



October 9, 2012

Natural Resource Committee  
Senator Chris Langemeier, Chair

Re: LR 495

Dear Senator Langemeier and Members of the Committee:

The purpose of this letter is to reiterate and supplement my oral testimony at the October 9, 2012 hearing and provide relevant information in regard to Legislative Resolution 495 (LR 495). The purpose of LR 495 is to study the flood control needs of Omaha and the greater Omaha metropolitan area and examine the resources that are available or that may be utilized to meet such needs, including compliance with various federal regulatory requirements. The information provided within this written testimony is based on my professional experience gained as a Water Resources Engineer for the Papio-Missouri River NRD and on professional studies performed by Olsson Associates. I am in favor of all aspects of good watershed management and believe that the Omaha Metropolitan Area must reduce its current and future risk of flooding.

I have worked as a Professional Engineer in Nebraska for over 10 years, all of which have been in the field of water resources and all of which have been in the Omaha area. I am also a Certified Flood Plain Manager, which requires a thorough understanding of the National Flood Insurance Program (NFIP) as well as basic hydrology and hydraulics. I started my career with the Papio-Missouri River NRD in January 2002. While there, I gained first-hand experience reviewing development in the floodplain, preparing updated floodplain maps, and participating in the Papillion Creek Watershed Partnership. After leaving the P-MRNRD in late 2008, I have been with Olsson Associates as a consulting engineer working on water resources and flood control projects. I have come to understand that the impact of flooding isn't limited to lines on a map; it affects all of us in one way or another. Ultimately, taxpayers will pay a higher cost in damages to public utilities, transportation and property if nothing is done to lower the risk and severity of flooding.

There are several factors which influence the risk of flooding. At the basic level, these factors include: where and how much it rains, the shape and size of the watershed, the land use within the watershed, the land use within the floodplain, the size and slope of the stream channels, and any previous flood control efforts. Humans can only really influence the last four of these factors.

The real problem for the Papillion Creek Watershed in Douglas, Sarpy and Washington Counties in Nebraska is that a number of these factors are changing for the worse, causing flooding to increase now and into the future:

- Watershed Land Use - The Papillion Creek Watershed falls within the boundaries of the Papio-Missouri River Natural Resources District (P-MRNRD) and is an area of that has undergone significant development over the years. A previous lack of stormwater controls has caused most of the watersheds to experience higher peak runoffs in shorter periods of time.
- Floodplain Land Use – Prior to Omaha joining the NFIP in 1971, there was no floodplain maps or information for homeowners or businesses to base safe development on. This resulted in older developments placed in the 1% chance annual floodplain.
- Size and Slope of Stream Channels - Prior to 1971 and any development within the Papillion Creek Watershed, the Papillion Creek was viewed as a drainage ditch for productive agricultural lands. As such, it was straightened and dredged to create more efficient drainage out of most of Sarpy County and parts of Douglas County. This continues to cause severe erosion and ultimately deeper and wider stream channels throughout the watershed. And while this may decrease floodplains near the enlarged channels, it is certainly a threat to change the timing of floodwater and create even more disastrous flooding downstream.
- Flood Control – While some flood control reservoirs have been completed, the majority of the dams in the US Army Corps of Engineers initial plan to protect the Papillion Creek Watershed have not been built.

What difference have these changing floodplain factors caused? In 2005, the P-MRNRD contracted with HDR to complete a detailed analysis of the West Papillion Creek and some of its tributaries. These proposed maps are now adopted. The impact of these maps is significant. Peak flows within the watershed increased 10% to 30%. Over 2000 homes and business were included within the revised floodplain boundaries. The initial impact of this revision will be that these home and business owners will be required to carry flood insurance if they have any federally insured loan on their property. Nobody responds well when suddenly “out” is now “in” and the impact is monetary.

The proposed floodplain delineation is based on two separate conditions: the first is based on land use conditions as they exist today, with no further development, the second condition accounts for a 100% build-out scenario. While upstream stormwater controls may be able maintain the “existing” floodplain boundary; it is still difficult to reduce the impact of change that has occurred between 1970 and 2005. I have included a copy of my presentation which shows the flood plain map for a reach along the West Papillion Creek from approximately 149<sup>th</sup> Street to Old L Street. The map illustrates the comparison of the 2005 floodplain and the proposed floodplain limits. Realistically, the only way to reduce the limits of flooding in an area impacted to this extent is some form of structural flood protection. For example, if the 1% chance (commonly referred to as 100-yr) runoff along the West Papillion Creek is reduced by 10%, the flooded area is reduced by approximately 40%.

There are other areas in the watershed that would benefit from structural flood control measures. A number of dam sites and water quality basins are identified in the updated Papillion Creek

Watershed Drainage Plan for Douglas and Sarpy Counties. However, no one agency or municipality has the funding available to build all of these structures without a form of financing.

I am aware that there is a very vocal contingent opposed to structural solutions to potential flood problems, most notably, the construction of dams. The general argument is that low impact development and best management practices will provide as much flood reduction as a dam, or “solve” the current potential for flooding. Low impact development and best management practices are excellent tools for establishing good management of a watershed, and they should be implemented wherever they are practical. In essence, they are meant to maintain a pre-developed runoff condition, **not provide flood protection or flood control.**

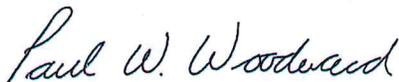
From an economic standpoint, several businesses would be removed from the floodplain with only a 10% reduction in the 1% chance runoff. One example of this is the Altech Business Park located northwest of 144<sup>th</sup> and F Street just south of the West Papillion Creek. The total assessed value of the current businesses in the Altech Business Park development is \$51.8 million. If damages were even reduced just 10% during a flood event, they might save as much as \$5.2 million dollars, most of which would be paid for by federal taxes because even if each building carried flood insurance, the limits on coverage would not cover the damage.

