

Town of Alta Water and Sewer Master Plans:

Fire Flows on the Town of Alta Water System

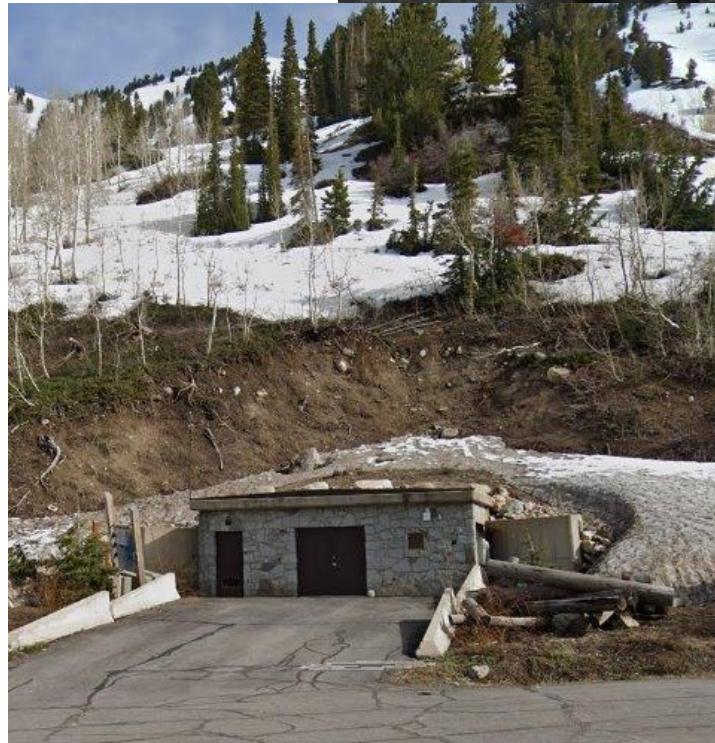
August 2024



Background

Town of Alta Culinary Water System

- Antimony Treatment Plant @ Bay City Tunnel
- 365,000-gallon storage tank, 10,000-gallon tank in Grizzly Gulch
- ~2.5 miles of 6/8/10" PVC pipes-1970s
- Pressure Reducing Valves (PRVs)
- ~25 fire hydrants
- 86 connections
- Isolation valve between Alta-Snowbird
- Recent improvements:
 - 2023: Replaced PRV, waterline to west Peruvian Estates, upgraded Grizzly line
 - Previous: Upsize pipe in Albion parking lot, Westward Ho loop from Powder Ridge to Wildcat Parking, minor pipe upgrades



Water System Planning

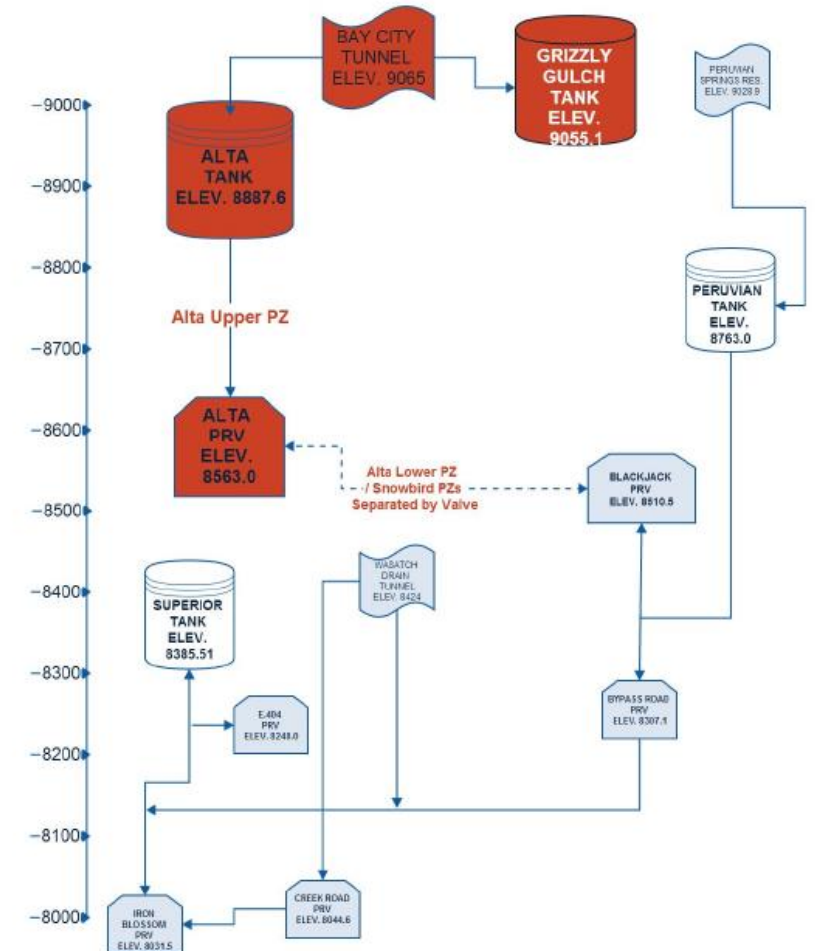
2011 Hydraulic Model and CIP

2014 Capital Improvements Analysis

- Evaluate 2011 CIPs against water model, propose

2024 Master Plan

- Updating water model, adding 2014 projects
- Evaluating remaining system capacity and future needs
- Providing CIP Recs in a "master plan"



