All-Hazards Mitigation Plan

FOR

Tri-Basin Natural Resources District

Prepared by

Olsson Associates

September 2013

FEMA-1674-DR-NE-0037
OA Project Number 009-0613

Tri-Basin NRD
All-Hazards Mitigation Plan

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

INTRODUCTION

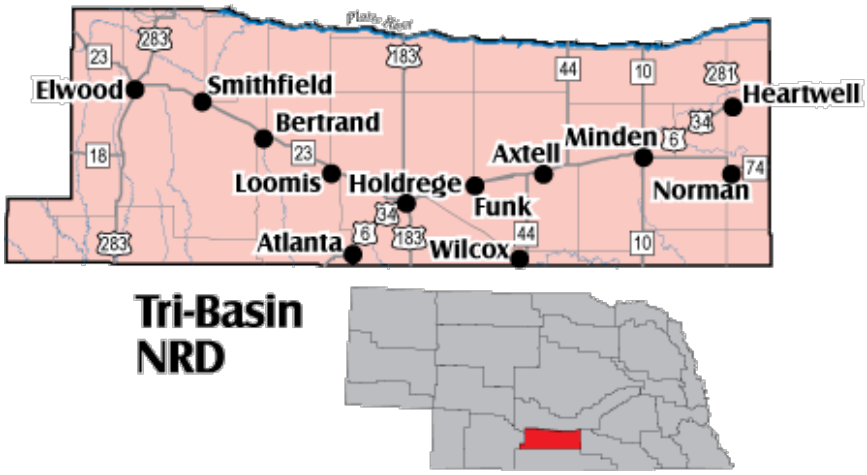
The Tri-Basin Natural Resources District (Tri-Basin NRD) is one of the 23 natural resources districts (NRDs) that were created in 1972 in the State of Nebraska. The NRDs have broad legislative authority for protecting natural resources within the state. Their key responsibilities include flood control, soil conservation, groundwater quality and quantity protection, and groundwater management. The Tri-Basin NRD consists of Gosper, Kearney, and Phelps counties in south central Nebraska, with the office headquarters located in Holdrege. The Tri-Basin NRD is unique because it includes portions of three different river basins: the Republican, the Platte, and the Little Blue.

According to the Nebraska Association of Resources Districts, the Tri-Basin NRD consists of 12 communities, has a population of 17,721 (U.S. Census 2010), and covers a total area of 974,720 acres.

Within these three counties, 33 entities were identified in the project application as being potential participants in the plan, including natural resources districts, communities, school districts, colleges, townships, rural water projects, health facilities, and fire departments. See Figure 1 for a map depicting the project area. Please see "Planning Process" to obtain further information on the entities that signed resolutions agreeing to participate in the planning process.

The purpose of this plan is to ensure that each participating community is eligible to obtain federal funding under the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance (FMA) program. Through this plan, the Tri-Basin NRD has determined the hazards affecting the area, determined the risks these hazards present to the respective communities, developed mitigation goals, and identified feasible mitigation activities for the participating entities.

Figure 1. Project Area



PLANNING PROCESS

The planning effort for the Tri-Basin NRD All-Hazards Mitigation Plan began in 2007, with the Tri-Basin NRD submitting its application for funding to complete the plan. The Tri-Basin NRD was awarded funding in 2008, and an engineering consultant was procured to help draft the plan. Olsson Associates in Holdrege, Nebraska, was awarded the project in 2008. The grant application was approved by the Nebraska Emergency Management Agency (NEMA) and the Federal Emergency Management Agency (FEMA) in April of 2008, officially beginning the planning process.

The project team was established to reflect the chain of command and communication procedures. The project team consists of the Tri-Basin NRD manager, John Thorburn; Olsson Associates staff members; and the county emergency management directors, Jeff England (Kearney County) and Patrick Gerdes (Gosper County and Phelps County). The Nebraska Department of Natural Resources (NDNR) and NEMA also provided assistance in the planning process. The planning team was assembled using personnel from each area that was familiar with the local hazards and capable of generating public interest in the project.

The project team notified all interested entities of the plan and the option to join in the planning process via contact to the public entities within the Tri-Basin NRD. Public entities near the Tri-Basin NRD that might be interested in joining in this plan were notified through public notice published in the two regional papers, the Holdrege Daily Citizen, published Friday, July 2, 2010, and the Minden Courier, published July 7, 2010. The Holdrege Daily Citizen is a daily paper with a circulation of approximately 2,700 and covers all or portions of Phelps, Gosper, Kearney, Harlan, Franklin and Furnas Counties. The Minden Courier is a weekly paper with a circulation of approximately 1,980 and covers all or a portion of Kearney, Phelps, Adams and Franklin Counties. A copy of the mailings and affidavit of publications are included in appendix D.

The planning team determined the public meeting dates, times, and locations. The general manager attended all the public meetings, and the county emergency managers attended the public meetings in their respective counties. Three (3) public meetings were held for the first set of meetings, one for each county. Community representatives were invited to attend the public meetings through emails, telephone calls, letters, and signs posted in public places. Representatives were encouraged to attend the meetings in their counties, or in an adjacent county, if they had a scheduling conflict. The first public meetings were held in March of 2010. Press releases were sent to the local newspapers to inform the public of the meeting dates and locations. A pre-meeting survey form also was sent out to the representatives. The dates and locations of these meetings were as follows:

- March 27, 2010 – Kearney County (Minden)
- April 2, 2010 – Phelps County (Holdrege)
- April 9, 2010 – Gosper County (Elwood)

Each of the first public meetings followed the same agenda, starting with a presentation prepared by Steve McMaster with NDNR. Group discussions and break-out sessions were scheduled to allow the entity representatives opportunities to ask questions and discuss the information presented. Survey forms, nearly identical to those sent by mail, were handed out as representatives arrived, and they were asked to fill them out during the group discussion portions of the presentation. These forms were crucial in providing Olsson Associates with the background information on the hazards that threaten each entity. The goal of the planning team was to ensure that everyone was given an ample opportunity to participate in the plan, whether through public meetings or through mailings. At the conclusion of each meeting, the attendees were notified that a copy of the presentation would be available by contacting Olsson Associates or the Tri-Basin NRD.

A second set of public meetings was held in July of 2010 on the following dates and at the locations listed:

- July 14, 2010 – Gosper County (Elwood)
- July 15, 2010 – Kearney County (Axtell)
- July 21, 2010 – Phelps County (Holdrege)

Each of these public meetings had the same agenda, starting with a presentation prepared by Olsson Associates, explaining what information had been gathered to date and what information was still needed. The STAPLEE forms were explained at the meeting by going through an example project. It was requested at the meetings that the public entities each fill one out for the projects they would like included. Questions about the plan's information, and status were asked and answered.

For entities that were unable to attend the public meetings, members of the planning team met one on one to discuss the plan, answer questions, and help complete the STAPLEE forms.

Below is a list of the key personnel involved in the planning process. To view records of the representatives that attended the public meetings, please see the public meeting sign-in sheets available in the appendix.

Planning Team

John Thorburn, General Manager – Tri-Basin NRD
Patrick Gerdes, Gosper and Phelps Counties Emergency Management
Jeff England, Kearney County Emergency Management
Steve McMaster, Natural Resources Planner – Nebraska Department of Natural Resources
Sheila Hascall, Hazard Mitigation Officer – Nebraska Emergency Management Agency

Table 1. Participating Entity List						
Community Name	**Signed Resolution of Participation**	**Attended Public Meeting #1 and Completed Public Input Forms Regarding Hazards of Concern**	**Attended Public Meeting #2**	**Completed STAPLEE Form**	**Submitted One or More Mitigation Projects***	**Adopted Plan****
NRD						
Tri-Basin NRD	X	X	X	X	X	
Gosper County						
Gosper County	X	X	X	X	X	
Village of Elwood***	X	X	X	X	X	
Village of Smithfield	X		X	X	X	
Kearney County						
Kearney County	X	X	X	X	X	
Village of Axtell	X	X		X	X	
Axtell Community Schools	X	X		X	X	
Village of Heartwell	X	X		X	X	
City of Minden	X	X	X	X	X	
Minden Public Schools	X	X		X	X	
Village of Norman	X	X		X	X	
Village of Wilcox	X	X	X	X	X	
Wilcox-Hildreth Public Schools	X	X		X	X	
Phelps County						
Phelps County	X	X	X	X	X	
Village of Atlanta	X	X		X	X	
Village of Bertrand	X	X		X	X	
Bertrand Public Schools	X			X	X	
Village of Funk	X	X		X	X	
City of Holdrege	X	X	X	X	X	
Holdrege Public Schools	X			X	X	
Village of Loomis****	X	X		X	X	

*Entities that have submitted a project are considered participating members of this plan.
**Upon approval of the plan by FEMA, this table will be updated with the entities that adopt the final plan.

***The presentation in Gosper County occurred on the same night at the Village of Elwood board meetings and the presentation was made at the board meeting.
****Loomis Rural Fire Department submitted a project and STAPLEE form that is included as part of the Village of Loomis' projects and STAPLEE.

To meet the guidelines established by the planning team, each entity was required to turn in a signed resolution, a STAPLEE form, and a project identification sheet. If those three forms were submitted, the entity was considered to be a part of the planning effort. In all, 21 different entities turned in the necessary paperwork and met the requirements to have their entities represented in the plan. Attending the public meetings was strongly suggested, but not required if the entity completed the project submittal and STAPLEE form.

All public entities within the Tri-Basin NRD were specifically invited to participate in this plan. Table 2 identifies those entities within the planning area that elected not to finish the process to participate in the plan and what level of involvement they did have. If these entities elect to participate in the plan in the future and meet the requirements of it, the plan will be revised to accommodate them in the future.

Table 2. Non-Participating Entity List

Community Name	Signed Resolution of Participation	Attended Public Meeting #1 and Completed Public Input Forms Regarding Hazards of Concern	Attended Public Meeting #2	Completed STAPLEE Form	Submitted One or More Mitigation Projects*	Adopted Plan**
Gosper County						
Elwood Public Schools	X	X				
Phelps County						
Loomis Public Schools						
Educational Service Unit 11						

One might note that townships were not documented as eligible entities to participate in the plan. This is because the emergency management directors indicated that no townships exist in Gosper County. In Phelps County, the townships are to dissolve within the next 12 months. In Kearney County, only one township is active, and it functions solely to operate the library in Wilcox. All other responsibilities of the townships are placed with their respective counties. Therefore, the counties will also have hazard mitigation responsibilities on behalf of the townships for purposes of this plan and projects that may result.

Existing Plans, Studies, Reports, and Technical Information

In addition to obtaining public opinion on the hazards threatening the project area, it also was important to incorporate any existing information into the plan documenting potential hazards or threats in the area. To obtain this information, Olsson Associates worked with the Tri-Basin NRD and NDNR to determine any existing plans, studies, reports, or other technical information that would be beneficial to include in this plan.

The following is a list of the information obtained from the Tri-Basin NRD, NDNR and through research:

- State of Nebraska Hazard Mitigation Plan
- Nebraska Association of Natural Resources Districts (NARD)
- U.S. Census Bureau
- Federal Emergency Management Agency (FEMA)
- Flood Insurance Studies (FIS)
- Gosper County Local Emergency Operations Plan (LEOP)
- Kearney County Local Emergency Operations Plan(LEOP)
- Phelps County Local Emergency Operations Plan (LEOP)
- University of Nebraska – Lincoln – High Plains Regional Climate Center (HPRCC)
- National Drought Mitigation Center (NDMC)
- National Oceanic and Atmospheric Administration (NOAA)
- National Climatic Data Center (NCDC)
- National Flood Insurance Program (NFIP)
- U.S. Army Corps of Engineers (USACOE)
- U.S. Geological Survey (USGS)
- Center for Disease Control (CDC)
- University of Nebraska – Lincoln – School of Natural Resources (UNL-SNR)
- Nebraska Department of Revenue
- Nebraska Department of Education
- Energy Information Association
- Zoning ordinances for all counties and communities within the planning area
- Building codes for all counties and communities within the planning area

FEMA Flood Insurance Studies (FIS) were available for one (1) county and ten (10) communities in the project area. The pertinent information acquired from each is summarized in the flooding portion of Section 1.0 for each county. The FIS available for the project area include the counties and communities listed below.

Gosper County (#310438)
- Village of Elwood (#310365)
- Village of Smithfield (#310131)

Kearney County
- City of Minden (#310389)
- Village of Axtell (#310344)
- Village of Norman (#310506)

Phelps County
- City of Holdrege (#310173)
- City of Loomis (#310524)
- Village of Atlanta (#310521)
- Village of Bertrand (#310522)
- Village of Funk (#310523)

The documents listed above were incorporated into the plan. The FIS and other FEMA documents were used as a base for the flood risk portion of the plan. Using the information in the FIS documents, Olsson Associates was able to do a thorough risk assessment for flooding throughout the project area and determine potential projects, with the help of local officials. Local Emergency Operations Plans (LEOPs) were also used to identify potential projects. Geographical Information System (GIS) databases were developed to determine areas where structures are located within FEMA designated floodplains; communities or structures located near dams; locations of wastewater treatment facilities; locations of tornadoes strikes within the project area; and historic districts within the communities. Any information regarding infrastructure within the project area that was provided to Olsson Associates also was incorporated into the GIS database when possible.

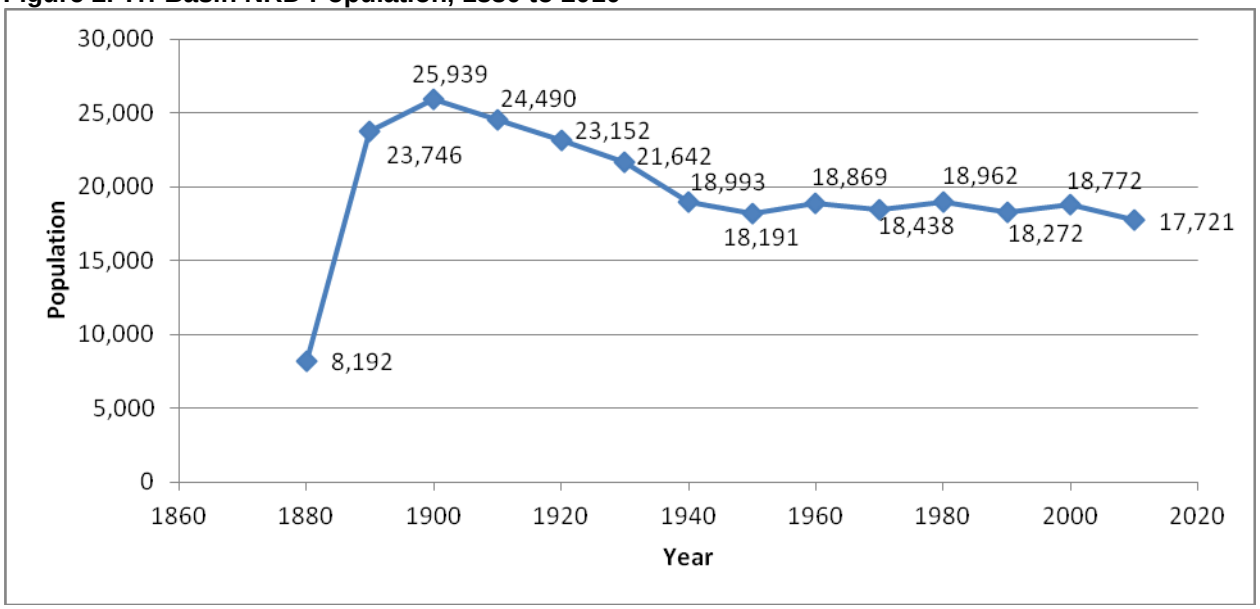
RISK ASSESSMENT

DEMOGRAPHIC SUMMARY

The public input process for this plan was crucial to determine the concerns of the Tri-Basin NRD and potential projects to mitigate the concerns of the citizens of the Tri-Basin NRD. Due to the project area for this planning effort, the Tri-Basin NRD and county emergency management districts (EMDs) were required to produce a high level of enthusiasm for this project by communicating to a diverse group of individuals. The following paragraphs summarize the diversity of the population with the demographic information for the NRD as a whole.

According to the U.S Census Bureau, the total population of the project area in 2010 was 17,721. The population in the project area has declined slightly during the past few years, decreasing from a population of 18,772 in 2000. Figure 2 shows the population trend in the Tri-Basin NRD since 1880.

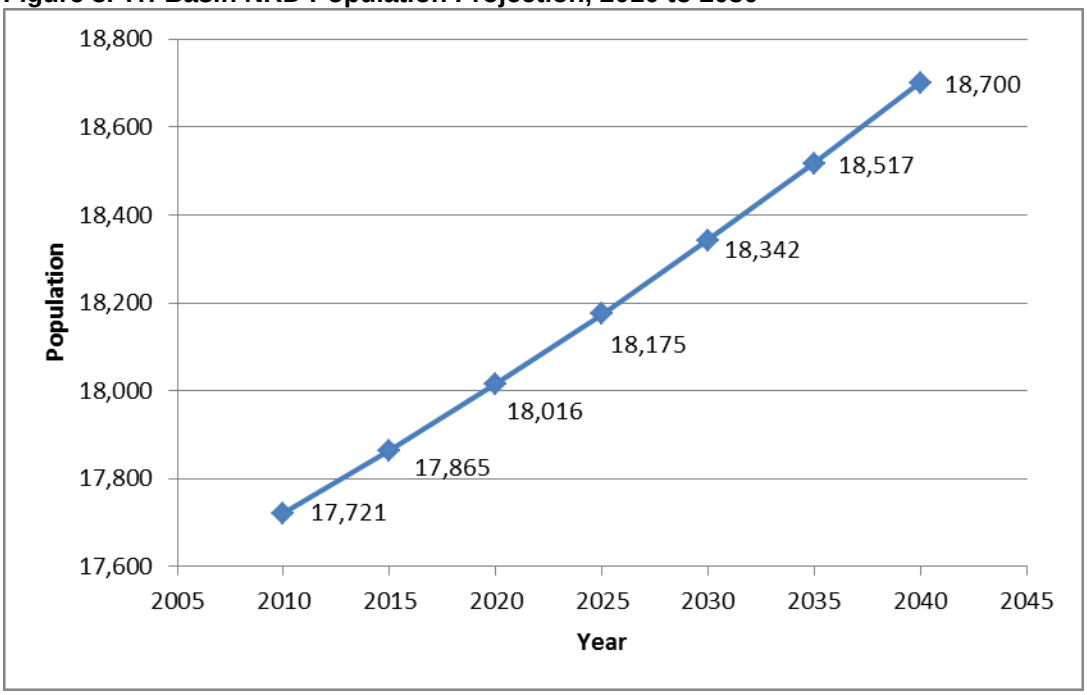
Figure 2. Tri-Basin NRD Population, 1880 to 2010



Sources: Nebraska State Data Center, Center for Public Affairs Research, University of Nebraska – Omaha, U.S. Bureau of Census, '1990 Census of Population and Housing', 'CPH-2-29, Population and Housing Unit Counts, Nebraska', Census Web Site (www.census.gov) and similar publications for preceding years.

The population of the project area is projected to slightly increase over time, as shown in Figure 3. Based on the county populations found on the U.S. Census Bureau website, the population in the project area was slightly lower in 2010 than it was in 2000.

Figure 3. Tri-Basin NRD Population Projection, 2010 to 2030



*2010 numbers are Census counts; other numbers are projections.
Source: University of Nebraska, Bureau of Business Research, Nebraska County Population Projections

The gender breakdown for the Tri-Basin NRD area as per the 2010 U.S. Census Bureau information (most recent information) is 49.4 percent male and 50.6 percent female. Table 3 depicts the age characteristics of the Tri-Basin NRD area.

Table 3. Age Characteristics of Tri-Basin NRD, 2010 Census

Age	Number of People	Percent of Total
Under 5 years	1,153	6.5%
5 to 9 years	1,167	6.6%
10 to 14 years	1,195	6.7%
15 to 19 years	1,128	6.4%
20 to 24 years	707	4.0%
25 to 34 years	1,895	10.2%
35 to 44 years	1,989	11.2%
45 to 54 years	2,788	15.7%
55 to 59 years	1,304	7.4%
60 to 64 years	1,121	6.3%
65 to 74 years	1,585	8.9%
75 to 84 years	1,183	6.7%
85 years and older	596	3.4%
18 years and over	13,433	75.8%
21 years and over	12,962	73.1%
62 years and over	4,013	22.6%
65 years and over	3,364	19.0%

Source: U.S. Census Bureau, DP-1. General Demographic Characteristics: 2010

As shown in Table 3, the population varies among the age brackets. However, a higher percentage of the population falls between the ages of 25 to 54 than in any other age bracket. A significant number of people are also older than age 65, which is an important fact to consider when determining the best method of protection from hazards for citizens and communities.

Another important demographic detail is housing occupancy and the age of the existing structures. Table 4 shows housing occupancy and tenure in the project area. Important to note is the large number of people who reside in Gosper County for seasonal, recreational, or occasional use. This group of residents should also be considered when determining protection and mitigation techniques.

Table 4. Units in Residential Structure of Tri-Basin NRD, 2010 Census

Subject	Number of Units	Percent of Total
Total Housing Units	8,309	100.0%
1-unit, detached	6,909	83.2%
1-unit, attached	65	0.8%
2 units	123	1.5%
3 or 4 units	206	2.5%
5 to 9 units	84	1.0%
10 to 19 units	140	1.7%
20 or more units	170	2.0%
Mobile home	612	7.4%
Boat, RV, Van, etc.	0	0.0%
Subtotals		
Permanent Housing Units	7,697	92.7%
Mobile Housing Units	612	7.4%

Source: U.S. Census Bureau, DP-4. Selected Housing Characteristics: 2010

Permanent Housing Units are typically built with more substantial building materials and building codes than Mobile Housing Units. For the purposes of this plan, Permanent Housing Units are considered housing units permanently attached to a foundation, and include all housing types listed in Table 4 except the Mobile homes and Boat, RV, Van, etc. categories.

Table 5 shows the age of homes within the Tri-Basin NRD. The age of the home is helpful in determining the level of damage that could be seen if a hazard occurs.

Table 5. Age of Structures in Tri-Basin NRD, 2010 Census

Year Structure Built	Number	Percent of Total
2005 or later	53	0.6%
2000 to 2004	342	4.1%
1990 to 1999	714	8.6%
1980 to 1989	717	8.6%
1970 to 1979	1378	16.6%
1960 to 1969	864	10.4%
1950 to 1959	827	10.0%
1940 to 1949	520	6.3%
1939 or earlier	2894	34.8%

Source: U.S. Census Bureau, DP-4. Profile of Selected Housing Characteristics: 2010

In addition to the data on residences within The Tri-Basin NRD, the Nebraska Department of Revenue lists 1,025 properties as either commercial or industrial in nature.

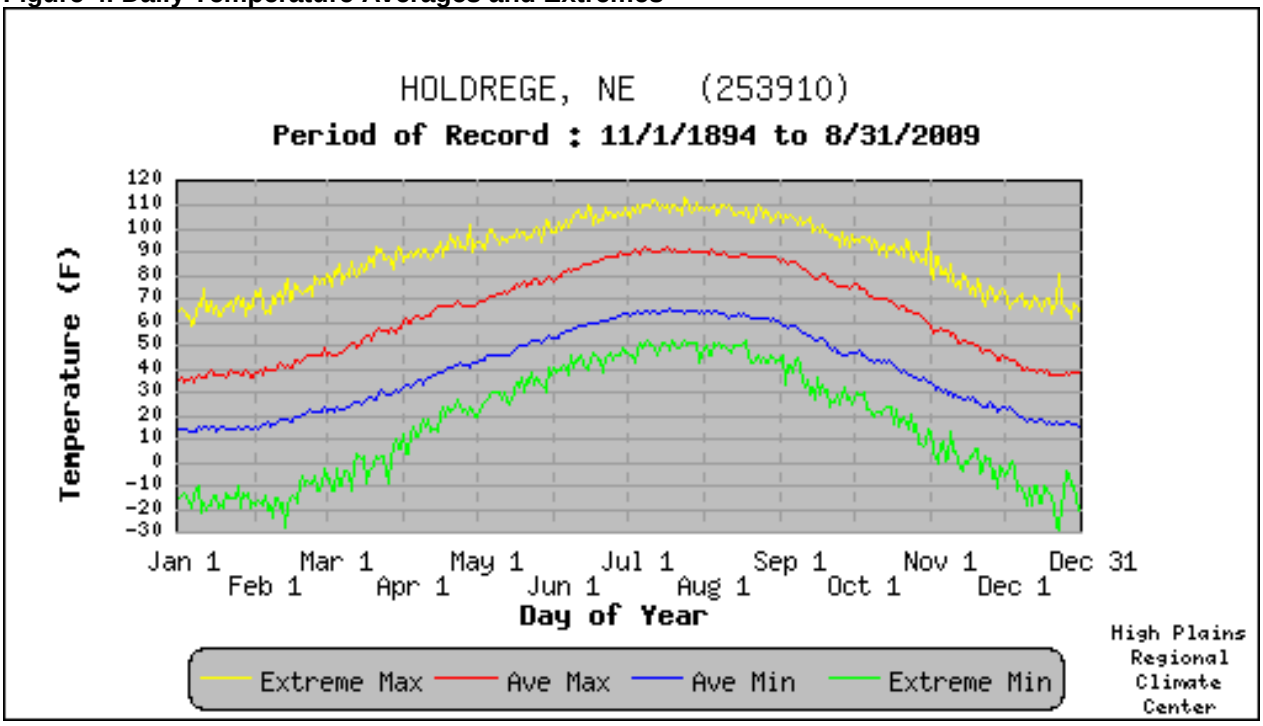
CLIMATE SUMMARY

Since the planning area is a three-county area, the climate varies slightly. To ensure that the climate information provided in this section is as accurate as possible, a central location in the planning area was selected as the source of the climate summary. The City of Holdrege, located in Phelps County, was the most centrally located city of those that had available information. Information in this report is based on climate data from the High Plains Regional Climate Center.

Nebraska has a continental climate, meaning the state experiences highly variable temperatures from season to season. In general, the planning area sees an average temperature of 28.0 degrees in the winter, 50.3 degrees in the spring, 74.5 degrees in the summer, and 53.1 degrees in the fall. The average annual precipitation in the area is 24.75 inches, and the average annual snowfall is 28.3 inches.

Figure 4 depicts the daily temperature averages and extremes. The period of record is 1894 to 2009. According to the High Plains Regional Climate Center, the daily extreme maximum temperature is the maximum of all daily maximum temperatures recorded for that day of the year. The average maximum is the average of all daily maximum temperatures recorded for that day of the year. The average minimum is the average of all daily minimum temperatures recorded for that day of the year. The extreme minimum is the minimum of all daily minimum temperatures recorded for that day of the year.

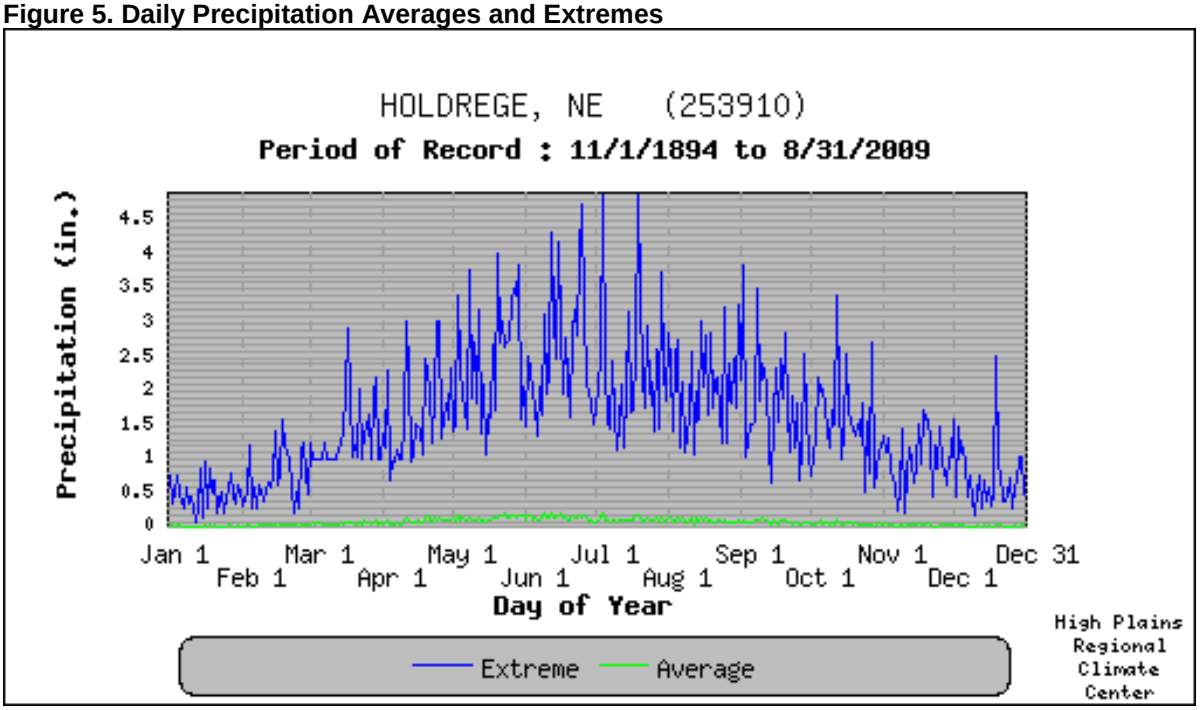
Figure 4. Daily Temperature Averages and Extremes



Source: High Plains Regional Climate Center

Figure 5 shows the precipitation averages and extremes for the planning area.

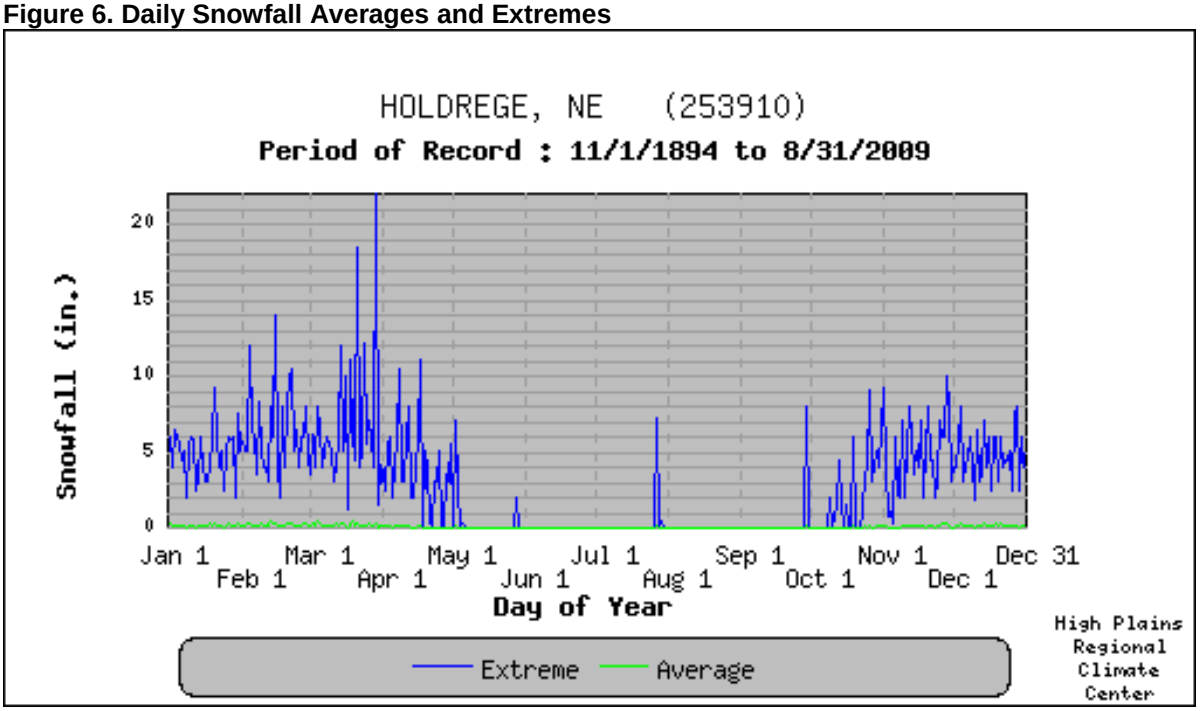
Figure 5. Daily Precipitation Averages and Extremes



Source: High Plains Regional Climate Center

Figure 6 details the snowfall averages and extremes for the project area. The daily extreme is the greatest precipitation or snowfall recorded for that day of the year. The daily average is the average of all daily precipitation or snowfall recorded for that day of the year.

Figure 6. Daily Snowfall Averages and Extremes



Source: High Plains Regional Climate Center

HAZARD IDENTIFICATION

A wide range of hazards affect the planning area. History has proven that many different types of hazards can cause extensive damage. In fact, from 1999 through 2009, six (6) federally declared disasters have affected at least one county of the three-county planning area. The following list depicts the number of times each county was involved in the six federal disasters:

- Gosper County – three
- Kearney County – six
- Phelps County – three

The federally declared disasters did not have a significant time span between each event, reinforcing the fact that another extensive disaster could occur at any time. In fact, one disaster was declared in each of the following years: 2004, 2005, 2006, and 2008, with two disasters declared in 2007. These events make this planning effort even more beneficial to the area.

To determine the impact of hazards and concerns of the public, it was vital for the Tri-Basin NRD and county personnel to develop a high level of interest from the communities. To obtain support from the communities, public meetings discussing the planning process were scheduled in the beginning stages of the planning process. The public meeting results and public input results are detailed in the following section.

During the initial public meeting planning, it was necessary to develop a list of hazards that affect the planning area. The State of Nebraska Hazard Mitigation Plan (2008) was referenced to help develop the list of hazards of concern. The following hazards of concern for the project area are listed in the State of Nebraska Hazard Mitigation Plan (2008):

- Agricultural Incidents – Animals/Livestock
- Agricultural Incidents – Plants/Crops
- Dam Failure

- Drought
- Earthquake
- Flooding
- Levee Failure
- Severe Winter Storms/Ice Storms
- Terrorism
- Thunderstorms/High Winds/Lightning/Hail
- Tornadoes
- Wildfires

For this planning effort the following hazards listed in the State of Nebraska hazard Mitigation Plan (2008) were not included in this plan:

- Agricultural Incidents – Animals/Livestock
- Agricultural Incidents – Plants/Crops
- Terrorism

While these hazards do pose a threat to the planning area, it was difficult to find information specifically regarding these events, and appropriate methods to mitigate against them. Other events (i.e. flooding, sever winter storms/ice storms, tornadoes, thunderstorms/high winds/lightning/hail, drought and wildfires) cover potential damages to agriculture plants and animals.

The survey forms filled out during the initial public meeting and those received by mail from the representatives and public officials for the project area were used to determine the hazards affecting the Tri-Basin NRD. In addition to listing the hazards, representatives were asked to rate the probability of the potential hazard affecting the area and their entity's vulnerability, if such an event were to occur. The following section details the results obtained from the survey forms for the entire project planning area.

The aim of this plan is to provide detailed information regarding the hazards that are most likely to affect the Tri-Basin NRD, to identify the associated risks due to these hazards, and to develop mitigation goals to prevent catastrophic damage from these hazards.

The information obtained through public input was analyzed by Olsson Associates to determine the hazards that are of biggest concern to the entities throughout the planning area. Table 6 summarizes the results of the survey forms. The probability and extent are based on historical occurrences when information existed and on public opinion for the items lacking historical data. The column listing past occurrences indicates whether the hazard has affected the project area in previous years. This information was provided by the National Climatic Data Center (NCDC), the NDNR, the NRD, and the county emergency management directors.

The hazard risk analysis criteria, as used during the planning process, are defined below.

Probability – What is the likeliness for this hazard to occur in the future?

- Highly Likely –
  - Nearly 100% chance in the next year
  - The event has occurred four or more times in the past 100 years
- Likely –
  - Between 10% and 99% probability in the next year, or at least one chance in 10 years
  - The event has occurred more than once, but less than four times in the past 100 years
- Possible –
  - Between 1% and 9% probability in the next year, or at least one chance in next 100 years
  - The event has occurred once in the past 100 years
- Unlikely –

- Less than 1% probability in next 100 years
- No record of occurrence in the past 100 years

Extent – The number of people to be negatively impacted, the physical or spatial negative impact upon the city, how quickly is the time to respond or react to the hazard?

- Catastrophic –
  - More than 50% of the total population of the jurisdiction, high risk to response personnel;
  - More than 50% of the jurisdiction;
  - Property destroyed or damaged beyond repair, complete shutdown of essential facilities for 3 days or more, major long-term environmental impact, severe impacts to the reputation of the jurisdiction
  - Percent Average Damage per Event 10% or greater
- Critical –
  - 25% to 50% of the total population on the jurisdiction, moderate risk to response personnel;
  - 25% to 50% of the jurisdiction;
  - Serious injury and illness, major property damage which threatens structural stability, shutdown of essential facilities and services for 24-72 hours, minor long-term environmental impact, moderate impact to reputation of the jurisdiction
  - Percent Average Damage per Event between 5.1% and 9.9%
- Limited –
  - 10% to 24% of the total population of the jurisdiction, moderate risk to response personnel;
  - 10% to 24% of the jurisdiction;
  - Minor injuries and illness, minor property damage not threatening structural stability, shutdown of essential facilities and services for 4 to 24 hours, minor short-term environmental impact, very limited impact to reputation of the jurisdiction
  - Percent Average Damage per Event between 1.1% and 5.0%
- Negligible –
  - Less than 10% of the total population of the jurisdiction, no risk to response personnel, or no response needed;
  - Less than 10% of the jurisdiction;
  - Few if any injuries, minor quality of life lost with little or no property damage, brief interruption of essential facilities for less than 4 hours, no environmental impact, no impact to reputation of the jurisdiction
  - Percent Average Damage per Event 1% or less

Table 6. Project Area Hazard Identification

Hazard	Probability	Extent	Past Occurrence
Thunderstorms/ High Winds/ Lighting/ Hail	Highly Likely	Limited	Yes
Severe Winter Storms	Highly Likely	Critical	Yes
Tornadoes	Highly Likely	Critical	Yes
Droughts	Likely	Limited	Yes
Flooding	Highly Likely	Critical	Yes
Wildfires	Unlikely	Negligible	No
Dam Failure	Unlikely	Limited	No
Earthquake	Unlikely	Negligible	No
Landslide	Unlikely	Negligible	No
Excessive Heat	Unlikely	Limited	No
Levee Failure	Unlikely	Negligible	No

The information summarized above is an average of the results for all entities in the planning area. To view the results of each county and view the individual entity survey forms, please refer to Appendices A through C.

The subsequent portions of this plan will discuss the hazards that have been identified as potential threats to the planning area, including all items listed in Table 6. In addition to describing the types of hazards affecting the area, a summary of previous occurrences of each hazard will be listed as well. To view hazard events for each county, please refer to Appendices A through C.

THUNDERSTORMS/HIGH WINDS/LIGHTING/HAIL

Hazard Summary

For the purposes of this plan, it was necessary to define what event would be termed a severe thunderstorm. According to NOAA's Web site (www.nws.noaa.gov/glossary), a severe thunderstorm is classified as a storm that "produces a tornado, winds of at least 58 mph (50 knots), and/or hail at least three-fourths-inch in diameter." In addition to high winds and hail, this hazard category also contains events dealing with lightning strikes and intense rainfall. Since tornadoes were defined as separate events on the survey forms, they will be included in a later portion of the plan and are, therefore, not included in this section, despite the NOAA definition.

Even though an extensive list does not exist of past occurrences of Thunderstorms/High Winds/Lighting/Hail within the entire project area, an extensive history of occurrences exists in isolated areas. This indicates the need to protect the communities and residents of the project area from the impact of these storms, as the area is highly likely to experience the effects of Thunderstorms/High Winds/Lighting/Hail in the future.

Historical Occurrences

According to the NCDC, since 1950, 637 Thunderstorms/High Winds/Lighting/Hail have been recorded in the planning area. Many of these storms produced either little or no recorded damage. Table 7 lists past occurrences of Thunderstorms/High Winds/Lighting/Hail causing $100,000 or more in damage according to the NCDC. The extensive list of past occurrences of Thunderstorms/High Winds/Lighting/Hail indicates the need to protect the communities and residents of the Tri-Basin NRD from the impact of these storms.

Table 7. Tri-Basin NRD Historical Thunderstorms/High Winds/Lighting/Hail Occurrences

Location	Date	Hazard Type	Magnitude	Property Damage	Crop Damage
Gosper	06/21/1996	Lightning	N/A	$500,000	$0
Phelps	07/07/1996	Hail	2.00 in	$70,000	$3,000,000
Kearney	07/22/1996	Thunder/Wind	N/A	$5,000	$100,000
Kearney	05/21/1997	Hail	4.50 in.	$70,000	$950,000
Kearney	07/07/1997	Hail	2.00 in.	$25,000	$250,000
Kearney	07/08/1997	Hail	1.50 in.	$25,000	$250,000
Kearney	08/21/1997	Thunder/Wind	N/A	$150,000	$750,000
Kearney	09/08/1997	Hail	1.00 in.	$10,000	$250,000
Kearney, Phelps, Gosper	10/08/1997	High Wind	63 mph (55 knots)	$300,000	$0
Gosper	05/21/1998	Hail	2.75 in.	$90,000	$725,000
Phelps	05/21/1998	Hail	2.75 in	$1,000,000	$1,200,000
Kearney	05/29/1998	Hail	0.75 in.	$0	$100,000

Gosper	06/13/1998	Hail	2.75 in.	$10,000	$200,000
Phelps	08/02/1998	Thunder/Wind	N/A	$5,000	$200,000
Phelps	09/25/1998	Thunder/Wind	N/A	$30,000	$200,000
Phelps	05/14/1999	Hail	1.75 in	$5,000	$100,000
Phelps	05/30/1999	Hail	1.75 in	$40,000	$400,000
Kearney	06/23/1999	Thunder/Wind	N/A	$0	$150,000
Kearney, Phelps	06/27/1999	Thunder/Wind	N/A	$475,000	$1,950,000
Phelps	07/25/1999	Thunder/Wind	N/A	$15,000	$150,000
Kearney	08/17/1999	Thunder/Wind	N/A	$25,000	$100,000
Kearney, Gosper	06/19/2000	Thunder/Wind	N/A	$100,000	$1,500,000
Kearney, Phelps	06/19/2000	Hail	1.75 in.	$30,000	$1,700,000
Phelps	06/19/2000	Heavy Rain	N/A	$20,000	$2,500,000
Gosper	06/29/2000	Hail	1.00 in.	$100,000	$2,000,000
Phelps, Gosper	06/29/2000	Thunder/Wind	N/A	$200,000	$4,000,000
Phelps	07/03/2000	Hail	0.75 in	$0	$100,000
Phelps	07/20/2000	Hail	2.75 in	$557,000	$4,750,000
Kearney	07/24/2000	Hail	0.88 in.	$0	$100,000
Phelps, Kearney	07/25/2000	Hail	1.75 in	$20,000	$350,000
Gosper	08/12/2001	Hail	1.00 in.	$5,000	$500,000
Phelps	05/26/2002	Hail	1.25 in	$45,000	$200,000
Kearney	06/02/2002	Thunder/Wind	N/A	$200,000	$0
Kearney	06/12/2002	Hail	4.50 in.	$25,000,000	$5,500,000
Gosper, Phelps	06/15/2002	Hail	1.75 in.	$20,000	$900,000
Kearney	07/24/2002	Hail	1.75 in.	$50,000	$1,000,000
Phelps	05/04/2003	Hail	1.75 in	$250,000	$0
Kearney, Phelps	06/23/2003	High Wind	64 mph (56 knots)	$1,450,000	$0
Phelps	07/05/2003	Hail	1.00 in	$10,000	$100,000
Phelps	07/06/2003	High Wind	80 mph (70 knots)	$1,300,000	$0
Phelps	09/09/2003	Hail	1.25 in	$10,000	$100,000
Phelps, Kearney, Gosper	04/18/2004	High Wind	59 mph (52 knots)	$750,000	$0
Phelps, Gosper	07/05/2004	Hail	1.00 in	$75,000	$2,250,000
Phelps	07/05/2004	Thunder/Wind	N/A	$50,000	$2,500,000
Phelps	05/07/2005	Hail	1.75 in	$50,000	$150,000
Kearney	05/10/2005	Hail	2.75 in.	$100,000	$0
Phelps	05/17/2005	Hail	1.75 in	$25,000	$100,000
Kearney	06/03/2005	Hail	0.88 in.	$0	$500,000
Gosper	06/06/2005	Hail	1.00 in.	$10,000	$250,000
Gosper	07/04/2005	Hail	1.00 in.	$0	$2,000,000
Gosper	08/17/2005	Thunder/Wind	N/A	$10,000	$2,000,000
Gosper, Phelps	09/05/2005	Hail	1.25 in.	$225,000	$1,250,000
Phelps, Gosper	04/02/2006	High Wind	46 mph (40 knots)	$200,000	$0
Kearney	06/16/2006	Hail	1.00 in.	$30,000	$800,000
Phelps	06/20/2006	Thunder/Wind	N/A	$25,000	$100,000
Phelps, Kearney	07/13/2006	Hail	1.75 in	$60,000	$575,000

Phelps	07/21/2006	Thunder/Wind	N/A	$10,000	$100,000
Phelps	08/01/2006	Thunder/Wind	N/A	$65,000	$250,000
Phelps, Kearney	09/15/2006	Hail	2.00 in	$65,000	$175,000
Phelps	04/24/2007	Heavy Rain	N/A	$0	$100,000
Gosper	07/12/2007	Hail	2.75 in.	$75,000	$400,000
Gosper	08/21/2007	Hail	1.00 in.	$5,000	$1,000,000
Gosper, Phelps	09/06/2007	Hail	1.75 in.	$225,000	$2,150,000
Phelps, Kearney	05/22/2008	Hail	1.75 in	$52,000	$900,000
Gosper	05/29/2008	Hail	2.00 in.	$20,000	$1,250,000
Kearney	06/04/2008	Hail	2.75 in.	$35,000	$900,000
Phelps, Kearney	06/07/2008	Hail	1.00 in	$4,000	$200,000
Kearney	06/19/2009	Hail	1.75 in.	$10,000	$150,000
Phelps, Kearney	07/22/2009	Thunder/Wind	N/A	$30,000	$2,000,000

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Highly Likely –
  - Nearly 100% chance in the next year
  - The event has occurred four or more times in the past 100 years

Thunderstorms/High Winds/Lighting/Hail poses a serious threat to the project area. The biggest threat is to properties and the potential loss of life. As mentioned above, Thunderstorms/High Winds/Lighting/Hail can produce tornadoes, hail, high wind, lightning strikes, and intense rain. Tornadoes, flooding, hail, and high wind events will be detailed in the following sections of this plan. If a Thunderstorms/High Winds/Lighting/Hail were to produce any of the above-mentioned conditions, the affected area could experience flooding; fires resulting from lightning strikes; structural damage from high winds, downed trees, or tree limbs; power outages; downed power lines; and loss of life. If residents were caught outside in such a storm, they would be at risk of lightning strikes, downed trees or tree limbs catching them unaware, or being caught in flash flooding situations. In the event of flash flooding, emergency response vehicles may not have direct access to the residents of the area. If power outages were to occur, critical infrastructure may be affected. Businesses and schools could be closed due to the impacts of lightning strikes or flooding. The damage resulting from such an event would affect existing and future structures, facilities, and population as well as future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 existing structures are within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1,025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures in the future

could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

Extent – The number of people to be negatively impacted, the physical or spatial negative impact upon the city, how quickly is the time to respond or react to the hazard?

