

APPENDIX M

WHIDBEY ISLAND AND CAMANO ISLAND WATER IMPORTATION STUDY

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1. WHIDBEY WATER IMPORTATION PLAN

Portions of Central Whidbey Island lack an adequate supply of good quality water. As an example, the Town of Coupeville constructed an electro-dialysis plant in the 1970s to treat its groundwater supply which was high in dissolved solids. Recently, the Town has prospected for additional water associated with its well field on the west side of Whidbey Island. It has obtained enough water by developing several shallow wells for its immediate needs. Other development in the vicinity of Coupeville has experienced considerable difficulty in obtaining sufficient water supply. The groundwater assessment conducted as part of this CWSP indicates there may be extremely limited additional groundwater supply available in Central Whidbey. Therefore, the long-term planning for additional water supply in Central Whidbey will require an alternative for importation of water.

A. Future Water Requirements

The City of Oak Harbor has recently completed an update of its Comprehensive Water Plan for its present and future service areas. The City's plan has projections for the years 1995 and 2010, including the U.S. Naval Air Station and Sea Plane Base. It is assumed the City will serve all of the population within its future service area by the year 2010.

The City's Comprehensive Water Plan projects that the population of the City and the population served water in the Navy installations will grow as follows:

1987	-	17,075
1990	-	19,900
1995	-	24,500
2010	-	40,300

The Oak Harbor Comprehensive Water Plan projects the following future water requirements from the Anacortes system.

	<u>Average Day (MGD)</u>	<u>Maximum Day (MGD)</u>	<u>Peak Hour (MGD)</u>
1990	1.8	5.3	9.5
1995	2.4	7.9	12.0
2010	4.4	11.3	19.2

The 10- and 24-inch pipelines from Anacortes have a capacity of approximately 10 MGD. These pipelines must be able to deliver at least the maximum daily demand rate, so the projected Oak Harbor use would approach the pipeline capacity by approximately 2005. At that time, a booster pump could be installed in the vicinity of Deception Pass to boost the capacity to approximately 15 MGD.

It is also helpful to review the water use in the Anacortes system. Table M-1 summarizes the 1987 actual usage and projects future use in the system. The projection is based on incomplete information and it is difficult to forecast the water use of some customers. The following assumptions are implicit in the projections.

- o The Shell and Texaco Refineries are using close to their contract amount of 150 million gallons per month. It is assumed that future use will continue at present levels.
- o The Anacortes system must be capable of supplying the maximum daily demands of its major industries and purveyor customers. These customers should provide storage to meet their peak hourly rates.
- o The water demands from the Oak Harbor Comprehensive Water Plan are used in projecting its future water requirements.
- o During the fall of 1987, Skagit County Public Utility District purchased large quantities of water from Anacortes because of the drought conditions. It is assumed this was a temporary situation and that future water use will revert to past levels of water consumption.
- o The water use criteria of 100 gpcd average and 250 gpcd maximum daily demands are used in forecasting future demands for Central Whidbey Island. The projected water use is for the service area on Central Whidbey Island, shown shaded on Exhibit M-1. It assumes that all existing sources will be abandoned in favor of the Anacortes supply.

As previously identified, the peak capacity of the Anacortes water treatment facility and transmission pipeline is approximately 30 MGD. Examination of Table M-1 indicates the Anacortes water supply should be adequate to serve its present customers, plus Central Whidbey Island in the year 2000. The demands will increase to the capacity of the Anacortes system between 2010 and 2015. At that time, Anacortes would be faced with major treatment/transmission expansion as discussed elsewhere in this report.

B. Future Service Area

Based on the investigations in other tasks of the CWSP, it is estimated that it may be feasible to extend a pipeline from Oak Harbor as far south as Coupeville by the year 2000. This judgment is based on existing water supply problems, the level of existing and projected future population, and shortages of groundwater within the area.

The feasible water supply service area for the pipeline is identified on Exhibit M-1. It includes the Penn Cove, Rolling Hills/Glenncairn, Coupeville, Sierra Country Club, Crockett Lake Estates, and Admiral's Cove areas. The unincorporated areas in the vicinity of Oak Harbor are not included because they are mostly covered by the future water use projected by Oak Harbor. The projected water service areas are shown for estimated year 2000 and 2015 planning horizons. The estimated future population and water requirements for the Central Whidbey area are summarized in Table M-2.

The Town of Coupeville has pipelines that extend for considerable distance outside of the corporate limits to the west and south. It is assumed that when it becomes economically feasible, the Town will be willing to extend its water system to serve additional areas.

C. Conceptual Water System

Exhibit M-1 shows a feasible water supply pipeline to Coupeville and the improvements that would be required to the Oak Harbor water system in order to be able to supply the additional demands projected for Central Whidbey Island.

The extension of a water pipeline south from Oak Harbor to serve areas in Central Whidbey Island will require improvements to the City's water distribution system. It will also hasten the day when future improvements will be required to the City's water supply from the Anacortes system.

The City of Oak Harbor has just completed an update to its Comprehensive Water Plan, as referred to earlier. The proposed improvements shown on Exhibit M-1 within the Oak Harbor system coincide with new pipelines shown in the Oak Harbor Comprehensive Water Plan. Oversizing the proposed Oak Harbor pipelines would permit delivery of the estimated 2 MGD maximum daily demand projected for the year 2015 within the proposed Central Whidbey water service area. Where two diameters are shown on a pipeline (e.g., 16/12) on Exhibit M-1, the 12-inch diameter pipeline is proposed in the Oak Harbor Comprehensive Plan and the 16-inch pipeline would be necessary to give extra capacity to serve Central Whidbey as well.

The proposed capital improvements identified in the Oak Harbor Comprehensive Water Plan are divided into several categories. The pipelines which are shown on Exhibit M-1 are identified as pipelines that would be required to serve the City's future water service area. For this reason, they are not scheduled to be constructed during the next 10 years as part of the City's capital improvement program. Their construction would likely depend upon requests for water service from the area to the west of the City's present service area. These pipelines would, however, benefit the City's present system. This system has difficulty both delivering water to the City's main 2-MG water reservoir, as well as providing fire flows to the high value areas within the City.

In order to extend the water supply system south as far as Coupeville, a 12-inch water supply pipeline is proposed, generally following SR-20 to Libby Road and then following Madrona Drive along Penn Cove to connect with the Coupeville system. This pipeline would be able to deliver approximately 1 MGD by gravity from the City of Oak Harbor's present reservoir. The delivery rate is determined by the reservoir overflow elevation in the Coupeville system, which is only approximately 20 feet lower than the water surface elevation in the Oak Harbor system. Most areas could be served directly by the new pipeline although customers at the lower elevations (from sea level to approximately 60 feet) would experience excessive pressure, and pressure reducing valves would be required as protection. This protection could be achieved either with individual PRVs on each customer service or through a larger PRV where the supply system connects into existing water distribution systems.

When the water demands on the supply system exceed the ability of the pipeline to deliver by gravity, the next increment would be for the Town of Coupeville to install a booster pump to fill its reservoir by pumping water from the supply system into the distribution system. Finally, as the maximum daily demands reach approximately 2 MGD (i.e., 2015 maximum daily demand), it would be necessary to install an additional booster pump approximately midway along the transmission pipeline to deliver larger quantities at adequate pressures. It is estimated that with the second booster pump the system could deliver approximately 3 MGD.

The Coupeville Comprehensive Water Plan includes a proposed new reservoir on Sherman Road at the same elevation as the Town's existing water reservoir. This could be used as a terminal reservoir for the water supply system. The connection could be valved and metered to allow water to flow from the reservoir back into the supply system during extreme peak or emergency conditions.

