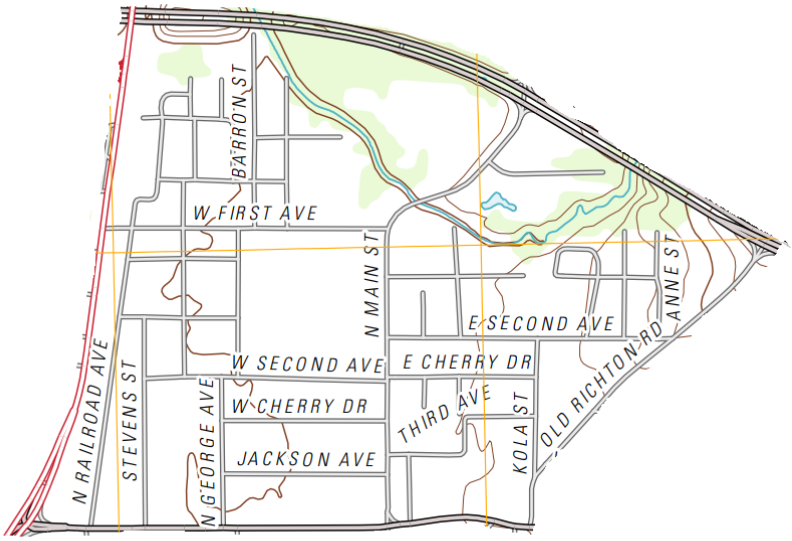
The Steele Plan Phase 1

Drainage Restoration and Improvement



DRAFT

Revised September 7, 2021

Petal, North Downtown Area

August 1, 2021

Gerald B. Steele, Ward 1 Alderman

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1.0 Introduction

1.1 Definitions

Ditch (or Ditches): refers to culverts, waterways, streams, or other surface water system used for drainage or flood control

Major water exit: an intended path for water to follow that leads out of the zoned area. These are the main paths that all water will eventually flow through and should alway take the highest priority above all others.

Gandy: The Evelyn Gandy Parkway

1.2 Purpose of Plan

(1) Improve drainage in the north downtown area of Petal, MS.

(2) To ensure that ditches will be cleaned, repaired, or modified only when starting at a location that connects to either a dedicated major water exit (as defined by this plan) or create a direct flow of water via existing drainage structures into a major water exit that is comprised of ditches that have been cleaned no more than 12 months prior.

(3) To coordinate the actions of the Petal Street Department and mayor with the solutions outlined in this plan and avoid unnecessary or off task work that is not covered by this plan.

(4) To generate data, maps, and charts that will be used by the board of aldermen to develop an annual policy to maintain the area indefinitely and possibly apply to other locations in the city.

(5) To create a special needs drainage area as described in this plan.

1.3 Authority and Acknowledgments

The creator of this plan, Gerald Steele, is not an engineer. He is a school teacher and has received no formal training in surface water management of any kind. Currently, he is Petal's Ward 1 Alderman. His primary residence and real estate properties are in the area of this plan.

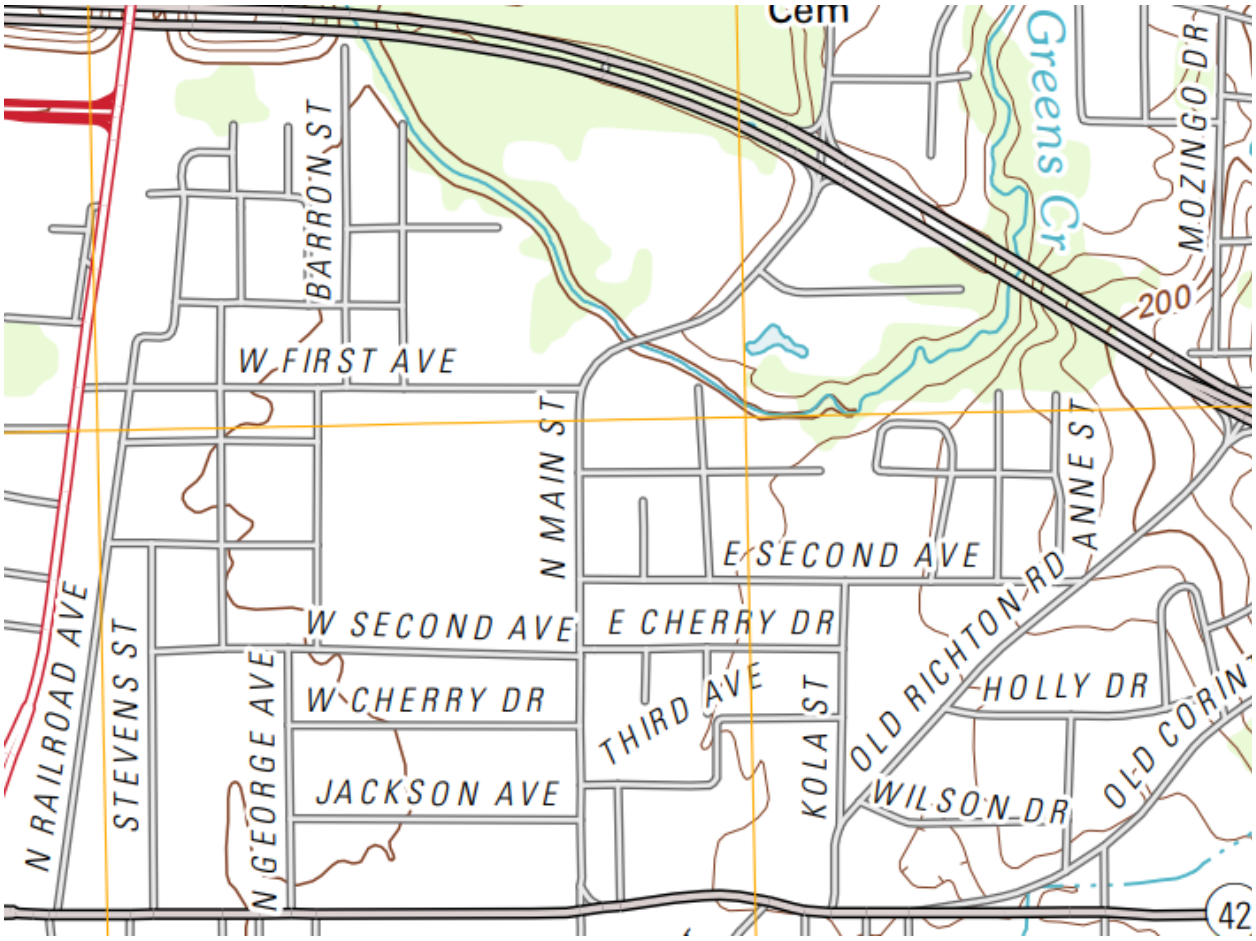
Anytime a certified engineer is needed or used in this plan it will be noted. However, the majority of this plan is restoring what already exists and therefore does not require any extra actions other than the actual work and oversight of that work and should be classified as Maintenance and Repair.

