



Cane Engineering

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March 9, 2016

Camano Water Association

As of April 11, 2016, Camano Water Association indicated that the Capital Facilities Plan is acceptable as is.

Re: Central Camano Water Systems
Cooperation Study - Report Appendix
(Capital Facilities Replacement Review)

Dear Camano Water Association Members:

Please find enclosed the DRAFT Capital Facilities Replacement Review for your water system. The purpose of analyses such as this is to use available information to estimate both the total cost, and the annual contribution to the eventual replacement, of all water system components.

I have prepared the analysis based on the records available to me at this time. One reason for this initial draft is to seek refining data (e.g. for Camano Water Association (CWA), the size and age of the Monticello generator). Once the data is refined, the final report can be a very useful tool for the Board of Directors in guiding future decisions relative to assessments for the replacement of the water system's facilities (I've discussed this further below).

There is one caution that I always make when preparing these analyses, that is, we should be wary of over-refinement. There is no doubt that there could be much fine-tuning on the margins. For example, should the useful life of the storage tank be 40 years, as I have used, or should it be 50 years? Or, should interest / inflation be included in the calculations? Communities invariably determine, even after many tweaks, that the required cost per household per year (as reflected in Column K) is still very high. The lesson, therefore, is not whether the CWA cost per household per year should be \$1,157.79, or \$1,000, or \$1,400, but that the replacement cost of the water systems capital facilities is high and should be addressed to the best ability of the Association.

If community members would like to further discuss the results of this review, I would be happy to answer any questions that may arise. As possible, it would be very helpful if you could forward to me any updates or corrections that you may have by Monday, April 11, 2016.

The notes below discuss the columns in the attached table.

Column A

This column reflects a summary of the water system components. Water system facility sizes, capacities, etc. have been based upon record information and documents. Please review this column and if you find incorrect information, please note it.

Column B

This is an estimate of the replacement cost (construction only) for the various water system components. For the most part, it is based on the budget cost information sheets enclosed herein. For instance, for the 950 square foot Bonnie Lane pumphouse, it is prudent to budget \$670 per square foot for a new pumphouse. This is an all-inclusive construction cost and takes into account the building, piping, pumps, electrical, control system, etc. The Column B value therefore for the 950 square foot pumphouse is $(950 \times \$670/\text{sq. ft.}) = \$636,500$.

Column C

Recent experience has shown that other (non-construction) costs for water system projects in Island County can add as much as 35% – 40% on top of construction costs. For this cost analysis, an additional 35% has been used. These additional costs can include engineering, construction management, archaeological / environmental review and mitigation, permitting, attorney's fees and contingencies.

This column reflects the total estimated component replacement costs.

Column D

The review year for this report is 2016.

Column E

Based on available information, the installation year for the noted component is reflected in this column. In some cases, I have estimated the installation year of a component. Please review this column. If your information differs from that included herein, please note this also.

Column F

Column D minus Column E.

Column G

The expected life of a component is based upon the table enclosed in this report (Enclosure E-1). This Expected Useful Life table is a summary of fourteen data sources which evaluated

the expected life of water system components. In the right hand column of the table, I have suggested an anticipated useful life for the various components.

Column H

Column H is the arithmetic difference between the component age and the expected life. As noted herein, the result may not necessarily be meaningful for this cost review. For example, for some galvanized steel pipe, the years remaining to replacement is a minus 31 years. Clearly, the steel pipe is functioning, and will continue to function for some time into the future.

Column I

This column allows the reviewer to use a more reasonable anticipated remaining life value for the various components. Again, considering the galvanized steel pipe, I have estimated a remaining life of five years for even the oldest steel pipe. The values placed within this column will be based upon the reviewer's knowledge of the condition of the various water system facilities.

Column J

The current number of households (aka, Equivalent Residential Units) connected to the water system.

Column K

This is the amount that each household would need to contribute toward a Capital Facilities Replacement Fund ("Replacement Fund") each year to provide their share of the cost for the noted component. For example, for the Bonnie Lane pumphouse, each household would need to contribute \$42.87 per year for the replacement of this component.

Column L

The noted support documents for your report are included herein, and the location reflected in this column.

Column M

Miscellaneous notes, including cost information not reflected elsewhere in the report.

Discussion

Looking at the bottom of Column K, the total required contribution per household of \$1,157.79 per year to a Replacement Fund is much more than is typically acceptable to the average homeowner. With the exception of a new water system, I am not aware of any similar analysis which did not result in an uncomfortably high required contribution to a Replacement

Fund. Most communities, therefore, do not find it feasible to contribute to a Replacement Fund at the level provided in these analyses.

Having said that, however, one should not cast aside the results of this analysis as it does a reasonably good job of providing a long-term replacement cost of a community's water system. Most communities of which I am aware, have utilized the results of these analyses to increase (or to initiate) contributions to a Replacement Fund. If a given component were to fail and require replacement before there is sufficient money in the Fund, a water system may elect to finance these capital replacements through one of a number of loan programs available.

Sincerely,

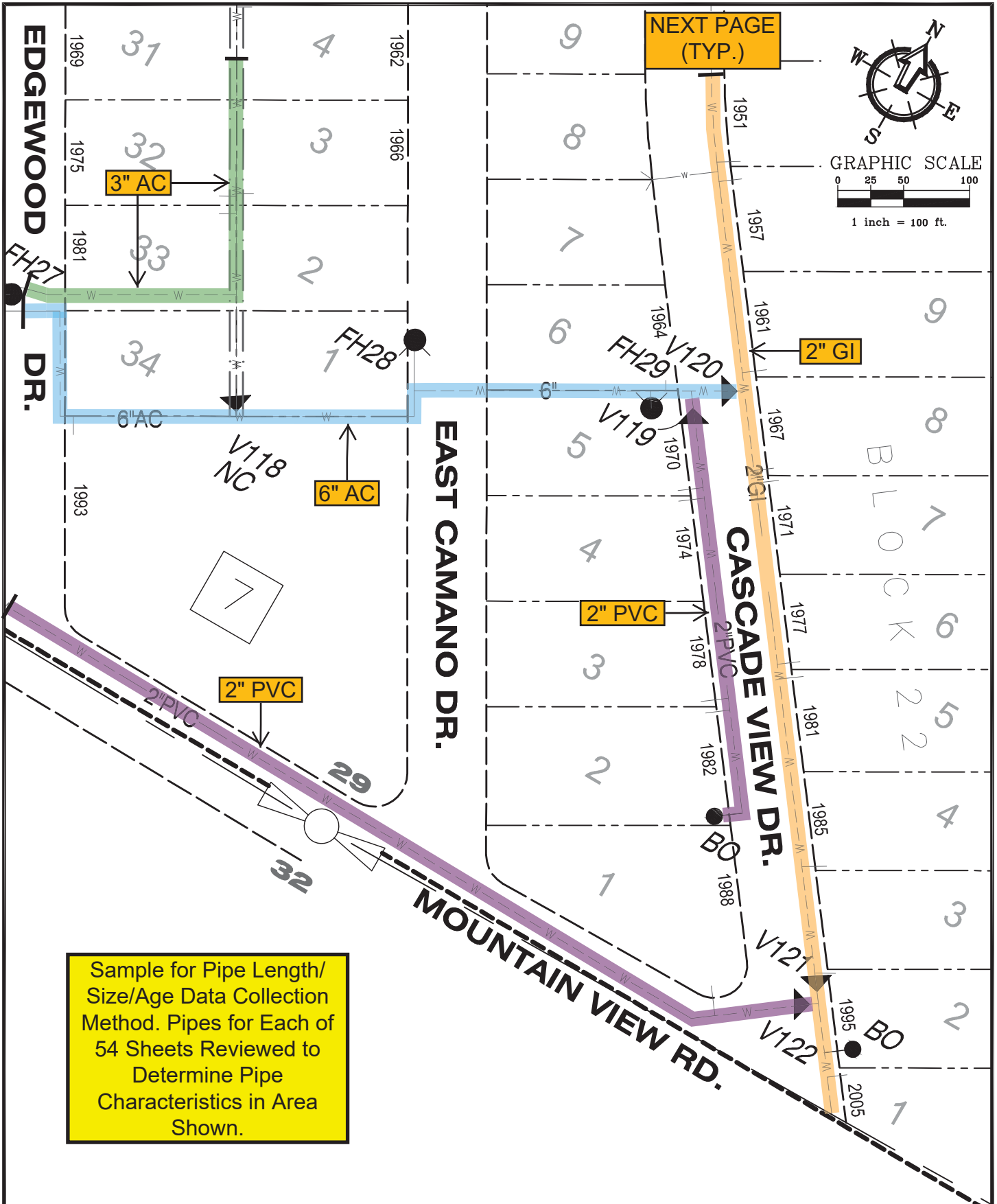
Cane Engineering

Gregory R. Cane, P.E.

