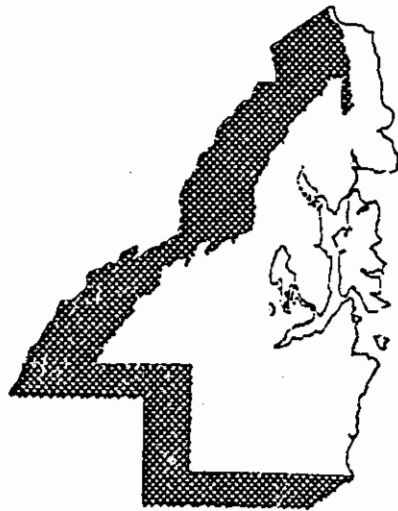


APPENDIX C



APPENDIX C

POULSBO-BREMERTON

1. DRAINAGE AND TOPOGRAPHY

The topography in the Poulsbo/Bremerton Subarea is similar to the other previously discussed areas. It is dominated by low rolling inland hills with some sea cliffs near the Puget Sound waterways. As seen in Exhibit II-7 in Volume I, the drainage pattern is generally perpendicular to the nearest shoreline. Some large basins, namely Clear Creek and Chico Creek, drain this area. Basins number 128 and 134 show a relatively high value of flow per unit area indicating a large groundwater base flow component. Basin number 259 shows a low value possibly indicating a groundwater flow to other drainage basins or loss to the sub-sea level groundwater system.

name? (what about)
Chico cr. ppt.?

2. GEOLOGY

A. Surficial Geology

The surface geology of the Poulsbo-Bremerton Subarea (see Exhibit C-1) is much like other areas in that Unit 5 dominates the surface of the subarea with smaller deposits of other units occurring sporadically throughout the subarea. Unit 1, including both the Tertiary Volcanics and the Blakeley Formation, is exposed in the southern part of the subarea. The Blakeley Formation crops out on Rocky Point and near Sulphur Spring and the Tertiary volcanics crop out south of Kitsap Lake.

B. Subsurface Geology

The subsurface geology is shown in cross sections T-T', U-U', X-X', V-V', W-W', and part of M-M' (see Exhibits C-3 through C-8 and A-6). Exhibit C-2 shows the location of database wells in this subarea. The cross sections show that most wells are completed in Unit Qg3 including a well with one of the highest transmissivities (500,000 gpd/ft) encountered in Kitsap County (see Well 03M01, Exhibits C-4 and C-7). Cross section V-V' shows many wells in the subarea completed in Unit Qg5. Cross section V-V' also provides a prime example of the variability of these aquifers. Comparison of the values of transmissivity in nearby wells completed in Qg5 displays this variability. Well 23N01 has a transmissivity of 5,000 gpd/ft whereas Well 22J01 located approximately 3000 feet away shows a value of 24,000 to 56,000 gpd/ft. (Cross section W-W' shows a good example of the discontinuous nature of the subsurface deposits.) Note the

This isn't a geologic description. Where are the sediments, stratig., etc.?

this is a start

presence of Unit Qg2 in the east and west ends of the cross section and its absence in the central part. Cross section T-T' clearly shows the nature of the occurrence of the thick Unit Tb, Tertiary volcanics, in the southern portion of the subarea.

3. PRINCIPAL AQUIFERS

the exhibit shows nine
Eight aquifer systems (see Exhibit C-9) are defined within this subarea. They are: the Edgewater, Poulsbo, Bangor, Keyport, Island Lake, Silverdale, Bucklin Hill, Gilberton-Fletcher, and Manette aquifers. Aquifer characteristics are presented in Table C-1.

The Edgewater aquifer system (Exhibit C-9) is noted on the west end of cross section M-M' and on the north end of T-T' (Exhibits A-6 and C-4 respectively). This sand and gravel aquifer is encountered in four wells, three of which are shown on Exhibit A-6. It occurs from approximately 200 feet above sea level to 150 feet below sea level within Unit Qg3. This unit is in some areas very productive (see Well 27J01, Exhibit A-6) and in other areas only moderately productive. The boundaries of the Edgewater aquifer system are not well defined. In fact, this aquifer may possibly be continuous with the upper aquifer of the Bangor aquifer system to the southwest.

The Bangor aquifer system (see Exhibit C-9) is by far the largest and the most intensively studied aquifer system in Kitsap County. The Bangor aquifer system is noted on cross sections U-U', W-W', and X-X' (see Exhibits C-5, C-7, and C-8), and is delineated by a large number of wells (see Table C-1). This aquifer system consists of two distinct aquifers. The shallower aquifer, found from approximately 25 feet above to 25 feet below sea level (see Well 06D01, Exhibit C-7), is within Units Qg3 and Qn2. The latter Unit is much coarser grained in this area than elsewhere in the county and typically is not found to yield significant amounts of groundwater in other areas. The deep aquifer encountered between 50 and 250 feet below sea level (see Well 18L01, Table C-1 and Exhibit C-5) is within Unit Qg4. The eastern boundary of the aquifer system is well defined by nonproductive wells. The extent of these aquifers to the north and south is not known, but the upper aquifer could possibly be connected with the Edgewater aquifer system.

The Keyport aquifer occupies an area of about one square mile centered on the Naval facility at Keyport, although its historic long-term yield indicates a much larger recharge area. The southern fringe of the Keyport aquifer system (see Exhibit C-9) is noted on the cross section W-W' (see Exhibit C-7). This sand and gravel aquifer is encountered in three wells (see Table C-1) from approximately 675 to 800 feet below sea level and is within Units Qg5 and Qn6 (see Well 02J02,

Table C-1 and Exhibit C-7). The Keyport aquifer is a very productive aquifer as demonstrated by the Navy's Keyport well (Well 36P05). Due to its depth and the lack of deep well data outside of the Naval facility the lateral extent of this aquifer is not well defined.

The Island Lake aquifer system (see Exhibit C-9) is noted in the middle of cross sections T-T' and W-W' (see Exhibits C-4 and C-7). The aquifer is predominantly gravel and sand deposits encountered from approximately 150 feet above sea level to sea level (see Wells 03E01 and 10D01, Table C-1, Exhibit C-4 and C-7) within Unit Qg3. This Unit is commonly very productive and has some of the highest values of transmissivity in the county (note Well 03E01, Table C-1). The aquifer's lateral extent is truncated to the north and south by topographic lows. Though less obvious the aquifer boundaries probably do not extend very far to the east or west due to the same constraints.

The Silverdale aquifer system (see Exhibit C-9), found at the head of Dyes Inlet, is noted in the center of cross section V-V' (see Exhibit C-6) and on the eastern end of cross section Q-Q' (see Exhibit D-6). Several wells (see Table C-1) encounter this moderately productive aquifer from approximately sea level to 250 feet below sea level (note Well 19H02, Exhibit C-6) within Unit Qg4. The southwest boundary of the aquifer is well defined by Well 10N01. In all other directions the lateral extent is poorly defined.

The Bucklin Hill aquifer system (see Exhibit C-9), noted on cross sections T-T' and V-V' (see Exhibits C-4 and 6), appears to overlap the Silverdale aquifer system in places. However, the Bucklin Hill aquifer system is much deeper and occupies a different unit than the Silverdale aquifer system. This mostly silty sand and gravel aquifer is encountered in four deep wells (see Table C-1) from approximately 400 to 700 feet below sea level (note Wells 22J01 and 23N02, Exhibit C-6) within Unit Qg5. The northeastern boundary of the aquifer is well defined by Well 24D02, but the extent in other directions is not well defined.

The Manette Peninsula portion of the Gilberton-Fletcher aquifer system (see Exhibit C-9) is noted on the eastern end of cross section V-V' (see Exhibit C-6). The system consists of two aquifers on the Manette Peninsula and one on Bainbridge Island. The deeper of the two aquifers is found from approximately 575 to 650 feet below sea level on the Manette Peninsula (note Well 19M01, Exhibit C-6). This deep aquifer is principally within Unit Qg5. Port Orchard Bay, which separates Bainbridge Island and the Peninsula, is much shallower than the aquifer. The intertie between the two sides is implied and probable, but not proven. The shallower aquifer is found between approximately 300 to 475 feet below sea level in Wells 19M02 and 25R01. This aquifer, within Unit

no, it isn't
*what exhibit?
where are these wells?*

Qg4, gives lower values of transmissivity (8,200 gpd/ft in Well 19M02) and is less productive than the deeper aquifer. The western boundary of the aquifer system is limited by Well 24P01. The extent of the aquifer system, in other directions is limited by the lack of deep-well data in the vicinity.

The relatively large Manette-Bremerton North aquifer system (see Exhibit C-9) is not noted on any cross section. Several wells (see Table C-1) encounter this predominantly sand and gravel aquifer from approximately sea level to 250 feet below sea level within Unit Qg3. The aquifer boundaries are not well defined in any direction. The boundary is drawn to encompass only the known data points.

4. GROUNDWATER FLOW SYSTEM

A groundwater elevation contour map for the shallow aquifer system in the Poulsbo-Bremerton Subarea is presented in Exhibit C-10. This map illustrates the general water level elevations and directions of horizontal groundwater flow in the shallow aquifer system. Areas of groundwater recharge and discharge can also be inferred from the map.

Generally, in this long and narrow subarea, shallow groundwater flows either to Puget Sound or Hood Canal. In the southern portion of the subarea Dyes Inlet is a major discharge location, along with the Puget Sound coastline. Discharge occurs through a number of creeks (including Clear, Barker and Crouch Creeks), and seeps/springs along the coast. Liberty Bay on Puget Sound draws much of the shallow groundwater in the northeast. The Poulsbo-Bremerton Subarea also has an extended shoreline along Hood Canal in the northwest. Shallow groundwater discharges to the canal from this area via coastal seeps and springs, and small streams.

Several recharge areas were identified from Exhibit C-10. The highlands between Dyes Bay and Puget Sound are recharge areas. Additionally, a north-south trending ridge of uplands in the northern portions of the subarea is a recharge area and divide from which flow emanates to Hood Canal and Puget Sound.

5. WATER BALANCE AND RECHARGE

Long-term average water balance components for the Poulsbo-Bremerton subarea are presented in Table II-14, Volume I. Average precipitation is estimated to range between 40 and 50 inches/year; average evapotranspiration between 15 and 18 inches/year; average runoff between 7 and 10 inches/year; and average direct recharge between 18 and 22 inches/year.

Precipitation estimates are based on the analysis of U. S. Weather Bureau data and the precipitation isohyetal presented in Volume I, Exhibit II-15. Evapotranspiration was estimated using the Thornthwaite method assuming a 3- to 5-inch

soil moisture holding capacity. Runoff was estimated to be approximately 10 to 15 percent of total precipitation. The runoff multiplier reflects the moderate to high infiltration potential of the area (Volume I, Exhibit II-13).

precedence for this reference?

here you are implying that runoff is 3 function of ppt.

6. POTENTIAL DEVELOPABLE YIELD

Estimates of potential developable yield (PDY) for the Poulsbo-Bremerton subarea are shown in Volume I, Table II-15. Two set of PDY estimates are presented within the table. The low end estimate (first four columns) assumes the effective recharge area that contributes to groundwater development is confined to the principal aquifer zones. The aquifer zones include Edgewater, Bangor, Keyport, Island lake, Silverdale, Bucklin Hill, Manette-Bremerton North, and Gilbert-Fletcher Bay (west). The recharge area to these aquifers was assumed to extend approximately 0.5 miles beyond the inferred limits of the aquifers which are shown on Exhibit II-8, Volume I, (exclusive of areas that extend into Puget Sound).

why was this assumed?

The high end estimate of PDY (column 5 through column 8 of Table II-15, Volume I) assumes that the entire subarea, with the exception of the high relief areas in vicinity of Puget Sound and the bedrock areas the occur in vicinity of Bremerton, contributes recharge to groundwater system which can be extracted for development.

Both estimates assume that a percentage of the total long-term average recharge within specified areas can be economically captured for development without imposing significant impacts on the hydrologic system (see Section II.C.10, Volume I).

yes, and this is undoubtedly true. What represents a reasonable % is what is in question.

The estimated recharge areas and recharge rates for the principal aquifers within the Poulsbo-Bremerton subarea are presented in Volume I, Table II-15. The PDY for these aquifer is estimated to be between 10.1 and 16.8 MGD (i.e. for C1 = 0.3 and C2 = 0.5, respectively). The recharge areas for the Island Lake and Keyport aquifers as well as the Silverdale, Bucklin Hill, Manette-Bremerton North, and Gilberton-Fletcher (west) coalesce, thus the two sets of aquifers were treated as two lumped aquifer systems.

The PDY for the entire subarea based on a recharge rate of 17 inches/year and a total recharge area of 79 square miles is estimated to be between 19.2 and 32.0 MGD (i.e. for C1 = 0.3 and C2 = 0.5, respectively).

Existing withdrawal (average day) from the subarea based on a 1985 water use data is approximately 7.44 MGD which lies near the lower bound of the PDY estimate. Groundwater development is projected to increase to approximately 16.27 MGD by the year 2040. This level of development lies near the upper limit of the PDY estimate for the principal aquifers and near the lower limit of the PDY estimate for the entire subarea.

There are insufficient water level trend data and other hydrologic information to assess whether present levels of development are creating adverse impacts within the subarea.

7. LAND USE AND WATER QUALITY ANALYSIS

A. Land Use Activities

The survey of existing and historical land use in the Poulsbo-Bremerton subarea with potential for impacting groundwater quality are depicted in Exhibits C-11 through C-16 and are discussed according to the Office of Technology Assessment's (OTA) categories where appropriate.

(1) Category 1 - Sewered/Unsewered Areas

Existing sewered areas within the Poulsbo-Bremerton subarea include the City of Bremerton and areas served by the Central Kitsap Sewer District, which is operated by the Kitsap County Department of Public Works. The population living outside of these areas utilizes on-site sewage disposal systems. Potential future sewered areas are defined as having an urban or semi-urban classification. Both existing and future sewered areas are depicted on Exhibit C-11.

(2) Category 2 - Landfills/Hazardous Waste Sites/Underground Storage Tanks

There are several historical landfills located within the Poulsbo-Bremerton subarea, including the Skirving, Howerton, Brem-Aire sites which were privately owned, and the federally operated sites at Bangor and Keyport. A majority of the regulated hazardous waste sites in the County are located in this subarea, 20 in all, with the main concentration in the Bremerton area. The U.S. Naval Submarine Base near Bangor contains a Superfund site which is currently undergoing a Remedial Investigation/Feasibility Study (RE/FS). This site is a former explosive ordinance disposal site which is approximately 10 acres in size. The majority of underground storage tanks can also be found in the Poulsbo-Bremerton subarea. The largest number can be found in Bremerton with a total of 281 underground tanks reported at 107 sites. Poulsbo also contains a number of reported underground storage tanks, as does Bangor and the Naval Shipyard. Locations of regulated hazardous waste facilities, landfills, and numbers of underground storage tanks are shown on Exhibit C-12.

any idea as to how many of these sites are known problems?

(3) Category 3 - Transportation

Major transportation corridors running through the Poulsbo-Bremerton subarea include State Routes (SR) 3, 303, 304, 306, and 308. The state Department of Transportation reports annually on accident frequency on State roads (37). The accident figures for transportation corridors indicate the potential for spills along specific sections of road. Values for the number of accidents from 1986 and accident rates for sections of state and federal highways are shown in Exhibit C-14. The Poulsbo-Bremerton subarea also contains an extensive rail system to the Bangor Submarine Base which is shown. In addition to materials spills, transportation corridors contain rights-of-way on which herbicides and pesticides may have been applied for weed control. This is also the case for Bonneville Power Administration's major power line right-of-way located in this subarea.

