City Council

Agenda Item

Subject: Acknowledgement of the Intent of City staff to appeal the preliminary FIRM maps released by FEMA.

Meeting: City Council - Sep 16 2024

From: Amanda Mack, City Manager

BACKGROUND INFORMATION:
FEMA has released the preliminary floodplain maps and started the formal 90-day review period on July 30, 2024. Staff have reviewed the maps and have significant concerns about the proposed base flood elevations (BFE) in several parts of town. Notably, along Lake Kampeska, in which the proposed BFE is 1720.5 feet, which is 4.3 feet lower than the current BFE of 1724.8 feet. Over the last 20 years, Lake Kampeska water level has exceeded the proposed BFE nine (9) times.

The City retained HDR Engineering to review the FEMA HEC-RAS model and provide additional concerns (see attached memo).

This motion is to acknowledge the intent of City staff to appeal the preliminary FIRM maps released by FEMA.

FINANCIAL CONSIDERATIONS:
N/A

OVERSIGHT / PROJECT RESPONSIBILITY:
Heath VonEye, Assistant City Manager/Public Works Director
Brandi Hanten, Community Development Manager
Justin Petersen, City Engineer

STAFF RECOMMENDATION / SUGGESTED MOTION:
Staff recommends approval of the following motion:

I move to Acknowledge of the Intent of City staff to appeal the preliminary FIRM maps released by FEMA.

ATTACHMENT(S):
Appeal Period Initiation Letter
Watertown FEMA Memo from HDR

U.S. Department of Homeland Security
Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267

FEMA

July 16, 2024

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 18-08-0048S

The Honorable Ried Holien
Mayor, City of Watertown
P.O. Box 910
Watertown, South Dakota 57201

Community: City of Watertown,
Codington County,
South Dakota

Community No.: 460016

APPEAL START

Dear Mayor Holien:

On February 22, 2022, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) provided your community with Preliminary copies of the revised Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for your community City of Watertown, Codington County, South Dakota and Incorporated Areas. FEMA has posted digital copies of these revised FIRM and FIS report materials to the following Website https://hazards.fema.gov/femaportal/prelimdownload/. The Preliminary FIRM and FIS report include proposed flood hazard information for certain locations in the City of Watertown. The proposed flood hazard information may include addition or modification of Special Flood Hazard Areas, the areas that would be inundated by the base (1-percent-annual-chance) flood; base flood elevations or depths; zone designations; or regulatory floodways.

We have published a notice of the proposed flood hazard determinations in the *Federal Register* and will publish a public notification concerning the appeal process (explained below) in the *Watertown Public Opinion* on or about July 23, 2024, and July 30, 2024. We will also publish a separate notice of the flood hazard determinations on the "Flood Hazard Determinations on the Web" portion of the FEMA Website (https://www.floodmaps.fema.gov/fhm/BFE_Status/bfe_main.asp). We have enclosed copies of the notice published in the *Federal Register* and the newspaper notice for your information.

These proposed flood hazard determinations, if finalized, will become the basis for the floodplain management measures that your community must adopt or show evidence of having in effect to qualify or remain qualified for participation in the National Flood Insurance Program (NFIP). However, before any new or modified flood hazard information is effective for floodplain management purposes, FEMA will

provide community officials and citizens an opportunity to appeal the proposed flood hazard information presented on the preliminary revised FIRM and FIS report posted to the above-referenced Website.

Section 110 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) is intended to ensure an equitable balancing of all interests involved in the setting of flood hazard determinations. The legislation provides for an explicit process of notification and appeals for your community and for private persons prior to this office making the flood hazard determinations final.

During the 90-day appeal period following the second publication of the public notification in the above-named newspaper, any owner or lessee of real property in your community who believes his or her property rights will be adversely affected by the proposed flood hazard determinations may appeal to you, or to an agency that you publicly designate. It is important to note, however, that the sole basis for such appeals is the possession of knowledge or information indicating that the proposed flood hazard determinations are scientifically or technically incorrect. The appeal data must be submitted to FEMA during the 90-day appeal period. Only appeals of the proposed flood hazard determinations supported by scientific or technical data can be considered before FEMA makes its final flood hazard determination at the end of the 90-day appeal period. Note that the 90-day appeal period is statutory and cannot be extended. However, FEMA also will consider comments and inquiries regarding data other than the proposed flood hazard determinations (e.g., incorrect street names, typographical errors, omissions) that are submitted during the appeal period, and will incorporate any appropriate changes to the revised FIRM and FIS report before they become effective.

If your community cannot submit scientific or technical data before the end of the 90-day appeal period, you may nevertheless submit data at any time. If warranted, FEMA will revise the FIRM and FIS report after the effective date. This means that the revised FIRM would be issued with the flood hazard information presently indicated, and flood insurance purchase requirements would be enforced accordingly, until such time as a revision could be made.

Any interested party who wishes to appeal should present the data that tend to negate or contradict our findings to you, or to an agency that you publicly delegate, in such form as you may specify. We ask that you review and consolidate any appeal data you may receive and issue a written opinion stating whether the evidence provided is sufficient to justify an official appeal by your community in its own name or on behalf of the interested parties. Whether or not your community decides to appeal, you must send copies of individual appeals and supporting data, if any, to: r8commentsandappeals@fema.dhs.gov. Please reference the City of Watertown and 18-08-0048S in the subject line of email. If there is a hard copy component to the appeal package, send a notification to the aforementioned email address and send hard copies of the data to:

Madi Pluss, FEMA Region VIII
Denver Federal Center, Building 710
Post Office Box 25267
Denver, Colorado 80225-0267

Additional copy to:

Katie Gronsky, Regional Service Center, STARR II
Dewberry, 990 South Broadway, Suite 400
Denver, Colorado 80209
kgronsky@Dewberry.com

If we do not receive an appeal or other formal comment from your community in its own name within 90 days of the second date of public notification, we will consolidate and review on their own merits such appeal data and comments from individuals that you may forward to us, and we will make such modifications to the proposed flood hazard information presented on the revised FIRM and in the revised FIS report as may be appropriate. If your community decides to appeal in its own name, all individuals' appeal data must be consolidated into one appeal by you, because, in this event, we are required to deal only with the local government as representative of all local interests. We will send our final decision in writing to you, and we will send copies to the community floodplain administrator, each individual appellant, and the State NFIP Coordinator.

All appeal submittals will be resolved by consultation with officials of the local government involved, by an administrative hearing, or by submission of the conflicting data to an independent scientific body or appropriate Federal agency for advice. Use of a Scientific Resolution Panel (SRP) is also available to your community in support of the appeal resolution process when conflicting scientific or technical data are submitted during the appeal period. SRPs are independent panels of experts in hydrology, hydraulics, and other pertinent sciences established to review conflicting scientific and technical data and provide recommendations for resolution. An SRP is an option after FEMA and community officials have been engaged in a collaborative consultation process for at least 60 days without a mutually acceptable resolution of an appeal. Please refer to the enclosed "Scientific Resolution Panels" fact sheet for additional information on this resource available to your community.

FEMA will make the reports and other information used in making the final determination available for public inspection. Until the conflict of data is resolved and the revised FIRM becomes effective, flood insurance available within your community will continue to be available under the effective NFIP map, and no person shall be denied the right to purchase the applicable level of insurance at chargeable rates.

The decision by your community to appeal, or a copy of its decision not to appeal, should be filed with this office no later than 90 days following the second publication of the flood hazard determination notice in the above-named newspaper. Your community may find it appropriate to call further attention to the proposed flood hazard determinations and to the appeal procedure by using a press release or other public notice.

If warranted by substantive changes, during the appeal period we will send you Revised Preliminary copies of the revised FIRM and FIS report. At the end of the 90-day appeal period and following the resolution of any appeals and comments, we will send you a Letter of Final Determination, which will finalize the flood hazard information presented on the revised FIRM and FIS report and will establish an effective date.

If you have any questions regarding the proposed flood hazard determinations, revised FIRM panels, or revised FIS report for your community, please call our FEMA Mapping and Insurance eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627) or e-mail the FMIX staff at FEMA-FMIX@fema.dhs.gov.

Sincerely,

Jeanine D. Petterson

Jeanine D. Petterson
FEMA Region VIII Mitigation Division Director

List of Enclosures:

Newspaper Notice
Proposed Flood Hazard Determinations *Federal Register* Notice
"Scientific Resolution Panels" Fact Sheet

cc: Brandi Hanten, Community Development Manager, City of Watertown
Community Map Repository (w/o enclosures)
Madi Pluss, FEMA Region VIII Risk MAP Specialist (w/o enclosures)
Robert Liska, FEMA Region VIII FM&I Specialist (w/o enclosures)

DEPARTMENT OF HOMELAND SECURITY

FEDERAL EMERGENCY MANAGEMENT AGENCY

Proposed Flood Hazard Determinations for Codington County, South Dakota and Incorporated Areas

The Department of Homeland Security's Federal Emergency Management Agency has issued a preliminary Flood Insurance Rate Map (FIRM), and where applicable, Flood Insurance Study (FIS) report, reflecting proposed flood hazard determinations within Codington County, South Dakota and Incorporated Areas. These flood hazard determinations may include the addition or modification of Base Flood Elevations, base flood depths, Special Flood Hazard Area boundaries or zone designations, or the regulatory floodway. Technical information or comments are solicited on the proposed flood hazard determinations shown on the preliminary FIRM and/or FIS report for Codington County, South Dakota and Incorporated Areas. These flood hazard determinations are the basis for the floodplain management measures that your community is required to either adopt or show evidence of being already in effect in order to qualify or remain qualified for participation in the National Flood Insurance Program. However, before these determinations are effective for floodplain management purposes, you will be provided an opportunity to appeal the proposed information. For information on the statutory 90-day period provided for appeals, as well as a complete listing of the communities affected and the locations where copies of the FIRM are available for review, please visit FEMA's website at https://www.floodmaps.fema.gov/fhm/BFE_Status/bfe_main.asp or call the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-FEMA MAP (1-877-336-2627).

Mitigation Administration, FEMA, 400 C Street SW, Washington, DC 20472, (202) 646–7659, or (email) *patrick.sacbibit@fema.dhs.gov;* or visit the FEMA Mapping and Insurance eXchange (FMIX) online at *https://www.floodmaps.fema.gov/fhm/fmx_main.html.*

SUPPLEMENTARY INFORMATION: FEMA proposes to make flood hazard determinations for each community listed below, in accordance with section 110 of the Flood Disaster Protection Act of 1973, 42 U.S.C. 4104, and 44 CFR 67.4(a).

These proposed flood hazard determinations, together with the floodplain management criteria required by 44 CFR 60.3, are the minimum that are required. They should not be construed to mean that the community must change any existing ordinances that are more stringent in their floodplain management requirements. The community may at any time enact stricter requirements of its own or pursuant to policies established by other Federal, State, or regional entities. These flood hazard determinations are used to meet the floodplain management requirements of the NFIP.

The communities affected by the flood hazard determinations are provided in the tables below. Any request for reconsideration of the revised flood hazard information shown on the Preliminary FIRM and FIS report that satisfies the data requirements outlined in 44 CFR 67.6(b) is considered an appeal. Comments unrelated to the flood hazard determinations also will be considered before the FIRM and FIS report become effective.

