Memorandum

To: Scott Wengewicz and Town Board Members

Project: Town of Shelby
Water System Improvements

Date: April 7, 2025

Purpose: This memo serves as an update for supplying the Town of Shelby with water directly from the Town of Royalton.

Background:

- The Town of Shelby is currently obtaining water from the Town of Royalton through the Freeman Road vault and the recently installed Johnson Road meter vault.
- The water is obtained from the 16" transmission main located along Griswold Road. Pressure within the Royalton water system is provided via booster pumps. The pumps are operated to maintain a set pressure within the transmission main. The pumps speed up or slow down automatically, as needed, to maintain a set pressure.
- Both vaults have one-way check valves installed inside to prevent water from going back into the Royalton water system.
- The Johnson Road and Freeman Road water mains are both 8" in size and are connected to the Royalton 16" transmission main.
- The Town Water Department recently removed the 6" pressure reducing valve from the existing vault on Blair Road to allow the Hamlet of Shelby Center to be supplied from Royalton. This increased the pressure within the Hamlet by approximately 7 psi.
- Royalton is currently supplying the Shelby water system from the town line up to and including NYS Route 63. The area includes:
    - New York State Route 63 from NYS Rt 31 to West Shelby Road
    - Hamlet of Shelby Center
    - Blair Road
    - Ryan Road
    - West Shelby Road
    - Shelby Basin Road
    - Salt Works Road up to the railroad tracks
    - Telegraph Road (NYS Route 31E) up to Middleport
    - Hoffman Road up to NYS Route 31
- See attached map with the area currently supplied by Royalton highlighted in blue. The closed meter vaults have also been noted.
- Currently water for the remaining areas of the Shelby water system is supplied by the Village of Medina at two locations, the pump station on NYS Route 31A and the vault on Maple Ridge Road at Charles Street.

- On April 3, 2025 three (3) additional fire flow tests were performed by the Town of Shelby Water Department and CPL to confirm the pressures and available fire flows within the area currently served from Royalton. This information will be used to calibrate the Shelby water model.
- The recent fire flow results are as follows:
    - Blair Road:
        - Static Hydrant: 1st hydrant west of flow hydrant, Static Pressure=74 psi, Residual Pressure=74 psi
        - Flow Hydrant: #11173 Blair Road, Flow = 1,015 GPM
    - NYS Route 63:
        - Static Hydrant: #4877 Rt. 63, Static Pressure=70 psi, Residual Pressure=70 psi
        - Flow Hydrant: #4814 Rt 63, Flow = 1,025 GPM
    - NYS Route 31E:
        - Static Hydrant: #10174 Telegraph Rd, Static Pressure=116 psi, Residual Pressure=115 psi
        - Flow Hydrant: #11173 Blair Road, Flow = 1,015 GPM

Discussion:

- The fire flows and residual pressures observed within the area currently served with Royalton water are adequate without making any other improvements.
- Based on discussions with the Town Water Department the next area to be considered for transferring supply is as follows:
    - NYS Route 63 from West Shelby Road to Fletcher Chapel Road
    - Bigford Road from Martin Road to Fletcher Chapel Road
    - Harrison Road
    - Edwards Road up to Fletcher Chapel Road
    - Please note Fletcher Chapel Road and Dunlap Road will remain supplied by the Village until the roads listed above are determined to be acceptable.
- Currently, approximately 50% of the Town is supplied by Royalton. The number of EDUs within each supply area will provide a rough idea of the ratio but it does not account for large users as well as using actual metered usage.
- Based on the 50:50 ratio, the hybrid water rate would be approximately $7.23/1,000 gallons which would save the typical water customer around $61/yr.

Recommendations:

- Recommend continuing to transition the water supply road by road.
- Recommend allowing the new areas supplied by Royalton to stabilize for a period of time (2-3 months) to allow the existing water system to adjust to the change of water flow direction and the slightly higher pressures.
- Recommend performing additional pressure and fire flow tests as each section is converted to Royalton water.

- Recommend collecting master meter data from all the feeds into the Town water system to determine the ratio of Royalton water to Village water. The ratio will be used to determine the new Town water rate.

