

Burnsville Natural Gas Pumping Station  
Saratoga Avenue  
Burnsville  
Braxton County  
West Virginia

HAER No. WV-33

HAER  
WVA,  
4-BURN,  
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
Department of the Interior  
Washington, D. C. 20240

HISTORIC AMERICAN ENGINEERING RECORD

Burnsville Natural Gas  
Pumping Station

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Location: On Saratoga Avenue between Little Kanawha River and C + O Railroad line, Burnsville, Braxton County, West Virginia

Date(s) of Construction: 1917, 1936, 1940, 1943

Owner: Equitable Resources Co. (originally built by the Pittsburgh and West Virginia Gas Co.; later called the Equitable Gas Co.)

Designer: Unknown; Steam engines and compressors manufactured by the Nordberg Co.; Boilers manufactured by the Oil City Boiler Works; Water tube boilers manufactured by the Geary Co.; Sales agent for boiler units was the Federal Engineering Co.; Superheaters manufactured by the Foster Wheeler Corp.; Field gas cleaner manufactured by the Blaw-Knox Co.

Significance: As of 1984, this site was the last known example of a steam powered, natural gas pumping station in West Virginia. Built as an integral part of a natural gas transmission system designed to supply gas to the greater Pittsburgh area, the Burnsville station is an important example of steam powered technology used by the fossil fuel industry.

Historical data prepared by: Donald C. Jackson, based on information provided by Assistant Superintendent James L. Wine and his staff, 1984

Transmitted by: Jean P. Yearby, HAER, 1985

Operation of the Burnsville station began in 1917 when two engine/compressor units (#1 and #2) were put "on line." At that time, the boilers which produced the steam used to power the engine/compressor units were coal-fired. In 1935-36 the station converted to gas-fired boilers and increased its pumping capacity with the addition of another engine/compressor unit (#0) in 1943. Interestingly, this latter unit was identical to the units (#1 and #2) installed in 1917. In 1936 the station was once again enlarged, this time with the addition of a "low pressure compressor" designed to raise the pressure of "field gas" gathered from Burnsville area wells so that it could be pumped towards Pittsburgh along with other gas in the Equitable system. This low pressure compressor unit (#3) was apparently relocated from some other gas pumping station because it is of the same basic technological design as the 1917 units. For forty years after 1943 the Burnsville station experienced no major additions or alterations.

The basic operation of the Burnsville station can be synopsized as follows: Water for the boilers is taken from the Little Kanawha River and "preheated" using waste heat from the steam engine condensers. In the "hot well" located outside the boiler house, water from the river is mixed with "recycled" water from the condensers. This water is then drawn into the boiler house where a heater pump raises it up into a heater tank. From the heater, tank water is gravity fed to the turbine pumps (where minerals and other impurities are also removed) before being delivered to the boilers. From the boilers, steam is delivered to the engine/compressor units at 150 pounds per sq. inch (psi). The engine/compressors are divided into two stages, a "high stage" and a "low

stage," whereby the steam is used to power two separate steam engines. In tandem, the two steam engines of each unit were reportedly rated at 1650 HP. After going through first the "low stage" and then the "high stage" engine, steam is drawn to the condensor, where it is converted from a gaseous to a liquid state. From there, the condensed water is recycled back to the "hot well."

The low pressure compressor (unit #3) is used to increase the pressure of field gas gathered in the Burnsville area from 5 psi to 40 psi. The other compressor units (#0, #1, #2) are capable of pumping gas at a maximum pressure of 300 psi, but the actual transmission pressure can vary widely depending upon the needs of the entire system. Normal pumping pressure in 1984 was usually around 130 psi. In 1980 the station pumped an average of approximately 30,000,000 cubic feet per day. Though this constituted a large amount of gas, it was far lower than the 102,955,000 cubic feet pumped on March 22, 1952. After leaving the compressors the gas is approximately 270°F and it is necessary that it be cooled to around 80°F before being sent north. This cooling is important because if the gas was shipped through the transmission pipes at a high temperature, then oil would condense in the pipes as the gas cooled and cause maintenance problems. Consequently, gas from the compressors is run through a system of water-cooled pipes located outside of the pumphouse before leaving the station.

In 1984 the station was operated by three four-man crews working 8 hour shifts. On each shift two men worked in the pumphouse making sure all the

equipment was properly lubricated and one man worked in the boiler house to insure that no mechanical problems went unnoticed. The shift supervisor made sure that the station properly responded to the demands of the entire Equitable system and directed all routine, and emergency, maintenance required to keep the station functioning properly. Interestingly, the new gas engine, powered pumping station, being built by Equitable to replace the historic steam powered facility, will require a total crew of only four men to operate it on a 24 hour a day basis. In essence, the new station will require only 1/3 the personnel of the old station. The new station is scheduled to become fully operational in 1985.

ADDENDUM TO  
BURNSVILLE NATURAL GAS PUMPING STATION  
Frontage Avenue between Little Kanawha River and  
C&O Railroad line  
Burnsville  
Braxton County  
West Virginia

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