HoustonEngineering Inc.

Fargo, ND | HEI No. 8150_002
December 23, 2015

NORTH BRANCH PARK RIVER WATERSHED

FEASIBILITY REPORT AND PLAN OF WORK

NORTH BRANCH PARK RIVER WATERSHED

Feasibility Report
And
Plan of Work

December 23, 2015

Prepared on Behalf of:
Park River Joint Water Resource District

By:
Houston Engineering, Inc.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of North Dakota.

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12/23/2015
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1 REQUEST OF ASSISTANCE

The Park River Joint Water Resource District (PRJWRD) made application for assistance from the Red River Retention Authority (RRRA) for Watershed Planning under the Regional Conservation Partnership Program (RCPP), administered by the Natural Resources Conservation Service (NRCS). The RRRA authorized the PRJWRD to proceed with a Cooperative Agreement with NRCS to perform Watershed Planning in the North Branch Park River Watershed. Watershed Planning funded through NRCS RCPP is required to follow Public Law 83-566 requirements.

2 PURPOSE AND NEED FOR ACTION

Both spring and summer flooding results in many problems within the North Branch watershed. Steep slopes in the upper portions of the watershed result in runoff accumulating quickly to the lower portions of the watershed, where slopes moderate. This often results in large areas becoming inundated from excessive runoff. These high flows impact agricultural production due to inundated crops, field erosion, and delayed planting. Roads and bridges in the region are also impacted by flooding from the North Branch Watershed. The community of Crystal, ND is located on the Cart Creek tributary within the North Branch Watershed, and routinely deals with the threat of flooding. Near Crystal, Simplot has also recently invested in a large facility. During the 2013 flood event, Simplot dealt with flooding cause by flows along Cart Creek. Alternatives will be identified to reduce flows within the North Branch Watershed to reduce flood damages to Crystal, agricultural production, and public and private infrastructure. Previous efforts for by the PRJWRD included pubic outreach and coordination with stakeholders in the watershed to determine the local purpose and desired future conditions. This document is included in Appendix A.

3 AGENCY AUTHORITY

RRRA Memorandum of Understanding no. 14-C-ND-669 and Cooperative Agreement 68-663-15-006.

4 RESOURCE INFORMATION

The North Branch Park River Watershed is located in northeast North Dakota, in portion of Cavalier, Pembina, and Walsh Counties. The North Branch is a tributary to the Park River (HUC0902310), and is located within the Red River Basin. Figure 01 provides a map of the North Branch Watershed. Available Geographic Information Systems data was compiled for resources within the North Branch Watershed and is summarized as follows.

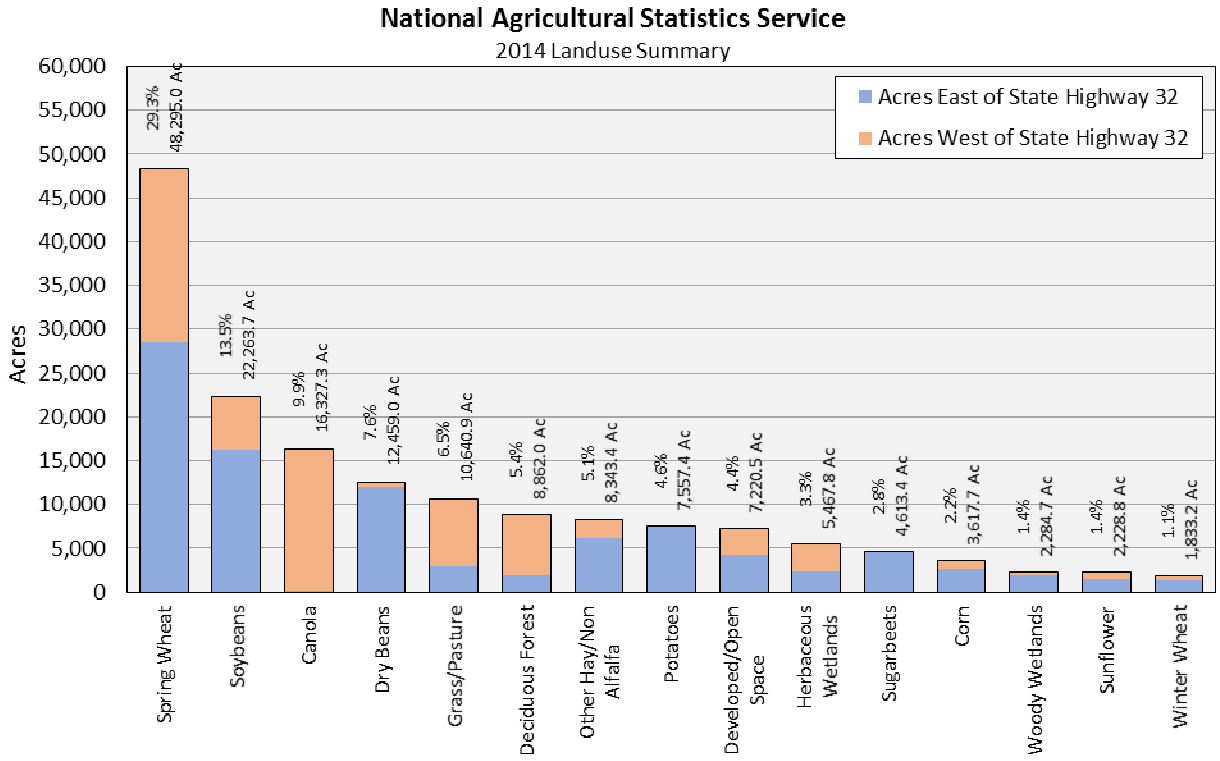
4.1 TOPOGRAPHY

LiDAR data collected in 2008 and 2009 is available for the North Branch Watershed[1]. This information indicates a maximum elevation of 1,665.2 (NAVD1988) in the western portion of the watershed, and a minimum elevation of 823.1 (NAVD1988) in the eastern portion of the watershed. LiDAR data also allows slopes to be easily analyzed with GIS processing techniques to determine landscape slopes within the watershed. In general, topography has steeper slopes in the western and central portions of the watershed, with moderating slopes further east. The steepest slopes within the Watershed are located near the Pembina County and Cavalier County line, where several coulees rapidly drop runoff from the upper portions of the Watershed in Cavalier County, to lower portions of the Watershed in Pembina County. LiDAR topography data, and derived slope information, is presented in Figures 02 and 03, respectively.

4.2 LAND USE

National Land Cover Data (NLCD)[2] developed in 2011 was acquired and reviewed to assess land use within the North Branch Watershed. Land use is primarily agricultural production (73.2% +/-), with lesser amounts of pasture/hay land (9.6% +/-). Forested areas are present in several flowages west of ND State Highway 32. NLCD 2011 data is presented in Figure 04.

The 2014 National Agricultural Statistics Service (NASS) Cropland Layer[3] was also reviewed to determine leading crops within the watershed These crops are Spring Wheat (29% +/-), Soybeans (13% +/-), and Canola (10% +/-). More information on 2014 land use, as defined by the 2014 NASS Cropland Layer, is presented in the chart below and in Figure 05. Visual inspection suggests variation between the west and east regions of the North Branch Watershed. To illustrate these differences, land use information is further categorized between the areas east and west of ND State Highway 32.



4.3 EXISTING STATE AND FEDERAL INTEREST LANDS

Various State and Federal Interest Lands are within the North Branch Watershed. Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) coverages were obtained by the PRJWRD in 2013 through a Freedom of Information Act (FOIA) request. The locations and extent of state and federal interest lands are illustrated in Figure 06.

4.4 USDA SSURGO SOILS DATA

Soils information provided by the USDA through the SSURGO Soils Database[4] was compiled and reviewed for the North Branch Watershed. The SSURGO Soils Database allows for various characteristics to be extracted. The following variables were extracted from the database and are presented in Figures 07 – 10:

- Hydrologic Soils Group (Figure 07)
- Crop Productivity Index (Figure 08)
- Farmland Classification (Figure 09)
- Normal Year Range Production (Figure 10)

Crop Productivity Index (CPI) and Farmland Classification data suggests high agricultural productivity within the North Branch Watershed. Approximately 50.1% of the Watershed has a CPI value greater than 80, indicating high production potential. Farmland classification also indicates approximately 60.2% of the watershed is listed as “All Areas Prime Farmland” or “Farmland of statewide importance.” When the Normal Year Range Production is overlaid with the “Grass/Pasture” NASS 2014 Land Classification, the average potential for annual vegetation growth of 3,150 pounds per acre. While this is an index of total plant growth

regardless of plant species, it still suggests reasonable value for range/pasture lands. This land classification represents approximately 10,600 acres of the North Branch Watershed (6.5% +/-).

4.5 RUNOFF POTENTIAL

Hydrologic Soils Group (HSG) from the USDA SSURGO Soils Database was also used, in combination with NLCD data to determine a NRCS Curve Number[5] distribution for 24-hour duration rainfall events across the North Branch Watershed. This curve number grid assumes average Antecedent Moisture Conditions (AMC II). The mean Curve Number for the Watershed is 74, suggesting a high portion of rainfall within the watershed is converted to surface runoff. This curve number distribution is presented in Figure 11.

4.6 WETLANDS

The US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI)[6] data was extracted for the North Branch Watershed. Approximately 2,140 acres, or 1.3% of the total watershed area, of wetlands are within the North Branch Watershed. This information is presented in Figure 12. The USFWS NWI data provides a general index of wetlands within the North Branch Watershed, however more detailed field review may be needed to assess wetlands during Watershed Planning.

4.7 ENDANGERED SPECIES

Review of the USFWS Endangered Species list from the USFWS Environmental Conservation Online System[7] for Cavalier County, Pembina County, and Walsh County indicate the following species of concern:

- Whooping Crane – Endangered
- Sprague's pipit – Candidate
- Northern Long-Eared Bat – Threatened

5 PRELIMINARY FINDINGS OF ENVIRONMENTAL EVALUATION

The North Branch Watershed has been reviewed with the PRJWRD to document local resource concerns and desirable outcomes for the North Branch Watershed. On July 1, 2014, the PRJWRD hosted a public meeting to solicit comments on flooding concerns in the watershed and identified locally perceived solutions. Additionally, the PRJWRD has also hosted two meetings with local stakeholders consisting of concerned citizens, water board members, and other local government representatives to document concerns in the region.

5.1 IDENTIFIED RESOURCE CONCERNS

The PRJWRD identified several resource concerns for the North Branch Watershed. The concerns identified are all related, in part, to excessive runoff volume and runoff rate within the Watershed. Local resource concerns are listed as follows.

- Delayed planting due to inundated unplanted cropland
- Crop damages from inundated planted cropland
- Reduced yields from excessive moisture
- Insufficient channel capacity in Cart Creek causing breakout flows
- Field erosion resulting from breakout flows along Cart Creek
- Frequent public infrastructure damages during high flow events
  (FEMA Disaster Declarations in 2004, 2005, 2006, 2009, 2011, and 2013)
- Flood risk to small communities within the North Branch Watershed
- Flood risk to rural residences from overland flooding
- Flood risk for private infrastructure, including a new Simplot Facility near Crystal, ND

5.2 POTENTIAL ALTERANTIVES

The locally identified resource concerns appear to most directly relate to high runoff volumes in the Watershed. Alternatives for reducing damages related to flooding are categorized and summarized in the four general categories. These categories were established and discussed in greater detail in a publication completed by the Red River Basin Technical and Scientific Advisory Committee[8].

- **Increase Temporary Flood Storage** – This method refers to structural measures that add flood storage at opportune locations within the Watershed. Examples of this include construction of on-channel and off-channel detention facilities and wetland restorations with the ability to effectively manage excess volumes.
- **Reduce Flood Volume** – In order to reduce flood volumes, the landscape must be altered to reduce the Curve Number, or the ability of the land to produce runoff. Examples of practices that would reduce flood volume include cropland conversion (CRP, WRP, etc…), tillage methods, and other Better Management Practices. This method is well suited for smaller watersheds with soil types that will allow for large variations in Curve Number values with differing land uses.
- **Increased Conveyance** – Construction of floodway channels that would handle discharges from the watershed is another option, however this method often results in increased peaks at the outlet of the constructed floodway. If the channel downstream cannot handle the excess flows, flood risk may be increased further downstream. Often times this method needs incorporate components that remove downstream impacts, such as upstream flood storage.

- **Protection/Avoidance** – Avoidance activities that are impacted by flooding is another alternative, however this tends to be more applicable to water courses with a defined and predictable flood corridor. Avoidance can be difficult in watersheds where flood damages are influenced by breakout flows that can be more difficult to predict. Protection can be applicable when trying to protect a defined area, such as a small community or buildings.

Of these four general categories for flood damage reduction strategies, increasing temporary flood storage appears to be the most applicable method. This will likely lead to analysis of large on-channel and off-channel impoundments within the watershed. Because of the size of the watershed, it would likely be more feasible and manageable for the local sponsor to impound runoff within a smaller number of larger storage sites (est. 2,000 – 7,000 acre feet). While smaller flood storage facilities, such as small dams and wetland restorations in the headwaters of the watershed, would provide some benefit, it may not be feasible or manageable for the local sponsor to implement and operate enough individual locations to create a meaningful benefit of the identified local resources of concern. Previous efforts by the PRJWRD include a detailed evaluation of strategies within each of these four categories. This strategy evaluation is included in Appendix B.

5.3 ESTIMATED COSTS

This preliminary investigation does not evaluate costs of alternatives. The Watershed Planning Effort will evaluate estimated costs of reasonable alternatives, and determine if they are feasible for the North Branch Watershed. There are several outside funding sources for increasing flood storage, such as the Red River Joint Water Resource District, the North Dakota State Water Commission, and other potential partners depending on any compatible uses that can be worked into each alternative.

5.4 POTENTIAL EFFECT

Alternatives in the North Branch Watershed have not been identified and developed to sufficiently determine specific impacts to various resources. More detailed watershed planning will use an in place group of local stakeholders and establish an interdisciplinary team consisting of various cooperating agencies. The group will work to establish a workable solution to the local resources of concern. Depending on the scope of impacts for identified alternatives, the following potential impacts will be reviewed by the team.

- Wetlands
- Water Quality
- Air Quality
- Recreation
- Flood Volume
- Flood Peak Flow
- Agriculture
- Cultural Resources
- Tribal Resources
- Endangered Species
- State Owned Lands and Easements
- Federal Owned Lands and Easements
- Private Owned Lands and Easements

While this list provides a general list of concerns, the stakeholders, general public, and interdisciplinary team will be engaged initially to determine the scope of the Environmental Assessment. This task will allow for input from all interested parties within the study area.

5.5 REQUIRED CONSULTATION AND PERMITS

Detailed planning within the North Branch Watershed will include completion of an Environmental Assessment (EA). This process requires that local, state, and federal agencies be given an opportunity to participate in planning as a Cooperating Agency, including potential permitting authorities.

5.6 NEPA DOCUMENTATION REQUIRED

It's anticipated that selected alternatives will only require an EA. However, this is dependent on the scope of impacts for selected alternatives. If the impacts cannot be reasonably overcome, an Environmental Impact Statement (EIS) may be necessary. This will not be known until impacts are quantified through the Watershed Planning process.

6 SCOPE OF PLANNING EFFORT

Watershed Planning in the North Branch Watershed will focus on reducing damages related to high flows and runoff volumes. The general public, watershed stakeholders, and various agencies with a vested interest in the watershed will be engaged to initially determine resources of concern within the study area. Outreach will continue throughout the planning effort to ensure that reasonable alternatives are developed. The following list of general tasks will be completed through this planning effort:

- Problems and Opportunities
- Scope of Environmental Assessment
- Inventory Resources
- Forecast Without-Project Conditions
- Develop Alternatives
- Effects of Alternatives
- Select Preferred Alternative
- Complete Watershed Plan-EA

A copy of the Plan of Work is available in Appendix C. This plan of work provides more details on sub tasks that will be completed in each of the tasks outlined above.

7 COOPERATIVE AGENCIES IDENTIFIED

Invitations will be sent to local, state, and federal agencies that have a vested interest in the North Branch Watershed. These agencies include the following:

- US Army Corps of Engineers
- US Fish and Wildlife Service
- Natural Resources Conservation Service
- North Dakota State Historical Officers
- North Dakota Tribal Historical Officers
- North Dakota Game and Fish Department
- North Dakota Department of Health
- North Dakota State Water Commission
- County Soil Conservation Districts

If additional interests are identified through Scoping of the EA, those interests will be invited to participate as a Cooperating Agency. In addition to Cooperating Agencies, local interests will be represented during the planning effort. This will be accomplished through several public outreach meetings and consultation with the Watershed Stakeholders Committee previously established by the PRJWRD. This group consists of landowners residing within the North Branch Watershed.

8 FACILITATING AND OBSTRUCTING FACTORS

Various factors that will affect the outcome of the planning effort will be identified during planning. To date, these factors are largely unknown because alternatives have not been studied to sufficiently understand impacts.

9 PLANNING TIMELINE

Development of the Watershed Plan-EA in the North Branch Watershed is anticipated to be completed by the end of 2017. Appendix D provide an estimated project timeline for the planning effort.

10 PUBLIC PARTICIPATION PLAN

Outreach for the North Branch Watershed Planning effort will include engaging the general public a minimum of three times. The previously referenced Watershed Stakeholders Committee and Cooperating Agencies will meet on a regular basis to provide comment and participate in watershed planning. A copy of the Public Participation Plan is available in Appendix E.

11 REFERENCES

[1] Red River Basin Mapping Initiative, International Water Institute. Blocks A and E. Collected 2008 and 2009. http://www.iwinst.org/lidar/

[2] Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K., 2015, *Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information*. Photogrammetric Engineering and Remote Sensing, v. 81, no. 5, p. 345-354

[3] USDA National Agricultural Statistics Service Cropland Data Layer. 2014. Published crop-specific data layer [Online]. Available at https://nassgeodata.gmu.edu/CropScape/ USDA-NASS, Washington, DC.