Next Steps:

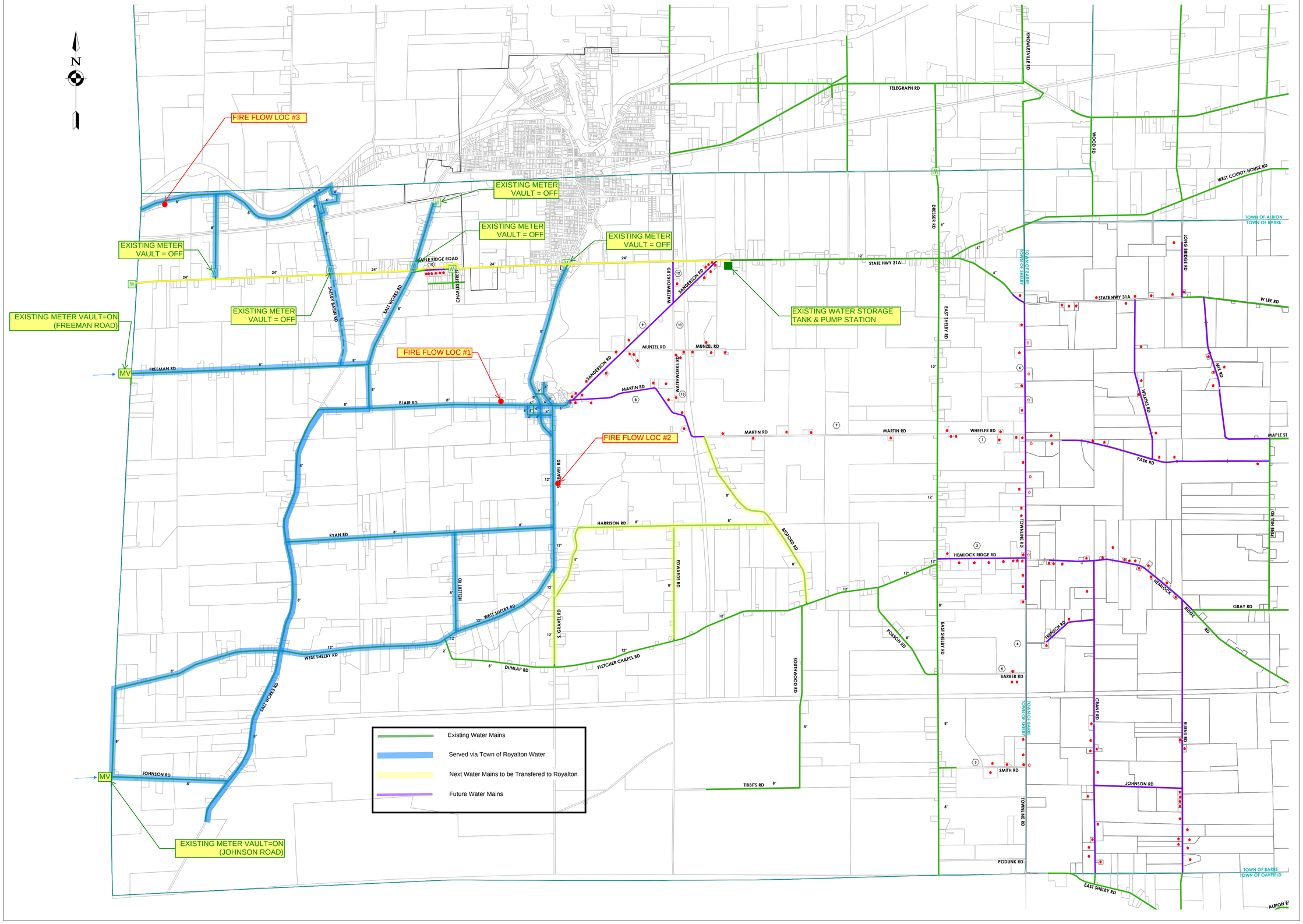
- Once we have more data from the field testing, we will calibrate our water model and determine what, if any, additional improvements are needed within the Shelby water systems to supply the entire system with water from Royalton.
- Prepare a cost estimate and concept plans for the improvements, as necessary.
- Calculate a "hybrid" water rate based on the ratio of the volume of water from Royalton verses Medina.
- Attend a Town Board meeting to present our findings and to determine the next steps, if any.

Summary prepared by:

CPL

Jason A. Foote, P.E.
Principal

Enc.



