



Stormwater Run-off Management System

AGENDA

- WHAT HAS BEEN THE TIMELINE?
- HOW MUCH INFRASTRUCTURE?
- MAJOR MAINTENANCE AND SYSTEM IMPROVEMENT NEEDS.
- STORMWATER RUN-OFF MANAGEMENT SYSTEM?
- HOW MUCH FUNDING IS CURRENTLY BUDGETED?
- HOW MUCH ADDITIONAL FUNDING IS NEEDED?
- PROPOSED FUNDING MECHANISM.
 - STORMWATER USER FEE
- SUMMARY
- QUESTIONS?

Overview of Timeline



Stormwater Overview

What is Surface Water & Stormwater?

- Surface water is water that exists on land surfaces before, during, & after stormwater runoff
 - Lakes, streams, wetlands, retention / detention ponds, etc.
- Stormwater runoff
 - Water that is derived from rainfall, snowmelt, any other form of precipitation, that flows over land or hard surfaces, such as paved streets, parking lots and building rooftops, and does not infiltrate into the ground
 - Ultimately flows into streams and lakes untreated



Pet waste



Fertilizer



Pesticides



Oil



Soap



Sediment



- City is required to manage stormwater quantity / quality

Flooding

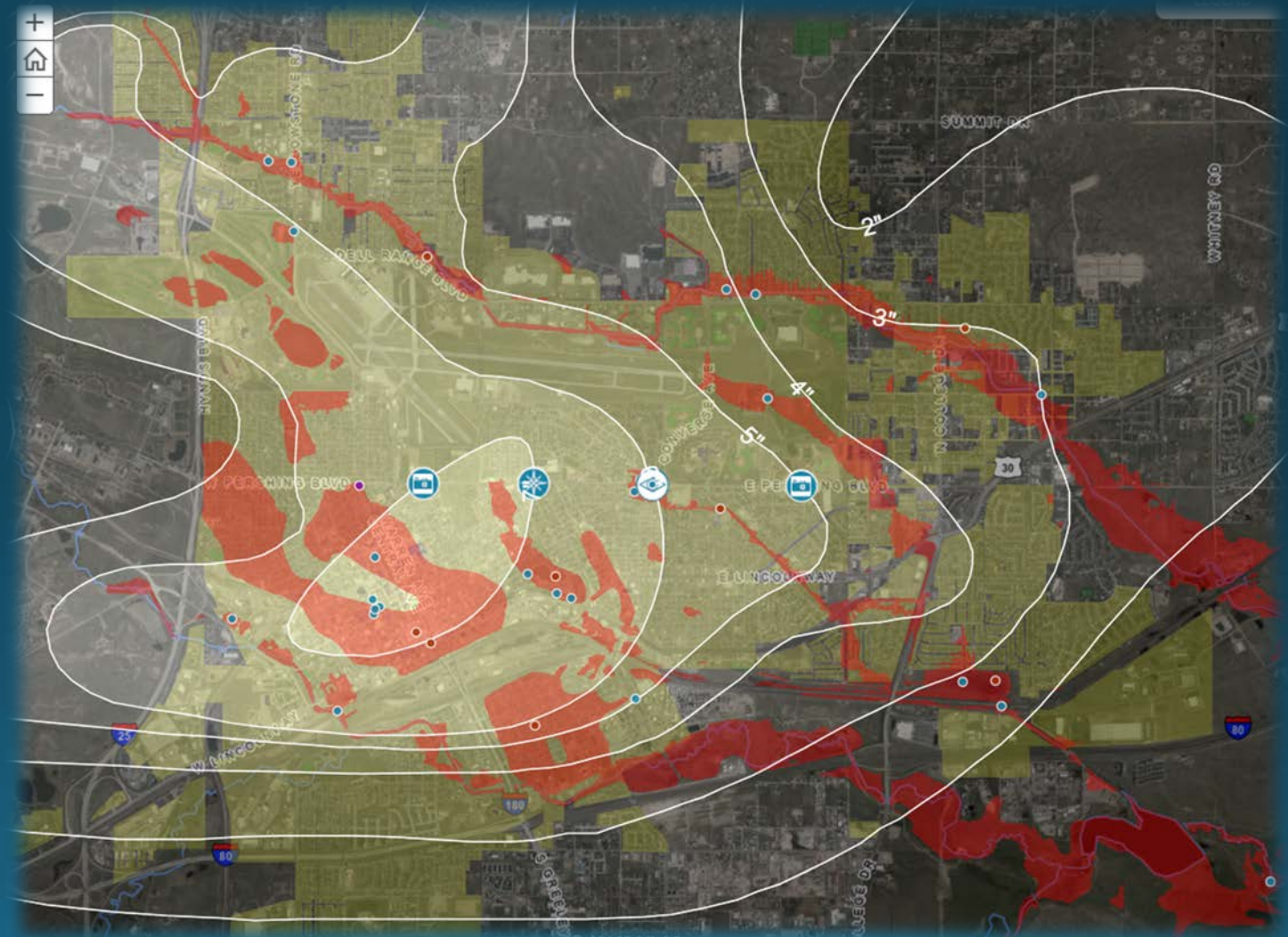
- Special Flood Hazard Area (SFHA)
 - FEMA Regulated
 - City/County Regulated
 - 1987 U.S. Geological Survey (USGS) Study

