

Idaho City Drinking Water Facility Plan Update

June 28, 2023

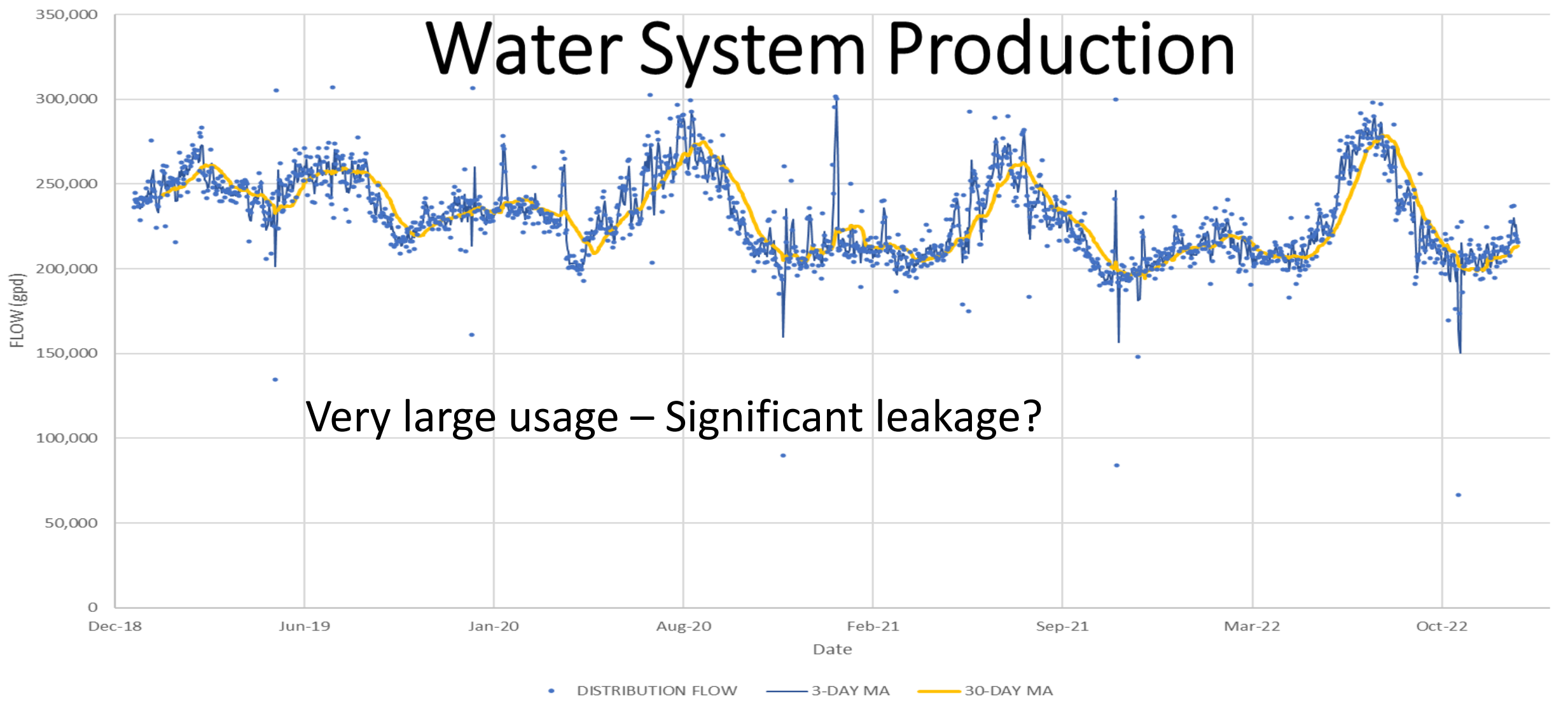
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Introduction

- Facility Plan:
 1. Focused on documenting existing water system infrastructure and capacity, evaluate system demand and future demand projections, identify deficiencies, and provide infrastructure improvement recommendations
 2. Planning tool for the City to understand the current system and strategize for the future (~20 years)