Encl

A	B	C	D	E	F	G	H	I	J	K	L	M
Camano Water Assn. - Capital Facilities Replacement Review - 2016												
Water System Component	Replacement Cost - Construction	Replacement Cost - Total (1)	Review Year	Year Installed (Approx)	Component Age	Expected Life (2)	Years to Replacement (Theoretical)	Years to Replacement (For Analysis)	Number of Households	Required per Household per Year	Enclosure	Notes
Wells												
Well 4- 372' Deep, 6" Casing	24,180	32,643	2018	1980	38	35	-1	10	1055	3.09	E-2	
Well 4 Pump - 10 Hp	14,800	19,980	2018	2008	10	15	5	5	1055	3.79	E-3	Pump Installed Date Estimated
Well 5- 260' Deep, 8" Casing	20,800	28,080	2018	1984	32	35	3	10	1055	2.86	E-2	
Well 5 Pump - 10 Hp	14,800	19,980	2018	2008	10	15	5	5	1055	3.79	E-3	Pump Installed Date Estimated
Well 6- 260' Deep, 8" Casing	21,200	28,920	2018	1989	27	35	8	15	1055	1.81	E-2	
Well 6 Pump - 30 Hp	23,400	31,590	2018	2014	2	15	13	13	1055	2.30	E-3	
Well 7- 260' Deep, 8" Casing	20,800	28,080	2018	1993	23	35	12	12	1055	2.22	E-2	
Well 7 Pump - 30 Hp	23,400	31,590	2018	2008	8	15	7	7	1055	4.28	E-3	Pump Installed Date Estimated
Well 8- 207' Deep, 8" Casing	20,560	27,758	2018	1997	19	35	16	16	1055	1.64	E-2	
Well 8 Pump - 30 Hp	23,400	31,590	2018	2014	2	15	13	13	1055	2.30	E-3	
Well Houses												
Well 4 - 128 SF	64,000	86,400	2018	1980	38	40	4	15	1055	5.46	E-4	
Well 5 - 100 SF	50,000	67,500	2018	1984	32	40	8	15	1055	4.27	E-4	Well House Size Estimated
Well 6 - 150 SF	75,000	101,250	2018	1989	27	40	13	13	1055	7.38	E-4	
Well 7 - 110 SF	55,000	74,250	2018	1993	23	40	17	17	1055	4.14	E-4	Well House Size Estimated
Well 8 - 110 SF	55,000	74,250	2018	1997	19	40	21	21	1055	3.35	E-4	Well House Size Estimated
Treatment												
Bonnie Lane - 600 Gpm	240,000	324,000	2018	2008	10	15	5	10	1055	30.71	E-5	Per - Noted Enclosure. Estimate \$400/gpm for Treatment Equipment Only.
Storage Tanks												
Monticello - 150,000 Gal	150,000	202,500	2018	1999	17	40	23	23	1055	8.35	E-6	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.00 / Gal
Monticello - 100,000 Gal	140,000	189,000	2018	1977	39	40	1	10	1055	17.91	E-7	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.80 / Gal (Approx. Const. Date)
Monticello - 80,000 Gal	128,000	172,800	2018	1969	47	40	-7	5	1055	32.76	E-8	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.60 / Gal
Bonnie Lane - 80,000 Gal	129,000	174,150	2018	2008	10	40	30	30	1055	5.50	E-9	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.50 / Gal
Bonnie Lane - 40,000 Gal	76,000	102,600	2018	1995	21	40	19	19	1055	5.12	E-10	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.90 / Gal
Crest View - 80,000 Gal	128,000	172,800	2018	1977	39	40	1	10	1055	16.38	E-11	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.60 / Gal (Approx. Const. Date)
Mountain View - 37,000 Gal	72,150	97,403	2018	2009	7	40	33	33	1055	2.80	E-12	Reinforced Concrete, "Low" Tank; Per Graph, Use \$1.95 / Gal
Pump Houses												
Bonnie Ln - 950 SF	636,500	859,275	2018	1995	21	40	19	19	1055	42.87	E-13	
Mountain View - 200 SF	134,000	180,900	2018	1999	17	40	23	23	1055	7.46	E-13	Area and Age Estimated
Monticello - 340 SF	227,800	307,530	2018	1995	21	40	19	19	1055	15.34	E-13	Age Estimated
Pipes												
8" PVC:												
1980 to 1989 (8,872 LF)	1,020,280	1,377,378	2018	1995	21	75	54	54	1055	24.18	E-14	
8" HDPE:												
2000 to 2009 (7,887 LF)	907,000	1,224,457	2018	2005	11	75	64	64	1055	18.13	E-14	
8" STEEL:												
1990 to 1999 (4,787 LF)	502,630	678,557	2018	1995	61	30	-31	5	1055	128.64	E-15	Replace w/ 8" HDPE/PVC
8" HDPE:												
2000 to 2009 (856 LF)	58,380	78,813	2018	2005	11	75	64	64	1055	1.17	E-15	
2010 to 2016 (8,696 LF)	913,080	1,232,658	2018	2013	3	75	72	72	1055	16.23	E-15	
8" PVC:												
1980 to 1989 (3,918 LF)	389,330	498,677	2018	1995	51	75	24	24	1055	19.69	E-15	
1970 to 1979 (4,063 LF)	426,615	575,930	2018	1975	41	75	34	34	1055	16.06	E-15	
1980 to 1989 (8,538 LF)	1,001,490	1,352,012	2018	1985	31	75	44	44	1055	20.13	E-15	
1990 to 1999 (8,823 LF)	926,415	1,250,660	2018	1995	21	75	54	54	1055	21.95	E-15	
8" AC:												
1990 to 1989 (1,163 LF)	122,115	164,855	2018	1995	61	45	-16	10	1055	15.63	E-15	Replace w/ 8" HDPE/PVC
1960 to 1989 (12,272 LF)	1,288,560	1,730,556	2018	1995	51	45	-6	10	1055	164.89	E-15	Replace w/ 8" HDPE/PVC
4" PVC:												
1980 to 1989 (2,219 LF)	232,050	313,269	2018	1995	51	75	24	24	1055	12.37	E-15	Replace w/ 8" HDPE/PVC
1970 to 1979 (400 LF)	42,000	56,700	2018	1975	41	75	34	34	1055	1.58	E-15	Replace w/ 8" HDPE/PVC
1990 to 1999 (2,943 LF)	309,015	417,170	2018	1995	21	75	54	54	1055	7.32	E-15	Replace w/ 8" HDPE/PVC
4" AC:												
1990 to 1989 (8,461 LF)	888,420	1,199,347	2018	1995	61	45	-16	10	1055	113.68	E-15	Replace w/ 8" HDPE/PVC
1960 to 1989 (3,668 LF)	385,140	519,039	2018	1995	51	45	-6	10	1055	49.28	E-15	Replace w/ 8" HDPE/PVC
3" PVC:												
1980 to 1989 (2,893 LF)	299,565	404,413	2018	1995	51	75	24	24	1055	15.97	E-15	Replace w/ 8" HDPE/PVC
3" AC:												
1960 to 1989 (8,929 LF)	937,440	1,265,544	2018	1995	51	45	-6	10	1055	119.96	E-15	Replace w/ 8" HDPE/PVC
2" PVC:												
1960 to 1989 (2,996 LF)	162,890	219,902	2018	1995	51	75	24	24	1055	8.68		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1970 to 1979 (1,996 LF)	103,740	140,049	2018	1975	41	75	34	34	1055	3.90		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1980 to 1989 (2,094 LF)	175,110	236,309	2018	1995	31	75	44	44	1055	5.09		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1990 to 1999 (1,069 LF)	69,485	93,805	2018	1995	21	75	54	54	1055	1.85		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
2" PE:												
1990 to 1989 (919 LF)	33,730	45,542	2018	1995	21	75	54	54	1055	0.80		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
2" GIP:												
1990 to 1989 (3,380 LF)	210,700	296,595	2018	1995	61	30	-31	5	1055	56.23		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1960 to 1989 (1,093 LF)	71,040	95,911	2018	1995	51	30	-21	5	1055	18.18		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1 1/2" GIP:												
1990 to 1989 (238 LF)	15,470	20,988	2018	1995	61	30	-31	5	1055	3.96		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
1" GIP:												
1990 to 1989 (198 LF)	12,870	17,375	2018	1995	61	30	-31	5	1055	3.29		Replacement for all Pipes, 2" and Smaller; Use \$65 / LF
Pressure Reducing Valves												
Three Total - 4" PRV's with Bypass	87,800	117,488	2018	1975	41	35	-6	10	1055	11.10	E-16	Installation Years Not Known - Estimated Here
One - 4" PRV with Bypass (Cavaliers)	29,000	39,190	2018	1996	20	35	15	15	1055	2.47	E-16	
Standby Generator												
Standby Generator - 110 Kw	80,500	108,675	2018	2007	9	15	6	10	1055	10.30	E-17	
Monticello Booster Generator - 10 kw	19,000	25,650	2018	2005	11	15	4	10	1055	2.43	E-18	Capacity and Date Installed Estimated
Chain Link Fence												
Monticello - 734 LF	16,882	22,791	2018	1999	17	40	23	23	1055	0.94	E-19	Installation Date is Estimated
Bonnie Lane - 665 LF	15,290	20,648	2018	1995	21	40	19	19	1055	1.03	E-19	Installation Date is Estimated
Crest View - 200 LF	8,600	11,610	2018	1999	17	40	23	23	1055	0.48	E-19	
Mountain View - 220 LF	9,020	12,177	2018	2009	7	40	33	33	1055	0.35	E-19	Estimated Length and Installation Date
Misc.												
Corporate Office - Storage (2500 SF)	250,000	337,500	2018	1990	26	50	24	24	1055	13.33		Age is Estimated. Use \$100/SF Replacement Cost.
Totals	\$14,676,712	\$19,678,561								\$1,167.79		