- Limited –
  - 10% to 24% of the total population of the jurisdiction, moderate risk to response personnel;
  - 10% to 24% of the jurisdiction;
  - Minor injuries and illness, minor property damage not threatening structural stability, shutdown of essential facilities and services for 4 to 24 hours, minor short-term environmental impact, very limited impact to reputation of the jurisdiction
  - Percent Average Damage per Event between 1.1% and 5.0%

Thunderstorms/High Winds/Lighting/Hail tend to be erratic and do not necessarily affect a large area with one storm. Determining an estimated loss for the three-county planning area is quite difficult due to the localized nature of these storms. If a Thunderstorms/High Winds/Lighting/Hail were to affect the project area, it was estimated that 1.45 percent of the property valuation within the planning area would be affected. This estimate was based on the following formula:

Total Damages Recorded ($92,073,000) / Total Events Recorded (69) =
Average Damage per Event ($1,334,391)

Average Damage per Event ($1,334,391) / Total Damages Recorded ($92,073,000) =
Percent Average Damage per Event (1.45%)

Percent Average Damage per Event (1.45%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($7,447,130)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

Jurisdictions	Structural Valuation	Damage Estimate
Elwood	$27,058,814	$392,353
Smithfield	$2,078,111	$30,133
Minden	$148,902,231	$2,159,082
Axtell	$30,304,143	$439,410
Heartwell	$2,031,812	$29,461
Norman	$1,855,074	$26,899
Wilcox	$12,081,359	$175,180
Atlanta	$3,704,187	$53,711
Bertrand	$25,735,608	$373,166
Funk	$11,595,958	$168,141
Holdrege	$229,201,515	$3,323,422
Loomis	$19,046,363	$276,172
Totals	**$513,595,175**	**$7,447,130**

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

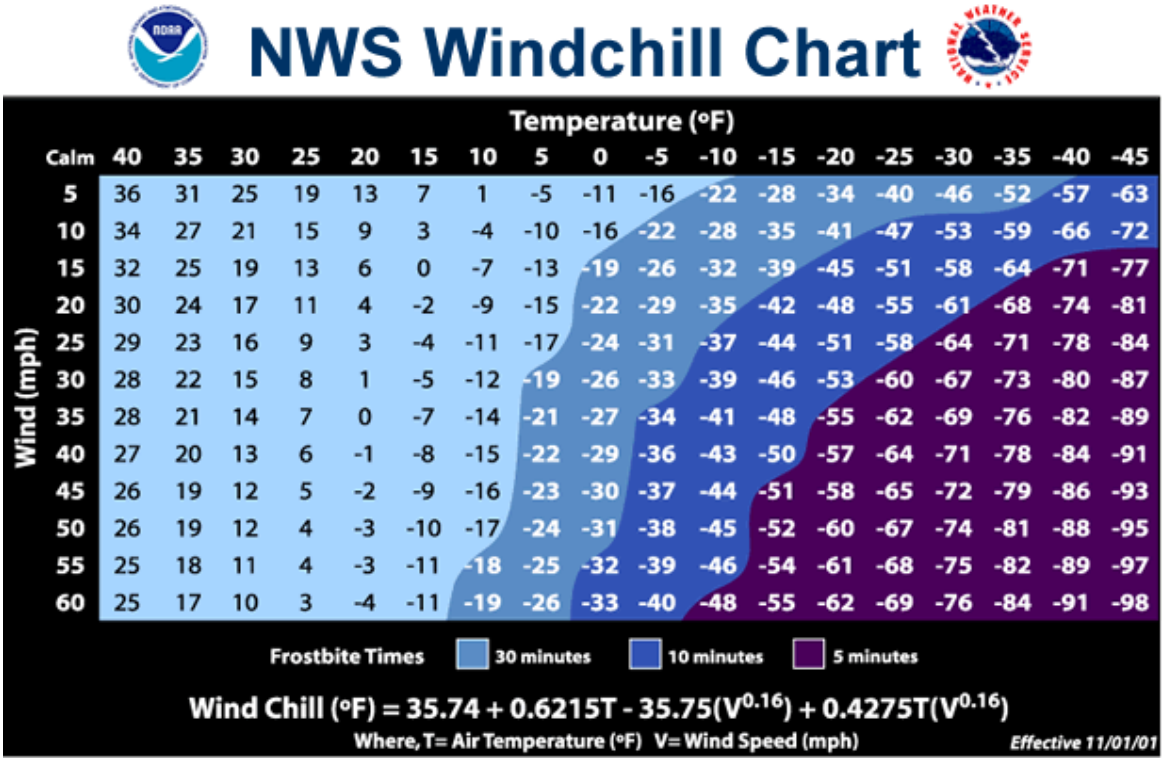
SEVERE WINTER STORMS

Hazard Summary

Severe winter storms can be defined in many different ways. In this plan, a severe winter storm includes events producing heavy snow, dangerous wind chills, extreme cold, ice, and blizzard conditions. According to the National Oceanic and Atmospheric Administration (NOAA) Web site (www.nws.noaa.gov/glossary), the events defining a severe winter storm are as follows:

- Heavy snow:
  - Snowfall accumulating to four inches or more in depth in 12 hours or less or
  - Snowfall accumulating to six inches or more in depth in 24 hours or less
- Dangerous wind chills:
  - No specific rules exist for determining when wind chill becomes dangerous.
  - As a general rule, the threshold for potentially dangerous wind chill conditions is about 20 degrees F. (see Figure 7)
- Ice storm:
  - Significant ice accumulations are usually accumulations of quarter-inch or greater.
- Blizzard:
  - Sustained wind or frequent gusts to 35 mph or greater
  - Considerable falling and/or blowing snow, for instance, frequently reducing visibility to less than a quarter-mile

Figure 7. Wind-chill Chart



Source: National Weather Service Office of Climate, Water and Weather Service

Historical Occurrences

According to the NCDC, since 1950, 206 severe winter storms have been recorded in the planning area. Many of these storms produced either little or no recorded damage. Table 8 lists past occurrences of severe winter storms, causing $100,000 or more in damage, in the Tri-Basin NRD, according to the National Climatic Data Center (NCDC). The list of severe winter storm events in the project area indicates the need for mitigation efforts to prevent the catastrophic effects of these storms.

Table 8. Tri-Basin NRD Historical Severe Winter Storm Occurrences

Location	Date	Hazard Type	Property Damage	Crop Damage
Gosper, Kearney, Phelps	04/11/1994	Heavy Snow	$500,000*	$0
Gosper, Kearney, Phelps	09/21/1995	Freeze	$0	$50,000,000*
Gosper, Kearney, Phelps	10/25/1997	Winter Storm	$15,000,000*	$1,500,000*
Gosper, Kearney, Phelps	12/07/1997	Ice Storm	$100,000*	$0
Gosper, Kearney, Phelps	12/21/1997	Ice Storm	$100,000*	$0
Gosper, Kearney, Phelps	03/07/1998	Winter Storm	$100,000*	$0
Gosper, Kearney, Phelps	03/01/2002	Winter Storm	$120,000*	$0
Kearney, Phelps	02/04/2004	Winter Storm	$230,000*	$0

Table 8. Tri-Basin NRD Historical Severe Winter Storm Occurrences (Continued)

Location	Date	Hazard Type	Property Damage	Crop Damage
Kearney	2/8/2005	Winter Storm	$250,000*	$0
Gosper, Kearney, Phelps	11/27/2005	Blizzard	$3,000,000*	$0
Gosper, Kearney, Phelps	03/20/2006	Winter Storm	$1,700,000*	$0
Gosper, Phelps	12/19/2006	Ice Storm	$300,000*	$0
Kearney	12/20/2006	Ice Storm	$100,000*	$0
Gosper, Kearney, Phelps	12/29/2006	Ice Storm	$12,000,000*	$0
Gosper, Kearney, Phelps	12/10/2007	Winter Storm	$100,000*	$0

*Values include areas outside of the planning area.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Highly Likely –
  - Nearly 100% chance in the next year
  - The event has occurred four or more times in the past 100 years

Severe winter storms pose a threat to the entire project area in terms of property damage and the potential loss of life. Severe winter storms, as described above, can produce heavy snowfall; dangerous wind chills; and extreme cold, ice, and blizzard conditions. If a storm were to produce any of the these conditions, the affected area could experience power outages, downed trees or tree limbs, and downed power lines resulting from the weight of the ice or snow; treacherous driving conditions; and loss of life, typically resulting from residents not being prepared for severe weather or due to automobile accidents. If residents are caught outside in such a storm, the risk of death increases due to the threat of hypothermia. In the event of heavy, accumulating snowfall, emergency response vehicles may have limited access to reach residents of the planning area. Emergency snow routes would be the primary access throughout communities. In addition to the

obvious dangers, such as downed trees and icy roadways, another potential vulnerability is that critical infrastructure, such as waterlines, sanitary sewer lines, and other vital underground utilities, could freeze if conditions persisted for days or even weeks. The functional downtime resulting from infrastructure failure or power outages would be extremely costly. Businesses and schools may need to be closed, and residents may need to be relocated to facilities that can provide heat and other necessities. While it is possible for a severe winter storm to affect the entire project area in one storm event, the likelihood that the entire project area, and all of the critical facilities in the planning area, would be rendered inoperable is unlikely. The damage resulting from such an event would affect existing structures, facilities, and population as well as future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 existing structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

Extent – The number of people to be negatively impacted, the physical or spatial negative impact upon the city, how quickly is the time to respond or react to the hazard?

- Critical –
    - 25% to 50% of the total population on the jurisdiction, moderate risk to response personnel;
    - 25% to 50% of the jurisdiction;
    - Serious injury and illness, major property damage which threatens structural stability, shutdown of essential facilities and services for 24-72 hours, minor long-term environmental impact, moderate impact to reputation of the jurisdiction
    - Percent Average Damage per Event between 5.1% and 9.9%

Severe winter storms tend to be unpredictable and affect a large area with one storm. Determining an estimated loss for the three-county planning area is quite difficult due to the large-scale nature of these storms. If a severe winter storm were to affect the project area, it was estimated that damage 6.67 percent of the property valuation within the planning area would be affected. This estimate was based on the following formula:

Total Damages Recorded ($85,100,000) / Total Events Recorded (15) =
Average Damage per Event ($5,673,333)

Average Damage per Event ($5,673,333) / Total Damages Recorded ($85,100,000) =
Percent Average Damage per Event (6.67%)

Percent Average Damage per Event (6.67%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($34,256,798)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

Jurisdictions	Structural Valuation	Damage Estimate
Elwood	$27,058,814	$1,804,823
Smithfield	$2,078,111	$138,610
Minden	$148,902,231	$9,931,779
Axtell	$30,304,143	$2,021,286
Heartwell	$2,031,812	$135,522
Norman	$1,855,074	$123,733
Wilcox	$12,081,359	$805,827
Atlanta	$3,704,187	$247,069
Bertrand	$25,735,608	$1,716,565
Funk	$11,595,958	$773,450
Holdrege	$229,201,515	$15,287,741
Loomis	$19,046,363	$1,270,392
Totals	**$513,595,175**	$34,256,798

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

TORNADOES

Hazard Summary

Tornadoes within the project area are common; in fact, according to the University of Nebraska-Lincoln High Plain Regional Climate Center (HPRCC), Nebraska averages more than 40 tornadoes a year, with the record number of 110 tornadoes in 2004. The peak month for tornadoes in Nebraska is June, with 78 percent of all tornadoes occurring in the months of May, June, and July. Table 9 shows the categories of the original Fujita Scale. Table 10 shows the categories for the Enhanced Fujita (EF) Scale. The EF Scale was implemented on February 1, 2007, as a way to classify tornado events. Tornadoes that occurred before implementing the Enhanced Fujita Scale were not reclassified; they were left under the original Fujita Scale classification.

Table 9. Fujita Scale (Classified before February 1, 2007)

Category	Wind Speed (mph)	Potential Damage
F0	< 72	Light Damage
F1	73-112	Moderate Damage
F2	113-157	Considerable Damage
F3	158-206	Severe Damage
F4	207-260	Devastating Damage
F5	261-318	Incredible Damage

Table 10. Enhanced Fujita Scale (Classified after February 1, 2007)		
Category	**Wind Speed (mph)**	**Potential Damage**
EF0	65-85	Light Damage
EF1	86-110	Moderate Damage
EF2	111-135	Considerable Damage
EF3	136-165	Severe Damage
EF4	166-200	Devastating Damage
EF5	Over 200	Incredible Damage

Historical Occurrences

According to the NCDC, since 1950, 71 tornadoes have been recorded in the planning area. Many of these storms produced little or no recorded damage. Table 11 lists past occurrences of tornadoes, causing $100,000 or more in damage, in the project area, according to the NCDC. As is evident from the historic records of tornado incidences, the planning area is highly susceptible to tornadoes. Hopefully, through this planning effort, the damage and risk to the public will be reduced.

Table 11. Tri-Basin NRD Historical Tornado Occurrences					
Location	**Date**	**Type**	**Magnitude**	**Property Damage**	**Crop Damage**
Phelps[1]	07/18/1958	Tornado	F2	$250,000	$0
Gosper	04/22/1975	Tornado	F1	$250,000	$0
Gosper[2]	06/02/1975	Tornado	F2	$250,000	$0
Kearney	04/13/1986	Tornado	F2	$250,000	$0
Phelps	06/29/1988	Tornado	F1	$2,500,000	$0
Kearney	07/14/1989	Tornado	F0	$250,000	$0
Kearney	03/13/1990	Tornado	F3	$2,500,000	$0
Kearney	03/13/1990	Tornado	F2	$250,000	$0
Phelps	10/17/1994	Tornado	F2	$250,000	$0
Phelps	10/16/1998	Tornado	F2	$400,000	$1,000,000
Phelps	05/02/1999	Tornado	F1	$100,000	$0
Phelps	05/07/2005	Tornado	F0	$250,000	$0

1 2 injuries from this event
2 4 injuries from this event

In addition to the documented occurrences listed above, another 59 tornadoes were recorded between June 22, 1950, and July 8, 2008, but were not listed because the damage amounts were less than $100,000 or were unknown.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Highly Likely –
  - Nearly 100% chance in the next year
  - The event has occurred four or more times in the past 100 years

Tornadoes pose a serious threat to the entire project area in terms of property damage and the potential loss of life. Tornadoes produce high winds and may accompany storms producing heavy rainfall and hail. If a major tornado event were to occur in the project area, damage could include structural damage to homes, businesses, and critical facilities; downed trees or limbs; power outages and downed power lines; and loss of life. If residents are outside or not in a shelter during a tornado, the risk of loss of life increases dramatically. If debris from structural damage, downed trees, and other sources affects the project area, it could block roads, limiting emergency response vehicles from accessing residents. In addition to structural damage, infrastructure damage could also result, including damage to roads, rail lines, water wells, and water towers. Critical facilities, including hospitals, fire stations, and emergency operations centers, may see extensive damage. The downtime resulting from a major tornado strike could be extensive. Rebuilding a community could take years if most structures and infrastructure were affected. Residents may need to be relocated if they lose their homes, and businesses and schools could be closed due to damage. The loss of life that could be associated with such an event could be devastating. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

Extent – The number of people to be negatively impacted, the physical or spatial negative impact upon the city, how quickly is the time to respond or react to the hazard?

- Critical –
    - 25% to 50% of the total population on the jurisdiction, moderate risk to response personnel;
    - 25% to 50% of the jurisdiction;
    - Serious injury and illness, major property damage which threatens structural stability, shutdown of essential facilities and services for 24-72 hours, minor long-term environmental impact, moderate impact to reputation of the jurisdiction
    - Percent Average Damage per Event between 5.1% and 9.9%

Tornadoes tend to be erratic and do not necessarily affect a large area with one storm. Determining an estimated loss for the three-county planning area is quite difficult due to the localized nature of these storms. If a tornado were to affect the project area, it is estimated that 8.33 percent of the property valuation within the planning area would be affected. This estimate was based on the following formula:

Total Damages Recorded ($8,500,000) / Total Events Recorded (12) =
Average Damage per Event ($708,333)

Average Damage per Event ($708,333) / Total Damages Recorded ($8,500,000) =
Percent Average Damage per Event (8.33%)

Percent Average Damage per Event (8.33%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($42,782,478)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

Jurisdictions	Structural Valuation	Damage Estimate
Elwood	$27,058,814	$2,253,999
Smithfield	$2,078,111	$173,107
Minden	$148,902,231	$12,403,556
Axtell	$30,304,143	$2,524,335
Heartwell	$2,031,812	$169,250
Norman	$1,855,074	$154,528
Wilcox	$12,081,359	$1,006,377
Atlanta	$3,704,187	$308,559
Bertrand	$25,735,608	$2,143,776
Funk	$11,595,958	$965,943
Holdrege	$229,201,515	$19,092,486
Loomis	$19,046,363	$1,586,562
Totals	**$513,595,175**	$42,782,478

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

DROUGHTS

Hazard Summary

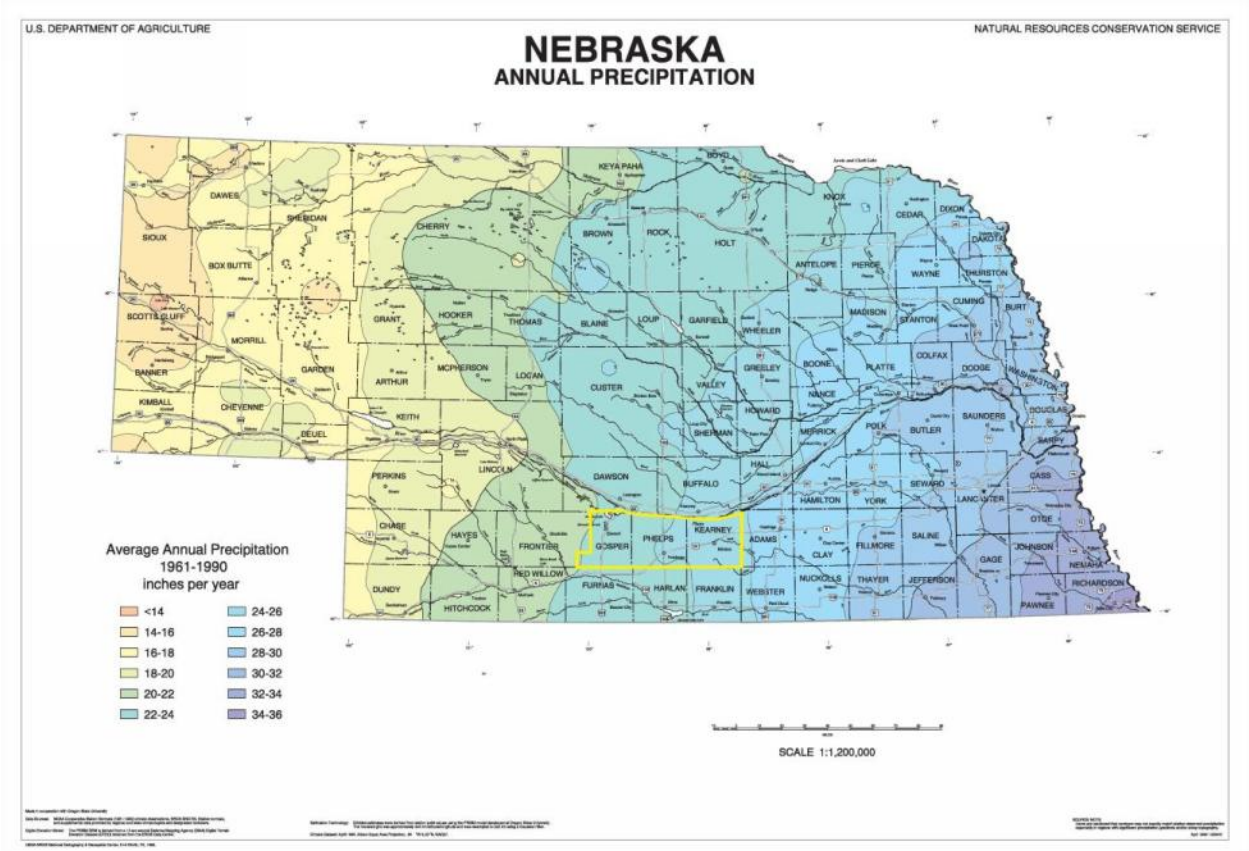
Drought is a known hazard throughout the state of Nebraska; in fact, in recent years, the state has been plagued by several extended periods of drought, and only recently has the conditions in the eastern portion of the state improved. Drought conditions are generally divided into four different categories: meteorological, agricultural, hydrological and socioeconomic. These categories are defined in the following way according to the National Drought Mitigation Center (NDMC):

- Meteorological drought
  - Usually defined on the basis of the degree of dryness -- in comparison to some normal or average amount -- and duration of the dry period
  - Must be considered as region specific
  - May relate actual precipitation departures to average amounts on monthly, seasonal, or annual time scales
- Agricultural drought

    - Links characteristics of meteorological drought to agricultural impacts, focusing on the following:
        - Precipitation shortages
        - Differences between actual and potential evapotranspiration
        - Soil water deficits
        - Reduced groundwater or reservoir levels
    - Accounts for the variable susceptibility of crops during different stages of crop development, from emergence to maturity
- Hydrological drought
    - Associated with the effects of precipitation, including snowfall, shortfalls on surface, or subsurface water supply
    - Frequency and severity of drought often defined on a watershed or river basin scale
    - Usually out of phase with or lags the occurrence of meteorological and agricultural droughts
    - Takes longer for precipitation deficiencies to show up in the components of a hydrological system
    - Competition for water in hydrological storage systems escalates during a drought, and conflicts between water users increase significantly.
- Socioeconomic drought
    - Associates the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought
    - Occurrence depends on the time and space processes of supply and demand to identify or classify droughts
    - Occurs when the demand for an economic good exceeds the supply as a result of weather-related shortfall in water supply

Figure 8 depicts the annual precipitation in the project area, with the project area zoomed to in Figure 9 (using the same legend as in Figure 8). In general, the project area averages between 20 to 26 inches of rainfall a year. If rainfall amounts deviate from the averages for consecutive years, droughts begin to threaten the area.

Figure 8. Nebraska Annual Precipitation

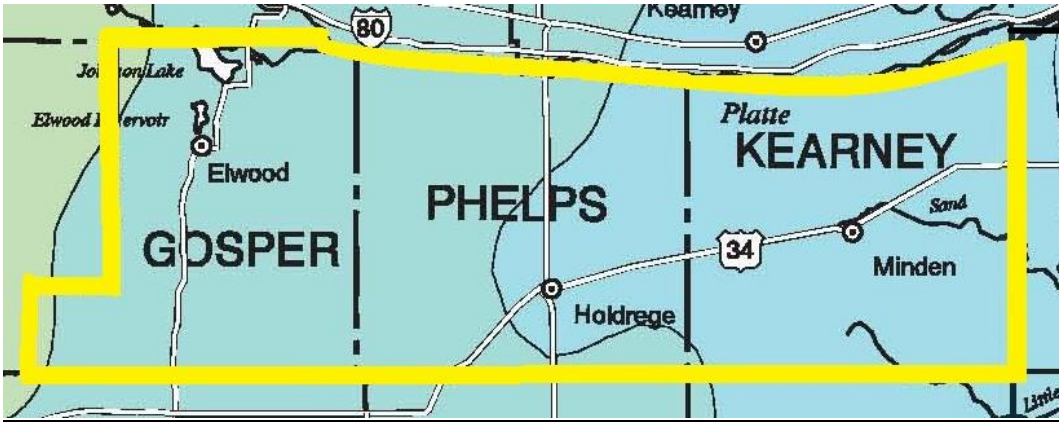


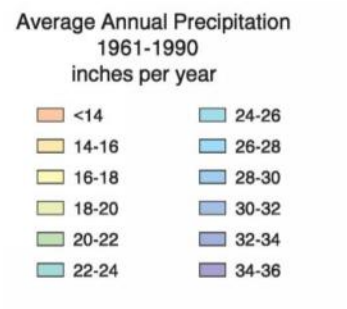
Source: U.S. Department of Agriculture – Natural Resources Conservation Service
In cooperation with Oregon State University

Data Source: NOAA Cooperative Station Normals (1961-1990) climate observations, NRCS SNOTEL Station normals, and supplemental data provided by regional and state climatologists and designated reviewers.

Digital Elevation Model: The PRISM DEM is derived from a 15-arc second Defense Mapping Agency (DMA) Digital Terrain Elevation Dataset (DTED) obtained from the EROS Data Center.

Figure 9. Nebraska Annual Precipitation – Gosper County, Kearney County, and Phelps County





This is a portion of Figure 8: Source: U.S. Department of Agriculture – Natural Resources Conservation Service
In cooperation with Oregon State University
Data Source: NOAA Cooperative Station Normals (1961-1990) climate observations, NRCS SNOTEL Station normals, and supplemental data provided by regional and state climatologists and designated reviewers.
Digital Elevation Model: The PRISM DEM is derived from a 15-arc second Defense Mapping Agency (DMA) Digital Terrain Elevation Dataset (DTED) obtained from the EROS Data Center.

Historical Occurrences

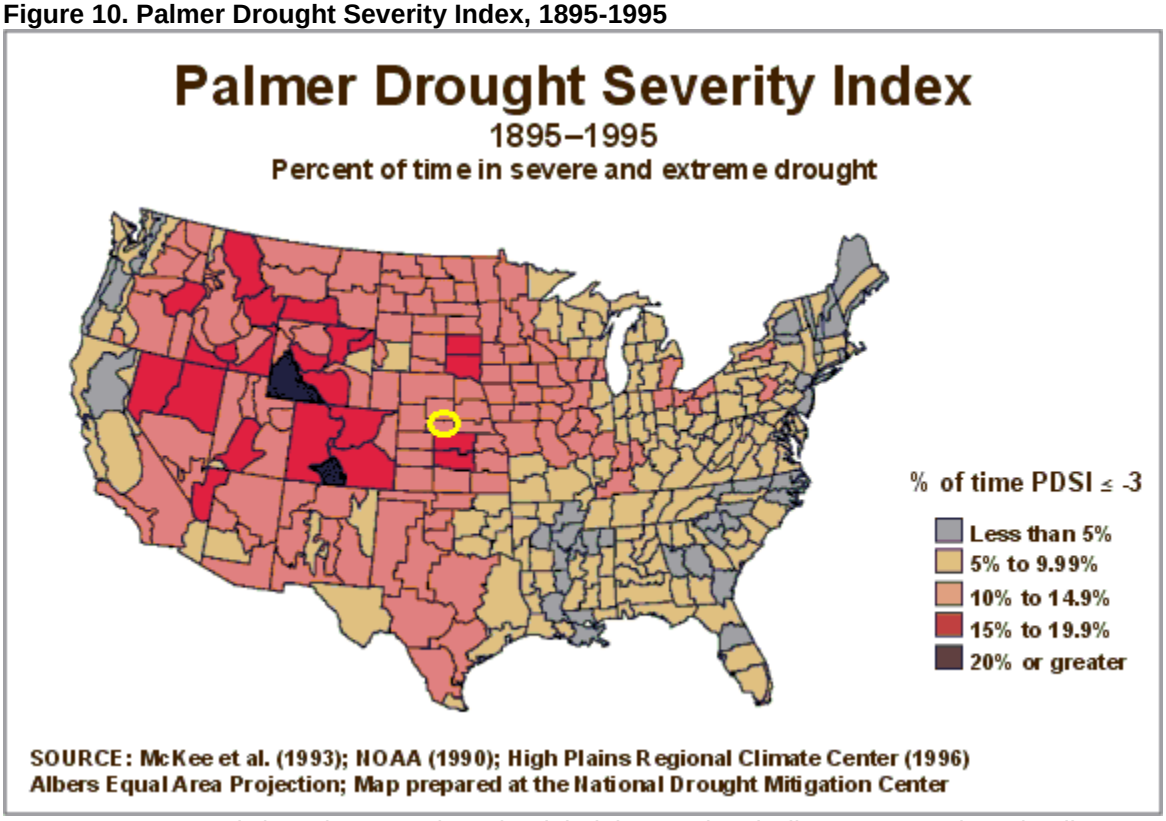
Table 12 lists the occurrences of drought in the Tri-Basin NRD according to the NCDC and the NDMC. While the records of drought in the area are not great in number, the impacts of these periods of drought were intense. With the importance of agricultural production in the project area, the effect of drought conditions has been severe in the past.

Table 12. Tri-Basin NRD Historical Drought Occurrences				
Location	**Date**	**Type**	**Property Damage**	**Crop Damage**
Gosper, Kearney, Phelps	Fall 1999 to Spring 2001	Drought	$0	$240,000,000*
Gosper, Kearney, Phelps	Spring 2002 to Summer 2004	Drought	$0	$480,000,000*

* Values include multiple counties, including outside of the planning area. No detailed breakdown on a per county basis is available.

Figure 10 shows the Palmer Drought Severity Index for the United States from 1895 to 1995.

Figure 10. Palmer Drought Severity Index, 1895-1995



Source: McKee et al. (1993); NOAA (1990); Highplains Regional Climate Center (1996); Albers Equal Area Projection; Map prepared at the National Drought Mitigation Center.
The location of the Tri-Basin NRD is approximately identified by the yellow oval.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Likely –
  - Between 10% and 99% probability in the next year, or at least one chance in 10 years
  - The event has occurred more than once, but less than four times in the past 100 years

Drought poses a threat to the entire project area in terms of crop damage, and the potential loss of animal life. Drought, as described above, can be defined in various ways and can affect various aspects of the planning area. If a drought were to affect the project area for an extended period of time, the area could see an increased risk of fire and the potential for the drinking water supply to be depleted. Typically, during severe droughts, water conservation practices would be implemented to limit the depletion of these drinking water supplies. In addition to these threats, chances would increase for animals to be at risk of losing their lives, which includes both livestock and domestic pets. The lack of water and high temperatures associated with summertime droughts increases the risk of heat-related deaths, as well as dehydration, if animals are outside for extended periods of time. The amount of damage to the project area in crop damage alone would be extremely high, which, in turn, could cause economic hardship for residents in the project area. The chances of a drought causing damage to existing or future buildings are limited beyond the potential issue of water sources running dry. It is impractical to estimate potential damages to buildings and critical facilities caused by droughts do to the nature of droughts and the lack of data.

Potential Impact

Droughts can be wide spread and span many months or years. Determining an estimated loss for the three-county planning area is quite difficult due to the broad nature of these and the length of time involved with these events. It is impractical to estimate potential damages to buildings and critical facilities caused by droughts do to the nature of droughts and the lack of data.

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

FLOODING

Hazard Summary

Some communities within the Tri-Basin NRD are located along streams; the risk of flooding in these areas is increased. Approximately 9,468 existing structures are in the Tri-Basin NRD, and, of those, approximately 20 structures are located within the FEMA designated floodplain. Table 13 details the flood events, causing $100,000 or more in damage, within the planning area, according to NCDC. As is evident in Table 9, flooding is of concern in the area.

Historical Occurrences

According to the NCDC, since 1950, 26 flood events have been recorded in the planning area. Many of these events produced little or no recorded damage. In the Tri-Basin NRD, it would not be unreasonable to see flooding resulting from ravine flooding, flash flooding, and urban drainage system flooding. Of the approximately 9,468 existing structures within the planning area, approximately 20 are within the FEMA-designated floodplain. Table 13 details the flood events, causing $100,000 or more in damage, within Tri-Basin NRD.

Table 13. Tri-Basin NRD Historical Flood Occurrences

Location	Date	Type	Property Damage	Crop Damage
Phelps, Kearney, Gosper	06/01/1995	Flood	$60,000	$240,000
Kearney	06/19/2000	Flash Flood	$250,000	$3,000,000

Phelps	07/03/2000	Flash Flood	$150,000	$1,000,000
Phelps, Kearney, Gosper	05/11/2005	Flash Flood	$5,000,000	$1,750,000
Phelps	09/05/2005	Flash Flood	$25,000	$250,000
Phelps	04/24/2007	Flash Flood	$75,000	$250,000
Gosper	05/20/2008	Flash Flood	$25,000	$500,000
Gosper	05/23/2008	Flash Flood	$25,000	$100,000
Phelps, Kearney	05/29/2008	Flash Flood	$55,000	$1,000,000

One important program developed to help communities identify their flooding risks is the FEMA-managed National Flood Insurance Program (NFIP). According to the official Web site of the NFIP (www.floodsmart.gov), the NFIP was created in 1968 to help property owners, including homeowners, renters, and business owners, to financially protect themselves by offering flood insurance to NFIP participating communities. These communities agree to adopt and enforce floodplain management techniques that meet or exceed FEMA requirements to reduce the risk of flooding. Community participation in the NFIP is purely voluntary; however, many communities across the country have become participants due to the benefits of participation for their residents and businesses.

According to FEMA's Web site (www.fema.gov), the NFIP has three components:

- Flood insurance
- Floodplain management
- Flood hazard mapping

The Web site also clarifies that flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage is reduced by nearly $1 billion a year through communities implementing sound floodplain management requirements and property owners purchasing flood insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance.

In addition to providing flood insurance and reducing flood damage through floodplain management regulations, the NFIP identifies and maps the nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance.

In the planning area, one county and several communities participate in the NFIP. According to the NFIP Community Status Book (www.fema.gov/fema/csb.shtm), following are the participants and their Community Identification (CID) numbers:

Gosper County (#310438)
- Village of Elwood (#310365)
- Village of Smithfield (#310131)

Kearney County
- City of Minden (#310389)
- Village of Axtell (#310344)
- Village of Heartwell (#310505)
- Village of Norman (#310506)
- Village of Wilcox (#310334)

Phelps County
- City of Holdrege (#310173)
- City of Loomis (#310524)
- Village of Atlanta (#310521)

- Village of Bertrand (#310522)
- Village of Funk (#310523)

A repetitive loss structure is defined by FEMA as any property that has experienced the following:

- Four or more flood insurance claims of more than $1,000
- Two flood insurance claims within a 10-year period that, combined, equal or exceed the current value of the property
- Three or more flood insurance claims that, combined, equal or exceed the value of the insured property

According to FEMA's Repetitive Loss list and the Nebraska Department of Natural Resources (NDNR), no repetitive loss properties exist in the Tri-Basin NRD. As part of complying with this plan, each entity currently enrolled with FEMA in the NFIP shall maintain this enrollment as long as they wish to participate in this plan. Currently, at the time this plan is being created, the flood maps are current, many having been recently updated. As the communities grow, the plans may need to be revised. For the communities that have not yet done so, it is encouraged that they adopt and enforce the floodplain management requirements, including regulating all and substantially improved construction within Special Flood Hazard Areas (SFHAs).

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Highly Likely –
  - Nearly 100% chance in the next year
  - The event has occurred four or more times in the past 100 years

Flooding poses a threat to the entire planning area, as each county has various meandering streams. The Platte River borders Phelps and Kearney counties and a small portion of Gosper County on the north. A threat of urban flooding also exists in the communities of the planning area if the storm sewer system's capacity becomes overwhelmed by the runoff resulting from such an event. If a flood event were to affect the planning area, the resulting damage could include structural damage, especially if these structures are within a FEMA-designated floodplain or floodway downed trees or limbs, downed power lines, dam or levee failure, roadway and bridge failures, crop damage, and potential loss of life. If heavy rainfall and flooding occur, emergency response vehicles may have limited access to residents in the planning area, especially in the event of road or bridge failures, downed trees, or other debris or floodwaters blocking access routes.

Residents could be in added danger if they are stranded in a vehicle during a flash flood, as waters rapidly rise and can quickly wash cars downstream. Dam or levee failure could cause large portions of communities to be affected by floodwaters and could threaten the lives of residents of each downstream community if proper warning is not given. Critical infrastructure also could be compromised, as flooding can cause sanitary sewer lines to back up, also posing a human safety risk, as well as contaminating drinking water sources. Residents may need to be relocated until the floodwaters recede and critical infrastructure is once again operational. The functional downtime resulting from power outages and infrastructure failure would be extremely costly. Businesses and schools may need to be closed, which would have a detrimental effect on the economy of the planning area. While it is possible for flooding to affect the entire project area in one flood event, it is highly unlikely that the entire project area, and the critical facilities in the planning area, would be affected during a single flood event. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 existing structures exist within the three-county planning area. Of those, approximately 134

are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those future structures could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Due to the nature of a flood, it is unlikely that the entire planning area would be affected in a single flood.

Potential Impact

Extent – The number of people to be negatively impacted, the physical or spatial negative impact upon the city, how quickly is the time to respond or react to the hazard?

- Catastrophic –
    - More than 50% of the total population of the jurisdiction, high risk to response personnel;
    - More than 50% of the jurisdiction;
    - Property destroyed or damaged beyond repair, complete shutdown of essential facilities for 3 days or more, major long-term environmental impact, severe impacts to the reputation of the jurisdiction
    - Percent Average Damage per Event 10% or greater

Determining an estimated loss for the three-county planning area is quite difficult due to the localized nature of these events. If flooding were to affect the project area, it was estimated that 11.11 percent of the property valuation within the planning area would be affected. This estimate was based on the following formula:

Total Damages Recorded ($13,755,000) / Total Events Recorded (9) =
Average Damage per Event ($1,528,333)

Average Damage per Event ($1,528,333) / Total Damages Recorded ($13,755,000) =
Percent Average Damage per Event (11.11%)

Percent Average Damage per Event (11.11%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($57,060,424)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

Jurisdictions	Structural Valuation	Damage Estimate

Elwood	$27,058,814	$3,006,234
Smithfield	$2,078,111	$230,878
Minden	$148,902,231	$16,543,038
Axtell	$30,304,143	$3,366,790
Heartwell	$2,031,812	$225,734
Norman	$1,855,074	$206,099
Wilcox	$12,081,359	$1,342,239
Atlanta	$3,704,187	$411,535
Bertrand	$25,735,608	$2,859,226
Funk	$11,595,958	$1,288,311
Holdrege	$229,201,515	$25,464,288
Loomis	$19,046,363	$2,116,051
Totals	**$513,595,175**	$57,060,424

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

WILDFIRES

Hazard Summary

While wildfires are not all that common in the project area, they do pose a threat. Wildfires can be started in several different ways, including lightning, human carelessness, machinery malfunction, arson, heat waves, and droughts, with the leading cause of wildfires being human carelessness. Wildfires are necessary to maintain natural habitats that depend on periodic burning; however, human factors have been documented as starting more than four out of every five wildfires. As such, it is necessary to be prepared, despite how rarely they occur. While wildfires are more common in forested areas, it is not uncommon to see wildfires in grasslands, crop stubble fields, and other similarly vegetated areas, therefore heightening the risk in the project area.

Historical Occurrences

According to the NCDC, no records exist of past occurrences of wildfires in the planning area.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Unlikely –
  - Less than 1% probability in next 100 years
  - No record of occurrence in the past 100 years

If a wildfire were to affect the project area, the resulting damage could include structural damage, if homes or businesses were in the path of the fire; crop damage; and loss of life, both human and livestock. Critical facilities are also at risk to wildfires, depending on their proximity in relation to the fire, and critical infrastructure potentially could be affected as well. Roads and bridges could be affected in the event of a wildfire, and, depending on the damage, roads could be closed, thus blocking access routes for emergency response vehicles, limiting their ability to reach residents in the planning area. If power outages result from such an event, the losses could be catastrophic. Not only would businesses, schools, and homes lose power, but, without a backup power source, critical infrastructure, such as water wells, may fail to work. Residents may be required to relocate

until the wildfire is under control. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

No historical occurrences were available of a wildfire in the planning area. It is impractical to estimate potential damages to buildings and critical facilities caused by wildfire do to the nature of wildfire and the lack of data.

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

DAM FAILURE

Hazard Summary

A dam differs from a levee in that a levee is designed to protect areas from floodwaters, and a dam is designed to store water and reduce flooding downstream. Dams can be used to create hydroelectric power or for agricultural purposes. Dam failures can occur due to a variety of reasons and with little warning to those in the inundation area. Seventy-one dams currently exist in the project area. Of those 71 dams, 69 are low hazard dams, one is a significant hazard dam, and one is a high hazard dam. Where a low hazard dam would only damage minor resources in the event of failure, a significant hazard dam would damage important resources, and a high hazard dam would result in loss of life.

Historical Occurrences

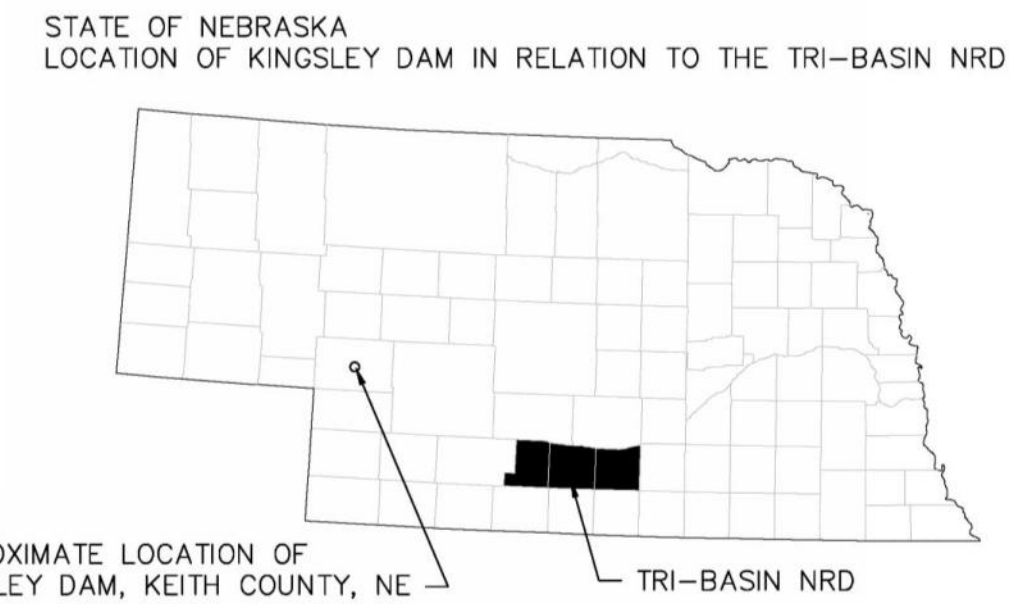
No dam failures have occurred in the Tri-Basin NRD. Even though little risk exists for dam failure within the planning area, dams could affect residents of the project area. In fact, according to the county local emergency operations plans (LEOP), the dams shown in Table 14 could negatively affect the project area if they fail.

Table 14. Dam Hazards within Tri-Basin NRD			
Location	**Structure Name**	**Owner**	**Inundation Area**
Gosper County	Johnson Lake Dam	Central Nebraska Public Power and Irrigation District	This would affect the entire Plum Creek watershed slightly beyond the 100-year floodplain as far as the Platte River in Phelps County.
Gosper County	Elwood Dam	Central Nebraska Public Power and Irrigation District	Currently Elwood Dam does not fall under the Federal Regulatory Commission guidelines. As such, no emergency plans have been prepared.
Keith County	Kingsley Dam	Central Nebraska Public Power and Irrigation District	This would affect the Platte River as far east as Louisville, inundating an area slightly above the 100-year floodplain along the Platte River, Nebraska.

Source: Local Emergency Operations Plans (LEOP) for all Counties

See Appendix A through C under 'Dam Failure' for a detailed breakdown of the high hazard, significant hazard, and low hazard dams that are located within the planning area. Figure 11 is a map of Nebraska identifying the approximate location of Kingsley Dam in relation to the Tri-Basin NRD.

