

#### Lake Whatcom Water and Sewer District

Sudden Valley WTP Assessment Project

September 30, 2020, 800 AM

Project Team: Russ Porter, Keith Stewart, Myron Basden, Aaron Pease, Jason Newquist



# Presentation Outline

- Project Description & Purpose
- Sudden Valley WTP
- Project Approach
- Summary of Findings
- Summary of Recommendations
- Next Steps



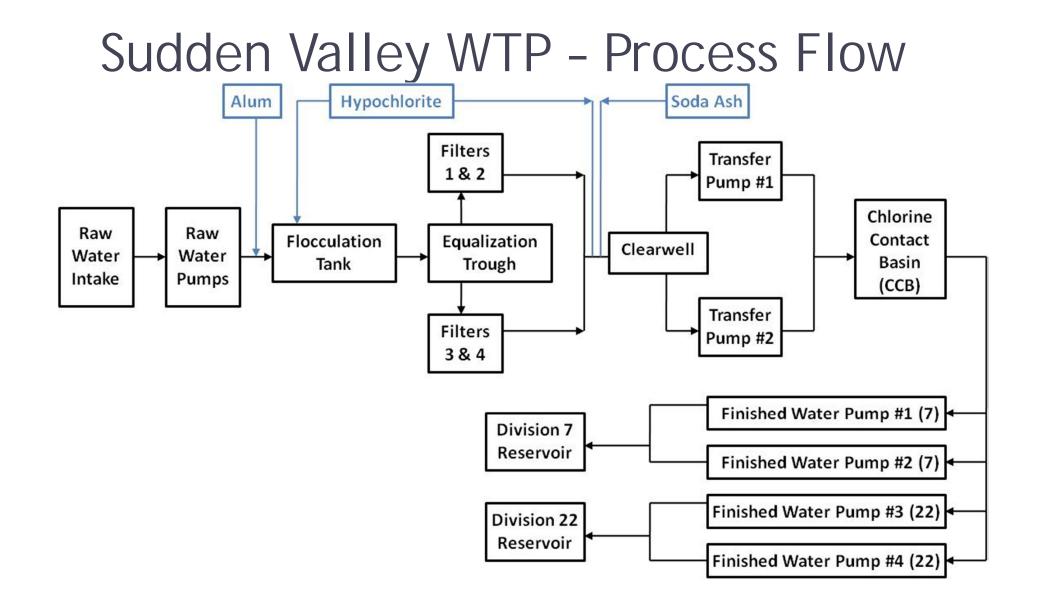


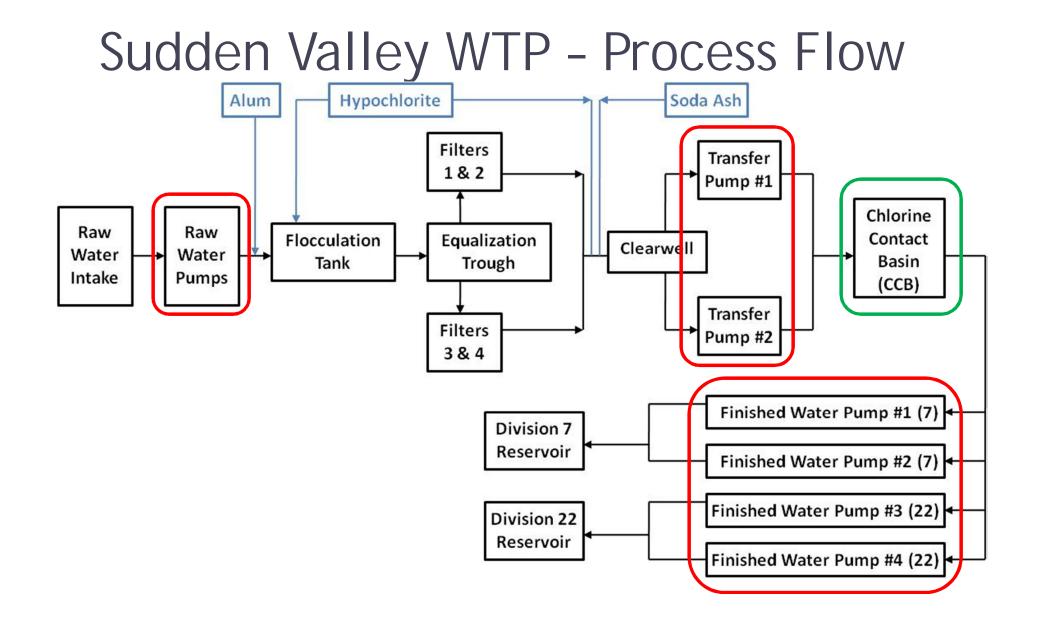
