The History of Burchfield and Kellerman, Tuscaloosa County, Alabama, from 1830 – 1939:

Through Maps, Photographs, Text and Geographic Information Systems

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By

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Abstract

In east Tuscaloosa County, Alabama, the Burchfield and Kellerman areas in late 2019 consist of a few isolated houses, active open-pit coal mines, and uninhabited reclaimed land along a single, rather lonely road. Yet in the early twentieth century, this area had thousands of residents who enjoyed all the conveniences of a populated town thanks to the underground coal mining operation. Geographic information systems (GIS) have been used along with historical maps and textual resources to create a better understanding of historic places. In recent years, more historic spatial and textual resources have been made available via digital and online formats. This availability has encouraged the use of historical resources to create new understanding of past landscapes.

The purpose of this project is to combine a selection of relevant historical maps, texts, photographs, and aerial images in order to detail the development of Burchfield and Kellerman in the nineteenth and early twentieth centuries, with additional focus on the area's heyday during the 1920s - 1930s. Historical sources were obtained through digital and online means and were brought into a GIS to create a historical GIS. Historic topographic maps were used to produce a three-dimensional model, or a historic digital elevation model, for a better visualization of the area's historic topography in the late 1920s – 1930s. Textual resources were used to confirm and enhance understanding of the area. Methods and materials used can be applied not only in future studies, but also in the fields of land and transportation development.

Acknowledgements

So many people have helped me with this degree and project. I will try to recognize as many as I can:

- My family, including my children, for supporting me on yet another degree, and this one seemed to last forever.
- My professors at the University of Alabama, where I started in geographic information systems, including Craig Remington and Dr. Joe Webber.
- Supervisors and coworkers in various departments and agencies in Tuscaloosa County.
- Fellow members of the GIS Association of Alabama and the GIS community across Alabama, for answering all kinds of questions and making our field of work interesting and rewarding.
- The late Dr. Terry Winemiller, who talked me into starting this program back in 2015 and allowed me to change my coursework and assignments to fit my interests.
- This thesis committee – nothing seemed to go as planned, from the passing of Dr. Winemiller to the COVID-19 pandemic.

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List of Abbreviations

BLM……...…….Bureau of Land Management

DEM…….…Digital elevation model

EPSG…….....European Petroleum Survey Group

GIS……...……..Geographic information systems

GNIS……...……Geographic Names Information System

HGIS……..…Historical geographic information systems

NAVD88……...…....North American Vertical Datum 1988

TIN……..……...……..Triangulated irregular network

USACE……...……...…….United States Army Corps of Engineers

USGS…….United States Geological Survey

WKID…….….Well Known Identification

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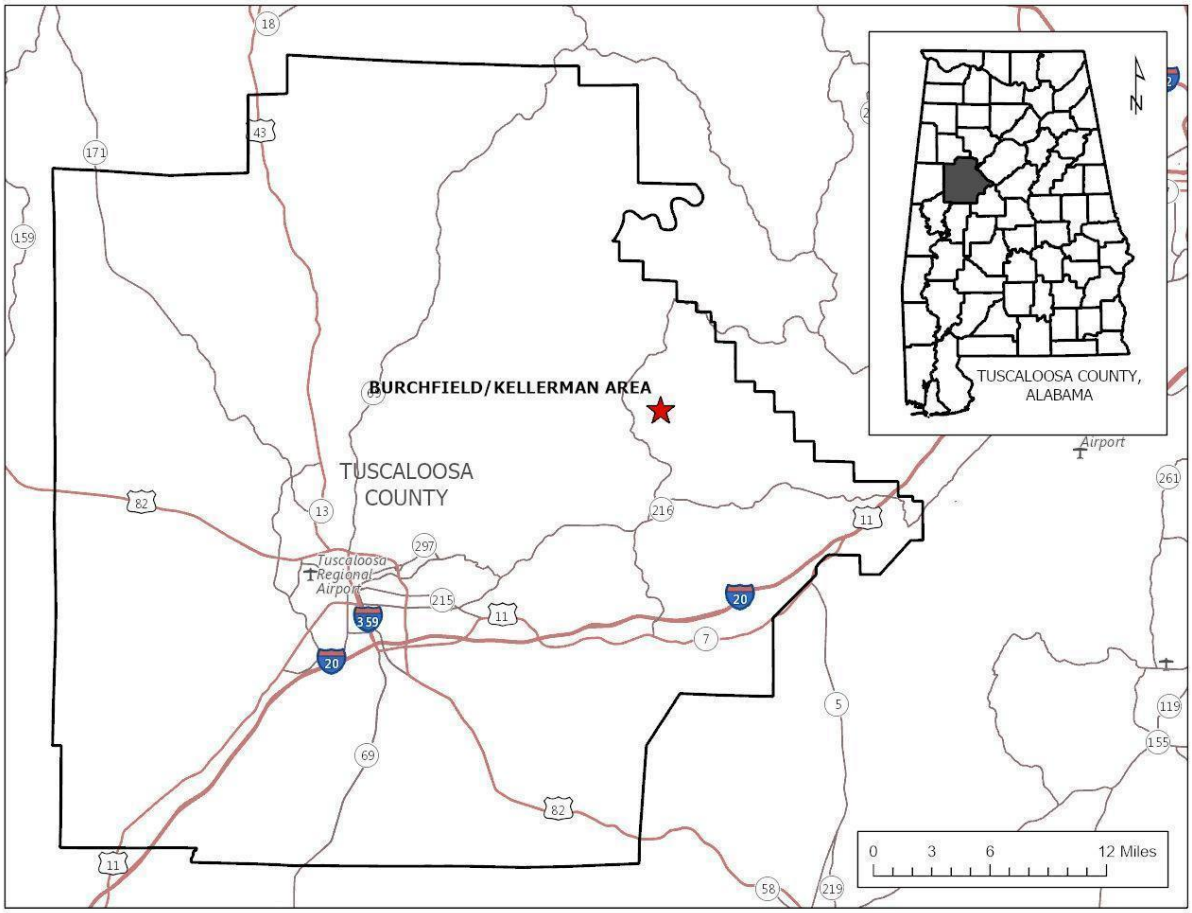
The History of Burchfield and Kellerman, Tuscaloosa County, Alabama, from 1830 – 1939: Through Maps, Photographs, Text and Geographic Information Systems

Background of the Study

Northeast Tuscaloosa County, Alabama, is an area where the coal mining interests have influenced the documentation and development of the landscape. Two named adjacent locations in this area are listed as Burchfield and Kellerman in the Geographic Names Information System and are shown in Figure 1, *Locational Map of the Burchfield/Kellerman Area in Tuscaloosa County, Alabama* (U.S. Geological Survey, 2012).

Figure 1

Locational Map of the Burchfield/Kellerman Area in Tuscaloosa County, Alabama



Note. U.S. Geological Survey. (2019). Transportation (MapServer) [web map service]. Retrieved 5 October 2019, from https://carto.nationalmap.gov/arcgis/rest/services/transportation/MapServer. U.S. Geological Survey. (2012). U.S. Geographic Names Information System (GNIS). Reston, VA: U.S. Geological Survey.

Current aerial imagery of the Burchfield and Kellerman areas (Tuscaloosa County Tax Assessor, 2019) displays only a few buildings and a single rather desolate public road, known as

Burchfield Road (Tuscaloosa County E-911 Communications, 2019). Tuscaloosa County only maintains the road to the end of the pavement on the east end, with a private driveway and unnamed road leading into property owned by the companies AmSouth Bank and Warrior Met Coal (Tuscaloosa County Tax Assessor, 2020). The imagery also displays open pit coal mines. Trees of uniform type and density indicate once disturbed areas that have been reclaimed. A settlement pond near the west end of Burchfield Road is another indication of past mining operations. Only a few homes can presently be found in the area.

Figure 2

Current Aerial Imagery (2019) of the Modern Locales of the Burchfield and Kellerman Areas (2012) With Current Road GIS Data (2019)

Note. The current (2019) imagery of the Burchfield and Kellerman area in Tuscaloosa County, Alabama, to show how the area is dominated by current and past mining operations, including sediment ponds, open pit mines, and lack of residential style development. Tuscaloosa County 9-1-1 Communications District (2019). *Roads* [geographic dataset]. Tuscaloosa County, AL. Tuscaloosa County Tax Assessor (2019). *East Tuscaloosa sid* [aerial imagery]. Tuscaloosa, AL. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

In contrast, viewing the parcel data on the Tuscaloosa County Tax Assessor's online Tuscaloosa County Alabama Public GIS Parcel Search website (Tuscaloosa County Tax Assessor, 2020b) gives hints of a more populated past. In contrast with the mining operations visible on the 2016 aerial imagery, there are property lines of subdivided parcels resembling a more residential style of development. I wondered, what had been here? Why did someone take the time to get this remote area surveyed and platted?

Figure 3

Aerial Parcel Map of the Burchfield and Kellerman Areas (2020) With East Center City Plat (1901) Delineated

Note. Image of an exported parcel map of the Burchfield and Kellerman area. A rectangle shows the border of the East Center City subdivision plat from 1901 also pictured in Figure 4, *Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020*. Tuscaloosa County Tax Assessor (2020b). *Tuscaloosa County Alabama Public GIS Parcel Search* [online records website]. Retrieved 28 June 2020, from https://www.alabamagis.com/Tuscaloosa/.

Closer inspection of some of these parcels shows property subdivisions often found in row-type housing. There are areas for streets, and even an alley. The plat is labeled EAST CENTER CITY S/D, with S/D meaning "subdivision," as shown in Figure 4, *Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020***.** The subdivision plat of East Center City was originally recorded at the Tuscaloosa County Courthouse on December 13, 1901. Scanned images of the original plat maps were viewed on the *Tuscaloosa County Record Room* (Tuscaloosa County, 2020) website as shown in Figure 5, *Map of the East Center City Subdivision Plat, Plat Book 1, Page 151, Recorded in 1901* **(**Bell, 1901a) and Appendix A1, *Map of the East Center City Subdivision Plat, Plat Book 1, Page 153, Recorded in 1901* (Bell, 1901b). According to these plats, the land was divided into 67 lots, for a J.P. Burchfield. The number of lots shown on these plat maps supported the idea of this area being a more populated community at some point in the past.

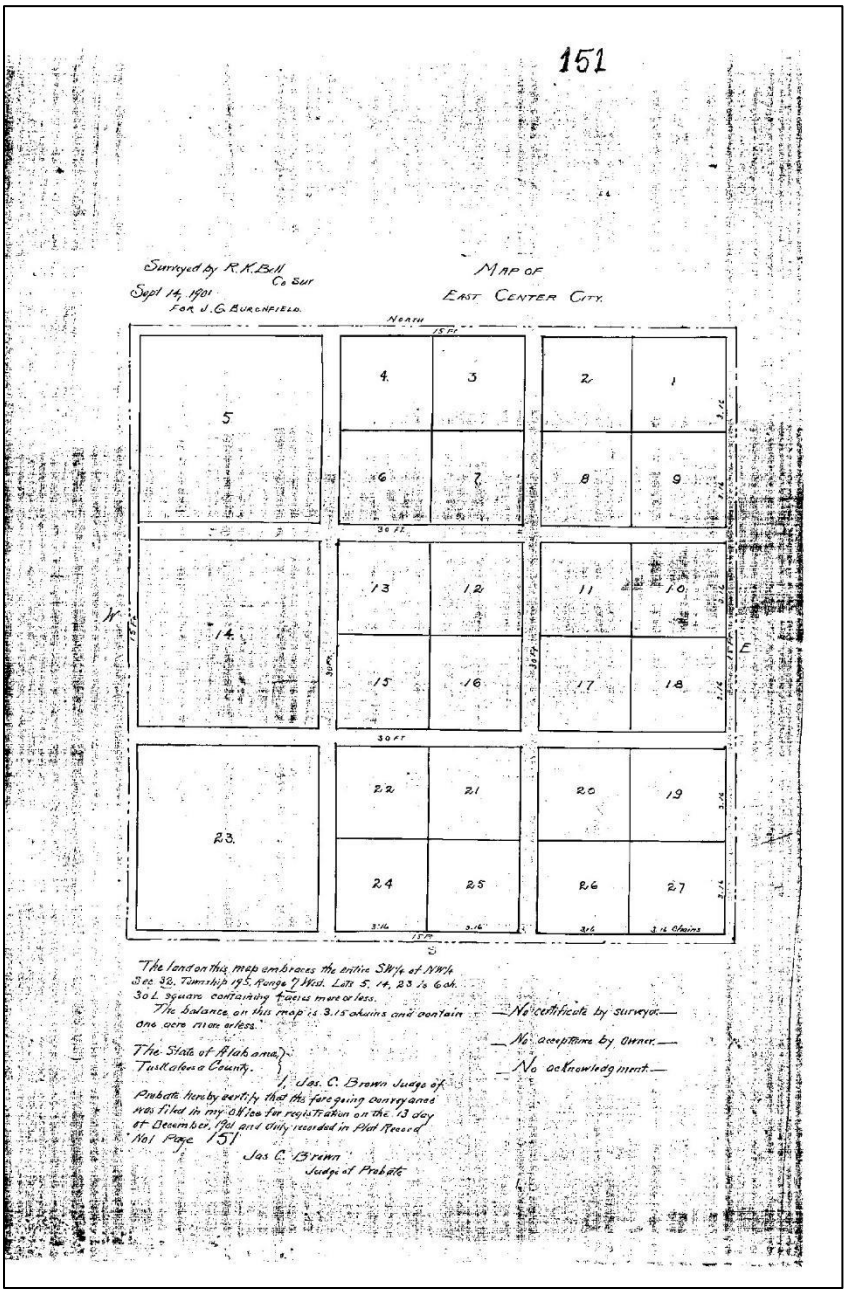
Figure 4

Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020

Note. The parcels are divided in a residential style, yet few houses remain. Tuscaloosa County Tax Assessor (2020b). Tuscaloosa County Alabama Public GIS Parcel Search [online records website]. Retrieved 28 June 2020, from https://www.alabamagis.com/Tuscaloosa/.

Figure 5

Map of the East Center City Subdivision Plat, Plat Book 1, Page 151, Recorded in 1901



Note. The original plat as recorded in the Tuscaloosa County Courthouse, featuring streets and smaller parcels suitable for a town with residences to contrast with the current appearance of the

area. Bell, R. K. (1901a). Map of East Center City, Platbook 1/Page 151 [land subdivision plat]. Retrieved 7 September 2020, from https://probate.tuscco.com/ProbateRecords/

During a weekend car ride around Tuscaloosa County on March 7, 2015, I took roadside photographs in the approximate areas shown on Figure 6, *Current (2019) Aerial Imagery with Current (2019) Road GIS Data.* Remnants of what looked to be a residential area were photographed, as shown in Figure 7 (*Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015),* Figure 8 (*Photograph of Concrete Steps, Taken on Burchfield Road, 2015*), and Figure 9 (*Photograph of a Building Foundation, Taken on Burchfield Road, 2015).*

Figure 6

Current (2019) Aerial Imagery with Current (2019) Road GIS Data

Note. Detailed view of Figure 2 with a dashed line to show approximate locations of recent photographs of an old road curb and decorative plantings (Figure 8, *Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015*), and a foundation for a small building (Figure 9, *Photograph of a Building Foundation, Taken on Burchfield Road, 2015*). Tuscaloosa County 9-1-1 Communications District (2019). *Roads* [geographic dataset]. Tuscaloosa County, AL. Tuscaloosa County Tax Assessor (2019). *East Tuscaloosa sid* [aerial imagery]. Tuscaloosa, AL. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

One location had a stacked stone curb on the south side of Burchfield Road, with remnants of decorative plantings with very small purple flowers (*Figure 7, Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015)*. Moving towards the sawed limb shown on Figure 8, *Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015* revealed a set of concrete and rock steps coming from the stone curb as seen in Figure 8, *Photograph of Concrete Steps, Taken on Burchfield Road, 2015*.

Figure 7

Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015

Note. A photograph of a stacked stone curb, on the south side of Burchfield Road, at the approximate location of the dashed line shown on *Figure 6, Current (2019) Aerial Imagery with Current (2019) Road GIS Data*, and where the labels for Lots 1 and 2 on *Figure 4, Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020*. These elements indicate a residence was once at this location.

Figure 8

Photograph of Concrete Steps, Taken on Burchfield Road, 2015

Note. A photograph of concrete steps, leading from the curb like that shown in Figure 7, *Photograph of a Stacked Stone Curb with Decorative Plantings, Taken on Burchfield Road, 2015* on the south side of Burchfield Road, at the approximate location of the dashed line shown on *Figure 6, Current (2019) Aerial Imagery with Current (2019) Road GIS Data*, and where the labels for Lots 1 and 2 on *Figure 4, Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020*. These elements indicate a residence was once at this location.

Figure 9

Photograph of a Building Foundation, Taken on Burchfield Road, 2015

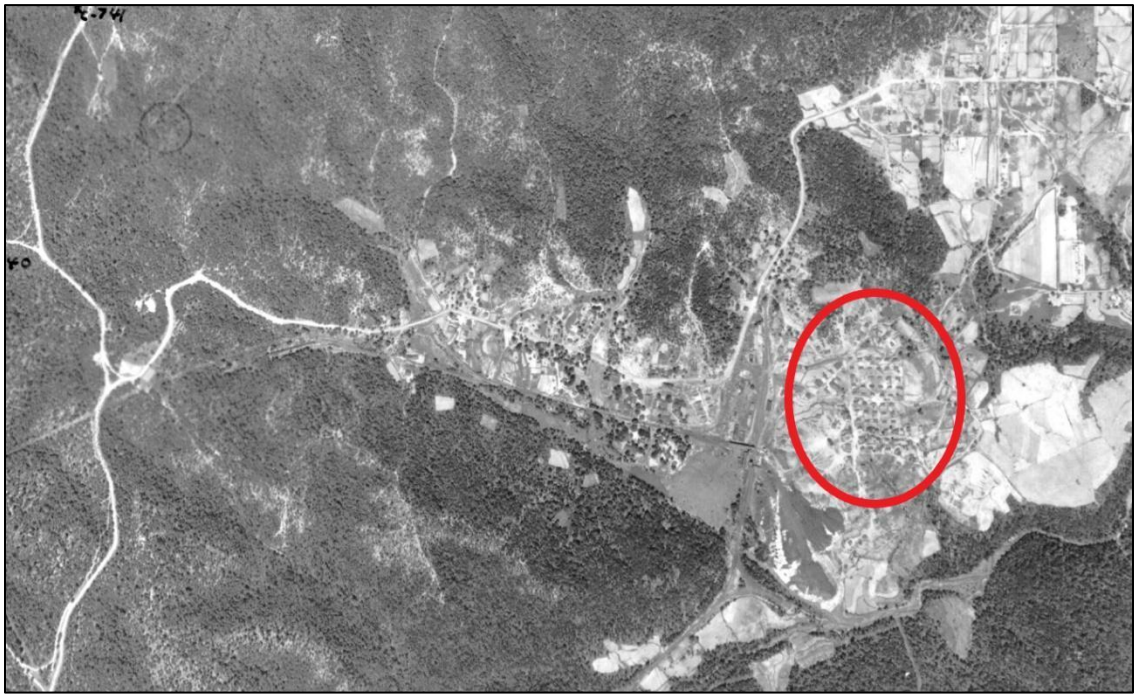
Note. A photograph of a concrete and cinder block building foundation, at the approximate location of the dashed line shown on *Figure 6, Current (2019) Aerial Imagery with Current (2019) Road GIS Data*, and where the labels for Lots 1 and 2 on *Figure 4, Aerial Image of the Kellerman Area Labeled with County Tax Parcel Numbers, 2020*. These elements indicate a residence was once at this location.

The 2015 roadside visit to the Burchfield and Kellerman area prompted a search of historical aerial photographs on the Alabama Maps website of the Cartographic Research Laboratory at the University of Alabama

(http://alabamamaps.ua.edu/aerials/Counties/Tuscaloosa/Tuscaloosa.html, accessed April 2, 2015). Two aerial photographs, Burchfield and Kellerman, were taken in 1938 (University of Alabama). These images show a more diverse and populated landscape. There are more roads, buildings, and cleared land, as shown in Figure 10, *Aerial Photograph of Kellerman Taken in 1938* . Interestingly, no open pit coal mining is visible in the 1938 images.

Figure 10

Aerial Photograph of Kellerman Taken in 1938



Note. Note the number of structures in the circled area, within a section of the Kellerman mine area, adjacent to the Burchfield locale. University of Alabama (n.d./1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true. An enlarged image showing greater detail of circled structures can be found in Appendix A2.

After finding the 1901 East Center City subdivision plat in Tuscaloosa County Tax Assessor website, visiting the Kellerman and Burchfield areas along Burchfield Road, and viewing the 1938 aerial photographs of the area, I wanted to learn more about these communities and of the history of this now sparsely populated area. In the spring of 2015, I began the first phase of this project by gathering historical aerial photographs of the area (University of Alabama, 1938) and georeferencing them into a GIS. Additional work was conducted over time as I gained new skills and resources.

While there have been other studies using geographical resources and geographic information systems (GIS) on historical areas, which will be described in the Review of the Literature section, there has not been a focused study on the Burchfield and Kellerman areas of Tuscaloosa County. One study commissioned by the United States Army Corps of Engineers (USACE) researched the Holt Lake area of the Black Warrior River area's history but did not focus on these specific locales. Additionally, the USACE study was completed in 1989 and did not include the use of GIS.

In recent years, the rise of online resources has enabled more efficient and thorough searching of both textual and geographic resources. In the past, researchers needed to arrange onsite visits to libraries and other repositories in order to obtain historical maps, texts, and photographs. Full-text searches did not exist, limiting searches to specific search terms. Today, internet researchers can locate and retrieve documents from around the world without leaving their desk. Millions of textual documents can be searched in their entirety for specific words or phrases. Retrieved documents can be brought into a GIS and new understanding gained.

Objectives of the project

While there have been studies using GIS and textual resources on historical communities, including the previously described USACE study of the Black Warrior River in Tuscaloosa County, there have been no studies focused on the Kellerman and Burchfield areas. The USACE project was completed before improvements in GIS software, which now allow for a wider userbase of geospatial technologies. Additionally, the rapid increase of internet accessible historic resources and rapid full-text searches have given users access to historical documents from around the world.

The present study focused on gathering a variety of map, textual, and photographic resources to learn more about the history of Burchfield and Kellerman from 1830 to 1939. Using online resources located through searchable digitized maps, images, and documents, I created a GIS of this historic area to serve as a digital repository and to give the sources a better geographic context. The project is an example of how textual and geographic historical resources can be combined to discover and document a historical locale, both for historical study and modern practical application. Using these methods, this project explored a wide range of interrelated questions (Table 1, *The Interrelated Questions Explored During the Creation of This GIS of the Historic Burchfield and Kellerman from 1830 to 1939*).

Table 1

The Interrelated Questions Explored During the Creation of This GIS of the Historic Burchfield and Kellerman from 1830 to 1939

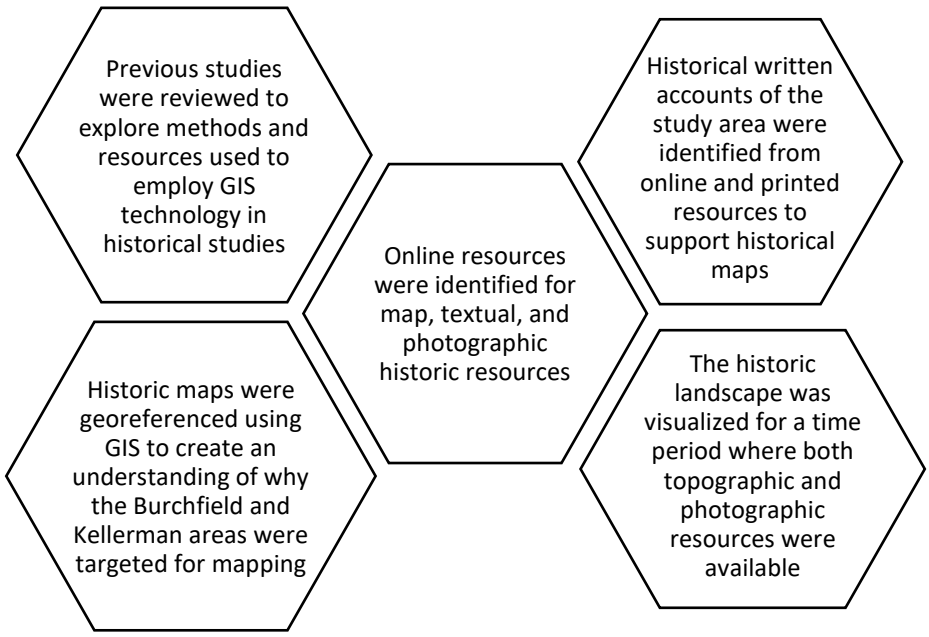
This project explored the following questions:
What are the resources available for studying these historic areas?
What early maps were made of the Burchfield and Kellerman areas?
What topics were featured on the historical maps?
How can historic maps and textual resources create a better understanding of the areas?
How did these maps aid in the understanding of why Burchfield and Kellerman were developed?
What cultural and commercial features were built to support the Kellerman mine operations?
How can historic resources be used within a modern GIS?
What were some of the services available to those living in the area?
What did the cultural landscape look like during the heyday of the area?
How might this historical landscape be recreated using historical maps and images?
What technology can be used to create a three-dimensional view of this vanished landscape?
How can the three-dimensional historic scene be easily viewed by a wider audience?
How can research methods and resources be used in Tuscaloosa County today?

Activities Leading to the Completion of This Project

As shown in Figure 11, *The Five Activities Leading to the Completion of This Project* below, five different types of activities led to the completion of this project. It should be noted these are not steps that were completed in a linear fashion. Often, one component of Figure 11, *The Five Activities Leading to the Completion of This Project*, would prompt additional activity in one or more of other four components.

Figure 11

The Five Activities Leading to the Completion of This Project



Note. This diagram design was chosen to highlight how each type of activity was related to the others, but not necessarily in a linear fashion.

The five types of activities are detailed in the remaining chapters of this project. Chapter 2 reviews resources and past studies relevant to this project. The third chapter details the methodology used to gain an understanding of the Burchfield and Kellerman area. Chapter 4 presents a history of the study area through historic maps, supporting written and photographic resources, and three-dimensional visualizations of the historic landscape. The final chapter is where I present my findings and discuss the practical modern-day applications of the methods used in this project, including its limitations..

Chapter 2

Literature and Resources Review

This chapter details projects and resources helpful to the present study. Specifically, the following topics will be discussed:

1) Historical overview of Tuscaloosa County coal and transportation development
2) Explanation and examples of GIS and historical GIS
3) Utilization of historical GIS related to historic communities and neighborhoods
4) Creation of three-dimensional visualizations from historic resources
5) Accessing digitized historic maps via web-based resources

Previous historical research related to the Burchfield and Kellerman Area

In 1988, the U.S. Army Corps of Engineers (USACE) Mobile District commissioned the Southeastern Archeological Services, Inc. project, "From Tuscaloosa to Squaw Shoals: A History of Holt Lake, Alabama." The purpose of this study was to determine if the study area is of historic significance (Wood, 1988).

The USACE study area consisted of the portion of the Black Warrior River in Tuscaloosa County known as Holt Lake and surrounding coal measure area known as the Warrior Coal Basin. Holt Lake was created when the USACE completed construction of Holt Lock and Dam in 1969 (Wood, 1988). The dam raised the water level of the Black Warrior and flooded much of the rail line that ran to the Kellerman Mine near the locale of Burchfield, in Tuscaloosa County. Historic buildings and landmarks were also inundated along the river's banks. Numerous cliffs, shoals, and falls that once were seen along the river's edges and tributaries also disappeared.

Wood used portions of contemporary and historic maps, as well as photographs from the study area. Onsite archeological surveys, interviews, and plant studies were used to complete the

report. The author concluded that while the area had significance in transportation, mining, and industrial development, it could not be a candidate for the National Register of Historic Places due to many of the relics being underwater or obliterated (Wood, 1988).

While this project brought together several historic maps, photographs, and written accounts near the present study area, it had a broader focus of the Warrior Coal Basin covering a large section of eastern Tuscaloosa County. Burchfield and the Kellerman mine were mentioned but were not the focus of the document.

Geographic Information Systems (GIS) and Historical Geographic Information Systems (HGIS)

Although books, maps, and text-based resources are helpful in the study of historical communities such as Burchfield and Kellerman, spatial data can provide additional resources for analysis. Examples of spatial resources are maps, drawings, plans, photographs, and imagery, which can be in print or digital formats. Because of the rich coal related resources and the potential for profit, many maps and geospatial datasets have been created for the Burchfield and Kellerman area.

It may be useful to have a collection of maps and reports on a desk, or even linear road features displayed on a computer screen, but it is a challenge to not only understand any relationships between locations (the spatial data) in various maps and photos, but also the characteristics of those locations. In the past, these characteristics or attributes have been documented in non-spatial data, which include tables, charts, and text. Relational databases allow users to be able to efficiently store and query non-spatial data.

Geographic information systems, or GIS, have changed the way users interact with spatial data, enabling users to not only examine relational databases but also associate the data

with locations. Disjointed data sources, such as those described in the preceding paragraphs, can be combined into a single, researchable spatial database that includes not only attribute values but the geographic features affiliated with them.

