THROUGH THE COAL FIELDS

THE DEVELOPMENT OF THE NORFOLK & WESTERN RAILWAY THROUGH SOUTHWESTERN VIRGINIA AND SOUTHERN WEST VIRGINIA, INCLUDING A SURVEY OF HISTORIC TUNNELS AND BRIDGES ALONG THE RADFORD AND POCAHONTAS DIVISIONS

FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION
21400 RIDGETOP CIRCLE
STERLING, VIRGINIA 20166-6511

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Research staff at the numerous libraries, archives, and museums, including but not limited to the National Register of Historic Places in Washington, D.C.; the Craft Memorial Library in Bluefield, West Virginia; the Iris Brammer Library in Narrows, Virginia; the Alderman Library at the University of Virginia, Charlottesville, Virginia; and the West Virginia State Archives in Charleston, West Virginia, provided invaluable research assistance.

Several individuals at state historic preservation offices or other regional or local institutions are thanked for their contributions to the project. Ginger Williford, Structural Historian at the West Virginia Division of Culture and History; Marc Holma, Architectural Historian with the Virginia Division of Historic Resources; Janie-Rice Brother, Donna Neary, and Yvonne Sherrick of the Kentucky Heritage Council; and Mark Epstein and Connie Torbeck of the Ohio Historic Preservation Office assisted in development of the Memorandum of Agreement (MOA) and/or reviewed this report and the inventory forms prepared for the surveyed bridges and tunnels in their respective states. The report was also reviewed by individuals at the Coal Heritage Authority, Norfolk Southern, and the Pulaski County (Virginia) Historical Society, and by representatives of the Pulaski County Government.

Special thanks go to the O. Winston Link Museum of Roanoke, Virginia. During the 1950s, Winston Link, one of the most skillful photographers in the country, worked to document the last days of steam operation along the Norfolk and Western Railway. The beautiful photographs that documented the Railway illustrate Link's fascination with the power of the railroad and the engineering marvels of locomotives, bridges, and tunnels. These images can be seen at the O. Winston Link Museum in Roanoke, Virginia (www.linkmuseum.org).

Thanks also to the Norfolk Southern Corporation, West Virginia University, Chris DellaMea (www.coalcampusa.com), and the Library of Congress for the use of their historic images and maps to enhance this report.

Safety Notice: *The surveyors were accompanied at all times by Norfolk Southern personnel at each of the surveyed bridges and tunnels, where stringent safety procedures, including the wearing of safety helmets, visors, and boots were required. While the public may observe and admire the bridges and tunnels discussed in this report, trespassing on railroad property is prohibited. Walking along the railroad right-of-way, crossing a railroad bridge, or entering a tunnel is extremely dangerous and should never be attempted without the express permission and assistance of Norfolk Southern Corporation.*

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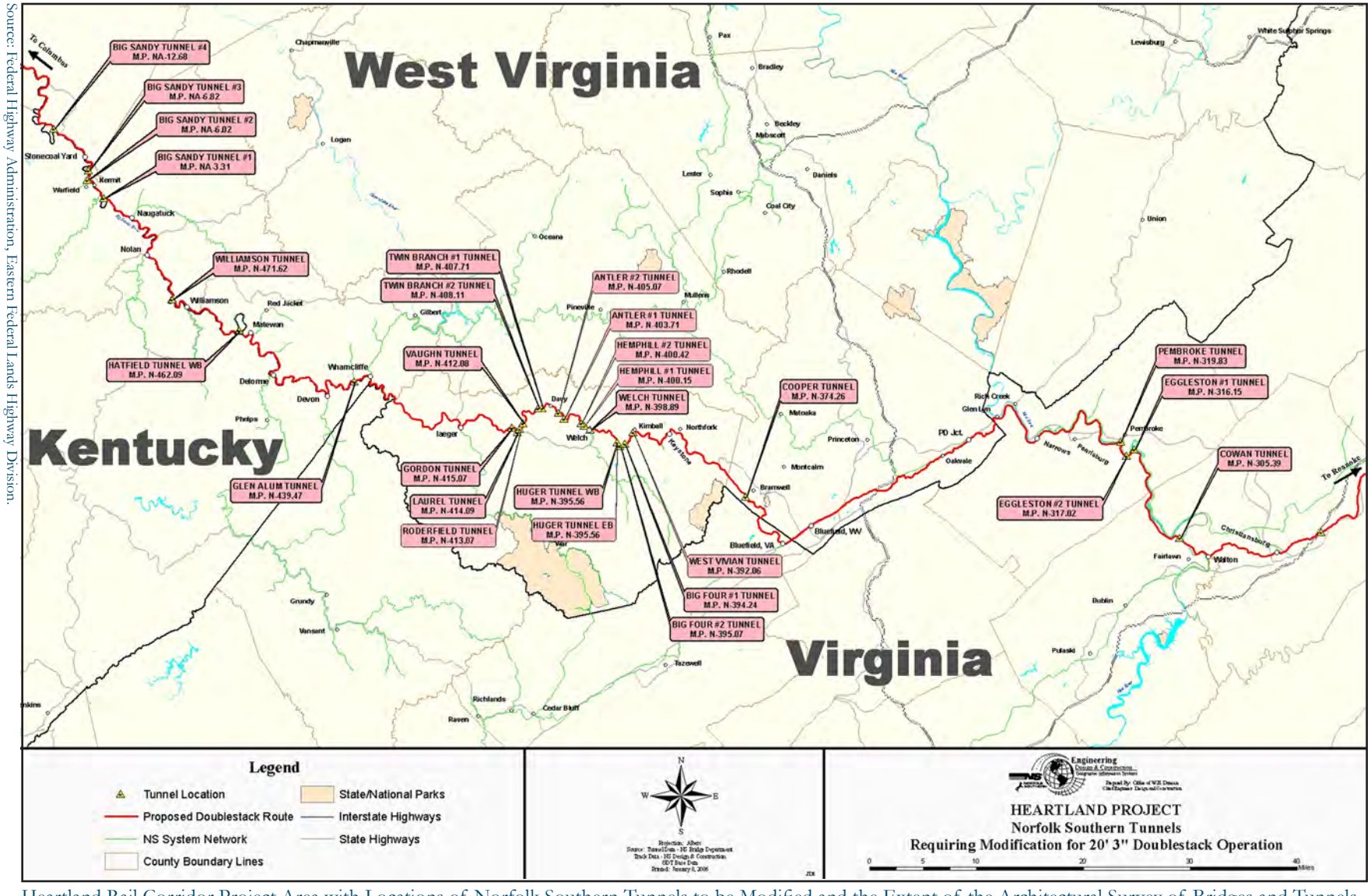
1. PROJECT BACKGROUND AND DESCRIPTION

The federal government, through the Federal Highway Administration's (FHWA) Eastern Federal Lands Highway Division, is providing funding for the Heartland Corridor rail clearance project. This project involves improvements and alterations to selected bridges and tunnels along Norfolk Southern (NS) Corporation's Radford and Pocahontas Divisions in Virginia, West Virginia, and Kentucky, as well as several minor adjustments of overhead and rock slide fences (www.efl.fhwa.dot.gov/projects-heartland-corridor.aspx). The project corridor extends from Cowan, Virginia (NS Milepost 305.43) to Bull, West Virginia (NS N.A. 12.68). Construction activities for the project will consist of double-stack vertical and horizontal clearance activities along the NS main line, which will be initiated and contracted by NS with oversight by the FHWA for those activities utilizing federal funds.

Section 106 of the *National Historic Preservation Act* (NHPA) of 1966, as amended, mandates the consideration of the effects to cultural resources (both archaeological and architectural) from any federally permitted, licensed, or funded undertaking, such as the Heartland Corridor project. Following consultation between the FHWA and the State Historic Preservation Officers (SHPOs) of Virginia, West Virginia, Kentucky, and Ohio—the Virginia Department of Historic Resources (VA SHPO), the West Virginia Division of Culture and History (WV SHPO), the Kentucky Heritage Council (KY SHPO), and the Ohio Historic Preservation Office (OH SHPO)—a Memorandum of Agreement (MOA) was developed to mitigate the adverse effects to historic resources from the Heartland Corridor project. (Although the project will adversely affect neither the railroad corridor nor any bridges or tunnels in Ohio, since the railroad corridor is considered a single property, the OH SHPO has been a participant in the consultation and is a signatory to the MOA.) The MOA was signed by the FHWA and the four consulting SHPOs in August 2007 (Appendix A).

The activities stipulated in the MOA included an historic architectural survey of 112 bridges and tunnels (as well as four abandoned tunnels) along the NS main line between Cowan, Virginia, and Bull, West Virginia, and preparation of a general history of the rail corridor between these two points. According to the MOA this history should be a "written record of the general history, people, and companies involved in the railroad's construction, maintenance, and ownership . . . based on research of the available records of the respective states [and] counties in the corridor and the Norfolk Southern Corporation." Additional survey products were to include a photographic record and completed state historic inventory forms for the 116 historic resources along the project corridor, drawings of the portal openings for five tunnels (Cowan, Cooper, Pembroke, Williamson, and Big Sandy No. 4), and mapping of all surveyed resources on labeled sections of USGS 7.5-minute quadrangle maps.

The historic architectural survey of 114 bridges and tunnels in the project corridor in Virginia, West Virginia, and Kentucky was completed in 2007 (Table 1). The abandoned Big Four Tunnel #1, located near Mile Post 394.24, has been "daylighted" and is no longer extant, and therefore was not recorded as part of this survey. In addition, a modern ballast deck bridge at Mile Post 361.48 in Bluefield, Virginia was not recorded at that time. That bridge was eventually surveyed in 2009, along with an additional bridge at Mile Post 362.85.



Source: Federal Highway Administration, Eastern Federal Lands Highway Division.

Heartland Rail Corridor Project Area with Locations of Norfolk Southern Tunnels to be Modified and the Extent of the Architectural Survey of Bridges and Tunnels.

Table 1. Bridges and Tunnels Documented During the Heartland Corridor Survey.

Active Tunnels and Bridges

Location	State	Mile Post	Type	Crossing
Cowan	VA	305.43	Tunnel	Cowan Tunnel
Belspring	VA	308.76	Deck Plate Girder	State Route 600 and Back Creek
Parrott Siding	VA	310.66	Deck Plate Girder	State Route 600
Eggleston	VA	316.15	Tunnel	Eggleston Tunnel #1
Eggleston	VA	317.02	Tunnel	Eggleston Tunnel #2
Pembroke	VA	319.83	Tunnel	Pembroke Tunnel
Pembroke	VA	320.66	Steel Beam	Rocky Hollow
Ripplemead	VA	321.87	Deck Plate Girder	Walker's Creek
Narrows	VA	333.73	Steel Beam	State Route 100
Narrows	VA	333.82	Deck Plate Girder	State Route 649 and Wolf Creek
Lurich	VA	338.71	Concrete Stone Arch	State Route 649
Glen Lyn	WV	340.68	Deck Plate Girder	East River
Glen Lyn	WV	340.79	Warren Deck Truss, Deck Plate Girder	East River
Wills	WV	341.60	Warren Deck Truss, Deck Plate Girder	East River
Wills	WV	343.02	Deck Plate Girder	County Route 219/8
Ingleside	WV	346.44	Deck Plate Girder	County Route 219/6 and Pigeon Creek
Ingleside	WV	346.62	Deck Plate Girder	East River
Ingleside	WV	349.13	Deck Plate Girder	State Route 112
Ingleside	WV	351.21	Deck Plate Girder	State Route 112
Ingleside	WV	352.00	Deck Plate Girder	State Route 112 and East River
Ingleside	WV	352.15	Deck Plate Girder	State Route 112 and East River
Ingleside	WV	352.83	Deck Plate Girder	State Route 112 and East River
Ingleside	WV	354.13	Deck Plate Girder	East River
Ada	WV	359.74	Deck Plate Girder	State Route 112
Bluefield	WV	361.48	Ballast Deck	NS Tracks
Bluefield	WV	362.23	Warren Through Truss	NS Tracks
Bluefield	VA	362.85	Deck Plate Girder	NS Tracks
Bluefield	VA	366.42	Deck Plate Girder	Bluestone River
East Furnace	VA	366.68	Deck Plate Girder	Bluestone River
East Furnace	VA	366.79	Half-Through Plate Girder	Bluestone River
East Furnace	VA	367.20	Deck Plate Girder	Bluestone River
Hale	VA	367.37	Deck Plate Girder	Bluestone River
Hale	VA	367.52	Warren Deck Truss	State Route 102
Hale	VA	367.79	Deck Plate Girder	Bluestone River
Hale	VA	368.08	Deck Plate Girder	Bluestone River
Falls Mill Scanner	VA	369.21	Deck Plate Girder	State Route 717 and Bluestone River
Falls Mills	VA	369.52	Deck Plate Girder	Bluestone River
Flat Top	VA	370.54	Half-Through Plate Girder	Private Road
Nemours	WV	372.06	Deck Plate Girder	Bluestone River
Bluestone	WV	373.40	Deck Plate Girder	Private Road
Bluestone	WV	373.91	Deck Plate Girder	Bluestone River

Table 1. Bridges and Tunnels Documented During the Heartland Corridor Survey.

Active Tunnels and Bridges

Location	State	Mile Post	Type	Crossing
Bluestone	WV	374.26	Tunnel	Cooper Tunnel
Bluestone	WV	374.45	Deck Plate Girder, Warren Deck Truss	County Route 20/9, Bluestone River
Maybeury	WV	375.52	Tunnel	Elkhorn Tunnel
Maybeury	WV	378.64	Warren Through Truss, Half-Through Plate Girder	County Route 52/12, Elkhorn Creek
North Fork	WV	385.91	Half-Through Plate Girder	Elkhorn Creek
North Fork	WV	386.50	Half-Through Plate Girder	Elkhorn Creek
Burke Spur	WV	387.00	Half-Through Plate Girder	Elkhorn Creek
Eckman	WV	388.07	Half-Through Plate Girder	Elkhorn Creek
Landgraff Scanner	WV	389.78	Half-Through Plate Girder	Elkhorn Creek
Vivian	WV	392.01	Deck Plate Girder	Road, Elkhorn Creek
Vivian	WV	392.06	Tunnel	West Vivian Tunnel
Vivian	WV	392.34	Deck Plate Girder	Road, Elkhorn Creek
Big Four	WV	393.16	Deck Plate Girder	Road, Elkhorn Creek
Big Four	WV	394.24	Tunnel	Big Four Tunnel #1
Huger	WV	395.07	Tunnel	Big Four Tunnel #2
Huger	WV	395.19	Deck Plate Girder	Elkhorn Creek
Huger	WV	395.56	Tunnel	Huger Tunnel Westbound
Huger	WV	395.56	Tunnel	Huger Tunnel Eastbound
Huger	WV	395.65	Deck Plate Girder	State Route 52/17 and Private Road
Huger	WV	395.65	Deck Plate Girder	Elkhorn Creek and Private Road
Maitland	WV	396.41	Half-Through Plate Girder	County Route 52/17 and Elkhorn Creek
Welch	WV	398.89	Welch Tunnel	Welch Tunnel
Tug	WV	399.19	Deck Plate Girder	US 16 and Tug Fork
Hemphill	WV	400.08	Half-Through Plate Girder	Tug Fork
Hemphill	WV	400.15	Tunnel	Hemphill Tunnel #1
Hemphill	WV	400.35	Deck Plate Girder	Road, Tug Fork
Hemphill	WV	400.42	Tunnel	Hemphill Tunnel #2
East Farm	WV	401.01	Deck Plate Girder	Tug Fork
Caples	WV	401.53	Deck Plate Girder	Upper Shannon Branch
West Farm	WV	402.92	Warren Through Truss	Tug Fork
Mohegan	WV	403.61	Half-Through Plate Girder	Tug Fork
Mohegan	WV	403.71	Tunnel	Antler Tunnel #1
Old Panco Siding	WV	405.07	Tunnel	Antler Tunnel #2
Old Panco Siding	WV	405.22	Deck Plate Girder	Tug Fork
Davy	WV	406.57	Deck Plate Girder	Tug Fork
Davy	WV	407.01	Ballast Deck	Big Davy Creek
Twin Branch	WV	407.71	Tunnel	Twin Branch Tunnel #1
Twin Branch	WV	408.05	Deck Plate Girder	State Route 7 and Tug Fork
Twin Branch	WV	408.11	Tunnel	Twin Branch Tunnel #2
Marytown	WV	409.19	Deck Plate Girder	Tug Fork

Table 1. Bridges and Tunnels Documented During the Heartland Corridor Survey.

Location	State	Mile Post	Type	Crossing
Active Tunnels and Bridges				
Roderfield	WV	412.01	Deck Plate Girder	State Route 81 and Tug Fork
Roderfield	WV	412.08	Tunnel	Vaughan Tunnel
Roderfield	WV	413.01	Deck Plate Girder	County Route 7 and Tug Fork
Roderfield	WV	413.07	Tunnel	Roderfield Tunnel
Roderfield	WV	413.26	Deck Plate Girder	County Route 52/10 and Tug Fork
Rogers	WV	414.04	Deck Plate Girder	Tug Fork
Rogers	WV	414.09	Tunnel	Laurel Tunnel
Rogers	WV	415.01	Ballast Deck	US 52 and Tug Fork
Rogers	WV	415.07	Tunnel	Gordon Tunnel
East Wilmore	WV	416.00	Deck Plate Girder	US 52 and Tug Fork
Mohawk	WV	430.97	Deck Plate Girder	Long Pole Creek
Four Pole Spur	WV	432.25	Deck Plate Girder	Four Pole Creek
Wharncliffe	WV	437.85	Deck Plate Girder	Ben Creek
Glen Alum	WV	439.47	Tunnel	Glen Alum Tunnel
West Devon	WV	447.36	Deck Plate Girder	Beech Creek
Lick Fork Spur Junction	WV	455.25	Deck Plate Girder	Private Road
Matewan	WV	460.56	Deck Plate Girder	Pedestrian Access
Sprigg	WV	462.01	Warren Through Truss	Tug Fork
Sprigg	KY	462.09	Tunnel	Hatfield Tunnel Westbound
Sprigg	KY	462.09	Tunnel	Hatfield Tunnel Eastbound
Sprigg	WV	462.30	Half-Through Plate Girder, Warren Through Truss	Tug Fork
Williamson	WV	469.51	Deck Plate Girder	Vinson Street
Williamson	WV	469.77	Deck Plate Girder	Harvey Street
Williamson	WV	471.62	Tunnel	Williamson Tunnel
Lizann Mining	WV	479.30	Deck Plate Girder	Millers Creek
Naugatuck	WV	000.20	Warren Through Truss	Pigeon Creek
Panco Siding	WV	003.31	Tunnel	Big Sandy Tunnel #1
Grey Eagle	WV	006.02	Tunnel	Big Sandy Tunnel #2
Grey Eagle	WV	006.70	Deck Plate Girder	Marrowbone Creek
Grey Eagle	WV	006.82	Tunnel	Big Sandy Tunnel #3
Buffalo Mining	WV	010.36	Deck Plate Girder	County Route 52/31 and Jennys Creek
Bull	WV	012.68	Tunnel	Big Sandy Tunnel #4
Abandoned Tunnels				
Eggleston	VA	N/A	Abandoned Tunnel	Eggleston Tunnel #1
Eggleston	VA	N/A	Abandoned Tunnel	Eggleston Tunnel #2
Twin Branch	WV	N/A	Abandoned Tunnel	Twin Branch Tunnel #2
Big Four*	WV	N/A	Abandoned Tunnel	Big Four Tunnel #1

**Not surveyed; tunnel has been daylighted.*

2. SURVEY METHODS

Background Research

Project staff conducted site-specific research on each of the specified bridges and tunnels in the 125-mile project corridor, as well as background research on the general history of the Norfolk & Western Railway and its route through the coal fields of southwestern Virginia, southern West Virginia, and eastern Kentucky.

Primary and Secondary Research Sources

The researchers consulted such primary sources as the *Annual Reports* of the Norfolk & Western Railroad (Norfolk and Western Railway after 1896) between 1881 and 2003; correspondence files on each bridge and tunnel kept at the Norfolk Southern Archives in Atlanta, Georgia; historic railroad maps showing the routes of the Norfolk & Western Railway through the project area; Sanborn Insurance Map Company maps of towns and cities in the project area; records of the Pocahontas Fuel Company, the principal land leasing company in the project area in the early twentieth century; drawings of the surveyed tunnels prepared by Norfolk & Western engineers; and blueprint drawings of the surveyed bridges prepared by such companies as the American Bridge Company and the Virginia Bridge & Iron Company, among others. These primary sources were used to establish construction dates for the surveyed tunnels and bridges, as well as to document the Norfolk & Western's construction history through the project area.

Secondary sources included published histories of the counties within the project area: Mercer, McDowell, Mingo, and Wyoming counties, West Virginia; Montgomery, Pulaski, and Giles counties, Virginia; and Pike County, Kentucky; published histories of the cities of Bluefield, West Virginia; and Radford, Virginia; National Register of Historic Places (NRHP) nominations for individual landmarks and historic districts in the three-state project area; published histories of the Norfolk & Western Railway and its predecessor railroad companies; general histories of coal mining, coal companies, and coal company towns in the project area; M.A. theses and Ph.D. dissertations on the project area; pictorial works on the Norfolk & Western Railway and the project area; on-line postcard and photographic archives; and city and county directories of the project area.

Research Repositories

The researchers conducted background and site-specific research at a wide variety of national, state, and local repositories in Virginia, West Virginia, Washington, D.C., and Georgia. Research personnel at the Norfolk Southern Archives in Atlanta, Georgia scanned all available engineering drawings, photographs, valuation tax maps, and correspondence files for each of the surveyed bridges and tunnels and placed these on CD-ROM discs. The repositories consulted as a part of this project include:

Virginia:

- Virginia Department of Historic Resources Archives, Richmond
- Virginia State Library and Archives, Richmond
- Alderman Library, University of Virginia, Charlottesville
- Newman Library, Special Collections, Virginia Polytechnic Institute and State University, Blacksburg (Virginia Tech)
- Virginia Museum of Transportation, Roanoke
- Iris Brammer Public Library, Narrows
- Montgomery-Floyd Regional Library—Christiansburg Branch, Christiansburg

West Virginia:

- West Virginia State Archives, State Cultural Complex, Charleston
- West Virginia Division of Culture & History, Historic Preservation Section, Charleston
- Craft Memorial Library and Eastern Regional Coal Archives, Bluefield
- Hardway Library, Bluefield State College, Bluefield
- McDowell County Library—North Fork Branch, North Fork
- Mercer County Library—Princeton Branch, Princeton
- Mingo County Library—Matewan and Williamson Branches
- Wyoming County Library, Pineville

Washington, District of Columbia:

- Library of Congress, James Madison Annex—Prints and Photographs Division; Geography and Map Division
- National Register of Historic Places (NRHP), National Park Service
- National Trust for Historic Preservation

Georgia:

- Norfolk Southern Corporation Archives, Atlanta

Fieldwork

The architectural survey of bridges and tunnels along the NS Heartland Corridor project corridor between Cowan, Virginia (NS Milepost 305.43) and Bull, West Virginia (NS N.A. 12.68) was carried out according to all applicable federal and state standards. These include: *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48FR44742)*; *Guidelines for Conducting Survey in Virginia* (Department of Historic Resources May 2005); *Guidelines for Phase I Surveys, Phase II Testing, Phase III Mitigation, and Cultural Resource Reports* (West Virginia Division of Culture and History 1991); and *Instructions for Completing the Individual Buildings Survey Form 2007-1* (Kentucky Heritage Council 2007).

The primary fieldwork was conducted in July and October 2007, and was supplemented by additional fieldwork in August 2009. Accompanied by NS personnel, the surveyors visited each bridge or tunnel, recorded the setting, features, and characteristics of each resource, and noted any alterations or additions. In Virginia, a Virginia Department of Historic Resources *Reconnaissance Level Field Form* was completed. A West Virginia Division of Culture and History *Historic Property Inventory Field Form* was completed for resources in West Virginia, and the Kentucky Heritage Council's *Kentucky Individual Buildings Survey Form* was completed for resources in Kentucky. Information collected in the field was entered into the respective state's database for historic resources. A sketch site plan was prepared for each surveyed resource, showing its location relative to other nearby landmarks such as roads or rivers. All surveyed resources were mapped on sections of the relevant USGS 7.5-minute quadrangle maps.

A photographic record consisting of both labeled black-and-white prints and color digital photographs was generated for each surveyed bridge and tunnel. For tunnels, a view of each of the tunnel openings and portals was taken. For bridges, a view of the bridge from both ends and/or a side view were taken, depending on accessibility.

Survey Products

Completed survey packets, consisting of print-outs of state survey forms, labeled black-and-white photographs, USGS maps, site plans, and digital photographs on CD-ROM, were submitted to the respective State Historic Preservation Office (SHPO) for review and archiving, and a CD-ROM containing the survey information saved as portable document format (PDF) files is included as Appendix C to this volume. Original survey products for each state can be viewed at each SHPO's archives during normal business hours:

Virginia
Virginia Division of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221
(804)367-2323
www.dhr/virginia/gov

West Virginia
West Virginia Division of Culture and History, Historical Preservation Section
Cultural Center, State Capitol Complex
1900 Kanawha Boulevard East
Charleston, West Virginia 25305
(304)558-0240
www.wvculture.org

Kentucky
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601
(502)564-7005
www.state.ky.us/khc

Survey Report

The remainder of this report is organized in the following manner. Chapter 3 provides an historic context for the Norfolk & Western Railway, from the founding of its predecessor, the City Point Railroad, in 1837 up to and following its merger with the Southern Railway to form Norfolk Southern Corporation in 1982. Chapter 4 includes a more detailed examination of several of the cities, towns, and communities historically affected by the Norfolk & Western, most of which owed their founding to the railroad. The major bridge types and tunnels surveyed along the Norfolk Southern rail line as a part of the Heartland Corridor Project are discussed in Chapter 5. Chapter 6 includes a short conclusion, followed by a bibliography of relevant research sources.

Appendix A contains the MOA between FHWA and the four SHPOs. Appendix B includes print-outs of representative state survey forms and photographs from Virginia (Cowan Tunnel MP 305.43); West Virginia (Maybeury Bridge MP 378.64); and Kentucky (Hatfield Tunnel MP 462.09). Appendix C contains digital (PDF) copies of state survey forms and this report. Appendix D contains a list of preparers.

Following the stipulations of the MOA, copies of this report have been distributed to libraries, historical societies, and other research repositories in the project area.

3. HISTORIC CONTEXT

Few, if any, written narratives of the Norfolk & Western (N&W) Railway have failed to note the fact that the railroad, for most of its history, existed almost solely to transport coal from the mines of southern Virginia, southern West Virginia, and eastern Kentucky. As one of the preeminent coal carriers in these states, the N&W was also responsible for opening up the region to sustained development, bringing it unprecedented economic prosperity, and forever changing the landscape and population of this part of Appalachia. For nearly a hundred years beginning in the 1880s, the story of the N&W Railway is the story of this region, its people, and the communities that grew up around the railroad.

Predecessors of the Norfolk & Western Railroad

The origins of the N&W Railway can be traced back to the ten-mile-long City Point Railroad built in 1837 between City Point, near the head of navigation on the James River, and Petersburg, Virginia (Thomas 1925:1). This was only seven years after the inaugural trip of the first American railroad, the Baltimore & Ohio (B&O) between Baltimore and Ellicott City, Maryland. The City Point Railroad, although it also carried passengers, was built primarily for the transport of agricultural goods, timber and minerals, presaging the basic business philosophy of its eventual successor, the N&W Railway. In 1842, coal was discovered twenty miles above Petersburg and by the close of the year 350,000 bushels had been mined and shipped via rail (Thomas 1925:6). Thus began the close connection between coal and railroads in Virginia.

The City Point Railroad, like many others in Virginia and the South, was an only marginally successful carrier of mostly agricultural produce before the Civil War. In 1847, the City Point Railroad became the Appomattox Railroad; in 1854 it was sold to the Southside Railroad, which operated tracks between Petersburg and the important tobacco and manufacturing city of Lynchburg, also located on the James River in south-central Virginia (Lambie 1954:1). Further westward, connections with the Southside Railroad were planned in 1858 in conjunction with the East Tennessee & Virginia Railroad (Thomas 1925:10). The latter railroad had initiated service to Big Lick (later Roanoke, Virginia) in 1852 and had built shops at Central City (now Radford, Virginia) in 1856. The Civil War brought a halt to both railroads' ambitious expansion plans, and they were forced to concentrate on their roles as major carriers of Confederate troops, material, and vital agricultural produce within Virginia.

The Southside Railroad was seized and briefly operated by Union forces between 1864 and 1865, but was returned to private ownership shortly thereafter. The railroad's 1865 *Annual Report* contained the hope of its president that "the fact that the receipts have averaged over $1,000 per day since we resumed transportation ought to satisfy the most desponding that the future of the railroad will be as bright as its warmest friends ever anticipated" (Thomas 1925:17).

After the Civil War, the trend toward consolidation of smaller intercity lines in the Upper South to form larger, interconnected rail networks increased dramatically. In 1871, the Southside, the Norfolk & Petersburg, and the Virginia & Tennessee railroads were consolidated into the Atlantic, Mississippi & Ohio (AM&O) Railroad, indicative of the geographic aspirations of the new railroad's directors.

The company's founders forecast great things for Norfolk's future as a port city and dreamed of an unbroken rail connection with the Mississippi River more than 1,000 miles to the west. During 1873, the AM&O embarked on an ambitious program of improvements to its tracks, switching facilities, and passenger stations. Profits were mostly eaten up by these improvements, however, and the railroad's financial health was further aggravated by extensive flood damage to its bridges in 1873 and 1876. In 1876, the AM&O Railroad went into receivership. On April 4, 1881, its track bed, property, and franchises were sold at auction to the newly formed Norfolk & Western (N&W) Railroad Company (Thomas 1925:38).

Frederick Kimball, the Norfolk & Western Railroad, and the Development of the Flat Top Coal Fields in Southwestern Virginia

The N&W Railroad Company was formed in 1881 by a group of Philadelphia bankers associated with E.W. Clark & Company. The Clark family had already embarked on the construction of the Shenandoah Valley Railroad on a route that ran south from Hagerstown, Maryland, through the Shenandoah Valley of Virginia. Several of its members also sat on the board of the rival Louisville & Nashville Railroad (Lambie 1954:7). The owners of the new N&W Railroad aggressively cut freight rates, pressed for completion of the Shenandoah Valley Railroad line, and then arranged for its absorption into the N&W system. By the end of 1881, the N&W's first vice-president, Frederick J. Kimball, committed the railroad to a crucial path, "one that defines and summarizes Kimball's contribution to the railroad and is largely responsible for the distinctive pattern to this day . . . the reaching out into the coal fields" (Lambie 1954:19).

