

# Central Camano Water Systems Cooperation Study

## Discussion of Notional System Consolidation (*Central Camano Water System - 2050*)

### INTRODUCTION

Lacking an imperfect “crystal ball”, there is no way of knowing what the configuration of the eight participating water systems will be in 2050, 34 years from now. In fulfillment, however, of the stated goal of the Study to provide an example of a consolidated water system, a notional *Central Camano Water System (CCWS) - 2050* was created. This is just one possibility out of many reflecting how the water supply facilities in this area may be configured in the future. Given the numerous options, it is more than likely that in 34 years the water systems in this area will be different from the concept discussed here. Having said that, there is value in taking an in-depth look at the CCWS. Information relative to the improvements required and the shared and participant-specific costs/benefits, will be useful for any number of potential scenarios.

In future years, if individual systems desire to consolidate, required improvements, costs and benefits will be evaluated on a case-by-case basis.

As noted above, there are costs and benefits associated with the creation of a Central Camano Water System. Four enclosures are provided herein which describe these costs/benefits, both from the standpoint of CCWS as a whole, and the eight study participants individually. The enclosures are listed here and are described below:

- Conceptual Plan: Central Camano Water System - 2050 (Updated May 10, 2016)
- Table I: System-Wide Improvements
- Table II: Internal System Costs and Savings
- Table III: Summary of Costs and Benefits

As a note, in order to facilitate the following discussion, the participating systems have been numbered, as follows:

- System 1: Camano Water Association (CWA)
- System 2: Camano Cooperative Water and Power Co. (Co-op)
- System 3: Camano Island Summit Association (Summit)
- System 4: Camano Sunset Water System (Sunset)
- System 5: Thunder Ridge Water System (Thunder Ridge)
- System 6: Mecca Community Association (Mecca)
- System 7: Seascope Water Association (Seascope)
- System 8: Elgerwood Maintenance Association (Elgerwood)

## DESCRIPTION OF ENCLOSURES

### Conceptual Plan - Central Camano Water System - 2050

This plan graphically shows the shared improvements that would be required in order to create the CCWS combined water supply facilities. Project ID lettering is included in order to facilitate coordination with the report tables.

### Table I: System-Wide Improvements

- Improvements detailed in this table provide benefits to multiple participating water systems, as follows:

#### Improvement A:

106,000 gallons of additional storage volume is required if Water Systems 3 through 8 are connected to the Central Camano Water System (CCWS). Costs are shared on a per-ERU basis by the noted systems.

#### Improvement B:

Improvement B is the installation of a twelve (12) inch transmission main along Elger Bay and Mt. View Roads. The benefitting systems include CWA, Mecca, Seascape and Elgerwood. A possible cost sharing formula is suggested in Table III.

#### Improvements C and D:

These improvements include the construction of an eight (8) inch main, and associated booster pump stations, which will interconnect CWA and the Co-op. The construction of this main will add valuable source and storage redundancy for all of the CCWS. As such, costs are shared equally by all CCWS ERUs. The new main passes through an area which is currently unserved by any existing water system. Collection of latecomers fees, therefore, would be possible when future connections are made to the water main.

#### Improvements E to G:

These combined improvements represent the transmission main and booster station construction that will be required to serve the higher elevation water systems at the north end of CCWS. These improvements are needed in order to connect the Summit, Sunset and Thunder Ridge water systems. Costs for the noted improvements would be shared on a per-ERU basis by these systems.

## Table II: Internal System Costs and Savings

### > Background:

As further discussed below, the systems are grouped according to their common characteristics:

#### Large Systems:

- System 1: Camano Water Association
- System 2: Camano Cooperative Water and Power Co.

The Large Systems will retain both their pipe<sup>1</sup> and non-pipe<sup>2</sup> infrastructure. Analysis shows that, with minor improvements, CWA and the Co-op have adequate source, storage and water treatment capacity to serve the entire Central Camano Water System.

#### North Systems:

- System 3: Camano Island Summit Association
- System 4: Camano Sunset Water System
- System 5: Thunder Ridge Water System

These are the higher elevation systems. A pressure boosting station and transmission mains are required to connect these to CCWS.