Using GIS as a tool to visualize and analyze features and attributes in historical landscapes has become to be known as historical GIS, or HGIS. In the article, "Geographical Information Systems and the Study of History," Martí-Henneberg asserts GIS can effectively combine the sometimes-disconnected studies of history and geography (2011, p. 3). The creation of site-specific datasets can come from combining scattered resources from a variety of disciplines (2011, p.3). Not only can scholars now examine what happened inside a study area, but where and perhaps why. Such "spatiotemporal studies" are aided by the technology's ability to layer data for the purpose of discovering relationships and changes that may otherwise be hidden (Martí-Henneberg, 2011, p. 6).

Utilization of HGIS to Study Railway and Development

One example of HGIS research is Morrillas-Torné's article, in which he describes how he and other researchers created a spatial database documenting the development of the European railway system from 1830-2010. The project also sought to link railway growth with changes in population and elevation, enhancing a historical study with a quantitative analysis. After gathering pertinent modern digital and historic print resources from each country, the author was challenged by a "lack of uniformity between sources" as he sought to find patterns common throughout Europe (Morrillas-Torné, 2012, p. 177).

To allow for study across data types and time periods, the resources had to be brought in to a HGIS and modified. The resources were georeferenced (Morrillas-Torné, 2012, p. 178), a process where the software assigns real-world location information, or coordinates, to images

such as maps or drawings, so the images can be associated with other spatial (maps and charts) or non-spatial data (database tables) sources. Overlaying the data allowed the researchers to be able to create line features representing the evolution of railway lines during the study period, as well as create another layer to display British train stations (Morrillas-Torné, 2012, p. 180). Finally, the data's features required topological correction, ensuring no railways were accidentally duplicated and that the railway features existed were contained by the study area. The resulting dataset allowed the researchers to measure the length of railway lines for each country and the continent over time, the characteristics of population growth associated with railways, as well as the relationship of railways to terrain elevation (Morrillas-Torné, 2012, p. 182).

Analysis of Historic Communities and Neighborhoods Using HGIS

Historical maps were also incorporated into a HGIS in a study of Victoria, Canada's 19th century laborer neighborhoods. Dunae, Lafreniere, Gilliland, and Lutz gathered resources including historical fire insurance maps, lot surveys, parcel data, and census records into a single GIS (2013). From this, not only could the authors visualize what structures had been where (the spatial data), but also who lived there (the corresponding non-spatial data).

The ability to combine tabular and locational data into a HGIS allowed the authors to make new discoveries. The study area had census data that ranged in detail depending on the source. Municipal records documented building addresses. The official census logged more comprehensive demographic information, plus the characteristics of the buildings themselves, including the number of floors and type of building materials (Dunae, Lafreniere, Gilliland, and Lutz, 2013, p. 30). The manner in which inhabitants were described yielded information on prevailing attitudes towards minority groups, as descriptions such as "Indian shanties" imply

negative racial attitudes. The spatial distribution of hotels, boarding houses, cabins, and "Victoria's Skid Row" were analyzed (p. 58). By combining population counts with the number and type of housing units, a per capita living space of just 6.8 square meters for the residents was calculated for the region (p. 57).

Using historical GIS as a tool for a multidisciplinary study of a disappeared community was also used by González-Tennant in the study of the Rosewood community in Florida. The African American population was violently removed after the Rosewood Race Riot of 1923 and their structures destroyed. The process to research and document the destroyed community was described by the author as an iterative process of referencing property records, transferring the legal descriptions to features in a GIS, connecting ownership attributes from Census data, and combining results with historical aerial imagery. The result was called a historical properties GIS (González-Tennant, 2016).

Creation of Three-dimensional Visualizations from Historical Resources

While two-dimensional maps can aid in understanding a historic place, three-dimensional rendering has the potential to influence greater appreciation for a location. McClure and Griffiths (2002) created a project for this purpose. Their goal for the study was to assist the Countryside Agency and West Oxfordshire District Council in their efforts to grow public support for wildlife, landscape, restoration and preservation efforts in the historic Royal Hunting Forest of Wychwood in England.

McClure and Griffiths used modern elevation contour datasets as sources for generating digital elevation models (DEMs). Historic structure and landmark GIS features were developed from parish maps drawn in 1812 and 1850. The historic features were draped over a three-dimensional ground surfaced generated from the DEMs creating a more realistic view. Modern

aerial photographs were also draped upon the same three-dimensional surface in another rendering, allowing the public to understand how the area had changed over time and hopefully realize the importance of managing this historic landscape.

Historic maps were also the basis for recreating a virtual historic landscape in India. Nalini and Rajani focused on the area around the city of Chitradurga, where a fortress built in the 1500s was being threatened by modern development (2012). Survey of India (date not indicated) topographic maps, along with historic two-dimensional surveys, paintings, and texts were combined modern elevation models. A GIS was created to illustrate how the historic fort possibly looked before the rapid development of the last two centuries and display how modern structures are impacting the fortress area. A three-dimensional view enhanced the visualization, and the authors hoped this would allow others to realize how the advancing development threatens the region.

Availability of Digitized Historic Mapped Resources

As geographic information systems (GIS) have become more common and easier to use, government agencies such as the United States Geological Survey (USGS) have been digitizing their modern and historic map products. Users can now visit online resources such as *TopoView* (2019), and the *USGS Historical Topographic Map Explorer* (2019). These websites are searchable by keyword or location, and relevant resources can be downloaded in zipped compressed files.

Many of the digitized map image files are already georeferenced to real-world coordinates, allowing for immediate use in a GIS. As described in the *TopoView* website (2019), the JPEG files are intended for fast visual reference, and the GeoPDF, KMZ, and GeoTIFF formats have geographic data included which can be used in a variety of GIS software. Of

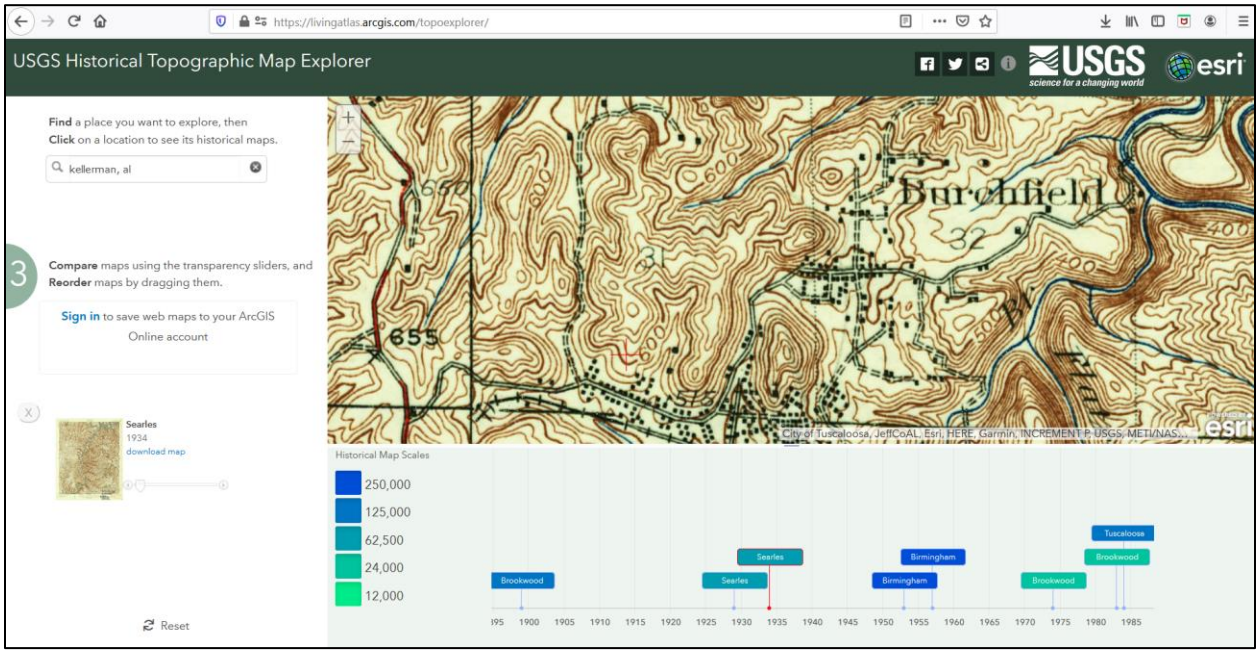
interest to this study was the GeoTIFF format, with its included georeferencing data allowing for immediate use in ArcGIS Pro (Esri, 2019) or other GIS software packages. The user simply imports the georeferenced historic map into the GIS software and the scanned image will display in the correct geographic location.

Metadata files for each of the USGS historical products are provided in the xml format, allowing users a better understanding of each data product's characteristics to help ensure appropriate use. Metadata include useful fields such as Datum, Projection, Survey Year, Revision, and Imprint Year.

Recently, the U.S. Geological Survey has added additional functionality to its *USGS Historical Topographic Map Explorer* (2019) on Esri's *ArcGIS Online* web platform (2019). To access this functionality, the user searches for the area or locale of interest. Clicking on the map reveals a timeline of historic USGS topographic quadrangles. Selecting the desired map and edition displays the historic map over the modern topographic map service. The same selected historic map also appears in a table of contents section with the option to download the map as an ungeoreferenced image or add to an ArcGIS Online web map, as shown in Figure 12, *USGS Historical Topographic Map Explorer*. The recently added convenience of adding the historical map to a web map allows users to quickly view the historic map in the context of a modern location, and create new features either in the ArcGIS Online platform or within ArcGIS Pro.

Figure 12

USGS Historical Topographic Map Explorer



Note. A screenshot of the *USGS Historic Topographic Map Explorer* website, with the timeline of available maps, and options for downloading an ungeoferenced image or adding to an ArcGIS Online web map. U.S Geological Survey. (n.d.). USGS Topographic Explorer [online map resource]. Retrieved 2 March 2019, from https://livingatlas.arcgis.com/topoexplorer/index.html.

Additionally, multiple historic topographic maps can be displayed in a single web map, allowing for users to view adjacent historic maps to be readily displayed next to each other. Now the user can utilize a nearly seamless unified web map of a study area that may span multiple historic topographic maps.

A topographic quadrangle map may have a single “base compilation” or survey, with subsequent updates and reissues. This is useful for historical study and further digitization of features. For example, the USGS historic topographic map *Searles* used in the present study as

the basis for creating a historical digital elevation model, was originally surveyed in 1928 and1929 but the official edition is 1934 with a reprinting date of 1942. Changes in ink or printing methods can make the same features more readable.

While there are now thousands of historic USGS topographic maps available from *TopoView* and other USGS resources, *TopoView* does mention there is no complete collection of historical maps. In the past, it was more difficult to create and print the maps, and often different maps were distributed to lending institutions without documentation. Thus, materials were not always catalogued, returned, or archived, leading to an unknown numbers and types of maps being lost. The *TopoView* website invites anyone with access to uncatalogued topographic maps to contact the USGS (2019).

If researchers wish to go further back into the history of a locale, the U.S. Department of the Interior Bureau of Land Management (BLM) offers its historical land records through a searchable online archive. The *Bureau of Land Management (BLM), General Land Office (GLO) Records Automation* web site allows users to search by persons' names, Public Land Survey System (PLSS) locations, states, townships, or meridians (2019). Scanned copies of the patents, surveys, and other related records date back to as early as 1788. For users new to the digital archives system, this BLM site offers documentation and contact information. While the scanned images of the records are not available in a georeferenced format, users familiar with GIS can create projection files using the PLSS section, township, and range features as a reference for known coordinates.

While there have been studies in which GIS has been used to analyze the development of geographical areas such as those noted in earlier in this section, the methods have not been applied to the present area. The rise of web-based resources and full text searches has increased

the amount and availability of print, photographic, and spatial resources. Bringing together print and digital resources specific to the study area into a single project created a new understanding of the Burchfield/Kellerman area.

Chapter 3

Methodology

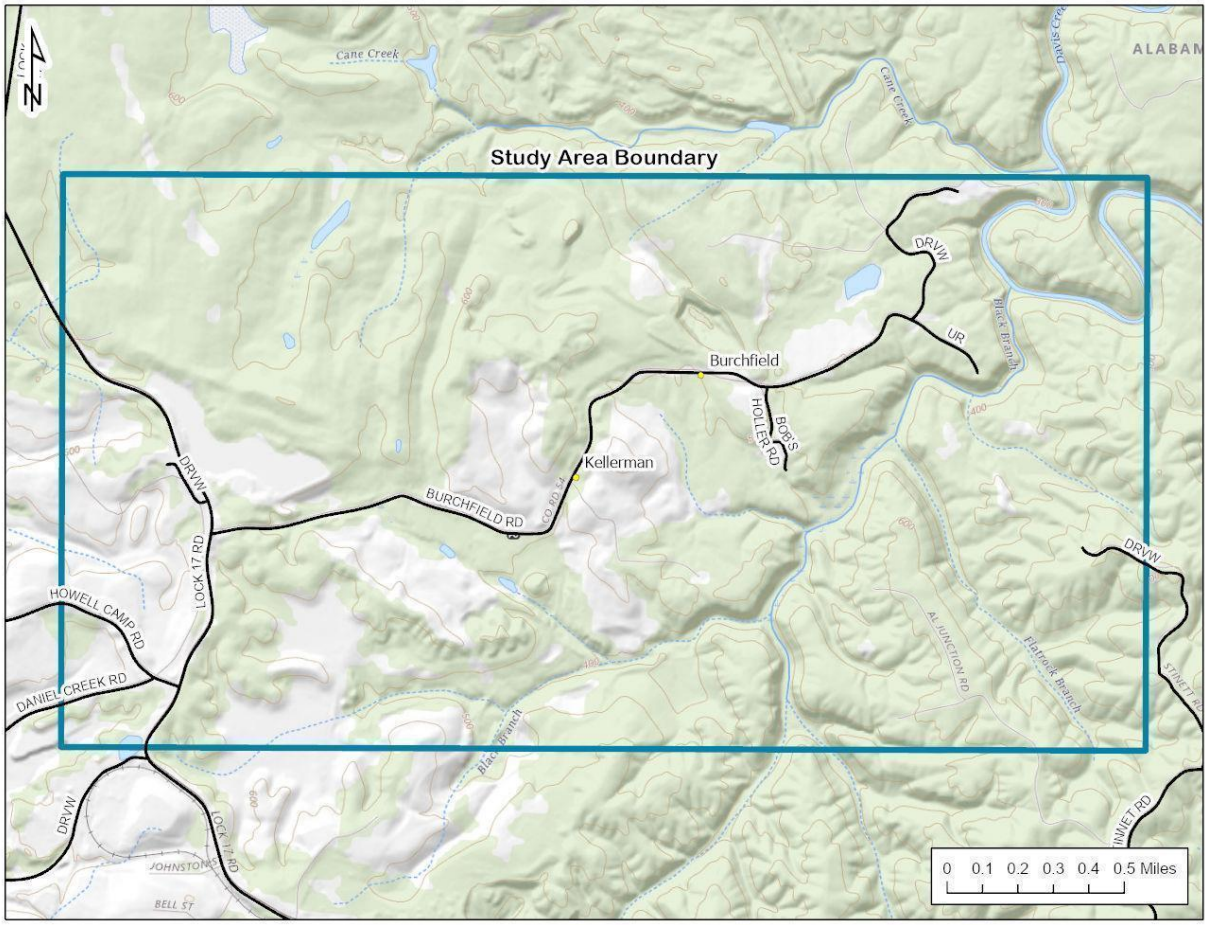
This project used a variety of spatial, photographic, and historical documents, retrieved from mostly online sources. This project utilizes a number of spatial techniques and data and incorporates them with textual and photographic resources. These are described in this chapter.

Defining the Study Area of Burchfield and Kellerman

As shown in Figure 1, *Locational Map of the Burchfield/Kellerman Area in Tuscaloosa County, Alabama*, the study area for this project is located in the north central area of Tuscaloosa County, Alabama, in the unincorporated locales of Burchfield and Kellerman. The locales of Burchfield and Kellerman were studied as a single, combined location due to the locales' proximity to each other as well as both being on Burchfield Road, as is shown as an approximate polygon shown in Figure 13, *Map displaying the study area consisting of Burchfield and Kellerman in Tuscaloosa County, Alabama, with the UStopo Map Service*. The study area boundary can only be described as approximate because of the limited accuracy inherent in historic maps, making it difficult to replicate the exact area on every historic map referenced in this project.

Figure 13

Map displaying the study area consisting of Burchfield and Kellerman in Tuscaloosa County, Alabama, with the UStopo Map Service



Note. Geological Survey of Alabama, 2012, U.S. Geological Survey, 2019. U.S. Geological Survey. (n.d.). USGS Historic Topographic Maps [online image service]. Retrieved 6 February 2020, from https://utility.arcgis.com/usrsvcs/servers/88d12190e2494ce89374311800af4c4a/rest/services/USGS_Historical_Topographic_Maps/ImageServer. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

Additionally, several maps with larger viewing extents were created to allow for: 1) Viewing the study area within a larger geographic context; 2) Understanding how other locations influenced the development of the study area; and 3) Utilizing historic maps made with larger viewing extents. The time periods for this study were the early development and documentation of the Burchfield and Kellerman areas from the 1800s to the end of the 1930s, with an increased emphasis on the 1920s and 1930s.

Utilizing Historical Maps

Un-georeferenced Historical Maps

The website for the University of Alabama's Cartographic Research Laboratory's *Alabama Maps* (http://alabamamaps.ua.edu/) was utilized as a data resource. For the historical maps by Tuomey (1849), Smith (1878), Smith (1879), Squire (1890), McCalley (1898), Alabama Traction, Light, and Power Company (1913), images were accessed from the website. Each map image was opened in the web browser and the viewing extent focused on the Burchfield and Kellerman areas, and the Holt and Central Foundry locations if appropriate. The Snippet Tool found in Microsoft Windows 10 Home Edition (2019) was used to create an image file of the study area.

Each image file was then opened in the geographic information system (GIS) software, ArcGIS Pro (Environmental Systems Research Institute, Inc., 2019). The image was georeferenced using geospatial data with known projection and coordinate systems, including the Bureau of Land Management's feature layer map service, *PLSS Township* (2019). Due to the limited accuracy of the historical maps, georeferenced results were used only for general reference to visualize the overall characteristics of the study area.

For the maps mentioned above, an affine transformation was used to create the final georeferenced raster images. This transformation is described by Chang (2016) as being a first order polynomial transformation, with six approximate multiplied factors applied to the rows and columns of the scanned images of the maps. The affine transformation is recommended when the map being georeferenced is likely to have a more consistent error. As described in the previous paragraph, the control points were often the corners of the PLSS. Since the historic maps used these regularly occurring PLSS features, or used common county boundary corners, the affine transformation was acceptable for general visualization purposes. An additional consideration was that often there were not many identifiable control points, making the affine transformation necessary as it often only requires three well-spaced control points to create an acceptable georeferencing result.

The exception was the use of a spline transformation for the map, *Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry* (Smith, 1879). The spline transformation links control point locations to the corresponding locations of the map being georeferenced exactly. There is an assumed error (the difference between the transformed location of the scanned map and the real-world location) of zero for those common points. From those matched points, the level of accuracy decreases, requiring at least ten control points to ensure adequate tie points (http://courses.geo.utexas.edu/courses/371c/Lectures/Fall16/Georeferencing_Fall16.pdf).

The historical map's extent and layout were in a very long rectangular shape, with the PLSS Sections, Townships, and Ranges boundaries clearly marked. A visual comparison of the modern Bureau of Land Management's feature layer map service, *PLSS Township* (2019), and the PLSS features on the Smith map was made. It was noticed that the historic map's PLSS features were very regularly shaped squares, which is not the case for the actual PLSS features.

The historic map's features and shape seemed to have adjusted to fit in printed space. These were taken as hints there was irregular distortion across the Smith map, making the spline transformation desirable. While it was only necessary to create control points for the Tuscaloosa County area for the present study, georeferencing the entire map was completed using approximately 190 control points.

The U.S. Geological Survey's Geographic Names Information System's *Populated Places* (2012) point features displaying Burchfield and Kellerman were then overlaid on the georeferenced historical map images for visual reference. Layouts were generated for each georeferenced historical map using the local coordinate system NAD 1983 StatePlane Alabama West FIPS 0102, WKID 102630 (https://www.spatialreference.org/ref/esri/102630/html).

Pre-georeferenced Historic Maps

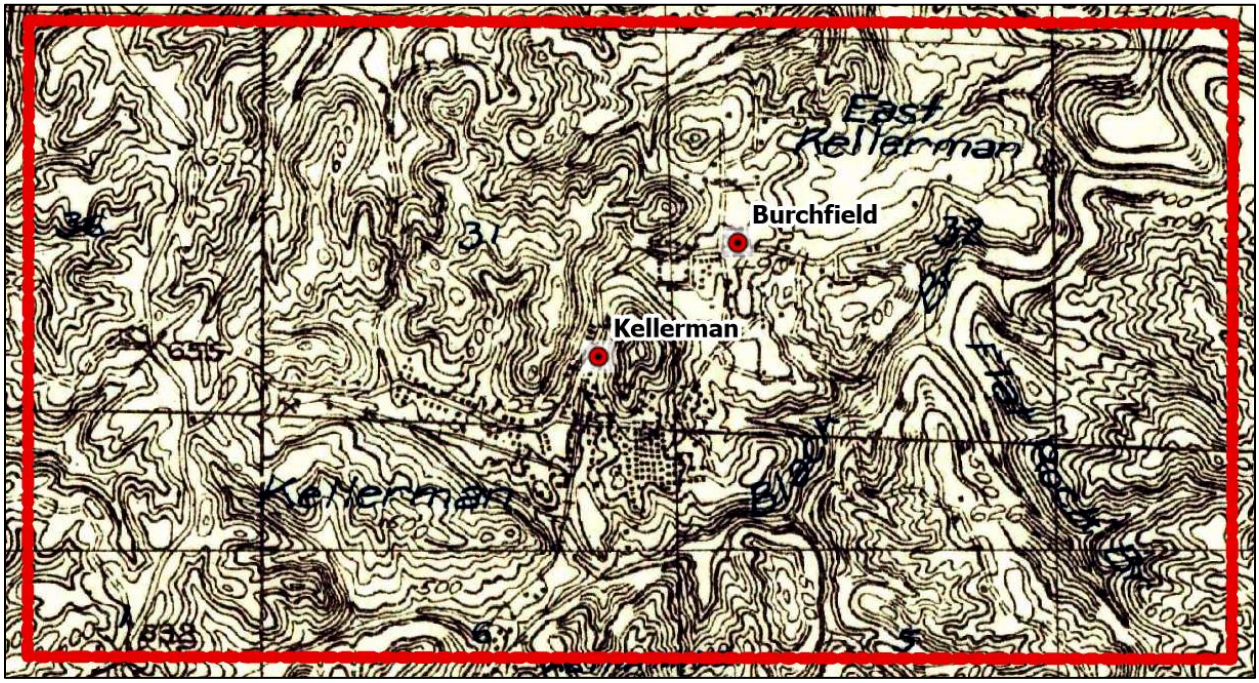
The USGS web resources *TopoView* (2019) and *USGS Historical Topographic Map Explorer* (2019) were accessed to view and retrieve historical topographic maps of the study area. A search using the place name of "Kellerman, Alabama" was used to navigate to the correct location for both websites. Then, a location in the resulting map view was clicked to produce a list of relevant historic USGS maps.

The *USGS 1:125000-scale Quadrangle for Brookwood, AL 1899* was selected as a GeoTIFF file in *TopoView* and downloaded. The downloaded resource included the necessary projection and coordinate system files to permit immediate use in the ArcGIS Pro software. The modern point features from the USGS Geographic Information System (2012) representing Burchfield and Kellerman were overlaid on the map for the purpose of visual reference. Moreover, *TopoView* was used to view and select a topographic map for the 1920s and 1930s. As described in the Review of the Literature section of this project, *TopoView* offers multiple

editions of some historic maps. The original survey for the *Searles* topographic quadrangle map extent was completed in 1928 and 1929. The first edition using these surveys, *USGS 1:48000-scale Quadrangle for Searles, AL 1929,* was the basis for later printings and editions. However, features on this 1929 edition were difficult to differentiate as shown in the following Figure 14, *Georeferenced Image of the USGS 1:48000-scale Quadrangle for Searles, AL 1929, with Study Area Boundary and Modern GNIS Features of Burchfield and Kellerman*.

Figure 14

Georeferenced Image of the USGS 1:48000-scale Quadrangle for Searles, AL 1929, with Study Area Boundary and Modern GNIS Features of Burchfield and Kellerman



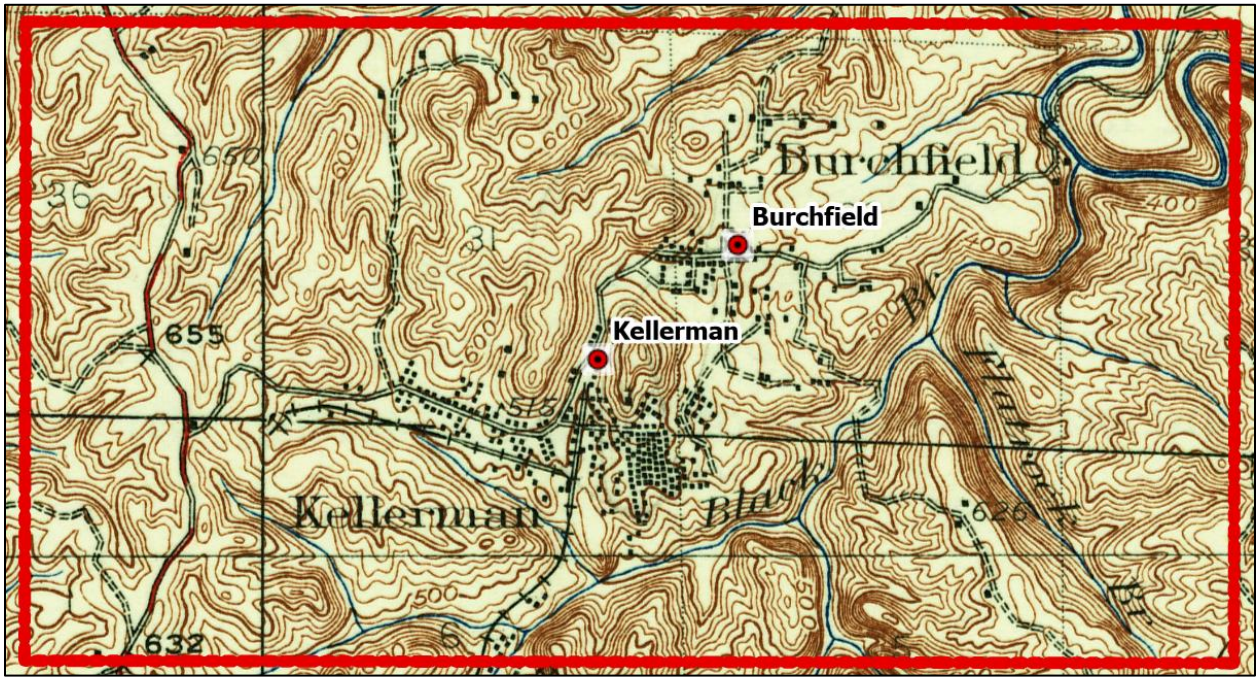
Note. Road and elevation line features were difficult to differentiate on the 1929 version of this USGS topographic map. U.S. Geological Survey. (1929). *USGS 1:48000-scale Quadrangle for Searles, AL 1929* [Scanned Map in GeoTIFF format], 1:48,000. Reston, VA: U.S. Geological Survey. Retrieved from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045.

Fortunately, the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* used the same 1928 and 1929 surveys, structures, roads, and elevation contour lines. As illustrated in Figure 15, *Georeferenced Image of the USGS 1:62500-scale Quadrangle for Searles, AL 1934, 1942 Reprint, with the Study Area Boundary and Modern GNIS Features of Burchfield and Kellerman*, this edition has more legible features useful for digitizing historic

features and was the source for digitizing historic contour lines and roads within the study area boundary. Road, rail line, and elevation features are clearer in this edition.