A cursory review of the system hydraulics for the Oak Harbor water supply pipeline from the Anacortes system was conducted as part of this study. The estimated 9.4 MGD capacity of the pipeline and the increase in capacity to 15 MGD presented in the Oak Harbor Comprehensive Water Plan appear reasonable. The new booster pump station and expansion of the existing Ault Field Road booster pump station would not be required immediately. In accordance with the Oak Harbor Comprehensive Water Plan, the Ault Field booster pump station would need to be expanded by about the year 2000. Furthermore, based on projected water demands for the Oak Harbor service area, a new booster station would be required by approximately the year 2005. The effect of adding water service to Central Whidbey Island, as outlined in this report, would be to require these improvements approximately 2 to 3 years earlier.

D. Estimated Construction Costs

Table M-3 summarizes the estimated cost for the construction of the proposed Central Whidbey pipeline project. The estimated total cost of \$3,210,400 includes the incremental costs for oversizing pipelines within the City of Oak Harbor. It is assumed the City will pay the cost of the pipelines sized in accordance with its Comprehensive Water Plan. The total construction cost for the pipelines within the City of Oak Harbor is also shown as an indication of the cost of these pipelines. Indirect costs including sales tax, construction contingencies, engineering, legal, and administrative costs are included in this construction cost. The estimate is based on January 1988 price levels and can be correlated with an Engineering News Record (ENR) construction index of 4685.

In addition to the costs shown on Table M-3, the water systems served by the Central Whidbey pipeline project will need to pay the cost of constructing pipelines connecting to the project. These costs are not shown and it is assumed that they will be paid by the system distributing the water.

E. Estimated Annual Costs

The customers of the proposed water supply system to Central Whidbey Island will need to pay charges and/or rates to amortize the capital cost of the facility and to pay for its operation and maintenance. In addition, they will need to pay the City of Oak Harbor for its cost of delivering water to the proposed system.

In order to get an approximate estimate of the cost of water supplied to the new system, we have used the current City of Oak Harbor rates. The City of Oak Harbor has several rate schedules which might apply: (1) a

master meter rate for customers outside the service area, and (2) an industrial rate within the City. A new rate especially for the Central Whidbey water supply system appears reasonable because the system will not use most of the distribution system and should pay a proportionate share of the cost for the water transmission/distribution pipeline improvements in the Oak Harbor system required to "wheel" the water to the new system.

The operating and maintenance costs for the new system should be minimal because there are no pump stations or reservoirs in the first phase. We have assumed 1/2 of 1 percent of the project cost as an allowance for operation and maintenance.

Table M-4 shows annual costs for several financing plans and different levels of water use. There is a corresponding estimate of monthly water charges for a typical residential customer. The least expensive monthly charge occurs if the rates are used only to pay the operating costs and the capital costs are paid by property assessments. On this basis, the monthly charges for a typical residential customer range from \$5.00 to \$9.00. The one-time property assessment for this customer could be on the order of \$1,000 or could be \$2,000 to \$3,000 depending on the number of customers (or property owners) contributing and whether or not grant/loan assistance is received for the project. Other financing options presented include: (1) the entire capital costs financed by revenue bonds; (2) a 50 percent grant for capital costs; and, (3) a public works trust fund loan.

F. Organization

There are several ways in which the Central Whidbey water supply system can be organized:

- (1) County Services Act - Island County can designate a water service area, proceed with the preparation of a general plan, and subsequently sponsor the development of the water system;
- (2) Water and/or Sewer District - A new unit of government, a district, could be formed for the purposes of financing and developing the proposed Central Whidbey water supply system;
- (3) Interlocal Agreement - As municipal corporations, the Cities of Oak Harbor and Coupeville, Island County, and/or the Penn Cove Sewer District have the authority under Washington law to enter into an Interlocal Agreement for the development of public facilities. One of these parties could take the lead in developing and operating the system.

G. Financing

A water system project such as the proposed water pipeline to Central Whidbey Island involves a large capital construction expenditure. Typically, this investment cannot be paid directly from system operating revenues but must be financed and paid for over time. Several methods are commonly used by municipalities to fund major public works projects. Revenue Bonds repaid by the water system revenues are a popular method for financing public works projects in the State of Washington. Bonds are issued to pay for the capital construction cost and are retired over 20 to 30 years from the water rates. Special assessment revenue bonds are bonds that are either backed by property assessments or can be retired from system revenues. General Obligation Bonds are another way to finance public works projects. They are retired by a property tax levee. The general obligation bonds would be issued by a district, city, or county and paid back by the property owners within the particular municipal corporation, whereas utility improvements may only benefit property owners within a small portion of this area.

Revenue Bonds are generally preferred for utility systems (in Washington State) because municipalities have a limited property tax bonding capacity. Revenue Bonds allow the utilities to charge customers in accordance with the use that they make of the system, and there is more flexibility in using Revenue Bonds because they generally do not require a vote each time they are issued.

There are several grant and loan programs to assist public agencies such as cities, counties, and special service districts with the financing of water and wastewater projects. At the federal level, the Farmer's Home Administration (FmHA) is probably the best source for financial assistance. This program is directed toward helping systems that either cannot obtain financing because they have not established their credit rating or to assist economically depressed areas and areas where the cost of water and/or sewer service is excessive. Some of the incentive to use this program has been eliminated in recent years because the interest rate on loans is no longer subsidized but has been "pegged" to current market levels. The amounts of grants and loans under this program are generally small in relationship to the cost for the proposed water supply project. Most loans and grants issued by the FmHA are for a few hundred thousands of dollars and almost all are less than \$1 million.

The State of Washington has been progressive in implementing programs to assist municipalities in the State with the construction of water and wastewater facilities. The Department of Health (DOH) has had a grant program under Referendum 38 which has funded water supply projects. This program has generally provided approximately 40 percent grants to

assist with the construction of successful projects. Unfortunately, the current funding authorization is exhausted. It must either be reauthorized or a new program implemented in order for funds to be available to Island County. Some funds already committed to projects could become available if they are not required for projects currently under construction, so it may be worthwhile to apply.

For the past several years, the State of Washington has been issuing low-interest loans under its Public Works Trust Fund Program. The maximum amount for these loans is \$1.5 million, with interest rates ranging from 1 to 3 percent depending on the percentage of local funding. This funding is available to cities, counties, water districts, sewer districts, public utility districts, and other local governmental units. It is not available to private water companies or water associations. The program allows a municipality to receive up to three public work trust fund loans.

The proposed Central Whidbey Island water system is a project that should be able to attract grant and/or loan assistance because it represents a cooperative effort by local citizens and government to resolve a regional water supply shortage.

Connection charges and/or Assessments are another way to finance all or part of the proposed water system. Each new customer could be required to pay a connection charge to help pay for the construction cost of the system. The proposed Central Whidbey water system will have capability to serve future customers within the service area. There are a large number of platted but undeveloped lots within subdivisions. Assessing these lots at the present time since the system is designed to serve their future demands would help to pay the construction costs for the system and make its construction today more feasible.

Table M-4 summarizes capital and operating costs for several possible financing options. It includes an estimate of monthly water rates to a typical residential customer for these alternatives. It defines a range of alternatives but is not intended to present all possible financing schemes.

H. Implementation

The following issues need to be addressed in order for a water supply pipeline to Central Whidbey Island to proceed:

- (1) Consideration of Comprehensive Plan, Preservation District, and SEPA requirements.
- (2) The City of Anacortes needs to agree to make a quantity of water available for this additional service area.