Use of a Scientific Resolution Panel (SRP) is available to communities in support of the appeal resolution process. SRPs are independent panels of experts in hydrology, hydraulics, and other pertinent sciences established to review conflicting scientific and technical data and provide recommendations for resolution. Use of the SRP only may be exercised after FEMA and local communities have been engaged in a collaborative consultation process for at least 60 days without a mutually acceptable resolution of an appeal. Additional information regarding the SRP process can be found online at *https://www.floodsrp.org/pdfs/srp_overview.pdf.*

The watersheds and/or communities affected are listed in the tables below. The Preliminary FIRM, and where applicable, FIS report for each community are available for inspection at both the online location *https://hazards.fema.gov/femaportal/prelimdownload* and the respective Community Map Repository address listed in the tables. For communities with multiple ongoing Preliminary studies, the studies can be identified by the unique project number and Preliminary FIRM date listed in the tables. Additionally, the current effective FIRM and FIS report for each community are accessible online through the FEMA Map Service Center at *https://msc.fema.gov* for comparison.

(Catalog of Federal Domestic Assistance No. 97.022, "Flood Insurance.")

Nicholas A. Shufro,

Assistant Administrator (Acting) for Risk Management, Federal Emergency Management Agency, Department of Homeland Security.

Community	Community map repository address
Mohave County, Arizona and Incorporated Areas Project: 20–09–0009S Preliminary Date: April 10, 2024	
City of Kingman	Engineering Department, 220 North 4th Street, Kingman, AZ 86401.
Unincorporated Areas of Mohave County	Mohave County Development Services, 3250 East Kino Avenue, Kingman, AZ 86409.
Codington County, South Dakota and Incorporated Areas Project: 18–08–0048S Preliminary Date: February 22, 2022 and March 29, 2024	
City of Watertown	City Hall, 23 2nd Street NE, Watertown, SD 57201.
Sisseton Wahpeton Oyate Tribe	Sisseton Wahpeton Oyate Emergency Management Office, 114 Lake Traverse Drive, Sisseton, SD 57262.
Town of Florence	City Finance Office, 220 Main Street, Florence, SD 57235.
Town of Henry	Town Hall, 210 Main Street, Henry, SD 57243.
Town of Kranzburg	Town Hall, 202 Hastings Avenue NW, Kranzburg, SD 57245.
Town of South Shore	Codington County Extension Complex, 1910 West Kemp Avenue, Watertown, SD 57201.
Unincorporated Areas of Codington County	Codington County Extension Complex, 1910 West Kemp Avenue, Watertown, SD 57201.

[FR Doc. 2024–14173 Filed 6–27–24; 8:45 am]
BILLING CODE 9110–12–P

DEPARTMENT OF HOMELAND SECURITY

[Docket No.: CISA–2024–0011]

Agency Information Collection Activities: CISA Gateway User Registration

AGENCY: Cybersecurity and Infrastructure Security Agency (CISA), Department of Homeland Security (DHS).

ACTION: 30-Day notice and request for comments; renewal, 1670–0009.

SUMMARY: DHS CISA Infrastructure Security Division (ISD), will submit the following information collection request (ICR) to the Office of Management and Budget (OMB) for review and clearance. CISA previously published this information collection request (ICR) in the **Federal Register** on April 24, 2024, for a 60-day public comment period. No comments were received by CISA. The purpose of this notice is to allow an additional 30 days for public comments.

DATES: Comments are encouraged and will be accepted until July 29, 2024. Submissions received after the deadline for receiving comments may not be considered.

ADDRESSES: Written comments and recommendations for the proposed information collection should be sent within 30 days of publication of this notice to *www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting "Currently under 30-day Review—Open for Public Comments" or by using the search function.

Memo

Date:	Wednesday, September 04, 2024
Project:	Watertown Preliminary FEMA Risk Maps
To:	City of Watertown
From:	Todd Yerdon, PE
Subject:	Watertown Preliminary FEMA Risk Map Comments

The City of Watertown (City) hired HDR to provide an initial review of the FEMA preliminary HEC-RAS models that were used to generate the preliminary FEMA Risk Maps developed for the City. The City has expressed their concerns to FEMA about various areas within the preliminary Risk Maps that do not correlate with past flooding events experienced in the area. Specific concerns regarding the lowering of the Base Flood Elevations (BFE) for both Lake Kampeska and Pelican Lake were expressed to FEMA. To this date, no revisions were made to the mapping based on the expressed concerns. The City is an active participant in the National Flood Insurance Program (NFIP) and desires to have accurately identified Special Flood Hazard Areas (SFHA) within the City's jurisdiction.

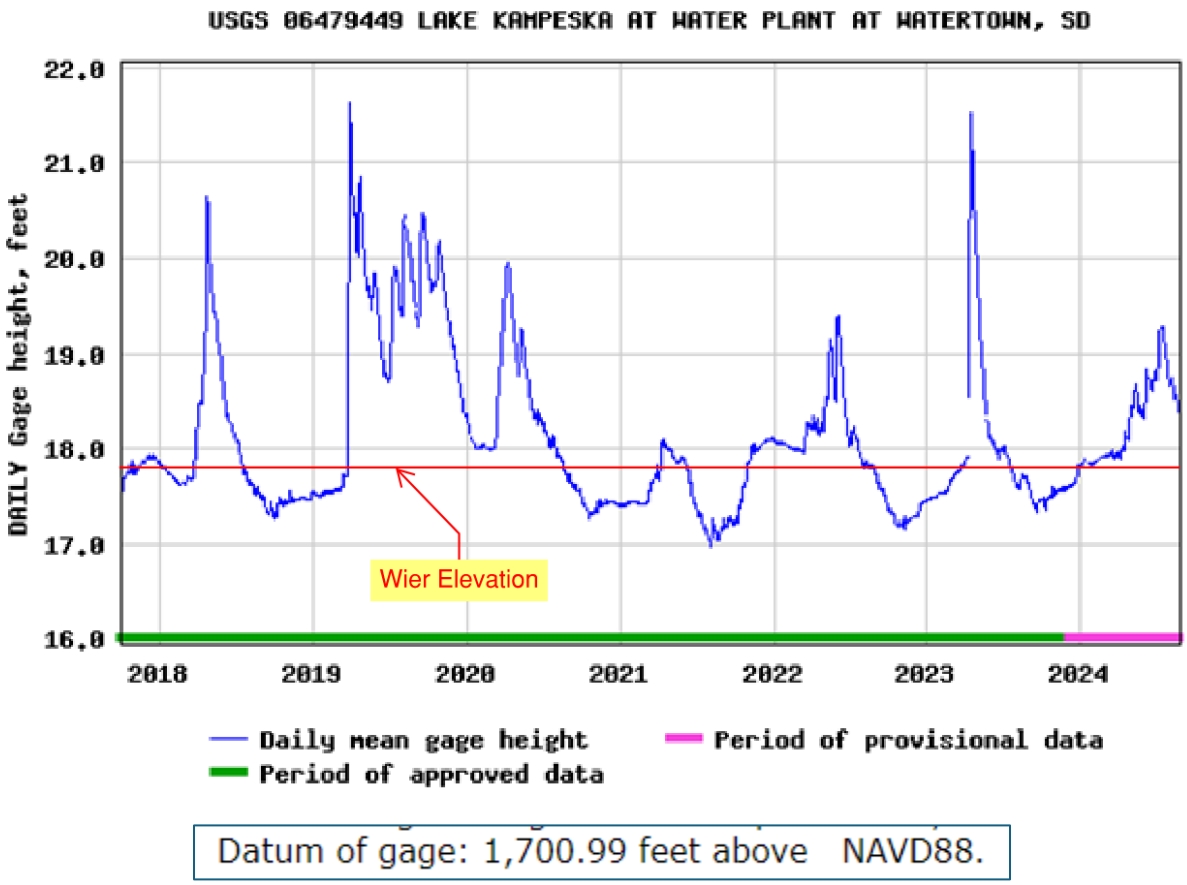
The City is part of a 2018 study to upgrade existing two-dimensional (2D) Base Level Engineering (BLE) models for select flooding sources to establish Zone AE SFHA. Specific areas upgraded include the Big Sioux River, Roby Creek, East Fork Roby Creek, Mud Creek Tributary, Willow Creek, Willow Creek Tributary, Lake Kampeska, and Pelican Lake. HDR's initial review focused on Lake Kampeska, Pelican Lake, Roby Creek and Big Sioux River. The following comments were identified during the review of the 2D enhanced model of the City:

1. **Existing Studies:** This study is intended to replace existing detailed studies within the Big Sioux River, Roby Creek, Lake Kampeska, and Pelican Lake. A detailed study must be supported by hydrology, hydraulics and terrain data that are consistent with the standards associated with a detailed study and demonstrate that the revised study is based on better data than was used with the previous study. Much of the data for the updated detailed studies in the City are derived from a lower level BLE analysis that is based on standards that are not consistent with current FEMA standards for a detailed study. Some of the supporting data also appears to be of lower quality than the original study.

2. **Terrain Quality:** Terrain data for this mapping and modeling effort uses "2012 Eastern South Dakota LiDAR" LiDAR (2012 LiDAR) dataset as noted in the supporting model development report. NOAA U.S. Interagency Elevation Inventory (https://coast.noaa.gov/inventory) lists this data source as having a vertical accuracy of 12.5 cm and of Quality Level (QL) 3 or lower data quality. In the "Guidance for Flood Risk Analysis and Mapping: Elevation Guidance" published by FEMA in 2016, FEMA notes that QL2 or better data is required for a detailed mapping project. The 2012 LiDAR dataset does not meet these standards. However, the 2021 Eastern P2 SD LiDAR (2021 LiDAR) data set is publicly available and meets the QL2 requirement laid out by the elevation guidance.

3. **Lake Kampeska Water Elevation:** The starting water elevation for Lake Kampeska appears to be modified by the modeling team in the model terrain because the model terrain is well below the LiDAR terrain water elevation. The lake elevation in the model terrain, elevation 1716.25 ft (NAVD88), is 2.7' below than the weir elevation in the model, and the weir elevation is the structure that regulates the water elevation in the lake.

   Gage data for Lake Kampeska from 2017 to 2024, as shown in the screen clip below, shows that the lake elevation has never been near elevation 1716.25 ft (NAVD88) (gage height 15.26), and for a significant period of time the water was above the weir elevation.