One final point is that none of the watershed planning to date has included any funding that would be dedicated to preserving or improving the slope and size of the stream channels. If left unattended, enlargements to the streams which carry the floodwater could require another revision to the floodplain maps in the future.

The West Papillion Creek Basin is just one area that would benefit from a combination of watershed stormwater controls, stream stabilization/grade control, and structural flood control methods to maintain the existing watershed and protect the residents. Structural flood control alternatives are not inexpensive, but neither are the results of a flood.

If you have questions or would like additional information for the study, please don't hesitate to contact me at 402.938.2470 or [pwoodward@olssonassociates.com](mailto:pwoodward@olssonassociates.com).

Respectfully Submitted,



Paul W. Woodward, P.E., C.F.M.  
Water Resources Group Leader

# Papillion Creek Floodplains



PAST AND PRESENT

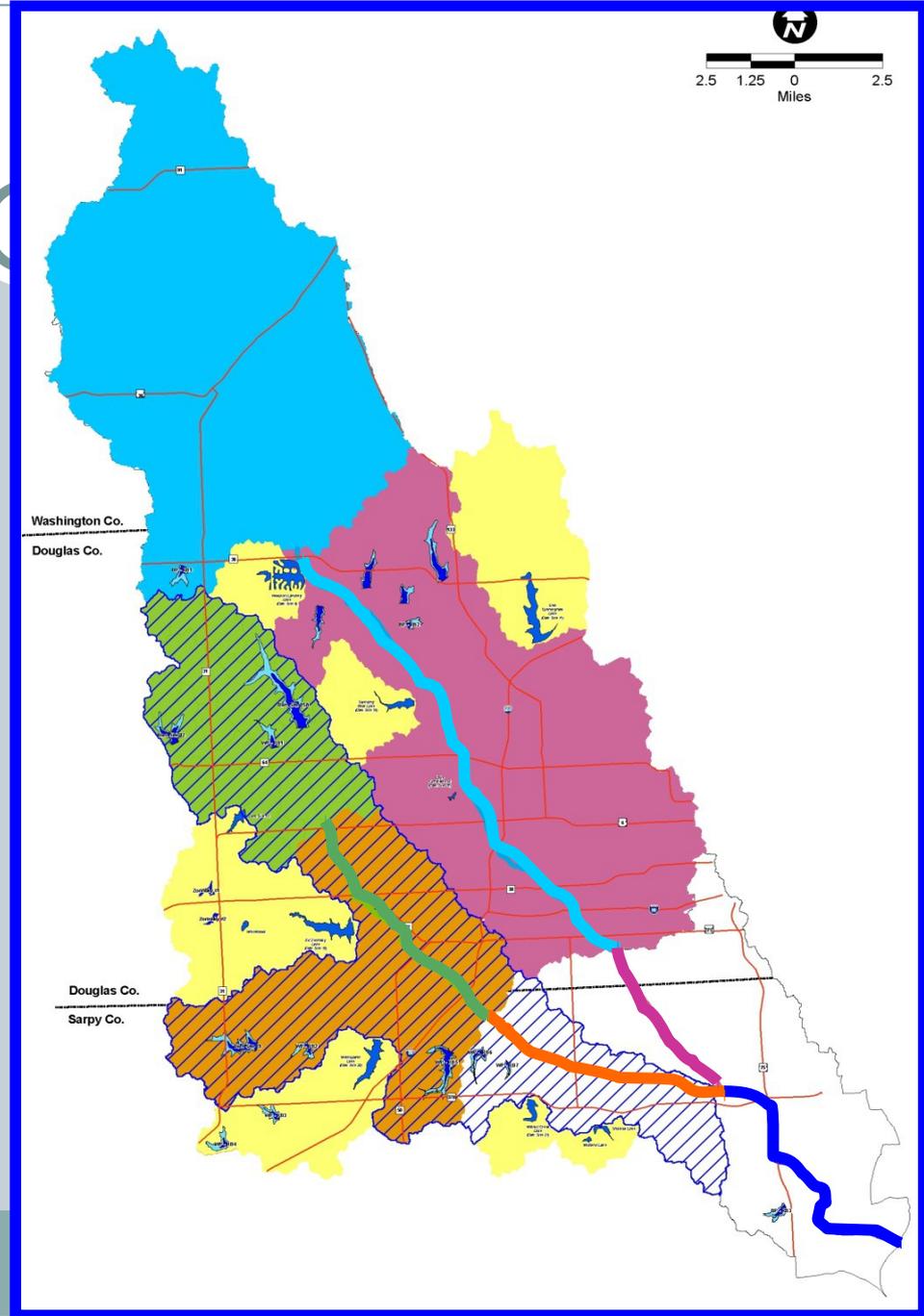
# Overview



- My Background and History
- Purpose of new Floodplain Maps
- Altech Business Park Example
- Economic Impacts
- West Papio Dam Site 15A
- Future of Papillion Creek floodplains

# Floodplain Factors

- Where/how much it rains
- Watershed shape/size
- Watershed Land Use
- Floodplain Land Use
- Stream channel size/slope
- Flood Control



# Papillion Creek Floodplains



- Original floodplain maps developed in 1970s
- Based on 10 foot contour intervals
- Did not consider “build out” conditions
- Inaccurate information for floodplain management

