

Comment on Large Surface Mining Permit #01180301 and NPDES #PA0279617

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Cambria District Mining Office District Mining Operations
PA Department of Environmental Protection
Commonwealth of Pennsylvania
286 Industrial Park Road
Ebensburg, PA 15931
Re: Comments on NPDES Permit Renewal Application
Permit No. PA0223239

This is to offer the following comment, both in what was stated at the July 23, 2019 Fairfield public hearing and in follow up support thereof.

On July 30, 2019 I visited a tributary which continuously flows from the SGI property to the west of the Pitts quarry, which runs through a culvert underneath Gum Springs Road and turns right into a wetland within the Michaux State Forest boundary. On the east side of the culvert, is a post displaying a small sign with “SS5”, with a SGI no trespassing sign hanging from a wire strung across the tributary upstream.



This turtle as observed was 7-8” long, had yellow spots completely over its shell, a yellow splotch on top of and around its neck, appeared yellow on the bottom side of its jaw, with yellow spots on leg scales. It initially appeared to be a “stone” amongst silted stones in cloudy water, then saw it move as it fed on underwater vegetation between 2 stones. I managed to take photos of it, glare and cloudy water aside. This appears to be a Wood turtle as when I blow up the photos, see pyramidal layering segments and keel on it’s shell, which should be definitive characteristics per wood turtles). It displayed color patterning (shell, spots on leg scale and dull yellowish jaw and neck splotching) similar to a Blanding turtle—very unlikely as it is very far from range reported for Blanding turtles.



This is silt-choked streambed and sediment piles just upstream before unnamed tributary (SS5) takes a right turn into a wetland upon entering the Michaux State Forest. This tributary subsequently flows through the state forest and into Toms Creek, which continues further downstream inside Michaux State Forest.



Wood turtle—notice yellow neck, patterning of spots on shell, and if you zoom in, pyramidal shell segment layering



Rear of wood turtle, silt/sediment covering stream bottom, rocks and turtle



Photo of pool on west side of Gum Springs across from SS5.

This tributary to upper Toms Creek and adjacent Gum Springs Road are already damaged by past storm overflow erosion along the road shoulder adjoining the SGI site; the larger unnamed tributary (outfall?) from culvert pipe segments separating. already receives uncontrolled overflow discharge from past and present site operations. Gum Springs is presently being rebuilt, with a small sinkhole just repaired over this culvert and repaved going north along the northern and western SGI property boundary lines.



Unnamed tributary (SS5 sign across Gum Springs Road) coming from SGI site, which flows down from between Pine Hill--Pitts quarry area; this is opposite road side of culvert from pool in which the wood turtle was found

Inadequacy of the bog turtle survey:

1-SGI submitted a Bog Turtle survey which was performed in December 2015, using data which was only valid for 2 years, using one form to compile and list data for multiple wetlands--this was previously objected to at the January 2019 hearing, with statement that this was inadequate and should be redone with current methodology and updated data. I reiterate this objection for the pending proposed Pitts Quarry discharge permit renewal in addition. There is a wetland area just inside Michaux State Forest immediately across the road from SGI (SS5) that appears to critical habitat, apparently impacted with sediment and silt eroding offsite into it from SGI Pitts quarry area. (photos above, taken 7/29/19 at Gum Springs Road culvert on opposite west side from SS5)

2-The present discharge permit review is addressing hydrology effects on wetlands within SGI boundaries ONLY and appears to accept as “adequate” upon minimal administrative walk through, an assessment using 2006 bog turtle survey methodology and outdated, not timely filed on the PNDI, invalid data which has determined to be incomplete and inadequate on its face, now appears to cite this assessment to state there will be no hydrological impact on habitats and wetlands—without any further assessments based upon findings from using updated criteria and methodology.

To reiterate once again, any adverse impacts on adjoining wetlands and tributaries, now with a confirmed occurrence of an endangered species and another species of concern, involving adjacent connected and disconnected habitat, have not been assessed adequately, if not at all. There is no evidentiary basis to conclude that adjacent habitat and wetlands are not being adversely impacted without actually and completely assessing these natural resources.

3- There has no consideration given whatsoever to the effects of repetitive blast shock impacts on adjacent wetlands adjoining the Northern Tract proposal and biota, especially adverse shock effects upon fish and turtles therein.