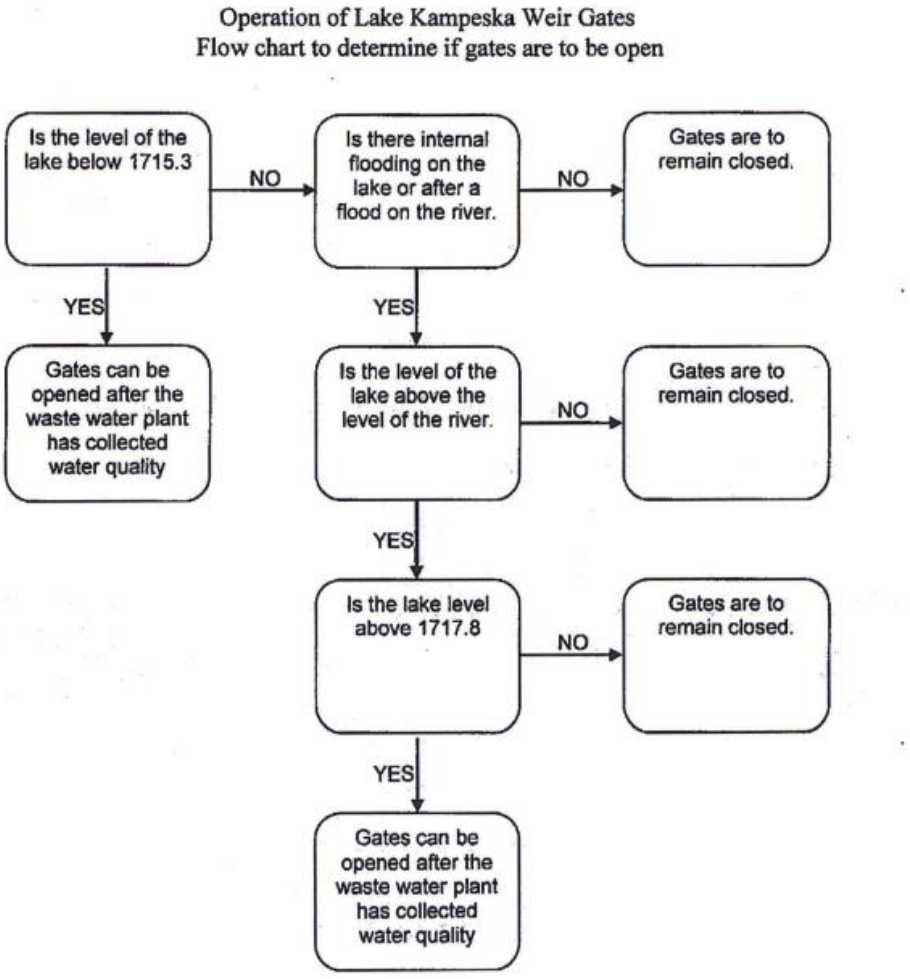


Lake Kampeska Gage Elevation from 2017 to 2024 with Datum Information

The operation of Lake Kampeska Weir Gate, as developed by the State and the USACE, establishes the normal lake water elevation for Lake Kampeska. The flow chart as shown in the screen clip below indicates that the standard operation typically has the gates closed until water reaches the top of the weir elevation at 1718.8 ft (NAVD 88). For risk map development, a starting elevation of 1718.8 ft (NAVD88) should be utilized since, at any given time during the year, water elevations could be at that elevation with no weir gates open. Any water elevation less than the weir elevation provides additional storage volume in the lake, and that additional storage volume cannot be guaranteed at any given time based on how the gates are operated. Starting the model at elevation 1716.25 ft (NAVD88) provided a significant amount of excess storage in the lake and diminishes the peak elevation of the lake in the model run which does not represent the real condition at the lake. It appears for this study that no background research was performed on the operation of the lake elevation which plays a significant role in establishing the BFE for the lake. The modeling

team should review the lake operation and revise the starting water elevation on the lake to be 1718.8 ft (NAVD88) which represents the top of weir elevation.

NGVD 29 datum



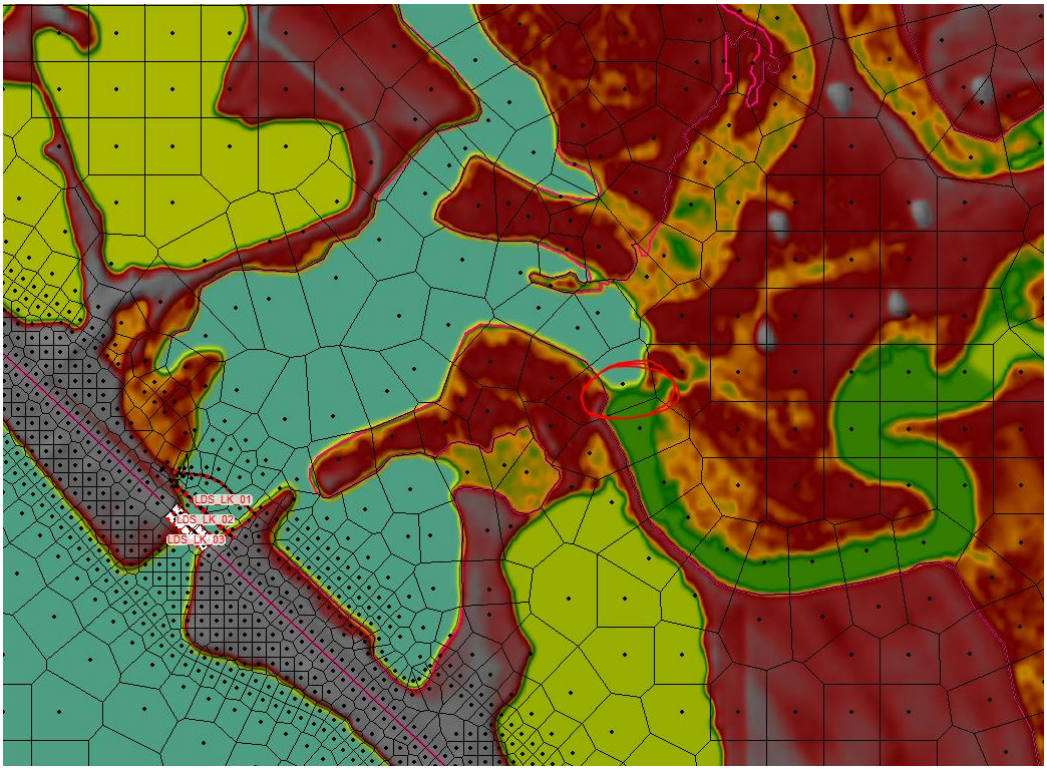
Operation of Lake Kampeska Weir Gates Flow Chart

4. **Lake Kampeska Downstream Terrain:** The starting water elevation for ponding areas downstream of Lake Kampeska appears to be modified by the modeling team in the model terrain because the model terrain is well below the LiDAR water terrain and no documentation indicates that survey was gathered for the bathymetry. The downstream water elevation in the model terrain, elevation 1716.25 ft (NAVD88), is approximately 1.57' below the downstream weir elevation (based on LiDAR). The artificially low elevation provides more water volume storage in the model and likely diminishes the peak flow elevation on the downstream side of the lake.

5. **Lake Kampeska Downstream Weir:** There is a weir downstream of Lake Kampeska on the Big Sioux River that is not modeled in the HEC-RAS model. The weir location is shown on the screen clip below. The weir impacts the Big Sioux River water elevations at the Lake Kampeska/Big Sioux River weir. Negating critical weir structures on the Big Sioux River which helps establish the lake BFE causes the Lake Kampeska BFE to be inaccurate. Not taking into consideration a critical weir structure also does not follow the "Guidance for Flood Risk Analysis and Mapping: General Hydraulics Considerations" published by FEMA in 2016 which states that the impact of hydraulic structures should be considered.

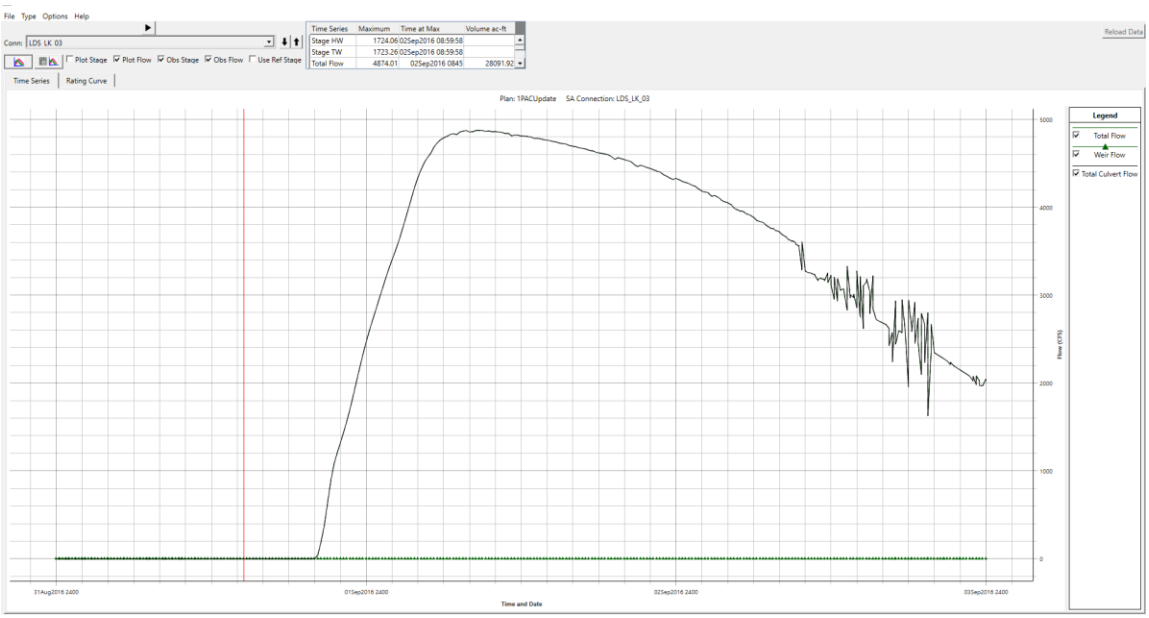
Lake Kampeska Weir Location Not Modeled

It should also be pointed out that at the location of the said weir, the modeling team developed a leaky cell across the said weir location which compounds the inaccuracy of the water elevations upstream on the Big Sioux River and Lake Kampeska. When establishing BFE's in a detailed analysis, leaky cells should not be utilized since the leaky cells generate inaccurate results for water conveyance. The leaky cell is shown in the screen clip below.

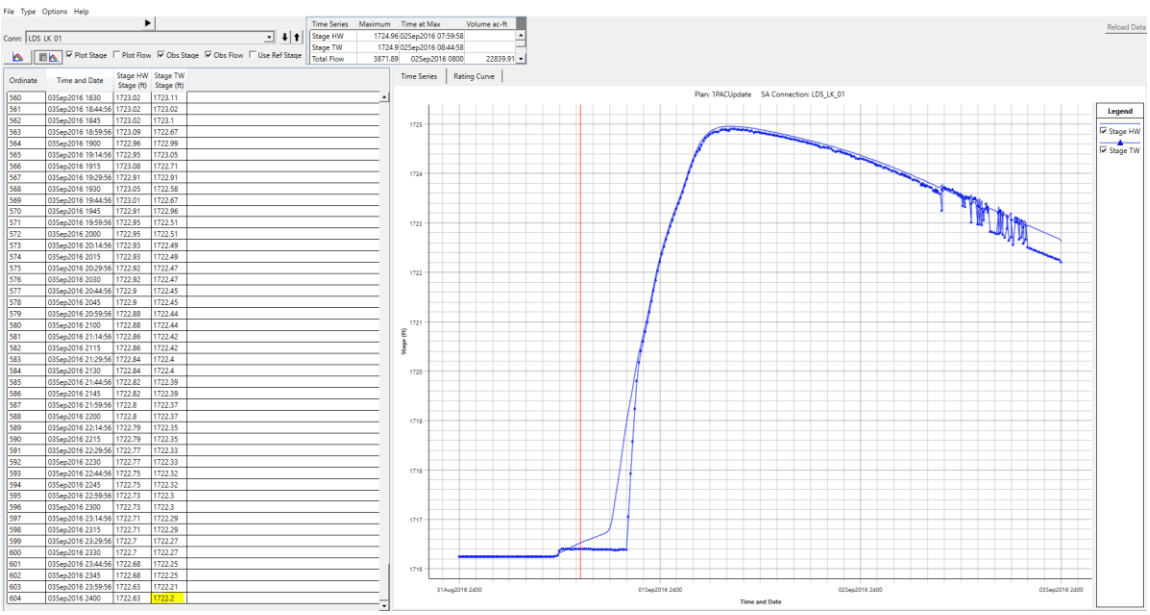


Big Sioux River Downstream Leaky Cell at Weir Structure

6. **Lake Kampeska BFE:** The BFE established for Lake Kampeska does not represent the peak water elevation of the lake according to the HEC-RAS model developed for the preliminary mapping. When reviewing the hydrographs results for flow entering Lake Kampeska at the Highway 20 bridge, it is evident the modeling team ended the model run prior to Lake Kampeska reaching the maximum BFE. The hydrograph shows that the lake is continuing to fill when the model run ended with approximately 2,000 cfs still entering the lake. The water elevation on the Big Sioux River side of the weir (1722.63 ft (NAVD88)) is higher than the Lake Kampeska water elevation (1720.52 ft (NAVD88)) at the end of the model run which means water was still entering into the lake and the actual BFE will be likely higher than 1720.5 ft (NAVD88) as shown on the preliminary mapping.