[4] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Available online at http://sdmdataaccess.nrcs.usda.gov/

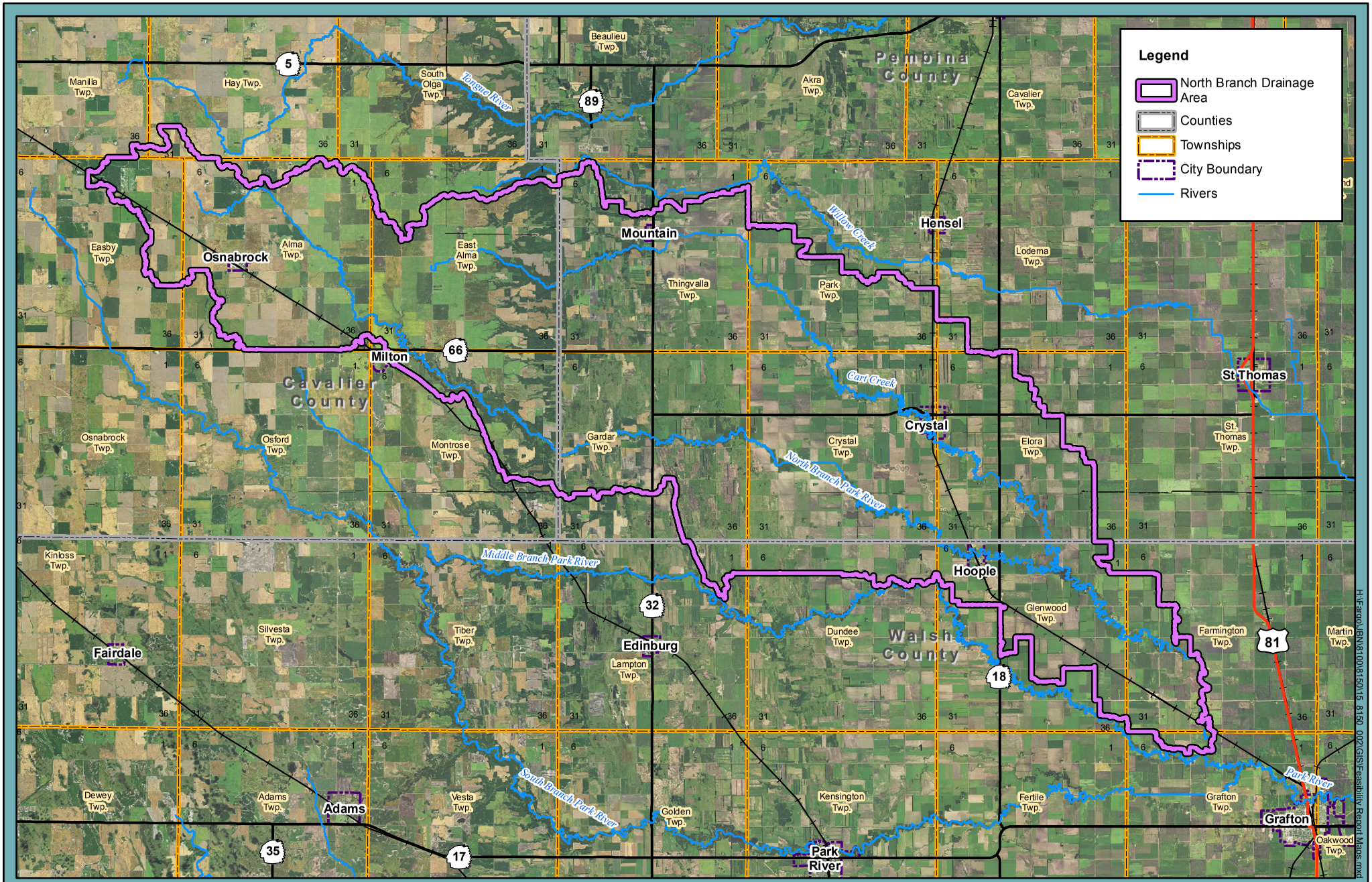
[5] USDA NRCS Title 210, National Engineering Handbook (NEH), Part 650, Chapter 2, Section 650.2 *Estimating Runoff and Peak Discharge.*

[6] U. S. Fish and Wildlife Service. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands

[7] US Fish and Wildlife Service. Environmental Conservation Online System; Threatened and Endangered Species. http://ecos.fws.gov/ecp/

[8] Anderson, C., Kean, A., Red River Basin Flood Damage Reduction Framework; Technical and Scientific Advisory Committee, Technical Paper No. 11. May 2004. Red River Basin Flood Damage Reduction Framework.

FIGURES



F-01

Figure 01: North Branch Park River Watershed

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

Houston Engineering Inc.

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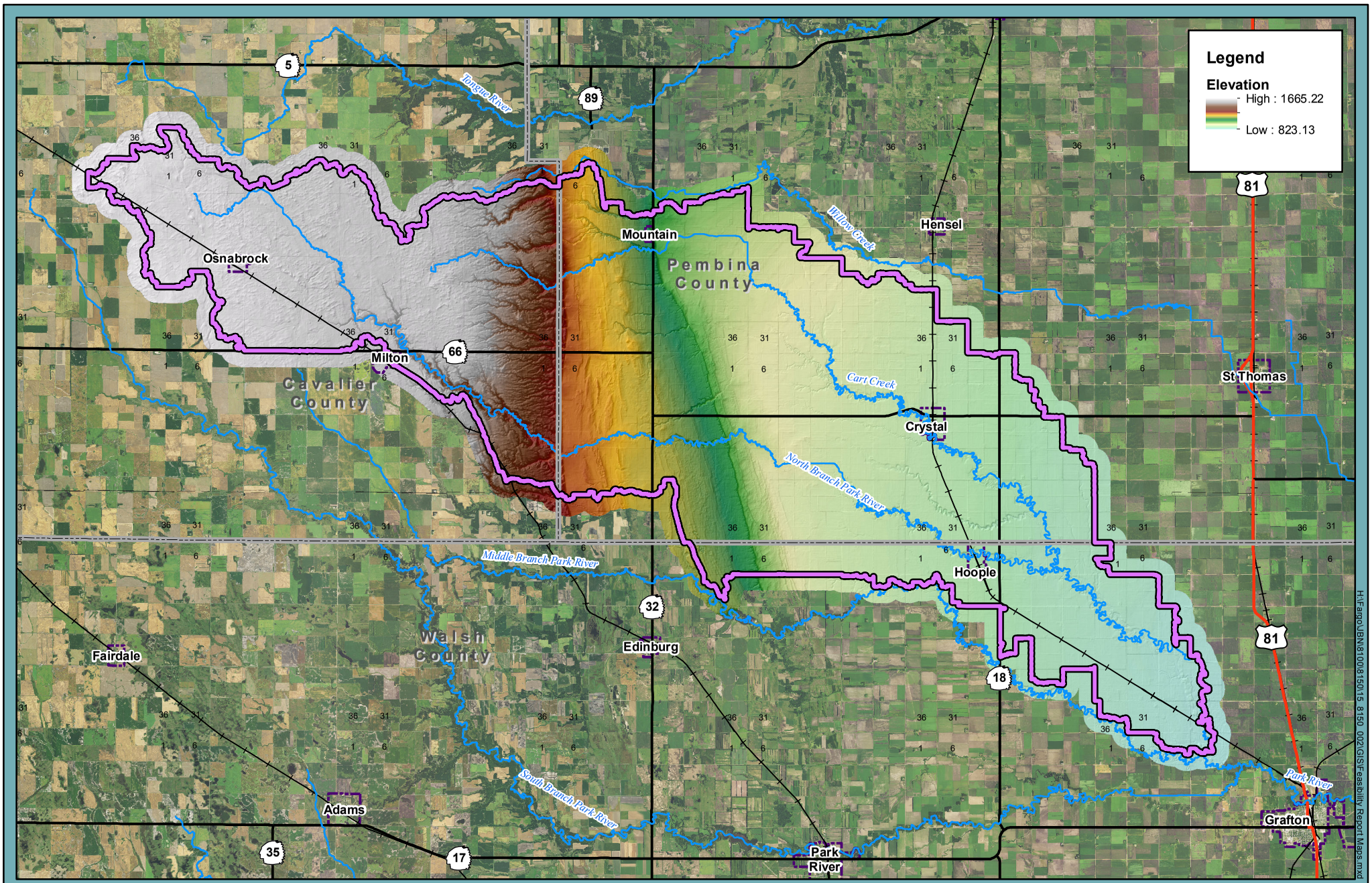

F-02

Figure 02: LiDAR Map

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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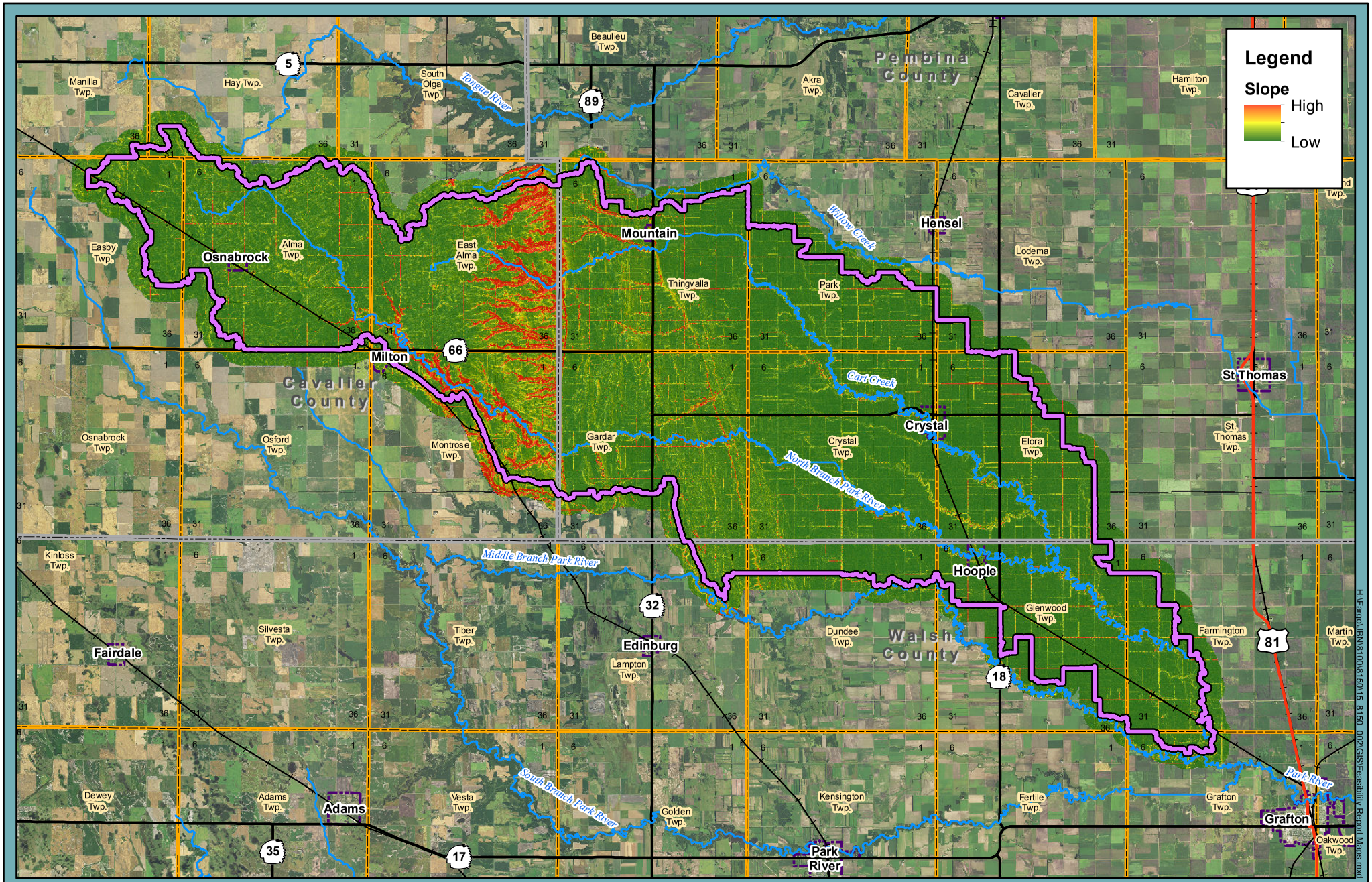

F-03

Figure 03: LiDAR Derived Slope

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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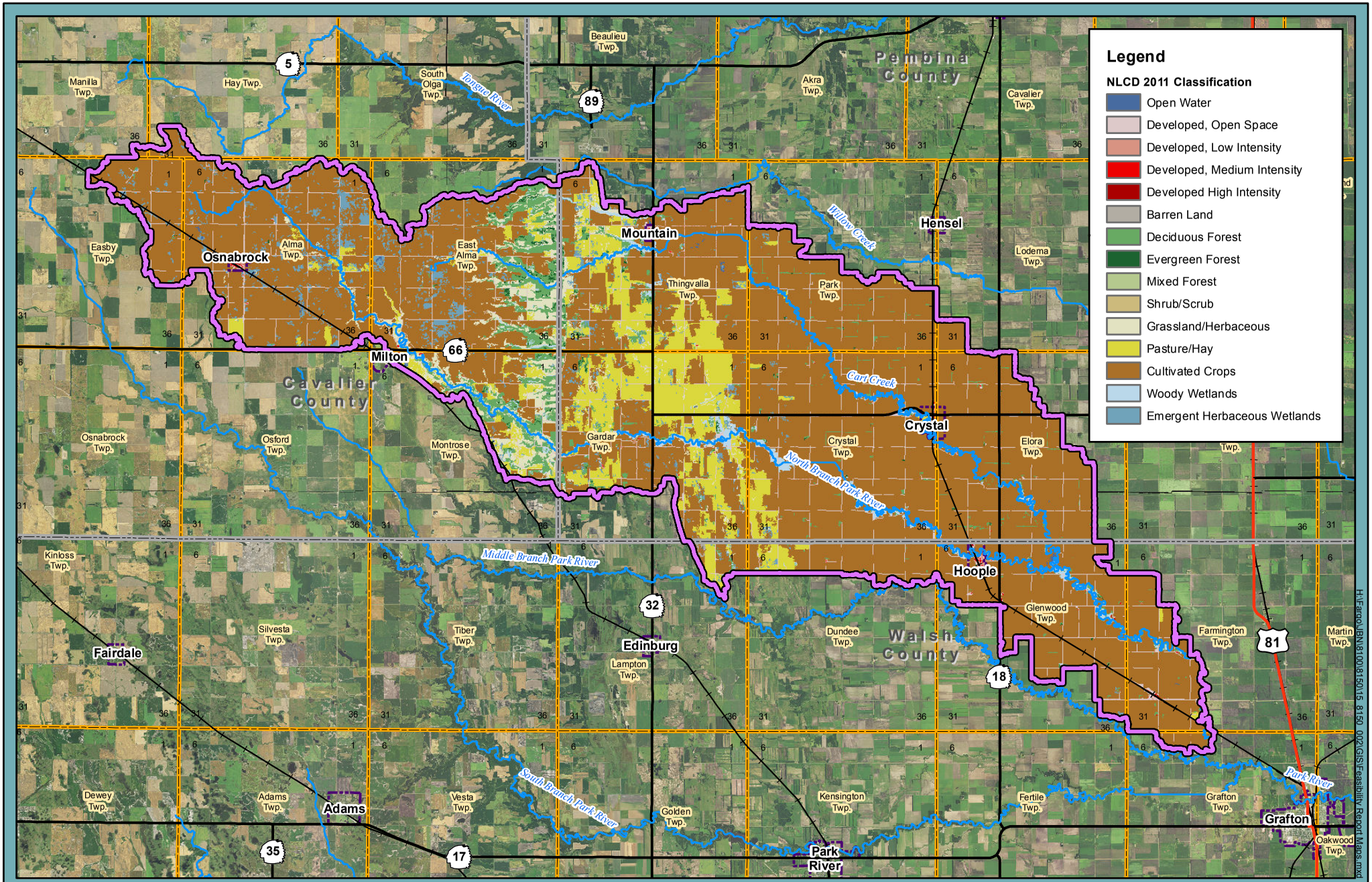

F-04

Figure 04: National Land Cover Data 2011

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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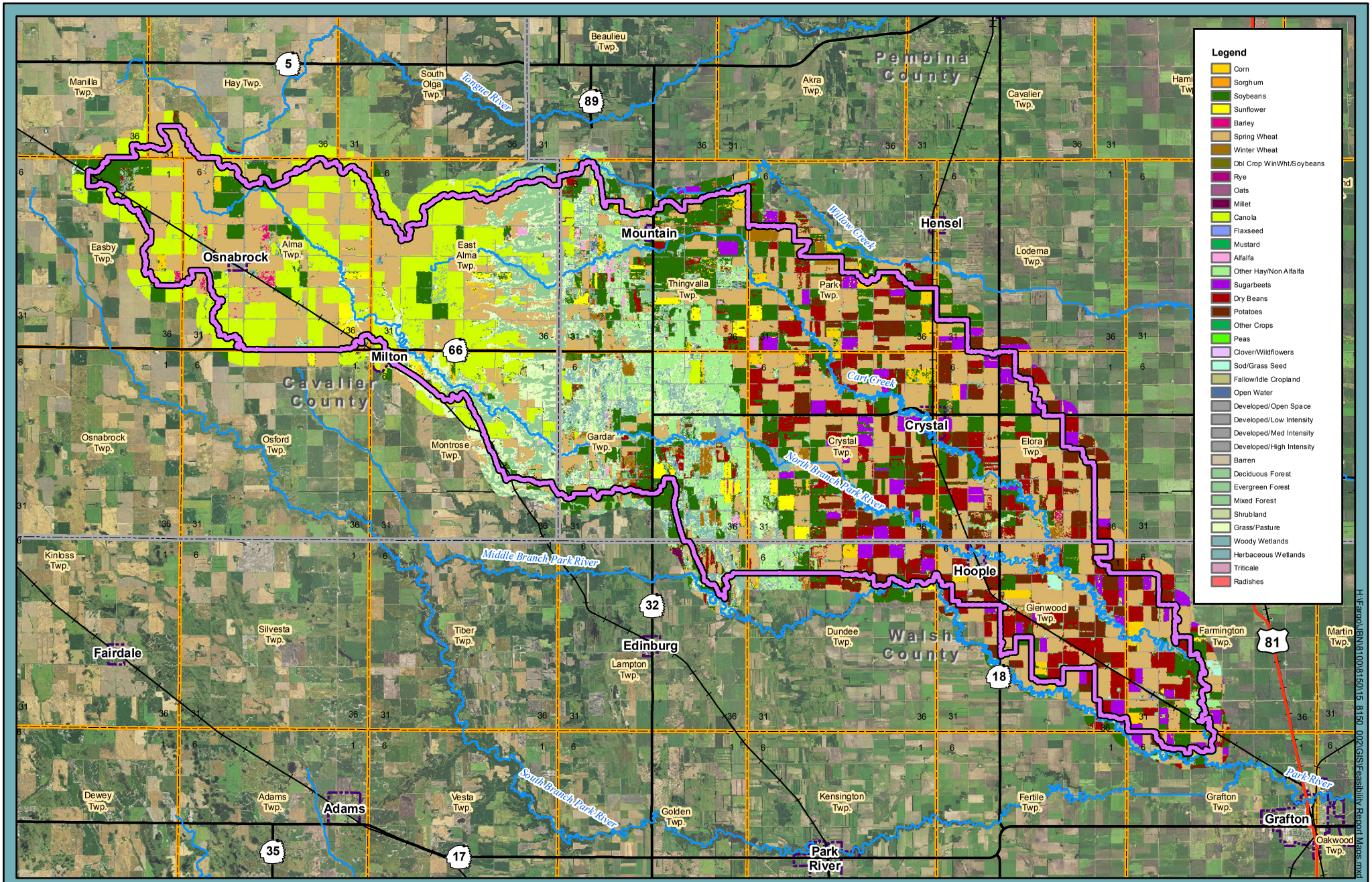

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F-05

Figure 05: National Agricultural Statistics Service Cropland Data (2014)

