

# UNION REGIONAL WATER SYSTEMS CONSOLIDATION COMMISSIONER WORKSHOP

SEPTEMBER 13, 2016

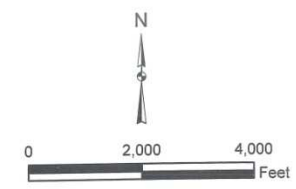
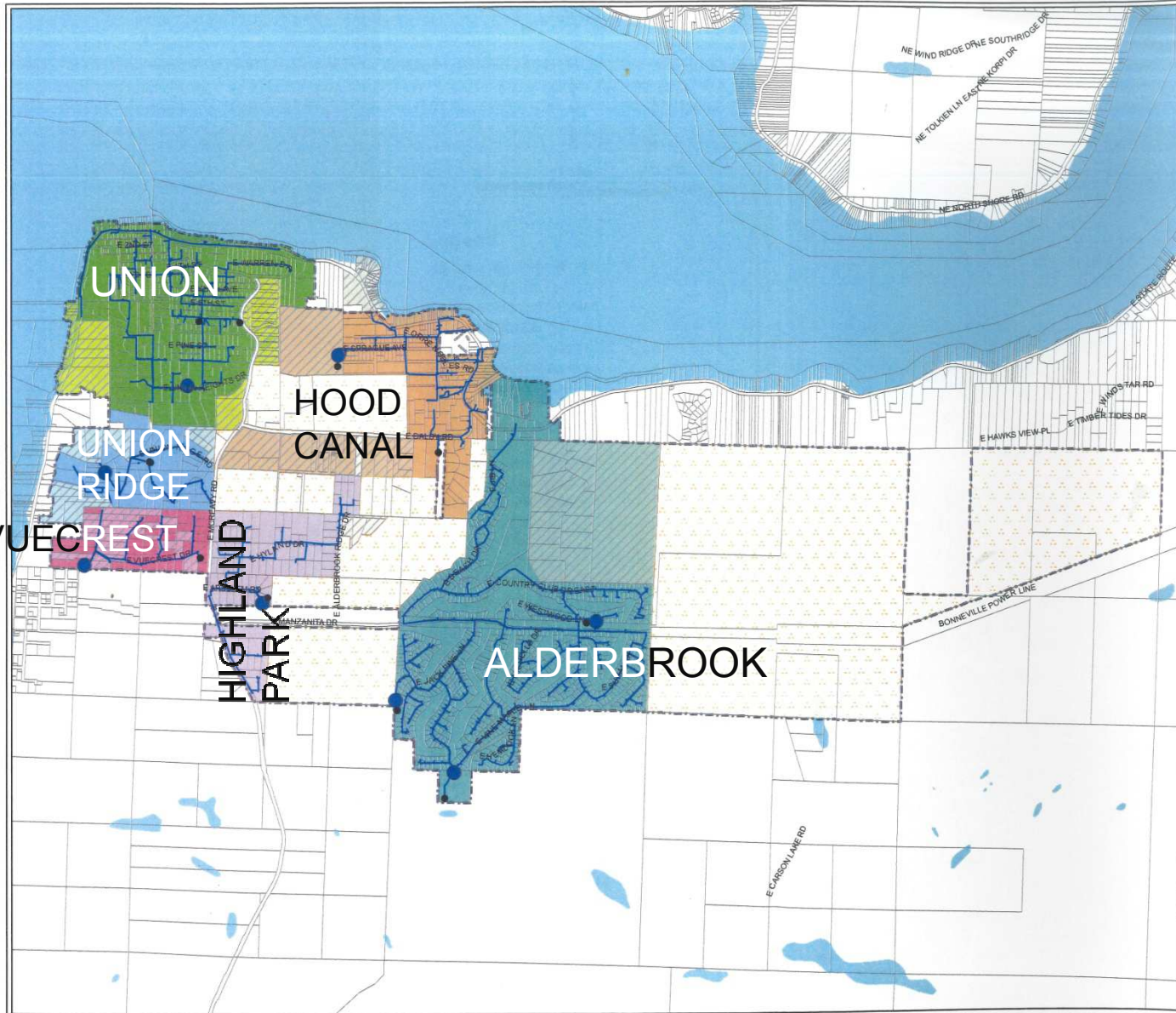
JOCELYNE GRAY, PE