All sources will be cited where used.

2.0 Area Studied

2.1 Area Location

The area of this plan is located in Petal Mississippi. More specifically, the areas enclosed by W Central Ave to the south, the railroad tracks to the West, Evelyn Gandy Pkwy to the North, and Old Richton Rd to the East.



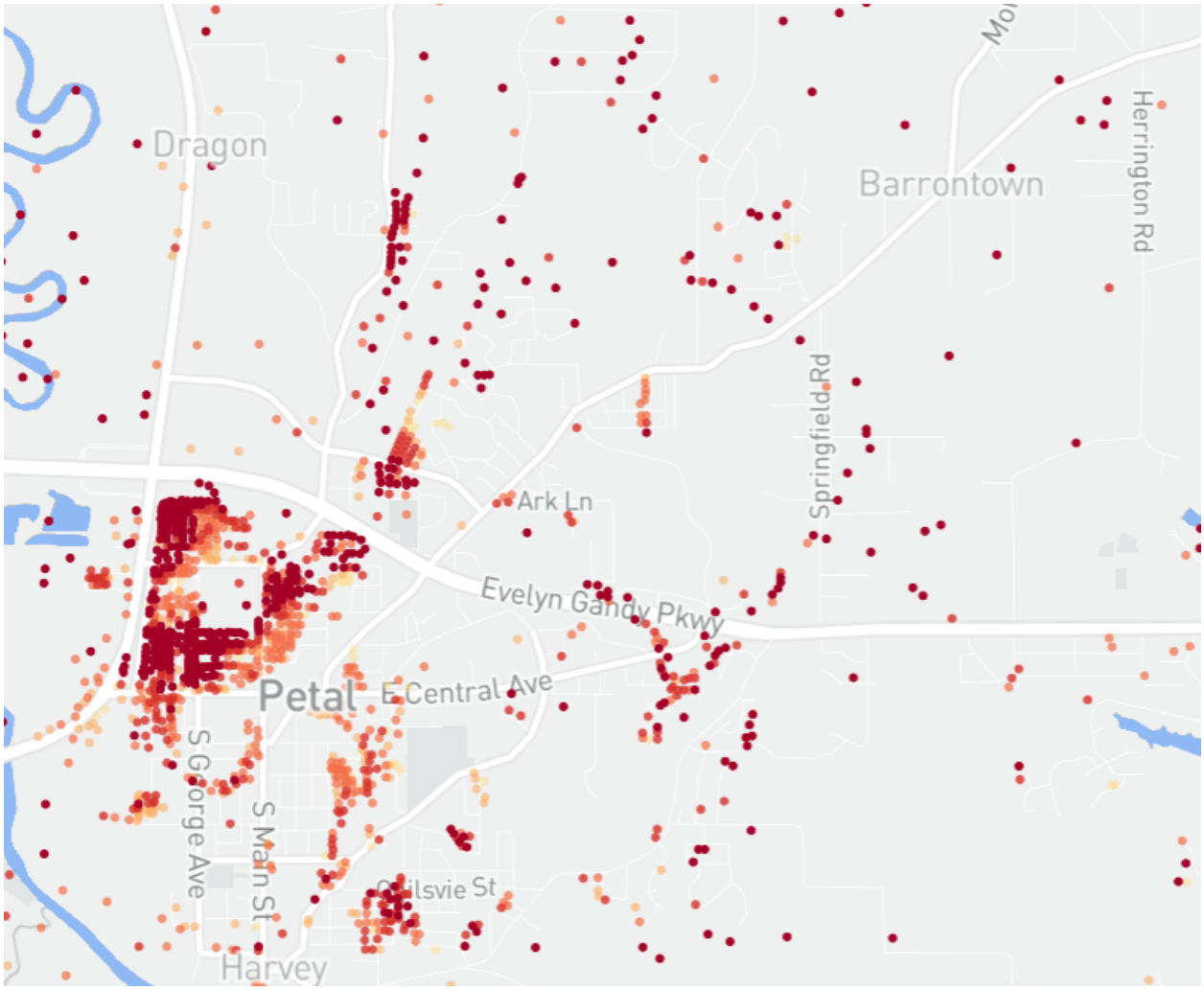
2.2 Community Description

This area is mostly residential with some light commercial. Water is blocked to the north by the Gandy, to the west by the railroad tracks, to the south by Central Avenue, and flows from East to West. There are two major water exits, one is a culvert under the railroad tracks and the other is Greens Creek.