#### South Systems:

- System 6: Mecca Community Association
- System 7: Seascape Water Association
- System 8: Elgerwood Maintenance Association

The South Systems are generally at lower elevations. In some cases, pressure reducing valve vaults will be required to serve the customers in these areas. Additionally, these systems are near the location of a proposed transmission main, currently slated for construction by the Camano Water Association (circa 2020).

---

<sup>1</sup> Distribution system piping (and appurtenances).

<sup>2</sup> All water system facilities except distribution system piping including, but not limited to, storage tanks, pumphouses, wells, water treatment, fencing and back-up generators.

> Internal System Costs Related to Inclusion in CCWS:

For inclusion into CCWS, each of the North and South systems will require two types of capital expenditures:

- 1) Improvements within their service area required to connect to CCWS, and
- 2) Contributions to “offsite improvements” common to CCWS in proportion to their benefit from these shared improvements.

This table evaluates internal improvements and their related costs, as described in (1), above.

> Internal System Savings Related to Inclusion in CCWS:

By connecting to CCWS, the North and South Systems will, over the long-term, be able to discontinue the use of their non-pipe infrastructure. These systems will benefit from the cost savings resulting from not having to replace these components at the end of their useful life.

The internal improvements, and their associated costs, are reflected for the respective water systems in Columns C and D of this table. The infrastructure eliminated over the long-term, and the value of those components, is reflected in Columns E and F.

Table III: Summary of Costs and Benefits

This table provides an overview of the impacts to each of the participating water systems resulting from inclusion into CCWS, and takes into account:

- The cost of internal improvements required in order to connect to CCWS.
- Non-pipe infrastructure eliminated, and the associated long-term savings derived from not having to replace these components at the end of their useful life.
- The proportioned share of participant costs of the system-wide CCWS improvements.

The *Discussion* column provides a description of possible cost sharing formulas.

## **STUDY PARTICIPANTS - SUMMARY INFORMATION**

For convenience, summary pages have been prepared for each of the study participants. As reflected in Figure 1, these summaries take into account the results of the Capital Facilities Replacement Review and the current analysis in order to determine the long-term additional cost (or conversely the long-term savings) associated with inclusion into the Central Camano Water System.

FIGURE 1

Water System Cooperation Study  
Summary Information - Participating System

|  |  |
|--|--|
| <b>NAME OF WATER SYSTEM:</b> Sample Water Association  |  |
| <b>DESCRIPTION OF WATER SYSTEM:</b><br>The system has 40 currently-connected ERUs, located on Appian Way, just north of Mt. Vesuvius. Much of the drinking water infrastructure was installed circa 250 BC.  |  |
| <b>CAPITAL FACILITIES REPLACEMENT REVIEW, SAMPLE SYSTEM ONLY *:</b>  |  |
| <ul style="list-style-type: none"> <li>• <b>All System Long-Term Replacement Cost:</b> <ul style="list-style-type: none"> <li>○ Total: \$1,500,500</li> <li>○ Total (Per ERU): \$37,513</li> </ul> </li> <li>• <b>“Non - Pipes” Only, Long-Term Replacement Cost:</b> <ul style="list-style-type: none"> <li>○ Total: \$500,250</li> <li>○ Total (Per ERU): \$12,506</li> </ul> </li> <li>• <b>“Pipes” Only, Long-Term Replacement Cost:</b> <ul style="list-style-type: none"> <li>○ Total: \$1,000,250</li> <li>○ Total (Per ERU): \$25,007</li> </ul> </li> </ul> |  |
| <b>LONG-TERM CAPITAL FACILITIES COST, CONNECTION TO CENTRAL CAMANO WATER SYSTEM - 2050</b>   |  |
| <ul style="list-style-type: none"> <li>• <b>Estimated Required Contribution to 2050 Construction:</b> \$155,000</li> <li>• <b>Cost of Connection to 2050 Distribution System:</b> <u>20,000</u></li> <li>• <b>Total Connection and Contribution Costs:</b> \$175,000</li> </ul>  |  |
| <ul style="list-style-type: none"> <li>• <b>“Pipes” Only, Sample Long-Term Replacement Cost:</b> <ul style="list-style-type: none"> <li>○ Total: \$1,000,250</li> <li>○ Total (Per ERU): \$25,007</li> </ul> </li> </ul>   |  |
| <b>COMPARISON OF LONG-TERM CAPITAL FACILITIES COSTS</b>  |  |
| <b>Sample as a Separate System:</b><br>Non-pipe and pipe replacement required per Capital Replacement Review: <ul style="list-style-type: none"> <li>• Total Long-Term Cost: <u>\$1,500,500</u></li> <li>• Total Long-Term Cost Per ERU: <u>\$37,513</u></li> </ul>  | <b>Sample as a Part of 2050 System:</b><br>Total Long-Term Connection and Contribution Costs: \$175,000<br>Total Pipes Only Long-Term Replacement Cost: <u>\$1,000,250</u><br>-----<br>Total Long-Term Capital Facilities Costs: <u>\$1,175,250</u><br><br>Total Long-Term Capital Facilities Costs Per ERU: <u>\$29,381</u> |
| <b>DISCUSSION:</b><br>If Sample becomes a part of the 2050 System, the long-term need for the replacement of non-pipe facilities is eliminated. As a result, the long-term net cost reduction for Sample is, as follows (2016\$):  |  |
| <ul style="list-style-type: none"> <li>• Total (\$1,500,500 - \$1,175,250 = ) \$325,250</li> <li>• Total Per ERU (\$37,513 - \$29,381 = ) \$8,132</li> </ul>   |  |
| <b>NOTES:</b><br>“Non-Pipes”: Cistern tank, well, and windmill<br>* - Construction Costs Only  |  |

