

**VIRGINIA DEPARTMENT OF HEALTH  
ENGINEERING DESCRIPTION SHEET**

**DATE:** May 15, 2013

**WATERWORKS NAME:** Fluvanna County Courthouse      **WATERWORKS CLASS:** VI  
**COUNTY/CITY:** Fluvanna County      **TYPE:** Nontransient Noncommunity  
**LOCATION:** On U.S. Route 15, 0.25 miles north of the intersection with U.S. Route 53  
**OWNER:** Fluvanna County  
**Contact:** Mr. J. Wayne Stephens, Director of Public Works  
197 Main Street  
P.O. Box 540  
Palmyra, VA 22963  
**Phone:** 434-591-1925  
**OPERATOR:** Licensed Class VI Operator Required  
**PERMIT NUMBER:** 2065245 Amended  
**EFFECTIVE DATE:** December 4, 2001; May 15, 2013  
**TYPE OF TREATMENT:** Disinfection  
**SOURCE:** One drilled well  
**DESIGN CAPACITY:** 56,160 gpd

**DESCRIPTION OF THE WATERWORKS**

The Fluvanna County Courthouse waterworks consists of a single drilled well, chlorine disinfection treatment, hydropneumatic storage and the distribution system. The only service connection is the Courthouse. A separate fire protection system with pump and storage is also located at the treatment building and is isolated from the waterworks by an RPZ backflow prevention device.

**Source**

Well Number 1 is located approximately 650 feet SSW of the treatment building and hydropneumatic storage tank. This well was completed on August 9, 2000 and is drilled to a depth of 285 feet. The well is cased with 6-inch steel casing to a depth of 54 feet and is grouted with cement to a depth of 50 feet. The well casing extends 12 inches above a 6-foot by 6-foot by 6-inch concrete pad and is equipped with a sanitary well cap and pitless adapter. The well discharge piping located in the treatment building is provided with a totalizing flow meter and raw water sample tap. Water is pumped from the well by means of a 7.5 HP submersible well pump capable of delivering 39 gpm at 357 TDH into the hydropneumatic storage tank. A 48 hour drawdown test conducted in August 2000 indicated a reliable well yield of 76 gpm with water level dropping from 46.8 feet (static condition) to 230.8 feet.

**Storage**

Storage is provided by a 5,000 gallon horizontal, cylindrical, welded steel hydropneumatic tank. The tank measures 6 feet in diameter by 24 feet long and is equipped with an access manway, separate tank drain, pressure gauge, water sight glass, pressure relief valve and automatic air/water balancing system. The working face of the hydropneumatic tank extends into the treatment building.

**Treatment**

Disinfection treatment is provided by a sodium hypochlorite feed system. Installed equipment includes a 24 GPD electronic diaphragm metering pump and 50 gallon polyethylene solution tank. The sodium hypochlorite feed equipment is located in the treatment building. Sodium hypochlorite solution is injected into the well discharge piping prior to the hydropneumatic tank. The metering pump operates in conjunction with the well pump.

An emergency generator system with automatic transfer switch is located at the treatment building and is capable of powering the entire waterworks and the fire protection system during a power failure.

**CAPACITY EVALUATION OF THE WATERWORKS**

Design Basis: per *Waterworks Regulations*, one ERC = 400 gpd and factories use 15-35 gpd/person.

1. Estimated Water Demand: The courthouse complex has approximately 60 employees and visitors per day: (25 gpd) x (60 persons) = 1,500 gpd

Actual water demand from March 2012 – February 2013 = 730 gpd average  
 Maximum monthly average = 1,700 gpd

Peak Hour Demand: Estimated PF:  $(4) \times [(24\text{hr/day}) / (8 \text{ hr/day use})] = 12$   
 $(12) \times (1,700 \text{ gpd}) = 20,400 \text{ gpd}$   
 $(20,400 \text{ gpd}) \times [(1\text{hr} / (24 \text{ hr/day}))] = 850 \text{ gallons}$

2. Source Capacity:

Well ID	Yield, gpd = gpm ÷ (0.5 gpm/ERC) x 400 gpd/ERC		Well Pump, gpd = gpm x 1,440 min/day		Limiting Capacity, gpd
	Well Number 1	76 gpm	60,800 gpd	39 gpm	
Total	-	-	-	-	56,160 gpd

3. Storage Capacity:  $(5,000 \times \frac{1}{3}) = 1,667 \text{ gal}$   
 \*1/3 of a hydropneumatic tank's volume is considered effective storage capacity.

Noncommunity systems are required to provide delivery capacity to meet peak hour demand. Estimated delivery capacity during 1 hour (including pressure storage):

Well pump =  $(39 \text{ gpm}) \times (60\text{min/hr}) = 2,340 \text{ gallons}$   
 Hydropneumatic Tank =  $(\frac{1}{3} \times 5,000 \text{ gallons}) = 1,667 \text{ gallons}$   
 $2,340 \text{ gallons} + 1,667 \text{ gallons} = 4,007 \text{ gallons}$

Peak Hour demand = 850 gallons < 4,007 gallons available delivery capacity

Conclusion:

This waterworks is permitted for a design capacity of 56,160 gpd due to the limited well pump described above. This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits.

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