4- There have been no assessments nor analysis of chemicals and fungicides it uses onsite and impacts to wetlands, biota, endangered or non-endangered, and whether such may be presently impacting degrading water quality, wetlands or biota.

4- Any mention of a bog turtle occurrence within the upper Toms Creek watershed was first documented in 2016 by the Pa Fish & Boat Commission, which was not timely registered on the PNDI nor publicly disclosed. A confirmed bog turtle presence should also have timely informed public participation and awareness during this discharge permit and the proposed Northern project reviews—information that bog turtles are an endangered species from habitat loss and are about to lose more critical wetlands, during a time when other citizen efforts were being made to have Toms Creek designated an “exceptional value waters”—presence of an endangered species is a critical factor in any EVW evaluation and review. Such irregularities and timing in making such information available have an adverse impact on the effectiveness of public awareness and actions in protecting their interests in ecological resources from politico-economic interests and resultant impacts therefrom. Potential threatened wetland habitat and actual protection of habitat following an actual endangered species’ confirmed presence convey two very different understandings as to the urgency of public participation.

5- “The characteristic wetlands of bog turtles are essentially habitat islands; movements between sites likely assist in maintaining genetic variation in the populations and support colonization or recolonization of suitable sites. The probability of population extinction may increase if movement between sites is restricted (Gibbs 1993;

Semlitsch and Bodie 1998; Carter et al. 2000). Genetic similarity is greater between bog turtles in the same drainage than between adjoining watersheds (King, in Herman 2003), consistent with extensive use of wet corridors.

Although the turtle movement reported here was along a stream corridor, bog turtles clearly use upland routes for dispersal (Herman 2003; Tryon 2004). The diversity of pathways used suggests that landscape-level protection would offer the best opportunity for gene flow between populations.

We are unaware of any reports of bog turtles utilizing undercut banks in streams prior to this account. Permit reviewers should recognize this potential when environmental impact is expected from projects in streams within the range of the bog turtle.”

(“In Stream, Streamside, and Under Stream Bank Movements of a Bog Turtle, *Glyptemys muhlenbergii*. Chelonian Conservation and Biology 6(Dec 2007):286-288 · January 2009

Somers, Ann & Mansfield-Jones, Jennifer & Braswell Alford, Jennifer. (2009)

“Additional Considerations

- The action area includes all areas that will be affected directly or indirectly by the action and not merely the immediate area involved in the action. For example, if the proposed action is a wetland fill to accommodate access to a proposed development, then the development is

included in the action area.

Surveys as extensive as outlined below are usually sufficient to detect bog turtles; however, there have been instances in which additional effort was necessary to detect bog turtles, especially when habitat was less than optimum, survey conditions were less than ideal, or turtle densities were low.

And:

6. A minimum of four (4) surveys per wetland site are needed to adequately assess the site for presence of bog turtles.

- At least two of these surveys must be performed in May.
- From April 15 to April 30, surveys should be separated by six or more days.
- From May 1 to June 15, surveys should be separated by three or more days.

Surveys during this time period are optimum as wetland vegetation growth is not too thick.

Note that bog turtles are more likely to be encountered by spreading the surveys out over a longer period. For example, erroneous survey results could be obtained if surveys were conducted on four successive days in late April due to possible late spring emergence, or during periods of extreme weather because turtles may be buried in mud and difficult to find.”

(source: “GUIDELINES FOR BOG TURTLE SURVEYS 1 For the Northern Population Range Phase 1 and 2 Surveys (Revised October 26, 2018)” can be found at <https://www.fws.gov/northeast/nyfo/es/bogturtle.htm>)

§ 93.4b. Qualifying as High Quality or Exceptional Value Waters.

(a) Qualifying as a High Quality Water. A surface water that meets one or more of the following conditions is a High Quality Water.

(b) Qualifying as an Exceptional Value Water. A surface water that meets one or more of the following conditions is an Exceptional Value Water:

(1) The water meets the requirements of subsection (a) and one or more of the following:

(2) The water is a surface water of exceptional ecological significance.

§ 105.17. Wetlands.