This is the construction-only replacement cost of the water system, as determined by the Capital Facilities Replacement Review enclosed with this Cooperation Study.

Proportioned share of improvements to "core" 2050 System. These improvements will be needed in order to serve the 2050 System as a whole.

"Pipes" is all distribution system piping and appurtenances. "Non-Pipes" is all other infrastructure, generally including the well, storage tank and pumphouse.

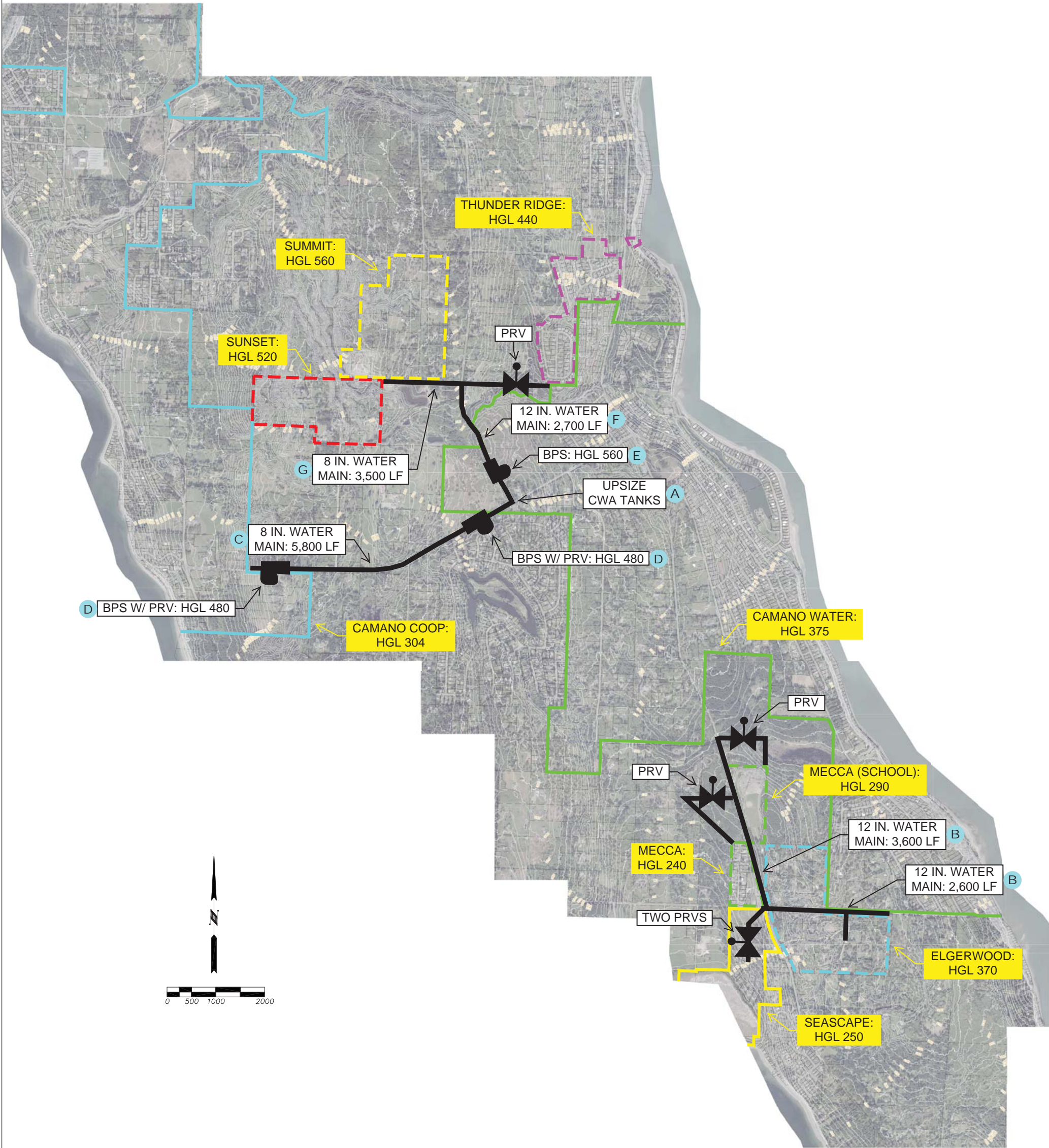
These costs are for the connection to the 2050 distribution system for work required inside the the service areas of the respective systems. Connection costs vary widely and can range from a simple tap onto an adjacent water main, to a long water main extension.