(4) Category 4 - Agricultural/Mining

The Poulsbo-Bremerton subarea has a large surface area for potential agricultural and forestry use, even with the urbanized areas of Bremerton and Poulsbo, as can be seen in Exhibit C-13. The areas shown are currently classified as Rural (2.5 acre), meaning the maximum density allowable will ultimately be only one dwelling unit for every 2.5 acres. Agricultural and forestry applications of herbicides and pesticides have the potential for affecting groundwater quality. Forest plantations throughout the County are normally sprayed with chemical herbicides once or twice during their sixty year life. This spraying occurs either during the winter while the trees are dormant, or during the early spring before the new growth has obtained three-quarters of its growth. Records from the Department of Natural Resources indicated eight surface mining sites were located in this subarea. These are also located on Exhibit C-13.

(5) Category 6 - Wetlands

Wetland areas may indicate an area of groundwater-surface water interaction. Locations of wetland areas were obtained from the National Wetlands Survey completed by the Department of Interior's Fish and Wildlife Service. These locations were mapped for Poulsbo-Bremerton subarea and are displayed in Exhibit C-15.

(6) Land Use/Zoning

Each of the subareas have land use policies in place which have been prepared by Kitsap County and the cities within each subarea. Exhibit C-16 displays the future land use categories for the Poulsbo-Bremerton subarea, according to the Kitsap County Department of Community Development.

B. Water Quality Trends

Water quality trends for the indicator parameters discussed in Section II- Technical Approach and Regional Issues, were performed for data within the Poulsbo-Bremerton subarea. The analysis was completed separately for shallow and deep wells, using a 100 foot depth as the cutoff between shallow and deep wells. A total of 123 wells, 46 shallow and 77 deep, were used in the trending analysis. Exhibit C-17 presents the location of wells from which water quality observations above the maximum contaminant level were observed.

Data did not exist for the following indicator parameters:

- Cyanide
- Copper
- Methylene Chloride
- Tetrachloroethylene
- 1,1,1-Trichloroethane
- Trichloroethylene
- Mercury
- Zinc
- Boron
- Phenols
- PCB
- Tin
- BTX
- TOX, TOC
- Indicator Pesticides

Trend plots for the remainder of indicator parameters can be seen in Technical Appendix H. Overall, no significant trends were calculated for any of the indicator parameters from either the shallow or the deep wells. One nitrate level was measured above the MCL and iron and manganese levels were found to be higher than secondary standards in several of the wells

C. Sensitive Areas

Existing water quality data does not indicate any areas sensitive to land use activity in the Poulsbo-Bremerton Subarea, although the amount of data for trending purposes is limited. The majority of the principal aquifer zones throughout the county are located at relatively deep depths and are protected from surface contamination sources by low permeability layers. However, the effects of increasing urbanization in the Silverdale area, as well as ongoing investigations of water quality at the Bangor Sub-base, should be monitored.

8. WATER USE AND WATER RIGHTS

A. Population

Based on the Puget Sound Council of Governments (PSCOG), June 1988, Population and Employment Forecast, the estimated existing population for the Poulsbo-Bremerton subarea is approximately 90,410 (1989). Future population is estimated to increase from 125,787 in 2010 to 174,722 in 2040. These population figures are summarized on Table C-2 by Forecast Analysis Zones (FAZs). More than 50 percent of the population within this subarea is located in the urban area with about 35 percent of the population located in the semi-urban/rural areas and the remaining population is located in the rural area.

B. Water Demand

(1) Municipal and Domestic

Average and peak day municipal and domestic water demand projections are population driven. Average day demands were derived based on an assumed average gpcd for three levels of development (i.e., urban, semi-urban/rural, and rural) to reflect varying mixes of residential, commercial, and industrial customers. Average per capita demands of 175, 140, and 100 gpd were assumed for existing conditions for urban, semi-urban/rural, and rural areas, respectively. Peak day demands were derived from average day demands by multiplying by an assumed peak to average day factor of 2.3, 3.0, and 3.0 for urban, semi-urban/rural, and rural areas, respectively. These average and peak day numbers are consistent with existing water demands experienced by utilities in Kitsap County and similar areas of the State.

Average day water demand is summarized on Table C-3 and peak day demand is summarized on Table C-4. Existing average day and peak day demand is estimated to be approximately 13.7 and

35.5 MGD, respectively. Average day is projected to increase from between approximately 16.0 and 18.6 MGD in 2010 to 21.7 and 25.4 MGD in 2040. Peak day demand is projected to range between 58.6 and 68.6 MGD in 2040.

The higher consumption values assume no change in water use patterns from existing condition. The lower values assume water conservation and an increase in multi-family housing units. Conservation assumes water savings of 5 percent in 1995 and 10 percent in 2000 and thereafter for all areas. An increase in multi-family units in the urban and transitional areas only was assumed to result in a savings of 1.5 and 3.5 percent in 1995 and 3 and 7 percent in 2000 and thereafter, respectively.

(2) Other

Very little other use is estimated for this subarea. As shown on Table C-5, approximately 0.8 MGD of commercial/industrial and irrigation water use is projected for 2040. Commercial/industrial water use was based on existing water rights and was estimated to be about 0.05 MGD. The majority of commercial/industrial supplies are provided by public water supplies within the area. Based on water right records, no water use was assumed for fish propagation and only 0.01 MGD was assumed for stock watering. Irrigation has been assumed to remain at present water use estimated amount of less than 0.8 MGD.

Irrigation water use for 1985 was based on 1982 Bureau of the Census statistics data for numbers of acres irrigated. Irrigation water use in 2040 was based on future land use. Irrigation estimates by subarea were apportioned based on existing water right records from Ecology. The number of acres under irrigation was assumed to be irrigated at an average rate of 1.5 acre-feet per acre per year. Irrigation figures were also based on a 150-day irrigation season rather than a calendar year as with other water uses.

C. Water Rights

The groundwater right information presented on Table C-6 has been primarily derived from the water right printout records of Ecology, dated July 11, 1988. The Table is divided into two parts. The first part contains all water rights for public water supply (i.e., identified on water right records as either "domestic multiple" or "domestic municipal"). The second part includes all the remaining water rights of record. Where a water right authorizes use for public water supply and one or more other uses, the right appears in both parts of the Table.

The Table does not include claims to groundwater rights or groundwater rights that have been established under the permit exemption provisions of the State Ground Water Code.

In this subarea, public water supply groundwater rights comprise approximately 94 percent of the annual authorization (acre-feet per year) under all the recorded rights. The annual authorization of 628 acre-feet per year for irrigation use is a little more than 76 percent of the authorizations for all uses other than public water supply and approximately 4 percent of total authorization. All other uses are minimal.

Table C-1

Aquifer Characteristics Data
Poulsbo-Bremerton Subarea

Local Well Number	Ground Surface	Elevation in Feet (MSL)		Static Water Level	Transmissivity in gpd/ft (3)	Storage Coefficient (3)	Specific Capacity in gpm/ft (4)	Potential Well Yield in gpm (5)	Owner Well Name and Number
		Top of Screen (1)	Bottom of Screen (2)						
EDGEWATER									
27N/01E-27J01	290.00	129.00	110.00	191.80	30000	0.1000000	9.20	385	EDGEWATER WELL NO. 3B
27N/01E-27J02	290.00	-112.00	-167.00	107.00	9000		5.49	549	EDGEWATER WELL NO. 3
27N/01E-27F02	232.00	-22.80	-29.90	108.00	1420		0.94	81	EDGEWATER WELL NO. 2 REPLACEMENT
27N/01E-27E01	200.00	-106.00	-121.00	55.00	240		0.43	43	EDGEWATER WELL NO. 1
BANGOR									
26N/01E-32L01	275.00	151.00	275.00	146.00			15.00		WELL 1181
26N/01E-18L01	205.00	-91.00	-136.00	49.00	77000		51.10	>2500	BANGOR WELL 504
26N/01E-19P01	305.70	-50.30	-119.30	68.20	91000	0.0001500	18.88	1491	RECHARGE WELL 1A-1
26N/01E-31B02	349.00	-76.00	-231.00	58.00	152000	0.0004300	56.71	>2500	RECHARGE WELL 2A-1
26N/01E-29N02	369.00	9.00	-91.00	75.00	9000		3.89	171	TEST WELL 7, SHALLOW
26N/01E-29R02	414.00	-2.00	-12.00	78.00			0.00		TEST HOLE 13, SHALLOW
25N/01E-06D01	340.00	340.00	340.00	213.00			0.00		
26N/01E-04B01	320.00	-328.00	-365.00	31.30	40000		5.42	542	VINLAND VIEW WELL 2
KEYPORT									
25N/01E-02J02	230.00	-790.00	-830.00	39.20	20000		3.04	304	KEYPORT NO. 2 KPUD
26N/01E-36M01	20.00	-681.90	-721.00	49.88	4200		2.47	247	KEYPORT WELL NO. 1
26N/01E-36P05	12.20	-711.80	-789.80	2.20	73000	0.0004000	42.92	>2500	KEYPORT NAVAL STATION WELL NO. 5
ISLAND LAKE									
25N/01E-03E01	371.00	81.00	40.00	207.10	250000	0.0002000	34.57	>2500	SPIRIT RIDGE WELL 4
25N/01E-10D01	420.00	143.80	99.70	201.00	50000		20.22	771	ISLAND LAKE WELL
25N/01E-03M02	330.00	160.00	145.00	182.00			9.44	138	SILVERDALE WD SPIRIT RIDGE WELL 1
25N/01E-10N01	315.00	-154.00	-165.00	101.30	3500		1.30	130	SILVERDALE WELL 1 ZONE 2E
BUCKLIN HILL									
25N/01E-22J01	190.00	-661.00	-691.00	40.00	56000		6.71	671	BRIDLERIDGE TEST WELL NO. 1
25N/01E-23N02	240.00	-570.00	-600.00	36.00	5000		1.52	152	PARKWOOD EAST NO. 1
25N/01E-14Q03	79.00	-421.00	-471.00	44.60	16200		3.28	328	BUCKLIN HILL ROAD WELL
25N/01E-22F01	95.00	-290.00	-310.00	101.00			8.00	533	SELBO RD TEST WELL NO. 1
25N/01E-24D02	150.00	-360.00	-372.00	54.00	3000		1.27	127	BROWNSVILLE, BREMERTON NO. 12

Table C-1 Aquifer Characteristics Data
Poulsbo-Bremerton Subarea

Local Well Number	Ground Surface	Elevation in Feet (MSL)		Static Water Level	Transmissivity in gpd/ft (3)	Storage Coefficient (3)	Specific Capacity in gpm/ft (4)	Potential Well Yield in gpm (5)	Owner Well Name and Number
		Top of Screen (1)	Bottom of Screen (2)						
SILVERDALE									
25N/01E-16J01	210.00	-41.50	-60.00	99.70	13000	0.0002000	6.20	583	R&N 5507 CHENA RD NO. 2
25N/01E-22F03	95.00	-81.00	-101.00	69.00			25.00	>2500	SELBO RD TEST WELL NO. 1
25N/01E-19H02	360.00	-140.00	-236.00	44.20	18240		2.21	221	DICKEY SCHOOL WELL
25N/01E-20C01	220.00	-29.00	-44.00	87.50			6.49	504	SILVERDALE WELL NO. 2
25N/01E-10N01	315.00	-154.00	-165.00	101.30	3500		1.30	130	SILVERDALE WELL NO. 1 ZONE 2E
GILBERTON-FLETCHER									
25N/02E-20K01	85.00	-856.00	-907.00	17.00	20000				FLETCHER BAY
25N/02E-19M01	136.00	-583.00	-634.00	32.00			6.89	689	GILBERTON WELL 1
25N/02E-19M02	136.00	-319.00	-344.00	39.00	8200		3.21	321	GILBERTON WELL 2
25N/01E-25R01	410.00	-392.00	-470.00	77.20			2.28	228	N PERRY AVE WD SUNSET AVE WELL
25N/01E-24P01	300.00	-458.00	-511.00	35.00			0.46	46	GILBERTON WEST TEST WELL
MANNETTE-BREMERTON NORTH									
24N/02E-01J01	342.00	-13.00	-57.00	232.00			8.62	862	PERRY AVE WELL
24N/02E-07D01	312.00	-73.00	-124.00	214.00			3.71	371	NPAWD - PICKERING STREET WELL
24N/02E-07M02	123.00	-86.40	-156.80	62.80	17000	0.0002000	8.38	833	CENTER ST WELL NO. 2
25N/01E-36B01	380.00	-189.00	-214.00	120.00	2100		1.87	187	BREMERTON EAST GOLF WELL
25N/01E-36R01	340.00	-320.00	-334.00	140.10	8500	0.0001000	4.60	460	RIDDELL RD WELL NO. 1
25N/01E-25R01	410.00	-392.00	-470.00	77.20			2.28	228	N PERRY AVE WD SUNSET AVE WELL
25N/01E-34H01	130.00	-119.00	-143.00	101.70	3529		3.71	371	MCWILLIAMS WELL NO. 1
25N/01E-34J01	140.00	-108.00	-133.00	107.10	9000		7.86	786	VENA ROAD WELL

NOTES:

- (1) Elevation of top of upper most screen or perforated section (some wells have multiple completions).
- (2) Elevation of bottom of lower most screen or perforated section.
- (3) Transmissivity and storage coefficient values are obtained from relatively extensive testing of the well as part of well development investigations.
- (4) Specific capacity is based on bail test or pump test data and is equal to the flow rate divided by the drawdown.
- (5) Potential well yields are estimated as the product of 2/3's the available drawdown or 100 feet (whichever is less). Potential well yields of greater than 2,500 gpm are indicated as >2,500 to reflect reasonable well yields. The available drawdown is equal to the difference between the static water level and the top of the screen or perforated section of the well.

TABLE C-2
SUBAREA 3 - POULSBO-BREMERTON
POPULATION PROJECTION

: FAZ : : NOS. :	% IN : SUB-AREA :	YEAR									
		1970	1980	:1985 (1):	1990	:1995 (1):	2000	:2010 (1):	2020	:2030 (2):	2040 (2):
9005	10%	114	210	275	341	383	426	517	608	699	791
9006	31%	561	1,062	1,431	1,799	1,985	2,171	2,667	3,162	3,658	4,154
9007	100%	4,171	5,277	7,076	8,874	11,670	14,466	19,749	25,032	30,315	35,598
9009	100%	2,247	2,926	3,350	3,774	4,478	5,182	6,648	8,114	9,580	11,046
9011	33%	849	1,404	1,612	1,820	2,078	2,335	3,033	3,731	4,429	5,127
9012	13%	855	1,737	2,094	2,451	2,775	3,099	3,854	4,610	5,365	6,121
9900	100%	4,152	5,026	5,465	5,904	6,240	6,575	6,959	7,343	7,727	8,111
9901	78%	3,297	4,546	4,738	4,931	5,520	6,109	6,867	7,625	8,383	9,141
9902	100%	26,151	23,723	23,837	23,950	24,589	25,227	26,167	27,106	28,046	28,985
9904	100%	10,530	11,076	11,337	11,598	11,909	12,219	12,840	13,461	14,082	14,703
9908	100%	398	2,966	2,920	2,873	2,936	2,998	3,082	3,166	3,250	3,334
9909	100%	2,127	2,475	2,706	2,937	3,221	3,504	3,929	4,354	4,779	5,204
9915	100%	2,796	6,929	8,780	10,631	11,876	13,121	15,398	17,674	19,951	22,227
9916	100%	2,750	8,345	9,142	9,939	10,991	12,043	14,078	16,112	18,147	20,181
TOTAL		60,997	77,702	84,762	91,822	100,649	109,475	125,787	142,098	158,410	174,722

- (1) Linearly extrapolated.
(2) Straight line projection.