Notes:
(1) Total Cost reflects additional 35% for engineering, archaeological and environmental review / mitigation, permitting, construction administration, attorney's fees and contingencies.
(2) See Enclosure E-1.



Sample for Pipe Length/
Size/Age Data Collection
Method. Pipes for Each of
54 Sheets Reviewed to
Determine Pipe
Characteristics in Area
Shown.

DWG No. 12063SP1.DWG
JOB #: 12063
**WATER SERVICE AREA FOR
CAMANO WATER ASSOCIATION**



220 W. Champion Street, Suite 290 t: 360.650.1408
Bellingham, WA 98225 f: 360.650.1401

**F R E E L A N D
& A S S O C I A T E S**

DATE
12-18-2012

SHEET
1 of 54

Water System Components - Expected Useful Life

Source Component	Expected Useful Life Table, Fannie Mae, 2014	Texas Commission on Environmental Quality, 2014	Environmental Finance Center, New Mexico Tech, 2006	Water Resource Engineering Linsley/Franzini 3rd ed	Illinois Municipal Treasurers Association, Website 2007	Irrigation Practice and Engineering, Early 1900's	Long Term Performance Prediction of PVC Pipes, AWWARF, 2005	Drinking Water Distribution Systems, Assessing and Reduction of Risks, National Academies Press, 2006	EPA, 2005	Corrosion Protection of Ductile Iron Pipe, Corpro Companies, Inc.	Asset Management: A Handbook for Small Water Systems, EPA, 2003	EPA Control and Mitigation of Drinking Water Losses in Distribution Systems, 2009	JM Eagle Pipe Web Page, 2010	Plastics Pipe Institute Web Page, 2010	USE - First Pass
Water Storage Tank (Generic)		30	50-80					30			30-60				
Concrete Water Storage Tank				50											40
Steel Water Storage Tank				40					50+						
Pipe (Generic)	50	35-40						35			35-40				35
Transite Pipe				50											45
PVC Pipe					25		100 (New Pipe?)					50-100	100		75
HDPE Pipe												50		50-100	75
Steel Pipe				30-40		15-50									30
Ductile Iron Pipe					75				40+	75-100		100			75
Cast Iron Pipe				65-75											
Wells		25-35		40-50							25-35				35
Well Pump															15
Water Meter		10-15		30				40	15		10-15				15
Hydrants		40		50							40-60				40
Pumphouse Bldg		30	60-70		50						30-60				40
Water Pump (Generic)	15	10-15		18-25							10-15				15
Standby Generator	25	10-20		14-17											15
Site and Building Electrical		7-10	25		20										20
Valves		35-40													35
Water Treatment	15	10-15									10-15				15
Chain Link Fence	40														40

New Drilled Well - Budget Construction Cost
Island County (2015 Dollars)
(Estimated Lifespan: 35 years)

Project	Cost Per Ft
Recent Bid Information	\$ 62.48
Estimate for Budgeting	\$ 65.00

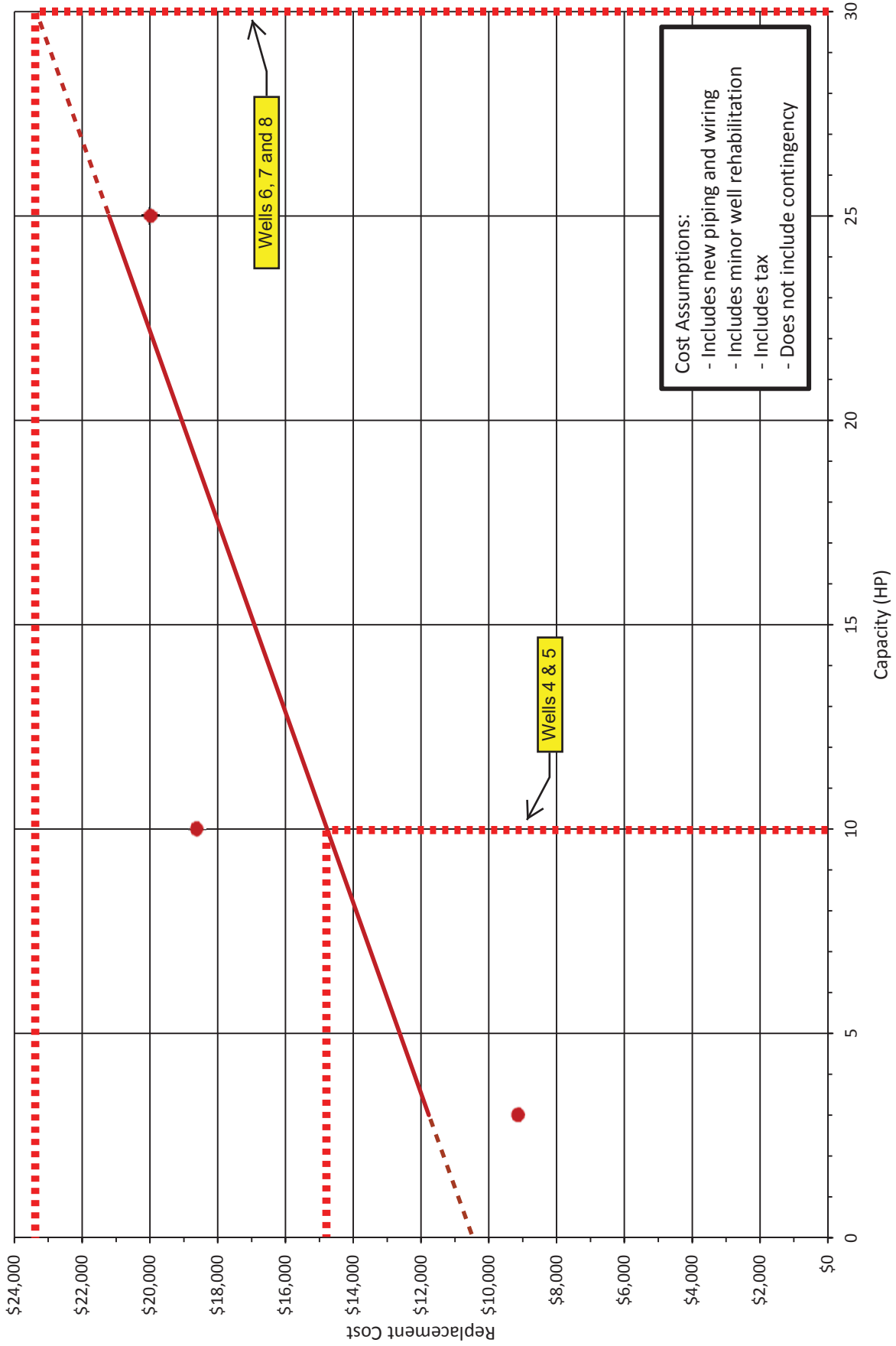
Use \$80/Ft for
8" Well

- Cost Assumptions:

 - 6-inch casing
 - ≥ 100 ft deep
 - Includes tax
 - Includes some site work
 - Does not include contingency

Well Pump - Budget Replacement Cost - Island County (2015 Dollars)

Estimated Useful Life: 15 Years



Pumphouse - Budget Construction Cost - Island County
Estimated Useful Life - Building: 40 years, Electrical: 20 years
(2015 Dollars)

Area (SF)	Year	Project Location	Total Construction Cost	Cost per SF
432	2007	South Whidbey - Bid	\$208,000	\$481
256	2010	North Whidbey - Bid	109,000	426
192	2012	Camano Island - Bid	174,000	906
437	2013	North Whidbey - Bid	212,000	485
620	2015	Camano Island - Bid	481,000	776
Average Per SF				\$615
Sales Tax (8.7%)				<u>53</u>
Total				668
Estimate for Budgeting				\$670

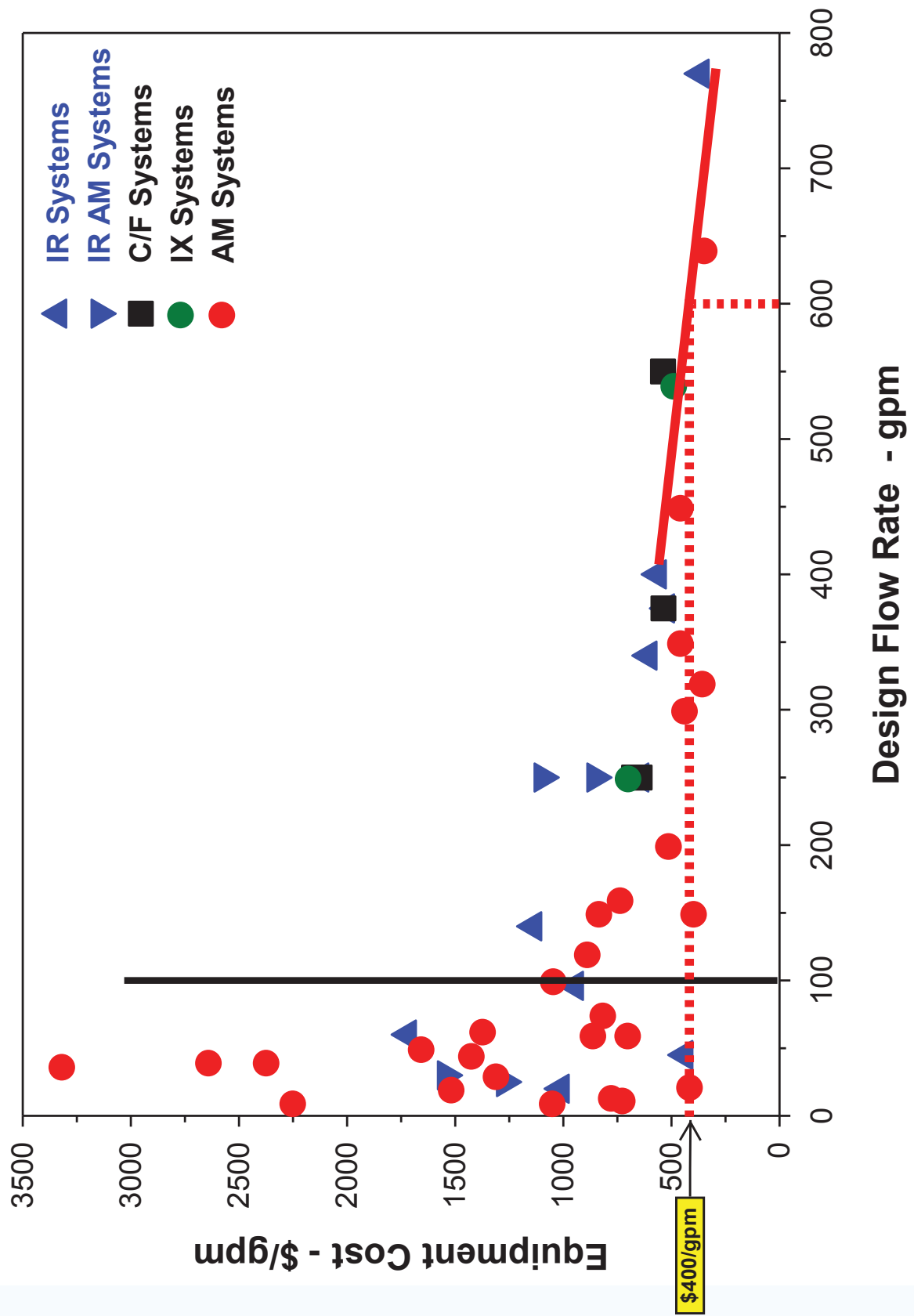
Cost Assumptions:

- All costs in 2015 dollars
- Includes electrical components
- Includes building and concrete slab
- Includes booster pumps and appurtenances
- Includes site piping
- Includes tax
- Includes some site work

Use \$500/SF for Well Houses
(Based on 2014 Camano Bid Tabulation)

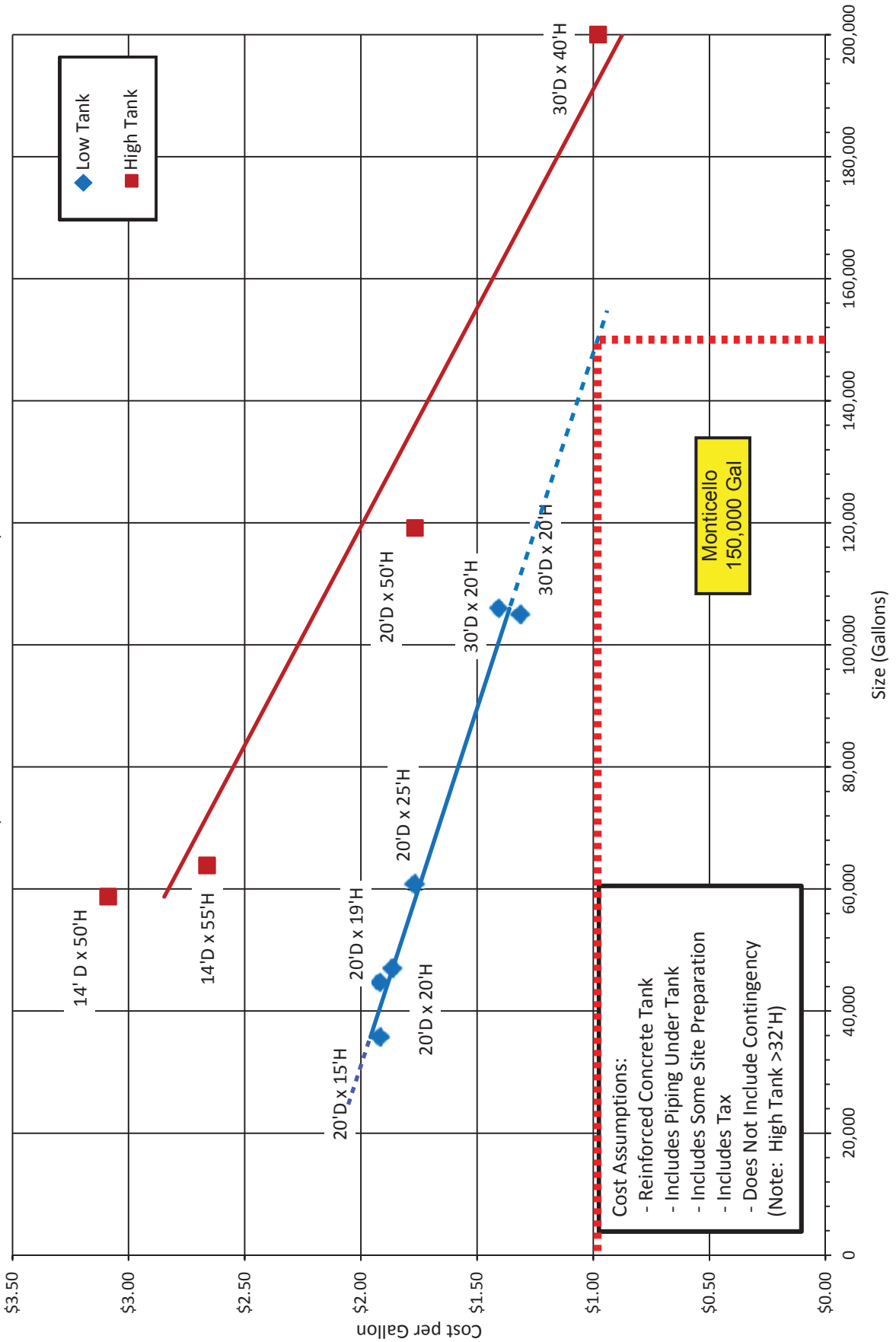
Equipment Costs: \$/ gpm vs Size (\$/gpm)