Kimball's vision for the N&W Railroad was based on his knowledge of previous investigations of the untapped coal resources of southwestern Virginia and southern West Virginia. As early as 1750, the explorer Thomas Walker had reported seeing coal outcroppings on Flat Top Mountain in western Virginia, and in 1800 Thomas Jefferson had mentioned the possibility of coal deposits there in his *Notes on the State of Virginia* (Lambie 1954:26).

Kimball had read the Haupt-Lecky Report submitted to the directors of the Shenandoah Valley Railroad that pointed to specific deposits of coal in the Clinch River valley of Tazewell County, Virginia (Lambie 1954:27). In 1873, geologist Captain Isaiah Welch and Major Jedediah Hotchkiss, the latter a friend of Kimball's, made a study documenting the extraordinarily rich and easily mined coal deposits that lay in the Elkhorn Valley of West Virginia, north of the Bluestone River. Based on these studies, Kimball decided that it was economically viable to build a railroad route to the coal deposits, thereby supplying coal directly to Eastern factories and domestic markets, as well as providing the N&W with its own source of cheap fuel.

Early on, Kimball decided that the N&W would not itself mine coal or own any coal companies; that would be left to independent coal operators who would pay the railroad to ship their freight and provide the railroad with cheap coal for its locomotives, all the while taking most of the business risks. In April, 1881, Kimball dispatched John Nuttall and Graham C. Wharton as agents for the railroad to pinpoint the specific lands most suitable for mining and to obtain lease options that could later be offered to coal operators at a profit to the N&W (Lambie 1954:28).

In May 1881, Kimball himself ventured to the region, showing particular interest in Flat Top Mountain in Tazewell County, Virginia. Kimball was struck by the quality and abundance of the coal in the Flat Top region, whose exploitation became the immediate goal for the railroad. According to one account, Kimball, on extracting a piece of coal from the ground with his penknife, uttered with some understatement: "This may be a very important day" (Harris 2003:114). It is said that Kimball's wife suggested the name Pocahontas for this coal vein (Harris 2003:114).

Building the Norfolk & Western's Radford (New River) Division to Bluefield, West Virginia

Planning the most efficient route for the railroad to the Flat Top Coal Fields was Kimball's first concern. Captain Welch and others argued for reaching the Flat Top region by following the course of the New, East, and Bluestone rivers through the valleys. Kimball believed that the N&W should construct its own exclusive route through the Virginia and West Virginia coal fields, instead of connecting with the line of the rival Chesapeake & Ohio (C&O) Railroad at Hinton, West Virginia.

Following delicate but ultimately successful negotiations with the other claimants to mining rights in the Flat Top region (specifically the planned but never-built New River Railroad Company), Kimball obtained control over the development of the region's coal, timber, and other mineral resources. In addition, the N&W obtained a monopoly of the freight traffic shipped from coal mines operating in the Flat Top region.

The Flat Top Coal Trust, a company connected to but not owned outright by the N&W, held the mining rights to over 230,000 acres of minerals and other lands in Tazewell County, Virginia, and Mercer County, West Virginia (Thomas 1925:51). Mining operations began at the Pocahontas Mine, near Laurel Creek, in Tazewell County in January 1882, with more than 40,000 tons of coal drawn from the ground in that year alone. The town of Pocahontas, laid out in 1881, soon comprised coal tipples and coke ovens, as well as houses built by the company for its workers. Within a year, Pocahontas contained nearly 1,000 inhabitants, in addition to seven stores and a hotel (Lambie 1954:33).

Work on the N&W Railroad's New River Division, which ran west from New River Depot in Pulaski County, Virginia and Central City (present-day Radford, Virginia) to Pocahontas, commenced in late 1881 (Kennedy 2004:8.13). From the beginning, the N&W decided against building a narrow-gauge line, and instead proceeded with plans to complete a wide five-foot gauge line. Kimball finally prevailed in his decision to drop the planned connection with the C&O Railroad at Hinton. Instead, the N&W Railroad's route followed the course of the New River through Virginia, with tunnels built at Pepper's Ferry (Cowan), Eggleston, and Pembroke to circumvent some of the most extreme of the river's horseshoe bends. Two of the original tunnels carved through the rock face at Eggleston can still be seen, although they were replaced by the present concrete-lined Eggleston Tunnels #1 & #2 in the early 1900s.

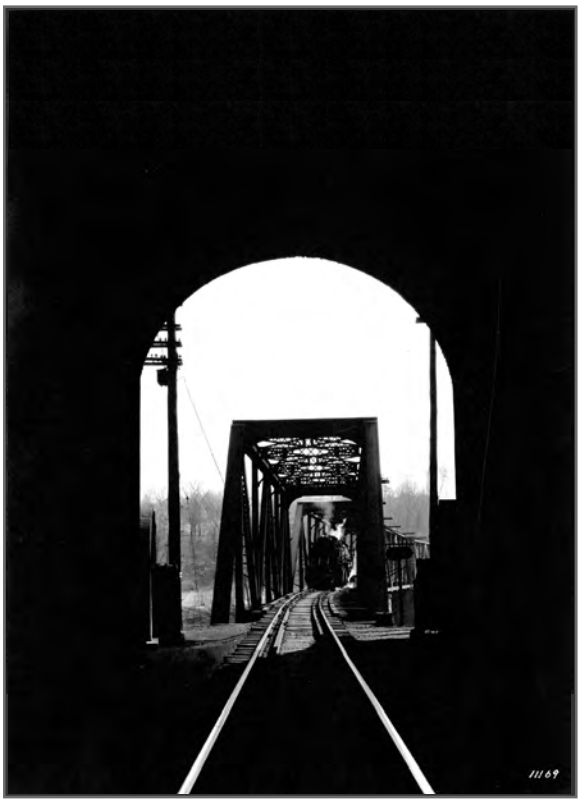
Source: TRC, September 2007.

View of Abandoned N&W Eggleston Tunnel #1, near Eggleston, Virginia.

Among the more important station stops planned along the route in Virginia west of Radford were Belspring and Narrows along the New River; the latter stop was located near Glen Lyn, Virginia, the point where the railroad line crossed into West Virginia. Thereafter, the route followed the course of the equally sinuous East River through West Virginia to a point west of present-day Bluefield, where it re-entered Virginia and proceeded west to Pocahontas.

Because coal mining operations at Pocahontas had begun in anticipation of the completion of the line, the mines there were prepared to ship as soon as the N&W Railroad arrived. On March 12, 1883 the first car of coal was loaded at the mine at Pocahontas bound for Norfolk, and on May 2 of that year the N&W's New River Division from New River Depot, Virginia to Bluefield, West Virginia was opened to regular rail traffic. That year, the N&W Railroad carried 81,900 tons of coal (Thomas 1925:52). In 1884, the N&W built the first of a series of piers at a new shipping and storage facility at Lambert's Point in Norfolk. This facility put the railroad on equal footing with the C&O Railroad, which had similar piers at Newport News, and boosted Norfolk as a port to rival Baltimore and Philadelphia (Lambie 1954:57).

The 1882 N&W *Annual Report* had predicted that "the completion of the New River Railroad from New River Station to the Flat Top Mountain Coal Region . . . will mark a new era of prosperity for this road



and the country traversed by it" (N&W Railroad 1882:3). The new shipping, repair, and switching facilities developed by the N&W at numerous points along its route led to increased economic activity in these communities. In Central City (Radford), for example, the N&W built a new stone passenger station, an office building, and the elegant Radford Inn (Kennedy 2004:8.13). Land companies formed by Northern speculators subdivided and developed much of the adjacent land in the town, and in 1892 the new city of Radford was incorporated. Roanoke for its part benefited as a junction point between the N&W and the Shenandoah Valley Railroad, which connected the city with Hagerstown, Maryland to the north. The N&W held a controlling interest in the Shenandoah Valley Railroad until 1890, when it acquired the railroad outright (Thomas 1925:45).

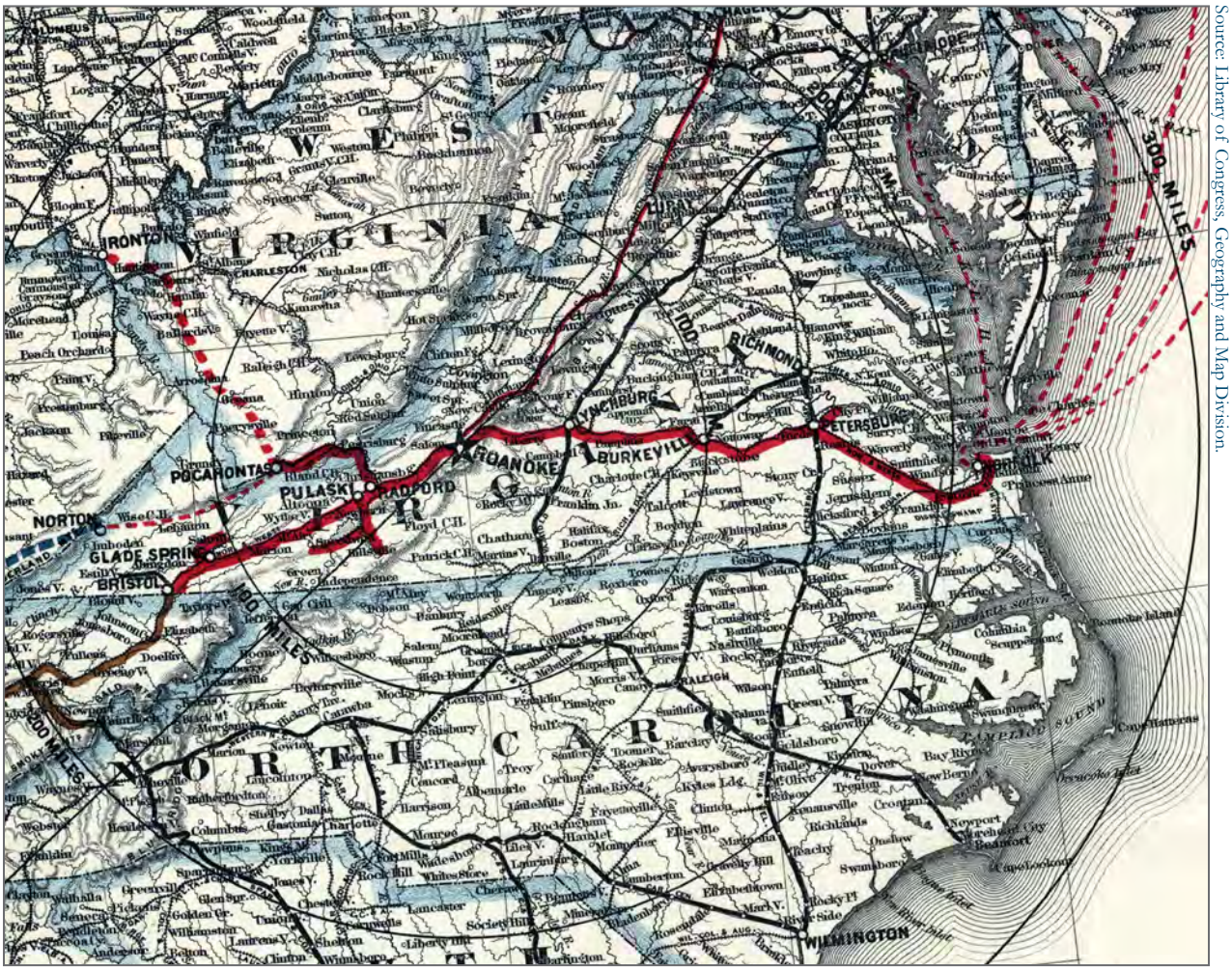
Photograph (ca. 1950) of a N&W Westbound Freight Train Crossing the New River Railroad Bridge before Entering the East Portal of the Cowan (Pepper) Tunnel (above left). N&W Depot, Glen Lyn, Virginia (above). N&W Depot, Belspring, Virginia (left).

Images courtesy of Norfolk Southern Corporation.

Building the Norfolk & Western's Pocahontas Division and the Ohio Extension

Planning for the construction of a rail route between Bluefield and the Ohio River had begun even before the completion of the New River Division. The N&W's 1883 *Annual Report* stressed the advantages of building a line to connect with existing railroads in the Midwest and eventually the West, in addition to more fully exploiting the West Virginia coal fields west of Bluefield in Mercer, Mingo, Wyoming, and McDowell counties.

Between 1884 and 1887, the N&W built its Bluestone Extension, from Mill Creek (now Maybeury) to Elkhorn, West Virginia. The Cooper Tunnel, completed in 1886, was the major engineering accomplishment along this line. The present Cooper Tunnel dates from 1902 and is a replacement of the original tunnel. Several new



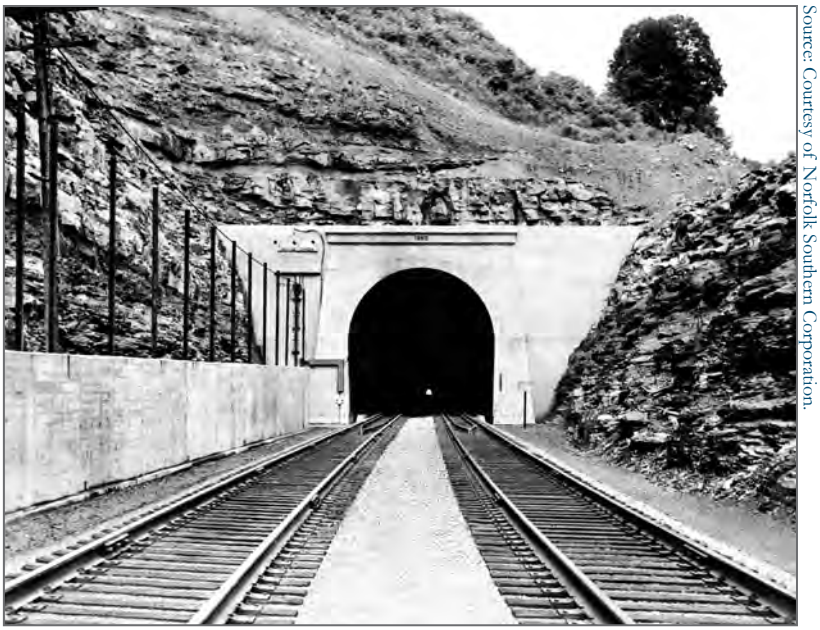
Source: Library of Congress, Geography and Map Division.

1887 Map of the N&W Railroad and Other Connecting Railroads, Showing the Completed Line Between Radford and Pocahontas, Virginia and the Projected Line to Ironton, Ohio on the Ohio River (Colton and Colton 1887).

mining operations were started along the proposed N&W route down the Bluestone River and up its western branches in West Virginia, in preparation for the completion of the N&W's line further into the coal field. The Beury-Cooper mines, located near present-day Bramwell, were the first to ship coal from a West Virginia mine. The first shipment was made November 10, 1884, the same day the N&W's line reached the area.

Construction at the Elkhorn Tunnel through Flat Top Mountain began in 1886. A major engineering feat, the tunnel opened up the Elkhorn Valley for sustained development of its coal resources (the present 7,100-foot long Elkhorn Tunnel was built in 1950 to replace the original tunnel). With the tunnel's completion in 1887, the N&W system had 554 miles of track in operation in Virginia, West Virginia, and Maryland (N&W Railroad 1893:3). In 1888, the N&W made Bluefield, West Virginia, formerly little more than a cluster of houses, the division point for its newly designated Pocahontas Division. The stage was set for the final push to the Ohio River.

Among the several routes of the N&W's Ohio Extension surveyed west of Bluefield at one time or another, two were deemed most feasible and liable to show the most immediate financial gain to the railroad. One followed the course of the Elkhorn, Pinnacle, Clear Fork, Coal, and Mud rivers. For a few years, this route was preferred by Kimball and others (Shawkey 1928:174). Following completion of further surveys in 1888, Kimball made the crucial decision to build the line along an alternative route that followed the course of the Tug Fork of the Big Sandy River west of Elkhorn for approximately 90 miles, then along Twelve Pole Creek for another



Source: Courtesy of Norfolk Southern Corporation.

Undated Photograph of the East Portal of the N&W's Elkhorn Tunnel, Completed in 1950.

70 miles before crossing the Ohio River at present-day Kenova, Ohio, and then on to Ironton, Ohio (Thomas 1925:55). Kimball wrote, "We desired to have a route which would give us easy grades, most economical in construction and operation, and the greatest amount of coal and lumber business" (Lambie 1954:123). He estimated the cost of construction for the planned Ohio Extension at six million dollars; the actual cost eventually exceeded eight million dollars.

Construction of the Ohio Extension (of which the N&W's Pocahontas Division is a part) commenced at both Bluefield and Kenova in December 1890. Because of the extremely winding nature of the water route through this valley, numerous major tunnels were planned. Construction of the tunnel at Hatfield Bend on the Tug Fork through Kentucky proved to be the most difficult. Kimball noted that the area, the center of the famous Hatfield and McCoy feud, was characterized by "so much lawlessness and shooting that we have found it almost impossible to get good men to work" (Lambie 1954:129).

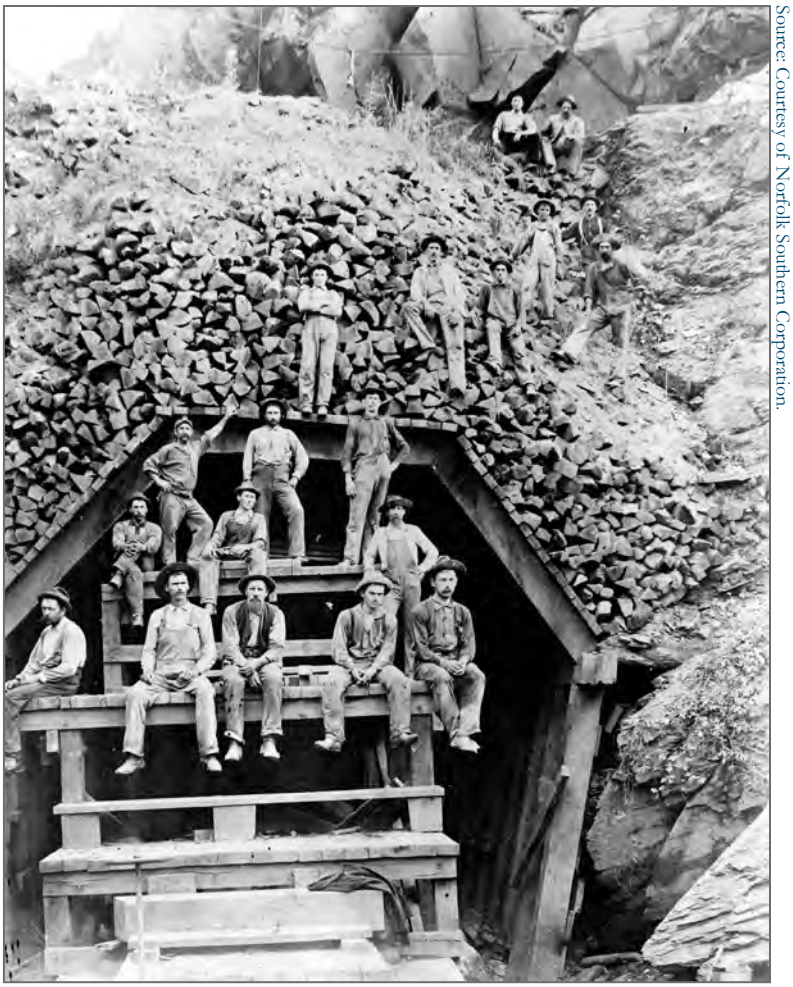
Constant bridging of the rivers and streams along whose courses the tracks were laid was required to avoid excessive curvature: "the Tug was crossed ten times, the Elkhorn thirteen, the Laurel Fork of Pigeon Creek four, and the Twelve Pole itself thirty-four" (Lambie 1954:130). Most of these early bridges were wooden trestles, although over the years they were replaced with metal bridges, usually plate girder bridges manufactured by such companies as the Virginia Bridge & Iron Company of Roanoke, Virginia, or the American Bridge Company of New York. Eventually eight tunnels were required, the longest of which, the Big Sandy Tunnel #1 at Panco Siding near Kermit, West Virginia, measured 2,627 feet long. An impressive steel bridge over the Ohio River was constructed at present-day Kenova, Ohio.

Coal mines continued to open during the 1890s as the N&W Railroad laid track along Elkhorn Creek and eventually reached Welch, in McDowell County. Among the earliest of these coal mines/coal camps were Maybeury, Elkhorn, Upland, and Keystone.

Source: TRC, October 2007.

Hatfield Tunnels, at Mile Post 462.09, Pike County, Kentucky.

Although the 1893 *Annual Report* stated that the Ohio Extension was sufficiently completed to permit operation along its tracks by November 1892, extensive ballasting and ditching were still required throughout 1893 to make it fully operational. When the approximately 400-mile stretch of track between Radford and Columbus, Ohio, was completed, the N&W could boast 1,556 miles of track (N&W Railroad 1893:1). Earlier, in 1890, the N&W had acquired the Scioto Valley & New England Railroad, which connected with the N&W at Ironton, Ohio, and therefore gave the N&W a direct connection with Columbus, Ohio.



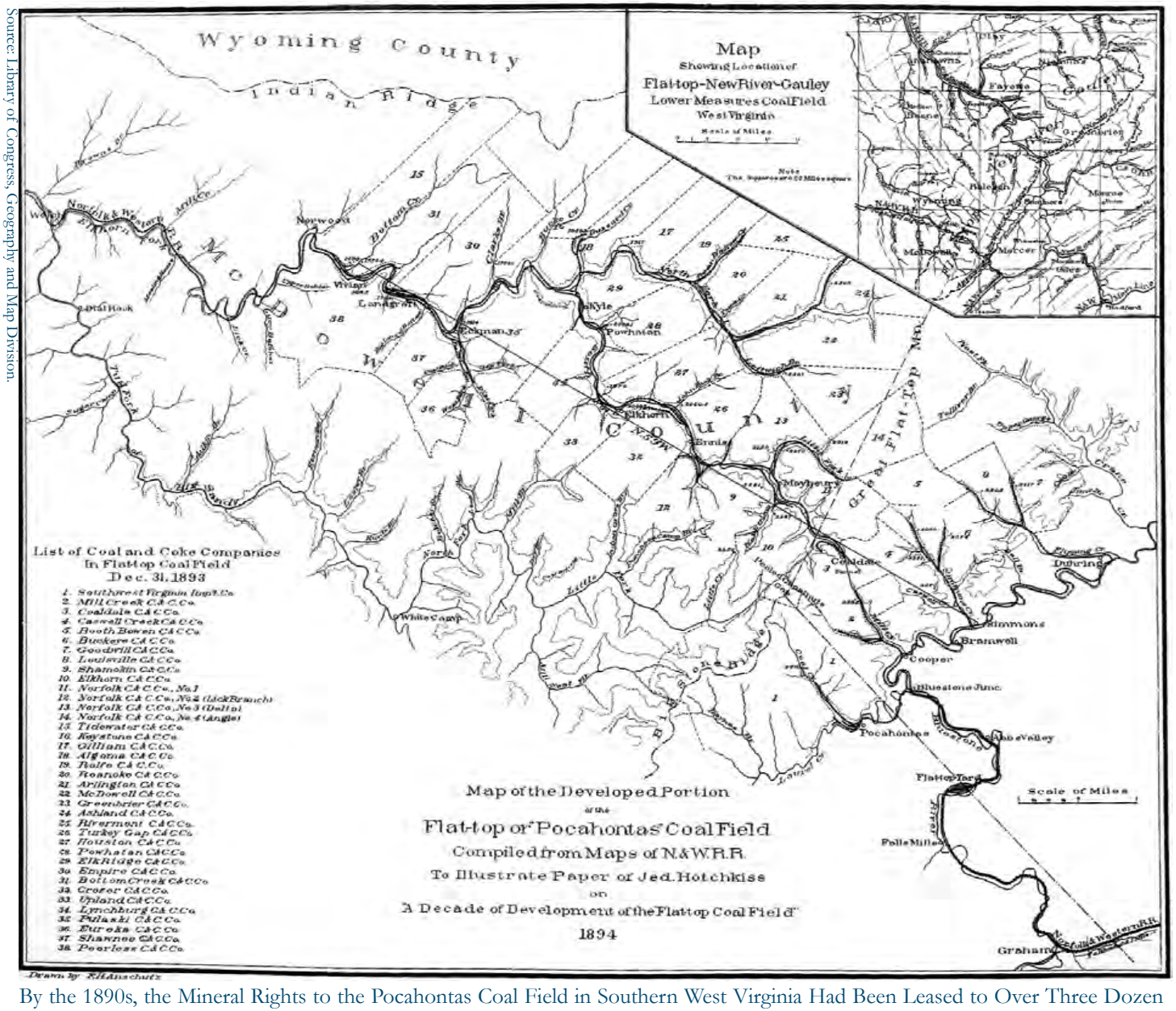
Source: Courtesy of Norfolk Southern Corporation.

N&W Bridge Gangs Building the Forms for Big Sandy Tunnel #4, near Bull, West Virginia.

By late 1893, the newly operational mines along the completed route were having an immediate effect on the N&W's freight hauling business: "The first year's operation of the Ohio Extension indicates clearly the important bearing it will have upon the traffic and revenue of your company, especially in coal, coke, and lumber shipments; the coal shipments over the extension amounted to 94,715 tons and the coke shipments to 167,724 tons" (N&W Railroad 1893:15). Kimball always believed that the decision to build the Ohio Extension through the coal fields was the right one, as it tied the railroad closely to the booming industrial economy of the Northeast and Midwest "Within a few years, as soon as our business over the Ohio Extension is developed, the Norfolk & Western will cease to be considered a Southern railroad" (Lambie 1954:133).

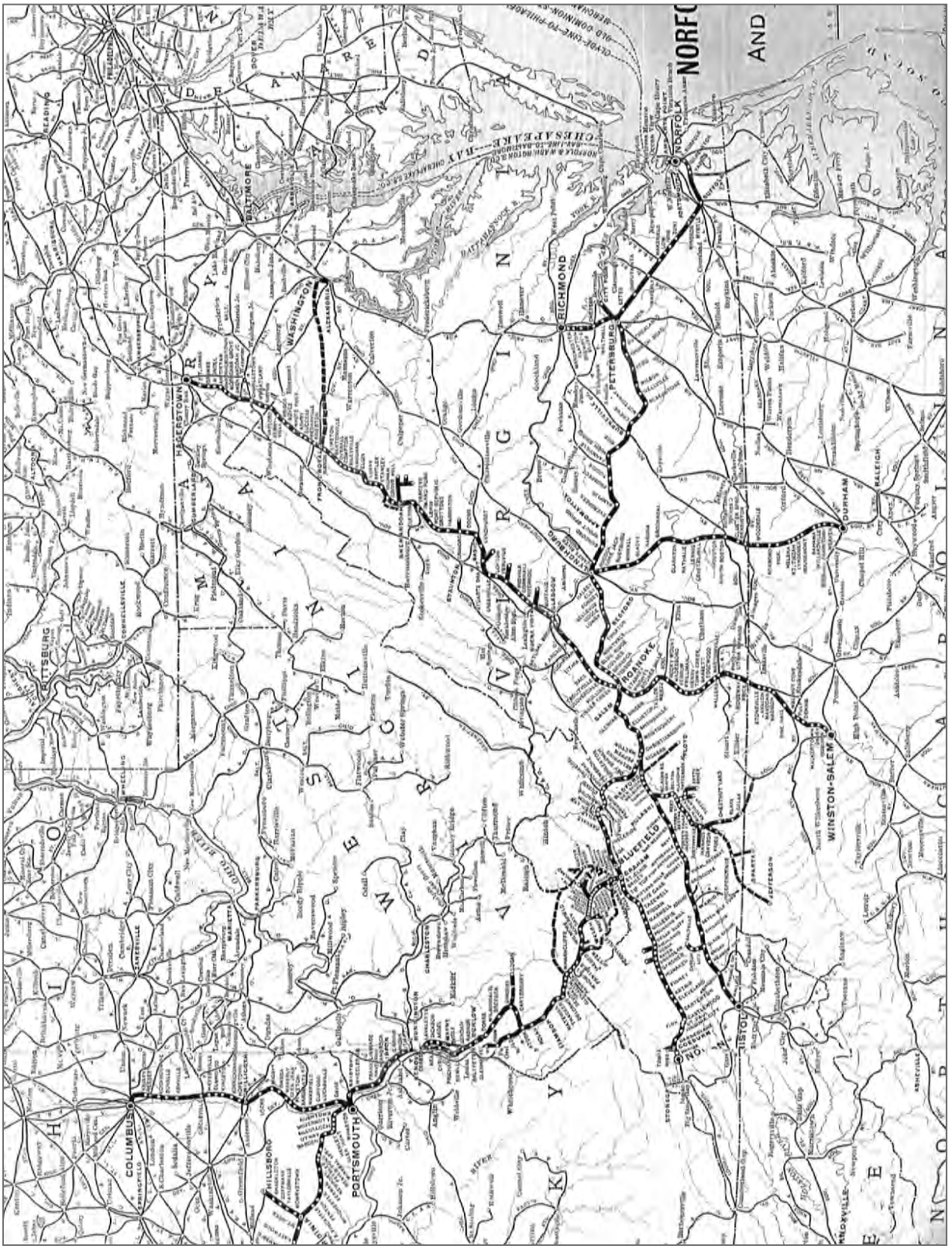
Nonetheless, the 1890s were a difficult period for the N&W financially. Bad weather had delayed completion of the Ohio Extension, and the heavy grades requiring numerous bridges and tunnels made its construction considerably more expensive than had been predicted. The railroad ended 1893 with a small floating debt, the first in its corporate history. Most importantly, the severe economic downturn of 1893–1894 greatly decreased demand for mined coal, and the N&W was left with huge stockpiles of unsold coal at its Lambert Point facility. Faced with these economic difficulties, and unable to make debt payments to creditors, the Norfolk & Western Railroad went into receivership in 1895 (Lambie 1954:132).

The company emerged reorganized as the Norfolk & Western Railway, with Kimball once again at the helm (Striplin 1997:72). The N&W Railway remained committed to its role as a coal carrier after the reorganization. Between 1897 and 1899, the quantity of coal transported along the railroad increased from 3.6 million tons to over 4.0 million tons and coke shipments increased from 1.1 million tons to 1.25 million tons (N&W Railway 1898–1899:36). By 1899, the business in coal, coke, and lumber had grown so rapidly that the limits of the



Source: Library of Congress, Geography and Map Division.

By the 1890s, the Mineral Rights to the Pocahontas Coal Field in Southern West Virginia Had Been Leased to Over Three Dozen Coal Companies, Many of Whom Had Established Mining Camps and Communities along the N&W Railroad's Route through the Area (Hotchkiss 1894).



