

**Virginia Department of Health  
Engineering Description Sheet**

**Date:** November 17, 2005

**Class:** VI

**Waterworks Name:** Ridgecrest Subdivision      **Type:** Community

**County/City:** Franklin County

**Location:** Five miles west of Rocky Mount on Route 40, then left on Route 756, then left on Route 754, and then left on Crestview Road.

**Owner:** Petrus Environmental Services  
1807 Murry Road, Unit O  
P.O. Box 21173  
Roanoke, VA 24018  
(540) 344-9800

**Operator:** Petrus Environmental Services  
1807 Murry Road, Unit O  
P.O. Box 21173  
Roanoke, VA 24018  
(540) 344-9800

**Permit Number:** 5067785

**Date Issue:** February 12, 1990      Amended  
November 17, 2005

**Type of Treatment:** Addition of polyphosphate for the purpose of sequestering iron and manganese

**Source:** One drilled well

**Design Capacity:** 49 Equivalent Residential Connections or 19,600 gpd

**Description of System**

This waterworks consists of one drilled well, chemical addition system, a 10,000-gallon atmospheric tank, a 7,000-gallon hydro-pneumatic tank and dual centrifugal pumps.

**Booster Pumps:** The booster pumps are each rated at 58 gpm at 80 feet TDH and driven by a 2-HP, 3450 rpm electrical motor. The dual centrifugal pumps are controlled by a pressure switch mounted on the hydro-pneumatic tank.

**Well No. 2:** This well is located in the concrete block control building to the left of Crestview Drive. The well is 250 feet deep and cased and grouted to 90 feet. The yield of the well is 29 gpm. Water is pumped from the well into the 10,000-gallon atmospheric tank. The well pump is a submersible pump rated at 26 gpm at 253 ft. TDH and driven by a 3-HP, 3450 rpm electric motor.

**Atmospheric-Type Storage Tank:** A 10,000-gallon steel tank is located adjacent to Well No. 2. Appurtenances include a screened vent, drain, roof access hatch, water level indicator, and screened overflow.

**Hydro-pneumatic Storage Tank:** A 7,000-gallon hydro-pneumatic storage tank is located adjacent to Well No. 2. Appurtenances include a pressure gauge, pressure relief valve, vacuum relief valve, water level sight glass gauge, drain, sample tap, and air/volume controller.

**Treatment:** One treatment system is located in the main control building. The metering pump adds polyphosphate for the purpose of sequestering iron and manganese. The polyphosphate is mixed in a 30-gallon tank.

### Evaluation of System

**Design Basis:** Commonwealth of Virginia *Waterworks Regulations*  
One Equivalent Residential Connection (ERC) = 400 gpd  
One well source restricted to 49 ERCs

**Existing Connections:** 25 Residential Connections

**Source Capacity:**

Well No.	Well Yield (gpm ÷ 0.5gpm/ERC x 400gpd/ERC)		Pump Capacity (gpd) (gpm x 1440 min/day)	Effective Capacity (gpd)
2	29 gpm	23,200 gpd	26 gpm 37,440 gpd	23,200 gpd
2	Single well source limited to 49 connections			19,600 gpd

$$23,200 \text{ gpd} \div 400 \text{ gpd/ERC} = 58 \text{ ERCs}$$

$$19,600 \text{ gpd} \div 400 \text{ gpd/ERC} = 49 \text{ ERCs}$$

**Storage Capacity:**

Atmospheric Tank	Gross Volume 10,000 gallons	Effective Volume 10,000 gallons
Hydropneumatic	7,000 gallons * 1/3 = 2,333 gallons	
12,333 gallons/200 gals/ ERC= 61 ERCs or 24,400 gpd		

**Booster Pumps:** Estimated Combined Capacity 116 gpm

**Maximum hour domestic demand flow:**  $Q = 11.4N^{0.544}$   $116 = 11.4N^{0.544}$   $N = 71 \text{ ERCs}$

Therefore, based on the critical value above, this waterworks is permitted for a design capacity of 49 equivalent residential connections, or 19,600 gpd.

RLP:jk



# COMMONWEALTH OF VIRGINIA

## DEPARTMENT OF HEALTH OFFICE OF DRINKING WATER

### WATERWORKS OPERATION PERMIT

Petrus Environmental Services Is Hereby Granted Permission To Operate A Class VI Community Waterworks Having A Design Capacity Of 49 Equivalent Residential Connections (ERCs) Or 19,600 GPD At Ridgcrest Subdivision Located In Franklin County In Accordance With The Provisions Of Title 32.1, Chapter 6, Article 2, Section 32.1 - 173 Code Of Virginia, As Amended, And § 12 VAC 5-590-260 Of The *Waterworks Regulations* Of The Virginia Department Of Health, As Amended. This Permit Is Issued In Accordance With Previously Issued Permits, Operation Permit No. 5067785 Issued February 12, 1990 And With The Understanding That This Owner Will Operate The Waterworks In Accordance With Part II, "Operation Regulations For Waterworks", Of The *Waterworks Regulations* Of The Virginia Department Of Health And Any Variances And/Or Exemptions Noted Below.

Variances And/Or Exemptions Granted (  ) None ( ) See Attached

An Engineering Description Sheet Is Attached Dated November 17, 2005

PERMIT NO. 5067785

EFFECTIVE DATE November 17, 2005

APPROVED \_\_\_\_\_ P.E.

*W. Baker*  
Director, Office of Drinking Water

for the State Health Commissioner pursuant to VA Code § 2.2-604

(REV 07/05)