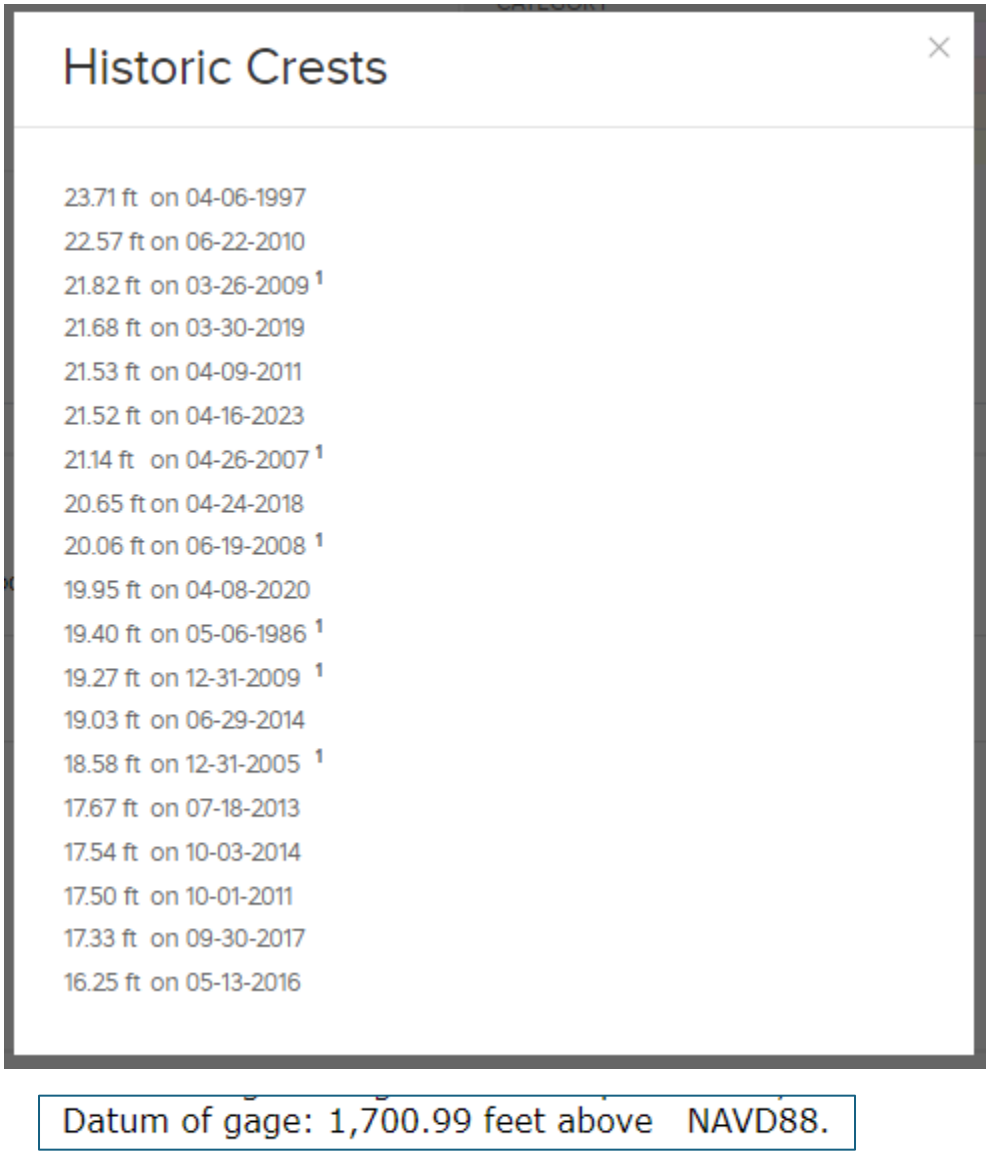


Flow Hydrograph at Highway 20



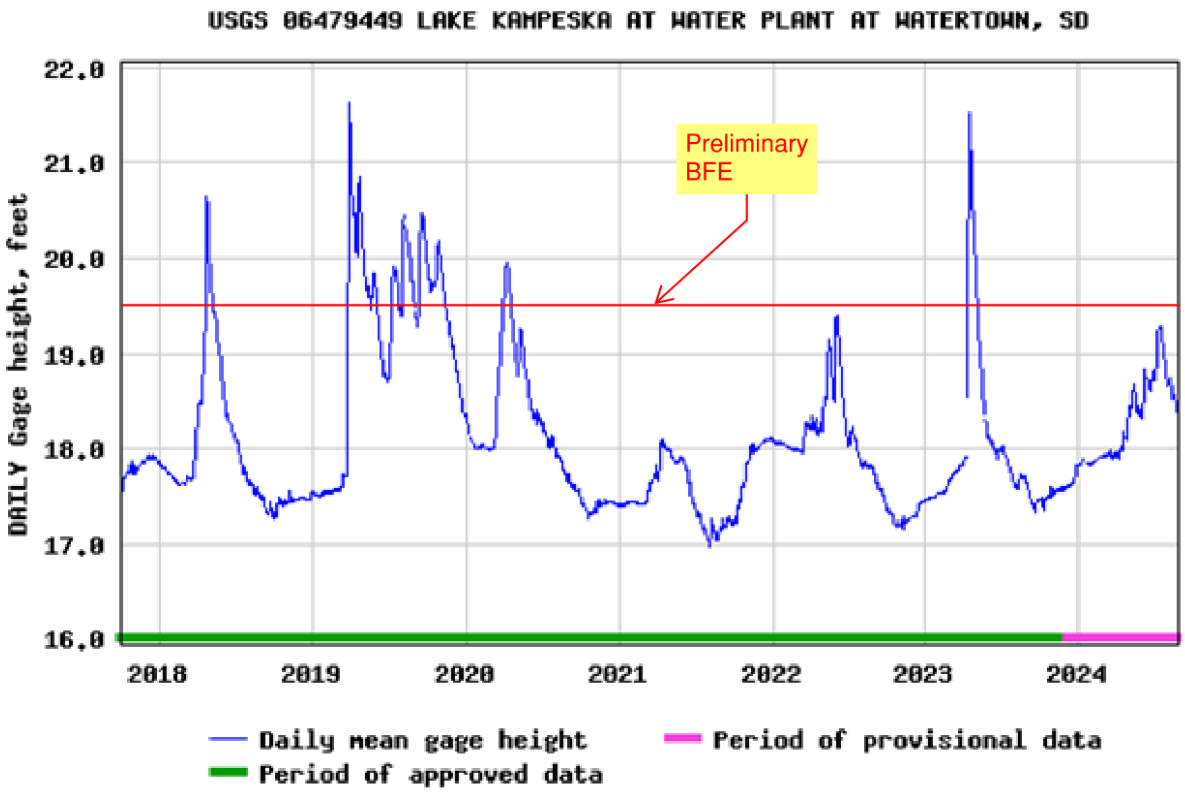
Water Elevation on the Big Sioux River at the Wier

7. **Lake Kampeska BFE:** The BFE developed for Lake Kampeska (1720.5 ft (NAVD88)) does not appear to represent the statistical 1% lake elevation. Gage data at Lake Kampeska demonstrates that lake elevations have reached elevation 1720.5 ft (NAVD88) (gage height 19.51) or greater 9 times in the last 20 years. According to the preliminary mapping, residents have experienced 1% lake levels 45% of the time over the last 20 years. The historical crests for the lake are shown in the screen clip below.



Historical Lake Crests

When looking at the USGS data from 2018 to 2024, the lake has been above the preliminary BFE 7 times as shown in the screen clip below.

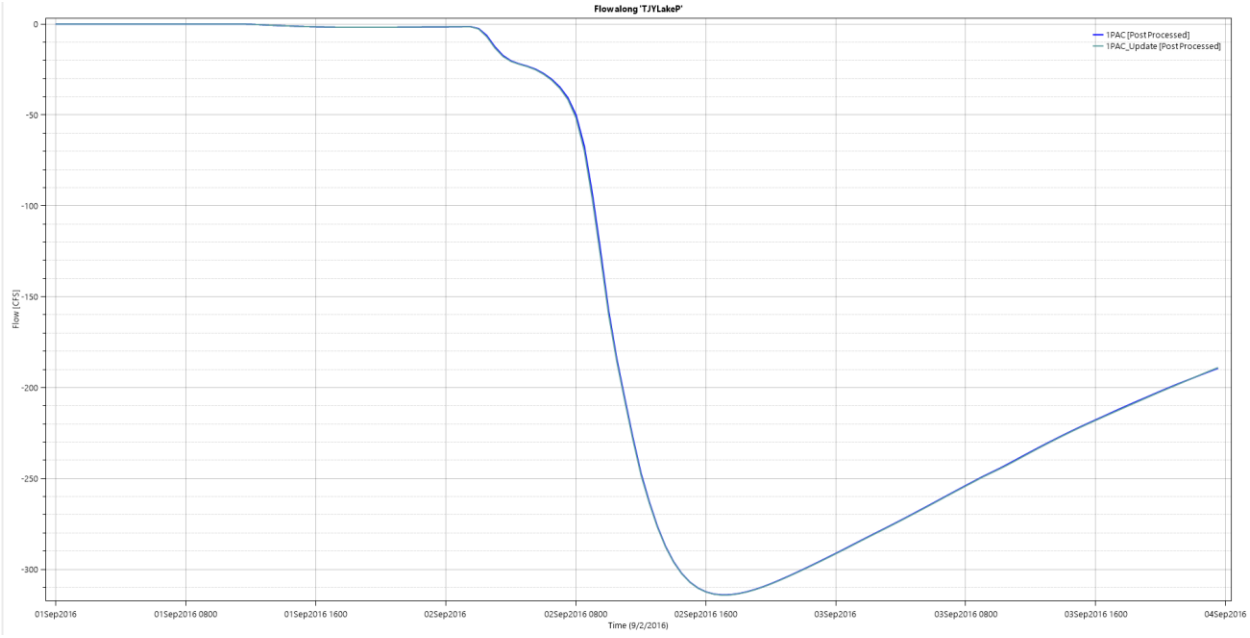


USGS Gage Data vs. Preliminary BFE

The modeling provided for the preliminary mapping project evaluated the peak water elevation for Lake Kampeska as it relates to a 1% storm event in the basin. It appears from the dates of the large peak lake elevations shown in the above screen captures that snow melt and ice may play a critical role in determining the statistical 1% peak lake elevation for Lake Kampeska and should be considered with this study. With extensive development along the shoreline, wave runup should be evaluated as well. It appears the analysis provided for the preliminary maps does not statistically represent the 1% peak lake elevation, and the techniques used with this analysis might not be appropriate defining the lake BFE.

