

## **QUESTIONS AND ANSWERS CONCERNING THE PUEBO LEVEE REPAIR**

**Q. What is the Federal Emergency Management Agency (FEMA)?** The Federal Emergency Management Agency is an agency of the United States Department of Homeland Security, initially created by Presidential Reorganization Plan No. 3 of 1978 and implemented by two Executive Orders on April 1, 1979. The agency's primary purpose is to coordinate the response to a disaster that has occurred in the United States. FEMA's mission is to support the nation's citizens and first responders to insure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards. Through FEMA's flood hazard mapping program, Risk Mapping, Assessment and Planning (MAP), FEMA identifies flood hazards, assesses flood risks, and partners with states and communities to provide accurate flood hazard and risk data to guide them to mitigation actions. Flood hazard mapping is an important part of the National Flood Insurance Program (NFIP), as it is the basis of the NFIP regulations and flood insurance requirements. FEMA maintains and updates data through Flood Insurance Rate Maps (FIRMS) and risk assessments. FIRM'S includes statistical information such as data for river flow, storm tides, hydraulic/hydrologic analyses and rainfall and topographic surveys.

**Q. What does FEMA have to do with Pueblo County?** After Hurricane Katrina struck the gulf coast, which resulted in major flooding to the City of New Orleans, the Corp of Engineers was subject to criticism for failure to assure that the levees that protect New Orleans were properly maintained. As a result, the Corp of Engineers and FEMA initiated a program for reviewing levees in the United States and updating flood plain mapping. The Pueblo Conservancy District was advised that unless the Arkansas River Levee was accredited by FEMA, the City would lose its protected status which ensures that flood insurance could be provided at very affordable rates.

**Q. What does the Arkansas River Levee do for Pueblo now that the Pueblo Dam and Reservoir is in place?** The Arkansas River Levee is a key component to flood protection for Downtown Pueblo and adjacent neighborhood areas. The Levee protects structures that house services provided to residents of the entire County of Pueblo. Services including but not limited to the Pueblo County Sheriff's office, the Pueblo Courthouse, the City of Pueblo Offices, Memorial Hall, the Pueblo Jail, the Pueblo Police Department, the Judicial Building, the Pueblo 911 Call Center, the Pueblo Library among others. The Arkansas River Levee was constructed prior to construction of the Pueblo Reservoir. The Pueblo Reservoir significantly reduces flood flows in the Arkansas River through the City of Pueblo but it does not eliminate flood risk. There is a significantly large watershed which exists between Downtown Pueblo and the Pueblo Reservoir (including Wildhorse Creek which extends northerly into Fort Carson). That watershed contributes large amounts of runoff to the Arkansas River during storm events of historic significance. The Arkansas River Levee is not required to provide as much flood protection as it did prior to construction of the Pueblo Reservoir (approximately 130,000 cfs). However, flows in the Arkansas River through the City of Pueblo as generated by the 100 year design storm event are still significant (40,000 cfs) even after construction of the Pueblo Dam and Reservoir.

The Arkansas River Levee is the only thing that keeps large areas of Pueblo County from being designated by FEMA to be in a flood plain, requiring flood plain insurance before any loan can be

made on the property. Flood plain insurance covers only the first \$500,000.00 of building value. To provide insurance to cover values in excess of \$500,000.00 there is an even greater cost to the property owners.

**Q. What is the Pueblo Conservancy District?** The Pueblo Conservancy District was formed, after petition to the District Court, in 1923. The District was organized pursuant to the Conservancy Law of Colorado, C.R.S. 37-1-101 et seq. These statutes were adopted by the Colorado Legislature in direct response to the catastrophic flood of 1921 in Pueblo. The Pueblo Conservancy District's boundaries were established in 1923. Construction of the Arkansas River Levee through the City of Pueblo was completed in 1925/26. As such, the originally constructed Arkansas River Levee through the City of Pueblo has successfully served the community for 90 years.