Source: Puget Sound Council of Governments (PSCOG) June 1988 Population and Employment Forecasts

TABLE C-3

SUBAREA 3 - POLLSBO-BREMERTON
MUNICIPAL AND DOMESTIC WATER DEMAND (1)
AVERAGE DAY DEMAND (MGD)

SCENARIO	FAZ NOS.	WATER USE CATEGORY	GPCD	YEAR							STRAIGHT-LINE	
				1980	1985	1990	1995	2000	2010	2020	2030	2040
SCENARIO 1 - EXISTING CONDITION (2)												
	9005	Rural	100	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.08
	9006	Rural	100	0.11	0.14	0.18	0.20	0.22	0.27	0.32	0.37	0.42
	9007	Semi-Urban/Rural	140	0.74	0.99	1.24	1.63	2.03	2.76	3.50	4.24	4.98
	9009	Rural	100	0.29	0.34	0.38	0.45	0.52	0.66	0.81	0.96	1.10
	9011	Semi-Urban/Rural	140	0.20	0.23	0.25	0.29	0.33	0.42	0.52	0.62	0.72
	9012	Rural	100	0.17	0.21	0.25	0.28	0.31	0.39	0.46	0.54	0.61
	9900	Urban	175	0.88	0.96	1.03	1.09	1.15	1.22	1.29	1.35	1.42
	9901	Urban	175	0.80	0.83	0.86	0.97	1.07	1.20	1.33	1.47	1.60
	9902	Urban	175	4.15	4.17	4.19	4.30	4.41	4.58	4.74	4.91	5.07
	9904	Urban	175	1.94	1.98	2.03	2.08	2.14	2.25	2.36	2.46	2.57
	9908	Rural	100	0.30	0.29	0.29	0.29	0.30	0.31	0.32	0.33	0.33
	9909	Rural	100	0.25	0.27	0.29	0.32	0.35	0.39	0.44	0.48	0.52
	9915	Semi-Urban/Rural	140	0.97	1.23	1.49	1.66	1.84	2.16	2.47	2.79	3.11
	9916	Semi-Urban/Rural	140	1.17	1.28	1.39	1.54	1.69	1.97	2.26	2.54	2.83
	TOTAL			11.98	12.94	13.91	15.15	16.39	18.63	20.88	23.12	25.37
SCENARIO 2 - MULTI-FAMILY INCREASE (3)												
	9005	Rural	100	0.02	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.08
	9006	Rural	100	0.11	0.14	0.18	0.20	0.22	0.27	0.32	0.37	0.42
	9007	Semi-Urban/Rural	140	0.74	0.99	1.24	1.58	1.88	2.57	3.26	3.95	4.63
	9009	Rural	100	0.29	0.34	0.38	0.45	0.52	0.66	0.81	0.96	1.10
	9011	Semi-Urban/Rural	140	0.20	0.23	0.25	0.28	0.30	0.39	0.49	0.58	0.67
	9012	Rural	100	0.17	0.21	0.25	0.28	0.31	0.39	0.46	0.54	0.61
	9900	Urban	175	0.88	0.96	1.03	1.08	1.12	1.18	1.25	1.31	1.38
	9901	Urban	175	0.80	0.83	0.86	0.95	1.04	1.17	1.29	1.42	1.55
	9902	Urban	175	4.15	4.17	4.19	4.24	4.28	4.44	4.60	4.76	4.92
	9904	Urban	175	1.94	1.98	2.03	2.05	2.07	2.18	2.29	2.39	2.50
	9908	Rural	100	0.30	0.29	0.29	0.29	0.30	0.31	0.32	0.33	0.33
	9909	Rural	100	0.25	0.27	0.29	0.32	0.35	0.39	0.44	0.48	0.52
	9915	Semi-Urban/Rural	140	0.97	1.23	1.49	1.60	1.71	2.00	2.30	2.60	2.89
	9916	Semi-Urban/Rural	140	1.17	1.28	1.39	1.48	1.57	1.83	2.10	2.36	2.63
	TOTAL			11.98	12.94	13.91	14.84	15.71	17.84	19.97	22.10	24.23
SCENARIO 3 - WITH WATER CONSERVATION (4)												
	9005	Rural	100	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	9006	Rural	100	0.11	0.14	0.18	0.19	0.20	0.24	0.28	0.33	0.37
	9007	Semi-Urban/Rural	140	0.74	0.99	1.24	1.55	1.82	2.49	3.15	3.82	4.49
	9009	Rural	100	0.29	0.34	0.38	0.43	0.47	0.60	0.73	0.86	0.99
	9011	Semi-Urban/Rural	140	0.20	0.23	0.25	0.28	0.29	0.38	0.47	0.56	0.65
	9012	Rural	100	0.17	0.21	0.25	0.26	0.28	0.35	0.41	0.48	0.55
	9900	Urban	175	0.88	0.96	1.03	1.04	1.04	1.10	1.16	1.22	1.28
	9901	Urban	175	0.80	0.83	0.86	0.92	0.96	1.08	1.20	1.32	1.44
	9902	Urban	175	4.15	4.17	4.19	4.09	3.97	4.12	4.27	4.42	4.57
	9904	Urban	175	1.94	1.98	2.03	1.98	1.92	2.02	2.12	2.22	2.32
	9908	Rural	100	0.30	0.29	0.29	0.28	0.27	0.28	0.28	0.29	0.30
	9909	Rural	100	0.25	0.27	0.29	0.31	0.32	0.35	0.39	0.43	0.47
	9915	Semi-Urban/Rural	140	0.97	1.23	1.49	1.58	1.65	1.94	2.23	2.51	2.80
	9916	Semi-Urban/Rural	140	1.17	1.28	1.39	1.46	1.52	1.77	2.03	2.29	2.54
	TOTAL			11.98	12.94	13.91	14.39	14.75	16.77	18.79	20.81	22.83
SCENARIO 4 - CONSERVATION AND MULTI-FAMILY INCREASE (5)												
	9005	Rural	100	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
	9006	Rural	100	0.11	0.14	0.18	0.19	0.20	0.24	0.28	0.33	0.37
	9007	Semi-Urban/Rural	140	0.74	0.99	1.24	1.49	1.68	2.29	2.91	3.52	4.14
	9009	Rural	100	0.29	0.34	0.38	0.43	0.47	0.60	0.73	0.86	0.99
	9011	Semi-Urban/Rural	140	0.20	0.23	0.25	0.27	0.27	0.35	0.43	0.51	0.60
	9012	Rural	100	0.17	0.21	0.25	0.26	0.28	0.35	0.41	0.48	0.55
	9900	Urban	175	0.88	0.96	1.03	1.02	1.00	1.06	1.12	1.18	1.23
	9901	Urban	175	0.80	0.83	0.86	0.90	0.93	1.05	1.16	1.28	1.39
	9902	Urban	175	4.15	4.17	4.19	4.02	3.84	3.98	4.13	4.27	4.41
	9904	Urban	175	1.94	1.98	2.03	1.95	1.86	1.95	2.05	2.14	2.24
	9908	Rural	100	0.30	0.29	0.29	0.28	0.27	0.28	0.28	0.29	0.30
	9909	Rural	100	0.25	0.27	0.29	0.31	0.32	0.35	0.39	0.43	0.47
	9915	Semi-Urban/Rural	140	0.97	1.23	1.49	1.52	1.52	1.79	2.05	2.32	2.58
	9916	Semi-Urban/Rural	140	1.17	1.28	1.39	1.41	1.40	1.64	1.87	2.11	2.35
	TOTAL			11.98	12.94	13.91	14.09	14.07	15.98	17.88	19.79	21.70

See Footnotes on next page.

Footnotes (Table C-3):

- (1) Includes City of Bremerton surface water demand. City of Bremerton's surface and ground water average day requirements have been estimated to be:

Average Day	1985 *	1990 **	1995 **	2000 **	2010 **	2020 **	2030 ***	2040 ***
Groundwater	3.0	3.1	3.3	3.6	4.1	4.6	5.1	5.6
Surface Water	5.5	5.7	6.2	6.7	7.6	8.5	9.5	10.4
Total	8.5	8.7	9.5	10.3	11.7	13.1	14.5	16.0

* No accurate records available for 1985. Based on actual water records for 1986 through 1988.

** Based on projected growth in water demand for Subarea 3.

*** Straight-line projection from 2020 to 2040.

See Table C-5 for other water uses.

- (2) Assumes the following average gallons per capita per day (gpcd) demand for existing conditions for each area:

Water Use Category	Average GPCD
Rural	100
Semi-Urban/Rural	140
Urban	175

- (3) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reduction in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban/rural areas for the year 1995, up to 3% and 7%, respectively, for the year 2000 and thereafter.
- (4) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.
- (5) Combination of Scenarios 2 and 3.

TABLE C-4

SUBAREA 3 - POULSBORO-BREMERTON
MUNICIPAL AND DOMESTIC WATER DEMAND (1)
PEAK DAY DEMAND (MGD)

SUB-AREA	FAZ NOS.	WATER USE CATEGORY	PEAK/AVG: FACTOR	YEAR								STRAIGHT-LINE	
				1980	1985	1990	1995	2000	2010	2020	2030	2040	
SCENARIO 1 - EXISTING CONDITION (2)													
9005		Rural	3.0	0.06	0.08	0.10	0.11	0.13	0.16	0.18	0.21	0.24	
9006		Rural	3.0	0.32	0.43	0.54	0.60	0.65	0.80	0.95	1.10	1.25	
9007		Semi-Urban/Rural	3.0	2.22	2.97	3.73	4.90	6.08	8.29	10.51	12.73	14.95	
9009		Rural	3.0	0.88	1.01	1.13	1.34	1.55	1.99	2.43	2.87	3.31	
9011		Semi-Urban/Rural	3.0	0.59	0.68	0.76	0.87	0.98	1.27	1.57	1.86	2.15	
9012		Rural	3.0	0.52	0.63	0.74	0.83	0.93	1.16	1.38	1.61	1.84	
9900		Urban	2.3	2.02	2.20	2.38	2.51	2.65	2.80	2.96	3.11	3.26	
9901		Urban	2.3	1.83	1.91	1.98	2.22	2.46	2.76	3.07	3.37	3.68	
9902		Urban	2.3	9.55	9.59	9.64	9.90	10.15	10.53	10.91	11.29	11.67	
9904		Urban	2.3	4.46	4.56	4.67	4.79	4.92	5.17	5.42	5.67	5.92	
9908		Rural	3.0	0.89	0.88	0.86	0.88	0.90	0.92	0.95	0.98	1.00	
9909		Rural	3.0	0.74	0.81	0.88	0.97	1.05	1.18	1.31	1.43	1.56	
9915		Semi-Urban/Rural	3.0	2.91	3.69	4.47	4.99	5.51	6.47	7.42	8.38	9.34	
9916		Semi-Urban/Rural	3.0	3.50	3.84	4.17	4.62	5.06	5.91	6.77	7.62	8.48	
TOTAL				30.49	33.27	36.05	39.53	43.02	49.42	55.83	62.23	68.64	
SCENARIO 2 - MULTI-FAMILY INCREASE (3)													
9005		Rural	3.0	0.06	0.08	0.10	0.11	0.13	0.16	0.18	0.21	0.24	
9006		Rural	3.0	0.32	0.43	0.54	0.60	0.65	0.80	0.95	1.10	1.25	
9007		Semi-Urban/Rural	3.0	2.22	2.97	3.73	4.73	5.65	7.71	9.78	11.84	13.90	
9009		Rural	3.0	0.88	1.01	1.13	1.34	1.55	1.99	2.43	2.87	3.31	
9011		Semi-Urban/Rural	3.0	0.59	0.68	0.76	0.84	0.91	1.18	1.46	1.73	2.00	
9012		Rural	3.0	0.52	0.63	0.74	0.83	0.93	1.16	1.38	1.61	1.84	
9900		Urban	2.3	2.02	2.20	2.38	2.47	2.57	2.72	2.87	3.02	3.17	
9901		Urban	2.3	1.83	1.91	1.98	2.19	2.39	2.68	2.98	3.27	3.57	
9902		Urban	2.3	9.55	9.59	9.64	9.75	9.85	10.22	10.58	10.95	11.32	
9904		Urban	2.3	4.46	4.56	4.67	4.72	4.77	5.01	5.26	5.50	5.74	
9908		Rural	3.0	0.89	0.88	0.86	0.88	0.90	0.92	0.95	0.98	1.00	
9909		Rural	3.0	0.74	0.81	0.88	0.97	1.05	1.18	1.31	1.43	1.56	
9915		Semi-Urban/Rural	3.0	2.91	3.69	4.47	4.81	5.13	6.01	6.90	7.79	8.68	
9916		Semi-Urban/Rural	3.0	3.50	3.84	4.17	4.45	4.70	5.50	6.29	7.09	7.88	
TOTAL				30.49	33.27	36.05	38.71	41.18	47.25	53.32	59.39	65.46	
SCENARIO 3 - WITH WATER CONSERVATION (4)													
9005		Rural	3.0	0.06	0.08	0.10	0.11	0.11	0.14	0.16	0.19	0.21	
9006		Rural	3.0	0.32	0.43	0.54	0.57	0.59	0.72	0.85	0.99	1.12	
9007		Semi-Urban/Rural	3.0	2.22	2.97	3.73	4.66	5.47	7.47	9.46	11.46	13.46	
9009		Rural	3.0	0.88	1.01	1.13	1.28	1.40	1.79	2.19	2.59	2.98	
9011		Semi-Urban/Rural	3.0	0.59	0.68	0.76	0.83	0.88	1.15	1.41	1.67	1.94	
9012		Rural	3.0	0.52	0.63	0.74	0.79	0.84	1.04	1.24	1.45	1.65	
9900		Urban	2.3	2.02	2.20	2.38	2.39	2.38	2.52	2.66	2.80	2.94	
9901		Urban	2.3	1.83	1.91	1.98	2.11	2.21	2.49	2.76	3.04	3.31	
9902		Urban	2.3	9.55	9.59	9.64	9.40	9.14	9.48	9.82	10.16	10.50	
9904		Urban	2.3	4.46	4.56	4.67	4.55	4.43	4.65	4.88	5.10	5.33	
9908		Rural	3.0	0.89	0.88	0.86	0.84	0.81	0.83	0.85	0.88	0.90	
9909		Rural	3.0	0.74	0.81	0.88	0.92	0.95	1.06	1.18	1.29	1.41	
9915		Semi-Urban/Rural	3.0	2.91	3.69	4.47	4.74	4.96	5.82	6.68	7.54	8.40	
9916		Semi-Urban/Rural	3.0	3.50	3.84	4.17	4.39	4.55	5.32	6.09	6.86	7.63	
TOTAL				30.49	33.27	36.05	37.56	38.72	44.48	50.24	56.01	61.77	
SCENARIO 4 - CONSERVATION AND MULTI-FAMILY INCREASE (5)													
9005		Rural	3.0	0.06	0.08	0.10	0.11	0.11	0.14	0.16	0.19	0.21	
9006		Rural	3.0	0.32	0.43	0.54	0.57	0.59	0.72	0.85	0.99	1.12	
9007		Semi-Urban/Rural	3.0	2.22	2.97	3.73	4.48	5.04	6.88	8.73	10.57	12.41	
9009		Rural	3.0	0.88	1.01	1.13	1.28	1.40	1.79	2.19	2.59	2.98	
9011		Semi-Urban/Rural	3.0	0.59	0.68	0.76	0.80	0.81	1.06	1.30	1.54	1.79	
9012		Rural	3.0	0.52	0.63	0.74	0.79	0.84	1.04	1.24	1.45	1.65	
9900		Urban	2.3	2.02	2.20	2.38	2.35	2.30	2.44	2.57	2.71	2.84	
9901		Urban	2.3	1.83	1.91	1.98	2.08	2.14	2.40	2.67	2.94	3.20	
9902		Urban	2.3	9.55	9.59	9.64	9.25	8.83	9.16	9.49	9.82	10.15	
9904		Urban	2.3	4.46	4.56	4.67	4.48	4.28	4.50	4.71	4.93	5.15	
9908		Rural	3.0	0.89	0.88	0.86	0.84	0.81	0.83	0.85	0.88	0.90	
9909		Rural	3.0	0.74	0.81	0.88	0.92	0.95	1.06	1.18	1.29	1.41	
9915		Semi-Urban/Rural	3.0	2.91	3.69	4.47	4.56	4.57	5.37	6.16	6.95	7.75	
9916		Semi-Urban/Rural	3.0	3.50	3.84	4.17	4.22	4.20	4.91	5.62	6.33	7.04	
TOTAL				30.49	33.27	36.05	36.73	36.88	42.31	47.74	53.17	58.59	

See Footnotes on next page.