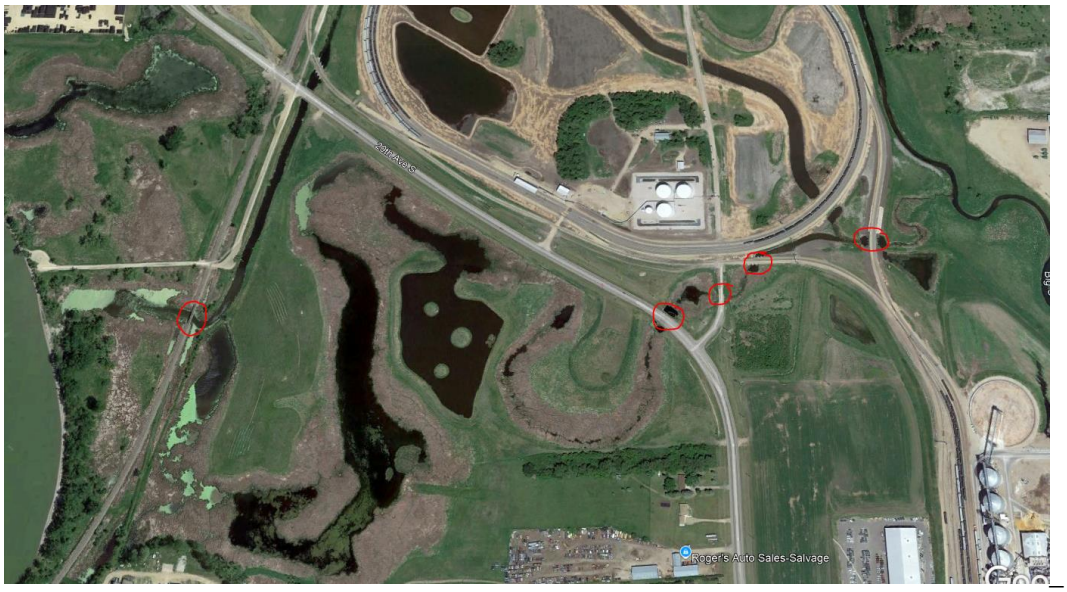
8. **Pelican Lake Water Elevation:** The starting water elevation for Pelican Lake appears to be modified by the modeling team in the model terrain because the model terrain is well below the LiDAR terrain water elevation. The lake elevation in the model terrain, elevation 1709.97 ft (NAVD88), is approximately 1.83' below the LiDAR water elevation 1711.8 ft (NAVD88). It was not apparent or documented how this elevation was determined. If the starting water elevation is below any normal water elevation for the lake, additional storage volume is provided for the lake which could create artificially lower BFE elevations for the lake; therefore, a normal water elevation for the lake needs to be established with this study. It appears the outlet for the lake is approximately elevation 1711.7 ft (NAVD88).

9. **Pelican Lake BFE:** The BFE established for Pelican Lake does not represent the peak water elevation of the lake according to the HEC-RAS model developed for the preliminary mapping. When reviewing the hydrographs results for flow entering Pelican Lake at the Pelican Lake Branch connection, it is evident the modeling team ended the model run prior to Pelican Lake reaching the maximum BFE. The hydrograph shows that the lake is continuing to fill when the model run ended with approximately 189 cfs still entering the lake. The water elevation on the Pelican Lake Branch (1713.61 ft (NAVD88)) is higher than the Pelican Lake water elevation (1711.79 ft (NAVD88)) at the end of the model run which means water was still entering into the lake and the actual BFE will be something higher than 1711.8 ft (NAVD88) as shown on the preliminary mapping.

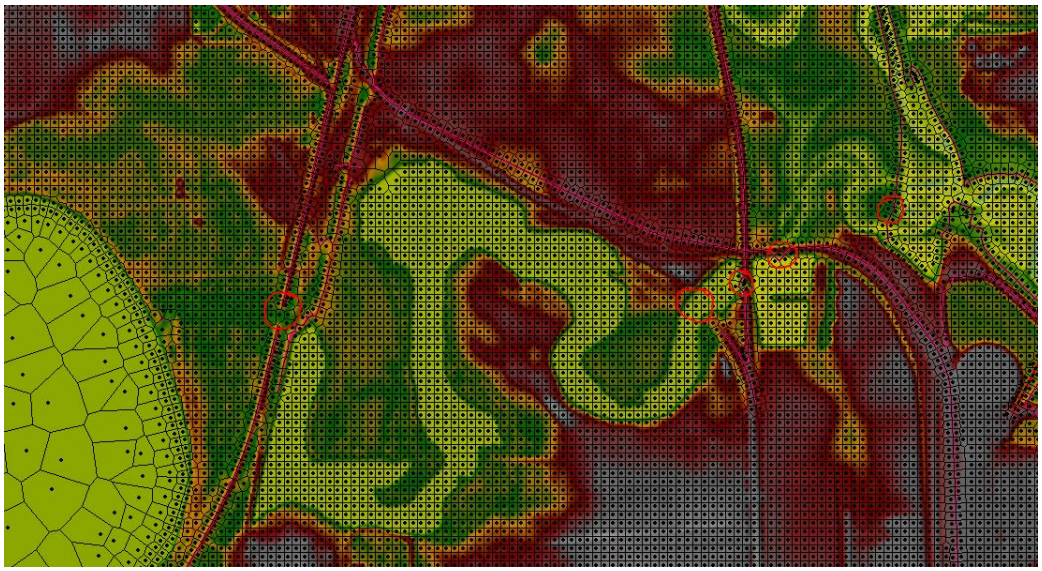


Flow Hydrograph at Pelican Lake

10. **Pelican Lake Branch Structures:** Pelican Lake Branch is identified as a Zone AE with floodway. The floodway has 5 structures associated with this reach, as shown in the screen clip below, and none of these structures are modeled as shown in the next screen clip below. These structures are visible in aerial imagery, but not incorporated in the model. It appears BLE level detail was used in this reach, and no refinement was made for an enhanced study. Ignoring critical structures does not follow the "Guidance for Flood Risk Analysis and Mapping: General Hydraulics Considerations" published by FEMA in 2016 which states that the impact of hydraulic structures should be considered.



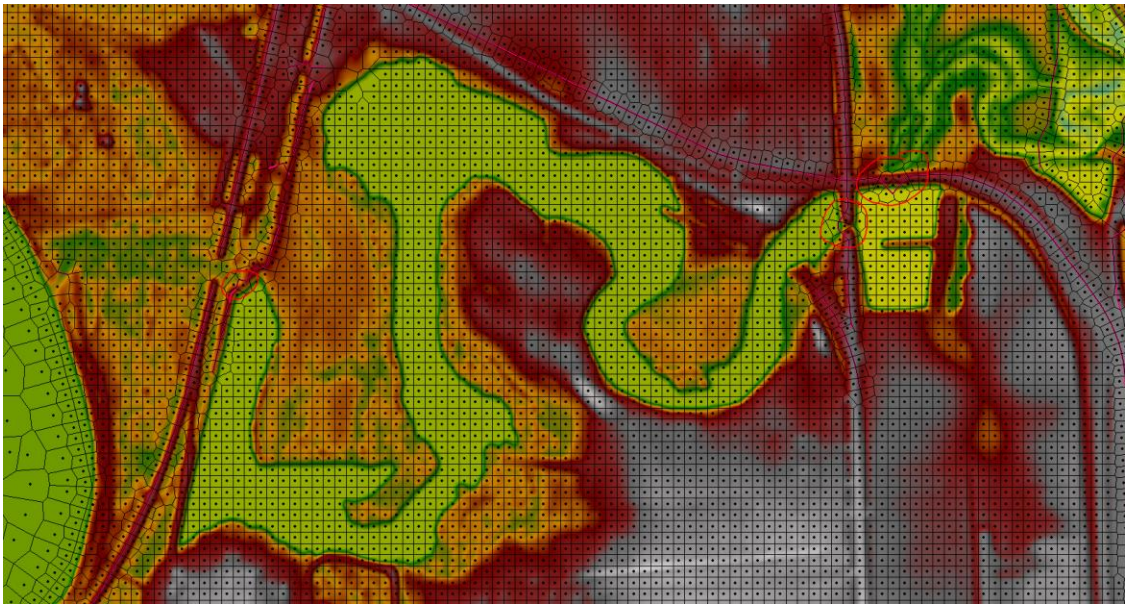
Pelican Lake Branch Structures



Pelican Lake Branch Missing Structures

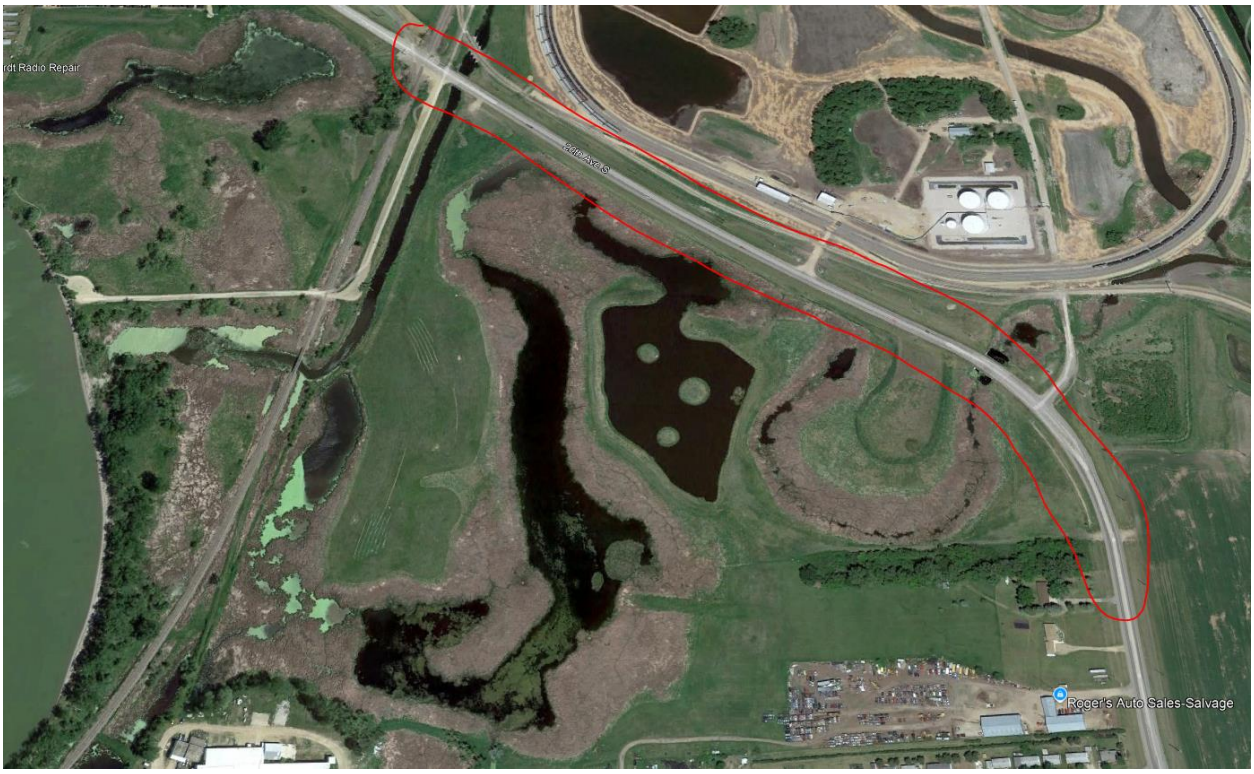
11. **Pelican Lake Branch Terrain:** The starting water elevation for ponding areas downstream of Pelican Lake appears to be modified by the modeling team in the model terrain the because model terrain is well below the LiDAR water terrain and no documentation indicates that survey was gathered for the bathymetry. The artificially low elevation provides more water volume storage in the model and likely diminishes the peak flow elevation on the downstream side of the lake.