Figure 11. Location of Kingsley Dam in Relation to the Tri-Basin NRD



Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Unlikely –
  - Less than 1% probability in next 100 years
  - No record of occurrence in the past 100 years

Dam failure poses a threat to the property located downstream. In the event of a dam failure, the inundation areas contained within the emergency action plans, on file with the NDNR and unavailable to the public because of security concerns, show the areas that would be affected. If a dam were to fail, potential damage resulting from the dam failure could include structural damage to homes, businesses, and possibly to critical facilities, as well as power outages and potential loss of life. Roads or bridges may fail depending on the location of the dams, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for lengthy periods, which would severely affect the local economy. If the dam were located just upstream of a community, loss of life in the inundation area could occur, especially if no warning is given and residents are caught unaware. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

Dam failure could affect portions of the three-county planning area, and impacts from the resulting flooding could last for days or even weeks.

No historical occurrences are available of a dam failure in the planning area.

See Appendix A through C under ‘Dam Failure’ for a detailed breakdown of the high hazard, significant hazard, and low hazard dams that are located within the planning area.

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

EARTHQUAKES

Hazard Summary

According to the U.S. Geological Survey (USGS) Web site (earthquake.usgs.gov), an earthquake occurs when a sudden slip on a fault causes the ground to shake and radiate seismic energy, which is caused by one or more of the following:

- A sudden slip along the fault
- Volcanic or magmatic activity
- Other sudden stress changes in the earth

Earthquakes are not typically mentioned as a high risk when referencing natural hazards in Nebraska; however, earthquakes can, and have, occurred within the state. In fact, according to the USGS Web site, several significant earthquakes have affected Nebraska, and, while the fault lines in the project area are not extremely active, it is possible for the area to experience an earthquake. The following summarizes the 12 levels of the Modified Mercalli Intensity Scale:

I. This level is not felt except by a very few under especially favorable conditions.

II. This level is felt only by a few people at rest, especially on upper floors of buildings.

III. This level is felt quite noticeably by people indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations are similar to the passing of a truck. Duration is estimated.

IV. This level is felt indoors by many, outdoors by few during the day. At night, some are awakened. Dishes, windows, and doors are disturbed; walls make a cracking sound. The sensation is like heavy truck striking the building. Standing motor cars rock noticeably.

V. This level is felt by nearly everyone; many are awakened. Some dishes and windows are broken. Unstable objects are overturned. Pendulum clocks may stop.

VI. This level is felt by all; many are frightened. Some heavy furniture is moved; a few instances of fallen plaster occur. Damage is slight.

VII. Damage is negligible in buildings of good design and construction; damage is slight to moderate in well-built ordinary structures; damage is considerable in poorly built or badly designed structures; some chimneys are broken.

VIII. Damage is slight in specially designed structures; damage is considerable in ordinary substantial buildings, with partial collapse. Damage is great in poorly built structures. Chimneys, factory stacks, columns, monuments, and walls fall. Heavy furniture is overturned.

IX. Damage is considerable in specially designed structures, and well-designed frame structures are thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings shift off foundations.

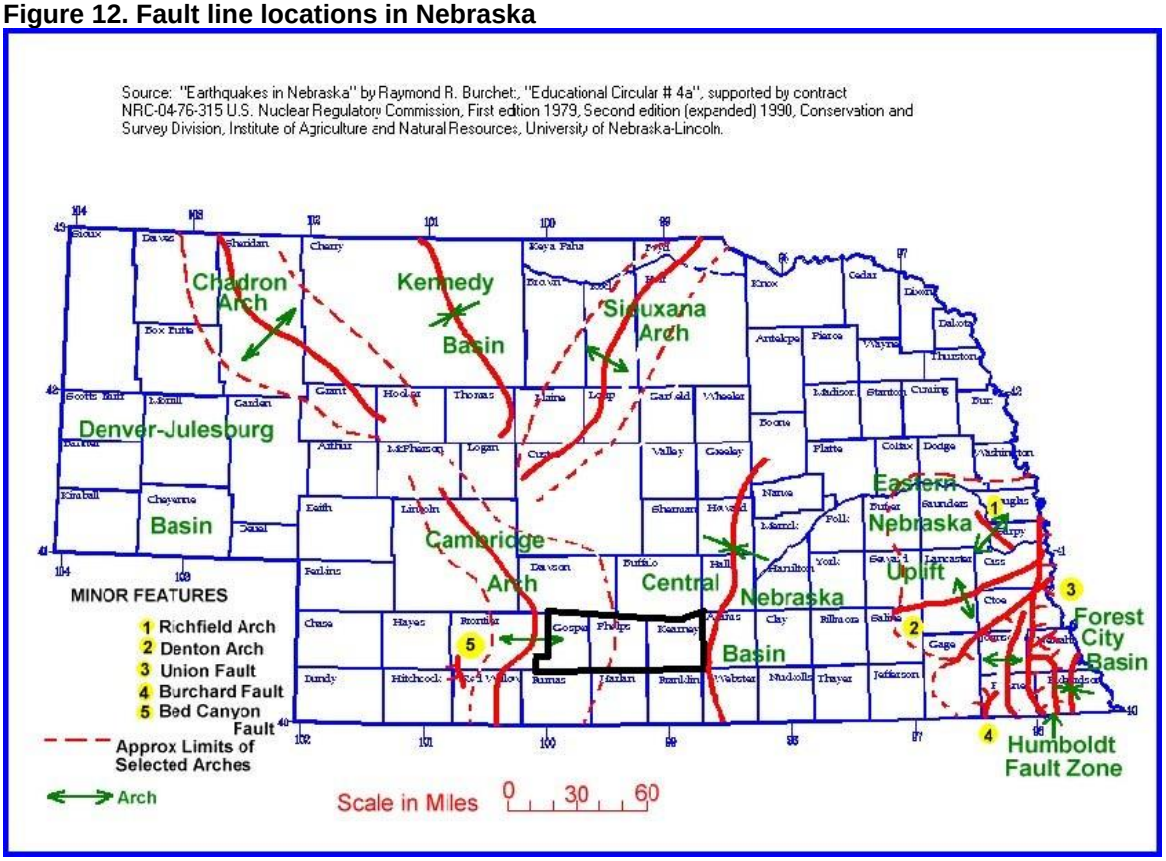
X. Some well-built wooden structures are destroyed; most masonry and frame structures are destroyed, with foundations rails bent.

XI. Few, if any, masonry structures remain standing. Bridges are destroyed. Rails are bent greatly.

XII. Damage is total. Lines of sight and level are distorted. Objects are thrown into the air.

While earthquakes can and have occurred in Nebraska, the state is typically not considered to be a high risk to experience these events. As shown in Figure 12, several fault lines exist in the state and near the project area. These fault lines are not extremely active, but it is possible for the area to experience an earthquake. Figure 12 depicts the fault line locations within the State of Nebraska.

Figure 12. Fault line locations in Nebraska



Source: "Earthquakes in Nebraska by Raymond R. Burchet; "Educational Circular #4a", supported by contract NRC-04-76-315 U.S. Nuclear Regulatory Commission, First edition 1979, Second editions (expanded) 1990, Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.
The location of the Tri-Basin NRD is outlined in black.

Historical Occurrences

According to the NCDC and the USGS, no records exist of damaging earthquakes affecting the Tri-Basin NRD.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Unlikely –
  - Less than 1% probability in next 100 years
  - No record of occurrence in the past 100 years

Earthquakes, as described above, occur when a slip on a fault causes the ground to shake. The damage resulting from an earthquake would depend on the magnitude of the event. If an earthquake were to occur, the area could experience power outages, structural damage, landslides, dam failure, and potential loss of life. In the event of an extreme earthquake, structures, including homes, businesses, schools, and critical facilities, all could suffer structural damage. Critical infrastructure, including waterlines, sanitary sewer lines, other pipelines, water wells, roads, and bridges, all could suffer from damage that destroys the affected area. Emergency response vehicles would have limited access to residents, increasing the risk of loss of life. Residents caught unaware could be injured from falling debris or could even be trapped in buildings or on roadways suffering structural damage. The functional downtime resulting from the aftermath of such an event is difficult to imagine. Businesses, schools, and critical facilities could be closed for weeks, which would be detrimental for the economy of the area. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

No historical occurrences are available of an earthquake in the planning area. It is impractical to estimate potential damages to buildings and critical facilities caused by earthquakes do to the nature of earthquakes and the lack of data.

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

LANDSLIDE

Hazard Summary

Typically, landslides in Nebraska pose the greatest threat to roads and homes. According to FEMA, a landslide occurs when “masses of rock, earth, or debris move down a slope.” Landslides may be small or large, slow or rapid. They can be activated by one or more of the following:

- Storms
- Earthquakes
- Volcanic eruptions
- Fires

- Alternate freezing or thawing
- Steepening of slopes by erosion or human modification

Historical Occurrences

The University of Nebraska – Lincoln School of Natural Resources (UNL-SNR) documents and maintains a database of landslides in the State of Nebraska. This database shows no record in Tri-Basin NRD.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Unlikely –
  - Less than 1% probability in next 100 years
  - No record of occurrence in the past 100 years

If a landslide occurs in the project area, potential damage resulting from the landslide could include property damage to homes, businesses, and critical facilities; power outages resulting from downed power lines; and potential loss of life if residents are caught unaware. Roads or bridges may fail depending on the location of the landslide, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for extended periods of time, which would severely affect the local economy. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 9,468 structures exist within the three-county planning area. Of those, approximately 134 are critical facilities. Due to the extent of the Tri-Basin NRD boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 9,468 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 7,697
- Mobile Housing Units 612
- Commercial/Industrial Properties 1025
- Critical Facilities 134

To determine a reasonable estimate for future structures, a growth rate of approximately one percent over five years was assumed for the planning area; therefore, approximately 9,546 structures could be affected in the future, and approximately 137 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

No historical occurrences are available of a landslide in the planning area. It is impractical to estimate potential damages to buildings and critical facilities caused by landslide do to the nature of landslide and the lack of data.

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

EXCESSIVE HEAT

Hazard Summary

According to NOAA's Web site (www.nws.noaa.gov), excessive heat is the leading cause of weather-related deaths. In Nebraska, summers are typically hot and there are heat waves in parts of the state most of the summer. Excessive heat events typically occur when temperatures that are significantly above normal are combined with high humidity. Of course, excessive heat events can occur in extremely dry weather as well. Figure 13 shows the Heat Index Chart, depicting how hot if feels outside for a given temperature for the different humidity levels and possible heat disorders for different heat indexes.

Figure 13. Heat Index: Temperature and Relative Humidity

Air °F	Relative Humidity (%)																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
135	110	121	134	148																	
130	108	117	127	139	151																
125	107	114	122	130	140																
120	105	110	116	122	130	139	148														
115	103	106	110	115	121	127	135	143													
114	102	105	109	113	119	125	132	140													
113	102	104	108	112	117	123	129	137	145												
112	101	104	107	111	115	121	127	134	142												
111	101	103	106	109	114	119	125	131	139	147											
110	100	102	105	108	112	117	122	129	136	143											
109	100	101	104	107	110	115	120	126	133	140											
108	99	101	103	105	109	113	118	124	130	137	144										
107	99	100	102	104	107	111	116	121	127	134	141										
106	98	99	101	103	106	109	114	119	124	130	137	145									
105	97	98	100	102	104	108	112	116	122	127	134	141									
104	97	97	99	100	103	106	110	114	119	124	131	137	145								
103	96	97	98	99	102	104	108	112	116	122	127	134	141								
102	96	96	97	98	100	103	106	110	114	119	124	130	137	144							
101	95	95	96	97	99	101	104	108	112	116	121	127	133	140							
100	94	94	95	96	98	100	102	106	109	114	118	124	130	136	143						
99	93	93	94	95	96	98	101	104	107	111	116	121	126	132	139	146					
98	92	92	93	94	95	97	99	102	105	109	113	117	123	128	134	141					
97	92	92	92	93	94	95	97	100	103	106	110	115	119	125	130	136	143				
96	91	91	91	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
95	89	90	90	91	92	93	94	97	99	102	105	109	113	118	123	128	134	140			
94	88	89	89	90	90	92	93	95	97	100	103	106	110	114	119	124	129	135	141		
93	88	88	89	89	89	90	92	93	95	98	101	104	107	111	116	120	125	131	136	142	
92	87	87	88	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131	137	143
91	86	87	87	87	87	88	89	91	92	94	97	99	102	105	109	113	117	122	127	132	137
90	85	85	86	86	86	87	88	89	91	93	95	97	100	103	106	110	113	118	122	127	132
85	81	82	82	82	82	82	83	84	84	85	87	88	89	91	93	95	97	99	102	104	107
80	77	78	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
Air °F	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	Relative Humidity (%)																				

Heat Index	Possible Heat Disorder
130°F or greater	Heat stroke highly likely with continued exposure.
105°F to 129°F	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible.
90°F to 104°F	Sunstroke, heat cramps and heat exhaustion possible.
80°F to 89°F	Fatigue possible with prolonged exposure and physical activity.

Source: National Weather Service (http://www.srh.noaa.gov/srh/cwwd/msd/publicmarine/misc/hindex.htm)

Historical Occurrences

According to the NCDC, no records exist of damage caused by excessive heat affecting the Tri-Basin NRD.

Vulnerability Assessment

Probability – What is the likeliness for this hazard to occur in the future?

- Unlikely –
  - Less than 1% probability in next 100 years
  - No record of occurrence in the past 100 years

If a severe excessive heat were to occur in the project area, the resulting damage could include loss of life, both human and livestock and crop damage. Critical infrastructure potentially could be affected as well through overloading of electric systems to operate air conditioning and cooling systems, asphalt roadways could become susceptible to damage if they become too warm and soft for prolonged periods of time. Residents may be required to evacuate their homes if they do not have cooling available control, as they are at risk from extreme temperatures. Though potentially threatening to existing and future human and animal populations, due to the nature of excessive heat, it is unlikely to have significant impacts on physical properties and buildings.

Potential Impact

No historical occurrences are available of excessive heat in the planning area. It is impractical to estimate potential damages caused by extreme heat do to the nature of extreme heat and the lack of data.

According to the FEMA publication "What is a Benefit: Guidance on Benefit-Cost Analysis of Hazard Mitigation Project (June 2009)", if an extreme heat event occurred within the plan area, the table below assumes the event could potentially cause a loss of electricity for ten percent of the population at a cost of $126 per person per day. In rural areas, the percent of the population affected and duration may increase during extreme events. The assumed damages do not take into account physical damages to utility equipment and infrastructure.

Jurisdictions	2010 Population	Damage Estimate
Elwood	707	$8,908
Smithfield	54	$680
Minden	2,923	$36,830
Axtell	726	$9,148
Heartwell	71	$895
Norman	43	$542
Wilcox	358	$4,511

Atlanta	131	$1,651
Bertrand	750	$9,450
Funk	194	$2,444
Holdrege	5,495	$69,237
Loomis	382	$4,813
Totals	**11,452**	**$144,295**

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

LEVEE FAILURE

Hazard Summary

A dam differs from a levee in that a levee is designed to protect areas from floodwaters, and a dam is designed to store water and to reduce flooding downstream. Levee failures can occur due to a variety of reasons and with little warning to those in the inundation area.

The planning committee research revealed no records of levees in the planning area. The National Levee Database, maintained by the U.S.A.C.E., shows no federal levees located in Gosper, Kearney and Phelps counties. While it is likely that levees exist, such as low-head agricultural levees, no records indicate that the breach of overtopping of these levees would impact property other than that of the levee owner. Damage to residential structures is unlikely. Should a levee be constructed in the project area in the future, its potential hazard due to failure should be evaluated at that time.

Historical Occurrences

No levee failures have been reported in the Tri-Basin NRD.

Vulnerability Assessment

Levee failure poses a threat to the property located downstream. In the event of a levee failure, potential damage resulting from the levee failure could include structural damage to homes, businesses, and possibly to critical facilities, as well as power outages and potential loss of life. Roads or bridges may fail depending on the location of the levees, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for lengthy periods, which would severely affect the local economy. If the levee were located just upstream of a community, loss of life in the inundation area could occur, especially if no warning is given and residents are caught unaware. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected.

Should any levees be reported in the Tri-Basin NRD, the vulnerability of the structure and potential impacts will be evaluated and added to this plan at that time.

MITIGATION STRATEGY

In addition to obtaining hazard information from the public meeting survey forms, the representatives also were asked to list projects that could protect the entities they were representing from hazards. These project lists indicated the problem areas in specific locations as well as identifying the items of most concern for the entities in the Tri-Basin NRD. Using this information, as well as information obtained from FEMA's how-to guide titled "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies," specific goals for the planning area were developed. The how-to guide identifies the following six categories of mitigation actions:

- Prevention:
  Mitigation actions that reduce hazard losses, including items such as planning and zoning regulations, building codes, capital improvement programs, open space preservation, and stormwater management practices

- Property Protection:
  Mitigation projects that modify structures or remove them to reduce damage from hazards, including acquisition projects, elevation projects, relocation projects, structural retrofits, storm shutters, and shatter-resistant glass

- Public Education and Awareness:
  Programs that inform and educate the public of the hazards affecting their area and ways to mitigate against them, including outreach programs, real estate disclosure, hazard information centers, and school-age and adult education programs

- Natural Resource Protection:
  Mitigation projects that preserve or restore natural systems while also reducing the hazard risks, including sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation

- Emergency Services:
  Mitigation actions that protect residents and property during and immediately following a hazard, including warning systems, emergency response services, and protection of critical facilities

- Structural Projects:
  Mitigation actions involving constructing structures to reduce impacts of hazards, including dams, levees, floodwalls, seawalls, retaining walls, and safe rooms

GOALS

Using the public meeting survey results and referencing the six categories of HMGP projects, the following are the mitigation goals for the Tri-Basin NRD:

Goal 1: Protect the Health and Safety of the Public

Objectives: Decrease the risk to the public due to identified hazards.

Actions:

1.1 Comply with NFIP by implementing and enforcing restrictions regarding new construction within designated flood zones.
1.2 Construct safe rooms in schools, in public buildings, and at select locations at popular outdoor venues.
1.3 Update or obtain additional outdoor warning sirens as needed in the project area.
1.4 Develop additional emergency notification methods to alert the public of potential hazards.
1.5 Provide educational opportunities for the public to promote preparedness in the project area.

Goal 2: Protect and Maintain Operation of Critical Facilities and Critical Infrastructure After a Hazard

Objectives: Decrease the risk of damage or destruction to critical facilities, and maintain their operation during or after a hazard.

Actions:

2.1 Obtain generators and other backup power systems required to keep critical facilities, critical infrastructure, and emergency operations running after a hazard event.
2.2 Develop studies to determine infrastructure systems that need to be updated.
2.3 Protect power lines throughout the NRD by burying them or reinforcing them.

Goal 3: Protect Existing Properties and Natural Resources

Objectives: Protect properties, structures, and natural resources from risks due to identified risks and hazards.

Actions:

3.1 Enforce a maintenance plan for tree trimming and tree removal.
3.2 Improve stormwater management and localized flooding.

Goal 4: Promote Efficient Use of Public Funds

Objectives: Find funding sources that promote and stretch the entities funds.

Actions:

4.1 Maximize funding opportunities through grant money and other outside sources.

MITIGATION ACTIONS

With these goals in mind, Table 15 provides specific projects that the Tri-Basin NRD chose to consider pursuing to mitigate damage within the NRD and to protect the public in the event of a hazard. This is not a complete list of the projects that could be considered in the project area, and additional projects may be included in subsequent plan revisions. Also, this project list does not guarantee that any of the represented entities have committed to undertaking these projects or have provided financial assistance to do so. The list represents projects that representatives of the entities believe would protect the residents and structures within the project area.

The mitigation actions depicted in Table 15 were analyzed using the STAPLEE method. This methodology is used to prioritize projects and is also used to conduct a preliminary benefit-cost review for each project. The STAPLEE forms for the communities were handed out at the second public meeting. The entities were encouraged to prioritize the proposed projects according to the entities needs. If the entity did not have a preferred order, the planning team helped the entity prioritize the projects based on guidance from the FEMA reference titled “Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)”. The STAPLEE method is an all-encompassing spreadsheet containing categories that include the following:

- Social – Projects are accepted by the community and do not adversely affect particular portions of the population.
- Technical – Projects are feasible and provide lasting protection with minimal impacts.
- Administrative – The entity has the necessary resources to implement the project.
- Political – Projects have the support of community officials and the public as a whole.
- Legal – Projects follow state and local laws, and the entity has the authority to implement the project.
- Economic – Projects are cost-effective, beneficial, and affordable for the entity.
- Environmental – Projects do not adversely affect the environment; comply with local, state, and federal environmental regulations; and remain consistent with local environmental goals.

The key ideas under each category are provided for each representative to contemplate and to rank. The STAPLEE forms for this plan were developed using a scale of high, medium, low, or not applicable. High means the project is very beneficial to an entity with regards to the specific category. Medium indicates that the mitigation action is favorable for the entity. Low signifies that the item is not favorable for the entity. Not applicable indicates that the category does not apply in that particular instance. Once the forms were completed, a value of two was assigned for high rankings; one, for medium rankings; minus one, for low rankings; and zero, for not applicable items. The values were multiplied by the number of times each ranking was assigned for a project, and the values were added. The project with the highest value was determined to be the highest priority for the entity. This system also allowed the project team to determine whether the projects were cost-effective based on the rankings provided on the STAPLEE

forms. For instance, a project with mostly low rankings may not be cost-effective due to the fact that the benefit to the entity would be outweighed by the costs, both direct and indirect, to complete the project. The list provided in Table 15 includes only projects that were deemed cost-effective based on the STAPLEE method. If an entity were to pursue one of the mitigation actions, a more formal benefit-cost analysis would need to be completed.

The priority for each project listed in Table 15 was assigned based on the entity's needs, available funding, and the potential to reduce risk. Also considered were the ratings listed on the STAPLEE form regarding need and likeliness the project would receive funding and approval.

The timeline for completing the projects listed in Table 15 is within the five-year period before the plan is updated or when funds become available.

Table 15. Tri-Basin NRD Mitigation Projects						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity & /Responsible Person**
Tri-Basin NRD						
1 3.1	Windbreaks/ Living Snow Fence	Severe Winter Storms Drought	$20,000/yr. for 5 years	Tri-Basin NRD Pre-Disaster Mitigation Program (PDM)	Tri-Basin NRD Gosper County Roads Department Kearney County Roads Department Phelps County Roads Department	Tri-Basin NRD Tri-Basin NRD Manager
2 3.1	Urban Tree Maintenance	Thunderstorms/High Winds/Lightning/Hail Severe Winter Storms Tornadoes	$20,000/yr. for 5 years	Tri-Basin NRD Pre-Disaster Mitigation Program (PDM)	Tri-Basin NRD Villages and Cities within the Tri-Basin NRD	Tri-Basin NRD Tri-Basin NRD Manager
3 3.2	Stream Bank Stabilization	Flood Thunderstorms/High Winds/Lightning/Hail	$5,000/yr. for 5 years	Tri-Basin NRD	Tri-Basin NRD	Tri-Basin NRD Tri-Basin NRD Manager
4 3.2	Drainage Improvements	Flood Thunderstorms/High Winds/Lightning/Hail	$10,000/yr. for 5 years	Tri-Basin NRD	Tri-Basin NRD	Tri-Basin NRD Tri-Basin NRD Manager

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
Gosper County						
1 2.1	Emergency Generator for Sheriff's Office	All	$50,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Gosper County Gosper County Emergency Management Agency Gosper County Sheriff's Department Nebraska Emergency Management Agency (NEMA)	Gosper County Gosper County Sheriff
2 1.3	New Warning Sirens	All	$50,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Gosper County Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Gosper County Gosper County Emergency Management Director
Village of Elwood						
1 1.3	New Warning Sirens	All	$25,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Elwood Gosper County Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Elwood Elwood Village Clerk
2 2.1	Backup Generators for Village Hall	All	$50,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program	Village of Ellwood Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Elwood Elwood Village Clerk

				(PDM)		

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
3 1.2	Storm Shelters/Safe Rooms	All	$125,000 5 Years	Hazard Mitigation Grant Program (HGMP) Pre-Disaster Mitigation Program (PDM)	Village Elwood Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Elwood Elwood Village Clerk
Village of Smithfield						
1 1.3	New Warning Sirens	All	$25,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Smithfield Gosper County Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Smithfield Smithfield Village Clerk
2 1.2	Storm Shelter/Safe Rooms	All	$100,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Smithfield Gosper County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Smithfield Smithfield Village Clerk
Kearney County						

1 1.4	Reverse 911 System for Kearney County 911 Center	All	Unknown 3 Years	Hazard Mitigation Grant Program (HMGP)	City of Holdrege Phelps County Kearney County Emergency Management Agency Communities of Kearney County Community Police Departments Nebraska Emergency Management Agency (NEMA)	Kearney County Kearney County Emergency Management Director

Table 15. Tri-Basin NRD Mitigation Projects (Continued)

Priority/Goal	Mitigation Action/ Program/Project	Hazard Addressed	Estimated Cost ($) and Anticipated Completion Time	Funding Sources	Funding Partners	Coordinating Entity& /Responsible Person
2 2.3	Bury Power Lines	All	Unknown Over 5 Years	Hazard Mitigation Grant Program (HMGP)	Nebraska Public Power District Kearney County Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Kearney County Kearney County Emergency Management Director
3 1.5	Comprehensive Effort of Resident Awareness and Education	All	Unknown Over 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Kearney County Kearney County Emergency Management Director
City of Minden						

1 3.1	Tree Maintenance Program	Tornado, High Wind, and Severe Winter Storms	$500,000 Over 5 Years	Hazard Mitigation Grant Program (HMGP) City of Minden	City of Minden	City of Minden Minden City Administrator
2 3.2	Drainage Improvements (North-East Part of City)	Flood	$1,250,000 3 Years	Hazard Mitigation Grant Program (HMGP) Community Development Block Grant (CDBG) City of Minden	City of Minden	City of Minden Minden City Administrator

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
3 3.2	Drainage Improvements (South Part of City)	Flood	$500,000 3 Years	Hazard Mitigation Grant Program (HMGP) Community Development Block Grant (CDBG) City of Minden	City of Minden Nebraska Emergency Management Agency (NEMA)	City of Minden Minden City Administrator
4 2.1	Emergency Generator for City Hall Complex (Includes Fire Department and City Hall)	All	$75,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	City of Minden Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	City of Minden Minden City Administrator
Minden Public Schools						
1 2.1	Emergency Generators	All	$150,000 2 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM) Minden Public Schools	City of Minden Kearney County Emergency Management Agency Minded Public Schools Minden Fire Department Nebraska Emergency Management Agency (NEMA)	Minden Public Schools Minden Public School Superintendent

2 1.2	Storm Shelter/Safe Room	All	$500,000 5 Years	Hazard Mitigation Grant Program (HMGP) Community Development Block Grant (CDBG) Minden Public Schools	City of Minden Minded Public Schools Nebraska Emergency Management Agency (NEMA)	Minden Public Schools Minden Public School Superintendent

Table 15. Tri-Basin NRD Mitigation Projects (Continued)

Priority/Goal	Mitigation Action/ Program/Project	Hazard Addressed	Estimated Cost ($) and Anticipated Completion Time	Funding Sources	Funding Partners	Coordinating Entity& /Responsible Person
Village of Axtell						
1 2.1	Backup Generators	All	$125,000 2 Years	Village of Axtell Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Axtell Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Axtell Axtell Village Clerk
2 3.1	Tree Maintenance Program	Thunderstorms/High Winds/Lightning/Hail Severe Winter Storms Tornadoes	$5,000/yr. For 5 Years	Village of Axtell Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Axtell Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Axtell Axtell Village Clerk
Axtell Community Schools						

1 2.1	Backup Generators	All	$200,000 3 Years	Axtell Community Schools Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Axtell Community Schools Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Axtell Community Schools Axtell Community School Superintendent

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
2 1.2	Storm Shelter/ Safe Room	All	$400,000 5 Years	Village of Axtell Axtell Community Schools Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Axtell Community Schools Village of Axtell Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Axtell Community Schools Axtell Community School Superintendent
Village of Heartwell						
1 2.1	Backup Generators	All	$75,000 3 Years	Village of Heartwell Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Heartwell Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Heartwell Heartwell Village Clerk
Village of Norman						
1 2.1	Backup Generators	All	$100,000 2 Years	Village of Norman Hazard Mitigation Grant Program (HMGP)	Village of Norman Kearney County Emergency Management Agency Nebraska Emergency Management Agency	Village of Norman Norman Village Clerk

				Pre-Disaster Mitigation Program (PDM)	(NEMA)	

Table 15. Tri-Basin NRD Mitigation Projects (Continued)

Priority/Goal	Mitigation Action/ Program/Project	Hazard Addressed	Estimated Cost ($) and Anticipated Completion Time	Funding Sources	Funding Partners	Coordinating Entity& /Responsible Person
2 1.2	Storm Shelter/ Safe Room	All	$300,000 5 Years	Village of Norman Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Norman Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Norman Norman Village Clerk
Village of Wilcox						
1 3.1	Tree Maintenance Program	All	$10,000 2 Years	Village of Wilcox Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Wilcox Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Wilcox Wilcox Village Clerk
2 3.2	Remove Flow Constrictions	Flood Sever Summer Storms	$50,000 Over 5 Years	Village of Wilcox Community Development Block Grant (CDBG)	Village of Wilcox	Village of Wilcox Wilcox Village Clerk

3 1.3	Alert Sirens	All	$20,000 5 Years	Village of Wilcox Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Wilcox Nebraska Emergency Management Agency (NEMA)	Village of Wilcox Wilcox Village Clerk

Table 15. Tri-Basin NRD Mitigation Projects (Continued)

Priority/Goal	Mitigation Action/ Program/Project	Hazard Addressed	Estimated Cost ($) and Anticipated Completion Time	Funding Sources	Funding Partners	Coordinating Entity& /Responsible Person
Wilcox – Hildreth School						
1 2.1	Backup Generators	All	$75,000 2 Years	Wilcox-Hildreth School Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Wilcox-Hildreth School Kearney County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Wilcox-Hildreth School Wilcox Hildreth School Superintendent
Phelps County						
1 2.1	Backup Generator	All	$100,000 2 Years	Phelps County	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Phelps County Phelps County Board of Commissioners

2 3.2	Flood Control North of Loomis	Flash Flooding Thunderstorms/High Winds/Lighting/Hail	$100,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Phelps County Phelps County Board of Commissioners
3 1.2	Storm Shelters/Safe Room	All	$250,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Phelps County Phelps County Board of Commissioners

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
4 1.4	Emergency Communication System	All	$75,000 5 Years	Phelps County	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Phelps County Phelps County Board of Commissioners
5 2.2	Community Rating System	All	$50,000 5 Years	Phelps County	Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Phelps County Phelps County Board of Commissioners
City of Holdrege						
1 2.3	Electric System Looped Distribution	All	$50,000 Over 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	City of Holdrege Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	City of Holdrege Holdrege Utility Director
2 3.2	Stormwater System Improvements	Flood Thunderstorms/High Winds/Lightning/Hail	$10,000 Over 5 Years	City of Holdrege	City of Holdrege	City of Holdrege Holdrege Public Works Director

3 2.1	Emergency Generator for Landfill	All	$50,000 2 Years	City of Holdrege	City of Holdrege Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	City of Holdrege Holdrege Public Works Director

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
4 1.3	Warning Sirens	All	$420,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	City of Holdrege Nebraska Emergency Management Agency (NEMA)	City of Holdrege Holdrege Public Works Director
Holdrege Public Schools						
1 2.1	Backup Generators	All	$200,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Holdrege Public Schools Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Holdrege Public Schools Holdrege Public School Superintendent
2 1.2	Storm Shelters/Safe Rooms	All	$750,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Holdrege Public Schools Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Holdrege Public Schools Holdrege Public School Superintendent
Village of Atlanta						

1 2.1	Backup Generators	All	$75,000 2 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Atlanta Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Atlanta Atlanta Village Clerk

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
2 1.2	Storm Shelter/Safe Room	All	$150,000 5 Years	Hazard Mitigation Grant Program (HMGP) Community Development Block Grant (CDBG)	Village of Atlanta Phelps County Emergency Management Agency Nebraska Department of Economic Development (NDED)	Village of Atlanta Atlanta Village Clerk
Village of Funk						
1 1.3	Outdoor All-Hazard Warning Siren	All	$50,000 2 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Funk Phelps County Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Funk Funk Village Clerk
2 3.2	Drainage Improvements	Flood Thunderstorms/High Winds/Lightning/Hail	$40,000 Over 5 Years	Village of Funk Community Development Block Grant (CDBG)	Village of Funk Nebraska Department of Economic Development (NDED)	Village of Funk Funk Village Clerk
Village of Loomis						
1 1.2 & 2.1	New Fire Hall and Shelter w/ Generator	All	$800,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Loomis Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA) Loomis Rural Fire	Loomis Rural Fire Department Loomis Rural Fire Department Fire

					Department	Chief

Table 15. Tri-Basin NRD Mitigation Projects (Continued)						
Priority/Goal	**Mitigation Action/ Program/Project**	**Hazard Addressed**	**Estimated Cost ($) and Anticipated Completion Time**	**Funding Sources**	**Funding Partners**	**Coordinating Entity& /Responsible Person**
Village of Bertrand						
1 1.2	Storm Shelters/Safe Rooms	All	$250,000 3 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Bertrand Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Bertrand Bertrand Village Clerk
2 2.1	Backup Generators	All	$50,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Bertrand Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Village of Bertrand Bertrand Village Clerk
Bertrand Public Schools						
1 1.2	Storm Shelters/Safe Rooms	All	$250,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation Program (PDM)	Village of Bertrand Bertrand Public Schools Phelps County Emergency Management Agency Nebraska Emergency Management Agency (NEMA)	Bertrand Public Schools Bertrand Public School Superintendent
2 2.1	Backup Generators	All	$50,000 5 Years	Hazard Mitigation Grant Program (HMGP) Pre-Disaster Mitigation	Village of Bertrand Bertrand Public Schools Phelps County Emergency Management Agency	Bertrand Public Schools Bertrand Public School Superinte

				Program (PDM)	Nebraska Emergency Management Agency (NEMA)	ndent

IMPLEMENTATION AND PLAN MAINTENANCE

A critical part of the planning process is implementing the plan and making certain the document is maintained and updated as required by FEMA. Not only is this a FEMA requirement, but it is also necessary to keep the document up-to-date and useful to all entities involved in the planning process. The concept of implementing the plan is somewhat complex and requires the coordination of the planning team to determine the best approach.

It was crucial for the planning team to develop sound mitigation alternatives that would benefit the entities they are representing while being cost-effective based on the FEMA benefit-cost analysis, meaning that the benefits must equal or outweigh the total project costs. The planning team was responsible for determining which projects were considered high-priority in the project area and for deciding whether the high-priority projects should be pursued immediately or identifying a projected time frame. Of the items listed in Section 2: Mitigation Strategy, Tri-Basin NRD representatives have deemed the following projects as their high-priority projects based on need and feasibility:

Tri-Basin NRD

- Windbreaks/Living Snow Fence
- Urban Tree Maintenance
- Stream Bank Stabilization
- Drainage Improvements

The Tri-Basin NRD Board will be responsible for determining which projects are pursued at the NRD level and the time frame for these projects. At the local level, the counties or communities within the project area ultimately will be responsible for determining which projects are pursued and the time frame for construction. However, the NRD also may be a project sponsor on those projects, which may require NRD Board approval. This plan was not designed to contain an all-inclusive project list; therefore, projects not identified in this edition should be incorporated into subsequent plan updates, as required by FEMA.

Monitoring the plan is an important step to making sure the information within the plan adequately reflects the hazards that could affect the project area and the projects that can mitigate these hazards. Since the lead agency is the Tri-Basin NRD, it will be its responsibility to monitor the plan. Due to the large project area, creating a committee responsible for monitoring the plan would allow the entire project area to be represented and would spread the work throughout the counties to lessen the impact of an individual monitoring process on the NRD. The representatives could come from various locations throughout the project area. This would limit the amount of time each representative would be required to put into the revision. This committee would be responsible for documenting the projects chosen for completion and for noting the construction timeline as the project progresses, to include that information in an update of this plan. Every year, the committee should evaluate the plan and incorporate any necessary changes into the document. The goal of this evaluation is to verify that the information still adequately describes the hazards affecting the project area and still lists relevant projects.

FEMA requires that the plan be updated every five years. This update also can take place after a major hazard affects the project area. Using the information obtained through monitoring and evaluating the plan, the five-year update will be much simpler. This update should take the form of the initial planning process and should include public participation and input. At this point, items that were discovered after the approval of the initial plan can be included in the updated plan. This document should be updated to verify that the recommendations coincide with the goals and objectives of the Tri-Basin NRD, and all entities included in the planning process, throughout the life of this plan. If an entity opted not to participate during the initial plan, these entities can be added at this time as well. If additional hazards and mitigation alternatives have been identified, it is crucial to include them in the plan during the revision period so they can be implemented after FEMA approval.

The following information was not originally available when this plan was created but should be considered and, if available, incorporated in any future updates if the information does become available:

- More detailed information regarding the number and types of structures within the planning area and local jurisdictions, specifically more detailed information on commercial, industrial, agricultural and institutional facilities.
- Additional hazard information, including from additional sources

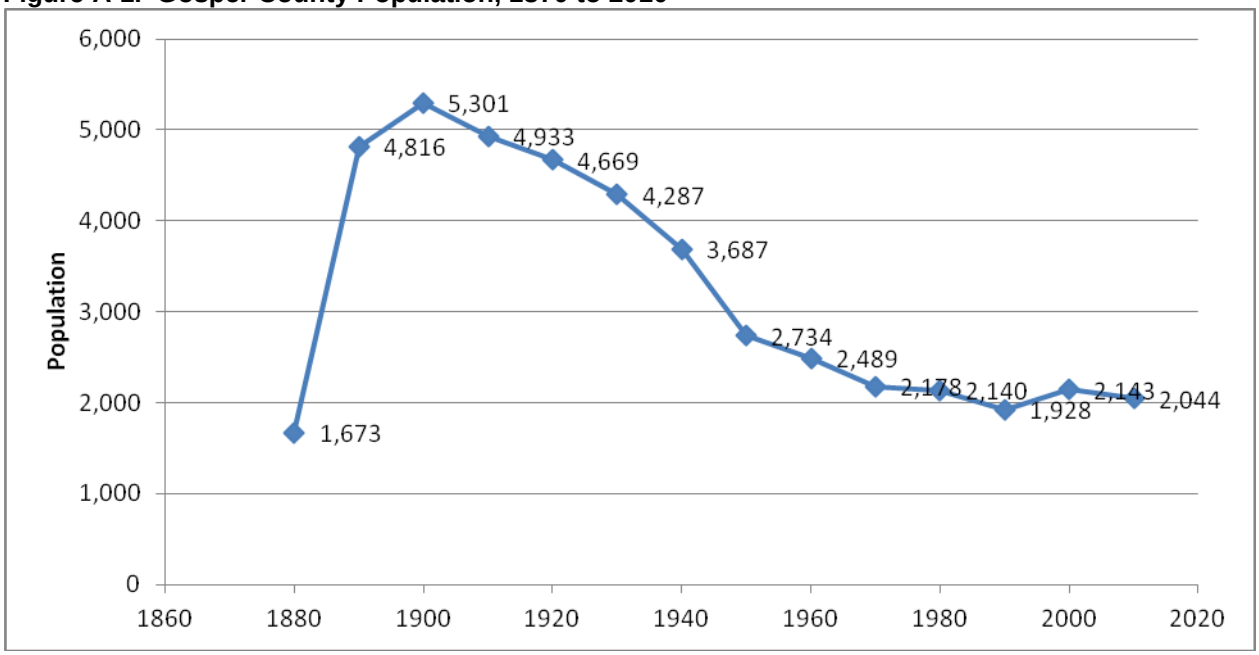
Implementation not only involves enforcing the mitigation alternatives listed in the Mitigation Strategy section of this report, but also involves incorporating this plan into existing planning mechanisms. At this time, no existing plans at the NRD level need to incorporate this plan. However, existing plans at the local level would benefit from including this plan. In the project area, this plan could be incorporated into the county LEOPs and any community comprehensive plans, at the discretion of the participating communities and the emergency management director for each county. It also is critical that the communities adopt and enforce the building codes effective for the State of Nebraska and include this All-Hazards Mitigation Plan in any capital improvement plans in the project area, again at the discretion of the participating communities and the county emergency management directors.

APPENDIX A: GOSPER COUNTY

DEMOGRAPHIC SUMMARY

According to the U.S Census Bureau, the total population of Gosper County in 2010 was 2,044. The population in the county has basically maintained during the past few years, as the population in 2000 was 2,143. Based on the information found on the U.S. Census Bureau Web site, the population in the county has decreased slightly from 2000 to 2010. Figure A-1 below shows the population trend in Gosper County since 1870.

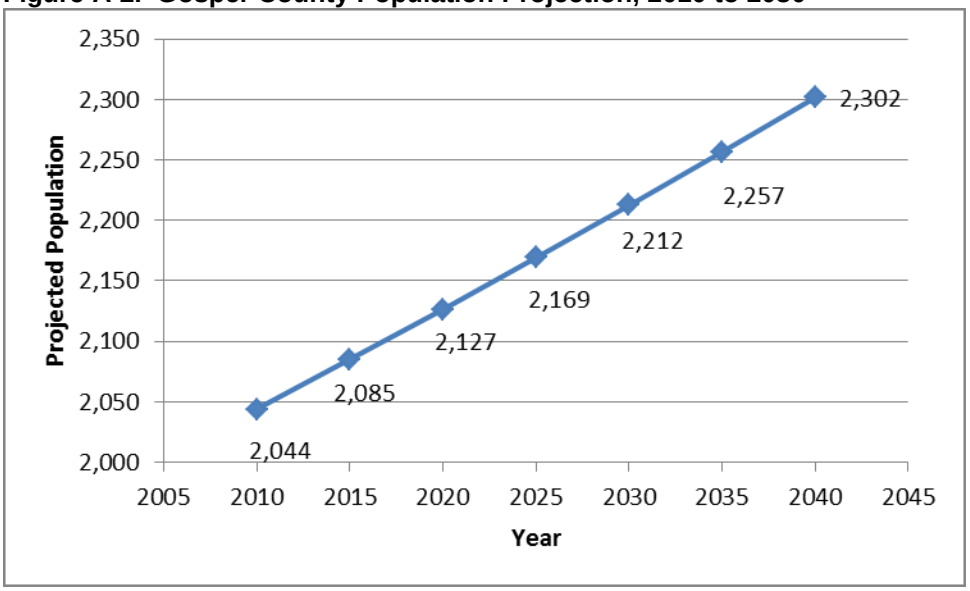
Figure A-1. Gosper County Population, 1870 to 2010



Sources: Nebraska State Data Center, Center for Public Affairs Research, University of Nebraska – Omaha, U.S. Bureau of Census, '2010 Census of Population and Housing', 'CPH-2-29, Population and Housing Unit Counts, Nebraska', Census Web Site (www.census.gov) and similar publications for preceding years.

The population of Gosper County is projected to increase very slightly over time, as shown in Figure A-2.

Figure A-2. Gosper County Population Projection, 2010 to 2030



*2010 numbers are Census counts; other numbers are projections.
Source: University of Nebraska, Bureau of Business Research, Nebraska County Population Projections

The gender breakdown for Gosper County per the 2010 U.S. Census Bureau Information (most recent information) is 50.1 percent male and 49.9 percent female. Table A-1 depicts the age characteristics of Gosper County.

Table A-1. Age Characteristics of Gosper County, 2010

Age	Number of People	Percent of Total
Under 5 years	117	5.7%
5 to 9 years	124	6.1%
10 to 14 years	128	6.3%
15 to 19 years	123	6.0%
20 to 24 years	62	3.0%
25 to 34 years	191	9.3%
35 to 44 years	209	10.2%
45 to 54 years	331	16.2%
55 to 59 years	164	8.0%
60 to 64 years	164	8.0%
65 to 74 years	222	10.9%
75 to 84 years	146	7.1%
85 years and older	63	3.1%
Age	**Number of People**	**Percent of Total**
18 years and over	1,586	77.6%
21 years and over	1,545	75.6%
62 years and over	514	25.1%
65 years and over	431	21.1%

Source: U.S. Census Bureau, DP-1. General Demographic Characteristics: 2010

As shown in Table A-1, the population varies among the age brackets; however, a higher percentage of the population falls between the ages of 35 to 54 than any other age bracket. A larger percentage also

falls in the 65 to 74 years age bracket, and a significant amount of the population is older than age 65, which is an important fact to consider when determining the best method to protect citizens and communities from hazards.

Another important demographic detail that should not be overlooked is the housing occupancy and the age of the existing structures. Table A-2 shows the housing occupancy and tenure in the project area.

Table A-2. Units in Residential Structure of Gosper County, 2010 Census

Subject	Number of Units	Percent of Total
Total Housing Units	1,228	100.0%
1-unit, detached	1,083	88.2%
1-unit, attached	6	0.5%
2 units	1	0.1%
3 or 4 units	4	0.3%
5 to 9 units	4	0.3%
10 to 19 units	2	0.2%
20 or more units	9	0.7%
Mobile home	119	9.7%
Boat, RV, Van, etc.	0	0.0%
Subtotals		
Permanent Housing Units	1,109	90.3%
Mobile Housing Units	119	9.7%

Source: U.S. Census Bureau, DP-4, Selected Housing Characteristics: 2010

Permanent Housing Units are typically built with more substantial building materials and building codes than Mobile Housing Units. For the purposes of this plan, Permanent Housing Units are considered housing units permanently attached to a foundation, and include all housing types listed in Table A-2 except Mobile homes and Boat, RV, Van, etc. categories.

