ST. MARY'S HOSPITAL

HIGHWALL PROJECT

NORTON, VIRGINIA

SUBMITTED BY:

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PROJECT STARTED: AUGUST 13, 1999

PROJECT COMPLETED: JUNE 12, 2000

CONSTRUCTION COST: $515,677.11

RECLAIMED BY: THE VIRGINIA ABANDONED MINE LAND PROGRAM AND LITTLE HENRY'S EXCAVATING & PAVING, INC.

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Background

St. Mary's Hospital, a 133- bed hospital that provides 24-hour emergency services, was constructed on an area that was surface mined during the 1970's. The hospital carries out the healing mission of the Catholic Church through the ministry of the Poor Servants of the Mother of God (the Sisters). It is located at the intersection of Virginia Avenue and Third Street in the City of Norton, which has the distinction of being the smallest City in the Commonwealth of Virginia.

Early settlement occurred in Norton in the late eighteenth century. The development of railways and coal mining provided the pivotal seeds for expansion of population, commerce and industry. Extensive surface and underground mining of four coal seams occurred within the City with most of the mining being performed prior to the enactment of the Surface Mining Coal Reclamation Act of 1977. The mining left several sections of dangerous highwall and other mine related hazards in the area. With the typical steep mountainous terrain being the normal topography, City developments quickly expanded to the flattened excavated benches left by the mining.

The hospital, the Medical Arts Building, the Norton elementary school, Cavanche Apartment buildings and private residences were all constructed on previously surface mined areas. Four separate sections of highwalls were dangerously close to the hospital, Virginia Avenue and Third Street. Highwalls aligned both sides of Third Street, the main access to the hospital and other developments. Exposed in the highwall were underground mine works which resulted in unstable slopes and hazardous mine openings. City road crews had to be dispatched on numerous occasions to remove material that had fallen onto Third Street from the highwall. The Medical Arts Building parking lot was located at the very edge of a dangerous highwall. The highwall at the St. Mary's Hospital emergency room entrance actually hung over a portion of the parking area. A dangerous highwall also extended along Virginia Avenue, the main access to the Cavanche Apartments.

Over the years the highwalls had become increasingly unstable. Large rocks were continuously falling onto the parking areas and onto the access roads. Norton City officials contacted the Department of Mines, Minerals & Energy (DMME), Division of Mined Land Reclamation (DMLR) expressing their concern about possible injuries to people from rocks falling from the highwall and requested assistance to eliminate the hazardous conditions.

Pre-Construction Planning

Teamwork and careful planning by the Abandoned Mined Land (AML) and the DMLR technical services engineering staff was essential to achieve successful reclamation while maintaining public safety and un-impeded traffic flow to and from St. Mary's Hospital, Norton Elementary School as well as local residences. Third Street, the road leading to the hospital's emergency room, could not be blocked or impeded at any time. There are approximately 450 students enrolled at Norton Elementary and about 300 employees at the hospital.

Third Street and Virginia Avenue are maintained and regulated by the City of Norton. Both streets are heavily traveled with an estimated 2,500 vehicles on a daily basis. In addition to the hospital, medical arts building, and local residential traffic, school buses traveled the streets on routine routes during the week. AML staff contacted the Virginia Department of Transportation to seek information to develop safe traffic flow patterns, safety lights and barricades during construction. Norton City officials and AML staff then worked together to design a traffic detour plan that would provide for the least traffic interruptions possible while providing public safety during construction. Also included in the plan was retention of all existing parking spaces.

Numerous utilities would be impacted by the construction work. Two 22 KV power lines that provide power to the City of Norton and one 12 KV power line would have to be relocated, and water and sewer lines located along Third Street would require protection. Utility lines that provided power and telephone communications to the hospital also had to be protected.

Meetings were held with the hospital administrative staff, Norton City officials, and the Old Dominion Power Company to discuss the proposed reclamation work. Constructing a retaining wall at the highwall located at the emergency room entrance was not a viable option because there was no competent foundation due to extensive underground mining. In addition, the hospital administrative staff was opposed to the construction of a retaining wall because it would mean the loss of the already limited parking space available. Reducing the highwalls through blasting was not possible because of their close proximity to the street, school, and hospital. Hospital officials also requested that the construction work to be limited to the hours of 7:00 a.m. to 7:00 p.m. The Old Dominion Power Company required ample lead-time for relocation of the two 22 KV power lines in order to obtain materials and schedule contract crews.

Reclamation Construction

Construction began on August 13, 1999 with the installation of a safety fence barrier at the base of the highwall adjacent to the hospital emergency room entrance. The 800 feet long 13 feet high safety fence was constructed of 6" x 6" x 16' pressure treated wooden posts and ¾" plywood laid in a herringbone pattern. Straw bales stacked three bales high were placed between the highwall and fence as an energy absorber. Dusk to dawn lighting was installed on top of the safety fence as a temporary lighting replacement for the streetlights that were removed. The contractor implemented precautionary traffic control measures at the hospital parking lot to ensure the emergency room entrance would not be blocked and to provide for the safety of the public. Meanwhile Old Dominion Power Company began relocating the two 22 KV and 12 KV power lines from the highwall adjacent to Third Street.