12. **Pelican Lake Branch Leaky Cells:** Many of the missing structure locations have leaky cells at roadway or rail crossings. When establishing a Zone AE with floodway for a detailed analysis, leaky cells should not be utilized since the leaky cells generate inaccurate results for water conveyance. Example of leaky cells are shown in the screen clip below.



Pelican Lake Branch Leaky Cells

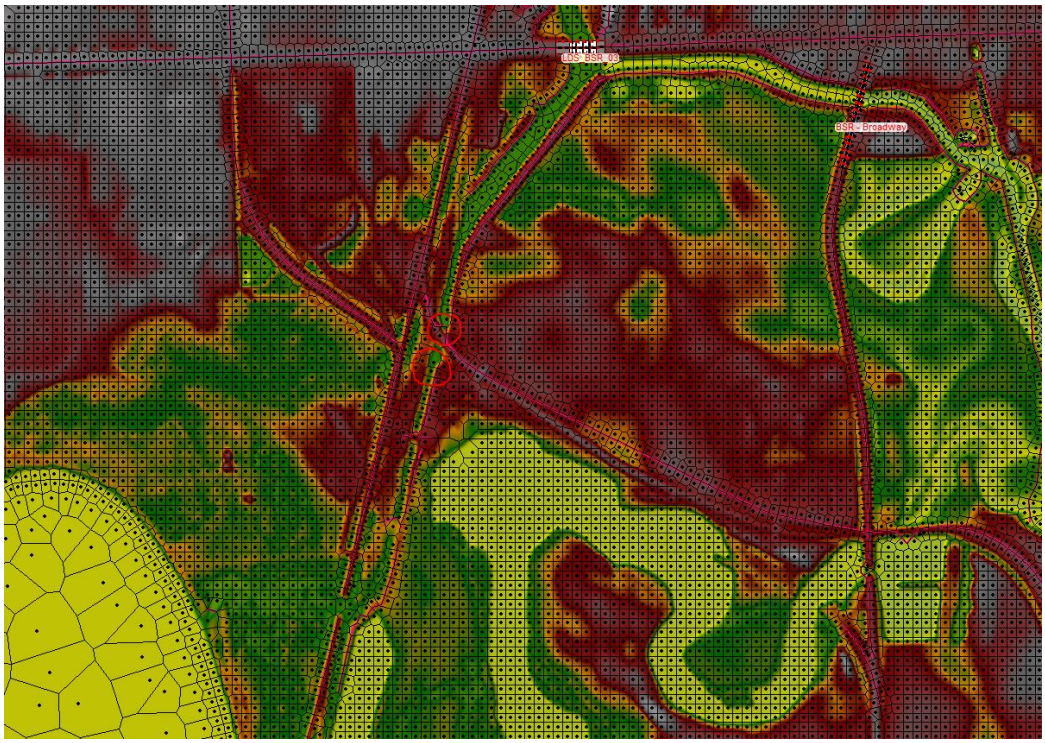
13. **20th Avenue South:** 20th Avenue South was constructed in 2012 and visible in aerial photography as shown in the clip below. The current modeling does not include the roadway embankment for 20th Avenue South which will have impacts on conveyance and water storage volume. As identified above, the roadway structures for the Pelican Lake Branch were also not incorporated into the model by the modeling team. The 2021 LiDAR captures the roadway embankment and should be used for by the modeling team for the preliminary mapping.



20th Avenue South Roadway Embankment

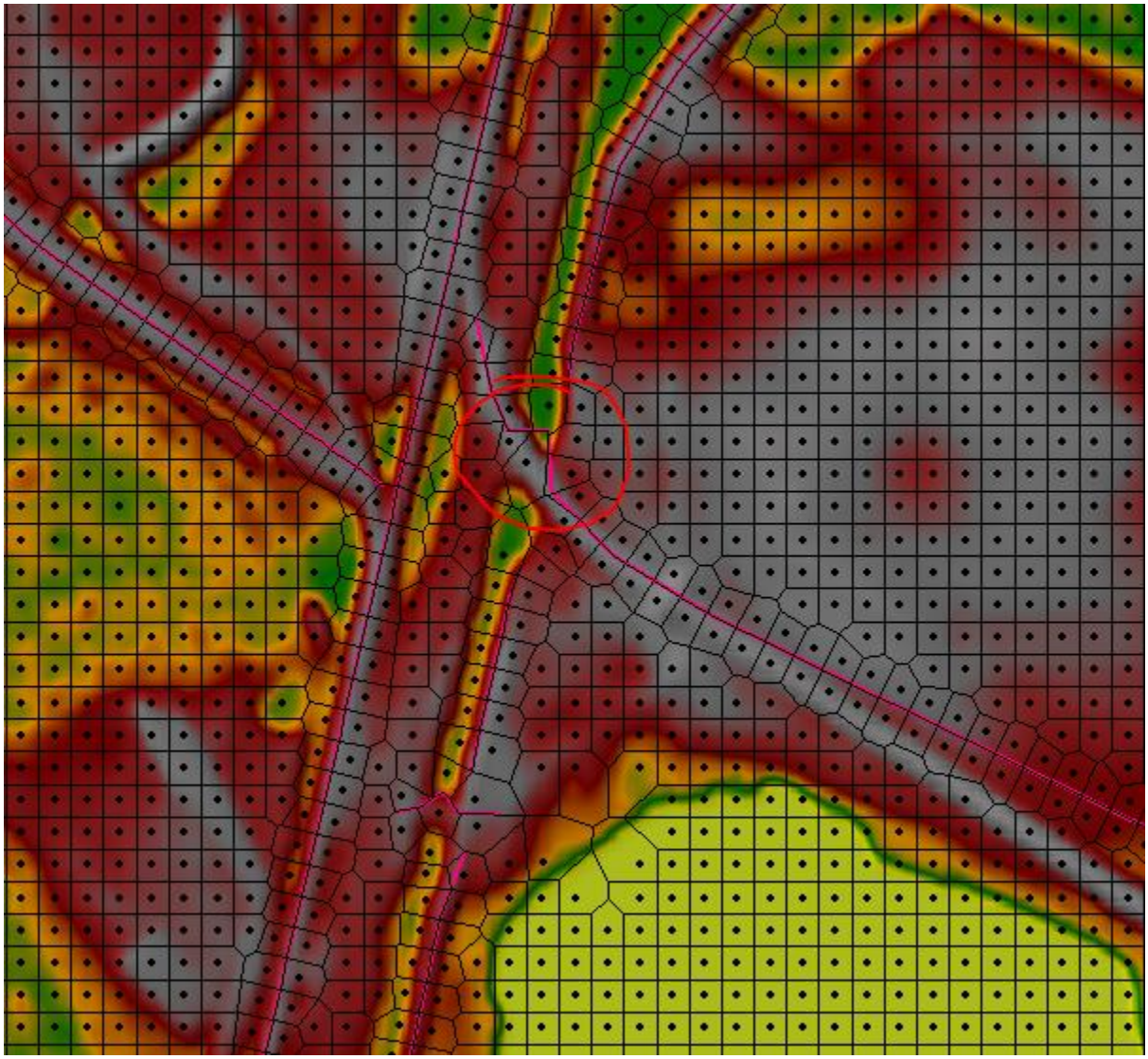
14. **Tributary to Pelican Lake Branch Structures:** Tributary to Pelican Lake Branch is identified as a Zone AE with floodway. The floodway has 2 conveyance structures associated with this reach, as shown in the screen clip below, and none of these structures are modeled as shown in the next screen clip below. These structures are visible in aerial imagery, but not incorporated into the model. It appears BLE level detail was used in this reach, and no refinement was made for an enhanced study. Ignoring critical structures does not follow the "Guidance for Flood Risk Analysis and Mapping: General Hydraulics Considerations" published by FEMA in 2016 which states that the impact of hydraulic structures should be considered.

Tributary to Pelican Lake Branch Structures



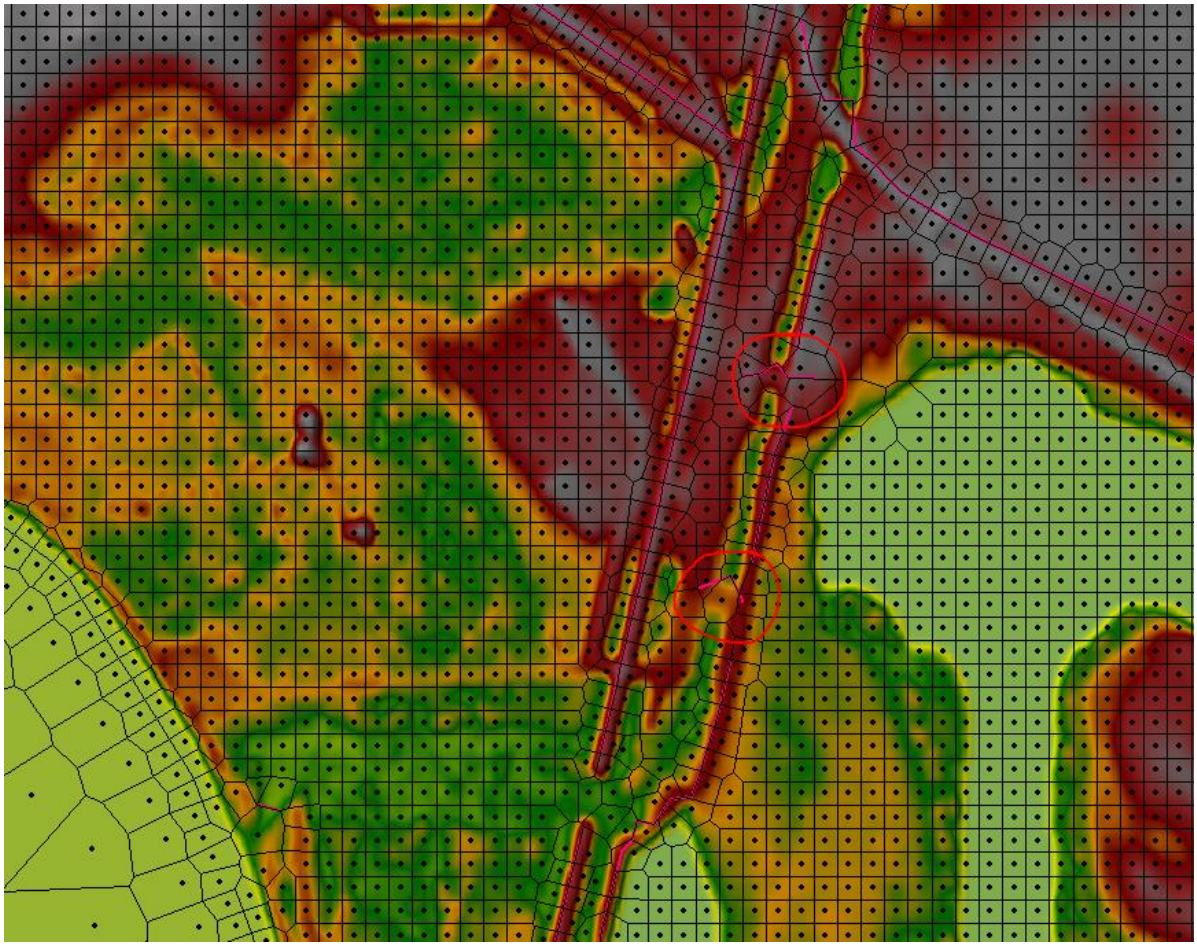
Tributary to Pelican Lake Branch Missing Structures

15. **Tributary to Pelican Lake Branch Leaky Cells:** One of the two missing structure locations on the Tributary to Pelican Lake has a leaky cell at the crossings, the other location does not even show the 20th Avenue South roadway embankment. When establishing a Zone AE with floodway for a detailed analysis, leaky cells should not be utilized since the leaky cells generate inaccurate results for water conveyance. Example of the leaky cell is shown in the screen clip below.