Table A-3 shows the age of homes within Gosper County. The age of the home is helpful in determining the level of damage that could be seen if a hazard occurs. In addition, the median value of a home in Gosper County is $67,900, which should also be considered in damaging events.

Table A-3. Age of Structures in Gosper County, 2010 Census

Year Structure Built	Number	Percent of Total
2005 or later	8	0.7%
2000 to 2004	55	4.5%
1990 to 1999	63	5.1%
1980 to 1989	164	13.4%
1970 to 1979	186	15.1%
1960 to 1969	170	13.8%
1950 to 1959	123	10.0%
1940 to 1949	91	7.4%
1939 or earlier	368	30.0%

Source: U.S. Census Bureau, DP-4. Profile of Selected Housing Characteristics: 2010

In addition to the data on residences within Gosper County, the Nebraska Department of Revenue lists 103 properties as either commercial or industrial in nature.

CLIMATE SUMMARY

This plan will focus on Elwood for information about the climate for Gosper County as a whole, as it has the most sufficient information available. Nebraska has a continental climate, meaning the state experiences highly variable temperatures from season to season. For Gosper County, the High Plains Regional Climate Center reports insufficient data related to temperatures. Based on this, no data is available specific to Gosper County.

The average annual precipitation is 18 inches, with the maximum daily rainfall amount of 6.63 inches occurring on April 20, 1933, and the average annual snowfall is just more than 17 inches, with the maximum daily snowfall amount of 12 inches occurring on February 19, 1984. Figure A-3 shows the precipitation averages and extremes for Gosper County.

Figure A-3. Daily Precipitation Averages and Extremes

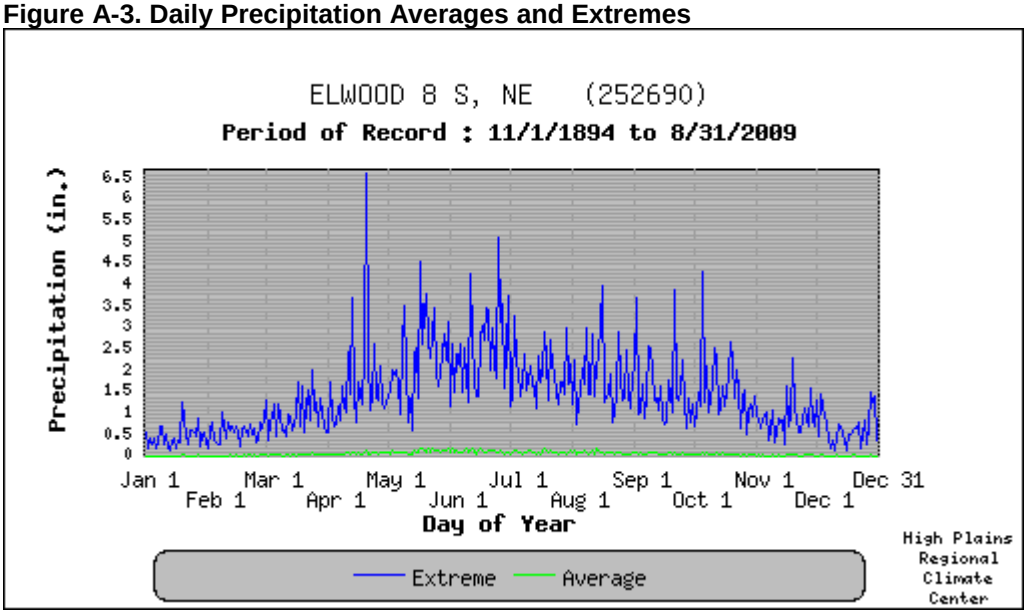
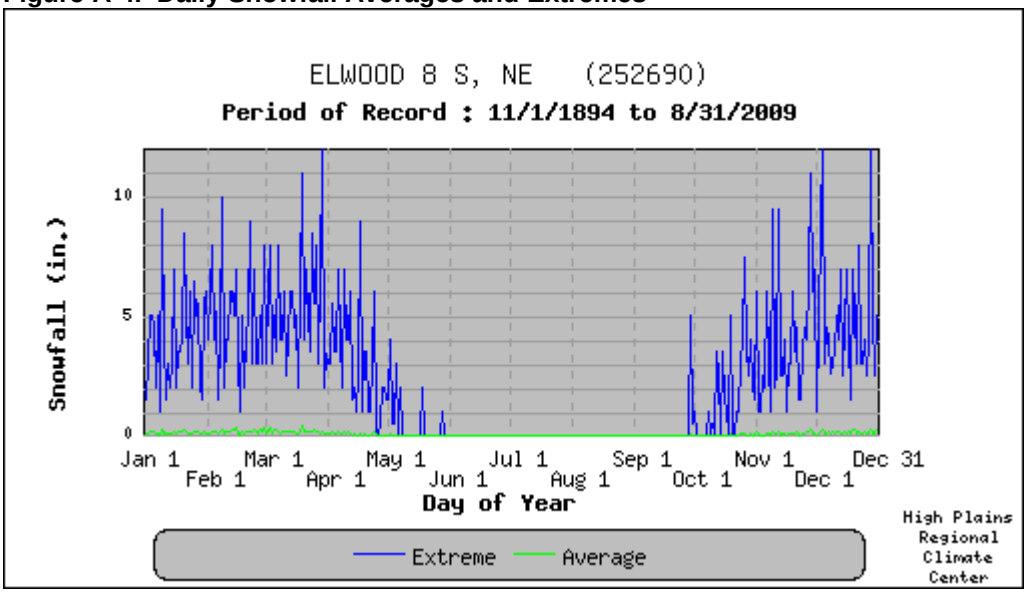


Figure A-4 details the snowfall averages and extremes for Elwood. The daily extreme is the greatest precipitation or snowfall recorded for that day of the year, and the daily average is the average of all daily precipitation of snowfall recorded for that day of the year.

Figure A-4. Daily Snowfall Averages and Extremes



Source: High Plains Regional Climate Center

HAZARD IDENTIFICATION

A wide range of hazards affect Gosper County and history has proven that many different types of hazards can cause extensive damage. In fact, from 2006 through 2008, three federally declared disasters have affected Gosper County.

The federally declared disasters did not have a significant time span between each, reinforcing the fact that another extensive disaster could occur at any time. In fact, a disaster was declared in 2006, 2007, and 2008, which makes this planning effort even more beneficial in Gosper County.

To obtain support from the communities, public meetings discussing the planning process were scheduled in the beginning stages of the planning process. The public meeting results for Gosper County are detailed in the following section.

The information obtained through public input was analyzed by Olsson Associates to determine the hazards that are of biggest concern to the entities throughout the county. Table A-4 summarizes the results of the Gosper County survey forms. The probability and vulnerability are based solely on public opinion. The column listing past occurrences indicates whether the hazard has affected Gosper County in previous years. This information was provided by the National Climatic Data Center (NCDC) and the county emergency management directors.

Table A-4. Gosper County Hazard Identification

Hazard	Probability	Extent	Past Occurrence
Tornadoes	Highly Likely	Critical	Yes
Thunderstorms/High Winds/Lightning/Hail	Highly Likely	Critical	Yes
Severe Winter Storms	Highly Likely	Limited	Yes
Wildfires	Likely	Limited	Yes
Droughts	Possible	Limited	Yes

Flooding	Possible	Limited	Yes
Landslide	Unlikely	Negligible	No
Dam Failure	Unlikely	Negligible	No

The information summarized above is an average of the results for all entities in Gosper County.

FLOODING

Hazard Summary

A summary of information regarding flooding may be found in the front portion of this plan. Please refer to the "Risk Assessment" section under "Flooding" to view this summary.

Historical Occurrences

According to the NCDC, since 1950, seven flood events have been recorded in Gosper County. Many of these storms produced little or no recorded damage. In Gosper County, it would not be unreasonable to see flooding resulting from ravine flooding, flash flooding, ice jams, and urban drainage system flooding. The Johnson Lake area and the area along the Platte River in the Northeast corner of the county are the most susceptible to flooding. The Village of Elwood and the Village of Smithfield would experience floodwater from overland flow and ponding due to the area's flat terrain. Approximately 1,346 structures exist in Gosper County, and no structures exist within the FEMA-designated floodplain. Table A-9 details the flood events, causing $100,000 or more, within Gosper County according to NCDC.

Table A-9. Gosper County Historical Flood Occurrences

Location	Date	Type	Property Damage	Crop Damage
Gosper County	06/01/1995	Flood	$20,000	$80,000
Gosper County	05/11/2005	Flash Flood	$1,000,000	$250,000
Johnson Reservoir	05/20/2008	Flash Flood	$25,000	$500,000
Johnson Reservoir	05/23/2008	Flash Flood	$25,000	$100,000

According to FEMA's Repetitive Loss list, no repetitive loss properties exist in Gosper County.

Vulnerability Assessment

Flooding poses a threat to Gosper County, as the county has various streams meandering through it. If a flood event were to affect the county, the resulting damage could include structural damage. Damage that could occur includes downed trees or limbs; downed power lines; dam or levee failure; roadway and bridge failures; crop damage; and potential loss of life. In the event of heavy rainfall and flooding, emergency response vehicles may have limited access to residents in the county, especially if roads or bridges fail; downed trees get in the way, or other debris or floodwaters block access routes. Residents could be in added danger if they are stranded in a vehicle during a flash flood, as waters rapidly rise and can quickly wash cars downstream. Dam or levee failure could cause large portions of communities to be affected by flood waters and could threaten the lives of residents of each downstream community if proper warning is not given. Critical infrastructure also could be compromised, as flooding could cause sanitary sewer lines to back up, also posing a human safety risk, as well as potentially contaminating drinking water sources. Residents may need to be relocated until the floodwaters recede and critical

infrastructure is operational. The functional downtime resulting from power outages and infrastructure failure would be extremely costly. Businesses and schools may need to be closed, which would have a detrimental effect on the economy of Gosper County. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 1,346 structures exist within the county. Of those, approximately 15 are critical facilities. Due to the extent of the county boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 1,346 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 1,109
- Mobile Housing Units 119
- Commercial/Industrial Properties 103
- Critical Facilities 15

To determine a reasonable estimate for future structures, a growth rate of approximately two percent over five years was assumed for the planning area. Therefore, approximately 1,373 structures could be affected in the future, and approximately 16 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

DAM FAILURE

Hazard Summary

A summary of information regarding dam failure may be found in the front portion of this plan. Please refer to the “Risk Assessment” section under “Dam Failure” to view this summary.

Historical Occurrences

Currently 53 dams exist in Gosper County. Of those, 51 are low hazard dams, one is a significant hazard dams, and one is a high hazard dam. A low hazard dam would only damage minor resources in the event of failure. A significant hazard dam would damage important resources in the event of failure. A high hazard dam would result in lives lost in the event of failure. No dam failures have occurred in Gosper County according to the Association of State Dam Safety Officials.

The Elwood Dam in Gosper County (a significant hazard dam) could affect the area. The dam is owned by the Central Nebraska Power & Irrigation District. The Johnson Lake Dam (a high hazard dam) in Gosper County also could pose a risk to the residents of Gosper County. The dam is owned by the Central Nebraska Power & Irrigation District, and, in the event of a dam failure, the inundation area would include commercial areas in Lexington located downstream. Due to the location of the high hazard dam, it is imperative to include dam failure in this plan.

Vulnerability Assessment

Dam failure poses a threat to the property located downstream. In the event of a dam failure, the inundation areas contained within the emergency action plans, which are on file with the NDNR, show the areas that would be affected. The action plans are unavailable for release because of security concerns.

If a dam were to fail in Gosper County, potential damage could include structural damage to homes, businesses, and critical facilities; power outages; and potential loss of life. Roads or bridges may fail depending on the location of the dams, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for extended periods of time, which would severely affect the local economy. If the dam were located just upstream of a community, loss of life in the inundation area could occur, especially if no warning is given and residents are caught unaware. Due to the presence of the Elwood and Johnson Reservoirs, and the potential for risk associated with each dam damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 1,346 structures exist within the county. Of those, approximately 15 are critical facilities. Due to the extent of the county boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 1,346 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 1,109
- Mobile Housing Units 119
- Commercial/Industrial Properties 103
- Critical Facilities 15

To determine a reasonable estimate for future structures, a growth rate of approximately two percent over five years was assumed for the planning area; therefore, approximately 1,373 structures could be affected in the future, and approximately 16 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

Potential Impact

Dam failure could affect portions of Gosper County, and impacts from the resulting flooding could last for days or even weeks. If a dam failure were to occur, it was assumed that approximately 11.11 percent of the county would be affected. This information was based on the following 'flooding' formula:

Total Damages Recorded ($13,755,000) / Total Events Recorded (9) =
Average Damage per Event ($1,528,333)

Average Damage per Event ($1,528,333) / Total Damages Recorded ($13,755,000) =
Percent Average Damage per Event (11.11%)

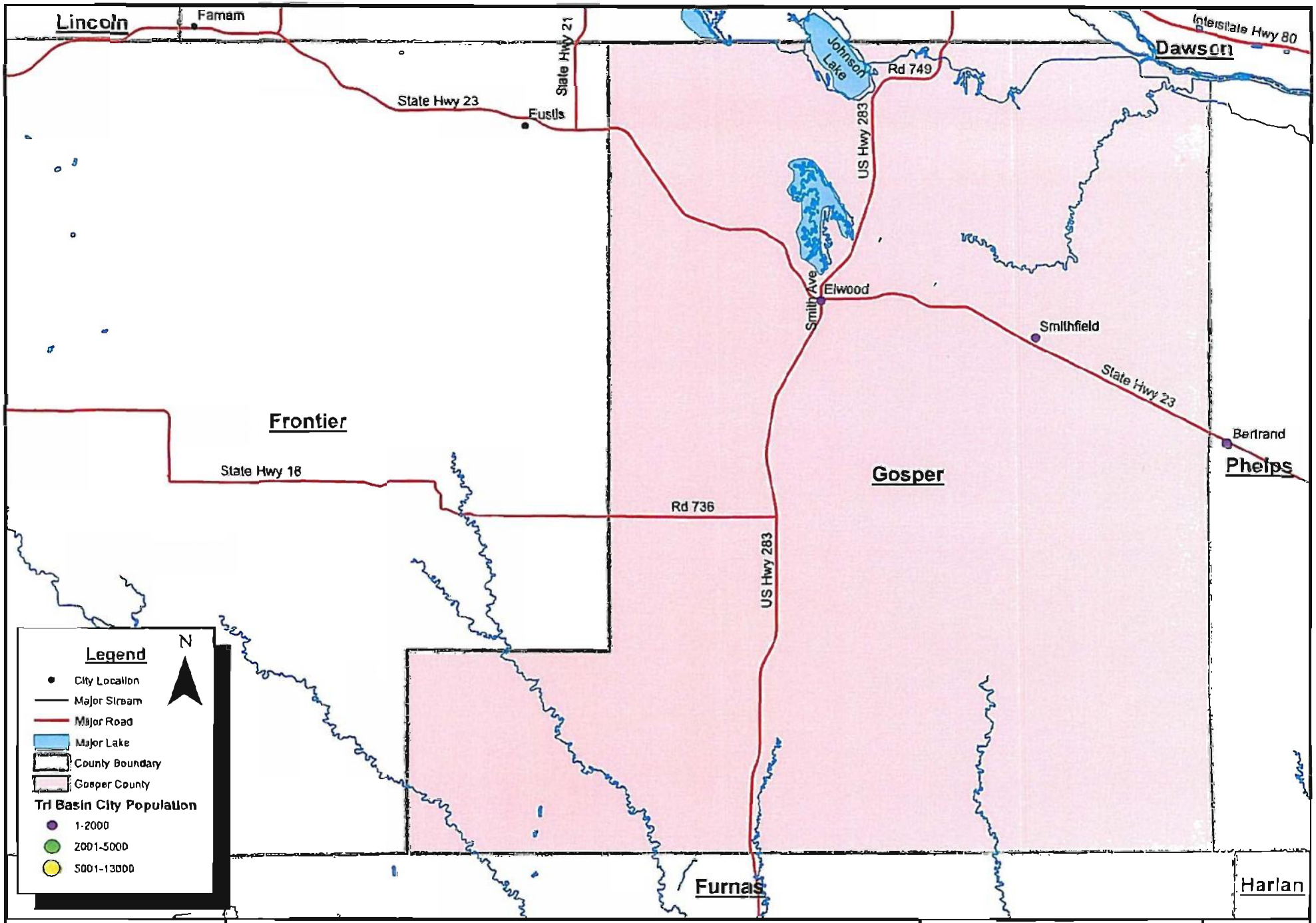
Percent Average Damage per Event (11.11%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($57,060,424)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

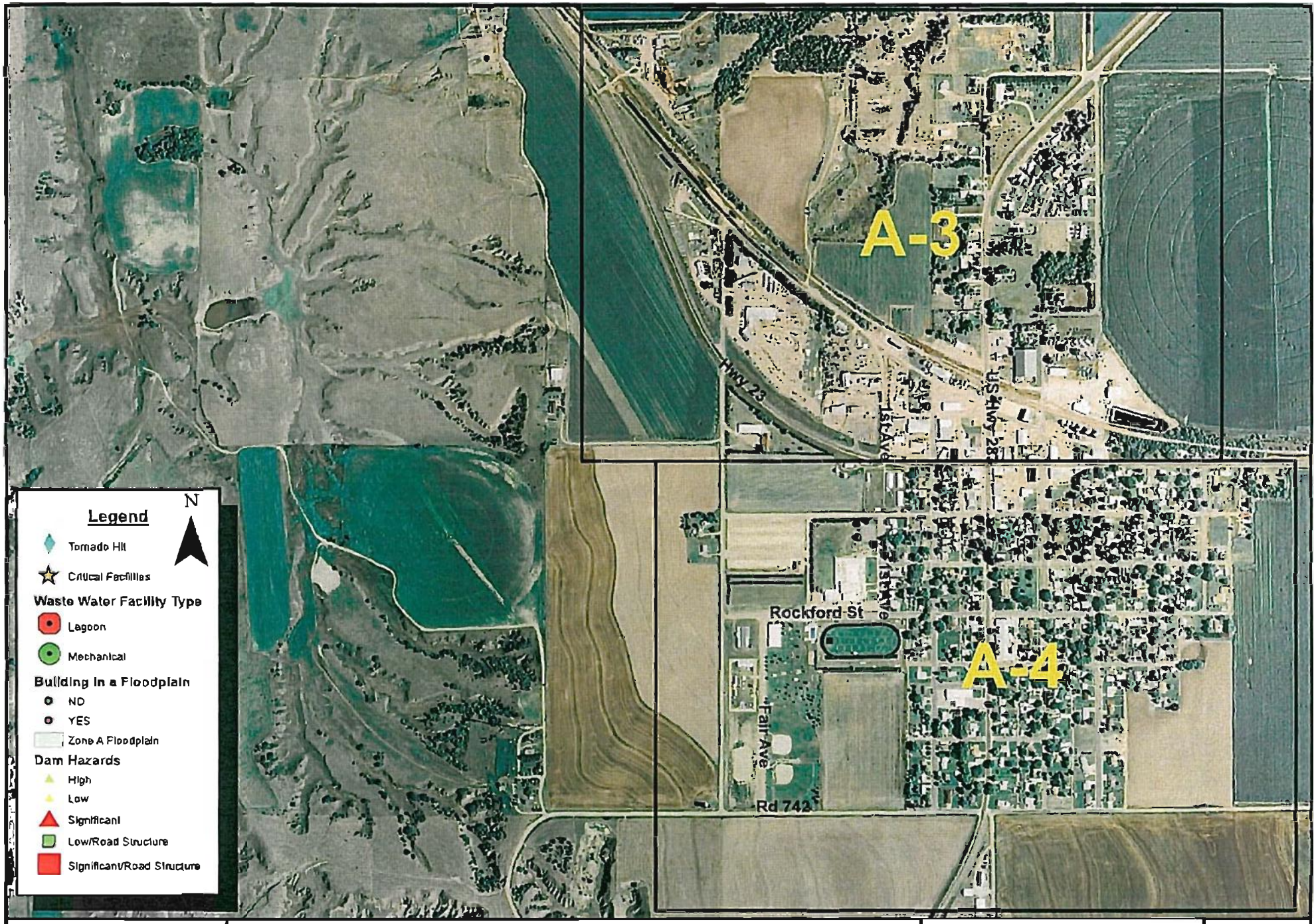
Jurisdictions	Structural Valuation	Damage Estimate
Elwood	$27,058,814	$3,006,234

Smithfield	$2,078,111	$230,878

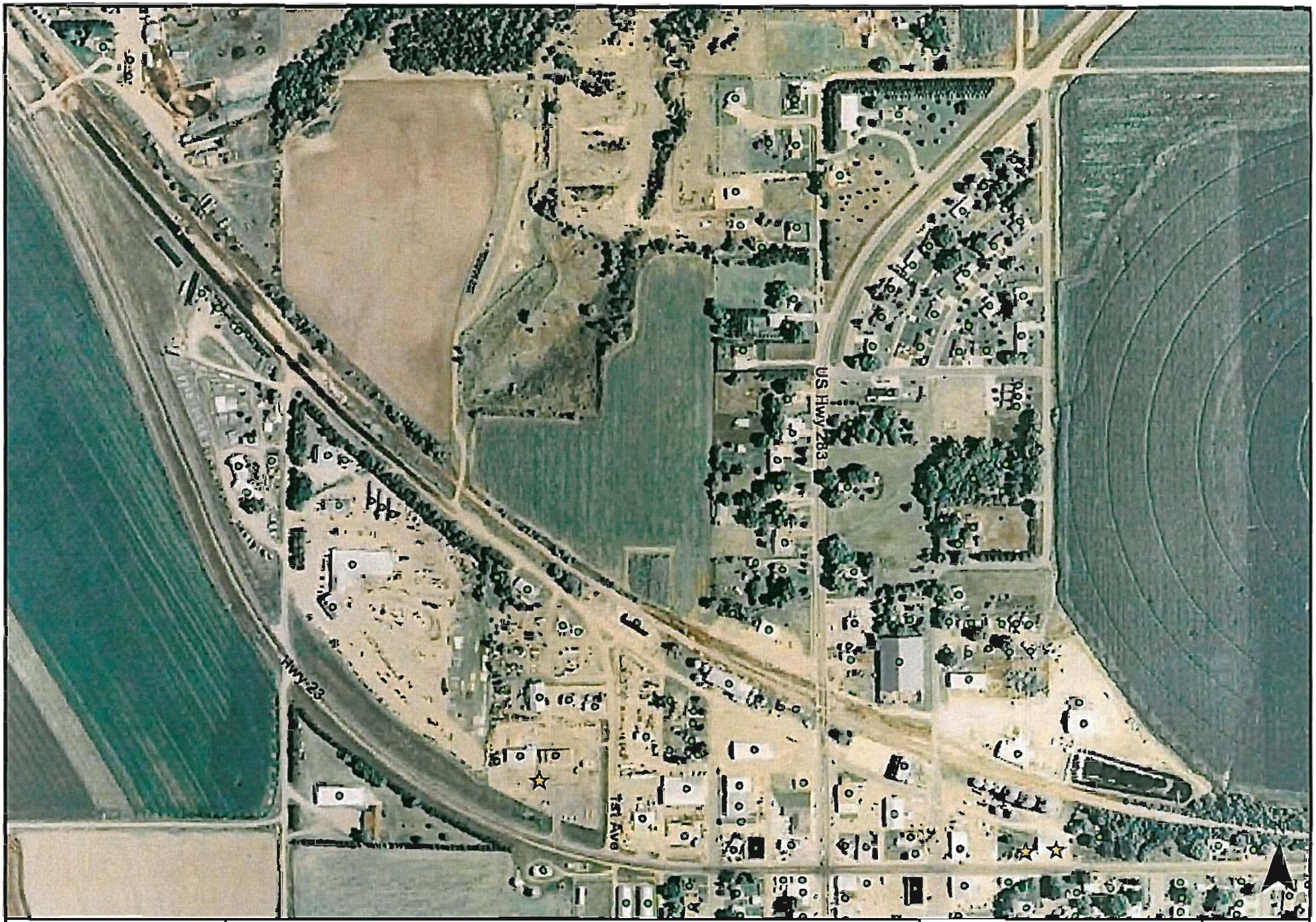
It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.



PROJECT NO.: 009-0613	GOSPER COUNTY ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-1
DATE: JUNE 2010	OLSSON ASSOCIATES	



PROJECT NO.: 009-0613	VILLAGE OF ELWOOD - INDEX MAP ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES	MAP
DRAWN BY: MDH			A-2
DATE: JUNE 2010			

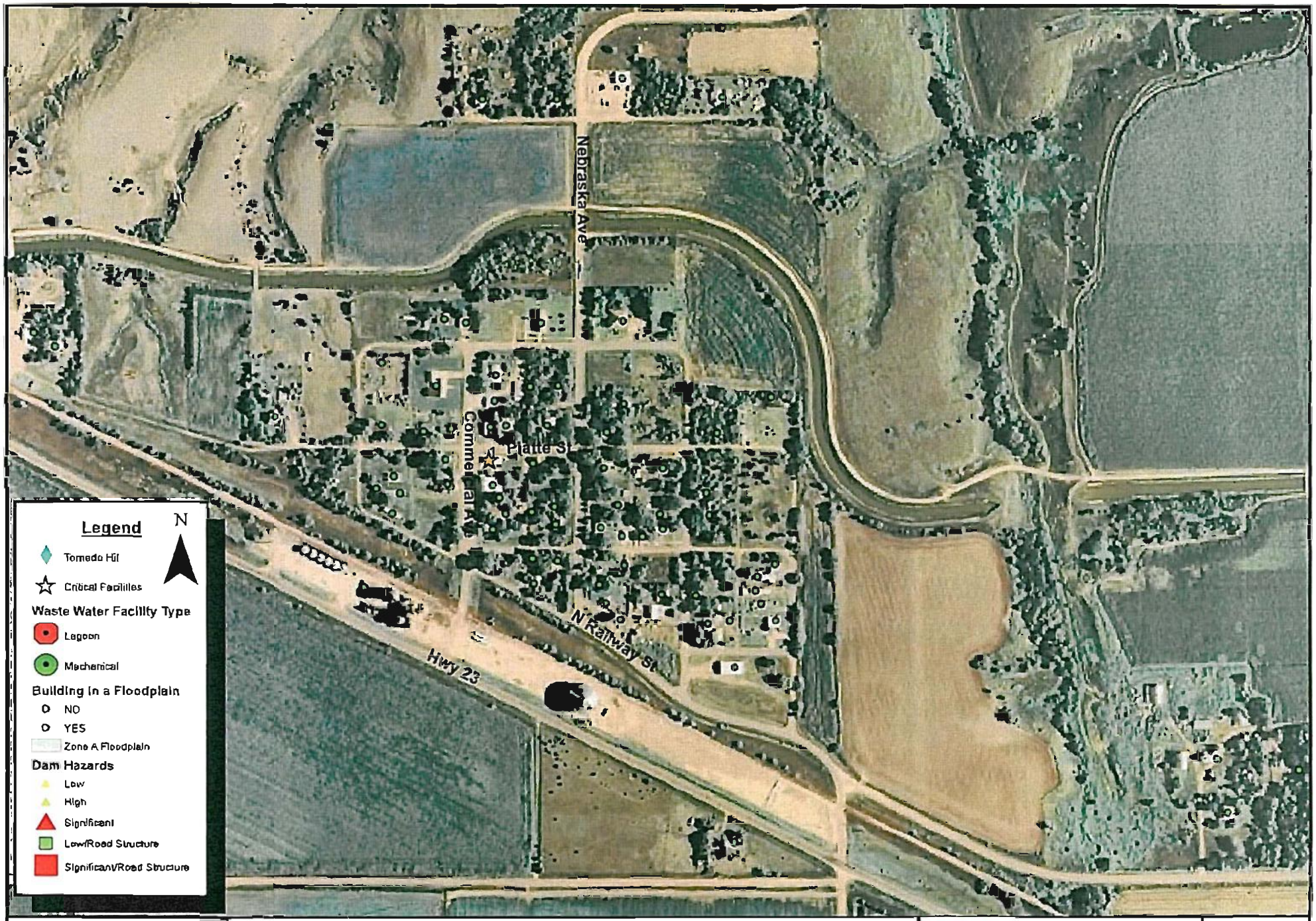


PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	VILLAGE OF ELWOOD ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

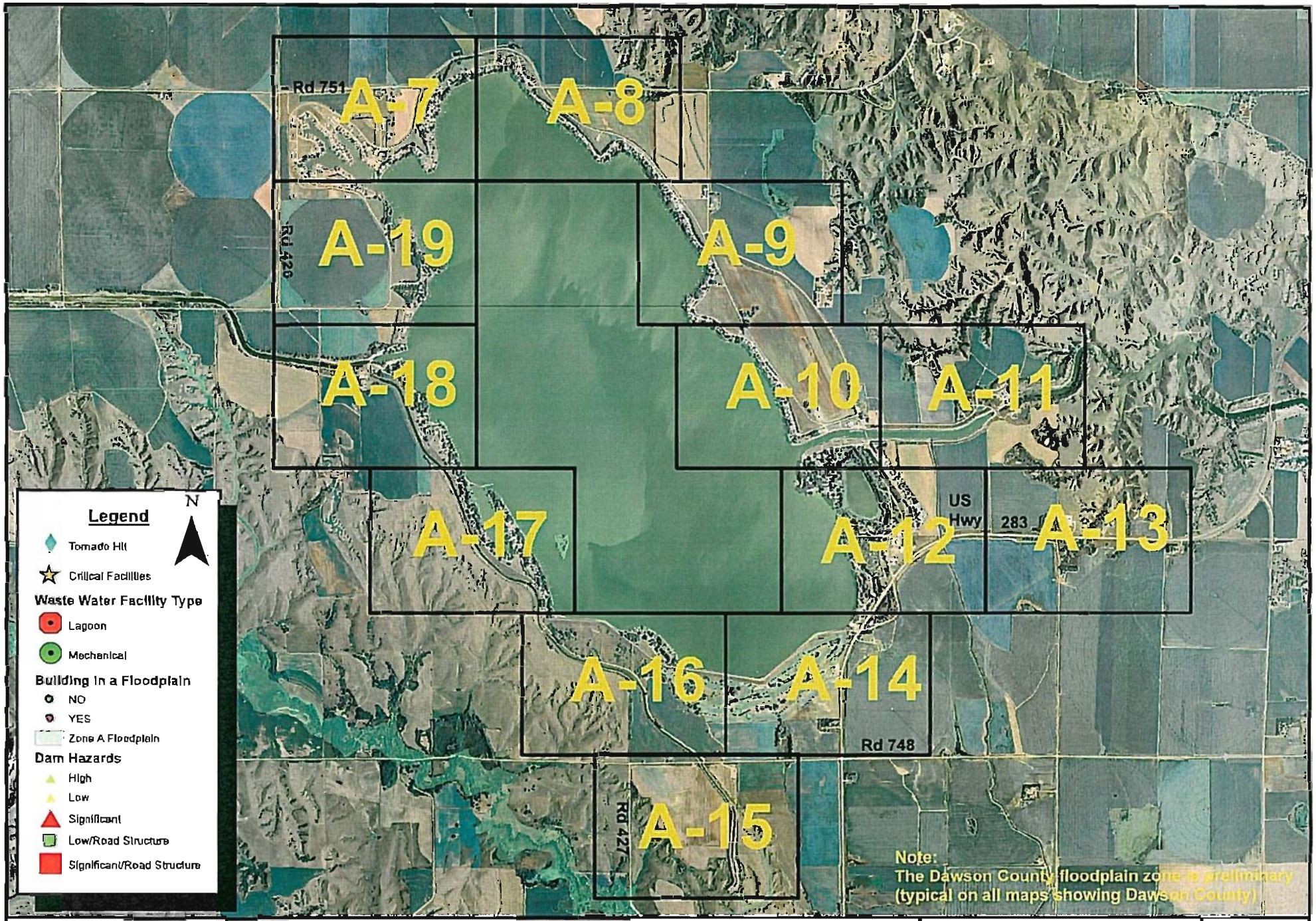
MAP
A-3

PROJECT NO.: 009-0613	VILLAGE OF ELWOOD ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-4
DATE: JUNE 2010		

OLSSON ASSOCIATES

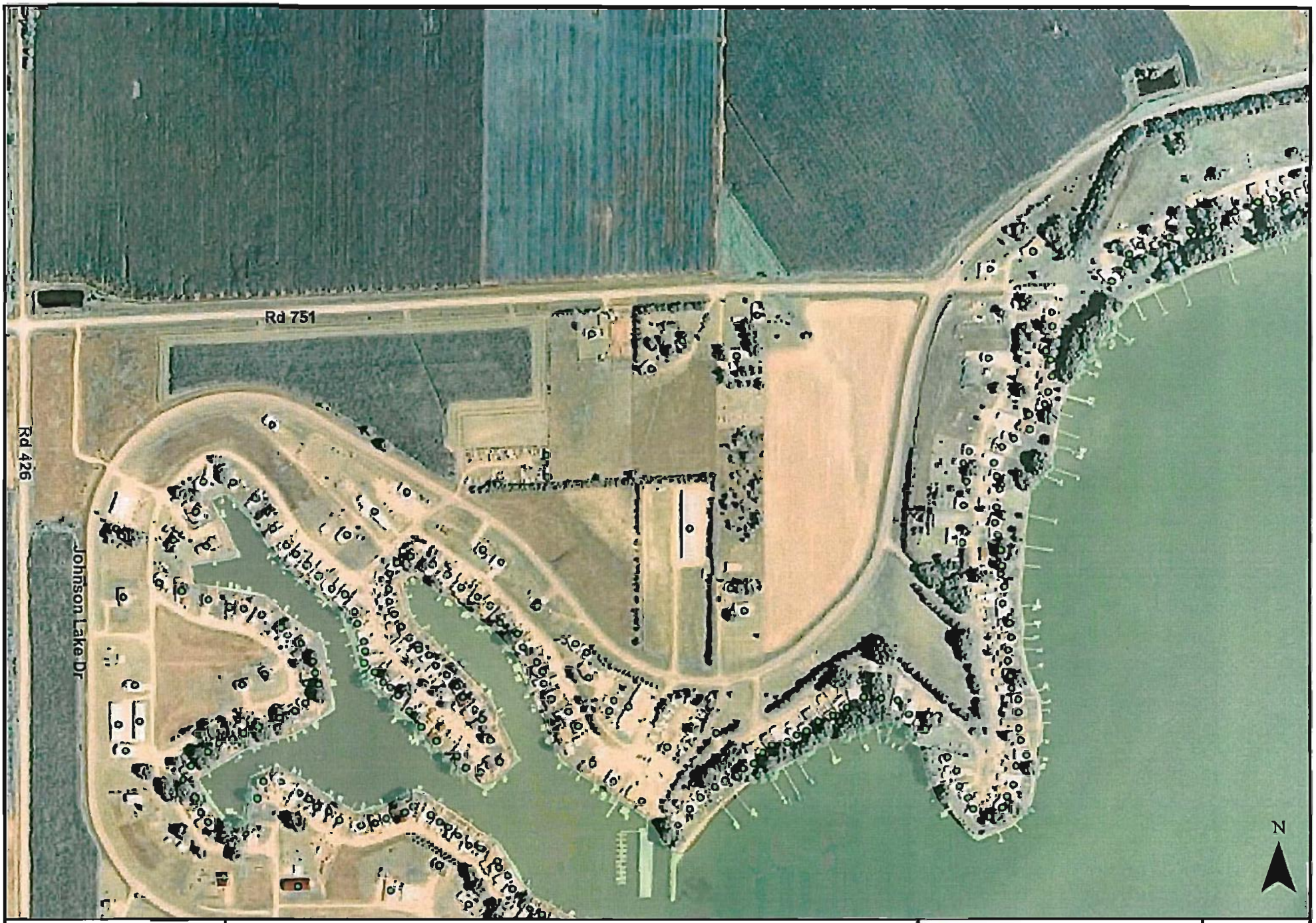


PROJECT NO.: 009-0613	VILLAGE OF SMITHFIELD ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES	MAP
DRAWN BY: MDH			A-5
DATE: JUNE 2010			



PROJECT NO.: 009-0613	JOHNSON LAKE - INDEX MAP ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-6
DATE: JUNE 2010		

OLSSON ASSOCIATES



PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	**JOHNSON LAKE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES

MAP
A-7

PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

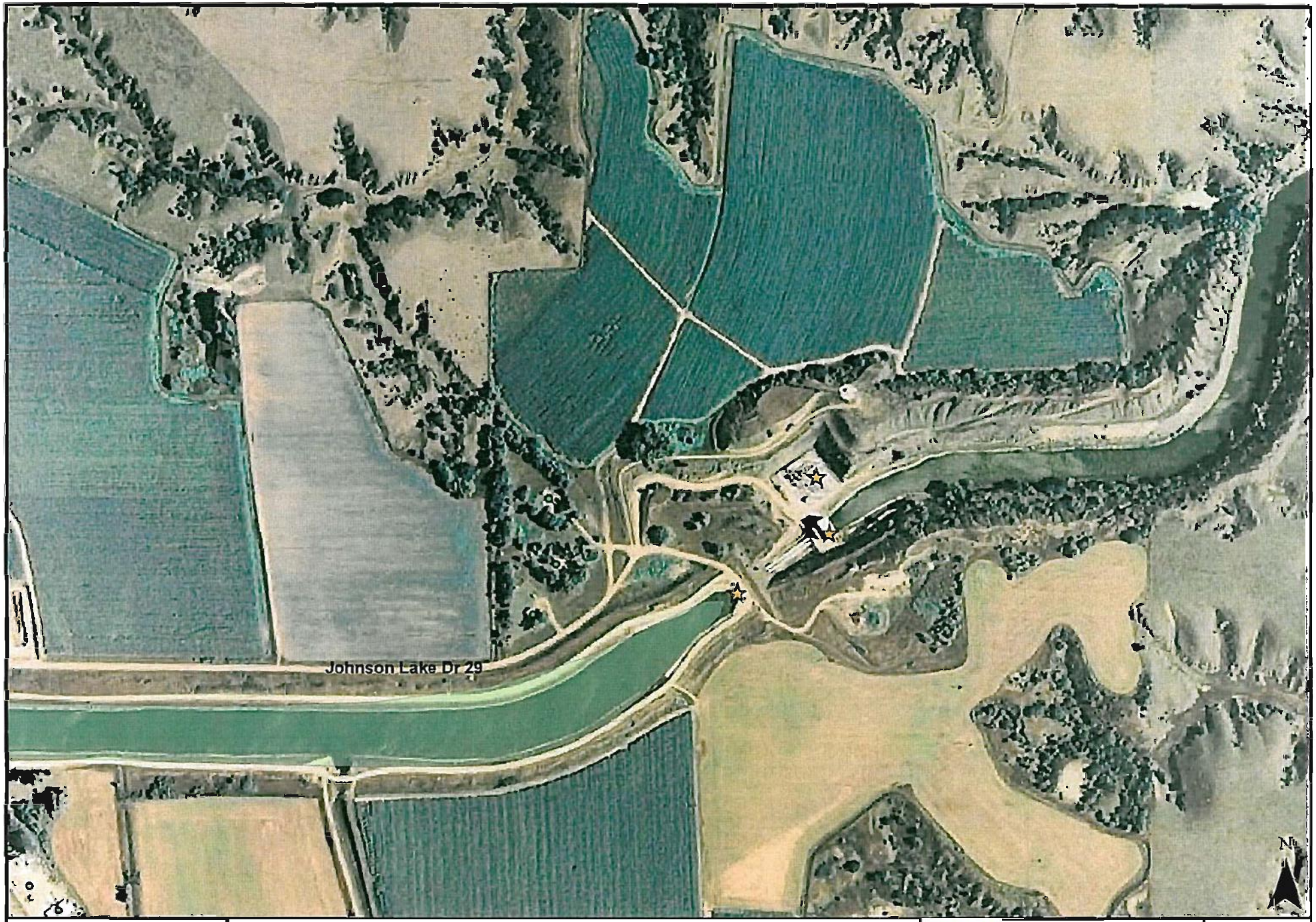
MAP
A-8

PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

MAP
A-9

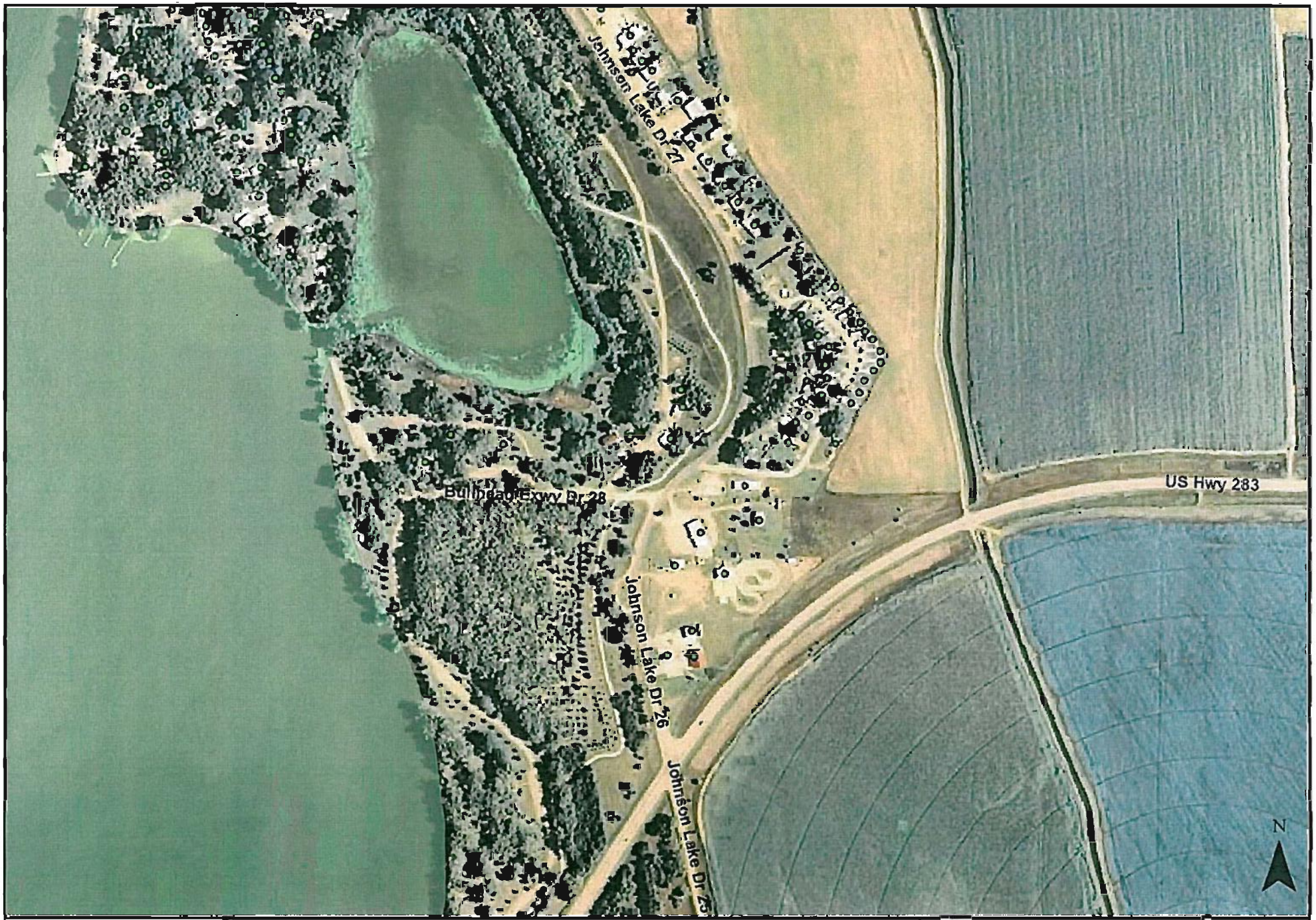
PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

MAP
A-10



PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

MAP
A-11



PROJECT NO.: 009-0613	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-12
DATE: June 2010		