2014 CIP Highlights

Town of Alta Culinary Water System

- Purpose: to identify system improvements to improve fire flows and create system redundancy
- Outcomes: Prioritized list of ten "looping" projects and pipe size upgrades
- Findings:
 - Storage
 - Lacking approximately 60,000 gallons of storage to meet State of Utah Division of Drinking Water Requirements for minimum fire flows and duration—1500 GPM x 2 hours
 - Flows deficient or below ideal in certain areas (as of 2014 study)
 - Grizzly Gulch
 - Alta Central
 - Albion Base Area
 - Hellgate
- <https://townofalta.com/wp-content/uploads/2024/09/Town-of-Alta-Water-System-CIP-Analysis-2-17-14-Package.pdf>



State Regulations: R-309 Drinking Water

R309-105-9. Minimum Water Pressure.

- (2) Unless otherwise specifically approved by the Director, new public drinking water systems constructed after January 1, 2007 shall be designed and shall meet the following minimum water pressures at points of connection:
- (a) 20 psi during conditions of fire flow and fire demand experienced during peak day demand;
 - (b) 30 psi during peak instantaneous demand; and
 - (c) 40 psi during peak day demand.
- (3) Individual home booster pumps are not allowed as indicated in R309-540-5(4)(c).

R309. Environmental Quality, Drinking Water.

R309-550. Facility Design and Operation: Transmission and Distribution Pipelines.

<https://deq.utah.gov/drinking-water/laws-and-rules#500>

R309. Environmental Quality, Drinking Water.

R309-510. Facility Design and Operation: Minimum Sizing Requirements.

R309-510-8. Storage Sizing.

- (1) General.

Each public water system, or storage facility serving connections within a specific area, shall provide:

- (a) equalization storage volume, to satisfy average day demands for water for indoor use and irrigation use,
- (b) fire flow storage volume, if the water system is equipped with fire hydrants intended to provide fire suppression water or as required by the local fire code official, and
- (c) emergency storage, if deemed appropriate by the water supplier or the Director.

- (2) Equalization Storage.

(a) All public drinking water systems shall provide equalization storage. The amount of equalization storage varies with the nature of the water system, the extent of irrigation use, and the location and configuration of the water system.

Fire Code – Residential

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the <i>International Fire Code</i> or Section P2904 of the <i>International Residential Code</i>	500	1/2
3,601 and greater	Section 903.3.1.3 of the <i>International Fire Code</i> or Section P2904 of the <i>International Residential Code</i>	1/2 value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m.