- (3) The City of Oak Harbor must agree to use a portion of the capacity of its existing water supply system to serve Central Whidbey Island, agree to proceed with upgrades to its distribution system earlier than otherwise would be necessary, agree to an allocation of attributable capital costs for existing and future improvements, and negotiate water rates for the Central Whidbey system.
- (4) A municipal corporation such as Island County, the Town of Coupeville, the City of Oak Harbor, or possibly a water or sewer district, or RWA, needs to take the lead role in the project and be willing to encumber debt.
- (5) There need to be commitments and contractual relationships between the various water purveyors on Central Whidbey Island to pay for and to purchase water from the system. In turn, the lead agency will need to enter into a long-term agreement with the City of Oak Harbor for the purchase of water.
- (6) A financial plan needs to be developed which takes advantage of any available financial assistance programs and has a plan for financing the local share of the cost of the project.
- (7) Engineering and construction of the project needs to proceed.

2. CAMANO WATER IMPORTATION PLAN

The groundwater investigations conducted as part of the Island County CWSP and GWMP have identified that water resources on Camano Island are limited. This is particularly true for the south end of Camano Island and for the northeast sector of the Island. Water systems in these areas have experienced either water shortages or deteriorating water quality due to high chlorides. The chloride levels are indicative of sea water intrusion along the coastal areas.

In particular, the Juniper Beach Water Association (Northeast Camano) has identified increasing chlorides as a serious problem to its system and is actively pursuing a connection to the Stanwood Water System. The Camano Vista Water District in south Camano Island has completed a well development program along the spine of the Island in order to try to extract enough groundwater to meet its needs.

The planning horizon for the CWSP is to the year 2015. Within this period, it appears feasible to import water from Stanwood to the northern part of Camano Island. The strategy for central and south Camano would be to interconnect systems and to share wells developed in good recharge areas of the Island. This report discusses the imported water supply.

A. Future Water Requirements

Using the inventory of water systems and the population forecasts developed as part of the CWSP, we identified likely future water service areas on North Camano Island for the year 2000 and the year 2015. These are shown on Exhibits M-2 and M-3.

The future population and estimated water use in what is identified as the Juniper Beach water service area is summarized in Table M-5. This area includes the Juniper Beach subdivision, a number of other plats, and some commercial development along State Route 532. The water use estimates are based on average and peak values of 100 and 250 gallons per capita per day. In the case of Juniper Beach and the other areas on Northeast Camano Island, the average daily water use has been reduced to one-half of the value in Table M-5 for purposes of estimating the annual quantities used (i.e., 50 gpcd) because of the high seasonal occupancy in these areas. The water supply facilities must be capable of meeting the maximum daily requirements, which are the criteria used in this report.

B. Proposed Water Supply System

There is a 12-inch pipeline through the Stanwood water system from the Bryant Wells, which are located east of the main water service area, to Twin City Foods, which is in the western area of the Town. This pipeline will soon be intertied to an 8-inch pipeline in East Stanwood. The 8-inch pipeline extends further west and could be connected to a new pipeline serving Camano Island in the vicinity of 104th Street. The connection point is shown on Exhibit M-4.

It appears feasible to extend a pipeline from the Stanwood system to North Camano Island. The initial phase would likely serve Northeast Camano Island and future phases might extend the pipeline to Utsalady and other areas of Camano Island. Exhibit M-4 shows the projected sizes for proposed Phase 1 system facilities and Table M-6 is a cost estimate.

Phase 1 is proposed as a 10-inch pipeline connecting to the Stanwood system, crossing the bridge over the slough to Camano Island, and following the highway (SR 532) to approximately Good Road where a reservoir would be constructed. The 10-inch pipeline is not required for the Northeast Camano service area, but will be required to extend service to Utsalady or other areas on North Camano. The reservoir is designed to provide equalizing, fire, and standby storage. Assuming a fire flow of 1,500 gpm for the commercial development at a minimum pressure of 20

psi and allowing for normal water service fluctuation plus some system losses requires a standpipe 70-80 feet high with a total capacity of approximately 500,000 gallons. If desired, the reservoir could be plumbed so as to be able to return some water to Stanwood during an emergency.

A booster pump will be required near the connection point with the Stanwood system to deliver the water with adequate pressure for the developments located on higher ground. The initial service area potentially includes Juniper Beach, Livingston Bay, Sundin Beach, Lands Hill, and the commercial development along State Highway 532. The estimated construction cost at January 1988 price levels (ENR CCI = 4,685) is \$1,045,000 with another \$276,400 required to connect the existing developments to the proposed system.

Either now, or in the future, the pipeline might likely be extended to Utsalady Bay. This area is presently served by several small water systems and there are water shortage and quality problems in the area. The water elevation in the reservoir constructed as part of Phase 1 should have adequate pressure to serve the Utsalady area.

Ultimately, Camano Island utilities will need to share their limited groundwater resources and to supplement them with outside sources, which could eventually justify the interconnection of large areas of the Island.

The Juniper Beach Water Association has conducted a preliminary investigation of a water supply pipeline connecting to the Stanwood system. Costs and facilities for this "minimum sized" facility to serve Juniper Beach are given in Table M-7. It is recommended that if the Juniper Beach community ends up developing the "minimum sized" system, the pipeline segment along SR 532 should be constructed of 10-inch diameter pipeline to permit future expansion. The pressure would be inadequate to serve elevations more than 35-40 feet above sea level unless a booster pump were added.

C. Organization

There are several possibilities for organizing the development of a water system for Northern Camano Island:

- (1) Island County could implement the County Services Act by designating a water service area, preparing a general plan, and sponsoring the development of the water system;
- (2) Snohomish Public Utility District (PUD) could develop and operate the system;

- (3) Stanwood could extend its water system;
- (4) A new water and/or sewer district could be formed; or,
- (5) One of the existing water systems such as Juniper Beach could take the lead role in developing the system.

The Snohomish PUD has the capability to serve all of Camano Island and can approach the water supply in a comprehensive and coordinated manner. Island County is sponsoring the preparation of this CWSP as its expression of interest in improving water supply. The PUD has had some discussions about serving water to areas on Camano Island. The PUD already provides electric power and has a water utility organization which would be beneficial to supplying water to Camano Island. The PUD is a governmental body with established credit ratings, qualifies for grant assistance programs, and has the capability to serve as a water utility.

If the PUD does not take a lead role for developing water supply on Camano Island, a system like Juniper Beach has the ability to improve its water supply. A new water and/or sewer district could be formed although this would be a proliferation of governmental units, which is not considered desirable since there already are local governmental units capable of providing the service. Stanwood also has the ability to extend its pipeline into Camano Island. This is not considered likely since it is outside the Town's service area. Also, Stanwood probably would not have an interest in building a booster pump, reservoir, and pipelines required to deliver water to the several developments in Northeast Camano Island.

D. Financing

The first issue to be resolved in financing the regional water supply to Northern Camano Island is the definition of the water supply system. In the case of the "minimum sized" system to serve Juniper Beach, it is clear that the Juniper Beach water system would need to finance all of the costs shown in Table M-7. Using the 135 lots in Juniper Beach, and the capital cost of \$378,000 shown in Table M-7, the cost per customer would be approximately \$2,800.