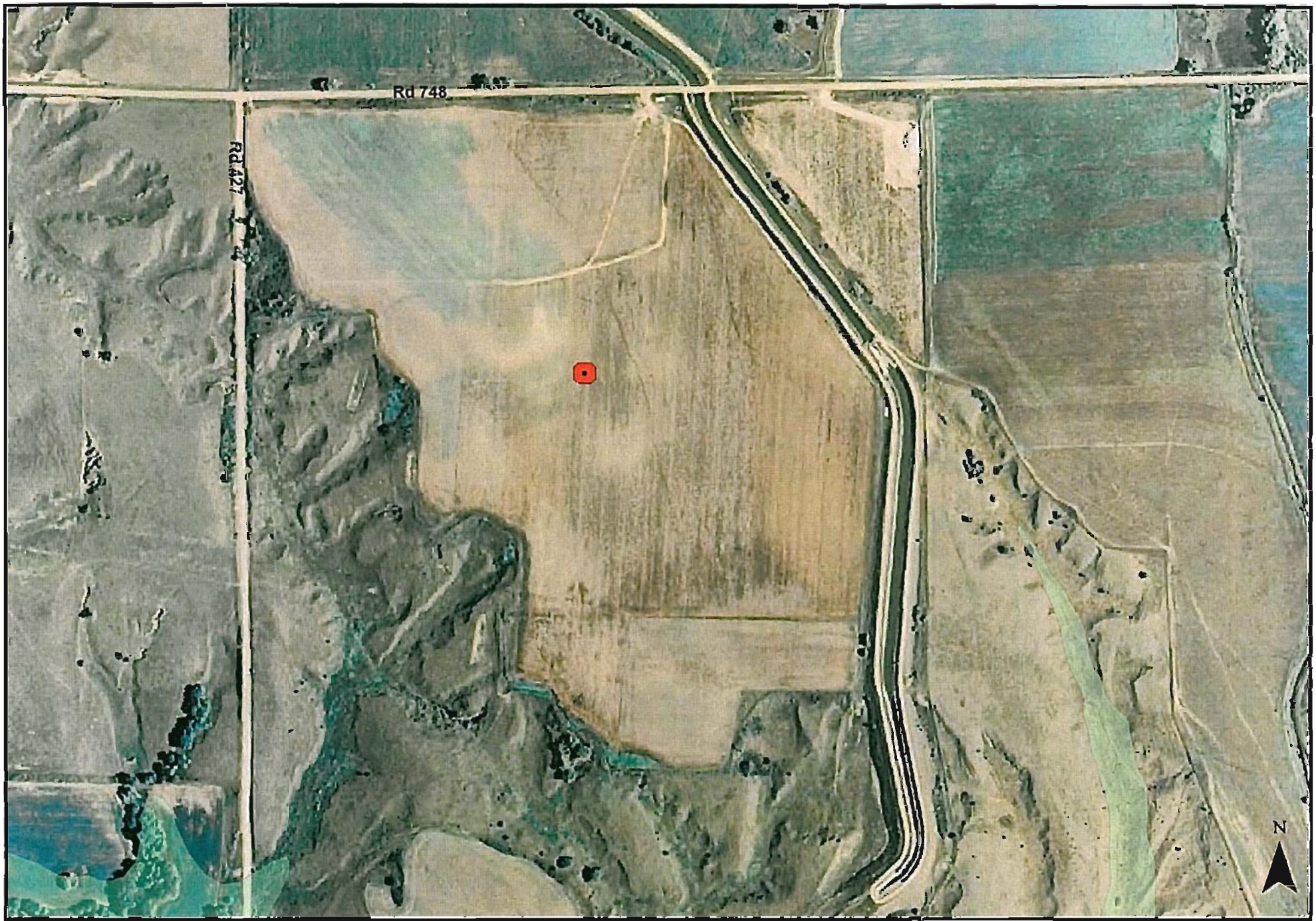
OLSSON ASSOCIATES

PROJECT NO.: 009-0613	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-13
DATE: June 2010		

OLSSON ASSOCIATES

PROJECT NO.: 009-0613	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		A-14
DATE: June 2010		

OLSSON ASSOCIATES



PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

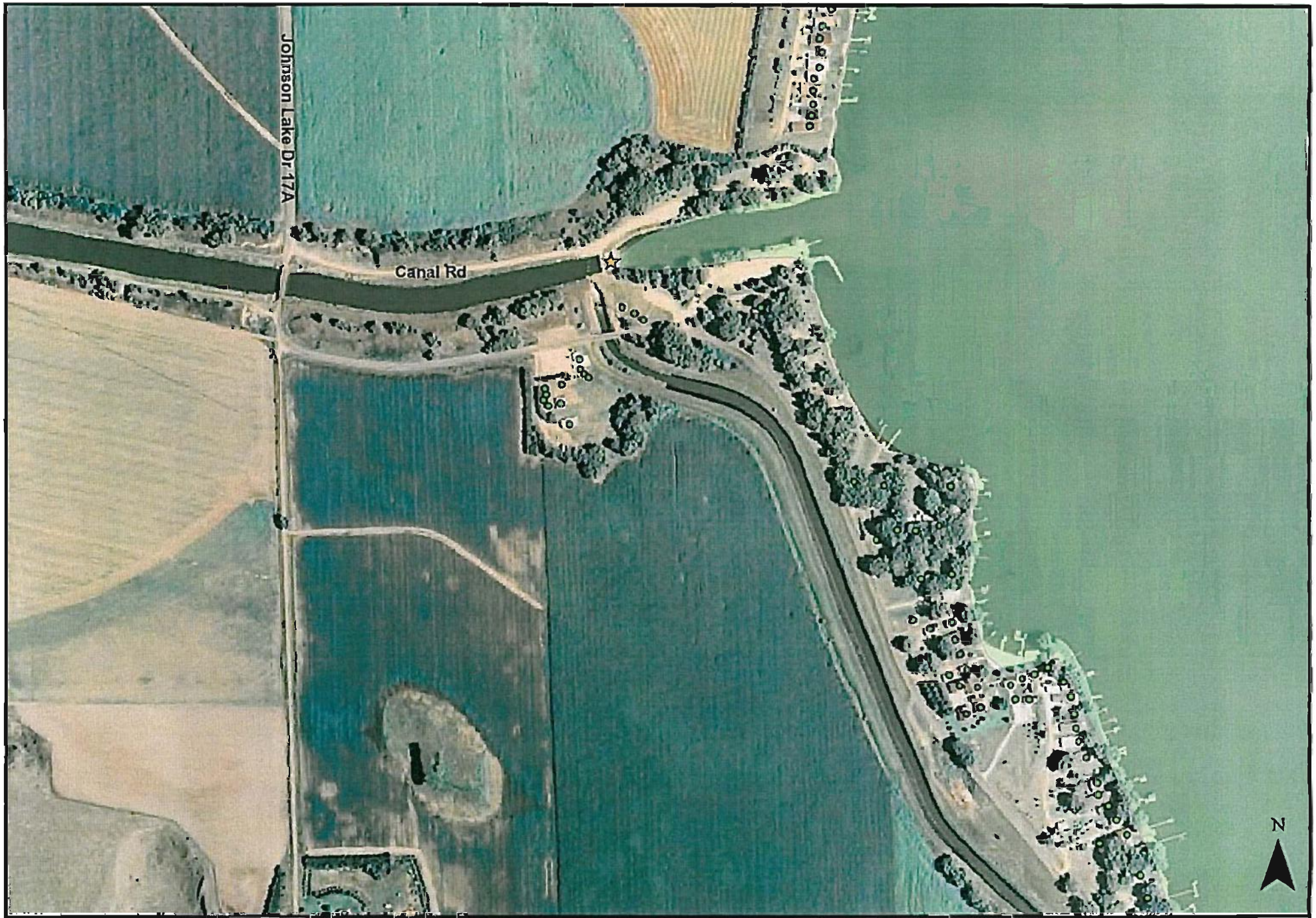
MAP
A-15

PROJECT NO.: 009-0613	**JOHNSON LAKE** **ALL - HAZARDS MITIGATION PLAN**	MAP
DRAWN BY: MDH		A-16
DATE: June 2010		

OLSSON ASSOCIATES

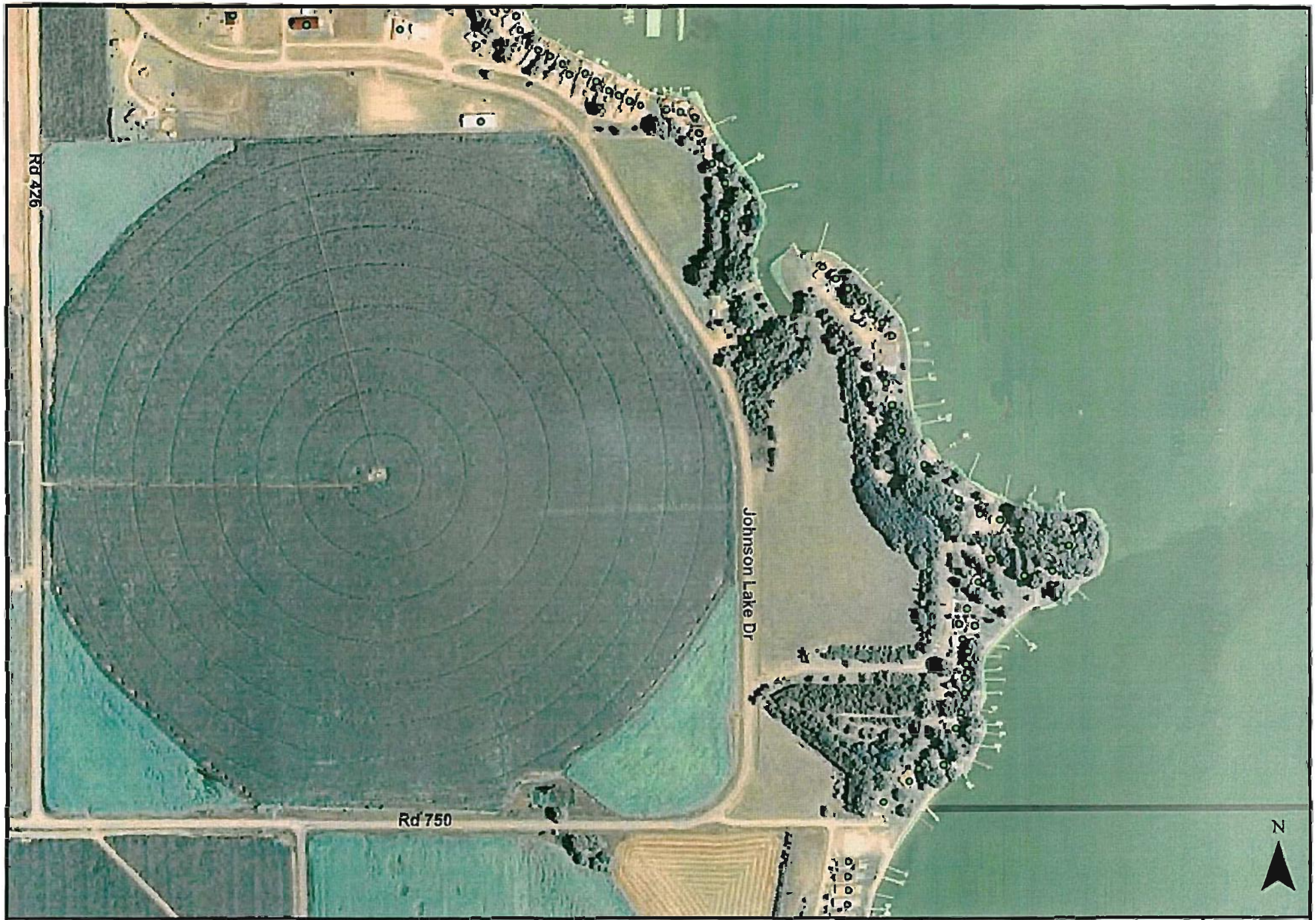
PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

MAP
A-17



PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	**JOHNSON LAKE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES

MAP
A-18



PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: June 2010	JOHNSON LAKE ALL - HAZARDS MITIGATION PLAN	OLSSON ASSOCIATES

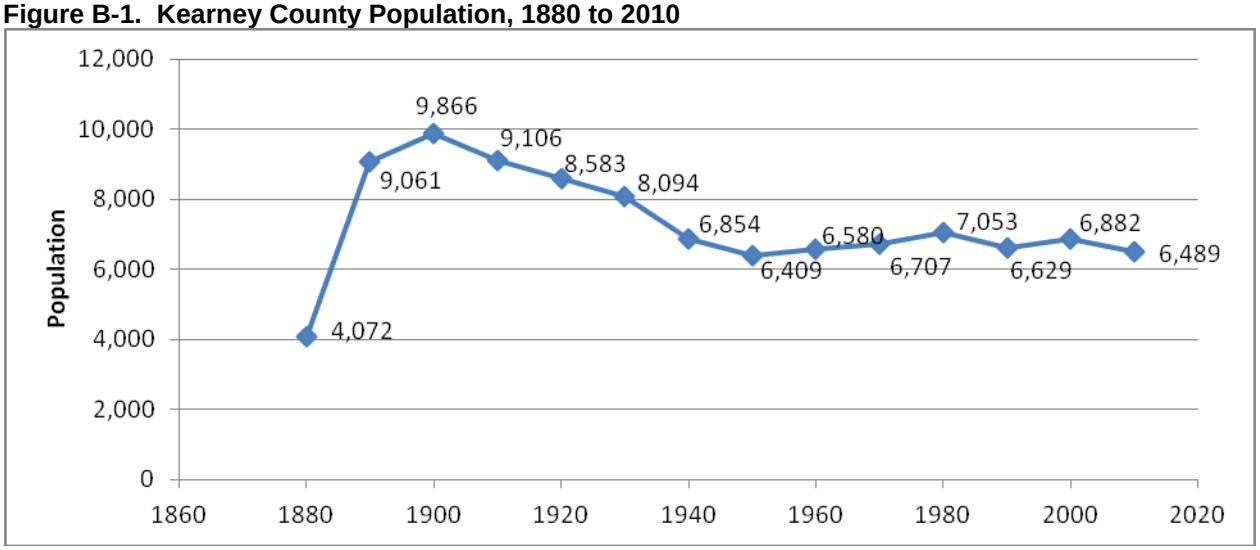
MAP
A-19

APPENDIX B: KEARNEY COUNTY

DEMOGRAPHIC SUMMARY

According to the U.S Census Bureau, the total population of Kearney County in 2010 was 6,489. The population in the county has decreased slightly during the past few years, as the population in 2000 was 6,882. Figure B-1 shows the population trend in Kearney County since 1880.

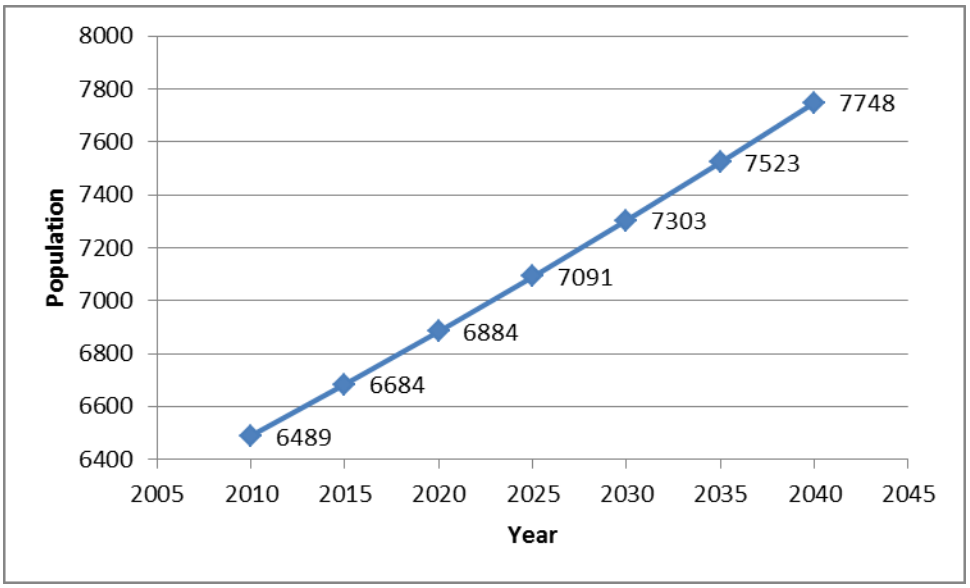
Figure B-1. Kearney County Population, 1880 to 2010



Sources: Nebraska State Data Center, Center for Public Affairs Research, University of Nebraska – Omaha, U.S. Bureau of Census, '2010 Census of Population and Housing', 'CPH-2-29, Population and Housing Unit Counts, Nebraska', Census Web Site (www.census.gov) and similar publications for preceding years.

The population of Kearney County is projected to increase over time, as shown in Figure B-2.

Figure B-2. Kearney County Population Projection, 2010 to 2030



*2010 numbers are Census counts; other numbers are projections.
Source: University of Nebraska, Bureau of Business Research, Nebraska County Population Projections

The gender breakdown for Kearney County per the 2000 U.S. Census Bureau Information (most recent information) is 49.6 percent male and 50.4 percent female. Table B-1 depicts the age characteristics of the project area.

Table B-1. Age Characteristics of Kearney County, 2010		
Age	**Number of People**	**Percent of Total**
Under 5 years	442	6.8%
5 to 9 years	405	6.2%
10 to 14 years	431	6.6%
15 to 19 years	436	6.7%
20 to 24 years	245	3.8%
25 to 34 years	680	10.5%
35 to 44 years	737	11.4%
45 to 54 years	1,045	16.1%
55 to 59 years	480	7.4%
60 to 64 years	401	6.2%
65 to 74 years	565	8.7%
75 to 84 years	412	6.3%
85 years and older	210	3.2%
Age	**Number of People**	**Percent of Total**
18 years and over	4,917	75.8%
21 years and over	4,723	72.8%
62 years and over	1,422	21.9%
65 years and over	1,187	18.3%

Source: U.S. Census Bureau, DP-1. General Demographic Characteristics: 2000

As shown in Table B-1, the population varies among the age brackets; however, a higher percentage of the population falls between the ages of 35 to 54 than any other age bracket. A significant amount of the population is also older than age 65, which is an important fact to consider when determining the best methods to protect citizens and communities from hazards.

Another important demographic detail that should not be overlooked is the housing occupancy and the age of the existing structures. Table B-2 shows the housing occupancy and tenure in Kearney County.

Table B-2. Units in Residential Structure of Kearney County, 2010 Census		
Subject	**Number of Units**	**Percent of Total**
Total Housing Units	2,888	100.0%
1-unit, detached	2,400	83.1%
1-unit, attached	30	1.0%
2 units	6	0.2%
3 or 4 units	57	2.0%
5 to 9 units	52	1.8%
10 to 19 units	22	1.8%
20 or more units	45	1.6%
Mobile home	276	9.6%
Boat, RV, Van, etc.	0	0.0%
Table B-2. Units in Residential Structure of Kearney County, 2010 Census		
Subtotals		
Permanent Housing Units	2612	90.4%
Mobile Housing Units	276	9.6%

Source: U.S. Census Bureau, DP-4, Selected Housing Characteristics: 2010

Permanent Housing Units are typically built with more substantial building materials and building codes than Mobile Housing Units. For the purposes of this plan, Permanent Housing Units are considered housing units permanently attached to a foundation, and include all housing types listed in Table B-2 except Mobile homes and Boat, RV, Van, etc. categories.

Table B-3 shows the age of homes within Kearney County. The age of the home is helpful in determining the level of damage that could be seen in the event of a hazard occurrence. In addition, the median value of a home in Kearney County is $77,600, which is also considered in events.

Table B-3. Age of Structures in Kearney County, 2010 Census		
Year Structure Built	**Number**	**Percent of Total**
2005 or later	14	0.5%
2000 to 2004	121	4.2%
1990 to 1999	255	8.8%
1980 to 1989	275	9.5%
1970 to 1979	484	16.8%
1960 to 1969	299	10.4%
1950 to 1959	295	10.2%
1940 to 1949	88	3.0%
1939 or earlier	1,057	36.6%

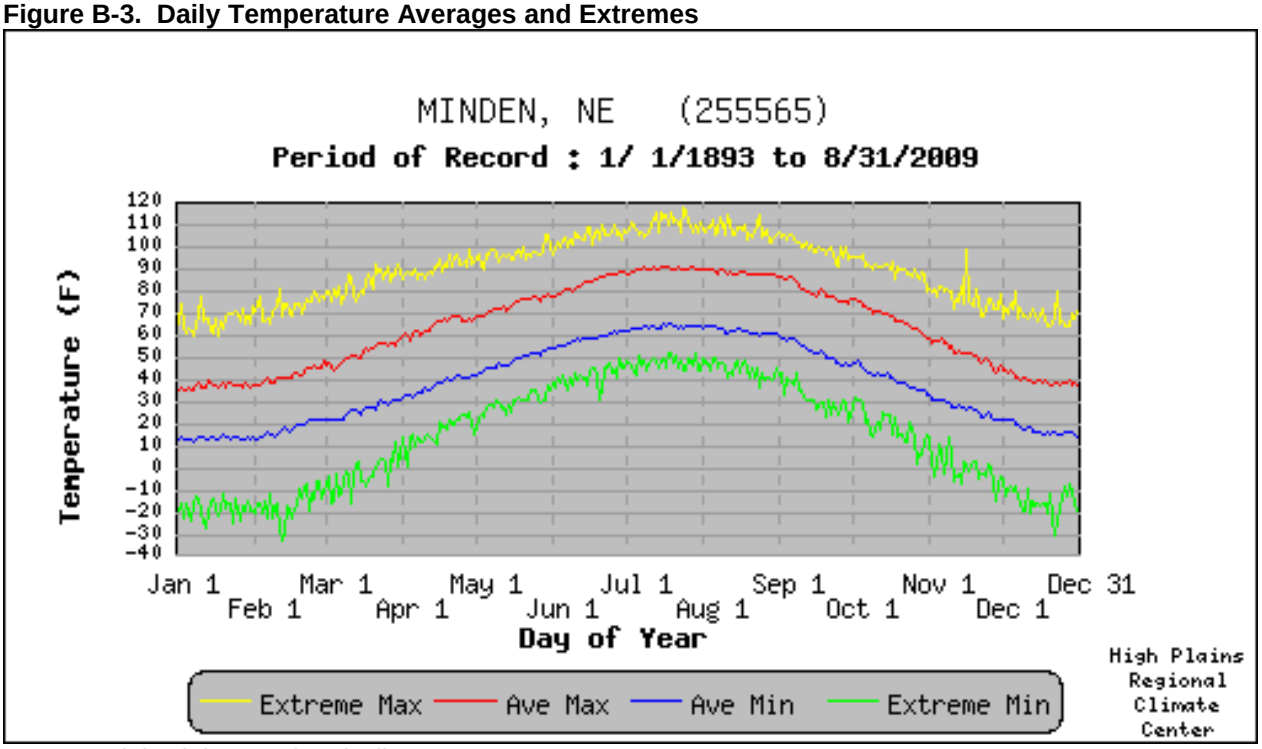
Source: U.S. Census Bureau, DP-4. Profile of Selected Housing Characteristics: 2010

In addition to the data on residences within Kearney County, the Nebraska Department of Revenue lists 360 properties as either commercial or industrial in nature.

CLIMATE SUMMARY

This plan will focus on the City of Minden as the most centrally located community with the most sufficient information available to provide information about the climate for Kearney County as a whole. Nebraska has a continental climate, meaning the state experiences highly variable temperatures from season to season. In general, Kearney County sees average temperatures of 27.6 degrees in the winter; 50.2 degrees in the spring; 74.4 degrees in the summer; and 53.1 in the fall. The record high was 118 degrees F on July 24, 1936. The record low was minus 33 degrees F on February 12, 1899. The average annual precipitation is 25.12 inches, with a maximum daily rainfall amount of 15.07 inches, which occurred on September 23, 1926, and the average annual snowfall is 26.6 inches. Figure B-3 below depicts the daily temperature averages and extremes, in a period from 1893 to 2009 in Minden. According to the High Plains Regional Climate Center, the daily extreme maximum temperature is the maximum of all daily maximum temperatures recorded for that day of the year. The average maximum is the average of all daily maximum temperatures recorded for that day of the year. The average minimum is the average of all daily minimum temperatures recorded for that day of the year. The extreme minimum is the minimum of all daily minimum temperatures recorded for the day of the year.

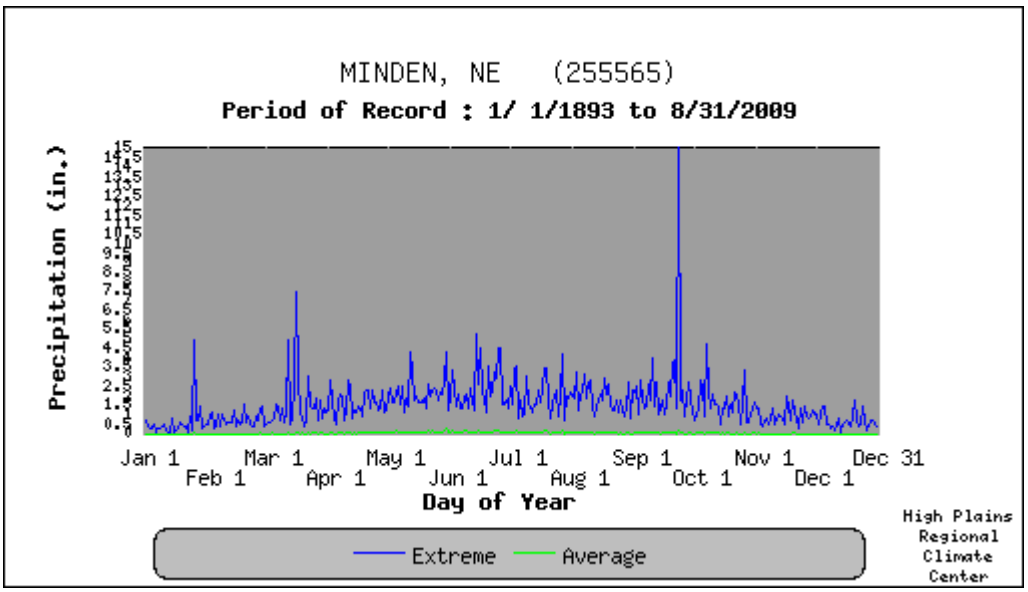
Figure B-3. Daily Temperature Averages and Extremes



Source: High Plains Regional Climate Center

Figure B-4 shows the precipitation averages and extremes for Kearney County.

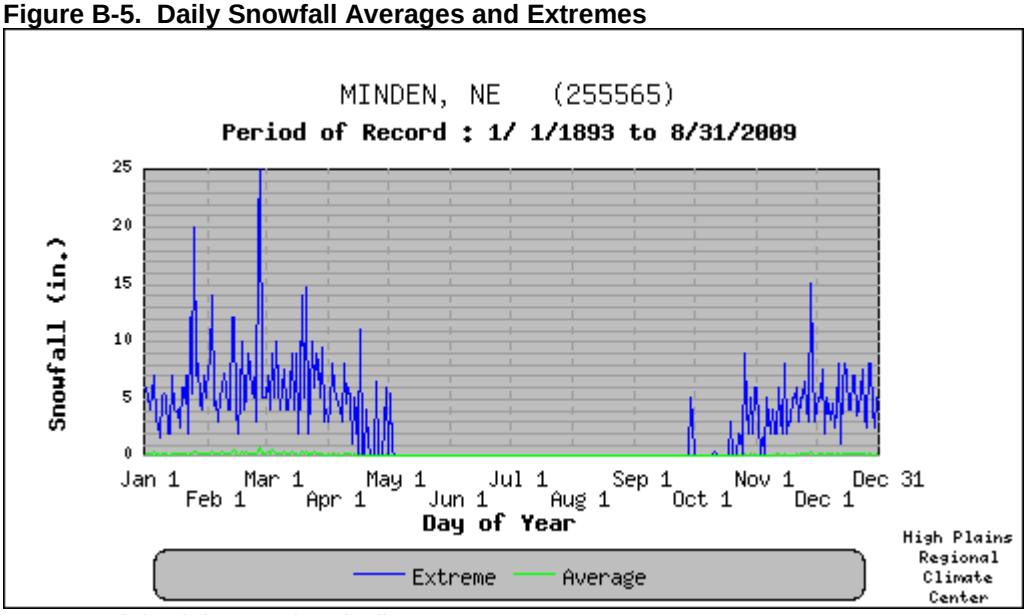
Figure B-4. Daily Precipitation Averages and Extremes



Source: High Plains Regional Climate Center

Figure B-5 details the snowfall averages and extremes for Kearney County. The daily extreme is the greatest precipitation or snowfall recorded for that day of the year, and the daily average is the average of all daily precipitation of snowfall recorded for that day of the year.

Figure B-5. Daily Snowfall Averages and Extremes



Source: High Plains Regional Climate Center

HAZARD IDENTIFICATION

A wide range of hazards affect Kearney County and history has proven that many different types of hazards can cause extensive damage. In fact, from 2004 through 2008, five federally declared disasters have affected Kearney County.

The federally declared disasters did not have a significant time span between each, reinforcing the fact that another extensive disaster could occur at any time. In fact, a disaster was declared in 2004, 2005, 2006, and two in 2007, which makes this planning effort even more beneficial in Kearney County.

To obtain support from the communities, public meetings discussing the planning process were scheduled in the beginning stages of the planning process. The public meeting results for Kearney County is detailed in the following section.

The information obtained through public input was analyzed by Olsson Associates to determine the hazards that are of biggest concern to the entities throughout the county. Table B-4 summarizes the results of the Kearney County survey forms. The probability and extent are based solely on public opinion. The column listing past occurrences indicates whether the hazard has affected Kearney County in previous years. This information was provided by the National Climatic Data Center (NCDC) and the county emergency management directors.

Table B-4. Kearney County Hazard Identification

Hazard	Probability	Extent	Past Occurrence
Thunderstorms/High Winds/Lighting/Hail	Highly Likely	Catastrophic	Yes
Severe Winter Storms	Highly Likely	Catastrophic	Yes
Tornadoes	Highly Likely	Catastrophic	Yes
Droughts	Possible	Limited	Yes
Flooding	Likely	Critical	Yes
Wildfires	Possible	Critical	No
Earthquakes	Unlikely	Negligible	No
Landslide	Unlikely	Negligible	No
Dam Failure	Unlikely	Limited	No

The information summarized above is an average of the results for all entities in Kearney County.

FLOODING

Hazard Summary

A summary of information regarding flooding may be found in the front portion of this plan. Please refer to the “Risk Assessment” section under “Flooding” to view this summary.

Historical Occurrences

According to the NCDC, since 1950, 10 flood events have been recorded in Kearney County. Many of these storms produced little or no recorded damage. In Kearney County it would not be unreasonable to see flooding resulting from ravine flooding, flash flooding, ice jams, and urban drainage system flooding. The City of Minden could experience ravine flooding from a tributary of Sand Creek. Approximately 3,000 structures exist in Kearney County, and, of those structures, approximately 15 structures are within the FEMA-designated floodplain. Table B-9 details the flood events, causing $100,000 or more in damage, within Kearney County, according to NCDC.

Table B-9. Kearney County Historical Flood Occurrences

Location	Date	Type	Property Damage	Crop Damage
Kearney County	06/01/1995	Flood	$20,000	$80,000
Kearney County	06/19/2000	Flash Flood	$250,000	$3,000,000
Kearney County	05/11/2005	Flash Flood	$3,000,000	$1,000,000
Newark	05/29/2008	Flash Flood	$25,000	$500,000

According to FEMA's Repetitive Loss list, no repetitive loss properties exist in Kearney County.

Vulnerability Assessment

Flooding poses a threat to Kearney County. The county has various streams meandering through it, the Platte River along the north county line and the beginning of the Little Blue River. Urban flooding is also a threat in the communities of Kearney County if the storm sewer system's capacity was overwhelmed by the runoff resulting from such an event. If a flood event were to affect the county, the resulting damage could include structural damage, especially if these structures are located in a FEMA-designated floodplain or floodway; downed trees or limbs; downed power lines; dam or levee failure; roadway and bridge failures; crop damage; and potential loss of life. In heavy rainfall and flooding, emergency response vehicles may have limited access to residents in the county, especially in the event of road or bridge failures, downed trees, or other debris or floodwaters blocking access routes. Residents could be in added danger if they are stranded in a vehicle during a flash flood, as waters rapidly rise and can quickly wash cars downstream. Dam or levee failure could cause large portions of communities to be affected by floodwaters and could threaten the lives of residents of each downstream community if proper warning is not given. Critical infrastructure also could be compromised, as flooding could cause sanitary sewer lines to back up, also posing a human safety risk, as well as potentially contaminating drinking water sources. Residents may need to be relocated until the floodwaters recede and critical infrastructure becomes operational. The functional downtime resulting from power outages and infrastructure failure would be extremely costly. Businesses and schools may need to be closed, which would negatively affect the economy of Kearney County. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 3,300 structures exist within the county. Of those, approximately 52 are critical facilities. Due to the extent of the county boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 3,300 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 2,612
- Mobile Housing Units 276
- Commercial/Industrial Properties 360
- Critical Facilities 52

To determine a reasonable estimate for future structures, a growth rate of approximately three percent over five years was assumed for the planning area. Therefore, approximately 3,399 structures could be affected in the future, and approximately 54 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

DAM FAILURE

Hazard Summary

A summary of information regarding dam failure may be found in the front portion of this plan. Please refer to the "Risk Assessment" section under "Dam Failure" to view this summary.

Historical Occurrences

Currently, 13 dams exist in Kearney County, all are low hazard dams. A low hazard dam would only damage minor resources in the event of failure. Currently, no records exist of dam failure in Kearney County.

Even though little risk exists for the dams located within the county, dams in surrounding counties could affect residents of Kearney County. According to the Kearney County Local Emergency Operations Plan (LEOP), the Kingsley Dam could affect the area. The dam is owned by the Central Nebraska Public Power & Irrigation District and is located near Ogallala, upstream from Kearney County. In the event of a failure, the inundation area would likely affect portions of the county along the Platte River.

Vulnerability Assessment

Dam failure poses a threat to the property located downstream. In the event of a dam failure, the inundation areas contained within the emergency action plans, which are on file with the NDNR, show the areas that would be affected in such an event. The action plans are unavailable for release because of security concerns.

If a dam were to fail, potential damage could include structural damage to homes, businesses, and critical facilities; power outages; and potential loss of life. Roads or bridges may fail depending on the location of the dams, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for extended periods of time, which would severely affect the local economy.

Potential Impact

Dam failure could affect portions of Kearney County, and impacts from the resulting flooding could last for days or even weeks. If a dam failure were to occur, it was assumed that approximately 11.11 percent of the county would be affected. This information was based on the following 'flooding' formula:

Total Damages Recorded ($13,755,000) / Total Events Recorded (9) =
Average Damage per Event ($1,528,333)

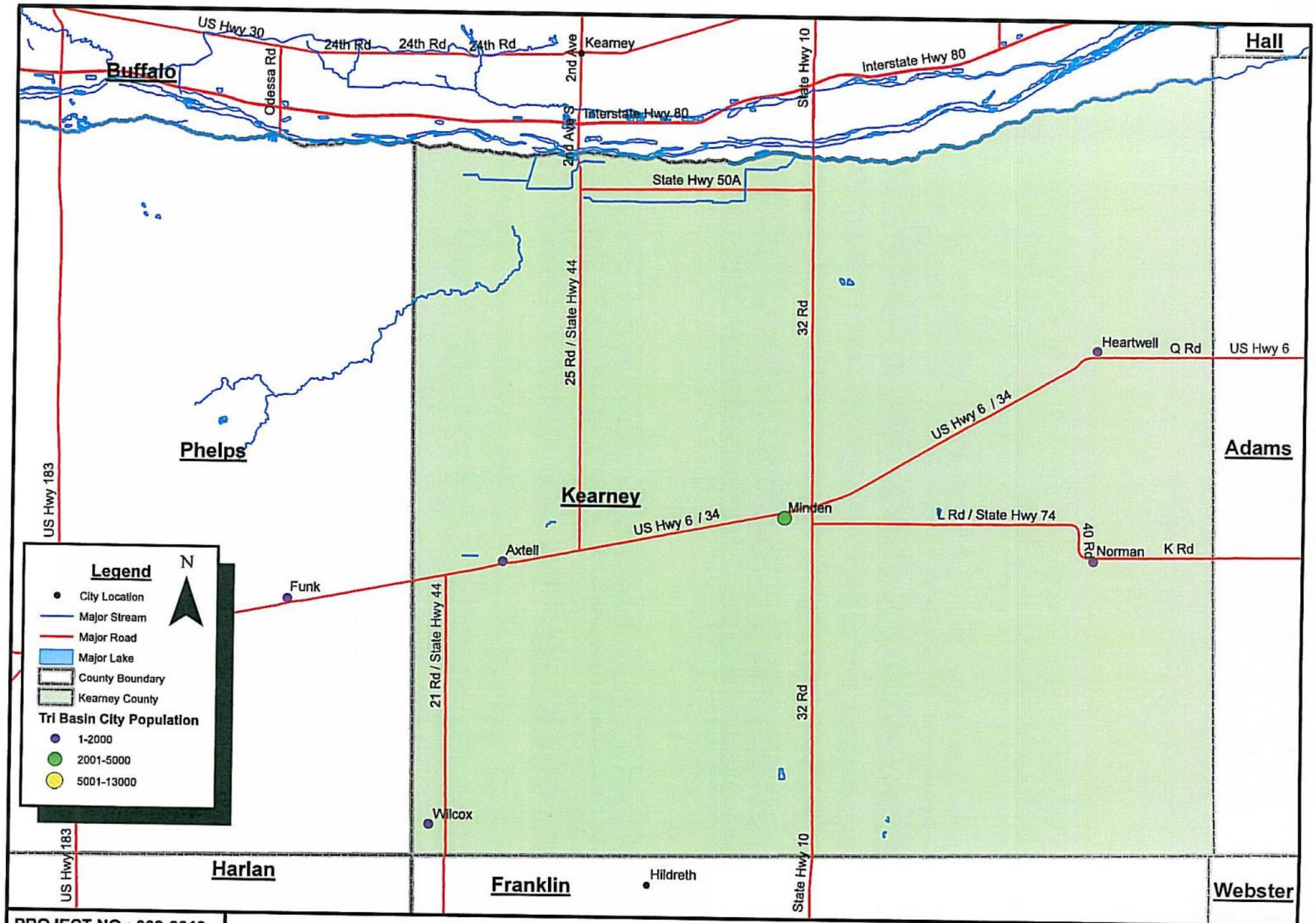
Average Damage per Event ($1,528,333) / Total Damages Recorded ($13,755,000) =
Percent Average Damage per Event (11.11%)

Percent Average Damage per Event (11.11%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($57,060,424)

*Damage totals based on historical occurrences with significant damages listed in the table above.
*Valuations based on League of Municipalities 2013

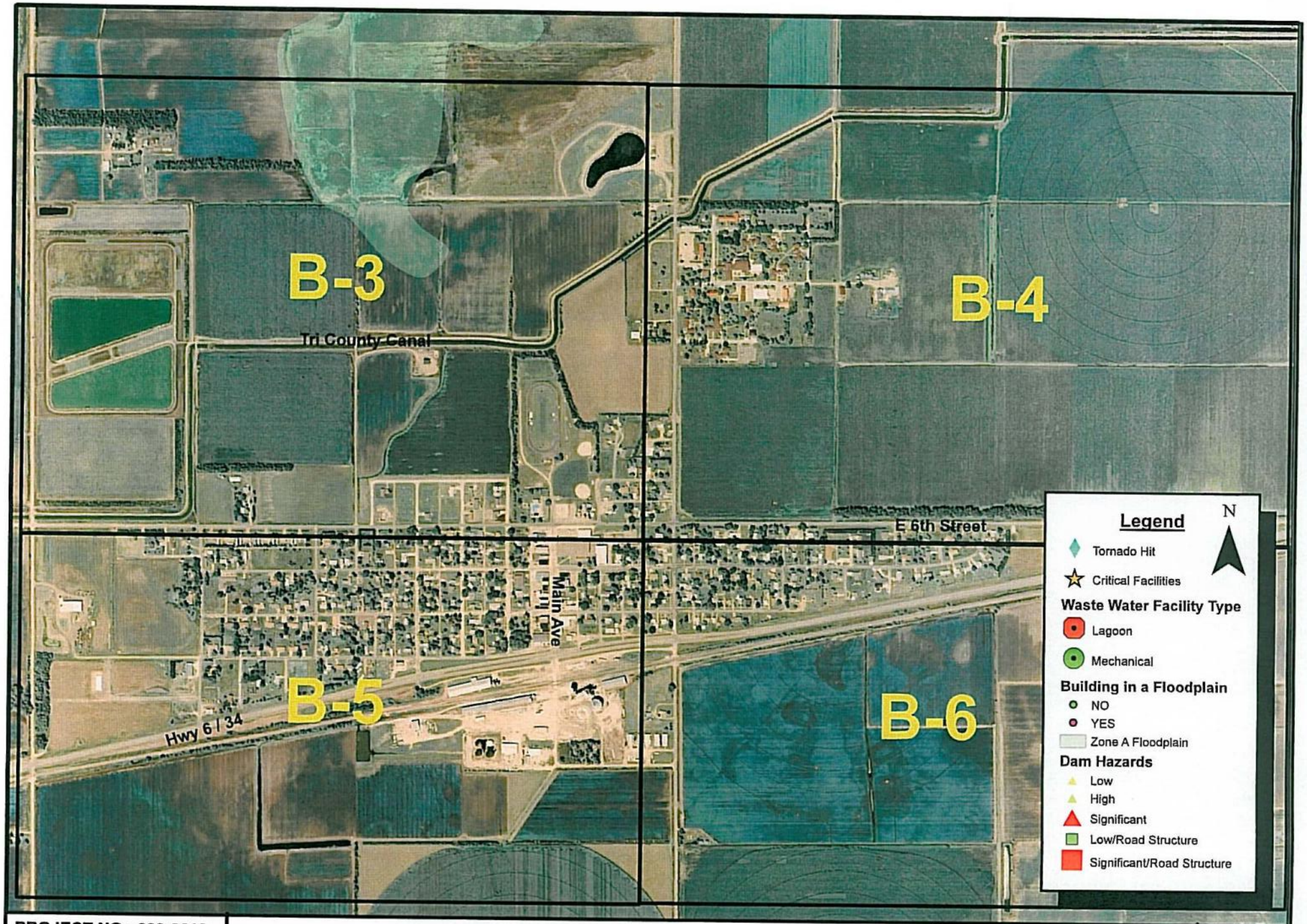
Jurisdictions	Structural Valuation	Damage Estimate
Minden	$148,902,231	$16,543,038
Axtell	$30,304,143	$3,366,790
Heartwell	$2,031,812	$225,734
Norman	$1,855,074	$206,099
Wilcox	$12,081,359	$1,342,239

It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.