A 320 Cat excavator fitted with a 4,000 lb. series hydraulic hammer was used to split and scale the highwall back. The contractor proceeded carefully to prevent free rolling rock. Initially this work was going quickly due to the deteriorated condition of the exposed wall. However once the outer portions of rock were removed, extremely hard sandstone was encountered. Excavation slowed tremendously. Haul trucks were sitting idle waiting for enough material to be generated for a load. The contractor brought in a second excavator with a newly purchased hydraulic hammer to work simultaneously with the first one. However, even two hydraulic hammers working were not able to generate enough material to keep the haul trucks moving. The contractor began working excavators twelve hours shifts and haul trucks ten hours in order to keep the excavation and hauling balanced. Mechanical problems plagued the hydraulic hammers due to the hardness of the sandstone. Further complications existed due to power poles carrying a 56 KV circuit line that were located within 20 feet of the top of the wall. These lines could not be feasibly relocated. Old Dominion Power Company determined that the contractor could safely work under the lines but was restricted to work no closer than fifteen feet of the power poles.

Several small disposal sites were selected because of the close proximity of so many structures and the lack of a single disposal area that could contain all of the material. Although it was possible to access some of the disposal areas by traveling Virginia Avenue, a separate disposal route was constructed to keep haul trucks off this already congested public road. This route followed a small walking trail used by the Sisters for exercise. Upon completion of the work, the road was graded and seeded so that the Sisters could continue to utilize the trail.

Once Old Dominion Power Company completed relocating the power line on the south side highwall adjacent to Third Street, the contractor decided to mobilize two additional excavators equipped with hydraulic hammers to begin

work on the highwalls in this area in an effort to speed up work because of the slow progress on the highwall near the emergency room. AML staff contacted Norton City officials to inform them that Third Street would need to be restricted to one-way traffic only for a period of about 90 days. In order to inform the public, a news release was prepared and placed in local papers, radio and television.

The contractor installed 648 lineal feet of New Jersey Barriers with flashing lights along the centerline of Third Street. Traffic signs and safety barricades, following the Virginia Department of Transportation's specification for type III barricades, were installed with low intensity flashing lights. One-way traffic was only allowed to travel on the right side toward the hospital to ensure access to the emergency room entrance. Exiting traffic was directed onto Virginia Avenue and doubled back into the City's main street, Park Avenue.

Work began with the south section of highwall on which the power lines had been relocated. Excess spoil material was hauled directly across Third Street and disposed of on an upper level bench to eliminate a section of priority three highwall. It was necessary for flagmen to be in place at the street crossover to ensure public safety. In an effort to protect the pavement and curbing of Third Street from severe damage, the contractor placed a temporary surface of stone over the pavement. Work progressed on this section without incident.

Reclamation of the north side highwall adjacent to Third Street required re-directing traffic to the left side of the street while still maintaining the one-way traffic flow towards the hospital. AML staff and the contractor anticipated that there would be great possibility for public confusion with the re-directed traffic even with the presence of barricades and road signs. Flagmen were stationed for a period of time to direct traffic to the correct routes. With careful planning and extra attention to traffic control no accidents occurred.

Several other difficult issues were present during reclamation of this section of highwall. The contractor had to use extreme caution working around telephone lines adjacent to the highwall. The telephone lines provided service to the hospital and could not be interrupted or disconnected. The contractor was also responsible during construction to provide protection to a sewer system manhole and a concrete storm drainage channel. The concrete drainage channel ran along the full length of Third Street had to remain functional at all times during construction in order to carry surface drainage from the hospital area.

Reclamation was completed on June 12, 2000. AML staff held a post construction meeting with St. Mary's Hospital administration staff, a Norton City official, and an Old Dominion Power Company representative to discuss the

completed construction work. All parties were very pleased with the construction and complimentary of the reclamation.

Results and Benefits

The St. Mary's Hospital Highwall Project was accomplished directly in the heart of one of the busiest areas in the City. The construction work was completed without incident in a setting that was primed for potential accidents. Reclamation of the dangerous highwalls in this highly developed area eliminated several serious public health and safety hazards. Elimination of the highwall at the hospital provided a larger and much safer area for ambulances turning into the emergency room entrance. The public is no longer forced to travel between sections of unstable highwalls along Third Street. The project accomplished the goals of the Abandoned Mine Land Program by eliminating mine related health and safety hazards while also meeting the needs of all affected and concerned parties.

In addition, other community benefits resulted from the reclamation. The hospital and medical arts building actually gained more parking areas. One regraded and revegetated haulroad that led to a disposal site now provides a safe walking trail for the Sisters.

The success of this project is due to careful planning and construction management by DMME's Abandoned Mine Land staff and Division of Mined Land Reclamation design staff and the active involvement of the St. Mary's Hospital administrative staff and Norton City officials.

Photo Descriptions:

Photo 1 - Highwall elimination and safety fence at the St Mary's Hospital Emergency Room entrance

Photo 2 - Excavation under 56 KV power lines near the hospital

Photo 3 - Third Street during highwall elimination

Photo 4 - Third Street after highwall elimination

Photo 5 - Highwall at St. Mary's Hospital and parking lots before reclamation

Photo 6 - Highwall at St. Mary's Hospital and parking lots after reclamation