The Norfolk & Railway System in 1903, the Year of Frederick Kimball's Death (N&W Railway *Annual Report* 1902–1903).

Source: Courtesy of Norfolk Southern Corporation.

N&W's facilities had been reached, justifying new expenditure on realignments and double-tracking, rolling stock, and repair facilities at the division points. The 1899 *Annual Report* detailed planned expenditures for the double-tracking of the line between Christiansburg and Elliston and on the western slope of Flat Top Mountain (N&W Railway 1899:13).

The N&W Railway continued to expand into southern West Virginia to meet the demands of coal operators in the region. The railway constructed numerous small branch lines in McDowell and Mingo counties as mines were opened up near smaller creeks and streams. In 1898–1899, the railroad carried almost 4.0 million tons of coal from the Pocahontas Coal Field; by 1902–1903, this figure had increased to almost 5.5 million tons (N&W Railway 1898–1899:45; 1902–1903:44).

In 1903, Frederick Kimball died, prompting the N&W's directors to note that "He lived to see the realization of his hopes in the prosperity of the Company and of the country traversed by the railroad" (N&W Railway 1903:20–21). In 1904, the 59-mile-long Big Sandy Low Grade Line between Naugatuck in Mingo County and Kenova on the Ohio River was completed. This line greatly eased traffic along the main Ohio Extension (Thomas 1925:66). Much of the Ohio Extension was double-tracked during the early 1900s, necessitating construction of new bridges and the widening of existing tunnels or the construction of new tunnels.

The other major change to the railroad's operation was the decision to pursue electrification of a portion of the N&W line in West Virginia, entered into somewhat reluctantly by what was after all the major coal carrier in the region. "The engineers of the company determined that certain lines in the coal fields could be operated with much greater economy by handling with electric power the heavy coal traffic in those sections where the density of train service was greatest and opposing grades were heaviest" (Thomas 1925:85). Contracts were let and by January 1, 1915, the 30-mile length of track between Bluefield and Vivian to the west had been electrified. By 1925, the N&W line as far west as Williamson had been electrified (N&W Railway 1925:20).

Coal Mining, Coal Companies, and the Norfolk & Western Railway

The *Historical Context for the Coal Heritage Survey* states it succinctly: "Coal and West Virginia are synonymous. In no other state in the nation has coal been so central to economic development and social life. The history of the state . . . is primarily the history of coal" (Workman et al. 1991:2). Coal, essential to the Industrial Revolution in the United States, catapulted West Virginia to national importance beginning in the 1890s. The state held this leading role for much of the twentieth century, leading the country in coal production from 1927, when it surpassed Pennsylvania, until 1973 (Workman et al. 1991:2). The coal industry, although much diminished in economic importance today, remains West Virginia's foremost industrial employer. Table 2 shows selected employment and production figures for West Virginia coal and coke between 1890 and 1985, with 1924 and 1945 being peak years for employment and production, respectively.

The Pocahontas Coal Field is among the largest and most productive of the historic coal fields in southwestern Virginia and West Virginia and owes its development from the 1890s onward to the N&W Railway. The Pocahontas Coal Field and the Williamson Coal Field, which is located to its northwest in Mingo and Wayne counties, West Virginia, are just two of many coal fields that have been classified by geologists within the more than 17,000-square-mile area in West Virginia in which coal is found. (By comparison, the coal area in Pennsylvania is 15,800 square miles, and in Ohio is 12,000 square miles) (Conley 1929:162).

The approximately 900-square-mile Pocahontas Coal Field has a very uneven topography, with the ridge summits in the west, near Iaeger, West Virginia, rising to 1,200 feet above the valley floor. In the east, near Pocahontas, Virginia, the maximum elevations exceed 3,000 feet (Gillenwater 1972:14). This coal field is generally described as consisting of eight seams, with the most important being the Pocahontas #3 Seam. The semi-bituminous coal mined in these seams has historically been regarded as being of extremely high quality, with the Pocahontas #3 Seam especially valuable (Conley 1929:63). This seam varies in thickness from 4 inches near Welch, West Virginia, to 30 inches at Pocahontas, Virginia (Gillenwater 1972:18).

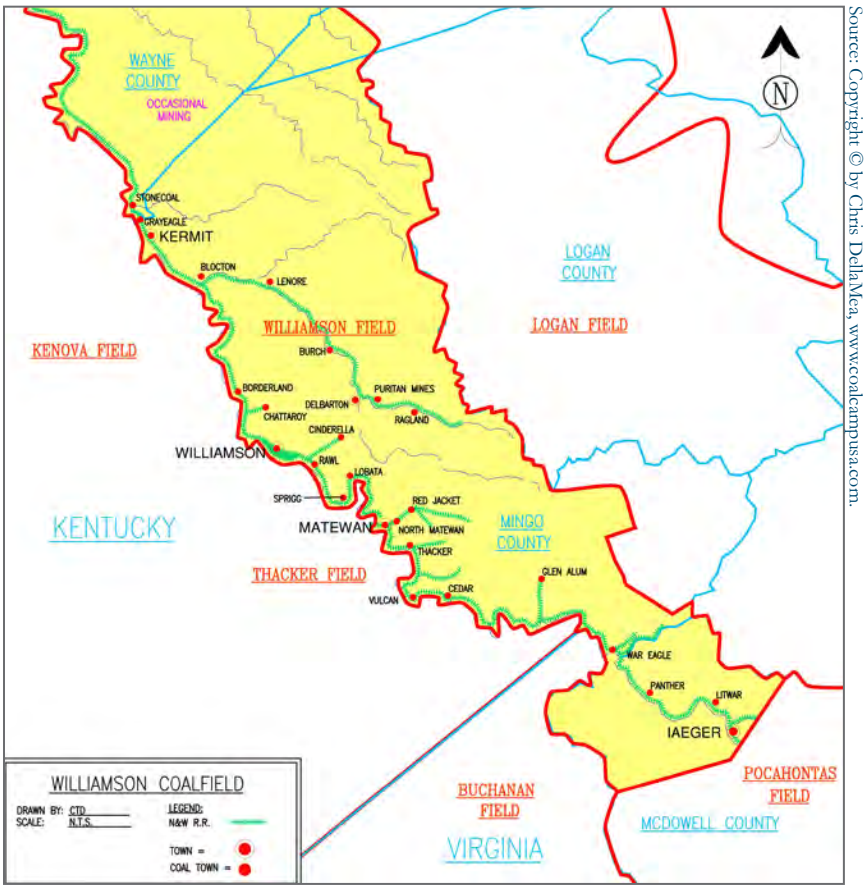
Table 2. Selected Employment and Production Figures for West Virginia's Coal Industry.

YEAR	MINING EMPLOYMENT	COAL PRODUCTION	COKE PRODUCTION
1890	11,497	7,394,564	892,490
1900	29,017	22,647,207	2,496,107
1910	68,135	59,274,708	4,217,381
1920	97,426	89,590,271	1,172,217
1924	115,964	156,570,631	649,574
1930	107,832	122,429,767	427,679
1940	110,457	126,619,825	217,943
1945	97,380	157,909,714	275,922
1950	119,568	145,563,295	169,528
1960	48,696	120,107,994	0
1970	45,261	143,132,284	79,800
1980	55,502	121,583,762	0
1985	35,913	127,867,375	0
TOTAL		12,655,074,259	80,004,748

Adapted from West Virginia Office of Miners' Health, Safety and Training, *Production of Coal and Coke in West Virginia, 1863–2004*.

Source: Copyright © by Chris DellaMea, www.coalcampusa.com.

Pocahontas (Flat Top) Coal Field, McDowell and Mercer Counties, West Virginia.



Source: Copyright © by Chris DellaMea, www.coalcampusa.com.

Williamson Coal Field, McDowell, Mingo and Wayne Counties, West Virginia.

As seen earlier, the reconnaissance surveys sponsored by the N&W in the 1870s and 1880s located the most obviously productive seams for coal mining; those locations largely determined the railroad's route through Virginia and West Virginia. The route chosen was also in a sense preemptive, as the N&W wished to prevent other railroads, particularly the C&O, from competing with it for the right to transport coal. Writing in 1891, the N&W's General Manager Sands put it best: "the coal business is our backbone" (Lambie 1954:135).

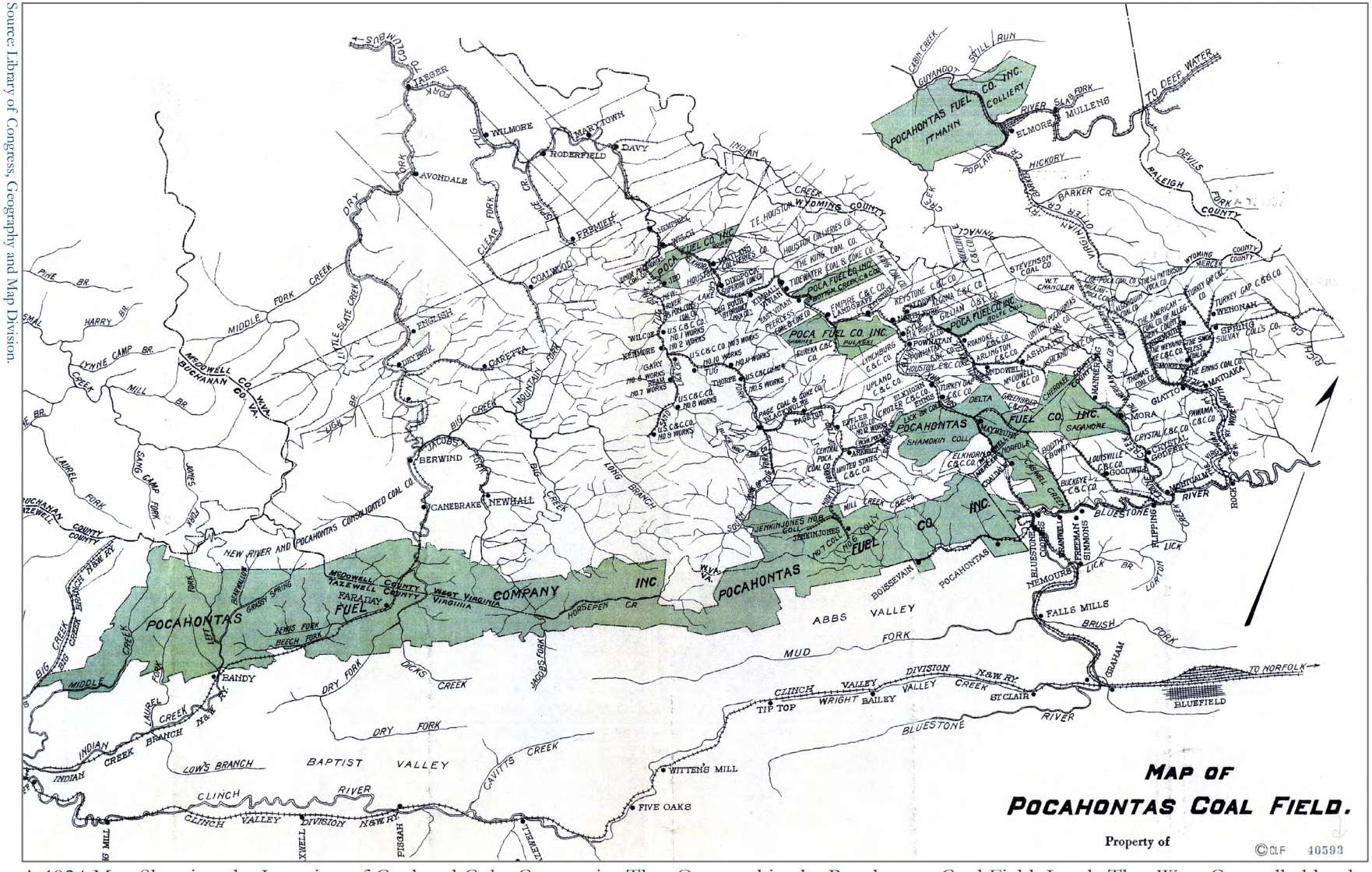
Over the years, the N&W developed a symbiotic relationship with both the Flat Top Land Association and the mining companies. In 1901, the Pocahontas Coal & Coke Company was formed as a successor to the Flat Top Land Association (Lambie 1954:237). Wholly owned by the N&W, the company controlled approximately 300,000 acres of land in Virginia and West Virginia, of which nearly 180,000 were leased for development and mining (Tams 1963:29).

The N&W's influence is seen even in the legal definition of the Pocahontas Coal Field's boundaries, as occurred in the case of *American Coal Company et al. vs. John W. Morris et al.* in which the area is described as:

> *. . . a certain definite territory which includes portions of McDowell, Mercer, Mingo, and Wyoming Counties, West Virginia and Tazewell County, Virginia and is that territory served by the Norfolk & Western Railway by its main line and branch lines between Flat Top Yard and Iaeger, WV; and by its Dry Fork line from Iaeger WV to Cedar Bluff VA . . .* (Gillenwater 1972:8)

By the early 1900s, the area of the Pocahontas Coal Field had been carved up into several tracts that were then either sold or leased to the coal mining companies (Gillenwater 1972:46). One of the largest of these mining companies, the Pocahontas Fuel Company, was organized in 1907 and soon dominated mining operations in McDowell County, West Virginia, the region's preeminent coal-producing county.

During the early 1900s, the N&W built numerous small branch lines, generally following the region's small creeks and streams, to access even the remotest coal mines. These branch lines fed into the N&W's main line, insuring the coal companies' access to national markets. By 1911, the 108-mile N&W rail line between Bluefield and Williamson had been supplemented by more than two dozen such branch lines, ranging from the 0.31-mile Laurel Creek Branch to the 30.11-mile Dry Fork Branch (N&W Railway 1911:53).



Source: Library of Congress, Geography and Map Division.

A 1924 Map Showing the Location of Coal and Coke Companies That Operated in the Pocahontas Coal Field. Lands That Were Controlled by the Pocahontas Fuel Company Are Shown in Green.

The amount of coal shipped by this virtual railroad monopoly increased exponentially in the 1890s and 1900s, far exceeding even the most optimistic expectations of the N&W's original builders. Barely 5,000 tons of coal were shipped over the N&W in 1882, its first full year of operation. In 1893, following completion of the Ohio Extension, the figure had risen to 2,869,215 tons (N&W Railroad 1893:10). By the 1910s, the figures had reached astounding levels: 15,467,781 tons of coal were transported over the N&W system in 1910 and 23,289,110 in 1914 (N&W Railway 1911:46 and 1915:39).

By the second decade of the twentieth century, the key ingredients—high-quality coal for which demand was increasing yearly, reliable transportation, and investment capital—were in place for the sustained development of what was to become one of the world's premier coal mining regions. In the five West Virginia counties of Mercer, McDowell, Wyoming, Wayne, and Mingo along with Tazewell County, Virginia, coal mining achieved the status of a "monoeconomy" (Workman et al. 1991:1). As Workman (1991:3) states, "If coal can be deemed 'king' in West Virginia, it must be considered an absolute monarch in the Southern (West Virginia) coal fields."

Coal mines proliferated as fast as branch lines could be opened by the N&W and workers brought in to work the mines. Between 1880 and 1885, 15 mining operations and eight mining camps were established in the Pocahontas Coal Field alone (Gillenwater 1972:28). In 1901, there were 30 coal mining operations in the region, 25 of them on land owned by the Pocahontas Coal & Coke Company; by 1905, the number of mines had increased to 58 (Striplin 1997:71). Between 1900 and 1910, 119 new mines opened and 55 new mining towns were established. In addition to the mine opening, most mine complexes included coal tipples, coke ovens, weighing scales, fan and engine houses, blacksmith shops, and the company's administrative/pay office (Gillenwater 1972:38).

The boom in coal mining in the Pocahontas Coal Field continued for four decades. In 1906, McDowell County surpassed Fayette County as the premier coal-producing county in West Virginia. Close to 16.5 million tons of coal were mined in the Pocahontas Coal Field in 1910, and by 1916, the figure had reached over 25 million tons (Workman et al. 1991:19). An historic high of nearly 36 million tons of mined coal in the McDowell/Mingo/Wyoming County region was reached in 1925.

Source: Courtesy of Norfolk Southern Corporation.

Coal Tipple, Peerless Coal & Coke Company Mine, Vivian, West Virginia.

Harnessing enough labor to mine the endless seams of coal was a critical problem for most mining companies in the Virginia and southern West Virginia coal fields. At first, the coal companies were able to rely on the local labor supply to man most of the small-scale mines. The sheer volume of coal to be mined had made this impracticable by the mid-1890s, however, and nearly all major mining operators were compelled to import thousands of unskilled laborers from elsewhere in the United States and later, from Europe. African-Americans, virtually unknown in this part of West Virginia before 1880, were recruited by agents of the mining companies from southern states, particularly Georgia, North Carolina, and Alabama. By 1910, McDowell County was one of the most ethnically and racially diverse counties in the state.

Source: Courtesy of Norfolk Southern Corporation.

Mill Creek Coal & Coke Company Mine, near Cooper, West Virginia.

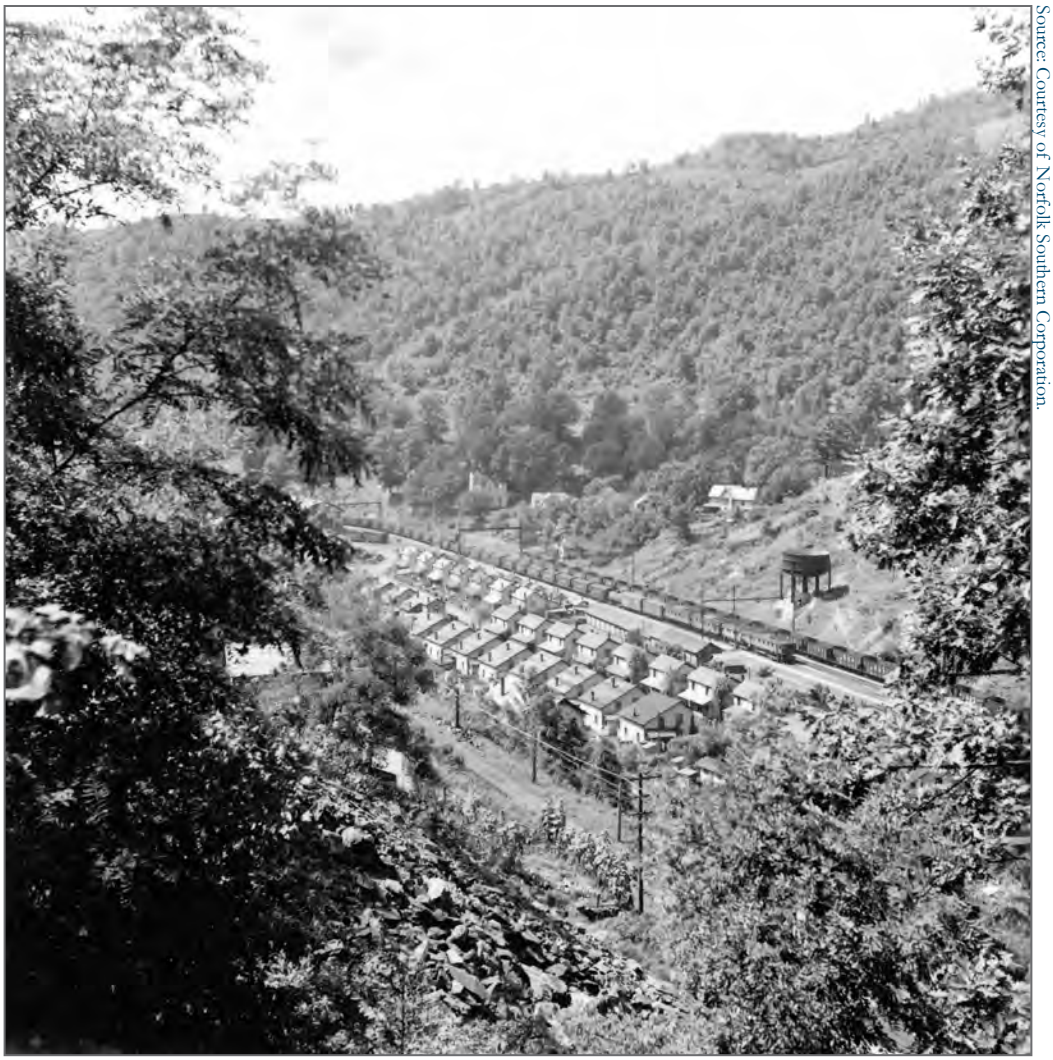
"A coal company provided not only a job but a unique way of life for miners and their families" (Gillenwater 1972:14). Whole mining camps with houses, dormitories, schools, churches, community centers, and company-owned stores or commissaries were erected by the companies. Lumber sawn from the huge stands of local virgin timber was used to construct these towns, as well as for the timbering of the mine tunnels. Miners' salaries were often paid in company-issued scrip, redeemable only at that company's store. Generally, the residences were leased to the workers, thus ensuring a measure of social and economic control by the company.

Source: Library of Congress , Prints & Photographs Division, FSA-OWI Collection (LC-USF33-030102-M1).

Shoppers Leaving a Company Store in Caples, West Virginia (ca. 1930).

Many company towns were hierarchical in their layout, with company officials and superintendents living in detached houses often removed from the mines and settlements; native-born whites living in a less desirable area; and foreign-born whites and African-American workers living in the least desirable sections closest to the mine openings or high atop the hills overlooking the towns (Workman et al. 1991:11–12).

Maybeury, located west of the Elkhorn Tunnel in McDowell County, was typical of the coal company towns of the era in southwestern Virginia, southwestern West Virginia, and eastern Kentucky. The town was in fact three separate mining camps, all founded in the late 1880s. These camps, known as Barlow, Shamokin, and Norfolk, each consisted of mining facilities, workers' housing, and stores (Gillenwater 1972:125). In addition, the camps contained separate schools and community centers constructed for blacks and whites. Within only a



Source: Courtesy of Norfolk Southern Corporation.

View of Eckman, a Typical Coal Company Town in McDowell County, West Virginia (ca. 1940).

few years, each of the three mining camps had grown to several hundred inhabitants. By 1902, the population of the Barlow mining camp was estimated at 600 (Gillenwater 1972:127). By 1907, it was estimated that nearly 2,000 people were living in the Norfolk camp, indicative of the explosive growth of mining operations there.

The company-owned store was the economic and social center of coal company towns. Depending on its size and location, the building might contain a corporate office, payroll office, and a post office; in addition it often sold groceries and household supplies, as well as clothes (Sone 1992:8.1). Many housed a community room used for movies and social activities. Although several large architect-designed company stores were built in McDowell and Mercer counties, the Norfolk Coal and Coke Company's store in Maybeury was more typical. The two-story wooden structure, in operation by 1903, served miners at all five of the company's mines in the Maybeury area (Sone 1992a:8.2).

The larger towns of Williamson, in Mingo County, and Welch, in McDowell County, served both as governmental centers for their respective counties and as service centers for the smaller coal camps in their vicinity. Both towns also were important stops along the N&W, with the Williamson rail yards being among the largest in West Virginia. Nearly all male workers in these two towns were employed either in mining or

by the N&W, and both towns experienced dramatic population growth as a result. Welch increased from 500 inhabitants in 1900 to 1,700 in 1910 and to 5,000 in 1920. Williamson's population increased from only 27 in 1893 to 10,000 in 1925 (Thomas 1925:58).

Although located nearly 12 miles from the nearest coal mine, Bluefield, Virginia/West Virginia was considered the capital of the southern West Virginia coal fields. Designated a division point by the N&W in 1888, Bluefield contained a vast complex of railroad-related buildings, including a gravity-powered switching yard, roundhouse, stone passenger station, shops and freight depots. The town grew spectacularly during the first half of the twentieth century, reaching over 26,000 inhabitants by 1925. Here lived the elite of this multi-county coal region, including N&W company officials, mine owners, lawyers, bankers, politicians, and the socially prominent. It was a vibrant commercial and entertainment center, drawing in inhabitants from surrounding communities who traveled to Bluefield by a well-developed interurban system (McGehee 1997).

Far outnumbering these towns and cities were the innumerable coal camps and company towns, some incorporated, many more not, that contained the bulk of the southern West Virginia coal region's population throughout the first half of the twentieth century. Towns with such names as Cooper, North Fork, Iaeger, Kermit, Kimball, Keystone, War, and others were strung out along the N&W main line or its numerous branch lines. "The company town was more prevalent in West Virginia than any other state, with fully 80.2% of all miners in the state living in such places in 1922" (Workman et al. 1991:10).

Source: Courtesy of Norfolk Southern Corporation.

View of North Fork, McDowell County, One of Several Incorporated Coal Mining Communities along the N&W.

Table 3. Twentieth Century Population Data for McDowell County, West Virginia.

YEAR	POPULATION
1900	18,747
1910	47,856
1920	68,571
1930	90,479
1940	94,354
1950	98,887
1960	71,359
1970	50,666
1980	49,899
1990	35,233
2000	27,329

Source: U.S. Bureau of the Census.

Source: Courtesy of Norfolk Southern Corporation.

Early Morning View of N&W Railyards and Adjacent Coal Mines in Eckman, McDowell County (ca. 1940).

The proliferation and continued growth of company towns contributed to the overall population growth of the region's counties, which was often dramatic. Tazewell County grew from 23,384 residents to 29,840 between 1900 and 1920. Mingo County (carved from Logan County in 1895) grew from 11,359 to 26,634 residents during the same period, and by 1920 Mercer County had experienced a more than 100% increase in its 1900 population of 23,023 (Thomas 1925:102). It was in McDowell County, where coal lay under nearly all of the county's land mass, that the population change was most striking. Table 3 shows the steep increase in population in McDowell County during the coal boom, as well as the similarly dramatic decrease in the county's population as a result of the slow decline of the coal industry after World War II.

Dry population and production statistics, however, cannot begin to convey the sights and sounds of the coal fields during the first half of the twentieth century: the heavy, smoky haze of early morning in the rail yards; the constant clanging of heavy mining machinery drowning out even loud conversations; the rumble of seemingly endless freight trains loaded with coal heading east; and the clatter of feet on wooden sidewalks following a shift change at the mines. Life in this region revolved around coal mining and was lived in fairly close quarters in coal company towns, with the N&W rail line often serving as the town's main street.

Decline of Coal Mining in the Project Area

The coal boom in the southern West Virginia and southwestern Virginia coal fields during the 1910s and 1920s masked several factors that would eventually lead to the decline of coal mining in the region, beginning with the Great Depression and continuing through today. These factors included the rise of alternative energy sources, overproduction, inefficient mining practices, labor strife, and the unionization of miners (Workman et al. 1991:4–5). Coal being the backbone of the N&W freight business, the railroad was greatly affected by that industry's transformation beginning in the 1930s. The N&W did, however, remain consistently profitable throughout this period.

Although levels of production reached record highs in the 1920s, coal mining in West Virginia was neither particularly efficient nor uniformly profitable. Numerous smaller coal companies went out of business or were absorbed by larger concerns, greatly reducing the number of locally-owned and operated coal companies in the region (Workman et al. 1991:7). Coal from Pennsylvania had a competitive advantage over West Virginia coal, due to the greater expense of shipping the latter to the Northeast. Many Pennsylvania coal companies did not have to provide housing and other services to their employees, further reducing their costs.

Nonetheless, West Virginia coal was still generally less expensive on the open market than Pennsylvania or New York coal, chiefly due to the higher wages paid to unionized coal miners in these states. Faced with constant pressure to keep labor costs low, coal operators in southern West Virginia presented a united front against the United Mine Workers union and their efforts to organize coal miners in the post World War I period (McCallister et al. 1993:8.4).

During the 1920s, coal companies held the line against wage increases, cut down on miners' hours, and instituted greater mechanization and efficiency measures (Workman et al. 1991:7). The companies' efforts were aided by cooperative local law enforcement officers and by the control the companies exerted over employees' housing.

Source: TRC, 2007.

McDowell County Courthouse, Welch, West Virginia. The Site of the Revenge Killings of Sid Hatfield and Ed Chambers during the Height of Labor Unrest in the Southern West Virginia Coal Fields in 1920–1921.

When miners resisted, the conflicts often turned violent. In May 1920, members of the Baldwin-Felts detective agency from Bluefield attempted to evict striking miners from company-owned housing in Matewan, West Virginia. A gun battle ensued along the N&W railroad tracks in Matewan, resulting in the death of several detectives and Matewan's mayor (McCallister et al. 1993:8.4). In revenge, on August 1, 1921, Matewan police chief Sid Hatfield and an associate were gunned down by Baldwin-Felts detectives on the steps of the McDowell County courthouse in Welch (Turley 1979:8.1).

By the late 1920s, it was apparent to most observers that there were too many miners in the coal fields producing too much coal. The Great Depression led to decreased demand for coal, mine closures, and much unemployment in the region. Employment by the N&W also dipped during this period, although in part this reflected increased efficiency of operations.

World War II gave a temporary reprieve to both coal mining in West Virginia and the region's freight railroads. The immediate postwar years marked the historic high point of coal production, employment, and population levels in the Virginia and West Virginia coal fields (Workman et al. 1991:6). The decline after 1950 was rapid. Mechanization of coal mining operations, the rise of strip mining at the expense of deep mining, and the abandonment of many mines altogether sharply reduced the number of miners in the workforce of the region. The out-migration of former miners from southwestern Virginia and southern West Virginia depleted the region's population. McDowell County, for example, experienced an over 70% population decline between 1950 and 2000. Many of the miners who remained were underemployed and reduced to near poverty. During the 1960 Democratic presidential primary in West Virginia, national attention was focused on the once-thriving coal towns and mines of the southern coal fields, by then rapidly becoming ghosts of their former selves.

Norfolk Southern Corporation Today

The 1950s were a time of change for the N&W as well. The new Elkhorn Tunnel was completed in 1950, eliminating the need for electric trains along the N&W's main line (Harris 2003:71). A new main line was rerouted around Welch. Although freight tonnage along the N&W remained consistently high, fewer workers were required to man freight yards, service rolling stock, and run trains. By the late 1950s, the N&W had made the momentous turn away from steam power towards diesel fuel, ending a significant chapter in its

history. Employment at many of the railroad's facilities, including Bluefield, declined steadily, even as the N&W recorded increased yearly profits.

During the late 1950s and into the late 1970s, the N&W sought to acquire smaller, profitable railroads both to increase its market share and to access additional markets in the Midwest and Northeast. In 1959, it succeeded in acquiring the Virginian Railroad, its main rival in the coal-hauling business in southern West Virginia. The Virginian, a well-engineered and profitably run railroad, contributed to increased overall efficiency in the N&W system. During the 1960s, the N&W acquired both the Wabash Railway and the Nickel Plate Road (officially the New York, Chicago, and St. Louis Railroad) (Harris 2003:72–74).