2.3 Principle Problem

The drainage system in this area is in dire need of maintenance and repairs. Much of the old drainage system is buried under years of sediment and no longer functions correctly. No flow maps currently exist to show where the water and culverts flow. No maintenance schedule or plan currently exists. No methodology is currently being applied when work in the area is selected. Work in the area is not following best practices or local ordinance.

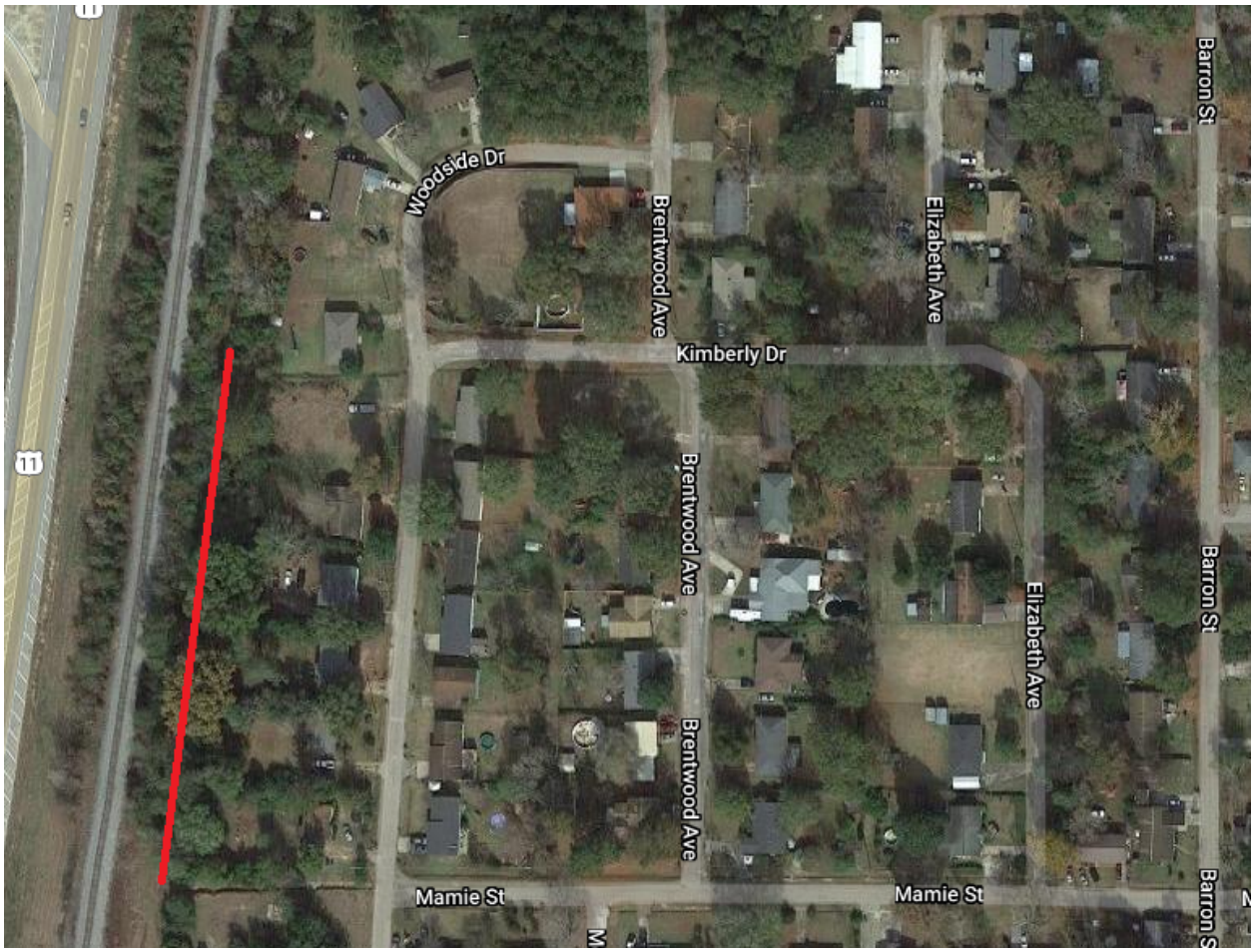
The designated area suffers from the most extreme flooding in the city as shown below (https://floodfactor.com/city/petal-mississippi/2856800_fsid).



2.4 Impact of Recent Drainage Efforts and Uncoordinated Pending Efforts

Work on Bell St is about to begin 9/6/21. This work is said by locals to include the digging of ditches on both sides of the street and the replacement of an undetermined number of culverts. Ward 1 Alderman was not consulted for this project. This project is not as urgent as the Steele plan's prioritized list. This work should be done eventually, but in logical order. This work, with what is known, is likely to make things worse unless E Second Ave and N Main also receive substantial work. Although the cost is unknown, it is clear that this is currently one of the most complicated and expensive projects in this plan. This work will not help the area as a whole. No reason or methodology was given for the selection of this project.