Figure 15

Georeferenced Image of the USGS 1:62500-scale Quadrangle for Searles, AL 1934, 1942 Reprint, with the Study Area Boundary and Modern GNIS Features of Burchfield and Kellerman



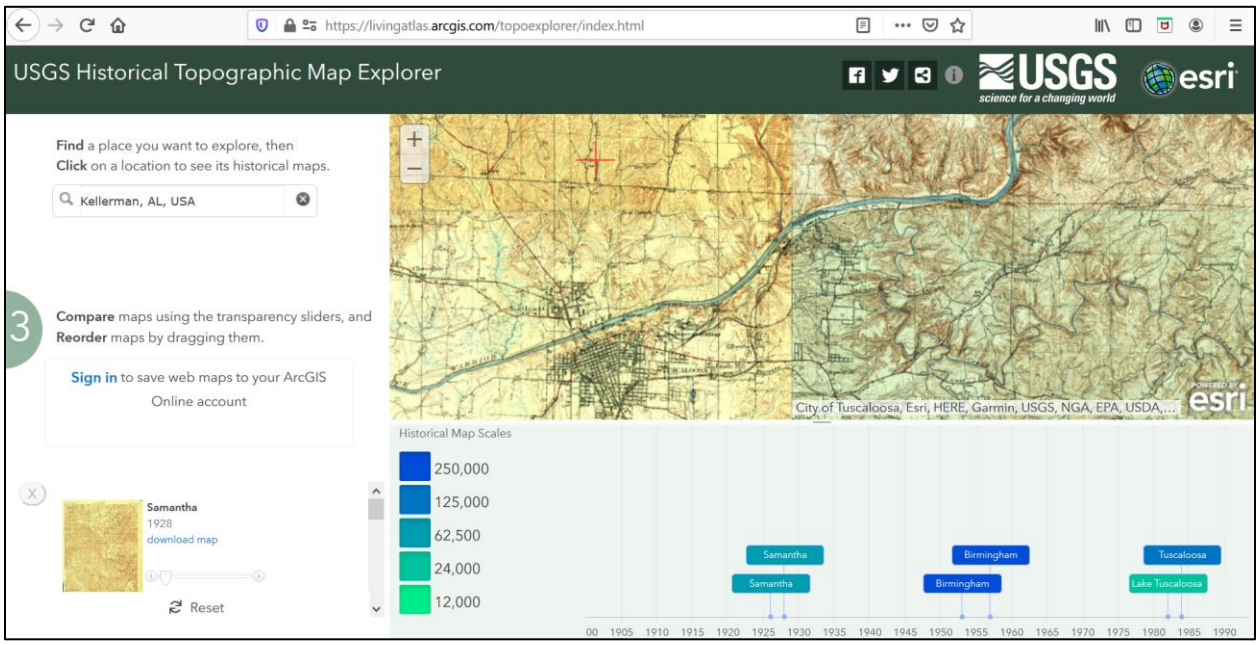
Note. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

The development of the railroad from Holt to Kellerman in 1903 was critical to the growth of the mine and its community. A map displaying the route of this railroad required a viewing area beyond the study area boundary and the *Searles* historical map and multiple historic topographic maps were needed. To obtain georeferenced historical maps to allow for digitizing historic rail line features, the ArcGIS Online platform was used via the *USGS Topographic*

Explorer (https://livingatlas.arcgis.com/topoexplorer/index.html) web application. As illustrated in Figure 16, *A Screenshot of the USGS Historical Topographic Map Explorer Website with Historic Topographic Maps Surrounding the Study Area,* the locale of "Kellerman, AL, USA" was found using the search box, and the desired location was selected on the web map. Then, the selected online images of the historic maps were brought into an ArcGIS Online (https://www.arcgis.com/index.html) web map and saved to a personal ArcGIS account.

Figure 16

A Screenshot of the USGS Historical Topographic Map Explorer Website with Historic Topographic Maps Surrounding the Study Area.

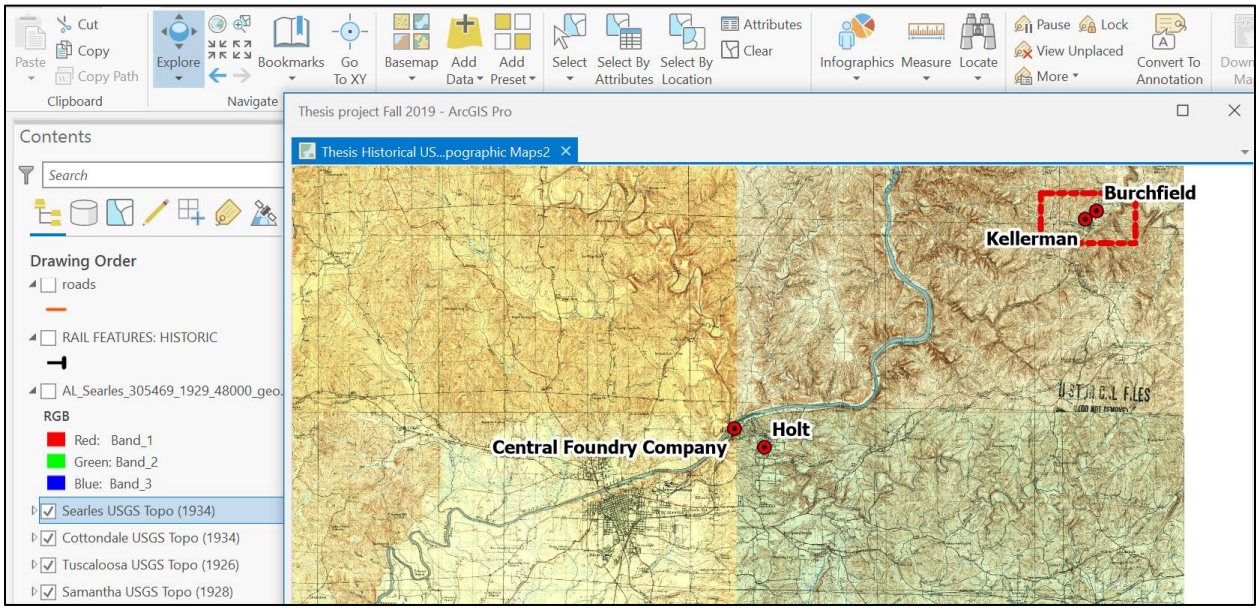


Note. U.S Geological Survey. (n.d.). USGS Topographic Explorer [online map resource]. Retrieved 2 March 2019, from https://livingatlas.arcgis.com/topoexplorer/index.html.

The ArcGIS Online web map and its historic topographic maps were then accessed in the ArcGIS Pro (2019) desktop software as web services. As shown in Figure 17, *Using Historic USGS Topographic Map Services in ArcGIS Pro*, the four maps appeared seamlessly, enabling easy visualization of the study area and associated Central Foundry Company and Holt locations. The default projected coordinate system used by ArcGIS Online services is WGS 1984 Web Mercator (auxiliary sphere) (Projection: 7483, n.d.). Since other datasets in this project used a local planar projection, the coordinate system NAD 1983 StatePlane Alabama West FIPS 0102, WKID 102630, was applied for this map (Projection: 102630, n.d.).

Figure 17

Using Historic USGS Topographic Map Services in ArcGIS Pro



Note. Using the historic USGS topographic maps, *Cottondale* (1934), Samantha (1928), Searles (1934) and Tuscaloosa (1928) from the ArcGIS Online image services to create a seamless reference map of the Burchfield and Kellerman areas with the associated Holt and Central Foundry Company locations. The study area is represented by a red rectangle. U.S. Geological Survey. (n.d.). USGS Historic Topographic Maps [online image service]. Retrieved 6 February 2020, from https://utility.arcgis.com/usrsvcs/servers/88d12190e2494ce89374311800af4c4a/rest/services/USGS_Historical_Topographic_Maps/ImageServer. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

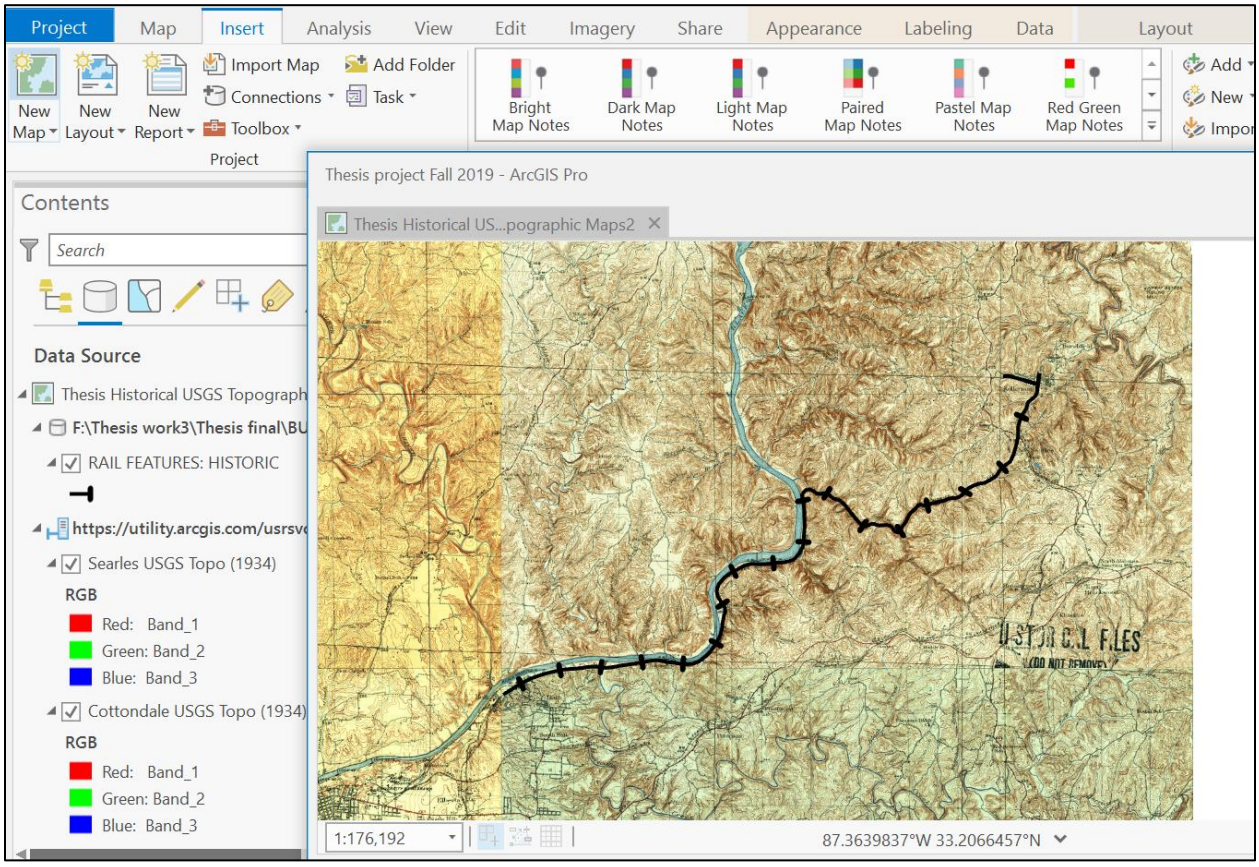
Digitizing Line Features from Historic Georeferenced Maps

Digitizing Historic Roads. Digitizing roads within the study area was done by creating a polyline feature class in ArcGIS Pro. The *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* was used as the reference. A domain of values for the digitized roads was created using the U.S. Geological Survey's document, *Topographic Instructions of the United States Geological Survey* (1928), as a guide. This document does not only serve the purpose of a standardized symbology, but it also provided a better knowledge of the types of roads in the study area when the features were updated in 1934 edition. The road features were traced using heads up digitization.

Digitizing Historic Railroads. Using the seamless web map imported into ArcGIS Pro, the historic Mobile and Ohio Railroad line connecting Holt and its Central Foundry to the Kellerman mine was digitized as illustrated in Figure 18, *Using Historic USGS Topographic Map Services in ArcGIS Pro to Digitize Rail Lines*.

Figure 18

Using Historic USGS Topographic Map Services in ArcGIS Pro to Digitize Rail Lines



Note. Using the historic USGS topographic maps from the ArcGIS Online image services as the basis for digitizing the historic Mobile and Ohio railroad line connecting the Central Foundry in Holt to the mining community of Kellerman. U.S. Geological Survey. (n.d.). USGS Historic Topographic Maps [online image service]. Retrieved 6 February 2020, from https://utility.arcgis.com/usrsvcs/servers/88d12190e2494ce89374311800af4c4a/rest/services/USGS_Historical_Topographic_Maps/ImageServer.

Digitizing Contour Lines. The 1942 reprint of the *USGS 1:62500-scale Quadrangle for Searles, AL 1934* was used as the source for digitizing the elevation contours. This edition was

selected because of its superior legibility of linear features based on the surveys done in 1928 and 1929. The *Searles* (1942) georeferenced image was loaded into an ArcGIS Pro map. The study area boundary was used to delineate the digitization limits.

An empty feature class (or map layer) was created in ArcGIS Pro for the purpose of displaying and storing the contour line elevations. Planning the schema of this feature class was very important to the digitization process as the schema ensured the proper contour line type and elevation was stored in each polyline feature's attribute values. The schema was designed as follows:

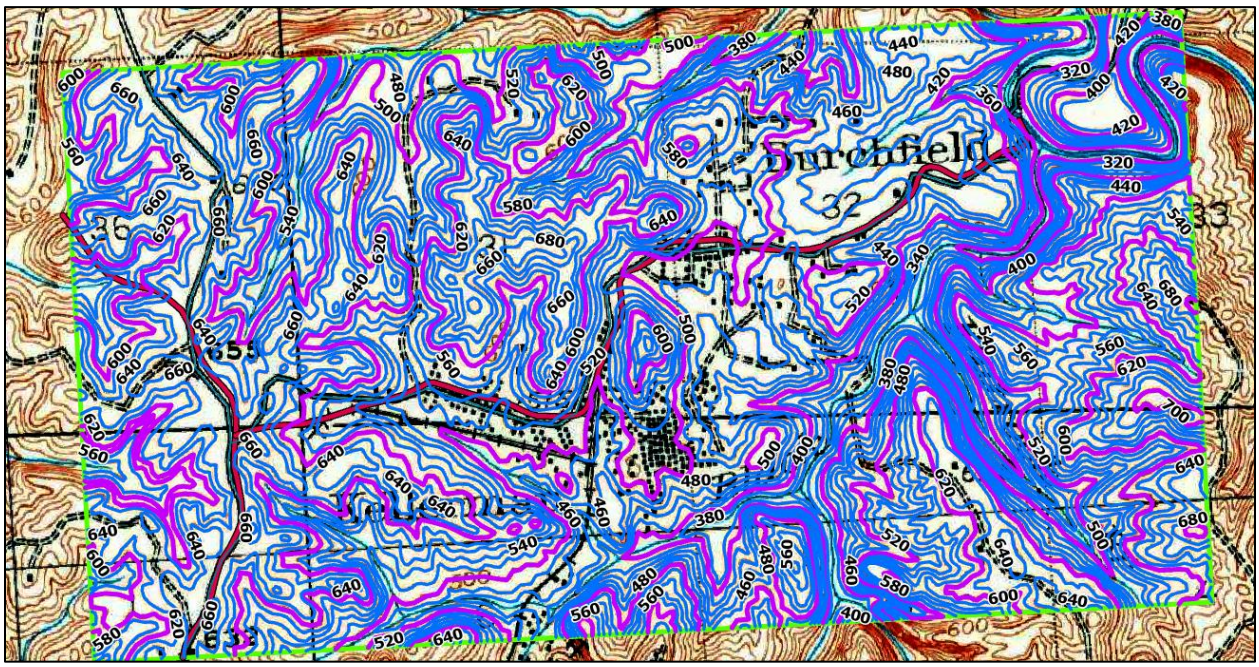
- Attribute fields were created to store needed data:
    - Field name ELEV, with a data type of Float, to store the elevation of the historical contour
    - Field name CONT_TYPE, with a data type of short integer, to store the contour type
        - A domain of three integer values was created for the CONT_TYPE field:
            - 0 = INTERMEDIATE
                - This was the default value as most contour lines types would be intermediate.
            - 1 = INDEX
            - 2 = SUPPLEMENTARY
                - Supplementary was not used in the project's study area but was added in case more digitization is done in future projects.

The schema allowed for consistent elevation line symbology which would assist in the digitization process. The feature symbology was dependent on the CONT_TYPE attribute. INDEX contours displayed as solid bright magenta, INTERMEDIATE contours solid bright blue, and the unused SUPPLEMENTARY contours dashed bright blue lines. The colors were selected because they were the most legible against the scanned image of the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* map. As each elevation line was created, the color of the line made for easy verification with the historic map image.

Labeling settings were also used to aid accurate elevation attribution. The labels on the digitized contours were set to display the ELEVATION attribute, which for the historic *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* map were measured in U.S. Feet. As lines were traced from the reference map, the elevation values would display and compared to the original map's elevation labeling as shown in Figure 19, *Historic USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint with Digitized Contour Lines within the Study Area Boundary*.

Figure 19

Historic USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint with Digitized Contour Lines within the Study Area Boundary



Note. Elevation contour lines symbolized by line type. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045

Utilizing Historic Aerial Imagery

Two historic aerial photographic images were obtained from the University of Alabama's Cartographic Research Laboratory for the year 1938 (University of Alabama, 1938). These images "Kellerman 1938" and "Burchfield 1938" were used for the following reasons: 1) They were the only aerial photographs found of the study area for the years of interest; 2) The images were very clear, and much detail visible; and 3) They would be georeferenced and draped over a

historic digital elevation model, to be described in the following section of this study. No information regarding the scanned photographs was found beyond the date, and georeferencing them proved to be a somewhat difficult process requiring two attempts.

For the first attempt, both 1938 aerial photographs were brought into ArcGIS Pro and a modern georeferenced aerial photograph was used to create the control points. Natural features including boulders, creeks, roads, and surviving buildings common between the historical and modern images were linked using the Georeferencing toolbar in ArcGIS Pro. An affine transformation was used as there were a good distribution of control points common to the historical and modern images. The results were acceptable for a two-dimensional map for general visualization purposes. However, when the 1938 images were overlaid on a historic three-dimensional surface generated from a historic USGS topographic map (which will be discussed in the following section), it was clear there were shortcomings. Creeks in the historical imagery were running along the sides of the three-dimensional banks among other visualization errors.

For the second georeferencing attempt, each of the two images was brought into ArcGIS Pro and the Georeference toolbar was used. The historic *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* was used as the basis for the control points. The reasons for this decision were as follows: 1) The survey years of 1928 and 1929 were within the time period of interest; 2) As described earlier, the map features were very legible on this 1942 reprint; 3) The map was surveyed and created by the USGS with a documented level of accuracy; and 4) The contour lines of this map would also be the basis of the historic digital elevation model, which would in turn generate a three-dimensional scene.

Again, the georeferencing process was time consuming. The level of detail in the scanned aerial images exceeded that of the historic map. Often it was easy to "get lost" in the details of the photographs, making it difficult to match the sharper photo locations with the generalized corresponding topographic map locations.

Additionally, the 1938 black and white tones on the photographs made it difficult to distinguish some features, such as roads and the confluence of waterways. This was somewhat resolved by changing the color ramp of the images. Two examples below demonstrate this use of color change to enhance feature identification.

The first image, Figure 20, *Portion of the Original Scanned Image of Burchfield (University of Alabama, 1938),* is the original black and white aerial photograph of a portion of the *Burchfield* 1938 image. Much of the settled area appears washed out, with the whiter tones obliterating cleared land and roadways.

Figure 20

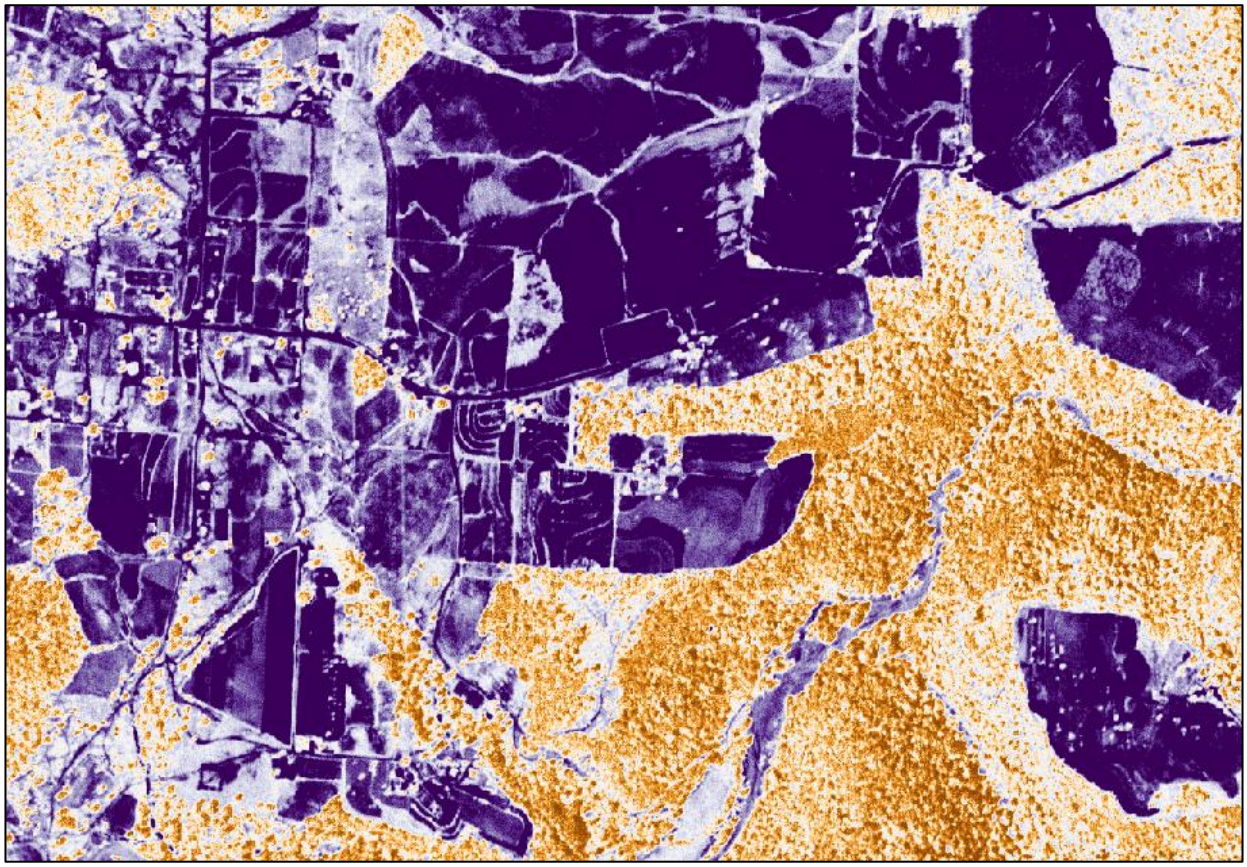
Portion of the Original Scanned Image of Burchfield (University of Alabama, 1938)

Note. Displayed using its original black and white tones. Some features such as roads and waterways appear washed out and difficult to differentiate. University of Alabama (n.d./1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Below in Figure 21, *Portion of the Scanned Image of Burchfield (University of Alabama, 1938) with an Orange and Purpose Color Ramp*, is the same area from the *Burchfield* image, but with a color ramp of oranges and blues. Linear features are more distinguished, and textures are more noticeable.

Figure 21

Portion of the Scanned Image of Burchfield (University of Alabama, 1938) with an Orange and Purple Color Ramp



Note. Changing the color ramp for the range of pixel values to orange-purple reveals features washed out in the original white-black color ramp. University of Alabama (n.d./1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Several different color ramps were used for the photographic images during the georeferencing process, with different color ramps revealing different features. Eventually enough control points were generated for the study area.

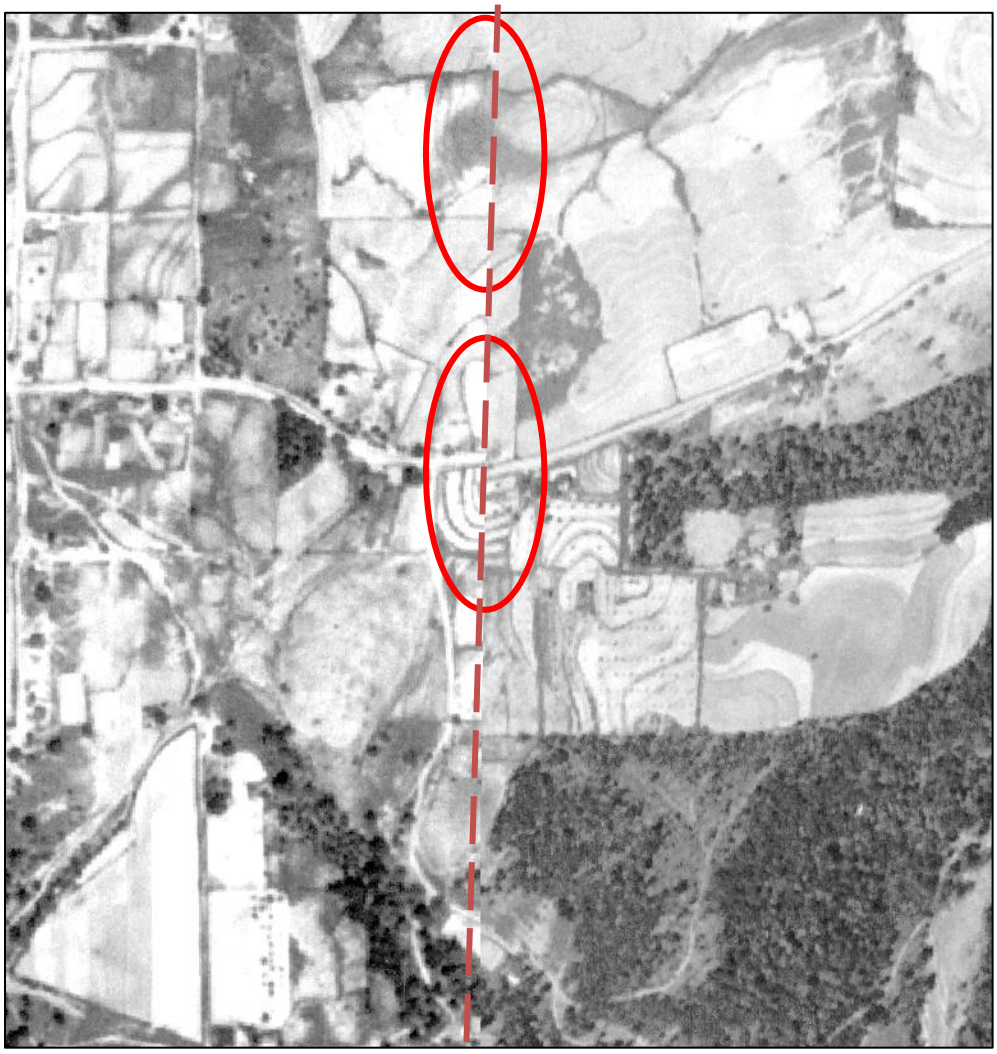
An affine transformation was used for the final georeferenced image output of both the *Burchfield* and *Kellerman* (University of Alabama, 1938) images. This decision was made because this transformation appeared to place the most linear features, such as roads, streams, and rail lines on the associated control features on the *Searles* quadrangle map.

Both the *Burchfield* and *Kellerman* georeferenced raster image layers were exported as projected raster images into the NAD 1983 StatePlane Alabama West FIPS 0102, WKID 102630, instead of the *Searles* map's Clark 1866 polyconic projection with the NAD27 (EPSG WKID 4267) vertical coordinate system. This allowed for the later creation of a 3-dimensional web scene, as the original projection and vertical datum were not supported in the ArcGIS Online Scene platform. Being able to extend the availability of the 3-dimensional scene was a priority of this study and therefore the coordinate system change was made.

Even with lengthy georeferencing work, there was less than perfect edge matching between the two historic aerial photographs (Figure 22, *Image Displaying Imperfect Edgematching Between the Kellerman and Burchfield Georeferenced Aerial Photographs (1938)*). This is likely due to the topographical displacement which increases with distance from each image's nadir, as well as the expected level of locational accuracy of the historic reference map. The resulting georeferenced historic images were suitable for producing a two-dimensional map and three-dimensional scene for general visualization purposes, as shown in Figure 23, *Final Georeferenced and Mosaicked Image of the Kellerman and Burchfield 1938 Aerial Photographs with Study Area*.