Recurrence Intervals and Probabilities of Occurrence		
Recurrence Interval (years)	Probability of Occurance in any Given Year	Percent Chance of Occurrence in any Given Year
100	1 in 100	1
50	1 in 50	2
25	1 in 25	4
10	1 in 100	10
5	1 in 5	20
2	1 in 2	50

- Localized Flooding

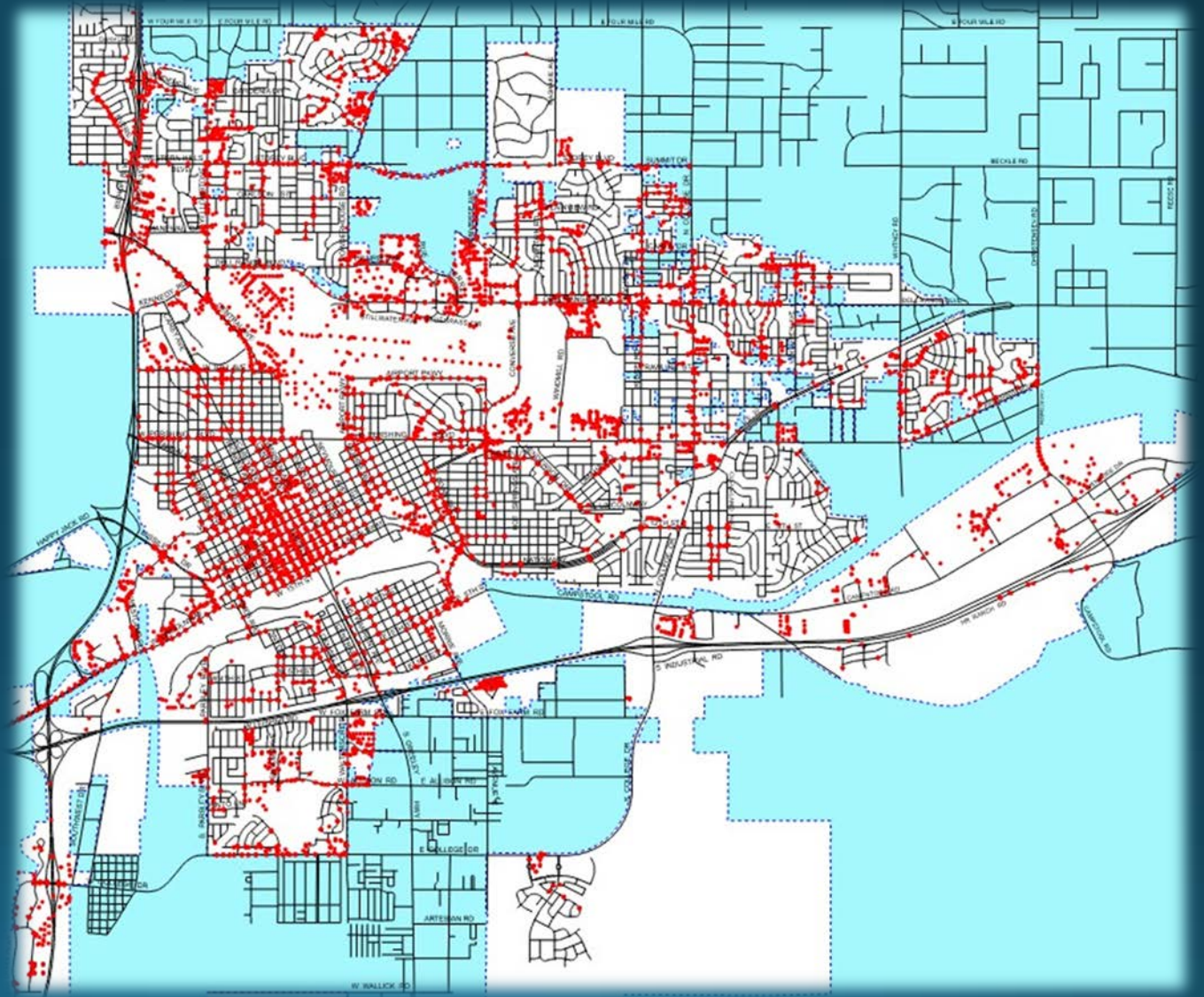


Localized Flooding



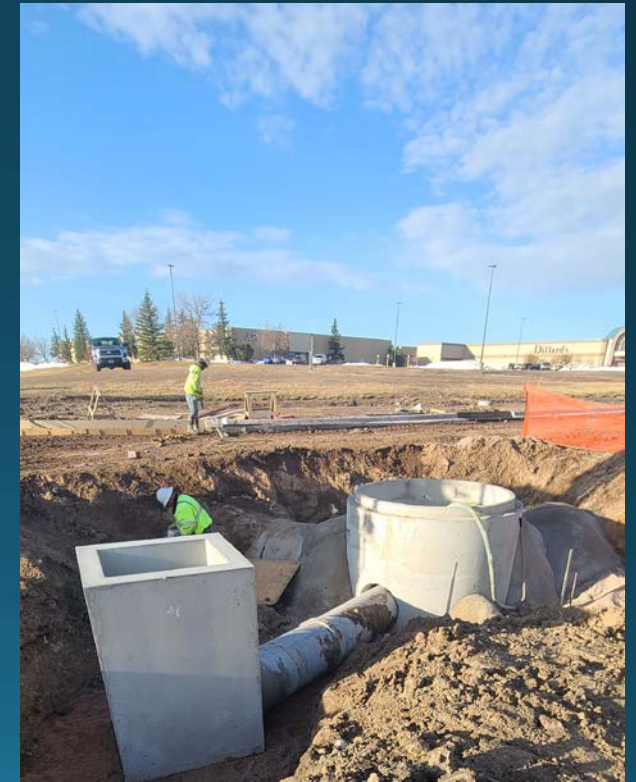
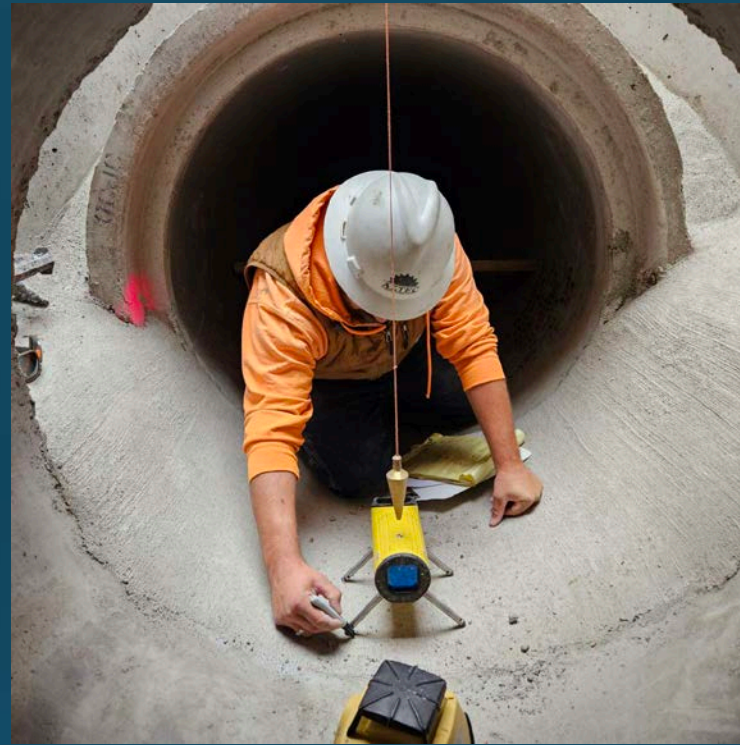
Drainage Infrastructure

- 700+ Miles of Curb and Gutter
- 135 Miles of Storm Pipe
- 4,119 Inlets/ Catch Basins
- 1,659 Manholes
- 236 Outlets
- 472 Stormwater Detention Ponds (160 Acres)
- Over 25 Miles of Open Channels
- 6 Lakes and Reservoirs
- 3 Dams
- 2 Levee Systems



Major Maintenance Needs

- Deferred Maintenance increases rehabilitation costs
- New Infrastructure continuously being added to the system



Major Maintenance Needs

- Open Channels and Detention Ponds
 - Vegetation Overgrowth
 - Overly Sedimented Channels



Major Maintenance Needs cont.

- Storm Sewer Collection System
 - Deteriorated Curb, Gutter and Valley Pans
 - Failed inlets
 - Deteriorated and obstructed pipes/culverts
 - Deteriorated manholes



Maintenance Needs cont.