**Q. How is the Pueblo Conservancy District governed?** There are nine directors of the Pueblo Conservancy District appointed pursuant to C.R.S. 37-3-101 (2). Four directors are appointed by the City of Pueblo, four are appointed by the County of Pueblo and one director at large is appointed jointly by the City and County of Pueblo. For a list of the current directors please go to [www.puebl levee.org](http://www.puebl levee.org).

**Q. What is the length of the Levee and how much of it has been improved or replaced to date?** The Arkansas River Levee extends from the 11<sup>th</sup> Street Bridge (station 100+00) to Runyon Lake (approximately station 229+65). That is a distance of approximately 12,965 linear feet or 2.45 miles. With the completion of Phase III of the Levee Improvements Project the levee will be replaced in its entirety from the 11<sup>th</sup> Street Bridge to the existing Black Hills/Harp Diversion Structure (station 157+60). That means 5,760 linear feet of the levee (approximately 1.1 miles) will have been replaced with the remaining 7,205 linear feet (approximately 1.35 miles) remaining to be improved/replaced.

The Levee Project is being completed in phases. Phases I is completed and Phase II was substantially completed in December of 2016. Phase III will be completed in the spring of 2017. Construction can only take place from about November 1 through March 31 when water in the river is at a minimum flow.

When Phase II of the project was undertaken, the levee was lowered by approximately 12 feet to simplify future levee improvement projects. That lowering work extended to approximately station 205+00.

**Q. What is the Wildhorse Creek Levee and where is it located?** The Wildhorse Creek Levee was created during the same time period as the Arkansas River Levee, in the mid 1920's. This Levee is located on the East side of Wildhorse Creek between 11<sup>th</sup> Street and 18<sup>th</sup> Street. Significant storm drainage flows through this levee to the Arkansas River Levee. This levee protects a significant part of downtown Pueblo from flood hazard.

**Q. Why is the Pueblo Conservancy District responsible for the Wildhorse Creek Levee?** The Pueblo Conservancy District is responsible for protecting the community from flood hazards and

therefore takes responsibility for the integrity of the Wildhorse Creek Levee as well as the Arkansas River Levee. The original boundaries of the Pueblo Conservancy District included the Wildhorse Creek Levee for the flood protection it provided to the City. In Phase II of the Project the Pueblo Conservancy District completed removal and replacement of the existing Wildhorse Creek Levee between the existing 11<sup>th</sup> Street Bridge (commencement point for the Arkansas River Levee) and West 18<sup>th</sup> Street. As mentioned above, Wildhorse Creek is a significant tributary to the Arkansas River. Certification of the Wildhorse Creek Levee is also a key component to FEMA's flood plain mapping efforts for the City of Pueblo.

**Q. What problems if any were discovered in the first phases of improving the existing Levee?**

During construction of the first three phases of the Arkansas River Levee Project, numerous deficiencies in the existing levee system have been identified. Those deficiencies include, but are not limited to: major voids in the embankment material behind the concrete facing, groundwater impounded behind the concrete facing due to missing or clogged weep holes, extremely deteriorated concrete (90 years old) in particular at or below low water levels, severely corroded reinforcing steel at joints and cracks in the existing concrete facing material, unsuitable embankment material which lead to slope stability issues, etc.

The existing earthen embankment is the actual levee while the existing concrete facing material only provides for slope stability and erosion protection. The deficiencies encountered to date are extremely serious. The voids which have been encountered indicate that water has gotten behind the concrete facing material and is eroding the levee embankment material. Water is most likely getting behind the concrete facing due to deterioration which is creating voids in the protective material. Significant voids in the existing embankment can result in the potential for several types of levee failure. A "piping failure" results when voids extend from one side of the embankment to the other. In this case, leakage through the embankment carries earthen material to the landside of the embankment. Once breached, those voids will grow in size very quickly resulting in the concrete facing material collapsing and flood water entering the embankment. Significant voids in the embankment can result in an embankment collapse which can happen very quickly and be very catastrophic in nature. Should the embankment collapse during a significant storm event, storm water will inundate portions of Downtown Pueblo and the surrounding neighborhoods very quickly.