Figure 22

Image Displaying Imperfect Edgematching Between the Kellerman and Burchfield Georeferenced Aerial Photographs (1938)



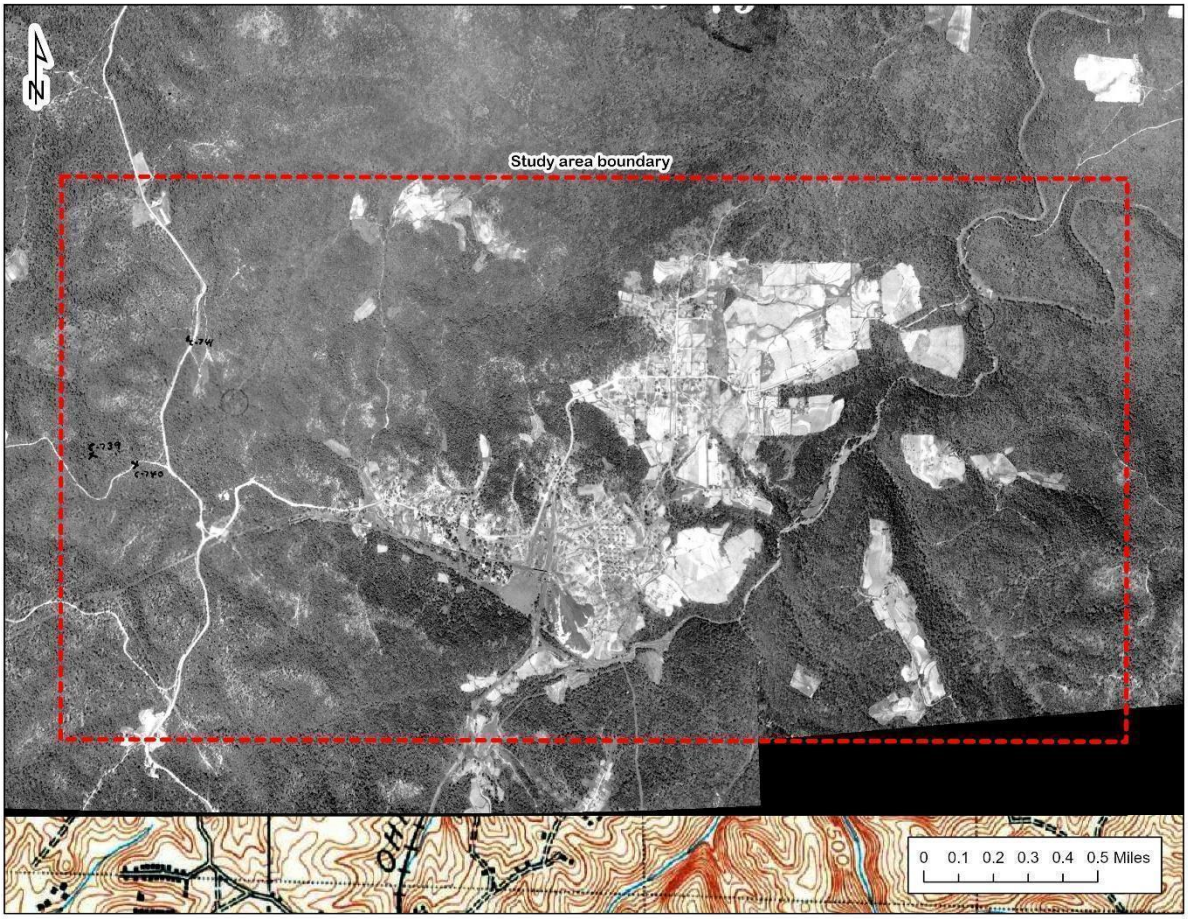
Note. Example of imperfect edge matching between the *Kellerman* (left) aerial photograph and *Burchfield* (right) aerial photograph after georeferencing. Notice how the circled areas have linear features that do not line up perfectly. The dashed line is the border between the *Kellerman* and *Burchfield* photographs. University of Alabama (1938a). Burchfield [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/

Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

University of Alabama (1938). Kellerman [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Figure 23

Final Georeferenced and Mosaicked Image of the Kellerman and Burchfield 1938 Aerial Photographs with Study Area



Note. Final mosaicked georeferenced image created from the historic Kellerman and Burchfield images. While not perfect, the image is suitable for creating two- and three-dimensional map and scene visual products. University of Alabama (1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

University of Alabama (1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

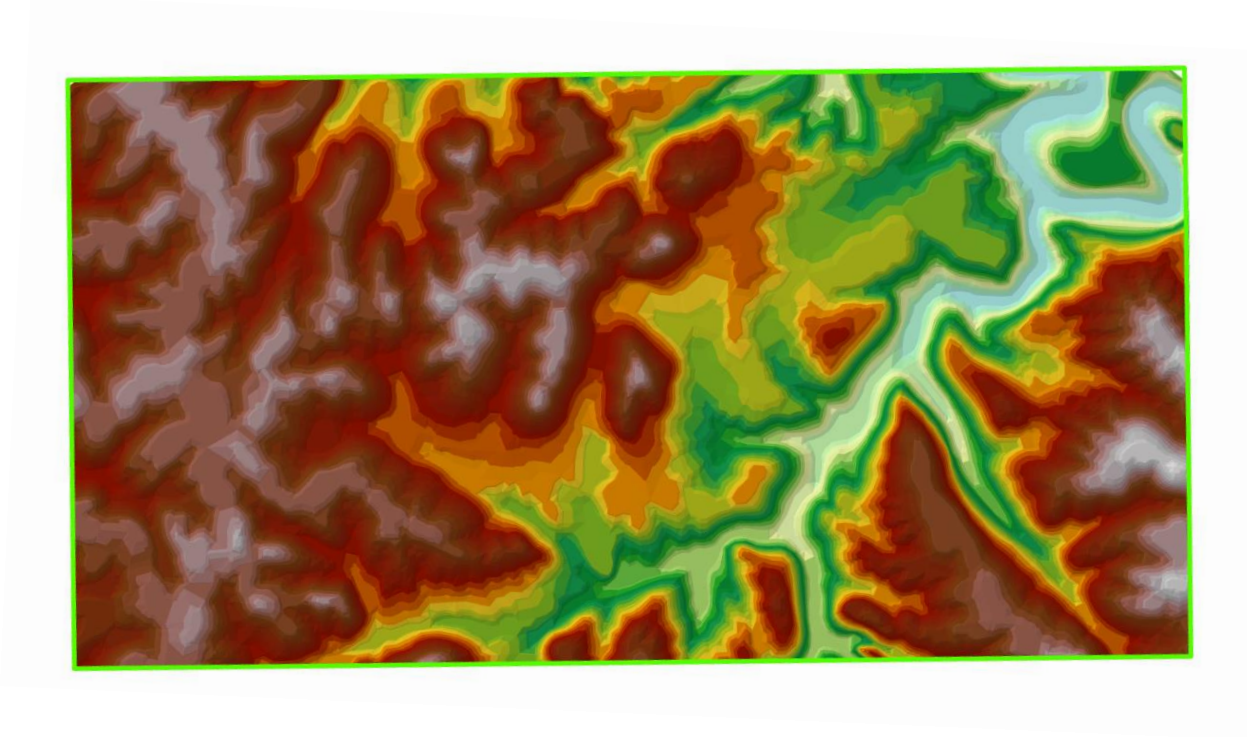
Generating Three-dimensional Visualizations of the Study Area

The creation of a three-dimensional visualization began with the digitization of the historic contour lines using the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* as described earlier. The contour lines were created using the Clark 1866 projection with the North American Datum of 1927 (NAVD27). This projection and datum were used as recommended based an email inquiry made to the U. S. Geological Survey (M. Adelson, personal communication, November 27, 2018). It was understood the vertical datum noted as being "mean sea level," on this Searles map is now known the National Geodetic Vertical Datum of 1929 (NGVD 29), as described by the National Geodetic Survey (https://www.ngs.noaa.gov/datums/vertical/national-geodetic-vertical-datum-1929.shtml).

Next, the Create TIN (triangulated irregular network) geoprocessing tool was used in ArcGIS Pro (2019), with the input feature class being the historic digitized contour lines and the height parameter the ELEVATION field. The elevation values were set to U.S. Feet. The resulting TIN (Figure 24, *The TIN Created from the Digitized Historical Elevation Contours from the USGS 1:62500-Scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint*) was reviewed to ensure it resembled the original *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* basic topography.

Figure 24

The TIN Created from the Digitized Historical Elevation Contours from the USGS 1:62500-Scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint



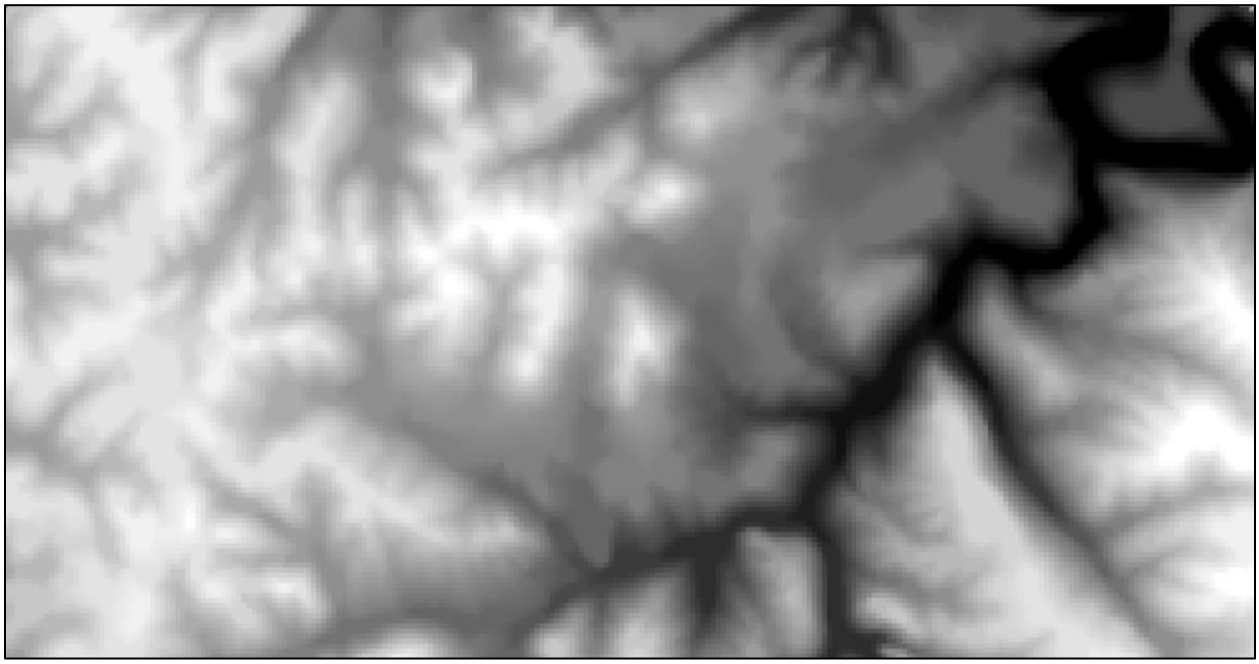
Note. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045

To create the historical digital elevation model (DEM), the TIN to Raster geoprocessing tool in ArcGIS Pro was used. The output was reviewed, again to verify the DEM resembled the topography of the historic topographic map. To ensure the DEM could be used in the ArcGIS online web scene platform, the DEM was reprojected to NAD 1983 StatePlane Alabama West

FIPS 0102, WKID 102630 (Projection: 102630, n.d.). The resulting historical DEM is shown in Figure 25, *The Historical DEM Created from the Digitized Historical Elevation Contours*.

Figure 25

The Historical DEM Created from the Digitized Historical Elevation Contours



Note. The DEM based on the historical elevation contours and reprojected to WKID 102630. Projection: 102630, n.d. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045.

The initial three-dimensional visualization was completed in ArcGIS Pro. A new three-dimensional scene was created. The historical DEM was used as a ground elevation source, which also set the coordinate system. The elevation units were set to U.S. Feet, with the NAVD88 height (ftUS) used as the vertical coordinate system (Geomatic Solutions, 2020). The reason for the selection of this vertical coordinate system will be described later in this section.

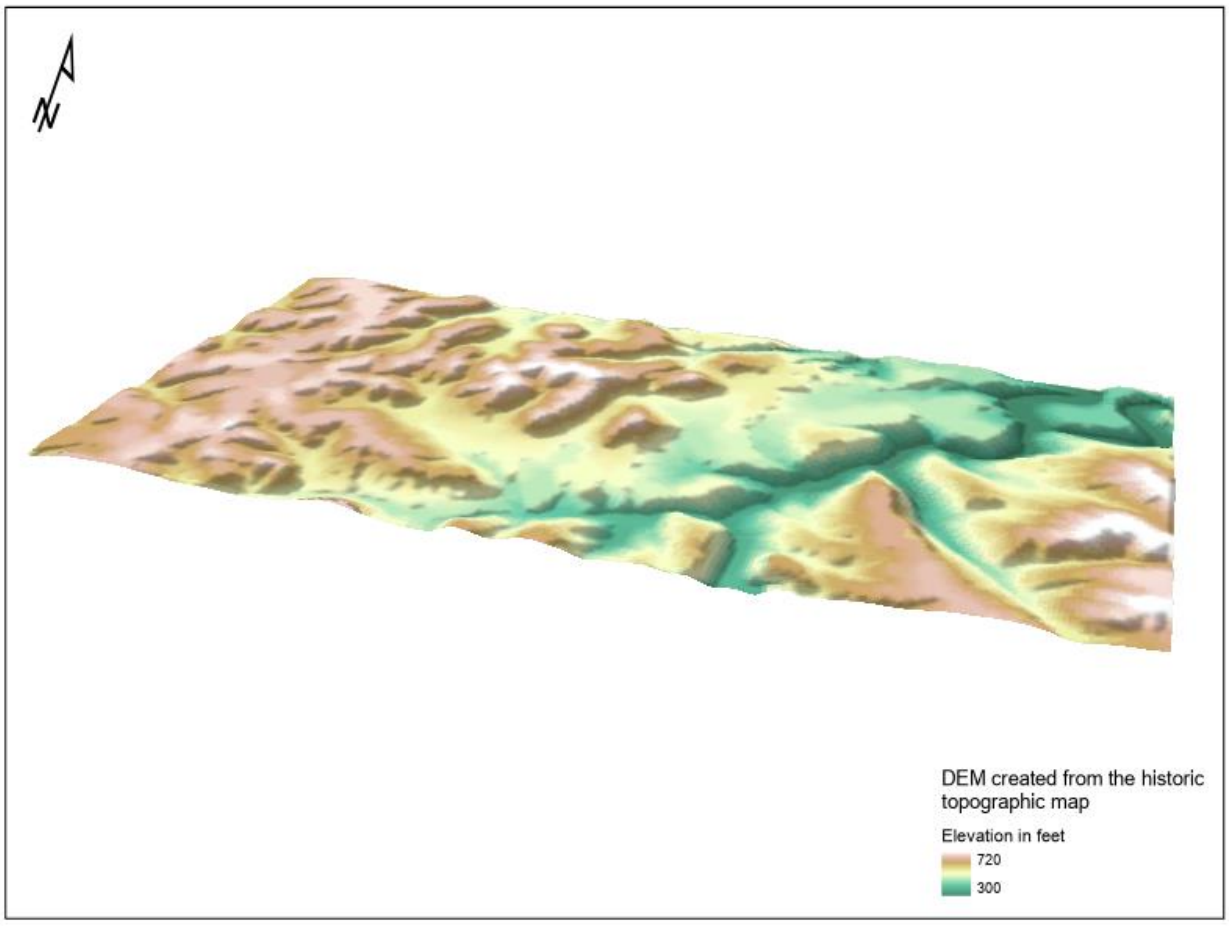
An image of this created DEM is show in Figure 26, *An Oblique View of the Historic Three-dimensional Scene*.

No conversion was made between the elevation values derived from the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* and the DEM's final NAVD88 heights. This decision was made for the following reasons: 1) The expected errors in the historic elevation contour digitization process; 2) The elevation datum for the *Searles* historic map is described as Mean Sea Level, which was renamed to be the National Geodetic Vertical Datum (NGVD29) by the National Geodetic Survey in 1973 (National Geodetic Survey, 2018b); 3) The expected inaccuracies in the creation of the resulting TIN and DEM; 4) The known inaccuracies of the reprojection process as values are resampled; and 5) The purpose of the final product being for general visualization purposes in the ArcGIS Online web scene viewer would require using the NAVD88, as the NAVD29 was not supported.

Additionally, there is only small differences between the NGVD29 and the NAVD88 heights. According to the online resource "VERTCON: NAVD 88 Minus NGVD 29 Datum Shift Contours," there is only a 0 to 20cm difference in heights between the two vertical datums (National Geodetic Survey, n.d.). This difference is small, and the final visualization product would not be affected enough to be noticed by the human eye.

Figure 26

An Oblique View of the Historic Three-dimensional Scene



Note. DEM created from historic contour lines, with color ramp symbology and hillshading used to highlight elevation values, as viewed at an oblique angle in a three-dimensional scene.

The georeferenced *Burchfield* and *Kellerman* (University of Alabama, 1938) mosaicked images were added to the scene, with the georeferenced *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* topographic map temporarily added on top of all the layers.

The *Searles* topographic map was used to check the accuracy of the elevations stored in the historic DEM. Elevation value review was done by hovering the cursor over index contour lines of the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* map. It was understood this scene would be for general visualization purposes and an exact match of map elevation values was not expected. The index contour values and the elevation values generated by the historic DEM were generally within a few feet of each other. An example of this process is shown in the following Figure 27, *Using the Historical Searles USGS Topographic Map 1942 Edition to Spot Check Elevations of the Historic DEM*. The historic elevation contour line of 600 feet was associated with the DEM elevation value of 596.48 feet, enough for general visualization purposes.

Figure 27

Using the Historical Searles USGS Topographic Map 1942 Edition to Spot Check Elevations of the Historic DEM

Note. Using one of the historic *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* map's index elevation contours (indicated by the X) and ArcGIS Pro's scene elevation display to check the historic DEM elevation values. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045.

The historic topographic map was removed, and the historic roads and rail lines were added as shown in Appendix A3, *Historic 1938 Aerial Photographs of Kellerman and Burchfield, Draped Over a Three-dimensional Surface, with Historic Line Features*.

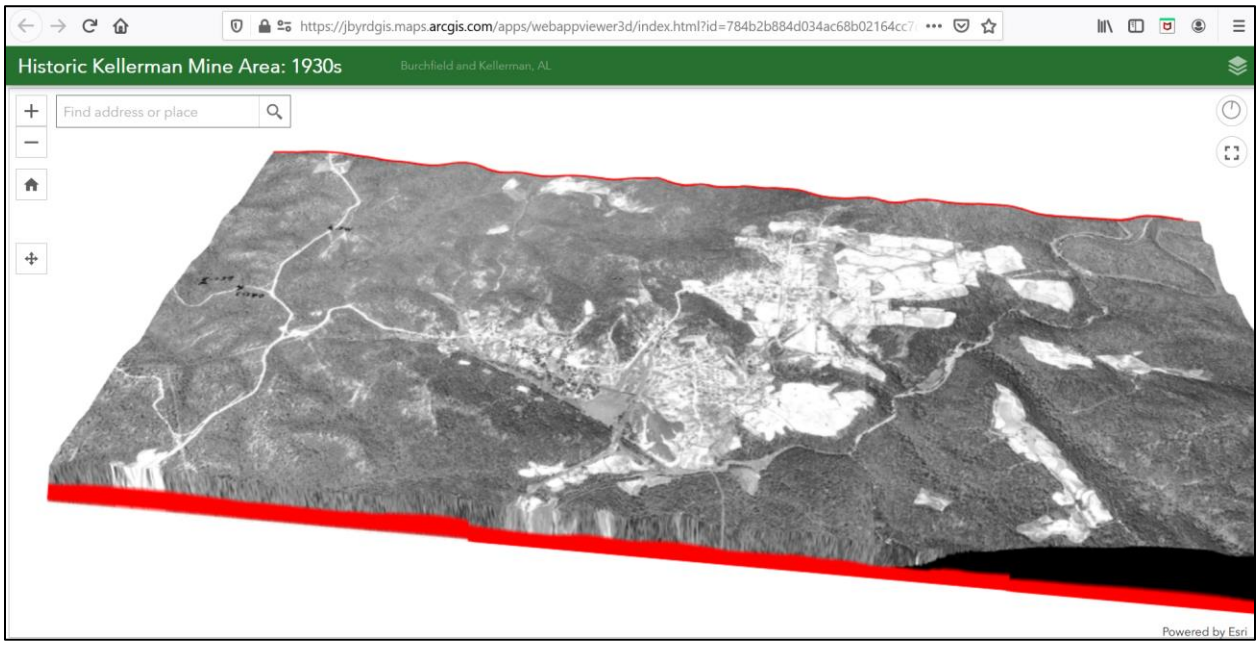
As stated earlier, a goal of this project was to be able to share the three-dimensional visualization of this area with a wider audience. A publicly available web scene was the solution, as the visualization could be viewed on any device with an internet connection and web browser. The ArcGIS Online Web Scene platform was selected (https://www.esri.com/en-us/arcgis/products/3d-scene-viewer), as ArcGIS Online is readily available, inexpensive for personal accounts, integrates with ArcGIS Pro desktop software, and served as the basis for other resources used in this project.

Appropriate layers and raster datasets were brought into an ArcGIS Pro (2019) local scene, which is a three-dimensional scene and this case was based on the NAD 1983 StatePlane Alabama West FIPS 0102, WKID 102630 (Projection: 102630, n.d.) with the vertical coordinate system being NAVD88 height (ftUS) described earlier (National Geodetic Survey, 2018a). The following data was included in this local scene: Project boundary, the mosaicked and georeferenced Burchfield and Kellerman 1938 aerial photographs, and the historic DEM. The local scene was packaged and shared to a personal ArcGIS Online account using the Share as a Web Scene tool in ArcGIS Pro (2019).

The local scene was then accessed in the personal ArcGIS Online account. Once it was confirmed the local scene was displaying properly, the historic scene's sharing setting was set to "Everyone." The ArcGIS Online Web App Builder (https://www.esri.com/en-us/arcgis/products/web-appbuilder/overview) was used to create a viewing app to enable anyone with a web browser to view the historic scene.

Figure 28

Three-dimensional Web Scene of Historic Burchfield and Kellerman, Alabama, Elevation from 1928-1929, Imagery from 1938



Note. The three-dimensional web scene of *Burchfield* and *Kellerman*, AL, with the georeferenced aerial images of Burchfield and Kellerman and the study area boundary as a red boundary, as displayed in the ArcGIS Online Web Scene platform. Environmental Systems Research Institute, Inc. (2020). *ArcGIS Online.* https://www.arcgis.com/.

University of Alabama (n.d./1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

University of Alabama (n.d./1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from

http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

To create printable versions of the three-dimensional historical scene, layouts were designed in ArcGIS Pro (Environmental Systems Research Institute, Inc., 2019). The three-dimensional scene was visually checked against an oblique photograph from 1930, which will be shown in the Results section in Figure 55, *Kellerman Operations Showing Coal Washer, Tipple and Part of Town* (Universal Pipe and Radiator Company, 1930).

Accessing Textual and Photographic Resources

Several online resources were used to support the information shown in the historic maps. Without the use of the Internet and searchable full-text resources, this project may not have been possible. The electronic resources described in the rest of this section were utilized from the spring of 2015 until the summer of 2020. Often, the use of one resource would prompt a search for another resource over the five-year period. Therefore, this portion of the project was not completed in a linear fashion.

HathiTrust Digital Library (HathiTrust, 2020) is a repository of online and searchable digitized resources. Member libraries scan items, enabling users to search millions of documents. For this project, the keyword searches were done using words and phrases related to Kellerman, Burchfield, Tuscaloosa County, and Central Iron and Coal Company. Search results were then evaluated, and full-text searches were completed within promising resources. HathiTrust allows the user to view most of the resources within the browser window and allows for anyone to print single pages of interest.

The University of Alabama Libraries also served as a gateway for historic sources used in this project. The Central Iron and Coal Company was prominent enough to have documented the construction and operation of its infrastructure, which is now housed in the University of Alabama Libraries Special Collections (2020). This resource is searchable online. A search for the company's name returns digital images of the Central Iron and Coal Photographic Collection. Additionally, there were historic photographs of the Kellerman community in the Eugene Allen Smith collection. These images were captioned and dated, providing valuable documentation of the company and its holdings. However, each digital image had an institutional watermark across the image.

During the summer of 2020, attempts were made to contact the library to obtain digital files of these photographs without the University of Alabama Libraries Special Collections watermark. An emailed response stated that no services were available requiring "physical access" (University of Alabama, personal communications, July 28, 2020) This is due to the COVID-19 pandemic. A statement on the Special Collection website (https://www.lib.ua.edu/libraries/hoole/) read, "Appointments for UA students, faculty, and staff only," as of July 28, 2020 (University of Alabama Libraries Special Collections). Thankfully, the Special Collections staff provided phone and email support. A selection unmarked and high-resolution images of the historic photographs were sent via email in early 2021. Some photographs in this project still have the institutional watermark, due to the cost of obtaining unmarked images.

In 2015 before the pandemic, the Special Collections of the University of Alabama was accessible to in-person visits. A search of the collections' holdings yielded a record for the Universal Pipe and Radiator Company's publication of the same name, created in 1930. This

company owned Central Iron and Coal Company. The purpose of the booklet was to inform and promote the company's holdings, which included photographs and descriptions of the Kellerman mine, infrastructure, and town. An in-person visit in February 2015 allowed access to the pamphlet, which was then photocopied by library staff. The photocopies were scanned and used in this project to add textual and visual knowledge of the Kellerman area.

A search of the https://www.worldcat.org/ (WorldCat, n.d.) online catalog for "Kellerman mine" returned a record for the Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). While WorldCat was not able to list what institutions held this collection, a Google search (www.google.com) returned two libraries with the resource: Harvard Business School Baker Library and Historical Collections (President & Fellows of Harvard College, 2020) and the Smithsonian Institution Online National Archives (Smithsonian, 2020).

When the Harvard Business Library was contacted in June 2018, the responding librarian explained that only faculty, staff, students, and possibly alumni of the institution would be assisted. The only other option would be to travel to Boston in person or find someone associated with Harvard and hire them to retrieve images of the Alabama Mining Institute photographs.

After receiving the negative response from Harvard, the Smithsonian was contacted. Again, the responding staff explained the hours for in-person services and how I could make an appointment. An emailed reply was sent to the staff explaining the project was being completed in Alabama, the cost to travel to Washington, DC was prohibitive, and Harvard had given a similar response. Thankfully, a kind Smithsonian archivist responded with an offer to help. Mr. Walter "Joe" Hursey and Ms. Sarah K. Rung scanned the photographs and emailed them within the week (personal communication, June 12, 2018). Their helpfulness will not be forgotten.

Having these on-the-ground historical photographs and textual descriptions helped with understanding the features visible on the 1938 aerial photographs. The photographs depicting the dwellings for African American workers showed smaller homes lined up in rows, in contrast with the photographs of white employee homes showed houses with more and irregularly spaced yards. This knowledge allowed for the identification of the African American dwellings on the 1938 aerial photographs. The photographs and descriptions of the electric rail line in the pamphlet *Universal Pipe and Radiator Company* (1930) and the earlier Hutchins article (1910) allowed for the identification of the corresponding feature on historical aerial photographs. These features were then labeled on the final maps and three-dimensional scenes.

One social media source was used for this project. Walter Energies was the corporation which owned some of the mining interests in the part of Tuscaloosa County where Burchfield and Kellerman are located. The Walter Energies Facebook page remained even after the company went bankrupt in recent years. Its photo album contained a photograph of the Kellerman train station (Walter Energies, 2013). A screenshot was taken of this image and included in the historical account of the area.

The Tuscaloosa County electronic resources were also used in this project. The historic subdivision plat “East Center City” was accessed via the Tuscaloosa County Record Room web application (Tuscaloosa County, 2020). The modern Tuscaloosa County Tax Assessor online parcel map (Tuscaloosa County Tax Assessor, 2020) was used to create the maps of the parcel lines with the 2016 aerial imagery.

Chapter 4

The History of Burchfield and Kellerman, Tuscaloosa County, Alabama, from 1830 – 1939: Through Maps, Photographs, Text and Geographic Information Systems

This section will detail the history of the Burchfield and Kellerman area, using the methods and resources described in the previous Methods section. The period covered in this project is from 1830 to 1939, with particular attention given to the maps, photographs, and textual resources of the 1920s and 1930s.

Land Grants and Geologic Interest of the 1800s

The recorded settlement of Burchfield dates to around 1830, and was named for the Burchfield family (Rich, 1979, p. 136). The U.S. Bureau of Land Management (BLM) lists land patents given to Gilbert B. and Thomas P. Burchfield in 1839 (Bureau of Land Management, 1839). A search of the BLM Land Patent Database returns an additional 21 land patents in the area (Township 19 South, Range 7 West, Huntsville Meridian) issued to the Burchfield family throughout the 19th century (Bureau of Land Management, n.d.).

To understand the history of the area that would become Burchfield and later Kellerman, it is important to explore the geology maps of the area before the early 20th century. Because mapping in the 19th century was a costly and time-consuming process, areas of economic potential were mapped more often. The area of the present study had rich mineral resources and was studied and documented well past its initial land grants.