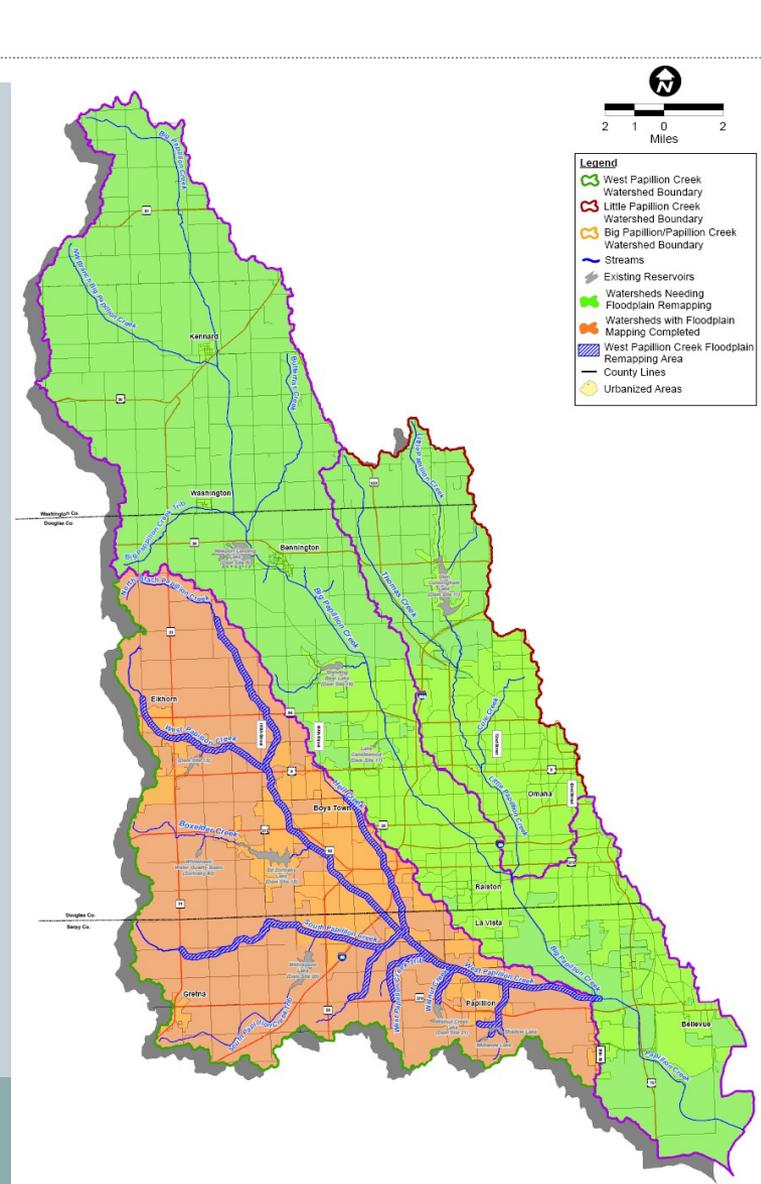
# New Floodplain Maps



- Based on current information
- LiDAR topo with 2 foot contour intervals
- New map includes “build out” conditions

# Floodplain Remapping Status

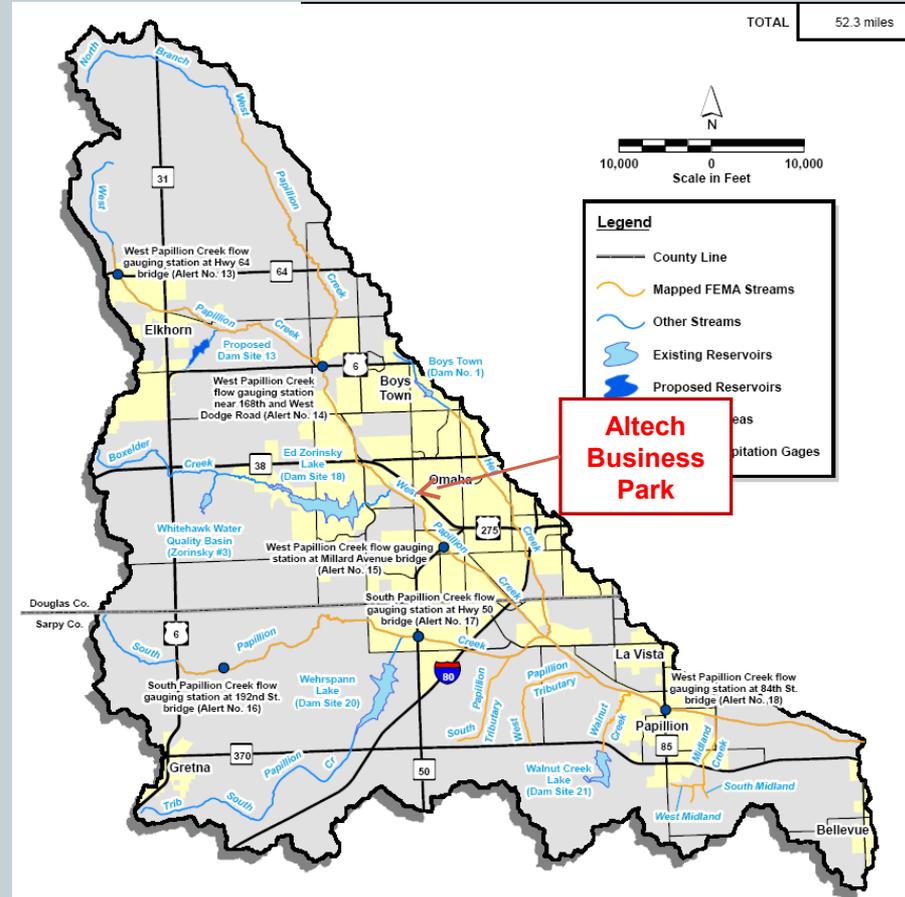
- West Papio Watershed Maps Complete
  - 135 mi<sup>2</sup>, 50 miles of streams
  - Increased 1% chance peak flows 10%-30%
- Need to update Big and Little Papio ASAP
  - Corp of Engineers is in the process of remapping