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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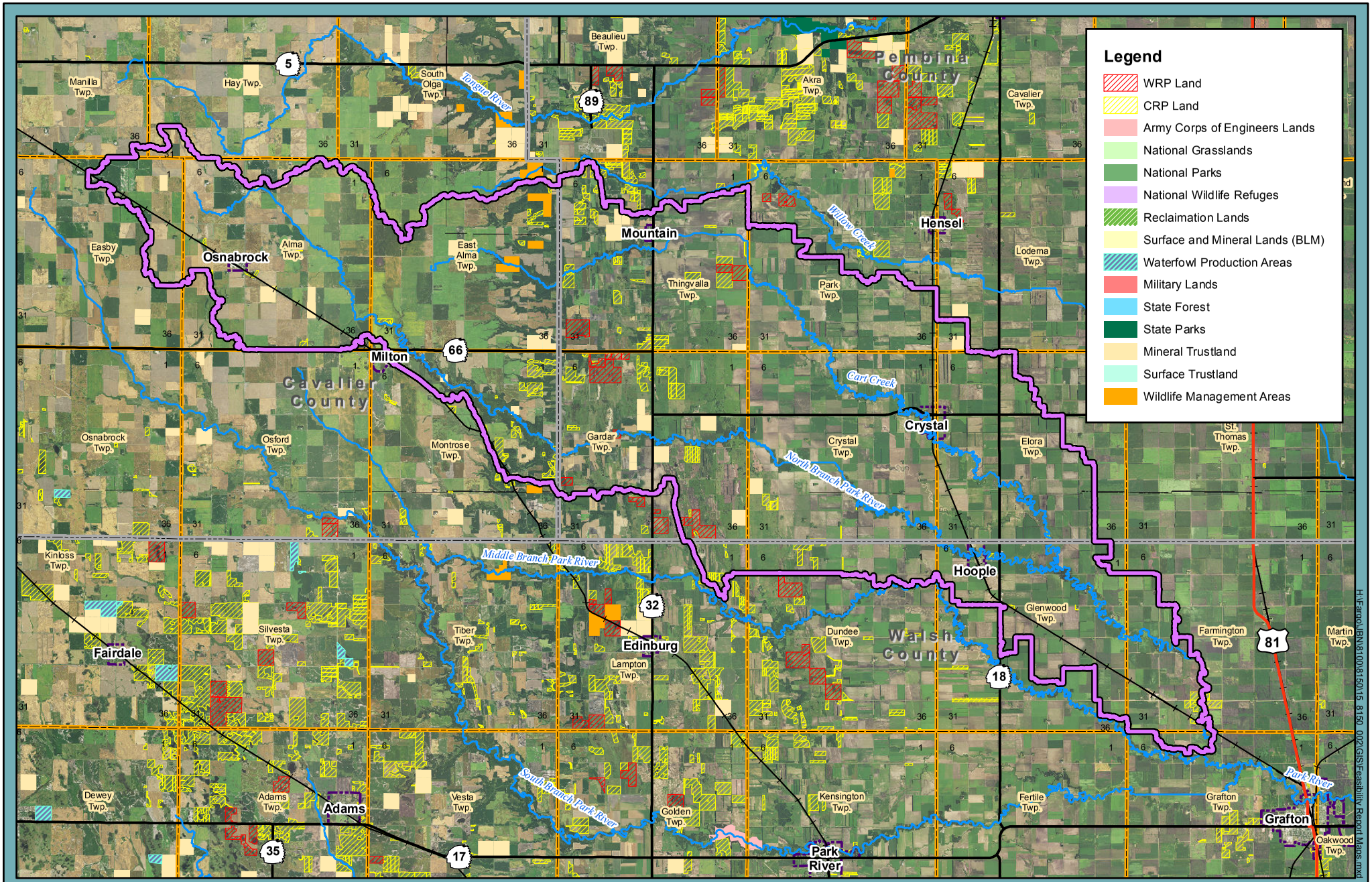

F-06

Figure 06: USDA/NRCS Easements and State/Federal Lands

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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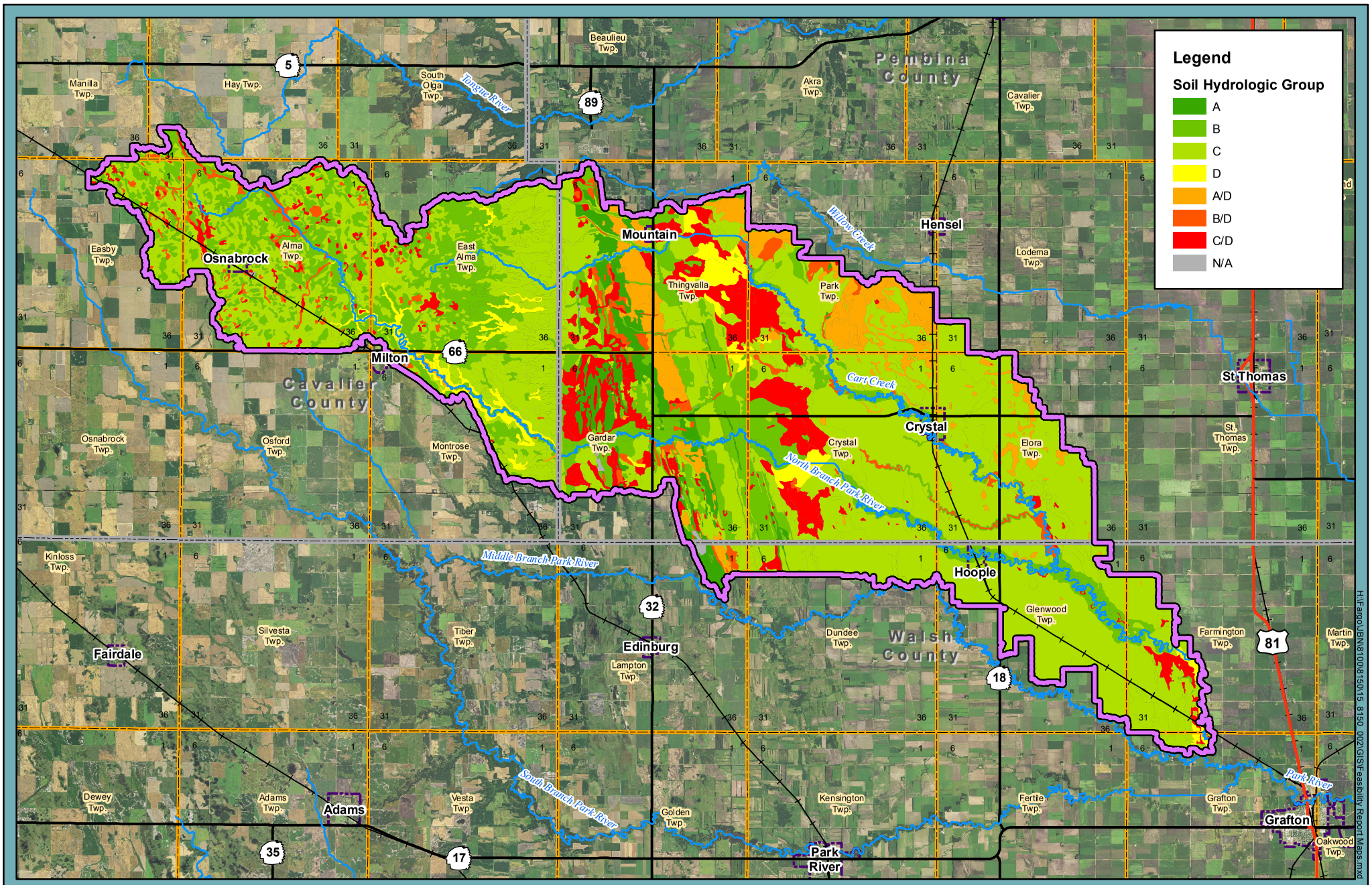
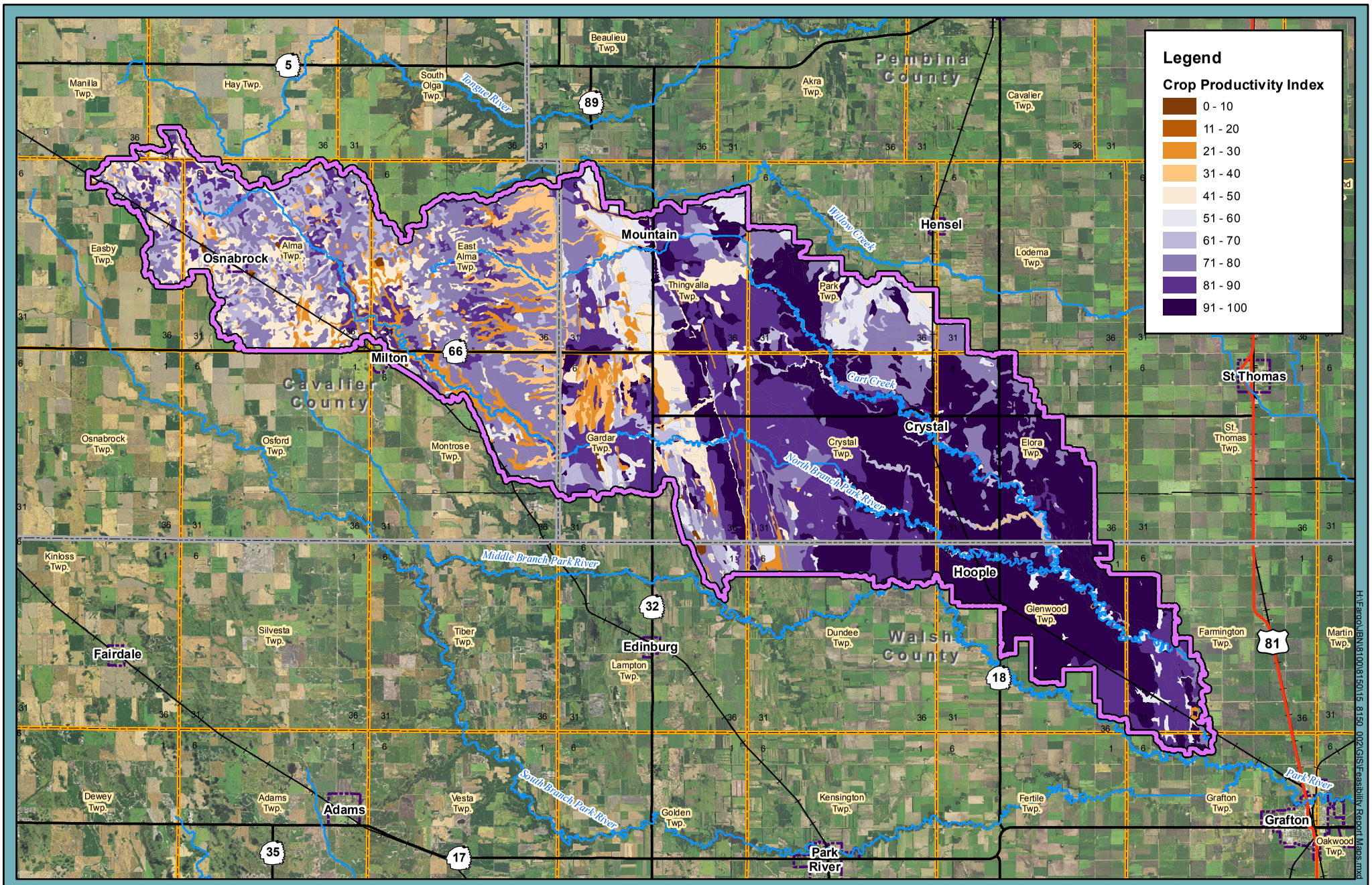


F-07

Figure 07: USDA SSURGO Hydrologic Soil Group

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District



F-08

Figure 08: USDA SSURGO Crop Productivity Index

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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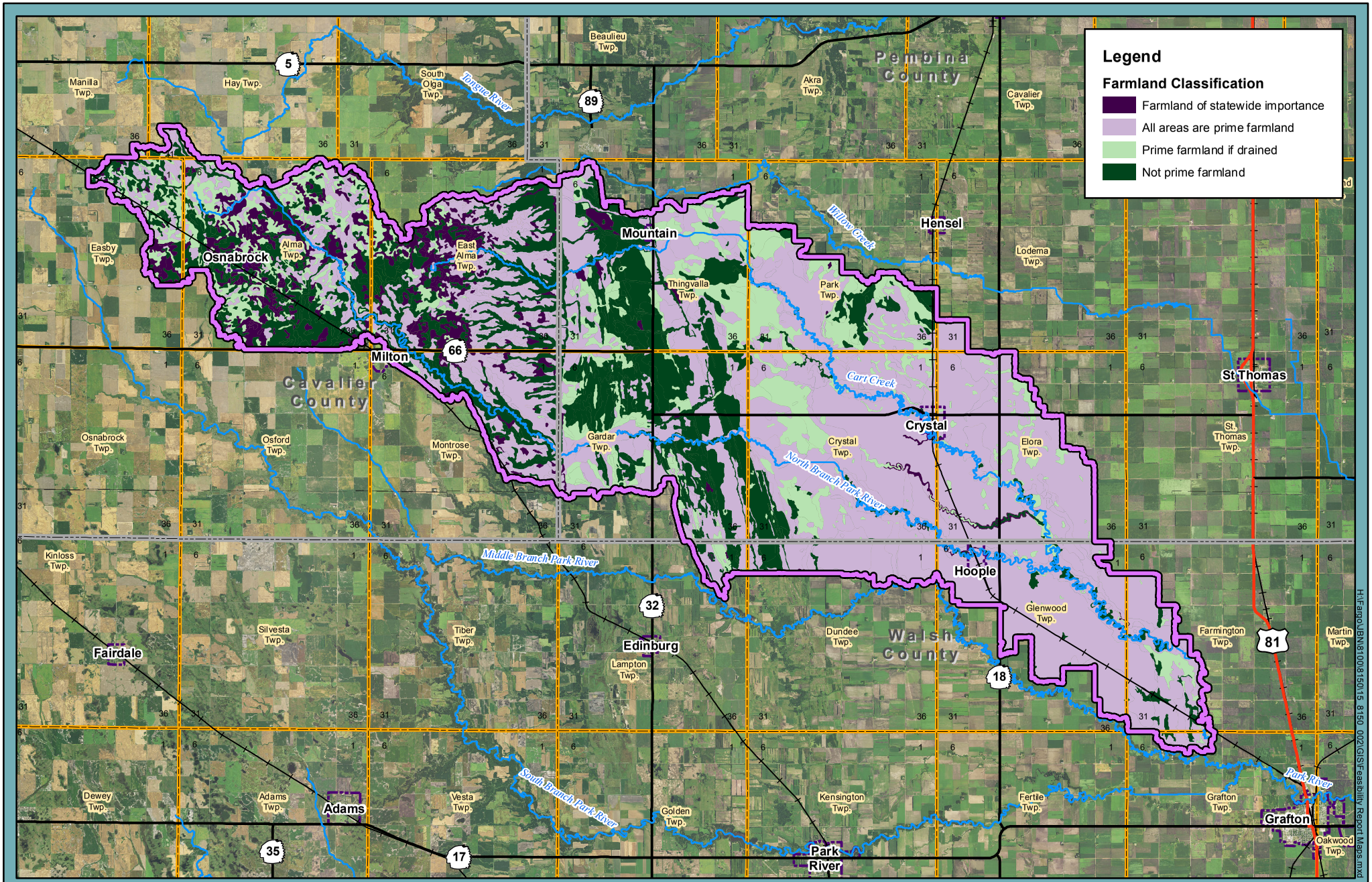

F-09

Figure 09: USDA SSURGO Farmland Classification
North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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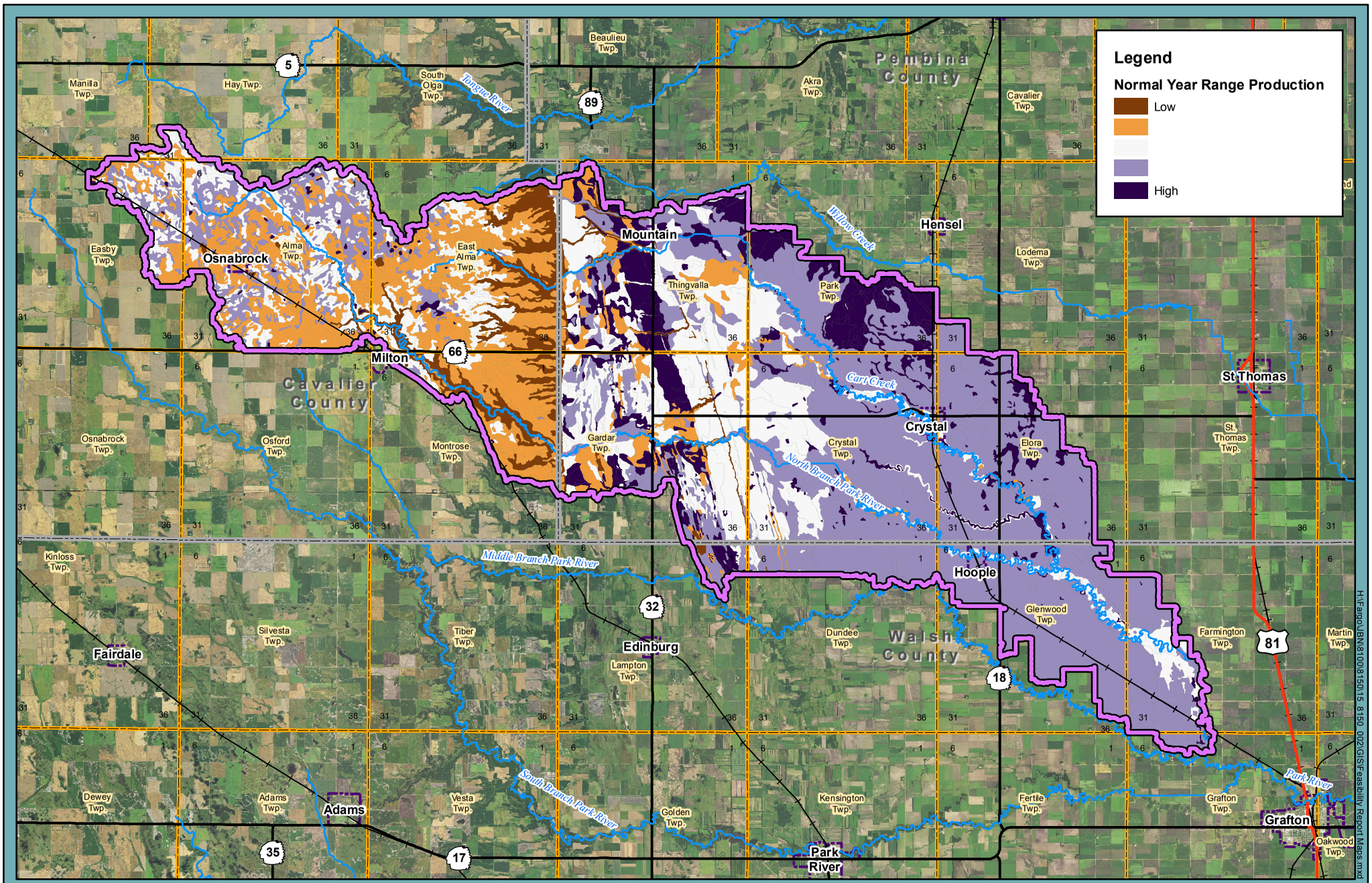

F-10

Figure 10: USDA SSURGO Normal Year Range Production

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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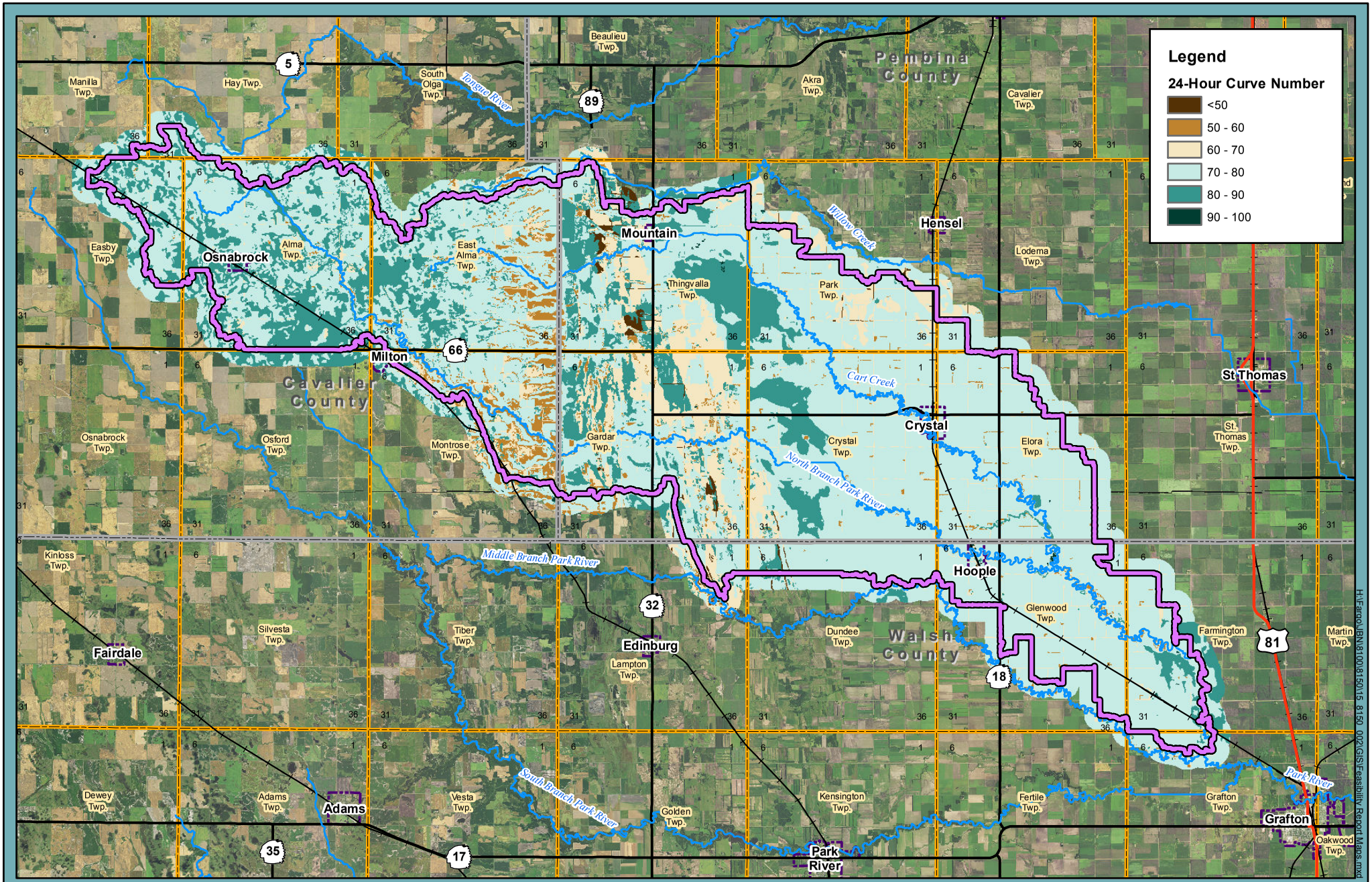
Houston Engineering Inc.