Although the N&W always was best known as a freight railroad, passenger service along its route between Norfolk and Ohio remained viable until 1971. Up until the 1920s, the N&W ran several daily mixed freight-passenger trains that stopped at even the smallest station stops in the coal fields of Virginia and southern West Virginia. With the popularity of automobiles and the growth of a paved road system beginning in the 1920s, most of this service was discontinued. Beginning in the 1940s, the N&W also initiated streamlined "name train" service on the route between Norfolk and Cincinnati. Making stops at Roanoke, Bluefield, Welch, and Williamson, among others, the *Cavalier* and the *Powhatan Arrow* offered full-class passenger train service along the N&W route until the service was taken over by Amtrak in 1971 (Harris 2003:112). Today, there is no regularly scheduled passenger service along the N&W's Radford and Pocahontas divisions.

In 1982, the N&W combined with the equally financially strong Southern Railway system to form the new Norfolk Southern Railway. The Southern Railway, with a history almost as old as the N&W, stood out during an era in which many national railroads were failing or were coming under federal ownership. This merger allowed the newly formed company (Norfolk Southern) to compete in the eastern United States with CSX Transportation—a corporation formed by the merger between Chessie System and Seaboard Coast Line that had been approved by the Interstate Commerce Commission in 1980. Headquarters for the newly established Norfolk Southern Railway were established in Norfolk, Virginia.

In 1998, the Norfolk Southern grew substantially with the acquisition of over half of the federally owned Conrail system, itself formed from several bankrupt northeastern railroads, including the once-mighty Pennsylvania and New York Central railroads. As a result of the transaction, the Norfolk Southern's rail operations grew to include some 7,200 miles (11,500 km) of the Conrail system (predominantly the former Pennsylvania Railroad) (Norfolk Southern Corporation 2000:8–9).

Today, Norfolk Southern Corporation operates along 21,500 miles of track in 22 eastern states, the District of Columbia, and Ontario, Canada. Continuing a tradition dating back to the N&W's formation, the railroad is still a major carrier of coal mined in West Virginia, Kentucky, Pennsylvania, Tennessee, and Virginia. At the end of 2003, the transport of coal, coke and iron ore made up 23% of the total amount of traffic hauled by Norfolk Southern. West Virginia bituminous coal is transported over the former N&W and Virginian Railroad tracks to the Norfolk Southern's Lambert's Point facility in Norfolk. There, the coal is shipped to steel mills and power plants worldwide (Norfolk Southern Corporation 2003:14–18).

The Norfolk Southern offers an extensive intermodal network in eastern North America and is a major transporter of auto parts and completed vehicles. In 2003, intermodal containers made up 19% of the total freight traffic; autoracks 14%; chemical tankers 12%; metals, construction materials, agriculture commodities, and consumer products 11%; and paper, clay, and forest products 10%. According to Norfolk Southern Corporations's *2003 Annual Report to Investors* (2003:10, 18–19), at the close of that year the corporation had more than 28,160 employees, 3,468 locomotives, and 101,095 freight cars.

4. CITIES AND TOWNS ALONG THE NORFOLK & WESTERN RAILWAY ROUTE IN VIRGINIA AND WEST VIRGINIA

Narrows, Virginia

The town of Narrows is located in Giles County, Virginia at the confluence of Wolf Creek and the New River, at the point where the river narrows between Peters and East mountains. The area was first settled in the late 1770s by the Hale, Hare, and French families (www.townofnarrows.org/home/historyofnarrows.html). Narrows was an historically important transportation point; its importance increased after the construction of the Great Cumberland Road through the area in 1838–1843. This road linked up with the Great Wagon Road in Botetourt County, bringing new settlers to eastern Kentucky and Tennessee (Kirk 1996:4).

Although Narrows saw heavy stagecoach traffic between Dublin and White Sulphur Springs before and after the Civil War, and had gained a post office by 1873, the arrival of the Norfolk & Western Railroad in 1882 ushered in a new phase in the town's history. Numerous branch lines were built by the N&W to access the region's rich timber and mineral resources, and the improved transportation system attracted both regional industries, particularly tanneries, and new residents to Narrows. The effect on the region's population was dramatic: in 1880, Giles County held 5,870 inhabitants; in less than five years time, the population had increased almost 50% to 8,794 (Kirk 1996:5).

The town continued to grow after 1900. The Virginian Railway, located across the New River from Narrows, was built through the area in 1907–1909. The First State Bank of Narrows was established in 1905, and by 1917, the town's businesses included a power company, a bottling company, and numerous retail establishments. By 1920, its population had reached 1,141, making Narrows the largest town in Giles County.

A new brick-and-frame depot was built by the N&W in 1923. In 1926, the Virginian Railroad completed an electrical generating plant near Narrows to power its freight trains hauling coal and timber (Kirk 1996:6). In 1941 the State Highway Department and the N&W funded construction of a railroad overpass over State Route 100 (Main Street), just west of the railroad depot.

Narrows' greatest period of prosperity began in 1939 when the Celanese Corporation built a plant producing acetate staple fibers; the plant reached its production peak in 1948, when it employed 600 workers. By that date Narrows had 2,820 inhabitants.

Changes in transportation by the mid-twentieth century again affected Narrows' history. Both the N&W and Virginian railroads had switched to diesel power for its locomotives by the late 1950s, eliminating the need for electrification and the region's power plant. The Virginian Railroad was absorbed by the N&W in 1959, resulting in a decline in rail traffic and railroad employment. The building of US 460 on the West Virginia side of the New River bypassed Narrows' commercial district in Giles County entirely, leading to further declines in the town's importance and population.

Bluefield, West Virginia/Virginia

Bluefield was little more than a frontier settlement in the years before the arrival of the N&W. Like other such communities in southwestern Virginia and southern West Virginia, it had a small population consisting of a tightly knit group of farming families who practiced subsistence farming on the hilly and only marginally productive landscape in the shadow of East River Mountain. First settled in the Revolutionary War period, the farming hamlet originally known as Graham lay west of the East River and the present Virginia/West Virginia state line (McGehee 1997).

The exploitation of the vast Pocahontas Coal Field after the Civil War was led by the N&W Railway, which in late 1880 selected a site a few miles east of Graham as the location of its Pocahontas Division headquarters. Although the railroad arrived in 1881, the town was not transformed overnight, but it soon changed its name to Bluefield. The town's first U.S. Post Office, chartered in 1887, served a mere fifty patrons and for a few years a discarded boxcar functioned as the first N&W depot (McGehee 1997). Soon, however, the N&W constructed a vast gravity-powered switching yard, roundhouse, stone passenger station, shops and freight depots at Bluefield, making it truly a railroad "company town."

Bluefield, West Virginia in 1888 (above). N&W Railway Yards, Bluefield, West Virginia in 1910 (below).

Images courtesy of Norfolk Southern Corporation.

Officially incorporated in November 1889, the town grew spectacularly in the years thereafter, paralleling the population explosion of the southern West Virginia coal fields. "Only 600 citizens lived along the dusty streets of the community in 1890. By 1900, 5,000 people crowded the smartly built brick downtown along the Avenue above the railyards" (McGehee 1997). The 1910 census enumerated 11,888 inhabitants in Bluefield, and by the 1920s the population had reached over 26,000 (Pauley and Gioulis 1986:8.2). Its elevation at 2,612 feet above sea level led to its nickname the "Air Conditioned City," for its pleasant summer temperatures. In 1924, nearby Graham, Virginia, changed its name to Bluefield as well, thus linking it to its fast-growing sister city in West Virginia.

Although the nearest coal mine or drift mouth was 12 miles away, Bluefield was the undisputed "Capital of the Southern West Virginia Coal Fields." Wholesale warehouses, banks, utilities, insurance companies, furniture factories, textile and flour mills and mine equipment firms sprang up to meet the needs of the coal mining industry (McGehee 1997). Some of the town's oldest commercial buildings are located along Princeton Avenue, facing the N&W Railway yards. The railroad also operated a hotel along this street, which was replaced by the present Norfolk & Western building in 1948 (Collins 1979:8.1).

Bluefield was home to an impressive array of businesses and financial institutions. *The Bluefield Daily Telegraph* was housed in a prominent building dating from 1916. The Bluefield Sanitarium, first built in 1914, was enlarged in 1921 and again in 1928 (Pauley and Gioulis 1986:7.9). The City's Municipal Building was completed in 1924–1925 (Collins 1979:8.1). The 12-story West Virginian Hotel, also completed in 1924, was by far the tallest structure in southern West Virginia. This and other hotels, restaurants, shops and theaters earned the city a reputation as an entertainment center in southern West Virginia, whose residents rode the local train into town to shop and dine. Bluefield was connected to the nearby Mercer County seat of Princeton by a well-developed interurban rail system.

Bluefield's economic fortunes during the twentieth century closely followed those of the intertwined coal and railroad industries in southern West Virginia. Following the economic boom of the 1920s, the Great Depression hit the coal fields hard, although many of the area's financial institutions stayed solvent. World

Source: Courtesy of Norfolk Southern Corporation.

Late-Nineteenth-Century View of Bluefield, Virginia.

Source: Courtesy of Norfolk Southern Corporation.

N&W Railway Passenger Station, Bluefield, Virginia.

Source: Courtesy of Norfolk Southern Corporation.

Coal Train (Steam Engine No. 2133) East of Bluefield, West Virginia.

War II and the immediate post-war years saw unprecedented expansion in Bluefield's economy, as coal mining and its transport by rail soared in volume. The city's population reached an historic high of 21,560 in 1950 (McGehee 1997).

Although not fully appreciated at the time, 1950 also marked the beginning of a slow decline in Bluefield's and the region's economy that has continued through today. With demand for other fuel sources increasing at the expense of coal, coal mining declined and many mines closed. Increasing mechanization of the coal mining operations that remained led to a sharp decrease in employment levels. The N&W Railway, although it was still a vital transportation artery, had to compete with interstate trucking companies for the transport of coal from the surrounding coal fields. Truck traffic increased after the completion of both US 460 and I 77 and the construction of a tunnel through the East River Mountain. Nonetheless, both coal mining and the Norfolk Southern Corporation still maintain an important, if greatly diminished role in the city's economy.

Maybeury, West Virginia

An important milestone in the construction of the Norfolk & Western Railway's line to Ohio was reached with the completion of the 3,000-foot-long Elkhorn Tunnel through Flat Top Mountain in 1887. That year the N&W built its first railroad station west of the tunnel at a spot near the confluence of the Little Fork and Elkhorn Creek. By 1888, seven mines were in operation in the upper Elkhorn Valley, each less than five miles from the western opening of the tunnel (N&W Railroad 1888). There, the Pocahontas #3 Seam outcropped along the lower slopes of the valley, with a thickness of some eight feet. Anticipating relatively easy mining operations and substantial profits, coal operators had bought leases in the Elkhorn Valley even before the tunnel was completed (Gillenwater 1972:123).

During 1888 and 1889, three separate coal companies rushed to establish their mining operations near the new depot. The Elkhorn Coal & Coke Company leased land two miles west of the tunnel. Edward Cooper leased a 1,000-acre tract nearby and founded the Shamokin Coal & Coke Company. Lastly, Stewart Buck leased 1,000 acres along Little Fork and organized the Norfolk-Angle Coal Company. Each company established its own mining camp (named Barlow, Shamokin, and Norfolk, respectively) and built mining facilities, workers' housing, and stores (Gillenwater 1972:125). Houses were for the most part built along the valley floor and lower slopes, with additional houses built along two tributary valleys, creating a Y-shaped layout. Collectively, the three settlements were known as Maybeury, both by the N&W and the U.S. Post Office.

Source: Courtesy of Norfolk Southern Corporation.

N&W Depot, Maybeury, West Virginia (ca. 1905).

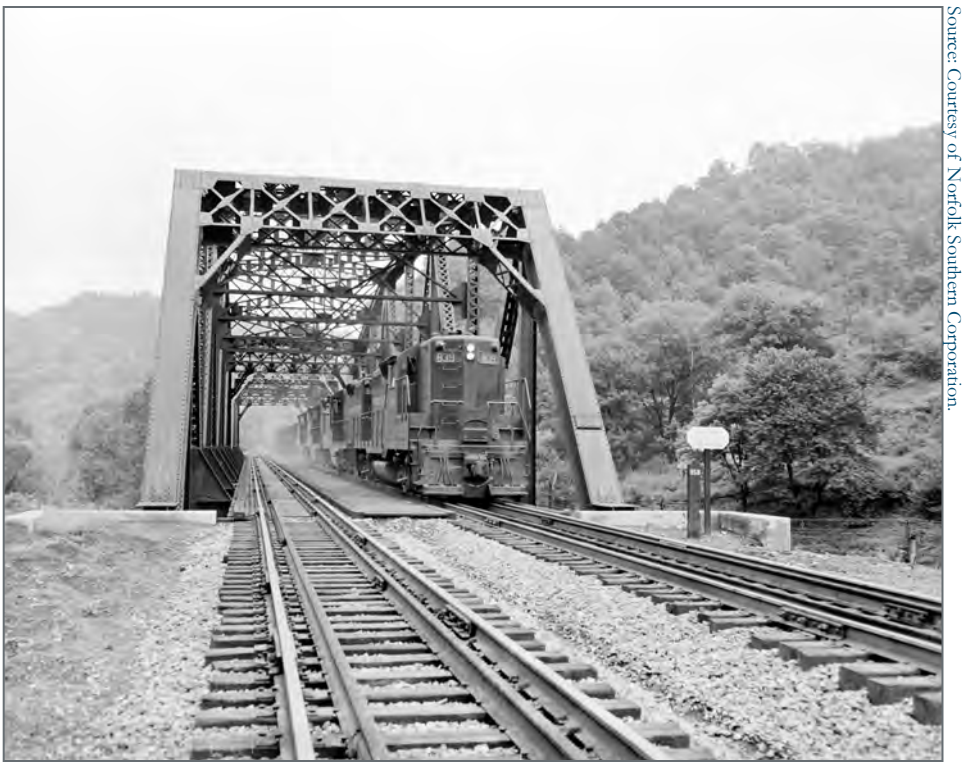
By 1900, there were two grammar schools (one for white children and one for African-Americans) in the Barlow camp. In 1902, when the Elkhorn Coal & Coke Company was acquired by W.C. Atwater & Associates, the new company built two community centers and churches; again both were racially segregated (Sone 1992a:8.1). In that year, the population of the Barlow mining camp was estimated at 600 (Gillenwater 1972:127).

Source: Courtesy of Norfolk Southern Corporation.

Crozer Mine, Elkhorn, near Maybeury, West Virginia.

The Shamokin camp was more centrally located and had extensive facilities, including a commissary, a clubhouse, churches, and several schools. Both the N&W Railway station and the visually prominent Maybeury railroad bridge over US 52 and Elkhorn Creek are located in the former Shamokin camp.

The Norfolk camp, located on both sides of the Little Fork, consisted of approximately 190 workers' houses built between 1891 and 1892 (Sone 1992a:8.2). The population in 1900 was estimated at 500. By 1907, it was estimated that nearly 2,000



Source: Courtesy of Norfolk Southern Corporation.

Diesel Engine 839 Crossing Maybeury Bridge, Built in 1948 (ca. 1955 photograph).

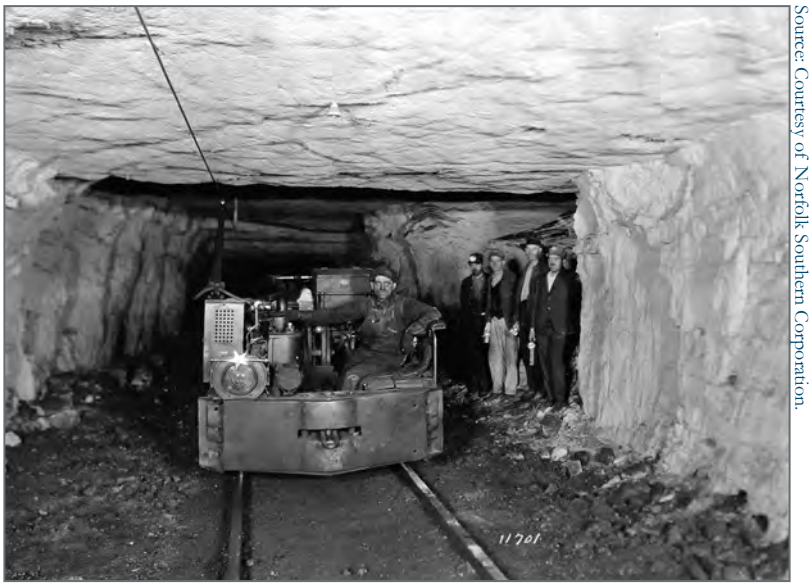
Source: Courtesy of Norfolk Southern Corporation.

Norfolk Angle Mine at Maybeury, West Virginia.

people were living in the Norfolk camp, indicative of the explosive growth of mining operations there. The company store, a two-story, hip-roofed frame structure built on a cut-stone foundation and located near the railroad tracks, was built shortly before 1903. In the 1910s, the store was acquired by the new owner, the Pocahontas Fuel Company, which kept it open until mining operations ceased in the 1940s (Sone 1992a:8.2). Still standing, the Pocahontas Fuel Company Store in Maybeury is listed in the NRHP.

Keystone, Kimball, and Landgraff, West Virginia

These three towns located in McDowell County are typical of the many coal company towns that sprang up along the route of the N&W Railway as a result of the mining and transport of coal that began in this region in the early 1890s. All shared similar characteristics; none pre-existed the entry of the N&W into this region with the construction of the Elkhorn Tunnel in 1887. These towns were created out of necessity by the mining companies that operated the financially lucrative but labor-intensive coal mines (Gillenwater 1972:23). Faced with a severe labor shortage, the companies imported workers from Eastern and Southern Europe, as well as African-Americans from the South, and housed them in company-built and -owned accommodations. It is estimated that by 1920, 80% of coal miners in the state were living in company-owned housing (Workman et al. 1991:10).



Source: Courtesy of Norfolk Southern Corporation.

Houston Collieries, Keystone, West Virginia.

Most mining communities were relatively small and had a generally linear layout, with the commercial district hugging the railroad and the small creeks and rivers of the region, and residences paralleling them and rising steeply up the hills on either side (Gillenwater 1972:28). Before the advent of a paved road system in the 1920s, the N&W Railway line served as the "Main Street" through many mining towns, and commercial buildings often faced the railroad, rather than the town's streets.


Source: Courtesy of Norfolk Southern Corporation.

View of Keystone in 1896, Shortly after the N&W Established a Station.

The economic center of such towns as Kimball, Keystone, and Landgraff was the company store, operated for the convenience of the mine workers and the profit of the coal company. These stores served as payroll offices where pay checks were distributed or conversely where company "scrip" (tokens or paper money issued by the coal company) was issued,

N&W Railway Depot in Kimball, West Virginia (top left). Kimball's Main Street (US 52) (ca. 1949) (top right). Miners' Houses in Landgraff, West Virginia (bottom left). The Interior of a Coal Company Store in Keystone, West Virginia (bottom right).

Images courtesy of Norfolk Southern Corporation.

redeemable only at the company store. These stores sold a wide variety of merchandise, including hardware, appliances, and clothing, and often housed the local post office.

Keystone, formerly Cassville, was founded in 1892 by the Keystone Coal & Coke Company, a Pennsylvania-based company (Tams 1963:103). The first mine there was Keystone No. 1, which produced for 94 years until it was exhausted in 1986. When it closed, it was the oldest coal mine still in operation in the Pocahontas Coal Field. In 1936, the Koppers Coal Company had purchased the mine and by 1939 was mining 1,189,000 tons of coal yearly. Incorporated in 1909, the town's population reached nearly 2,500 by 1925, but by 1940 had begun to decline with changes in mining technology that resulted in layoffs and mine closures (Conley 1929:471). By the 1980s, strip mining carried out by the Pocahontas Empire Coal Company was the town's principal industry. With a population of 453 in the 2000 U.S. Census, the town still retains many of its original company-built houses, although the coal companies largely divested themselves of these houses in the 1950s. A row of brick houses built by the Empire Coal Company and originally inhabited by workers of Italian descent stands along the town's main street (Sone 1992b:8.2).

Kimball was named for the Norfolk & Western Railway's president Frederick Kimball. Laid out and developed by the Houston Coal Company, the town was incorporated in 1911 (Sone 1992b:8.1). The town retains several rows of company-built houses, as well as the Tudor Revival home of the company's founder and president, John Houston. Its centerpiece is the Houston (later Koppers) Coal Company Store, built in 1923. This one-

story brick, Renaissance Revival building is one of the largest and best-preserved former coal company stores in McDowell County (Sone 1992b:8.2).

Landgraff was named after Constance Landgraff Andrews, the wife of an official of the Empire Coal Company. The first mining operations at Landgraff opened in 1896, and the one-story frame Empire Coal Company store was built soon after. In 1922, the company hired the Bluefield architect A.B. Mahood to design a handsome two-story clubhouse for its executives a short distance out of town. Still standing, the clubhouse is now an inn (Sone 1992c:8.2).

Welch, West Virginia

Welch owes its founding to Captain Isaac Welch, a surveyor and entrepreneur, whose reports of extensive coal seams in the Elkhorn Valley impressed N&W Railway president Frederick Kimball. In 1888, in anticipation of the railroad's arrival, Welch purchased land at the confluence of the Tug Fork and Elkhorn Creek for what was to become the town of Welch. Meanwhile, the N&W began construction of the line running east from Kenova on the Ohio River and westward from the Elkhorn Tunnel. By 1891, the rail line had reached Welch, bringing with it the promise of sustained prosperity as one of several centers of the rich Pocahontas Coal Field. Within a few years, more than 30 mines were in operation in the Welch vicinity, bringing a large influx of both native-born and foreign mine workers to the area (Valente 1992:8.2).

Source: Courtesy of Norfolk Southern Corporation.

View of Welch, West Virginia (ca. 1893). *top center,* the Newly Constructed McDowell County Courthouse; *center,* the N&W Depot.

Source: Courtesy of Norfolk Southern Corporation.

Norfolk & Western Railway Station, Welch, West Virginia (ca. 1907–1908).

In 1892, the McDowell County seat was moved from Perryville to Welch, and in 1893 the town was laid out in regular lots and incorporated (Conley 1929:521). The Romanesque Revival style McDowell County courthouse, designed by architect Frank J. Milburn, was completed in 1893 (Turley 1979:8.1). Most of the town's other early buildings were of wood, sawn locally at one of the town's many lumber mills. By 1900, Welch's population had reached 500 (Thomas 1925:55).

The commercial heart of Welch was concentrated along McDowell and Wyoming streets, near the N&W Railway station. A wide variety of goods and services could be obtained in the downtown stores, as Welch served as the principal shipping point and commercial center for the entire Elkhorn Valley.

In 1910, the town's population numbered approximately 1,600 (Conley 1929:963). A disastrous fire swept through downtown Welch in 1911, destroying most of the town's older wooden buildings (Valente 1992:8.2). These were soon replaced by more substantial brick and stone buildings, the latter usually executed by the many Italian stone masons employed by the N&W Railway. These masons were often contracted out by the N&W for road building projects and other civic improvements. By 1915, Welch was served by passenger trains running between Norfolk, Virginia, and Cincinatti, Ohio. Welch also served as a junction point for the Tug Branch of the N&W, which served numerous small regional coal mines. By 1925, the N&W conducted $675,000 worth of business in Welch (Thomas 1925:55).

Welch and surrounding McDowell County enjoyed an extraordinary period of wealth during the 1920s, as the mining and shipment of coal from the Pocahontas-New River coal areas reached new heights—more than 21 million tons in 1928 (Conley 1929:521). By 1920, its population had reached 3,223 (Conley 1929:521). In 1924, Welch contained two dozen coal company offices, a state hospital for miners, and a thriving commercial center with both local businesses and national retail chain stores. Its population had reached 4,500, according to a state census estimate that year. During the 1920s, McDowell County ranked second in population of all West Virginia counties and sixth in assessed valuation, an extraordinary accomplishment for a region that only 30 years earlier had been almost entirely agricultural.

The 1920s were also marked by major labor unrest in the West Virginia coal fields, particularly in McDowell and Logan counties, resulting in the so-called "mine wars" between labor organizers and coal companies. Labor sympathizer and Matewan police chief Sidney Hatfield was murdered on the steps of the McDowell County courthouse on August 21, 1921 by detectives employed by the coal companies (Workman et al. 1991:23).

Welch's economic fortunes rose and fell with those of the coal industry in southern West Virginia. The Depression hit the coal fields hard, forcing prices down and leading to layoffs, labor unrest, and economic decline. World War II brought a dramatic surge in demand for West Virginia coal and fueled a ten-year economic boom in McDowell and surrounding counties. The 1950s, however, initiated the long decline of southern West Virginia's coal-based economy that has continued through today. Numerous mining operations closed during this period, and those that remained became highly mechanized, leading to mass layoffs (Workman et al. 1991:14).

The construction by the N&W of the Elkhorn Tunnel in 1950 resulted in the diverting of much rail activity away from Welch. Its formerly busy railyards were largely inactive by the 1960s. When John F. Kennedy campaigned in Welch by train during the 1960 West Virginia Democratic primary, he observed first-hand the effects of the declining coal economy in the state, leading him to propose anti-poverty programs for Appalachia during his term in office.

Devastating floods in 2001 and 2002 destroyed much of the low-lying commercial area of the town. In 2004, the population of Welch was estimated at only 2,680.

Matewan, West Virginia

No town is more closely associated with the turbulent history of the labor movement in the southern West Virginia coal fields during the 1920s than Matewan, located along the N&W Railway main line in Mingo County. Like many coal towns, its shape is roughly linear, with the railroad tracks forming a central spine, and the town's business district lying on both sides. In fact, several of Matewan's historic commercial buildings have double façades—one side faces the railroad tracks, with the other side facing Mate Street, the town's main street.

Leases were signed for the rich coal fields that lay in McDowell and Logan counties even before the arrival of the N&W in the Matewan area in 1892. With seemingly unlimited amounts of coal to mine and not enough native workers, coal companies imported large numbers of foreign-born workers, as well as African-Americans from the South, to work in the mines. In 1893, only a year after the first residents moved in, Matewan was incorporated and soon was well on its way to becoming a thriving commercial and shipping center. Matewan was the location of the Matewan National Bank, one of the region's most powerful financial institutions (McCallister and Sone 1993:8.1). In 1895, the population of the surrounding region had increased such that Mingo County was created from a portion of Logan County, with nearby Williamson designated the county seat.

For the most part, residents of Matewan lived in houses and shopped in stores owned and/or controlled by the local coal operators. The companies built both single- and double-houses, as well as dormitory-style residences for its workers using stock plans and often with locally sawn lumber and materials. The companies also provided numerous social outlets for the otherwise isolated workers, often building community centers, churches, and recreation facilities (Tams 1963:75).

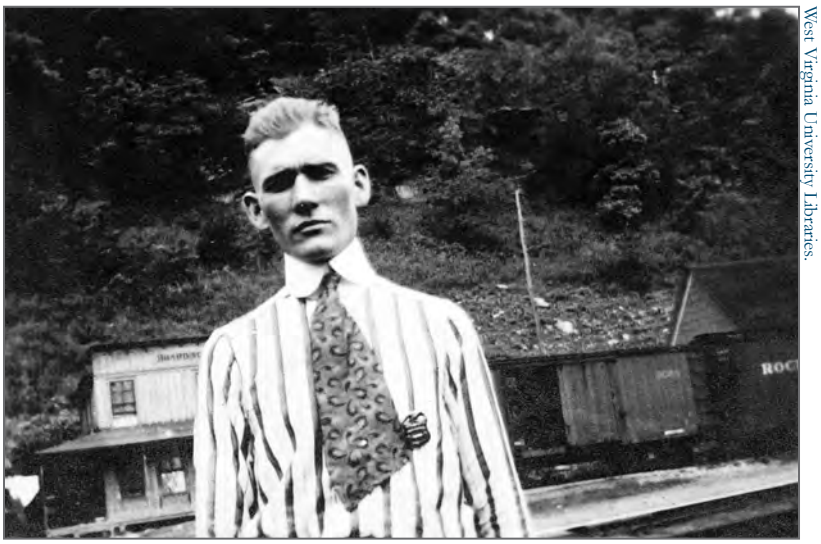
Although there were many exceptions, most miners in the West Virginia coal fields lived a fairly comfortable if difficult life during the boom periods of high production and high wages between 1900 and the end of World War I. After the war, however, world demand for coal declined, and petroleum and natural gas challenged coal's supremacy in the domestic energy markets. During the early 1920s, the number of days that a coal miner worked per year dropped from a wartime high of 249 days to 142 days (McCallister and Sone 1993:8.1).

Faced with job layoffs, many miners in southern West Virginia turned a receptive ear to the organizing efforts of the United Mine Workers Union (UMWU). In 1920, the UMWU started a campaign to organize miners in this region, so as not to undercut the already unionized coal mines of the Midwest and Pennsylvania (Workman et al. 1991:7). West Virginia coal operators put up a united front against the UMWU and its local unionizing efforts, threatening dissident miners with firings and eviction from company-owned housing.

Miners in Mingo County went on strike in the spring of 1920 to force the coal companies to recognize the UMWU; the companies responded by bringing in armed guards from the Baldwin-Felts detective agency in Bluefield to enforce their will on the miners. The tense atmosphere culminated in a violent confrontation between the Baldwin-Felts guards and Matewan police chief Sidney Hatfield on May 19, 1920 near the Matewan depot, where the town's mayor, two miners, and seven Baldwin-Felts detectives were killed in a shoot-out. After a sensational trial in which he was cleared of murder charges in connection with the Matewan

N&W Depot, Matewan. Site of the Gun Battle Known as the "Matewan Massacre" on May 19, 1920 between Miners and Baldwin-Felts Detectives.

Source: Courtesy of Norfolk Southern Corporation.



Source: West Virginia and Regional History Collection, West Virginia University Libraries.

Matewan Police Chief Sidney Hatfield, Prominent in the "Matewan Massacre," Who Was Gunned Down on the Steps of the McDowell County Courthouse in 1921 during the "Mine Wars" in the Southern West Virginia Coal Fields.

killings, Hatfield was gunned down by Baldwin-Felts detectives on the steps of the McDowell County courthouse in Welch in late 1921.

The violence at Matewan eventually culminated in the famous confrontation at Blair Mountain during the 1921 "Miner's March" on Logan County (Savage 1990:120–138). Matewan's historic commercial center, including the site of the "Matewan Massacre," has been recognized by listing in the NRHP.