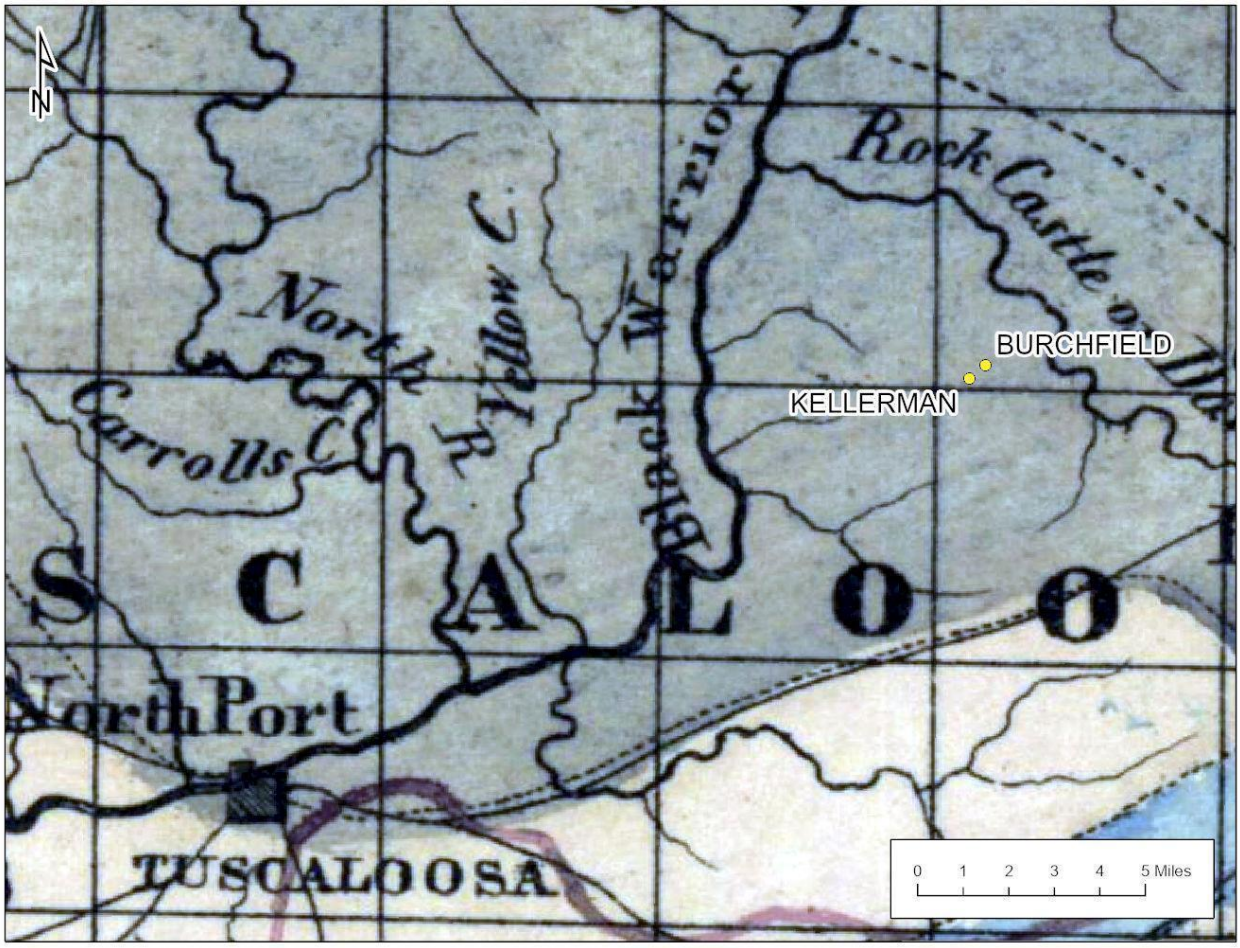
Mineral resources were recognized early in east Tuscaloosa County's history. The dark gray feature on the *Geological Map of Alabama,* published in 1849 by Alabama's first State Geologist Michael Tuomey (Figure 29, *Excerpt from Tuomey's Geological Map of Alabama, 1849, with Modern Locations of Kellerman and Burchfield*), represents the presence of a "Coal

Measure." Alabama's second State Geologist, E. A. Smith, continued natural resource mapping after the Civil War. The map is more developed than Tuomey's map, with additional roads and towns, as well as industrial features, as shown in Figure 30, *Excerpt from E.A. Smith's Geological Map of Alabama, 1878, with Modern Locations of Kellerman and Burchfield*. E. A. Smith created another map in 1879 titled, *Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry.* It also had features focused on "Coal Measures**"** (Figure 31, *Excerpt from E.A. Smith's Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry, with Modern Locations of Kellerman and Burchfield*)**.**

An 1890 geologic map by Joseph Squire also shows this part of Tuscaloosa County as being a coal-rich area, as indicated by the gray shading **(**Figure 32, *Excerpt from Squire's Geography and Geology of the Coal Bearing Region of Alabama*). A later 1898 map (Figure 33, *Excerpt from McCalley's Map of the Warrior Coal Basin, 1898*) depicts the area as being in the "Warrior Coal Basin," and the features are detailed enough to show the Burchfield and Kellerman areas as being in the Brookwood coal seam (McCalley, 1898). The same area of northeast Tuscaloosa County was of enough interest to the U.S. Geological Survey that a topographic survey was done in 1895 and the topographic map *Brookwood* (Figure 34, *Excerpt from USGS Brookwood Topographic Map, 1899***)** was published in 1899.

Figure 29

Excerpt from Tuomey's Geological Map of Alabama, 1849, with Modern Locations of Kellerman and Burchfield



Note. Georeferenced image from *Geological Map of Alabama* with Modern Locations of Burchfield and Kellerman, Alabama, with modern data from U.S. Geological Survey, as a reference. The darkest area represents the "Coal Measure."

Tuomey, M. (1849). *Geological Map of Alabama* [map], 1:1,053,000. New York: Ackerman's Lithography. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

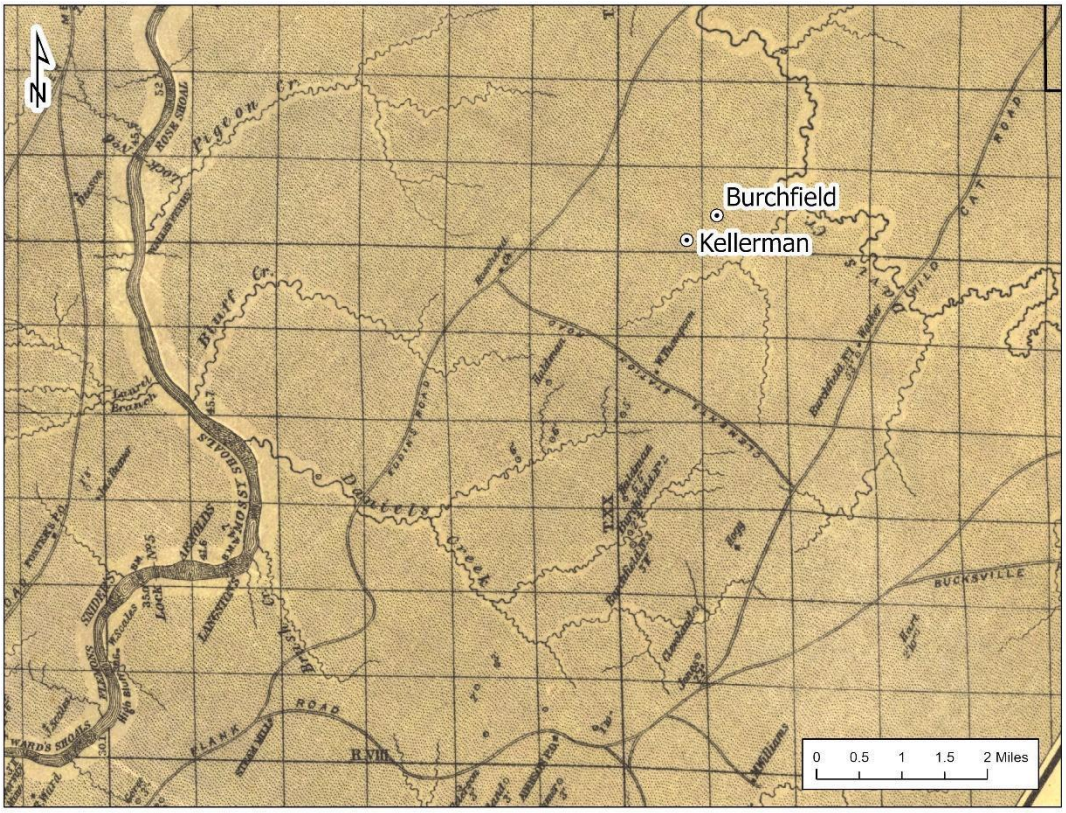
Figure 30

Excerpt from E.A. Smith's Geological Map of Alabama, 1878, with Modern Locations of Kellerman and Burchfield

Note. Georeferenced image from *Geological Map of Alabama* with Modern Locations of Burchfield and Kellerman, Alabama, with modern data from U.S. Geological Survey, as a reference. Smith, E. A. (1878). *Geological Map of Alabama* [map]. 1:1,440,000. New York: G.W. and C.B. Colton & Co. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

Figure 31

Excerpt from E.A. Smith's Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry, with Modern Locations of Kellerman and Burchfield

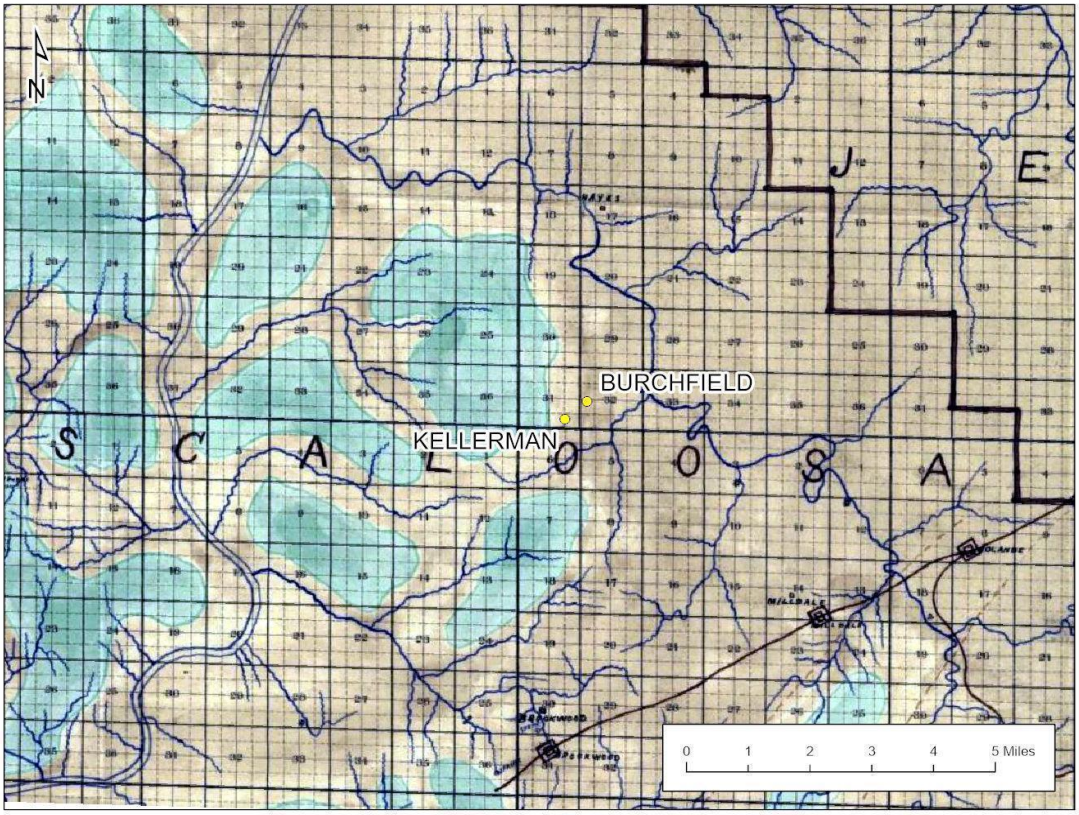


Note. Georeferenced image from *Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry,* with Modern Locations of Burchfield and Kellerman, Alabama, with modern data from U.S. Geological Survey, as a reference. Smith, Eugene A. (1879). *Black Warrior River from Tuscaloosa to the Fork of Sipsey and Mulberry* [map]. 1:125,000. Tuscaloosa, AL: Geological Survey of Alabama, 1879.

U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

Figure 32

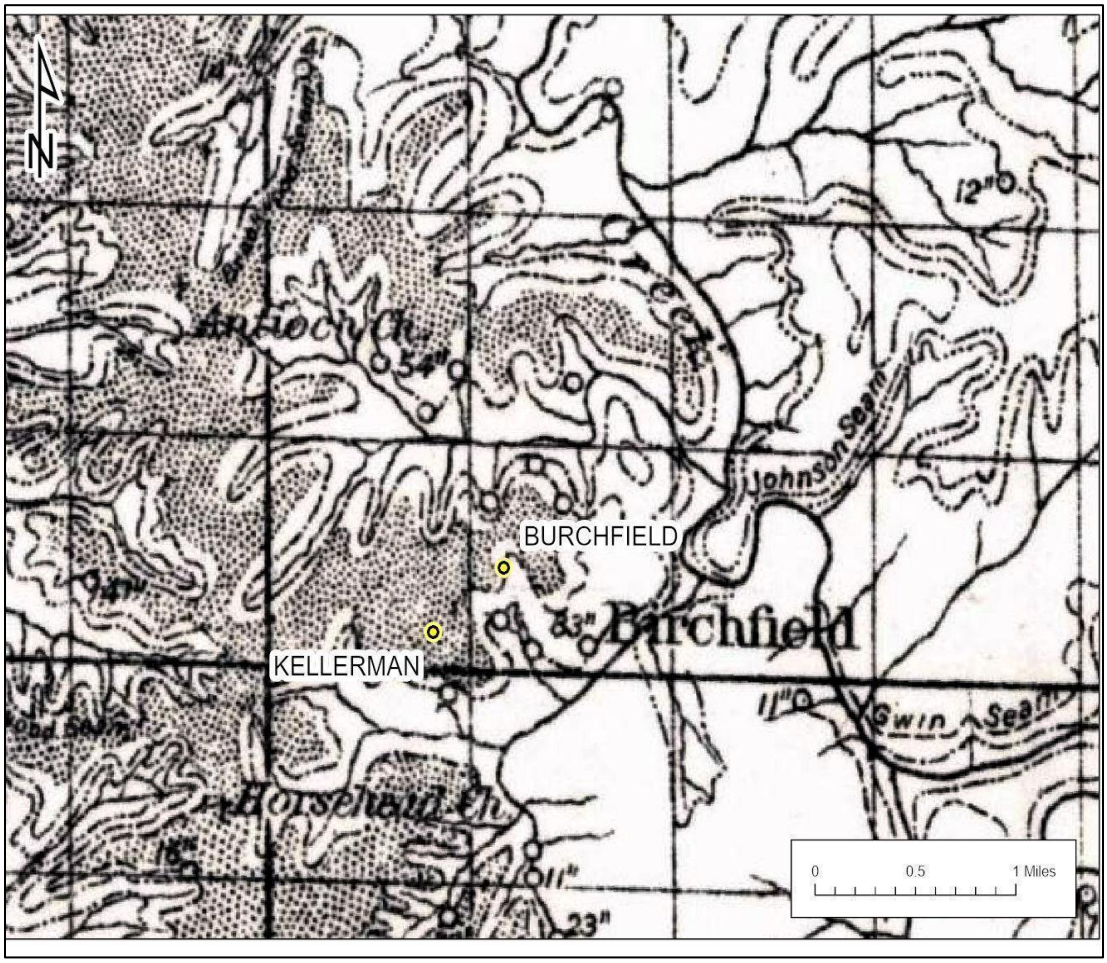
Excerpt from Squire's Geography and Geology of the Coal Bearing Region of Alabama



Note. Georeferenced image from Joseph Squire's *Geography and Geology of the Coal Bearing Region of Alabama,* 1890, with modern locations of Burchfield and Kellerman, Alabama. The gray shading indicates coal. Squire, J. (1890). *Geography and geology of the coal bearing region of Alabama* [map]. 1:125,000. Retrieved 27 March 2020, from http://alabamamaps.ua.edu/historicalmaps/geology/squire%20index.htm. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

Figure 33

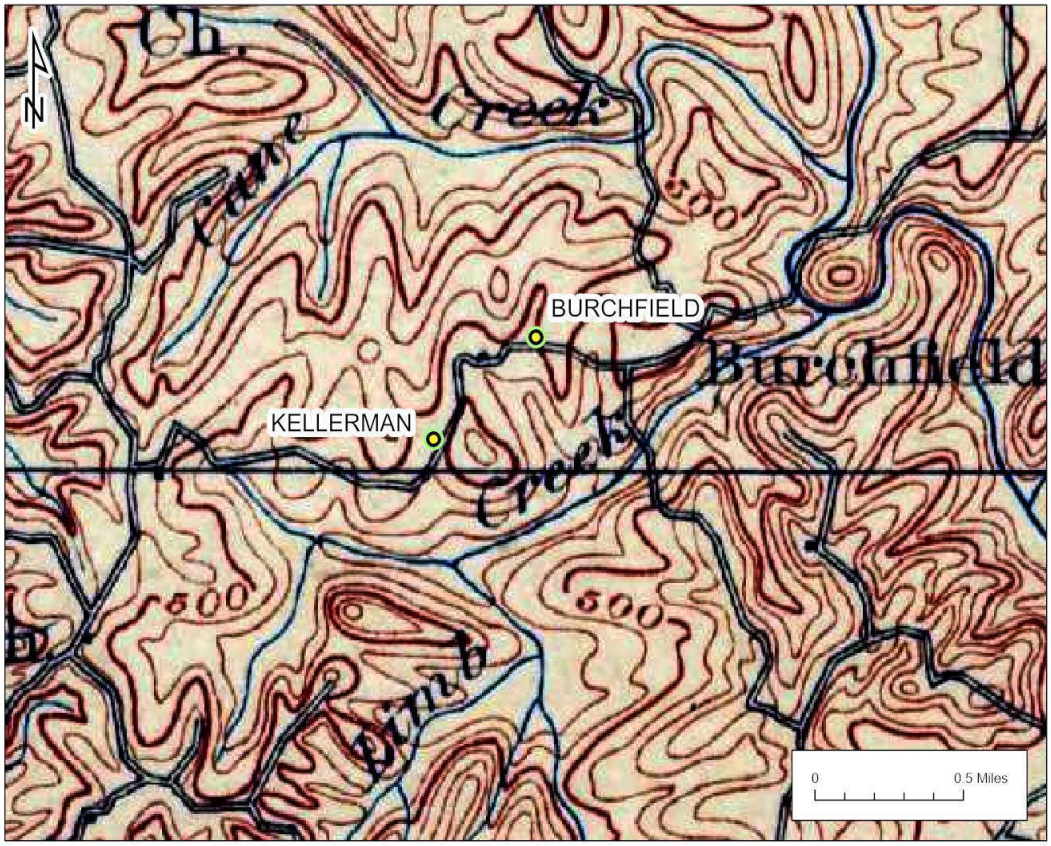
Excerpt from McCalley's Map of the Warrior Coal Basin, 1898



Note. Georeferenced image from H. McCalley's *Map of the Warrior Coal Basin*, 1898, with Modern Locations of Burchfield and Kellerman, Alabama. McCalley, H. (1898). *Map of the Warrior Coal Basin* [Map].1:142,000. New York: Julius Bien and Co. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

Figure 34

Excerpt from USGS Brookwood Topographic Map, 1899



Note. Georeferenced image of the U.S. Geological Survey's *Brookwood* topographic quadrangle (1899), with modern locations of Burchfield and Kellerman, Alabama. The fact that such an early topographic map was created of the area is an indication of the area's significance. U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

U.S. Geological Survey. (1899). *USGS 1:125000-scale Quadrangle for Brookwood, AL 1899* [Scanned Map in GeoTIFF format], 1:125,000. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045.

Clearly, there was a focus on the presence of coal resources in the area. Additional mapping projects were completed to further document this area where mineral resources were being identified.

Central Iron and Coal Company and the Creation of Kellerman and Related Infrastructure

While Kellerman is labeled for reference in the proceeding historical maps, it should be noted that the name did not actually exist until the early 20th century. The emergence of a cast iron pipe foundry in the Holt community, just east of the city of Tuscaloosa, resulted in the development of Burchfield and Kellerman. Donald Brown relates the story of Frank Holt, an employee of the Central Foundry Company (a holding company of the Central Iron and Coal Company), who purchased land for a planned cast iron pipe factory in 1900 (Singleton & Brown, 2004). Central Iron and Coal Company also bought a coal mine some sixteen miles to the northeast near the existing Burchfield area.

With new investments and mining operations developing in the area, in November 1901, J.P. Burchfield commissioned R.K. Bell, noted as a County Surveyor, to survey a portion of the land. The plat titled East Center City was drawn by Bell on two pages and recorded at the Tuscaloosa County Courthouse on December 13, 1901 (Bell, 1901a and 1901b), as shown in Figure 5, *Map of the East Center City Subdivision Plat, Plat Book 1, Page 151, Recorded in 1901*, and Appendix A1, *Map of the East Center City Subdivision Plat, Plat Book 1, Page 153, Recorded in 1901,* in the Introduction section of this project. The design of the plat is like those found in towns, indicating Burchfield was expecting new residents in the area.

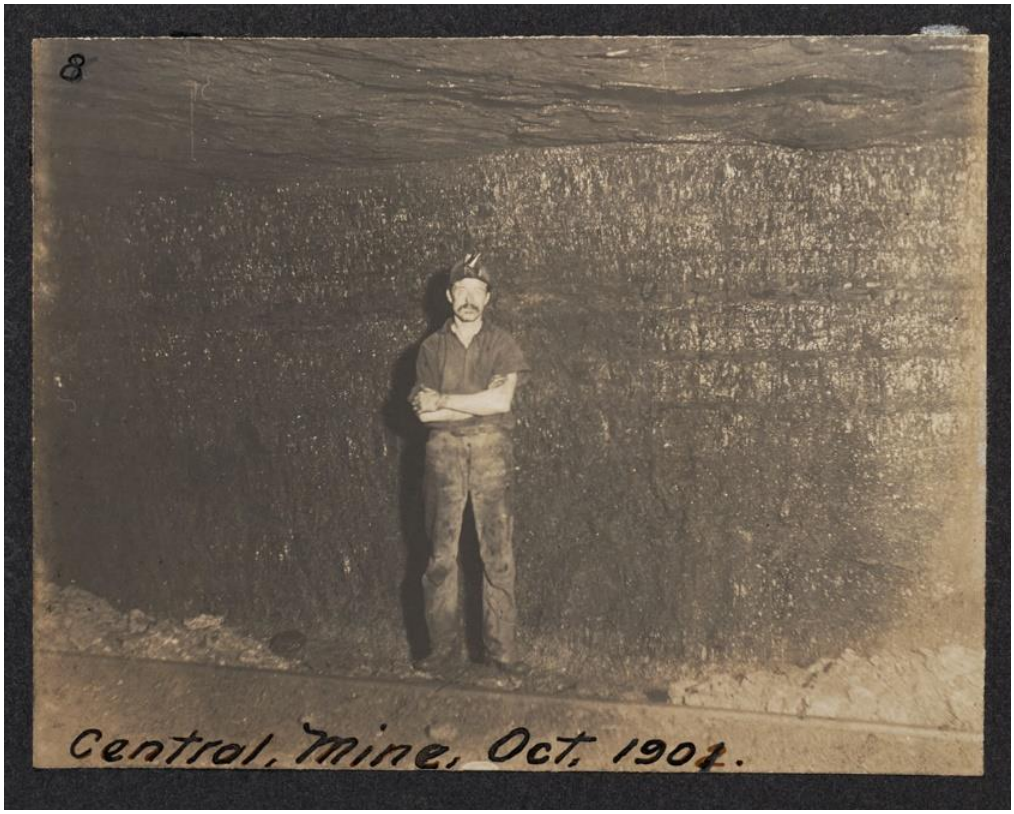
The coal in this area was to be used for creating coke, which was necessary to produce the pipe iron. The coal mine was adjacent to the Burchfield settlement. According to Rich's

dissertation (1979) as well as the work of Singleton and Brown (2004), Kellerman likely got its name from a civil engineer working for the Central Iron and Coal Company, around the year 1900. A post office was established in 1902 (Rich, 1979, p. 313).

As Central Iron and Coal began mining at Kellerman, the company began to document its operations. A photograph inside the "Central Mine," as the Kellerman mine was sometimes called, was taken in 1901 and shows the valuable coal seam with a coal miner (Figure 35, *Photograph, Miner Inside of Mine, Central Mine, Oct. 1901).* The new mine entrance was photographed in December of 1901 (Figure 36, *Photograph, Mine Shaft, Central Mine, Dec. 1901*).

Figure 35

Photograph, Miner Inside of Mine, Central Mine, Oct. 1901



Note. The photograph highlights the coal seam, which is behind the unnamed worker. A rail can be seen at his feet. Central Iron and Coal Company. (1901). *Miner inside of mine* [Photograph] Central Iron and Coal Photograph Collection. University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 June 2020, from http://purl.lib.ua.edu/15512.

Figure 36

Photograph, Mine Shaft, Central Mine, Dec. 1901

Note. This photograph shows the area while it was still under some construction, with building materials in the foreground and the area around the entrance unfinished. Central Iron and Coal Company. (1901). *Mine shaft, 1901 December* [Photograph] Central Iron and Coal Photograph Collection., University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 June 2020 from http://purl.lib.ua.edu/15507.

The Kellerman mine and the development of the Central Foundry at Holt led to the Mobile and Ohio Railroad constructing a line leading to the mine in 1902-1903 (United States

Interstate Commerce Commission, 1939). From the Holt area, the route followed the course of the Black Warrior River eastward until it reached the mine. Eugene Allen Smith documented the construction of this rail line in his photographic collection, which included the February 1, 1902, photograph titled, *Central Iron and Coal Railroad Camp* (Figure 37, *Photograph, Central Iron and Coal Railroad Camp)***.** Later in June of that same year, Smith photographed a train on this new track (Appendix B1, *Photograph, Train Transporting Coal*).

Limestone was another required material for the operations at the Holt foundry. This material (along with iron) was mined for the company in the Vance community, in the eastern portion of Tuscaloosa County. The operation was important enough to be included in the photograph, *Central Iron and Coal Mines*, taken on May 15, 1902 **(**Figure 38, *Photograph, Central Iron and Coal Mines).*

Figure 37

Photograph, Central Iron and Coal Railroad Camp

Note. The construction of the rail line was important enough for E. A. Smith to document, as seen in this photograph. The rail service was needed to enable the delivery of the Kellerman coal to the foundry in Holt. Smith, E. A. (1902). *Central Iron and Coal Railroad Camp* [Photograph]. Eugene Allen Smith Collection, University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 October 2020, from http://purl.lib.ua.edu/46180.

Figure 38

Photograph, Central Iron and Coal Mines

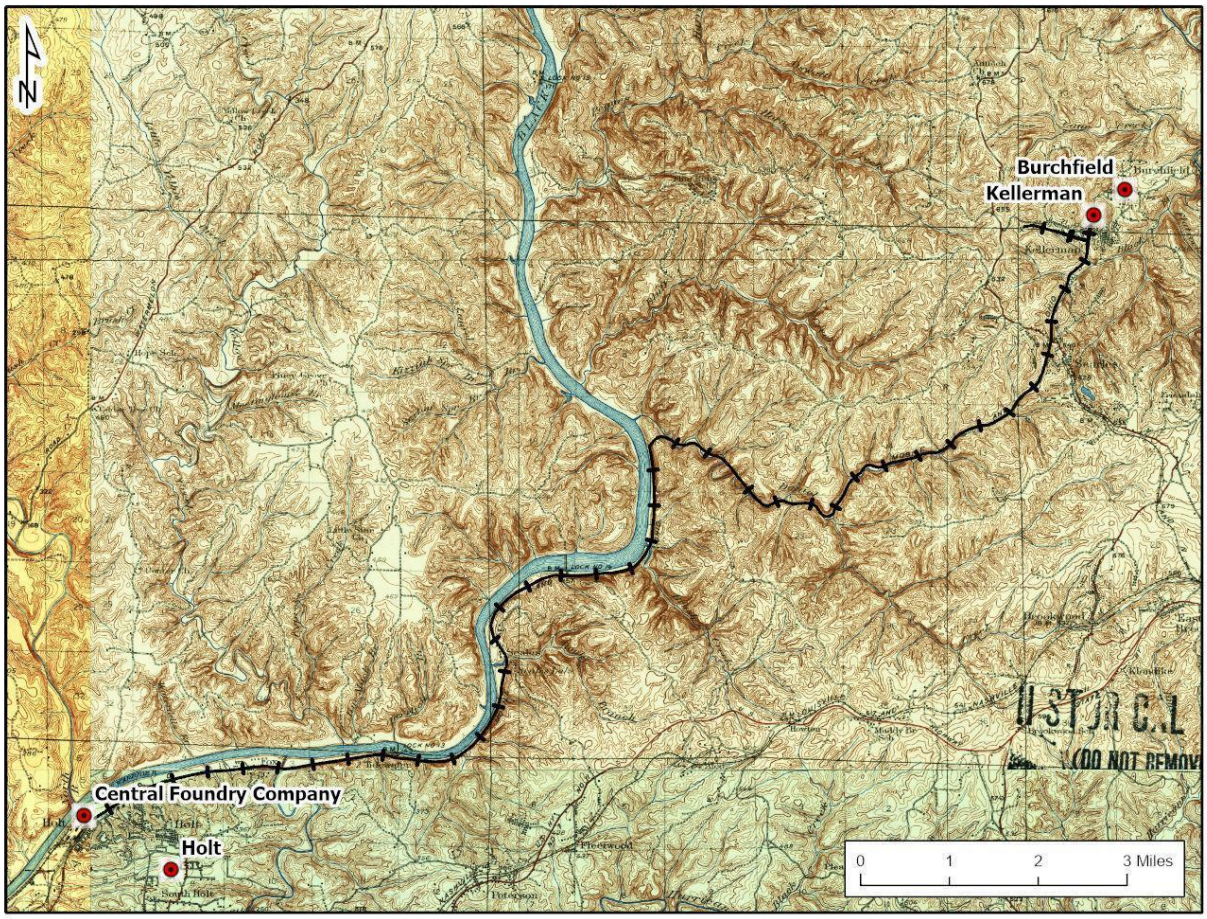
Note. The photograph taken by E. A. Smith in 1902 provides a glimpse into the working environment of the miners at the Vance mine. The location of the three necessary resources, coal, limestone, and iron, was crucial to the development of the Holt furnace and therefore the development of the Kellerman Mine. Smith, Eugene A. (1902). *Central Iron and Coal Mines* [Photograph]. Eugene Allen Smith Collection, University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 October 2020, from http://purl.lib.ua.edu/46164.

