

# What to Expect from Watershed Services

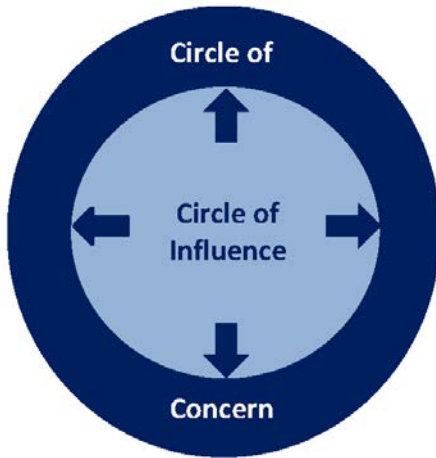
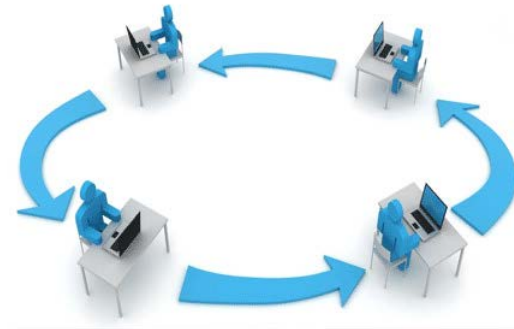
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2017 UDFCD Annual Seminar



Shea B. Thomas, PE  
Manager  
Watershed Services

# Watershed Services Goals



# Problem statement:

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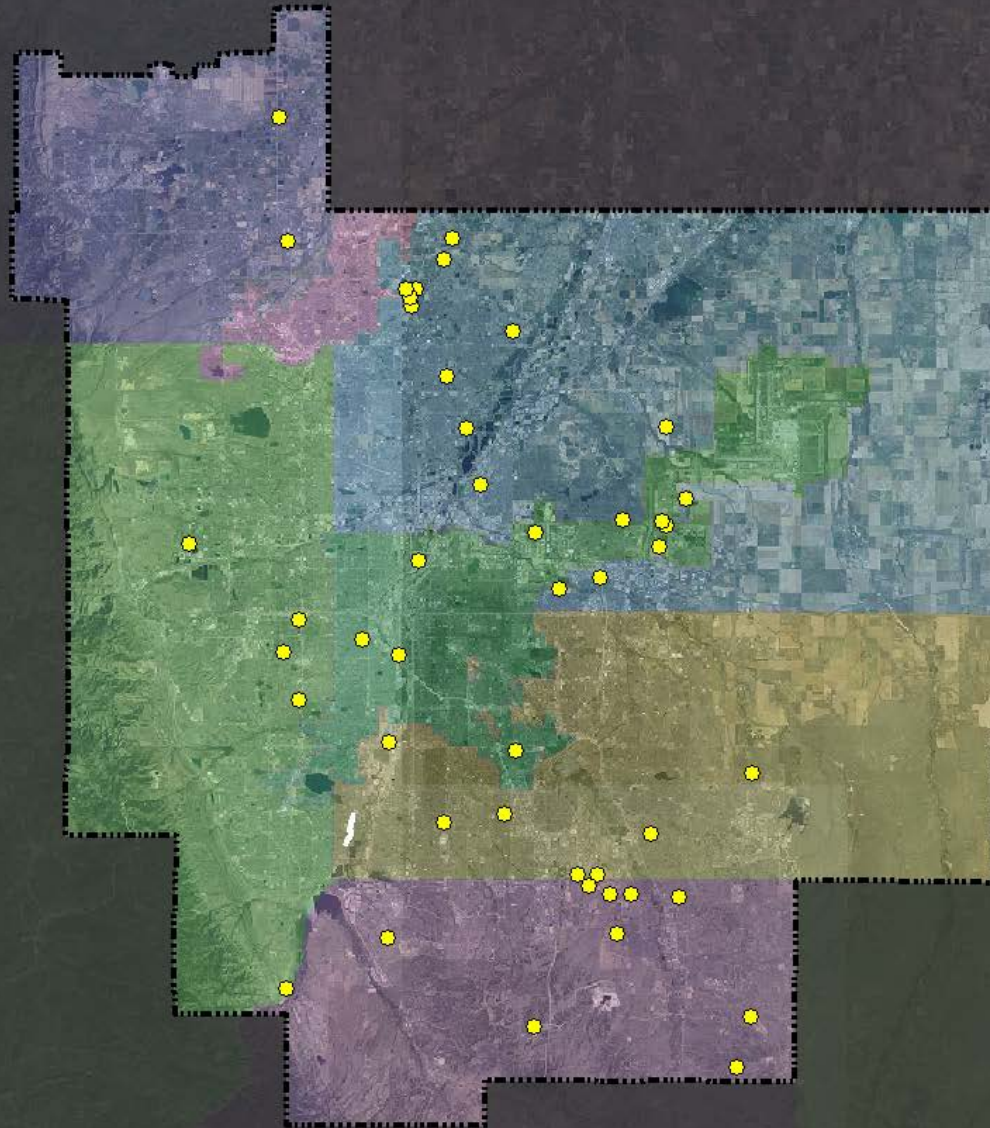
Fixed pot of maintenance funds



Growing pool of maintenance eligible projects

# MEP in construction

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# What we want

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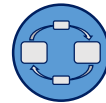


# What we don't want

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# The rules:



## Leyden Creek Major Drainageway Plan

October 2015

Urban Drainage and Flood Control District  
City of Arvada, Jefferson County



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# URBAN STORM DRAINAGE

VOLUME

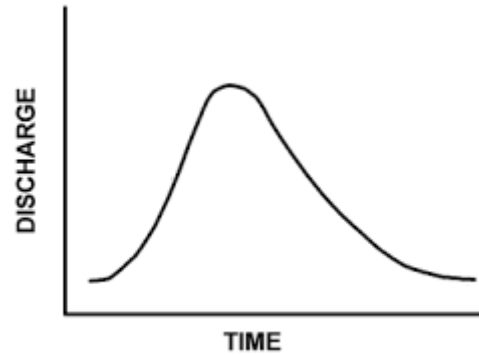
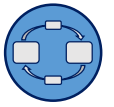
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CRITERIA  
MANUAL