Footnotes (Table C-4):

- (1) Includes City of Bremerton Surface water demand. City of Bermerton's current maximum surface water supply capacity is 15 MGD and with proposed improvements will be 20 MGD. This capacity offsets peak day demands.
- (2) Assumes the following peak gallons per capita per day (gpcd) demand for existing conditions for each area:

Water Use Category	Peak GPCD
Rural	300
Semi-Urban/Rural	420
Urban	402.5

- (3) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reduction in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban/rural areas for the year 1995, up to 3% and 7%, respectively, for the year 2000 and thereafter.
- (4) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.
- (5) Combination of Scenarios 2 and 3.

TABLE C-5

SUBAREA 3 - POULSBO-BREMERTON
SUMMARY OF WATER DEMAND PROJECTIONS
AVERAGE DAY DURING IRRIGATION SEASON

SUB- AREA :	WATER USE CATEGORY :	YEAR						STRAIGHT-LINE	
		1985	1990	1995	2000	2010	2020	2030	2040
SCENARIO 1 - EXISTING CONDITION (1)									
	Municipal (5)	10.36	11.13	12.12	13.11	14.91	16.70	18.50	20.29
	Domestic/Single Family (6)	2.59	2.78	3.03	3.28	3.73	4.18	4.62	5.07
	Commerical/Industrial (7)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Irrigation (8)	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
	Fish Propagation (9)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Stock Watering (10)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	TOTAL Scenario 1	13.76	14.73	15.96	17.20	19.45	21.69	23.94	26.18
SCENARIO 2 - WITH MULTI-FAMILY INCREASE (2)									
	Municipal (5)	10.36	11.13	11.87	12.57	14.27	15.98	17.68	19.39
	Domestic/Single Family (6)	2.59	2.78	2.97	3.14	3.57	3.99	4.42	4.85
	Commerical/Industrial (7)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Irrigation (8)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Fish Propagation (9)	0	0	0	0	0	0	0	0
	Stock Watering (10)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL Scenario 2	13.27	14.24	15.17	16.04	18.17	20.30	22.43	24.56
SCENARIO 3 - WITH WATER CONSERVATION (3)									
	Municipal (5)	10.36	11.13	11.51	11.80	13.41	15.03	16.65	18.26
	Domestic/Single Family (6)	2.59	2.78	2.88	2.95	3.35	3.76	4.16	4.57
	Commerical/Industrial (7)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Irrigation (8)	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
	Fish Propagation (9)	0	0	0	0	0	0	0	0
	Stock Watering (10)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	TOTAL Scenario 3	13.76	14.73	15.21	15.56	17.58	19.60	21.62	23.65
SCENARIO 4 - WITH CONSERVATION AND MULTI-FAMILY INCREASE (4)									
	Municipal (5)	10.36	11.13	11.27	11.26	12.78	14.31	15.83	17.36
	Domestic/Single Family (6)	2.59	2.78	2.82	2.81	3.20	3.58	3.96	4.34
	Commerical/Industrial (7)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Irrigation (8)	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
	Fish Propagation (9)	0	0	0	0	0	0	0	0
	Stock Watering (10)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	TOTAL Scenario 4	13.76	14.73	14.90	14.89	16.79	18.70	20.60	22.51

- (1) Assumes the following average gallons per capita per day (gpcd) demand for existing conditions for each area:
- | Water Use Category | Average GPCD |
|--------------------|--------------|
| Rural | 100 |
| Semi-Urban/Rural | 140 |
| Urban | 175 |
- (2) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reduction in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban /rural areas for the year 1995 up to 3% and 7%, respectively, for the year 2000 and thereafter.
- (3) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.
- (4) Combination of Scenarios 2 and 3.
- (5) Includes all water supplied by public water systems based on estimate of number of persons served by Class 1 - 4 water systems. Approximately 80 percent of population is presently served by public supply.
- (6) Assumes remaining population (approximately 20 percent of the County) is served by individual wells.
- (7) Based on existing annual water right records from Department of Ecology.
- (8) Total for 1985 through 2040 based on 1982 Bureau of the Census agriculture statistic. Proportioned to subareas based on water right records from Department of Ecology. Number of acres assumed to be irrigated at 1.5 acre-feet per acre per year. Also, water use based on a 5 month irrigation period rather than average over 12 month period.
- (9) Based on existing annual water right records from Department of Ecology.
- (10) Based on existing annual water right records from Department of Ecology.

TABLE C-6

GROUNDWATER RIGHT INFORMATION
KITSAP COUNTY GROUNDWATER MANAGEMENT AREA
POULSBO-BREMERTON

PUBLIC WATER SUPPLY (1) WATER RIGHTS

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T24N, R01E						
North Perry Ave.	24N 01E 01J	G1*05258C	630	.91	1,001.6 (s) 6.4	Cl.1-60950M
Erland Point Water	24N 01E 05E	G1*03817C	450	.65	672	Cl.1-23850K
Erland Point Water	24N 01E 05E	G1*06991C	405	.58	648	Cl.1-23850K
Erland Point Water	24N 01E 05P	G1-24251P	360	.52	250	Cl.1-23850K
Rhododendron Hts.	24N 01E 06M	G1-20629C	100	.14	12	Cl.2-72200L (2 wells)
Chico Vista	24N 01E 06K	G1-23917C	70	.10	20	
Harlow	24N 01E 17	G1*00001S	70	.10	112	
Subtotal			2,085	3.00	1,720.4	
T24N, R02E						
North Perry Ave.	24N 02E 07M	G1*03781C	270	.39	432	Cl.1-60950M
North Perry Ave.	24N 02E 07D	G1*04139C	365	.53	432 (s) 137.6	Cl.1-60950M
North Perry Ave.	24N 02E 07M	G1-24717C	500	.72	640 (s)	Cl.1-60950M
Subtotal			1,135	1.64	569.6	
T25N, R01E						
South Keyport Hts.	25N 01E 01	G1-20017C	40	.06	32	Cl.2-81860W
Kitsap Co. PUD #1 (Keyport W.S.)	25N 01E 02K	G1-23792P	500	.72	560	Cl.1-38550J
Island Lake Water	25N 01E 03	G1-00145C	60	.09	22.4	Cl.1-36150W
Stafford	25N 01E 03K	G1-20836C	310	.45	200	
Silverdale W.D.	25N 01E 03M	G1-22992P	690	.99	1,104	Cl.1-793006
Island Lake Water	25N 01E 03P	G1-24314P	80	.12	92.6	Cl.1-36150W

TABLE C-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T25N, R01E continued						
Silverdale W.D.	25N 01E 03E	G1-24645C	1,600	2.30	1,792	Cl.1-793006
Barker (Forest Gr. Pk.)	25N 01E 04	G1-21095C	90	.13	14.5	Cl.2-259202
Clark	25N 01E 04R	G1-23618P	50	.07	4	
Dawn Park Water	25N 01E 05	G1-00654C	350	.50	57.5	Cl.1-181900
Olympic View Water	25N 01E 06M	G1-24235C	26	.04	13	Cl.2-63650E
Okerman (Littlewood Wtr. System)	25N 01E 07P	G1-23110C	8	.01	9	Cl.4-47560R
Vergeer	25N 01E 08Q	G1*08281C	20	.03	2	
Sanderson & Assoc.	25N 01E 08Q	G1-23483C	38	.05	19	
G&H Enterprises	25N 01E 08M	G1-23489P	60	.09	19	
Sanderson & Assoc.	25N 01E 08L	G1-24616C	60	.09	19	
Island Lake Bible	25N 01E 10	G1-20860C	50	.07	8	CU (Inst.) w/I-20 Cl.3t-361750
Silverdale WD #16	25N 01E 10N	G1-23004C	210	.30	336	Cl.1-793006
Silverdale WD #16	25N 01E 10D	G1-24644C	365	.52	448 (s)	Cl.1-793006
Rottler	25N 01E 11G	G1-24798P	13	.02	4	Cl.4-37451V
N. Perry Ave. W.D.	25N 01E 14Q	G1-23781C	500	.72	800 (s)	Cl.1-60950W
Hogan	25N 01E 15L	G1-20711C	30	.04	10	Cl.4-336255
Ross	25N 01E 16	G1*05436C	20	.03	32	
Silverdale WD #16	25N 01E 16R	G1-23399C	200	.29	320	Cl.1-793006
Silverdale WD #16	25N 01E 16J	G1-24646C	405	.58	560 (s)	Cl.1-793006
Kitsap School District 401	25N 01E 17K	G1*04287C	30	.04	25	CU w/I-5
Walker (Apex Airport)	25N 01E 18D	G1*10310C	70	.10	56	Cl.2-02685J
Apex Airpark	25N 01E 18D	G1-23137C	70(s)		56 (s)	CU (Inst.) w/I- Cl.2-02685J
Silverdale WD #16	25N 01E 19H	G1-23389C	188	.27	300	CU (Inst.) w/I- Cl.1-793006
Saenz	25N 01E 19K	G1-24448C	57	.08	10.8	
Geriets	25N 01E 19N	G1-24913C	40	.06	4.5	
Silverdale WD #16	25N 01E 20C	G1*07018C	350	.50	560 (s)	Cl.1-793006
Triplett	25N 01E 20E	G1-24553C	34	.05	4.5	
Bucklin Hill Water	25N 01E 22C	G1*05661C	8.3	.01	13.2	Cl.4-09030B
Silverdale WD #16	25N 01E 22F	G1-22194C	280	.40	112.9	Cl.1-793006

TABLE C-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T25N, R01E continued						
Bremerton	25N 01E 22J	G1-22933C	280	.40	448 (s)	C1.1-08200R
Bucklin Hill Water	25N 01E 22D	G1-23160C	20	.03	10.8	C1.4-09030B
Strand	25N 01E 24	G1*05246C	100	.14	9	
Bremerton	25N 01E 24D	G1-20682C	100	.14	12	C1.1-08200R
Golden	25N 01E 24M	G1-22305C	50	.07	10	C1.4-28385L
Smith (Joanne Lane Comm. College)	25N 01E 24M	G1-22817C	20	.03	6	C1.4-367748
Bremerton	25N 01E 25L	G1*06683C	250	.36	400 (s)	C1.1-08200R
N. Perry Ave. W.D.	25N 01E 25R	G1-24090C	125	.18	200 (s)	C1.1-60950M
Wittenfeld	25N 01E 28	G1-21148C	60	.09	3	CU (Inst.) w/I-2
Faith Fellowship	25N 01E 30D	G1-23507C	13	.02	1.8	C1.3t-40201W
Eldorado W.D.	25N 01E 31A	G1*10271C	100	.14	45 (s)	C1.2-227003
Eldorado W.D.	25N 01E 31A	G1-22105C	125	.18	51	C1.2-227003
Eldorado Hills Utilities	25N 01E 31G	G1-24455P	80	.12	69 (s)	C1.2-22750C
Eldorado Hills Utilities	25N 01E 31	G1-24456P	100	.14	69 (s)	C1.2-22750C
Eldorado Hills Utilities	25N 01E 31	G1-24457P	75	.11	69	C1.2-22750C
Bremerton	25N 01E 34J	G1-23367C	680	.98	1,088	C1.1-08200R
Bremerton	25N 01E 34H	G1-23718C	500	.72	800	C1.1-08200R
N. Perry Ave. W.D.	25N 01E 36R	G1-24718P	300	.43	384 (s)	C1.1-60950M
Subtotal			9,810.3	14.1	7,257.5	
T25N, R01W						
Johnston	25N 01W 12Q	G1-22894C	30	.04	7.2	
Jackson	25N 01W 12	G1-24260C	24	.03	1.5	
Berni/Torpey	25N 01W 12L	G1-24291C	30	.04	1.5	
PRP Co./Purvis	25N 01W 12K	G1-24315P	25	.04	13	
Harbor Water Co. (Verdan/Anderson)	25N 01W 13G	G1-21896C	30	.04	23.4	C1.2-91470N
Matheson	25N 01W 13C	G1-22376C	30	.04	16	C1.2-86115L
Smith	25N 01W 13R	G1-24854P	37	.05	4.5	
Subtotal			206	.28	67.1	

TABLE C-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T25N, R02E						
North Perry Ave.	25N 02E 19	G1-00589C	900	1.30	1,440	Cl.1-60950M
North Perry Ave.	25N 02E 19M	G1-23075C	400	.58	640	Cl.1-60950M
Deseret Park	25N 02E 30N	G1*04406C	<u>36</u>	<u>.05</u>	<u>50</u>	Cl.2-19050W
Subtotal			1,336	1.93	2,130	
T26N, R01E						
Mutual of Seattle	26N 01E 03H	G1-23729C	75	.11	10.5	
Tennesen (Vinland View Kitsap #1)	26N 01E 04B	G1-23071C	53	.08	32.4	Cl.4-91923K
Adams (Bela Vista) (Kitsap PUD #1)	26N 01E 05K	G1*06324C	120	.17	63	Cl.2-052456
Bela Vista Water System Kitsap PUD #1	26N 01E 05K	G1-21652C	150	.22	180	Cl.2-052456
Miller	26N 01E 09E	G1-23482C	30	.04	9	Cl.4-546829
Kaster	26N 01E 10N	G1*06618C	225	.32	45	
Kaster	26N 01E 10N	G1-00247C	225	.32	5.6	
Poulsbo	26N 01E 10N	G1-00643C	100	.14	160	Cl.1-691506
Sanderson & Assoc. (Poulsbo Heights)	26N 01E 10	G1-22724C	170	.24	45	Cl.2-691527
Ermence	26N 01E 15G	G1-22469C	20	.03	3	Cl.4-23861B
Young	26N 01E 21K	G1-22577C	35	.05	16	
Pugh	26N 01E 22E	G1-24091C	60	.09	5.4	Cl.4-133370
Hoover	26N 01E 26	G1-20828C	50	.07	3.3	Cl.4-34194V
Wali	26N 01E 28P	G1*09434C	25	.04	10	
Hinckley	26N 01E 33M	G1*06971C	10	.01	16	
Odyssey Group	26N 01E 33D	G1-23518C	25	.04	12.5	
Christmas	26N 01E 33N	G1-23796C	60	.09	12	
Tyee Well Drilling	26N 01E 33N	G1-24464C	26	.04	2	
Keyport Water Work	26N 01E 36	G1*09518C	35	.05	28	Cl.1-38550J
Kitsap Co. PUD #1 (Keyport)	26N 01E 36	G1-22416C	<u>250</u>	<u>.36</u>	<u>270</u>	Cl.1-38550J
Subtotal			1,744	2.51	900.7	

TABLE C-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T26N, R01W						
Olympic Circle Water	26N 01W 25G	G1-00340C	55	.08	17.9	Cl.2-63478U
Old Bangor W.D. #19	26N 01W 25G	G1-23164C	<u>150</u>	<u>.22</u>	<u>20.7</u>	Cl.2-04184H
Subtotal			205	.30	38.6	
T27N, R01E						
Wash. State Parks & Recreation (Kitsap Mem.)	27N 01E 22	G1*08099C	30	.04	20	Cl.1t-SP345K
Francklyn	27N 01E 23M	G1-24527C	46	.07	3	Cl.4-253396
Dillon	27N 01E 27	G1*07351C	20	.03	32	
Tamsen, Inc.	27N 01E 27F	G1*10372C	90	.13	60	
Kitsap Co. PUD #1 (Edgewater Est.)	27N 01E 27H	G1-24040P	500	.72	400	Cl.1-224207
Edgewater Estates Water	27N 01E 28	G1-21813C	20	.03	6	Cl.1-224207
Redman	27N 01E 33	G1*05536C	10	.01	16	Cl.4-129598
Guice	27N 01E 34R	G1-21367C	15	.02	4	CU (Inst.) w/S & I-7.5
Gresham	27N 01E 34P	G1-24714P	<u>59</u>	<u>.08</u>	<u>4.5</u>	Cl.4-31566E
Subtotal			790	1.13	545.5	
TOTALS			<u>17,311.3</u>	<u>24.89</u>	<u>13,229.4</u>	

Footnotes:

- (1) Public water supply includes all water rights recorded with a use designation of "domestic multiple" or "domestic municipal" based on Ecology water right printout dated July 11, 1988.
- (2) Under Source I.D. column, the entry is generally the original water right holder. The parenthetical entry denotes the public water supply entity from DSHS records.
- (3) (s) = Supplemental rights are not included in subtotal or totals.