# Altech Business Park

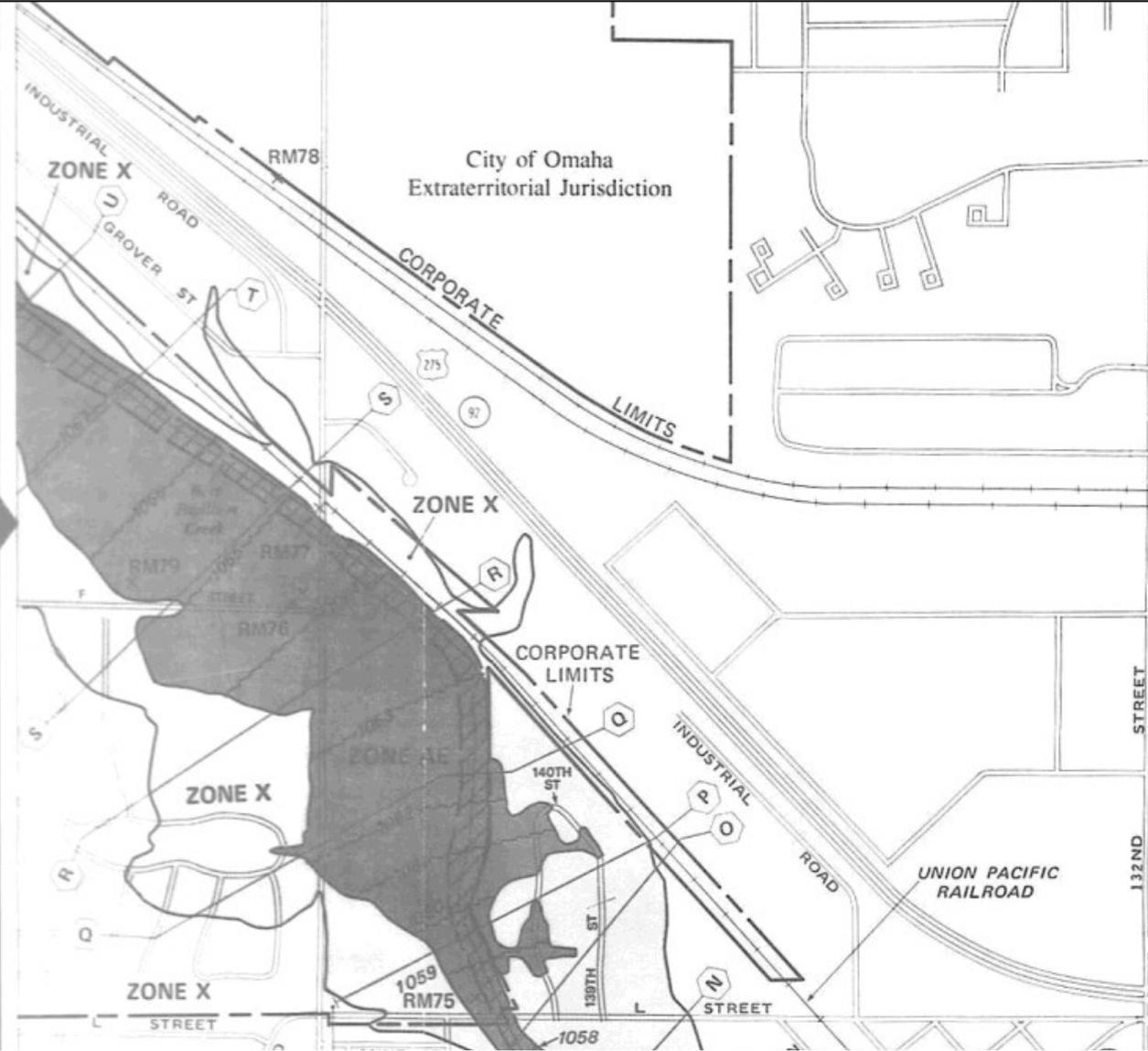


- Platted in 1998
- Constructed Channel Improvements in 1998-1999
- Reduced floodplain limits within development
- Roller coaster of changes...





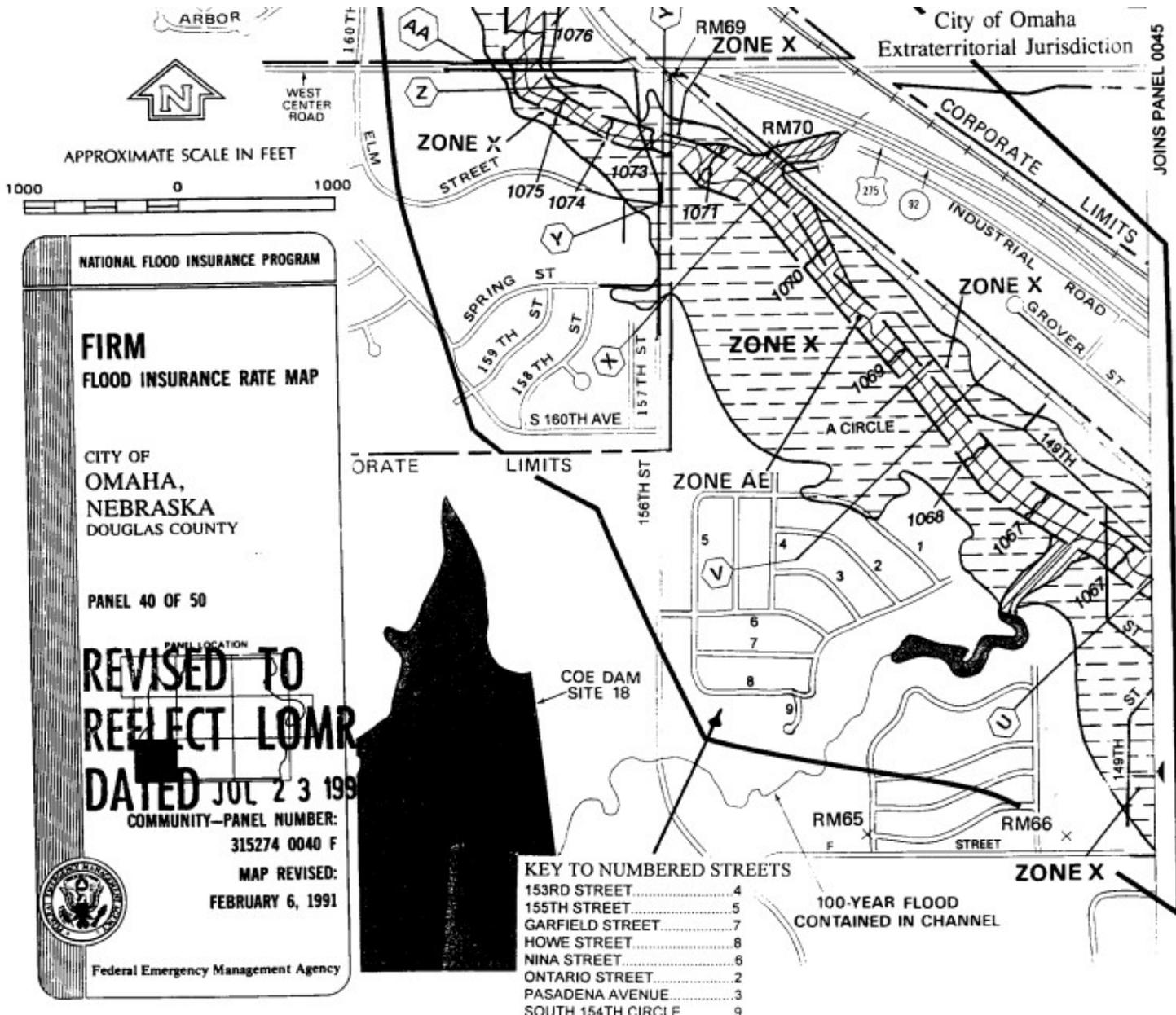
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# Altech Business Park 1991 Flood Map