If the system is built to serve Northeastern Camano Island as described in Table M-7 and shown on Exhibit M-4, there are several options for defining the project and financing the improvements. The system consists of the 10-inch water supply pipeline along SR 532, the booster pump, reservoir, and the water connections to the various platted developments and individual properties that will be served. The supply system could be defined as all of the above facilities or it could be limited to the supply pipeline, booster pump, and reservoir, i.e., those facilities that benefit all

or most of the customers. The customer connections to the individual properties or to the water distribution systems serving the several subdivisions benefit only those systems and their costs will vary depending on the distance from the supply facilities to the customer. For purposes of this financing analysis, the water supply system is therefore considered to be the major pipeline, booster pump, and reservoir facilities that are of common benefit to most of the customers in the system. The cost of the customer connections to individual customers or existing distribution systems is presumed to be their responsibility.

Table M-7 shows that the estimated cost for the water supply system, as defined above, is \$1,045,000. Counting the platted lots in Juniper Beach, Sundin Beach, Livingston Bay, and Lands Hill with some allowance for individual or commercial customers gives approximately 270 customers. This is a cost of \$3,870 per customer or platted lot. In addition, each distribution system would have to pay for the cost to connect to the water supply system, which in the case of Juniper Beach is \$92,400 or \$685 per customer for a total of \$4,555. The cost of this system is, therefore, significantly more than for the "minimum build" system but is designed to provide fire protection as well as water supply and has the ability for future system extension.

In Washington State, there are several alternatives for financing water system improvements. Considering the large capital cost of the water system facilities, most of this cost is usually financed over time rather than directly from water rates or as a lump sum assessment amount. Revenue bonds repaid from water system revenues are a popular method for financing public works projects in Washington State. Bonds are issued to pay for the capital construction cost and are retired over 20 to 30 years from the water rates. Special assessment revenue bonds are secured by property assessments against benefitted properties and can be paid back from revenues or by the property assessments. General Obligation Bonds are also used by cities, counties, and special service districts to finance public works improvements with property assessments. They are probably not particularly applicable to Northeastern Camano Island unless a water or sewer district is created because they must be applied to all of the property within a municipality. The issuance of General Obligation Bonds usually requires an election and it is difficult to win public support unless the proposed improvements will benefit all or most of the property within the jurisdiction.

Grant or loan assistance could be available for the Northeast Camano water system. At the Federal level, the FmHA has a grant and loan program to assist public agencies such as cities, counties, and special service districts with the financing of water and wastewater projects. This program is directed toward helping systems that either cannot obtain

financing because they have not established a credit rating or to assist areas where the cost of water and/or sewer service is excessive. The loans carry an interest rate comparable to current market levels and grants are offered if the cost of the water and/or sewer service would otherwise be excessive under FmHA criteria.

There are also assistance options available from state government for projects like the Northeast Camano water supply system. DOH has administered a grant program (Referendum 38) which has provided 40-percent grants for eligible water supply projects. The current funding is exhausted and the program must either be reauthorized or a new program implemented. It is conceivable that some committed funds could become available if they are not required for projects currently under construction.

For the past several years, the State of Washington has been issuing low-interest loans under its Public Works Trust Fund Program. The loans are available to cities, counties, public utility districts, water or sewer districts, and other local governmental units. Water associations, homeowners associations, or private water companies are not eligible. For example, the Juniper Beach Water Association would be ineligible. The maximum amount of these loans is \$1.5 million with interest rates ranging from 1 to 3 percent depending on the percentage of local funding.

Connection charges are another way to finance all or part of the proposed water system. A new customer is always required to pay for the cost of the customer service connection. In addition, connection charges can be used to charge future customers for system facilities that have been built to provide them service. This is particularly pertinent to the Northeast Camano Island system, which will have the capability to serve considerable future customers. The water supply system that is being constructed will have the capacity to serve approximately 1,000 customers in the future. Since the cost of the Northeast Camano system is estimated to be approximately \$1,045,000, it is suggested that each customer be charged approximately \$1,000 when they connect to the system.

Table M-8 outlines water system costs under several possible alternative financing arrangements:

- (1) 50 percent public works trust fund loan and 50 percent grant.
- (2) 50 percent construction grant with the balance financed through revenue bonds.
- (3) 100 percent public works trust fund loan.

(4) All costs locally financed with revenue bonds.

The Town of Stanwood has no wholesale water rates. Also, the Town charges a 7-percent surcharge on the rates for customers outside the City. The Town does have a special contract with Twin City Foods and has a volume charge for the cannery.

It is suggested that water supply to Camano Island would be by an agreement to be negotiated with the Town of Stanwood. The rates would be a new wholesale rate equal to the cost of providing service. For purposes of this analysis, we have assumed a wholesale rate similar to the Twin City Foods rate.

Table M-8 summarizes the capital, operating and maintenance, and the annual debt service or loan repayment schedule for the different financing scenarios. It gives an estimate of the average rate to a typical residential customer. In addition, the systems would need to pay for the cost of extensions to deliver the water to their systems. The water rates charged by these purveyor systems would also include the costs for operating and maintaining the distribution system.

The use of connection charges offers the opportunity to significantly reduce monthly rates. The assumption used in Table M-8 for purposes of analysis is \$1,000 per customer as a connection fee.

If the proposed Northeast Camano Island water system is extended to Utsalady (or other areas of Camano Island) in the future, these customers would be expected to pay the \$1,000 connection charge. In addition, a financing plan would need to be developed to pay for the costs of any future extension to the system. Once connected to the system, these future customers would pay water rates for operation and maintenance as well as the portion of the capital costs recovered through rates.

E. Implementation

The following steps will be necessary in order for water supply from the Town of Stanwood to areas on Camano Island to become a reality:

- (1) Consideration of Comprehensive Plan, Preservation District, and SEPA process requirements.
- (2) The Town of Stanwood must agree to sell a portion of its supply on Camano Island.
 - (a) Stanwood should be approached to include Northeast Camano Island within its future water service area as part of the current update of its Comprehensive Water Plan.

- (b) If necessary, the residents of Camano Island may need to assist Stanwood with the cost of developing new water sources.
- (3) A sponsoring agency should take the responsibility for developing the water system to Camano Island. Ideally, this could be an RWA or a municipality such as Island County, Snohomish County Public Utility District, or the Town of Stanwood.
- (4) Preference should be given to developing a system that will serve Northeast Camano Island. However, Juniper Beach has an immediate need, whereas the interest among the other residents of Northeast Camano Island is less clear. Also, Juniper Beach can solve its water supply needs at less cost (but not with an equivalent system) with the "minimum sized" system. Realistically then, the "minimum sized" system may be the first phase of the project. The Camano Regional Water Association should be organized to develop a plan for larger scale regional service, and to assist Juniper Beach with development of initial phases.
- (5) There needs to be support from the residents of Camano Island to pay for the system facilities either through grants and/or loans, connection charges, or by issuing bonds that will be paid back from system revenues or property assessment.
- (6) Contractual agreements need to be developed by the agency sponsoring the water system for purchase of water from Stanwood and for the sale of water to the various water systems on Camano Island.
- (7) A financial plan needs to be developed for underwriting the capital cost of the water system project. This plan should seek to take advantage of available grant and/or loan programs.
- (8) Engineering and construction of the water system should proceed.