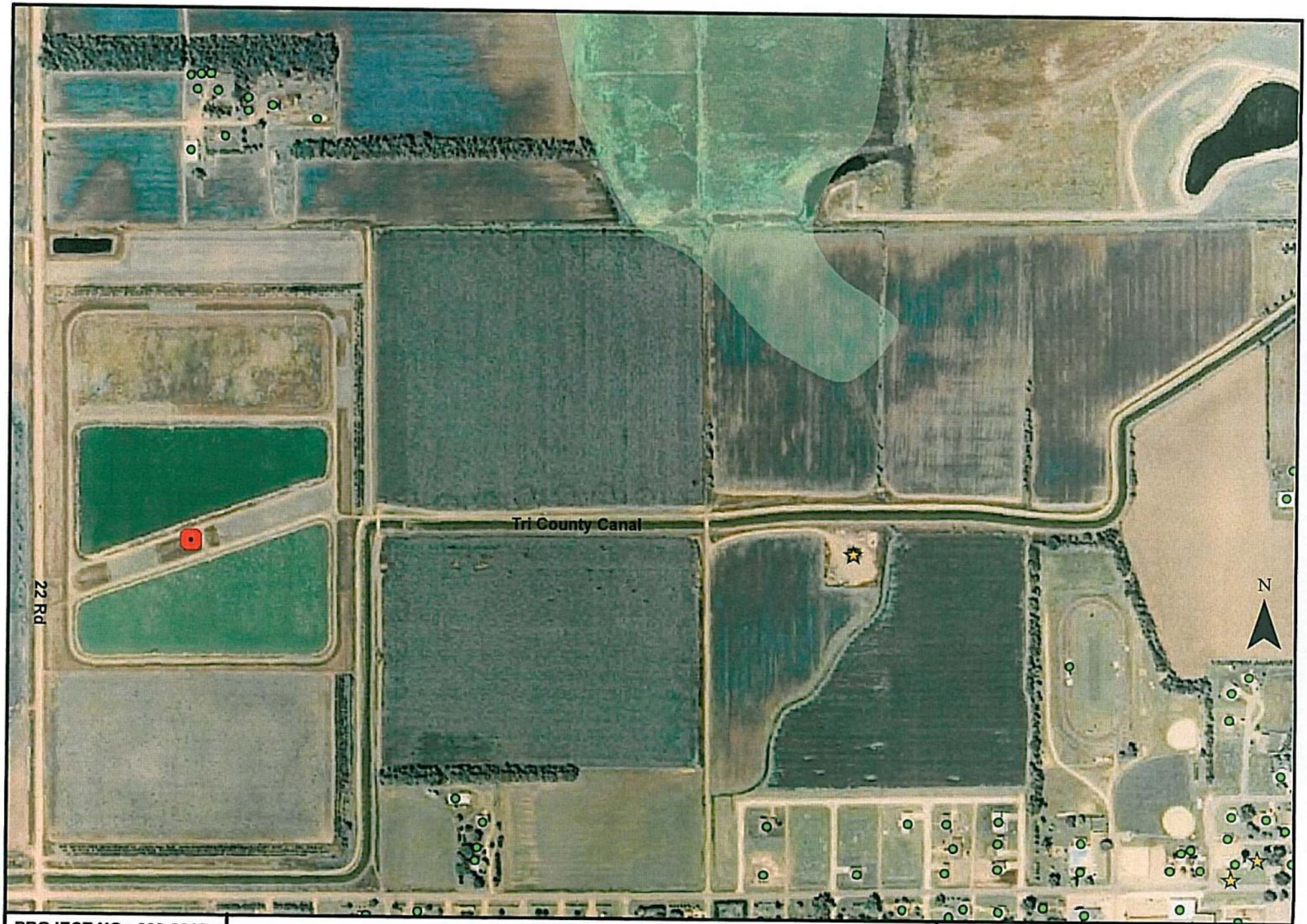


PROJECT NO.: 009-0613	KEARNEY COUNTY ALL - HAZARDS MITIGATION PLAN	MAP B-1
DRAWN BY: MDH		
DATE: JUNE 2010		

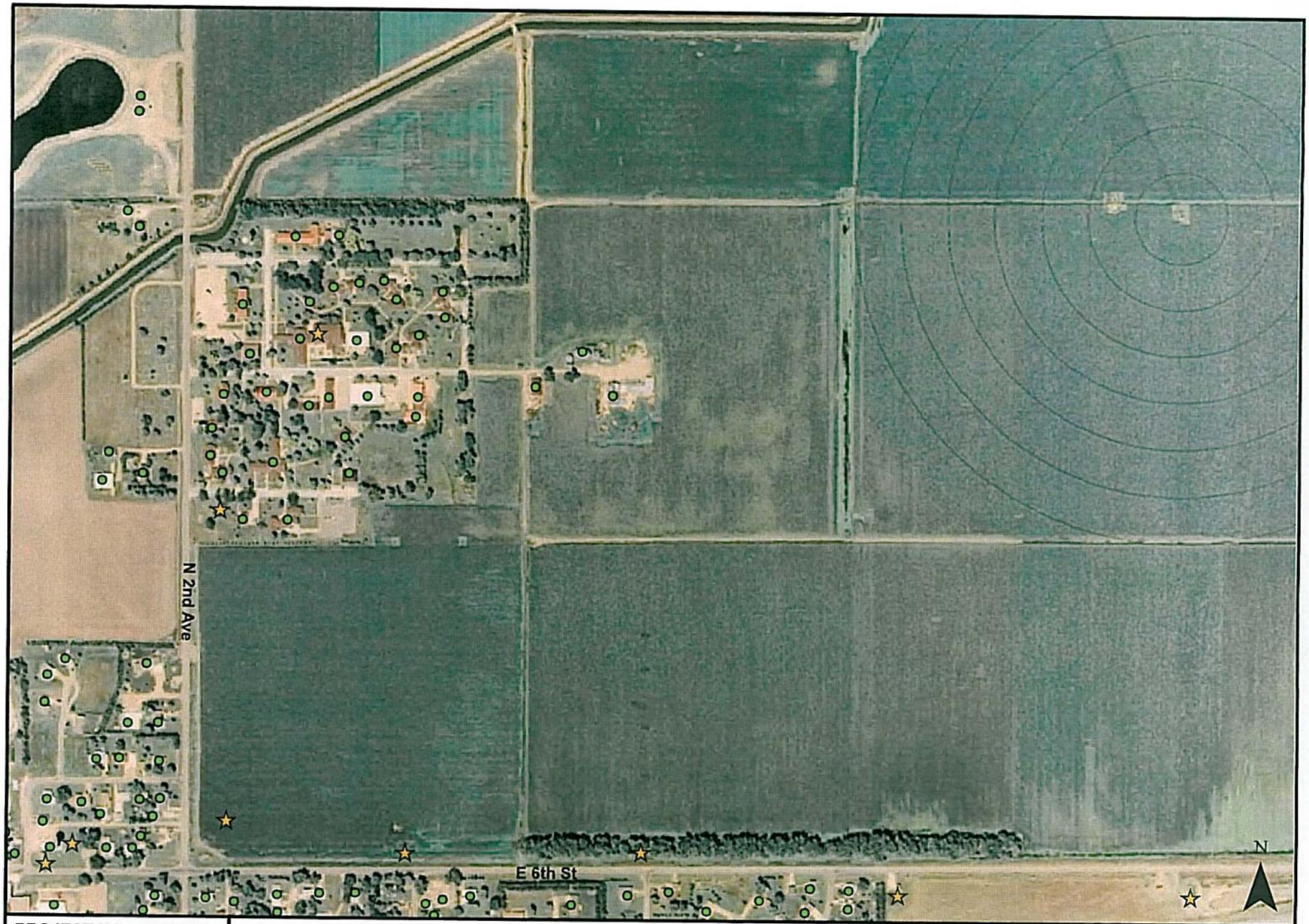
OLSSON ASSOCIATES



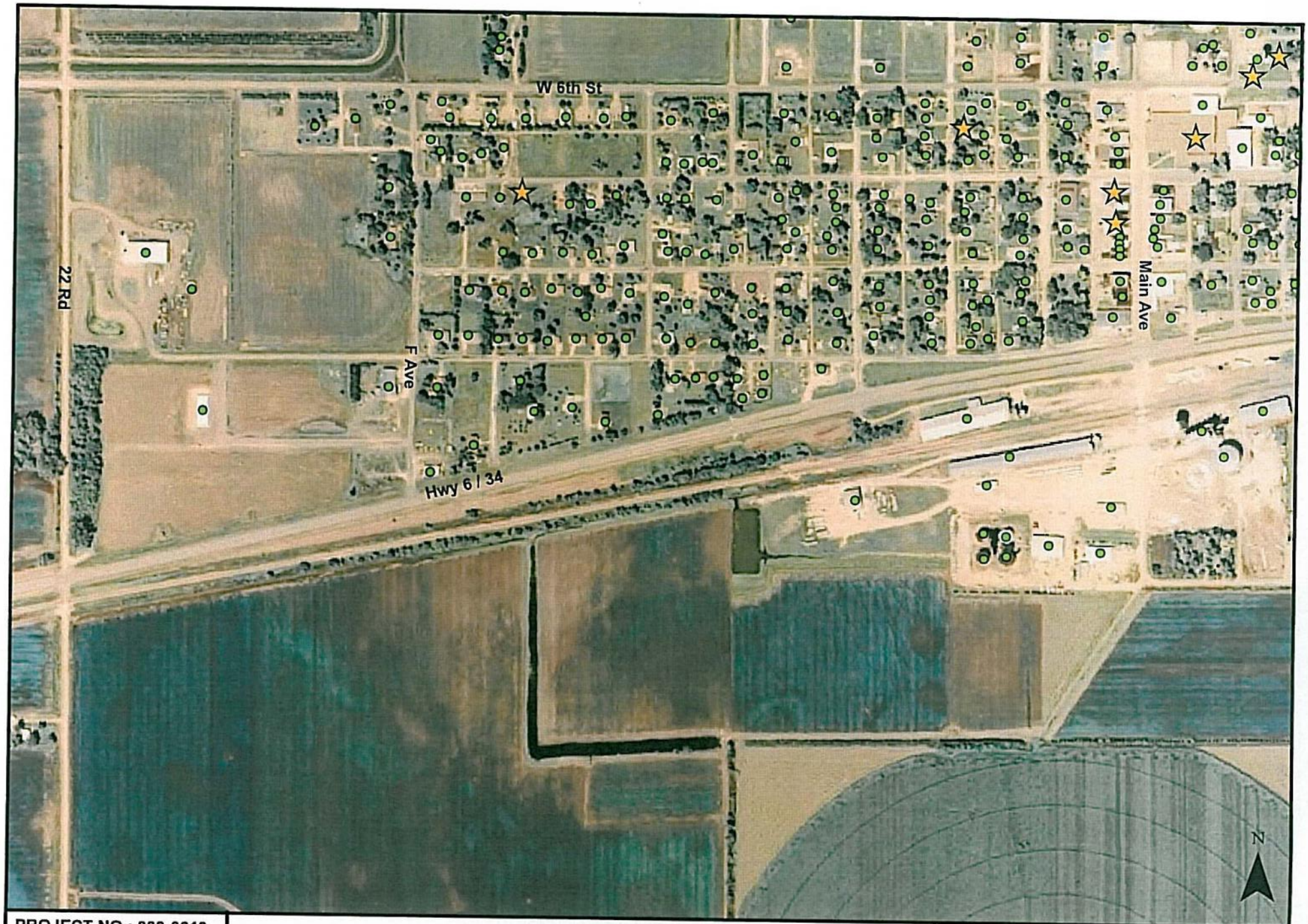
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF AXTELL - INDEX MAP** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP B-2



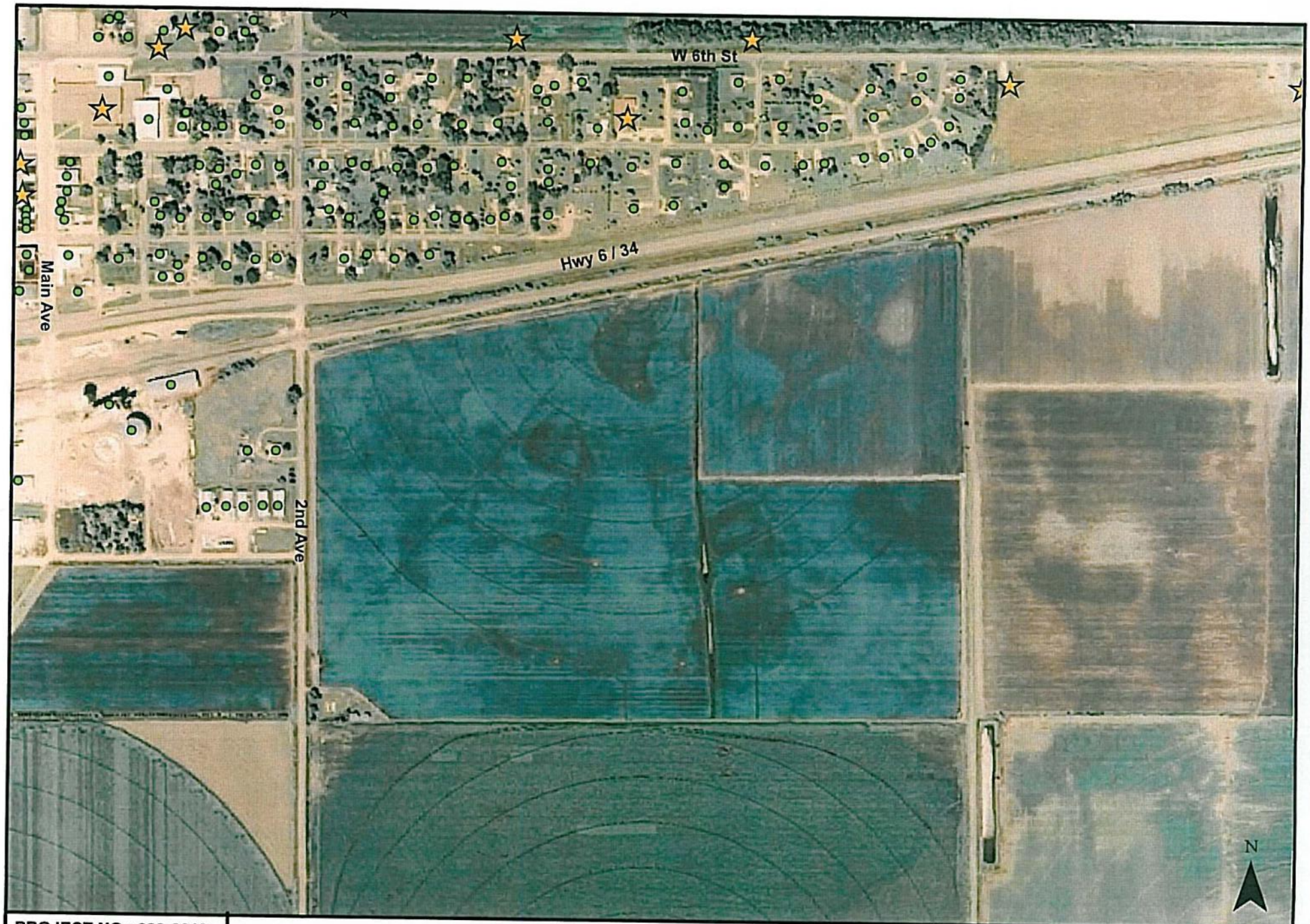
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF AXTELL** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-3**



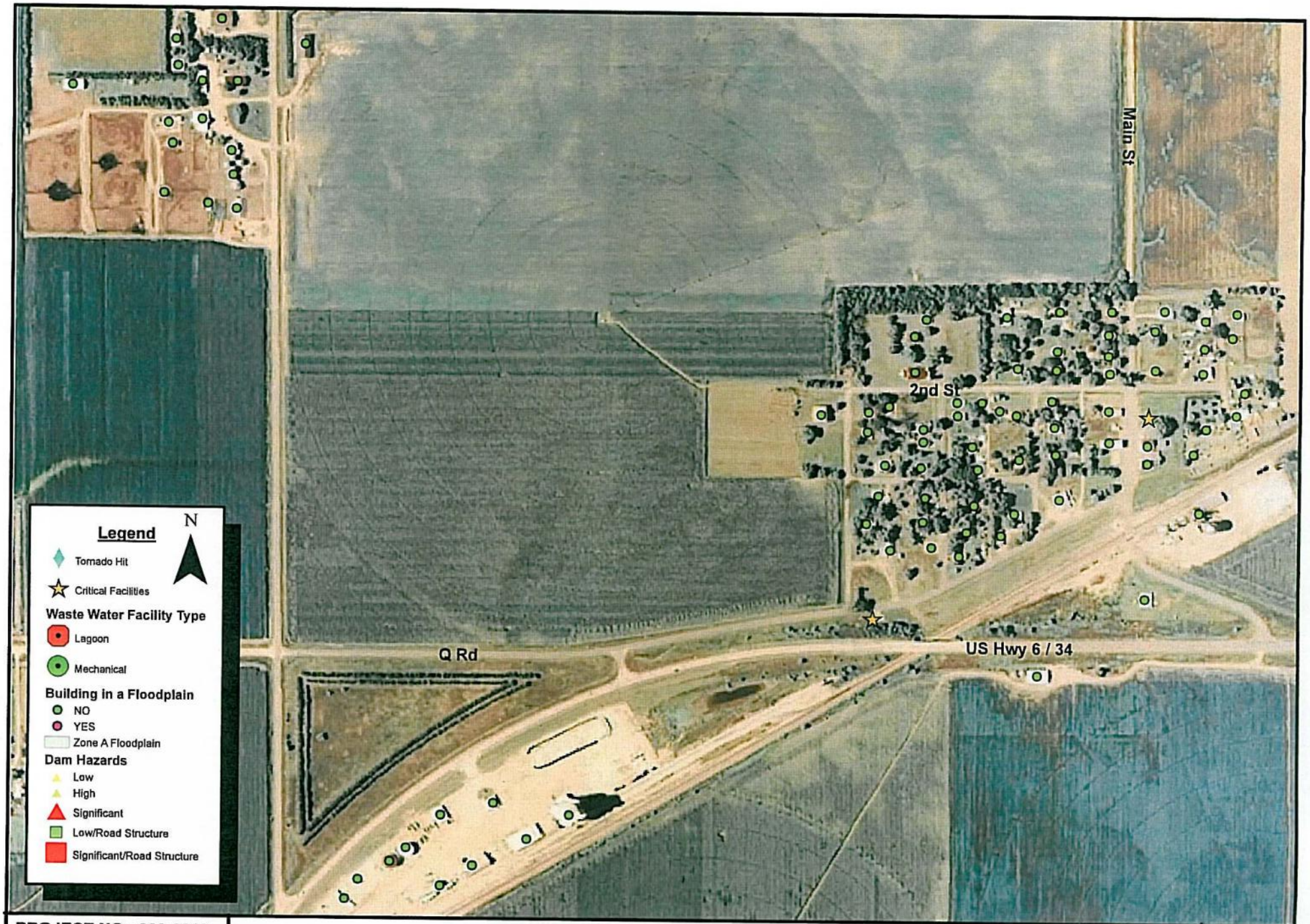
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF AXTELL** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-4**



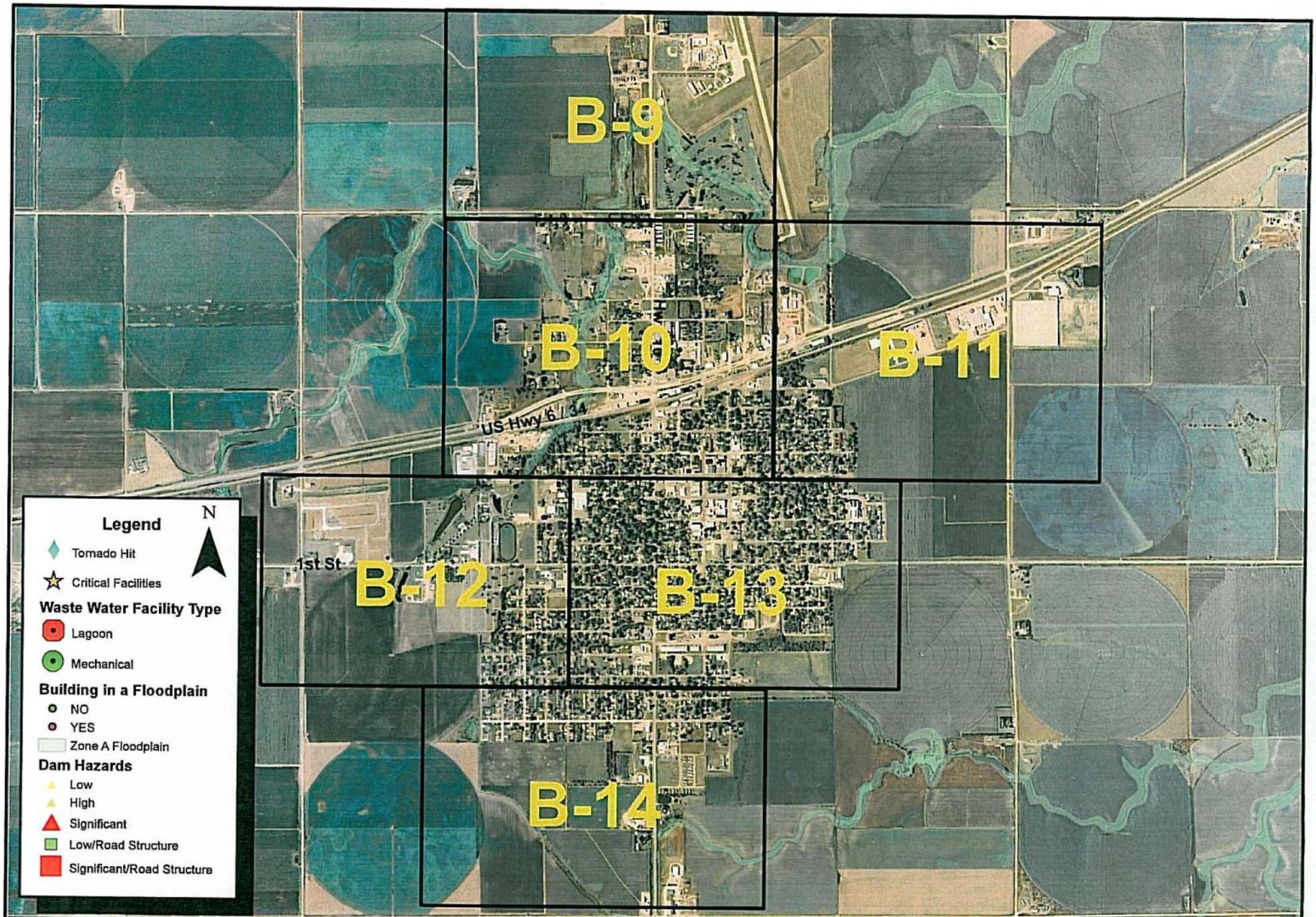
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF AXTELL** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-5**



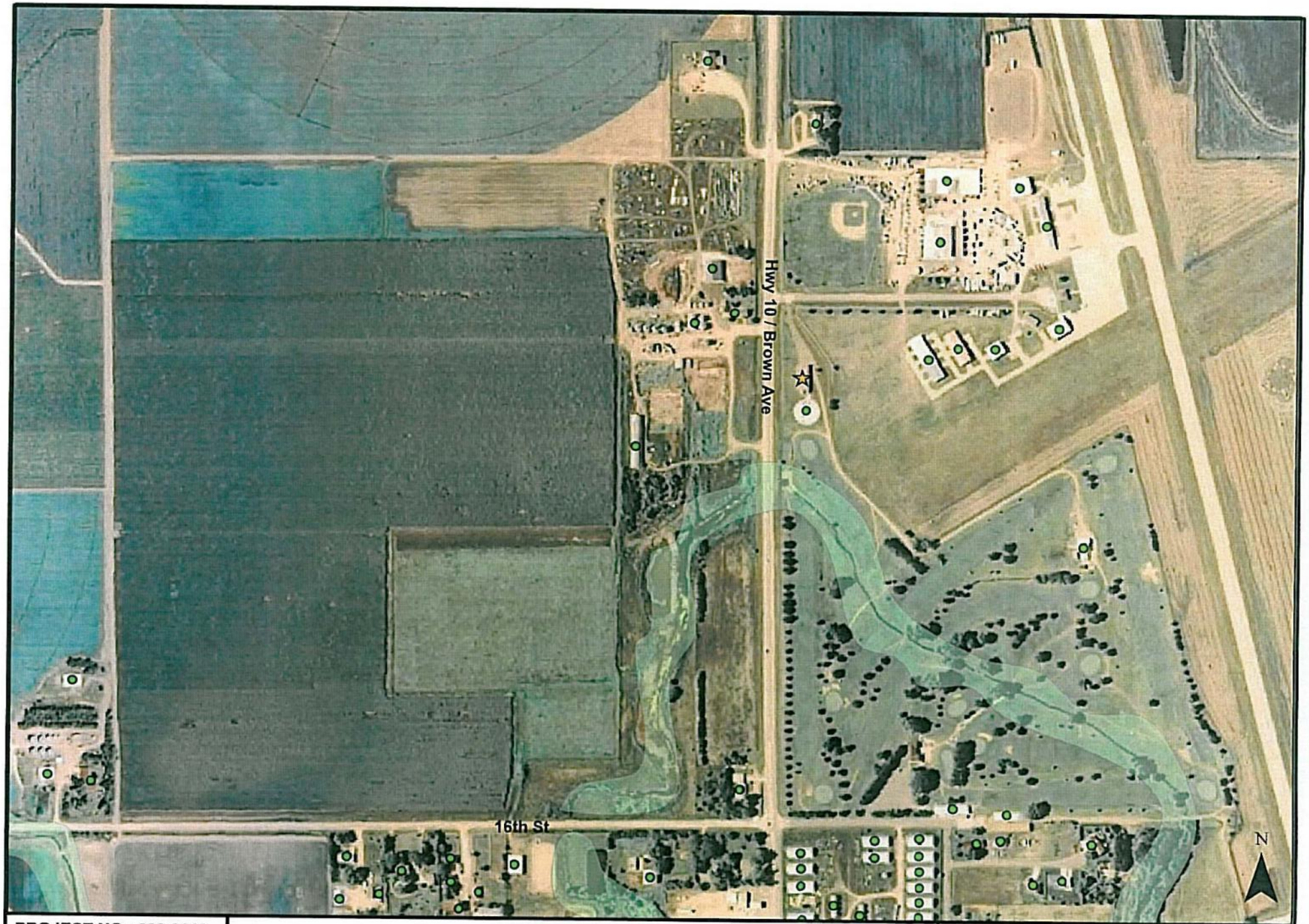
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF AXTELL** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-6**



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF HEARTWELL** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-7**

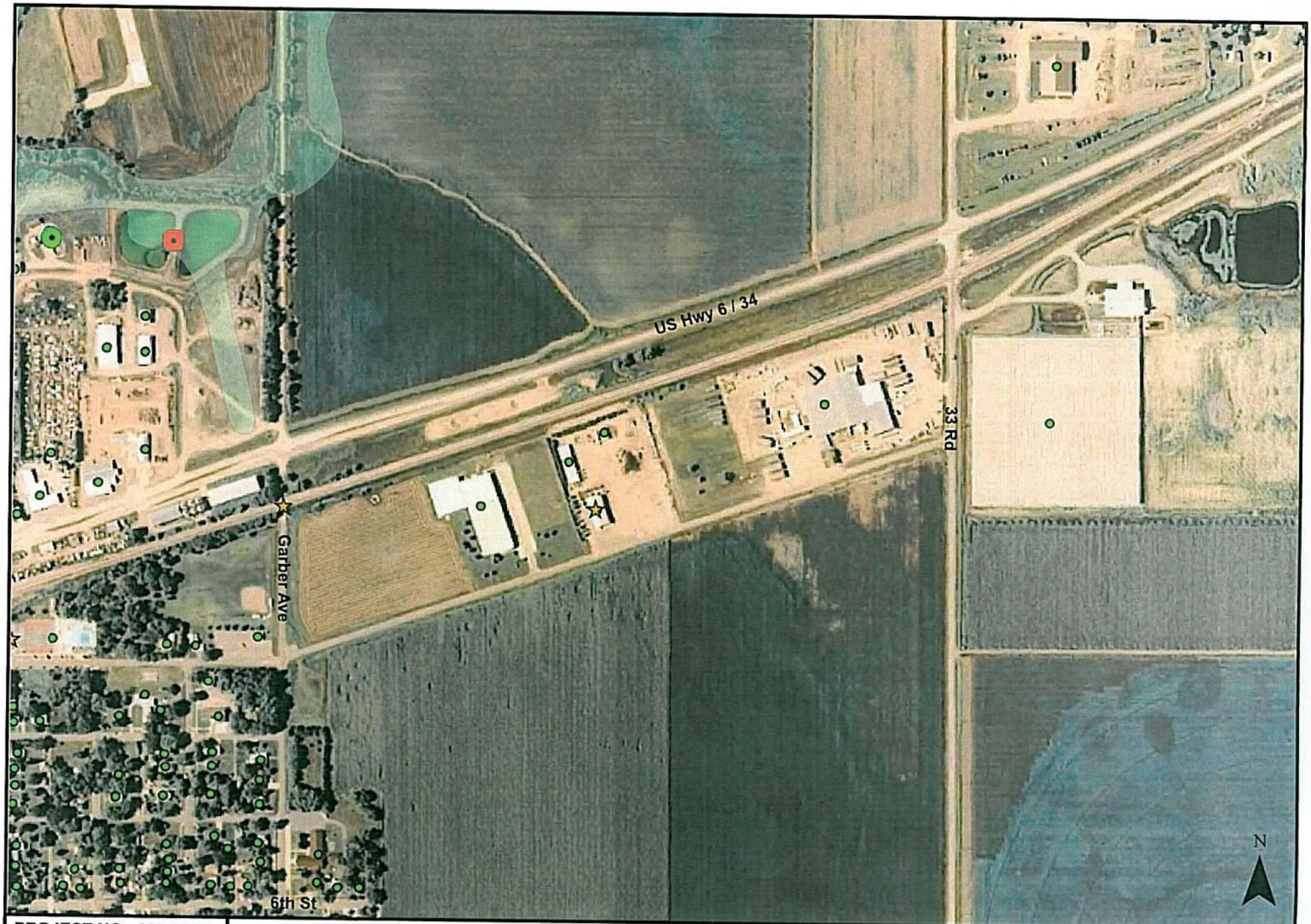


PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN - INDEX MAP** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-8**

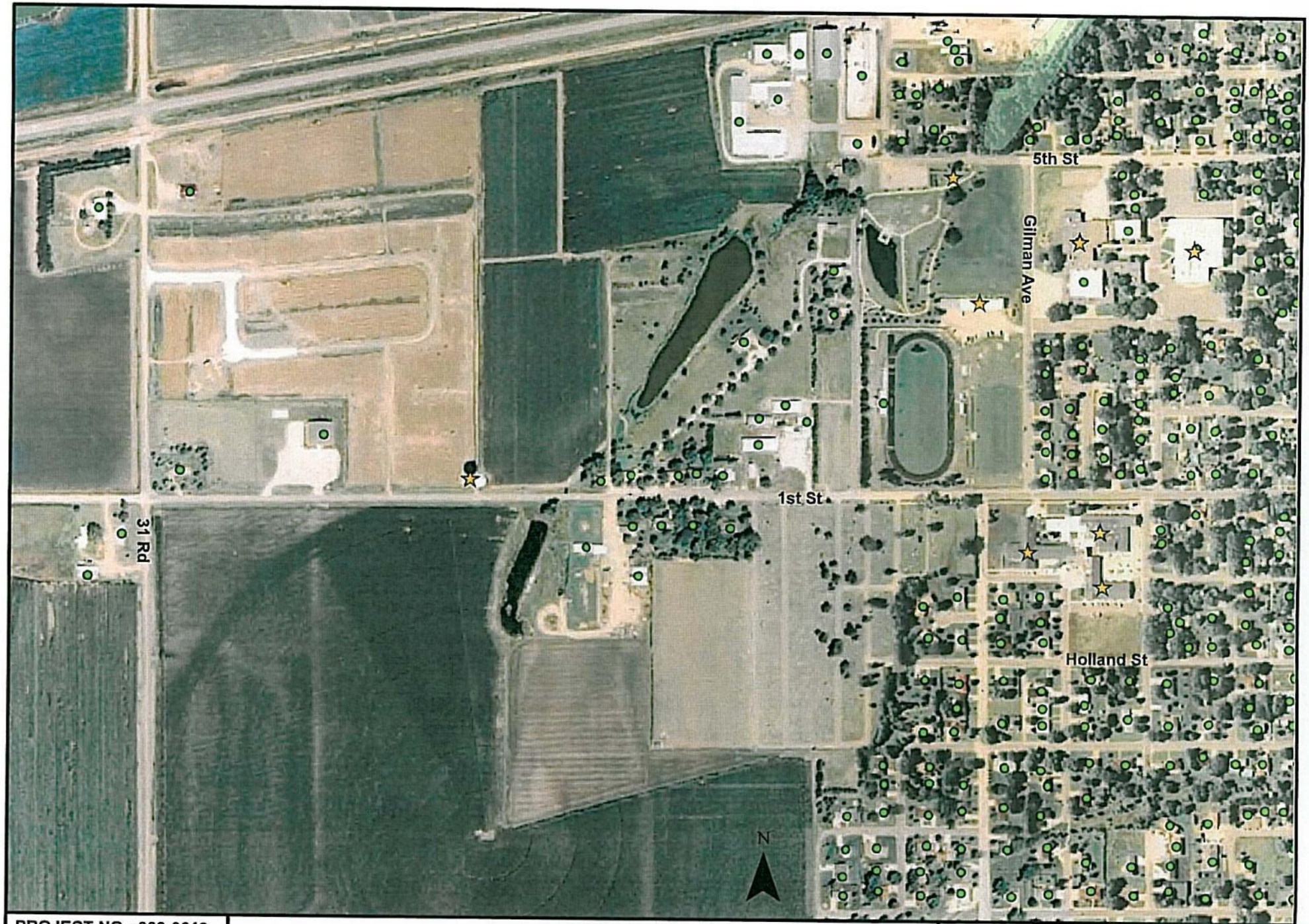


PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-9**

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-10**

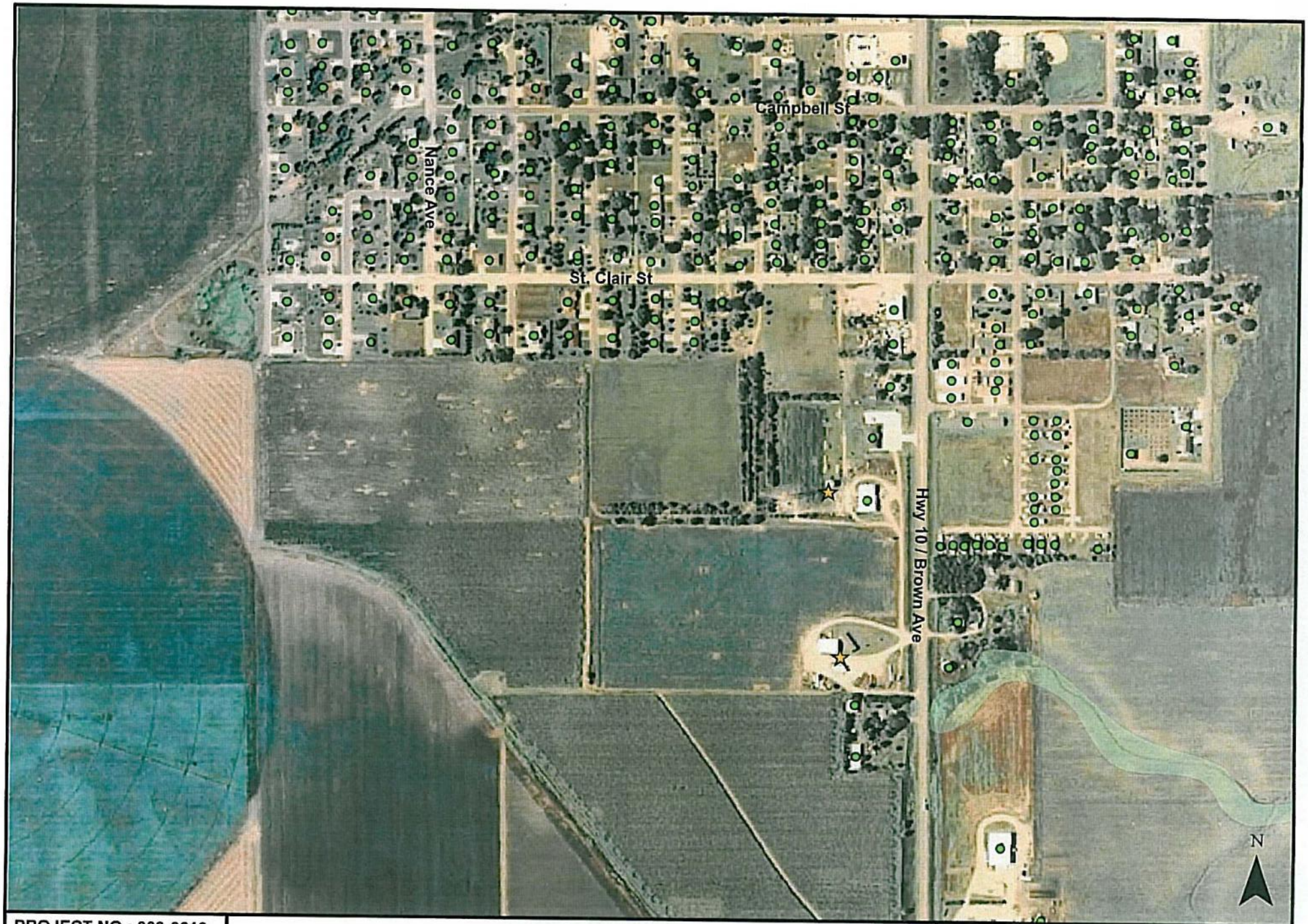


PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-11**

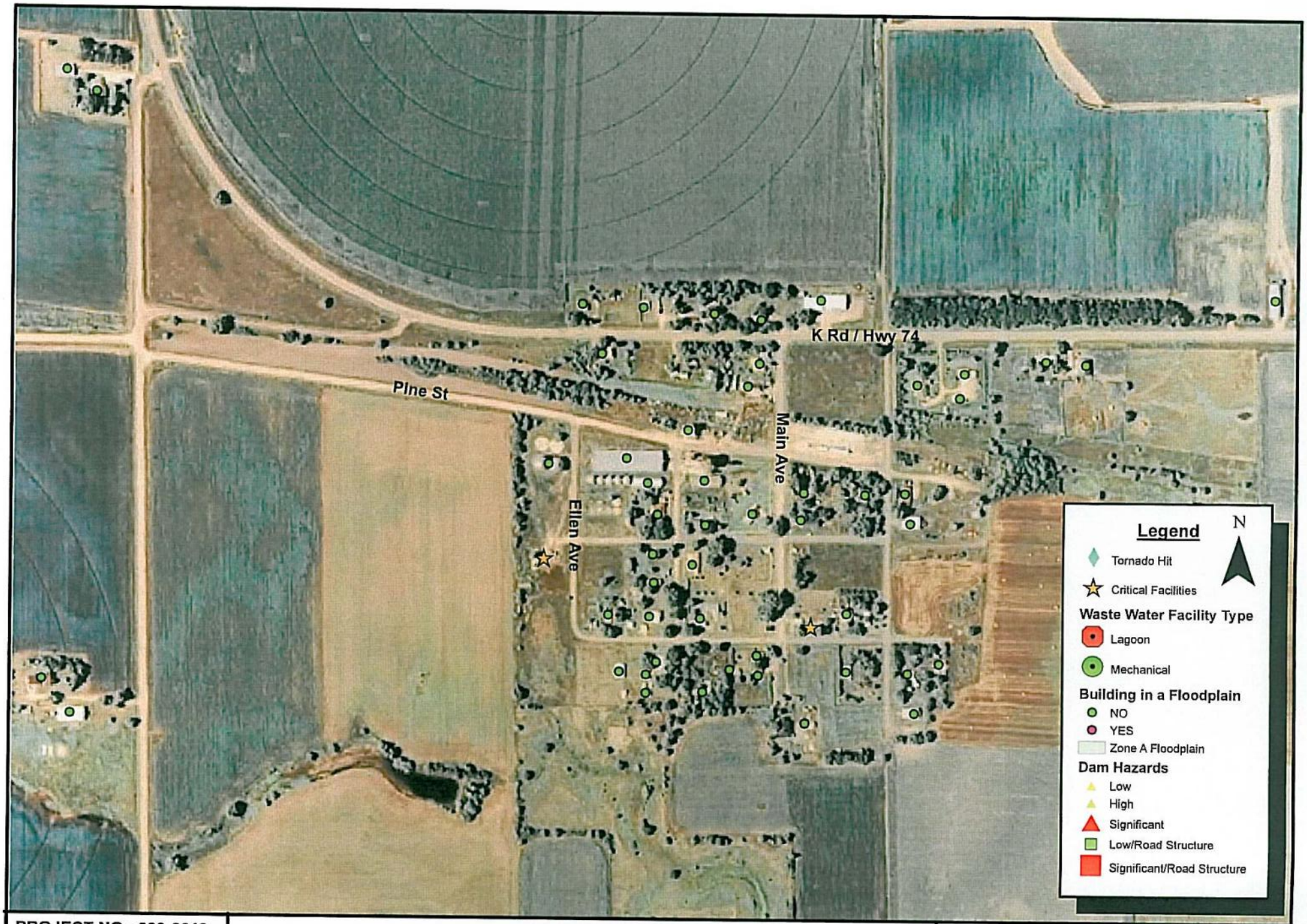


PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-12**

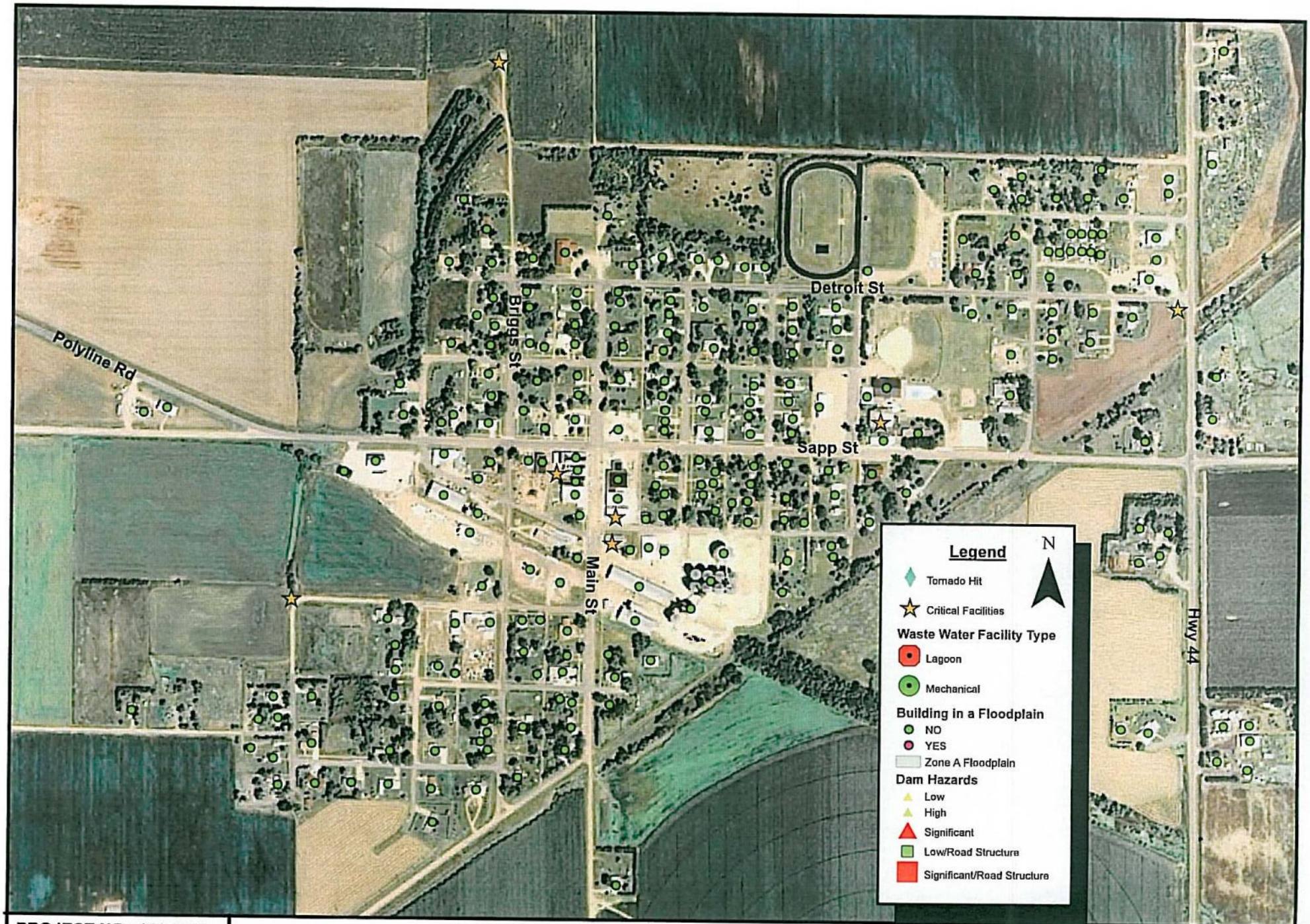
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-13**



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF MINDEN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-14**



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF NORMAN** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-15**



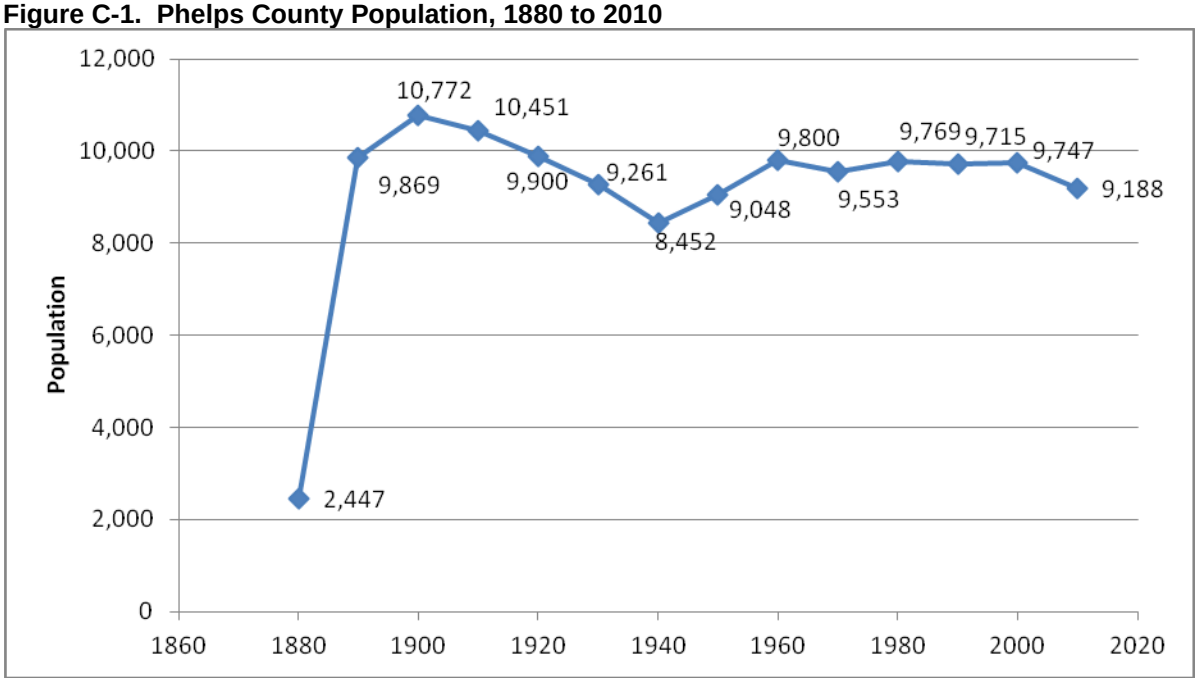
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF WILCOX** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **B-16**

APPENDIX C: PHELPS COUNTY

DEMOGRAPHIC SUMMARY

According to the U.S Census Bureau, the total population of Phelps County in 2010 was 9,188. The population in the county has decreased slightly during the past few years, as the population in 2000 was 9,747. Figure C-1 shows the population trend in Phelps County since 1880.