MANAGEMENT, HYDROLOGY, AND HYDRAULICS

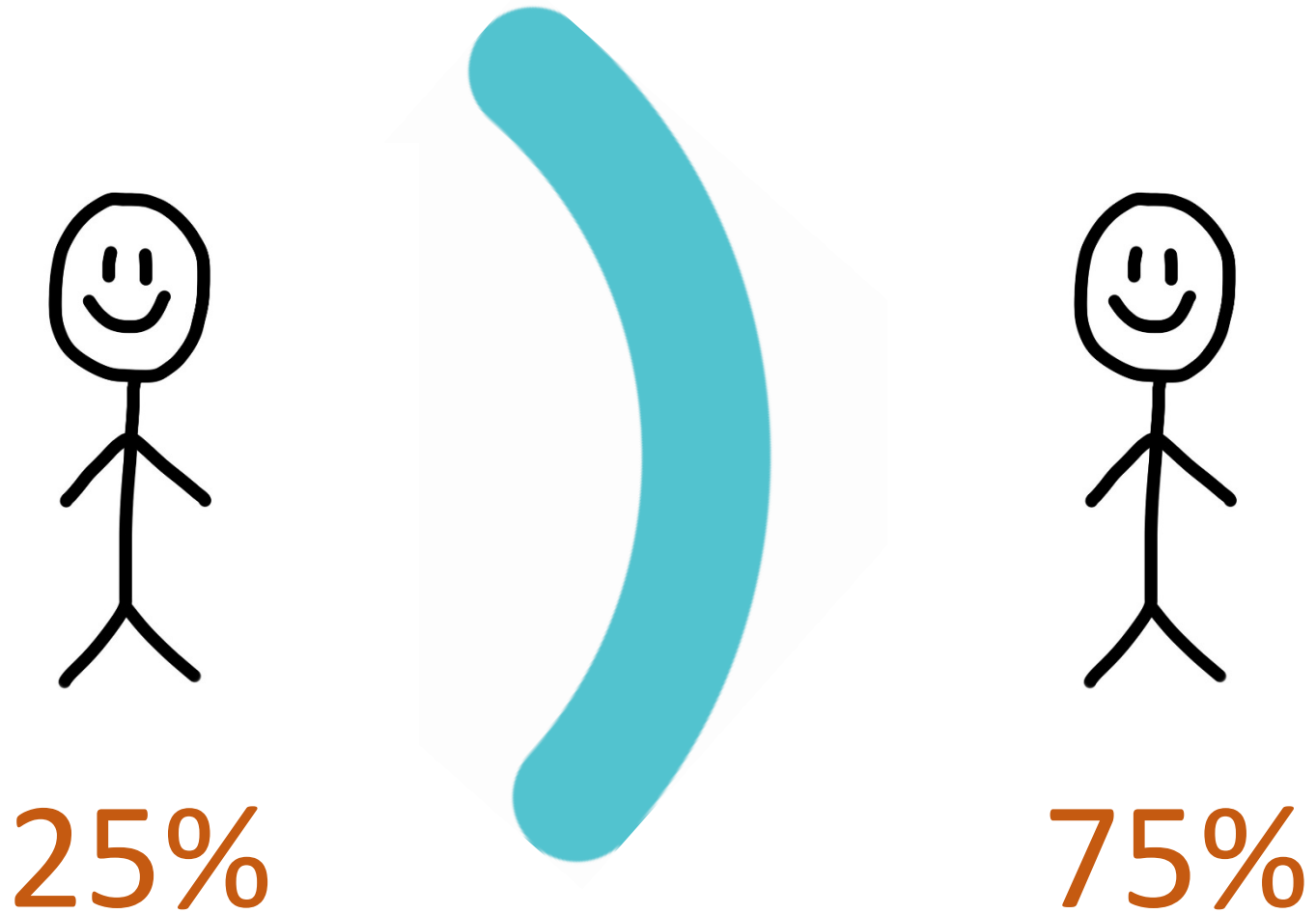
# Stream Services



**WHY?**



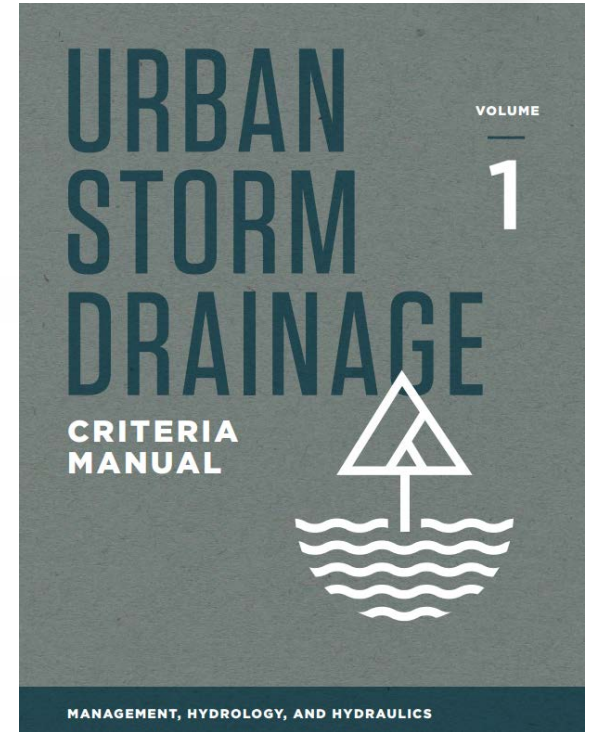
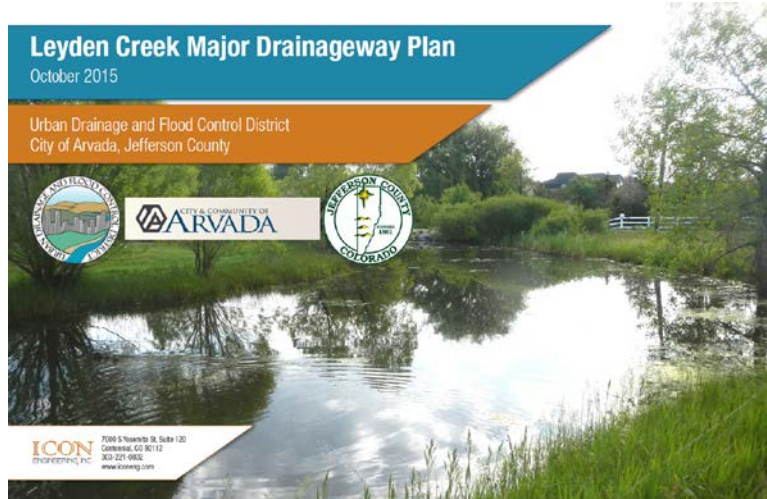