DIRECTOR OF OPERATIONS-WATER



# Water Systems Involved

- Union
- Union Ridge
- Vuecrest
- Highland Park
- Hood Canal
- Alderbrook



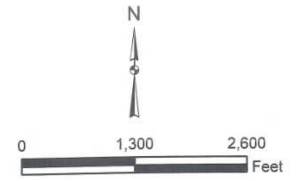
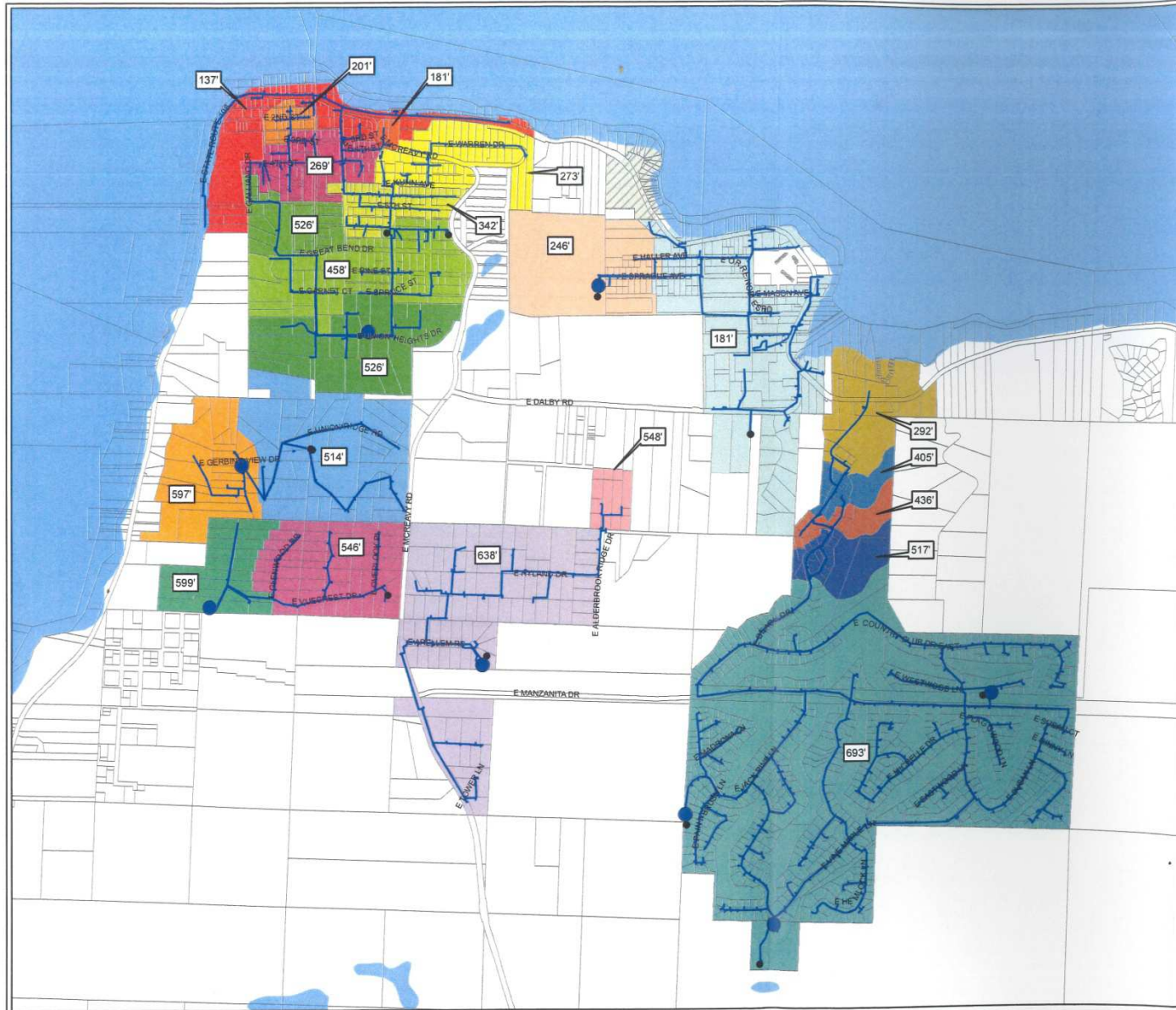
**Legend**

- EXISTING RESERVOIRS
- EXISTING WELLS
- EXISTING WATER LINES
- CONSOLIDATED RETAIL SERVICE AREA
- CONSOLIDATION AREAS
- ALDERBROOK EXISTING RETAIL SERVICE AREA
- ALDERBROOK FUTURE RETAIL SERVICE AREA
- HIGHLAND PARK EXISTING RETAIL SERVICE AREA
- HIGHLAND PARK FUTURE RETAIL SERVICE AREA
- HOOD CANAL EXISTING RETAIL SERVICE AREA
- HOOD CANAL FUTURE RETAIL SERVICE AREA
- UNION EXISTING RETAIL SERVICE AREA
- UNION FUTURE RETAIL SERVICE AREA
- UNION RIDGE EXISTING RETAIL SERVICE AREA
- UNION RIDGE FUTURE RETAIL SERVICE AREA
- VUECREST EXISTING RETAIL SERVICE AREA
- VUECREST FUTURE RETAIL SERVICE AREA
- MADRONA BEACH (NOT SERVED)

**UNION CONSOLIDATION**

FIGURE 1  
EXISTING RETAIL WATER SERVICE AREA MAP

**Gray & Osborne, Inc.**  
CONSULTING ENGINEERS



**Legend**

- EXISTING RESERVOIRS
- EXISTING WELLS
- EXISTING WATER LINES
- PRESSURE ZONES:**
- ALDERBROOK ZONE 1
- ALDERBROOK ZONE 2
- ALDERBROOK ZONE 3
- ALDERBROOK ZONE 4
- ALDERBROOK ZONE 5
- HIGHLAND PARK ZONE 1
- HIGHLAND PARK ZONE 2
- HOOD CANAL ZONE 1
- HOOD CANAL ZONE 2
- UNION ZONE 1A
- UNION ZONE 1B
- UNION ZONE 2
- UNION ZONE 3
- UNION ZONE 4
- UNION ZONE 5
- UNION ZONE 6
- UNION ZONE 7
- UNION ZONE 8
- UNION RIDGE ZONE 1
- UNION RIDGE ZONE 2
- VUECREST ZONE 1
- VUECREST ZONE 2
- MADRONA BEACH (NOT SERVED)
- xxx HYDRAULIC GRADE LINE FOR ZONE

**UNION CONSOLIDATION**

FIGURE 2  
EXISTING PRESSURE ZONE MAP

**Gray & Osborne, Inc.**  
CONSULTING ENGINEERS

# Why Consolidate?

- Address system deficiencies
- Improve water quality
- Add redundancies (backup)
- Increase efficiency
- Plan for future area growth

# Highland Park System Deficiencies

- Waiting list of property owners wanting water connections within Highland Park Plat (21 lots) and outside the plat (4 lots)
- Needs additional reservoir storage volume
- Booster pumps need to be upsized
- Well pump 43 years old
- Single source system
- Undersized mains (2-inch and 3-inch)