Footnotes continued:

- (4) Under Comments, the class of public supply system and DSHS water facility inventory number is shown; also, CU - Common Usage (i.e. water right quantities are not broken down by use category; and CU (Inst.) - Common Usage (Instantaneous) (i.e., the instantaneous rate of withdrawal is not broken down by use category).

TABLE C-6 continued

ALL OTHER RECORDED GROUNDWATER RIGHTS

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T24N, R01W							
Hubert	24N 01W 01	G1-21818C	D	25	.04	2	CU (Inst.)
			<u>I-10</u>	<u>25</u>	<u>.04</u>	<u>20</u>	
Subtotal			I-10	25	.04	22	
T24N, R01E							
Davis	24N 01E 07J	G1-00051C	I-3	30	.04	6 (s)	
Skirving	24N 01E 20B	G1-00400C	<u>C&I</u>	<u>300</u>	<u>.43</u>	<u>36</u>	
Subtotal			I-3	330	.47	36	
T25N, R01W							
Keen	24N 01W 01	G1-00097C	D	25	.04	1	CU (Inst.)
			<u>I-2.5</u>	<u>25</u>	<u>.04</u>	<u>5</u>	
Subtotal			I-2.5	25	.04	6	
T25N, R01E							
Harrison	25N 01E 01D	G1*03631C	D	20	.03	5.6	
Rask	25N 01E 02D	G1-00157C	D	10	.01	1	
Kuehl	25N 01E 03J	G1-22435C	D	30	.04	1	CU (Inst.)
			I-2			4	
Baughman	25N 01E 07J	G1-20357C	D	15	.02	2	CU (Inst.)
			R&B			4	
			I-9			18	
Bikfasy	25N 01E 08J	G1-00392C	D	50	.07	1.25	CU (Inst.)
			S			.25	
			I-3			7.5	
Leahy	25N 01E 09J	G1*10022C	D	10	.01	1	
Crowder	25N 01E 09B	G1-22101P	FP	30	.04		CU (Inst.)
			R&B				

TABLE C-6 continued

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T25N, R01E continued							
Crowder	25N 01E 09B	G1-22102C	FP R&B	20	.07		CU (Inst.)
Island Lake Bible Holt	25N 01E 10	G1-20860C	I-20			48	CU (Inst.) w/DM
	25N 01E 11Q	G1*07877C	D I-20	50	.07	1 40	CU (Inst.)
Burgess Wester	25N 01E 12M	G1-00246C	D	5	.01	1	
	25N 01E 13	G1*07769C	D I-.75	7	.01	1 1.5	CU (Inst.)
Reddick Allpress	25N 01E 14E	G1*06078C	I-15	150	.22	30	
	25N 01E 14N	G1*07772C	D I-50	90	.13	1 72	CU (Inst.)
Minder	25N 01E 14Q	G1-00016C	D	100	.14	1	(s) CU (Inst.)
			S			2	(s)
			I-30			75	(s)
Iles	25N 01E 14E	G1-24327G	D	20	.03	1	CU (Inst.)
			S			.5	
			I-3			6	
Wood	25N 01E 14E	G1-24382C	D	14	.02	1	CU (Inst.)
			S			.5	
			I-3			6	
Christian	25N 01E 15R	G1-21316C	D	22	.03	2	CU (Inst.)
			S			2	
			I-2			4	
Steen	25N 01E 15J	G1-21318C	D	10	.01	2	CU
			I-.75				
Kitsap School District 401	25N 01E 17K	G1*04287C	I-5				CU w/DM
Kenyon Sand and Gravel	25N 01E 19F	G1-22442C	C&I	100	.14	10	
	25N 01E 18D	G1*10310C	I-			2	CU (Inst.) w/DM
Walker	25N 01E 18D	G1-23137C	I-			2	(s) CU (Inst.) w/DM
Apex Airpark Harris	25N 01E 19B	G1-23984B	S I-4	15	.02	.10 4	CU (Inst.)
	25N 01E 20L	G1-20709C	I-1	28	.04	2	
Nordby Lundgren	25N 01E 21	G1*03389C	D I-1	25	.04	6.6	CU

TABLE C-6 continued

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T25N, R01E continued							
Hallia	25N 01E 21	G1*03401C	D	20	.03	8.5	CU
Blay	25N 01E 21	G1*06916C	I-1	50	.07	13.6	CU
			S				
Jones	25N 01E 21	G1*07238C	I-4	20	.03	5.6	
			D				
Hill	25N 01E 21	G1-00088C	C&I	40	.06	5	
Beck	25N 01E 22E	G1-21559C	D	20	.03	1	CU (Inst.)
			I-2			3	
Bumpass	25N 01E 23A	G1-20267C	D	8	.01	1	CU (Inst.)
			I-1			2	
Michelsen	25N 01E 25N	G1*05327C	D	10	.01	16	
			I-15			2	
Crane	25N 01E 25M	G1*05378C	D	50	.07	30	CU
			I-15			2	
Harris	25N 01E 25B	G1-20163C	D	15	.02	2	CU (Inst.)
			C&I			2	
Jones	25N 01E 26	G1*06773C	I-5	100	.14	10	CU
			D			65.6	
Wittenfeld	25N 01E 28	G1-21148C	I-30	50	.07	4	CU w/DM
			I-2			10	
Kint	25N 01E 28	G1*01340C	D	50	.07	10	CU
			I-5				
Wash. State DNR	25N 01E 36B	G1-00358C	I-100	400	.58	217	
			D			4	
Missal	25N 01E 36G	G1-22646C	<u>D</u>	<u>4</u>	<u>.01</u>	<u>2</u>	
Subtotal			334.5	1,608	2.29	689.1	
T26N, R01W							
Bondy	26N 01W 36	G1*05660C	D	10	.01	7.6	CU
Subtotal			I-1	10	.01	7.6	
			I-1				

TABLE C-6 continued

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T26N, R01E							
Winmar Co.	26N 01E 09Q	G1-23472P	D	22	.03	24	
Strandskov	26N 01E 21G	G1-20696C	D	25	.04	1	CU (Inst.)
			S			1	
			I-10			20	
Wilson	26N 01E27	G1*05678C	D	25	.04	8.6	CU
			I-1.5				
Peterson	26N 01E 27L	G1-20943C	D	25	.04	2	CU
			I-1				
Jenkins	26N 01E 28H	G1*05921C	D	8	.01	1	
Knutsen	26N 01E 32R	G1-21193C	D	3.4	.00	1	
Parker	26N 01E 33R	G1-20192C	D	8	.01	1	CU (Inst.)
			I-1			2	
Pioneer Builders	26N 01E 33E	G1-24601P	D	38	.05	6	
Waali	26N 01E 34F	G1*07602C	D	10	.01	1	
Wasell	26N 01E 35E	G1-21539C	D	60	.09	8	CU
			I-3.5				
Larm	26N 01E 35	G1*10072C	D	40	.06	1	CU (Inst.)
			I-5			10	
Subtotal			22	264.4	.38	87.6	
T27N, R01E							
Dupee	27N 01E 26E	G1-23223G	D	10	.01	1	
			S	10	.01	1	
			I-10	100	.14	20	
Lanning	27N 01E 27K	G1*03485C	C&I	200			
White	27N 01E 28Q	G1-24420P	D	15	.02	1	
Smith	27N 01E 33	G1*05892C	D	20	.03	5.6	CU
			I-.5				
Gregersen	27N 01E 33B	G1*09888C	D	14	.02	1	
Subtotal			I-10.5	369	.23	29.6	
TOTALS			383.5	2,631.4	3.46	877.9	
GRAND TOTALS				19,942.7	28.35	14,207.3	

Footnotes:

- (1) Use abbreviations are as follows: D - Domestic Supply; I-_____ - Irrigation-(number of acres); C&I - Commercial and/or Industrial; R&B - Recreational and/or Beautification; WP - Wildlife Propagation; FP - Fish Propagation; and S - Stockwatering.
- (2) (s) = Supplemental rights are not included in subtotal or totals.
- (3) CU - Common Usage (i.e. water right quantities are not broken down by use category); CU (Inst.) - Common Usage (Instantaneous) (i.e. the instantaneous rate of withdrawal is not broken down by use category); and CU w/DM or CU (Inst.) w/DM means common usage with domestic multiple or domestic municipal entry in the public water supply table.



Map Unit	Unit
1 Bedrock	Characteristics
2 High Slope	Volcanic and Sedimentary Rocks
3 Lacustrine	Steep Topography/Complex Geology
4 Peat	Lake and Flood Plain Sediments
5 "Till"	Saturated Organic Sediments
6 Sands	Poorly Sorted Glacial Deposits
7 Gravels	Stratified Sand Deposits
8 Undifferentiated	Gravels With Sand
	Variable Undifferentiated Glacial Deposits

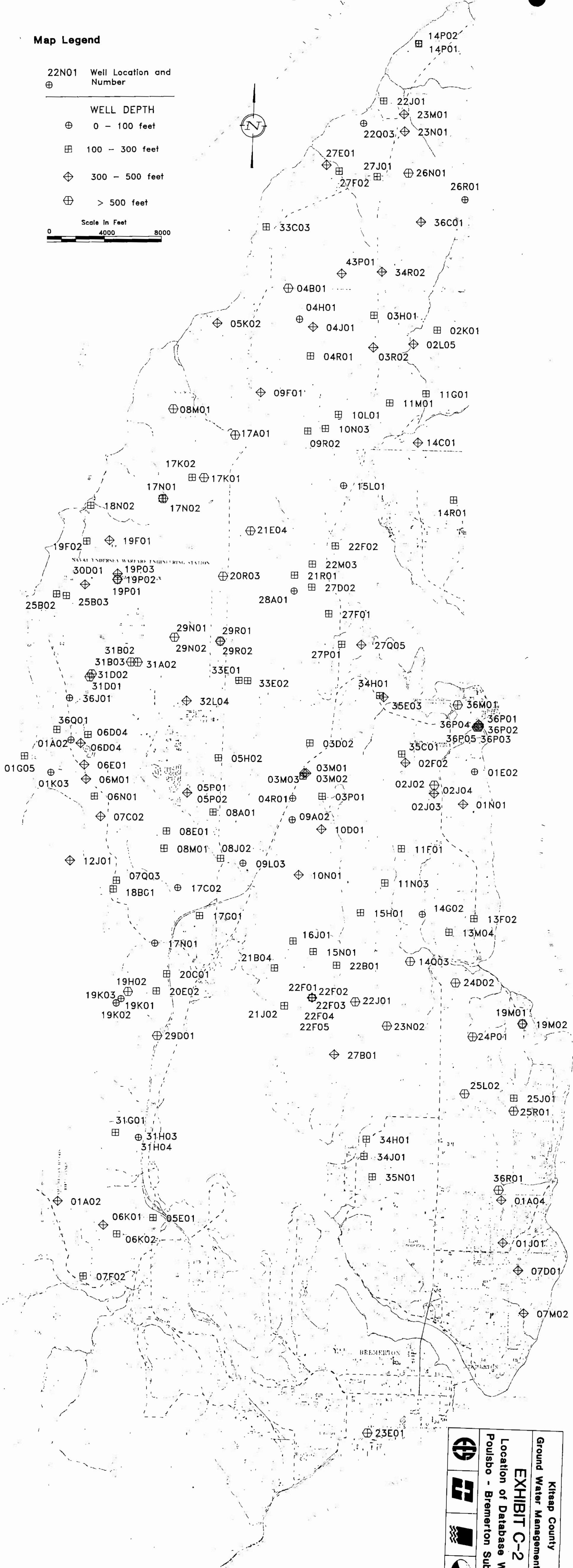
Kitsap County
Ground Water Management Plan
EXHIBIT C-1
Geologic Characteristics Map
Poulsbo-Bremerton

(Based on Deeter, 1979)
 Note: Refer to Volume I, Section II 4 B for descriptions of units
 Scale in Feet
 4000 8000

Map Legend

- 22N01 Well Location and Number
⊕
-
- WELL DEPTH
- ⊕ 0 - 100 feet
 - ⊞ 100 - 300 feet
 - ⊠ 300 - 500 feet
 - ⊡ > 500 feet

Scale in Feet
0 4000 8000



	Kitsap County
	Ground Water Management Plan
	EXHIBIT C-2
	Location of Database Wells
	Poulsbo - Bremerton Subarea

Map Legend

○ 24N01 Well Location and Local Well Number

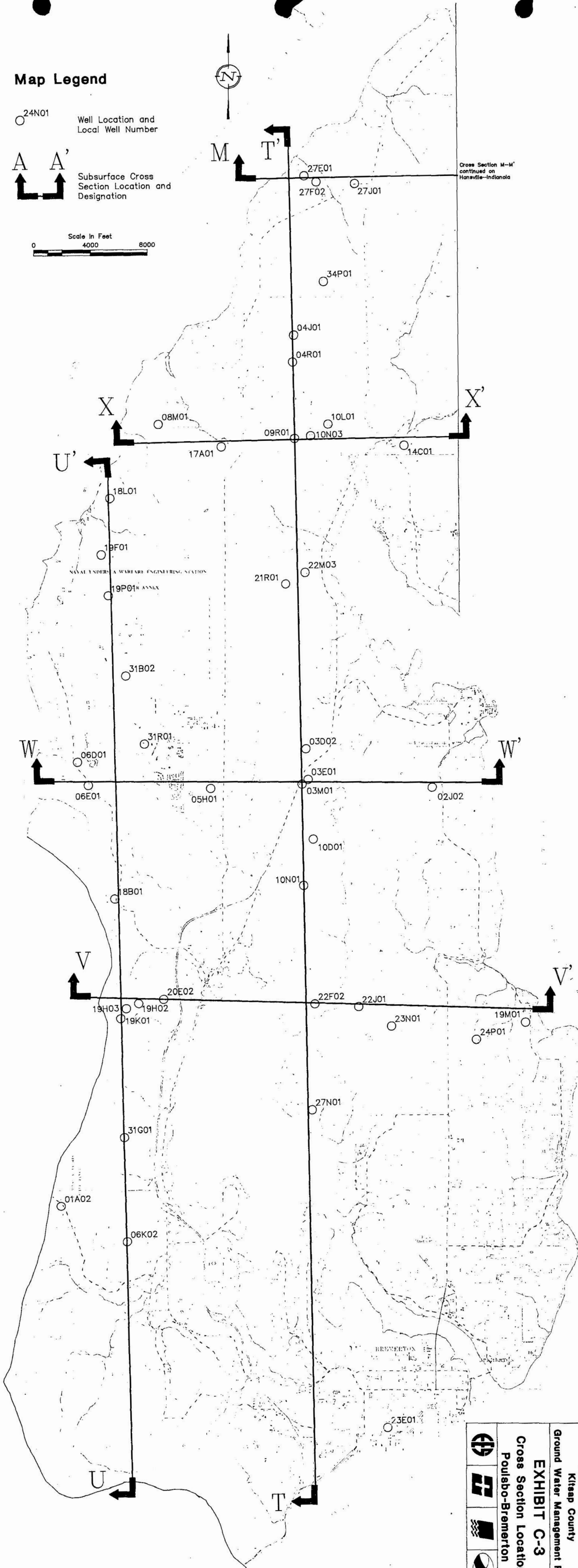
A A' Subsurface Cross Section Location and Designation