F-11

Figure 11: NRCS 24-Hour Curve Number

North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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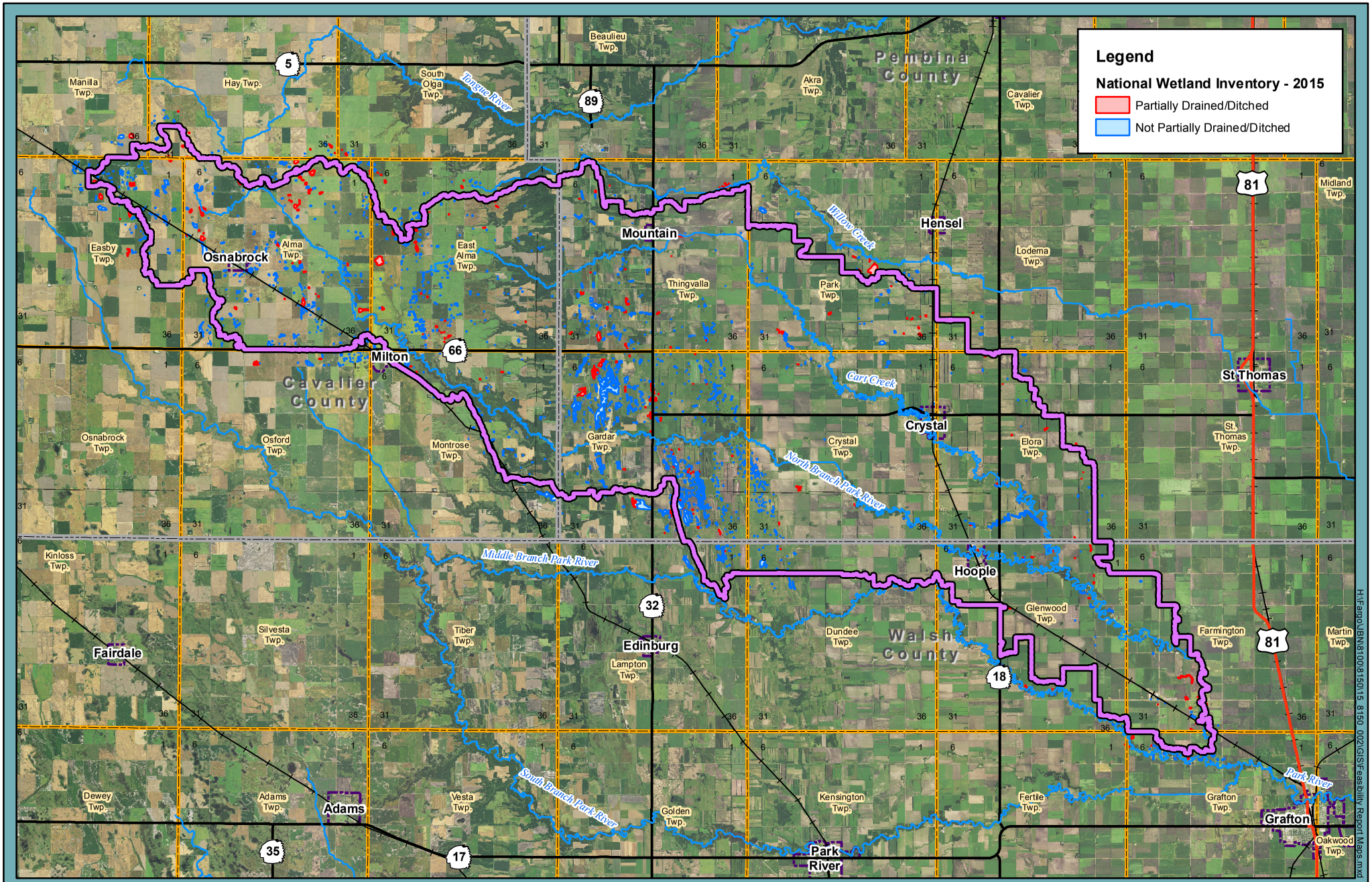

F-12

Figure 12: USFWS National Wetlands Inventory
North Branch Park River Watershed
Feasibility Study And Plan of Work
Park River Joint Water Resource District

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APPENDIX A

DRAFT Purpose and Project Goals

Developed from previous efforts undertaken by the PRJWRD.

North Branch Park River Watershed
Comprehensive Flood Damage Reduction
Purpose and Project Goals
December 16, 2014 - DRAFT

Prepared by:
Park River Joint Water Resource District
North Branch Park River/Cart Creek Stakeholders Committee

In cooperation with Houston Engineering, Inc.

1. Watershed Background

The Park River Watershed encompasses approximately 990 square miles of the Red River Basin, and resides primarily in three North Dakota counties; Cavalier, Pembina, and Walsh. This area in relation to the Red River Basin is illustrated on **Attachment 1**. Much of the Park River Watershed is comprised of three branches, combining near the community of Grafton, ND. The area contributing to the South Branch and Middle Branch encompasses approximately 403 square miles. A structure was recently completed along the Middle Branch that detains approximately 3.2 inches of runoff when combined with other existing upstream flood water impoundments. The South Branch has limited capacity to detain runoff in impoundment structures, and often contributes to flooding experienced on lower portions of the Park River. The area contributing to the North Branch encompasses 258 square miles, including the flood prone Cart Creek tributary. Currently, there are no impoundments in the North Branch Watershed. Substantial flood damages in this region often occur during both spring runoff and summer rainfall events, as was evident during the spring of 2013. Refer to **Attachment 2** for an illustration of the three branches of the Park River Watershed and the locations of existing impoundment structures.

2. Public Comment Solicitation

On July 1, 2014, the Park River Joint Water Resource District (PRJWRD) hosted a public comment meeting in Mountain, ND for residents and landowners in the North Branch Watershed. This meeting focused on gathering information to better define the existing flood problems and potential solutions. Information was also gathered with regard to locally perceived causes and solutions to flooding in the region. Approximately 80 people were in attendance at this meeting. Questionnaires were provided at the meeting, as well as direct mailed to invited landowners. Approximately 35 completed questionnaires have been provided back to the PRJWRD. This information was used to better define the *Problem Statement* discussed in Section 3 and *Expected Outcomes* discussed in Section 4. These comments are summarized in **Attachment 4**.

3. Problem Statement

The North Branch of the Park River and its tributaries has long been recognized as an area of concern for flooding by the Walsh, Pembina, and Cavalier County Water Resource Districts. Flooding within this region was especially problematic during the spring and summer of 2013. Above average spring and early summer runoff was experienced throughout the watershed. Widespread flooding was experienced by those residing along the North Branch, Cart Creek, and at points further downstream along the Park River. Flooding impacted rural residents in the area as well many of the communities within the region. This area lacks a comprehensive flood mitigation plan to reduce flood risks for impacted residents.

3.1. Local Scale Problems – *North Branch Park River Watershed*

Both spring and summer flooding results in a multitude of problems within the North Branch watershed. Steep slopes in the upper portions of the watershed result in runoff traveling quickly to the lower portions of the watershed, where slopes begin to flatten out. This often results in expansive areas becoming inundated with excessive runoff. High flows also cause substantial damages to the landscape as a result of erosion. In the last 10-years, FEMA declarations for the townships in question have occurred in 2004, 2005, 2006, 2009, 2011, and 2013. More specific information on problems within the North Branch watershed are summarized as follows. **Attachment 3** illustrates the FEMA regulatory floodplain extents as well as the drainage boundary for the North Branch Park River Watershed.

3.1.1. Communities

The community of Crystal, ND is within the North Branch watershed and currently lacks adequate flood protection. This increased flood risk results in impacts to residential, industrial, and infrastructure within Crystal, ND.

3.1.2. Rural

3.1.2.1. Residences

In addition to the communities previously described, risk for flood damages exist for residents living within flood prone areas along the North Branch and its tributaries. This flood risk has potential to result in loss or damage to personal property, and in extreme events, potentially loss of life.

3.1.2.2. Infrastructure

Flooding along the North Branch Park River and Cart Creek has resulted in substantial damages to rural infrastructure, such as existing drainage systems, roadways, and stream crossings. This was extremely apparent during the spring and summer of 2013, where the region was impacted by rapid spring snow melt and severe spring rains. Increased flows resulted in roads overtopping in many location, with several of these locations “washing out”. The increased flows also resulted in damages to many public and private drainage systems in the region. These damages are not limited to the spring of 2013 and are experienced frequently during periods of high flows.

3.1.3. Agricultural

Flooding of agricultural lands along the North Branch of the Park River and its tributaries is a frequent problem. Prolonged inundation of cropland leads to delayed planting dates in the area resulting in reduced yields for area producers. Additionally, high flows result in large amounts of erosion occurring on agricultural land within the area.

3.2. Regional Scale Problems – *Park River Watershed*

Flooding within the Park River Watershed, particularly in Walsh and Pembina Counties, has been a persistent problem for residents in the region. The community of Grafton, ND is located downstream of the confluences of the three Branches of the Park River watershed. A substantial portion of Grafton is located in the regulatory 100-year flood plain, and has led to the evaluation of several potential solutions to alleviate flood risk for the community. While these potential solutions have focused on reducing flood risk for residents within Grafton, ND, they haven't evaluated potential comprehensive solutions to reduce flood risk for area residents living outside of the community of Grafton, ND. Other communities, such as Crystal, Mountain, and Hoople, also deal with flooding during periods of high runoff. With the primary industry of the region consisting of agriculture, losses experienced as a result of flooded agricultural lands are also felt by the area. **Attachment 3** illustrates the FEMA regulatory floodplain extents within the Park River Watershed.

3.3. Red River Basin Wide Scale Problems

Runoff produced from the Park River Watershed contributes to the Red River Basin. The Red River Basin is an international, multi-jurisdictional watershed of approximately 45,000 square miles, with 80% of the Basin contained within the United States, and the remaining 20% of the Basin located in Canada. Flooding along the Red River and its tributaries is a prolonged issue for the region. Substantial damages are often experienced during periods of excessive runoff. Impacts experienced along the Red River mainstem are a result of combined tributary subwatershed contributions (including the Park River Watershed).

4. Project Purpose & Expected Outcomes

The North Branch Park River project will focus on primary benefit to local scale problems outlined in Section 3.1. Any benefit provided to the problems outlined in Sections 3.2 and 3.3 will be considered secondary, and not a primary focus for alternative analysis. Rather, potential alternatives will be recognized if secondary benefit is given to these problems. Strategies or alternatives that will result in potentially more severe downstream flooding along the Park River and potential to increase contributions to the Red River will not be considered.

4.1. Local Scale Purpose – *North Branch Watershed*

Project components of the North Branch Park River Flood Damage Reduction project will reduce flood risk for local communities, rural residences and infrastructure, and the agricultural community within the project watershed. The provided benefit is directly related to the locally acceptable amount of flood risk.

4.1.1. Expected Outcome No. 1 (Primary) – *Reduce Flood Risk for Crystal, ND*

- *Provide 100-year flood protection.*

4.1.2. Expected Outcome No. 2 (Primary) – *Reduce Flood Risk for Rural Residences*

- *Reduce flows along Cart Creek to minimize breakouts and overland flooding.*

4.1.3. Expected Outcome No. 3 (Primary) – *Reduce Flood Risk for Rural Infrastructure*

- *Reduce the frequency of road overtopping and washouts.*

4.1.4. Expected Outcome No. 4 (Primary) – *Reduce Impacts to Agriculture*

- *Reduce peak flows and duration of flooding along Cart Creek to reduce flooding and erosion of land in agricultural production*

4.2. Regional Scale Purpose

The North Branch Park River project will provide benefits to the Park River Watershed downstream of where the three branches of the Park River combine. The project will not incorporate any features that could increase the rate of runoff from the North Branch Park River, and potentially increase the severity of downstream flows.

4.2.1. Expected Outcome No. 5 (Secondary) – *Regional*

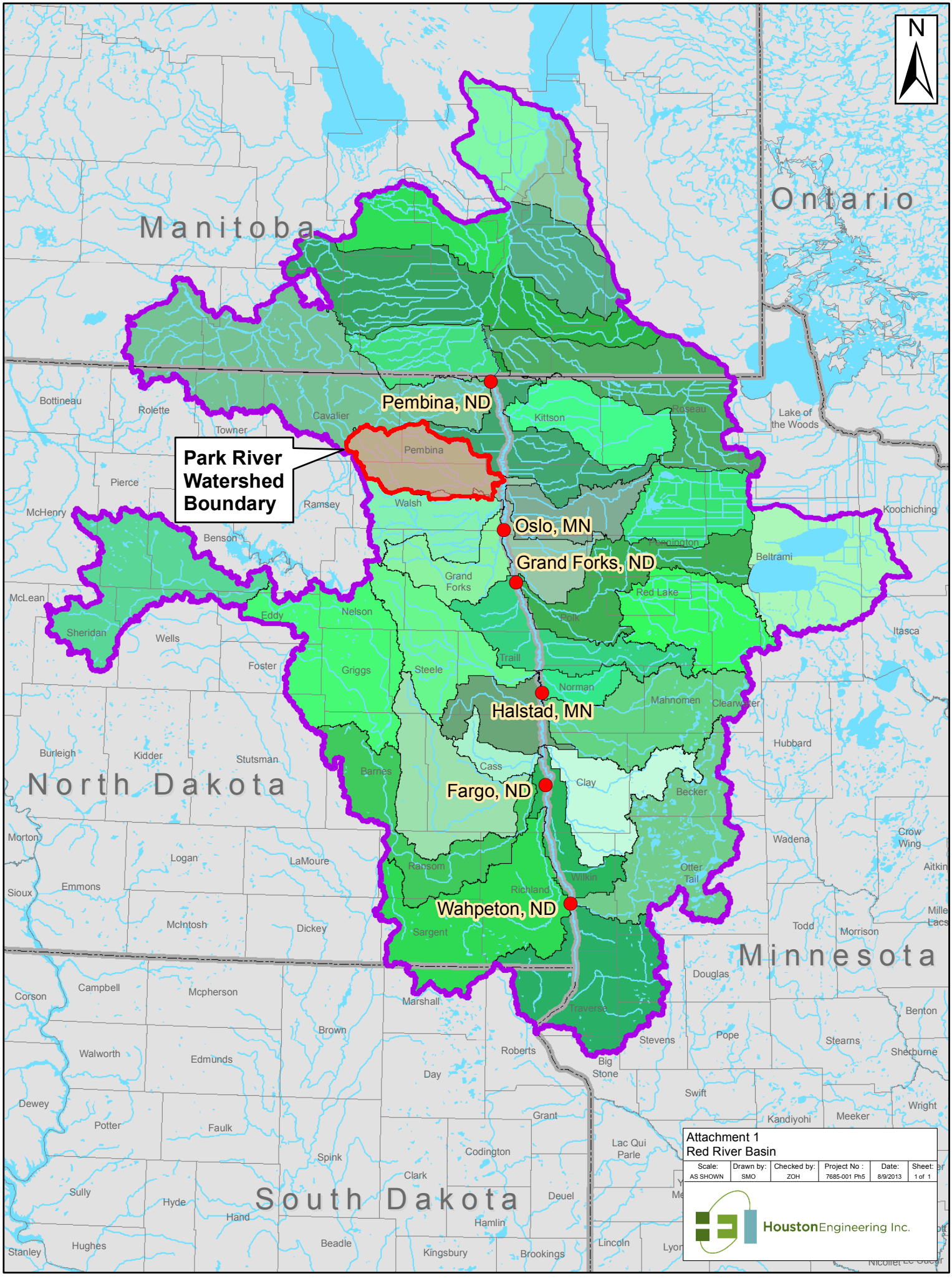
The project will reduce the magnitude of flooding from the North Branch Park River to the Park River mainstem. No alternatives will be considered that will result in increased downstream flows and potential adverse impacts as a result of the project. This will provide impacted interests along the Park River mainstem, including the community of Grafton, ND, reduced impacts as a result of flooding in the North Branch Watershed.

4.3. Red River Basin Wide Scale Purpose

As part of the Red River Basin Commission's Long Term Flood Solutions for the Red River Basin (RRBC LTFS), peak flow and runoff volume reduction goals were established to reduce Red River main stem flooding by approximately twenty percent. To achieve this goal, individual tributary goals were generally to provide 35%± peak flow reduction and 15-20%± overall volume reduction.

4.3.1. Expected Outcome No. 6 (Secondary) – *Basin-wide*

Alternatives considered in the North Branch Park River watershed will attempt to work towards providing peak flow and volume reductions as specified in the RRBC LTFS. The total peak flow and volume reductions recommended for the Park River watershed are 35% and 20% reductions, respectively. Projects will not be considered with this as primary objective, rather will be recognized if alternatives can assist reducing the Park River's contribution to downstream flooding.


