1440} = \_\_\_\_\_GPM$

Note: 1 ERC = 240 GPM

2. Select appropriate peaking factor (see Appendix E-2) and determine Design Peak Flow:

| | | |
|---|---|---|
| Initial | Avg. X _____ | Peak = _____gpm |
| Intermediate | Avg. X _____ | Peak = _____gpm |
| Ultimate | Avg. X _____ | Peak = _____gpm |

3. Primary Operating Volume in gallons for a minimum cycle time of 12 minutes will be 3 X the pumping rate in gallons per minute. Note: The spacing between 'lead pump on' and 'lead pump off' shall be a minimum of 2 feet. Levels will be field adjusted to match calculations.

   Compute for Initial and Ultimate conditions.

4. Compute Primary Operating Range = Vol. required divided by Vol. per vertical foot. Compute for Initial, Intermediate, and Ultimate conditions.

5. Calculate Emergency Storage Time (see Section 575, Paragraph 3.2.2.5).

6. Calculate Emergency Storage Volume = Emergency Storage Time X QAV. Calculate for Initial and Ultimate Flow conditions. The minimum emergency storage volume shall be 1,880 gallons (5-feet of additional depth for 8-foot diameter wet well).

7. Calculate Alarm Time Range = Alarm Volume divided by volume per vertical foot.

8. Identify the lowest discharge (or spill) point assuming lift station has failed and system is surcharging.

9. Establish critical pump control elevations.

10. Check Flotation: Total weight - buoyancy force x 1.2 must be positive.

**REQUIRED CALCULATION FOR FORCE MAIN DESIGN:**

Compute System Curve

TDH shall be evaluated separately for discharge elevation and elevation of high points of the force main, and for initial and aged "C" factors. The typical “C” factors for PVC for initial and aged conditions shall be 140 and 100, respectively. Other “C” factors may be utilized as necessary when analyzing piping of various materials (e.g. ductile iron).

**Static Head** High Point _____ or Discharge Elevation_____- Pump Off_____=_____ft.

**Pump Selection:**

| PERIOD | PUMP | | | MOTOR | | | | PERFORMANCE | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MAKE | MODEL | IMPELLER | MODEL | HP | RPM | ELEC. | GPM | TDH | EFFIC. |
| Initial | | | | | | | | | | |
| Intermediate | | | | | | | | | | |
| Ultimate | | | | | | | | | | |