# Hood Canal System Deficiencies

- Needs additional reservoir storage volume (64,200 gal deficit)
- Booster pumps need to be upsized
- Undersized, aged mains (2-inch and 3-inch)
- Water quality problems in the mains

# Union System Deficiencies

- Needs additional reservoir storage volume
- Well pumps are aging (49 yrs old and 36 yrs old)
- Undersized, old mains (1-inch, 2-inch, and 3-inch)
- High system leakage
- Pressure issues in parts of system



# Union Ridge System Deficiencies

- Needs additional reservoir storage volume
- Single source system
- Undersized mains (2-inch, and 3-inch)
- Pressure issues in upper portion of system

# Vuecrest System Deficiencies

- Waiting list of property owners wanting water connections within Vuecrest (8 lots)
- Needs additional reservoir storage volume
- Booster pumps need to be upsized
- Single source system
- Undersized mains (1-inch, 2-1/2-inch, and 3-inch)

# Alderbrook System Deficiencies

- Needs additional source capacity (upsized Well 3 pump)
- Needs additional reservoir storage volume
- Well 1 pump is aging (13 yrs old)
- Aging mains
- System leakage above state standards
- Pressure issues in parts of systems

# Individual vs Consolidation

- Individual

- 6 separate funding packages
- 6 designs in phases
- 6 separate report sets
- Does not address lack of redundancy
- Less complicated sampling

- Consolidation

- 1 funding package
- More points on funding pkg for regional needs
- 1 design in phases
- 1 set of reports
- Addresses redundancy
- Cost spread over more connections
- Less \$/connect

# Highland Park Projects

Project	Unit Cost	Total Cost	Years
Reservoir Repairs	\$5,000	\$5,000	2017
WSP Update	\$10,000	\$20,000	2022, 2028
35,300 Gal Tank	\$1.80/Gal	\$63,540	2019
Property for Tank	\$75,000	\$75,000	2018
Booster Station for Tank	\$175,000	\$175,000	2018
Brass Meter Replacement for Lead Reduction – convert to AMR	\$350/meter	\$7,350	2020
Main Line Replacement – convert to AMR	\$100/ft	\$690,000	2019-2021
Main Line PRV Replacement	\$1,000 ea	\$1,000	2023
Repaint Booster Station	\$2,000	\$2,000	2021
Tank Inspection & Cleaning		\$6,300	2018, 2022, 2026
Well Pump Replacement (due to age)	\$200/ft	\$78,000	2018
<b>Total Highland Park 11- Yr CIP</b>		<b>\$1,123,190</b>	<b>(69 connections)</b>

# Hood Canal Projects

Project	Unit Cost	Total Cost	Years
Permanent Chlorination	\$15,000 initial \$500/Yr	\$20,000	2017-2028
WSP Update	\$10,000	\$20,000	2022, 2028
6,600 Gal Tank	\$2.00/Gal	\$13,200	2028
Main Line Replacement	\$100/ft	\$930,000	2020-2024
Fire Hydrant Repair & Maintenance	\$1,000 ea	\$3,000	2025
Repaint Well Houses	\$3,300	\$3,300	2021
Tank Inspection & Cleaning		\$6,300	2018, 2022, 2026
<b>Total Hood Canal 11-Yr CIP</b>		<b>\$995,800</b>	<b>(123 connections)</b>

# Union Projects

Project	Unit Cost	Total Cost	Years
Brass Meter Replacement for Lead Reduction – Convert to AMR	\$350/meter	\$7,000	2019
Meter Replacement due to Age – Convert to AMR	\$350/meter	\$28,000	2019
WSP Update	\$10,000	\$20,000	2022, 2028
35,300 Gal Tank	\$2.00/Gal	\$70,600	2028
Booster Station for Tank	\$200,000	\$200,000	2028
Main Extension within Service Area	\$100/ft	\$150,000	2019-2020
Main Line Replacement	\$100/ft	\$500,000	2020-2028
Main Line PRV Replacement	\$1,000 ea	\$4,000	2022
Service PRV Installations due to Pressures	\$606/ea	\$3,636	2020
Tank Inspection & Cleaning		\$6,600	2019, 2023, 2027
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# Union Projects

Project	Unit Cost	Total Cost	Years
Well 1 Pump Replacement due to Age	\$200/ft	\$33,200	2024
Well 2 Pump Replacement due to Age	\$200/ft	\$59,600	2024
Repaint Well Houses & Booster Station Buildings	\$4,500	\$4,500	2021
Fire Hydrant Repair & Maintenance	\$1,000/ea	\$6,000	2020
Fire Hydrant Replacement	\$6,500	\$19,500	2020
<b>Total Union 11-Yr CIP</b>		<b>\$1,112,536</b>	<b>(215 connections)</b>



# Union Ridge Projects

Project	Unit Cost	Total Cost	Years
Reservoir Exterior Painting	\$10,000	\$10,000	2017
WSP Update	\$10,000	\$20,000	2022, 2028
35,300 Gal Tank	\$1.80/Gal	\$63,540	2019
Property for Tank	\$75,000	\$75,000	2018
Booster Station for Tank	\$125,000	\$125,000	2019
Repaint Well House and Existing Booster Station	\$3,000	\$3,000	2021
Tank Inspection & Cleaning		\$4,800	2017, 2021, 2025
<b>Total Union Ridge 11-Yr CIP</b>		<b>\$301,340</b>	<b>(33 connections)</b>

# Vuecrest Projects

Project	Unit Cost	Total Cost	Years
WSP Update	\$10,000	\$20,000	2022, 2028
23,500 Gal Tank	\$1.80/Gal	\$42,300	2018
Property for Tank	\$75,000	\$75,000	2018
Booster Station for Tank	\$125,000	\$125,000	2018
Paint Well House		\$1,000	2017
Rebuild Existing Booster Station		\$15,000	2018
Tank Inspection & Cleaning		\$6,300	2018, 2022, 2026
<b>Total Vuecrest 11-Yr CIP</b>		<b>\$284,600</b>	<b>(29 connections)</b>