TABLE M-1

ANACORTES WATER SUPPLY SYSTEM
PROJECTED WATER USE

	ACTUAL 1987			PROJECTED 2000		PROJECTED 2015	
	Avg. Day	Max. Day	Peak Hour	Avg. Day	Max. Day	Avg. Day	Max. Day
Anacortes	1.47	4.27	5.18	1.90	5.50	2.35	6.85
Wholesale Customers							
Oak Harbor/NAS Whidbey (2)	2.14	5.02	6.35	3.00	9.10	5.00	12.50
LaConner	0.27	0.70	0.88	0.45	1.15	0.50	1.30
Swinomish Tribal Community	0.01	0.03	0.04	0.05	0.15	0.07	0.20
Skagit County PUD No. 1 (1)	0.77	2.60	2.60	0.20	0.50	0.25	0.65
Subtotal	3.19	8.35	9.87	3.70	10.90	5.82	14.65
Industrial Customers							
Shell	4.66	5.76	6.19	4.70	5.80	4.70	5.80
Texaco	4.31	4.61	5.04	4.60	5.10	4.60	5.10
Other	0.14	0.21	0.29	1.00	1.00	1.00	1.00
Subtotal	9.11	10.58	11.52	10.30	11.90	10.30	11.90
System Losses							
0.34	0.34	0.34	0.60	0.60	0.65	0.65	0.65
Theoretical Demand							
14.08	23.54	26.91	16.50	28.90	20.12	34.05	
Actual Demand/Filter Plant Production							
14.08	18.47	21.00	16.50	24.60	20.12	29.00	
Potential Future Service to Whidbey Island							
Whidbey Island (3)				0.55	1.40	0.85	2.05
Total Likely Demand, Filter Plant Production				17.05	26.00	20.97	31.05

Footnotes:

(1) Actual Demand = 0.77 in 1987 due to drought connection. W/O Drought = 0.15.
 (2) Oak Harbor/NAS Whidbey future water demands derived from the Oak Harbor Comprehensive Water Plan.
 (3) Whidbey Island future water demands taken from Island County Coordinated Water System Plan.

TABLE M-2
CENTRAL WHIDBEY ISLAND
POPULATION AND WATER SUPPLY PROJECTIONS

POPULATION

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Penn Cove	506	818	1,133
Rolling Hills Glenncairn	450	697	944
Coupeville	2,020	3,128	
Crockett Lake Estates	278	431	6,190
Admiral's Cove	<u>362</u>	<u>561</u>	
TOTAL	3,616	5,635	8,267

AVERAGE WATER USE (GPD)

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Penn Cove	50,600	82,000	113,000
Rolling Hills Glenncairn	45,000	70,000	94,000
Coupeville	202,000	313,000	
Crockett Lake Estates	27,800	43,000	619,000
Admiral's Cove	<u>36,200</u>	<u>56,000</u>	
TOTAL	361,600	564,000	826,000 gal.

MAXIMUM DAY (GPD)

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Penn Cove	126,500	205,000	283,000
Rolling Hills Glenncairn	112,500	174,000	236,000
Coupeville	505,000	782,000	
Crockett Lake Estates	69,500	108,000	1,548,000
Admiral's Cove	<u>90,500</u>	<u>140,000</u>	
TOTAL	904,000	1,400,000	2,067,000

TABLE M-3

CENTRAL WHIDBEY WATER SUPPLY PROJECT

CAPITAL COSTS

(Reference to Engineering News Record
 Seattle Construction Cost Index = 4,685)

<u>Pipeline Segments</u>	<u>Length (feet)</u>	<u>Diameter (1) (inches)</u>	<u>Unit Costs</u>		<u>Construction Costs</u>		<u>Construction Costs (2)</u>			
			<u>Larger Diameter</u>	<u>Smaller Diameter</u>	<u>Larger Diameter</u>	<u>Smaller Diameter</u>				
Oak Harbor Improvements										
Between										
Goldie Road and Harbor Road	2,000	16/12	\$52	\$40	\$ 104,000	\$ 80,000	\$ 24,000			
Harbor Road	2,350	16/12	52	40	122,200	94,000	28,200			
Between Harbor Road and	2,700	20/16	62	52	167,400	140,400	27,000			
Heller Road	1,900	16/12	52	40	98,800	76,000	22,800			
Heller Road	7,300	16/12	52	40	379,600	292,000	87,600			
Heller Road and Swantown Road	2,400	16/10	52	34	124,800	81,600	43,200			
SR 20 to Waterloo Road	4,500	16/10	52	34	234,000	153,000	81,000			
					1,230,800	917,000	Subtotal			
							313,200			
Central Whidbey Water Supply										
SR 20 - Waterloo Road to										
Libby Road	32,500	12	40				1,300,000			
Madrona Drive to Coupeville	17,000	12	40				680,000			
							Subtotal			
							1,980,000			
							Total Construction Cost			
							Indirect Costs @ 40% (3)			
							Project Capital Costs			
							\$2,293,200			
							917,200			
							\$3,210,400			

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- (1) Where two diameters are shown, the first is the size that will be required to serve both Oak Harbor and Central Whidbey Island. The second diameter is that shown in the Oak Harbor Comprehensive Water Plan.
- (2) The construction cost for improvements within the Oak Harbor water service area is the incremental cost between the cost of a pipeline to serve both Central Whidbey and Oak Harbor and a pipeline that would be required to serve Oak Harbor alone.
- (3) Indirect costs include sales tax, construction contingencies, engineering, legal and administrative costs.

TABLE M-4
ESTIMATED COST OF WATER
CENTRAL WHIDBEY WATER SUPPLY SYSTEM

OPERATION AND MAINTENANCE COSTS (1)

AVERAGE DAILY USE (MGD)	OPERATION (2) AND MAINTENANCE	DEBT (3) SERVICE	TOTAL COST	ESTIMATED (3) MONTHLY RATE
0.1	\$ 35,000			\$ 9.00
0.2	\$ 52,000			\$ 6.50
0.5	\$103,000			\$ 5.25
0.8	\$154,000			\$ 5.00

50 PERCENT CONSTRUCTION GRANT/OAK HARBOR INDUSTRIAL RATE

AVERAGE DAILY USE (MGD)	OPERATION (2) AND MAINTENANCE	DEBT (3) SERVICE	TOTAL COST	ESTIMATED (4) MONTHLY RATE/ RESIDENTIAL CUSTOMER
0.1	\$ 35,000	\$216,000	\$251,000	\$ 63
0.2	\$ 52,000	\$216,000	\$268,000	\$ 34
0.5	\$103,000	\$216,000	\$319,000	\$ 16
0.8	\$154,000	\$216,000	\$370,000	\$ 12

3 PERCENT PUBLIC WORKS LOAN/OAK HARBOR INDUSTRIAL RATE

AVERAGE DAILY USE (MGD)	OPERATION (2) AND MAINTENANCE	DEBT (3) SERVICE	TOTAL COST	ESTIMATED (4) MONTHLY RATE/ RESIDENTIAL CUSTOMER
0.1	\$ 35,000	\$283,000	\$318,000	\$ 80
0.2	\$ 52,000	\$283,000	\$335,000	\$ 43
0.5	\$103,000	\$283,000	\$386,000	\$ 19
0.8	\$154,000	\$283,000	\$437,000	\$ 14

NO GRANT/OAK HARBOR MASTER METER RATE

AVERAGE DAILY USE (MGD)	OPERATION (2) AND MAINTENANCE	DEBT (3) SERVICE	TOTAL COST	ESTIMATED (4) MONTHLY RATE/ RESIDENTIAL CUSTOMER
0.1	\$ 64,000	\$432,000	\$496,000	\$122
0.2	\$111,000	\$432,000	\$541,000	\$ 66
0.5	\$248,000	\$432,000	\$680,000	\$ 34
0.8	\$386,000	\$432,000	\$818,000	\$ 25

- (1) Under this financing plan, the capital costs would be paid by property assessment. Depending on the grant/loan assistance received the amount of the on-time assessment could range from \$1,000 to \$3,000.
- (2) Includes Oak Harbor water charges for master meter connection outside water service area @ \$0.95 per 100 cf plus meter charges.
- (3) Assume 8% interest, 20 year bonds with 1.2 coverage factor. Project costs escalated 10% to assumed 1990 construction date.
- (4) Estimated monthly water supply charge for residential customer, assumes three persons per household and 100 gpcd average usage.