Pelican Lake Branch Leaky Cells

16. **Tributary to Pelican Lake Branch Terrain:** The terrain for the Tributary to Pelican Lake Branch is inaccurate. There are 2 locations where it looks like high ground crosses through the Tributary as shown in the screen clip below, but the aerial imagery in the following screen clip demonstrates no high ground is found in the channel. The 2021 LiDAR clearly represents the channel correctly and should be used for updates to the preliminary maps.



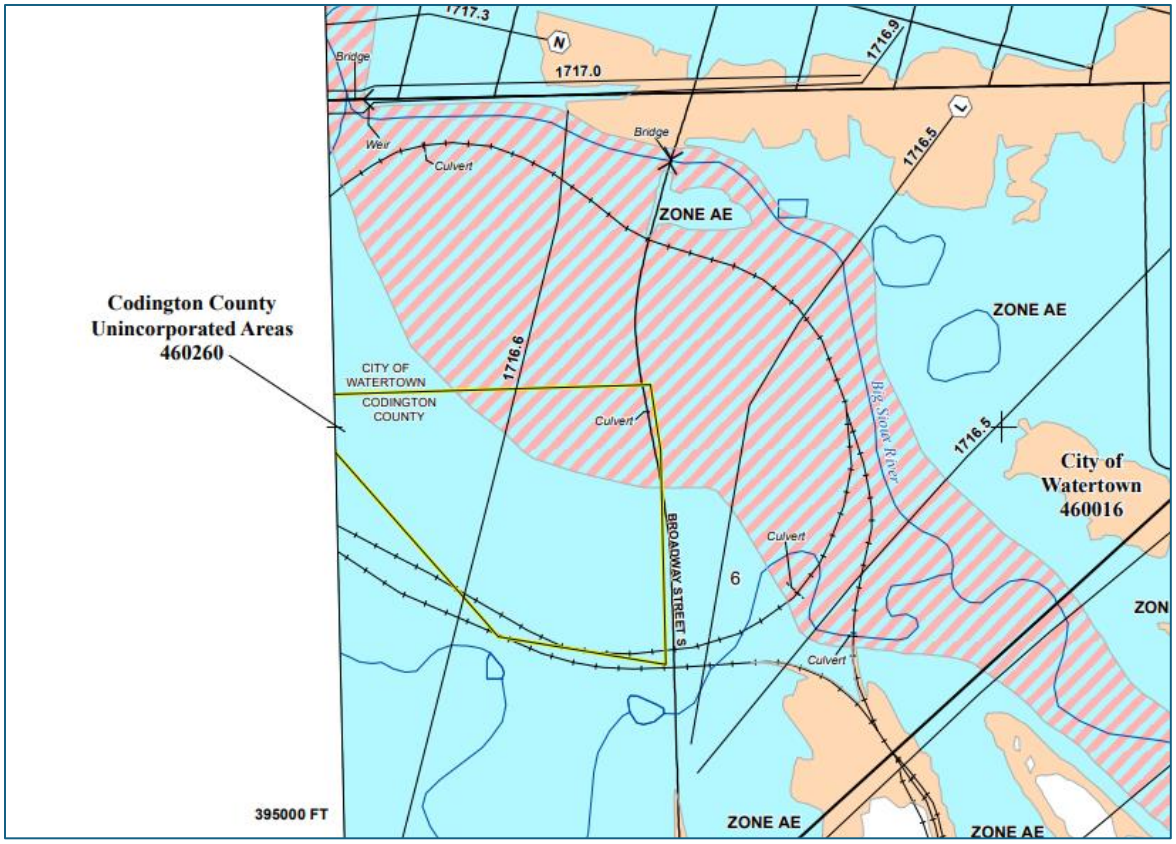
Tributary to Pelican Lake Branch Terrain High Ground

Tributary to Pelican Lake Branch Terrain Actual Channel

17. **Tributary to Pelican Lake and Big Sioux River Weirs:** There are two weirs downstream of Highway 212 on the Tributary to Pelican Lake and on the Big Sioux River that is not incorporated in the HEC-RAS model. The weir locations are shown on the screen clip below. The weirs impact the Big Sioux River water elevations and help regulate overflow into Pelican Lake. Negating critical weir structures likely cause BFE's throughout this area to be inaccurate. Ignoring a critical weir structure also does not follow the "Guidance for Flood Risk Analysis and Mapping: General Hydraulics Considerations" published by FEMA in 2016 which states that the impact of hydraulic structures should be considered.

Weir Locations not Modeled

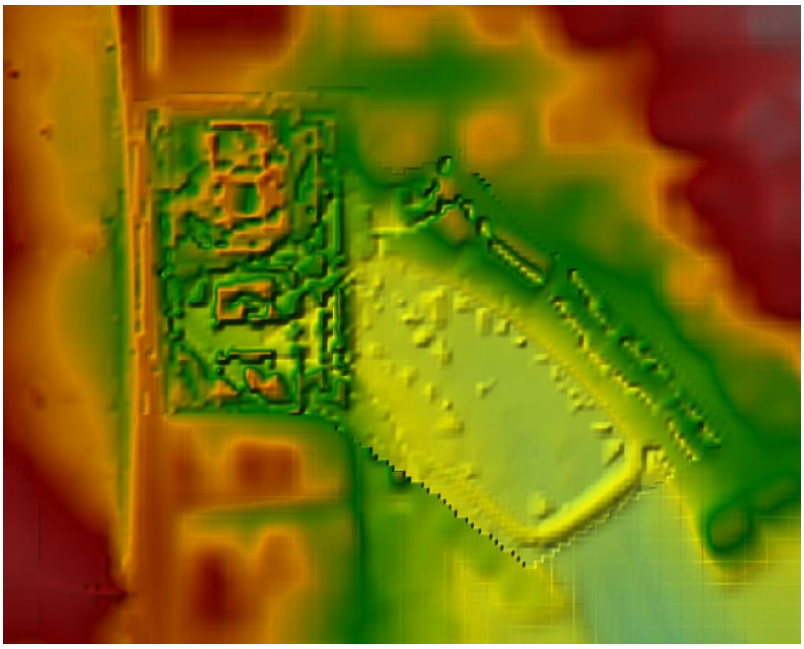
18. **LOMR Case Number 22-08-0217P:** The constructed surface of LOMR Case 22-08-0217P was not incorporated into the model (south of Highway 212 between the Big Sioux River, Tributary to Pelican Lake Branch, and Pelican Lake Branch). The screen clip below shows the mapping update for the railroad tracks and added structures. The floodplain modifications in this area are significant and need to be represented in the preliminary maps. 2021 LiDAR reflects railroad embankment added to the floodplain, but any model revisions will need to incorporate the added structures as well. Not including the LOMR into the preliminary map generates inaccurate results in the modeling and mapping, and the models and maps should be updated to incorporate these modifications to the floodplain that have already been approved by FEMA through the proper LOMR process.



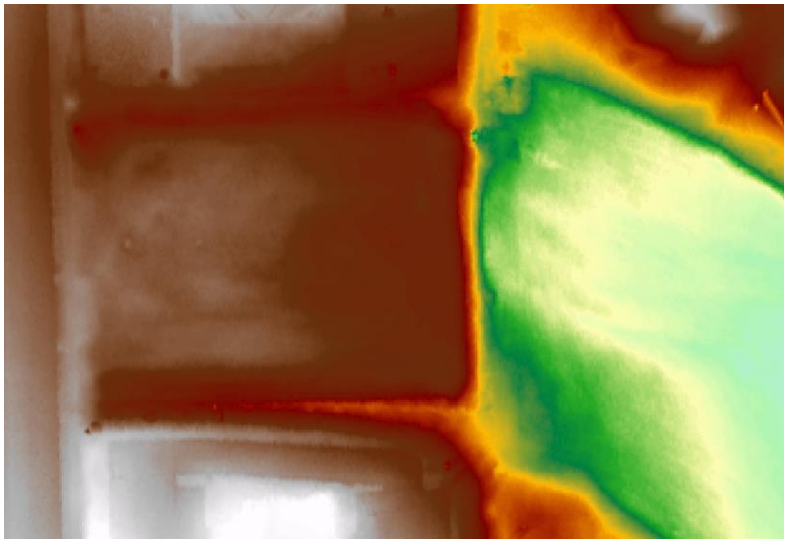
LOMR Case Number 22-08-0217P Map

LOMR Case Number 22-08-0217P Aerial Image of Modifications in the Floodplain

19. **LOMR Case Number 17-08-0664P:** The supporting documentation for the mapping project indicates that LOMR 17-08-0664P was incorporated into the remapping efforts of Roby Creek. It appears the surface was modified in the HEC-RAS model in this area, but the surface meshed into the model does not represent the current or past conditions of the site. The model surface ungulates and does not match the final smooth graded surface depicted in the 2021LiDAR as shown in the screen clips below. It is unclear what surface was used in the model, but the elevations and grading do not depict the actual site conditions and generates an inaccurate map at the site since the majority of the actual site is above the BFE according to the 2012 and 2021 LiDAR.