# Effective master plans



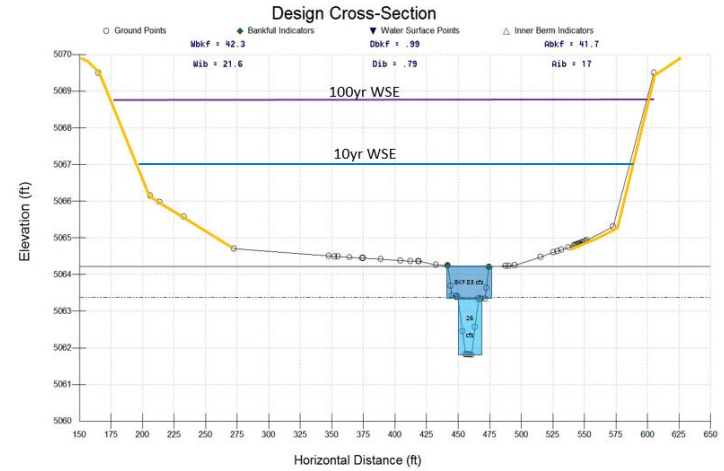
# Team Roster:



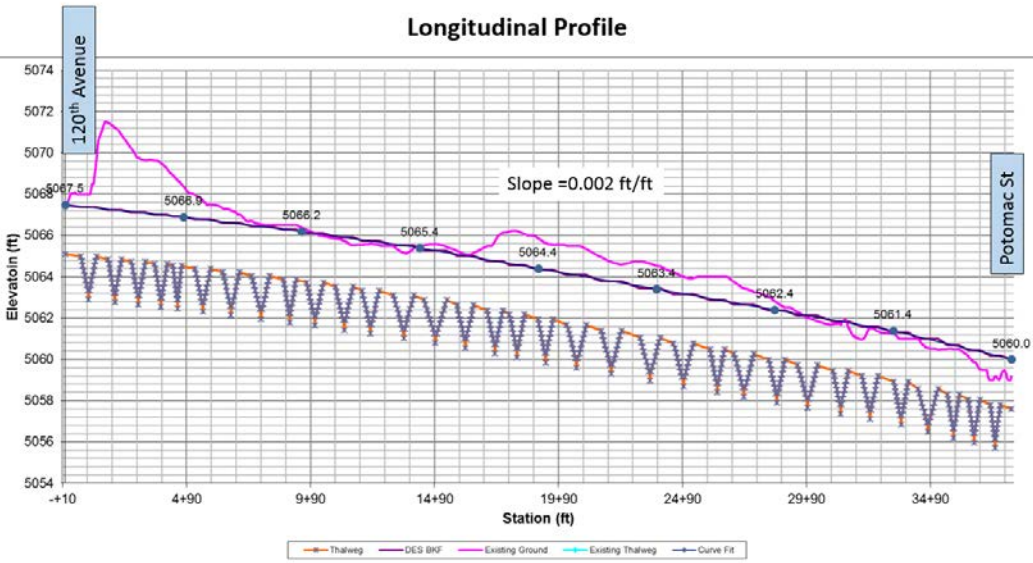




# Deliverables

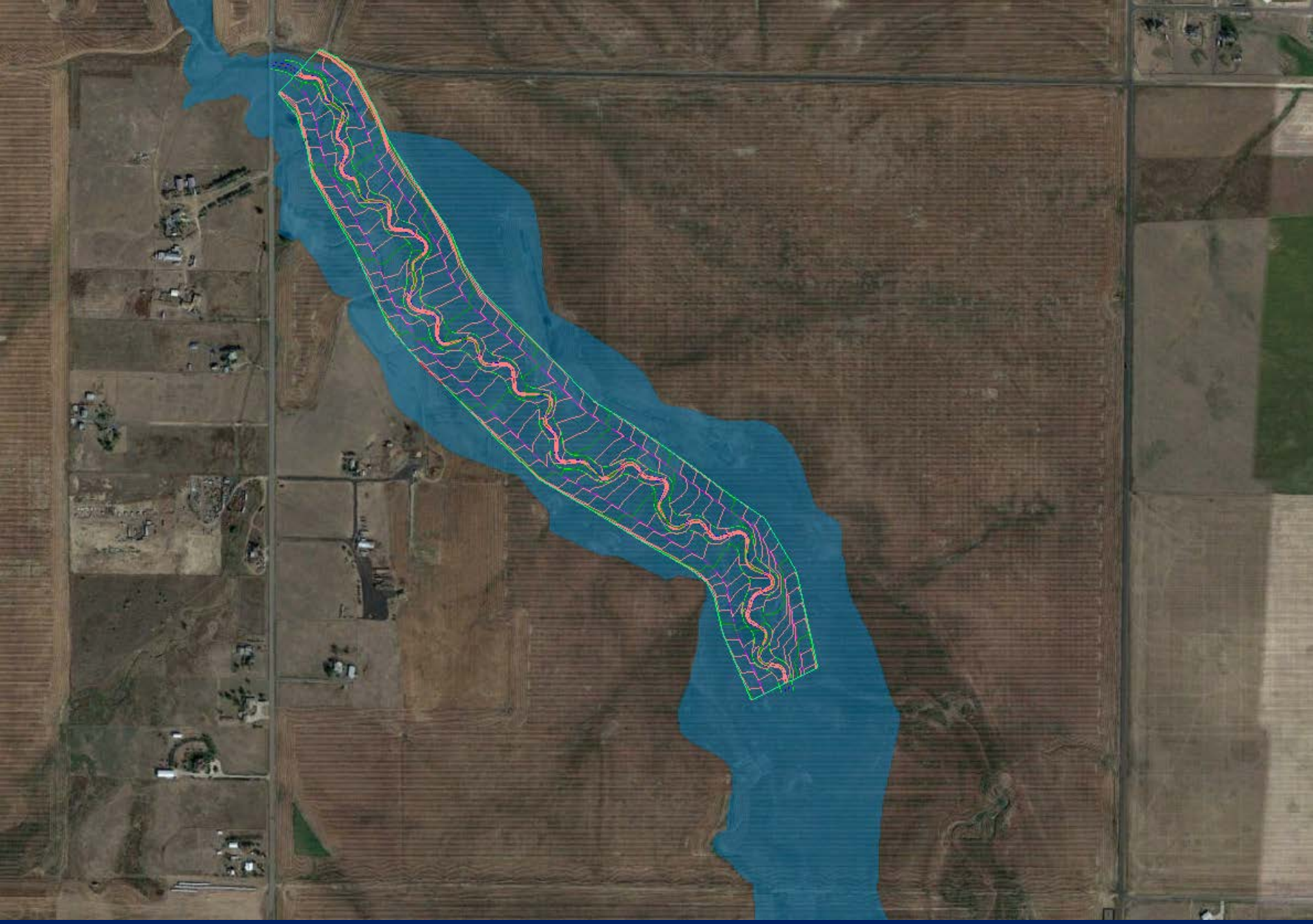


Longitudinal Profile

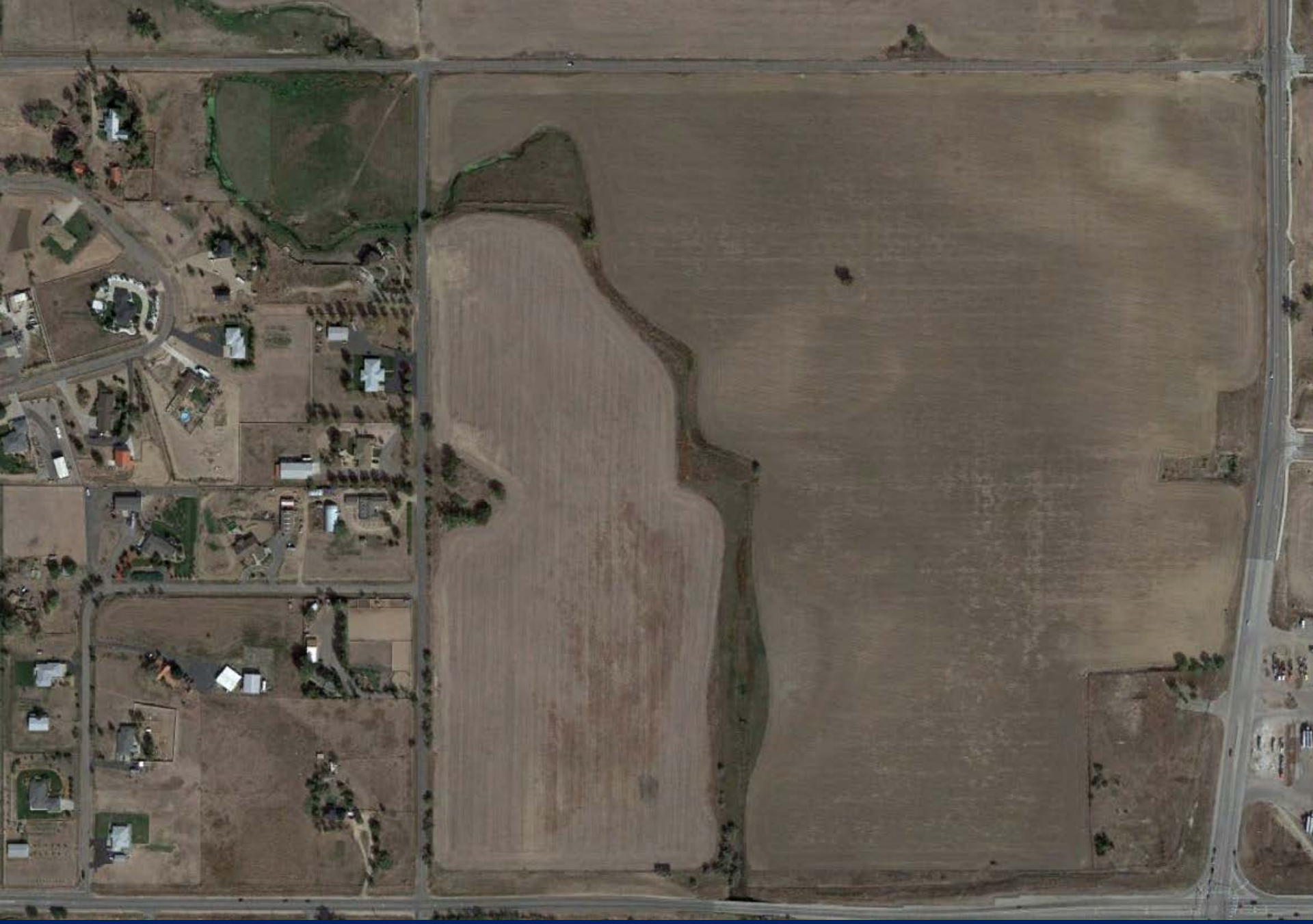


Performance Standards

Parameter	Measurement Method	Functioning Range
<b>Hydrology</b>		
Low Flow Channel (IB) Discharge	Drainage Area Relationship	25 cfs
Bankfull Channel Discharge	Regional Curve and Existing Condit	90 cfs
Floodplain Terrace Discharge	Drainage Area Relationship	250 cfs
100-year Discharge	MCP	8673 cfs
<b>Hydraulics</b>		
Flow Dynamics	Bankfull Velocity	<2-4 fps
	Floodplain Shear Stress	< 1 psf
<b>Geometry (Refer to typical section)</b>		
Proposed Stream Type	Stream Classification	C5
Valley Type	Stream Classification	Unconfined Alluvial
Floodplain Connectivity	Bank Height Ratio (BHR)	1-1.2
	Entrenchment Ratio (ER)	30-35
Low Flow Channel (IB)	Width	12.5 ft
	Mean Depth	0.8 ft
	Max Depth	1.1 ft
	Inner Berm Bench Width	17.5 ft
	Area	40% of Bankfull Area or 13 square feet
Bankfull Channel	Width	24 ft
	Mean Depth	1.60 ft