TABLE M-5
NORTHEAST CAMANO ISLAND
POPULATION (1) AND WATER SUPPLY PROJECTIONS (2)

Population

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Juniper Beach	351	405	405
Sundin Beach	78	78	78
Livingston Bay	78	180	180
Lands Hill	75	90	90
Other	—	<u>127</u>	<u>417</u>
Total	582	880	1,170
Utsalady (future)		<u>2,300</u>	<u>2,950</u>
Grand Total		3,180	4,120

Average Water Use (gpd)

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Juniper Beach	17,500	20,300	20,300
Other	11,500	<u>23,700</u>	<u>76,500</u>
Utsalady (future)	29,000	44,000	96,800
		<u>230,000</u>	<u>295,000</u>
		274,000	391,000

Maximum Day (gpd)

	<u>1985</u>	<u>2000</u>	<u>2015</u>
Juniper Beach	87,800	101,500	101,500
Other	57,500	118,500	191,200
Utsalady (future)		<u>575,000</u>	<u>737,300</u>
		795,000	1,030,000

(1) Assumes 3 persons/dwelling unit.
 (2) Assumes 100 gpcd average use and 250 gpcd maximum use, except that average daily use on Northeast Camano Island is estimated at 50 gpcd because of high percentage of seasonal customers.

TABLE M-6
CONSTRUCTION COSTS
WATER SYSTEM TO SERVE NORTHEAST CAMANO ISLAND
 (Reference to Engineering News Record
 Seattle Construction Cost Index = 4,685)

Construction

<u>Description</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Stanwood connection including meter, vault, and backflow protection	Lump sum (ls)	\$ 8,000	\$ 8,000
Pump station	1s	100,000	100,000
10-inch pipeline from Stanwood connection along SR 532 to reservoir site near Good Road .	10,800 linear feet (lf)	25	270,000
Additional cost for bridge crossing and insulation	1s	28,000	28,000
Reservoir	1 @ 500,000 gallons	220,000	220,000
10-inch pipeline from reservoir west along SR 532 to Livingston Bay connection	4,800 lf	25	<u>120,000</u>
Total Construction Cost, Supply System			746,000
Indirect Costs @ 40%			<u>299,000</u>
Supply System Capital Costs			<u>\$1,045,000</u>

Other Costs

Construction

<u>Description</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
8-inch Juniper Beach connection	4,400 lf	\$ 21	\$ 92,400
8-inch Sundin Beach connection	4,400 lf	21	92,400
8-inch Livingston Beach connection	600 lf	21	<u>12,600</u>
Total Construction Cost			197,400
Indirect Costs @ 40%			<u>79,000</u>
Total, Distribution Connections			<u>\$ 276,400</u>

TABLE M-7
CONSTRUCTION COSTS
MINIMUM SIZED WATER SYSTEM
TO SERVE JUNIPER BEACH

<u>Construction Description</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Cost</u>
Stanwood connection including meter, vault, and backflow protection	Lump sum (1s)	\$ 8,000	\$ 8,000
10-inch pipeline(1) from Stanwood connection along SR 532 to base of bluff	7,000 linear feet (lf)	25	175,000
Additional cost for bridge crossing and insulation	1s	28,000	28,000
6-inch pipeline from SR 532 to Juniper Beach along the base of the bluff	3,500 lf	15	53,000
Altitude valve for existing Juniper Beach Reservoir	1s	6,000	6,000
Total Construction Cost		270,000	
Indirect Costs @ 40%		<u>108,000</u>	
Project Capital Costs			\$ <u>378,000</u>

(1) 6-inch pipeline adequate for Juniper Beach, but 10-inch pipeline recommended to allow future expansion.

TABLE M-8

**ESTIMATED COST OF REGIONAL WATER SUPPLY FOR
JUNIPER BEACH "MINIMUM SIZED" & NORTHEAST CAMANO ISLAND SYSTEMS**

50 PERCENT CONSTRUCTION GRANT AND 1 PERCENT PUBLIC WORKS LOAN

Customer	Operation and Maintenance	Debt Service	Total Cost	No. of Customers	Estimated Monthly Rate, Typical
Juniper Beach N.E. Camano Island			Not applicable, does not qualify for Public Works Loan \$26,000 \$36,100 \$ 62,300	220	\$24

50 PERCENT CONSTRUCTION GRANT

Juniper Beach N.E. Camano Island	\$ 8,600 \$26,000	\$14,800 \$47,250	\$23,400 \$73,250	117 220	\$17 \$28
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1 PERCENT PUBLIC WORKS LOAN

Juniper Beach N.E. Camano Island	\$ 8,600 \$26,000	\$22,600 \$72,200	\$37,200 \$78,200	117 220	\$22 \$37
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NO GRANT

Juniper Beach N.E. Camano Island	\$ 8,000 \$26,000	\$29,600 \$94,500	\$ 38,200 \$120,500	117 220	\$27 \$46
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NOTES:

<u>Construction Cost</u>	<u>Total Cost</u>	Less \$1,000 Connection Cost /Lot	<u>Balance to be Financed</u>
Juniper Beach (minimum sized)	\$ 378,000	\$135,000	\$243,000
N.E. Camano Island	\$1,045,000	\$270,000	\$775,000

- Assumes each lot will pay \$1,000 connection charge.
- Debt service based on 8% interest, 20-year bonds with 1.2 coverage factor.
- Construction costs based on 1988 price levels. (ENR = 4,685)

<u>Customer Information</u>	<u>No. Customers</u>	<u>Total Lots</u>
Juniper Beach	117	135
N.E. Camano Island	220	270

Water Use at 100 gpcd **Annual Use (MG)**

Juniper Beach	12.8
N.E. Camano Island	24.1

- Operation and Maintenance Costs assumed to be negligible for "Minimum Sized" system and \$10,000/yr for N.E. Camano Island system. This cost includes the cost of purchased water from Stanwood at an assumed wholesale rate of \$0.50/100 cf.

-ECONOMIC AND ENGINEERING SERVICES, INC.