N
Manitoba
Ontario
Pembina, ND
Park River Watershed Boundary
Oslo, MN
Grand Forks, ND
Halstad, MN
Fargo, ND
Wahpeton, ND
North Dakota
South Dakota
Minnesota
Bottineau
Rolette
Towner
Cavalier
Pembina
Kittson
Roseau
Lake of the Woods
Pierce
McHenry
Ramsey
Walsh
Koochiching
Benson
Beltrami
McLean
Grand Forks
Red Lake
Sheridan
Wells
Eddy
Nelson
Foster
Griggs
Steele
Traill
Itasca
Norman
Mahnomen
Clearwater
Burleigh
Kidder
Stutsman
Barnes
Cass
Clay
Becker
Hubbard
Morton
Logan
LaMoure
Ransom
Wilkin
Otter Tail
Wadena
Crow Wing
Sioux
Emmons
Richland
McIntosh
Dickey
Sargent
Todd
Morrison
Corson
Campbell
Mcpherson
Marshall
Traverse
Douglas
Benton
Brown
Roberts
Stevens
Pope
Stearns
Sherburne
Walworth
Edmunds
Day
Big Stone
Swift
Dewey
Potter
Faulk
Grant
Kandiyohi
Meeker
Wright
Spink
Codington
Lac Qui Parle
Clark
Sully
Hyde
Hand
Deuel
Hamlin
Stanley
Hughes
Beadle
Kingsbury
Brookings
Lincoln
Attachment 1
Red River Basin
Scale: AS SHOWN
Drawn by: SMO
Checked by: ZOH
Project No : 7685-001 Ph5
Date: 8/9/2013
Sheet: 1 of 1
HoustonEngineering Inc.

Park Dams
Area Controlled Above Grafton
Middle Branch Drainage Area
South Branch Drainage Area
Cart Creek Drainage Area
North Branch Park River Drainage Area

N

LANGDON
CAVALIER
HAMILTON
MOUNTAIN
HENSEL
OSNABROCK
MILTON
LOMA
NEKOMA
ST THOMAS
CRYSTAL
DRAYTON
HOOPLE
FAIRDALE
EDINBURG
ADAMS
EDMORE
GRAFTON
PARK RIVER
LANKIN
PISEK
MINTO
CONWAY

Pembina County
Ramsey County
Walsh County

Red River
North Branch Park River
Cart Creek
South Branch Park River
Middle Branch Park River
Middle Branch Forest River
Park River
Tongue River
Willow Creek

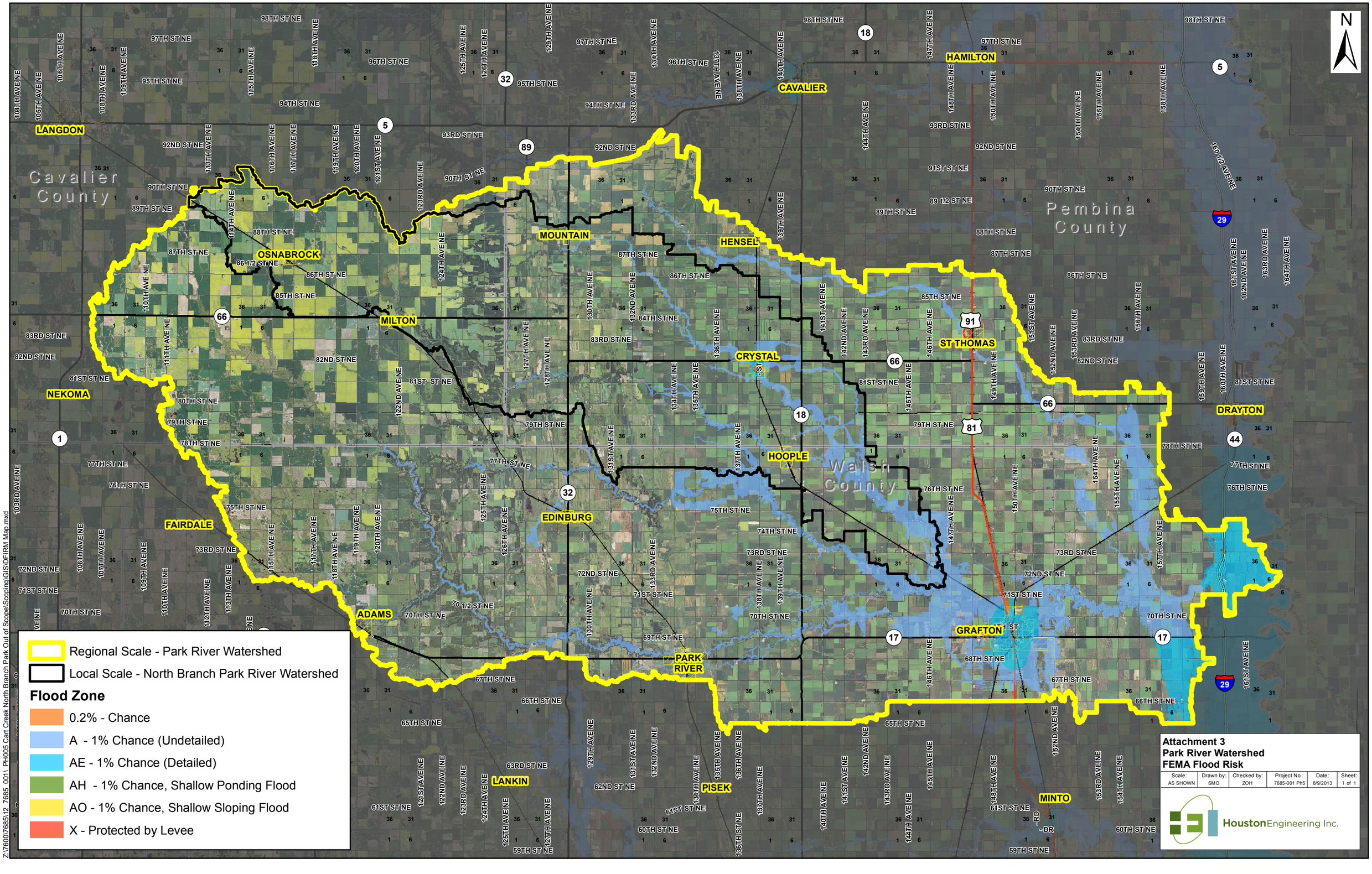
WILLOW CREEK-PARK RIVER DET DAM #1
MIDDLE BR. PARK RIVER #10 - MELSTAD
MIDDLE BR. PARK RIVER #9 - UNION
MIDDLE BR. PARK RIVER #8
MIDDLE BR. PARK RIVER #6
WALSH CO WRD DAM 5
ADAMS DAM
HOMME RESERVOIR
GUSTAFSON DAM
NORTH SALT LAKE

Attachment 2
Park River Watershed
Tributary Subwatersheds

Scale:	Drawn by:	Checked by:	Project No :	Date:	Sheet:
AS SHOWN	SMO	ZOH	7685-001 Ph5	8/8/2013	1 of 1

HoustonEngineering Inc.

Z:\7600\7685\12_7685_0011_PH005 Cart Creek North Branch Park Out of Scope\GIS\Park DAs and Dams zoom out.mxd


N
LANGDON
Cavalier County
CAVALIER
HAMILTON
Pembina County
MOUNTAIN
HENSEL
OSNABROCK
MILTON
NEKOMA
CRYSTAL
ST THOMAS
DRAYTON
HOOPLE
Walsh County
EDINBURG
FAIRDALE
ADAMS
PARK RIVER
GRAFTON
LANKIN
PISEK
MINTO
Regional Scale - Park River Watershed
Local Scale - North Branch Park River Watershed
Flood Zone
0.2% - Chance
A - 1% Chance (Undetailed)
AE - 1% Chance (Detailed)
AH - 1% Chance, Shallow Ponding Flood
AO - 1% Chance, Shallow Sloping Flood
X - Protected by Levee
Attachment 3
Park River Watershed
FEMA Flood Risk
Scale: AS SHOWN
Drawn by: SMO
Checked by: ZOH
Project No : 7685-001 Ph5
Date: 8/9/2013
Sheet: 1 of 1
HoustonEngineering Inc.
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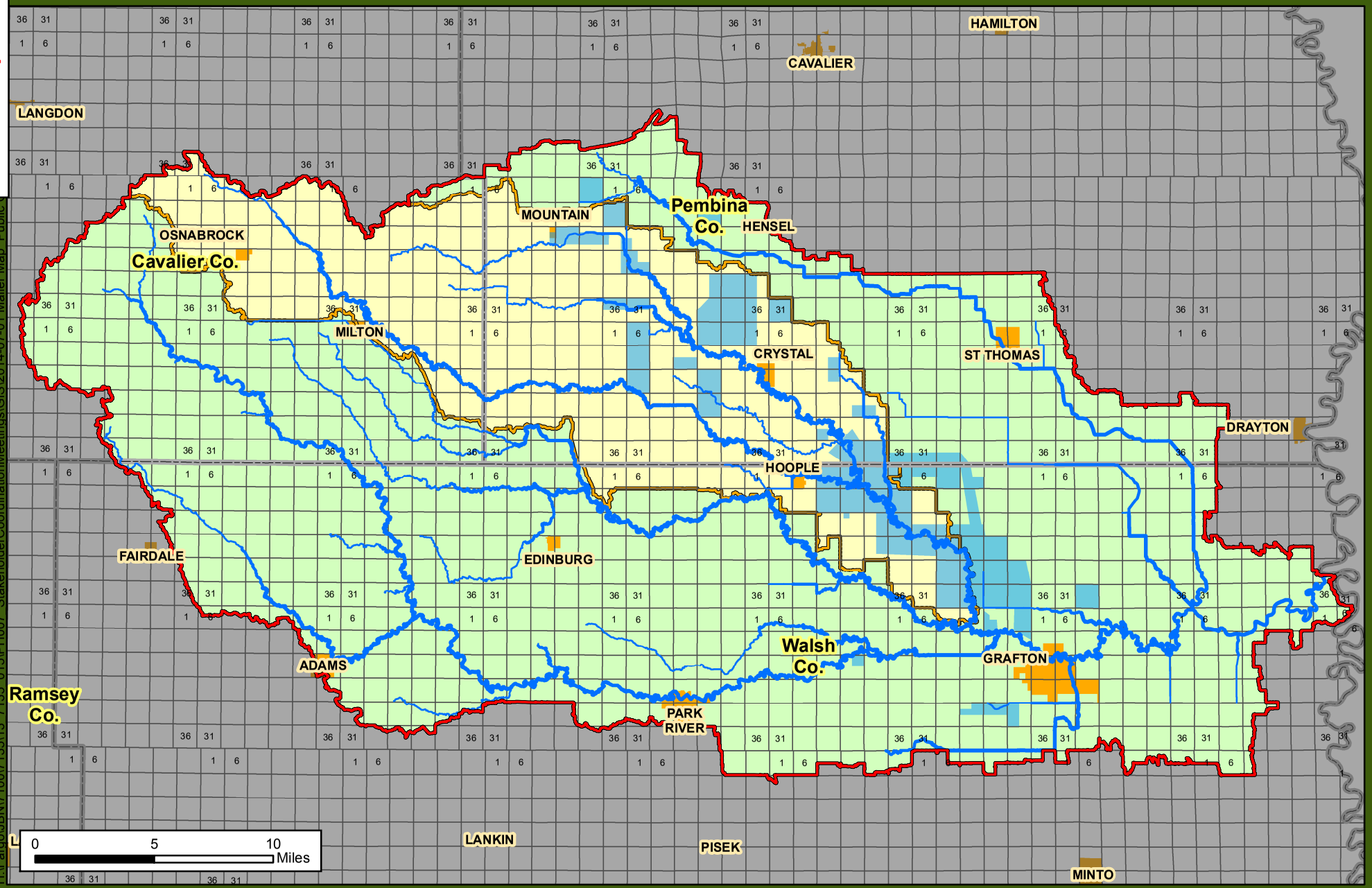
Attachment No. 4



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Park River Joint Water Resource District

North Branch Park River
Comprehensive Flood Damage Reduction
Public Comment Form

- North Branch Watershed
- Park River Watershed
- Rivers and Streams
- County Boundary
- Township Boundary
- City Limits
- Received Problem Areas

N W E S

Prepared By:

Houston Engineering Inc.

Attachment No. 4

Name	Address	Impacts to Your Property as a Result of Flooding	Overland Flooding Observations	How to Reduce Flood Risk	Additional Comments
James Aasand	1221 Western Ave Grafton, ND 58237	Crop loss due to North Branch of Park River backing up onto land or slow drainage into N Branch or N Branch overflowing its banks onto farmland causing overland flooding crop & land damage	Around the Nash area large amounts of land has been underwater	By slowing down or diverting waters from entering North Branch	
J. G. Beattie	8345 142nd Ave NE Crystal, ND 58222	Crop loss	There is so much water that comes into Elora Twp, over flow from willow creek, cart creek, the coulee south of Crystal along with local water. The water flows into the Twp so fast from the west & northwest & our Twp is flatter and doesn't have the elevation advantage that the Twp's west and northwest have.	Slow down the flow of water coming into Elora Twp before it gets here.	
Richard A Brabakken Sr	14180 77th St NE	All of the above. Last year I was flooded 3 times	It has been getting worse but there has been more heavy rains and more drainage	It would be nice if the water could be held upstream and slow the water down. It is pretty flat to hold much water where I live	We can handle are own water but we can not handle the water from upstream
Ray Brubakken	PO Box 307 Hoople, ND 58243	Loss of crops after a heavy rain. Unable to plant crops. Erosion cause by fast moving water.	With all the CRP removal, draining and diking, water moves faster than ever before. 2013 was the worst I have ever seen. 50% of our farm was not planted.	Hold water, clean river & Cart Creek.	I own the land where Cark Creek and the North Branch of the Park River meet. Cart Creek was always dry before July or August not that long ago. Now it never is.
Joyce Collis	14750 Hwy 17 Grafton	All of the culverts going east are collapsed or at the wrong angle all of the water backs up around and many property		redo the drainage	
Doug Davis	1344 Lawler Ave Grafton, ND	Crop loss, sandbagging of 2 properties, extensive erosion to ditches from overland Cart Creek flooding and water depositing in the field for a long period of time. Continuous running of sump pumps many acres of preventing planting 2013	too much water coming from Cart Creek into Park River and it comes too fast	some diversions of water from Cart Creek, dams or holding ponds to slow down water.	Water from Cart Creek not only damages adjacent property but the overland water, which could be enhanced by cutting of roads or ditches during flooding has devastated road ditches and filled my fields at my farm at Sec 5 Farmington 2 times within last 10 years. Costs to clean clay out of fields and fill holes in ditches have been quite high. Plus farm ability on the land for following years, especially in this wet cycle has been challenging.
John F. Desautel	405 Eastern Ave Grafton, ND 58237	We had to dike around the farm to try and keep water out. late spring planting, washed out roads, crops lost, and land damage.	The North Branch is filled with dead trees and has flooded our area for the last 20 or 30 years. It was gone over its banks and has been a big problem	I believe by slowing or holding water back & finding a over flow outlet to the east along with a clean out & doing some shayling(?) of the North Branch.	Prop Location (Sec 34 & part of 27 & 26). Areas impacted by flooding (Sec 21, 22, 28, 27, 33, 34).
John F. Desautel Farming Co. & D&H Land Co. LLC	7275 148th Ave NE Grafton, ND 58237 % Kevin Hoenke	Have lost crop many times from water coming down North Branch overflowing and going overland	To much water coming in North Branch river is not open to take all the water drainage has been changed upstream and water is coming too fast	I am hopeful that the two counties are talking. We have to have to use all options	I have been involved in Drain 70, 74 in Walsh County. The last 10 years the amount of water has changed we have lost hundreds of thousands in crop
Robert Desautel	15309 74th St NE Grafton, ND	Can't get in to see it P.P. 3 times last 5 years, when seeded heavy rain comes from NW. Drowns my crops	It jumps out of the North Branch straight north of Nash 1.5 miles. Runs across land to the southeast.	Holding water back to the Northwest	I think storing water close to the escarpment would be very feasible.
Beth & Rick Engelmann	Box 136 Hoople, ND 58243	Crop loss, land erosion, ditching		Getting Mountain water to Red River without going through Grafton. Clean Cart Creek, channel blocked with trees	Land Affected: SE 1/4 S9 159-54, NE 1/4 S16 159-54, SE 1/4 S22 159-54, SW 1/4 S23 159-54, SE 1/4 SW 1/4 S27 159-54, SW 1/4 S28 159-54, S35 159-54
Loren Estad	13545 84th St NE Crystal, ND	Crop damages and erosion to farm land	Mountain east to willow coulee on North side of 3 is becoming a major artery for excess runoff	Retention dams be placed west of Hwy 32	
Lindsey Fingarson	13021 78th St NE Edinburg, ND 58227	Crop loss - seeding later in the spring because of excess water from Cart Creek	Cart Creek can not handle the large amount of water at spring runoff and big summer rains.	Putting in retention dams at the water heads	19-160-55
Hans & Tara Halvorson	7467 Cty Rd 6 Nash, ND	Flooded yard most years. Water on the main floor in home for 1st time in 2013. Flooded woods most years. Flooded buildings (barn, outbuildings) most years	Getting worse every year. Incredible amount of "personal protection" that collectively affects others	Create "holding areas" further upstream to manage water levels	
Russell Hannessor	13120 Co Rd 3 Mountain, ND	Water exceeds creek and does major soil erosion next to drain	wetter weather causing more water and water coming off hill in Cavalier Co. faster than before	Slow down water in big coulee to the west in western Pembina and Cav. county	Your surface ponds will work but there is to much slope for five miles east of Mountain so detention dams are only thing that will help Mountain Area

Attachment No. 4

Name	Address	Impacts to Your Property as a Result of Flooding	Overland Flooding Observations	How to Reduce Flood Risk	Additional Comments
Chad Hornbaker	14445 76th St NE	Lived at residence 11 years. No damage from flooding. New drainage ditch on east side of property could have adverse effects in spring!	Water flows overland one mile north of my property and comes south 1.5 miles east of my property. Neighbors are affected by overland flooding.	Control individuals diking, ditching, and putting culverts in to protect their property but as a result force water on others.	Neighbors are fighting over forcing water on each others crops/fields/land and continue to dike/ditch with no obvious regulation or monitoring. Who is responsible for figuring out how ditch/dike will affect the watershed & flooding
Kevin Johnson	3348 McIntosh Dr Billings, MT 59101	Mostly just brush & some garbage	I really haven't seen any - but I don't live there either	Quit draining natural pot holes	
John H. Johnson	12637 81st St NE Edinburg, ND 58227	The North Branch of the Park River is eroding the banks at a faster pace than years ago. I live close to the river	I live on the Pembina Hills Escarpment and water drains at a high rate here so overland flooding is brief	More control of the water upstream	
Lonnette Kelley	8135 130th Ave NE Mountain, ND 58262	I have lived here since 1995 - during these past years never any flooding except for the time we had 9.5 inches at once-only small amounts of water in basement. Since 2005 yearly water in basement and increasing from 1 sump pump to 4 additional when the water starts running in. Has caused many dollars worth of damages and huge amounts of time fighting water	Last number of years water is coming from Walhalla area. Everything comes to our gravel corner & Hwy3-like a basin it fills the entire fields surrounding my home. Tries to run down the small creeks and ditches east but just no place to go. Something has changed in the last years to divert the water (all) to this basin area	Change whatever changed and let the water go back to its original path. Stop diverting the heavy flows of water here.	This change in the water flow is causing a hardship with my home-creating many problems with this 100 year old home, the drain fields, basement, appliances, as this is my business also creates many issues for my guests, with plumbing issues and cancelled appointments. Very costly and hard to continue fighting the waters. Was never this way in the past years.
Andrew Kirking, Emergency Manager	Not in Project Area		Rapid water movement through legal drains & ditches causing deep rutting & washouts	Slow water down. Whether through retention or increasing wetlands, hold water longer upstream	I'm not a farmer & have no land at stake, but if it is possible to have many smaller storage areas so that many give a little. Multi-section detention sites are better than what we have now, but could many small areas be implemented?
Michael Kiser (C/O) Dorothy Doktor Family Trust, Kiser Family Trust, Apalona Kiser	501 5th St W Ada, MN 56510	The entire family farm consists of 400 acres and includes a building site which we use and maintain. Basically the entire farm is impacted by flooding. The farmstead has not gotten flooded recently, but that is because we have diked it at our own expense. In 2013, the farmstead was almost flooded in spite of our diking effort's. In 2013, the farm flooded in the spring plus 3 times during the summer. The access to the farm was blocked by flooded roads. Soil and clay was eroded from neighboring farms and deposited on our farm, causing additional damage and expense. Very little of the farm was planted. Although previous years may not have been as bad as 2013, getting the crop planted and then having it survive summer floods has been increasingly very challenging and risky for the past 20 years or so.	2013 may have been the worst year yet.	Our farm is at the bottom of the Cart Creek watershed, so about 99% of the water in the entire watershed goes through it. Better enforcement of drainage restrictions on upper areas of watershed would have helped in the past and should be done in the future. At this point cleaning and diking the channels may help. Water retention may also help.	It is possible some farmland could be given up and used for water retention, but owners would need adequate compensation. It is noted compensation should be based on what the farm would rent and sell for if it was not negatively impacted by the drainage projects on farms upstream.
Bruce & Vicki Lenz	640 6th St Crystal, ND 58202	Personally none; however, flooding damaged parks, several homes in which one had to be destroyed, friends house had damage	Crystal has Cark Creek running through it. There was a lake here which is grown in swamp now the creek flows through it. If we got grants to restore the lake & fix the damn it would cut back on the town flooding	Explained above. Half the town was flooded	If the lake was restored, fish could be introduced, park could set up camp sights and it would be more $ in county with tourism
Bill Mitchell	1286 8th Ave NE Thompson, ND 58278				Section 22 has a small coulee on one end only flooding is some overland on this property
Leslie A. Moe POA for Helen Moe	1721 Charleswood Est Dr West Fargo, ND 58078	NA	Culverts not properly cared for or larger culverts need to be installed - ditches not cleaned out	Clean trees out of ditches, larger culverts to allow water to flow and bridge repair	
Ronald D. Moe	6689 Hwy 81 Grafton, ND 58237	Perpetual field crossing washouts, delayed spring planting, and some annual crop losses.	It is getting worse every year as farmers improve upon their field drains.	See my eleven page letter enclosed.	I think you should seriously look at doing a high-water diversion of Cart Creek and the north branch of the PR from the confluence of the two directly to the Red River along mid-section lines. Considering the property lines and farmstead locations shown on plat book maps it loos very doable to me.