The replacement cost for pipes is the same for both options (Separate System, or part of the 2050 System).

In the long-term, it is less expensive for the Sample System to be included in the 2050 System (the long-term cost savings will be \$325,250). For other water systems, the cost of inclusion may be greater than if they were to remain separate.

# CENTRAL CAMANO WATER SYSTEM - 2050

(Updated May 10, 2016)



| LEGEND |  |
|--------|--|
|        | CAMANO COOPERATIVE WATER & POWER COMPANY |
|        | CAMANO ISLAND SUMMIT ASSOCIATION         |
|        | CAMANO SUNSET WATER SYSTEM               |
|        | CAMANO WATER ASSOCIATION                 |
|        | ELGERWOOD MAINTENANCE ASSOCIATION        |
|        | MECCA COMMUNITY ASSOCIATION              |
|        | SEASCAPE WATER ASSOCIATION               |
|        | THUNDER RIDGE WATER SYSTEM               |

**TABLE I**

| <b>CENTRAL CAMANO WATER SYSTEM<br/>SYSTEM-WIDE IMPROVEMENTS</b> |  |                                     |   |
|---|--|-------------------------------------|---|
| <b>Improvement ID</b>   | <b>2050 System Improvement Description</b>   | <b>2050 System Improvement Cost</b> | <b>Misc Notes</b>   |
| <b>A</b>  | Additional Storage at Monticello Site (266 ERUs X 400 Gal/ERU=) 106,400 Gal. ; Assume \$1.25/gal | \$133,000                           | Storage for 266 additional ERUS: Cost based on current required capacity of area systems (Camano Co-op: 373 Gal/ERU; CWA 382 Gal/ERU) |
| <b>B</b>  | 6,200 LF of 12" Water Main on Elger Bay and Mt. View:  | 1,230,000                           | From CWA June 4, 2015 Improvement Plan  |
| <b>C</b>  | 8" Pipe Intertie, CWA/Coop; 5,800 LF   | 667,000                             | Use \$115/LF  |
| <b>D</b>  | <u>Two</u> BPS/PRV Stations (HGL 480); CWA/Coop Intertie; 440 SF each @ \$670 / SF               | 589,600                             | BPS to HGL 480; PRV to respective CWA/Coop storage tank WSL.  |
| <b>E</b>  | BPS to North (HGL 560); 440 SF @ \$670/SF  | 294,800                             | Incl. fire pump capable of 500 gpm @ 200 ft. Possible pump: Aurora No. 3x4x9b (50 hp)   |
| <b>E</b>  | Genset for BPS to North for 50 hp 3 ph pump (125 Kw); Use \$800/kw                               | 100,000                             | Ref CE Notes and City of Paducah Bid Tab (6/10/14)  |
| <b>F</b>  | 2,700 LF of 12" Water Main to North @ \$205/LF   | 553,500                             | Use \$205/LF based on Elger Bay estimate  |
| <b>G</b>  | 8" Pipe; North Transmission; 3,500 LF  | <u>402,500</u>                      | Use \$115/LF  |
| <b>Total - 2050 System Wide Improvements</b>                    |  | <b>\$3,970,400</b>                  |   |