On 7/21/21 work was started behind the houses on Woodside Dr. The work done will not have a positive effect on any homes or businesses and may potentially make matters worse if it is to continue. The major flaw in this work is that it does not follow objective 2 (see 1.2). Digging from a major water exit to the problem area would be beneficial and is desperately needed. However, this work is starting at an “upstream” location and water has no place to flow out to because the downstream path is clogged. Starting this work “upstream”, will create a massive retention ditch that cannot flow out. The red line below marks the location of the new work. This area is addressed by the Steele plan below (marked as the green line and given 4th highest priority).

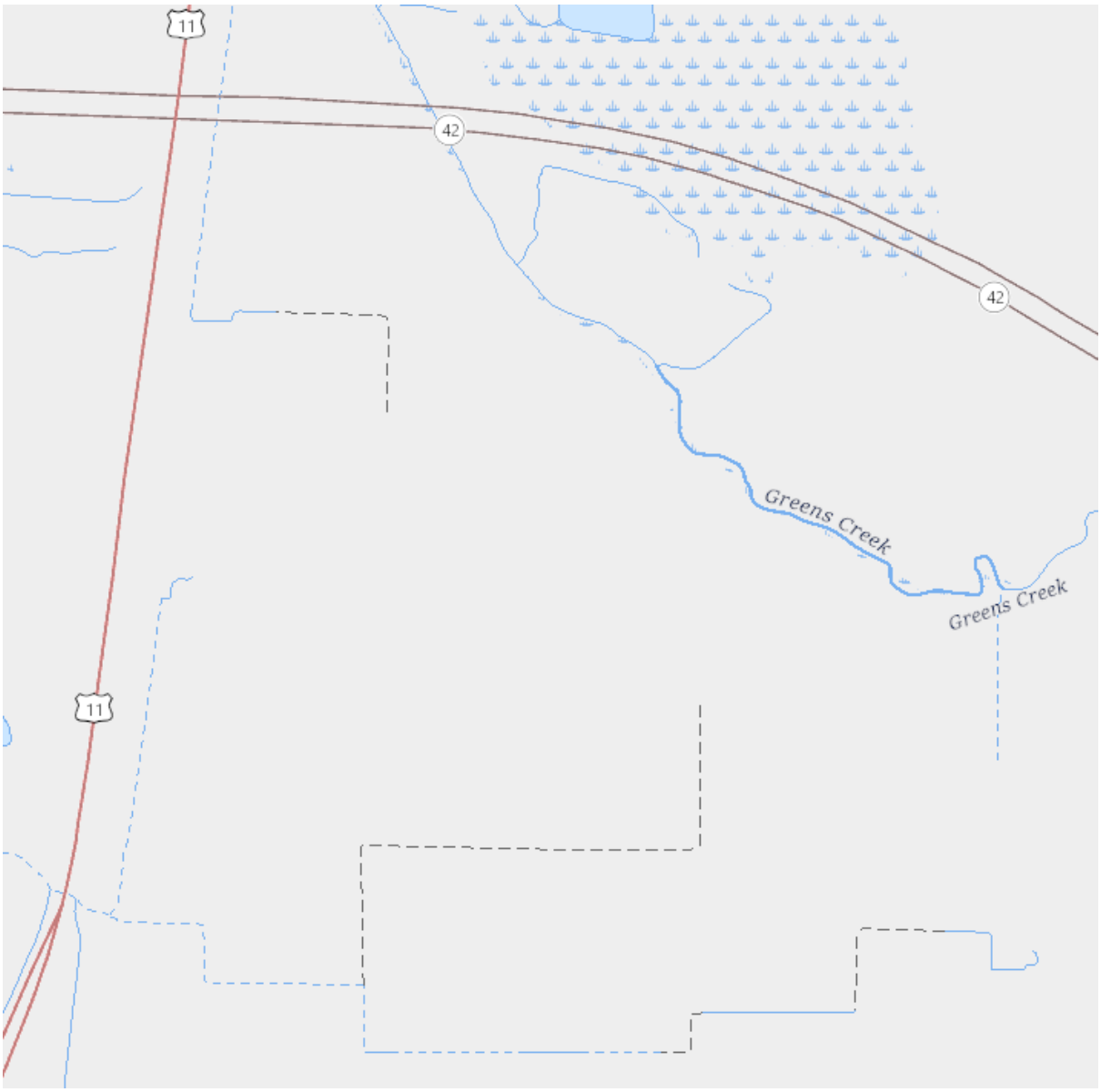


On 8/20/21 work was completed on N Railroad St. The work was done on the train side of the tracks and will not have a positive effect on any homes or businesses. This work will not help the area as a whole. No reason or methodology was given for the selection of this project. This project has the potential to slow the flow of water exiting residential areas. The blue line marked below shows the criticized work while the red lines show work that was requested by the elected alderman for the area. The work did need to get done eventually, however, it was clearly not a priority and should have been done much later in the process.