Wetlands are a valuable public natural resource. This chapter will be construed broadly to protect this valuable resource. (1) *Exceptional value wetlands.* This category of wetlands deserves special protection. Exceptional value wetlands are wetlands that exhibit one or more of the following characteristics:

(i) Wetlands which serve as habitat for fauna or flora listed as “threatened” or “endangered” under the Endangered Species Act of 1973 (7 U.S.C.A. § 136; 16 U.S.C.A. § § 4601-9, 460k-1, 668dd, 715i, 715a, 1362, 1371, 1372, 1402 and 1531—1543), the Wild Resource Conservation Act (32 P. S. § § 5301—5314), 30 Pa.C.S. (relating to the Fish and Boat Code) or 34 Pa.C.S. (relating to the Game and Wildlife Code).

(ii) Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified under subparagraph (i) and that maintain the habitat of the threatened or endangered species within the wetland identified under subparagraph (i).

In its response, SGI acknowledges potential impacts to Wetland D and it being an “...expansive habitat extending well beyond the Northern Tract permit boundary”—and stating “...no impacts have been reported to any of the wetlands as a result of the adjacent Pitts Quarry operations.” There are no assessments of wetlands outside the Northern Tract permit boundary submitted with this application in support of this statement, as objection was made to this for exclusion of potential impacts on adjoining wetlands from consideration in the 2015 Bog Turtle survey at the January 2019 public hearing.

“Drawing from the experience in operation of the adjacent Pitts Quarry, it is noted that no impacts have been reported to any of the wetlands as a result of the adjacent Pitts Quarry operations; and similarly no significant wetlands impacts are anticipated from the Northern Tract quarry operations.” (SPECIALTY GRANULES LLC PROPOSED NORTHERN TRACT QUARRY RESPONSES TO PUBLIC COMMENTS RECEIVED AT JANUARY 30, 2019 PUBLIC MEETING AND RELATED PERIOD FOR SUBMISSION OF WRITTEN COMMENTS Large Noncoal Surface Mining Permit Application No. 01180301 NPDES Permit Application No. PA0279617 Submitted: July 3, 2019 P. 18-19)

The above photos (SS5) are submitted in response to the unsupported claim that “no impacts have been reported to any of the wetlands as a result of the adjacent Pitts Quarry operations.”

The SINGLE 2015 BT (which served only to approximate whether bog turtles might be present and was performed using outdated 2006 criteria) is inadequate to support any conclusion the effect of the proposed project will be insignificant discountable. The photos included herein demonstrate alteration to ground and surface waters has already occurred and continues to date.

There should be a more complete comprehensive survey and review of Toms Creek’s watershed for potential designation of exceptional value water, with measures and planned actions to better protect upper Toms Creek’s biota and waters from further degradation, as warranted by the presence of an endangered species and co-concurrent turtle species presence, a Species of Concern (US FWS National Listing Workplan 5 year work plan (May 2019 version), has been found present in unsurveyed wetlands.

nonasbestiform toxicity

NIOSH recognizes that results from such research may impact environmental as well as occupational health policies and practices. Many of the issues that are important in the workplace are also important to communities and to the general population. As more information became available on the relationship between the dimensions of asbestos fibers and their ability to cause nonmalignant respiratory disease and cancer, interest increased in exposure to other “mineral fibers.” The term “mineral fiber” has been frequently used by nonmineralogists to encompass thoracic-size elongate mineral particles (EMPs) occurring either in an asbestiform habit (e.g., asbestos fibers) or in a nonasbestiform habit (e.g., as needle-like [acicular] or prismatic crystals), as well as EMPs that result from the crushing or fracturing of nonfibrous

minerals (e.g., cleavage fragments). Asbestos fibers are clearly of substantial health concern. Further research is needed to better understand health risks associated with exposure to other thoracic-size EMPs, including those with mineralogical compositions identical or similar to the asbestos minerals and those that have already been documented to cause asbestos-like disease, as well as the physicochemical characteristics that determine their toxicity.

Appendix 1 Historical significance of “Lee’s Retreat”, route taken by main body of the Confederate Army through Fairfield Gap following its defeat in the Battle of Gettysburg; historical research and excerpts

Respectfully submitted

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July 31, 2019

Appendix 1

Historical significance of “Lee’s Retreat”, route taken by main body of the Confederate Army through Fairfield Gap following its defeat in the Battle of Gettysburg; historical research and excerpts:

The significance of the Fairfield Gap-Monterrey Gap route over South Mountain during the period weeks before the battle of Gettysburg, and especially during the Lees’ Retreat following the defeat at Gettysburg on July 3, 1863, went virtually unrecognized in popular Civil War history until recent years. Fairfield Gap-Monterrey Pass was, by far, the shortest geographic route from Gettysburg to Williamsport, MD, in returning back to Virginia. The following accounts and statements are offered in support of comments on the historical significance of the Fairfield Gap route over South Mountain, just before and following the Battle of Gettysburg, the largest battle of the American Civil War.