While this rail line was built years earlier, USGS topographic maps surveyed in the 1920s display the railroad's course in detail, as shown in Figure 39, *Historic Rail Line on USGS*

Topographic Maps from the 1920s and 1930s, and in other maps later in this project.

Figure 39

Historic Rail Line on USGS Topographic Maps from the 1920s and 1930s

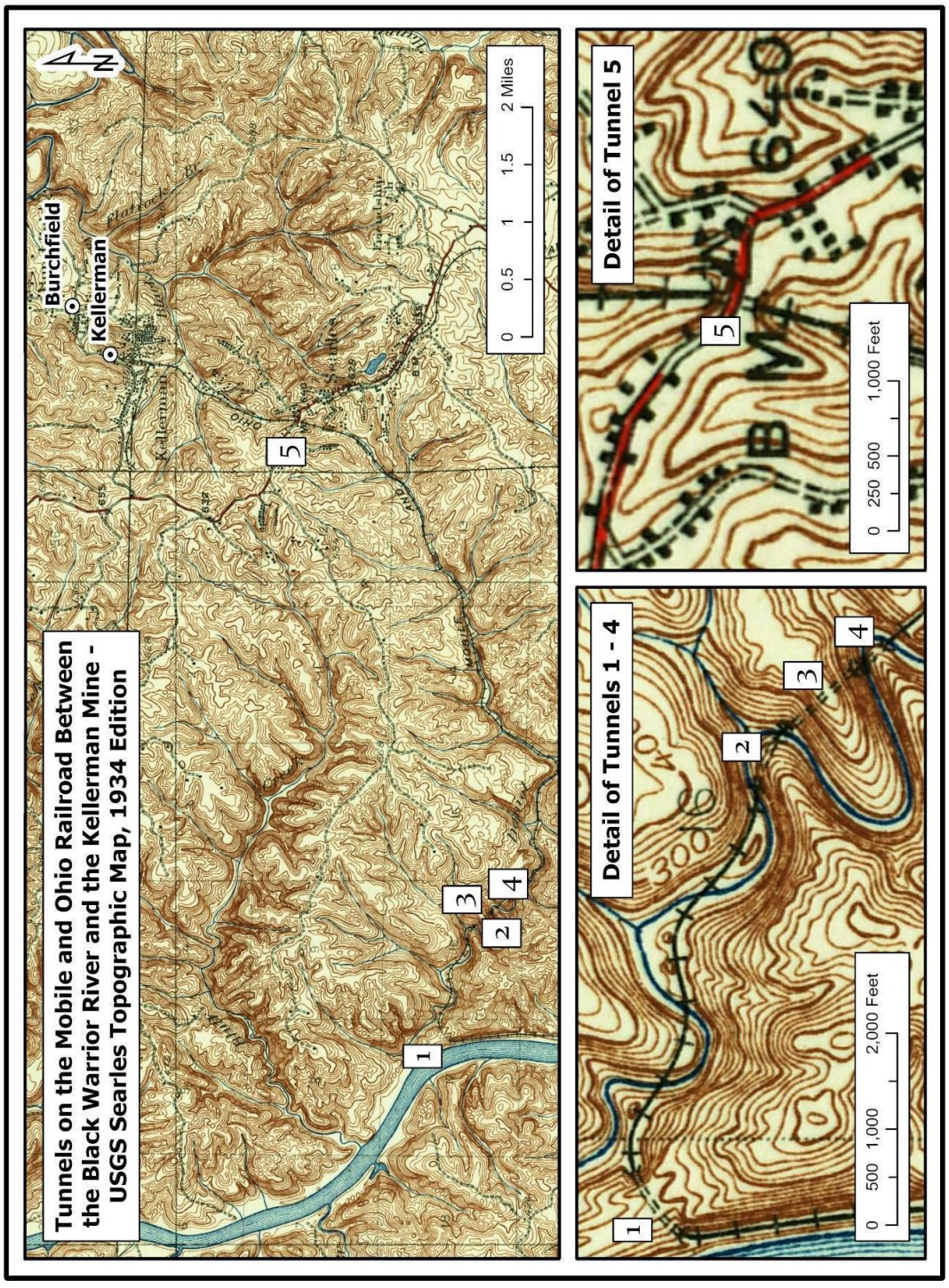


Note. Digitized railway line built by the Mobile and Ohio Railroad, with the Central Foundry location, with Modern Locations of Holt, Burchfield and Kellerman, Alabama (U.S. Geological Survey, 2012), with historic U.S. Geological Survey historic topographic maps Cottondale (1934), Samantha (1928), Searles (1934), and Tuscaloosa (1936) accessed from https://utility.arcgis.com/usrsvcs/servers/88d12190e2494ce89374311800af4c4a/rest/services/USGS_Historical_Topographic_Maps/ImageServer, February 6, 2020.

Closer inspection of the historic topographic maps shows another indication of the importance of the Kellerman Mine. The course of the railway once it turned eastward from the Black Warrior River was not an easy one. Five railroad tunnels built through solid rock are shown on the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint*, with the rail line crossing Daniel Creek and numerous tributaries as it makes its way to the Kellerman mine. Construction of a rail line through such challenging territory would have only been attempted if it were economically viable.

Figure 40

Tunnels on the Mobile and Ohio Railroad Between the Black Warrior River and the Kellerman Mine



Note. The Mobile and Ohio Railroad line, from the Black Warrior River to the Kellerman mine, with detailed maps of the tunnel locations, from the Searles USGS topographic map, 1934 Edition, 1942 Reprint (https://utility.arcgis.com/usrsvcs/servers/88d12190e2494ce89374311800af4c4a/services/USGS_Historical_Topographic_Maps/ImageServer, retrieved July 25, 2020)

The rail line also required the construction of other structures to travel the difficult terrain along the Black Warrior River and Daniel Creek toward the Kellerman mine, such as bridges and trestles. While the historic topographic maps do not show these structures, a 1960 article in the magazine *Trains* featured this rail line that then still serviced the Kellerman area (Lamb & Thomas, 1960). At that time, the rail line had four remaining railroad tunnels still in use. The number of wooden trestles was listed as 25, with 21 crossing a single stream (Lamb & Thomas, 1960, p. 38). Based on this description, that stream described in the article was Daniel Creek and its adjacent tributaries. Such structures were expensive to build and maintain, another indication of the significance of the Kellerman mining area.

The Kellerman area became a model mine and company town. Evidence of its development and growth are found in religious, industrial, and government publications featuring the Kellerman operations and its associated Holt blast furnaces. One of the earliest signs of community development in the Burchfield and Kellerman area was when the Tuscaloosa Baptist Association saw a need for a new church. According to the publication, *History of Tuscaloosa County Baptist Association 1834-1934*, the association met in 1905 and determined the area should have a Baptist church. Three years later in 1908, eleven people formed the East Kellerman Baptist Church in the area platted as the East Center City subdivision, near the parcel noted as Lot 52 (Figure 5, *Map of the East Center City Subdivision Plat, Plat Book 1, Page 151, Recorded in 1901*)**.** A hand drawn map of member churches, shown in Figure 41. *Map Showing Churches of the Tuscaloosa County Baptist Association – September1, 1933,* includes the East Kellerman Church.

Figure 41

Map Showing Churches of the Tuscaloosa County Baptist Association – September1, 1933

MAP SHOWING CHURCHES OF THE TUSCALOOSA COUNTY BAPTIST ASSOCIATION — SEPTEMBER 1, 1933.

Note. This hand drawn map shows the location of the East Kellerman Church. The population was great enough in Kellerman and Burchfield to justify forming a church in 1908 and have it mapped later in 1933. Foster, H. B. (1934). History of Tuscaloosa County Baptist Association 1834-1934: a record of the development of Baptist interest in the bounds of the association, containing other information of concern to all Baptists, sketches of the churches, and biographies of many of the ministers and laymen who helped to make this history. Tuscaloosa, Alabama:

Weatherford Printing. Retrieved 16 October 2020, from https://hdl.handle.net/2027/wu.89076998954

In 1910, the trade publication, *Mines and Minerals*, featured the Kellerman operation and provided many details on the methods and characteristics of the mine and community (Hutchins). The mine's operation was considered significant enough to deserve photographs in the article. The photograph shown in Figure 42, *Photograph, Fig. 1. Entrance to Kellerman Mine,* displays the entrance that was under construction in Figure 36, *Photograph, Mine Shaft, Central Mine, Dec. 1901*. The stonework and rails are an indication of how important the mine was. The rails are also shown on Figure 39, *Historic Rail Line on USGS Topographic Maps from the 1920s and 1930s,* as the short westward spur near the Kellerman feature.

Figure 42

Photograph, Fig. 1. Entrance to Kellerman Mine

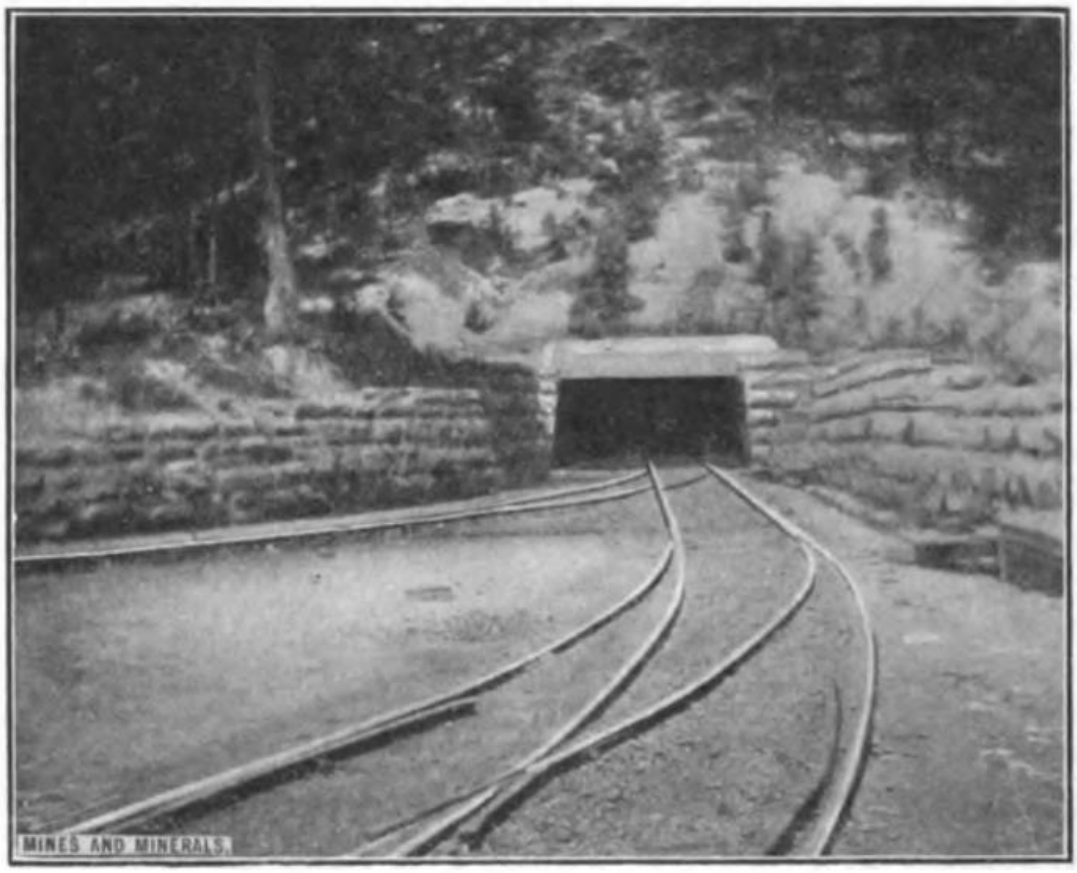


FIG. 1. ENTRANCE TO KELLERMAN MINE

Note. The photograph above is an indication of the importance of the Kellerman mine. Hutchins, N. (1910). Kellerman Mine, Kellerman, Ala. *Mines and Mineral, 31*(4), 204-206. The entrance had been improved since the 1901 photograph, shown in Figure 36, *Photograph, Mine Shaft, Central Mine, Dec. 1901*.

The mining operations were described in detail in the Hutchins article. The property had 5,000 acres, and beneath the surface it was rich with the Milldale, Brookwood, and the deeper Pratt coal seams. The entrance of the mine and its rail lines were important enough to have a

photograph in the publication. Workers would enter here, with the path having a slight increase in elevation as it went one mile into the hillside. Workers mined coal with picks, and mules would pull loads of coal to the main underground rail lines. From there, rail engines powered by compressed air would take over the loads, bringing the coal to the tipple. There it was transported and sifted before going to the Stewart coal washer. Power for the mining and washing operations came from an on-site steam plant, powered by Kellerman's nut coal, so named for the size of the coal pieces, mined on the property. The tipple, steam plant, and Stewart washer were adjacent to each other for efficient operation and featured in another photograph in the article, shown in Figure 43, *Photograph, Fig. 2. Steam Plant, Tipple and Washery, Kellerman Mine* (Hutchins, 1910, p. 205). The further development of this asset will be seen later in this section.

Figure 43

Photograph, Fig. 2. Steam Plant, Tipple and Washery, Kellerman Mine

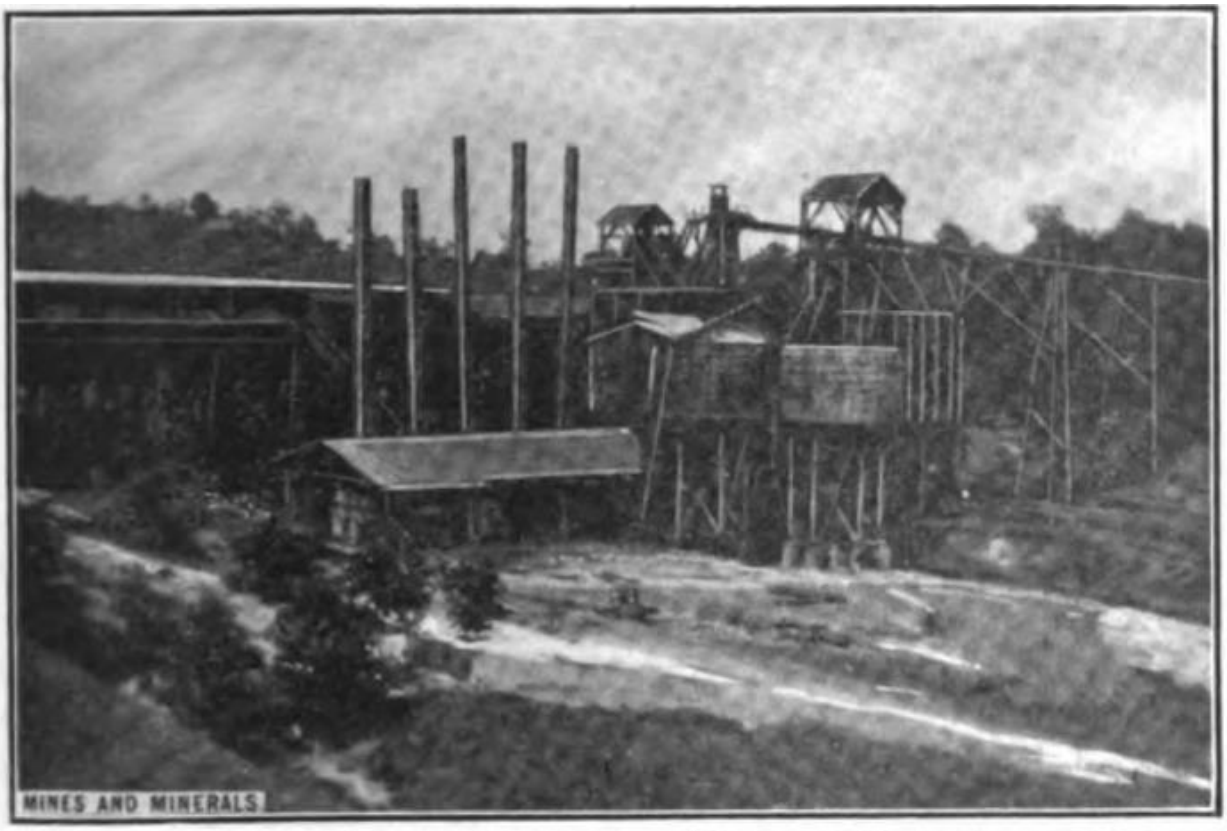


FIG. 2. STEAM PLANT, TIPPLE AND WASHERY, KELLERMAN MINE

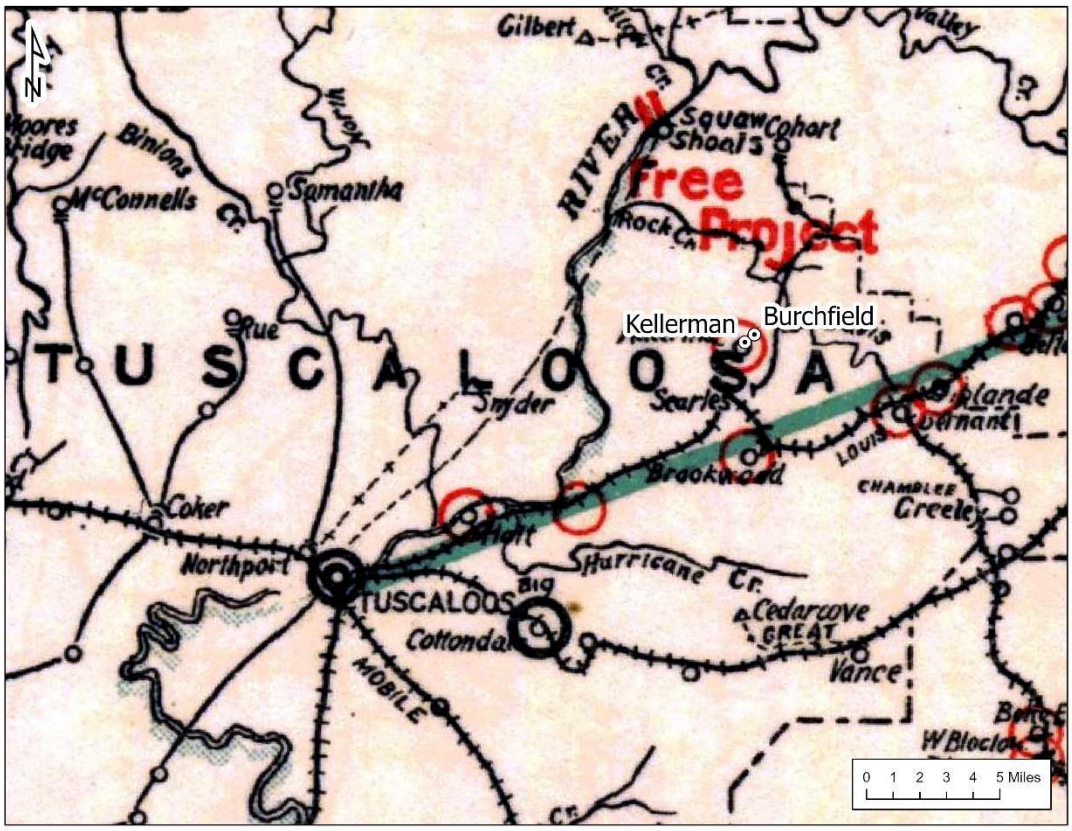
Note. The inclusion of this photograph in an industry publication shows the importance of the mining operation in Kellerman. Hutchins, N. (1910). Kellerman Mine, Kellerman, Ala. *Mines and Mineral*, *31*(4), 204-206.

In 1913, there were plans to expand electrical service across parts of Alabama, as publicized in Figure 44, *Map Showing the Location of Developments and Projected Transmission Lines of the Alabama Traction, Light and Power Company* (1913). The map featured select mines, shown as red circles on the map. Kellerman was important enough at that time to be included, along with its dedicated railroad line. The mining operation and the

associated communities were important enough to enjoy electrical service. Photographs taken in the 1920s and 1930s include electrical service lines to structures in the Kellerman area and will be included later in this section.

Figure 44

Map Showing the Location of Developments and Projected Transmission Lines of the Alabama Traction, Light and Power Company



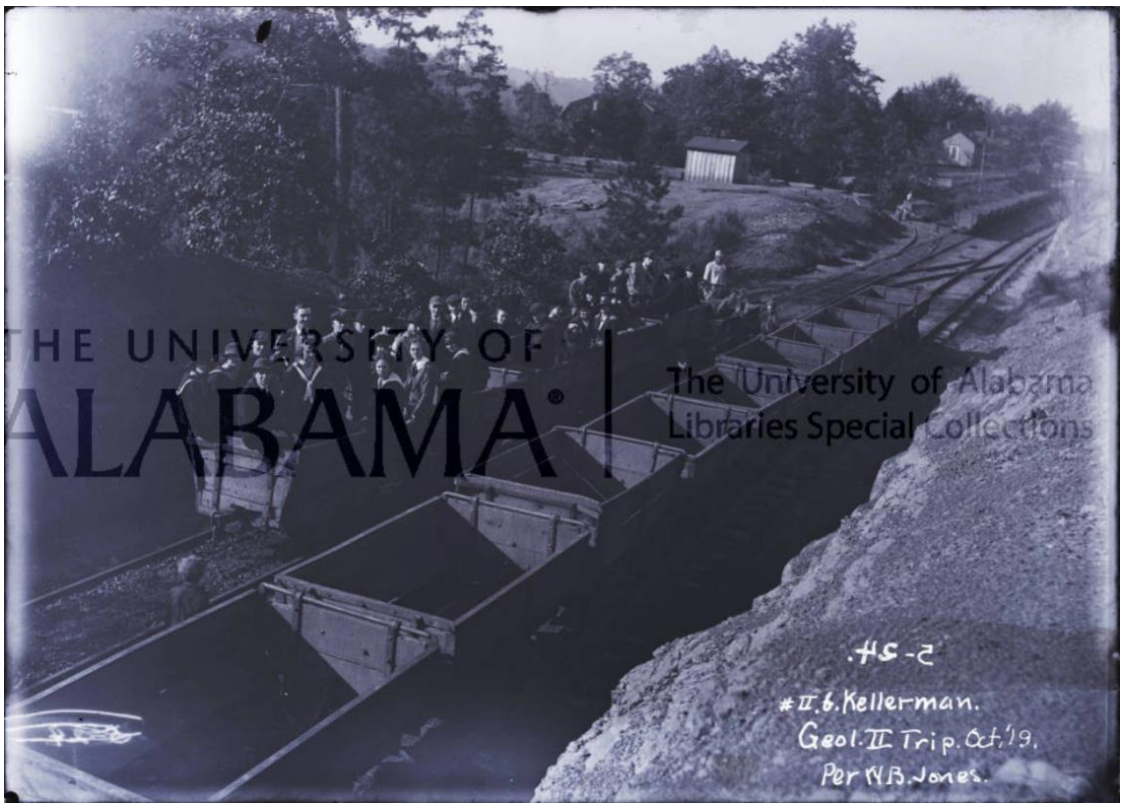
Note. Georeferenced image of an excerpt from *Map Showing the Location of Developments and Projected Transmission Lines of the Alabama Traction, Light and Power Company* (Alabama Traction, Light, and Power Company, 1913), with modern locations of Burchfield and Kellerman, Alabama (U.S. Geological Survey, 2012). The Kellerman area shows electrical service and its rail line. Map showing the location of developments and projected transmission lines of the Alabama Traction, Light and Power Company (Limited): also iron and coal mines, cotton mills and cement plants in the State of Alabama [map]. (1 February 1913). 1:1,140,000.

U.S. Geological Survey. (2012). *U.S. Geographic Names Information System (GNIS).* Reston, VA: U.S. Geological Survey.

The Kellerman mine was significant enough to become a destination for the University of Alabama field trips. Photographs taken by Walter P. Jones documented the Geology II class visit in October of 1919**.** In Figure 45, *Photograph, Kellerman Coal Mine*, the class was posed inside some of the coal hauling cars that ran on the multiple track line to the mine entrance. Appendix B3, *Photograph, Kellerman Coal Mines*, the photograph is set against a house. Photographs later in this section provide evidence this house was likely for white employees.

Figure 45

Photograph, Kellerman Coal Mine



Note. The University of Alabama students pose inside coal hauling rail cars. The rails are also shown on Figure 39, *Historic Rail Line on USGS Topographic Maps from the 1920s and 1930s*, as the short westward spur near the Kellerman feature, and in Figure 42, *Photograph, Fig. 1. Entrance to Kellerman Mine.* Additional figures of this multiple line spur will be included later in this section. Jones, W. B. (October 1919). *Kellerman Coal Mine* [photograph]. Eugene Allen Smith Collection, University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 October 2020, from http://purl.lib.ua.edu/46106.

Central Iron and Coal Company's Kellerman mine was featured in the Alabama Mining Institute photograph album, *Alabama Mining Institute Photograph Albums, 1922-1923*. According to WorldCat.org, a world-wide non-profit library search and services group, this collection of photographs was organized for the United States Coal Commission during a review of the coal business. The photographs provide detail of the type of structures in Kellerman, with views of the landscape in the background. Most of the photographs are taken from a street level perspective, giving the viewer an idea of the mining town's appearance during this period.

The Kellerman mine and the related community were photographed to showcase Central Iron and Coal Company's model mining operations. In Figure 46, *Central Iron and Coal Company, Kellerman, Alabama, Tipple and Washer*, it is evident the structure has been enhanced since the 1910 photograph shown earlier in this section (Figure 43, *Photograph, Fig. 2. Steam Plant, Tipple and Washery, Kellerman Mine*). A commissary was present in the community, as shown in Figure 47**,** *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Commissary Building*, and Appendix B2, *Central Iron and Coal Company, Kellerman, Alabama, Interior Commissary.* Photographing both the outside and inside of the company store is an indication of its importance.

Central Iron and Coal Company also built and ran an entertainment and boarding establishment. The structure shown in Figure 48, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Auditorium and Moving Picture Show*, is two stories high with a decorative façade and neatly built clapboards, and is topped by the name of building, "Harder Hall." The hall is surrounded by neatly swept streets and dwellings, allowing company residents easy access to the venue.

Figure 46

Central Iron and Coal Company, Kellerman, Alabama, Tipple and Washer

Note. Photograph, *Central Iron and Coal Company, Kellerman, Alabama, Tipple and Washer*, from the *Alabama Mining Institute Photograph Albums, 1922-1923.* The asset has more equipment than in Figure 43, *Photograph, Fig. 2. Steam Plant, Tipple and Washery, Kellerman Mine,* taken in 1910, indicating the mining operations were still of importance. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Figure 47

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Commissary Building

Note. The outside of the Commissary shows an attractive and tidy exterior. Electrical lines are present in the photograph. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603

Figure 48

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Auditorium and Moving Picture Show

Note. Harder Hall was located near dwellings and had wide, clear roadways. Electrical lines are present in the photograph. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

The company mining town, like communities across the southern United States at the time, was openly segregated. The captions for most of the Alabama Mining Institute photographs indicated if the structures were for "White" or "Colored" employees. There is a photograph of a school shown in Figure 49, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, School Building for White Children,* but no photograph for a school for African Americans.

Figure 49

Photograph, Central Iron and Coal Company, Kellerman, Alabama, School Building for White Children

Note. This photograph is the only one in the Alabama Mining Institute Photograph collection showing a school in Kellerman. This school was described as being for "White" students. No mention is made for a school for African American children. It is likely the location of this school is shown in Figure 57, *Excerpt from the 1942 Reprint of the Searles 1934 Topographic Map with Detail of a School*, included later in this section. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, http://www.worldcat.org/oclc/52815603.

Other examples of the segregation of the Kellerman community were seen in the types of homes. The dwellings for "White" employees have picket fences for small yards (Figure 50, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 1,* and Appendix B4, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 2*). While the photographs for the "Colored Employes" [sic] shows rows of small houses with no fences (Figure 51, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling Houses for Colored Employees*). A "boarding house" was photographed as well (Figure 52, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Boarding House for Colored Employees)*, while no mention was made of a boarding house for "White" employees.

Figure 50

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 1

Note. The dwelling for "White" employees features fencing, stair railings, and placement in a hilly part of the Kellerman mine community. There is a drainage ditch in front of the house with a small footbridge between the road and yard. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Figure 51

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling Houses for Colored Employees

Note. These dwellings for "Colored" employees appear to be placed on an area of lower relief and are lined up in rows. This allowed for identification in the later Figure 59, *Aerial Photographs of Kellerman and Burchfield, 1938, with Selected Features Emphasized,* of the area for African American homes. The title of this figure is taken from the original title in the collection. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Figure 52

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Boarding House for Colored Employees

Note. A boarding house for the "Colored" employees. No photograph was included for "White" employees. The title of this figure is taken from the original title in the collection Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Places of worship in the company town of Kellerman were also segregated and differed in appearance and structure. In Figure 53, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for White People*, the building has painted white clap boards, a brick retaining wall and concrete steps and walkway. In contrast, in Figure 54, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for Colored People*, the structure has board and batten walls, wooden steps with no walkway, and a rusty bell sitting on the bare ground. The front of this church also had its electrical service lines very near and within reach of the stairs and doorway to the church.