Water System Production



Demand	Per Connection Demand		System	
	gpd	gpm	gpd	gpm
Average Day Demand ADD	919	0.64	243,500	169
Maximum Day Demand	1,158	0.81	307,000	213
Peak Hour Demand	NA	2.56	NA	676

Water Rights

Water Right No.	Priority Date	Source	Place of Use	Beneficial Use	Diversion Rate		Diversion Period
					cfs	gpm	
63-2627	12/17/1945	Surface water – Elk Creek	City of Idaho City	Municipal	0.36	162	01/01 - 12/31
63-33888	1/03/2014	Groundwater	City of Idaho City	Municipal	0.67	300	01/01 - 12/31
Combined					0.87	391	

Idaho City lies within the portion of the Boise River watershed above Lucky Peak Reservoir. This portion of the Boise River watershed has been fully appropriated for both surface and groundwater rights, and as such, new consumptive water rights are not available.

Source of Supply – Elk Creek Plant

- Infiltration gallery intake (inactive)
- Shallow well intake
- Three slow-sand filter bays
- Clearwell
- Disinfection system
- Finished water pump station
- Total Capacity – 360 gpm (240 gpm Firm Capacity)



Source of Supply – Groundwater



Well No.	Year Drilled	Total Depth (ft)	Total Screened Length (ft)	Reported Well Capacity (gpm)	Drawdown (ft)	Maximum Pumping Time (hrs)	Minimum Recovery Time (hrs)
1	2016	430	66	188 max (150 usable)	296	26	Unknown
2	2016	407	53	188 max (150 usable)	216	72	Unknown

Source of Supply – Groundwater

- Well No. 2 recharge is slow, resulting in low sustainable well production capacity.
- Wells No. 1 and No. 2 are hydraulically connected and pumping one well results in drawdown in the other.
- Wells and RO treatment system are sized above the sustainable recharge/pumping rate from the aquifer. Operation will require either limiting the time the system operates or the capacity at which it operates. Continuous operation at the RO skid design flow of 188 gpm is not sustainable.



Source of Supply – Summary

- Well No. 2 recharge is slow
- Wells No. 1 and No. 2 are hydraulically connected
- Continuous operation at the reverse osmosis skid design flow of 188 gpm is not sustainable.

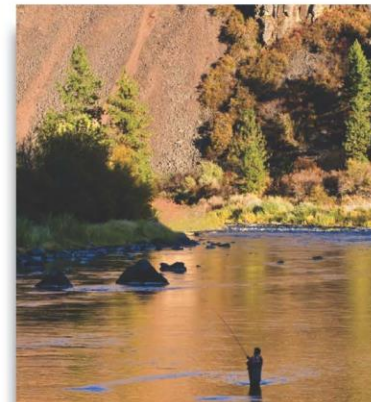


Source of Supply - Summary

Customer Demand		Source Of Supply Balance		
Year	Max Day Demand (gpm)	Total/Firm Supply Available (gpm)	Total Surplus / (Deficit) (gpm)	Firm Surplus / (Deficit) (gpm)
2023	181	385/265	204	84
2028	190	385/265	195	75
2033	199	385/265	186	66
2038	210	385/265	175	55
2043	220	385/265	165	45

Notes:

- 1) Groundwater supply considered 25 gpm sustainable capacity. Short-term peaking capacity is greater than 25 gpm.
- 2) Elk Creek Plant Capacity – 360 gpm



Finished Water Storage



Storage Component	Hill Road	Football Field	Total Volume (gallons)
Operational (OS)	10,400	4,600	15,000
Equalization (ES)	61,650	0 ²	61,650
Standby (SB)	0	0	0
Fire Suppression (FSS)	150,000	151,200 ¹	301,200
Dead Storage (DS)	0	0	0
Total Required	222,050	155,800	377,850
Total Available	342,000	175,500	517,500
Surplus (Deficit)	119,950	19,700	139,650