Scale in Feet
0 4000 8000



M T'

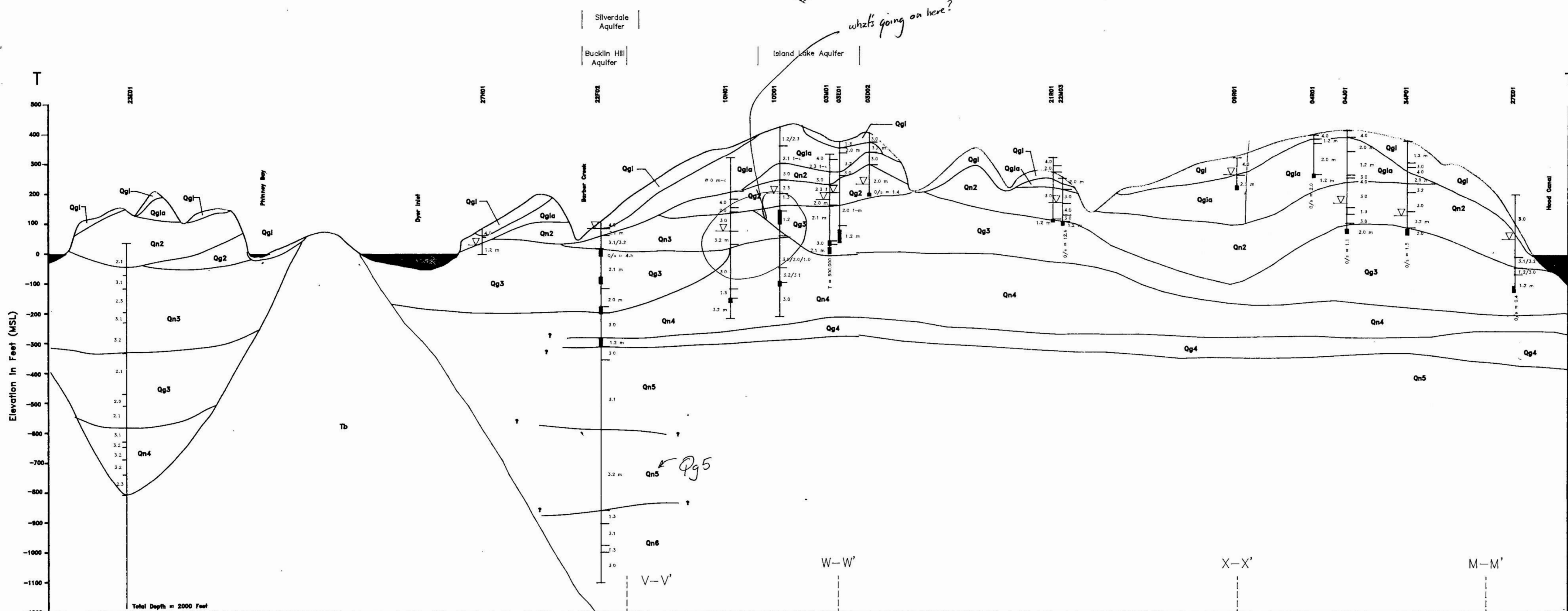
Cross Section M-M' continued on Hanaville-Indiana



NAVAL UNDERSEA WARFARE ENGINEERING STATION

BREMERTON

<p>Kitapo County Ground Water Management Plan EXHIBIT C-3 Cross Section Locations Poulsbo-Bremerton</p>			



CROSS SECTION LEGEND

--	--

LITHOLOGY

1.0	GRAVEL
1.2	Sandy GRAVEL (or GRAVEL and SAND)
1.3	SILTY SAND and GRAVEL
2.0	SAND
2.1	Coarsely SAND
2.3	SILTY SAND
3.0	SILT/CLAY
3.1	Coarsely SILT/CLAY
3.2	Sandy SILT/CLAY
4.0	GRAVEL with SAND, SILT/clay Matrix (as TII)
5.0	Bedrock

f.m.c. Grain Size of Sand Fraction (fine, medium, coarse)
T Transmissivity (gpd/ft) calculated from controlled pumping tests
o/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records

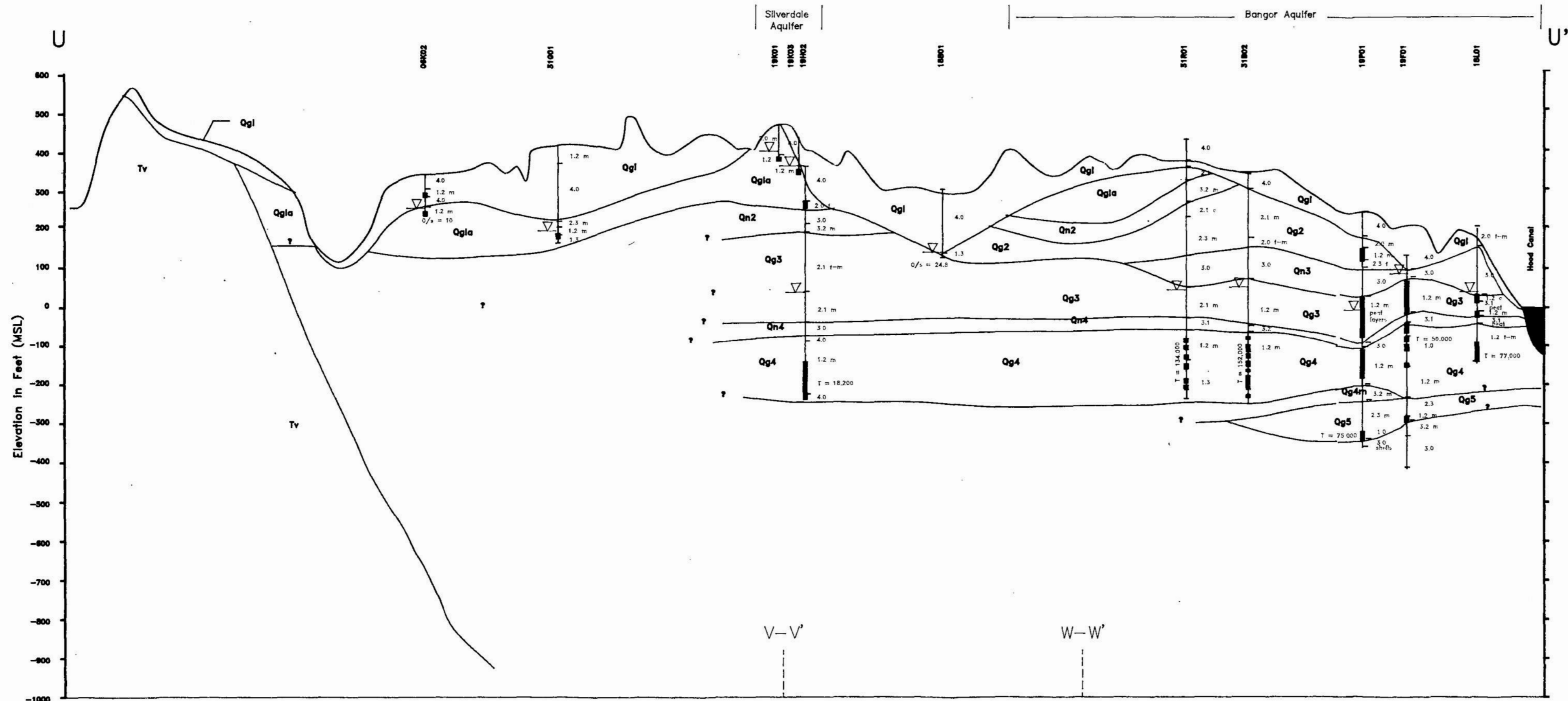
Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

Horizontal Scale in Feet
0 4000 8000

Vertical Scale in Feet
0 200 400
Vertical Exaggeration x 20

Kitsap County Groundwater Management Plan

EXHIBIT C-4 HYDROGEOLOGIC CROSS SECTION T-T'



CROSS SECTION LEGEND

	Local Well Number	Aquifer Zone and Name
	Static Water Level Elev.	G-G' Cross Section Intersect
	Lithologic Interval and Identifier	
	Perforated or Screened Interval	

LITHOLOGY

- 1.0 GRAVEL
- 1.2 Sandy GRAVEL (or GRAVEL and SAND)
- 1.3 Silty SAND and GRAVEL
- 2.0 SAND
- 2.1 Gravelly SAND
- 2.3 Silty SAND
- 3.0 SILT/CLAY
- 3.1 Gravelly SILT/CLAY
- 3.2 Sandy SILT/CLAY
- 4.0 GRAVEL with SAND, SILT/Clay Matrix (as TR)
- 5.0 Bedrock

L_{m,c} Grain Size of Sand Fraction (fine, medium, coarse)
T Transmissivity (gp/ft) calculated from controlled pumping tests
Q/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records

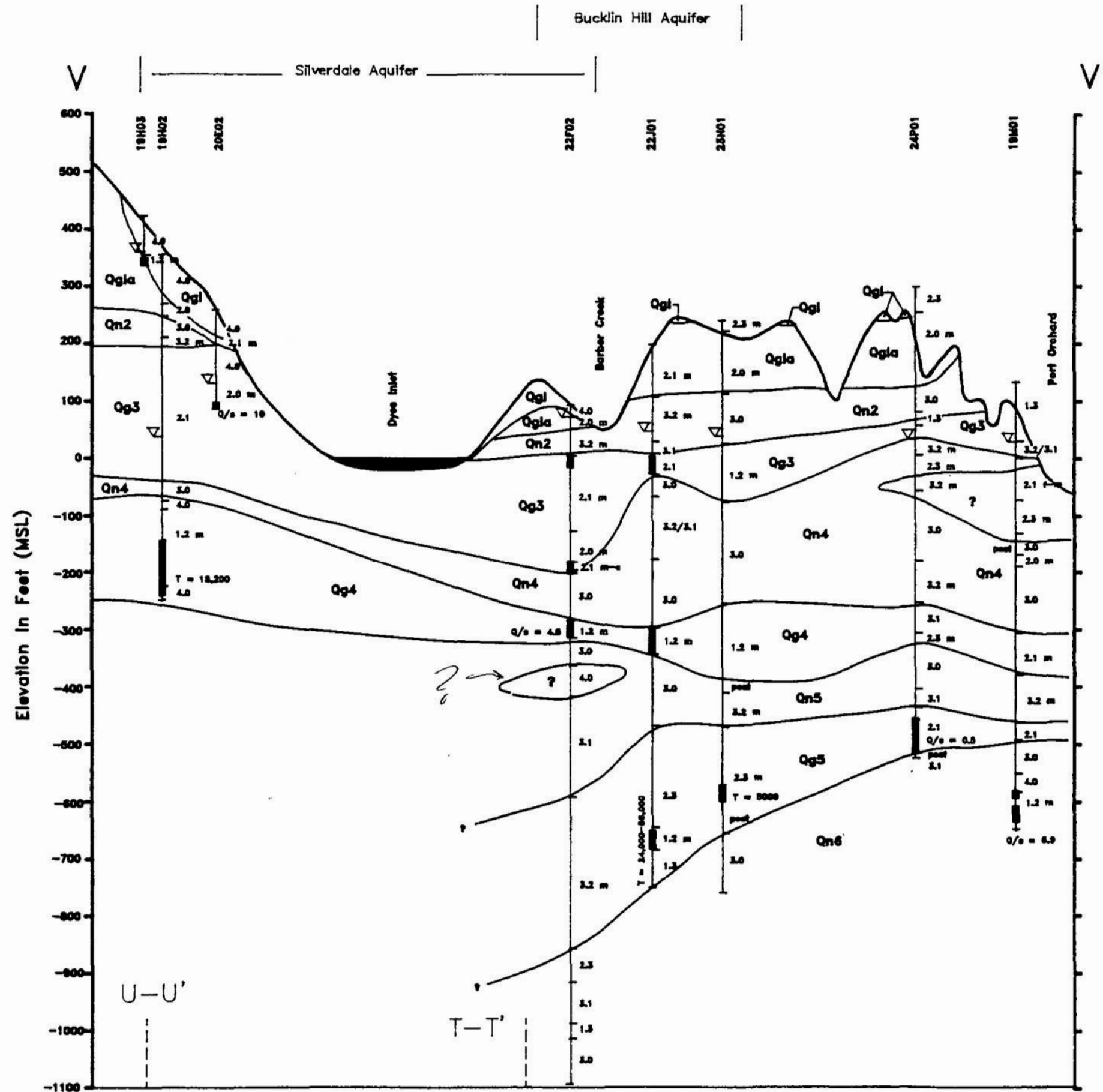
Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

Horizontal Scale in Feet
 0 4000 8000

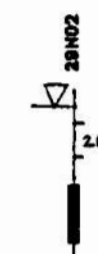
Vertical Scale in Feet
 0 200 400
 Vertical Exaggeration x 20

Kitsap County
 Groundwater Management Plan

EXHIBIT C-5
 HYDROGEOLOGIC
 CROSS SECTION U-U'



CROSS SECTION LEGEND



Load Well Number

Stable Water Level Elev.

2.0 m Lithologic Interval and Identifier

Perforated or Screened Interval

Aquifer Zone and Name

G-G'

Cross Section Interval

LITHOLOGY

- 1.0 GRAVEL
- 1.2 Sandy GRAVEL (or GRAVEL and SAND)
- 1.3 Silty SAND and GRAVEL
- 2.0 SAND
- 2.1 Gravelly SAND
- 2.3 Silty SAND
- 3.0 SILT/CLAY
- 3.1 Gravelly SILT/CLAY
- 3.2 Sandy SILT/CLAY
- 4.0 GRAVEL with SAND, Silty/Clay Matrix (as TBE)
- 5.0 Bedrock

f.m.c. Grain Size of Sand Fraction (fine, medium, coarse)


T Transmissivity (gd/ft) calculated from controlled pumping tests

Q/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records

Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g. Qg1, Qn1)