Williamson, West Virginia

As construction of the N&W Railway's line to Ohio proceeded westward in the late 1880s and early 1890s, landowners in its path saw their property values increase in anticipation of the railroad's arrival. The Williamson family owned vast tracts of undeveloped land along the Tug Fork of the Big Sandy River, in southwestern Logan County, West Virginia. In 1888, following a visit to the area by a N&W survey crew, family patriarch Wallace J. Williamson formed the Williamson Mining and Manufacturing Company to subdivide family-owned land at a planned railroad depot near the West Virginia-Kentucky state line (Taylor 2006:8.55). In 1892, the new town of Williamson was surveyed, and lots were laid out and sold.

The railroad reached Williamson that same year, assuring it almost immediate prosperity. By 1894, Williamson was served by four passenger trains daily at its new frame depot. In 1895, a portion of western Logan County was split off and constituted as Mingo County. Williamson, with barely 100 inhabitants, was chosen as the county seat, primarily due to the influence of the N&W (Conley 1929:171).

By 1900, the booming coal mining industry in southwestern West Virginia had convinced the N&W to establish a divisional hub and build extensive railroad yards and a roundhouse at Williamson. The Williamson yards eventually grew to equal those at Bluefield, West Virginia in importance and were second only to the company's main yards at Roanoke, Virginia (Thomas 1925:99).

Both the railroad and the coal industry provided steady employment for thousands in the Williamson coal fields during the 1900–1930 period, and the town's population increased dramatically as a result. In 1900, Williamson still contained only 688 inhabitants, but had increased to 3,516 ten years later (Thomas 1925:99). By 1920, the population had reached 6,819, which swelled to an historic peak of 9,410 in 1930 (Taylor 2006:8.56). As was true throughout southern West Virginia, an influx of foreign-born workers, chiefly Italian and Eastern European, accounted for much of the population increase after 1900. African-American miners were also brought in from such southern states as Georgia and Alabama.

Williamson experienced an accelerated building boom in 1927, during which nearly one billion dollars in new construction occurred, including several public buildings, a community hospital, apartment buildings,

and numerous private homes (Taylor 2006:8.57). In 1933, O.W. Evans, manager of the N&W's Fuel Department, conceived the idea of building a house entirely of coal in downtown Williamson to symbolize the dominance of the coal industry in the town's economy (Pauley 1979:8.1). The Coal House, located adjacent to the Mingo County Courthouse, currently serves as the Mingo County Chamber of Commerce headquarters; it is also listed in the NRHP.

During the 1930s, the residential sections of Williamson expanded north of the N&W Railway yards; the latter formed a central spine between the residential and commercial parts of the town, with the Tug Fork and South Williamson, Kentucky located to the south. In 2006, the Williamson Historic District, comprising much of the town's historic residential section, was listed in the NRHP in recognition of its significance in the history of Williamson's development and growth during the first half of the twentieth century.

Source: Courtesy of Norfolk Southern Corporation.

N&W Railroad Yards, Williamson, West Virginia (ca. 1930).

View of Williamson (ca. 1913). *Left*, Town's Residential Section; *center*, the N&W Railway Yards; *right*, Williamson's Commercial Downtown.

Source: Courtesy of Norfolk Southern Corporation.

5. SURVEY FINDINGS

Bridges and Tunnels along the Norfolk & Western Railway

As part of the architectural survey of the 125-mile Norfolk Southern line between Belspring, Virginia, and Bull, West Virginia, the researchers documented 83 bridges and 33 railroad tunnels (including three abandoned tunnels). The surveyed bridges and tunnels have construction dates that range from the 1890s to the 1980s and (except for the three abandoned tunnels) are still in active use. These structures provide an important historical record of the N&W's construction progress through the Virginia and West Virginia coal fields during the late nineteenth and early twentieth centuries. Because the N&W continually rebuilt and replaced its bridges and tunnels as they wore out or as they became inadequate, these structures also reflect bridge- and tunnel-building technology from several different time periods.

The N&W faced numerous physical obstacles in constructing the New River (Radford) and Pocahontas divisions of its rail line west from Radford, Virginia, through the Virginia/West Virginia coal fields, and on to the Ohio River beginning in 1881. Foremost of these was the difficult terrain through which much of the route had to pass. West of Radford lay an almost unbroken chain of mountains, pierced only intermittently by gaps or narrows in the ridges. The railroad builders were thus faced with constructing steep grades and accepting long detours along its route, or in the most extreme cases, building tunnels through a portion of a mountain. Snaking their way through the area's mountainous terrain were numerous rivers and creeks, which presented their own set of difficulties for the railroad. Many of these rivers, such as the New, Bluestone, East, Tug Fork, and Big Sandy often consisted of one horseshoe bend after another, and sometimes had to be bridged at intervals of one thousand yards or less.

In building the N&W's rail line, bridges, and tunnels in southwestern Virginia and southern West Virginia, the company's engineers relied on almost a half-century of technological advancements in construction materials and methods. Beginning in the 1830s, American and British engineers had led the world in developing bridge designs that could meet the technological demands of heavier and faster train locomotives and of ever increasing freight loads. American engineers had also developed new and more efficient tunnel building methods by the end of the nineteenth century, aided by the invention of the pneumatic drill and more efficient blasting technology.

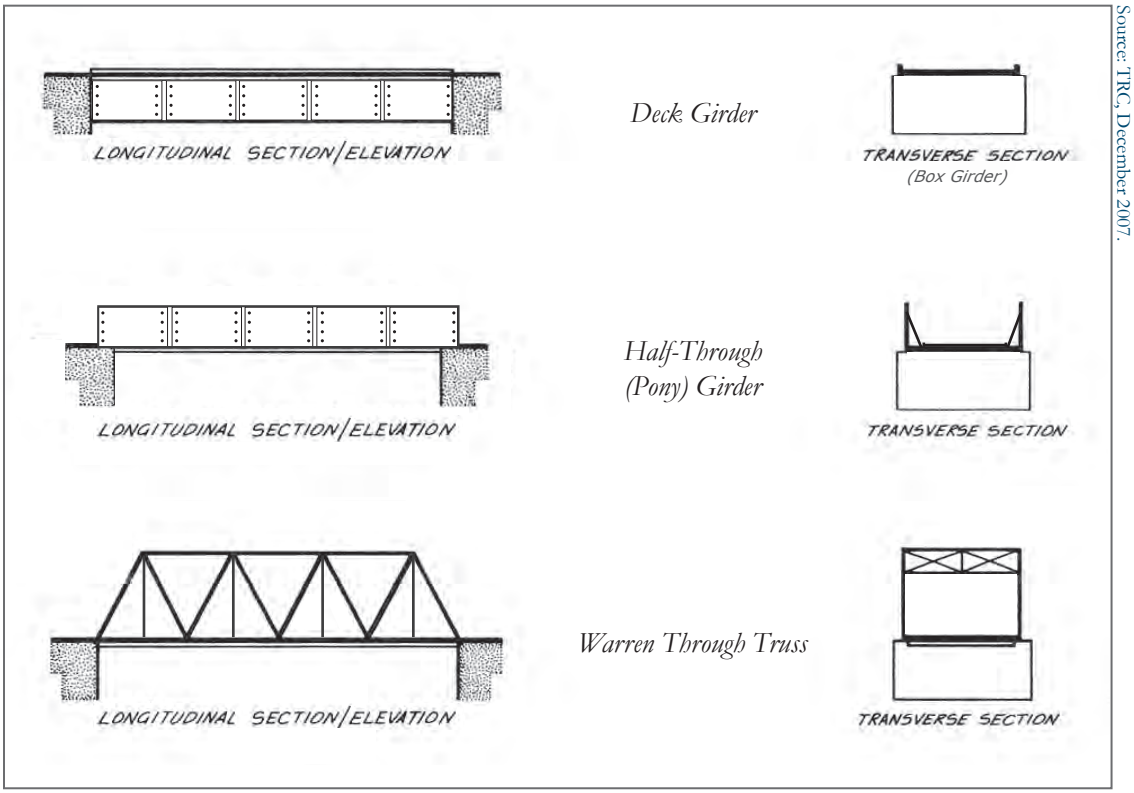
Surveyed Bridge Types along the Norfolk & Western Railway

The first railroad bridges in the United States were built of wood, and wood construction predominated in the railroad industry for most of the nineteenth century (Bianculli 2003:16). The majority of the original bridges built by the N&W as it constructed its line westward in the early 1880s were wooden. Wooden bridges possessed numerous advantages: they were relatively inexpensive to construct, did not require skilled artisans to assemble, and if they were being built in a heavily forested area, had the advantage of being constructed on-site with locally sawn timber. Both the N&W and the newly established mining companies in Virginia and West Virginia produced their own wooden ties and bridge elements at the numerous sawmills established in the area. Yet, wooden bridges usually were regarded as temporary structures at best. Although many were well-constructed, wooden railroad bridges have obvious limitations. Wooden members are not strong in tension and have a tendency to crack or bend, they decay rapidly unless scrupulously maintained, and they are combustible.

Developments in metallurgical technology during the early and mid-nineteenth century were eagerly exploited by railroad bridge builders who constructed many "firsts" throughout the United States. The country's first iron railroad bridge was built by the engineers of the Philadelphia & Reading Railroad at Manayunk, Pennsylvania, in 1845 (Bianculli 2003:17). Metal building technology greatly advanced after the Civil War, particularly after steel replaced iron as the material of choice. The first all-steel railroad bridge in the United States was the Glasgow Bridge over the Missouri River, completed by the Chicago, Alton & St. Louis Railroad in 1879.

The N&W's *Annual Reports* from the early 1900s describe the railroad's intensive effort to replace its existing iron bridges with more durable steel bridges. By this point, the railroad was rarely designing and manufacturing its own bridges. Instead, its engineers sent its design specifications and load requirements to one of several metal bridge manufacturers, such as the Edge Moor Bridge Company, the American Bridge Company of New York, or the Virginia Bridge & Iron Company of Roanoke. These companies produced the shop drawings and manufactured the finished bridge parts, which were then shipped by rail to the bridge site. There they were assembled by railroad work crews under the skilled supervision of the railroad's bridge engineers. Most of the original bridge drawings prepared for the N&W, as well as later drawings prepared as part of subsequent bridge repair programs, remain in the Norfolk Southern archives.

The bridges surveyed along the N&W main line are comprised of two main types: beam (also known as girder) bridges and truss bridges (Figure 1). The girder bridge, the most ancient bridge type, consists of one or more flat beams spanning a river or roadway. The first wood-and-metal girder railroad bridge was built in the United States in 1847; the first all-metal railroad girder bridge, with a span of nearly 87 feet, was built in 1861 by the Boston & Worcester Railroad (Bianculli 2003:28). Although at first wooden beam bridges were commonly built by the N&W, they were quickly replaced as soon as practicable by the railroad and none have survived along this portion of the Norfolk Southern line.



Source: TRC, December 2007.

Figure 1. Bridge Types: Deck Girder, Half-Through Girder and Warren Through Truss.

Short distances (less than 50 feet) can usually be spanned with a single metal beam. Longer distances require the laying of two or more parallel beams end-to-end to form individual spans, with the ends of each beam resting on stone, metal, or concrete piers. The stone or concrete supports at each end of the entire bridge superstructure are known as abutments. Most metal girder bridges are "plate girders" where metal shapes (with I or L cross sections) are riveted together and reinforced with side braces. Where these elements are assembled into a hollow box (in cross section) they are known as box girders. Often, the parallel beams were tied together by metal cross braces or metal trusses, which made the deck surface both stable and rigid.

Of the 83 bridges surveyed, 76 are girder or truss/girder bridge combinations, with most of those constructed between 1900 and 1930. The majority are deck girder bridges, defined as girder bridges on which the rails and ties are laid directly atop the beams. One example is Bridge #905, located at mile post 412.01, near Big Sandy, in McDowell County, West Virginia. This pair of four-span, riveted-plate deck girder bridges carries the two-track railroad line over both the Tug Fork of the Big Sandy River and a narrow dirt road. The first and fourth spans of both bridges measure 61 feet and 6 inches, and the second and third spans measure 60 feet and 3 inches. Each of the bridge spans consists of two parallel steel beams with built-up steel plates, with the beams fastened together at the top with lateral metal braces and topped by a wooden decking. The bridge superstructure rests on steel plates atop the cast concrete piers and abutments.

The first bridge at this location was a two-span girder bridge constructed for the N&W by the Edge Moor Bridge Works of Edge Moor, Delaware in 1890. The old bridge was damaged as a result of a spectacular derailment in July 1908 and was repaired. This bridge was subsequently purchased by the McDowell County government for use as a roadway bridge, was moved, and thereafter replaced by a new bridge manufactured by the Pennsylvania Steel Company and put in place sometime in 1908–1909 (Norfolk & Western Drawings Y-2681 and Y-10609). Other examples of deck girder bridges surveyed along the N&W's route include the bridges located at mile post 308.76 over Back Creek in Belspring, Virginia; at mile post 333.82 over Wolf Creek in Narrows, Giles County, Virginia; and at mile post 340.68 over the East River in Glen Lyn, Mercer County, West Virginia.

Source: TRC, October 2007.

Bridge #905, Located at Mile Post 412.01, near Big Sandy, in McDowell County, West Virginia.

A variant of the girder bridge is the half-through girder bridge. In a half-through bridge (also known as a pony girder bridge), the bridge deck is supported between two plate girders, often resting on top of the bottom flange. The overall bridge then has a U-shape in cross section. As cross-bracing cannot normally be added, vertical stiffeners on the girders are normally used to prevent buckling (technically described as 'U-frame behavior'). This form of bridge is most often used on railroads as the construction depth (distance between the underside of the vehicle, and the underside of the bridge) is much less. This allows obstacles to be cleared with less change in height.

Source: TRC, October 2007.

Half-Through Girder Bridge at Mile Post 403.61 Adjacent to the East Portal of Antler Tunnel #1, near Mohegan, McDowell County, West Virginia.

An example of the half-through girder bridge type is seen at mile post 403.61 adjacent to the east portal of Antler Tunnel #1, near Mohegan, McDowell County, West Virginia. This pair of three-span, half-through, metal plate girder bridges, built in 1905, carries the two-track line on a wide curve

over the Tug Fork of the Big Sandy River. The two parallel bridges are identical, with each of the three 85-foot-long bridge spans consisting of four parallel steel beams fastened together at the bottom with lateral metal cross braces. The main bridge beams are built-up riveted through-plate girders and have triangular metal stiffeners connecting the sides to the deck structure. The bridge superstructure rests directly on cast concrete piers and abutments. A metal date plaque on the north bridge is stamped "American Bridge Company of New York, 1905."

The truss bridge is the other major bridge type surveyed; six truss bridges are present, and five other bridges include truss elements. (The final bridge is a stone and concrete arched bridge.) Like beam bridges, truss bridges were first constructed of wood; many covered wooden truss roadway bridges from the nineteenth century still survive throughout the country. Their underlying principal is the use of bridge members in a triangular configuration, with each side of the triangle resisting loads exerted on the triangle itself. By the early 1800s, American bridge builders had developed a number of truss designs, which had a lattice-like appearance or consisted of V- or inverted V-shapes. In 1819, the architect Ithiel Town conceived a parallel truss design consisting of upper and lower chords that eliminated the need for an arch as part of the truss structure, a major improvement. Numerous other truss designs followed, usually named for their inventor, such as the Howe Truss (1840), the Whipple Truss (1841), the Pratt Truss (1844), and the Warren Truss (Bianculli 2003:51).

The Warren Truss was invented and patented in the 1850s by the British engineer Russell Warren, and by the 1880s was in widespread use by American railroads. Its greatest period of popularity was in the first quarter of the twentieth century, when metal Warren truss bridges were also built as road bridges by many state highway departments. Most Warren truss bridges were of the through-truss type, in which the tracks or roadway are located at the base of the bridge superstructure. The vertical elements above the track are riveted or pin-connected to both the bottom and top chords, with the top chords also joined by crossbeams and metal bracing (Bakht et al. 1979:4).

One of the largest and most impressive bridges along this portion of the Norfolk Southern main line is the Maybeury Bridge, located at mile post 378.64 in the town of Maybeury, McDowell County, West Virginia. This massive bridge, which carries the two-track railroad line over both US 52 and Elkhorn Creek, consists of three different bridge spans laid end to end. The easternmost span is a steel camel-back, Warren through-truss bridge measuring 230 feet from back wall to pier with eight panels, and resting on a concrete abutment on the west end and a tapered concrete pier on the east. This section spans Elkhorn Creek. The center section is a steel camel-back, Warren through-truss bridge measuring 227 feet with eight panels and resting on tapered concrete piers. This section spans US 52. On the west is a 56-foot half-through plate girder bridge. A plaque on the far eastern end of the truss bridge identifies it as having been constructed by the Virginia Bridge & Iron Company of Roanoke in 1948.

Source: TRC, October 2007.

Maybeury Bridge, Mile Post 378.64, Maybeury, McDowell County, West Virginia.

The two truss bridges located at the west end of the Hatfield Tunnels—at mile post 462.01 near Matewan, Mingo County, West Virginia, and the Harding Street/Belcher Street Bridge built by the N&W over its rail yards at Bluefield, Mercer County, West Virginia—are other good examples of the Warren through-truss type.

Source: TRC, October 2007.

Harding Street/Belcher Street Bridge over the NS Tracks at MP 362.23, Bluefield, Mercer County, West Virginia.

The Cooper Bridge, located at mile post 374.45 at the west end of the Cooper Tunnel in the town of Cooper, Mercer County, West Virginia, is another combination deck-and-truss metal railroad bridge. Spanning County Route 20/9 and the Bluestone River, this bridge's two center spans consist of a Warren truss deck bridge, flanked by two deck girder bridges on the east and west. In a deck truss bridge, the railroad tracks run along the top of the bridge superstructure.

Source: TRC, October 2007.

Cooper Bridge, Mile Post 374.45, Cooper, West Virginia.

Surveyed Tunnels along the Norfolk & Western Railway

America's railroads constructed numerous ambitious tunnel projects beginning in the mid-nineteenth century. Foremost of these were the tunnels built by the Virginia Central Railroad through the Blue Ridge Mountains of Virginia in the 1850s under the direction of engineer Claudius Crozet (Bianculli 2003:95). With the development of dynamite in 1866 and with the introduction of safer and more efficient power tools, tunnel construction became both more feasible and more common.

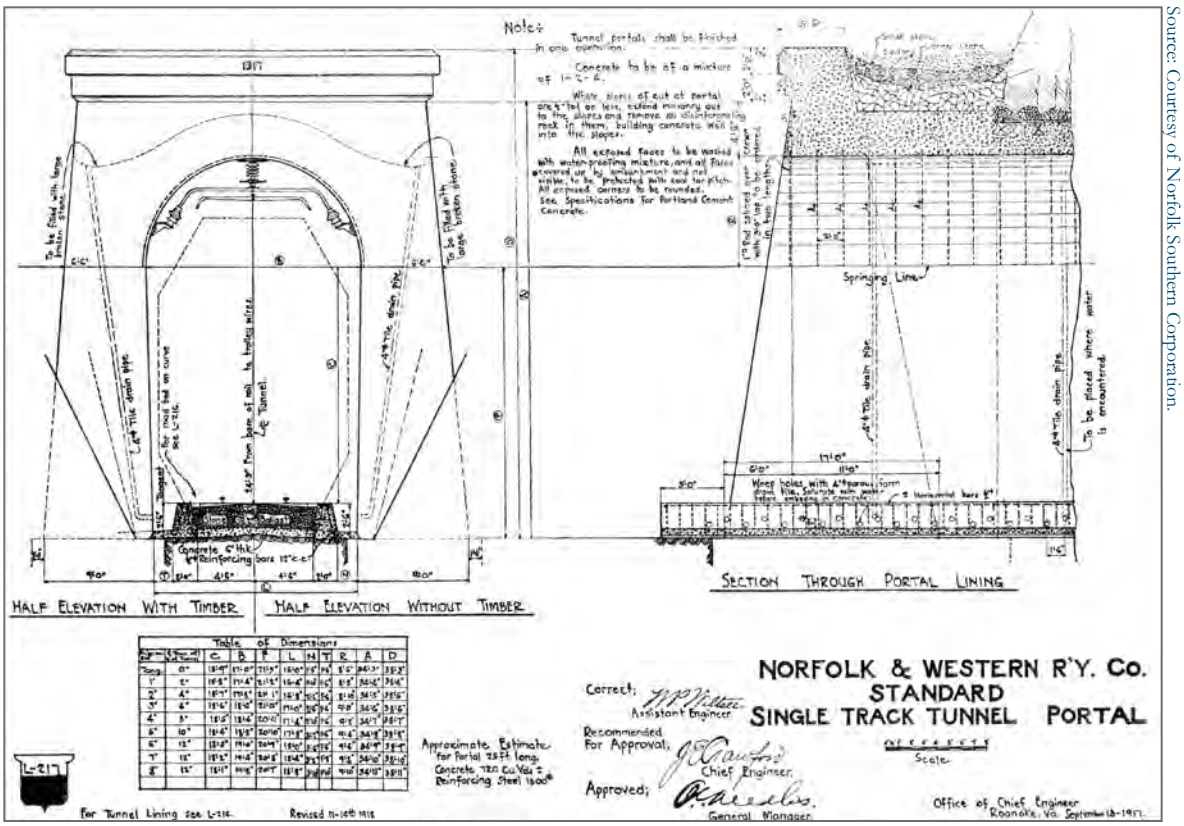
Nevertheless, George L. Vose, in his *Manual for Railroad Engineers and Engineering Studies,* written in 1878, stated "Tunnels, driven through hills or spurs of mountains to avoid very deep cutting, are at best sources of large expenditure and should be avoided" (Vose 1878:89). The tunnel excavation method utilized depended on the hardness of the material; the major task in constructing hard rock tunnels was the breaking away of the rock itself. Given the great difficulty involved in their construction and excavation, many railroad companies followed Vose's advice and simply avoided building tunnels wherever possible. As a consequence, many mountainous railroad routes, such as the original route of the N&W's Ohio Extension through Mercer and McDowell counties, West Virginia, were characterized by steep grades and numerous sharp curves. For steam locomotives, long tunnels were especially impractical. Unless properly ventilated, the tunnel trapped smoke from slow-moving trains, suffocating their crews.

At first, the N&W was willing to accept this solution to routing its line through the mountainous coal fields of West Virginia. The railroad's experience in building the Elkhorn (Flat Top) Tunnel in 1887 had been instructive; both its cost and construction time had greatly exceeded original projections. But by the late 1890s, its finances buoyed by coal traffic revenue, the N&W embarked on an ambitious project to widen and improve existing tunnels and build new tunnels to eliminate many of the steep grades and wide curves of the current route. When completed, these improvements to the Pocahontas Division resulted in 23 tunnels between the Elkhorn Tunnel and the Big Sandy Tunnel #4 at Bull, West Virginia, earning this stretch the nickname of the "N&W's subway."

The earliest tunnels had been constructed with wooden linings, often mortised and tenoned together. Because wooden linings were liable to decay and were susceptible to catching fire from flying sparks, they were soon replaced by brick or stone linings. Brick was often used along the crown, even in otherwise stone-lined tunnels. Italian stone masons were responsible for the construction of many of the tunnels along the N&W's route through West Virginia. In some tunnels, such as the Pembroke Tunnel, in Virginia, mason's marks can still be seen on the stone tunnel lining. Over the years most of the N&W's tunnels have been relined with gunnite—a mortar or concrete coating that has been sprayed onto the original surface.

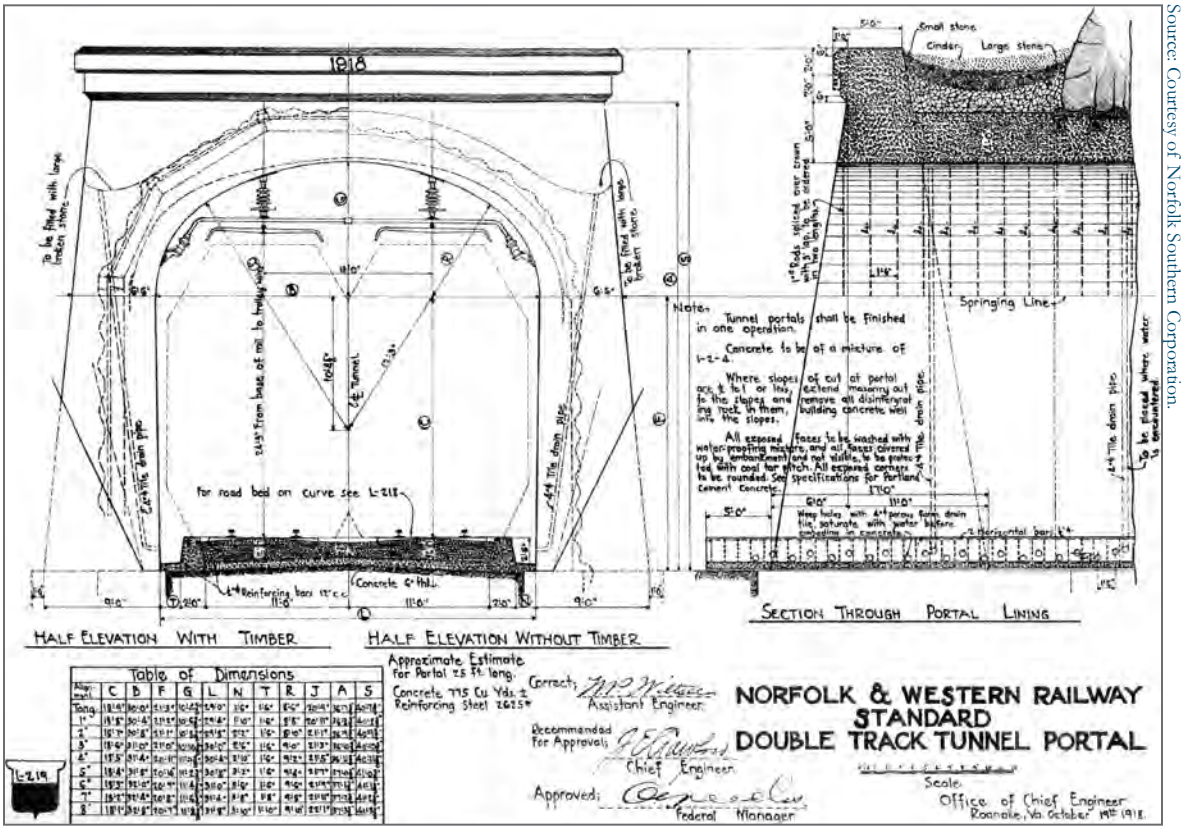
N&W workers constructed railroad tunnels according to standard plans prepared by the company's engineers. Drawings and plans were prepared for both single-track and double-track tunnel openings (Figures 2 and 3). Some of the tunnel portals built for single-track openings in the early 1900s feature a portal and wing walls faced with cut-stone masonry. Big Sandy Tunnel #4, located at N.A. 12.68 at Bull, West Virginia, was one such tunnel. Built in 1904, the tunnel measures 2,068 feet in length, making it one of the longer tunnels along this portion of the N&W's Pocahontas Division. The Mingo (Williamson) Tunnel, located at mile post 471.62 near Williamson, West Virginia, is a variant of this design built for a two-track opening. Completed in 1906, the 678-foot-long tunnel retains its stone lining with a brick crown.

Many of the tunnels constructed by the N&W after 1900 feature a cast concrete portal opening design, with a segmental arched head, tapered sides, and a simple raised cornice along the top. The Big Sandy Tunnel #1, located at N.A. 3.30 near Panco Siding, West Virginia, was built for a single-track line. Completed in 1905, the tunnel measures 2,627 feet long and 14 feet wide. The Gordon Tunnel, located at mile post 415.07, near Mohegan, West Virginia, is another of these tunnels, but built for a two-track width. Built ca. 1907–1908, it is 1,271 feet long and 28 feet wide, and has a concrete lining throughout its length.



Source: Courtesy of Norfolk Southern Corporation.

Figure 2. Standard Plan Designed by Norfolk and Western Engineers for Single-Track Tunnel, 1917.



Source: Courtesy of Norfolk Southern Corporation.

Figure 3. Standard Plan Designed by Norfolk and Western Engineers for Double-Track Tunnel, 1918.

Source: TRC, October 2007.

Big Sandy Tunnel #4, N.A. 12.68, Bull, West Virginia.

Source: TRC, October 2007.

Mingo (Williamson) Tunnel, Mile Post 471.62, Williamson, West Virginia.

Source: TRC, October 2007.

Big Sandy Tunnel #1, N.A. 3.30, Panco Siding, West Virginia.

Source: TRC, October 2007.

Gordon Tunnel, Mile Post 415.07, Mohegan, West Virginia.

From its completion in 1887, the Elkhorn Tunnel in McDowell County was recognized for its importance in opening up the Elkhorn Valley to its west for sustained development by both the railroad and coal mining companies. Its sheer length made it difficult to traverse by steam engine and was one of the reasons for the switch by the N&W to electrification of its locomotives along this stretch of its route beginning in the early 1910s. After World War II, the N&W embarked on a major realignment of its route in eastern and central McDowell County, building a new Elkhorn Tunnel and bypassing Welch to the west. Designed by the N&W and built by the Sturm & Dillard Construction Company of Columbus Ohio, the second Elkhorn Tunnel was inaugurated in 1950. Located at mile post 375.52, the Elkhorn Tunnel measures 7,107 feet long and is 31 feet wide at both portal openings. Giant metal ventilator fans located at the west portal opening blew fresh air into the tunnel, especially important after the N&W returned to using steam engines in 1950. The fans' useful life was short-lived, however. After the N&W made the difficult but necessary decision to switch to diesel-powered locomotives and abandoned its reliance on coal-powered engines, the Elkhorn Tunnel's ventilation system was deactivated in 1961.

Source: TRC, October 2007.

Elkhorn Tunnel West Portal with Ventilating Fans, Mile Post 375.52, Elkhorn, West Virginia.
Source: TRC, October 2007.

6. CONCLUSION

This survey of bridges and tunnels built by the N&W Railway is just one of many studies that have attempted to document the rich architectural, social, and economic heritage of the coal mining areas of southwestern Virginia and southern West Virginia. A formerly isolated and rural agricultural outpost in Appalachia, this region was transformed in less than a generation into one of the world's most productive coal mining areas. The decline in the region's population and its economic fortunes after 1950 has been more gradual, although equally dramatic.

Like the earlier coal companies, social and economic historians have mined the rich vein of culture, customs, music, literature and architecture of the coal fields region. Since the 1960s, numerous authoritative books and studies have been produced on the history of coal mining; the development and characteristics of the coal company town; the ethnic and racial makeup of West Virginia coal miners; and the often violent history of the labor movement in the region's coal fields. In addition, several well-written histories of the N&W, such as Joseph Lambie's *From Mine to Market: The History of Coal Transportation on the Norfolk and Western Railway* (1954), and Pat Striplin's *Norfolk & Western: A History* (1997) have documented the crucial role the railroad played in opening up the region for sustained development. The Norfolk & Western Historical Society in Roanoke, Virginia plays an active role in preserving a record of the N&W and its history, as well as the history of the people and places it served (www.nwhs.org).