# Project Description & Purpose

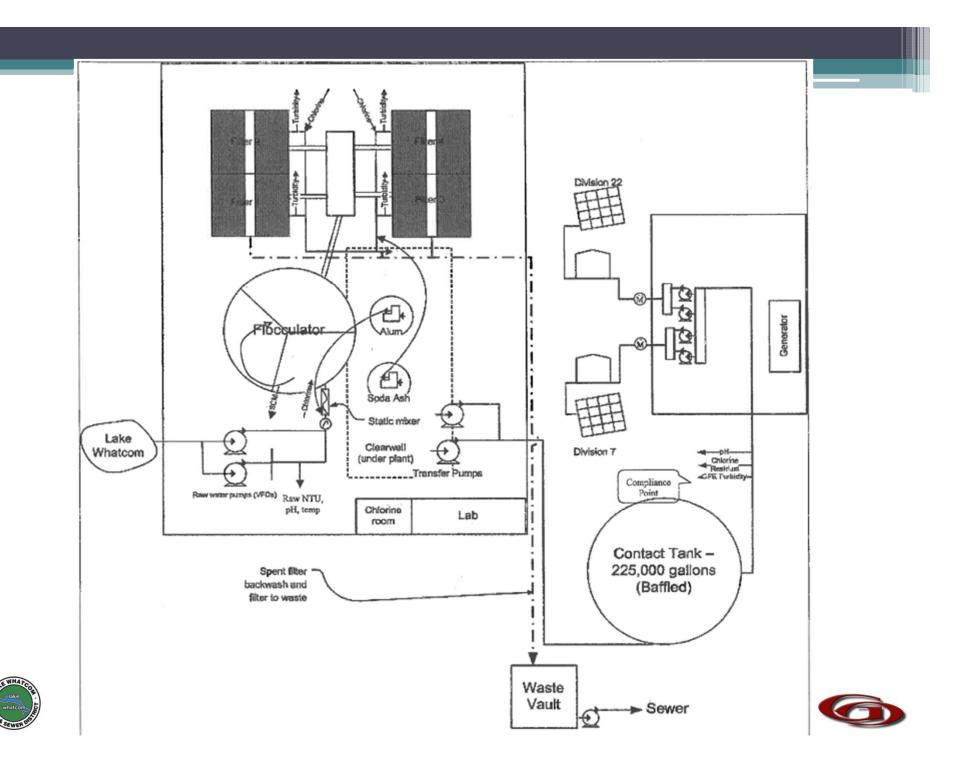
- South Shore Water System Assessment
  - Assess conditions at Sudden Valley WTP
  - Provide basis for decision making with regards to WTP modifications and / or continued use
    - Phase I (Previous)
      - Assess existing condition of structures and equipment
    - Phase II (Current)
      - Provide alternatives analysis (Capital Improvements Plan for the Sudden Valley WTP)