****Caveat: Sprinklers reduce flow requirements as determined by local fire code official**

Fire Code -- Commercial

TABLE B105.1(2) REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	

****Caveat: Sprinklers reduce flow requirements as determined by local fire code official**

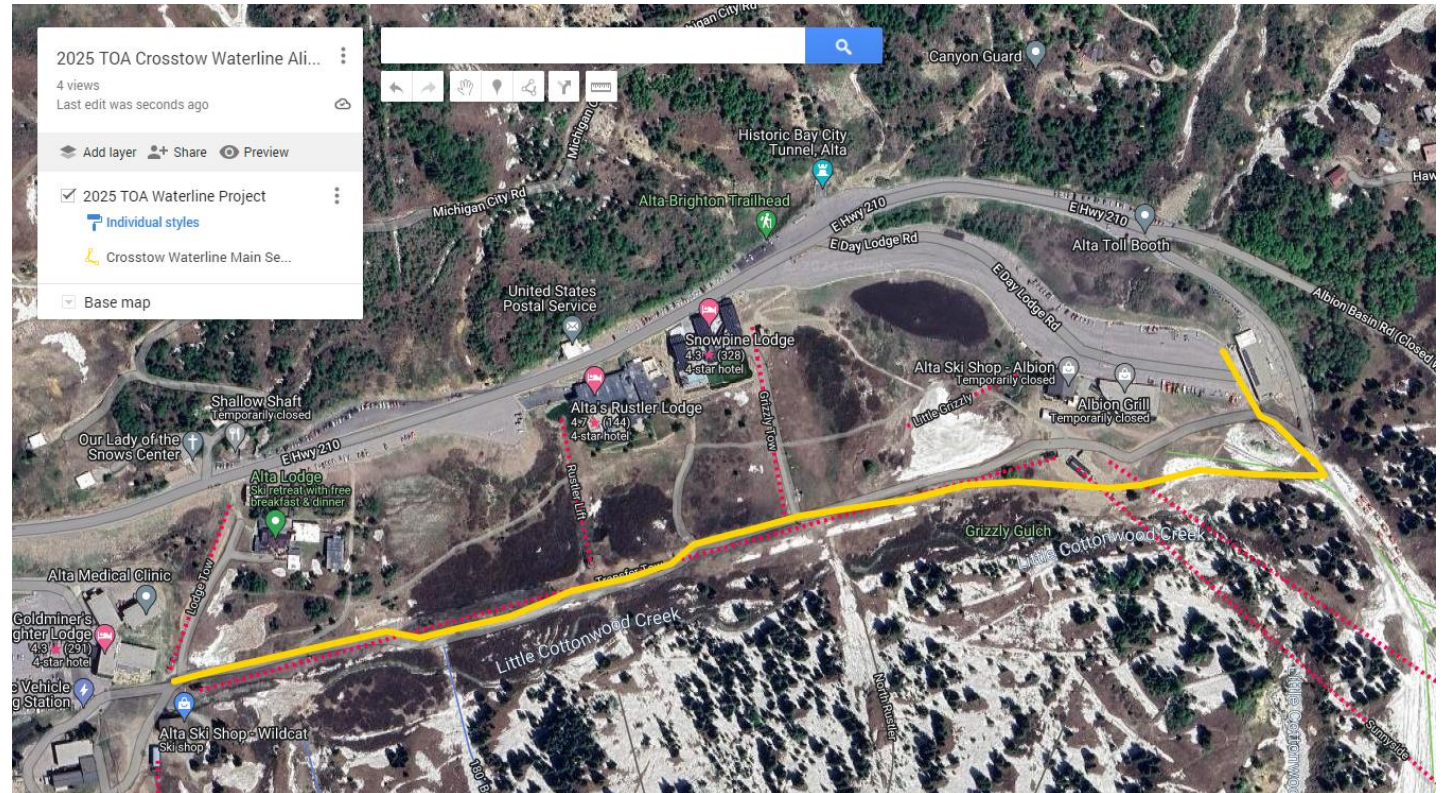
What are we doing – Master Plan

Master Plan Scope:

1. Update Water Model – almost complete
2. Evaluate Existing Water and Sewer Infrastructure, Deficiencies – in progress
 1. Engineers preparing memo on applicable regulations and recommended fire flow targets
3. Project System Growth
4. I.D. Capital Improvements to Correct Deficiencies, Support Growth
5. Develop and Adopt Capital Improvement Plan

What are we doing – Crosstow Waterline

- Work with ASL to install a 10" waterline in snowmaking trench along Alta Ski Area Cross Tow
- Project would combine elements of two projects from 2014 CIP
- Increase fire flows in "Commercial Core" and redundancy on entire system
- Hansen, Allen, & Luce:
 - PRV not included in 2014 design, would be necessary
 - May not need connection from Bay City to Cross Tow line
- Engineering, submit for USFS and State DDW Approval



Water System CIPs: Future

Water Fund Projects

Fund Balance: May 31, 2024

\$

392,409

Fund Balance	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	Future / Unknown date
As of July 1 (start) of the fiscal year	694,693	-	-	-	-	-	-	-	-	-

GL Code	Project Name	FY 2024 YTD	FY 2024 Budget	FY 2025 Budget	FY 2026 Budget	FY 2027 Budget	FY 2028 Budget	FY 2029 Budget	FY 2030 Budget	FY 2031 Budget	FY 2032 Budget	Future / Unknown date
51-40-740	Peruvian West Water Line Replacements	280,207	337,997									
51-40-740	Remote Water Meter Reading	9,102	83,000	60,000								
51-40-740	Shrontz Estate - water line payment	50,000	50,000									
51-40-740	Grizzly Gulch Water Line Completion	92,388	92,388									
51-40-740	Grizzly Gulch Communication System	6,975	10,000									
51-40-320	Water System Study Update	-	25,000	25,000								
51-40-320	Source Water Protection Plan	-	6,000									
51-40-740	Albion to Wildcat Loop				750,000							
51-40-740	Hellgate 8" Loop						300,000					
51-40-740	Westward Ho 10" Loop								200,000			
51-40-740	Replace Pipe in Road (hellgate/bypass)										500,000	
51-40-740	Alta Central 8" Line											300,000
Total Projects		438,672	579,385	85,000	750,000	-	300,000	-	200,000	-	500,000	300,000

* Items in red are proposed, not approved (for years 2026 - 2032 #'s are approx. twice what was in the 2014 CIP plan)