- Crow Creek
 - Ames Underpass to Morrie Avenue

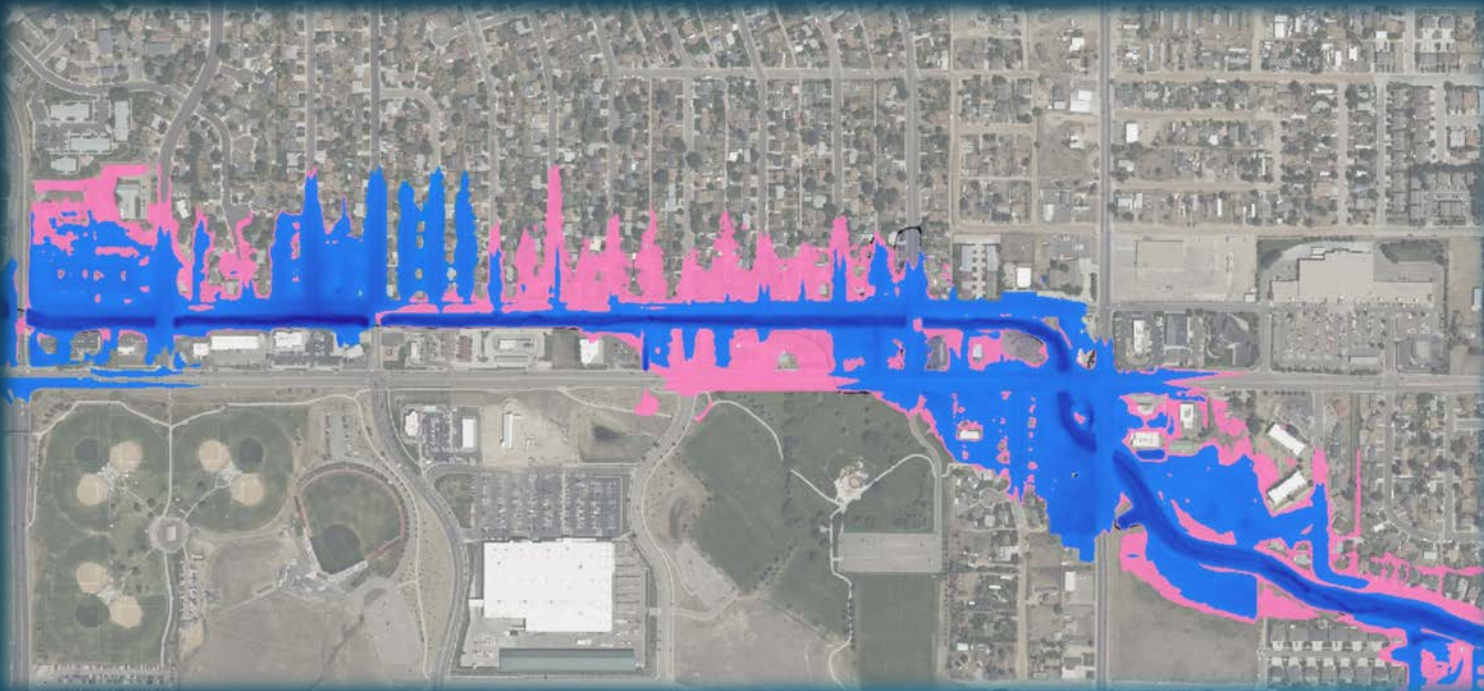


Normal Friction High Friction 50% Impedance at I-180 Culvert

122

Maintenance Needs cont.

- Dry Creek
 - Converse Ave. to College Dr.



Major System Improvements

- **Ward I**

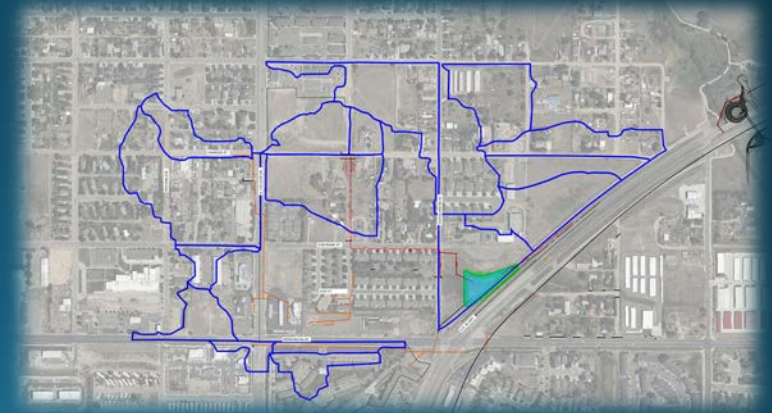
- 19th and Missile: \$3.0M
- Duff Avenue Storm Interceptor: \$5.0M

- **Ward II**

- Hilltop Rd. Culvert Replacement: \$1.5M
- Mountain Rd. Culvert Replacement: \$1.5M

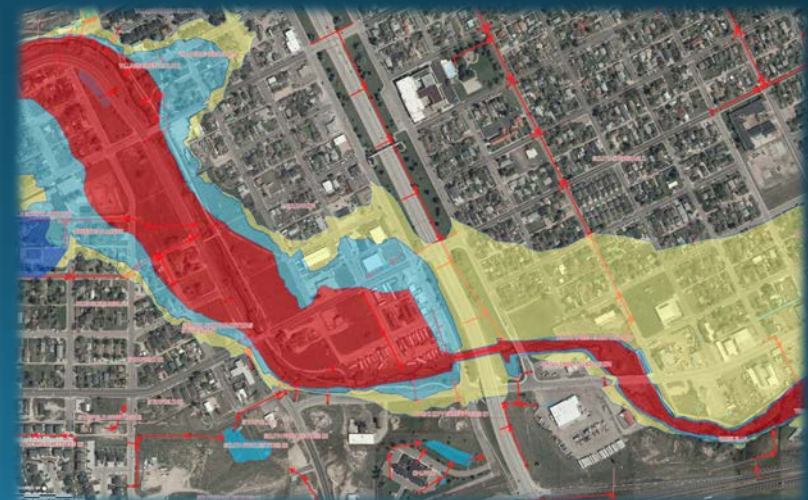
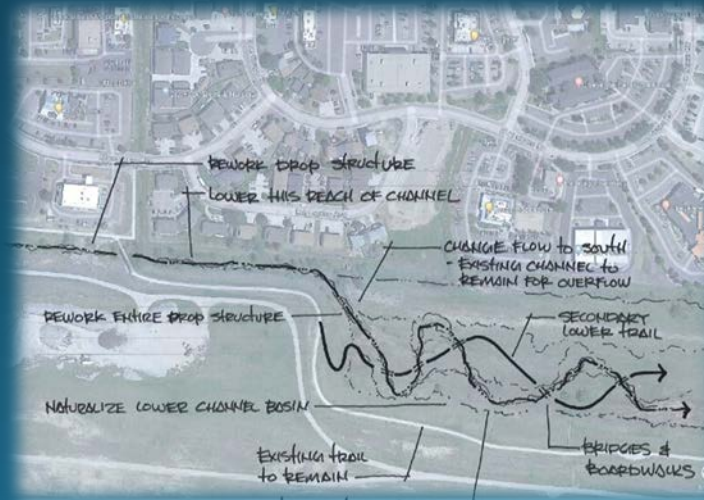
- **Ward III**