Source: USEPA January 27, 2015 Webinar - Tom Sorg, PE (Red Lines by Cane)



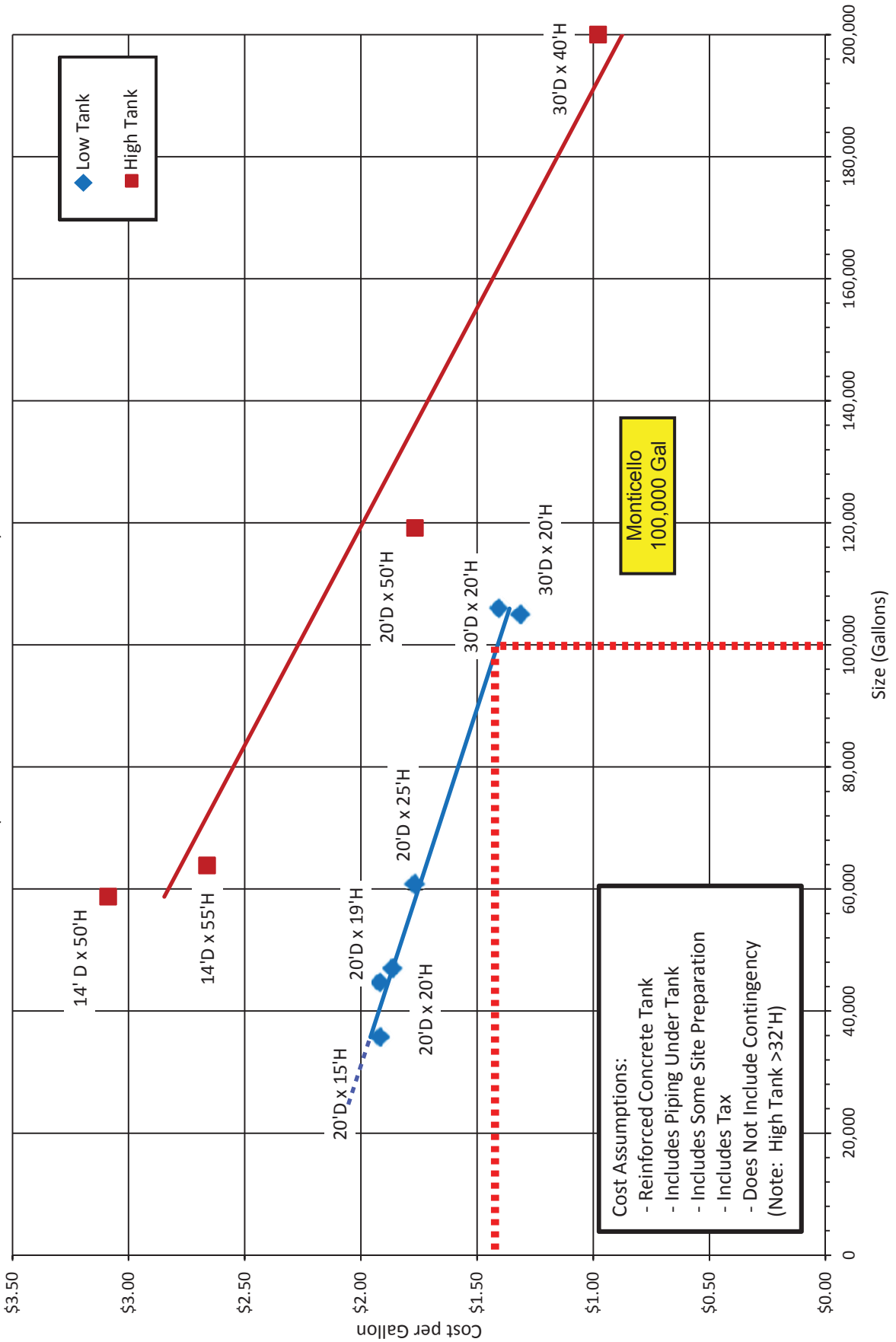
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



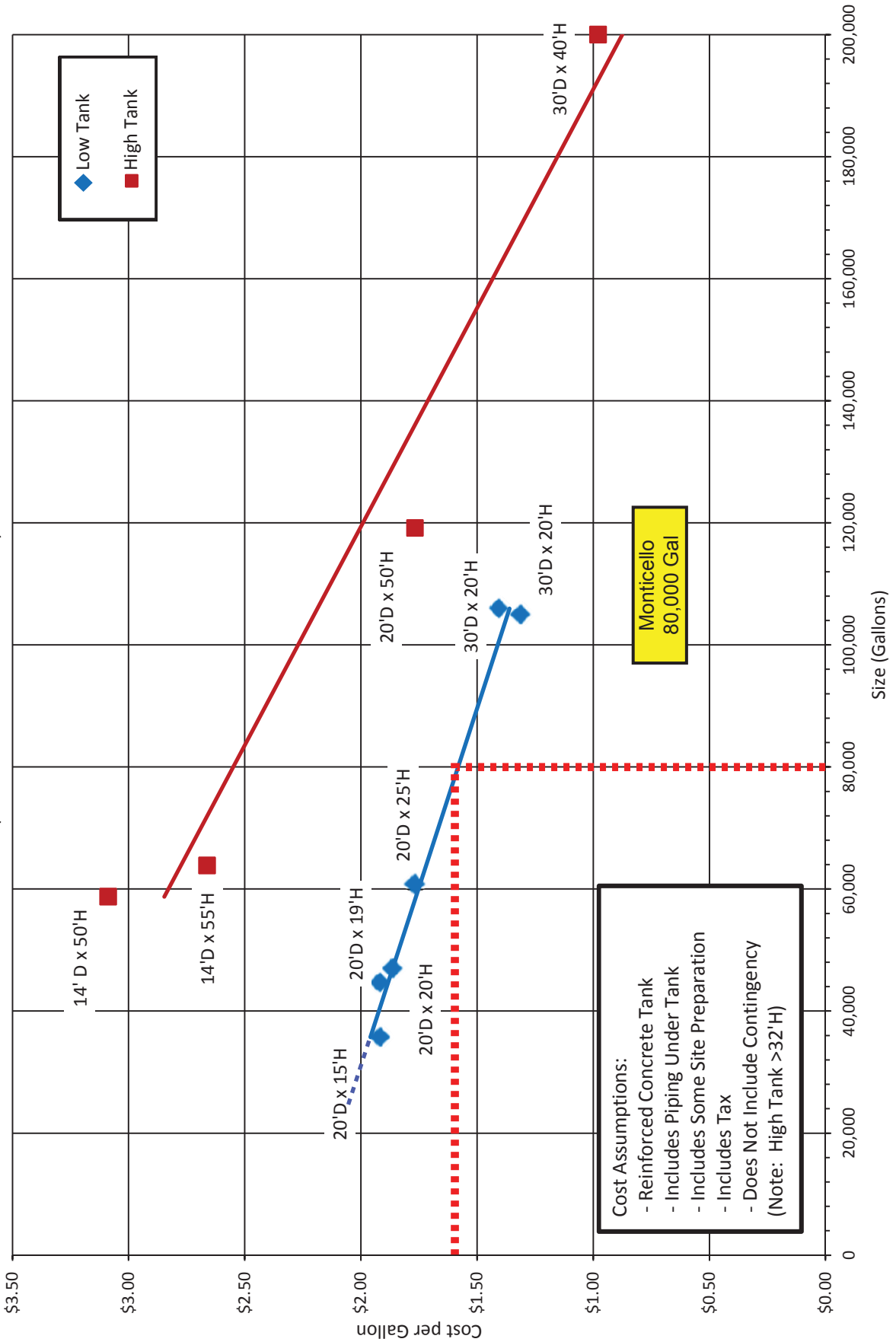
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