Notes:

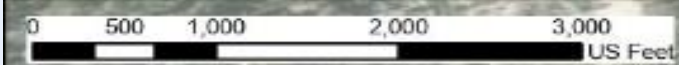
- 1) Football Field Reservoir is not sufficient sized to provide required 180,000 gallons of FSS. However, the reservoir is supplied by the Elk Creek Water Treatment Plant, which has a firm capacity of 240 gpm. FSS requirement is reduced by 28,800 gallons (240 gpm for 2 hours).
- 2) Football Field Reservoir serves fewer than 20 residential customers. Equalization Storage is not required since PHD for 20 customers is less than supply from Elk Creek Water Treatment Plant.



Bear Run Booster Pumping Facility

- Currently the system consists of two 5 horsepower pumps and one 2 horsepower jockey pump
- Operates based on a set pressure
- Total capacity of 130 gpm
- Booster station does not have standby power
- Cannot provide fire flow



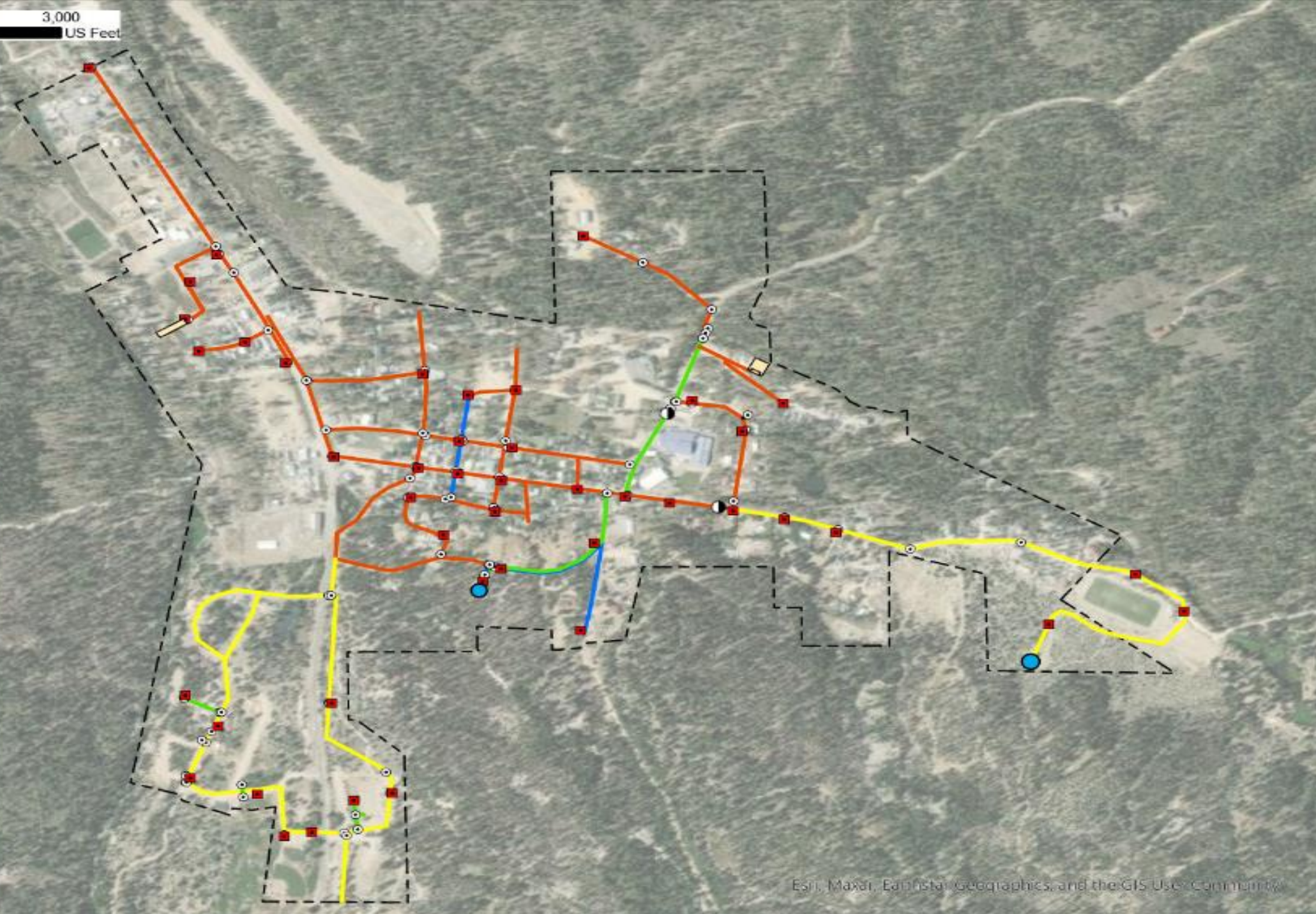


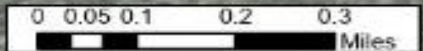
Legend

Diameter

- 2 - inch
- 4 - inch
- 6 - inch
- 8 - inch
- 10 - inch

- Fire Hydrant
- ⊙ Known Valves
- PRV
- Water Storage
- Water Treatment
- ⌞ Planning Boundary





RO Water Treatment

SSF Water Treatment

Hill Rd. Tank

Football Field Tank

Legend

HR Boosted Zone

- 40-50 PSI
- 50-60 PSI
- 60-70 PSI

Hill Rd. Tank Zone

- 40-49 PSI
- 50-59 PSI
- +60 PSI

Football Field Tank Zone

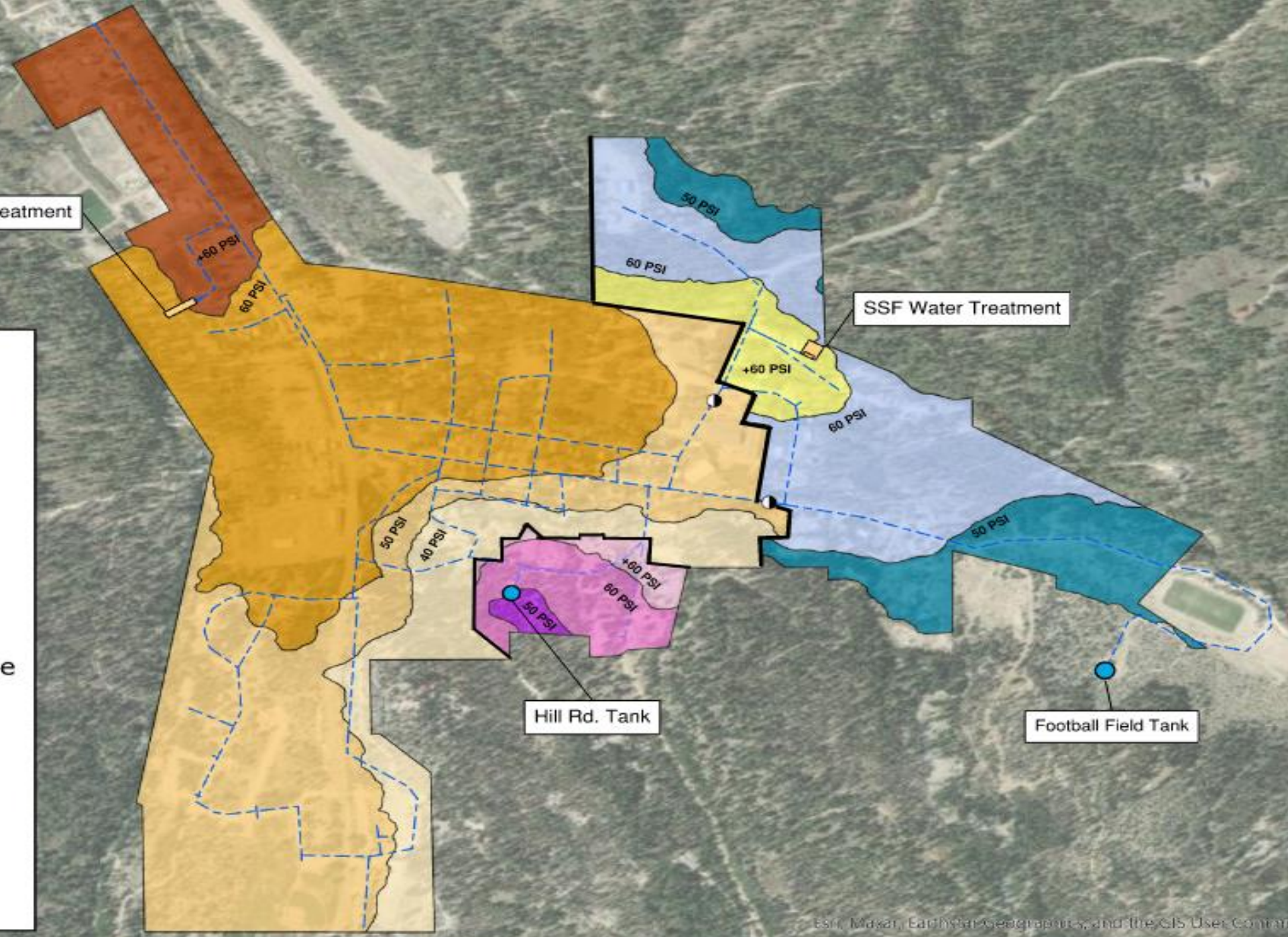
- <40 PSI
- 40-49 PSI
- 50-59 PSI
- +60 PSI