# Alderbrook Projects

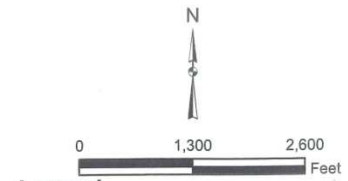
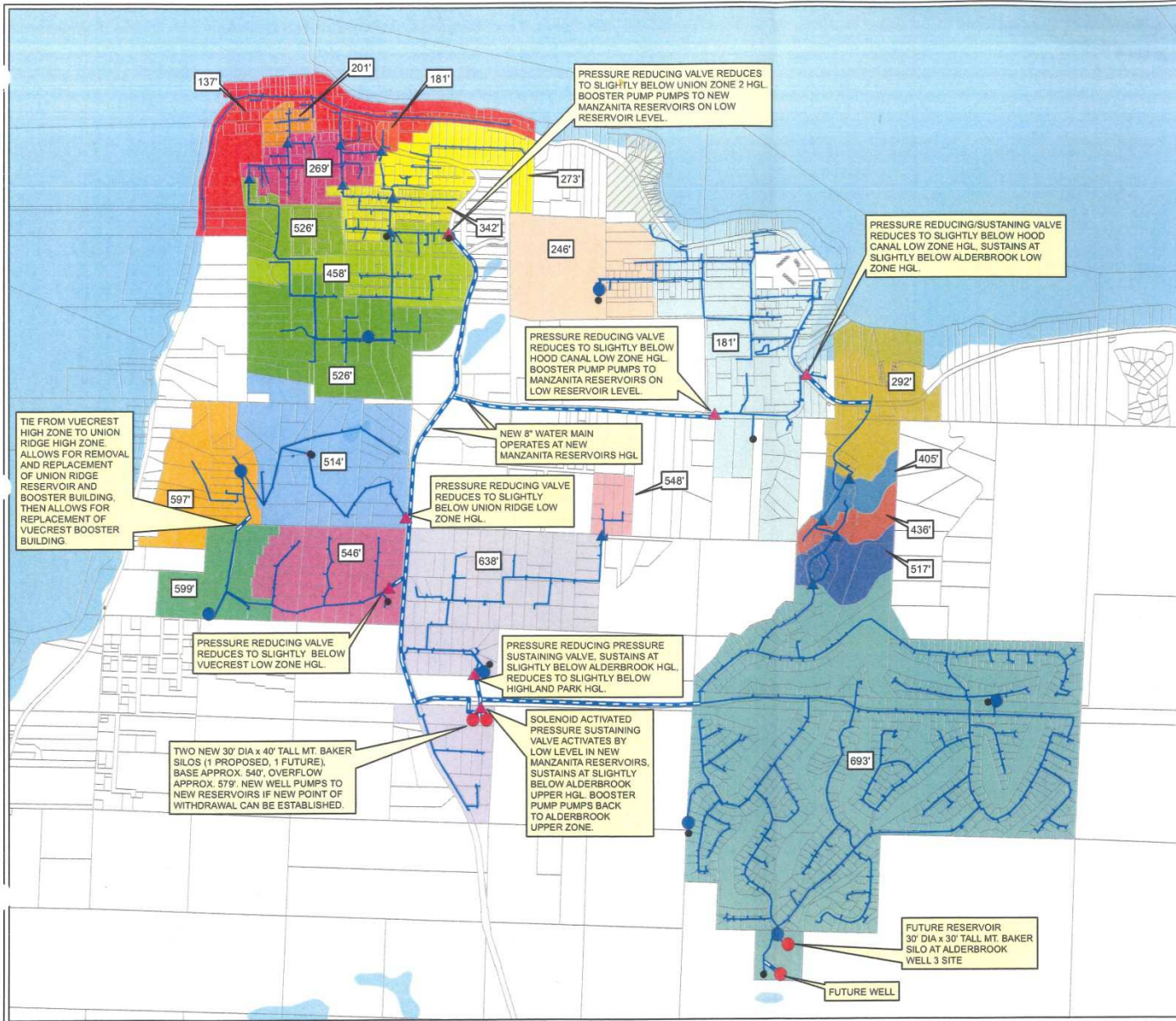
Project	Unit Cost	Total Cost	Years
Brass Meter Replacement for Lead Reduction – Convert to AMR	\$350/meter	\$75,600	2019-2020
Reservoir #1 & #2 Recoating & Resealing	\$350/meter	\$240,000	2017
Main Replacement due to Age	\$110/ft	\$1,100,000	2020-2028
Well 1 Pump Replacement due to Age	\$200/ft	\$58,400	2027
Upgrade Well 3 Pump for Capacity	\$200/ft	\$52,400	2027
Water System Plan Update	\$10,000 ea	\$20,000	2022, 2028
Additional Water Rights (gpm) to Meet Capacity	\$40,000	\$40,000	2025
35,000 Gal Reservoir for Resort	\$2.00/Gal	\$70,000	2023
1,235,000 Gal Tank for Capacity	\$2.00/Gal	\$2,470,000	2028
Booster Station Upgrades for Tank		\$200,000	2028
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# Alderbrook Projects

Project	Unit Cost	Total Cost	Years
Fire Hydrant Repair & Maintenance	\$1,000/ea	\$48,000	2020
Fire Hydrant Replacement	\$6,500/ea	\$32,500	2020
Separate Golf Course from Domestic Water System		\$500,000	2024
Main Line PRV Replacements	\$500/ea	\$6,000	2024
Repaint Wood on Well Houses and Booster Stations		\$2,500	2017
Reservoir Inspections & Cleanings		\$15,150	2020, 2024, 2028
<b>Total Alderbrook 11-Yr CIP</b>		<b>\$4,930,550</b>	<b>(390 connections)</b>