The necessity for continuing study and recognition of the unique way of life in the West Virginia and Virginia coal fields becomes more pressing with each passing year. Former coal company stores deteriorate or are torn down, former miners die or move away, and valuable records and photographs are destroyed or continue to remain unnoticed in attics and county courthouses.

Local historical societies and libraries have taken the lead in preserving artifacts and records of the region's history and culture, as well as sponsoring the collecting of oral histories of former miners and residents of the area. These include such libraries and museums as the Iris Brammer Library in Narrows, Virginia (www.townofnarrows.org/home/townlibrary.html), and the Raymond Ratcliffe Memorial Museum in Pulaski, Virginia (www.pulaskitown.org/pulaskiinformation.aspx). The Eastern Regional Coal Archives, housed in the Craft Memorial Library in Bluefield, West Virginia, houses the region's largest repository of coal-related research materials and historical artifacts of all kinds (craftmemorial.lib.wv.us/coal.htm).

The region's railroads, the N&W, the C&O, and the Virginian, remained consistently profitable enterprises, even while the coal industry declined. Yet, due to technological advances, mechanization, and the end of passenger train service, many railroad-related buildings and structures, such as passenger and freight depots, telegraph stations, flag stops, and repair shops, have disappeared altogether. A few historic buildings of the N&W have been rehabilitated for other uses, however, such as the former N&W passenger station in Roanoke, Virginia, which now houses the O. Winston Link Museum, displaying the famous photographs of this chronicler of the last days of steam power along the N&W (www.linkmuseum.org/index.html).

In recognition of the need to preserve, recognize and honor the rapidly disappearing physical and cultural artifacts of the nineteenth- and twentieth-century coal boom in this region, the U.S. Congress in 1988 enacted Public Law 100-699. This law authorized "conducting studies to determine the feasibility of protecting and preserving certain significant, cultural, natural, and historic resources associated with the coal mining heritage of southern West Virginia . . . beginning with specific sites and points of interest." This act led to the creation of a National Coal Heritage Area (NCHA), encompassing all or part of the southern West Virginia counties of Mercer, Boone, McDowell, Logan, Raleigh, Fayette, Mingo, Wayne, Summers, Lincoln, Cabell, and Wyoming (www.coalheritage.org).

In 1991, the West Virginia Institute for History of Technology and Industrial Archaeology produced the *Historical Context for the Coal Heritage Survey* (Workman et al. 1991). This historical study provides a framework for the evaluation of historic buildings, structures, objects, sites and districts within the NCHA. The West Virginia Division of Culture and History and the National Park Service also have sponsored architectural surveys within the NCHA to identify and evaluate the significance of the region's historic resources.

An important means for recognizing and ultimately preserving historically significant buildings and districts is through their listing in the National Register of Historic Places (National Register). The National Register, established in 1966 as part of the *National Historic Preservation Act,* is the nation's official listing of buildings, structures, archaeological sites of national, state, or local significance (www.nps.gov/history/nr). A few buildings within the project area for this study of the N&W have been listed in the National Register, including the Coal House in Williamson, the McDowell County Courthouse in Welch, and the Municipal Building in Bluefield. The historic commercial and residential sections of such diverse communities as Radford, Bluefield, Williamson, and Welch have been listed as historic districts in the National Register. The Matewan Historic District was designated a National Historic Landmark in recognition of its association with the history of the labor movement in the southern West Virginia coal fields. In 1991, several remaining coal company stores in McDowell County were collectively listed in the National Register.

This study of the bridges and tunnels along the Norfolk Southern's rail line between Cowan, Virginia, and Bull, West Virginia, is a direct result of one of the provisions of the *National Historic Preservation Act* which mandates the consideration of the effects to historic resources from federally funded actions such as the Heartland Rail Corridor project. The survey forms produced on the individual bridges and tunnels represent the most detailed documentation produced to date on these structures. By depositing this report and the survey forms with the State Historic Preservation Offices of Virginia, West Virginia, and Kentucky, as well as with numerous libraries and historical societies, the FHWA is furthering the study and recognition of the valuable historic resources of this region.

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APPENDIX A: MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT
among the
EASTERN FEDERAL LANDS HIGHWAY DIVISION
of the
FEDERAL HIGHWAY ADMINISTRATION
and the
WEST VIRGINIA, VIRGINIA, KENTUCKY and OHIO STATE HISTORIC PRESERVATION OFFICES
regarding
the
HEARTLAND CORRIDOR RAIL CLEARANCE PROJECT
Walton, Virginia to Columbus, Ohio

WHEREAS, in Public Law 109-59, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 1301(m)(2) describes this project as: "Heartland Corridor Project including multiple intermodal facility improvements and improvements to facilitate the movement of intermodal freight from VA to OH", and SAFETEA-LU, Section 1702, Project No. 5072 further described this project as: "Double stack clearance of tunnels on the Norfolk and Western Mainline in Virginia located on the Heartland Corridor"; and

WHEREAS, SAFETEA-LU allocates funds to be utilized to provide vertical and horizontal clearance through existing tunnels and bridges for freight trains carrying double stacked, standard freight containers on the existing Norfolk Southern Railway Company (NS) mainline rail corridor between Walton, Virginia, and Columbus, Ohio; and

WHEREAS, this undertaking is to modify existing tunnels and bridges to provide double stack vertical and horizontal clearance on the NS mainline between Walton, Virginia, and Columbus, Ohio, and does not include construction of any intermodal facilities, stations, sidings or other rail facilities; and

WHEREAS, the Federal Highway Administration (FHWA) is the lead federal agency for implementation of this rail clearance project; and

WHEREAS, NS and the FHWA executed a Memorandum of Agreement on August 8, 2006, establishing the working relationship and responsibilities to implement the undertaking, and documents the ability of the FHWA to undertake actions with and for NS on NS property (see attachment A); and

WHEREAS, the FHWA has consulted with the West Virginia, Virginia, Kentucky, and Ohio State Historic Preservation Offices (SHPOs); and

WHEREAS, the West Virginia Division of Culture and History, which in WV is the WV SHPO, the Virginia Department of Historic Resources, which in VA is the VA SHPO, the Kentucky Heritage Council, which in Kentucky is the KY SHPO and the Ohio Historic Preservation Office, which in Ohio is the OH SHPO, and the FHWA have agreed that the

NS mainline railroad corridor between Walton, Virginia, and Columbus, Ohio, is eligible for listing in the National Register of Historic Places; and

WHEREAS, the FHWA has determined, in consultation with the WV SHPO, VA SHPO and KY SHPO, that the proposed undertaking will have an adverse effect upon contributing resources of the NS mainline railroad corridor; and

WHEREAS, the FHWA has consulted with the Ohio SHPO regarding the railroad corridor in Ohio and have agreed that the effect of the undertaking on the corridor in Ohio (when considered alone) would not be adverse to the corridor, and because the corridor is considered a single property located in four states, and there is an adverse effect upon the property by this undertaking (due to actions in the other three states), Ohio has agreed to participate in this consultation and be a signatory of this Memorandum of Agreement (MOA) so its participation and the effect in Ohio will be documented; and

WHEREAS, in accordance with 36 CFR Section 800.6(a)(1), the FHWA has notified the Advisory Council on Historic Preservation (Council) of its adverse effect determination with specified documentation and the Council has chosen not to participate in the consultation pursuant to 36 CFR Section 800.6(a)(1)(iii); and

WHEREAS, the FHWA has determined that areas of this undertaking are located within the aboriginal territory of the Cherokee Tribe, the FHWA has consulted with the Eastern Band of Cherokee Indians, the Cherokee Nation of Oklahoma, the United Keetoowah Band of Cherokee Indians and the Virginia Council on Indians and all have declined to participate in this consultation, however, all have requested notification should Native American artifacts or human remains be inadvertently discovered; and.

WHEREAS, the FHWA has notified the public regarding this undertaking through postings on its web site as well as that of the National Coal Heritage Area Authority (Authority); and

WHEREAS, the FHWA has contacted and continues to work and consult with the Authority through its active relationship and current projects with counties, municipalities and other consulting parties in the area of the undertaking, and will continue to solicit and consider local input, particularly regarding distribution and placement of historic documentation related to this undertaking; and

WHEREAS, the FHWA has coordinated with the Pulaski County, Virginia, Historical Society and Pulaski County, Virginia, regarding this undertaking, and they have both declined to participate in this consultation, but they have agreed to assist and coordinate with FHWA regarding distribution and placement of historic documentation (when they are available) related to this undertaking; and

WHEREAS, the FHWA has determined that the effects of the undertaking cannot be avoided and that all reasonable measures have been taken to minimize adverse effects on historic properties; and

WHEREAS, current plans are to restrict construction work and disturbance to the existing, previously disturbed limits of the railroad bed, track, bridges and tunnels, (except for Big

Four No. 2 tunnel in West Virginia, where the tunnel overburden, naturally sloping at greater than 20 percent will be removed), the possibility nevertheless exists that historic properties could inadvertently be discovered during construction activities, these will be governed by the inadvertent discovery clauses in NAGPRA, 36 CFR Section 800.2 and stipulations of this MOA; and

NOW THEREFORE, the FHWA, WV SHPO, VA SHPO and KY SHPO agree that the following stipulations shall be implemented to mitigate the adverse effects of the undertaking on the rail corridor. The FHWA shall ensure that the terms and conditions of this MOA are implemented in a timely manner and with adequate resources in compliance with the National Historic Preservation Act of 1966, as amended (16 U.S.C . 470).

STIPULATIONS

FHWA shall ensure the following stipulations are carried out.

I. MITIGATION

A. The FHWA shall ensure that a survey and documentation of the 112 individual tunnel and railroad bridges listed on attachment B and a general history of the railroad corridor between Cowan, Virginia and Bull, West Virginia will be completed within 12 months of the last signature date of this MOA. The FHWA shall ensure that the survey and documentation consist of the following:

1. A written record of the general history, people and companies involved in the railroad's construction, maintenance and ownership between Cowan, Virginia and Bull, West Virginia (and the appropriate national, state and regional context of this section of rail line) based on research of available records held by the respective states, counties in the corridor and Norfolk Southern Corporation.
2. A photographic record and a completed site survey form, (form and completion requirements appropriate and meeting the standards for the state in which the element is located) for each contributing element on the attached list (see attachment B). The photographs shall be 8" by 10" black and white (or alternate size as approved by the respective SHPO) and meet the respective state's standards. At each individual tunnel a photograph will be provided of each portal, for bridges, one photograph will be provided of each elevation (side view).
3. Sketch drawings of the following stone masonry tunnel portals indicating the width and height of the portal structure as well as the width, height and arch dimensions of the tunnel opening: Cowan, Pembroke, Cooper, Williamson and Big Sandy Number 4.
4. A partial United States Geological Survey based map with site location arrow for each individual tunnel or bridge location and quadrangle name.

The appropriate state site identification number will be included on all documentation and photographs.

The FHWA shall ensure that 40 hard cover, bound copies of the history and photographic record of the recorded elements are produced and distributed to public libraries in the railroad corridor, each of the four state SHPOs, each of the four state libraries/archives and other signatories of this MOA.

FHWA will coordinate with the Authority, the Pulaski County, Virginia, Historical Society, Pulaski County, Virginia, and local jurisdictions in West Virginia and Kentucky for distribution of documentation as well as wording and placement of interpretive signs (see items B., C. and D. below).

The photographic record, history and final site forms will be submitted to the WV SHPO, VA SHPO and KY SHPO and shall comply with the respective state's archival standards for such material.

The individual site surveys and documentation shall be completed and accepted by the respective SHPOs prior to the start of any construction work at the individual site location. The respective SHPOs shall have thirty (30) days upon receipt of the complete documentation package in which to comment on the material. If the WV SHPO, VA SHPO or KY SHPO do not respond within the 30 days, FHWA shall assume concurrence and proceed.

The principal investigator/researcher responsible for completing the research, documentation and field investigation will meet professional qualifications standards outlined in the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (36 CFR Part 61, Appendix A).

B. Provide an electronic record of the documentation and photographs suitable for posting on state and local web sites. FHWA shall pursue opportunities to post an electronic record of the documentation and photographs on appropriate state and local web sites such as the VA Department of Rail and Public Transportation and related agencies in the four states, county historical societies along the rail corridor and railroad related historical and interest groups in the four states. FHWA shall report to the WV SHPO, VA SHPO, KY SHPO and OH SHPO within twelve (12) months after execution of this Agreement the web sites hosting the documentation and photographs.

C. Pursue providing and installing one standard, cast metal, historic highway marker in the vicinity of Cowan, Virginia. The text for this marker will be determined in consultation with the VA SHPO. Location and installation of the marker in highway right of way will be coordinated and approved by the Virginia Department of Transportation. FHWA shall submit an application for an historic marker to VA SHPO within twelve (12) months after execution of this Agreement.

D. Provide and install ten interpretative markers at five different, publicly accessible sites, on public property in West Virginia, with the specific locations as well as size and format to be agreed upon by the WV SHPO, the Authority, the local government having jurisdiction of the sign site area and FHWA. The interpretative

markers will describe, through graphics and writing the history of the railroad and its connection to the local area's history and economy. The markers will be mounted on pedestals or attached to existing site features such as retaining walls or pavements. The markers will become the property of/and be maintained by a designated local jurisdiction. The text and graphics for each marker will be determined in consultation with the WV SHPO and the Authority. Should any of these interpretive markers be proposed for placement in the right of way of a roadway under the jurisdiction of the West Virginia Department of Transportation (WVDOT), the WVDOT will be consulted and its approval obtained for the location and construction/installation details of such marker. Subject to approval of sign placement by the land owner/manger of the land on which the sign is to be installed, the interpretive markers will be installed within 18 months of the last signature date of this MOA.

II. POST REVIEW DISCOVERIES

A. FHWA shall implement the following plan for discovery of historic properties should the proposed undertaking encounter a previously unknown historic property, or should the undertaking directly or indirectly affect a known property in an unanticipated manner. Initially, all work within 200 feet of the find that might adversely affect the historic property shall cease until FHWA, in consultation with the SHPOs (and notification to the other consulting parties), can evaluate the historic property's National Register eligibility and the probable effects to it. FHWA shall also consult with the SHPOs and other consulting parties to evaluate the discovery and to determine whether avoidance, data recovery, or other mitigation measures should be undertaken. Consultation shall also determine if and when work at the location of the discovery may resume. If a property has been determined to be damaged by the undertaking, the resource shall be evaluated for National Register eligibility. If eligible, a site damage assessment shall be completed by a qualified archaeologist pursuant to 36 CFR Section 800.2(a)(1). All signatories shall review this report. FHWA in consultation with the SHPOs and other consulting parties shall recommend appropriate mitigation measures in the site damage assessment.

B. The FHWA shall ensure that the design and initiation of data recovery or other mitigation measures shall be implemented as expeditiously as possible and with the SHPOs' approval. Mitigation measures shall be arrived at through consultation and agreed upon by all parties to the consultation. If data recovery is the selected treatment option, FHWA shall ensure that the plan is developed in consultation with the appropriate SHPO and other consulting parties and is consistent with the Council's Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites (April 2002). In the event a dispute arises with regard to appropriate mitigation measures, FHWA shall consult with the Council in accordance with Stipulation VII to resolve the issue.

III. DISCOVERY OF HUMAN REMAINS AND ASSOCIATED CULTURAL ITEMS

A. FHWA shall ensure that appropriate consideration is also given to the possibility that

historic period as well as Native American remains may be discovered. If human remains are identified during construction, the FHWA shall require that construction be halted immediately at the location of the remains. FHWA shall ensure that further construction does not occur within 200 feet in any direction of the discovery until a qualified archeologist arrives to assess the discovery. FHWA will secure the area of the apparent human remains to ensure no further disturbance or removal of those remains and associated material occurs. FHWA shall also ensure that vehicular traffic across the area is restricted to a location removed from the discovery. After arrival at the site, the cultural resource specialist shall evaluate the discovery. If it does consist of human remains, the cultural resource specialist shall follow the procedures as follows:

- If human remains and cultural items, as defined by the Native American Graves Protection and Repatriation Act (NAGPRA), are encountered on Federal lands during inventory, testing, data recovery or any construction-related activities, work within 200 feet of the discovery would cease. FHWA would immediately notify the SHPO and all other signatories and consulting parties of the discovery. The appropriate Federal land-managing agency would then implement internal procedures for complying with NAGPRA.

- On non-federal lands, or in the event that human remains not subject to NAGPRA are discovered on Federal lands, a permit for the archaeological removal of human remains may be required under applicable Virginia, West Virginia and Kentucky law, together with assurances that any such remains will be treated with dignity and respect.

IV. UNDERTAKING MODIFICATIONS

A. It may be possible that during construction that certain minor modifications to the undertaking may become necessary. Examples of these modifications include rerouting to avoid other environmental impacts, temporary construction, the establishment of construction camps or staging areas, minor changes in access routes or rights-of-way, borrow areas and other construction contractor-dependent actions. FHWA shall ensure that any area scheduled for surface disturbance would be inventoried for cultural resources prior to any disturbance of the area, conforming to this agreement as well as state and federal regulations. A separate cultural resource inventory report(s) may be necessary to cover additional surveys. Review and comment on this report(s) would follow existing regulations. Should cultural resources be recorded, FHWA would follow the provisions of this agreement and applicable state and federal regulations for determinations of eligibility and effect.

B. Should historic properties be identified during an additional inventory, FHWA shall attempt to move the impacting activity, modify the activity to reduce or eliminate adverse effects, or if possible, cancel the activity. Should none of these options be possible, FHWA shall prepare a treatment plan in consultation with

the WV SHPO, VA SHPO or KY SHPO, which ever is appropriate.

V. INITIATION OF CONSTRUCTION ACTIVITIES

A. After FHWA has concurrence from the SHPOs and all other signatories for the final inventory report, which includes recommendations for eligibility and effect, some construction activities would be allowed to proceed in those portions of the area of the undertaking where no effect to historic properties is expected. The location of these areas and the allowable construction activities would be determined by FHWA in consultation with the SHPOs.

B. These construction activities would be subject to the requirements in Stipulation II regarding post-review discoveries and Stipulation III regarding human remains.

VI. AMENDMENTS TO AGREEMENT

A. Any signatory to this MOA, through consultation, may request an amendment to its terms, and the provisions of any attachment hereto. The signatory wishing to amend the MOA shall initiate consultation with FHWA.

B. FHWA shall consult with the signatory submitting the suggested amendment, and if there is agreement, submit the amendment to all signatories for a concurrent review and signature. The signatories shall have thirty (30) calendar days from receipt to provide comment to FHWA. After review and signature, each signatory advises FHWA of their decision, who shall prepare a final amendment form with a compiled signature page and send it to all signatories.

C. Upon execution of the amendment, each signatory shall attach a copy of the fully executed form to their copy of this MOA, and shall enter the amendment number and date on the upper-right-hand corner of the first page of this MOA.

D. Should a dispute arise concerning an amendment, the procedures in Stipulation VII shall be followed to resolve the dispute.

VII. DISPUTE RESOLUTION

A. Should any party to this MOA object within thirty (30) calendar days to any actions proposed pursuant to this MOA, FHWA shall inform all signatories of the nature of the dispute and consult with the objecting signatory to resolve the objection. If FHWA determines that the objections cannot be resolved, FHWA shall forward all documentation relevant to the dispute to the Council, and inform all signatories of the status of the dispute. Public objections will also be considered by the FHWA in this process. Within 30 calendar days after receipt of all pertinent documentation, the Council shall:

1. Provide FHWA with recommendations, which FHWA shall take into

account in reaching a final decision regarding the dispute; or

2. Notify FHWA that it shall comment pursuant to 36 CFR Section 800.7(c), and proceed to comment. Any Council comment provided in response to such a request shall be taken into account by FHWA in accordance with 36 CFR Section 800.13 with reference to the subject of dispute.

3. Advise the FHWA that the Council concurs in the FHWA's proposed response to the objection, whereupon the FHWA shall respond to the objection accordingly.

B. Any recommendation or comment provided by the Council shall be understood to pertain only to the subject of the dispute. Responsibilities to carry out all actions under this MOA that are not the subject of the dispute shall remain unchanged.

VIII. TERMINATION

A. Only the signatories may terminate this MOA. If any such signatory proposes termination of this MOA, the signatory party proposing termination shall in writing notify all other signatories to this MOA, explain the reasons for proposing termination, and consult with all other signatories for at least 30 calendar days to seek alternatives to termination. Should such consultation result in an agreement on an alternative to termination, the signatories shall proceed in accordance with the terms of that agreement.

B. Should such consultation fail, the signatory party proposing termination may terminate this MOA by promptly notifying all other signatories to this MOA in writing. Termination hereunder shall render this Agreement null and void.

C. If this MOA is terminated hereunder and if FHWA determines that the undertaking shall nonetheless proceed, then FHWA would either consult in accordance with 36 CFR Section 800.6 to develop a new Agreement or request the comments of the Council pursuant to 36 CFR Part 800.

IX. DURATION OF THIS AGREEMENT

A. Unless this MOA is terminated pursuant to Stipulation VIII or superseded by another agreement executed for the undertaking, or the undertaking has been terminated, this MOA shall remain in effect for a period of five years from the date of the last signature. Upon a determination by FHWA that construction of all aspects of the undertaking have been completed and that all terms of this MOA have been fulfilled in a satisfactory manner, FHWA shall notify the other signatories of this determination in writing, whereupon this MOA shall no longer be in affect.

B. At least six months prior to the date of expiration of this MOA, the consulting parties should discuss the need to amend or alter the MOA.

Execution and implementation of this Agreement evidence that FHWA has afforded the Council an opportunity to comment on the undertaking and that FHWA has taken into account the effects of this undertaking on historic properties. Prior to six months from the date of expiration, the consulting parties should discuss the need to amend or alter the agreement. This agreement shall become effective upon the date of the last signatory's signature.

SIGNATORIES:

WEST VIRGINIA DEPARTMENT OF CULTURE AND HISTORY

Signature: Susan M. Pierce Date: 7/30/07

Susan M. Pierce, Deputy West Virginia State Historic Preservation Officer

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES

Signature: Date: 8/7/07

Kathleen S. Kilpatrick, Virginia State Historic Preservation Officer

KENTUCKY HERITAGE COUNCIL

Signature: Donna M. Neary Date: 08/09/07

Donna M. Neary, Executive Director, Kentucky Heritage Council and State Historic Preservation Officer

OHIO HISTORIC PRESERVATION OFFICE

Signature: _____ Date: 8/22/07

Mark Epstein, Department Head, Resource Protection and Review, Ohio Historic Preservation Office

FEDERAL HIGHWAY ADMINISTRATION

Signature: _____ Date: 16 Aug 07

Melisa L. Ridenour, P.E. Division Engineer, Eastern Federal Lands Highway Division, FHWA

CONCURRING PARTIES:

NATIONAL COAL HERITAGE AREA AUTHORITY

Signature: _____ Date: 8/28/07

Christy Bailey, Executive Director, National Coal Heritage Area Authority

WEST VIRGINIA DIVISION OF HIGHWAYS

Signature: _____ Date: 8/31/07

for the West Virginia Division of Highways

MOA ATTACHMENT A

AGREEMENT No. DTFH71-06-X-00018

Memorandum of Agreement

between

Norfolk Southern Railway Company

and the

Department of Transportation,
Federal Highway Administration,
Eastern Federal Lands Highway Division

for the

Environmental Planning, Design and Construction
of the Heartland Corridor Project

PURPOSE OF THE AGREEMENT

The purpose of this Agreement is to establish the roles, responsibilities, funding, and procedures by which Norfolk Southern Railway Company (the "Railroad") and the United States Department of Transportation, Federal Highway Administration, Eastern Federal Lands Highway Division (the "EFLHD"), (collectively hereinafter referred to as the "Parties"), will jointly participate in the environmental planning, design, and construction of the Heartland Corridor - a project to increase freight capacity on the vital Virginia to Ohio route.

The "Clearance Project" portion, (for purposes of this Agreement hereinafter referred to as the "Project"), consists of all work to allow double-stacked freight trains to run between the Hampton Roads region in Virginia and Columbus, Ohio. A double-stacked freight train is a train configured to carry two layers of standard freight containers. The Project does not include work at rail facilities, nor at any stations or sidings along the route. The EFLHD is responsible for the coordination and facilitation of the overall schedule for the entire Project, as well as for the management of the Federal funding. Only certain portions of the work will be paid for in part with Federal funds, as noted below. The design and construction of the Project will be done by the Railroad.

BACKGROUND - LEGISLATIVE HISTORY

The Project is described twice in Public Law 109-59, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). At Section 1301(m)(2) it is described as: "Heartland Corridor Project including multiple intermodal facility improvements and improvements to facilitate the movement of intermodal freight from VA to OH." At Section 1702, Project No. 5072, it is described as: "Double stack clearance of tunnels on the Norfolk and Western Mainline in Virginia located on the Heartland Corridor."

In addition, Section 1301(a), Findings, at Subsection (a)(4) also states: "Projects of national and regional significance have national and regional benefits, including improving economic productivity by facilitating international trade, relieving congestion, and improving transportation safety by facilitating passenger and freight movement."

AUTHORITIES

WHEREAS, Congress has authorized $95 million for this Project in Public Law 109-59, SAFETEA-LU; $90 million under Sections 1301(m)(2) and $5 million under 1702, Project No. 5072;

WHEREAS, Norfolk Southern Railway Company has authority to design and construct renovations to its rail corridor;

WHEREAS, the States of Virginia, West Virginia, and Ohio (the "States") have agreed under a separate Memorandum of Agreement to request the funds as required under those Sections of Public Law 109-59 and to authorize the transfer of those funds to the EFLHD under authority of Title 23, United States Code, Section 104 and the legislative authority given to their respective Departments of Transportation;

WHEREAS, Title 23 United States Code, Section 308(a) authorizes the United States Secretary of Transportation to perform engineering or other services in connection with the survey, design, construction, and improvements of highways for other Federal or State cooperating agencies, and "highways" has been interpreted to include surface transportation projects such as this one; and whereas that authority has been delegated to the Federal Highway Administration by authority of Title 49, Code of Federal Regulations, Section 148; and whereas that authority has been delegated to the Federal Lands Highway Program and to the Eastern Federal Lands Highway Division by authority of FHWA Order M1101.1A, Chapters 4 and 6;

WHEREAS, the Federal funds authorized by this project are being used to achieve significant public benefits, including the reduction of congestion, the improvement of safety, and the improvement of the health and welfare of the national economy;

WHEREAS, the Railroad is not providing EFLHD any services or any property in exchange for such Federal funds, but will abide by the terms of this agreement as a condition of receipt of the

Federal funds; and

WHEREAS, the parties intend to be fully bound by the terms and conditions set forth herein.

NOW THEREFORE, the Railroad and the EFLHD do hereby mutually agree as follows:

ARTICLE I: SCOPE OF WORK (Obligations, Responsibilities, and Funding)

A. The Railroad agrees to:

1. Participate in the environmental review by the EFLHD, including public involvement as applicable, and shall cooperate in the efforts of the EFLHD to obtain the required final environmental clearances. The Railroad will cooperate with the EFLHD to the extent practicable with regard to assistance and support in the preparation and/or revision of environmental reports or other documents, and in the defense of any environmental litigation resulting from the planning, design, and/or construction of the Project.

2. Develop, in coordination with the EFLHD, a Financial Management Plan, as required by the FHWA for all projects over $100 million, in order to clarify financial commitments and procedures.

3. Develop, in coordination with the EFLHD, a Project Management Plan, as determined appropriate for this type of project, in order to clarify resource and schedule commitments and procedures.

4. Prepare monthly written status reports for the Project, including a detailed financial accounting, schedule update, contracting activities, and other status information requested by the EFLHD. Provide an opportunity for field reviews when requested by the EFLHD.

5. Award and administer contracts for the design, construction, and/or contract administration of those portions of the Project that Railroad does not normally perform with its own forces. The Railroad will be responsible for the administrative settlement or adjudication of any claims arising from contracts awarded by the Railroad. Reimbursement for any such costs will be subject to the availability of project funds.

6. Prepare design and construction plans, specifications, and estimates ("Plans") for the Project. The Plans shall conform to all applicable Federal and State regulatory standards. The Plans shall be submitted to the EFLHD at 70% and 95% for review by EFLHD, which will coordinate review of the Plans with the appropriate State. Railroad shall also submit Final Plans to EFLHD for approval. When Final Plans are approved by EFLHD, the Railroad will submit the bid package for posting, as set forth in subsection 11, below. The Railroad shall not proceed with construction advertisement until it receives written approval to proceed from the EFLHD. Any work commenced prior to the receipt of

approval from the EFLHD shall be at the risk of the Railroad, including the risk of non-payment of Federal funds for unapproved work. The Plans may be amended by the Railroad upon request to and written approval from the EFLHD.

7. Utility Relocation Costs – As between the Railroad and EFLHD, the Railroad shall be solely responsible for any identified utility relocation costs. EFLHD recognizes that the Railroad may require utilities to relocate facilities at their expense, or to reimburse Railroad for the cost of relocating these facilities, as required by law or as set forth in whatever agreements may exist between the Railroad and the utilities.

8. Grade Crossings - The Railroad certifies that it will conform to all applicable Federal and State specifications and regulations in its work on any public grade crossings, to the satisfaction of the EFLHD.

9. Certify that it has obtained prior to the commencement of construction any and all rights-of-way necessary for construction of the Project. The Railroad will be responsible to record any conveyance of right-of-way in the appropriate government office and be responsible for any recording fees and transfer taxes. Rights-of-way shall be acquired in accordance with all applicable Federal and State laws, policies and procedures.

10. The Railroad shall obtain from the appropriate governmental agencies all necessary clearances, permits, licenses, and other approvals necessary to proceed with the construction phase of the Project prior to the commencement of the Project construction, except for any approvals that EFLHD agrees to obtain pursuant to Section B of this Article I.

11. In selecting construction contractors, the Railroad will ensure that:
    a. contracting is done competitively in accordance with the Federal Acquisition Regulations;
    b. the contracts contain no restrictions on local hiring;
    c. bid packages are sent to EFLHD so that solicitations may be posted on State DOT websites and linked to a Federal website as allowed;
    d. contractors meet State licensing requirements to the extent such requirements can be met after bid opening but prior to award of the contract; and
    e. the total cost of contracts awarded will not exceed the sum of Railroad's total capital improvement budget authorization for the Project, plus any reimbursement pursuant to this Agreement.

12. Construction Inspection - The Railroad, with its own forces or by contract, shall provide staff to adequately inspect and supervise all construction work for the Project. Proper supervision and construction inspection must be provided to ensure that all Project work is completed in accordance with the Plans and in compliance with applicable State and Federal regulatory requirements.