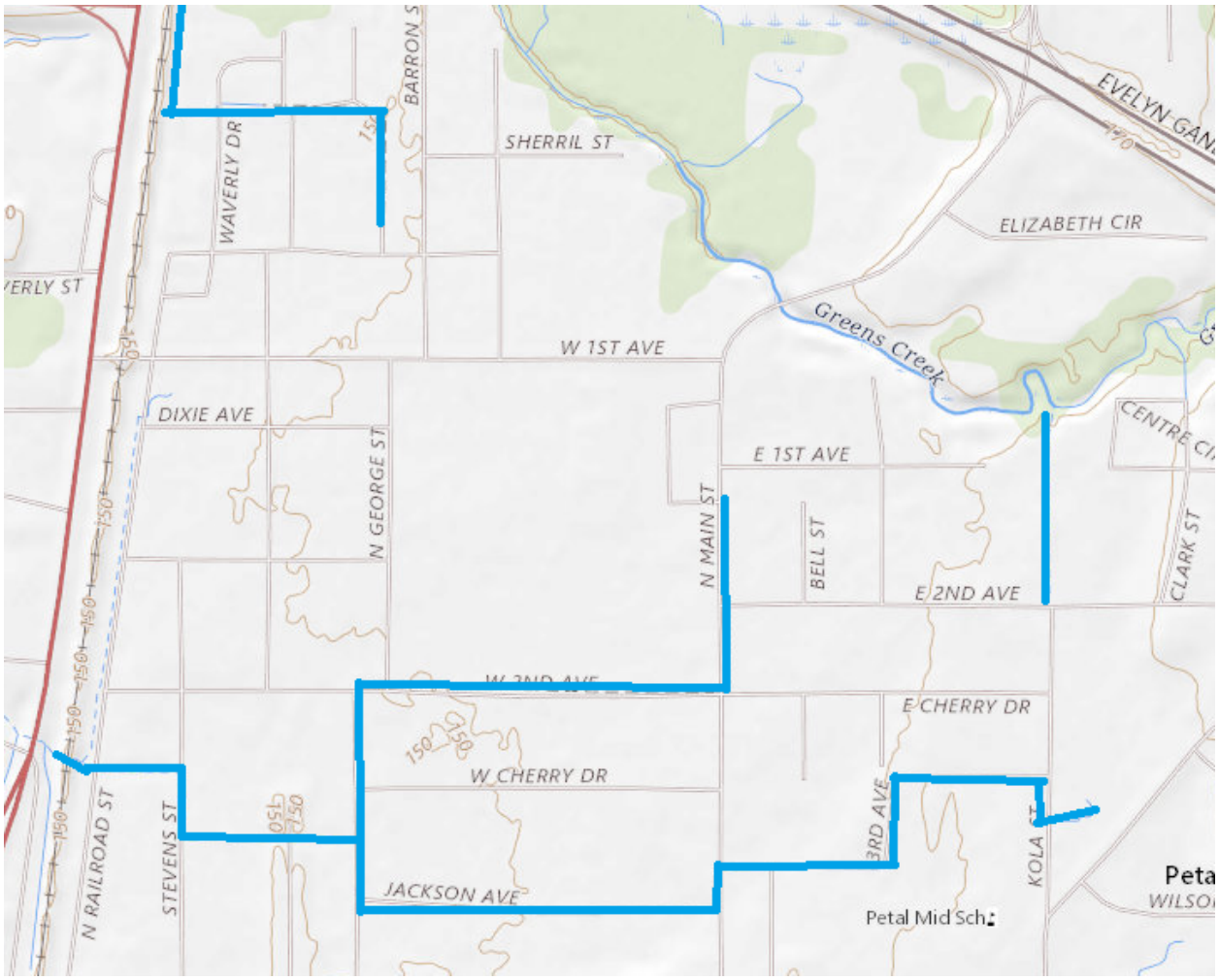
On 6/2/20 work was completed on Stevens St. The work did not have a positive effect on any homes or businesses and did make the problem worse. Several ditches were dug, on both sides of the street, but did not have any outlet. These ditches have no flow and hold water for days after a rain. Although the work was started by a citizen complaint, that complaint was retracted and work was requested to stop, before it was started, by the original complantant. The author of this plan tried to have the work stopped, with the support of all owners of all affected properties. He even went so far as to stand in front of a bulldozer to halt the work. However, the work was done while residents were at work later in the week. The work was started in an “upstream position” and therefore is unable to drain out. The work did not follow local ordinance in regard to slope and is now impossible to mow. A water line was exposed and remains exposed (right bottom photo). This work demonstrates a disconnect between decision making and residents of the area and is unacceptable.

3.0 Methods and Reasoning

Input was gathered from residents, FEMA charts and maps, U.S. Geological Survey maps, video during rain storms, personal data gathering, weather reports and records, as well as newspaper articles. During this study, an old drainage infrastructure was found. The best representation of this old system was found in the USGS mapping system as shown below.