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PROJECT INFORMATION

Project Number
R23.14780.00

Client Name
TOWN OF SHELBY

Project Name
TOWN OF SHELBY WATER SYSTEM IMPROVEMENTS

Project Address
4062 SALT WORKS RD
MEDINA, NY 14103

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description

PROFESSIONAL STAMPS

FOR REVIEW ONLY
NOT FOR PERMIT OR CONSTRUCTION

SHEET INFORMATION

Issued	Scale
XX/XX/XX	1" = 2000'
Drawn By	Checked By
DKH	JAF

Drawing Title
TOWN OF SHELBY WATER SYSTEM IMPROVEMENTS

Drawing Number	Revision Number
FIG 01	0

Sheet Size: 22x34
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Date last accessed: 2/15/2024 3:48 PM
Date last plotted: 2/15/2024 3:48 PM
Plotted By: Brandon Moore

Town of Shelby
NCWD vs Medina
Water Cost & Flushing Calculations

Historic Flushing and Water Loss

Item	2020	2021	2022	2023	Avg (excluding 2023) [1]	Avg	$/Yr
Total Flushed Annually (gal) [4]	1,964,000	3,212,000	1,189,000	2,360,000		**2,181,250**	$ 13,100
Water Sold Annually (gal)	34,644,000	36,764,000	37,232,000	34,536,000		35,794,000	
Total Annual Purchased	43,698,000	46,266,000	53,185,000	65,366,106	**47,716,333**	52,128,777	$ 311,542
Daily Average Purchased	119,721	126,756	145,712	179,085	**130,730**	142,819	
Service Connections	765	830	839	840		819	
People Served	1,790	2,075	2,087	2,087		2,010	
Usage per Connection/Yr [2]	45,286	44,294	44,377	41,114		**43,768**	
Water Loss (gal)	7,090,000	6,290,000	14,764,000	*28,470,106*	9,381,333	13,199,088	$ 78,900
Water Loss % [3]	16.2%	13.6%	27.8%	43.6%	**19.2%**	25.3%	

Notes:
1. The total and averages for water purchased excludes 2023 because there was an abnormally high amount of water purchased due to a major leak.
2. An annual usage of 44,000 gallons per connection was used for calculations.
3. A water loss of 20% was assumed based on historic data.
4. The average annual flushing volume of 2,200,000 gallons was used for calculations below.

Flushing Costs

NCWD	Medina	NCWD Water Rate	Medina Water Rate	Daily Purchased (gal)	Annual Purchased (gal)	Total Annual Cost of Water (Purchase)	Average Purchase Water Rate	Estimated Total Water Loss (20%) (gal) [3]	Estimated Annual Cost for Water Loss	Total Estimated Annual Savings for Water Loss	Estimated Annual Flushing Volume (gal) [2]	Estimated Annual Cost of Water Loss for Flushing	Estimated Annual Savings for Flushing
100%	0%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 153,008	$ 3.20	9,563,000	$ 30,602	$ 26,551	1,100,000	$ 3,520	$ 9,628
90%	10%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 166,283	$ 3.48	9,563,000	$ 33,257	$ 23,896	1,210,000	$ 4,208	$ 8,940
80%	20%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 179,559	$ 3.76	9,563,000	$ 35,912	$ 21,241	1,320,000	$ 4,957	$ 8,191
70%	30%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 192,834	$ 4.03	9,563,000	$ 38,567	$ 18,585	1,430,000	$ 5,767	$ 7,381
60%	40%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 206,109	$ 4.31	9,563,000	$ 41,222	$ 15,930	1,540,000	$ 6,638	$ 6,510
50%	50%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 219,385	$ 4.59	9,563,000	$ 43,877	$ 13,275	1,650,000	$ 7,571	$ 5,578
40%	60%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 232,660	$ 4.87	9,563,000	$ 46,532	$ 10,620	1,760,000	$ 8,564	$ 4,584
30%	70%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 245,935	$ 5.14	9,563,000	$ 49,187	$ 7,965	1,870,000	$ 9,618	$ 3,530
20%	80%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 259,211	$ 5.42	9,563,000	$ 51,842	$ 5,310	1,980,000	$ 10,734	$ 2,414
10%	90%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 272,486	$ 5.70	9,563,000	$ 54,497	$ 2,655	2,090,000	$ 11,910	$ 1,238
0%	100%	$ 3.20	$ 5.9764	131,000	47,815,000	$ 285,762	$ 5.98	9,563,000	$ 57,152	$ -	2,200,000	$ 13,148	$ -

Notes:
1. The average purchase water rate was calculated by dividing the total annual cost of water based on the proportion of flow from each source by the average annual water purchased volume.
2. It is assumed the annual total flushing volume of 2,200,000 gallons will decrease by 50% if the Freeman Road connection is utilized since a large portion of the flushing is at this location.
3. The total water loss is based on the historic percentage loss (20%) between 2020 and 2022. The average excludes 2023 because there was an abnormally high amount due to a major leak.