- Sunnyside Regional Detention Pond: \$800k
- Charles Street Drainage Improvements: \$2.0M



Major System Improvements

- Converse Ave. Culvert Replacement: \$3.0M
- Prairie Ave. Crossing: \$1.5M
- Additional conveyance structures at I-180 and Crow Creek \$8.0M
- Clear Creek Offline Detention: \$2.0M
- 18th Street Storm Interceptor: \$2.0M
- Carey Reservoir Modifications: \$2.0M



Why do We Need a Stormwater Management System?

- Maintain MS4 (Municipal Separate Storm Sewer System) Permit Compliance.
 - Required for communities with populations > 50k by the DEQ.
 - Mitigate contaminants introduced into federally regulated waters
 - E. coli
 - Selenium
 - Sediment
 - PCE and PFAS Chemicals
 - Fertilizers and Pesticides
 - Hydrocarbons
 - Etc.
- Assist in the Administration of SFHA in accordance with the National Flood Insurance Program's (NFIP) guidelines and FEMA requirements.
 - Required participation to obtain federally backed mortgages
 - Document Community Rating System (CRS) Tasks



 Department of Environmental Quality
To protect, conserve, and enhance the Quality of Wyoming's environment for the benefit of current and future generations.

General Permit to Discharge Storm Water
Associated with
Municipal Separate Storm Sewer Systems (MS4s)
under the
Wyoming Pollutant Discharge Elimination System (WYPDES)

In compliance with the provisions of the federal Water Pollution Control Act and the Wyoming Environmental Quality Act, facilities located within the State of Wyoming, except areas within the Wind River Indian Reservation where the state does not have jurisdiction, which are or may discharge storm water and related effluents associated with activities related to municipal separate storm sewer systems, as described in this permit, are hereby authorized to discharge to surface waters of the State of Wyoming in accordance with the requirements of this permit.

This general WYPDES permit, WYR04-0000, is issued under the provisions of Wyoming Water Quality Rules and Regulations Chapter 2.

This permit shall become effective when signed by the Administrator and Director.

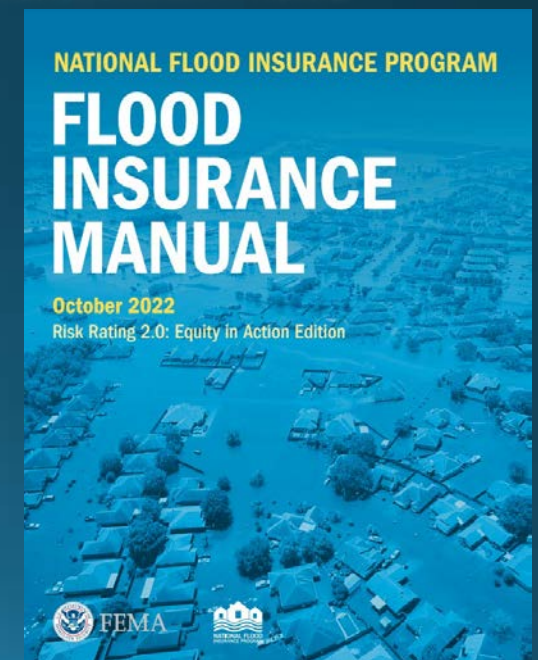
This permit shall expire on September 30, 2013.

Discharges are authorized under this permit only upon written authorization from the Department of Environmental Quality/Water Quality Division. See Part 3 of the permit for specific information.

 John F. Wagner, Administrator, Water Quality Division
 John V. Clark, Director, Department of Environmental Quality

Hercher Building - 122 West 25th Street - Cheyenne, WY 82002 - <http://deq.state.wy.us>

ADMINISTRATIVE	PERMITS DIVISION	AIR QUALITY	INDUSTRIAL SERVICES	LAND QUALITY	WATER QUALITY
(307) 777-3700	(307) 777-4440	(307) 777-2344	(307) 777-2900	(307) 777-2700	(307) 777-2700
FAX 777-3610	FAX 777-6662	FAX 777-6667	FAX 777-6667	FAX 777-6664	FAX 777-6675