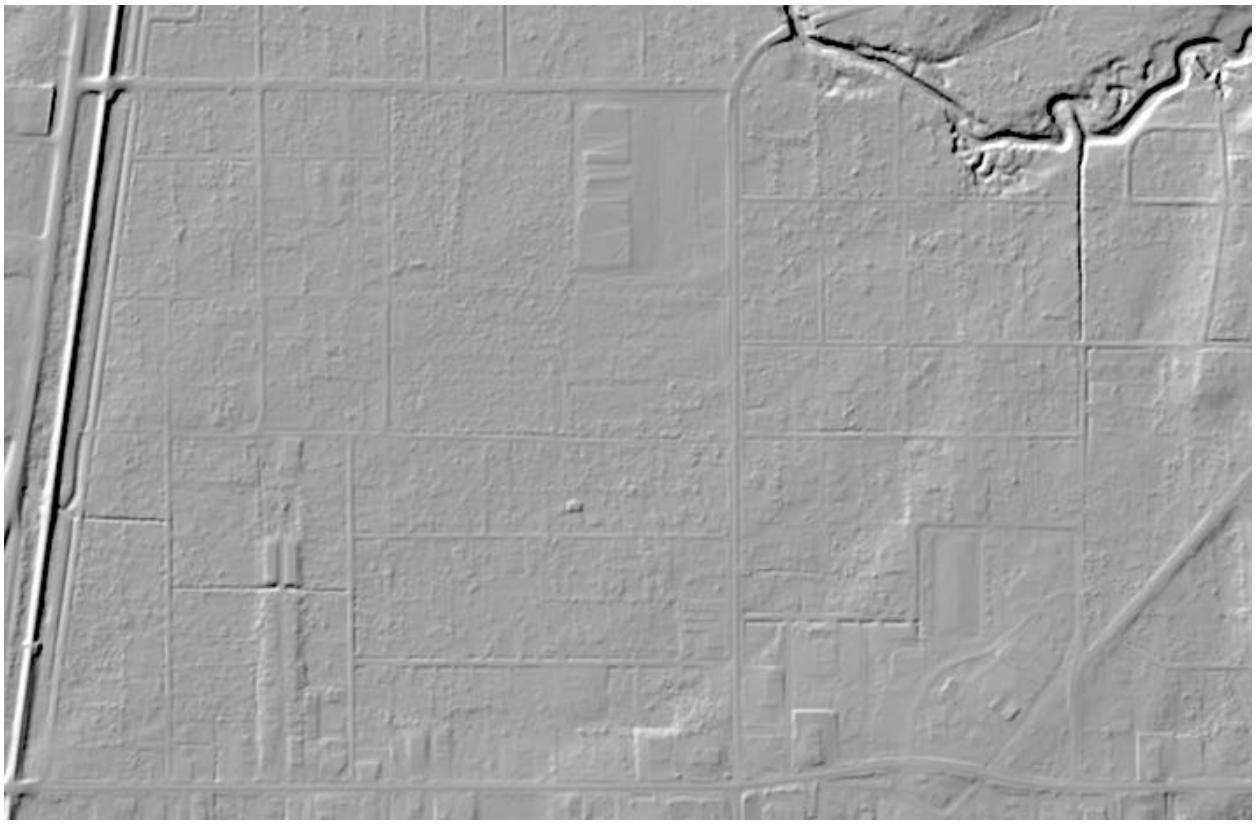
To help understand where these forgotten waterways are in relation to our streets we can overlay them on a road map as seen in the bottom map.



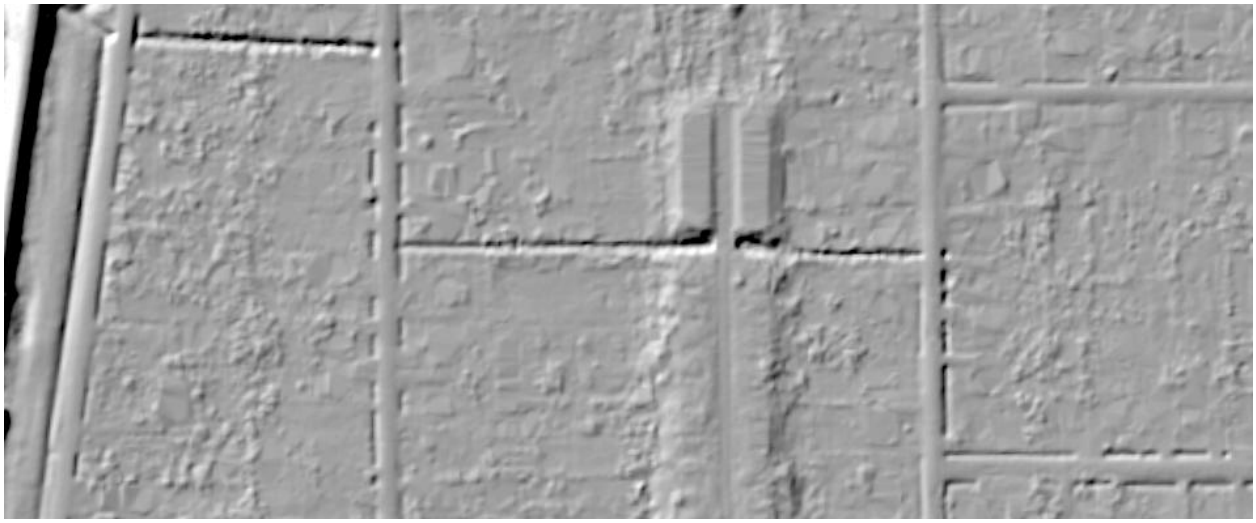
This is the first phase of the Steele Plan. The restoration of this old drainage system will have a major positive impact on the entire area. Some of these lines need repairs and modification while others need very little, but in the first phase we must focus on cleaning and reactivating these lines in order to see how the water flows to better determine where repairs and modifications should take place.

A further inspection of these above artifacts and firsthand exploration revealed that this designated area currently only has two major water exits working; through the railroad tracks to the west and Greens Creek. However, the third major water exit, as shown below, is not currently working. Repairing this old ditch would provide relief to those near Woodside Dr and also create a much needed third major water exit that would ultimately help the entire zone. This project is part of the Steel plan and named the green line. It is the 4th highest priority.