**Q. Why does the entire Levee need replacement and can part of the Levee remain in place?** The design team for the Arkansas River Levee Improvements Project is using each Phase of construction to improve means and methods to be used for future Project Phases. It has been very important for the design team to control costs. One way to control costs would be to leave existing portions of the levee in place without replacement. Unfortunately, as previously indicated, the existing concrete facing and its reinforcing steel are extremely deteriorated. In particular in areas below the low water elevation. Because of that deterioration, the risk of water penetrating the earthen embankment behind the concrete is very high. Once that water reaches the earthen embankment, voids and resulting failures, as discussed above, can occur. Also, without removing the existing concrete facing the design team is unable to determine where voids may exist. Water may enter the embankment behind the concrete facing at one point but not create a void for several hundred feet downstream (this condition has been identified in several areas). That is the result of conditions

associated with the original construction of the existing embankment. The design team has explored other means of improving the existing embankment and concrete facing such as pressure grouting. Unfortunately, without knowing what exists behind the existing concrete facing, there is no way to quantify costs for the alternative improvement options.

The existing levee downstream of the Santa Fe Avenue Bridge and upstream of Runyon Lake was constructed by the US Army Corps of Engineers at a date later than the remainder of the Arkansas River Levee. To control project costs, it may be possible to defer improvements to that section of the levee. That area is less than 1,000 feet in length.

**Q. What is FEMA doing about this at the present time?** FEMA has prepared flood plain mapping for the City of Pueblo based on two conditions. The first condition assumes that improvements to the Arkansas River Levee and subsequent accreditation of the levee are completed. The second condition assumes that the levee is not reconstructed nor accredited. In that case, large portions of Downtown Pueblo and adjacent neighborhoods will fall in the flood plain and will be required to obtain flood insurance.

FEMA is currently working with the Pueblo Conservancy District and the City of Pueblo with respect to flood plain mapping. The currently adopted mapping assumes accreditation of the Levee since the improvement project is ongoing. FEMA's mapping does state, via notes, that large areas of Downtown Pueblo and the adjacent neighborhoods are in a potential risk area as the levee improvements are not yet complete. We believe, and FEMA has confirmed, that if the levee improvement project was halted after Phase III due to a lack of funding, FEMA would replace the currently adopted flood plain map which assumes levee accreditation with a flood plain map showing a non-accredited levee. That would result, as previously stated, in large areas of Downtown Pueblo and adjacent neighborhoods falling within the flood plain and being required to purchase flood insurance.

**Q. What is the risk to the citizens of Pueblo County if the Levee Project is halted?** Until such time as the entire Levee Project is completed and the new levee is accredited, a significant level of flood risk exists for Downtown Pueblo and the adjacent neighborhoods.

**Q. What is the total cost of the Levee Project if completed?** Approximately \$22 Million dollars for design, engineering, testing and construction.

**Q. Where is the money coming from to pay for the Levee Project?** The Pueblo Conservancy District is authorized by statute to assess what is known as a Maintenance Fund Assessment. This Assessment is much like a fee charged by various governmental agencies. The Maintenance Fund Assessment is paid by all property owners in Pueblo County. Property owners in the historic flood plain of the Arkansas River are charged a higher fee than property owners outside the historic flood plain. There are three levels of assessments, the highest being on properties in the historic flood plain, then a lower assessment is made on properties in the City of Pueblo but outside of the historic flood plain, then an ever lower assessment is made on properties in the County of Pueblo but outside of the City limits and outside of the historic flood plain. All property owners in Pueblo

County benefit from having the Levee accredited by FEMA and benefit from the flood protection it provides.

**Q. How much does it cost property owners in Pueblo County to fund this Levee Project?** The simple answer is this: a lot less than the cost of flood insurance. As an example of this, consider a property in the historic flood plain having an actual value of \$201,570.00. The flood insurance cost would be \$2,718.00 annually. The current Maintenance Fund Assessment on that property is \$353.70. The Pueblo Conservancy District needs to increase that fee for 2018 by no more than \$123.80 to pay for the cost to complete the Levee Project. That would bring the Maintenance Fund Assessment to a total of \$477.50 for that property vs. \$2,718.00 for flood insurance. This is a significant annual savings.