On June 22nd [1863] a skirmish erupted at Monterey Pass near the Mason and Dixon Line of South Mountain as Company D of the 14th Virginia Cavalry of General Albert Jenkins' Brigade ran into an armed militia of Captain Robert Bell's 21st Pennsylvania, Captain David Conaughy's Home Guard and a detachment of 1st Troop Philadelphia City Cavalry under Captain Samuel Randall. Confederate skirmishers scoured the woods on foot on each side of the Emmitsburg and Waynesboro Turnpike. When the Federal cavalry left, the Confederates reached Monterey Springs and continued firing at several bodies on horseback to enter Fairfield at dusk. This was the first fight that took place on South Mountain during the Pennsylvania Campaign.

Henry F. Long of the 17th Pennsylvania Cavalry wrote had this to say in regards to the movement around Zora (now Carroll Valley):

" June 29, we marched from Middletown, through Boonsborough to Cavetown, to Monterey Springs, PA to near Fairfield where Confederate troops were encountered; withdrew a short distance toward Emmitsburg, MD; June 30, moved from near Fairfield, through Emmitsburg, Maryland, and then toward Gettysburg; July 1, on picket duty somewhere near Gettysburg in Adams County, PA."

Major General Alfred Pleasonton wrote this in his official report of the Gettysburg Campaign:

"Orders having been issued for the advance of the army toward Pennsylvania, on June 29, Buford's division moved as follows, to cover and protect the left flank of the line of march: The Reserve Brigade was detached under Brig. General Merritt, and moved to Mechanicstown and afterward to Emmitsburg. The First and Second Brigades passed through Boonsborough, Cavetown, and Monterey Springs, and encamped near Fairfield, within a short distance of a considerable force of the enemy's infantry.

On June 30, 1863, Captain Ulric Dahlgren of the Union Army passed west over the Monterey Pass on a mission to intercept a packet of dispatches en route from Richmond to General Lee, and after succeeding, returned back via Monterey Pass to Zora (Carroll Valley).

https://www.emmitsburg.net/archive_list/articles/history/civil_war/zora_%20and_gettysburg_part_1.htm

As soon as Colonel Preston and the 1st Vermont Cavalry rode off toward Smithsburg, General Kilpatrick ordered Colonel Town to take a regiment of his battalion to head off the retreating wagon train. Near the

Clermont House, the 1st Michigan Cavalry under Lt. Colonel Peter Stagg was sent on a road leading to Fairfield Gap to head off the Confederate wagon train coming out of Fairfield.

General Custer hired Emmitsburg resident James McCullough on June 27th as a guide during the Pennsylvania Campaign, when the Michigan Brigade encamped at the old Toll House south of Emmitsburg. During the battle of Monterey, McCullough guided Colonel Stagg's 1st Michigan Cavalry to Fairfield Pass.

https://www.emmitsburg.net/archive_list/articles/history/civil_war/monterey_civilians.htm

Lee and the MAIN BODY of the Confederate Army

The Confederate Army's use of this much shorter route, facilitated its escape from Gettysburg and avoided total destruction by the Union Army. This turned out to be a critical factor in why the Civil War continued on another 1.5 years after the Battle of Gettysburg. Lee and the MAIN BODY of the Confederate Army, with trailing wagon trains, went through Fairfield Gap along Iron Springs Road, Lower Gum Road and Maria Furnace Road. The scale of this desperate massive movement back to Virginia, "Lee's Retreat" following its loss at Gettysburg was very impressive in the enormous scale of the retreating Corps and their trailing wagon trains.

The horrendous weather and road conditions, as well as the Union Army interception of a miles long Confederate wagon train at the Waynesboro-Emmitsburg Pike, Martha Furnace Road At Fairfield, many Confederate troops became bottle necked. To relieve the congestion, Lt. Gen. Longstreet's Corps would march along Jacks Mountain Road to the Emmitsburg and Waynesboro Turnpike at Fountaindale. From there, they would march into South Mountain to Monterey Pass. Lieutenant General Ewell's Corps would move behind Hill's Corps on the Hagerstown Road.