--- Existing Lines

● PRV

Water Treatment

Water Storage



Primary System Deficiencies

Component	Facility	Limitation
Source of Supply	Surface Water Treatment Facility (SSF WTP)	<ul style="list-style-type: none">○ Surface water intake is non-functional○ Direct pumping from Elk Creek increases vulnerability to contamination.○ Finished water turbidity exceeds 1 NTU during spring runoff events○ City has insufficient water rights to produce water at plant capacity.
	Groundwater Source (RO WTF)	<ul style="list-style-type: none">○ The groundwater recharge rate after pumping is slow resulting in low sustainable well production capacity.○ Equipping both wells with pumps provides little benefit to the City other than well and pumping redundancy.

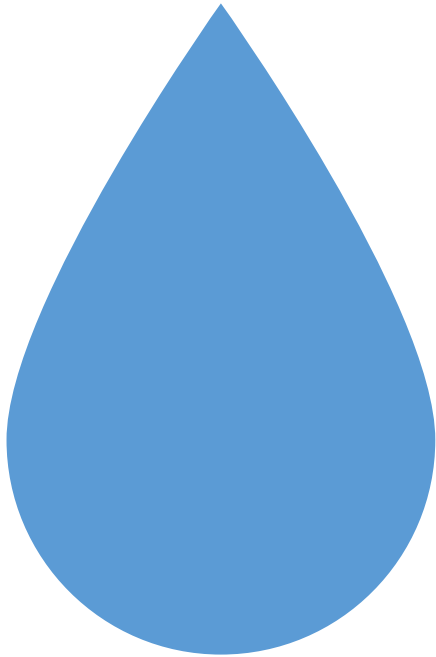
Primary System Deficiencies

Component	Facility	Limitation
Storage Facilities	Hill Road Reservoir	<ul style="list-style-type: none">○ Current system operation does not allow use of full capacity.
	Football Field Reservoir	<ul style="list-style-type: none">○ Water can only be supplied to reservoir from the Elk Creek Surface Water Treatment Plant.○ Level indicator and digital readout are non-functional.
Booster Pumping Stations	Bear Run Booster	<ul style="list-style-type: none">○ Lacks emergency standby power.○ Insufficient size to serve expanded pressure zone.○ Insufficient size to provide fire protection.○ Outdated electrical gear.