Attachment No. 4

Name	Address	Impacts to Your Property as a Result of Flooding	Overland Flooding Observations	How to Reduce Flood Risk	Additional Comments
Mountain Cemetary Assn	Box 146 Mountain, ND 50262	No impact			
F. Paul O'Keefe	8233 137th Ave NE Crystal, ND 58222	During high water we are isolated by water over the roads and as a result the gravel is washed off. No damage to buildings	Erodes the topsoil. Delays planting. Piles up Debris. Bring in weeds	Holding areas to the N.W. on Cart Creek. Diversion around Crystal	High water is occurring more often. This has an impact on our property value, making sale of this property difficult. I am not qualified to comment on water storage
F Kenneth Olafson	208 E Oakland Ave Milton, ND 58260	Large comment letter, didn't return form.			
Roger Olafson	12945 84th St NE Edinburg, ND 58227	Moderate crop loss. Moderate to heavy property damage due to erosion and washouts caused by stream breakouts.	It seems some changes have been made upstream as water comes through in larger amounts in places there didn't use to cause problems	Combination of retention dams, holding areas to temporarily store water, channel improvements (cleaning & widening)	This is the third such meeting I have attended on Park River/Cart Creek flooding problems (Mountain-2006, Hoople-2009, Mountain-2014) and this is the first one where I felt there were some meaningful dialogue and well through out possible solutions to the flooding issues.
Robert Olgeirson	301 W Ave C Bismarck, ND 58501	We were forced to dig a $3000+ ditch across a good field to direct overland flooding. It came across several fields instead of the creek channel	Getting worse than it ever was	Keep some of the water in Cavalier county- which is the source	Main creek on our property flows south of Hwy 66 and then back. Creek shown on map is Not the main one but a much smaller drain and insignificant in comparison
Jerry & Nadine Olson	14187 State Hwy 66 - Box 74 Hoople, ND 58243	Our yard is very old and people chose the high ground	Overland flooding is created by us persons by using roads for dams and everyone wanting to run water away from them. Every north-south road should have a large culvert every mile to let water run east to the Red River	For many years nearly all farms had (potholes) or low ground that held water for days weeks or months before being planted. With new leveling and dirt mover these areas have been changed or moved.	Country Road 12 acts as huge dam and directs water as do many other township build (roads or dams) to keep water moving to someone else's land. I hope if you live in Osnabrock and want to go to Pembina there is a short way than through Grafton
Doug Ramsey	8169 136th Ave NE Crystal, ND 58222	It floods our land and puts water in our basement	It piles up along township roads and washes them out. It floods Crystal	Putting a diversion ditch around the west side of Crystal	For the North Branch of the Park River and Cart Creek dams should be built on the Pembina Escarpment.
Darryl Sander	810 Westwood Ave Larimore, ND 58251	On sec 31-157-53 the coulee that runs threw this quarter used to be spring runoff only, now with all the upstream drainage it has become a year round river. I understand a lot of drainage has been done without the proper permits. Why?			Some thing needs to be done about all the upstream drainage into a coulee when it should go to the river
Penny Sigfusson (Ventor)	8115 128th Ave NE	Water running in the basement like a waterfall	There is nowhere for the water to go except through my yard		All I need is a culvert put in on the North side of my yard, I think that would fix the problem
Chris Thompson	15320 71st PL Ne Grafton, ND 58237	Crop loss, property damage	I believe there is overland flooding caused by illegal dikes and other practices that don't allow the water to go into it's natural channels	Improving the existing drains and waterways	
Ron & Delores Willis	PO Box 370 Ilwaco, WA 98624	Unknown, Live in Washington State	None	No Knowledge	(Picture on comment form)

APPENDIX B

DRAFT Strategy Evaluation Table

Developed from previous efforts undertaken by the PRJWRD.

North Branch Park River Watershed
Comprehensive Flood Damage Reduction
Strategy Evaluation Worksheet
February 4, 2015 - DRAFT

		Expected Outcome No. 1 – Reduce Flood Risk for Communities in the North Branch Watershed	**Expected Outcome No. 2** – Reduce Flood Risk for Rural Residences	**Expected Outcome No. 3** – Reduce Flood Risk for Rural Infrastructure	**Expected Outcome No. 4** – Reduce Impacts to Agriculture	**Expected Outcome No. 5** – Regional	**Expected Outcome No. 6** – Basin-wide	**Practicability** - Ability to implement and reasonably manage	Locally desirable for additional evaluation (Primary, secondary, or not applicable)	Reasoning and Justification Locally Desirable Determination
Increase Temporary Flood Storage	Dams and Impoundments	5	5	5	5	5	5	4	Primary	Selected as a primary alternative for further analysis based on logistics of consolidating runoff storage into larger impoundments or dry dams. A reasonable expectation to implement and manage a smaller number of larger sites as compared to a large number of smaller distributed sites (wetlands).
	Create or Restore Wetlands	3	3	3	2	2	2	1	Secondary	While this strategy would provide storage for runoff within the watershed, it has been ruled out for future analysis based on practicality. Unreasonable expectation to implement sufficient number of wetland restorations to make a meaningful difference to problem areas. Wetland enhancements that would provide additional flood storage should be encouraged on a voluntary basis.
	Alter ground water through drainage	1	1	1	4	1	1	1	Not Applicable	This strategy was ruled out based on practicality. Topography west of Highway 32 would likely not allow for sufficient residence time for runoff to infiltrate into subsurface drainage systems before running off.
	Culvert sizing to meter runoff	2	2	1	2	1	1	1	Not Applicable	Using culvert sizing recommendations has been ruled out due to a Technical Feasibility. Many culverts within the watershed are already under sized, resulting in substantial road overtopping and wash-outs during severe floods. Topography in the upper watershed would not allow for substantial storage before overtopping.
	Overtopping Levees	1	1	1	4	1	1	2	Secondary	Set-back or overtopping levees could be used to benefit ag lands for smaller rainfall events. However, during severe floods minimizing or reducing overland breakout flows would likely result in substantial adverse impacts for communities and rural residences along water ways. Detaining runoff would likely be required to mitigate adverse impacts.
Increase Conveyance Capacity	Channelization of existing water ways and flowages	2	2	4	4	1	1	2	Not Applicable	This strategy was ruled out due to potential of downstream adverse impacts. While ditching and channelizing would likely reduced the amount of overland flooding, reducing floodplain storage would likely result in higher flows experienced downstream, where flooding issues already exist.
	Drainage	2	2	4	4	1	1	2	Not Applicable	Ruled out for same issues described in "Channelization of existing water ways and flowages" strategy above.
	Diversions	5	2	2	2	1	1	4	Primary	Selected as primary alternative to carry forward to further technical analysis because this will likely be required to provide Crystal, ND with 100-year flood protection. Increased conveyance will likely need temporary flood storage to mitigate downstream impacts.
	Set-back Levees	1	1	1	4	1	1	2	Secondary	Set-back or overtopping levees could be used to benefit ag lands for smaller rainfall events. However, during severe floods minimizing or reducing overland breakout flows would likely result in substantial adverse impacts for communities and rural residences along water ways. Detaining runoff would likely be required to mitigate adverse impacts.
	Increasing road crossing capacity	4	4	4	4	1	1	4	Not Applicable	This strategy was ruled out due to potential of downstream adverse impacts. While increasing capacity would likely reduced the amount of overland flooding, allowing flows to move quicker downstream would likely result in higher flows experienced downstream, where flooding issues already exist.
Reduce Flood Volume	Create or Restore Wetlands	3	3	3	2	2	2	1	Secondary	While this strategy would provide storage for runoff within the watershed, it has been ruled out for future analysis based on practicality. Unreasonable expectation to implement sufficient number of wetland restorations to make a meaningful difference to problem areas. Wetland enhancements that would provide additional flood storage should be encouraged on a voluntary basis.
	Cropland BMPs	1	1	1	3	1	1	1	Secondary	Cropland BMPs would provide localized benefit to ag land, however implementation of sufficient BMPs to attain Expected Outcomes is considered impractical. Therefore, this strategy was eliminated for future consideration but should be encouraged on a voluntary basis.
	Cropland Conversion	1	1	1	1	1	1	1	Not Applicable	Conversion of sufficient cropland to attain the Expected Outcomes was determined to be Not Applicable due to Practicability to implement.
	Other Beneficial Uses	1	1	1	3	1	1	1	Secondary	Another beneficial use that could be explored as a secondary benefit for Increasing Temporary Flood Storage strategies would be irrigation. Potatoes are a commodity crop extensively grown in the portions of the region, and typically require irrigation.
Protection/Avoidance	Urban Levees	5	1	1	1	1	1	2	Not Applicable	Urban Levee's have been ruled out due to practicability to implement. Encroachment on the floodplain would likely require floodplain evacuation in order to provide a sufficient cooridor to construct levees.
	Farmstead Levees	1	5	1	2	1	1	2	Secondary	This alternative was ruled out for further analysis due to inconsistency with the Expected Outcomes. Where applicable, Farmstead Levees should be pursued on a case-by-case basis if desired by a landowner.
	Agricultural Levees	1	1	1	4	1	1	2	Secondary	Set-back or overtopping levees could be used to benefit ag lands for smaller rainfall events. However, during severe floods minimizing or reducing overland breakout flows would likely result in substantial adverse impacts for communities and rural residences along water ways. Detaining runoff would likely be required to mitigate adverse impacts.
	Evacuation of the floodplain	4	4	1	1	1	1	1	Not Applicable	Evacuation of Floodplain was ruled out based on inconsistency with the Expected Outcomes and impracticality to implement. Flooding the watershed is characterized by breakout flows and overland flooding. Severe flooding is not contained to the river floodplain cooridor.
	Flood proofing	4	4	1	1	1	1	2	Secondary	This alternative was ruled out for further analysis due to inconsistency with the Expected Outcomes. Where applicable, Farmstead Levees should be pursued on a case-by-case basis if desired by a landowner.
	Flood warning system	2	2	1	1	2	2	2	Not Applicable	Early warning systems would benefit the watershed, however flooding typically happens very quickly within the North Branch Watershed and advanced warning would likely only allow for evacuation of at risk areas. Temporary protection of communities, rural residences, and infrastructure would likely not be realistic, therefore this alternative was ruled out based on practicability to implement.

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APPENDIX C

Plan of Work

Houston Engineering Inc.

				HOUSTON ENGINEERING, INC.										GANNETT FLEMING				SUBCONSULTANT TBD		BRAUN INTERTEC	
				Senior Project Manager hours	Professional Engineer hours	Graduate Engineer hours	Senior Environmental Scientist hours	Scientist hours	GIS Technician I hours	CAD Operator hours	Land Surveyor hours	Two-person crew (plus equipment) hours	Administrative Assistant hours	Project Management hours	Project Economist hours	Analyst hours	Administrative Assistant hours	Preliminary Cultural Review Lump Sum	Detailed Cultural Review Lump Sum	Preliminary Geologic Review Lump Sum	Geologic Exploration Per Site
PROBLEMS AND OPPORTUNITIES		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Publicize Planning	The general public within the Watershed Area will be made aware of the Watershed Study consistent with NRCS requirements defined in Title 400 of the General Manual. Notification to the public will be made through the invitation to participate in the Initial Public Meeting. The public meeting will also review Scoping materials discussed in the NWPM 501.24. Contractor will provide assistance to Project Sponsor with project narratives suitable for publicizing.	COMPLETED	COMPLETED																		
B. Identify Need for Proposed Action	The project sponsor will assist to identify the Need for the Proposed Action. This will identify the magnitude, frequency and extent of damages within the problem area.	COMPLETED	COMPLETED																		
C. Gather and Review Existing Data	Existing studies will be inventoried and reviewed to determine previous planning completed in the Study Area. Information will be solicited from the Local Sponsor, NRCS, applicable state agencies, and other parties that may have completed previous planning. Additional information to be solicited includes recent FEMA damage claims.	COMPLETED	COMPLETED																		
D. Assemble Interdisciplinary Team	The interdisciplinary team developed based on requirements in the NWPM Section 501.3/NWPH Section 601.3. The interdisciplinary team will be made up of Federal, State, and Local agencies that have an expertise or authority over the proposed action.	1/1/2016	2/1/2016		2		2														
E. Develop Public Participation Plan	A pubic participation plan will be developed consistent with NRCS requirements defined in Title 400 of the General Manual. This includes objectives of public participation, define groups or individuals invited, techniques (meetings, surveys, etc.), information to be provided and obtained, and an approximate schedule.	COMPLETED	COMPLETED																		
F. Conduct Public Meeting to Obtain Local Input	An initial public meeting will be held to inform the public of the study tasks and schedule. The initial Public Meeting will allow for public input about concerns outlined in the NWPM 501.24. The meeting will engage the public through a presentation, oral public comments, and provide a form for written public comments.	2/1/2016	3/1/2016	6	16																
G. Document Sponsor Objectives	After public input has been solicited and inventoried, the information will be reviewed with the Project Sponsor to further document the Need for the Proposed Action.	COMPLETED	COMPLETED																		
H. Write Purpose and Need Statement	Public input, sponsor objectives, and the initially developed Need for Proposed Action will be used to develop a the Project Purpose and Need Statement. This statement will clearly list problems and desired outcomes that the Proposed Action should address. This task has largely been completed, however additional time is allotted to incorporate any revisions to the purpose and need statement based on additional public comment.	3/1/2016	4/1/2016		8		8														
I. Conduct Interdisciplinary Team Meeting	The interdisciplinary team will meet to be updated on work completed to date, the Watershed Planning process, and review the Purpose and Need Statement that has been previously developed. Information will be provided to the interdisciplinary team prior to meeting to allow for sufficient review. If possible, this meeting will be held during the interagency team meeting that is typically held monthly in Bismarck.	2/1/2016	3/1/2016	6	12																
J. Write Draft *Purpose and Need for Action* section (NWPM 501.34/NWPH 601.34)	The adopted Purpose and Need will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.34/NWPH 601.34.	3/1/2016	4/1/2016	2	16																
K. Summarize and Incorporate into the Reviewable Record	Outcomes from the *Problems and Opportunities* section will be made available for review in the Reviewable Record.	3/15/2016	4/1/2016		2																
Subtotal				*14*	*56*	*0*	*10*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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SCOPE OF ENVIRONMENTAL ASSESSMENT		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Conduct Interdisciplinary Team Meeting	The interdisciplinary team will convene to review the required concerns for NEPA. These concerns are highlighted in the NWPM 501.24. Information required to develop information required in NWPH Sections 606.18 and 606.19. This will be conducted concurrently with the Interdisciplinary Team Field Review.	5/1/2016	6/1/2016		8				4												
B. Conduct Interdisciplinary Team Field Review	The Interdisciplinary team will conduct a field review of the watershed to gain a better understanding of the watershed setting. This field review will be conducted over a one day period. Comments will be solicited from the Interdisciplinary Team to assist in developing scoping materials.	5/1/2016	6/1/2016		12		12		4												
C. Develop Scoping Materials Consistent with NWPM 501.24/NWPH 601.24	Based on input from the Interdisciplinary Team Meeting and the initial Public Meeting, the required scoping tables defined in NWPH 606.18 and 606.19 will be developed.	5/1/2016	6/1/2016	1	4		4														
D. Write Draft *Scope of Environmental Assessment* Section (NWPM 501.35/NWPH 601.35)	Scoping will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.35/NWPH 601.35.	5/1/2016	6/1/2016	2	8																
E. Solicit comment for the Scope of EA and incorporate as it relates to the proposed action	The Draft *Scope of Environmental Assessment* will be made available to the interdisciplinary team for comments. Any comments received will be incorporated into the *Scope of Environmental Assessment* as necessary. Comment will be solicited after completion of the Field Review with available Interdisciplinary Team members.	6/1/2016	7/1/2016	1	4		4														
F. Summarize and Incorporate into the Reviewable Record	Outcomes from the *Scoping of Environmental Assessment* section will be made available for review in the Reviewable Record.	6/15/2016	7/1/2016		2																
	Subtotal			*4*	*38*	*0*	*20*	*0*	*8*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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INVENTORY RESOURCES		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Compile Inventory Data	Available data sources will be reviewed and compiled for pertinent information as it relates to affected environments defined from Scoping the EA. This information is comprised of available GIS data. Additional information may be solicited from interdisciplinary team members with expertise in certain affected environments. Assumed that most resource data has already been gathered. No acquisition of field data will occur in this phase. Much of this data has already been developed from previous planning efforts. Additional data will be compiled as needed, based on the Scope of the Environmental Assessment.	3/1/2016	7/1/2016		4		4	8	24												
B. Field Review/Reconnaissance of Watershed	HEI planning staff will conduct a field review of the watershed to validate any potential high-value resource concerns. These concerns may be review of unique wetland complexes and other environmentally sensitive areas. If the local sponsor has a locally preferred Proposed Action, this location will also be reviewed. This review does not include delineation of environmentally sensitive areas, rather a high level review to gain familiarity with the watershed setting.	5/1/2016	7/1/2016		12		24														
C. Conduct Watershed Transects	Watershed transects will be conducted using NRCS procedures. These procedures are to travel a predefined driveable course through the watershed, taking notes of crop type, residue, and other conservation measures on the landscape. This method is traditionally used by NRCS to determine percent treatment within a watershed area. NRCS staff has indicated that training assistance will likely be available in completing this task.	5/1/2016	6/1/2016				60														
D. Hydrology and Hydraulics	HEC-HMS models developed for detention plans will be used as the base model. Modifications will be made as necessary to evaluate the proposed action. Previously developed HEC-RAS Unsteady models will be used for known problem areas. This task includes development of additional recurrence events to provide 2-year through 100-year events. 10-year through 100-year will be mapped.	3/1/2016	6/1/2016		8	48			8												
E. Water Quality	Innovative GIS applications will be used to assess the existing conditions contaminant loading for water courses within the project area. These applications predict the sediment mass leaving an agricultural field, route that mass downstream, and estimate loadings within a water course. These techniques utilize the Revised Universal Soil Loss Equation, developed by the USDA.	4/1/2016	6/1/2016		8				100												
F. Economic and Social Effects	To be completed by subconsultant - will provide background information required to forecast the future without project condition and the proposed action(s).	4/1/2016	6/1/2016											8	120	64	8				
G. Air Quality	Air Quality will be reviewed based on potential impacts caused by the proposed action. It's anticipated that the proposed action will result in minimal change.	5/1/2016	6/1/2016				2														
H. Recreation	Receation will be reviewed based on potential impacts caused by the proposed action. Unless the proposed action impacts existing recreational opportunities, or additional recreational opportunties are incorporated into alternatives, its anticipated that the proposed action will result in minimal change.	5/1/2016	6/1/2016				2														
I. Support Maps Formatted For Suitable Use in Final Plan Appendix	All geographic data will be mapped in a format suitable for use in the Watershed Plan.	5/1/2016	6/1/2016		2				8												
J. Conduct Interdisciplinary Team Meeting	Resource data will be presented to the Interdisciplinary Team. Resource data will be discussed to identify potential environmentally sensitive areas to aid in alternative development. Resource data will also be reviewed and discussed to identify resource opportunities to acheive goals in the Purpose and Need Statement. Any additional resource data requested by the Interdisciplinary Team will be provided after the meeting. This meeting will be held concurrently with the Forecast Without-Project Conditions and Formulate Alternatives Interdisciplinary Team Meeting.	7/1/2016	8/1/2016		8				4												
K. Write Draft applicable portions of *Affected Environments* Section (NWPM 501.36/NWPH 601.36)	The applicable portions of the *Affected Environments* Section will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.36/NWPH 601.36.	7/1/2016	8/1/2016	2	16		16														
L. Summarize and Incorporate into the Reviewable Record	Outcomes from the *Inventory Resources* section will be made available for review in the Reviewable Record.	7/15/2016	8/1/2016		2																
Subtotal				*2*	*60*	*48*	*108*	*8*	*144*	*0*	*0*	*0*	*0*	*8*	*120*	*64*	*8*	*0*	*0*	*0*	*0*