**TABLE II**

| <b>INTERNAL SYSTEM COSTS/SAVINGS ASSOCIATED WITH INCLUSION IN THE CENTRAL CAMANO WATER SYSTEM</b> |                     |  |                                  |   |   |
|---|---------------------|--|----------------------------------|---|---|
| <b>Column A</b>   | <b>Column B</b>     | <b>Column C</b>                                    | <b>Column D</b>                  | <b>Column E</b>   | <b>Column F</b>                                 |
| <b>System No.</b>   | <b>Water System</b> | <b>Internal Improvement Description</b>            | <b>Internal Improvement Cost</b> | <b>Infrastructure Eliminated</b>  | <b>Total Value of Infrastructure Eliminated</b> |
| <b>1</b>  | Camano Water        | None   | NA                               | None  | NA  |
| <b>2</b>  | Camano Cooperative  | None   | NA                               | None  | NA  |
| <b>3</b>  | Summit              | 600 LF of 6" pipe to connect to mains              | 63,000                           | Well; Well Pump; Pumphouse; Storage Tank  | 163,950   |
| <b>4</b>  | Sunset              | 1,800 LF of 6" pipe to connect to mains            | 189,000                          | Well; Well Pump; Pumphouse; Treatment; Storage Tank   | 283,410   |
| <b>5</b>  | Thunder Ridge       | 200 LF of 8" pipe to connect to mains              | 23,000                           | Well; Well Pump; Pumphouse; Fence; Two Storage Tanks; Standby Generator                     | 582,245   |
| <b>6</b>  | Mecca               | One 6" PRV; One 4" PRV                             | 64,000                           | Well; Well Pump; Pumphouse; Fence; Storage Tank; Standby Generator; 1,530 LF of 8" Pipe     | 515,950   |
| <b>7</b>  | Seascape            | Two 4" PRVs; 700 LF of 6" pipe to connect to mains | 131,500                          | Well; Well Pump; Pumphouse; Fence; Storage Tank   | 389,375   |
| <b>8</b>  | Elgerwood           | Two Interties                                      | 10,000                           | Well; Well Pump; Pumphouse; Storage Tank; Treatment; Standby Generator; 1,200 LF of 6" Pipe | 534,380   |