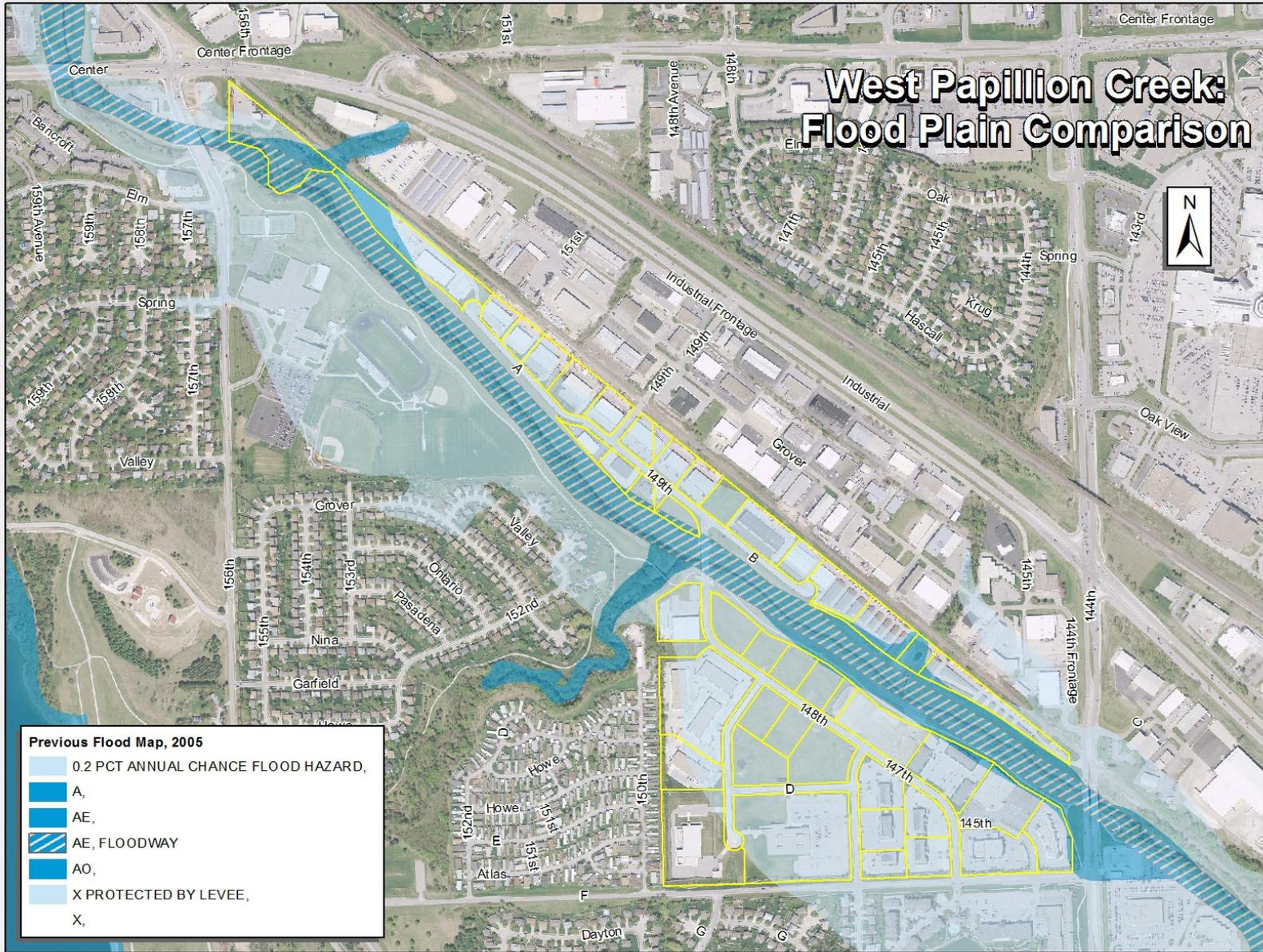
# Channel Improvements for Development





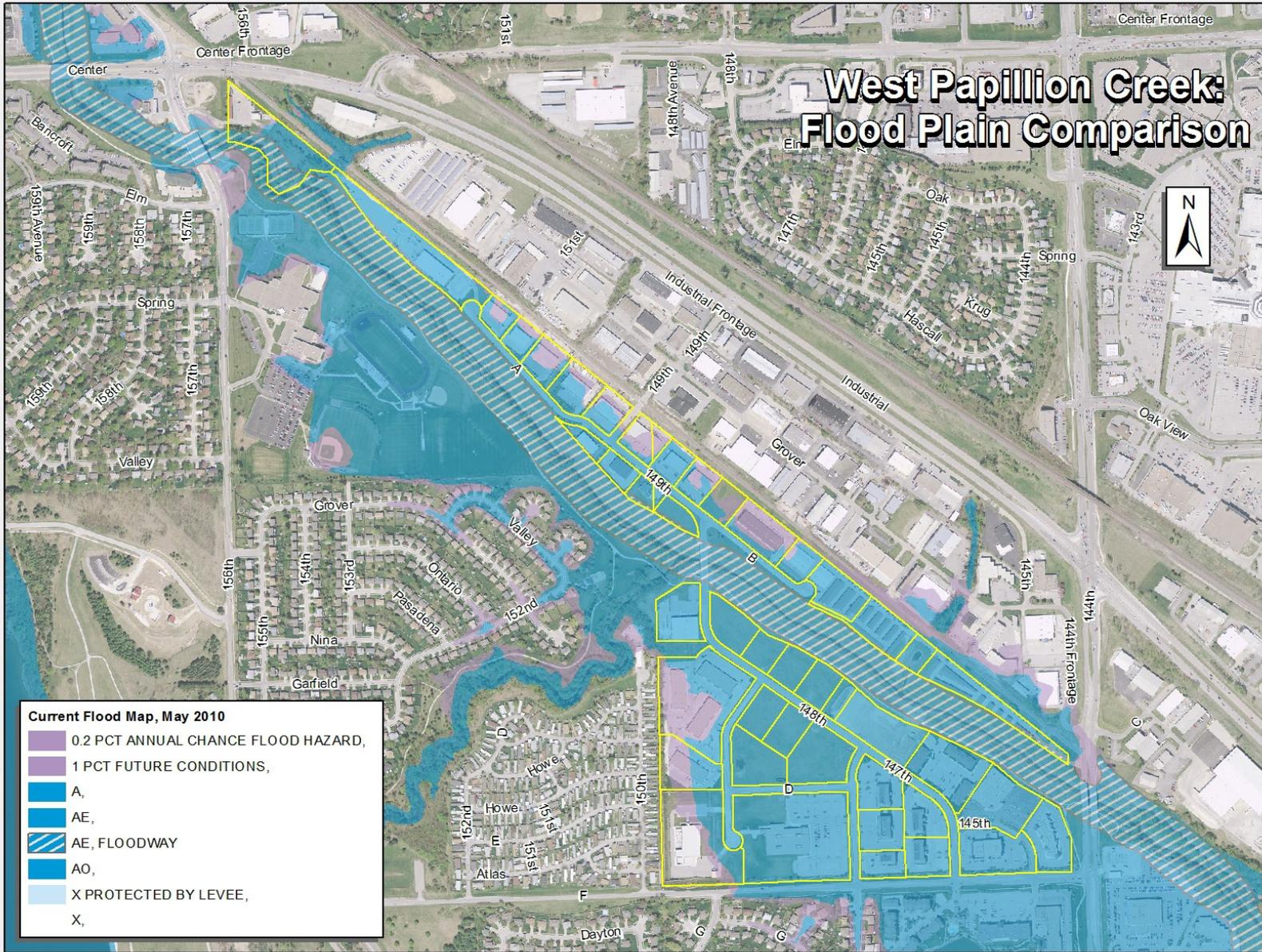
# Altech Business Park 1999 LOMR

# West Papillion Creek: Flood Plain Comparison

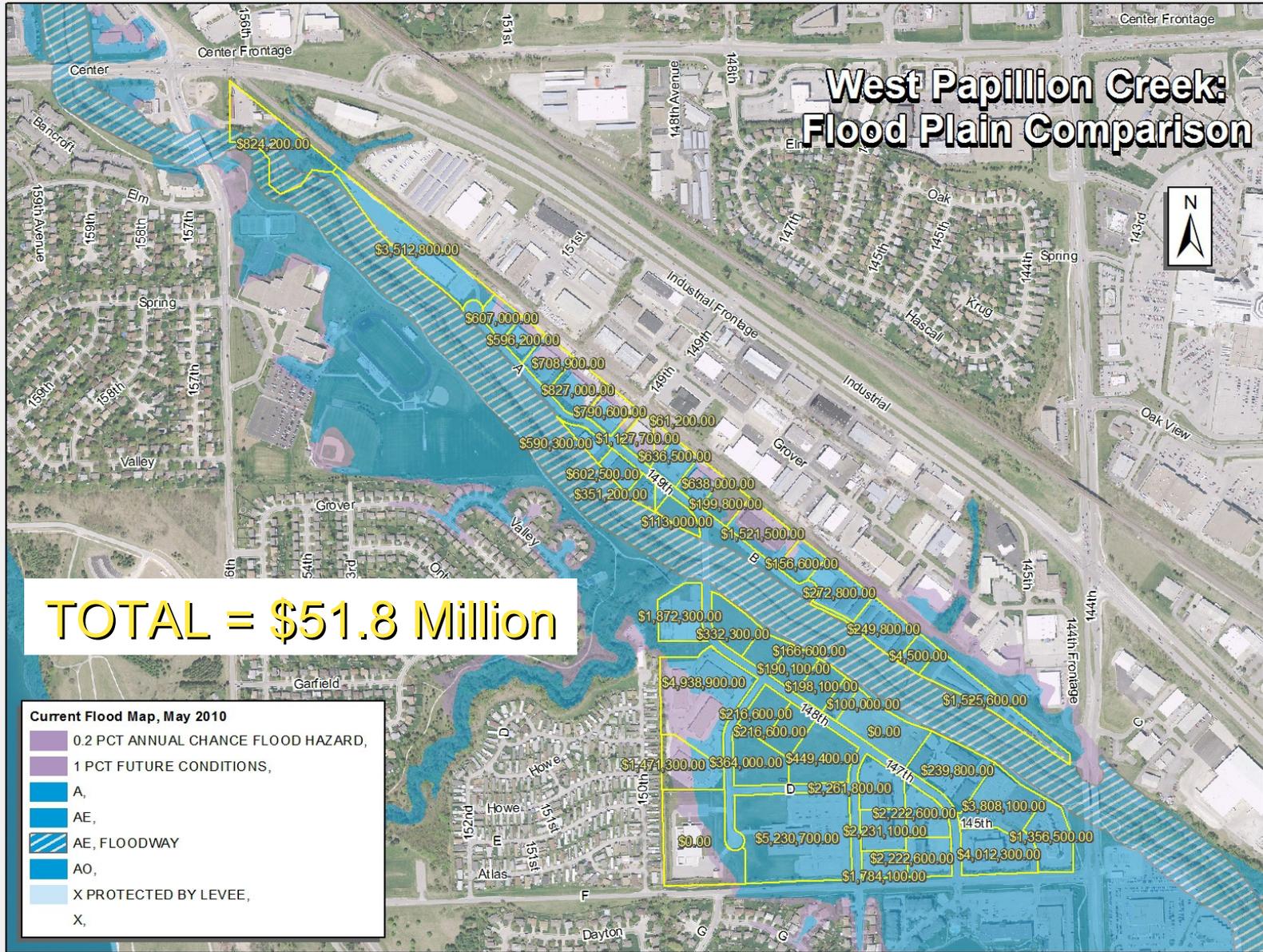


Altech Business Park 2005 Flood Map