# Union Area Individual Projects


Water System	Total 11-Year Cost	Current Active Connections	\$/Connect
Highland Park	\$1,123,190	69	\$16,278
Hood Canal	\$995,800	123	\$8,096
Union	\$1,112,536	215	\$5,175
Union Ridge	\$301,340	33	\$9,132
Vuecrest	\$284,600	29	\$9,814
Alderbrook	\$4,930,550	390	\$12,642
<b>Total 11-Year CIP</b>	<b>\$8,748,016</b>	<b>859</b>	
<b>Average Cost Per Connect = \$10,189</b> (\$8,748,016 / 859 = \$10,184 per connect)			



**Legend**

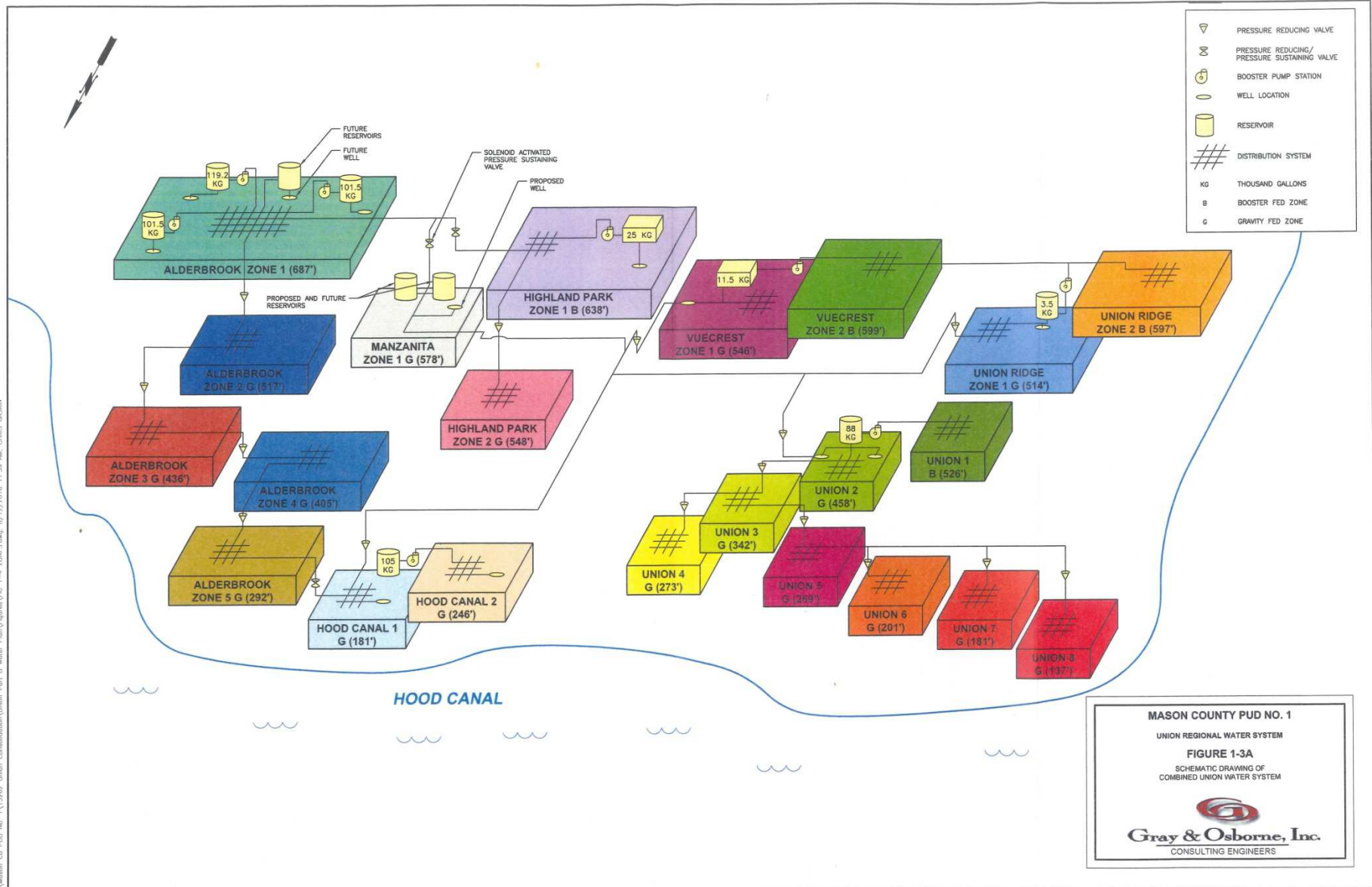
- EXISTING RESERVOIRS
  - EXISTING WELLS
  - ▲ EXISTING PRV
  - EXISTING WATER LINES
  - PROPOSED RESERVOIR
  - ▲ PROPOSED CONTROL VALVE
  - PROPOSED WATER LINES
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**MASON COUNTY PUD NO 1**  
 UNION REGIONAL WATER SYSTEM  
 FIGURE 1-3  
 FACILITIES AND PRESSURE ZONE MAP



**Gray & Osborne, Inc.**  
 CONSULTING ENGINEERS

M:\Users\cgr\3D No. 1\12507 Union Consideration\Union Plant to Water Plant\Views\FIG 1-4 - 2016\3.dwg, 8/22/2016, 11:36 AM, cgr, cgr