General Ewell's Corps marched into the mountain on Maria Furnace Road following Hill's Corps. When Ewell's Corps cleared Fairfield, they left behind severely wounded soldiers who were too critical to be placed in Imboden's wagon train that had already moved out of Cashtown. The rain and the dampness added to the misery. The soldiers marched through water and mud that was knee to ankle deep.

General Ewell recalled "We encamped for the night on a hill 1½ miles west of Fairfield, and next day, July 6, the Third Corps moving by another road, we were still in the rear, Rodes' division acting as rearguard, and repelling another attack of the enemy." General Ewell then continues "Attacked the troops making the summons, and drove them out of a wood in which they were posted. The enemy did not follow much beyond Fairfield. The road was again blocked till noon. That night we encamped near Waynesboro, and reached Hagerstown about noon of July 7."

https://www.emmitsburg.net/archive_list/articles/history/civil_war/recoil_of_monterey.htm

The account above describes a vast logjam already overloading the very narrow confines of the Iron Springs Road gorge!! The length of the Confederates' wagon trains going through the Fairfield Gap to Monterey, variously estimated by historic accounts as between 14-22 miles in length. Rodes' and Ewell's Corps were literally trapped overnight within the very narrow confines of the Toms Creek gorge by the Battle of Monterey Gap raging atop South Mountain. This was the main body of Lee's Confederate army estimated at 40,000 following the loss at Gettysburg, at least 2/3s of which went in on Iron Springs Road, got blocked overnight when the battle raging in a wide area around the toll gate, bridge and intersection with Emmitsburg and Waynesboro turnpike, subsequently spilling over into the Cumberland Valley, would have clogged any open ground in its enormity, as it did when part of the wagon train subsequently became a debris logjam between Rouzersville, PA and Leitersburg, MD after General Custer and Michigan cavalry attacked and set the retreating Confederate wagon train ablaze.

The enormous scale of these wagon trains and troops belie the recognition and significance of Lee's incredibly successful retreat from the battle of Gettysburg through the Fairfield Gap. Had it been unsuccessful and the Confederate Army destroyed, the Civil War would have likely ended soon after, instead of almost 2 years after "Lee's Retreat" as it is now popularly renown in Civil War history.

That night, Longstreet's Corps bivouacked along the Emmitsburg and Waynesboro Turnpike. Major General Lafayette McLaws Division encamped along the eastern base of South Mountain. Major General George Pickett's Division encamped on the grounds of the Monterey Inn. Major General John B. Hood's Division, commanded now by Brigadier General Evander M. Law, encamped in the area that the Monterey Pass Battlefield Park Museum is located, in addition to points west, down Old Route 16.

After marching up South Mountain, Hill's Corps bivouacked for the night. Major General Richard Anderson's Division encamped along the Maria Furnace Road near the Monterey Pass toll house. Brigadier General James Lane, now commanding Pender's/Trimble's Division, encamped along Maria Furnace Road. Major General Henry Heth's Division, now commanded by Brigadier General James Pettigrew, brought up the rear.

Just at the eastern base of South Mountain, along modern day Iron Springs Road, was Lt. Gen. Ewell's Corps. Major General Robert Rodes's Division, followed by Major General Edward Johnson, and bringing up the rear of the Confederate army was Major General Jubal Early's Division.

Early the next morning on July 6, the Confederate army began marching. Lieutenant General James Longstreet's Corps would take up the lead as they marched down the western slope of South Mountain into Waynesboro, PA. Major General Lafayette McLaws's Division would take the lead down South Mountain along Old Route 16. Following behind would be Brig. Gen. Law's Division. Major General Pickett's Division was ordered to move along with Hill's Corps.

Lieutenant General Hill's Corps moved directly behind Longstreet's Corps. Brigadier General Lane led the advance of Hill's Corps. Following behind was Brig. Gen. Pettigrew, followed by Maj. Gen. Anderson's Division. Bringing up the rear of Hill's Corps was Maj. Gen. Pickett's Division and Lee's Headquarters.