TABLE III

SUMMARY OF COSTS AND BENEFITS  
CENTRAL CAMANO WATER SYSTEM - 2050

| System<br><br>2050 System Improvement     | 1 - Camano Water<br>(1055 ERUs) |                        |                      | 2 - Camano Cooperative<br>(538 ERUs) |                        |                      | 3 - Summit<br>(18 ERUs) |                        |                      | 4 - Sunset<br>(15 ERUs) |                        |                      | 5 - Thunder Ridge<br>(134 ERUs) |                        |                      | 6 - Mecca<br>(29 ERUs) |                        |                      | 7 - Seascape<br>(24 ERUs) |                        |                      | 8 - Elgerwood<br>(46 ERUs) |                        |                      | Discussion  |
|---|---------------------------------|------------------------|----------------------|--------------------------------------|------------------------|----------------------|-------------------------|------------------------|----------------------|-------------------------|------------------------|----------------------|---------------------------------|------------------------|----------------------|------------------------|------------------------|----------------------|---------------------------|------------------------|----------------------|----------------------------|------------------------|----------------------|---|
|   | System-Specific Add'l           | System-Specific Deduct | Share of 2050 System | System-Specific Add'l                | System-Specific Deduct | Share of 2050 System | System-Specific Add'l   | System-Specific Deduct | Share of 2050 System | System-Specific Add'l   | System-Specific Deduct | Share of 2050 System | System-Specific Add'l           | System-Specific Deduct | Share of 2050 System | System-Specific Add'l  | System-Specific Deduct | Share of 2050 System | System-Specific Add'l     | System-Specific Deduct | Share of 2050 System | System-Specific Add'l      | System-Specific Deduct | Share of 2050 System |   |
| A - Increase Storage                      |                                 |                        |                      |                                      |                        |                      |                         |                        | 9,000                |                         |                        | 7,500                |                                 |                        | 67,000               |                        |                        | 14,500               |                           |                        | 12,000               |                            |                        | 23,000               | Cost Shared by Systems 3 through 8. Total Project Cost: \$133,000. Cost Per ERU: (133,000/266=) \$500   |
| B - 12" Main to Southeast                 |                                 |                        | 1,035,790            |                                      |                        |                      |                         |                        |                      |                         |                        |                      |                                 |                        |                      |                        |                        | 56,890               |                           |                        | 47,081               |                            |                        | 90,239               | Assume one half of System 1 ERUs Benefit from this improvement. Other Systems Benefiting are 6, 7 and 8. Total ERUS Benefiting: (528+29+24+46=) 627. Cost Per ERU: (1,230,000/627=) \$1,962 |
| C - 8" Main on Monticello                 |                                 |                        | 378,528              |                                      |                        | 193,032              |                         |                        | 6,458                |                         |                        | 5,382                |                                 |                        | 48,079               |                        |                        | 10,405               |                           |                        | 8,611                |                            |                        | 16,505               | Source and Storage Reliability Improvement. This Work Shared by all Eight Systems. Cost Per ERU: (667,000/1,859=) \$359   |
| D - Two BPS for Monticello Main           |                                 |                        | 334,604              |                                      |                        | 170,632              |                         |                        | 5,709                |                         |                        | 4,757                |                                 |                        | 42,499               |                        |                        | 9,198                |                           |                        | 7,612                |                            |                        | 14,589               | Source and Storage Reliability Improvement. This Work Shared by all Eight Systems. Cost Per ERU: (589,600/1,859=) \$317   |
| E - BPS and Genset for North              |                                 |                        |                      |                                      |                        |                      |                         |                        | 42,553               |                         |                        | 35,461               |                                 |                        | 316,786              |                        |                        |                      |                           |                        |                      |                            |                        |                      | Costs Shared by Systems 3,4 and 5. Total Project Cost: \$394,800. Cost Per ERU: (394,800/167=) \$2,364  |
| F - 12" Main to North                     |                                 |                        |                      |                                      |                        |                      |                         |                        | 59,659               |                         |                        | 49,715               |                                 |                        | 444,126              |                        |                        |                      |                           |                        |                      |                            |                        |                      | Costs Shared by Systems 3,4 and 5. Total Project Cost: \$553,500. Cost Per ERU: (553,500/167=) \$3,314  |
| G - 8" Main @ North                       |                                 |                        |                      |                                      |                        |                      |                         |                        | 43,383               |                         |                        | 36,153               |                                 |                        | 322,964              |                        |                        |                      |                           |                        |                      |                            |                        |                      | Costs Shared by Systems 3,4 and 5. Total Project Cost: \$402,500. Cost Per ERU: (402,500/167=) \$2,410  |
| System Internal Changes<br>(See Table II) |                                 |                        |                      |                                      |                        |                      | 63,000                  | 163,950                |                      | 189,000                 | 283,410                |                      | 23,000                          | 582,245                |                      | 64,000                 | 515,950                |                      | 131,500                   | 389,375                |                      | 10,000                     | 534,380                |                      |   |
| Totals                                    |                                 |                        | 1,748,922            |                                      |                        | 363,664              | 63,000                  | 163,950                | 166,762              | 189,000                 | 283,410                | 138,968              | 23,000                          | 582,245                | 1,241,454            | 64,000                 | 515,950                | 90,993               | 131,500                   | 389,375                | 75,304               | 10,000                     | 534,380                | 144,333              |   |
| NET CAPITAL COSTS/SAVINGS                 | \$1,748,922                     |                        |                      | \$363,664                            |                        |                      | \$65,812                |                        |                      | \$44,558                |                        |                      | \$682,209                       |                        |                      | \$360,957              |                        |                      | \$182,571                 |                        |                      | \$380,047                  |                        |                      |   |

COLOR CODE KEY:  
RED - WATER SYSTEM COSTS  
GREEN - WATER SYSTEM SAVINGS