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FORECAST WITHOUT-PROJECT CONDITIONS			***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A.	Project Applicable Inventory Data	Where applicable, resource inventory data will be projected into the future when a basis for extrapolating future conditions is warranted.	6/1/2016	7/1/2016		2		8														
B.	Hydrology and Hydraulics	For the North Branch Park River Watershed, the future conditions hydrology and hydraulics will be consistent with the existing conditions hydrology and hydraulics.	COMPLETED	COMPLETED																		
C.	Water Quality - *Literary Review*	Available water quality studies will be reviewed to determine trends in contaminent loading. These trends will be used to provide a general projection into the future for water quality within the study area. Interagency Team members with an expertise in water quality will be consulted to ensure reasonable projections are made.	6/1/2016	7/1/2016		2		2														
D.	Economic and Social Effects	To be completed by subconsultant - will project future without project condition damages. This task be focused on flood damage reduction. Additional damages may be calculated for other resource data. Additional resource data review is not represented in these costs, and will only be performed on an as needed basis to fully account of damages to be used in the B/C analysis.	6/1/2016	7/1/2016												124	144					
E.	Air Quality	Potential future changes that may influence Air Quality will be reviewed. It's anticipated that the future without project condition will result in minimal change in most study areas.	6/1/2016	7/1/2016				2														
F.	Recreation	Potential future changes that may influence Recreation will be reviewed. It's anticipated that the future without project condition will result in minimal change in most study areas.	6/1/2016	7/1/2016				2														
G.	Conduct Interdisciplinary Team Meeting	The future without project condition will be presented to the Interdisciplinary Team. This meeting may run concurrently with the Interdisciplinary Team Meeting defined in the *Inventory Resources & Formulate Alternatives* list of tasks.	7/1/2016	8/1/2016		8		8														
H.	Write Draft Future Without Project Section of *Alternatives* Section (NWPM 501.37/NWPH 601.37)	The Future Without Project Conditions portions of the *Alternatives* Section will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.37/NWPH 601.37.	7/1/2016	8/1/2016	2	8																
I.	Write Draft Future Without Project Section of *Environmental Consequences* Section (NWPM 501.38/NWPH 601.38)	The Future Without Project Conditions portions of the *Environmental Consequences* Section will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.38/NWPH 601.38.	7/1/2016	8/1/2016	2	8																
J.	Summarize and Incorporate into the Reviewable Record	Outcomes from the *Forecast Without-Project Conditions* tasks will be made available for review in the Reviewable Record.	7/15/2016	8/1/2016		2																
		Subtotal			*4*	*30*	*0*	*22*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*124*	*144*	*0*	*0*	*0*	*0*	*0*

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FORMULATE ALTERNATIVES			***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A.	Develop Range of Strategies	A range of strategies defined in TSAC Paper No. 11 will be evaluated to determine flood damage reduction practices that are applicable to flood damage reduction within the project area. Strategies will be listed for evaluation. It's important to note that strategies are not alternatives. The range of strategies determines the type of alternatives that will be further considered.	COMPLETED	COMPLETED																		
B.	Evaluate Strategy Potential	The Range of Strategies will be evaluated based on their anticipated ability to meet outcomes from the Purpose and Need section, a reasonable ability to implement, potential environmental challenges, suitability to the localized study area, and any other pertinent considerations for the Wateshed area. The preferred strategie(s) will be determined based on these considerations.	COMPLETED	COMPLETED																		
C.	Develop Initially Selected Alternatives from Preferred Strategies	Once preferred strategies are identified, project alternatives will be initially developed based on technical considerations. Alternatives will also be initially selected in an effort to eliminate or minimize disturbance to environmentally sensitive areas.	COMPLETED	COMPLETED																		
D.	Proposed Conditions Hydrology and Hydraulics	Proposed alternatives will be preliminary analyzed using hydrology and hydraulic models developed in the *Inventory Resources* section to determine potential flow reduction benefit to flooding downstream. This level of analysis will be preliminary, and will not consider spillway sizing or dam classification. This level of analysis is an initial look at benefit potential before investing resources in detailed planning.	COMPLETED	COMPLETED																		
E.	Develop Impacted Lands & Resources Summary	Impacted lands information will be developed using the data aquired in the *Inventory Resources* section. Information will be compiled in table format to display the anticipated impacts to environmental concerns, ag land, non-ag land, and any other pertinent information that specific to each alternative.	COMPLETED	COMPLETED																		
F.	Conduct Interdisciplinary Team Meeting	Strategy evaluation and initially selected alternatives will be reviewed with the Interdisciplinary Team. Any comments from the interdisciplinary team will be noted, and revisions made if necessary.	COMPLETED	COMPLETED																		
G.	Preliminary Off-Site Geologic Investigation	To be completed by subconsultant - An offsite review of soils will be done based on any available information. The goal of this review will be to identify any potential geotechnical issues, and allow avoidance if practical.	2/1/2016	4/1/2016																	1	
H.	Identify Potential Cultural Resources Issues	Class I cultural resources review will be completed to determine any potential issues with the initially identified alternatives. The goal of this review will be to identify any potential issues, and allow avoidance if practical.	2/1/2016	4/1/2016															1			
I.	Public Outreach - Impacted Landowners Meetings	Landowners impacted by alternatives will be engaged in small groups to discuss the preliminary alternatives. Concerns by the impacted landowners will be noted, and revisions that may appease concerns will be discussed. Revisions will include embankment alignments, frequency of use, and other considerations for the initially selected alternative. Multiple meetings are anticipated with impacted landowners to address concerns.	2/1/2016	5/1/2016	40	100																
J.	Revisions to Alternatives	Revisions will be made to the geometry of the initially selected alternatives based on impacted landowner input. Will focus primarily on revisions to geometrics (alignments, inundation areas, etc.)	2/1/2016	5/1/2016		16	80			16												
K.	Update Proposed Conditions Hydrology and Hydraulics	Proposed alternatives revisions will be preliminarily analyzed using hydrology and hydraulic models developed in the *Inventory Resources* section to determine potential flow reduction benefit to flooding downstream. This level of analysis will be preliminary, and will not consider spillway sizing or dam classification. This level of analysis is an initial look at benefit potential before investing resources in detailed planning. This task will be updated after impacted landowner consultation.	4/15/2016	6/1/2016	4	24	110			20												
L.	Preliminary Benefits Analysis	Preliminary benefits for the proposed alternative(s) will be computed. This task be focused on flood damage reduction. Additional damages may be calculated for other resource data. Additional resource data review is not represented in these costs, and will only be performed on an as needed basis to fully account of damages to be used in the B/C analysis. This task will be completed as minimally as possible to determine the maximum benefit provided by preliminary alternatives.	6/1/2016	7/1/2016												38	6					
M.	Update Impacted Lands & Resources Summary	Impacted lands information will be updated based on coordination with impacted landowners using the data aquired in the *Inventory Resources* section. Information will be compiled in table format to display the anticipated impacts to environmental concerns, ag land, non-ag land, and any other pertinent information that specific to each alternative.	6/1/2016	7/1/2016		4	8			12												
N.	Conduct Interdisciplinary Team Meeting	Revisions to the alternatives based on coordination with impacted landowners will be discussed with the Interdisciplinary Team. The Interdisciplinary Team will review the developed acceptable alternatives and determine additional considerations. This meeting will be held concurrently with the Forecast Without-Project Conditions and Inventory Resources Interdisciplinary Team Meeting.	7/1/2016	8/1/2016	8	12				8												

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O.	Determine Acceptable Alternatives for Further Analysis	Alternatives that have been reviewed by the impacted landowners and interdisciplinary team will be further reviewed.	7/1/2016	8/1/2016	2	4																
P.	Additional field survey as needed to aid in design	Any additional field survey to aid in detailed planning will be acquired. This includes any additional channel survey along outlet routes, embankment profiles, and any other required pertinent field survey data.	8/1/2016	10/1/2016		8						8	200									
Q.	Geologic Investigation	A preliminary geologic investigation will be conducted at alternative(s) included in detailed analysis. This analysis will include exploratory borings to sufficiently determine costs and construction plans to a 30% level.	8/1/2016	10/1/2016																		2
R.	Cultural Resources Review	A more detailed cultural resources will be completed of the alternatives. This will include a field review of each site.	8/1/2016	10/1/2016																1		
S.	Off-site Environmental Review	An off site environmental review will be completed using historic FSA slides. This task will be used to validate NWI wetland data within the pool footprint.	8/1/2016	10/1/2016		4		16		60												
T.	Sedimentation Estimate	LiDAR, land-use, and soil-types will be used in a GIS application of the Revised Unit Soil Loss Equation (RUSLE) to estimate sedimentation into the proposed alternatives.	8/1/2016	10/1/2016		4	24															
U.	Hydrologic & Hydraulic Dam Design	The alternatives selected for detailed analysis will be hydraulically sized based on requirements in NRCS's TR-60 documentation to develop outflow rating curves at each alternative. TR-60 considerations include, but not limited to; dam classification, development of design hydrographs, spillway capacity, earth spillway erosion, and sedimentation capacity.	10/1/2016	12/1/2016	4	60	240			8												
V.	Preliminary Structural Spillway Design	Preliminary structural review will be undergone to complete construction plans and costs to a 30% level. This task may occur after the geotechnical review, if needed.	10/1/2016	12/1/2016	2	40	160															
W.	Engineering Design & Cost Estimate	Recommendations from the geologic investigation will be used for embankment design. Assumptions for land acquisition will be reviewed with the project sponsor, and used to account for impacted lands. Costs developed for any structural design will be included to determine a total anticipated construction cost for a 30% review level. Preliminary construction plans will be developed to illustrate cross section information, pool footprints, embankment alignments, spillway geometry and structural details.	10/1/2016	12/1/2016	16	124	360	12		12	200											
X.	Develop List of Further Considerations for Identified Alternatives	Anticipated further considerations will be documented for each alternative. These considerations will include additional technical review for further design, environmental considerations, and any other information not evaluated for the purposes of developing alternatives, but needed for implementation.	12/1/2016	1/1/2017	2	2		2														
Y.	Document Rationale for Formulating Alternatives	The reasoning for developing each alternative will be documented. This includes strategy screening, initial alternative selection, revisions to alternatives based on impacted landowner comment, and technical design considerations. This document will be summarized in a technical memo suitable for review by the Interdisciplinary Team. This information will developed in a manner suitable for the *Formulation Process* portion of the *Alternatives* Section of the Watershed Plan.	12/1/2016	1/1/2017	2	16		8														
Z.	Complete Draft Technical Documentation Suitable for Use as Appendices in the Final Plan	Techincal reports will be developed to convey data to NRCS staff reviewing technical aspects of each of the alternatives. This information will include; design calculations, geotechnical reports (provided subconsultant), dam safety classification rationale, design hydrograph, and hydrologic and hydraulic design information.	12/1/2016	1/1/2017	4	20	20															
AA.	Write Draft applicable portions *Alternatives* Section (NWPM 501.37/NWPH 601.37)	Applicable portions of the *Alternatives* Section will be put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.37/NWPH 601.37.	12/1/2016	1/1/2017	2	16																
BB.	Summarize and Incorporate into the Reviewable Record	Outcomes from the *Formulate Alternatives* tasks will be made available for review in the Reviewable Record.	12/15/2016	1/1/2017		2																
		Subtotal			*86*	*456*	*1002*	*38*	*0*	*136*	*200*	*8*	*200*	*0*	*0*	*38*	*6*	*0*	*1*	*1*	*1*	*2*

Houston Engineering Inc.

				HOUSTON ENGINEERING, INC.										GANNETT FLEMING				SUBCONSULTANT TBD		BRAUN INTERTEC	
				Senior Project Manager hours	Professional Engineer hours	Graduate Engineer hours	Senior Environmental Scientist hours	Scientist hours	GIS Technician I hours	CAD Operator hours	Land Surveyor hours	Two-person crew (plus equipment) hours	Administrative Assistant hours	Project Management hours	Project Economist hours	Analyst hours	Administrative Assistant hours	Preliminary Cultural Review Lump Sum	Detailed Cultural Review Lump Sum	Preliminary Geologic Review Lump Sum	Geologic Exploration Per Site
EVALUATE EFFECTS OF ALTERNATIVES		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Field Review to Address Further Environmental Considerations	A field review will be conducted as necessary to evaluate further considerations with regards to environmental review. This review will be used to validate wetland impacts quantified in the *Formulate Alternatives* Section. This task will include field delineation work, if necessary.	9/1/2016	10/1/2016		2		100														
B. Determine Unavoidable Adverse Environmental Impacts	After completing the environmental field review, the alternatives will be studied to determine unavoidable adverse impacts such as wetland impacts within the flood pool. Impacts will be quantified, and determined if they can be mitigated.	11/1/2016	12/1/2016	2	8		8														
C. Develop Mitigation Strategy for Adverse Environmental Impacts	The quantified environmental impacts will be assessed for an appropriate mitigation strategy. This strategy will likely either by development of mitigation by the project sponsor, purchasing available credits from a 3rd party (depending on availability), or a combination there-of.	11/1/2016	12/1/2016	2	4		8	40	8												
D. Incorporate Mitigation Strategy into Cost Estimate	An associated cost to implement the mitigation strategy for environmental impacts will be developed and incorporated in the overall cost estimate for each alternative.	11/1/2016	12/1/2016		2	8	4														
E. Water Quality Effects	If needed, innovated GIS applications will be used as needed to determine benefits to water quality downstream. This will focus on sediment loading reductions within downstream channels. GIS outputs from the Sedimentation Estimate completed in *Formulate Alternatives* Section will be utilized in this task.	11/1/2016	12/1/2016																		
F. Water Quantity Effects	Update Proposed Conditions Hydrology and Hydraulics with rating curves developed from TR-60 will be input into hydrology and hydraulic models developed from the *Inventory Resources* section to analyze benefits to the problem areas.	11/1/2016	12/1/2016	4	20	92			24												
G. Fisheries Effects	Consultation with the appropriate member of the Interdisciplinary Team to determine potential fisheries impacts for each alternative.	11/1/2016	12/1/2016				2														
H. Wildlife Habitat Effects	If applicable to the analyzed alternatives, wildlife habitat impacts will be evaluated using an approved NRCS methodology. This may be a result of impacts or existing habitat, or creation of new habitat as a result of each alternative.	11/1/2016	12/1/2016		2		4	16													
I. Recreational Effects	Potential future changes that may influence Recreation will be reviewed. It's anticipated that the future without project condition will result in minimal change in most study areas.	11/1/2016	12/1/2016				2														
J. Air Quality Effects	Potential future changes that may influence Air Quality will be reviewed. It's anticipated that the future without project condition will result in minimal change in most study areas.	11/1/2016	12/1/2016				2														
K. Economic and Social Effects	To be completed by subconsultant - Each alternative will be analyzed to determine monetary benefit provided. Costs associated with this task are focused on benefits associated with reduced flood damages. Additional monetary benefit may be calculated for other resource data. Additional resource data review is not represented in these costs, and will only be performed on an as needed basis to fully account of damages to be used in the B/C analysis. This task will be completed as minimally as possible to attempt to attain a B/C greater than 1.	12/1/2016	2/1/2017											12	250	58	20				
L. Conduct Interdisciplinary Team Meeting	The Interdisciplinary Team will meet to review each alternative & the NED alternative, adverse impacts, and benefits. Concerns voiced by each team member will documented.	2/1/2017	3/1/2017	8	12				8												
M. Conduct Public Meeting to Obtain Local Input	The NED Alternative will be presented to the general public. This discussion will review work completed since the initial public meeting, review of each alternative, unavoidable adverse impacts, and benefits provided. The general public will be engaged to solicit comments and concerns with the proposed alternatives.	2/1/2017	3/1/2017	8	16																
N. Write Draft applicable portions *Alternatives* Section (NWPM 501.37/NWPH 601.37)	The Draft *Alternatives* Section will be completed and put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.37/NWPH 601.37.	2/1/2017	3/1/2017	2	8																
O. Write Draft applicable portions *Environmental Consequences* Section (NWPM 501.38/NWPH 601.38)	The Draft *Environmental Consequences* Section will be completed and put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.38/NWPH 601.38.	2/1/2017	3/1/2017	2	16																

					HOUSTON ENGINEERING, INC.										GANNETT FLEMING				SUBCONSULTANT TBD		BRAUN INTERTEC	
					Senior Project Manager hours	Professional Engineer hours	Graduate Engineer hours	Senior Environmental Scientist hours	Scientist hours	GIS Technician I hours	CAD Operator hours	Land Surveyor hours	Two-person crew (plus equipment) hours	Administrative Assistant hours	Project Management hours	Project Economist hours	Analyst hours	Administrative Assistant hours	Preliminary Cultural Review Lump Sum	Detailed Cultural Review Lump Sum	Preliminary Geologic Review Lump Sum	Geologic Exploration Per Site
P.	Summarize and Incorporate into the Reviewable Record	Outcomes from the *Evaluate Effects of Alternatives* tasks will be made available for review in the Reviewable Record.	2/15/2017	3/1/2017		2																
Subtotal					*28*	*92*	*100*	*130*	*56*	*40*	*0*	*0*	*0*	*0*	*12*	*250*	*58*	*20*	*0*	*0*	*0*	*0*

Houston Engineering Inc.