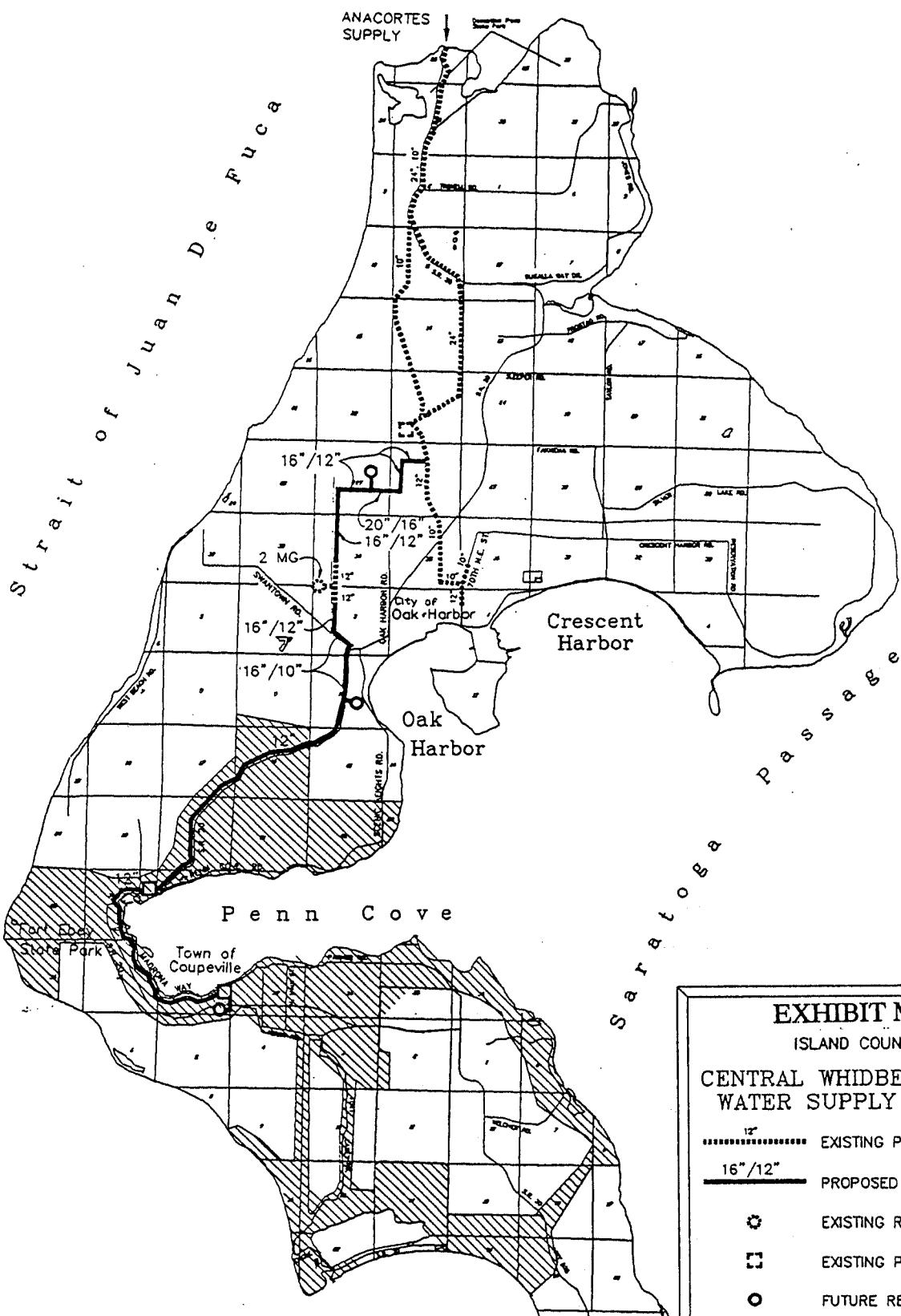


EXHIBIT M-1

ISLAND COUNTY

CENTRAL WHIDBEY ISLAND WATER SUPPLY SYSTEM

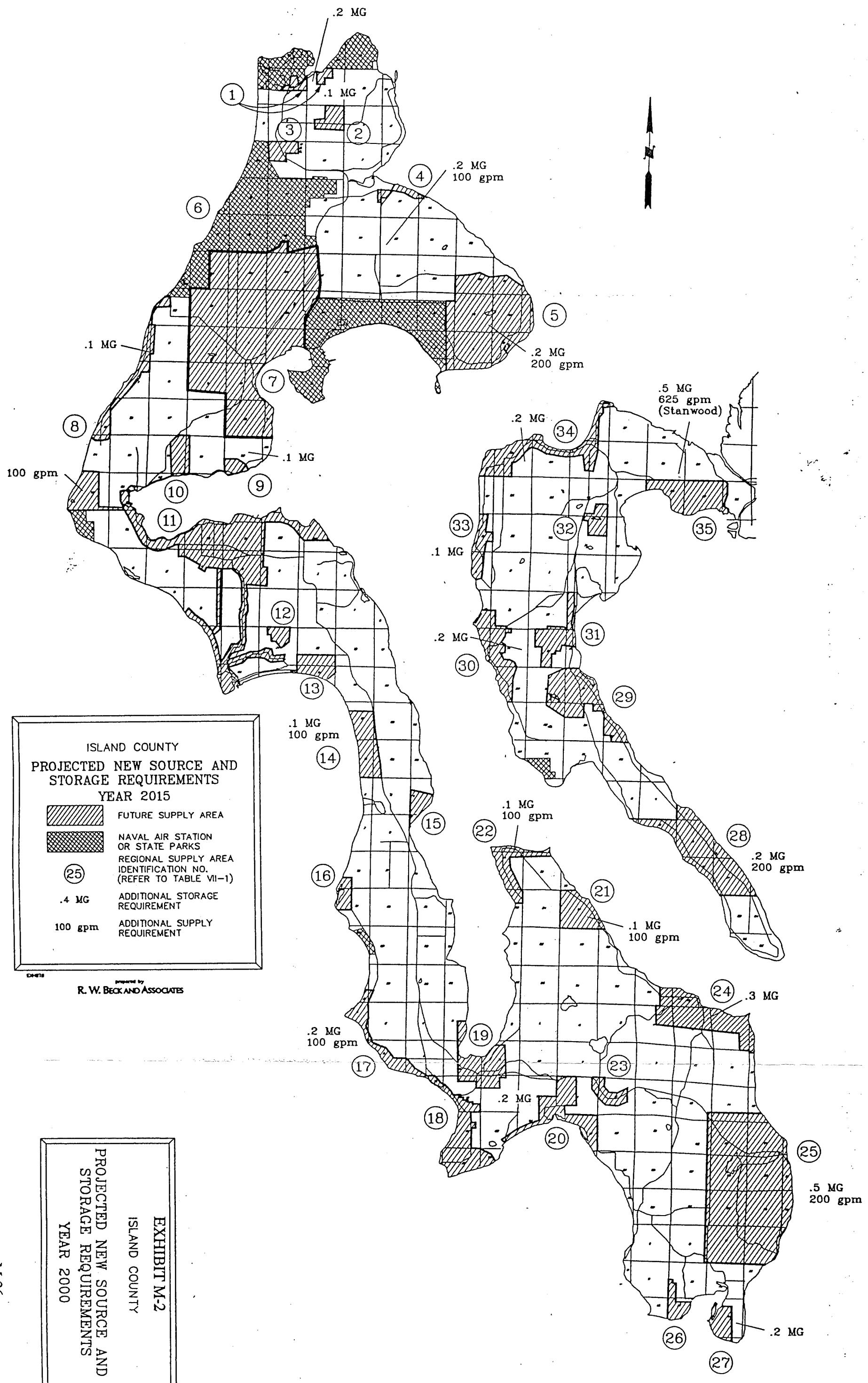
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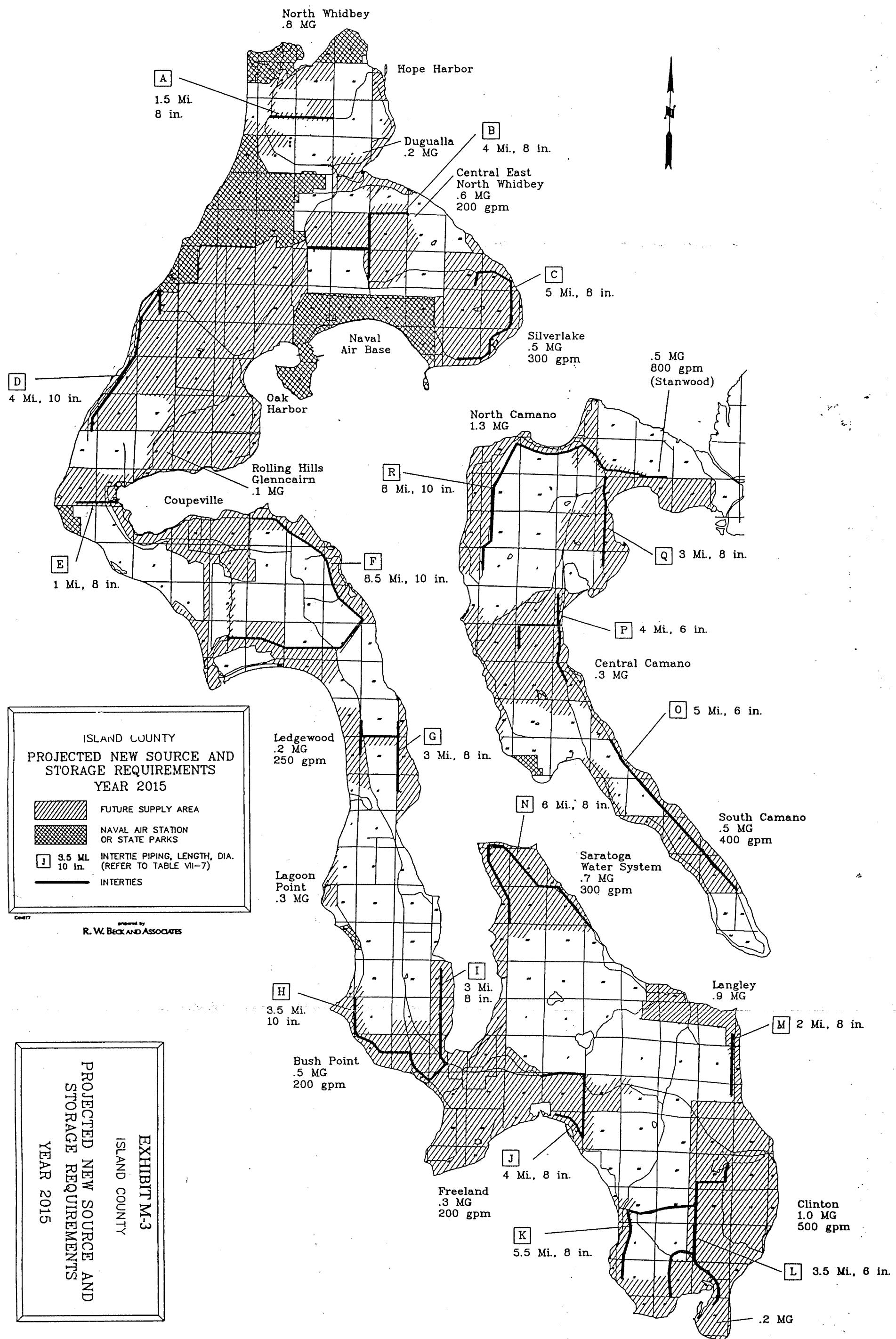
◆ EXISTING RESERVOIR
 □ EXISTING PUMP STATION
 ○ FUTURE RESERVOIR
 □ FUTURE PUMP STATION
 // AREA SUPPLIED
 BY PIPELINE