Primary System Deficiencies

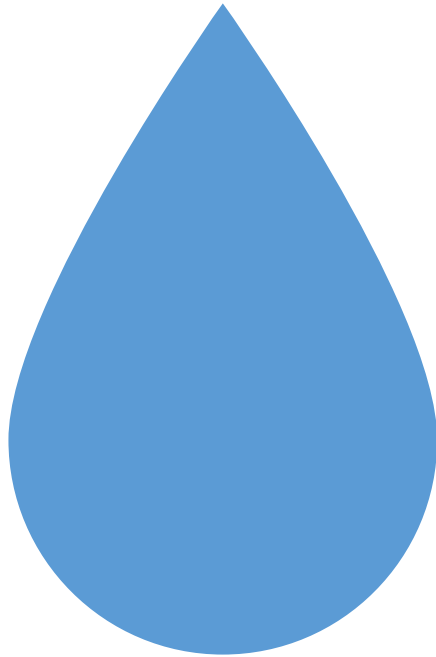
Component	Facility	Limitation
Distribution System	All	<ul style="list-style-type: none">○ Undersized mainline to meet the required fire demands within the system.○ PRV valves are not sensitive enough to precisely control the elevation of storage in Hill Road Reservoir.○ No current hydrant replacement program.
Communication and Controls	All	<ul style="list-style-type: none">○ PRVS do not have radio communication with the system.

Primary Project Alternatives



- Reconstruction of Elk Creek Intake – SS-1
 - Improve water quality concerns
- Acquisition of Senior Water Rights– SS-2
 - Consider annexation into NMID
- Booster Station Electrical and Pumping Upgrades – BP-1
 - Address low pressure and provide fire flow
- Instrumentation of PRV Vault – CC-1
 - Allow for full utilization of Hill Road Storage

Primary Project Alternatives – Transmission and Distribution



- TD-1: Leak Detection
- TD-2: High Priority Leak Repair
- TD-3: Main Street Water Main Replacement
- TD-4: Highway 21 Water Main Replacement
- TD-5: Walulla To Mores Creek Water Main Replacement



Funding

- IDEQ has selected Idaho City to receive \$3.4 Million in grant funding for water improvements
- Based on submission of Letter of Interest in January 2023

Project Selection

Project	Priority 1	Priority 1 and 2
Source of Supply Alternatives		
SS-1: Elk Creek Intake Reconstruction	\$622,000	\$622,000
SS-2: Water Right Acquisition	\$145,000	\$145,000
Booster Pumping Alternatives		
BP-1: Bear Run Booster Station Expansion	--	\$1,888,000
Transmission and Distribution Alternatives		
TD-1: Leak Detection Evaluation	\$100,000	\$100,000
TD-2: Water Main Leak Replacement	\$534,000	\$534,000
TD-3: Main Street Water Main Replacement	\$1,116,000	\$1,116,000
TD-4: Highway 21 - Main to Fire Station Water Main Replacement	--	\$830,000
TD-5: Walulla Street to Mores Creek Water Main Replacement	--	\$484,000
Communication and Control Alternatives		
CC-1: PRV Vault Automation	\$100,000	\$100,000
Total Estimated Construction Cost	\$2,617,000	\$5,919,000
Engineering and CMS @ 15%	\$392,550	\$887,850
Construction Observation @ 5%	\$130,850	\$295,950
Additional Services @ 5%	\$130,850	\$295,950
Legal and Admin @ 5%	\$130,850	\$295,950
Total Estimated Project Cost	\$3,402,100	\$7,694,700



Next Steps

- Finalize Facility Plan
 - Following presentation Mountain Waterworks will submit to DEQ for technical approval
 - Following technical approval will complete environmental documentation
 - Following technical approval have public comment period and formally select alternatives
- Finalize Leading Idaho Funding Package

Questions?