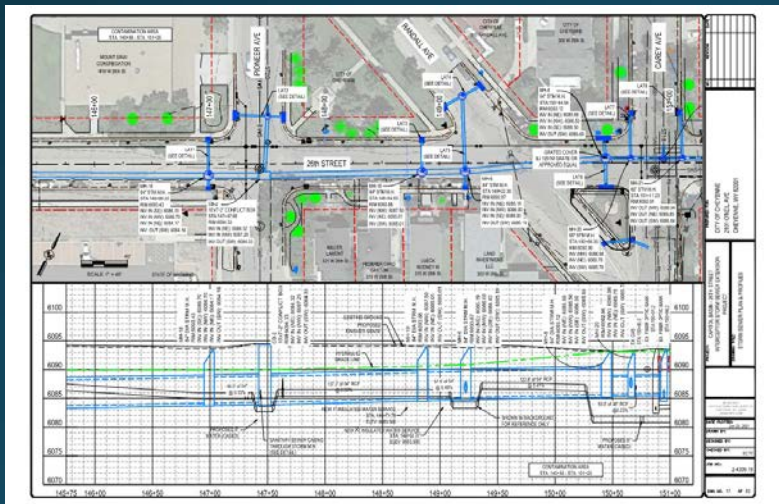
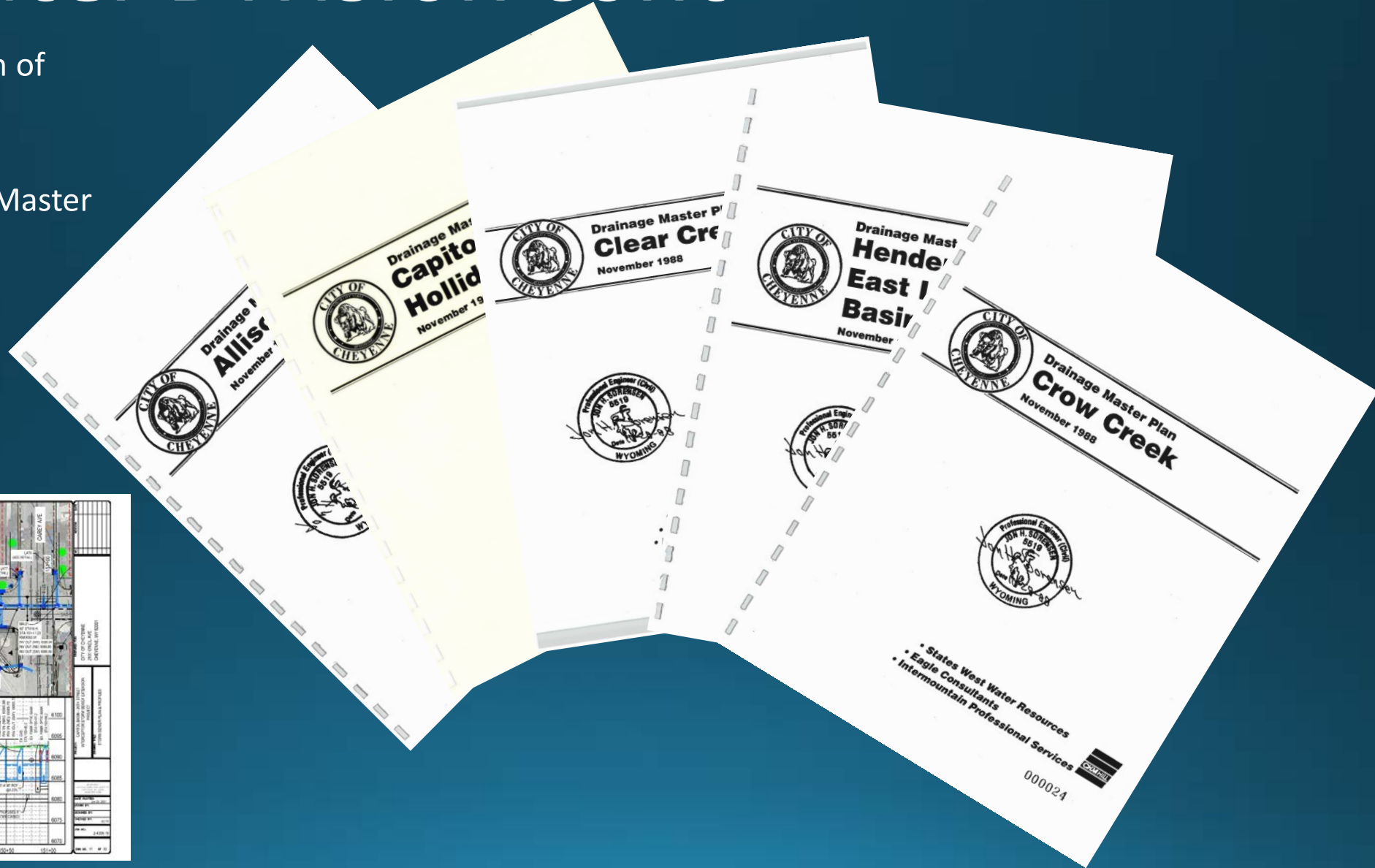
Stormwater Division cont.

- Development of a Stormwater Asset Management System
 - Ongoing inspection of existing storm system
 - Maintenance programming
 - Identification of deteriorated infrastructure
 - Capital Improvement Project programming
- Identify and Address Localized Flooding Problems
- Investigate and Respond to Citizen Drainage Concerns



Stormwater Division cont

- Design and Construction of Stormwater Capital Improvement Projects
- Update Drainage Basin Master Plans



What are the Magnitude of Costs?