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Prepared by
R. W. BECK AND ASSOCIATES





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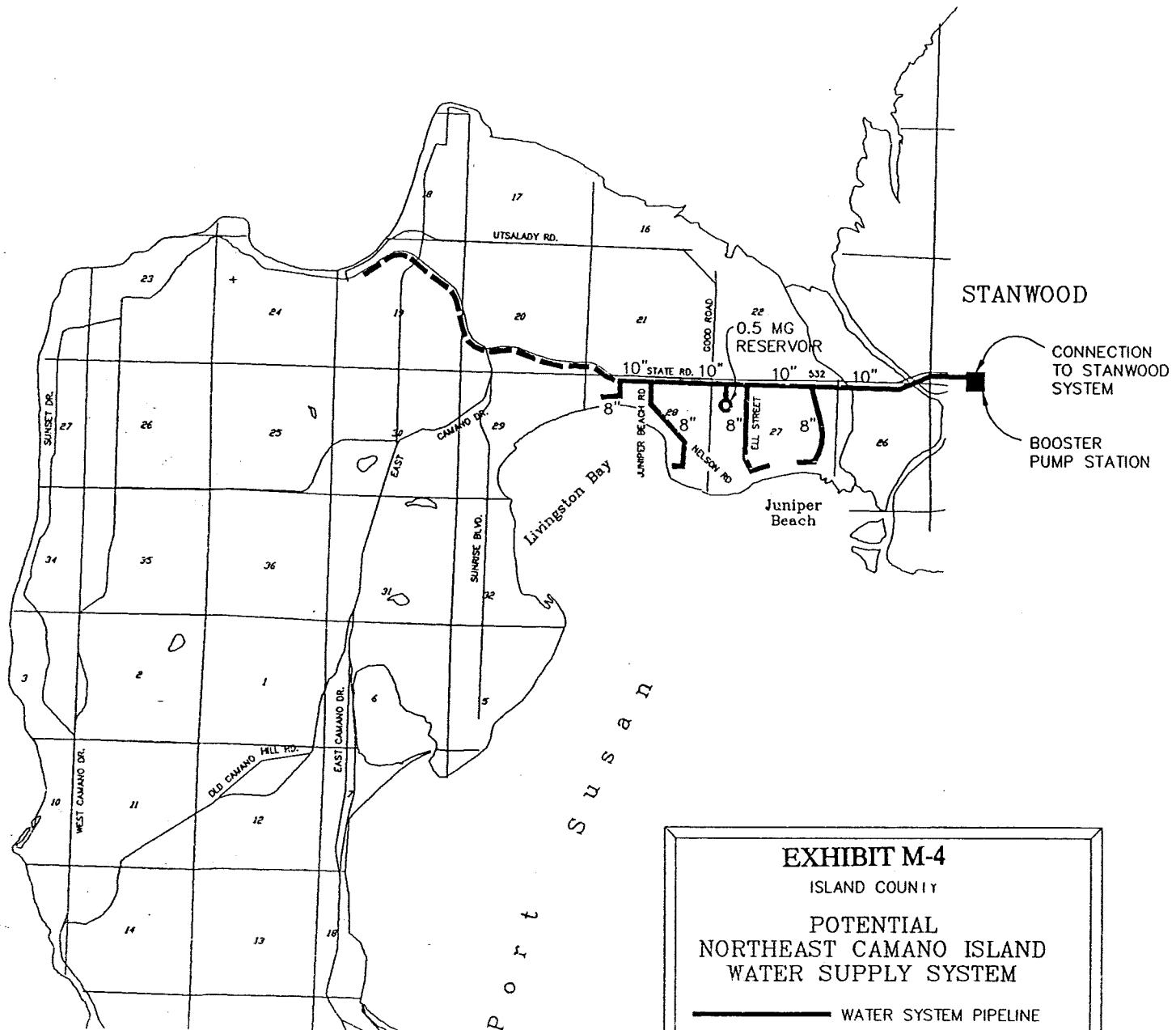


EXHIBIT M-4
ISLAND COUNTY
POTENTIAL
NORTHEAST CAMANO ISLAND
WATER SUPPLY SYSTEM

EXHIBITS

prepared by
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