				HOUSTON ENGINEERING, INC.										GANNETT FLEMING				SUBCONSULTANT TBD		BRAUN INTERTEC	
				Senior Project Manager hours	Professional Engineer hours	Graduate Engineer hours	Senior Environmental Scientist hours	Scientist hours	GIS Technician I hours	CAD Operator hours	Land Surveyor hours	Two-person crew (plus equipment) hours	Administrative Assistant hours	Project Management hours	Project Economist hours	Analyst hours	Administrative Assistant hours	Preliminary Cultural Review Lump Sum	Detailed Cultural Review Lump Sum	Preliminary Geologic Review Lump Sum	Geologic Exploration Per Site
DETERMINE PREFERRED ALTERNATIVE		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Conduct Interdisciplinary Team Meeting	Review of the public engagement meeting and comments received will be presented and by the interdisciplinary team. *Note - meeting may not be needed, unless locally preferred alternative is different than the NED Alternative.*	3/1/2017	4/1/2017	8	12																
B. Meeting with Project Sponsors	The NED Alternative and other feasible alternatives will be discussed with the Project Sponsor to determine the locally preferred alternative.	3/1/2017	4/1/2017	4	4																
C. Identify the Preferred Alternative	The Preferred Alternative will be identified by the Project Sponsor after evaluating the NED Alternative and other alternatives that provide economic benefit. *Will be accomplished in the Project Sponsor and Interdisciplinary Team Meetings*	3/1/2017	4/1/2017																		
D. Document Rational of Selecting Preferred Alternative	Rational for selecting the preferred alternative will be documented based on the NWPH 601.40A. If the preferred alternative differs from the NED alternative, documentation for the added increment is necessary.	3/1/2017	4/1/2017	2	12																
E. Determine Level of NEPA Documentation Required *(Assumed EA Plan)*	Review of Environmental Impacts to determine if mitigation can fully replace impacts. This Plan of Work assumes the preferred alternative will result in an Environmental Assessment. If an Environmental Impact Statement is necessary, additional costs will be required.	3/1/2017	4/1/2017				4														
F. Write Draft applicable portions *The Preferred Alternative* Section (NWPM 501.40/NWPH 601.40)	The Draft *The Preferred Alternative* Section will be completed and put into the required NRCS format for a Watershed Plan. This format is defined in the NWPM 501.38/NWPH 601.38.	3/1/2017	4/1/2017	2	24																
G. Summarize and Incorporate into the Reviewable Record	Outcomes from the *Determine Preferred Alternative* tasks will be made available for review in the Reviewable Record.	3/1/2017	4/1/2017		2																
Subtotal				*16*	*54*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
PREPARE WATERSHED PLAN - EA		***APPROXIMATE BEGIN***	***APPROXIMATE COMPLETION***																		
A. Prepare Draft Plan for Review	The Draft Watershed Plan-EA will be prepared using the sections previously developed in other Phases. Additional sections will be drafted to complete requirements contained in the NWPM. The Draft Watershed Plan-EA will be provided to the Interdisciplinary Team for comment.	4/1/2017	6/1/2017	4	40	4	16		4				4	4	16		4				
B. Conduct Interdisciplinary Team Meeting	The Draft Watershed Plan-EA will be discussed with the Interdisciplinary Team. Comments on the Plan will be documented.	6/1/2017	7/1/2017	8	12																
C. Address Interdisciplinary Team Comments	Comments received by members from the Interdisciplinary Team will be reviewed and addressed as necessary.	6/1/2017	7/1/2017	2	8		8														
D. Solicit and Address Agency Comments	After Watershed Plan-EA comments are address, the Draft Plan will be made available for review by impacted Agencies and Local Governing Bodies. Any comments received will be documented and addressed, if necessary.	7/1/2017	9/1/2017	2	8		8														
E. Finalize Watershed Plan - EA	The Watershed Plan-EA will be finalized after all comments have been received and addressed as necessary. Plan will need to be approved and adopted by the Project Sponsor. Comments received will be included as an Appendix in the Final Plan	9/1/2017	10/1/2017	2	16								8								
Subtotal				*18*	*84*	*4*	*32*	*0*	*4*	*0*	*0*	*0*	*12*	*4*	*16*	*0*	*4*	*0*	*0*	*0*	*0*
Total				***172***	***870***	***1154***	***364***	***64***	***332***	***200***	***8***	***200***	***12***	***24***	***548***	***272***	***32***	***1***	***1***	***1***	***2***

APPENDIX D

Schedule of Work

North Branch Park River NRCS Watershed Plan

Schedule of Work

Houston Engineering Inc.

Q3 - 2015 | Q4 - 2015 | Q1 - 2016 | Q2 - 2016 | Q3 - 2016 | Q4 - 2016 | Q1 - 2017 | Q2 - 2017 | Q3 - 2017 | Q4 - 2017

Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

PROBLEMS AND OPPORTUNITIES
- Publicize Planning
- Identify Need for Proposed Action
- Gather and Review Existing Data
- Assemble Interdisciplinary Team
- Develop Public Participation Plan
- Conduct Public Meeting to Obtain Local Input
- Document Sponsor Objectives
- Write Purpose and Need Statement
- Conduct Interdisciplinary Team Meeting
- Write Draft Purpose and Need for Action section (NWPM 501.34/NWPH 601.34)
- Summarize and Incorporate into the Reviewable Record

SCOPE OF ENVIRONMENTAL ASSESSMENT
- Conduct Interdisciplinary Team Meeting
- Conduct Interdisciplinary Team Field Review
- Develop Scoping Materials Consistent with NWPM 501.24/NWPH 601.24
- Write Draft Scope of Environmental Assessment Section (NWPM 501.35/NWPH 601.35)
- Solicit comment for the Scope of EA and incorporate as it relates to the proposed action
- Summarize and Incorporate into the Reviewable Record

INVENTORY RESOURCES
- Compile Inventory Data
- Field Review/Reconnaissance of Watershed
- Conduct Watershed Transects
- Hydrology and Hydraulics
- Water Quality
- Economic and Social Effects
- Air Quality
- Recreation
- Support Maps Formatted For Suitable Use in Final Plan Appendix
- Conduct Interdisciplinary Team Meeting
- Write Draft applicable portions of Affected Environments Section (NWPM 501.36/NWPH 601.36)
- Summarize and Incorporate into the Reviewable Record

FORECAST WITHOUT-PROJECT CONDITIONS
- Project Applicable Inventory Data
- Hydrology and Hydraulics
- Water Quality - Literary Review
- Economic and Social Effects
- Air Quality
- Recreation
- Conduct Interdisciplinary Team Meeting
- Write Draft Future Without Project Section of Alternatives Section (NWPM 501.37/NWPH 601.37)
- Write Draft Future Without Project Section of Environmental Consequences Section (NWPM 501.38/NWPH 601.38)
- Summarize and Incorporate into the Reviewable Record

FORMULATE ALTERNATIVES
- Develop Range of Strategies
- Evaluate Strategy Potential
- Develop Initially Selected Alternatives from Preferred Strategies
- Proposed Conditions Hydrology and Hydraulics
- Develop Impacted Lands & Resources Summary
- Conduct Interdisciplinary Team Meeting
- Preliminary Off-Site Geologic Investigation
- Identify Potential Cultural Resources Issues
- Public Outreach - Impacted Landowners Meetings
- Revisions to Alternatives
- Update Proposed Conditions Hydrology and Hydraulics
- Preliminary Benefits Analysis
- Update Impacted Lands & Resources Summary
- Conduct Interdisciplinary Team Meeting
- Determine Acceptable Alternatives for Further Analysis
- Additional field survey as needed to aid in design
- Geologic Investigation
- Cultural Resources Review
- Off-site Environmental Review
- Sedimentation Estimate
- Hydrologic & Hydraulic Dam Design
- Preliminary Structural Spillway Design
- Engineering Design & Cost Estimate
- Develop List of Further Considerations for Identified Alternatives
- Document Rationale for Formulating Alternatives
- Complete Draft Technical Documentation Suitable for Use as Appendices in the Final Plan
- Write Draft applicable portions Alternatives Section (NWPM 501.37/NWPH 601.37)
- Summarize and Incorporate into the Reviewable Record

EVALUATE EFFECTS OF ALTERNATIVES
- Field Review to Address Further Environmental Considerations
- Determine Unavoidable Adverse Environmental Impacts
- Develop Mitigation Strategy for Adverse Environmental Impacts
- Incorporate Mitigation Strategy into Cost Estimate
- Water Quality Effects
- Water Quantity Effects
- Fisheries Effects
- Wildlife Habitat Effects
- Recreational Effects
- Air Quality Effects
- Economic and Social Effects
- Conduct Interdisciplinary Team Meeting
- Conduct Public Meeting to Obtain Local Input
- Write Draft applicable portions Alternatives Section (NWPM 501.37/NWPH 601.37)
- Write Draft applicable portions Environmental Consequences Section (NWPM 501.38/NWPH 601.38)
- Summarize and Incorporate into the Reviewable Record

DETERMINE PREFERRED ALTERNATIVE
- Conduct Interdisciplinary Team Meeting
- Meeting with Project Sponsors
- Identify the Preferred Alternative
- Document Rational of Selecting Preferred Alternative
- Determine Level of NEPA Documentation Required (Assumed EA Plan)
- Write Draft applicable portions The Preferred Alternative Section (NWPM 501.40/NWPH 601.40)
- Summarize and Incorporate into the Reviewable Record

PREPARE WATERSHED PLAN - EA
- Prepare Draft Plan for Review
- Conduct Interdisciplinary Team Meeting
- Address Interdisciplinary Team Comments
- Solicit and Address Agency Comments
- Finalize Watershed Plan - EA

APPENDIX E

Public Participation Plan

NORTH BRANCH PARK RIVER WATERSHED
NRCS SMALL WATERSHED PLAN
PARK RIVER JOINT WATER RESOURCE DISTRICT
PUBLIC PARTICIPATION PLAN

Houston Engineering Inc.

Activity	Estimated Date of Occurrence	Description of Activity	Notice Method	Activity Objectives
Assemble Interdisciplinary Team	1/1/2016 to 2/1/2016	The interdisciplinary team developed based on requirements in the NWPM Section 501.3/NWPH Section 601.3. The interdisciplinary team will be made up of Federal, State, and Local agencies that have an expertise or authority over the proposed action.	Individual letters outlining NEPA requirements for Cooperating Agencies.	Invitation letters consistent with the NWPH will be sent out to agencies with a vested interest in Watershed Planning activities within the North Branch Watershed. Additionally, invitations will be sent out to representatives of the previously established Wateshed Stakeholders Group.
Conduct Public Meeting to Obtain Local Input	2/1/2016 to 3/1/2016	An initial public meeting will be held to inform the public of the study tasks and schedule. The initial Public Meeting will allow for public input about concerns outlined in the NWPM 501.24. The meeting will engage the public through a presentation, oral public comments, and provide a form for written public comments.	Two advertisements in the Walsh County Record (Walsh Co.), Cavalier Chronicle (Pembina Co.), and Cavalier County Extra (Cavalier Co.).	Educate the geneal public on the Watershed Planning effort. Establish concerns from NWPM 501.24 are important to the general public for the planning area. Document oral and written concerns from the general public.
Conduct Interdisciplinary Team Meeting	2/1/2016 to 3/1/2016	The interdisciplinary team will meet to be updated on work completed to date, the Watershed Planning process, and review the Purpose and Need Statement that has been previously developed. Information will be provided to the interdisciplinary team prior to meeting to allow for sufficient review. If possible, this meeting will be held during the interagency team meeting that is typically held monthly in Bismarck.	Individual invitation letters and e-mail notification, if applicable.	Educate the Cooperating Agencies & Watershed Stakeholders on the Watershed Planning Effort. Discuss the Feasibility Study and Plan of Work documents. Introduce concerns from NWPM 501.24 are important to Cooperating Agencies within the planning area as it relates to the proposed action. Solicit written response from Cooperating Agencies.
Conduct Interdisciplinary Team Meeting	5/1/2016 to 6/1/2016	The interdisciplinary team will convene to review the required concerns for NEPA. These concerns are highlighted in the NWPM 501.24. Information required to develop information required in NWPH Sections 606.18 and 606.19. This will be conducted concurrently with the Interdisciplinary Team Field Review.	Individual invitation letters and e-mail notification, if applicable.	Finalize scoping information to satisfy information requirements to complete NWPH 606.18 and 606.19.
Conduct Interdisciplinary Team Field Review	5/1/2016 to 6/1/2016	The Interdisciplinary team will conduct a field review of the watershed to gain a better understanding of the watershed setting. This field review will be conducted over a one day period. Comments will be solicited from the Interdisciplinary Team to assist in developing scoping materials.	Individual invitation letters and e-mail notification, if applicable.	If requested by members of the Cooperating Agencies, a one day field review of the watershed will be provided by the HEI staff.
Solicit comment for the Scope of EA and incorporate as it relates to the proposed action	6/1/2016 to 7/1/2016	The Draft Scope of Environmental Assessment will be made available to the interdisciplinary team for comments. Any comments received will be incorporated into the Scope of Environmental Assessment as necessary. Comment will be solicited after completion of the Field Review with available Interdisciplinary Team members.	Individual invitation letters and e-mail notification, if applicable.	Incorporate comments from Cooperating Agencies on the Scope of the Environmental Assessment.
Conduct Interdisciplinary Team Meeting	7/1/2016 to 8/1/2016	Resource data will be presented to the Interdisciplinary Team. Resource data will be discussed to identify potential environmentally sensitive areas to aid in alternative development. Resource data will also be reviewed and discussed to identify resource opportunities to acheive goals in the Purpose and Need Statement. Any additional resource data requested by the Interdisciplinary Team will be provided after the meeting. This meeting will be held concurrently with the Forecast Without-Project Conditions and Formulate Alternatives Interdisciplinary Team Meeting.	Individual invitation letters and e-mail notification, if applicable.	Provide Resource Inventory Data to Cooperating Agencies & Watershed Stakeholders for review. Discuss how resource data will relate to the proposed action. Document concerns from Cooperating Agencies.
Conduct Interdisciplinary Team Meeting	7/1/2016 to 8/1/2016	The future without project condition will be presented to the Interdisciplinary Team. This meeting may run concurrently with the Interdisciplinary Team Meeting defined in the Inventory Resources & Formulate Alternatives list of tasks.	Individual invitation letters and e-mail notification, if applicable.	Provide the Cooperating Agencies & Watershed Stakeholders with information about the anticipated future-without-project conditions. The information will be largely related to effects to resources of concern.
Public Outreach - Impacted Landowners Meetings	2/1/2016 to 5/1/2016	Landowners impacted by alternatives will be engaged in small groups to discuss the preliminary alternatives. Concerns by the impacted landowners will be noted, and revisions that may appease concerns will be discussed. Revisions will include embankment alignments, frequency of use, and other considerations for the initially selected alternative. Multiple meetings are anticipated with impacted landowners to address concerns.	Individual invitation letters and e-mail notification, if applicable.	Discuss design considerations for potential alternatives with landowners within the project footprints. Document concerns of impacted landowners.
Conduct Interdisciplinary Team Meeting	7/1/2016 to 8/1/2016	Revisions to the alternatives based on coordination with impacted landowners will be discussed with the Interdisciplinary Team. The Interdisciplinary Team will review the developed acceptable alternatives and determine additional considerations. This meeting will be held concurrently with the Forecast Without-Project Conditions and Inventory Resources Interdisciplinary Team Meeting.	Individual invitation letters and e-mail notification, if applicable.	Provide information about preliminary alternatives to Cooperating Agencies & Watershed Stakeholders. Information will include preliminary impacts to resource concerns. Document concerns of Cooperating Agencies & Watershed Stakeholders. Documentation will assist in determining reasonable alternatives to carry forward.
Conduct Interdisciplinary Team Meeting	2/1/2017 to 3/1/2017	The Interdisciplinary Team will meet to review each alternative & the NED alternative, adverse impacts, and benefits. Concerns voiced by each team member will documented.	Individual invitation letters and e-mail notification, if applicable.	Discuss impacts to resource concerns for alternatives. Present the NED alternative. Document Cooperating Agency & Watershed Stakeholder concerns. Solicit written responses from Cooperating Agencies related to the NED alternative and other alternatives studied in detail.
Conduct Public Meeting to Obtain Local Input	2/1/2017 to 3/1/2017	The NED Alternative will be presented to the general public. This discussion will review work completed since the initial public meeting, review of each alternative, unavoidable adverse impacts, and benefits provided. The general public will be engaged to solicit comments and concerns with the proposed alternatives.	Two advertisements in the Walsh County Record (Walsh Co.), Cavalier Chronicle (Pembina Co.), and Cavalier County Extra (Cavalier Co.).	Update the general public on the Watershed Planning effort. Present alternatives studied in detail. Present the NED alternative. Discuss resource impacts. Solicit comments from the general public. An opportunity will be given for oral comments and a form will be provided for written comments. Comments will be documented for use as rational to select the locally preferred alternative.
Conduct Interdisciplinary Team Meeting	3/1/2017 to 4/1/2017	Review of the public engagement meeting and comments received will be presented and by the interdisciplinary team. Note - meeting may not be needed, unless locally preferred alternative is different than the NED Alternative.	Individual invitation letters and e-mail notification, if applicable.	If public comment, Cooperating Agency comment, and Watershed Stakeholders Comment suggests that the locally preferred plan is not the NED plan, the Watershed Stakeholders and Cooperating Agencies will meet to discuss rational for selecting an alternative plan. Rational will be documented. Cooperating Agencies will be requested for written response.
Meeting with Project Sponsors	3/1/2017 to 4/1/2017	The NED Alternative and other feasible alternatives will be discussed with the Project Sponsor to determine the locally preferred alternative.	Meeting posted as required for governing board by the ND Century Code. Will be open to general public.	Project sponsors will discuss the NED alternative and other alternatives studied. Project sponsors will determine whether to pursue NED alternative, or differing alternative. Board action on alternative to proceed forward with.
Conduct Interdisciplinary Team Meeting	6/1/2017 to 7/1/2017	The Draft Watershed Plan-EA will be discussed with the Interdisciplinary Team. Comments on the Plan will be documented.	Individual invitation letters and e-mail notification, if applicable.	Review the draft Watershed Plan-EA with Cooperating Agencies and Watershed Stakeholders. Provide draft plan to Cooperating Agencies to review for comment.
Solicit and Address Agency Comments	7/1/2017 to 9/1/2017	After Watershed Plan-EA comments are address, the Draft Plan will be made available for review by impacted Agencies and Local Governing Bodies. Any comments received will be documented and addressed, if necessary.	Posted by NRCS for agency review.	After Cooperating Agency comments have been addressed, the Watershed Plan-EA will be posted for comment.