Capacity Analysis for System Name PWS ID: 1234567

Water Demand Calculations

Population: 100
Average Daily Water Use: 100 gpcd
Average Daily Demand (ADD) = 100 gpcd x 100 people = 10,000 gpd or 6.9 gpm
Maximum Daily Demand (MDD) = 2.0 x 10,000 gpd = 20,000 gpd or 13.9 gpm
Peak Hourly Demand = 2.0 x 13.9 gpm = 27.8 gpm
Pump Capacity = 32 gpm? > 27.8 gpm

Hydropneumatic Tank Sizing

According to Ten State Standards, Hydro Tank should be 10x the pump capacity.

$$10 \text{ x } 32 \text{ gpm} = 320 \text{ gpm}$$

Existing Hydro Tank must be at least 320 gallons to meet this criteria.

Ten States Standards also states that the capacity of the wells and pumps in a hydropneumatic system should be at least ten (10) times the Average Daily Demand, or:

$$10 \text{ x (ADD)} = 10 \text{ x } 6.9 \text{ gpm} = 69 \text{ gpm}$$

Existing Well Pump must be at least 69 gpm to meet this criteria.

Subsection 62-555.320(19) (a), F.A.C., requires finished water storage capacity to be at least 25 percent of the maximum day water demand (MDD).

$$0.25 \text{ x } 20,000 \text{ gpd} = 5,000 \text{ gallons}$$

Existing Hydro Tank must be at least 5,000 gallons to meet this criteria.

Subsection 62-555.320(19) (b), F.A.C., allows a storage capacity less than 25 percent of the maximum day demand if in conjunction with the water system's finished-water storage capacity, *"the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (excluding any storage capacity for fire protection) is sufficient to meet the water system's peak-hour demand for at least four consecutive hours."*

$$\begin{aligned} PHD_4 \quad &= PHD \text{ (gpm) x 60 minutes/hour x 4 hours} \\ &= 27.8 \text{ gpm x 60 min./hr x 4} \\ &= 6,672 \text{ gallons} \end{aligned}$$

The well pump is 32 gpm.

$$32 \text{ gpm x } 60 \text{ x } 4 = 7680 \text{ gallons} > 6,672 \text{ gallons}$$

The Existing Hydro Tank and Well Pump are sufficient based on this criteria.

Small water systems with hydropneumatic tanks permitted after August 28, 2003 must also demonstrate that, *"the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (i.e., the water system's total effective hydropneumatic tank volume) is sufficient to meet the water system's peak instantaneous water demand for at least 20 consecutive minutes."*

$$PID = ADD \times 10 = 6.9 gpm \times 10 = 69 \text{ gpm}$$

$$PID_{20} = 69 \text{ gpm} \times 20 \text{ min.} = 1380 \text{ gallons}$$

The existing well pump is 32 gpm.

$$32 \text{ gpm} \times 20 \text{ min.} = 640 \text{ gallons}$$

The existing well pump and hydro tank are insufficient to meet this criteria.

Maximum Permissible Capacity Based on Existing System

$$32 \text{ gpm} \times 1440/3.75 = \textbf{12,288 gpd}$$

Recommendations
It is recommended that Ashley Cove:

1. Install a well pump of at least 69 gpm.
2. Increase the hydropneumatic tank capacity to at least 690 gallons and ensure that there is a bypass line on the hydropneumatic tank so that the system can meet the peak demands. Sizing the hydropneumatic tank this way will prevent short cycling of the well pump.

FLORIDA RURAL WATER ASSOCIATION

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Capacity Analysis for System Name PWS ID: 1234567

Prepared by: Engineer or Circuit Rider Name, November 30, 2012

Water Demand Calculations

Population: 100
Average Daily Water Use: 100 gpcd
Average Daily Demand (ADD) = 100 gpcd x 100 people = 10,000 gpd or 6.9 gpm
Maximum Daily Demand (MDD) = 2.0 x 10,000 gpd = 20,000 gpd or 13.9 gpm
Peak Hourly Demand = 2.0 x 13.9 gpm = 27.8 gpm
Pump Capacity = 32 gpm? > 27.8 gpm

Hydropneumatic Tank Sizing

According to Ten State Standards,[1] Hydro Tank should be 10x the pump capacity.

10 x 32 gpm = 320 gpm

Existing Hydro Tank must be at least 320 gallons to meet this criteria.

Ten States Standards also states that the capacity of the wells and pumps in a hydropneumatic system should be at least ten (10) times the Average Daily Demand, or:

10 x (ADD) = 10 x 6.9 gpm = 69 gpm

Existing Well Pump must be at least 69 gpm to meet this ~~criteria.~~

Subsection 62-555.320(19) (a), F.A.C., requires finished water storage capacity to be at least 25 percent of the maximum day water demand (MDD).

0.25 x 20,000 gpd = 5,000 gallons

Existing Hydro Tank must be at least 5,000 gallons to meet this criteria.

Subsection 62-555.320(19) (b), F.A.C., allows a storage capacity less than 25 percent of the maximum day demand if in conjunction with the water system's finished-water storage capacity, *"the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (excluding any storage capacity for fire protection) is sufficient to meet the water system's peak-hour demand for at least four consecutive hours."*

$$PHD_4 = PHD \text{ (gpm) x 60 minutes/hour x 4 hours}$$
$$= 27.8 \text{ gpm x 60 min./hr x 4}$$
$$= 6,672 \text{ gallons}$$

The well pump is 32 gpm.

32 gpm x 60 x 4 = 7680 gallons > 6,672 gallons

Footnote:
1. Recommended Standards for Water Works is also known as "Ten States Standards" paragraph 7.2 and has been incorporated into FDEP Rule by 62-555.330(3), F.A.C.

The Existing Hydro Tank and Well Pump are sufficient based on this criteria.

Small water systems with hydropneumatic tanks permitted after August 28, 2003 must also demonstrate that, *"the capacity of the water system's source, treatment, and finished-water pumping facilities, the water system's total useful finished-water storage capacity (i.e., the water system's total effective hydropneumatic tank volume) is sufficient to meet the water system's peak instantaneous water demand for at least 20 consecutive minutes."*

Peak Instantaneous Demand =

$PID = ADD \times 10 = 6.9 gpm \times 10 = 69 gpm$

$PID_{20} = 69 gpm \times 20 min. = 1380 gallons$

The existing well pump is 32 gpm.

$32 gpm \times 20 min. = 640 gallons$

The existing well pump and hydro tank are insufficient to meet this criteria.

Maximum Permissible Capacity Based on Existing System

$32 gpm \times 1440/3.75 = \textbf{12,288 gpd}$

Recommendations
It is recommended that Ashley Cove:

1. Install a well pump of at least 69 gpm.
2. Increase the hydropneumatic tank capacity to at least 690 gallons and ensure that there is a bypass line on the hydropneumatic tank so that the system can meet the peak demands. Sizing the hydropneumatic tank this way will prevent short cycling of the well pump.

- **This analysis should also include a Treatment Capacity Analysis / Calculations** – sodium hypochlorite feed system, aerator, poly/orthophosphate feed system, filters, etc.
- A separate Source Capacity Analysis Section is recommended.
- Report should also list source of data used. Was it taken from the sanitary survey or did you field verify anything?