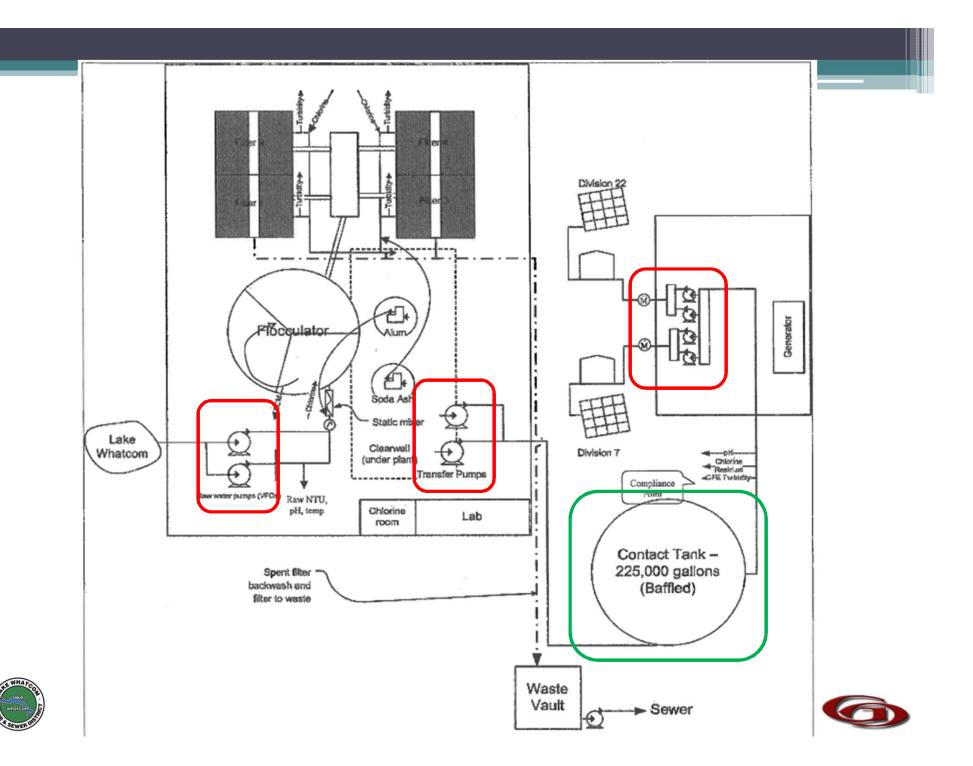












#### Project Approach Methodology

- Phase I WTP Assessment
  - Review existing documentation
  - Conduct on-site assessment at the WTP
  - Prepare written report
  - Provide scoping for Alternatives Analysis
- Phase II Alternatives Analysis
  - Prepare technical memoranda
    - A la carte approach
  - Prepare final written report





#### Project Approach Schedule

	Board Meeting Dates								
Scope of Work Item	Sep-09	Sep-09 Oct-14 Nov-11 Dec-09 Jan-13 Feb-10					Mar-10	Apr-14	May-12
	Sep-30	Oct-28	Nov-25	Dec-30	Jan-27	Feb-24	Mar-31	Apr-28	May-26
1 Project Management									
2.1 Pump Performance Test									
2.2 Chemical Systems Analysis									
2.3 Disinfection Systems Analysis									
2.4 Backwash Systems Analysis									
2.5 Filtration System Analysis									
2.6 Tier 2/3 Seismic and Structural Analysis									
2.7 Structural/Arch Workspace Analysis									
2.8 NACE III Coating Inspection									
2.9 Risk Assessment and Project Prioritization									
2.10 Draft Alternatives Analysis Report									
2.11 Draft Alternatives Analysis Meeting									
2.12 Final Alternatives Analysis Report									
2.13 Alternatives Analysis Board Presentation									
2.14 Financial Analysis Board Meeting									
3 Quality Assurance/Quality Control									
NOTATION LEGEND									
	p Planned (labor not started)								
	a Active (labor underway)								
	c Completed (no further labor needed)								
	t Target Completion								

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### Project Approach Methodology

- Task 2.1
  - Pump Performance Testing
    - Raw Water Pumps
    - Transfer Pumps
    - Finished Water Pumps
  - Complete Technical Memorandum 20434-1
- Task 2.8
  - NACE III Coating Inspection for CCB
  - Complete Technical Memorandum 20434-2





#### Project Approach Task 2.1 - Pump Performance Testing

Raw, Transfer, and Finished Water Pumps



Raw Water Pumps – Both pumps installed in 1992. Pump 1 motor replaced in 2002.



Transfer Pumps – Pumps installed in 1992.



Finished Water Pumps – Pumps installed in 1992.





## Project Approach Task 2.1 - Pump Performance Testing

Pump Motor Control Centers (MCCs)



MCC 1 – Located in Finished Water Pump Building. Controls Finished Water Pumps.



MCC 2 – Located in WTP Main Building. Controls Clearwell Transfer Pumps.



MCC 3 – Located in WTP Main Building. Controls Raw Water Pumps.





### Project Approach Task 2.1

- Pump Performance Testing Methodology
  - Use District provided equipment
  - Operate one pump at various flows
  - Measure and record
    - Flow
    - Discharge pressure
    - Inlet Pressure
    - Amperage
  - Adjust flow and repeat



Plot data vs. manufacturer curve and compare



- Pump Performance Testing
  - Finished Water Pumps
    - Performing near manufacturer's curve and amperage
    - No apparent decrease in performance
    - No physical/operational trouble indicators (noise, heat, etc.)
    - MCCs old and no longer supported
    - Operational desire to go to variable frequency drive motor starters
    - Existing motors not inverter duty rated





- Pump Performance Testing
  - Transfer Pumps
    - Testing not completed due to lack of a discharge flow meter or functional pressure gauges
    - No physical/operational trouble indicators (noise, heat, etc.)
    - MCCs old and no longer supported
    - Operational desire to go to variable frequency drive motor starters
    - Existing motors not inverter duty rated





- Pump Performance Testing
  - Raw Water Pumps
    - Testing not completed due to lack of a functional pressure gauge, inaccurate gauges, small pump size, and age of equipment
    - No physical/operational trouble indicators (noise, heat, etc.)
    - Motor for RWP 01 replaced in 2002
    - MCCs in poor condition due to proximity to chemicals and moisture
    - Operational desire to go to variable frequency drive motor starters
    - Existing motors not inverter duty rated





#### Project Approach Task 2.8 - CCB Inspection



CCB – Tank was erected in 1992.