Figure 53

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for White People

Note. Neatly constructed brickwork is present on the stair and retaining wall. The building's paint is in good condition. Electrical service lines attach to the building high above the ground. This is in contrast with the worship space set aside for African Americans, as seen in the following Figure 54, Photograph, *Central Iron and Coal Company, Kellerman, Alabama, Church for Colored People*. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Figure 54

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for Colored People

Note. While there is electrical service going to the church for African American employees, the lines and service head are low and near the stairs and doorways. The title of this figure is taken from the original title in the collection. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

As noted in the earlier map, Figure 44, *Map Showing the Location of Developments and Projected Transmission Lines of the Alabama Traction, Light and Power Company (1913)*, there was electrical service provided to the area. Kellerman had electrical service to its social services and dwellings as evidenced by the presence of power lines in the photographs and are another

indication of how prominent the community was. The electrical service lines are visible in the following figures: (a) Figure 47, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Commissary Building*; (b) Appendix B2, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Interior Commissary*; (c) Figure 48, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Auditorium and Moving Picture Show*; (d) Figure 50, Photograph, *Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 1*; (e) Appendix B4, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 2*; (f) Figure 51, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling Houses for Colored Employees*; (g) Figure 52, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Boarding House for Colored Employees*; (h) Figure 53, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for White People*; and (i) Figure 54, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Church for Colored People*.

The operations of the Central Iron and Coal Company were prominent enough to be involved in a research project featured by the Bureau of Mines in 1927 (Kinney, Royster, and Joseph, p. 4 and 10). The study resulted in findings that suggested changes in furnace combustion areas and movement of materials. The company was prosperous enough to use one of its furnaces, and the renowned coal mined in Kellerman, for the project. The acknowledgements section of the study recognized great efforts and cost covered by Central Iron and Coal Company, another indication of the prominence and wealth of the company at the time (p. 12).

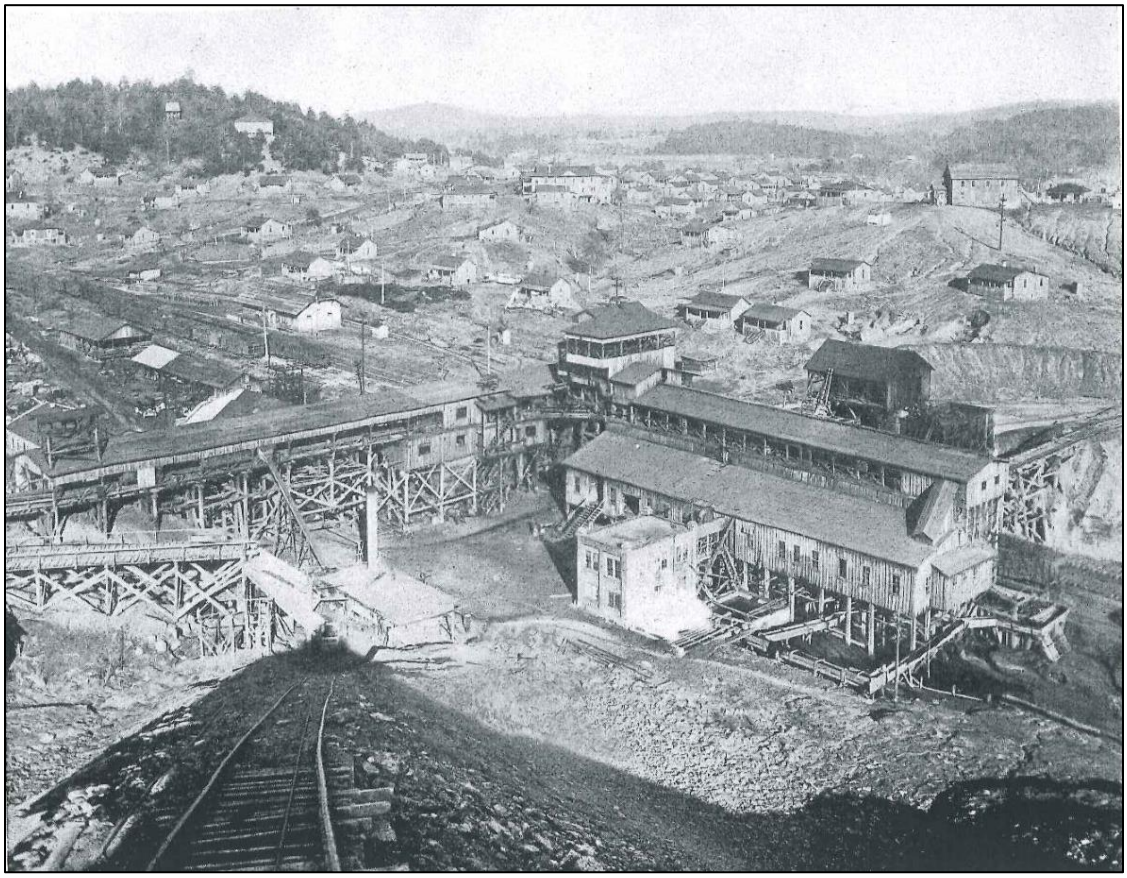
A few years later, more documentation was created in an effort to showcase the mining operations and community. In a 1930 company booklet created for stockholders and customers,

the Universal Pipe and Radiator Company, parent company of the Central Iron and Coal Company and Central Foundry Company, describes Kellerman as a "town" of 2,000 residents residing in 224 company houses, on over 6,000 acres of land (p. 8). In Figure 55, *Photograph, Kellerman Operations Showing Coal Washer, Tipple and Part of Town*, the washer, rail lines, streets, houses, and terrain are visible.

More employee homes are shown in Appendix B5, *Photograph, Part of White Residential Section of Company-owned Town of Kellerman*. The style and placement of these homes matches those shown in Figure 50, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 1* and Appendix B4, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 2*, providing a different view of the dwellings of the "White" employees.

Figure 55

Photograph, Kellerman Operations Showing Coal Washer, Tipple and Part of Town



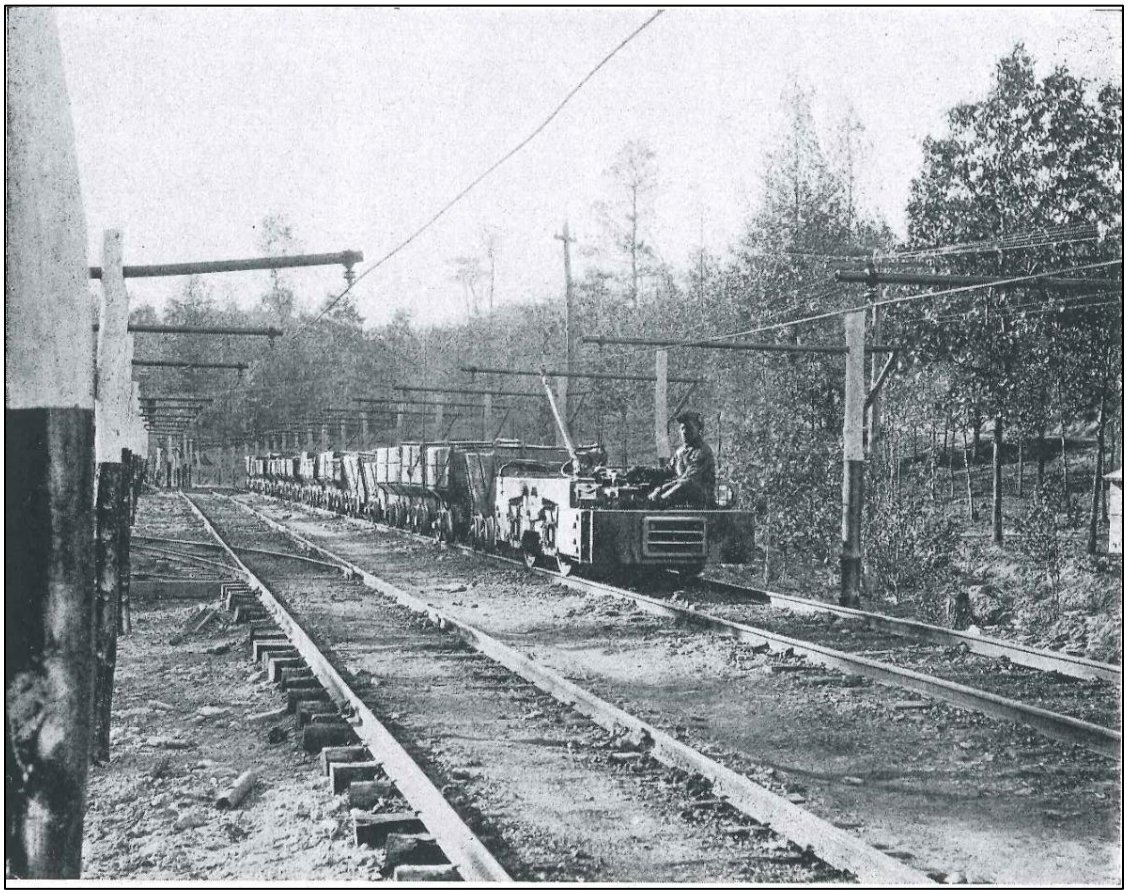
Note. The Universal Pipe and Radiator Company chose to showcase its Central Iron and Coal Company washer complex and the company community to promote the enterprise with shareholders. Universal Pipe and Radiator Company. (1930). *Universal Pipe and Radiator Company*. Universal Pipe and Radiator Company.

Also noted in the company pamphlet, bituminous coal was being mined at a rate of 30,000 tons of material per month, and then sent to the settlement of Holt, where it was processed into coke (Universal Pipe and Radiator Company, 1930, p. 8-9). The publication also boasts, “Fourteen ‘electric mules or locomotives’ “, as seen in Figure 56, *Photograph, A Train of Loaded Cars Hauled by One of the Company’s Fourteen 10-Ton Electric Locomotives, at Kellerman Mines,* and Appendix B6, *Photograph, Main Line of the Company’s Double Track Electric Coal Haulage System***.** Additionally, the electric rail line had its own powerhouse, as shown in Appendix B7, *Power House for Electric Coal Haulage, Near Mine Entrance at Kellerman Mines***.** These photographs show a different view of the double rail line shown as the westward spur from the Kellerman feature in Figure 39, *Historic Rail Line on USGS Topographic Maps from the 1920s and 1930s*, and more legible feature near the school in Figure 57, *Excerpt from the 1942 Reprint of the Searles 1934 Topographic Map with Detail of a School*.

The company publication goes on to mention, **“**Two schools and two churches are maintained here in Kellerman by the Company, also a gasoline station, a general store, and a medical department” (p. 10). It is not known if one of these two schools is shown in Figure 49, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, School Building for White Children*, or if one of the schools was used for African American students. No photograph was found for a school intended for non-“White” children in any publication. One of these two schools is mapped on the USGS topographic map in Figure 57, *Excerpt from the 1942 Reprint of the Searles 1934 Topographic Map with Detail of a School*. As stated earlier in this section, this mapped feature is likely the school for “White” students.

Figure 56

Photograph, A Train of Loaded Cars Hauled by One of the Company's Fourteen 10-Ton Electric Locomotives, at Kellerman Mines

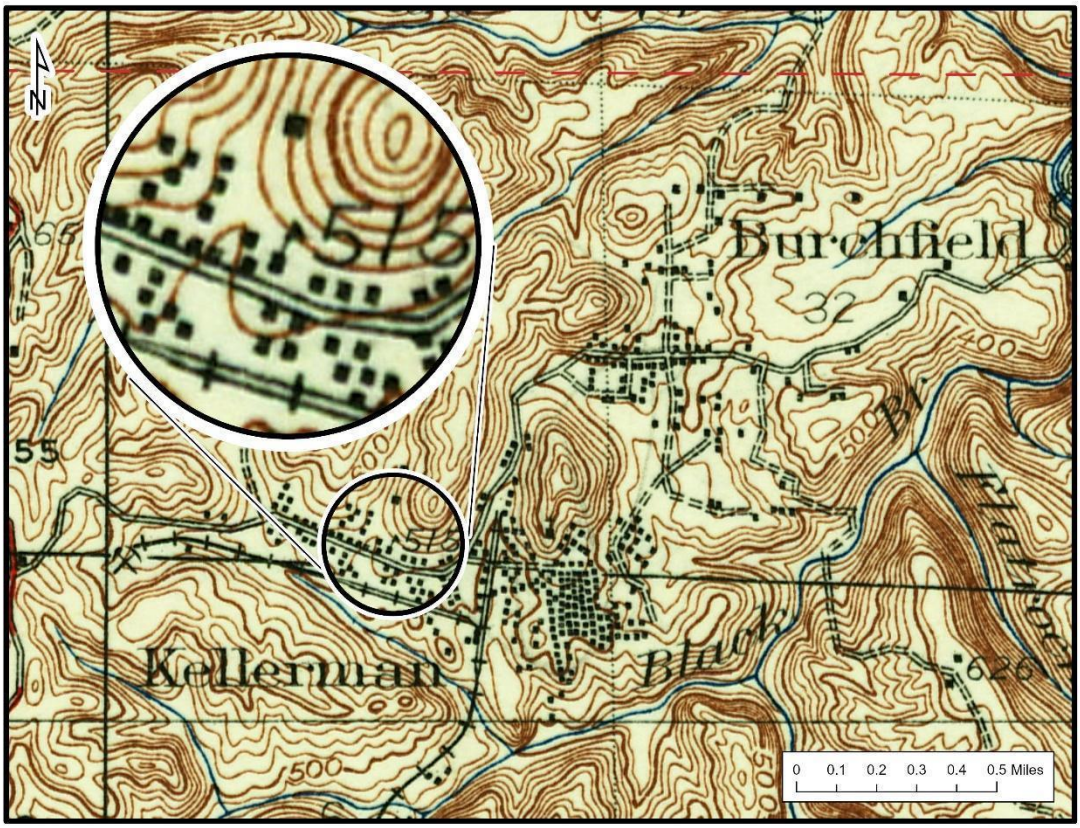


Note. Photograph from the *Universal Pipe and Radiator Company* pamphlet, including the electrical lines powering the rail system. Universal Pipe and Radiator Company. (1930). *Universal Pipe and Radiator Company*. Universal Pipe and Radiator Company.

These depictions from the company booklet and Alabama Mining Institute photographs are in agreement with some features displayed in Figure 57, *Excerpt from the 1942 Reprint of the Searles 1934 Topographic Map with Detail of a School*. There are many houses drawn on the topographic map, which was surveyed during 1928 and 1929. The double rail line leading to the mine entrance is present, with the symbol for the mine being the pickaxes just north of the “K” in the Kellerman label.

Figure 57

Excerpt from the 1942 Reprint of the Searles 1934 Topographic Map with Detail of a School



Note. There are many buildings and roads shown on the map, including one school. Based on the Figure 49, *Central Iron and Coal Company, Kellerman, Alabama, School Building for White Children*, it is likely the location for that school shown in 1922. The electric double rail line is visible just north of the "Kellerman" label, leading to the mining entrance, indicated by the two crossed pickaxes. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603. U.S. Geological Survey. (1942). *USGS 1:62500-scale Quadrangle for Searles, AL 1934* [Scanned Map in GeoTIFF format], 1:62,500. Reston, VA: U.S. Geological Survey. Retrieved 16 October 2020, from https://ngmdb.usgs.gov/topoview/viewer/#14/33.3418/-87.3045.

Although these publications depict an idyllic and prosperous mining community, the Kellerman mine would not be immune from the effects of the Great Depression. Hard times would come soon after the Universal Pipe and Radiator Company publication produced in 1930. In the memoir, *Foundry Life: Holt, Alabama*, Paul Singleton, Sr. (with Donald Brown, 2004) describes the decrease in production at the Holt plant, which caused the Kellerman mine to be closed temporarily in 1931. Singleton and Brown stated that year was the last that Kellerman would provide coal to Holt.

A review of aerial photographs of Burchfield and Kellerman produced in 1938 (University of Alabama) agree with the historical accounts mentioned earlier in this section. The georeferenced and mosaicked aerial images with labeled features are shown in Figure 58, *Aerial Photographs of Kellerman and Burchfield, 1938,* and Figure 59, *Aerial Photographs of Kellerman and Burchfield, 1938, with Selected Features Emphasized.* The aerial photographs show numerous roads, buildings, fields, fence lines, woodlands, and a railroad. Burchfield Road appears to be the main road going through this community and continuing over a bridge, crossing nearby Davis Creek to the east (University of Alabama, 1938). The entrance to the mine, as photographed in Figure 36, *Photograph, Mine Shaft, Central Mine, Dec. 1901*, and Figure 42, *Photograph, Fig. 1. Entrance to Kellerman Mine,* is visible.

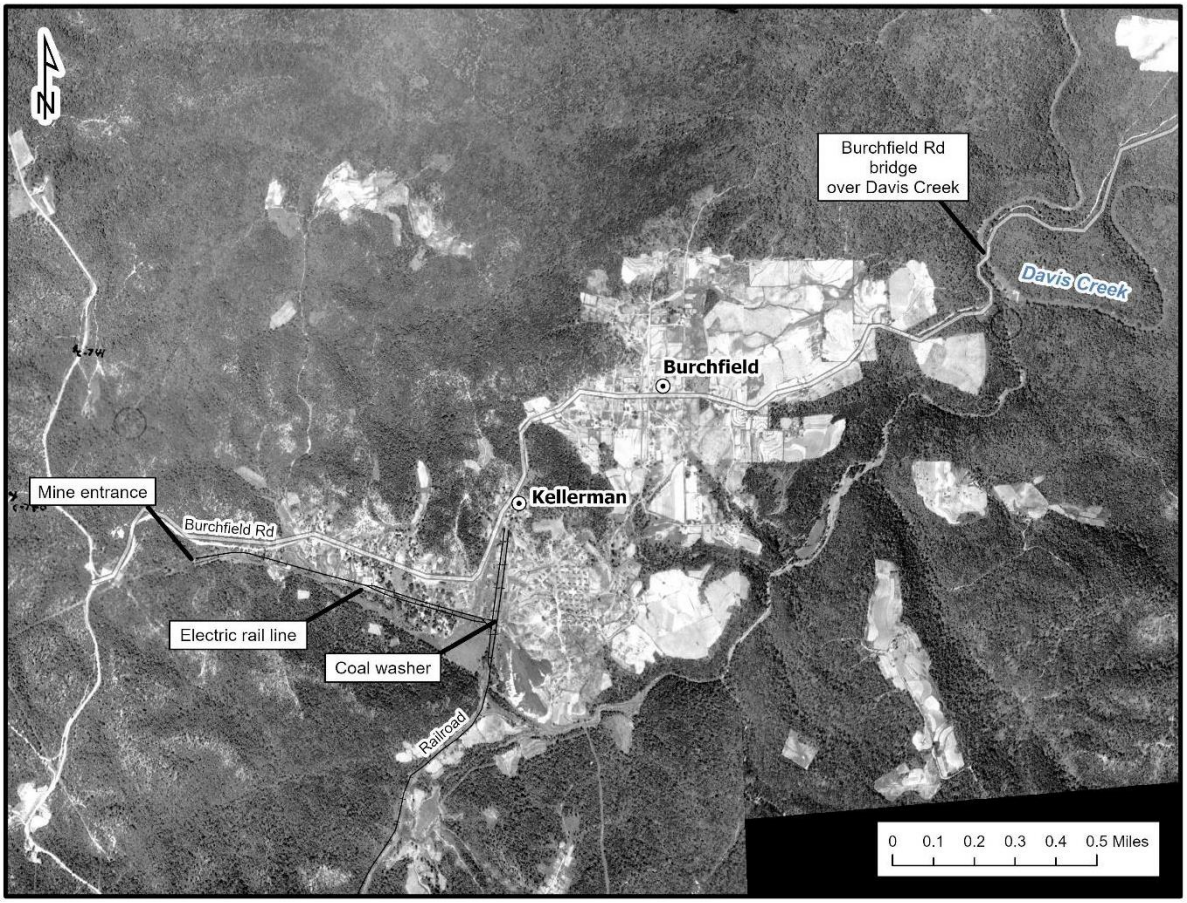
By studying the photographs taken for the 1922 Alabama Mining Institute collection and the 1930 Universal Pipe and Radiator Company publication, it is possible to identify other features in the 1938 aerial photographs (University of Alabama), as well as estimate of where the historic photographs were taken on the ground. The rows of house for African American workers shown in Figure 51, *Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling Houses for Colored Employees*. The photographs featuring the double electric rail lines

in Figure 56, *Photograph, A Train of Loaded Cars Hauled by One of the Company's Fourteen 10-Ton Electric Locomotives, at Kellerman Mines*, Appendix B6, *Photograph, Main Line of the Company's Double Track Electric Coal Haulage System*, and Appendix B7, *Photograph, Power House for Electric Coal Haulage, Near Mine Entrance at Kellerman Mines*, allowed for the identification of the corresponding feature in the 1938 aerial photographs.

The homes intended for "White" employees had been photographed in both the 1922 and 1930 publications. Unlike the homes for African American employees which were placed in a gridded pattern, those for "White" employees were photographed as having an irregular placement. This asymmetrical arrangement of dwellings made it impossible to decisively determine locations of "White" homes.

Figure 58

Aerial Photographs of Kellerman and Burchfield, 1938

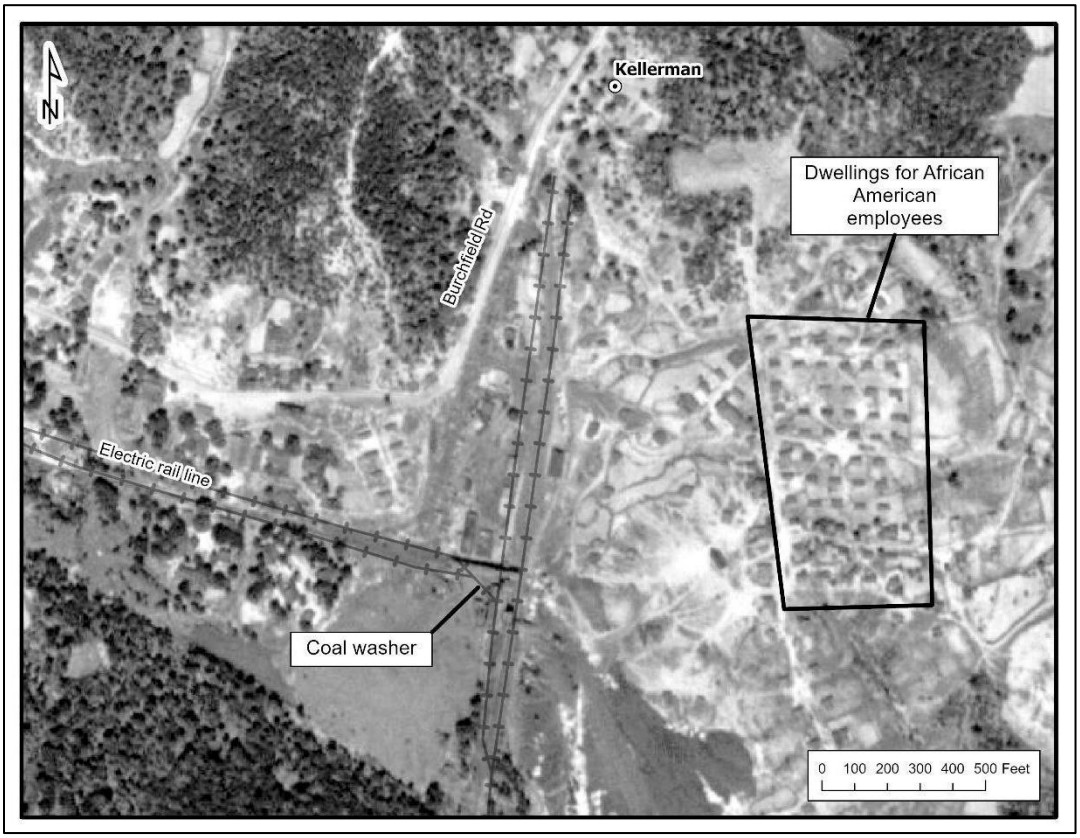


Note. Georeferenced aerial photographs from 1938, with modern features of Kellerman and Burchfield, with Burchfield Road going through the area and across Davis Creek. Other features of the mining operation are labeled. University of Alabama (1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true. University of Alabama (1938b). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from

http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true.

Figure 59

Aerial Photographs of Kellerman and Burchfield, 1938, with Selected Features Emphasized



Note. The electric rail line, coal washer, Burchfield Road, and African American dwellings are identified on this map created from the 1938 aerial photographs. University of Alabama (n.d./1938a). Burchfield [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

University of Alabama (n.d./1938). Kellerman [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/

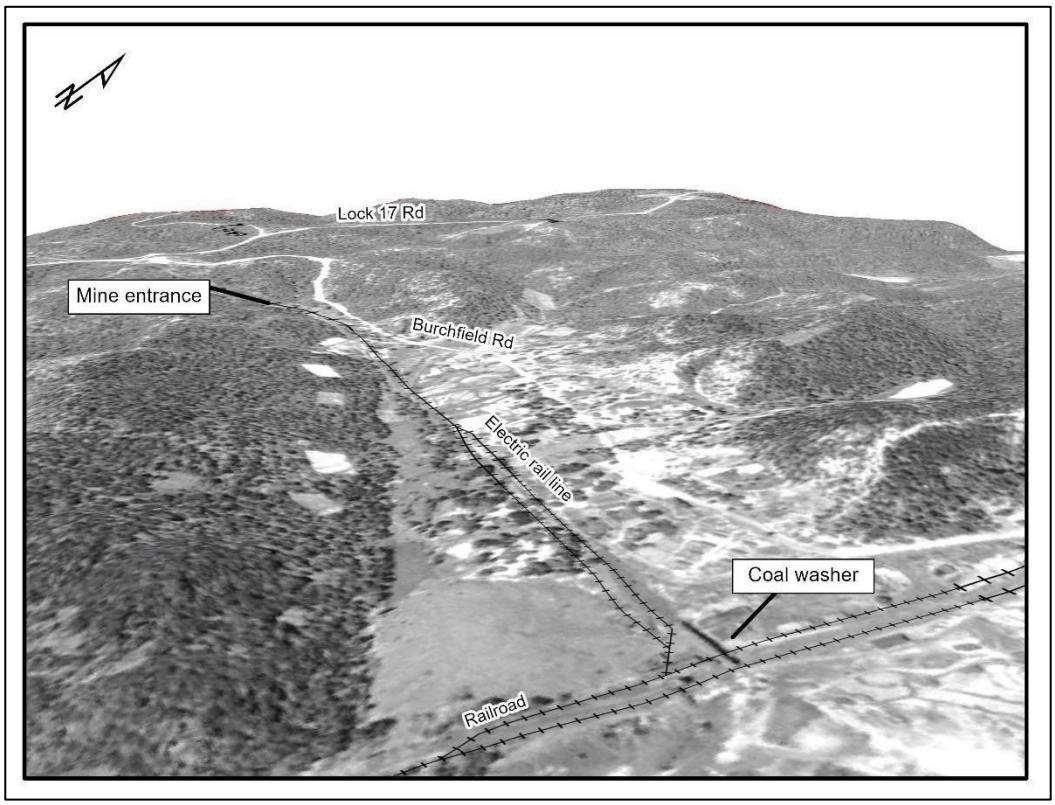
Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Three-dimensional Visualization of the Historic Topography with 1938 Aerial Imagery

The Kellerman and Burchfield communities during the late 1920s and the 1930s can visualized using a three-dimensional web scene. Because the mining operations were underground at that time, the terrain and features were different than what is seen today. In later decades of the 20th century, these features would be altered or removed as the Kellerman community was torn down and the bridge removed as strip mining operations took over. Some of the 1930s topography and scenery can be viewed in Figure 60, *Recreated Oblique Historic View of the Coal Washer, Electric Line, and Mine Entrance, 1938, Facing Northwest,* Figure 61, *Recreated Oblique Historic View of the Coal Washer, Electric Line, Railroad, and African American Dwellings, 1938, Facing Northeast,* and Figure 62, *Recreated Oblique Historic View of the Coal Washer, Electric Line, Railroad, and African American Dwellings, 1938, Facing South.*

Figure 60

Recreated Oblique Historic View of the Coal Washer, Electric Line, and Mine Entrance, 1938, Facing Northwest



Note. The electric rail line, railroad, main roads, and coal washer are identified on this map created from the 1938 aerial photographs. The topography represents that from the time period.