- Cost for Dredging (\$70/ft)
 - Over 25 miles of open channels
 - Approximately over \$9 M to Dredge all open channels
 - Channels require regular maintenance
- Total Costs for Projects in this Presentation
 - Approximately \$30M
- Dell Range and Van Buren Storm Improvements Project
 - Over \$2.1 M per mile of storm sewer pipe, inlets, and standard manholes
- Localized Flooding Areas
 - \$???.?M

How much 5th Penny Funds are designated for Storm Sewer Maintenance and Construction?

The current 2023-2026 allocation is documented in Resolution No. 6248.

Storm Sewer maintenance allocation adjusted from \$550k to \$1.0M in 2023.

Revenue received from an optional sales tax approved by the voters every four years is to be used primarily for street and road projects (i.e. 80% of Total).

Project Name/ Type	Estimated Total Costs	
	Annual	2023-2026 Total
City Streets and Pavement Maintenance	\$5.00 M	\$20.0 M
Public Works (Street and Alley)	\$1.25 M	\$5.0 M
Traffic Safety Improvements (i.e. Upgrading traffic signals)	\$750 K	\$3.0 M
1% Construction Office Administration and Management	\$750 K	\$3.0 M
Storm Sewer Maintenance and Construction	\$1.00 M	\$4.0 M
Designated Priority Projects	\$1.25 M	\$5.0 M
Priority 1: Converse Ave. Pedestrian Bridge to Masonway	-	-
Priority 2: Realign Missile Drive at 19th Street	-	-
Priority 3: Storm Sewer Interceptor Along Duff Ave. and Bradly Ave.	-	-
Totals	\$10.0 M	\$40.0 M

Funding

- Current
 - \$1.0 million per year
 - \$750 k Major Maintenance and Improvement Projects
 - \$250 k Personnel and Equipment
 - Minor System Maintenance
 - Priority 5th Penny Projects
 - 3 Projects listed in 5th penny ballot
 - Potential 6th Penny Funding
 - Supplemented by Grants
 - Proposed Stormwater Fee



Adopted Stormwater Management System Budget (FY 2025)

Stormwater Budget

- MAJOR MAINTENANCE

- Channel Dredging \$1.0 M
- Vegetation Management \$200 K
- Channel Stabilization \$100 K
- Pipe Cleaning \$100 K
- Pipelining \$600 K

Subtotal = \$2.0 M

- CAPITAL IMPROVEMENT PROJECTS

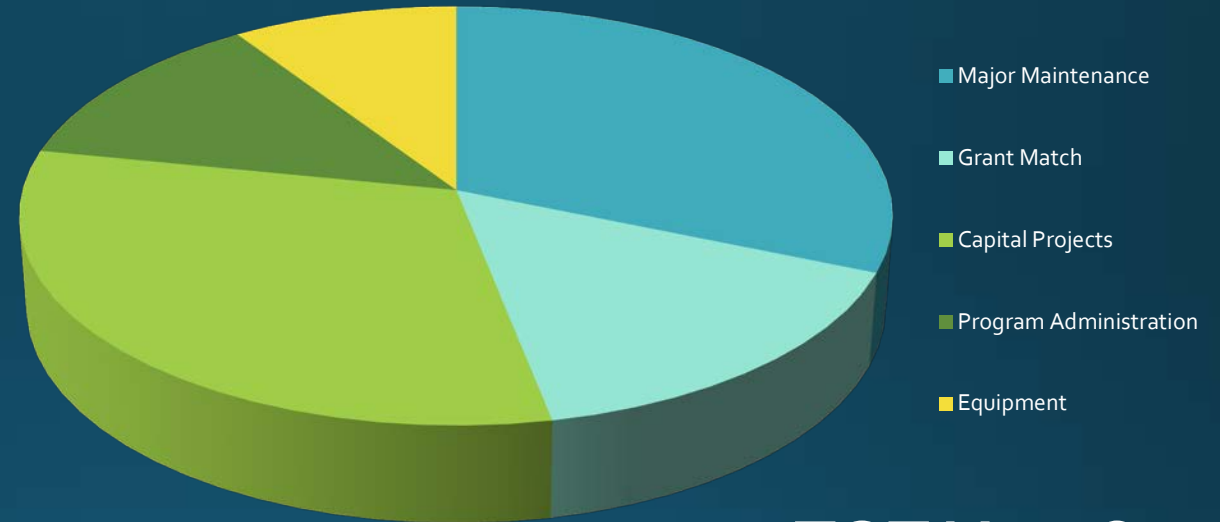
- Grant Match \$1.0 M
- Projects \$2.0 M