	Max Depth	2.40 ft
	Area	32 square feet
	Bend to Bend Spacing	5 - 7 times Bankfull Width (120 ft - 160 ft)
	Radius of Curvature (POC)	2 - 5 times Bankfull Width (48 ft - 120 ft)
	Tangent Lengths	1 - 3 times Bankfull Width (24 ft - 72 ft)
	Meander Wavelength	10 - 14 times Bankfull Width (230 ft - 320 ft)
	Meander Belt width	3 - 4.5 times Bankfull Width (72 ft - 108 ft)
Flood Terrace	Width	70-75 ft
	Area	300% of Bankfull Area or 36 square feet
	Bend to Bend Spacing	Same as Bankfull Planem
	Radius of Curvature	3 - 5 times the Flood Terrace Width (210 ft - 375 ft)
	Tangent Riffle Lengths	2 - 5 times the Bankfull Width (48 ft - 120 ft)
	Meander Belt width	1.5 - 2 times the Flood Terrace Width (105 ft - 150 ft)
	Expansion and Contraction Ratios	greater than 10:1
100-year Floodplain	Width	600 to 900 ft
	Radius of Curvature	3 - 5 times the Flood Terrace Width (210 ft - 375 ft)
	Tangent Lengths	2 - 5 times the Bankfull Width (48 ft - 120 ft)
	Meander Belt width	1.5 - 2 times the Flood Terrace Width (105 ft - 150 ft)
	Expansion and Contraction Ratios	greater than 10:1