Current Water Rate		Shelby Water Fee Schedule [5]					Composite Water Rate Calculation		
Annual Usage	Quarterly Usage	0 - 4000 gallons	Next 10,000 gal ($8.17/1,000)	Next 10,000 gal ($7.95/1,000)	Quarterly Total ($)	Annual Total ($) [1,2]	Composite Water Rate [3]	Purchase Cost	Calculated O & M Cost [4]
60,000	15,000	$ 37.58	$ 81.70	$ 7.95	$ 127.23	$ 508.92	$ 8.48	$ 5.9764	$ 2.51
55,000	13,750	$ 37.58	$ 79.66	$ -	$ 117.24	$ 468.95	$ 8.53	$ 5.9764	$ 2.55
50,000	12,500	$ 37.58	$ 69.45	$ -	$ 107.03	$ 428.10	$ 8.56	$ 5.9764	$ 2.59
45,000	11,250	$ 37.58	$ 59.23	$ -	$ 96.81	$ 387.25	$ 8.61	$ 5.9764	$ 2.63
44,000	**11,000**	**$ 37.58**	**$ 57.19**	**$ -**	**$ 94.77**	**$ 379.08**	**$ 8.62**	**$ 5.9764**	**$ 2.64**
40,000	10,000	$ 37.58	$ 49.02	$ -	$ 86.60	$ 346.40	$ 8.66	$ 5.9764	$ 2.68
35,000	8,750	$ 37.58	$ 38.81	$ -	$ 76.39	$ 305.55	$ 8.73	$ 5.9764	$ 2.75
30,000	7,500	$ 37.58	$ 28.60	$ -	$ 66.18	$ 264.70	$ 8.82	$ 5.9764	$ 2.85
25,000	6,250	$ 37.58	$ 18.38	$ -	$ 55.96	$ 223.85	$ 8.95	$ 5.9764	$ 2.98
20,000	5,000	$ 37.58	$ 8.17	$ -	$ 45.75	$ 183.00	$ 9.15	$ 5.9764	$ 3.17
16,000	4,000	$ 37.58	$ -	$ -	$ 37.58	$ 150.32	$ 9.40	$ 5.9764	$ 3.42

Notes:
1. The annual total water cost for a typical customer was calculated based on annual usage and the Town's current fee schedule.
2. The annual total cost was used to calculate a composite water rate based on the historic average annual usage of 44,000 gallons (rounded from 43,768). $379.08/44 = $8.615
3. The calculated composite water rate ($8.62) is equal to the purchase price ($5.9764) plus the Town's operation and maintenance (O & M) charges.
4. The O & M charges ($2.64) were determined by subtracting the purchase price ($5.9764) from the composite water rate ($8.62).
5. Shelby Water Rates (Per quarter) = $37.58 (0 - 4,000 gal) + $8.17/1,000 gallon for next 10,000 gallons + $7.95/1,000 gallon for next 10,000 gallons.

Proposed Annual Water Costs With Hybrid Water Rate

NCWD	Medina	Quarterly Water Purchased (gal)	Total Annual Purchased (gal) [3]	Average Purchase Water Rate	O & M Charge [2]	Total Composite Water Rate	Total Annual Cost of Water Per Connection [1]	Total Annual Savings Per Connection [4]
100%	0%	11,000	44,000	$ 3.20	$ 2.64	$ 5.84	$ 257	$ 122
90%	10%	11,000	44,000	$ 3.48	$ 2.64	$ 6.12	$ 269	$ 110
80%	20%	11,000	44,000	$ 3.76	$ 2.64	$ 6.39	$ 281	$ 98
70%	30%	11,000	44,000	$ 4.03	$ 2.64	$ 6.67	$ 294	$ 86
60%	40%	11,000	44,000	$ 4.31	$ 2.64	$ 6.95	$ 306	$ 73
50%	50%	11,000	44,000	$ 4.59	$ 2.64	$ 7.23	$ 318	$ 61
40%	60%	11,000	44,000	$ 4.87	$ 2.64	$ 7.50	$ 330	$ 49
30%	70%	11,000	44,000	$ 5.14	$ 2.64	$ 7.78	$ 342	$ 37
20%	80%	11,000	44,000	$ 5.42	$ 2.64	$ 8.06	$ 355	$ 24
10%	90%	11,000	44,000	$ 5.70	$ 2.64	$ 8.34	$ 367	$ 12
0%	100%	11,000	44,000	$ 5.98	$ 2.64	$ 8.62	$ 379	$ -

Notes:
1. This table calculated the proposed annual water costs per connection based on the hybrid purchase rate and the calculated O & M cost from above.
2. O & M charge is based on the historical average usage of 44,000 gallons/yr/connection.
3. Annual water cost is based on the rates above and 44,000 gallons per year or 11,000 gallons per quarter.
4. The total annual saving per connection is based on the difference between a 100% Medina supplied source and the corresponding proportioned flow with NCWD.