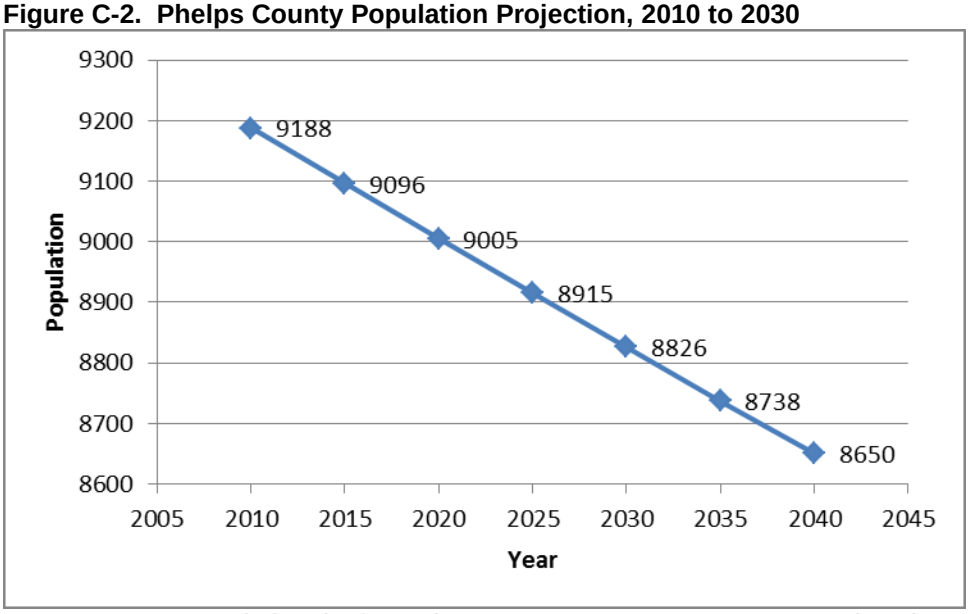
Figure C-1. Phelps County Population, 1880 to 2010



Sources: Nebraska State Data Center, Center for Public Affairs Research, University of Nebraska – Omaha, U.S. Bureau of Census, '2010 Census of Population and Housing', 'CPH-2-29, Population and Housing Unit Counts, Nebraska', Census Web Site (www.census.gov) and similar publications for preceding years.

The population of Phelps County is projected to decrease over time, as shown in Figure C-2. Based on the information found on the U.S. Census Bureau Web site, the population in the county has decreased from 2000 to 2010.

Figure C-2. Phelps County Population Projection, 2010 to 2030



Source: 2010 population is from the 2010 US Census Bureau, University of Nebraska, Bureau of Business Research, Nebraska County Population Projections

The gender breakdown for Phelps County per the 2010 U.S. Census Bureau information (most recent information) is 49.5 percent male and 50.5 percent female. Table C-1 depicts the age characteristics of Phelps County.

Table C-1. Age Characteristics of Phelps County, 2010		
Age	**Number of People**	**Percent of Total**
Under 5 years	594	6.8%
5 to 9 years	638	6.2%
10 to 14 years	636	6.6%
15 to 19 years	569	6.7%
20 to 24 years	400	3.8%
25 to 34 years	934	10.5%
35 to 44 years	1,043	11.4%
45 to 54 years	1,412	16.1%
55 to 59 years	660	7.4%
60 to 64 years	556	6.2%
65 to 74 years	798	8.7%
75 to 84 years	625	6.8%
85 years and older	323	3.5%
Table C-1. Age Characteristics of Phelps County, 2010 (Cont.)		
Age	**Number of People**	**Percent of Total**
18 years and over	6,930	75.4%
21 years and over	6,694	72.9%
62 years and over	2,077	22.6%
65 years and over	1,746	19.0%

Source: U.S. Census Bureau, DP-1. General Demographic Characteristics: 2010

As shown in Table C-1, the population varies among the age brackets; however, a higher percentage of the population falls between the ages of 35 to 54 than any other age bracket. A significant amount of the

population is also older than age 65, which is an important fact to consider when determining the best method of protection from hazards for citizens and communities.

Another important demographic detail that should not be overlooked is the housing occupancy and the age of the existing structures. Table C-2 shows the housing occupancy and tenure in Phelps County.

Table C-2. Units in Residential Structure of Phelps County, 2010 Census		
Subject	**Number of Units**	**Percent of Total**
Total Housing Units	4,193	100.0%
1-unit, detached	3,426	91.4%
1-unit, attached	29	0.7%
2 units	116	2.8%
3 or 4 units	145	3.5%
5 to 9 units	28	0.7%
10 to 19 units	116	2.8%
20 or more units	116	2.8%
Mobile home	217	5.2%
Boat, RV, Van, etc.	0	0.0%
Subtotals		
Permanent Housing Units	3976	94.8%
Mobile Housing Units	217	5.2%

Source: U.S. Census Bureau, DP-4. Selected Housing Characteristics: 2010

Permanent Housing Units are typically built with more substantial building materials and building codes than Mobile Housing Units. For the purposes of this plan, Permanent Housing Units are considered housing units permanently attached to a foundation, and include all housing types listed in Table C-2 except Mobile homes and Boat, RV, Van, etc. categories.

Table C-3 shows the age of homes within Phelps County, to help determine the level of damage that could be seen if a hazard occurs.

Table C-3. Age of Structures in Phelps County, 2010 Census		
Year Structure Built	**Number**	**Percent of Total**
2005 or later	31	0.7%
2000 to 2004	166	4.0%
1990 to 1999	396	9.4%
1980 to 1989	278	6.6%
1970 to 1979	708	16.9%
1960 to 1969	395	9.4%
1950 to 1959	409	9.8%
1940 to 1949	341	8.1%
1939 or earlier	1,469	35.0%

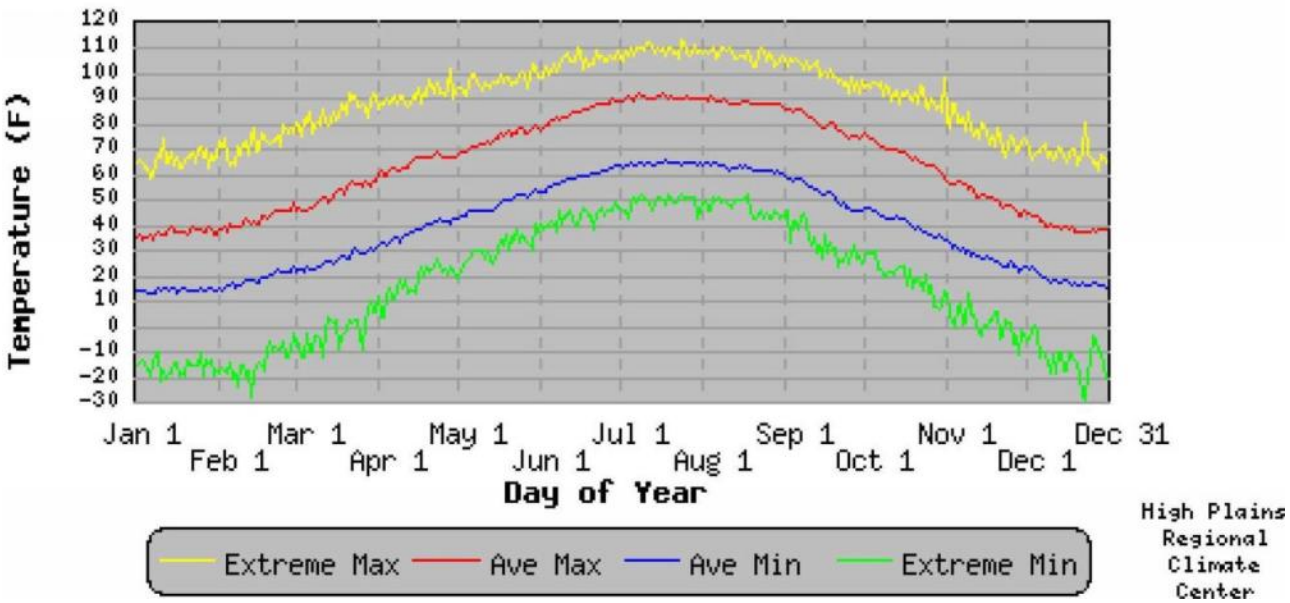
Source: U.S. Census Bureau, DP-4. Profile of Selected Housing Characteristics: 2010

In addition to the data on residences within Phelps County, the Nebraska Department of Revenue lists 567 properties as either commercial or industrial in nature.

CLIMATE SUMMARY

Nebraska has a continental climate, meaning the state experiences highly variable temperatures from season to season. In general, Phelps County sees average maximum temperatures in the mid- to upper-30s in January and December; temperatures in the 40s in February, March, and November; temperatures in the mid- to upper-60s in April and October; temperatures in the mid- to upper-70s in May and September; and temperatures in the 80s from June through August. The record high was 113 degrees F on July 24, 1936. The average minimum temperatures range from being in the teens in January, February, and December; to being in the mid- to upper-20s in March and November; to being in the upper-30s in April and October; to being in the low-40s to mid-50s in May, June, August, and September; to being in the mid-60s in July. The record low, of minus 29 degrees F, occurred on December 23, 1989. The average annual precipitation is just more than 26 inches, with the maximum daily rainfall of 4.85 inches on July 19, 1988, and the average annual snowfall is nearly 29 inches, with the maximum daily snowfall amount of 22 inches on March 29, 1901. Figure C-3 depicts the daily temperature averages and extremes, in a period from 1893 to 2008, in Holdrege. According to the High Plains Regional Climate Center, the daily extreme maximum temperature is the maximum of all daily maximum temperatures recorded for that day of the year. The average maximum is the average of all daily maximum temperatures recorded for that day of the year. The average minimum is the average of all daily minimum temperatures recorded for that day of the year. The extreme minimum is the minimum of all daily minimum temperatures recorded for that day of the year.

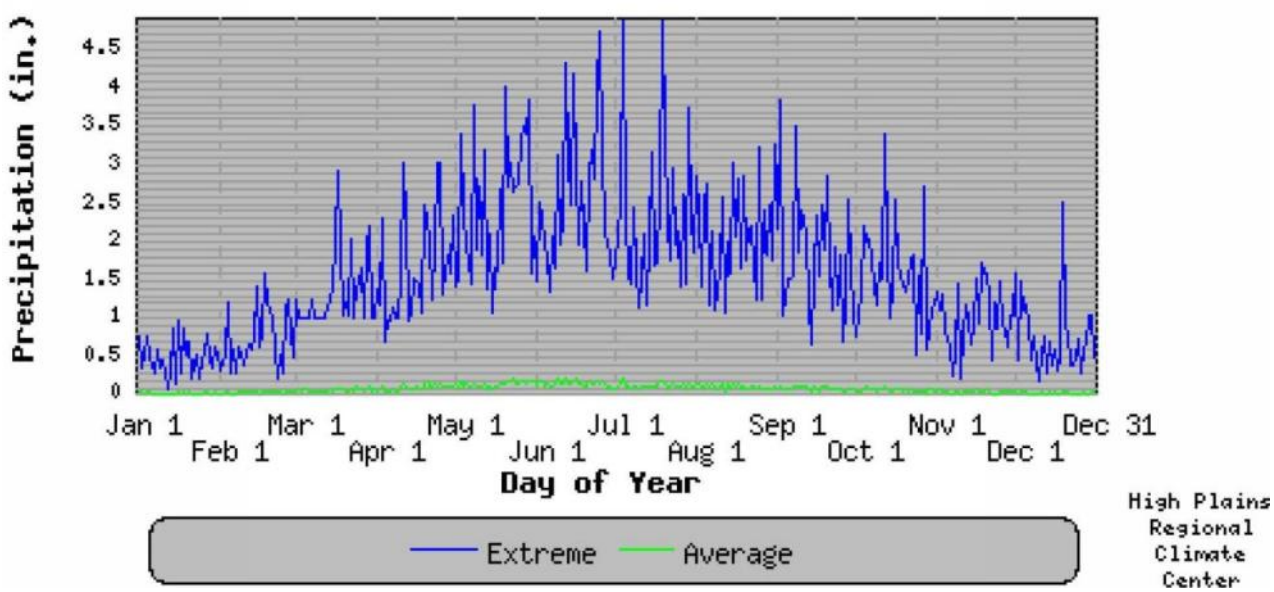
Figure C-3. Daily Temperature Averages and Extremes



Source: High Plains Regional Climate Center

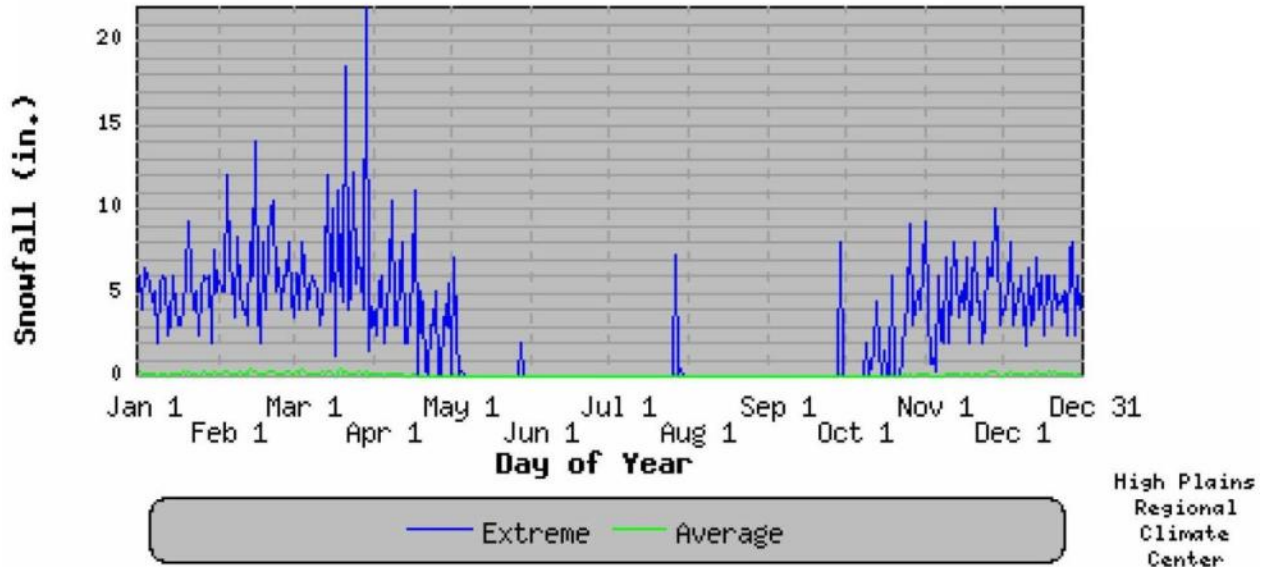
Figure C-4 shows the precipitation averages and extremes for Phelps County. Figure C-5 details the snowfall averages and extremes for Phelps County. The daily extreme is the greatest precipitation or snowfall recorded for that day of the year, and the daily average is the average of all daily precipitation of snowfall recorded for that day of the year.

Figure C-4. Daily Precipitation Averages and Extremes



Source: High Plains Regional Climate Center

Figure C-5. Daily Snowfall Averages and Extremes



Source: High Plains Regional Climate Center

HAZARD IDENTIFICATION

A wide range of hazards affect Phelps County, and history has proven that many different types of hazards can cause extensive damage. In fact, from 1999 through 2008, four federally declared disasters have affected Phelps County.

The federally declared disasters did not have a significant time span between each, reinforcing the fact that another extensive disaster could occur at any time. In fact, a disaster was declared in 2004, 2005, 2007, and 2008, which makes this planning effort even more beneficial in Phelps County.

To obtain support from the communities, public meetings discussing the planning process were scheduled in the beginning stages of the planning process. The public meeting results for Phelps County are detailed in the following section.

The information obtained through public input was analyzed by Olsson Associates to determine the hazards that are of biggest concern to the entities throughout the county. Table C-4 summarizes the results of the Phelps County survey forms. The probability and extent are based solely on public opinion. The column listing past occurrences indicates whether the hazard has affected Phelps County in previous years. This information was provided by the National Climatic Data Center (NCDC) and the county emergency management directors.

Table C-4. Phelps County Hazard Identification

Hazard	Risk	Vulnerability	Past Occurrence
Thunderstorms/High Winds/Lighting/Hail	Highly Likely	Catastrophic	Yes
Tornadoes	Highly Likely	Catastrophic	Yes
Severe Winter Storms	Highly Likely	Catastrophic	Yes
Droughts	Likely	Critical	Yes
Flooding	Possible	Limited	Yes
Landslide	Unlikely	Negligible	No
Wildfires	Unlikely	Limited	No
Earthquakes	Unlikely	Limited	No
Dam Failure	Unlikely	Negligible	No

The information summarized above is an average of the results for all entities in Phelps County.

FLOODING

Hazard Summary

A summary of information regarding flooding may be found in the front portion of this plan. Please refer to the "Risk Assessment" section under "Flooding" to view this summary.

Historical Occurrences

According to the NCDC, since 1950, nine flood events have been recorded in Phelps County. Many of these storms produced either little or no recorded damage. In Phelps County it would not be unreasonable to see flooding resulting from ravine flooding, flash flooding, ice jams, and urban drainage system flooding. Approximately 4,500 structures exist in Phelps County, and, of those structures, approximately 20 structures are within the FEMA-designated floodplain. Table C-9 details the flood events, causing $100,000 or more in damage, within Phelps County according to NCDC.

Table C-9. Phelps County Historical Flood Occurrences

Location	Date	Type	Property Damage	Crop Damage
Phelps County	06/01/1995	Flood	$20,000	$80,000
Phelps County	07/03/2000	Flash Flood	$150,000	$1,000,000
Phelps County	05/11/2005	Flash Flood	$1,000,000	$500,000

Northern Phelps County	09/05/2005	Flash Food	$25,000	$250,000
Holdrege	04/24/2007	Flash Flood	$75,000	$250,000
Westmark	05/29/2008	Flash Flood	$30,000	$500,000

According to FEMA's Repetitive Loss list, no repetitive loss properties exist in Phelps County.

Vulnerability Assessment

Flooding poses a threat to Phelps County, as the county has various streams meandering through it and the Platte River runs along the north border of the county. A threat of urban flooding also exists in the communities of Phelps County, if the storm sewer system's capacity was overwhelmed by the runoff resulting from such an event. If a flood event were to affect the county, the resulting damage could include structural damage, especially if these structures are located in a FEMA-designated floodplain or floodway; downed trees or limbs; downed power lines; dam or levee failure; roadway and bridge failures; crop damage; and potential loss of life. In the event of heavy rainfall and flooding, emergency response vehicles may have limited access to residents in the county, especially if roads or bridges fail or if downed trees or other debris or floodwaters block access routes. Residents could be in added danger if they are stranded in a vehicle during a flash flood, as waters rapidly rise and can quickly wash cars downstream. Dam or levee failure could cause large portions of communities to be affected by floodwaters and could threaten the lives of residents of each downstream community if proper warning is not given. Critical infrastructure also could be compromised, as flooding could cause sanitary sewer lines to back up, also posing a human safety risk, as well as potentially contaminating drinking water sources. Residents may need to be relocated until the floodwaters recede and critical infrastructure is operational. The functional downtime resulting from power outages and infrastructure failure would be extremely costly. Businesses and schools may need to be closed, which would have a detrimental effect on the economy of Phelps County. The damage resulting from such an event would affect existing and future structures, facilities, and population, depending on the areas affected. According to information obtained from the U.S. Census Bureau, approximately 4,822 structures exist within the county. Of those, approximately 67 are critical facilities. Due to the extent of the county boundaries, areas outside of community corporate limits were not included for critical facility counts, as it is difficult to determine critical facilities outside of community corporate limits. Of the approximately 4,822 structures, the following breakdown depicts the types of buildings that could be affected and the number of each type within the planning area:

- Permanent Housing Units 3,976
- Mobile Housing Units 217
- Commercial/Industrial Properties 562
- Critical Facilities 67

To determine a reasonable estimate for future structures, a growth rate of approximately negative one percent over five years was assumed for the planning area. Therefore, approximately 4,774 structures could be affected in the future, and approximately 67 of those structures in the future could be classified as critical facilities, based on the information collected. Additional information regarding building types in the planning area was unavailable but will be a focus of future plan updates.

DAM FAILURE

Hazard Summary

A summary of information regarding dam failure may be found in the front portion of this plan. Please refer to the "Risk Assessment" section under "Dam Failure" to view this summary.

Historical Occurrences

Five low hazard dams currently exist in Phelps County. A low hazard dam would only damage minor resources if it fails. Currently, no records exist of dam failure in Phelps County, but it is still imperative to include dam failure in this plan.

Even though little risk exists for dam failure within the county, dams in the area that could affect residents of Phelps County. In fact, according to the Phelps County Local Emergency Operations Plan (LEOP), the failure of Kingsley Dam or Johnson Lake Dam could cause significant damage, particularly along the Platte River. The Kingsley Dam is owned by the Central Nebraska Public Power & Irrigation District and is located in Ogallala upstream from Phelps County. If a dam fails, the inundation area would likely not affect the entire county. The Johnson Lake Dam is owned by the Central Nebraska Public Power & Irrigation District and is located in northern Gosper County upstream from Phelps County.

Vulnerability Assessment

Dam failure poses a threat to the property located downstream. In the event of a dam failure, the inundation areas contained within the emergency action plans, which are on file with the NDNR, show the areas that would be affected. The action plans are unavailable for release because of security concerns.

Even though little risk exists for the dams located within the county, dams in surrounding counties could still affect residents of Phelps County. If Kingsley Dam or Johnson Lake Dam were to fail, potential damage could include structural damage to homes, businesses, and critical facilities; power outages; and potential loss of life. Roads or bridges may fail, depending on the location of the dams, thus cutting off access for emergency response vehicles. If power outages were to occur, businesses and schools may need to be closed for extended periods of time, which would severely affect the local economy. If the dam were located just upstream of a community, loss of life in the inundation area could occur, especially if no warning is given and residents are caught unaware.

Potential Impact

Dam failure could affect portions of Phelps County, and impacts from the resulting flooding could last for days or even weeks. If a dam failure were to occur, it is assumed that approximately 11.11 percent of the county would be affected. This information is based on the following formula:

Total Damages Recorded ($13,755,000) / Total Events Recorded (9) =
Average Damage per Event ($1,528,333)

Average Damage per Event ($1,528,333) / Total Damages Recorded ($13,755,000) =
Percent Average Damage per Event (11.11%)

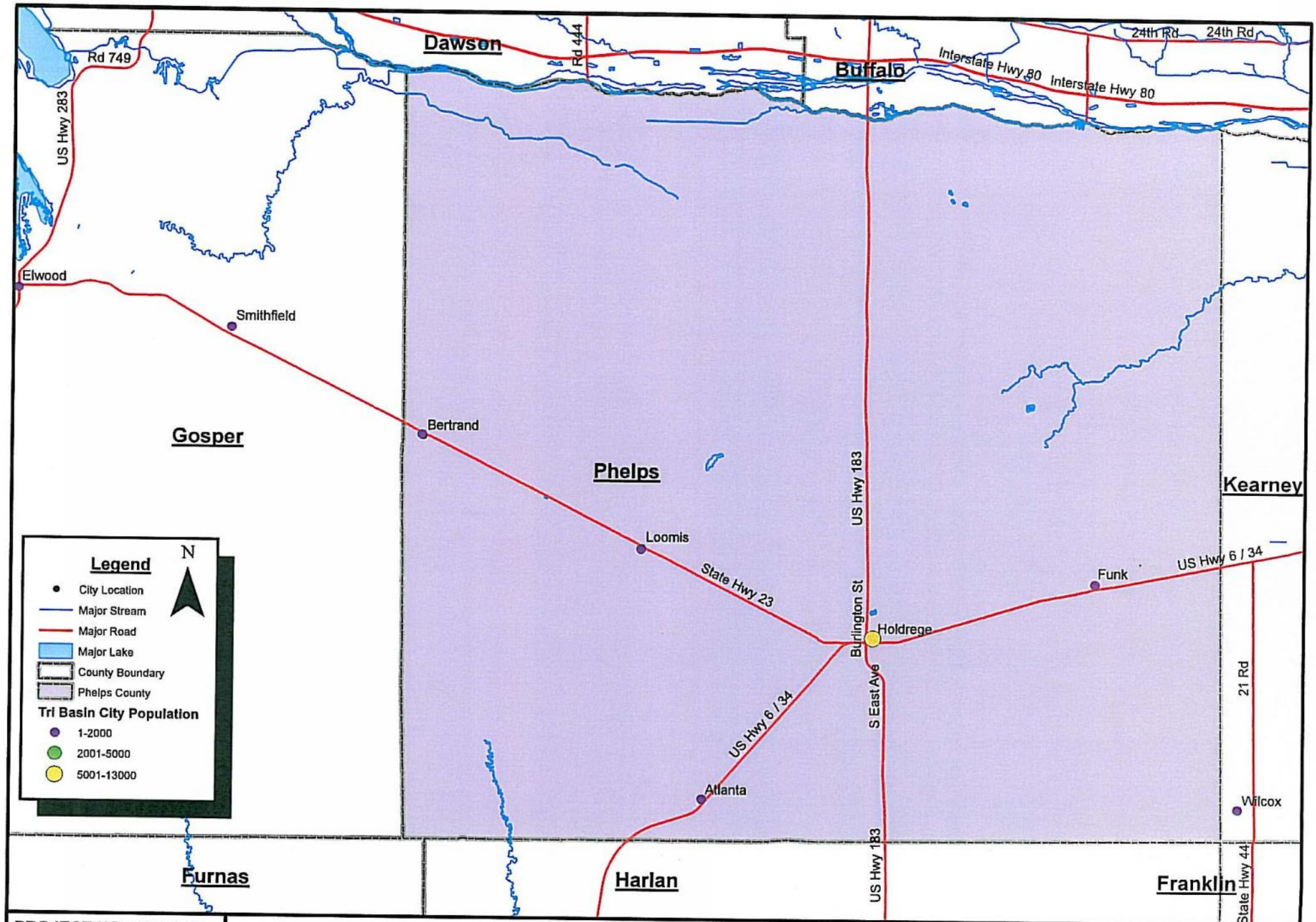
Percent Average Damage per Event (11.11%) * Structural Valuation ($513,595,175) =
Average Damage per Event Estimate ($57,060,424)

*Damage totals based on historical occurrences with significant damages listed in the table above.

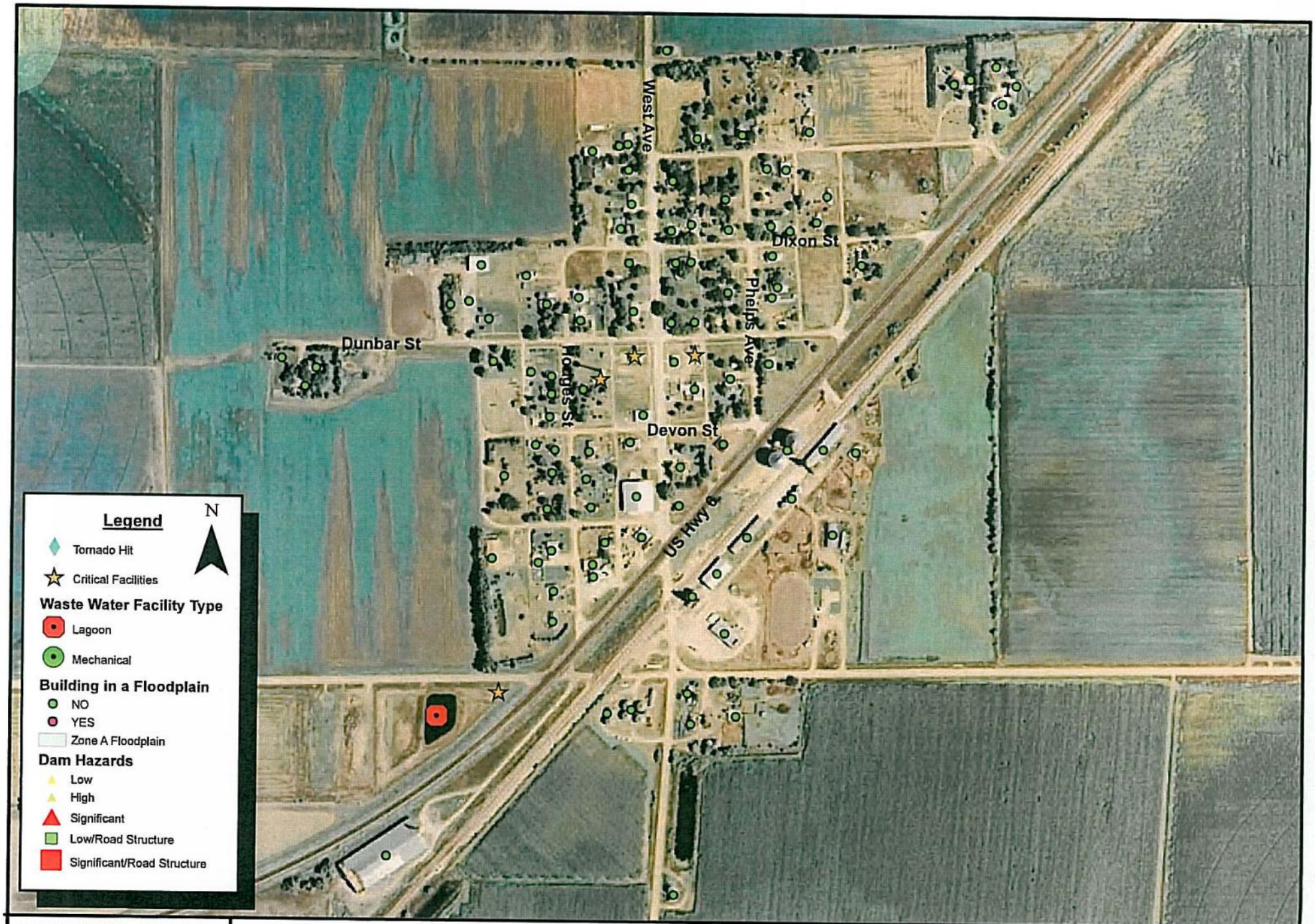
*Valuations based on League of Municipalities 2013

Jurisdictions	Structural Valuation	Damage Estimate
Atlanta	$3,704,187	$411,535
Bertrand	$25,735,608	$2,859,226
Funk	$11,595,958	$1,288,311
Holdrege	$229,201,515	$25,464,288
Loomis	$19,046,363	$2,116,051

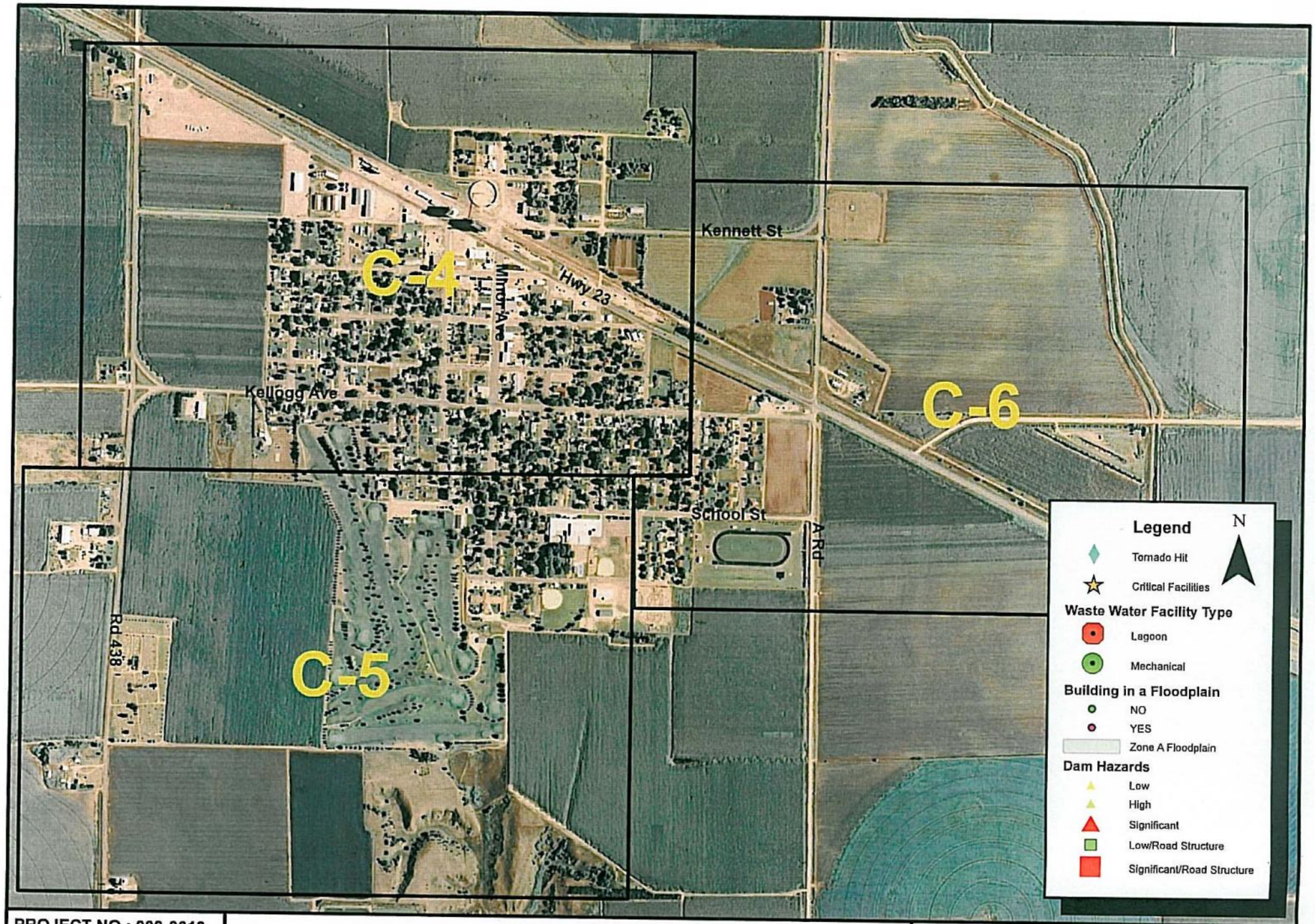
It is impossible to account for the costs associated with the loss of human life or livestock that could occur with these events.



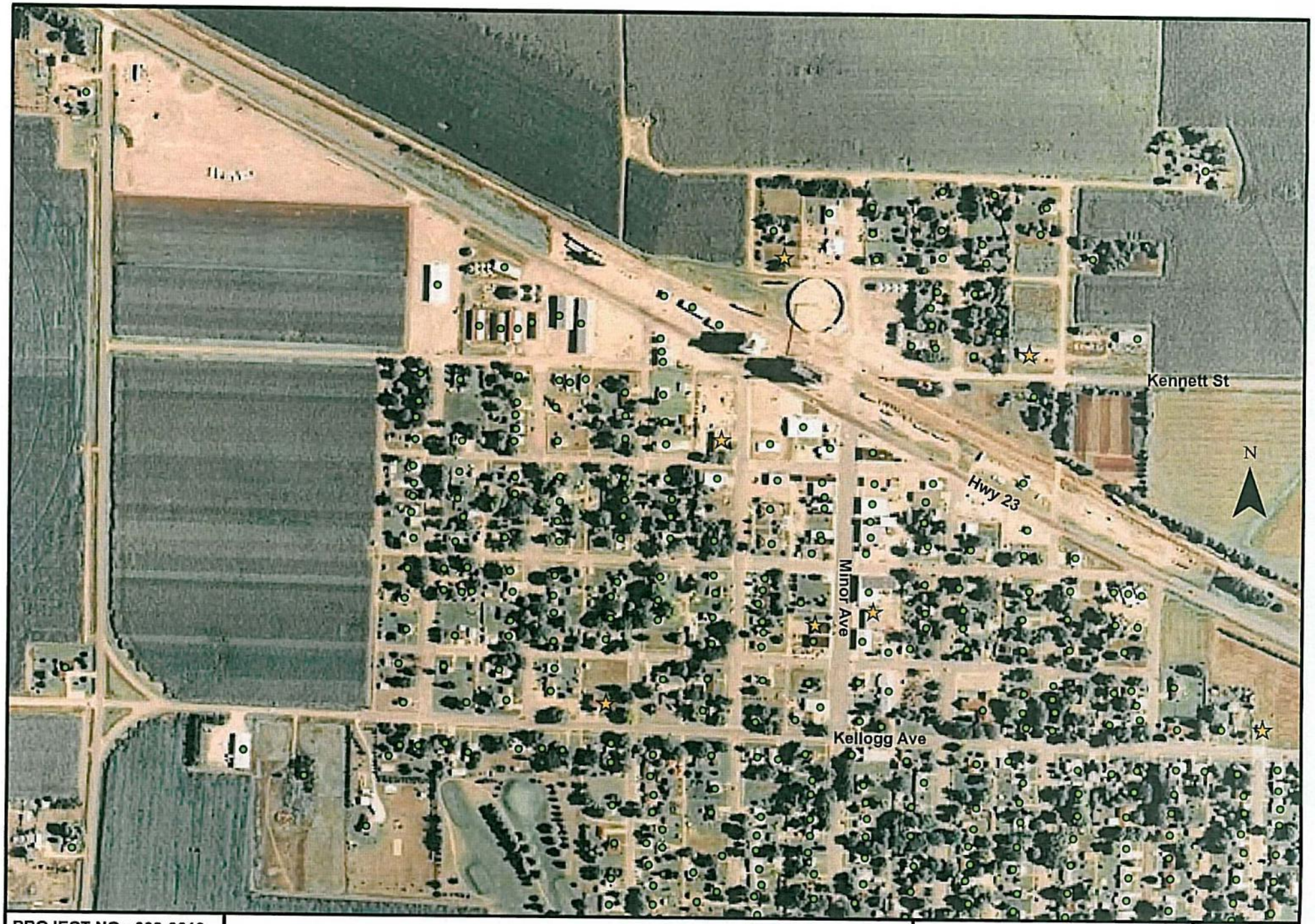
PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	**PHELPS COUNTY** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-1



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**VILLAGE OF ATLANTA** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-2

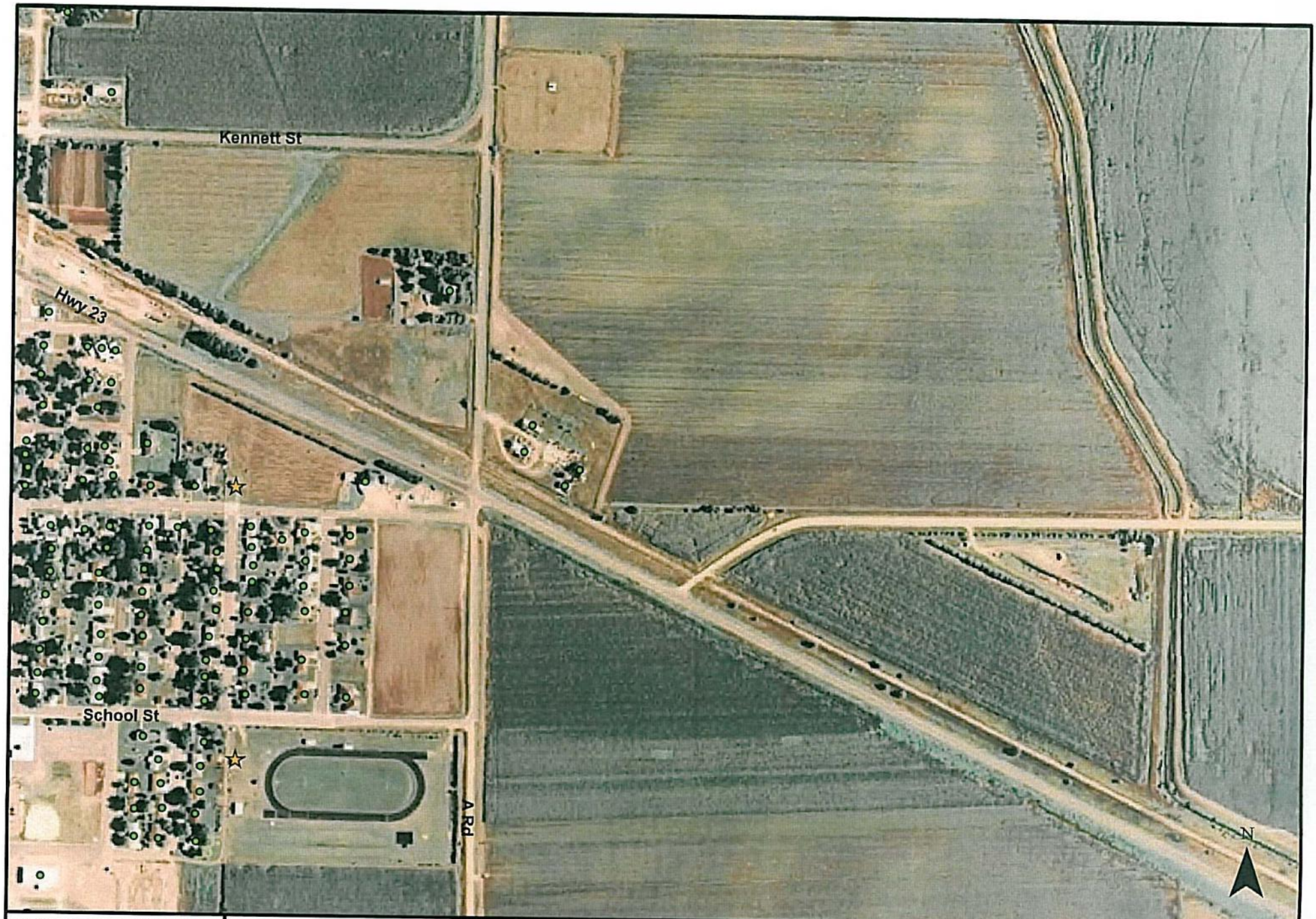


PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	**VILLAGE OF BERTRAND - INDEX MAP** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-3

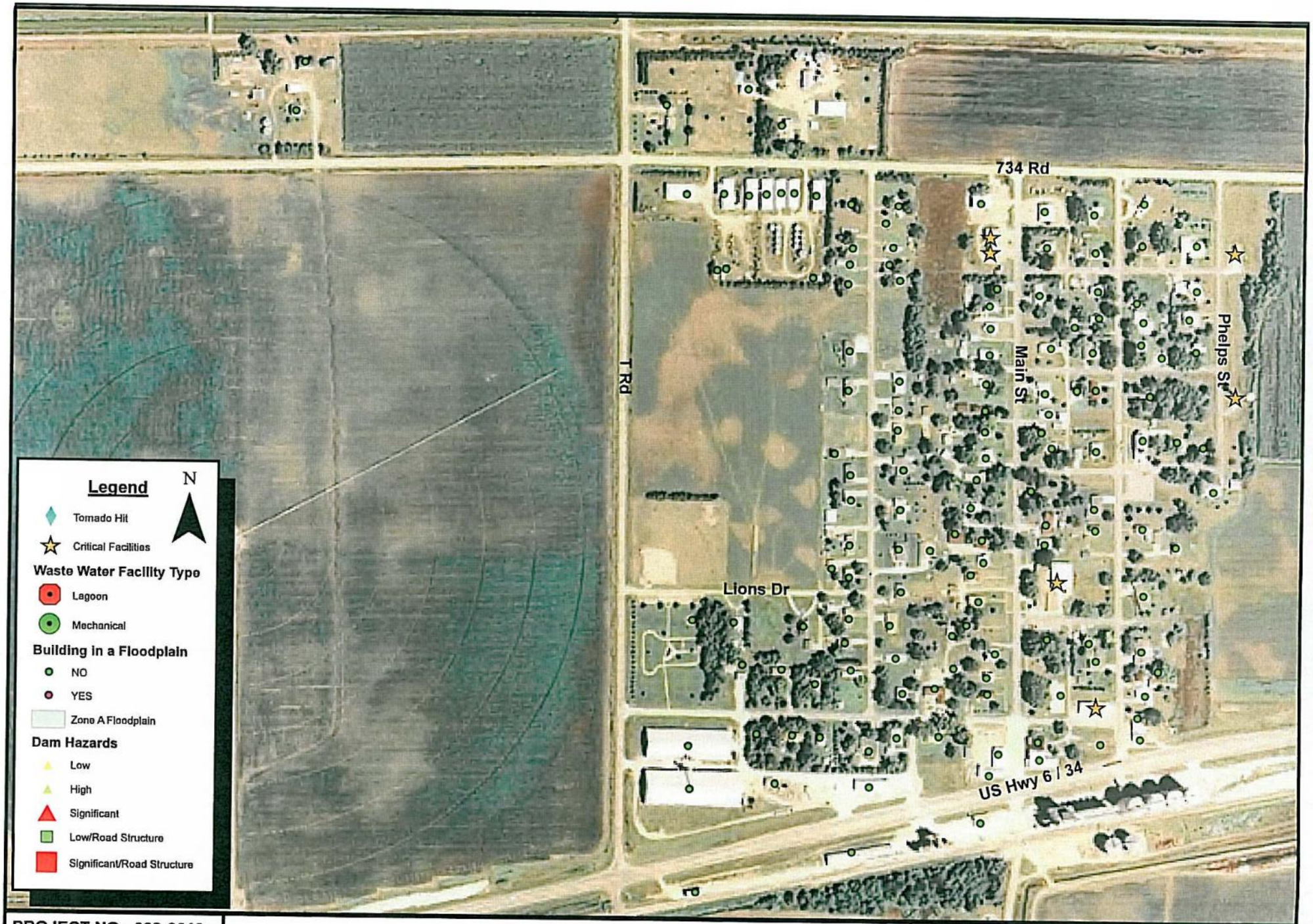


PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	**VILLAGE OF BERTRAND** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **C-4**