13. Buy American Act - Materials furnished will be provided in accordance with the

requirements of the Buy American Act. All steel materials or steel products must be of domestic origin or manufacture, as set forth in the Buy American Act.

14. Disadvantaged Business Enterprise - The Railroad shall follow EFLHD's guidance and directives to ensure that construction contracts contain disadvantaged business and small business subcontracting provisions in compliance with the requirements of the Federal Acquisition Regulations (FAR), including the submission for approval of a small business and disadvantaged business subcontracting plan, as required by Part 19 of the FAR.

15. Maintenance Requirements - Assume all future maintenance and liability for improvements to Railroad-owned facilities and property, including structures carrying Railroad facilities, signalization (signals), crossing surfaces, and any other maintenance responsibilities as may be assigned in connection with utilities.

16. Records - The Railroad and its consultant and/or contractor shall maintain all books, documents, papers, records, supporting cost proposals, account records, electronic employee payroll records, and other evidence pertaining to the Project costs, and shall make such materials available to the Parties to this Agreement or their designees for inspection and audit at all reasonable times during the contract period and for three (3) years after the date of final payment to any contractor, whichever is later in time. For hourly employees of Railroad, a complete record shall also be kept for personnel assigned part-time to the Project, which record shall include such personnel's time dedicated to work outside of the Project. In addition, the computation of overhead costs will be supported by audit.

B. The EFLHD agrees to:

1. Coordinate the overall schedule for the entire Project and facilitate cooperation among the Parties and the Railroad.

2. Accept and manage Federal funding for the Project and reimburse Railroad for its eligible costs in accordance with Article II of this Agreement.

3. Act as the lead agency for the coordination, preparation, and approval of the environmental documentation required pursuant to the National Environmental Policy Act (NEPA), 23 CFR §771, 49 U.S.C. §303, and Section 106 of the National Historic Preservation Act (including environmental documentation, 4(f) statement, and Section 106 statement) for the Project.

4. Select consulting services, as appropriate, for environmental planning assistance using procurement procedures in accordance with the Federal Acquisition Regulation (FAR), and the Transportation Acquisition Regulation (TAR).

5. Provide a quarterly status report to the Railroad and the State DOTs, both written and oral (face-to-face, videoconference, or teleconference), on the overall management of the Project. The report will detail, at a minimum, the financial status, schedule, and current and upcoming contracting activities of the Project, as well as any specific issues that have arisen.

6. Provide a Special Project Manager to coordinate day-to-day administration, including technical issues, of the Project. Technical issues will be discussed between the Parties as issues arise.

7. Review and approve the Financial Plan to be prepared by the Railroad for the Project.

8. Work jointly with the Railroad to determine appropriate action regarding a Project Management Plan.

9. Serve as a representative of the State DOTs on any consultant selection panel convened by the Railroad.

10. Ensure to the maximum extent possible that:
    a. design and construction work will be contracted out, except work that is normally done by the Railroad's employees. (It is recognized that decisions regarding whether to contract for construction engineering and inspection must be made by the Railroad.)
    b. contracting is done competitively and that the contracts contain no restrictions on local hiring.
    c. solicitations are posted on State DOT websites and linked to a Federal website as allowed;
    d. contractors meet State licensing requirements to the extent such requirements can be met after bid opening but prior to award of the contract;
    e. contracts contain disadvantaged business and small business subcontracting provisions in compliance with the requirements of the Federal Acquisition Regulations (FAR), including the submission for approval of a small business and disadvantaged business subcontracting plan, as required by Part 19 of the FAR.

11. Receive from the Railroad and provide to the State DOTs for review as appropriate the plans, specifications, and estimates, along with other necessary design documents for review and comment at the normally scheduled milestone completion percentages.

12. Approve the annual budget of the State DOTs for their anticipated costs.

13. Require its employees, contractors, and agents to comply with any job site safety training and safety requirements of the Railroad.

C. Responsibility of the Parties

1. Both Parties to this Agreement shall agree to cooperate with each other and with their respective Contractor(s) so as to coordinate their respective schedules in an effort to not delay the completion of the Project.

2. Both Parties to this Agreement will be afforded the opportunity to inspect, review and comment on, at any time, work in progress, the financial records, and any other supporting documentation; and to participate in all meetings and field reviews.

ARTICLE II. FUNDING AND REIMBURSEMENT

The respective financial obligations of the parties under this Agreement shall be as follows:

A. The Heartland Corridor Project is subject to and contingent upon the funds identified under Sections 1301 and 1702 of Public Law 109-59 (SAFETEA-LU) being transferred to the EFLHD for administration and the approval by the Board of Directors of Railroad's parent, through its capital improvement budget authorization process, of sufficient monies to fund the difference between the total Project cost and the actual Federal reimbursement provided under this Agreement. Failure to obtain the funds as required by law or the Railroad's internal processes shall relieve the Parties of their obligations under this Agreement.

B. Congress has authorized $95 million for this Project in Public Law 109-59, SAFETEA-LU. Under Section 1301(m)(2), Congress authorized $90 million for the work of the Project; and under Section 1702, Project No. 5072, Congress authorized $5 million for the work in Virginia. Both Sections authorize an annual distribution. For Section 1301, funds are distributed as follows: for fiscal year 2005 -- 10%, for fiscal year 2006 -- 20%, for fiscal year 2007 -- 25%, for fiscal year 2008 -- 25%, and for fiscal year 2009 - 20%. For Section 1702, funds are distributed at 20% per fiscal year. In addition, for fiscal years 2005 and 2006, Congress has imposed an obligation limitation in order to protect the funds in the Highway Trust Fund. This results in a reduction of the available funds that are set for each year. For fiscal year 2005, the obligation limitation was 85.5%. For fiscal year 2006, the obligation limitation was 87%. It can be assumed that Congress will impose an obligation limitation in future fiscal years as well. Finally, for funds available in fiscal year 2006, Congress imposed an additional 1% rescission of funds to all Federal funding categories, in order to provide for emergency supplemental appropriations to address damages from the hurricanes in the Gulf in 2005 (Public Law 109-148).

C. Federal funding available for the Project requires a "State match" of 20%, which for Section 1301 funds will be provided by the Railroad and for Section 1702 by the State or the Railroad.

D. The EFLHD will provide Federal funding up to 80% of the total Project costs, up to the amount available under the law, as discussed above. EFLHD's costs for the environmental

review and general project oversight are to be reimbursed out of this 80%. The Railroad shall be responsible for the remaining total cost of the Project. To ensure that the total cost of the Project less the amount of actual Federal reimbursement is within its capital improvement budget authority, Railroad reserves the right to reject bids, re-bid the Project or portions thereof as appropriate, re-design the Project or portions thereof as appropriate, or take such further reasonable measures as may be appropriate under the circumstances.

E. The Railroad agrees to make its invoices and supporting records available for Federal audit.

F. The Railroad may bill the EFLHD no more frequently than every thirty (30) days for any and all actual and approved costs within the scope of the Project. The Railroad, for the purpose of reimbursement, shall submit to the EFLHD on a monthly basis:

a) Certified invoices, including proof of allowable costs, for work performed by the Railroad forces on the Project. The proof of allowable costs may include but not be limited to, time sheets, material invoices and equipment records of the Railroad. Invoices shall be deemed certified when they are signed and dated by an authorized representative of the Railroad.

b) Certified invoices already paid by the Railroad based on current estimates of the work performed on the Project by the Railroad's contractors and/or consultant. Copies of the estimates will be included with the invoices. Invoices shall be deemed certified when they are signed and dated by an authorized representative of the contractor of consultant.

Upon receipt of such invoices, the EFLHD will promptly make payment to the Railroad after review and approval of the invoice.

G. The EFLHD and the Railroad understand that the Federal funds are available as follows: 30% in 2006; 25% in 2007, 25% in 2008, and 20% in 2009. Unused prior year funds may be expended in the current year, but subsequent year funds cannot be disbursed until the appropriate federal fiscal year.

H. Nothing in this Agreement shall preclude the Railroad from submitting bills for costs incurred by in-house forces necessary to accomplish the Project. Proof of costs incurred or payments by the Railroad must be submitted along with the request for reimbursement under this Agreement.

I. The Railroad, by executing this Agreement, certifies that it has on hand sufficient funds to meet all of its obligations under the terms of this Agreement, and that it, not the other Parties to this Agreement, shall provide all funds needed to pay any costs incurred in excess of those costs eligible for Federal participation and shall bear all excess costs, subject to Railroad's right to control, reduce or eliminate costs in consultation with EFLHD. The Railroad shall be solely responsible for one hundred percent of this portion of the total Project costs. The Railroad may use any combination of funds from its own budget and/or outside sources, whether public or private.

J. The EFLHD shall not reimburse any additional or extra work done or materials furnished that are not specifically provided for in the approved plans and the specifications, unless the EFLHD has first approved such additional or extra work or materials in writing. Any such work done or materials furnished without such written approval first having been given by the EFLHD shall be at the Railroad's own risk, cost and expense.

K. Work in Kentucky will be paid for in full by the Railroad.

L. Work in Ohio will be paid for in full by the Railroad and the Ohio Rail Development Commission (ORDC).

M. The Railroad will own all of the improvements performed, constructed or completed pursuant to this Agreement, with the exception of improvements to existing nonrailroad-owned public structures that may be impacted by the Project.

ARTICLE III: TERM OF AGREEMENT

1. This Agreement and the authorizations granted in it shall be effective only after the full execution and approval by both Parties to this Agreement.

2. This Agreement shall be in force and effect and shall remain in effect until the work, including payment, has been completed to the mutual satisfaction of both Parties.

3. This Agreement may be modified by the written consent of both of the Parties.

ARTICLE IV: KEY OFFICIALS AND CONTACTS

Designated points of contact for the coordination of this project are as follows:

For the RAILROAD:

Dr. Robert E. Martinez
Vice President Business Development
Norfolk Southern Corporation
Three Commercial Place
Norfolk, Virginia 23510
Phone: (757) 629-2748

Mr. James N. Carter, Jr.
Chief Engineer Bridges and Structures
Norfolk Southern Corporation
1200 Peachtree Street
Atlanta, Georgia 30309
Phone: (404) 529-1408

Fax: (757) 629-2849
email: robert.martinez@nscorp.com

Fax: (404) 527-2589
email: james.carterjr@nscorp.com

For the EFLHD:

Ms. Melisa Ridenour
Division Engineer
Department of Transportation
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, Virginia 20166
Phone: (703) 404-6201
Fax: (571) 434-1599
email: melisa.ridenour@fhwa.dot.gov

Mr. Kurt Dowden
Special Project Manager
Department of Transportation
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, Virginia 20166
Phone: (571) 434-1569
Fax: (703) 404-6217
email: kurt.dowden@fhwa.dot.gov

ARTICLE V: TERMINATION AND FORCE MAJEURE

A. This Agreement will terminate when all transfers of funds are completed and all work associated with this Agreement has been inspected and approved in writing by the Parties and the State DOTs. Approval by the State DOTs will be by written notification to the EFLHD, and will be only with regard to facilities impacted by the Project that are owned and maintained by the respective State.

While it is the intention of the Parties to complete this Project, it is recognized that not all future events can be anticipated. If it becomes apparent that total Project costs, less the total amount of reimbursement from Federal funds that will be available under this Agreement, exceed the Railroad's approved capital budget authorization for the Project, the Railroad shall give notice to the EFLHD of the gap in funding. If, at the end of ninety (90) days (or such other period as Railroad and EFLHD may mutually agree) from the date Railroad gives notice, Railroad and EFLHD have failed to reach an agreement on how the gap in funding will be filled, either with as yet unidentified additional Federal funds, Railroad funds or funds from other sources, the Railroad may terminate this Agreement by sending written notice to EFLHD. If Railroad exercises this termination right, it shall refund to EFLHD any of the Federal funds received by Railroad under this Agreement.

In case of the failure on the part of either Party to observe any of the conditions of this Agreement, the affected Party may terminate this Agreement for default by giving written notice of default to the other Party, which will have thirty (30) days to cure said default (or, if the default cannot be cured in thirty days, such reasonable amount of time as may be necessary to cure the default). If the default is not cured within the applicable cure period, then this Agreement shall terminate effective at the end of the applicable cure period. The

Parties agree to try to resolve any such disagreements or differences.

B. The Railroad shall be excused from its obligations hereunder for any period in which the following conditions of force majeure occur: Act of God, act of the public enemy, authority of law, fire or explosion, lockout, strike, war, act of terrorism, insurrection or any like causes beyond the control of the Railroad. If the Railroad declares force majeure, it shall promptly notify EFLHD when the force majeure condition begins, the nature of the force majeure, and when the condition is terminated.

ARTICLE VI: ASSIGNMENT

No transfer or assignment of this Agreement, or any part thereof or interest therein, directly or indirectly, voluntarily or involuntarily, shall be made unless such transfer or assignment is first approved in writing by the other Party, except that the Railroad may freely transfer or assign this Agreement to any of its parents, subsidiaries or affiliates as long as the Railroad's obligations under this agreement are fully assumed by the transferee/assignee.

ARTICLE VII: LIABILITY

1. The Parties accept full responsibility for any property damage, injury, or death caused by the acts or omissions of their respective employees, acting within the scope of their employment, or their contractors' scope of work, to the fullest extent of the law. Each Party shall defend, indemnify and save harmless the other Party and all of its agents and employees from all suits, actions or claims of any character, name or description arising from such damage, injury or death to the extent permitted by law. The EFLHD will require its contractors to carry insurance to indemnify both Parties for any action under their contract. All claims shall be processed pursuant to applicable governing law.

2. Except as provided in Section 1 of this Article VII, the Railroad shall indemnify and save harmless and (if requested) defend the States and/or the United States, and all of their agents and employees from all suits, actions or claims of any character, name or description, including, but not limited to, those relating to title to real property, brought for or on account of any injuries or damages received or sustained by any person, persons or property, arising out of, resulting from or connected with the design, construction, occupancy, use and/or maintenance of the improvements and/or any other activities relating to the improvements by the Railroad and/or the Railroad contractor(s) or consultant(s) and their officers, agents and employees, whether the same be due to defective materials, defective workmanship, neglect in safeguarding the work, or by or on account of any act, omission, neglect or misconduct of the Railroad and/or Railroad consultant(s) and/or contractor(s), their officers, agents and employees, during the performance of the work or thereafter.

ARTICLE VIII: REQUIRED AND STANDARD CLAUSES

1. Nothing in this Agreement shall be construed as limiting or affecting the legal authorities of the Parties, or as requiring the Parties to perform beyond their respective authorities. Nothing in this Agreement shall be deemed to bind any party to expend funds in excess of available Federal appropriations or the capital improvement budget authorizations of the Railroad.

2. **NON-DISCRIMINATION**: The Parties shall not discriminate in the selection of employees or participants for any employment or other activities undertaken pursuant to this Agreement on the grounds of race, creed, color, sex, or national origin, and shall observe all of the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. 2000(d) et. seq.). The Parties shall take positive action to ensure that all applicants for employment or participation in any activities pursuant to this Agreement shall be employed or involved without regard to race, creed, color, sex, or national origin.

3. **ANTI-DEFICIENCY ACT**: Pursuant to the Anti-Deficiency Act, 31 U.S.C. Section 1341(a)(1) (1994), nothing contained in this Agreement shall be construed as binding the United States or any State to expend any sum in excess of appropriations made by Congress for the purposes of this Agreement, or as involving the United States or any State in any contract or other obligation for the further expenditure of money in excess of such appropriations.

4. **INTEREST OF MEMBERS OF CONGRESS**: No member of, or Delegate to, or Resident Commissioner in Congress shall be admitted to any share or part of this Agreement, or to any benefits that may arise therefrom, unless the share or part or benefit is for the general benefit of a corporation or company.

5. **LOBBY PROHIBITION:** The Parties will abide by the provisions of Section 1913 (Lobbying with Appropriated Monies) of 18 U.S.C., which states:

   No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other devise, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or its departments or agencies from communicating to Members of Congress on the request of any Members of Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of public business.

6. Public Law 101-121, Section 319, 31 U.S. Code Section 1352, prohibits the recipient or any lower tier sub-recipients of a Federal contract, grant, loan or cooperative agreement

from expending federal funds to pay any person for influencing or attempting to influence a Federal Agency or Congress in connection with the awarding of any Federal contract, the making of any federal grant or loan or the entering into of any cooperative agreement.

7. This Agreement is subject to all laws governing Federal and State procurement and to all regulations and rules promulgated thereunder, whether now in force or hereafter enacted or promulgated, except as specified in this Agreement. Nothing in this Agreement shall be construed as in any way impairing the general powers of the Parties for supervision, regulation, and control of its property under such applicable laws, regulations, and rules.

ARTICLE IX. ENTIRE AGREEMENT

This Agreement and its attachments constitute the entire Agreement and understanding of the Parties with respect to the Heartland Corridor Project. No oral or other written provisions shall have any force or effect except those contained in a written amendment to this Agreement executed by the parties or as specifically provided for in this Agreement.

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AGREEMENT No. DTFH71-06-X-00018

IN WITNESS THEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives.

NORFOLK SOUTHERN RAILWAY COMPANY

Donald W. Seale 8/3/06

Donald W. Seale — Date
Vice President

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION

Melisa D. Ridenour 8 Aug 06

Ms. Melisa Ridenour — Date
Division Engineer

MOA ATTACHMENT B

	STATION	ST	PFX	MP	TYPE	CROSSING	DOT NO.
1	COWAN	VA	N	305.43	TUNNEL	COWAN TUNNEL	
2	BELSPRING	VA	N	308.76	DECK PL GDR	ST ROUTE 600, BACK CREEK	469529U
3	PARROTT SIDING	VA	N	310.66	DECK PL GDR	ST ROUTE 600	469530N
4	EGGLESTON	VA	N	316.15	TUNNEL	EGGLESTON #1 TUNNEL	
5	EGGLESTON	VA	N	317.02	TUNNEL	EGGLESTON #2 TUNNEL	
6	PEMBROKE	VA	N	319.83	TUNNEL	PEMBROKE TUNNEL	
7	PEMBROKE	VA	N	320.66	STL BEAM	ROCKY HOLLOW	
8	RIPPLEMEAD	VA	N	321.87	DECK PL GDR	WALKER'S CREEK	
9	NARROWS	VA	N	333.73	STL BEAM	ST ROUTE 100	469549F
10	NARROWS	VA	N	333.82	DECK PL GDR	ST ROUTE 649, WOLF CREEK	469550A
11	LURICH	VA	N	338.71	STONE ARCH	ST ROUTE 649	469557X
12	GLEN LYN	WV	N	340.68	DECK PL GDR	EAST RIVER	
13	GLEN LYN	WV	N	340.79	DECK PL GDR	EAST RIVER	
14	WILLS	WV	N	341.60	DECK PL GDR	EAST RIVER	
15	WILLS	WV	N	343.02	DECK PL GDR	CO ROUTE 219/8	469564H
16	INGLESIDE	WV	N	346.44	DECK PL GDR	CO ROUTE 219/6	469566W
17	INGLESIDE	WV	N	346.62	DECK PL GDR	EAST RIVER	
18	INGLESIDE	WV	N	349.13	DECK PL GDR	ST ROUTE 112	
19	INGLESIDE	WV	N	351.21	DECK PL GDR	ST ROUTE 112	469574N
20	INGLESIDE	WV	N	352.00	DECK PL GDR	ST ROUTE 112, EAST RIVER	469576C
21	INGLESIDE	WV	N	352.15	DECK PL GDR	ST ROUTE 112, EAST RIVER	469577J
22	INGLESIDE	WV	N	352.83	DECK PL GDR	ST ROUTE 112, EAST RIVER	469579X
23	INGLESIDE	WV	N	354.13	DECK PL GDR	EAST RIVER	
24	ADA	WV	N	359.74	DECK PL GDR	ST ROUTE 112	469590X
25	EAST END BLUEFIELD	WV	N	361.48	OH HWY-STEEL	CO ROUTE 25	471126F
26	BLUEFIELD	WV	N	362.23	OH HWY-STEEL	BELCHER STREET	471125Y
27	BLUEFIELD	VA	N	366.42	DECK PL GDR	BLUESTONE RIVER	
28	EAST FURNACE	VA	N	366.68	DECK PL GDR	BLUESTONE RIVER	
29	EAST FURNACE	VA	N	366.79	THRU PL GDR	BLUESTONE RIVER	
30	EAST FURNACE	VA	N	367.20	DECK PL GDR	BLUESTONE RIVER EB	
31	HALE	VA	N	367.37	DECK PL GDR	BLUESTONE RIVER	
32	HALE	VA	N	367.52	DECK TRUSS	ST ROUTE 102	469146S
33	HALE	VA	N	367.79	DECK PL GDR	BLUESTONE RIVER	
34	HALE	VA	N	368.08	DECK PL GDR	BLUESTONE RIVER	
35	FALLS MILL SCANNER	VA	N	369.21	DECK PL GDR	ST ROUTE 717, BLUESTONE R	469150G
36	FALLS MILLS	VA	N	369.52	DECK PL GDR	BLUESTONE RIVER	
37	FLAT TOP	VA	N	370.54	THRU PL GDR	PRIVATE ROAD	469154J
38	NEMOURS	WV	N	372.06	DECK PL GDR	BLUESTONE RIVER	
39	BLUESTONE	WV	N	373.40	DECK PL GDR	PRIVATE ROAD	471059N
40	BLUESTONE	WV	N	373.91	DECK PL GDR	BLUESTONE RIVER	
41	BLUESTONE	WV	N	374.26	TUNNNEL	COOPER TUNNEL	
42	BLUESTONE	WV	N	374.45	DECK PL GDR, DECK TRUS	CO ROUTE 20/9, BLUESTONE	471056T
43	MAYBEURY	WV	N	375.52	TUNNEL	ELKHORN TUNNEL	
44	MAYBEURY	WV	N	378.64	DECK PL GDR, THRU TRUS	CO ROUTE 52/12, ELKHORN CREE	471054E
45	NORTH FORK	WV	N	385.91	THRU PL GDR	WATERWAY	
46	NORTH FORK	WV	N	386.50	THRU PL GDR	WATERWAY	
47	BURKE SPUR	WV	N	387.00	THRU PL GDR	WATERWAY	
48	ECKMAN	WV	N	388.07	THRU PL GDR	ELKHORN CREEK	
49	LANDGRAFF SCANNEF	WV	N	389.78	THRU PL GDR	WATERWAY	
50	VIVIAN	WV	N	392.01	DECK PL GDR	ROAD, ELKHORN CRK	471036G
51	VIVIAN	WV	N	392.06	TUNNNEL	WEST VIVIAN TUNNEL	
52	VIVIAN	WV	N	392.34	DECK PL GDR	ROAD, ELKHORN CRK	471035A
53	BIG FOUR	WV	N	393.16	DECK PL GDR	ROAD, ELKHORN CRK	471034T
54	BIG FOUR	WV	N	394.24	TUNNEL	BIG FOUR #1 TUNNEL	
55	HUGER	WV	N	395.07	TUNNEL	BIG FOUR #2 TUNNEL	
56	HUGER	WV	N	395.19	DECK PL GDR	WATERWAY	
57	HUGER	WV	N	395.56	TUNNEL	HUGER TUNNEL WB	
58	HUGER	WV	N	395.56	TUNNEL	HUGER TUNNEL EB	
59	HUGER	WV	N	395.65	DECK PL GDR	ST ROUTE 52/17, PVT ROAD	471029W
60	HUGER	WV	N	395.65	DECK PL GDR	ELKHORN CREEK, PVT ROAD	
61	MAITLAND	WV	N	396.41	THRU PL GDR	CO ROUTE 52/17, ELKHORN C	471028P

62	WELCH	WV	N	398.89	TUNNEL	WELCH TUNNEL	
63	TUG	WV	N	399.19	DECK PL GDR	ST ROUTE 16, TUG FORK	471023F
64	HEMPHILL	WV	N	400.08	THRU PL GDR	TUG FORK	
65	HEMPHILL	WV	N	400.15	TUNNEL	HEMPHILL #1 TUNNEL	
66	HEMPHILL	WV	N	400.35	DECK PL GDR	ROAD, TUG FORK	471020K
67	HEMPHILL	WV	N	400.42	TUNNEL	HEMPHILL #2 TUNNEL	
68	EAST FARM	WV	N	401.01	DECK PL GDR	TUG FORK	
69	CAPLES	WV	N	401.53	DECK PL GDR	UPPER SHANNON BRAN	
70	WEST FARM	WV	N	402.92	THRU TRUSS	TUG FORK	
71	MOHEGAN	WV	N	403.61	THRU PL GDR	TUG FORK	
72	MOHEGAN	WV	N	403.71	TUNNEL	ANTLER #1 TUNNEL	
73	OLD PANDO SDG	WV	N	405.07	TUNNEL	ANTLER #2 TUNNEL	
74	OLD PANDO SIDING	WV	N	405.22	DECK PL GDR	TUG FORK	
75	DAVY	WV	N	406.57	DECK PL GDR	TUG FORK	
76	DAVY	WV	N	407.01	DECK PL GDR	BIG DAVY CREEK	
77	TWIN BRANCH	WV	N	407.71	TUNNEL	TWIN BRANCH #1	
78	TWIN BR	WV	N	408.05	DECK PL GDR	ST ROUTE 7, TUG FORK	471012T
79	TWIN BRANCH	WV	N	408.11	TUNNEL	TWIN BRANCH #2	
80	MARYTOWN	WV	N	409.19	DECK PL GDR	TUG FORK	
81	RODERFIELD	WV	N	412.01	DECK PL GDR	ST ROUTE 81, TUG FORK	471009K
82	RODERFIELD	WV	N	412.08	TUNNEL	VAUGHAN TUNNEL	
83	RODERFIELD	WV	N	413.01	DECK PL GDR	CO ROUTE 7, TUG FORK	471008D
84	RODERFIELD	WV	N	413.07	TUNNEL	RODERFIELD TUNNEL	
85	RODERFIELD	WV	N	413.26	TUNNEL	CO ROUTE 52/10, TUG FORK	471007W
86	ROGERS	WV	N	414.04	DECK PL GDR	TUG FORK	
87	ROGERS	WV	N	414.09	TUNNEL	LAUREL TUNNEL	
88	ROGERS	WV	N	415.01	DECK PL GDR	US 52, TUG FORK	471006P
89	ROGERS	WV	N	415.07	TUNNNEL	GORDON TUNNEL	
90	EAST WILMORE	WV	N	416.00	DECK PL GDR	US 52, TUG FORK	471005H
91	MOHAWK	WV	N	430.97	DECK PL GDR	LONG POLE CREEK	
92	FOUR POLE SPUR	WV	N	432.25	DECK PL GDR	FOUR POLE CREEK	
93	WHARNCLIFFE	WV	N	437.85	DECK PL GDR	BEN CREEK	
94	GLEN ALUM	WV	N	439.47	TUNNNEL	GLEN ALUM TUNNEL	
95	WEST DEVON	WV	N	447.36	DECK PL GDR	BEECH CREEK	
96	LICK FORK SPUR JCT	WV	N	455.25	DECK PL GDR	PRIVATE ROAD	470845N
97	MATEWAN	WV	N	460.56	DECK PL GDR	PEDESTRIAN ACCESS	470852Y
98	SPRIGG	WV	N	462.01	THRU TRUSS	TUG FORK	
99	SPRIGG	KY	N	462.09	TUNNEL	HATFIELD TUNNEL WB	
100	SPRIGG	KY	N	462.09	TUNNEL	HATFIELD TUNNEL EB	
101	SPRIGG	WV	N	462.30	THRU PL GDR, THRU TRUS	TUG FORK	
102	WEST SYCAMORE	WV	N	469.51	DECK PL GDR	VINSON ST-CO RT 11	407859W
103	WEST SYCAMORE	WV	N	469.77	DECK PL GDR	HARVEY STREET	470862E
104	WILLIAMSON	WV	N	471.62	TUNNEL	WILLIAMSON TUNNEL	
105	LIZANN MINING	WV	N	479.30	DECK PL GDR	MILLERS CREEK	
106	NAUGATUCK	WV	NA	0.20	THRU TRUSS	PIGEON CREEK	
107	PANCO SDG	WV	NA	3.31	TUNNEL	TUNNEL NO. 1	
108	GREY EAGLE	WV	NA	6.02	TUNNEL	TUNNEL NO. 2	
109	GREY EAGLE	WV	NA	6.70	DECK PL GDR	MARROWBONE CREEK	
110	GREY EAGLE	WV	NA	6.82	TUNNEL	TUNNEL NO. 3	
111	BUFFALO MINING	WV	NA	10.36	DECK PL GDR	CO ROUTE 52/31, JENNYS CR	471597V
112	BULL	WV	NA	12.68	TUNNEL	TUNNEL NO. 4	

In the early 1900's the railroad mainline track curve radii were increased at several locations, this resulted in the abandonment of several tunnel (bypassed by tunnels on the current list, see above). The following "bypassed" tunnels will also be recorded (by site forms and photographs). These tunnels are located at: Egglesto No. 1, Eggleston No. 2, Big Four No. 1, and Twin Branch No. 2.

APPENDIX B: EXAMPLES OF STATE SURVEY FORMS AND DOCUMENTATION

(see Appendix C for all forms in digital format)

Department of Historic Resources
Reconnaissance Level Survey

Montgomery ***DHR Id#:* 077-5079**

Resource Identification

Property Name(s): ..... Pepper Tunnel, Pepper's Ferry Tunnel {Historic}
Cowan Tunnel {Current}
Property Date: ..... ca 1899
Address(s): ..... Mile Post 305.43 {Current}
County/Independent City: Montgomery
City: ..... Radford
State, Zip: ..... Virginia 24141
Magisterial District: ..... Price's Fork
USGS Quad Name: ..... RADFORD NORTH
Surrounding area: ..... Rural

National Register Eligibility Status
Property is Historic (50 years or older)

This property is associated with the Radford Army Ammunition Plant Historic District

Resource Description

Ownership Status: ..... Private
Acreage: 0.5

Primary Resource Exterior Component Description:

Component	Comp Type/Form	Material	Material Treatment
Structural System	Structural System - Masonry	Brick	
Structural System	Structural System - Masonry	Concrete	
Structural System	Structural System - Masonry	Stone	

Site Description: ..... The east portal of the Cowan Tunnel is on the heavily wooded west bank of a horseshoe bend of the New River, at the west end of a metal truss railroad bridge crossing the river. A spur line of the Norfolk/Southern running to the Radford Army Ammunition Plant is located on the opposite (east) bank of the river. Within the immediate surrounding of this portal is a small concrete post inscribed with the date 1952 as well as the foundations of a coaling tower, the latter was removed at an unknown date. The Cowan Tunnel passes under a portion of the Radford Army Ammunition Plant, as well as VSH 623. The west portal opens to the heavily wooded east bank of the west side of the horseshoe curve.