# Consolidation Projects

Project	Unit Cost	Total Cost	Year
Brass Meter Replacements for Lead Reduction – Convert to AMR	\$350/meter	\$89,950	2019-2020
Meter Replacement due to Age – Convert to AMR	\$350/meter	\$28,000	2019
Alderbrook Main Replacement due to Age	\$110/ft	\$1,100,000	2020-2028
Main Replacements Due to Age, Other Union Systems	\$100/ft	\$2,120,000	2019-2028
Separate Golf Course from Domestic Water		\$500,000	2024
Union Main Line Extension	\$100/ft	\$150,000	2018-2019
Intertie Alderbrook and Hood Canal via SR 106	\$353/ft	\$353,000	2018
Main from Manzanita Tank to Highland Park	\$156/ft	\$78,000	2025
Water Main McReavy to Vuecrest	\$220/ft	\$88,000	2025
Water Main McReavy to Union Ridge	\$220/ft	\$33,000	2025

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# Consolidation Projects

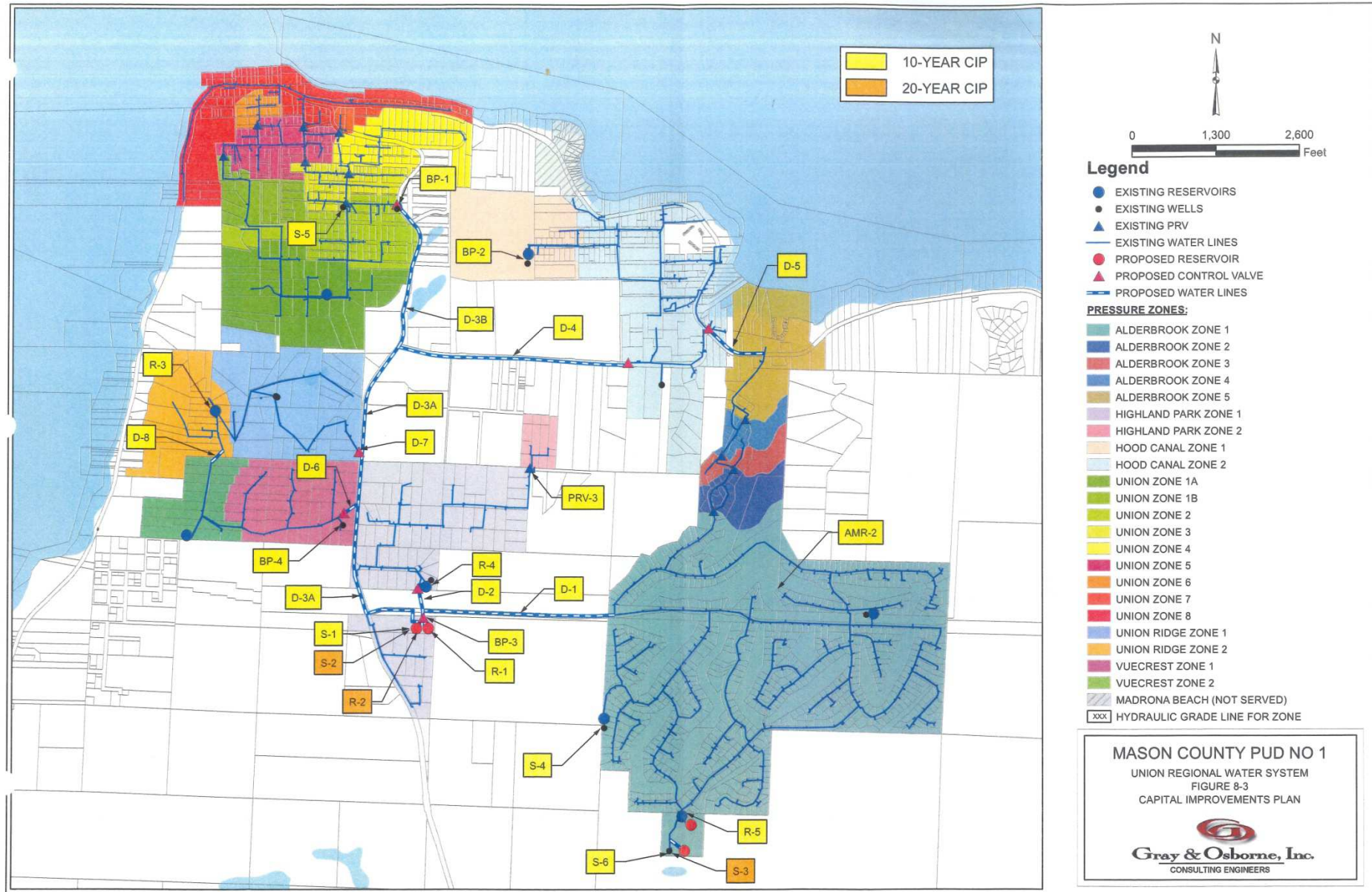
Project	Unit Cost	Total Cost	Year
Intertie Vuecrest to Union Ridge	\$153/ft	\$84,150	2025
Alderbrook Well 1 Pump Replacement due to Age	\$200/ft	\$58,400	2027
Alderbrook Well 3 Pump Upgrade for Capacity	\$200/ft	\$52,400	2027
Highland Park Well Pump Replacement due to Age	\$200/ft	\$78,000	2018
Union Well 1 Pump Replacement due to Age	\$200/ft	\$33,200	2024
Union Well 2 Pump Replacement due to Age	\$200/ft	\$59,600	2024
New Manzanita Well	\$344/ft	\$344,000	2025
Water System Plan Updates	\$30,000/ea	\$60,000	2022,2028
Rebuild Existing Vuecrest Booster Station		\$15,000	2018
Repaint Well Houses and Booster Stations		\$16,300	2017, 2021
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# Consolidation Projects