Horizontal Scale in Feet

0 4000 8000



Vertical Scale in Feet





0 200 400

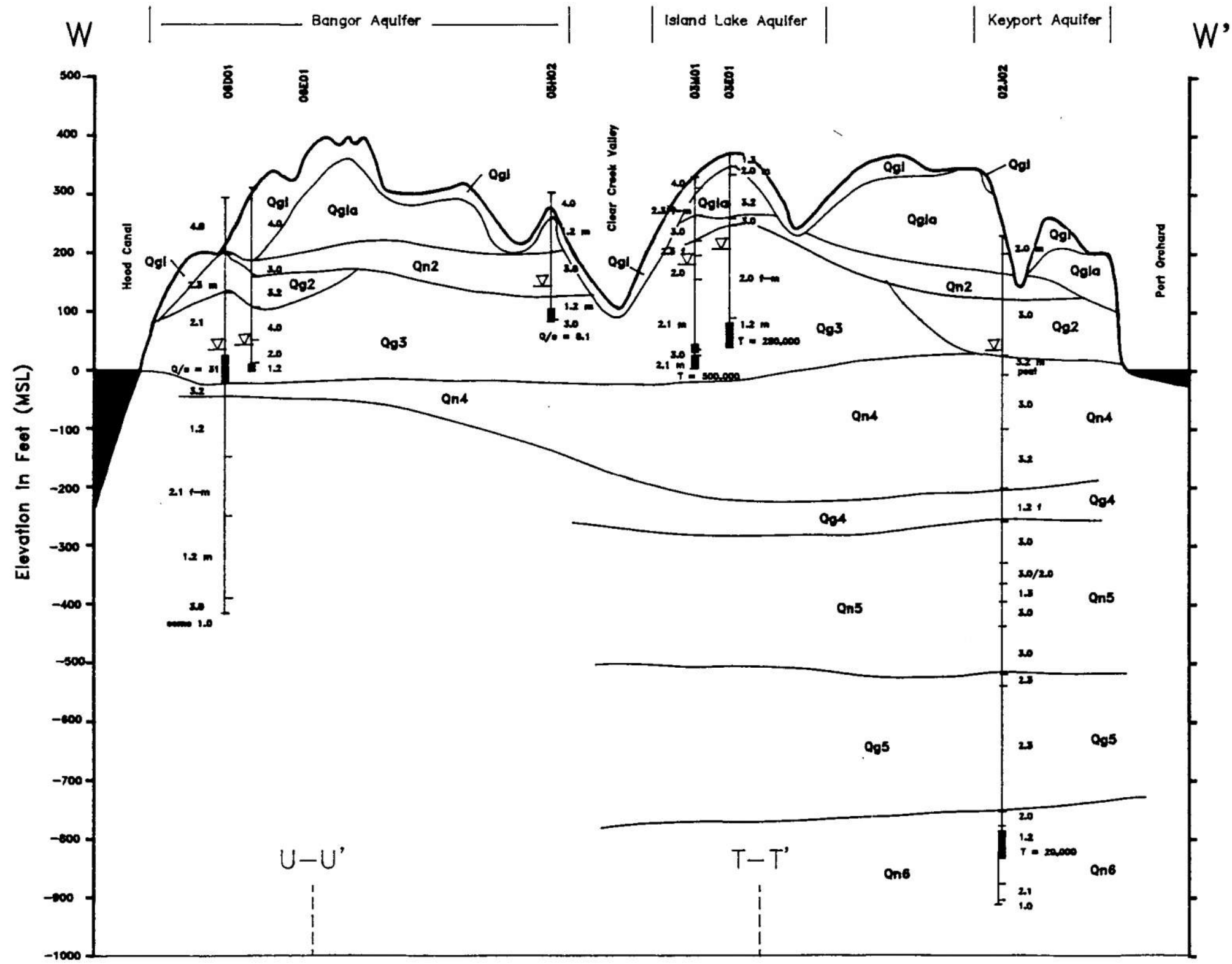
Vertical Exaggeration x 20

Kitsap County
Groundwater Management Plan

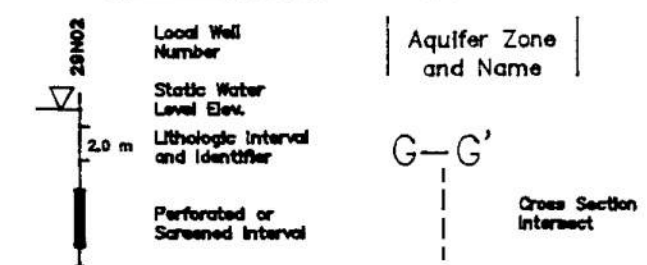
EXHIBIT C-6

HYDROGEOLOGIC CROSS SECTION V-V'

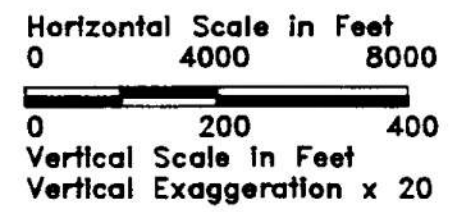


CROSS SECTION LEGEND



LITHOLOGY

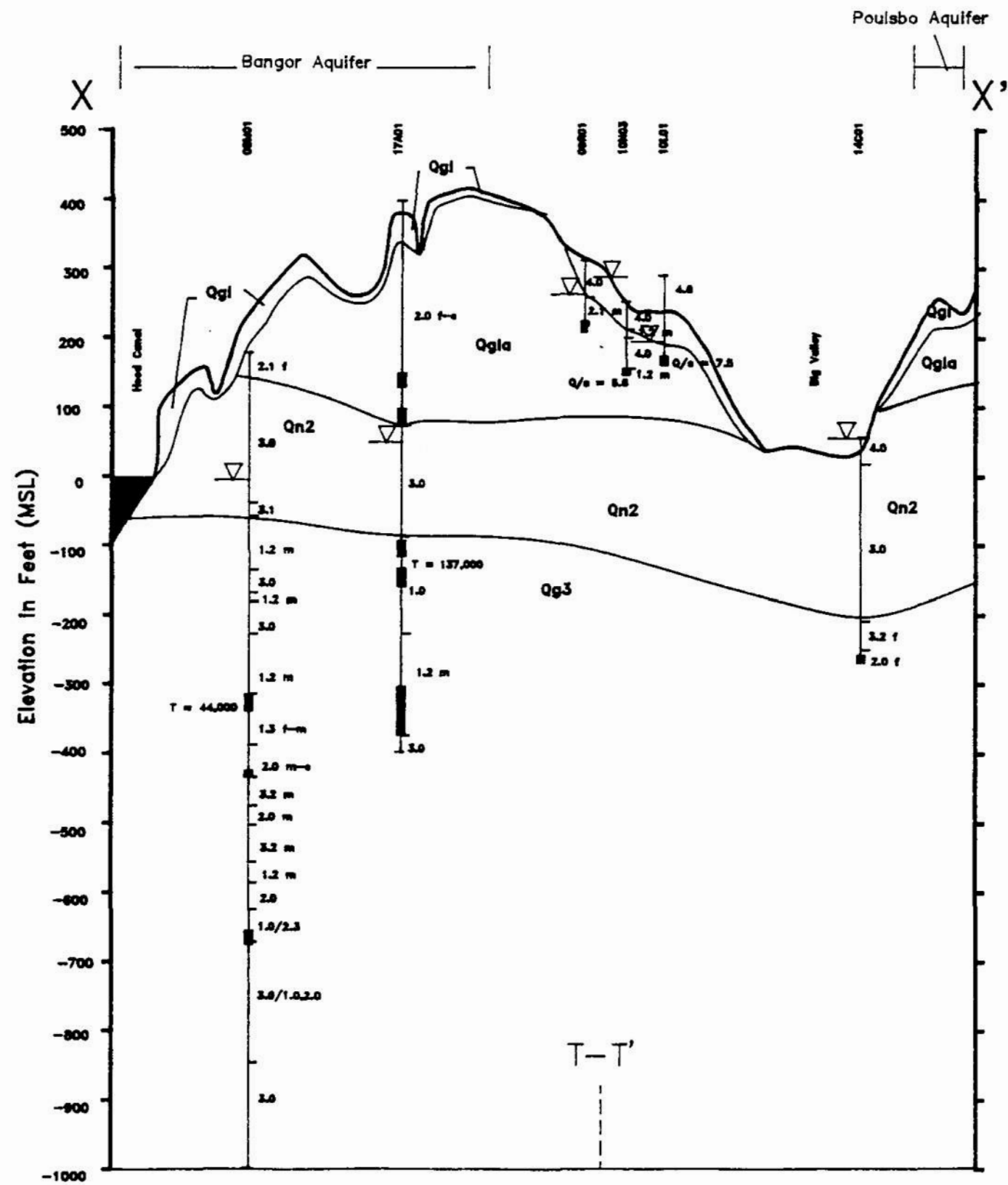
- 1.0 GRAVEL
 - 1.2 Sandy GRAVEL (or GRAVEL and SAND)
 - 1.3 Silty SAND and GRAVEL
 - 2.0 SAND
 - 2.1 Gravelly SAND
 - 2.3 Silty SAND
 - 3.0 SILT/CLAY
 - 3.1 Gravelly SILT/CLAY
 - 3.2 Sandy SILT/CLAY
 - 4.0 GRAVEL with SAND, Silty/Clay Matrix (as Tff)
 - 5.0 Bedrock
- f.m.c Grain Size of Sand Fraction (fine, medium, coarse)
 T Transmissivity (cpd/ft) calculated from controlled pumping tests
 Q/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records
- Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g. Qg1, Qn1)



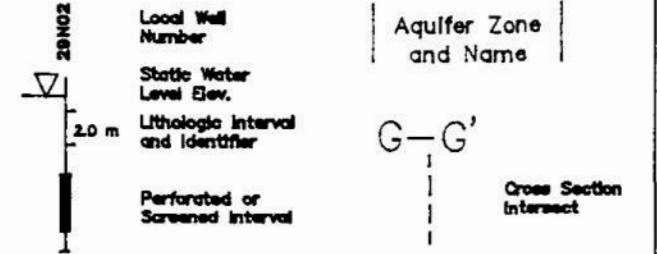
Kitsap County
Groundwater Management Plan

EXHIBIT C-7 HYDROGEOLOGIC CROSS SECTION W-W'



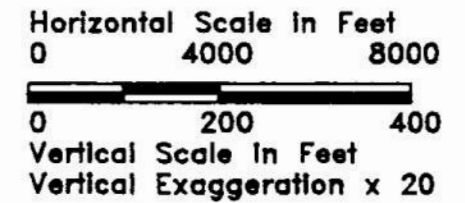


CROSS SECTION LEGEND



LITHOLOGY

- 1.0 GRAVEL
 - 1.2 Sandy GRAVEL (or GRAVEL and SAND)
 - 1.3 SILTY SAND and GRAVEL
 - 2.0 SAND
 - 2.1 Gravelly SAND
 - 2.3 SILTY SAND
 - 3.0 SILT/CLAY
 - 3.1 Gravelly SILT/CLAY
 - 3.2 Sandy SILT/CLAY
 - 4.0 GRAVEL with SAND, SILT/CLAY matrix (as TTB)
 - 5.0 Bedrock
- f₂₀₋₆₀* Grain Size of Sand Fraction (fine, medium, coarse)
- T* Transmissivity (gpd/ft) calculated from controlled pumping tests
- Q/s* Specific Capacity (gpm/ft of drawdown), usually from driller's records
- Note: Refer to Table 8-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)



Kitsap County
Groundwater Management Plan

EXHIBIT C-8 HYDROGEOLOGIC CROSS SECTION X-X'



Map Legend

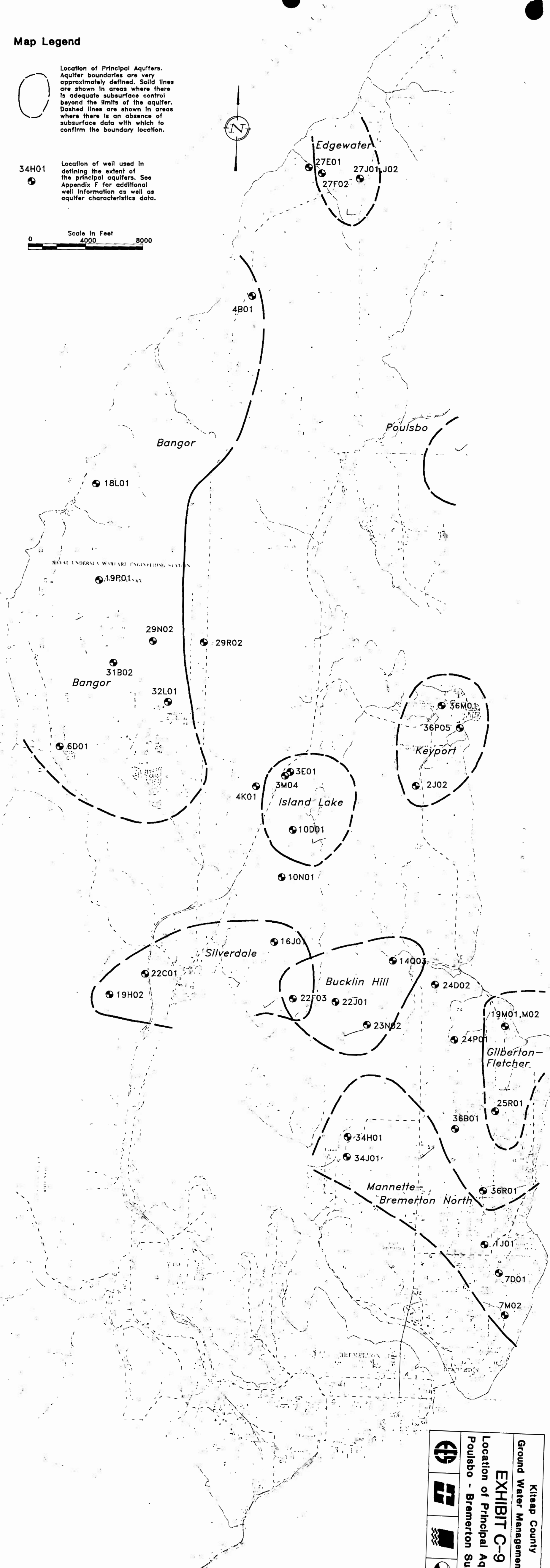
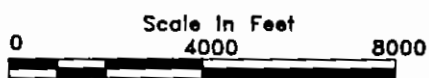


Location of Principal Aquifers. Aquifer boundaries are very approximately defined. Solid lines are shown in areas where there is adequate subsurface control beyond the limits of the aquifer. Dashed lines are shown in areas where there is an absence of subsurface data with which to confirm the boundary location.

34H01



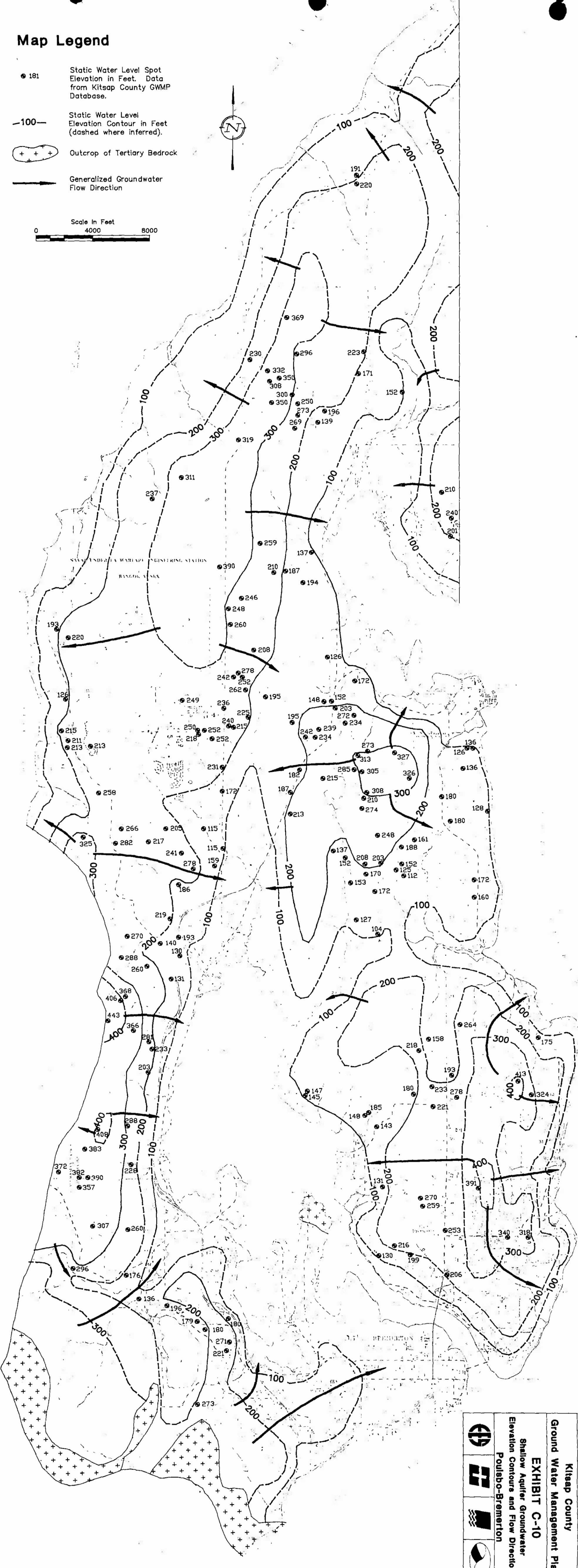
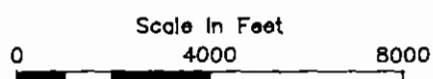
Location of well used in defining the extent of the principal aquifers. See Appendix F for additional well information as well as aquifer characteristics data.