# Bottom line:



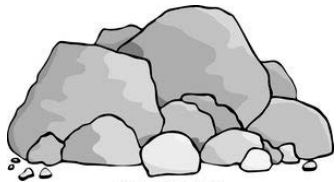
cannot commit future



to maintain



heavily

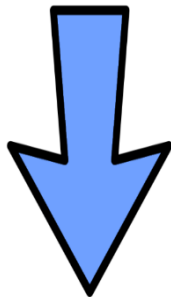


systems built by private entities

when they could have built

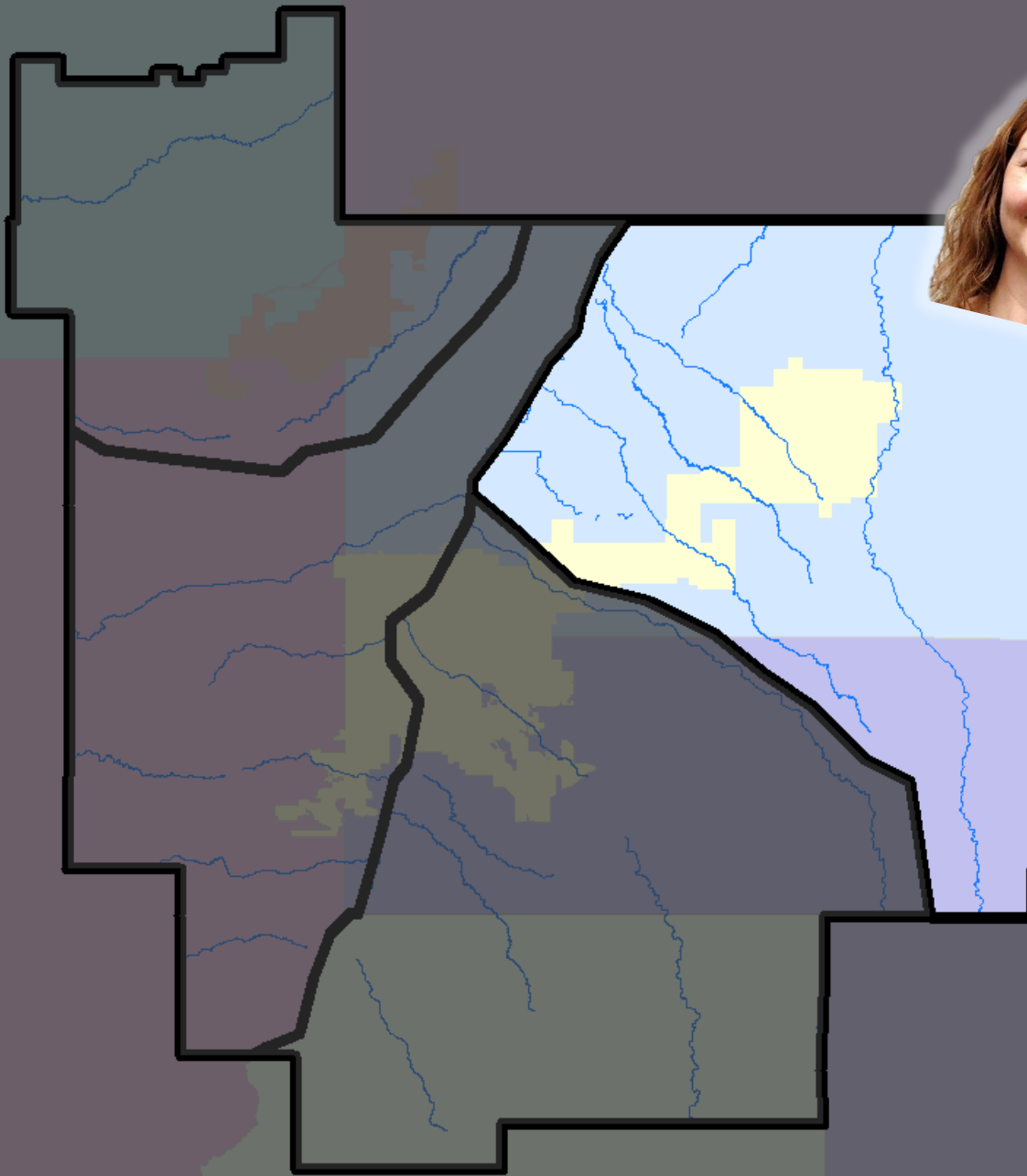


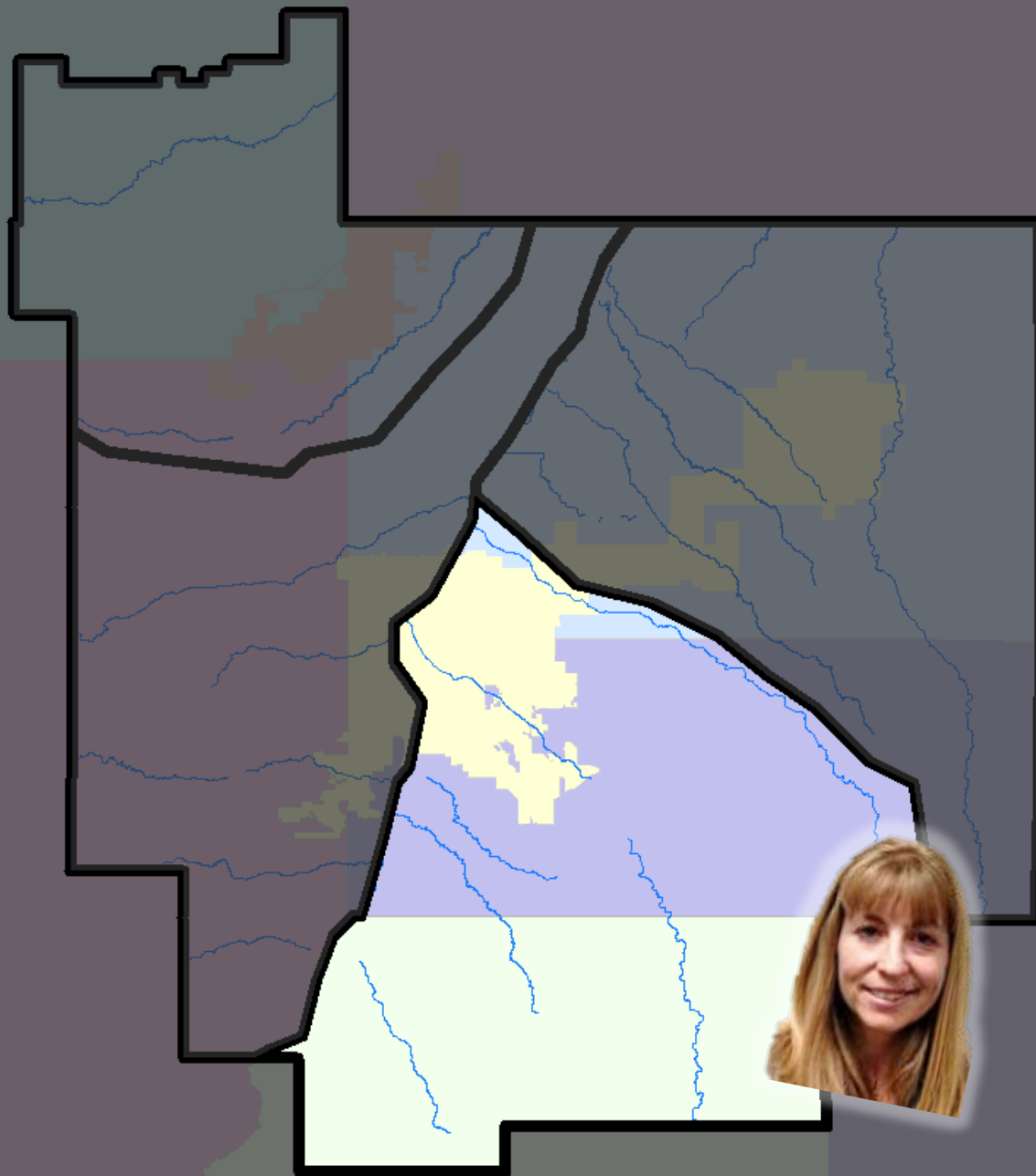