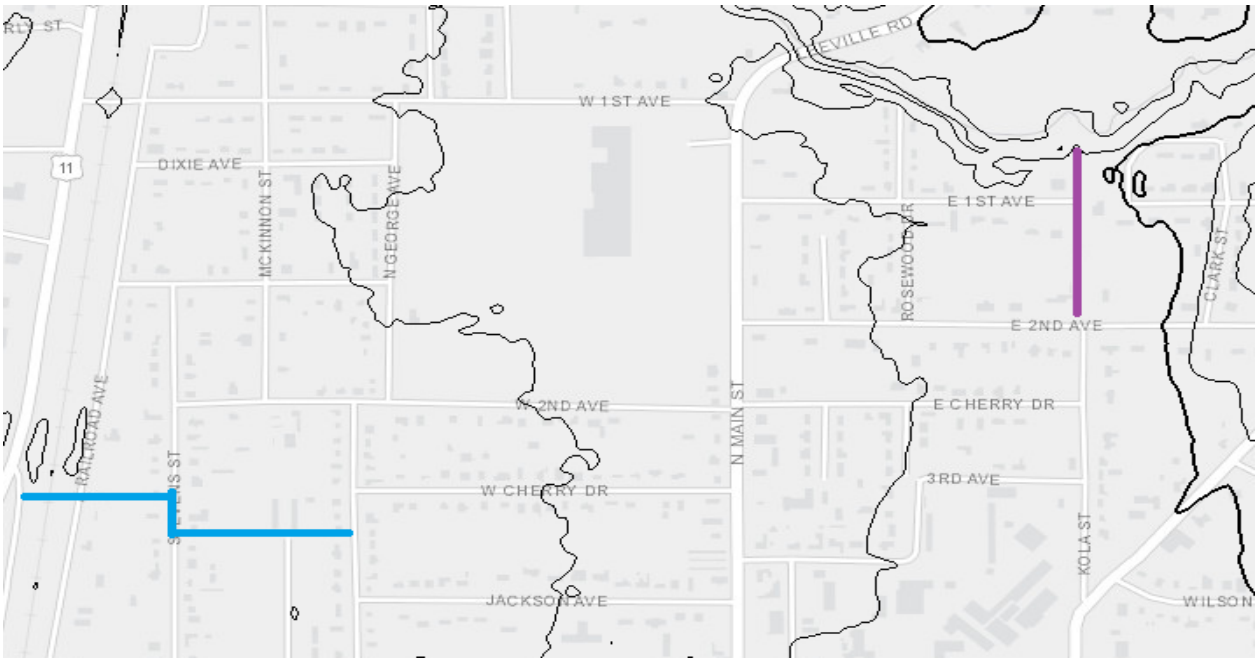
However, a look at USGS mapping again shows us that our priorities need to be very deliberate and calculated. The below images show surface contours and where our most important ditches are. The two horizontal lines in the South West corner and the deep vertical line in the north East corner are our main lines that feed directly into the only working major water exits.