# West Papillion Creek: Flood Plain Comparison



# West Papillion Creek: Flood Plain Comparison

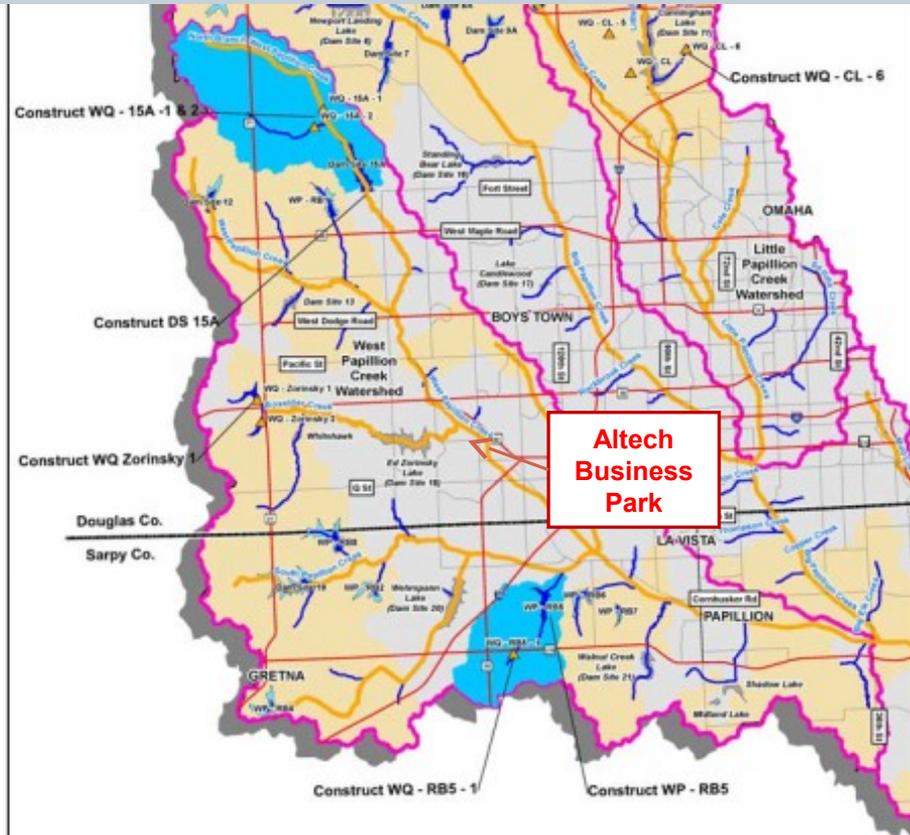


Altech Business Park 2010 Assessed Value

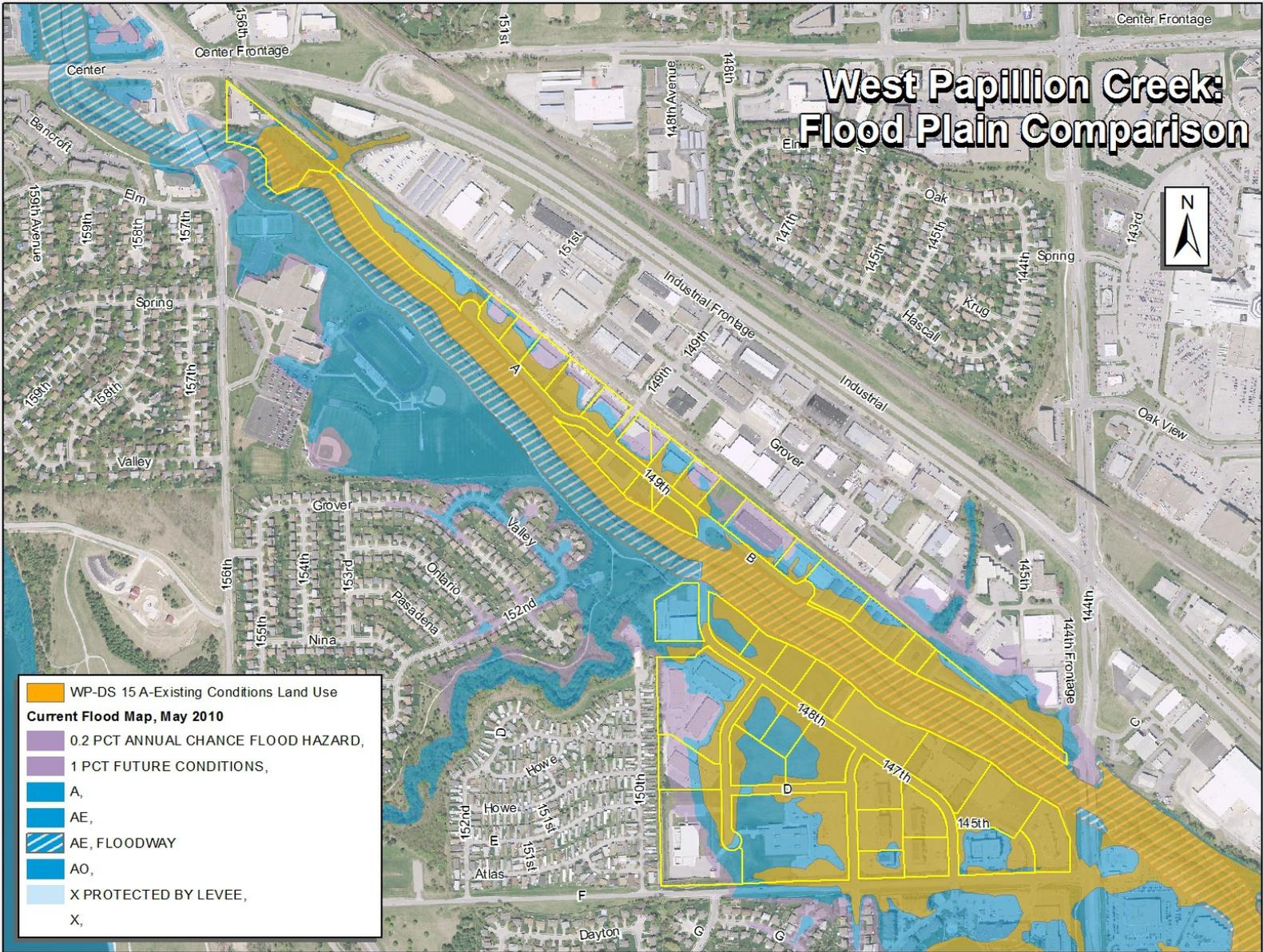
# West Papio Dam Site 15A



- Over 11 mi<sup>2</sup> drainage area