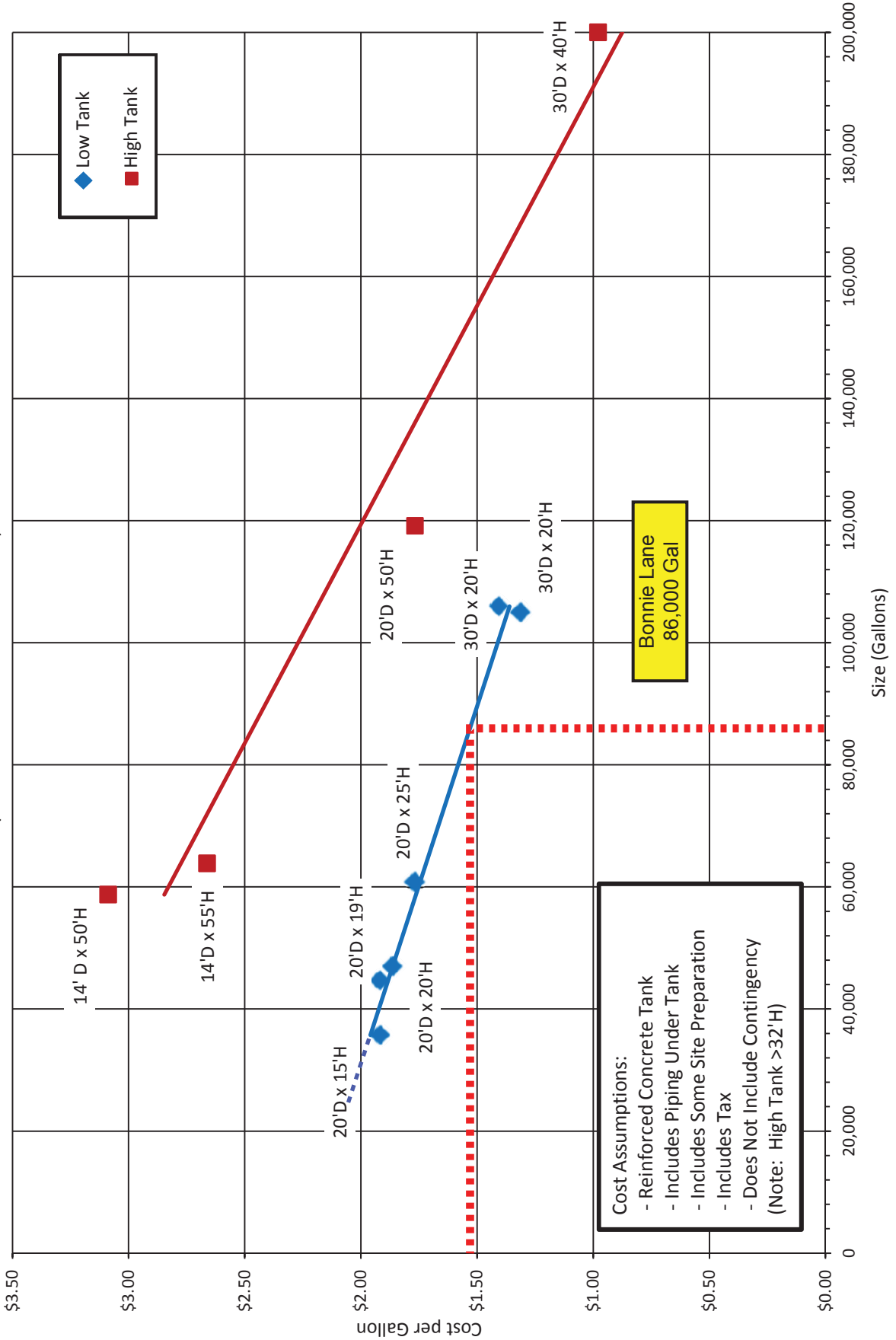
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



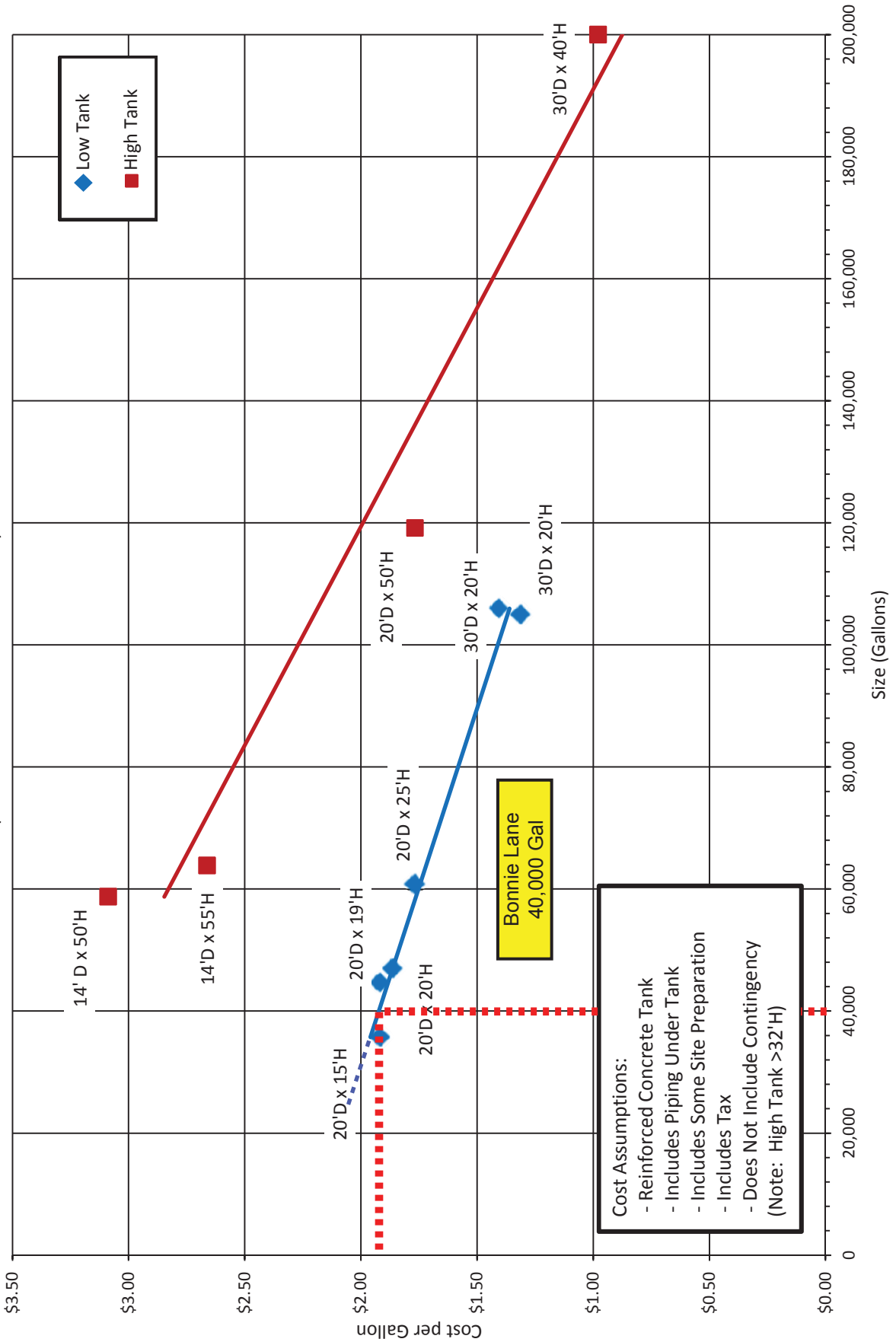
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