Project	Unit Cost	Total Cost	Year
Booster Station at Manzanita for New Reservoir		\$314,000	2024
193,000 Gal Tank at Manzanita		\$465,000	2024
Recoat & Reseal Alderbrook Tanks #1 & #2	\$120,000 ea	\$240,000	2017
Tank Inspections and Cleanings		\$45,350	2017-2028
Highland Park Tank Repairs		\$5,000	2017
Union Ridge Tank Exterior Recoating		\$10,000	2017
Install Regional Fire Hydrants in Commercial Areas	\$6,500/ea	\$26,000	2017, 2019
Fire Hydrant Repair & Maintenance	\$1,000/ea	\$57,000	2020, 2025
Fire Hydrant Replacement	\$6,500/ea	\$52,000	2020
Main Line PRV Replacements		\$11,000	2022-2024
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# Consolidation Projects

Project	Unit Cost	Total Cost	Year
Service PRV Installations due to High Pressures	\$606/ea	\$3,636	2020
Main from Manzanita Booster down McReavy past Union Ridge (3985 lf)	\$240/ft	\$956,400	2025
<b>Subtotal Union Consolidated Capacity 11-Year CIP</b>		<b>\$7,777,186</b>	<b>859 connections</b>
<b>\$9,054/Connection for Capacity Projects</b>			

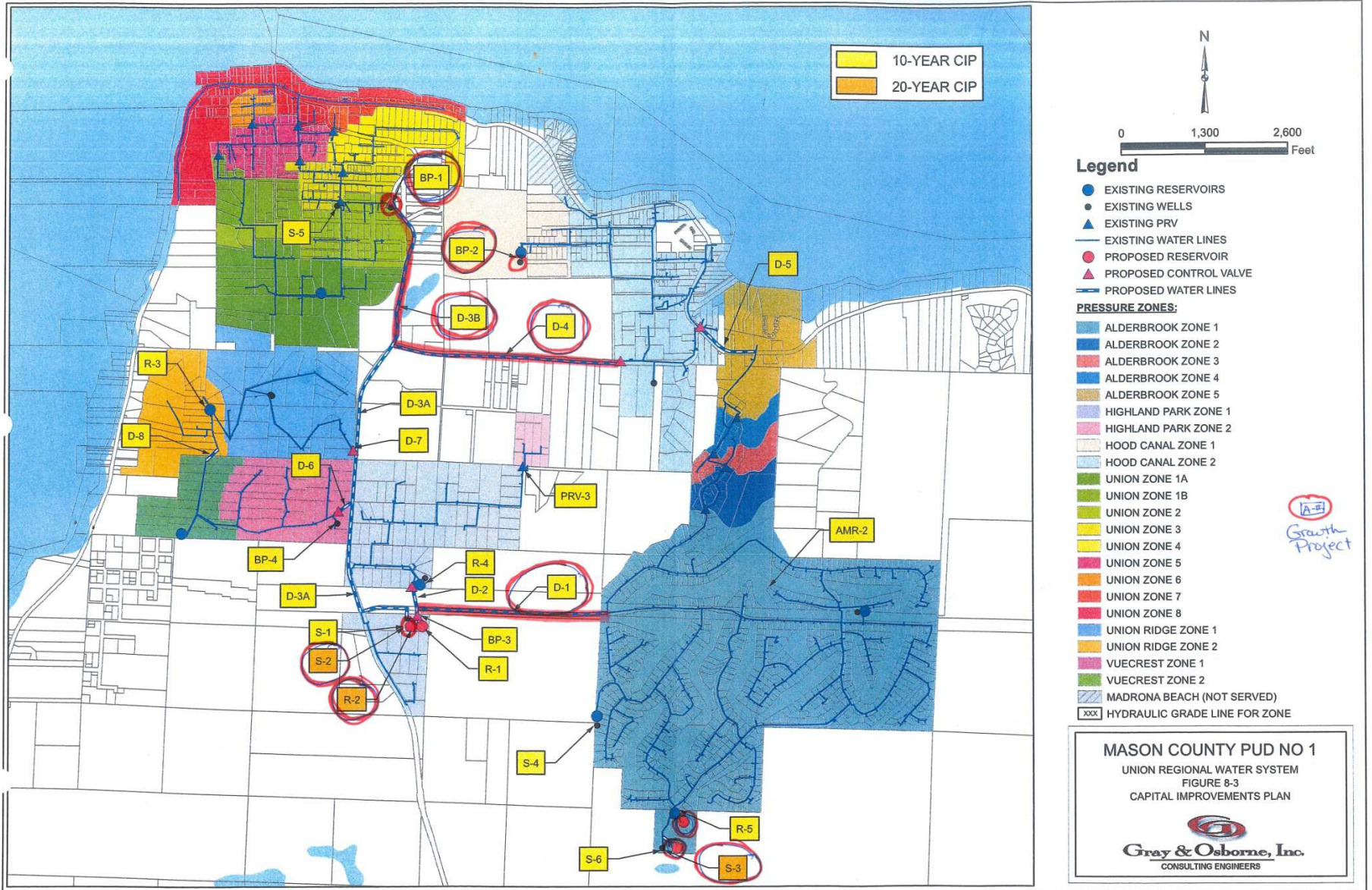


All proposed Capital Improvement Projects over the next 10 years and some stretch into 20 years.