HEC-RAS surface



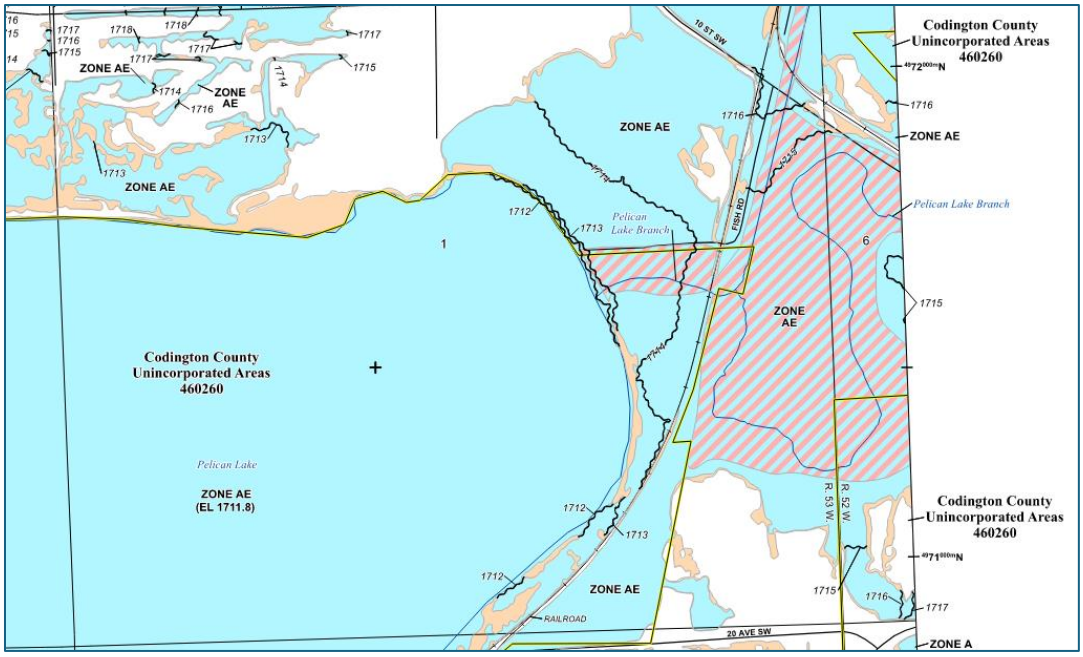
2021 LiDAR Surface

20. **Terrain Bathymetry:** "Guidance for Flood Risk Analysis and Mapping: Hydraulics: Two-Dimensional Analysis" published by FEMA in 2016 identifies that at a minimum topographic data of the channel (including bathymetry) and floodplain is required for 2D analysis. The guidance states that not having detailed enough terrain data to undertake the modeling effort is a major concern for 2D models. If the data does not exist, it is not recommended to use a 2D model because the model effort will not provide improved results. For significant flow paths within the model a terrain will need to be supplemented with channel and structure surveys to ensure that flow is routed correctly through the floodplain. This point is confirmed in the "Guidance for Flood Risk Analysis and Mapping: General Hydraulics Considerations" published by FEMA in 2016, which states, "the geometry of the channel bathymetry should be considered in enhanced studies."

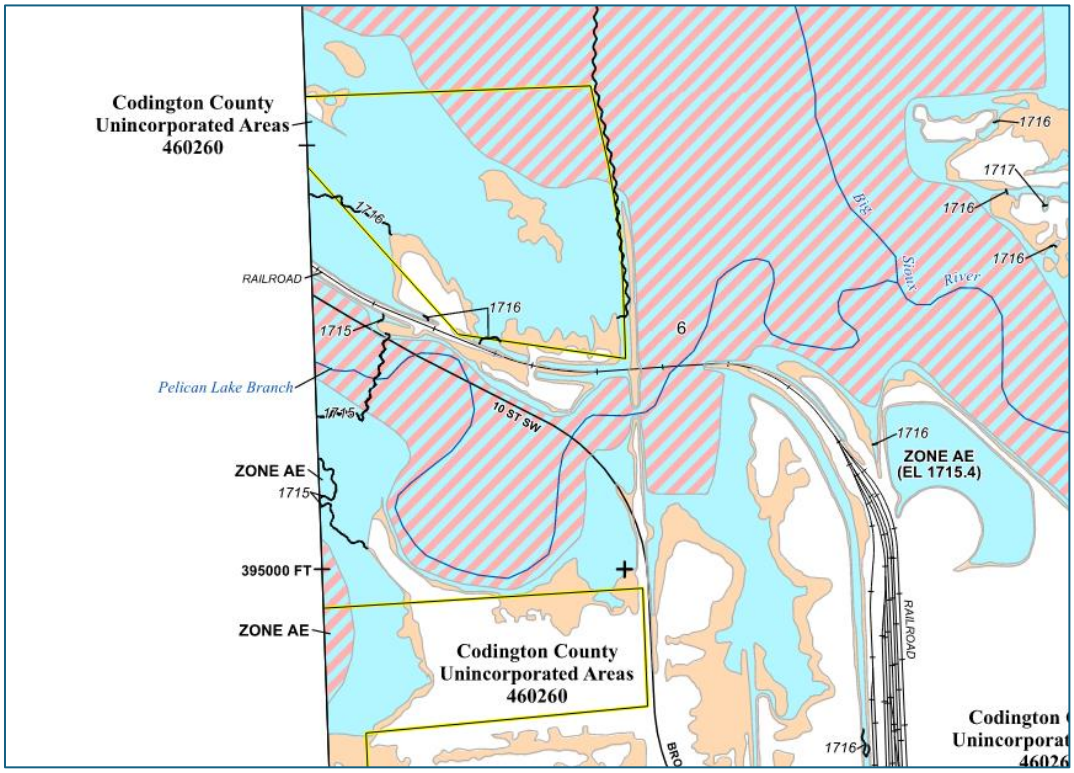
    The area of specific concern is the Pelican Lake Branch which is mapped as floodway and found on Preliminary FIRMs 46029C0338E and 46029C0319E as shown in the screen clips below. It is evident in the model that channel bathymetry was not available, and the modeling team modified the model terrain to have an arbitrary bottom elevation of 1709.72 ft (NAVD 88) for a portion of the reach and 1709.38 ft (NAVD 88) for another area. LiDAR of the area does not depict these same channel elevations as shown in the model, and there is no documentation of channel survey to justify the channel elevations used. The modification of the channel bottom allows for additional water volume storage in the reach and improves conveyance capacity through the Pelican Lake Branch which likely generates BFE's that are not accurate for this detailed reach, Pelican Lake, and potentially the Big Sioux River.

    It is also unclear what information was used for the Big Sioux River channel bathymetry. Documentation does not discuss model channel bathymetry or survey of channel bathymetry, but it appears modifications were made to the bathymetry in the model based on the LiDAR. The lack of documentation and information provided by FEMA to the City makes it impossible to verify survey information was used to define the bathymetry of the Big Sioux River correctly.

    For Roby Creek and Willow Creek, it does not appear bathymetry was added to the model. For the majority of the conveyance structures within Roby Creek, the conveyance structures had to be blocked, the majority by over 50%, to allow the model to run which significantly reduces conveyance capacity in these reaches.



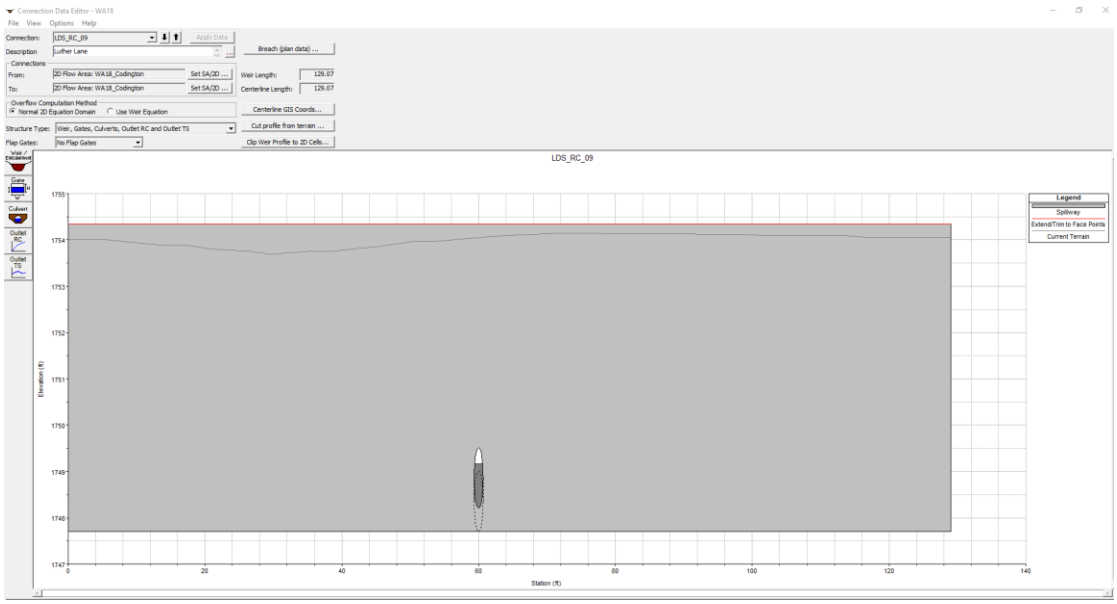
Pelican Lake Branch Preliminary FIRM (46029C0319E) with Floodway



Pelican Lake Branch Preliminary FIRM (46029C0338E) with Floodway

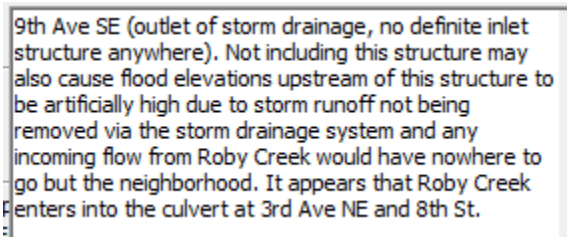
21. **Blockage of Hydraulic Structures:** The report for the mapping project notes that hydro-enforcement of the terrain was not performed and where structures with inverts lower than the terrain were identified, a portion of the structure can be blocked such that the blocked elevation is equal to or just above the elevation of the adjacent 2D cell to allow the model to run. The report also notes that LiDAR topography does not often collect data below the water surface which is true of LiDAR sensor limitations. Channel bathymetry is required to adequately reflect conveyance below the water line and can be added to the terrain in RAS Mapper. Bathymetry through the entire detailed study reach must be included to adequately reflect structure hydraulics and channel conveyance. Using the blocked structure opening in lieu of adding accurate channel bathymetry may be adequate for an approximate study, but not a detailed Zone AE study with a floodway.

    For the majority of the culverts along Roby Creek, channel culverts are artificially blocked by a half a pipe diameter or more which reduces conveyance capacity of these structures by over 50% or more. Taking an approach of artificially blocking structure conveyance capacity by over 50% to allow the model run appears to artificially create additional backwater in the model, increases base flood elevations, and creates a false hydraulic representation of the structure's true conveyance capacity. Luther Lane on Roby Creek is an example of a culvert blocked by 73% as shown in the screen clip below.



Luther Lane Culvert Blocked

22. **Hydraulic Structure Survey:** Rapid field survey also referred to in the study report as limited-detail survey appears to have been used to capture all of the hydraulic structures. It is unclear why a limited-detail survey approach was used on the detailed study streams. For a detailed study a field survey, as-builts, or design plans that are confirmed in the field should be used. Many structures south of Highway 212 were completely ignored as well and need a full survey when incorporating them into the model.
23. **Roby Creek Outlet Pipe:** The outlet pipe for Roby Creek is an approximation by the modeling team. The modeling team notes, as shown in the screen clip below, indicates there is a lack of knowledge on the Roby Creek outlet pipe.



The outlet pipe for Roby Creek is an urban stormwater network approximately 5,750 feet long with varying pipe sizes and pipe direction in the stormwater network. The modeling team utilizes a single box culvert for the conduit, but City records indicate the pipe is not a box culvert. It is unclear how this can be considered an enhanced study when the modeling team does not know anything about the urban stormwater system on Roby Creek. We believe HEC-RAS 2D is not an appropriate software for modeling a stormwater system with varying pipe sizes and direction.

Conclusion:

After reviewing the HEC-RAS 2D model used to develop the preliminary FEMA FIRM for the City of Watertown, there were numerous concerns identified with the model. The comments detailed above demonstrate that the modeling lacks the required detail needed for an enhanced study according to the published FEMA guidance. Concerns with the model terrain quality, missing critical conveyance structures in the model, artificial manipulation of the model terrain, BLE level modeling techniques in an enhanced study area, negating improvements made with previous LOMR's, and truncated model simulation windows are examples of concerns identified with the model. The accuracy of the preliminary maps are questionable based on the above comments, and model refinement needs to be completed prior to issuing new preliminary FIRM maps.