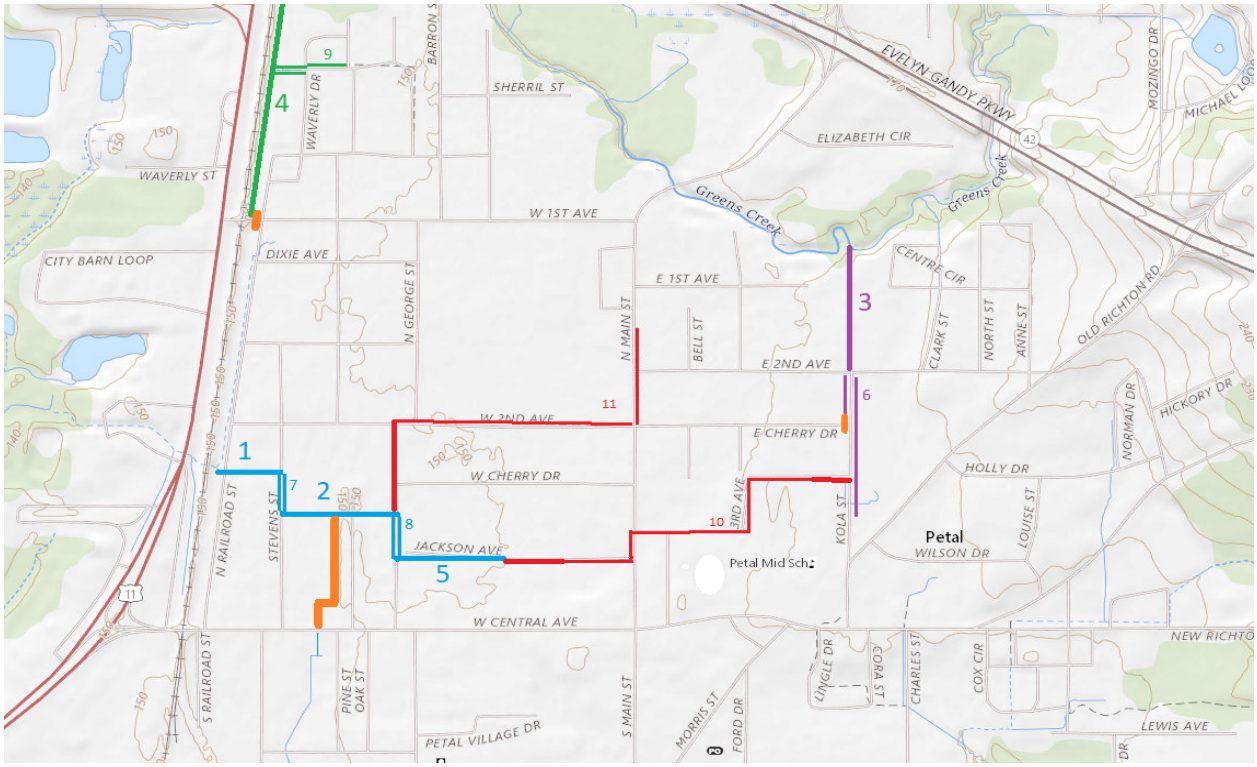
South West corner



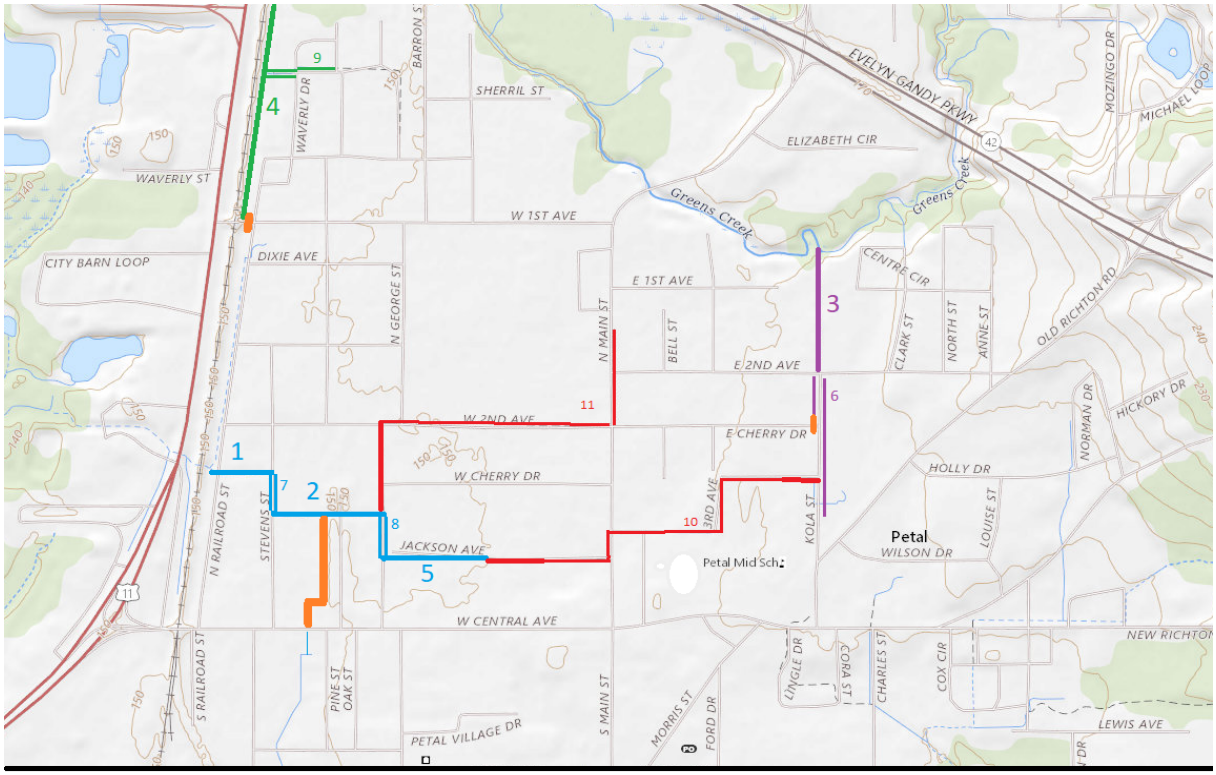
Based on the elevation of these two major water exits, a determination was made that the lower one likely “moves” more water. Below is a topographical map showing a slope to the west. This ranked these two lines as first and second priority, as they are extremely overgrown with vegetation, with the currently clogged Woodside Dr being second.



From this point a map was made that incorporated other projects and a prioritization order to clean ditches.



Some simplified explanations were added via a legend and added to the priority map. This was sent to the street department, mayor, and all aldermen. Support was expressed and work was started.



The blue line is the lowest part of the area, and it handles more flow then any other ditch, making it the first priority. Cleaning and maintaining these ditches will have positive impacts as far east as Old Richton Rd and as far north as the Gandy. This line is one of two main ways water can get out of this area at this time.

These are three major projects in planning. The first is a culvert under 1st st , the second is a culvert under E Cherry, and the last is a connection from the BlueLine to a pre existing culvert that passes under central. This will provide another much needed way for water to make it to the river. Currently there are only two outlets. I am waiting for the city engineer to finish a report.

This line will continue under the Gandy and connect into Greens Creek. This was functional at one time and shows up on old maps, but has not been maintained and needs to be redug at this point. This is only the first step for this area, but also the most important. This will provide yet another new way for water to escape the area.

These are old underground drainage pipes and drains that have filled with dirt. They are no longer working as they should and need to be cleaned out and repaired. They will also need to be properly connected into the existing infrastructure.

This is one of the two ways water can drain out of this area and it is in need of cleaning. The surrounding ditches will also need cleaning and some minor work to make sure they flow out to Greens Creek.

* Numbers show order of progression and priority. The orange lines are not included.

3.1 <u>Progress on Steele Plan phase 1</u>

Section 1 (Blue line)

Completed 9/1/21

The first section of the blue line (marked 1), as shown above, has been completed.

This was one of the more difficult ditches to clean.

It took two days to complete.

No extra expenses outside of regular payroll and equipment maintenance were needed.

Number of crew is unknown.
Number of hours is unknown

Section 2

Pending