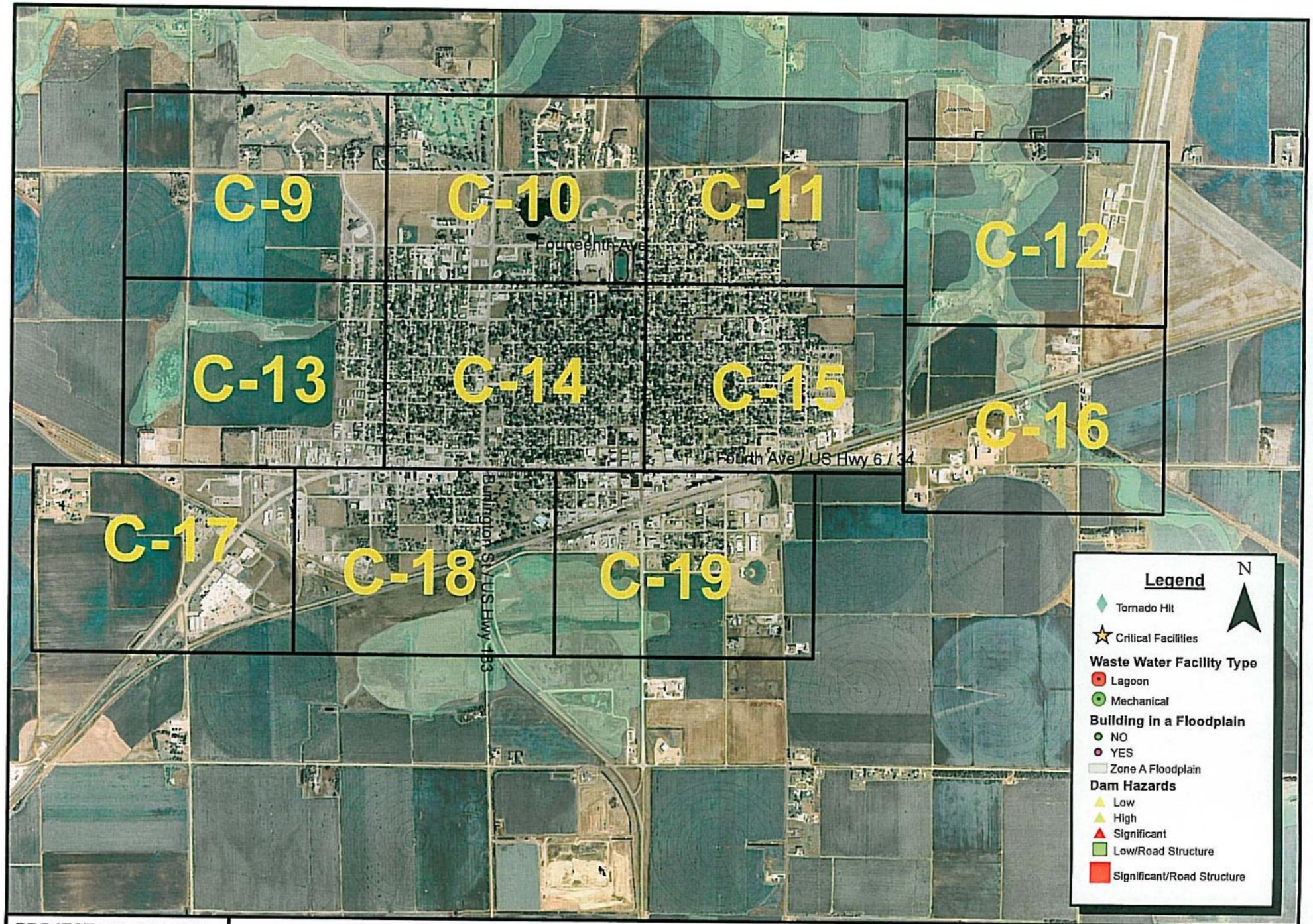
PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	**VILLAGE OF BERTRAND** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-5



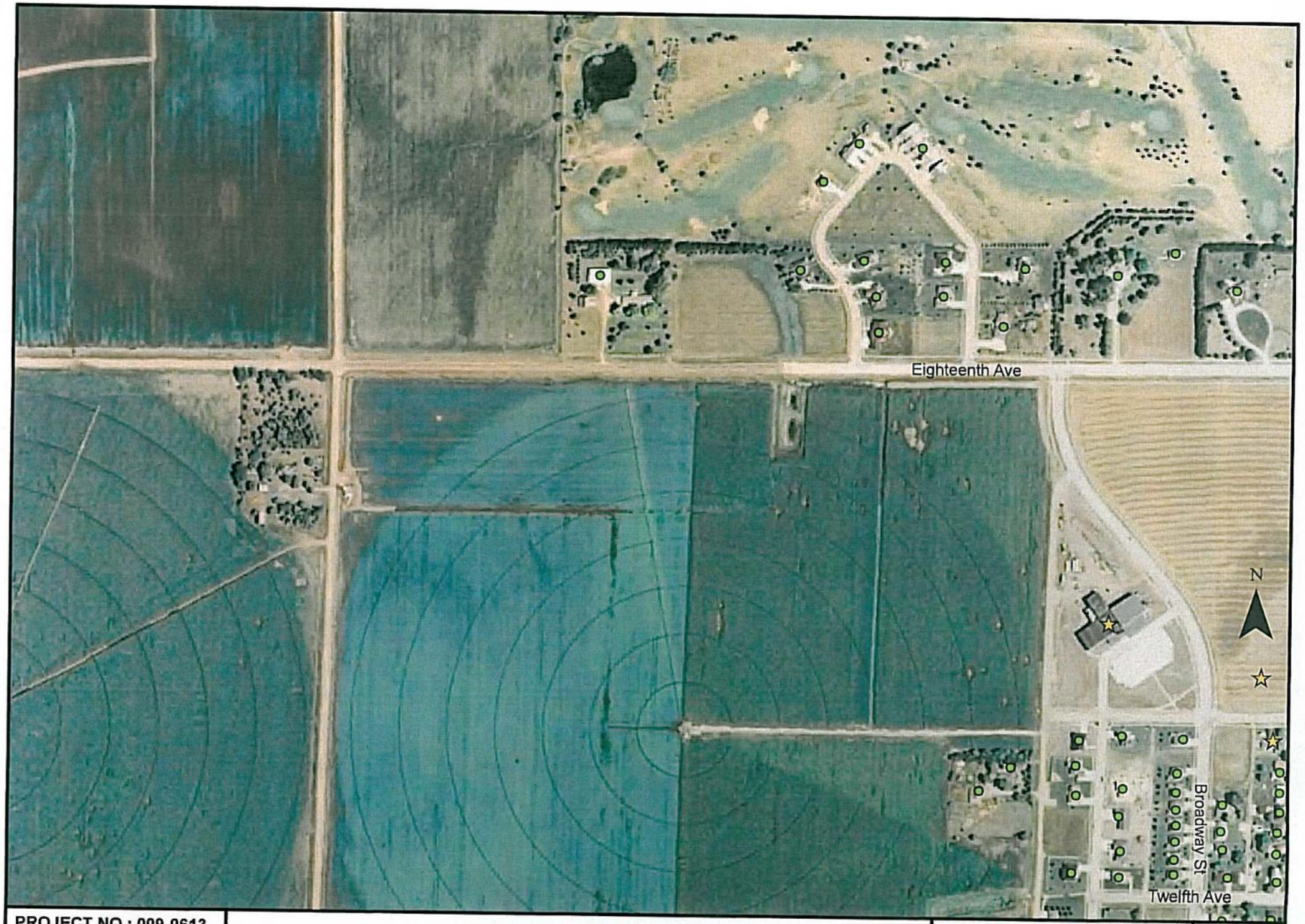
PROJECT NO.: 009-0613 DRAWN BY: MDH DATE: JUNE 2010	**VILLAGE OF BERTRAND** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-6



PROJECT NO.: 009-0613	VILLAGE OF FUNK ALL - HAZARDS MITIGATION PLAN	MAP
DRAWN BY: MDH		C-7
DATE: JUNE 2010	OLSSON ASSOCIATES	



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE - INDEX MAP** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-8



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP **C-9**

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-10

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-11

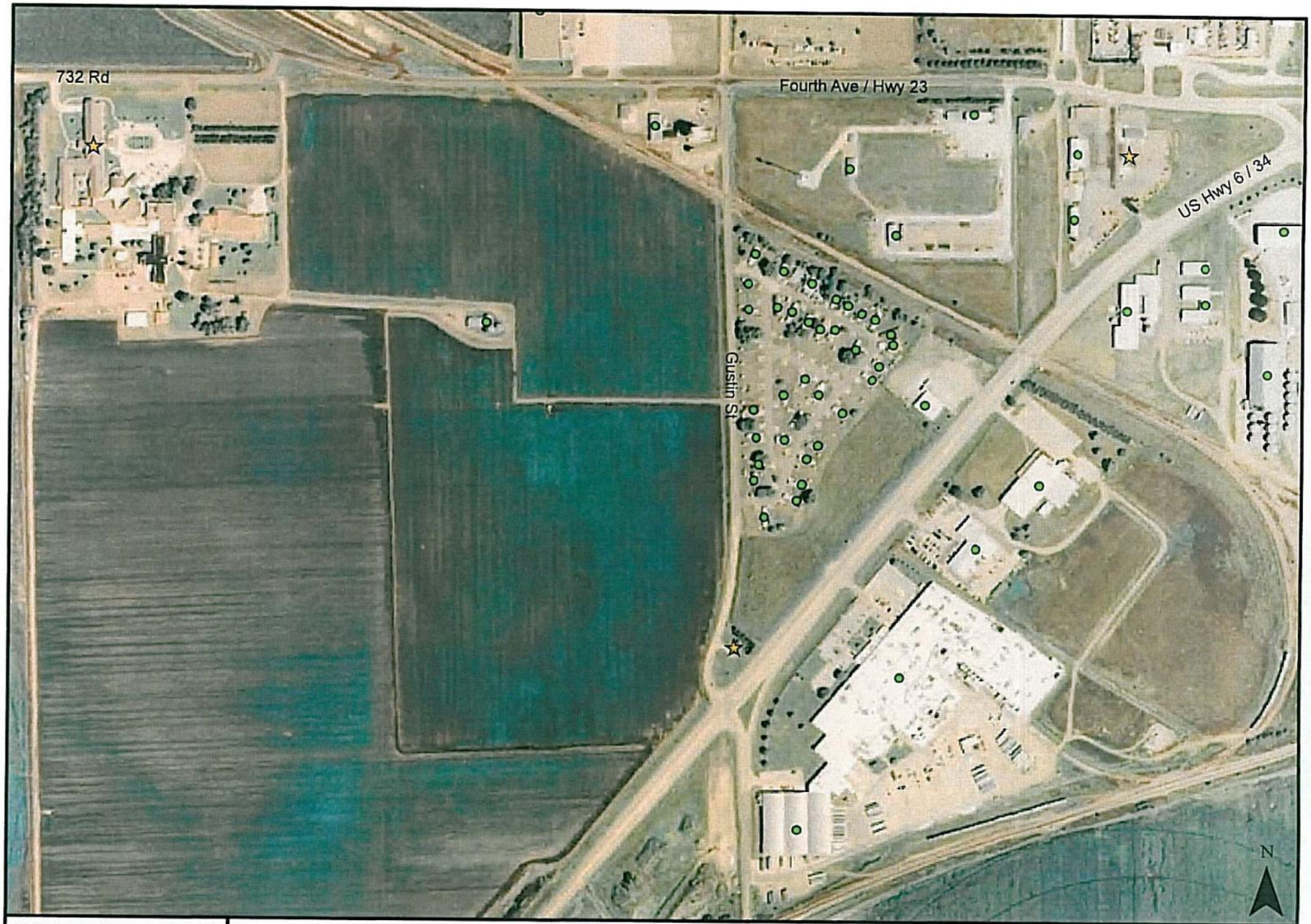
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-12

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-13

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-14

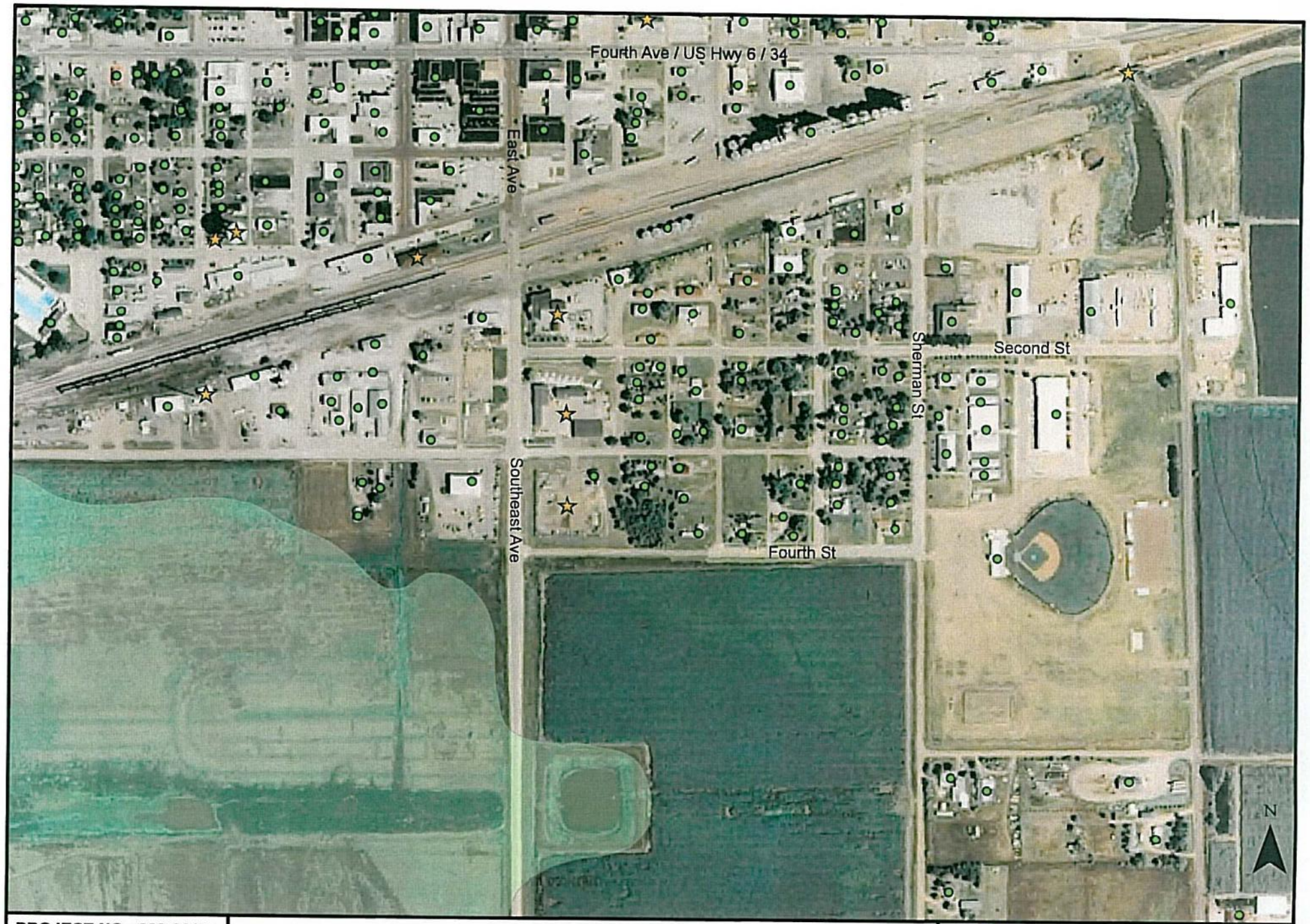
PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-15

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-16

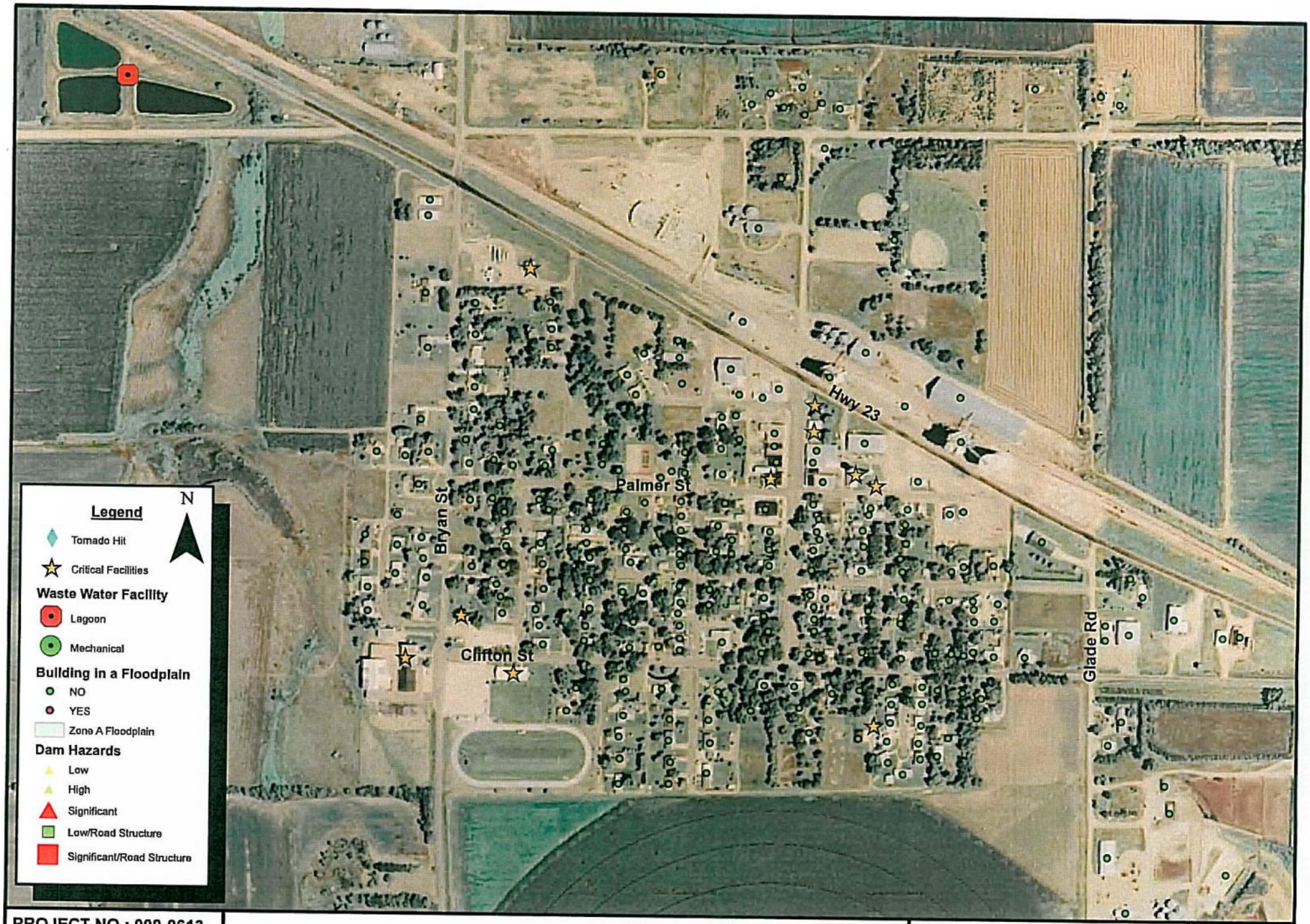


PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-17

PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES MAP C-18



PROJECT NO.: 009-0613 DRAWN BY: JSL DATE: JUNE 2010	**CITY OF HOLDREGE** **ALL - HAZARDS MITIGATION PLAN**	OLSSON ASSOCIATES	MAP C-19



PROJECT NO.: 009-0613	VILLAGE OF LOOMIS	OLSSON ASSOCIATES	MAP
DRAWN BY: MDH	ALL - HAZARDS MITIGATION PLAN		C-20
DATE: JUNE 2010			

RESOLUTION NO. 10-27

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

Resolved that Phelps County Supervisors hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEREOF, this resolution was approved and executed this 26 Day of October, 2010

PHELPS COUNTY COUNTY OFFICIAL SEAL Attest HOLDREGE, NEBR.

Sally Fox — October 26, 2010 (Date)

James Ostgren — Russell Cruise

Sheryl Brenn

Elden Lenbrecht

Harold Raburn

RESOLUTION NO. 11-10

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

Resolved that Village of Atlanta hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEREOF, this resolution was approved and executed this 10th Day of November, 2010.

Ken Erickson — 11/10/10 (Date)

Attest

Janice J. Ludeke — 11/10/10

Kevin F. Pauz — 11/10/10

Jayne Ostgaard — 11-10-10

Arden Watson — 11-10-10

RESOLUTION NO. 253

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

Resolved that the Village of Bertrand hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEROF, this resolution was approved and executed this 14th Day of September, 2010.

LaDonna Bennett 9-14-10

Date

Attest

[signature] 9-14-10

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

Resolved that Bertrand Community School, District 0054, hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEROF, this resolution was approved and executed this 13th Day of September, 2010.

Michael Bamsey — 9-13-10

President/Bertrand Board of Education — Date

Lorie A. Hinson — 9-13-10

Secretary/Bertrand Board of Education — Date

SEP 2010

RESOLUTION NO. 118

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

Resolved that the Village of Funk hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEREOF, this resolution was approved and executed this 7 Day of September, 2010.

	9-7-10
	Date

Attest

	9-7-10
	9-7-10
	9-7-10
	9-7-10

The City of Holdrege

Municipal Building
502 East Avenue
P.O. Box 436
Holdrege, NE 68949-0436

308-995-8681
FAX 308-995-5486

city@cityofholdrege.org
www.holdrege.org

August 27, 2010

Tri-Basin NRD
% John Thorburn
1723 Burlington
Holdrege, NE 68949

Dear John:

The Mayor and Council of the City of Holdrege have unanimously selected to participate in the All-hazard Mitigation Plan and process. Enclosed you will find a copy of the City of Holdrege Resolution 2010-16 indicating the City's willingness to commit to this project.

Please keep us informed as to the next step in the process and what the City's responsibilities will be. Correspondence may directed through the City Clerks office and it will be distributed from there.

Thank you for your willingness to serve as the Coordinator of this plan.

Warm Regards,

Dane Jensen

Dane Jensen
City Clerk

AUG 2010
RECEIVED

RESOLUTION 2010-16

WHEREAS, a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

WHEREAS, FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

WHEREAS, the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District in a three-county area including all of Gosper, Kearney and Phelps counties and all associated local governmental entities, and

WHERAS, an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process,

NOW, THEREFORE be it RESOLVED that the Mayor and the Council of the City of Holdrege hereby approve participation in the proposed All-Hazards Mitigation Planning Process described above, authorize the signing of the Interlocal Agreement between the Tri-Basin Natural Resources District and the Counties previously identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for the public we serve.

IN WITNESS WHEREOF, this resolution is approved and executed this 17th Day of August, 2010.

Mark M. Rona, Mayor

Attest:

Dane C. Jensen, City Clerk

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Resolved that Holdrege Public Schools hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve, subject to Board approval to the extent the activities involve expenditures or significant resources.

IN WITNESS WHEROF, this resolution was approved and executed this 13th day of September, 2010.

The above Resolution having been consented to by a majority vote of the members of the School Board of this School District was declared as passed and adopted by the President at a duly held and lawfully convened regular meeting of the School Board in full compliance with Nebraska Open Meetings Law.

DATED this 13th day of September, 2010.

Holdrege Public Schools

BY: Michelle Ehresman
President

Attest:
Sandy Demaday
Secretary

RESOLUTION NO. 01 - 10

RESOLUTION FOR PARTICIPATION IN ALL-HAZARDS MITIGATION PLANNING

Whereas a joint All-Hazards Mitigation Plan identifies the vulnerability of public bodies to natural or man-made hazards and the projects that can be implemented to reduce or eliminate vulnerability exposure, and

Whereas FEMA now requires that any public entity must have a current All-Hazards Mitigation Plan in place before they are eligible for Federal funding for hazard mitigation projects and mitigation efforts resulting from natural disasters, and

Whereas the Tri-Basin Natural Resources District is proposing to serve as the coordinating agency for the development of a multi-jurisdictional All-Hazards Mitigation Plan for their respective District and a three-county area including all of Gosper, Kearney and Phelps and all associated local governmental entities, and

Whereas an Interlocal Agreement has been prepared describing the terms of participation in the multi-jurisdictional All-Hazards Mitigation Planning process, therefore be it

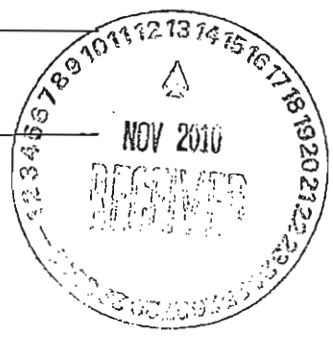
Resolved that VILLAGE OF LOOMIS hereby approves participation in the proposed All-Hazards Mitigation Planning process described above, authorize the signing of the Interlocal Agreement between the NRD and Counties identified as sponsors of the planning process, and pledges to attend required meetings and participate in those activities necessary to complete an effective plan for public we serve.

IN WITNESS WHEREOF, this resolution was approved and executed this 8th Day of November, 2010.

Chairman — 11-8-10 Date

Attest

Clerk — Nov 8 - 2010



STAPLEE ACTION EVALUATION TABLE: Phelps County

STAPLEE Criteria Consideration

LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable

Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Mainenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	H	H	H	H	H	H	H	H	H	H	H	H	N	H	M	H	H	M	H	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H	M	H	H	H	H
Storm Shelters / Safe Rooms	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H	M	H	H	H	H
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H	M	M	H	H	H
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

Village of Atlanta

STAPLEE ACTION EVALUATION TABLE:

STAPLEE Criteria Consideration

LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable

Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	M	H	L	H	H	H	H	H	N	H	M	H	N	H	N	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
(1) Back-Up Generators	H	H	H	H	M	H	M	H	H	H	H	H	H	N	H	M	H	H	L	L	N	H	H
(2) Storm Shelters / Safe Rooms	H	H	H	H	H	H	M	H	H	H	H	H	H	N	H	H	H	H	M	L	N	H	H
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: Village of Bertrand

STAPLEE Criteria Consideration

LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable

Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Mainenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	M	H	L	H	H	H	H	H	N	H	M	H	N	H	N	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators	H	N	H	H	H	H	M	H	H	M	H	H	H	N	H	M	H	H	M	M	H	H	H
Storm Shelters / Safe Rooms	H	H	H	H	H	H	H	H	H	H	H	H	H	N	H	H	H	H	M	M	H	H	H
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: Bertrand Schools

STAPLEE Criteria Consideration

LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable

Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	H	H	H	H	H	H	H	H	N	H	M	H	H	H	N	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	N	N	N	H	H
Storm Shelters / Safe Rooms	H	N	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	N	N	N	H	H
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: Village of Funk

STAPLEE Criteria Consideration

LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable

Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	M	H	L	H	H	H	H	H	N	H	M	H	N	H	N	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators																							
Storm Shelters / Safe Rooms																							
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens	H	N	H	H	H	H	H	H	H	H	H	N	H	L	H	H	H	H	H	N	N	H	H
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements	H	N	H	H	H	H	M	M	H	H	H	~~N~~	H	L	H	M	H	H	M	N	N	H	H
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: City of Holdrege

Alternative Actions	STAPLEE Criteria Consideration LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable																				
	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example Bridge Replacement																							
Bridge Replacement																							
Road / Bridge Protection																							
(3) Back-Up Generators	H	N	H	H	H	H	M	H	H	H	H	H	H	N	H	M	H	H	M	M	H	H	H
Storm Shelters / Safe Rooms																							
Bury Power and Service Lines																							
(1) Electrical System Looped Distribution	H	N	H	H	L	H	M	H	H	H	H	H	H	N	H	L	H	H	L	L	N	H	H
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
(4) Warning Sirens	H	N	H	H	L	H	M	H	H	H	H	H	H	N	H	L	H	H	L	L	N	H	H
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
(2) Storm Water Systems Improvements	H	N	H	H	M	H	M	H	H	H	H	H	H	N	H	L	H	H	L	L	N	H	H
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: Holdrege Public Schools

Alternative Actions	STAPLEE Criteria Consideration LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable																					
	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	H	H	H	H	H	H	N	H	N	H	M	H	H	H	N	N	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators	H	N	H	H	H	H	H	H	H	H	H	N	H	H	H	M	H	H	H	N	N	H	H
Storm Shelters / Safe Rooms	H	N	H	H	H	H	H	H	H	H	H	N	H	H	H	M	H	H	H	N	N	H	H
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							

STAPLEE ACTION EVALUATION TABLE: Loomis Rural Fire District

Alternative Actions	STAPLEE Criteria Consideration LEGEND: Probability of being acceptable: H High M Medium L Low N Not Applicable																					
	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
Tri Basin Natural Resources District	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT / Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
Example: Bridge Replacement	H	N	H	H	H	M	H	L	H	H	H	H	H	N	H	M	H	N	H	N	H	H	H
Bridge Replacement																							
Road / Bridge Protection																							
Back-Up Generators																							
Storm Shelters / Safe Rooms																							
Bury Power and Service Lines																							
Electrical System Looped Distribution																							
Elevated Pad Mounted Transformers																							
Windbreaks																							
Tree Maintenance Programs																							
Weather Radios																							
Emergency Communications (Ex. Reverse 911 System)																							
Warning Sirens																							
Alert Sirens																							
Community Rating System (CRS)																							
Evaluate and Improve Building Standards																							
Levee Improvements																							
Stream Bank Stabilization																							
Grade Control Structures																							
Remove Flow Constrictions																							
Storm Water Systems Improvements																							
Flood Prone Property Acquisition																							
Flood Plain Mapping / Remapping																							
National Flood Insurance Program																							
Flood Walls																							
Anchoring Fuel Tanks																							
Public Awareness Programs																							
Infrastructure Protection																							
Emergency Preparedness Training																							
Drainage Improvements																							
Evacuation Plan / Emergency Snow Route																							
New fire hall + Shelter	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H	H	M	H	N	N	H	H

Tri-Basin NRD
1723 Burlington
Holdrege, NE 68949

Natural Resources District

Phone: (308) 995-6688
Toll Free: 1-877-995-6688
Fax: (308) 995-6992
Email: tribasin@tribasinnrd.org

Memo

To: Tri-Basin NRD Hazard Mitigation Plan stakeholders

From: John Thorburn, Tri-Basin NRD Manager

CC: TBNRD Directors

Mike Milius, Olsson Associates

Date: 3/26/09

Re: Hazard Mitigation Plan development "Kick-off" meetings

I invite you to attend one of two upcoming meetings to gather your input on how to develop a plan to mitigate, or minimize, potential damage from natural hazards for Gosper, Phelps and Kearney counties. Tri-Basin Natural Resources District (NRD) is partnering with Gosper, Kearney, and Phelps counties and their Emergency Management Directors to develop an All-Hazards Mitigation Plan. An All-Hazards Mitigation Plan must be completed and approved by the Federal Emergency Management Agency (FEMA) before any local governmental entity can receive federal funding through FEMA's Hazard Mitigation Assistance Programs, such as Hazard Mitigation Grant Program (HMGP), post-disaster funds, Pre-Disaster Mitigation (PDM) funding; Flood Mitigation Assistance (FMA); Repetitive Flood Claim (RFC), and the Severe Repetitive Loss (SRL) Programs.

The first step in developing the All-Hazards Mitigation Plan is to hold public meetings in each county to receive public comments about potential disaster types, problem areas, and potential mitigation solutions. This is your chance to provide input for your community and what steps you'd like to see taken to protect it.

Public officials and citizens are encouraged to attend a meeting to learn more about the planning process, what information is needed to develop the plan and how they can participate.

Meetings have been set for the following counties and locations:

April 2	7:00 p.m.	Phelps Co.	Tri-Basin Offices, Holdrege
April 9	7:00 p.m.	Gosper Co.	American Legion Hall, Elwood

Public comments will be reviewed, compiled, and added to the plan. Tri-Basin NRD has hired Olsson Associates to develop the plan over the next 18 months. A second series of public meetings will be scheduled later in the project to review a draft plan.

Thank you for your interest in this planning process. Feel free to call me if you have questions, or need additional information.

March 13, 2009

Contact: John Thorburn, Manager, Tri-Basin NRD
308.995.6688 or jthorburn@tribasinnrd.org

All-Hazard Mitigation Planning Meetings Scheduled

Public invited to participate

If your town is threatened by a tornado and you're in a structure with no basement, where would you go to protect yourself during the storm? If your home or business is damaged, would you know what to do to start rebuilding?

If a winter storm knocks out electric power and the lines can't be fixed for days—or weeks, how would you react? Who's there to help?

Plans to prepare for these situations and other natural disasters, such as floods, wind storms, droughts, wildfires, and dam failures, are all part of a plan currently being developed for each community in your county.

Tri-Basin Natural Resources District (NRD) is partnering with Gosper, Kearney, and Phelps Counties and their Emergency Management Directors to develop an All-Hazards Mitigation Plan. An All-Hazards Mitigation Plan must be completed and approved by the Federal Emergency Management Agency (FEMA) before any local governmental entity can receive federal funding through FEMA's Hazard Mitigation Assistance Programs, such as Hazard Mitigation Grant Program (HMGP), post-disaster funds, Pre-Disaster Mitigation (PDM) funding; Flood Mitigation Assistance (FMA); Repetitive Flood Claim (RFC), and the Severe Repetitive Loss (SRL) Programs.

The first step in developing the All-Hazards Mitigation Plan is to hold public meetings in each county to receive public comments about potential disaster types, problem areas, and potential mitigation solutions. This is your chance to provide input for your community and what steps you'd like to see taken to protect it.

Public officials and citizens are encouraged to attend a meeting to learn more about the planning process, what information is needed to develop the plan and how they can participate.

"The public's participation is critical for a successful plan," said John Thorburn, manager of the Tri-Basin NRD. "We hope that local residents can provide some of the detailed information that we need for this plan."

Meetings have been set for the following counties and locations:

March 24	7:00 p.m.	Gosper Co.	American Legion, Elwood
March 25	1:30 p.m.	Phelps Co.	Tri-Basin Offices, Holdrege
March 27	1:30 p.m.	Kearney Co.	First National Bank, Minden

Public comments will be reviewed, compiled, and added to the plan. Tri-Basin NRD has hired Olsson Associates to develop the plan over the next 18 months. A second series of public meetings will be scheduled later in the project to review a draft plan.

NOTICE OF PUBLIC MEETING ON ALL HAZARDS MITIGATION PLAN DRAFT

NOTICE IS HEREBY GIVEN that on July 15, 2010 at 2:30 PM, the Tri-Basin Natural Resources District will facilitate a public meeting concerning a draft of the All-Hazards Mitigation Plan at the Axtell Volunteer Fire Department Fire Hall, Axtell, Nebraska. This plan is part of the Hazard Mitigation Grant Program administered by the Federal Emergency Management Agency. The purpose of the program is to reduce loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

The All-Hazards Mitigation Plan must be completed and approved by the Federal Emergency Management Agency (FEMA) before any local governmental entity can receive federal funding through FEMA's Hazard Mitigation Assistance Programs. FEMA provides grants to States and local governments to implement long-term mitigation measures after a major disaster declaration. This meeting is the second step in securing public input for the All-Hazards Mitigation Plan.

The All Hazards Mitigation Plan contains an assessment of the vulnerability of each community and county within the Tri-Basin service area to the identified hazards, provides an estimation of the potential losses, suggests general approaches for potential mitigation projects, and identifies potential funding sources to implement the recommended mitigation projects. Tri-Basin encompasses Phelps, Kearney, and Gosper Counties and the communities within these counties.

The draft All Hazards Mitigation Plan will be available for public inspection at the Tri-Basin NRD office located at 1723 N. Burlington, Holdrege, NE 68949.

All interested citizens and parties are invited to attend this public meeting at which time you will have an opportunity to be heard regarding the draft plan. Written testimony will also be accepted at the public meeting scheduled for 2:30 PM on July 15, 2010 at the Axtell Volunteer Fire Department Fire Hall, Axtell, Nebraska.

Written comments may be addressed to Ryan Kaven, Project Engineer, Olsson Associates at 800 W. 3rd Street, Suite 219, Hastings, Nebraska 68901 will be accepted if received on or before August 15, 2010.

Please contact John Thorburn, Manager, Tri-Basin NRD, at 308.995.6688 or jthorburn@tribasinnrd.org for more information regarding the draft plan or the public meeting.

7-2-1 Fri.

Proof of Publication

STATE OF NEBRASKA)
) ss
PHELPS COUNTY)

I, Barbara J. Penrod, Advertising Manager of the Holdrege Daily Citizen, a legal newspaper published daily in Holdrege, Phelps County, Nebraska, do solemnly swear that a copy of the foregoing notice as per clipping attached, was published weekly in the regular and entire issue of said newspaper, and not in any supplement thereof 1 consecutive weeks, next preceding the time appointed as follows.

1. Friday, July 2, 2010
2.
3.
4.
5.

that said newspaper is a legal newspaper under the Statutes of the State of Nebraska and all of the above is within my personal knowledge.

Lenda S. Boyll

Subscribed in my presence and sworn to before me this 6th day of July, 2010.

Bonnie C. Ruybalid

Notary Public

(SEAL)

GENERAL NOTARY - State of Nebraska
BONNIE C. RUYBALID
My Comm. Exp. May 17, 2014

My Commission expires 5-17-14

Printer's Fee $ 30.92

AFFIDAVIT OF PUBLICATION

KEARNEY COUNTY }
STATE OF NEBRASKA } §

MIKE CONYERS, being first duly sworn deposes and says that he is a representative of The Minden Courier, a weekly legal newspaper printed in whole and in the English language and published in its entirety at its office maintained in Minden, Nebraska, in said county, and of general circulation therein and has been published more than fifty-two successive weeks in said county prior to the first publication of the annexed notice, and has a bonafide circulation of more than 300 copies, and that the notice, a true copy of which is hereto annexed was published in the full and complete edition of said paper 1 consecutive weeks, one in each week, July 7, 2010.

Fee $ 34.00

Mike Conyers
REPRESENTATIVE OF THE MINDEN COURIER

Subscribed in my presence and sworn to me this 7 day of July, 2010

_____ My Commission expires.

JAMES EDGECOMBE
MY COMMISSION EXPIRES
November 10, 2011

JUL 2010
RECEIVED

NOTICE OF PUBLIC MEETING ON ALL HAZARDS MITIGATION PLAN DRAFT

NOTICE IS HEREBY GIVEN that on July 15, 2010 at 2:30 PM, the Tri-Basin Natural Resources District will facilitate a public meeting concerning a draft of the All-Hazards Mitigation Plan at the Axtell Volunteer Fire Department Fire Hall, Axtell, Nebraska. This plan is part of the Hazard Mitigation Grant Program administered by the Federal Emergency Management Agency. The purpose of the program is to reduce loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

The All-Hazards Mitigation Plan must be completed and approved by the Federal Emergency Management Agency (FEMA) before any local governmental entity can receive federal funding through FEMA's Hazard Mitigation Assistance Programs. FEMA provides grants to States and local governments to implement long-term mitigation measures after a major disaster declaration. This meeting is the second step in securing public input for the All-Hazards Mitigation Plan.

The All Hazards Mitigation Plan contains an assessment of the vulnerability of each community and county within the Tri-Basin service area to the identified hazards, provides an estimation of the potential losses, suggests general approaches for potential mitigation projects, and identifies potential funding sources to implement the recommended mitigation projects. Tri-Basin encompasses Phelps, Kearney, and Gosper Counties and the communities within these counties.

The draft All Hazards Mitigation Plan will be available for public inspection at the Tri-Basin NRD office located at 1723 N. Burlington, Holdrege, NE 68949.

All interested citizens and parties are invited to attend this public meeting at which time you will have an opportunity to be heard regarding the draft plan. Written testimony will also be accepted at the public meeting scheduled for 2:30 PM on July 15, 2010 at the Axtell Volunteer Fire Department Fire Hall, Axtell, Nebraska.

Written comments may be addressed to Ryan Kavan, Project Engineer, Olsson Associates at 800 W. 3rd Street, Suite 219, Hastings, Nebraska 68901 will be accepted if received on or before August 15, 2010.

Please contact John Thorburn, Manager, Tri-Basin NRD, at 308.995.6688 or jthorburn@tribasinnrd.org for more information regarding the draft plan or the public meeting. 1-1

PUBLIC MEETING
All Hazard Mitigation Plan
April 9, 2009, 7:00 P.M.
American Legion, Elwood, Gosper County Nebraska

Sign In Sheet

Name	Agency	Address	Phone No.	Email
[illegible]	Elwood Village	[illegible]	[illegible]	[illegible]
[illegible]	Village - Elwood	P.O Box 371	785-2961	
Dennis Ocken	Gosper County Sheriff	PO Box 316 Elwood	785-2420	gosperso@nctcjed.net
[illegible]	Elwood village	PO Box 3 Elwood	785-2953	chaulk@securityfirstbank.com
Brenton Lewis	City of Minden	325 N Colorado	832-1820	bblewis@gtmc.net

Gosper County All Hazard Plan Public Meeting: Sign-In

July 14, 2010

Name (PLEASE PRINT)	Community You're Representing	Address + Zip	Phone Number
JOE BAKER	OLSSON ASSOC.	900 WEST 3RD ST. SUITE 219	402-463-0240
RYAN KAVAN	OLSSON ASSOC.	900 WEST 3RD ST. STE. 219	402-463-0240
JOHN THORBURN			
Cheryl L Taft	Gosper County Assessor	gcassessor@atcjet.net PO Box 52 Elwood	308-785-2258
Pat Qerdes	Region 15 Emergency Mgmt	715 5th Ave, Holdrege	308-995-2250

PUBLIC MEETING
All Hazard Mitigation Plan
Friday, March 27, 2009, 1:30 P.M.
First Bank, Minden, Kearney County, Nebraska

Sign In Sheet

Name	Agency	Address	Phone No.	Email
Burton Lewis	City of Minden	PO Box 239	308 832 1520	bblewis@gtmc.net
Gregg Hinrichsen	" "	" "	" "	ghinrichsen@gtmc.net
Jeff England	Kearney Co EMA	PO Box 7	830-1569	jenglandkcem@charter.net
Richard Schwenka	Kearney Co Rd	1479 M Rd	830-1919	
James Huff	Minden PD	246 N. Colorado	832-1150	Jameshuff1@hotmail.com
Kevin Klahn	Minden PD	246 N Colorado	832 1150	
Matt Jordan	Minden Fire Dept	325 N Colorado	832-0448	
Craig Space	Minden Fire Dept	325 or colorado	832 0448	mindenfire@gtmc.net
Chris Klahn	Minden Fire Dept	325 N Colorado	832-0448	
Bryan Smith	N.P.P.D	664 N. Lincoln	830-3801	bsmith@nppd.com
Blair Johnson	Wilcox Fire Dept	306 S Briggs	991 7941	
Mark Tuxhorn	Wilcox Fire Dept	Box 29, Wilcox	991-6272	wilcoxfire@charter.net
Roger Jones	City of Minden	PO Box 239	627-6138	

Kearney County All Hazard Plan Public Meeting: Sign-In

July 15, 2010

Name (PLEASE PRINT)	Community You're Representing	Address + Zip	Phone Number
Ryan Kavan	Olsson Associates	800 W. 39th St Suite 219 Hastings NE	402-463-0240
JEFF ENGLAND	Axtell – Kearney Co	402 Main Ave	308-830-1569
Blair Johnson	Wilcox	wilcox@gpcom.net 306 South Briggs	308 991 7941
Brent Lewis	Minden	325 N Colorado	308 832 1820
Alison Raymond	Phelps / Kearney	PO Box 479 Holdrege 68949	308 995 3190

PUBLIC MEETING
All Hazard Mitigation Plan
Thursday April 2, 2009, 7:00 P.M.
Tri-Basin NRD Office, Phelps County, Nebraska

Sign In Sheet

Name	Agency	Address	Phone No.	Email
Dennis DaMoude	Holdrege P.D.	813 5th Ave Holdrege	995-4407	ddamoude@cityofholdrge.org
Colleen Jameson	Phelps Memorial Health Ctr	1215 Tibbals	995-8878	cajameson@phelpsmemorial.com
BOB RAGER	CITY OF HOLDREGE	502 EAST AVE	995-8681	brager@cityofholdrege.org

PUBLIC MEETING
All Hazard Mitigation Plan
Thursday April 2, 2009, 7:00 P.M.
Tri-Basin NRD Office, Phelps County, Nebraska

Sign In Sheet

Name	Agency	Address	Phone No.	Email
Cindy Sela Frerichs	JCIA's Daycare		995-6478	
Jerik Frerichs	Daycare provider		995-6478	
Layston Frerichs	———		995-6478	
Kindra Ross			995-6478	
Pat Gerdes	Region 5 EMA		995-2250	
Jordan Ross			402-760-1145	
Greg Vandell	Village of Funk		308-991-1099	
Larry K. Mattson	Funk Fire		308-991-3833	

Phelps County All Hazard Plan Public Meeting: Sign-In

July 21, 2010

Name (PLEASE PRINT)	Community You're Representing	Address + Zip	Phone Number
Ryan C. Kavan	Olsson Associates	800 West 39th St. Hastings, NE 68901	402-463-0240
Dennis DaMaude	Holdrege Police Dept.	813 5th Ave Holdrege 68949	308-995-4407
ART JOHNSEN	PHELPS COUNTY EMA	715 5TH AVE. HOLDREGE NE 68949	308-995-2996
Jim Ostgren	Phelps County Supervisor	1804 Brewster Rd. Holdrege NE.	308-991-2073