- Reduce peak flow at Altech Business Park
- Reduce floodplain elevation and extents



# West Papillion Creek: Flood Plain Comparison



Altech Business Park w/ Dam Site 15A

# Future Papillion Creek Floodplains

- Past projects and watershed planning will help, but not enough.
- Land use changes will have effects on channel capacity.
- Current funding sources will not address future needs.

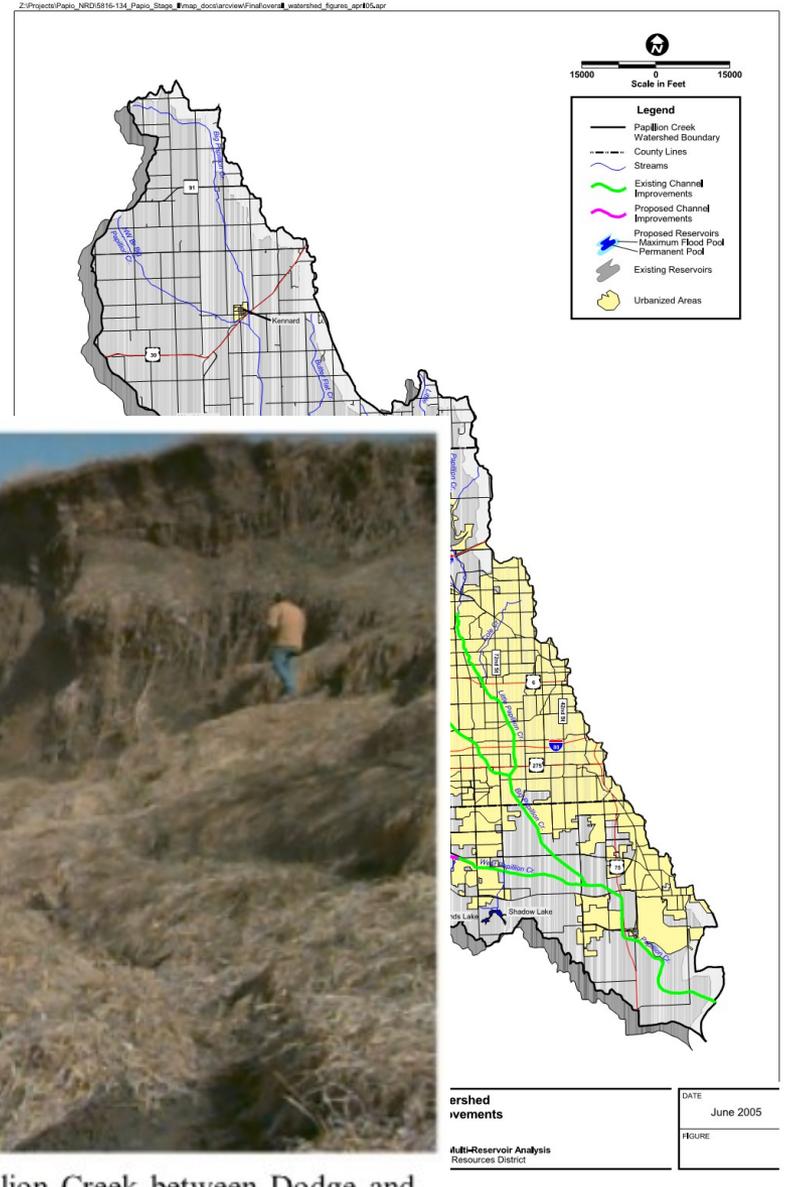


Figure 1.6 Streambank failure along West Papillion Creek between Dodge and Pacific Streets.