Moving up South Mountain and skirmishing with elements of the Union Army VI Corps was Lt. Gen. Ewell's Corps. His corps marched with Maj. Gen. Early in advance, followed by Maj. Gen. Johnson. Bringing up the rear of the entire Confederate army was Maj. Gen. Rodes's Division. The last Confederate soldier to march through Monterey Pass occurred at around 3:30 p.m. [July 6, 1863]

Wittenberg, Eric J., J. David Petrucci, and Michael F. Nugent, *One Continuous Fight: The Retreat from Gettysburg and the Pursuit of Lee's Army of Northern Virginia, July 4-14, 1863*, Savas Beatie, 2008, ISBN 978-1-932714-43-2, pp. 54-58

Brown, Kent Masterson, *Retreat from Gettysburg: Lee, Logistics, and the Pennsylvania Campaign*, University of North Carolina Press, 2005, ISBN 978-0-8078-2921-9; p. 131.

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https://www.emmitsburg.net/archive_list/articles/history/civil_war/recoil_of_monterey.htm

Major John Harman, whose reserve wagon train was estimated to be about 20-22 miles in length, was located close to Cashtown. Major Harman was ordered to relocate the reserve wagon train to Fairfield, where the wagons of Lt. Gen. Ewell's Corps were ordered to follow behind. Lt. Gen. Ewell's wagon train was estimated to be about 17-20 miles in length and were strung out to the north and northwest of Gettysburg. Escorting these two wagon trains, under the direction of Major Harman, were Brigadier Generals William Jones and Beverly Robertson, both being instructed to lead the wagons back into the safety of Virginia through Monterey Pass. Brown, Kent Masterson. *Retreat from Gettysburg. Chapel Hill and London: The University of North Carolina Press, 2005. 93, 95-97, 103.*

The old Wagon Road today would make up the following modern day roads. From Gettysburg, it was the Fairfield Road (Route 116) to Iron Springs Road, west of Fairfield into South Mountain to Gum Springs Road, through Fairfield Gap, onto Maria Furnace Road, and would have connected to Old Waynesboro Road. From there, it ran west of the mountain, sidestepping Waynesboro, continuing to Hagerstown, and ended at Williamsport. Many historians state that Iron Springs Road was used during the Confederate retreat, however, no road past the current intersection of modern day Gum Springs Road exists on any Civil War period maps. Iron Springs Road from Gum Springs Road that leads to Old Waynesboro Road today, was established in the late 1860's when copper was discovered in the mountain. The earliest map that shows the Monterey Pass area and the Great Wagon Road was first surveyed in 1751 by Colonel Joshua Fry and Peter Jefferson and was known as Nicholson Gap. FOOTNOTE #4

<https://southmountaincw.wordpress.com/category/fairfield-pass/>

By July 5, 1863, the Confederate infantry was well on its way back to Virginia, marching on the Hagerstown Road. Lieutenant General A. P. Hill's Corps moved first to Fairfield. From there the advance units of Hill's Corps began marching into South Mountain at 8:00 a.m. Lieutenant General James Longstreet's Corps marched behind Hill's Corps. Bringing up the rear was that of Lieutenant General Richard Ewell's Corps. At Fairfield, Lt. Gen. Hill's Corps was the first to enter South Mountain via Fairfield Gap and Monterey Pass.

In today's terms, regarding the Hagerstown or Fairfield Road, Hill's Corps left Route 116 and marched onto Iron Springs Road. From Iron Springs Road, Hill's Corps marched due west on Gum Springs Road, which turns into Furnace Road on the Franklin County side. At the top of the South Mountain, Furnace Road became Maria Furnace Road, which connected at the Monterey Pass toll house, along Old Rt 16, west of Blue Ridge Summit. The Old Waynesboro Road, Charmian Road, and Old Rt 16 was known as the Emmitsburg and Waynesboro Turnpike during the Civil War. <https://southmountaincw.wordpress.com/2016/09/16/the-confederate-retreat-and-the-union-pursuit-part-three/>

Brigadier General Kilpatrick will reorganize his force for the next attack, sending the majority of Custer's brigade up the turnpike to hit the Confederate front and right flank. He will also order the 18th Pennsylvania Cavalry to move along Furnace Road, and then head into the woods and hit the Confederate left flank. Rodenbough, Theophilus Francis, Grier Thomas J. *History of the Eighteenth regiment of cavalry, Pennsylvania volunteers. New York, NY: 1909. 84.*