Kitsap County			
Ground Water Management Plan			
EXHIBIT C-9			
Location of Principal Aquifers			
Poulsbo - Bremerton Subarea			


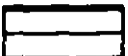
Map Legend

- 181 Static Water Level Spot Elevation in Feet. Data from Kitsap County GWMP Database.
- 100- Static Water Level Elevation Contour in Feet (dashed where inferred).
- + + + Outcrop of Tertiary Bedrock
- Generalized Groundwater Flow Direction



	Kitsap County
	Ground Water Management Plan
	EXHIBIT C-10
	Shallow Aquifer Groundwater
	Elevation Contours and Flow Directions
	Poulsbo-Bremerton

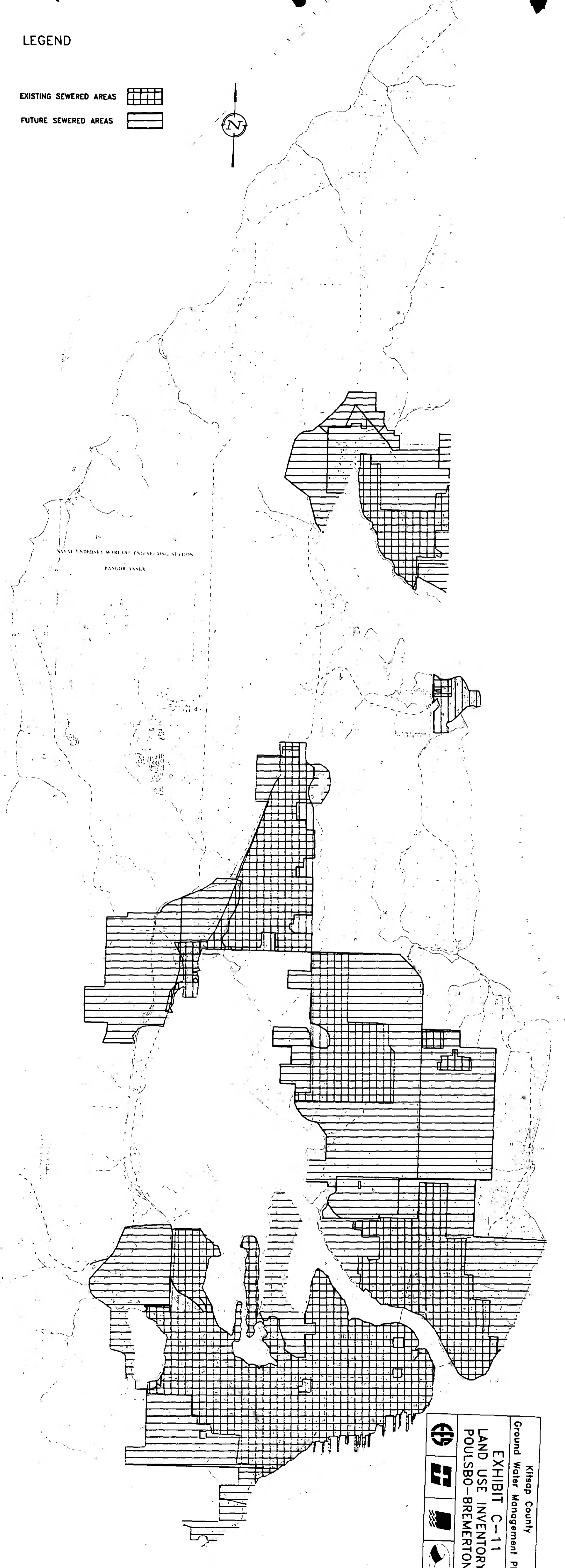
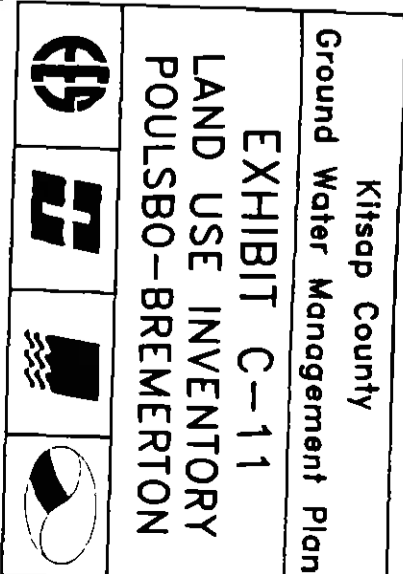
LEGEND

EXISTING SEWERED AREAS 
FUTURE SEWERED AREAS 



NAVAL UNDERSEA WARFARE ENGINEERING STATION
BANGOR ANNEX

Kitsap County
Ground Water Management Plan
EXHIBIT C-11
LAND USE INVENTORY
POULSBORO-BREMERTON



LEGEND

REGULATED HAZARDOUS WASTE FACILITIES



LANDFILLS



UNDERGROUND STORAGE TANKS

PORT GAMBLE
2 SITES
5 TANKS



ORDINANCE DISPOSAL SITE

POULSBO
33 SITES
106 TANKS

NAVAL UNDERSEA WARFARE ENGINEERING STATION

BANGOR
4 SITES
74 TANKS

KEYPORT LANDFILL
KEYPORT
3 SITES
16 TANKS

HOWERTON

SILVERDALE
16 SITES
41 TANKS

BREM-AIRE

BREMERTON

NAVAL SHIPYARD
2 SITES
72 TANKS

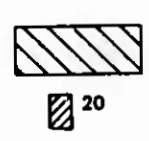
SKIRVING

BREMERTON
107 SITES
281 TANKS

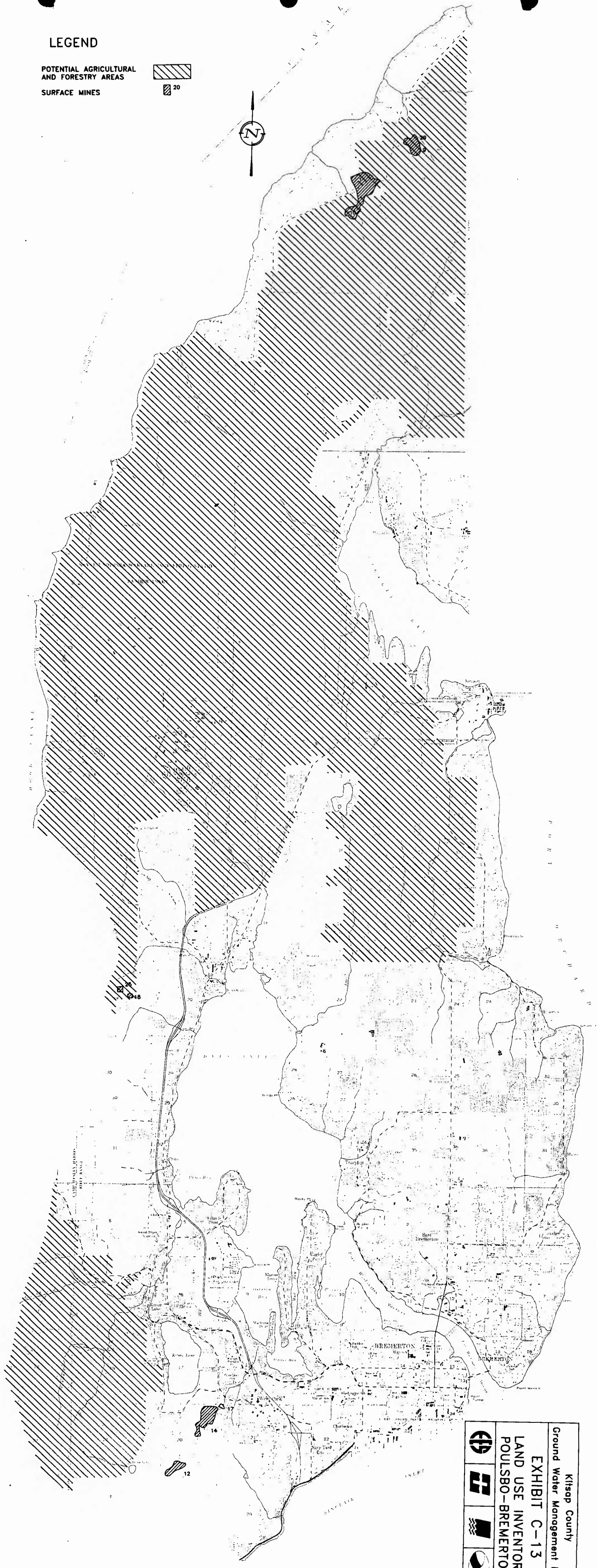
Kitsap County Ground Water Management Plan EXHIBIT C-12 LAND USE INVENTORY POULSBO-BREMERTON			

LEGEND

POTENTIAL AGRICULTURAL
AND FORESTRY AREAS



SURFACE MINES







Kitsap County			
Ground Water Management Plan			
EXHIBIT C-13			
LAND USE INVENTORY			
POULSBO-BREMERTON			

LEGEND

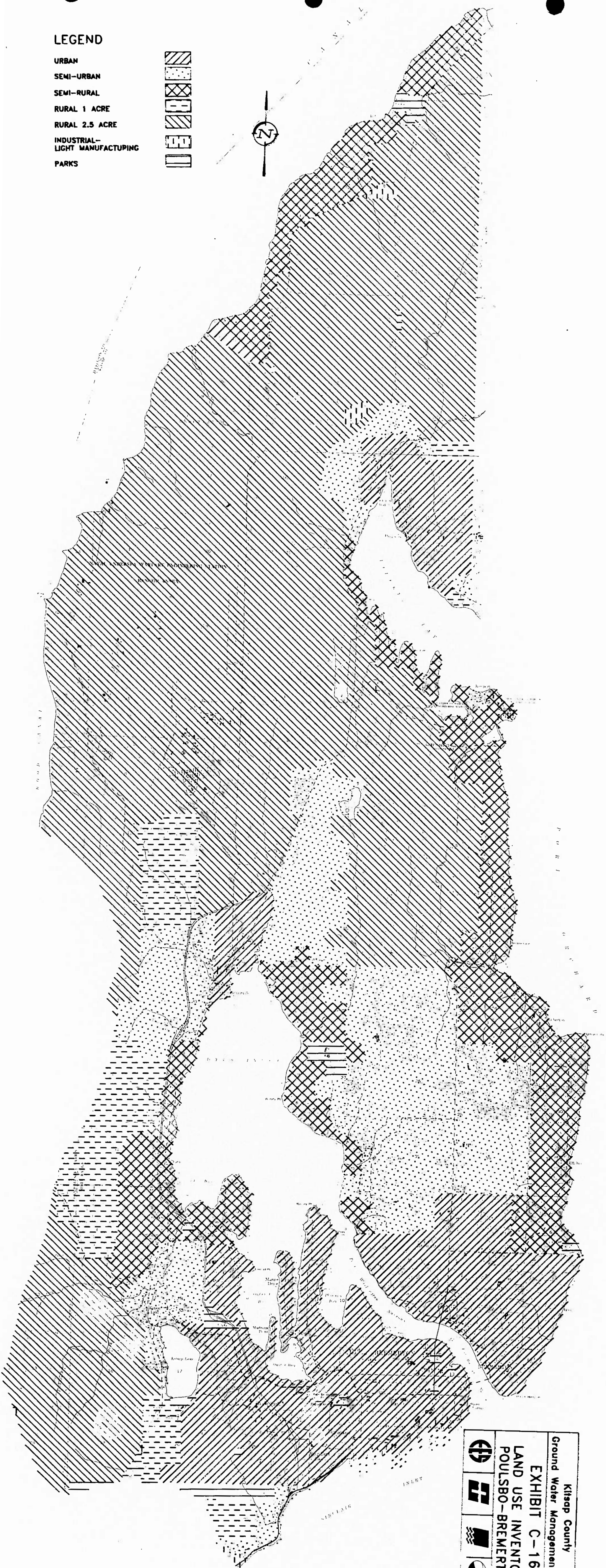
WETLANDS



Kitsap County			
Ground Water Management Plan			
EXHIBIT C-15			
LAND USE INVENTORY			
POULSBO-BREMERTON			
			

LEGEND

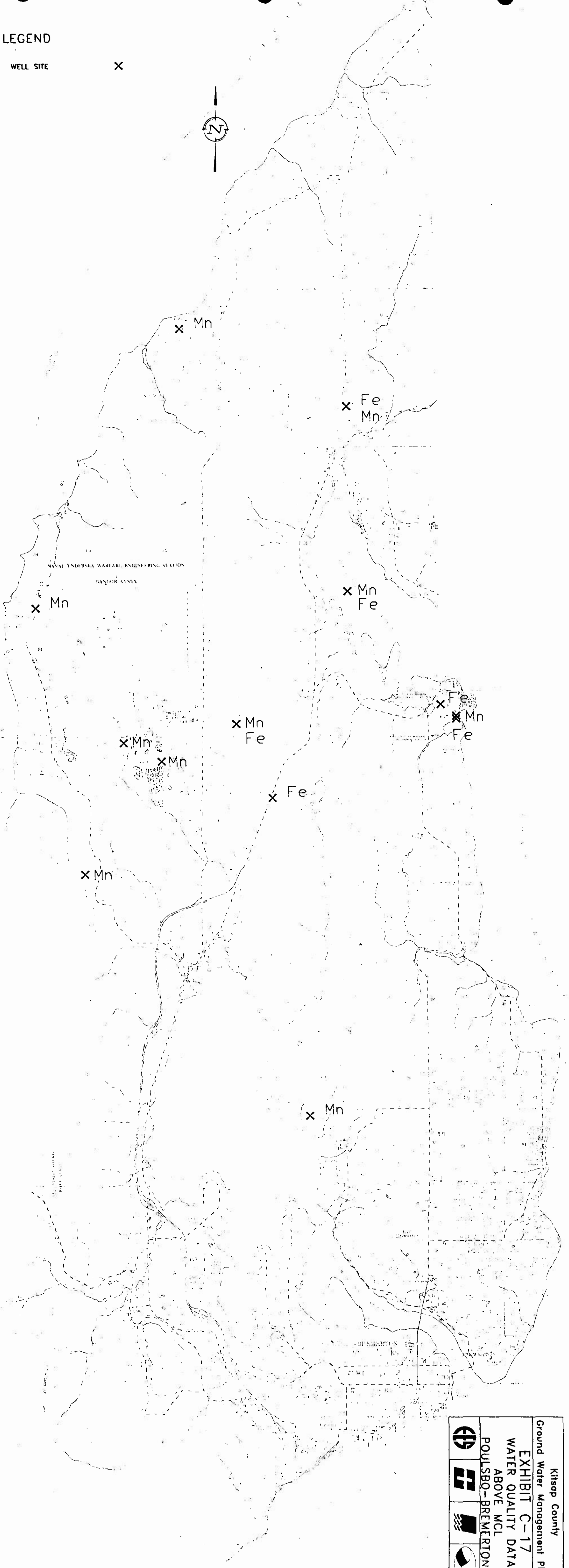
- URBAN
- SEMI-URBAN
- SEMI-RURAL
- RURAL 1 ACRE
- RURAL 2.5 ACRE
- INDUSTRIAL-LIGHT MANUFACTURING
- PARKS



Kitsap County			
Ground Water Management Plan			
EXHIBIT C-16			
LAND USE INVENTORY			
POULSBO-BREMERTON			

LEGEND

WELL SITE



NAVAL UNDERSEA WARFARE ENGINEERING STATION
BANGOR ANNEX

HEBERTON

Kitsap County			
Ground Water Management Plan			
EXHIBIT C-17			
WATER QUALITY DATA			
ABOVE MCL			
POULSBO-BREMERTON			