with

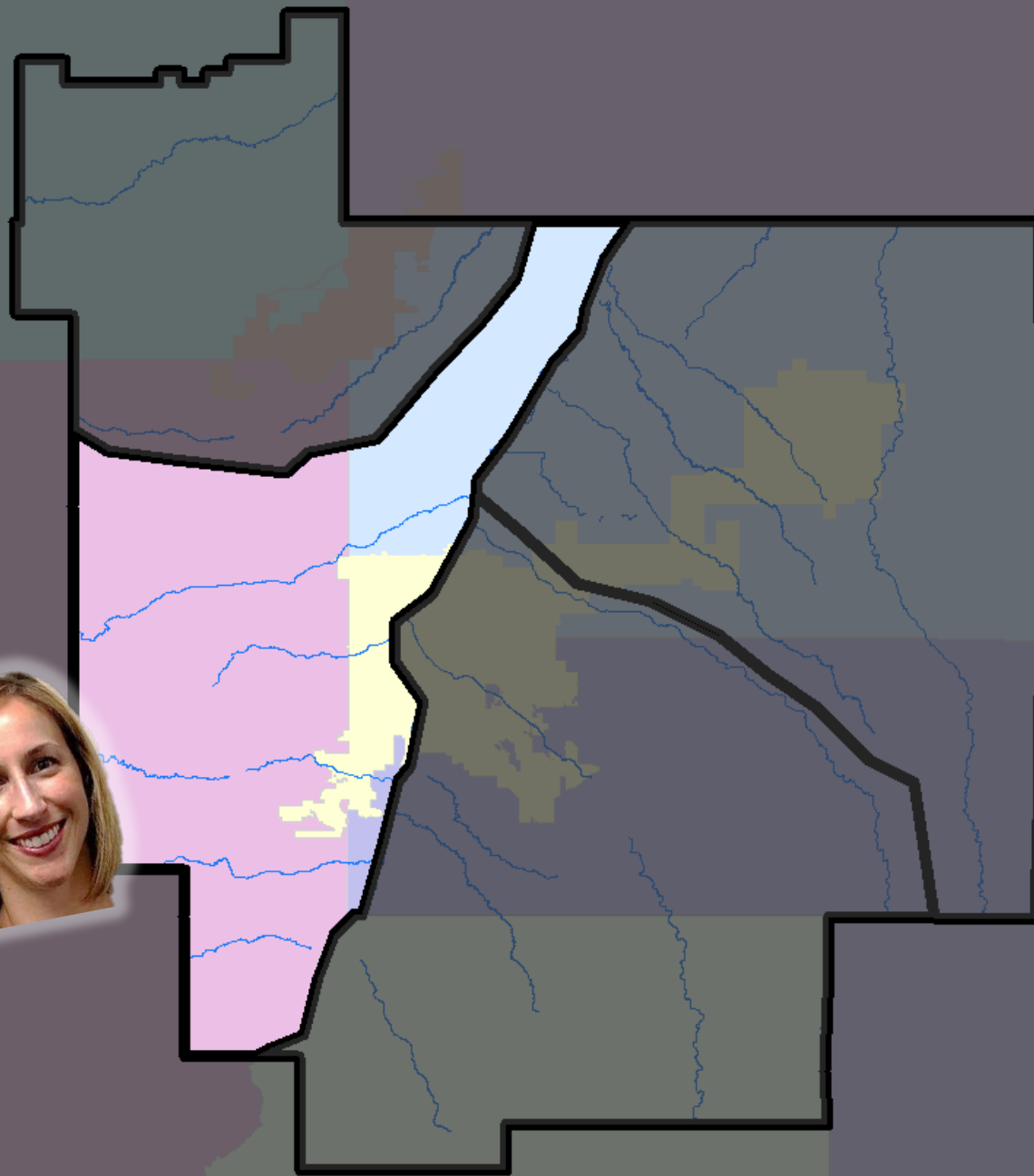


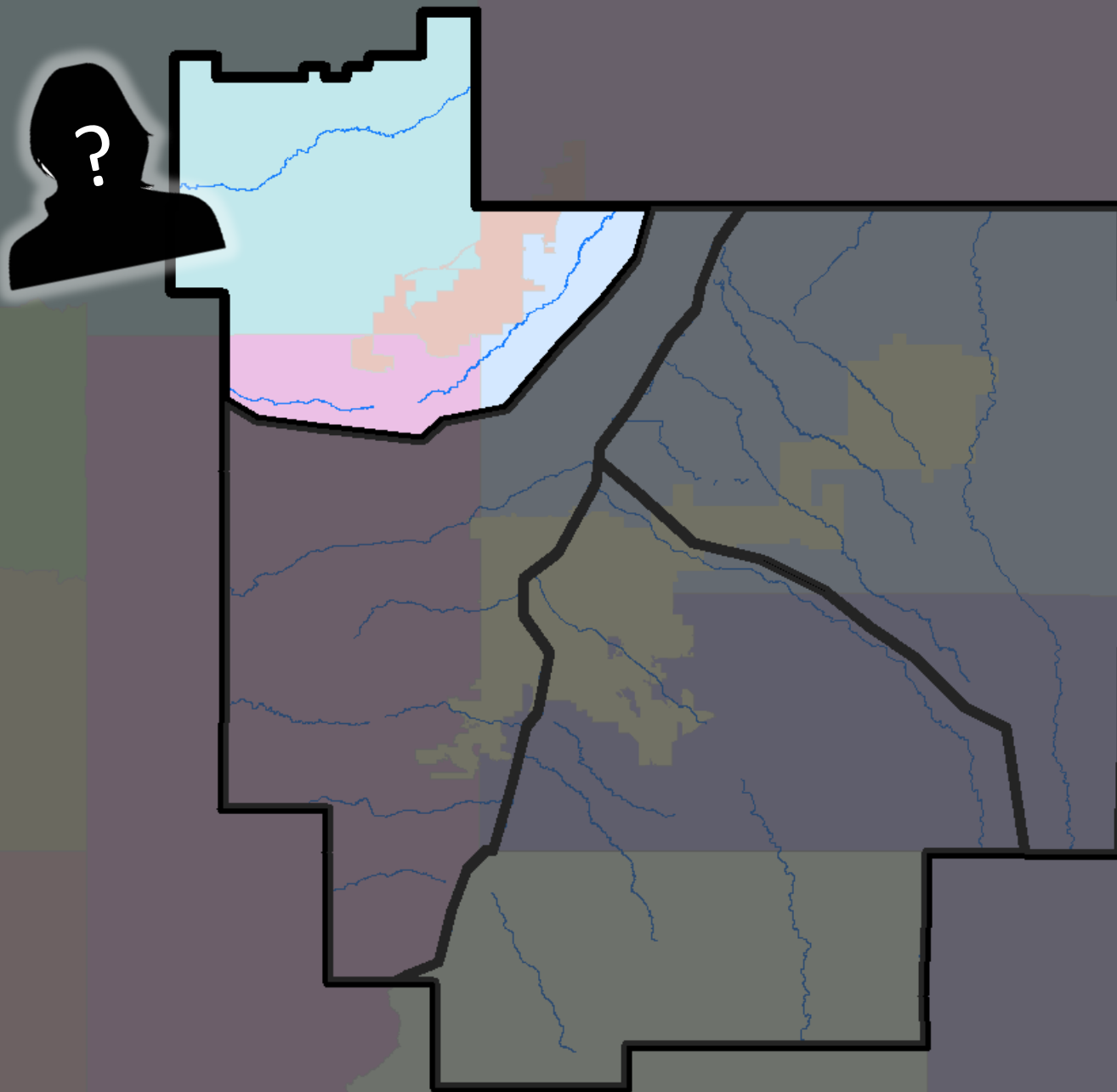
long-term maintenance