Corrosion – Tank has several corrosion spots, some of which have been repaired.



Algae – Roof exhibits lichen and algae growth, both of which may have damaged the coatings.





#### Project Approach Task 2.8

- CCB Coating Inspection Methodology
  - Utilize NACE III Certified coatings inspector
  - Perform visual inspection
  - Collect samples for RCRA metals
  - Perform exterior coating adhesion testing
    - Set dollies
    - Pull dollies and collect data
      - Failure tension
      - Manner of failure
    - Record the results





- CCB Coating Inspection
  - Exterior coating is in fair condition
  - Roof coating is in moderate condition
  - Interior coating is in moderate condition above the water line, and fair condition below it
  - Tank is not seal welded
  - Tank is critical to WTP function and can not be taken offline for coating
  - Tank should implement additional security features





### Summary of Recommendations Task 2.8

- CCB Coating Inspection
  - Remove existing exterior & interior coatings and replace within 5 years
  - Provide seal welding on the tank interior
  - Install additional roof access hatch
  - Replace exterior ladder cage with ladder guard
  - Provide cover for existing rooftop padlock
  - Address temporary and or permanent alternative CT system
  - Replace existing roof vent





# Summary of Recommendations

Task 2.8

Cost Estimate

□ ~\$680,000

NO.	ITEM
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#### QUANTITY UNIT UNIT PRICE AMOUNT

Mobilization and Demobilization	1 LS	S	30,000	\$	30,000
Removal of Mill Scale	4000 SF	S	4	S	16,000
Tank Exterior - Preparation & Recoating	1 LS	S	105,000	\$	105,000
Tank Interior - Preparation & Recoating	1 LS	S	115,000	\$	115,000
Tank Containment	1 LS	S	35,000	\$	35,000
Interior Seal Welding, Complete	1 LS	S	75,000	\$	75,000
Access Hatch	1 LS	S	10,000	S	10,000
Roof Vent & Additional Tie-offs	1 LS	S	25,000	\$	25,000
Surface Restoration	1 LS	S	5,000	\$	5,000

#### Subtotal\* \$ 416,000

Contingency (20%) \$ 83,200

#### Subtotal \$ 499,200

Washington State Sales Tax (9.0%)\*\* \$ 44,900

#### Subtotal \$ 544,100

Design and Project Administration (25.0%)\*\*\* \$ 136,000

#### TOTAL CONSTRUCTION COST \$ 680,000



- New Tank
  - □ ~\$1.1M \$1.2M



### Summary of Recommendations Task 2.1

- Pump Performance Testing
  - Raw, Transfer, and Finished Water Pumps
    - Replace MCCs
    - Replace motor starters with VFD technology
    - Replace existing pumps and motors





## Summary of Recommendations

NO. ITEM

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Task 2.1

- Finished Water Pumps □ \$~740,000
- Transfer Pumps □ ~\$340,000
- Raw Water Pumps
  - □ ~\$240,000

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•	ITEM	QUANTITY	UNIT	UNIT	PRICE	Al	MOUNT
	Pressure Gauge Assembly	4	EA	S	600	\$	2,400
	Spare Pressure Gauge	2	EA	S	200	\$	400
	Division 7 Pump VFD	2	EA	S	30,000	\$	60,000
	Division 7 Pump/Motor	2	EA	S	35,000	\$	70,000
	Division 22 Pump VFD	2	EA	S	35,000	\$	70,000
	Division 22 Pump/Motor	2	EA	S	50,000	\$	100,000
	Pump Removal & Wastehauling	4	EA	S	10,000	\$	40,000
	MCC 1 Replacement	1	LS	S	75,000	\$	75,000
	Electrical	1	LS	\$	35,000	\$	35,000

Subtotal\* \$ 452,800 Contingency (20%) \$ 90,600

Subtotal \$ 543,400 Washington State Sales Tax (9.0%)\*\* \$ 48,900

Subtotal \$ 592,300 Design and Project Administration (25.0%)\*\*\* \$ 148,100

#### TOTAL CONSTRUCTION COST \$ 740,000



# Next Steps

- Technical Memorandum 20434-3
  - Tier II / Tier III Seismic Analysis
    - October 7, 2020
- Technical Memorandum 20434-4
  - Chemical Systems Analysis
    - October 28, 2020
- Technical Memorandum 20434-5
  - Filter System Analysis
    - October 28, 2020
- Board Summary Presentation
  - October 28 or November 11





## Questions?