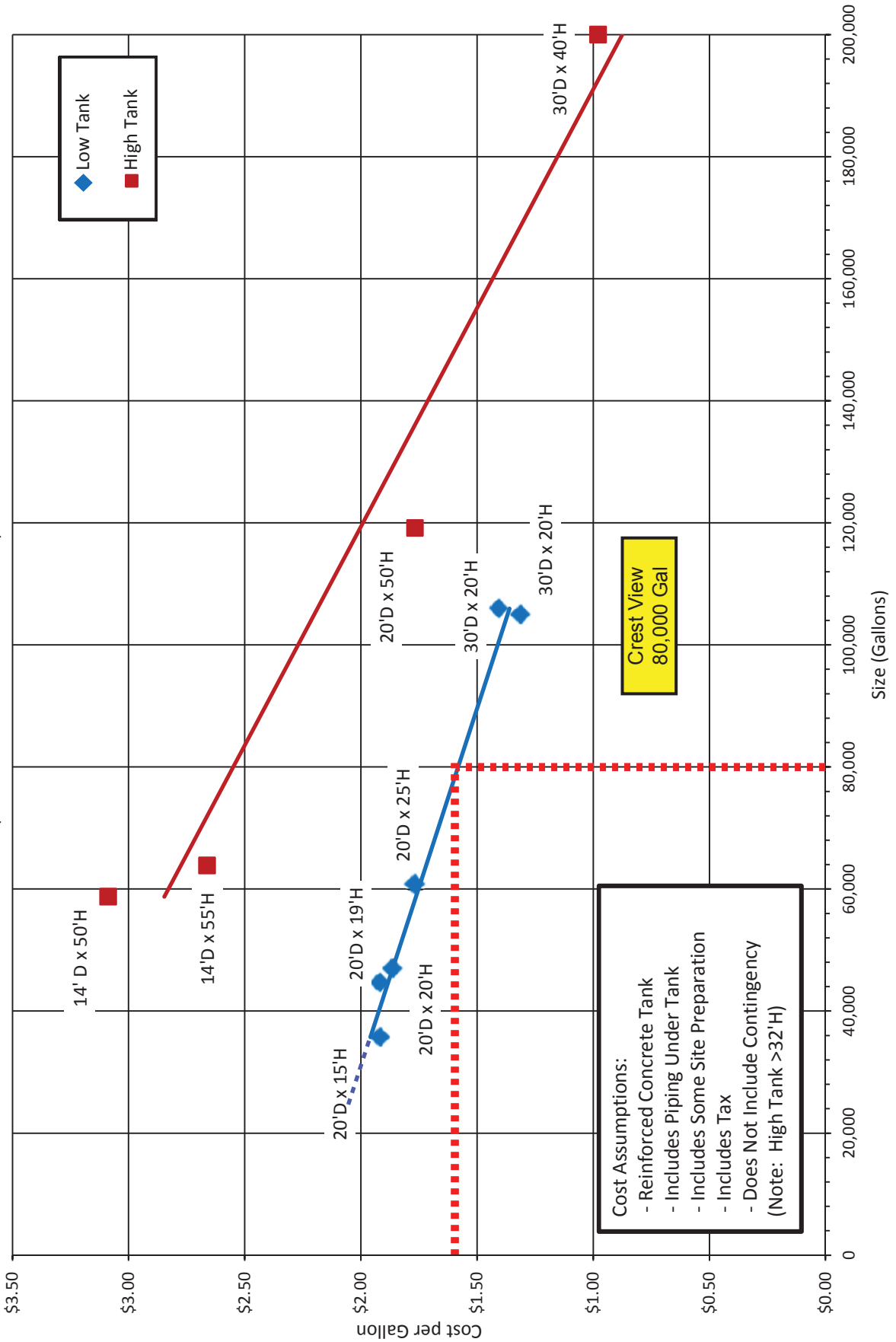
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



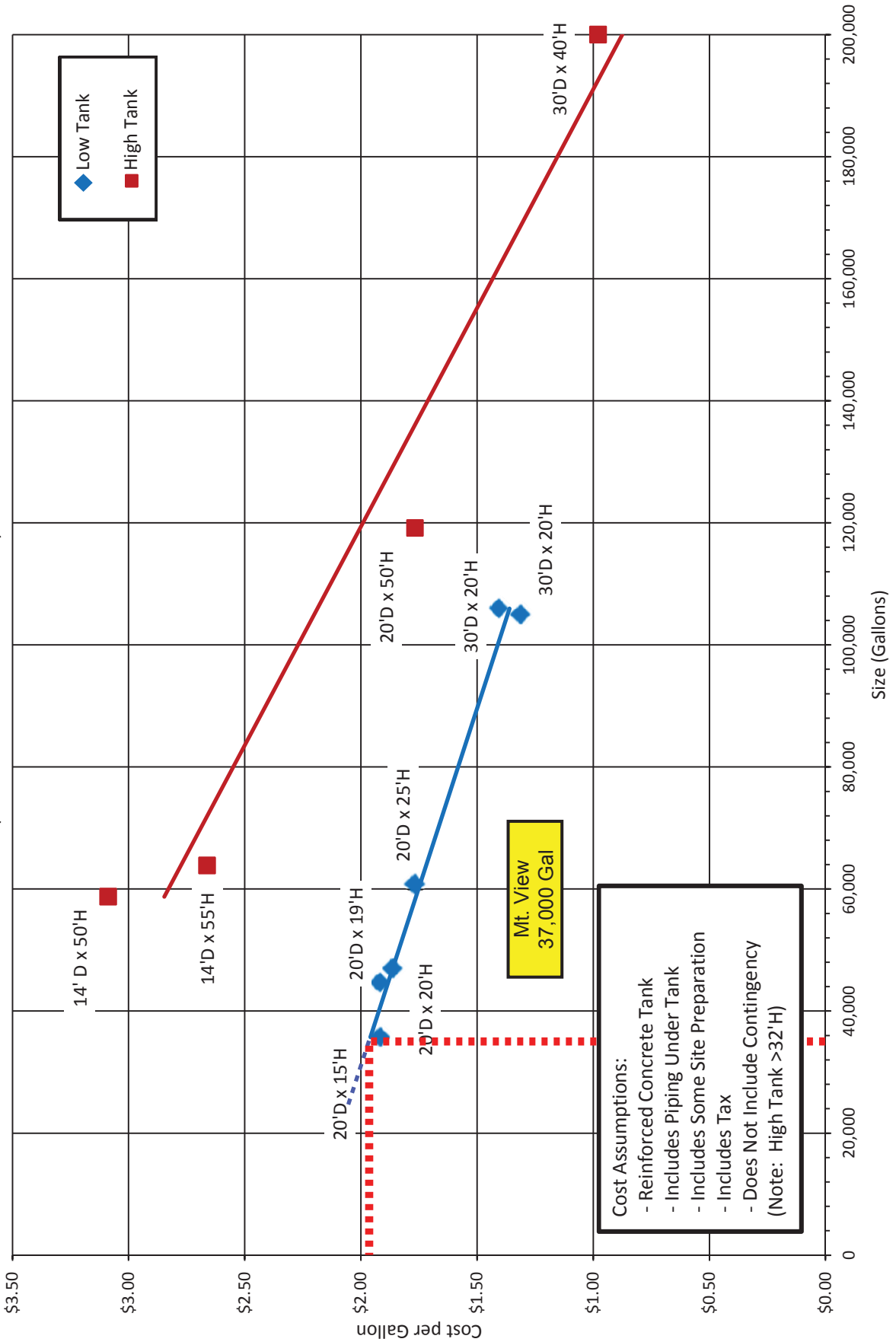
Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



Reservoir- Budget Installation Cost - Island County (2015 Dollars)

(Estimated Useful Life: 40 Years)



Cost Assumptions:

- Reinforced Concrete Tank
- Includes Piping Under Tank
- Includes Some Site Preparation
- Includes Tax
- Does Not Include Contingency

(Note: High Tank >32'H)

Mt. View
37,000 Gal

Pumphouse - Budget Construction Cost - Island County
Estimated Useful Life - Building: 40 years, Electrical: 20 years
(2015 Dollars)

Area (SF)	Year	Project Location	Total Construction Cost	Cost per SF
432	2007	South Whidbey - Bid	\$208,000	\$481
256	2010	North Whidbey - Bid	109,000	426
192	2012	Camano Island - Bid	174,000	906
437	2013	North Whidbey - Bid	212,000	485
620	2015	Camano Island - Bid	481,000	776
Average Per SF				\$615
Sales Tax (8.7%)				<u>53</u>
Total				668
Estimate for Budgeting				\$670

Cost Assumptions:

- All costs in 2015 dollars
- Includes electrical components
- Includes building and concrete slab
- Includes booster pumps and appurtenances
- Includes site piping
- Includes tax
- Includes some site work

Distribution System Piping - Budget Construction Cost - Island County
 HDPE with Meters and Appurtenances
 (Estimated Useful Life: 75 years)
 (2015 Dollars)

8-Inch HDPE Piping				
Preliminary Cost Estimate: Installation Per Typical 1,000 FT				
Description	Unit	Quantity	Unit Price	Total
Mobilization	LS	1	11,000.00	\$11,000.00
Removal of Structure & Obstruction	LS	1	5,000.00	5,000.00
8-Inch HDPE Pipe	LF	1,000	36.00	36,000.00
8-Inch Gate Valve	EA.	2	1,400.00	2,800.00
8-Inch Tees, Bends & Fittings	EA.	4	500.00	2,000.00
6 Inch Hydrant Assembly	EA.	1	3,700.00	3,700.00
Air Vacuum Valve Assembly	EA.	1	1,900.00	1,900.00
Single Service - Near Side	EA.	10	900.00	9,000.00
Single Service - Far Side	EA.	10	1,800.00	18,000.00
Connect Main to Existing System	EA.	2	1,800.00	3,600.00
Crushed Surfacing	TN	75	32.00	2,400.00
Commercial HMA - Pavement Patch	TN	10	275.00	2,750.00
Topsoil / Bark Mulch	CY	20	45.00	900.00
Corrugated Polyethylene Culv. Pipe 12 Inc. Diam.	LF	60	22.00	1,320.00
Project Temporary Traffic Control	LS	1	500.00	500.00
Select Gravel Backfill	TN	300	15.00	4,500.00
Sub-Total				\$105,370.00
Sales Tax (8.7%)				9,167.19
Total				\$114,537.19
Estimated Price Per LF				\$114.54
Estimate Per LF For Budgeting				\$115.00