# Consolidation Projects

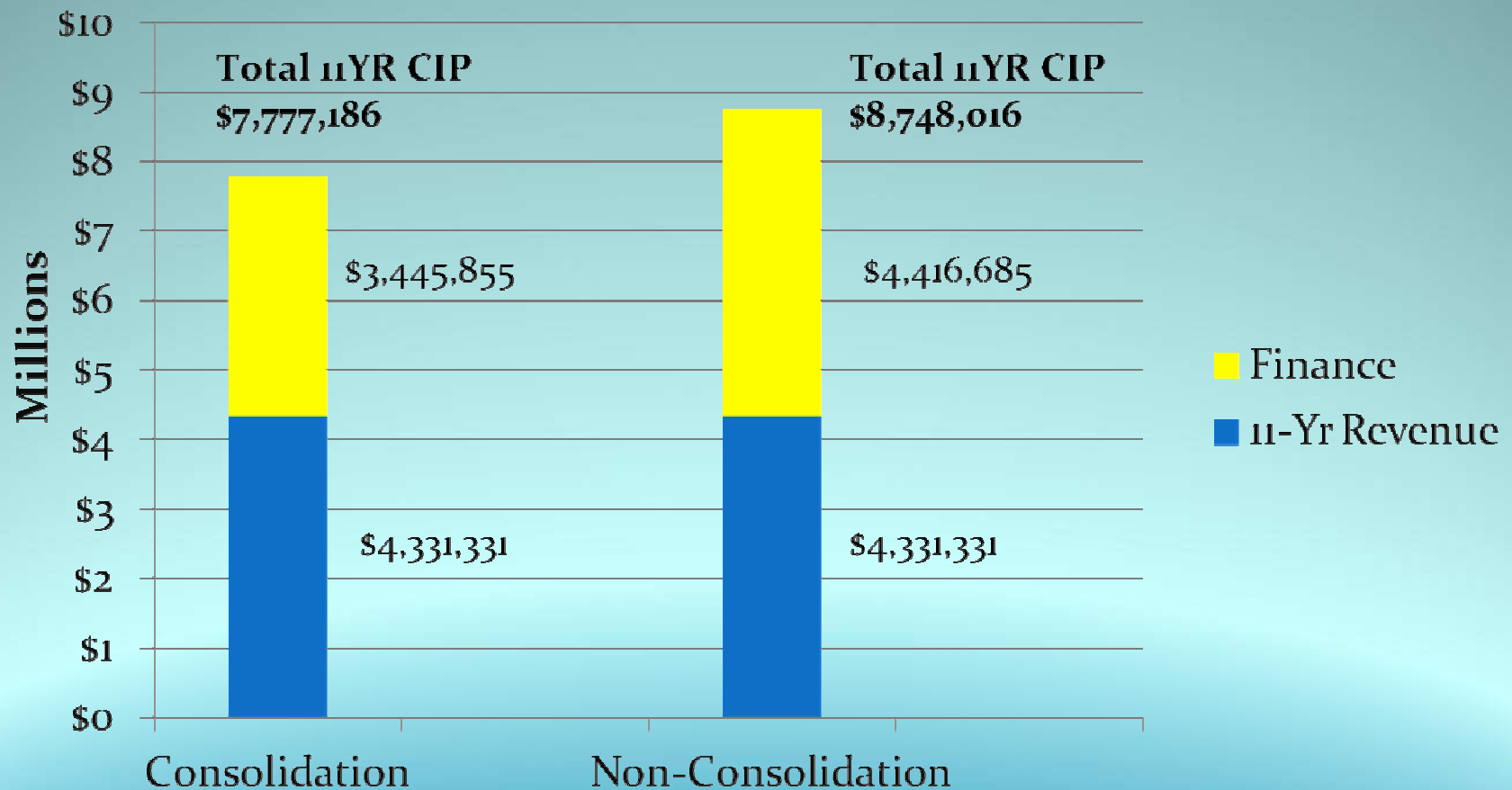
Growth Project	Unit Cost	Total Cost	Year
Water Main – Alderbrook to Manzanita Tank	\$240/ft	\$720,000	2024
Water Main – McReavy: Union Ridge to Union	\$240/ft	\$956,400	2025-2026
Water Main – Dalby: McReavy to Hood Canal	\$240/ft	\$919,920	2026
Alderbrook Booster Station #3 Upgrades for Reservoir #4		\$75,000	2028
Union Booster Station at Union Well 2		\$230,000	2025
Hood Canal Booster Station Upgrades		\$239,000	2026
Alderbrook Reservoir #4		\$465,000	2028
Land Acquisition, as needed		\$250,000	2019
Install Fire Hydrants in Commercial Areas	\$6,500/ea	\$52,000	2021-2026
<b>Subtotal Growth Projects</b>		<b>\$3,657,320</b>	<b>859 connects</b>

**\$4,258/Connection for Growth Projects**  
**Growth projects only needed based on demand.**



Circled projects are for growth only.

# Revenue vs Finance



# Capital Surcharge

## Consolidation

859 connects  
\$4,011/connect financed  
20 years  
5% Interest

Estimated Capital Surcharge  
\$26/connection

## Non-Consolidation

859 connects  
\$5,142/connect financed  
20 years  
5% Interest

Estimated Capital Surcharge  
\$34/connection



# Capital Surcharge vs Interest Rate

Interest Rate	Consolidated Capital Surcharge	Non-Consolidated Capital Surcharge
0.5%	\$17.60	\$22.50
1.5%	\$19.40	\$24.80
3%	\$22.20	\$28.50
5%	\$26.30	\$33.80

Assuming 859 existing active connections

# Additional Growth Projects

Project	Estimated Cost
2 <sup>nd</sup> Well at Manzanita Site	\$344,000
4 <sup>th</sup> Well at Alderbrook Well 3 Site	\$344,000
2 <sup>nd</sup> Tank at Manzanita Site	\$401,000
<b>Total 20-Year Growth CIP</b>	<b>\$1,089,000</b>

These projects only needed as growth demands more capacity.

# Final Outcome

- A single recognized water system – Union Water System
- Three distinct areas isolated with control valves:
  - Union
  - Union Ridge – Vuecrest
  - Highland Park – Hood Canal - Alderbrook

# Final Outcome Service Area