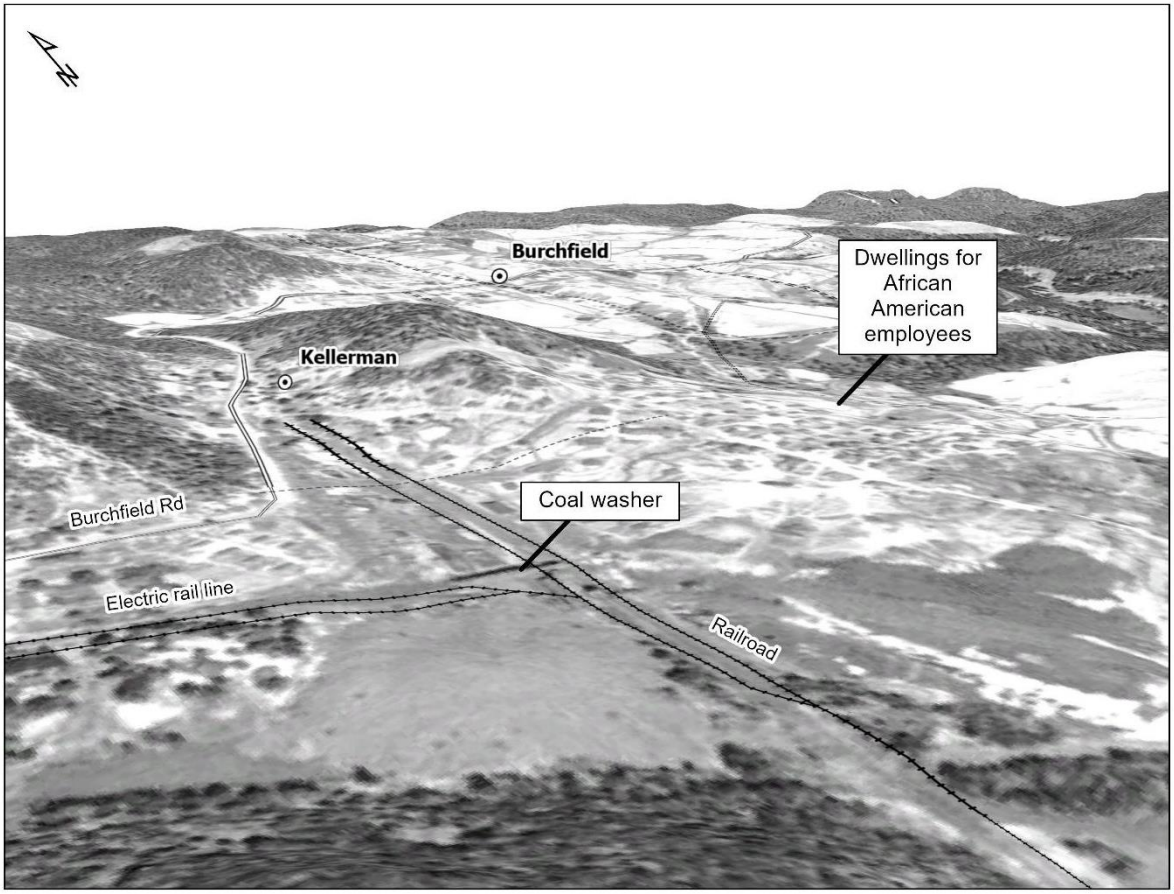
University of Alabama (n.d./1938a). Burchfield [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

University of Alabama (n.d./1938). Kellerman [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from

http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Figure 61

Recreated Oblique Historic View of the Coal Washer, Electric Line, Railroad, and African American Dwellings, 1938, Facing Northeast



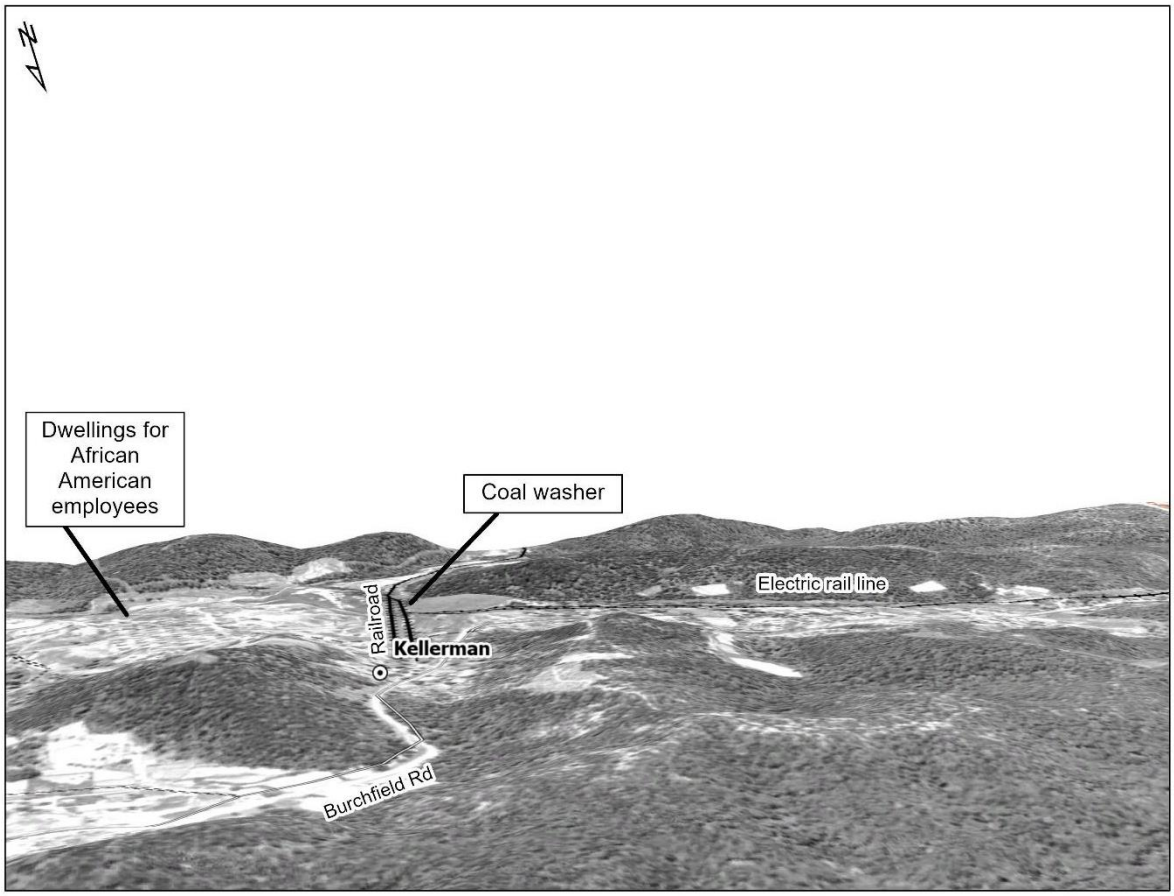
Note. Georeferenced aerial photographs from 1938, with modern features of Kellerman and Burchfield, with Burchfield Road. Other features of the mining operation are labeled. University of Alabama (1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true. University of Alabama (1938b). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3

March 2020, from

http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true.

Figure 62

Recreated Oblique Historic View of the Coal Washer, Electric Line, Railroad, and African American Dwellings, 1938, Facing South



Note. Georeferenced aerial photographs from 1938, with modern features of Kellerman and Burchfield, with Burchfield Road. Other features of the mining operation are labeled. University of Alabama (1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true. University of Alabama (1938b). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3

March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true.

Additional views of the historic landscape of the Burchfield and Kellerman, created from historic elevation contour lines and aerial photographs used in the oblique views in this section, can be found on the ArcGIS Online platform at https://jbyrdgis.maps.arcgis.com/apps/webappviewer3d/index.html?id=784b2b884d034ac68b02164cc7d24b1e (Byrd, 2020).

The Holt blast furnace that depended on Kellerman coal was still closed in 1938, leading to the mining town being at risk of losing its railroad service. The railroad going from Holt to Kellerman was in financial trouble. The Warrior Southern Railway Company was the receiver of the Mobile and Ohio Railroad Company and applied to the Interstate Commerce Commission requesting approval for abandoning the rail line (United States Interstate Commerce Commission, 1939). The Alabama Public Service Commission challenged the request (p. 528) and the State Geologist of Alabama (p. 532). During the appeal, Warrior Southern described the decrease of coal being moved from the area since the 1931 shutdown and the line having operated at a financial loss for several years (p. 530). There had been a “coach and caboose” passenger service included with the main freight hauls, but this was discontinued when no passengers had ridden during most of 1937 (p. 530-531). A photograph of the train station serving the Kellerman community is shown in Figure 63, *Photograph, Kellerman Train Station, Date Unknown.*

Figure 63

Photograph, Kellerman Train Station, Date Unknown

Note. The Kellerman train station or depot. Passenger service was available to the Kellerman area. No date given for this photograph. Water Energy. (2013, February 19). Kellerman, Alabama train station [photograph]. Retrieved from https://www.facebook.com/Walter-Energy-237022309765962/photos/a.258504347617758/258524657615727.

The Commission granted Warrior Southern's petition to abandon the line, though the company stated it was open to selling the line to Central Iron and Coal (United States Interstate Commerce Commission, 1939). In 1940, the properties in Holt and Kellerman were purchased in Federal court by the Associated Metals and Minerals Corporation, as Central Iron and Coal had

not been able to cover its loans (Woodward, 1940). These financial troubles were signs the golden age of Kellerman was coming to a close.

Chapter 5

Conclusion

My interest in the study area of Burchfield and Kellerman in east Tuscaloosa County, Alabama, began after noticing a residential style of property subdivision on Tuscaloosa County Tax Assessor's online Tuscaloosa County Alabama Public GIS Parcel Search website (https://www.alabamagis.com/Tuscaloosa/), as shown in Figure 3, *Aerial Parcel Map of the Burchfield and Kellerman Areas (2020) With East Center City Plat (1903) Delineated.* Study of the property subdivision plats revealed not only subdivided parcels, but also areas reserved for streets and alleys **(**Bell, 1901a; Bell, 1901b). A subsequent roadside visit in 2015 featured stacked stone curbs, decorative vegetation, and a house foundation in ruins. All of these were evidence of the area once having a more populous past.

The purpose of this project is to combine a selection of relevant historical maps, texts, photographs, and aerial images in order to detail the development of Burchfield and Kellerman in the nineteenth and early twentieth centuries, with additional focus on the most populated period during the 1920s - 1930s. While the USACE had commissioned a study of the Black Warrior River area which included the same area and time period of the present study, the USACE project did not focus on the Kellerman area. Other research projects had used historical resources and GIS technologies, but again the Kellerman and Burchfield areas had not been the focus.

Online database and full-text searches were used to gather historical resources. Excerpts from historic maps were georeferenced and brought into a modern GIS to gain a better spatial understanding of the physical features which caused the study area to be documented and developed by mining interests. Photographic and textual resources were obtained from current

internet research sites. These historic sources were incorporated into this study to build a better picture of the Burchfield and Kellerman areas before the decline of these locales in the 1940s. For a more realistic view, historic topographic map elevation contours from the late 1920s were digitized to store elevation values and create a DEM. Aerial photographs from 1938 were georeferenced and draped over a three-dimensional surface to create a visualization of a landscape.

The Kellerman and Burchfield area of east Tuscaloosa County has been studied, developed, mined, reclaimed, and mined again. Beginning in the 1800s, resources were devoted to the surveying and mapping of the coal resources. Several maps depicting the Warrior Coal Basin were created with increasing frequency and detail as more was learned about the area's natural resources. Burchfield and what would become the Kellerman community was sparsely populated during this time.

Industrial development in the late 19th and early 20th centuries would change the landscape of this part of Tuscaloosa County. The Central Iron and Coal Company required a reliable coal supply and acquired the coal mine near the Burchfield area. The Mobile and Ohio Railroad realized the profit potential of the enterprise, and a rail line was constructed from the newly named Kellerman mine to the Central Iron and Coal operation in Holt. The rail line required tunneling through solid rock and trestles along creeks and hilly terrain.

The Kellerman mine required many workers, and the Central Iron and Coal Company created a company community in this once isolated area around 1903. Schools, churches, houses, roads, stores, and other structures were built by the company. The mining infrastructure included rail lines, washers, and electrified services for the underground mine. The mine and settlement were significant enough to be documented in industry and government publications. Topographic

maps and aerial photographs from the 1920s and 1930s supported the amount of investment being into the area.

The nature of the coal and iron industry was volatile in the period of the Great Depression, and Central Iron and Coal and the Kellerman mine suffered. By 1939, the community was in decline. In subsequent decades, mining in the Burchfield and Kellerman area changed to surface operations. The company town of Kellerman was removed, and the landscape was altered.

To recreate the landscape of the Burchfield and Kellerman area during the 1920s-1930s, historic contour lines were digitized into a GIS to create a three-dimensional view of this landscape later altered by surface mining activities. The aerial photographs of a similar time period in the 1930s were also georeferenced, and then draped over the three-dimensional model. The final product is a three-dimensional view of the Burchfield and Kellerman communities, very different from the abandoned landscape documented in modern aerial and roadside photographs. Using a web mapping platform allows a wider audience a 3D view this community via common web browsers.

This project is by no means a comprehensive history of the Burchfield and Kellerman area. As more resources are digitized and indexed, it is expected additional details about the area will become available. There are local historical societies with print resources not explored in this project. Social media has become a way for people from the same area to reconnect and share pictures and stories and could be a source for further study.

Digitizing historic resources is far from a perfect process. Scanning historic maps, such as those used to create the historic DEM and three-dimensional scene, introduce error. The georeferencing process completed by the USGS creates error as the image is warped to fit

control points. Digitizing the historic contours, creating the TIN, and the final historical DEM each introduce the possibility for horizontal and vertical error.

Similar errors are encountered when georeferencing historic aerial photographs. Because of the nature of the later strip-mining operations removing much of the landscape visible in the photographs, it was challenging to locate modern control points. Imperfect edge matching between the Kellerman aerial photograph and the Burchfield photograph can be seen in the final product. However, the purpose of the final product was for general visualization purposes and the three-dimensional scene achieved its purpose of recreating a landscape not seen in decades.

The methods used in the project have implications beyond the present study. Similar procedures and resources have benefited Tuscaloosa County Public Works in Tuscaloosa, Alabama, a department responsible for county-maintained roads and bridges. For example, it is sometimes necessary to determine if a road was in existence at a certain date. Historical aerial photography and maps are georeferenced and brought into a modern GIS. The length of the roadway can be documented through time, including long gone structures such as bridges and culverts.

Historic topographic maps have identified old stream paths covered by later development, revealing possible causes of washouts. Tuscaloosa County Public Works was tasked with repairing a landslide that had damaged part of Hargrove Road East, a road shown on the *USGS 1:125000-scale Quadrangle for Brookwood, AL 1899*, and the *USGS 1:62500-scale Quadrangle for Cottondale, AL 1934*. The 1934 map was referenced at the location of the slide, and it was determined the road had once curved sharply to the east to avoid a gulley. The gulley had been used as a trash dump, as evidenced by old debris and historic clogged drainage pipes revealed during the modern repair project. Over the decades, the gulley had been filled in and the road had

been straightened. Substantial rains had reopened the old topography and damaged the road. The historic resources gave a better understanding of the area's past during the repair project.

GIS has become more accessible through web mapping applications, such as those for this project. Tuscaloosa County Public Works has benefited from this technology. Department staff can view geospatial data using only a web browser and network connection. Aerial imagery from several years has been published as web services, helping county employees identify issues such as long-term illegal tire disposal sites, resulting in citations against the property owners. Overlays of geological resources helped Tuscaloosa County identify potential areas where road materials, such as chert, might be extracted.

With the development of web accessible GIS technologies and historical resources, more people than ever can utilize the same types of online maps and data sources used in this project. Anyone with a web browser can gain a greater understanding of historical geography. Federal, state, and local agencies are developing web-based platforms to better communicate historical happenings within a geographic context. Recently, the Alabama Department of Archives and History has launched web-based maps displaying locations of historical significance. During the recent bicentennial of Tuscaloosa County, an online interactive map provided a guided tour of historic locations in Tuscaloosa. The present project may be of interest to these groups.

Former Kellerman and Burchfield residents and their families can, for the first time in decades, view the community where worked, lived, learned, and worshiped. The hills, roads, and forests that were once familiar geography in the first third of the 20th century might not be seen on Sunday drives today. But through the integration of historic resources and GIS, the company town destroyed by the industry that created it is once again visible.

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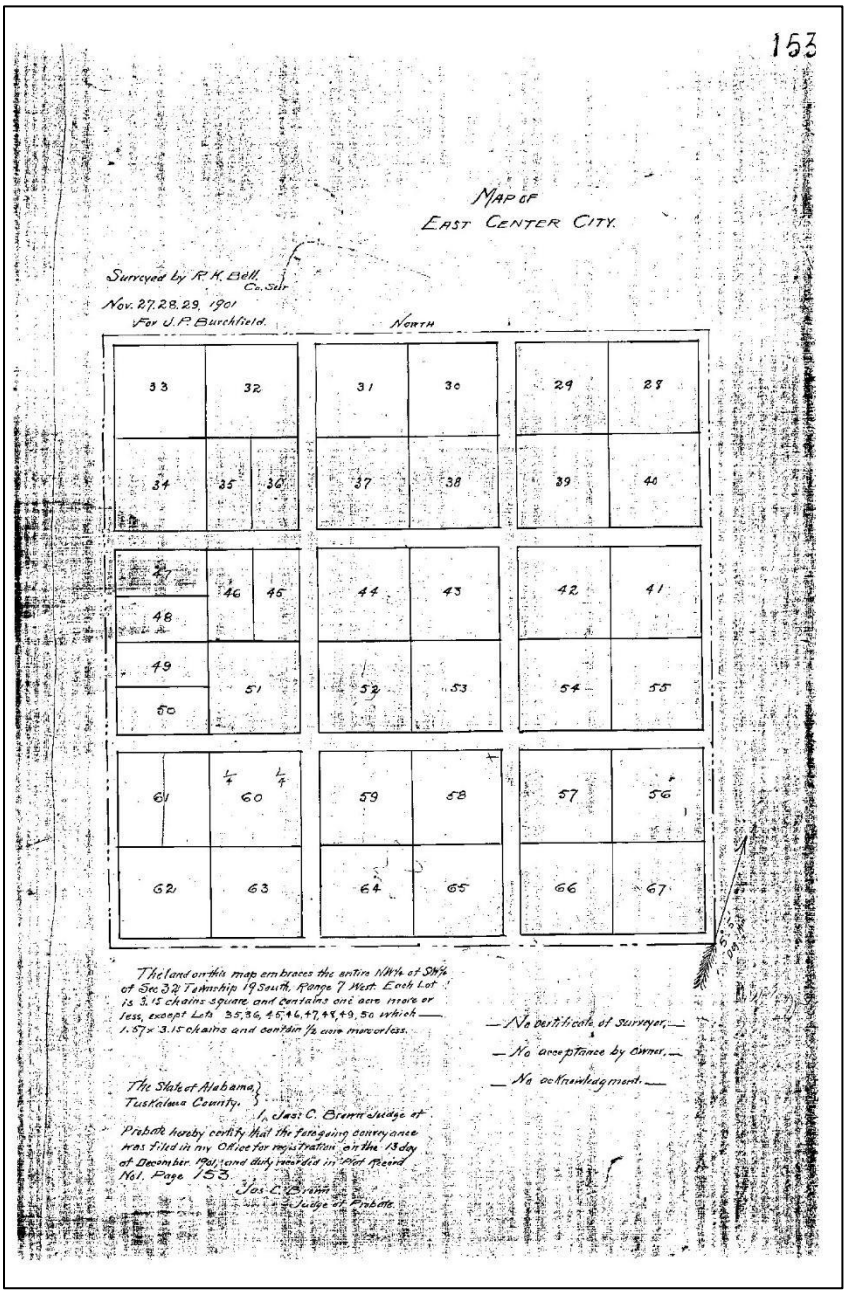
Appendix A

Additional Introductory and Methodology Figures

Appendix A1

Map of the East Center City Subdivision Plat, Plat Book 1, Page 153, Recorded in 1901



Note. The original plat as recorded in the Tuscaloosa County Courthouse, featuring streets and smaller parcels suitable for a town with residences to contrast with the current appearance of the area. Bell, R. K. (1901b). Map of East Center City, Platbook 1/Page 153 [land subdivision plat]. Retrieved 7 September 2020, from https://probate.tuscco.com/ProbateRecords/.

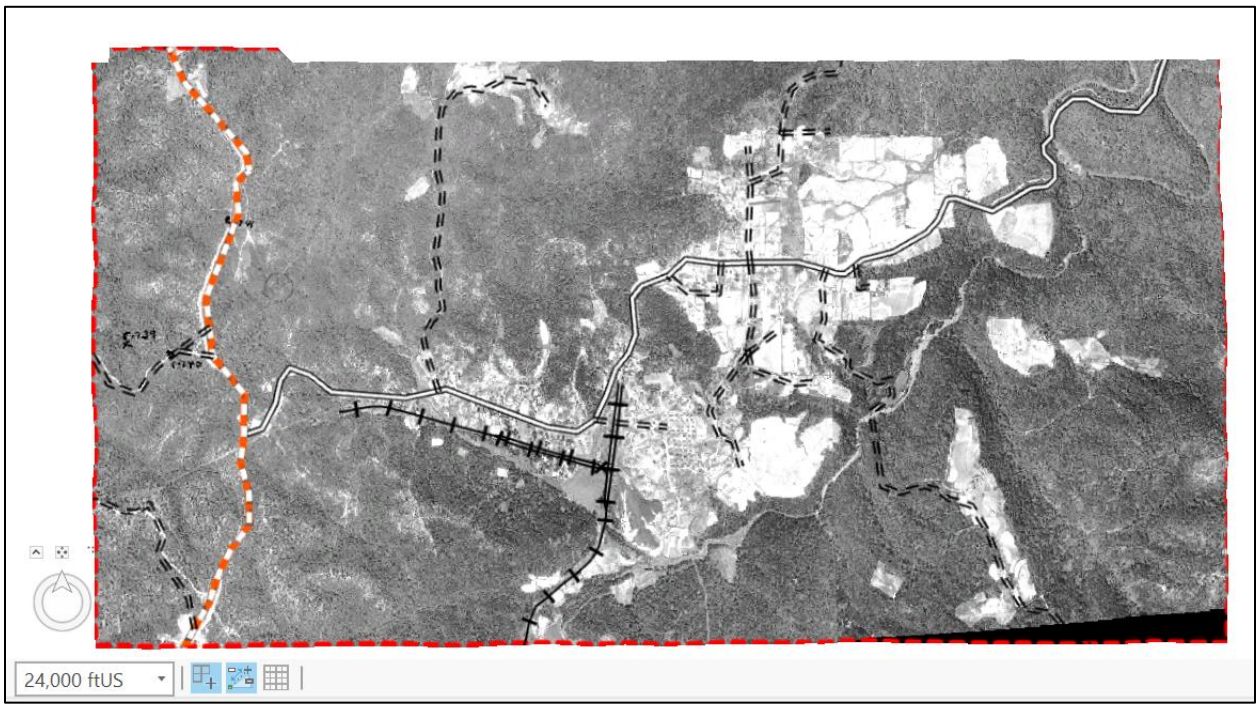
Appendix A2

Enlarged Aerial Photograph of Kellerman Taken in 1938

Note. When the photograph is enlarged, the structures appear to be arranged in a grid, common for dwellings. University of Alabama (n.d./1938). *Kellerman* [air photo]. Photo AXO-13-73. Tuscaloosa, Alabama: 1938. Retrieved 3 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Kellerman%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

Appendix A3

Historic 1938 Aerial Photographs of Kellerman and Burchfield, Draped Over a Three-dimensional Surface, with Historic Line Features



Note. The resulting georeferenced Burchfield and Kellerman 1938 aerial photographs draped over the historic three-dimensional surface, with road and rail linear features digitized from the *USGS 1:62500-scale Quadrangle for Searles, AL, Edition of 1934, 1942 Reprint* map. University of Alabama (n.d./1938a). *Burchfield* [air photo]. Photo AXO-14-15. Tuscaloosa, Alabama: 1938. Retrieved 27 March 2020, from http://cartweb.geography.ua.edu/lizardtech/iserv/calcrgn?cat=Special%20Topics&item=Aerials/Tuscaloosa/Tuscaloosa%20Burchfield%201938.jp2&wid=1000&hei=900&rops=item(Name,Description),cat(Name,Description)&style=default/view.xsl&plugin=true

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Appendix B

Additional Historical Photographs

Appendix B1

Photograph, Train Transporting Coal

Note. The rail line was important enough to document, as it was necessary to transport the coal from Kellerman to the foundry in Holt 16 miles away. Smith, E. A. (1902). *Train transporting coal* [Photograph]. Eugene Allen Smith Collection, University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 October 2020, from http://purl.lib.ua.edu/15546.

Appendix B2

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Interior Commissary

Note. The interior of the commissary, with stocked shelves and employees. Electrical lights are present in the photograph. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

Appendix B3

Photograph, Kellerman Coal Mines

Note. Jones, Walter B. (October 1919). *Kellerman Coal Mines* [photograph]. Eugene Allen Smith Collection, University of Alabama Libraries Special Collections, University of Alabama, Tuscaloosa, AL, United States. Retrieved 16 October 2020 from http://purl.lib.ua.edu/46105.

Appendix B4

Photograph, Central Iron and Coal Company, Kellerman, Alabama, Dwelling House, White Employee 2

Note. This second photograph of a house for "White" employees also shows stair railings and placement on a hilly portion of the Kellerman area. Alabama Mining Institute. (1923). Alabama Mining Institute Photograph albums, 1922-1923 (inclusive). Retrieved 16 October 2020, from http://www.worldcat.org/oclc/52815603.

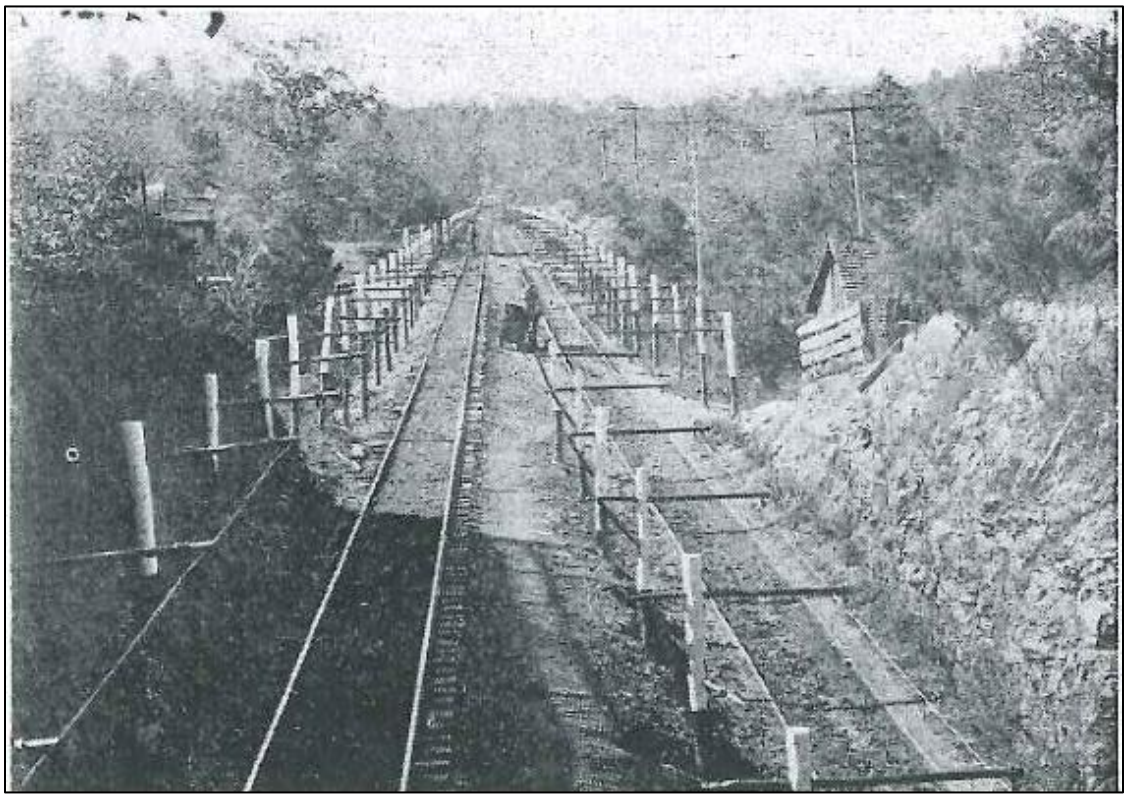
Appendix B5

Photograph, Part of White Residential Section of Company-owned Town of Kellerman

Note. The Universal Pipe and Radiator Company chose to showcase its Central Iron and Coal Company homes for “White” workers to promote the enterprise with shareholders. Universal Pipe and Radiator Company. (1930). *Universal Pipe and Radiator Company*. Universal Pipe and Radiator Company.

Appendix B6

Photograph, Main Line of the Company's Double Track Electric Coal Haulage System



Note. Photograph from the *Universal Pipe and Radiator Company* pamphlet, including the electrical lines powering the rail system, as well as general electrical service lines on the taller poles. Universal Pipe and Radiator Company. (1930). *Universal Pipe and Radiator Company*. Universal Pipe and Radiator Company.

Appendix B7

Photograph, Power House for Electric Coal Haulage, Near Mine Entrance at Kellerman Mines

Note. Photograph from the *Universal Pipe and Radiator Company* pamphlet (1930), featuring the electric lines and generation assets for the Kellerman mining operation. Universal Pipe and Radiator Company. (1930). *Universal Pipe and Radiator Company*. Universal Pipe and Radiator Company.