Cost Assumptions:

- Pipe installed on shoulder of road
- Typical residential
- Assume HDPE pipe but similar for PVC pipe
- Includes tax
- Does not include permits, engineering, archaeological review (these additional items can be 30-40% additional cost)
- Does not include contingency

Distribution System Piping - Budget Construction Cost - Island County
 HDPE with Meters and Appurtenances
 (Estimated Useful Life: 75 years)
 (2015 Dollars)

6-Inch HDPE Piping				
Preliminary Cost Estimate: Installation Per Typical 1,000 FT				
Description	Unit	Quantity	Unit Price	Total
Mobilization	LS	1	10,000.00	\$10,000.00
Removal of Structure & Obstruction	LS	1	5,000.00	5,000.00
6-Inch HDPE Pipe	LF	1,000	28.00	28,000.00
6-Inch Gate Valve	EA.	2	900.00	1,800.00
6-Inch Tees, Bends & Fittings	EA.	4	500.00	2,000.00
6 Inch Hydrant Assembly	EA.	1	3,700.00	3,700.00
Air Vacuum Valve Assembly	EA.	1	1,900.00	1,900.00
Single Service - Near Side	EA.	10	900.00	9,000.00
Single Service - Far Side	EA.	10	1,800.00	18,000.00
Connect Main to Existing System	EA.	2	1,800.00	3,600.00
Crushed Surfacing	TN	75	32.00	2,400.00
Commercial HMA - Pavement Patch	TN	10	275.00	2,750.00
Topsoil / Bark Mulch	CY	20	45.00	900.00
Corrugated Polyethylene Culv. Pipe 12 Inc. Diam.	LF	60	22.00	1,320.00
Project Temporary Traffic Control	LS	1	500.00	500.00
Select Gravel Backfill	TN	300	15.00	4,500.00
Sub-Total				\$95,370.00
Sales Tax (8.7%)				8,297.19
Total				\$103,667.19
Estimated Price Per LF				\$103.67
Estimate Per LF For Budgeting				\$105.00

Cost Assumptions:

- Pipe installed on shoulder of road
- Typical residential
- Assume HDPE pipe but similar for PVC pipe
- Includes tax
- Does not include permits, engineering, archaeological review (these additional items can be 30-40% additional cost)
- Does not include contingency

4-Inch PRV Station (For 6" Main)
 Island County Budget Construction Cost (2015 Dollars)
 (Estimated Useful Life: 35 Years)

Year	Project Name	Cost
2006	North Whidbey - Bid	\$34,652
2010	North Whidbey - Estimate	27,940
2011	North Whidbey - Bid	19,435
2013	Camano Island - Bid	23,033
Average		\$26,265
Sales Tax (8.7%)		2,285
Total		28,550
Estimate for Budgeting		\$29,000

Cost Assumptions: - Includes tax - Includes some site work - Does not include contingency
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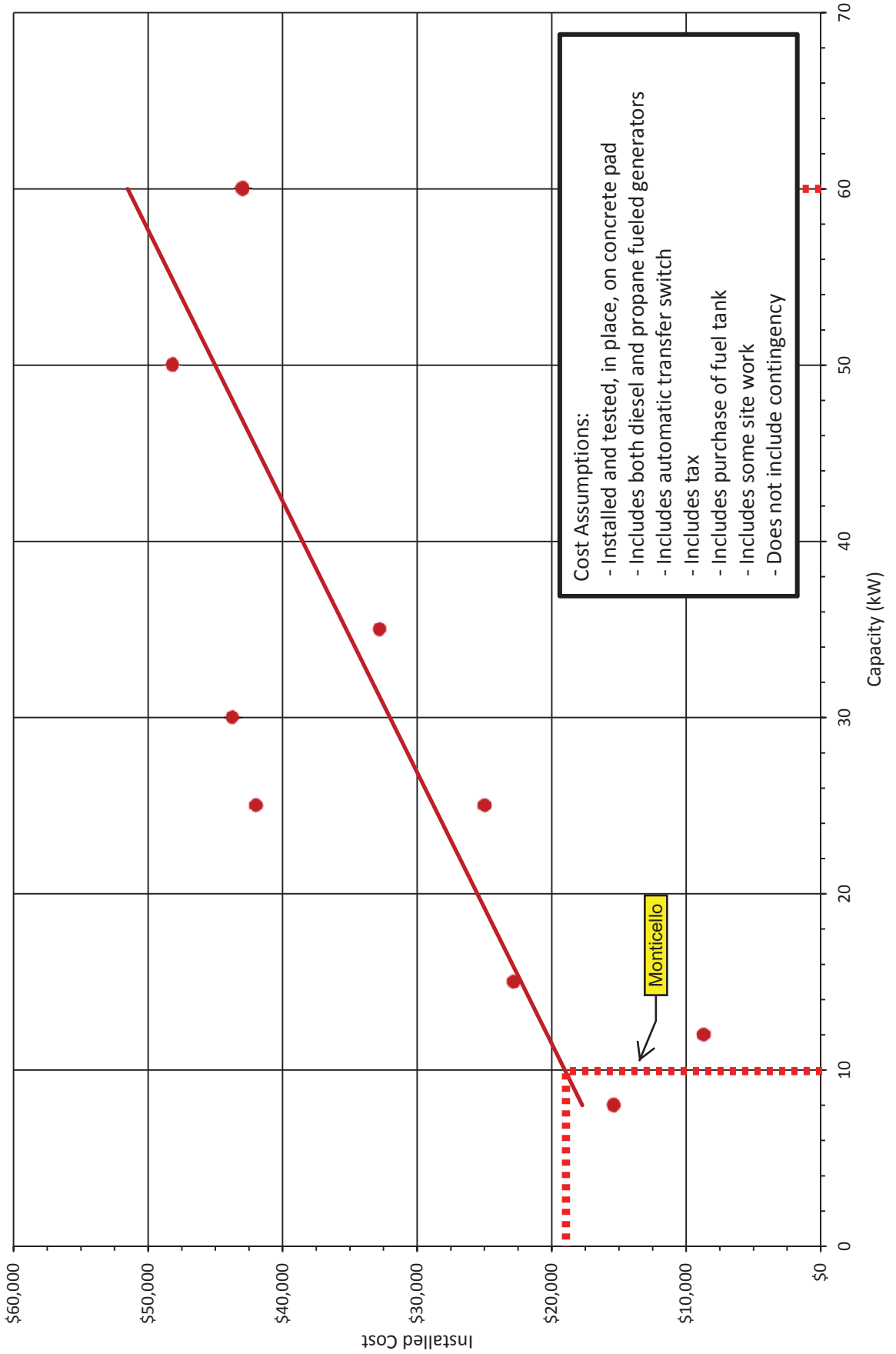
**Camano Water Association
110 KW Generator - Replacement Cost
February 11, 2016**

Capacity	Purchase Cost (w/ Transfer Switch)	Installed Cost	Ratio (Installed Cost vs. Purchase Cost)
12 KW	\$3,100.00	\$20,000.00	6.5 : 1
38 KW	16,000.00	37,000.00	2.3 : 1
60 KW	20,400.00	52,000.00	2.5 : 1
Use 2.5 : 1 Ratio to Estimate Installation Cost for 110 KW Generator			
110 KW	32,200.00	80,500.00	2.5 : 1

Cost Assumptions:

- Installed and tested, in place, on concrete pad
- Includes both diesel and propane fueled generators
- Includes automatic transfer switch
- Includes tax
- Includes purchase of fuel tank
- Includes some site work
- Does not include contingency

Back-up Generator Budget Installation Cost - Island County (2015 Dollars) Estimated Useful Life: 15 Years



Chain Link Fence- Budget Replacement Cost - Island County (2015 Dollars)

Estimated Useful Life: 40 Years