There is no road access to the east portal, only rail access. Access to the west portal is via the paved Gate 10 Road with a short (1/4-mile long) stretch of unnamed gravel road to the gravel parking lot located about 1000 feet from the west portal.

Secondary Resource Desc: There are no secondary resources associated with this structure.

WUZIT Count:

No.	Wuzit Types	Historic?
1	Rail-Related	Contributing

NR Resource Count:

#	NR Resource Type	Contributing Status
1	Structure	Contributing

Contributing: 1.00 Total: 1.00

Department of Historic Resources
Reconnaissance Level Survey

Montgomery ***DHR Id#:*** **077-5079**

Individual Resource Information

WUZIT: ..... Rail-Related

Est. Date of Construction:	1899 ca {Tax Records}	*Accessed?*	Yes
Primary Resource?	Yes	*Number of Stories:*	0.0
Architectural Style:	No Style Listed	*Condition:*	Good-Excellent
Interior Plan Type:		*Threats to Resource:*	Major Alteration

Description: The single-width Cowan Tunnel serves the single-track Main #1 of the Radford Division of the Norfolk Southern (formerly Norfolk & Western) Railroad near Radford, Virginia. The tunnel measures 3,302 feet long with a nominal width of 15 feet, with a lining consisting of gunnite over brick as well as concrete. A slide fence circuit is mounted on the south wall. The west portal consists of regular rows of squared, rusticated ashlar facing. A single row of square blocks encircles the tunnel opening. An entablature consisting of a corbelled row of stone blocks runs along the top of the stone section of the portal. Two wing walls on either side of the tunnel opening are covered with concrete. The east portal was altered at an unknown date (perhaps 1952 as indicated by the nearby concrete post) at which time the stone facing was removed and replaced with an unadorned concrete extension.

Cemetery Information

Bridge Information

National Register Eligibility Information

Historic Context(s): ..... Technology/Engineering
Transportation/Communication

Historic Time Period(s):..... P- Reconstruction and Growth (1865 to 1914)
R- World War I to Present (1914 - Present)

Significance Statement: The Radford Division of the Norfolk & Western was constructed as a wide-gauge line, of 5-foot gauge. The railroad also decided to alter the line's original route, dropping the planned connection with the C&O at Hinton. Instead, the road would head directly into the untapped Flat Top-Pocahontas Coal Field turning away from the New River at a point near Glen Lyn, at the Virginia-West Virginia border, from there traveling along the East and Bluestone rivers to the site of a newly created coal mining operation, located at present-day Pocahontas, in Tazewell County, Virginia.
Parcels for the Pepper's Ferry (renamed Cowan) Tunnel were acquired in 1899, and it is believed that the tunnel was constructed in 1899 or shortly thereafter. According to a real estate valuation record, a concrete lining was added in 1919. The date for the concrete extension of the east portal is unknown, but possibly 1952.

Bibliographic Documentation

Reference #: 1
Bibliographic RecordType: ..... Map
Author: .....
Citation Abbreviation: .....
Notes: ..... Valuation maps (V-10VA/26 & 27). Accessed at Norfolk Southern Archives. 1200 Peachtree Street NE, Atlanta, GA.

Reference #: 2
Bibliographic RecordType: ..... Other
Author: .....
Citation Abbreviation: .....
Notes: ..... (http://www.wvexp.com/index.php/Flat_Top_-_Pocahontas_Coal_Field)

Ownership Information

Name: ..... Unknown Unknown
Company: ..... Norfolk Southern Corporation
Address: ..... Three Commercial Place
City: ..... Norfolk
Zip: ..... 23510 *State:* Virginia *Country:* USA
Phone/Extension: 540-981-4059 000-000-0000
Relation to the Property: Owner of property

Graphic Media Documentation

Medium	*Depository ID #*	*Photo Depository*	*Date*	*File Name*
B&W 35mm	23586	VDHR	2007/08/07	G Henry

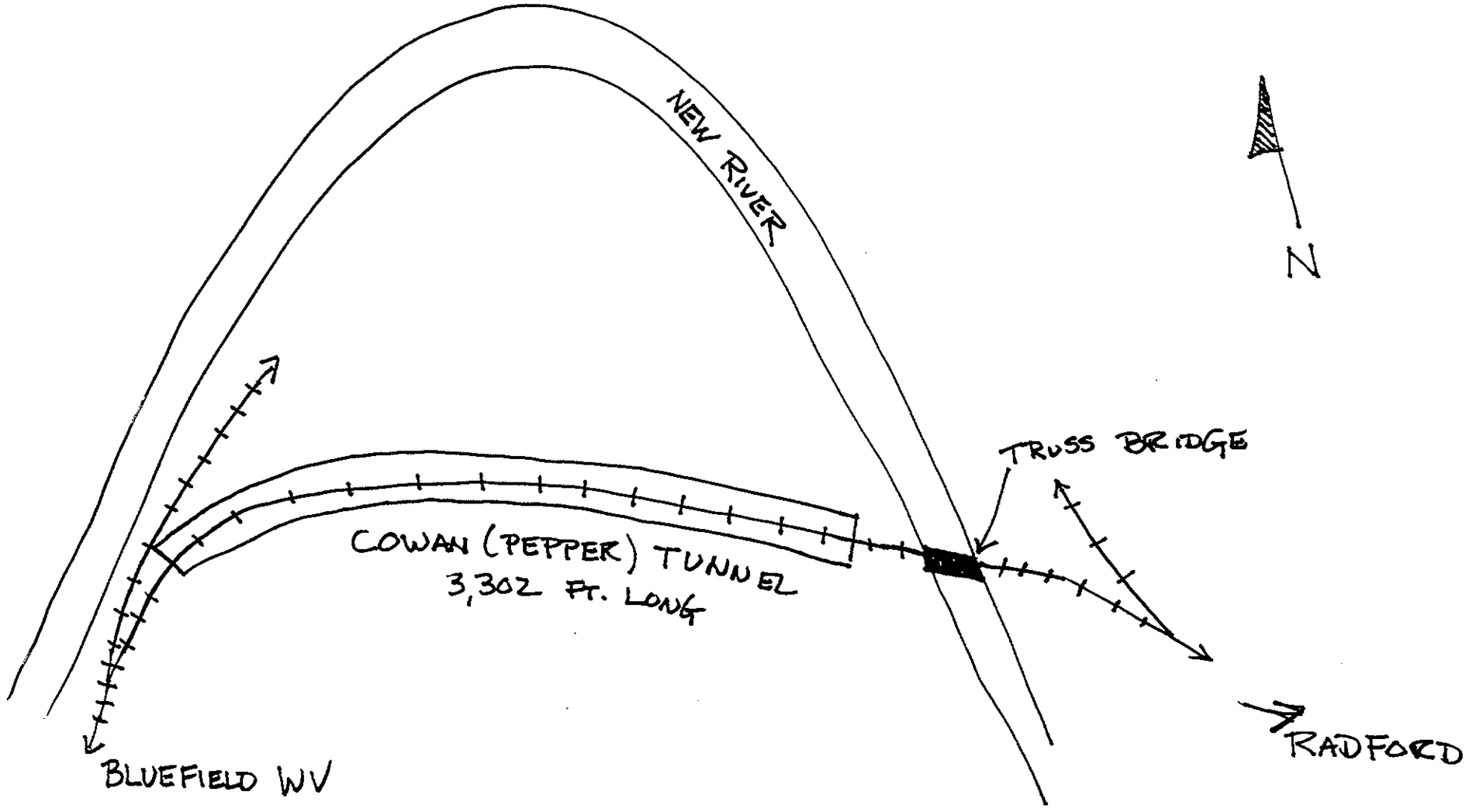
Cultural Resource Management (CRM) Events

CRM Event # 1,
Cultural Resource Management Event: ..... Survey:Phase I/Reconnaissance
Date: 2007/08/07
Organization or Person: ..... Geoffrey Henry
VDHR Project ID # Associated with Event: .. 2007-0249
CRM Event Notes or Comments: ..... TRC Environmental Inc.
9056 Chevrolet Drive
Ellicott City MD 21042
410-465-7929

CRM Event # 2,
Cultural Resource Management Event: ..... Other
Date: 2007/09/14
Organization or Person: ..... Marc Holma
VDHR Project ID # Associated with Event: .. 2007-0249
CRM Event Notes or Comments: ..... The documentation submitted by G. Henry with TRC was received pursuant to an MOA with the US DOT/Fed. Highway Admin. and the material was reviewed and DHR accepts the material as partial fulfillment of the terms of the MOA.

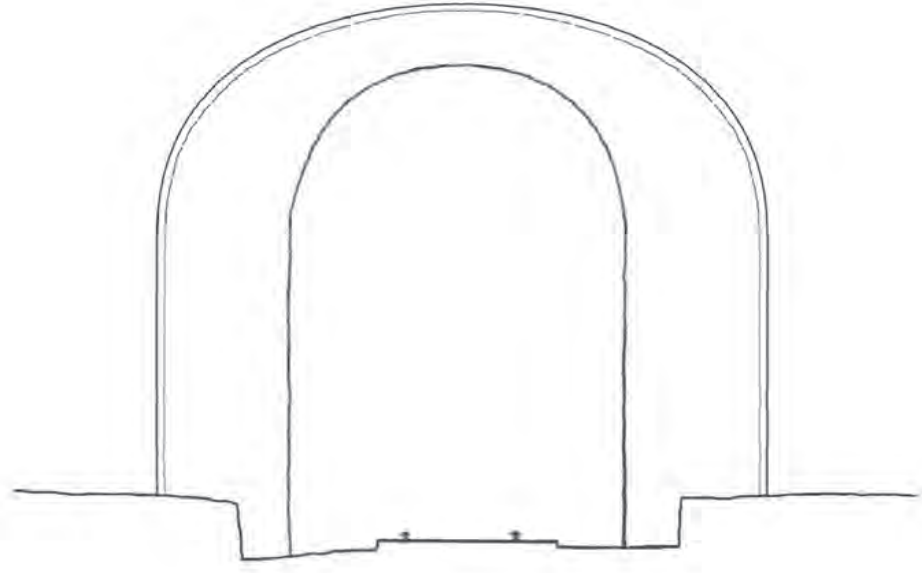
077-5079
Cowan Tunnel at MP 305.43
UTM 17 538083E 4114833N (NAD27)
USGS Radford North (VA) Quadrangle

N



77-5079
COWAN (PEPPER) TUNNEL
NEAR RADFORD VA. M.P. 305.43
8/6/2007 G. HENRY
NOT TO SCALE

EAST ELEVATION

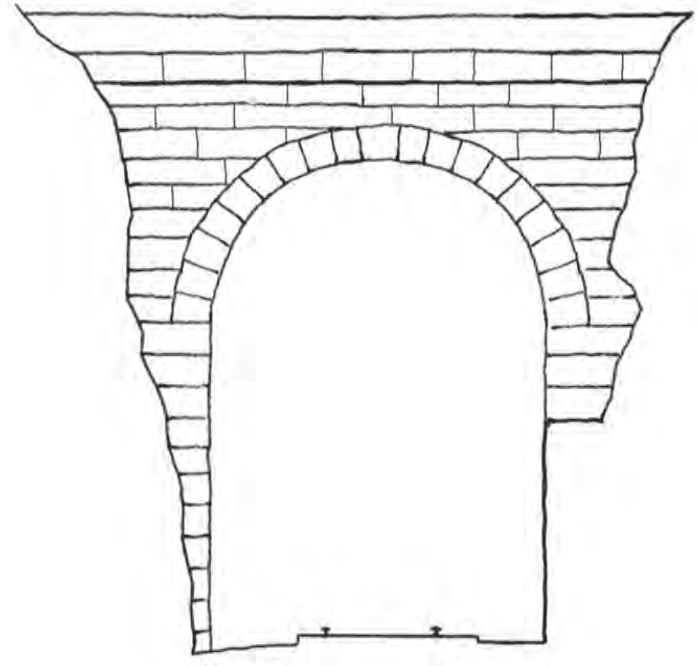


0 Feet 8

DHR # 77-5079
Cowan Tunnel
Norfolk/Southern, Virginia Division
Mile Post 305.39
Near Radford, Virginia
Scale: 1 inch = 8 feet
Drawn by: Vincent Macek
Date: August 13, 2007

TRC

WEST ELEVATION



0 Feet 8

DHR # 77-5079
Cowan Tunnel
Norfolk/Southern, Virginia Division
Mile Post 305.39
Near Radford, Virginia
Scale: 1 inch = 8 feet
Drawn by: Vincent Macek
Date: August 13, 2007

TRC

Cowan Tunnel East Portal, Mile Post 305.43, Cowan, Virginia.
Source: TRC, October 2007.

Cowan Tunnel West Portal, Mile Post 305.43, Cowan, Virginia.
Source: TRC October 2007

Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address MP 378.64 Norfolk/Southern Railway	**Common/Historic Name/Both** X X O Maybeury Bridge Bridge 858 (historic)	**Field Survey #** TRC-22	**Site # *(SHPO Only)***
Town or Community Maybeury	**County** McDowell	**Negative No.** Roll 1, Nos. 11-16	**NR Listed Date**
Architect/Builder Virginia Iron & Bridge Company	**Date of Construction** 1948 (date plaque)	**Style** Warren Through Truss; Half-Through Girder	
Exterior Siding/Materials Steel	**Roofing Material** N/A	**Foundation** Concrete; masonry	
Property Use or Function Residence O Commercial O Other X Railroad Bridge	**UTM#** UTM 17 467035E 4135717N	**Photograph** See Continuation Sheets	
Survey Organization & Date TRC Environmental Corp. August 7, 2007	**Quadrangle Name** Bramwell (WV,VA)		
	Part of What Survey/FR# Federal Highway Administration-Heartland Corridor Clearance Project, FR#07-812-MULTI-7		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.

Present Owners	Owners Mailing Address
Norfolk/Southern Corporation	Three Commercial Place
Phone # 540-981-4059	Norfolk, VA 23510

Describe Setting

This bridge crosses US 52 and Elkhorn Creek at their intersection with County Route 10 at the village of Maybeury. The surrounding topography is mountainous, with the village and the bridge set in a steep valley.

N/A Archaeological Artifacts Present

Description of Building or Site (Original and Present) N/A Stories N/A Front Bays

This three-span steel railroad bridge carries the two-track line (east bound and west bound) of the Pocahontas Division of the Norfolk/Southern (formerly Norfolk & Western Railway) over two-lane US 52 and Elkhorn Creek. The bridge consists of three sections laid end to end. The easternmost section is a steel camel-back, Warren through truss bridge measuring 230 feet from back wall to pier, with eight panels resting on a concrete abutment on the west end and a tapered concrete pier on the east. This section spans Elkhorn Creek. The center section is a steel camel-back, Warren through truss bridge measuring 227 feet with eight panels resting on tapered concrete piers. This section spans US 52. On the west is a 56-foot-long half-through girder bridge. A plaque on the far eastern end of the Warren truss bridge identifies it as having been constructed by the Virginia Iron & Bridge Company of Roanoke in 1948.

(Use Continuation Sheets)

Alterations	Yes	No	If yes, describe
		X	

Additions	Yes	No	If yes, describe
		X	

Describe All Outbuildings

N/A

(Use Continuation Sheets)

Statement of Significance

See Continuation Sheet

(Use Continuation Sheets)

Bibliographical References (The following are located at Norfolk/Southern Archives, 1200 Peachtree Street NE, Atlanta, Georgia (404) 962-5777).

"Contract V 6640, Erection Diagram, Bridge No. 858 at Maybeury for the Norfolk & Western Rwy." Virginia Iron & Bridge Company, Roanoke, Virginia, 1949.

(Use Continuation Sheets)

Form Prepared By: **Date: August 10, 2007**

Name/Organization: Geoffrey B. Henry, Program Manager-Architectural History/ TRC Environmental Corp.

Address: 9056 Chevrolet Drive, Ellicott City MD 21042

Phone #: 410-465-7929

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

Statement of Significance

Between 1884 and 1887, the Norfolk & Western Railroad built its Bluestone Extension, from Mill Creek (now Maybeury) to Elkhorn, WV. Prior to the company's beginning its route down the Bluestone and up its western branches, several new mining operations were incorporated in West Virginia, in preparation for the completion of the N&W's line further into the coal field. The Beury-Cooper mines, located near present-day Bramwell, WV were the first to ship coal from a mine located in West Virginia. The first shipment was made November 10, 1884, the same day the N&W's line reached the area. The N&W's original "wide gauge" track of five-foot width on its western extension was changed to standard gauge on May 29, 1886, and its main line re-gauged to standard gauge on June 1, 1886.

In 1913, the N&W began to electrify a part of its mainline west of Bluefield, WV. By 1926, the N&W had completed 52-miles of electrification of its line between laeger and Bluefield. By the end of the 1920's, the N&W had greatly increased its operating efficiency by electrifying 210 miles of its track on mountain grades in the state, and was using sixteen electric locomotives. Continued improvements along this line in the 1940s and 1950s included the replacement of the existing bridge at Maybeury by the present steel Warren through truss bridge, built in 1948 by the Virginia Iron & Bridge Company of Roanoke. The need for electrification was eliminated in 1950, with the relocation of the rail route and the completion of a new Elkhorn tunnel.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

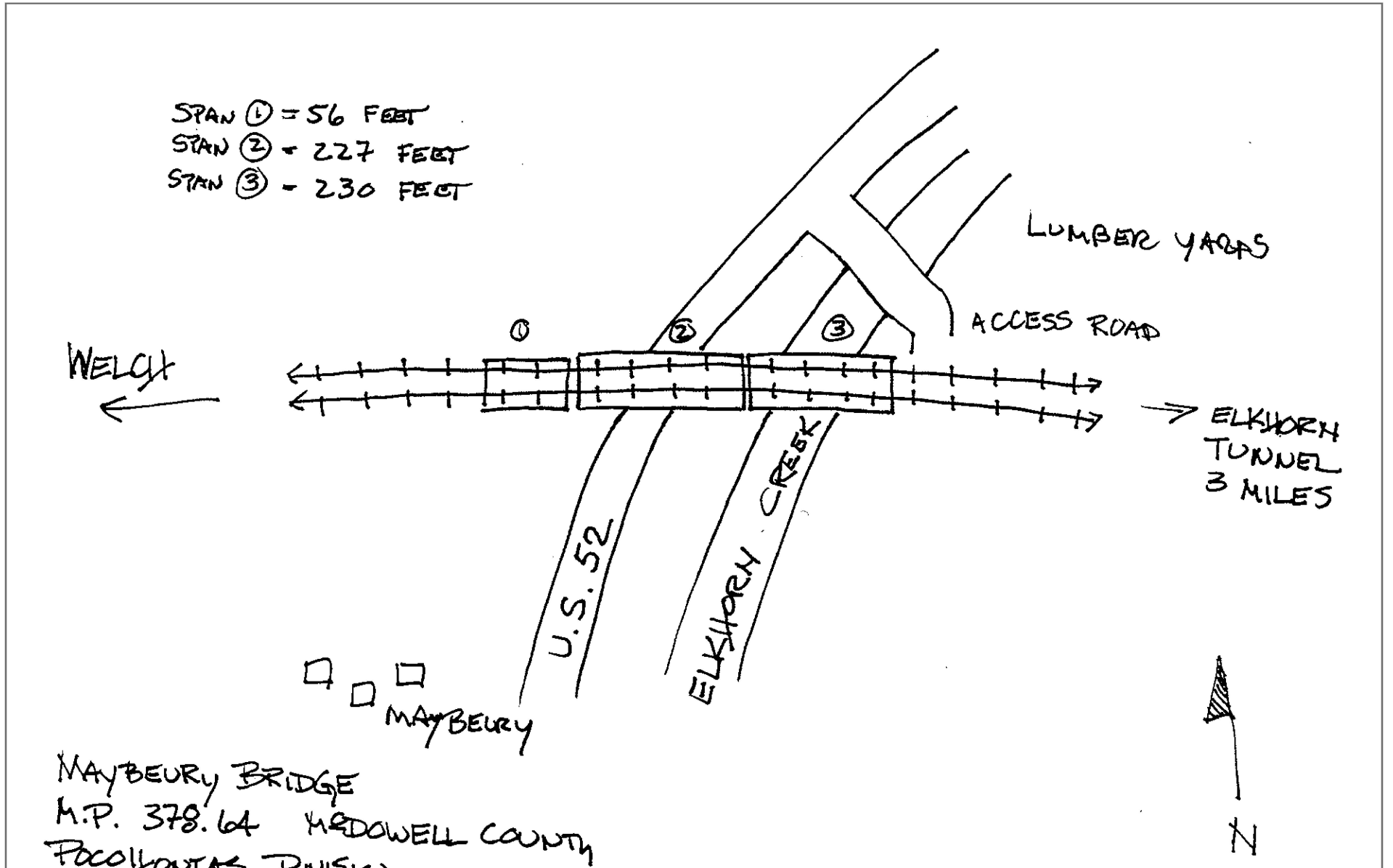
WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME Maybeury Bridge **SITE#** TRC-22

TRC-22
Maybeury Bridge at MP 378.64
UTM 17 467035E 4135717N (NAD27)
USGS Bramwell (WV,VA) Quadrangle



MAYBEURY BRIDGE
M.P. 378.64 MCDOWELL COUNTY
POCOHONTAS DIVISION
NORFOLK/SOUTHERN
9/8/07 G. HENRY (NOT TO SCALE)

Maybeury Bridge Looking West, Mile Post 378.64, Maybeury, West Virginia.
Source: TRC, October 2007.

Maybeury Bridge Looking East, Mile Post 378.64, Maybeury, West Virginia.
Source: TRC, October 2007.

KENTUCKY INDIVIDUAL BUILDINGS SURVEY FORM

(KHC 2007-1)

COUNTY Pike
RESOURCE # PI 387
EVALUATION N
SHPO EVALUATION
DESTROYED

1. NAME OF RESOURCE (how determined):
Hatfield Tunnel (westbound)/ 7

2. ADDRESS/LOCATION:
Norfolk/Southern Railway Mile Post 462.09, between Sprigg and Matewan, West Virginia

3. UTM REFERENCE:
Quad. Name: Delbarton
Date: 1976/ Zone: 17/ method: C
Easting: 3/9/5/5/2/7/
Northing: 4/1/6/4/9/4/0/

4. OWNER/ADDRESS:
Norfolk/Southern Corporation
1200 Peachtree Street NE, Atlanta, Georgia 30309

5. FIELD RECORDER/AFFILIATION:
Geoffrey Henry, TRC Environmental Corp. 9056 Chevrolet Drive, Ellicott City MD 21042 410-465-7927

6. DATE RECORDED: October 15, 2007

7. SPONSOR:
Federal Highway Administration-Heartland Corridor Project

8. INITIATION: 03/

9. OTHER DOCUMENTATION/RECOGNITION:
_____ Survey
_____ KY Land
_____ NR
_____ HABS/HAER
_____ Local Land
_____ NHL

10. REPORT REFERENCE:
Through the Coalfields: The Development of the Norfolk & Western Railway Through Southwestern Virginia and Southern West Virginia, Including a Survey of Historic Tunnels and Bridges Along the Radford and Pocahontas Divisions (TRC Environmental 2008)

11. ORIGINAL PRIMARY FUNCTION: 16 A/ / /

12. CURRENT PRIMARY FUNCTION: 16 A/ / /

13. CONSTRUCTION DATE: 5/ / estimated
/ / / / / documented

14. DATE OF MAJOR MODIFICATIONS:
/
/

15. CONSTRUCTION METHOD/MATERIAL:
S1/ / original
/ / subsequent

16. DIMENSIONS:
Height 30 ft. Width 17 ft. Depth 997 ft. Acreage

17. PLAN:
U/ first
/ second

19. FOUNDATION:

TYPE	MATERIAL	
0/	H/	period 1
/	/	period 2

20. PRIMARY WALL MATERIAL:
A/ original
/ replacement

21. ROOF CONFIGURATION/COVERING:

CONFIGURATION	COVERING
0/	/

22. CONDITION: G/

23. MODIFICATION: 1/

24. ARCHITECT/BUILDER:
Norfolk & Western Railway

25. PHOTOGRAPH FILE #: 07/11/6-7, 14,16

COMMENTS/HISTORICAL INFORMATION:

Following completion of surveys in 1888, the Norfolk & Western Railway decided to build its Ohio Extension between Bluefield, WV and Portsmouth, OH along a route that followed the course of the Tug Fork of the Big Sandy River west of Elkhorn, WV for approximately 90 miles, then along Twelve Pole Creek for another 70 miles before crossing the Ohio River, and then on to Ironton, OH. The company estimated the cost of construction at 6 million dollars; the actual cost exceeded 8 million dollars.

Construction of the Ohio Extension commenced at both ends in December, 1890. Because of the extremely winding nature of the water route through this valley, numerous major tunnels were planned. Constant bridging of the rivers and streams along whose courses the tracks were laid was also required to avoid excessive curvature. Eventually eight tunnels were required, the longest of which, the Big Sandy Tunnel #1 at Panco Siding near Kermit, West Virginia, measured 2,627 feet long.

Much of the Ohio Extension was double-tracked during the early 1900s, necessitating construction of new bridges and the widening of existing tunnels or the construction of new tunnels. Parcels for the Hatfield Tunnel were acquired in 1891 and 1903 and the tunnel is shown on Valuation maps V-17-17WV/2 dated June 30, 1916.

18. STYLISTIC INFLUENCE:
____00/ _____; _____/ _____ first
____/ _____; _____/ _____ second

26. SUPPORT RESOURCES: SITE PLAN KEY FUNCTION CONSTRUCTION DATE METHODMATERIAL

27. SITE PLAN (Complete if #26 was answered or if you are using sub-numbers).

28. MAP (Scan or attach copy of map showing exact location of resource)

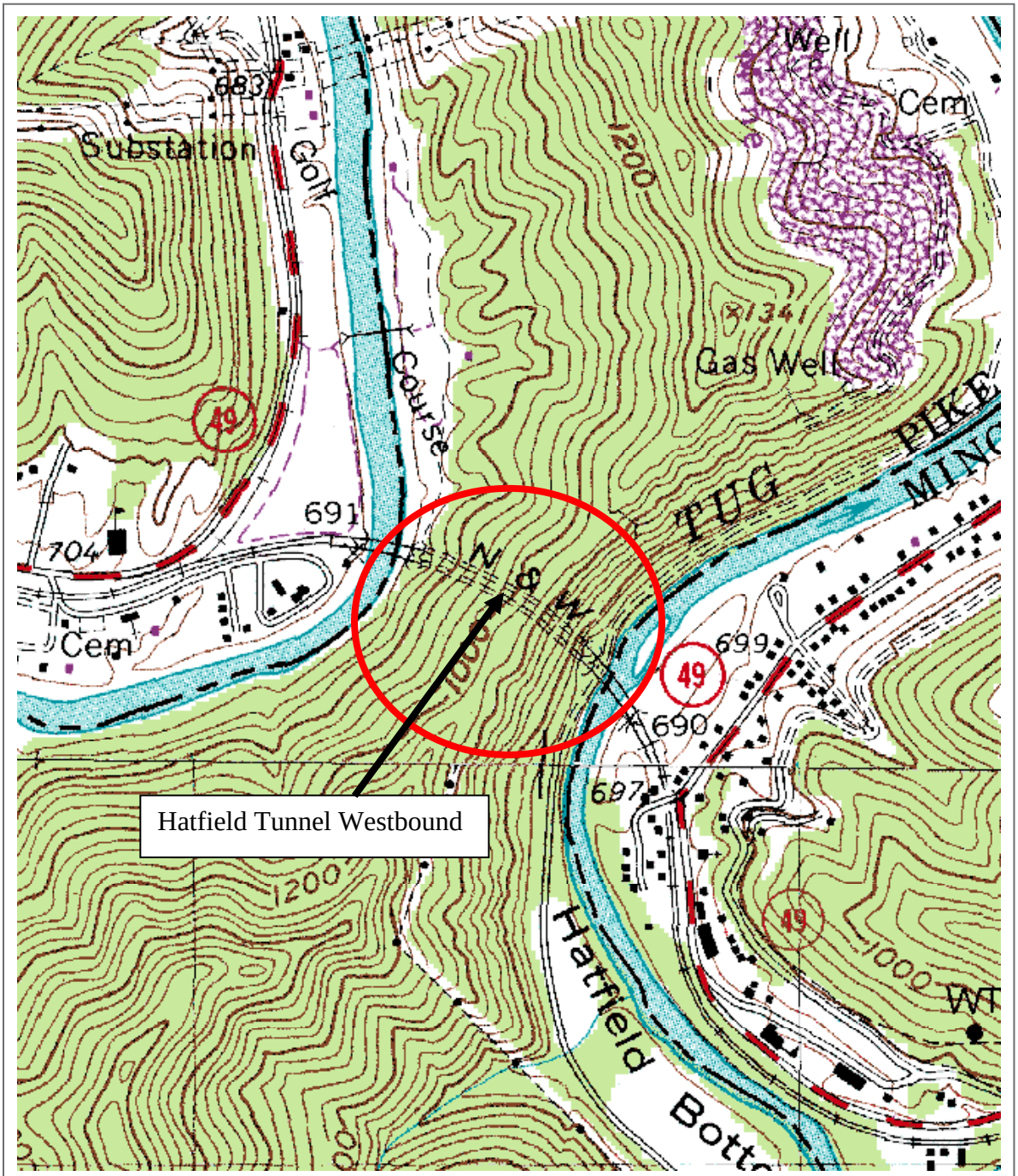
PI 387 Continuation Sheet

PI387_01

PI387_02

PI387_03

PI387_04



PI 387
Hatfield Tunnel Westbound at MP 462.09
UTM 17 395527E 4164940N (NAD27)
USGS Delbarton (WV,KY) Quadrangle

N

Hatfield Tunnel Westbound East Portal, Mile Post 462.09, between Sprigg and Matewan, West Virginia. Source: TRC, October 2007.

Hatfield Tunnel Westbound West Portal, Mile Post 462.09, between Sprigg and Matewan, West Virginia. Source: TRC, October 2007.

APPENDIX C: DIGITAL STATE SURVEY FORMS AND REPORT (CD-ROM)

APPENDIX D: LIST OF PREPARERS

LIST OF PREPARERS

Federal Highway Administration (FHWA), Eastern Federal Lands Highway Division (EFLHD)
Jack Van Dop, Environmental Compliance Specialist

TRC Environmental Corporation (TRC)
Paul Webb, Project Manager
Geoffrey Henry, Senior Archaeological Historian
Ellen Jenkins, Architectural Historian
Matthew Paré, Layout and Design
Heather Olson, Permissions
Vince Macek, Survey Form Graphics