Subtotal = \$3.0 M

- DIVISION ADMINISTRATION

- Equipment \$300 K
- Personnel and Program Development \$800 K

Subtotal = \$1.1 M



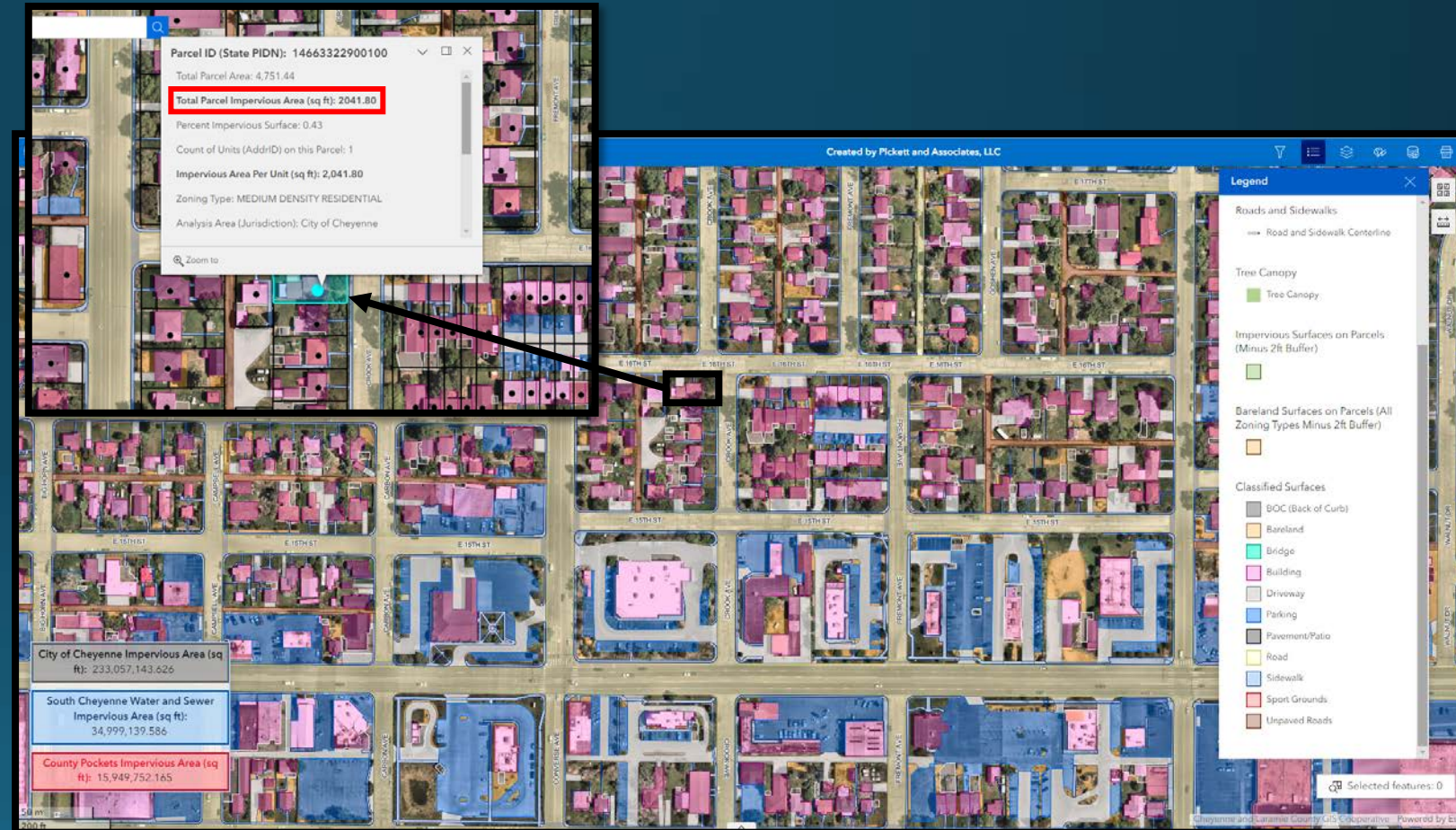
TOTAL: \$6.1m

Proposed Stormwater Rate and User Fee

- Rate calculated based on City-Wide Hard Surface Area and the Budget
- Uniform Rate for ALL properties (\$0.0024/sf/month)
- User fee calculated based on the rate and the properties' hard surface area
 - Residential Fees
 - Min (\$1.82), Max (\$55.52), Average (\$7.30)
- User fee applied to all property within the city
 - Residential, commercial, jurisdictional, institutional properties, etc.
 - Excludes City property and City ROW
 - 5th Penny contribution (\$1.0 M yearly)
 - ROW part of stormwater conveyance system
- <https://gis.pickettusa.com/CheyenneImperviousSurfaces/>

City-Wide Hard Surface Area by Parcel

- Utilized high-resolution imagery.
- AI based algorithm applied to identify hard surfaces.
- Classification accuracy was analyzed using 1500 random parcels.
- 97% accuracy for hard surface area.



Residential Fee Examples

- Property 1:
 - 1022 Hard surface sf
 - $1022\text{sf} * \$0.0024/\text{sf} = \$2.47/\text{mo}$
- Property 2:
 - 3954 Hard surface sf
 - $3954\text{sf} * 0.0024/\text{sf} = \$9.56/\text{mo}$



Summary

- Inspections, maintenance, and construction have been limited for the last 20+ years.
- Needs significantly exceed the funding available today.
- Stormwater user fee.
 - Uniform rate (fair and equitable).
 - User fee is based on each individual parcel's hard surface area.
- Our responsibility is to hold paramount the health and safety of the citizens of Cheyenne.

QUESTIONS?