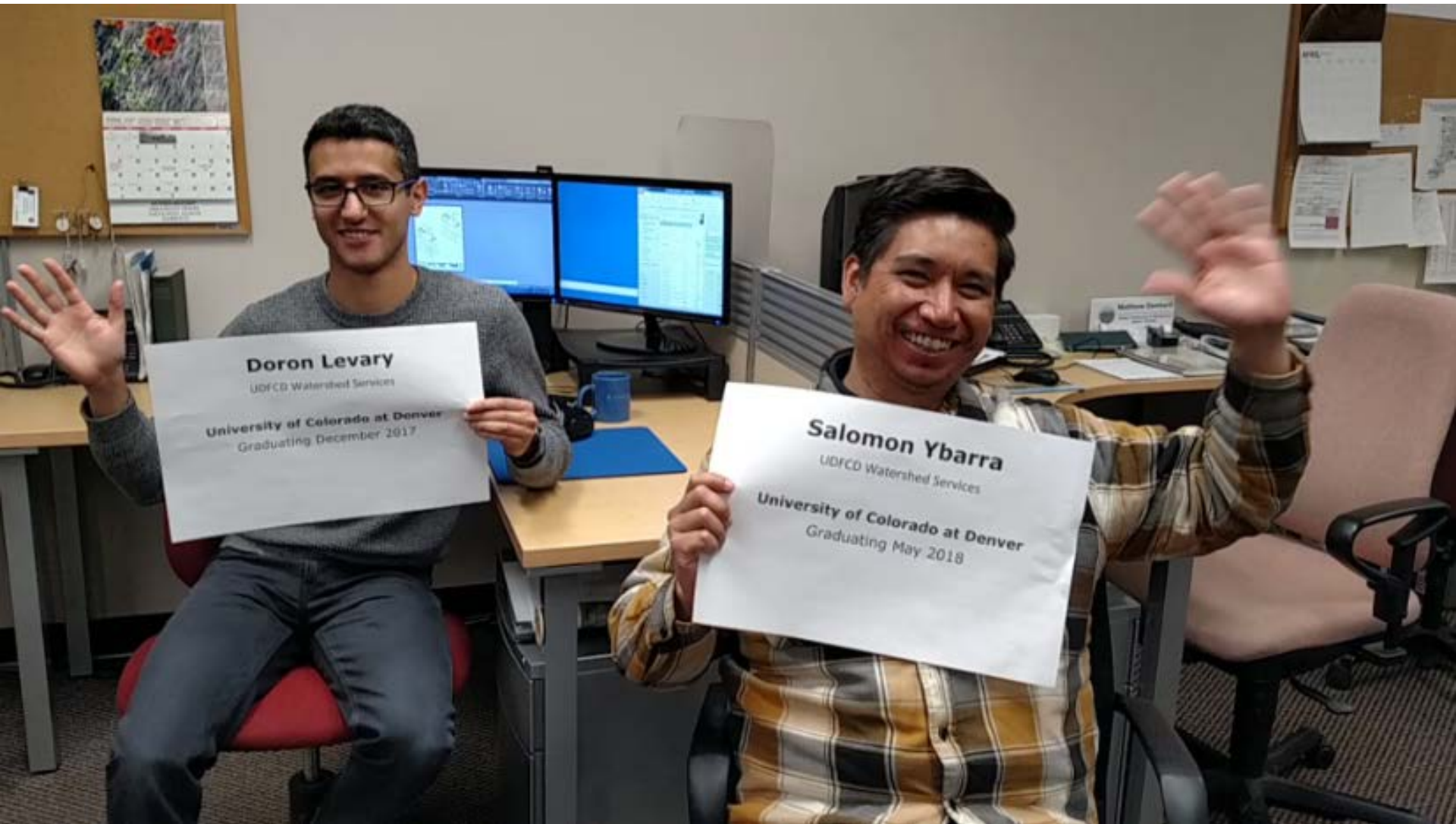






# The 'Shed Bunch





# Thank you!

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