

WATER SYSTEM AUDIT

CITY OF REDMOND

PREPARED FOR INTERIM WATER GROUP

MARCH 25, 1999



INTRODUCTION

PURPOSE

As authorized by the Redmond City Council on October 6, 1998, the City of Redmond has submitted formal application for membership in the Cascade Water Alliance (CWA). This document has been prepared to augment information presented as part of the District's membership application process. It has been prepared to comply with Article V, Section 5.1 of the June 16, 1998 draft Cascade Water Alliance Interlocal Contract, which requires that a Water Supply Audit be prepared for each agency applying to become a member of the CWA.

UTILITY DESCRIPTION

The City of Redmond is a municipal corporation that owns and operates a public water system serving customers inside its water service area. Table 1 summarizes information pertinent to the City's water system, as presented in materials included with the City's application for membership in CWA and/or obtained from the Washington State Department of Health.

Table 1

**City of Redmond
General Water System Information**

Water System Name:	City of Redmond
Water System ID No.:	71650
Water System Classification:	Group A – Community Type
Type of Ownership:	Local Government
Owner No.:	4821
Address:	15670 N.E. 85 th Street, Redmond, 98073-9710
System Contact Person:	Scott Thomasson
Service Area Population :	42,230
Equivalent Residential Units:	23,340

Sources of Information: City of Redmond CWA Membership Application and Washington DOH

Figure 1, from the 1992 City of Redmond Water System Plan, shows the current city limits and the ultimate water service area. The ultimate service area is consistent

with the East King County Coordinated Water Supply Plan (EKC CWSP) adopted by King County in June 1990 and subsequently approved by the Redmond City Council.

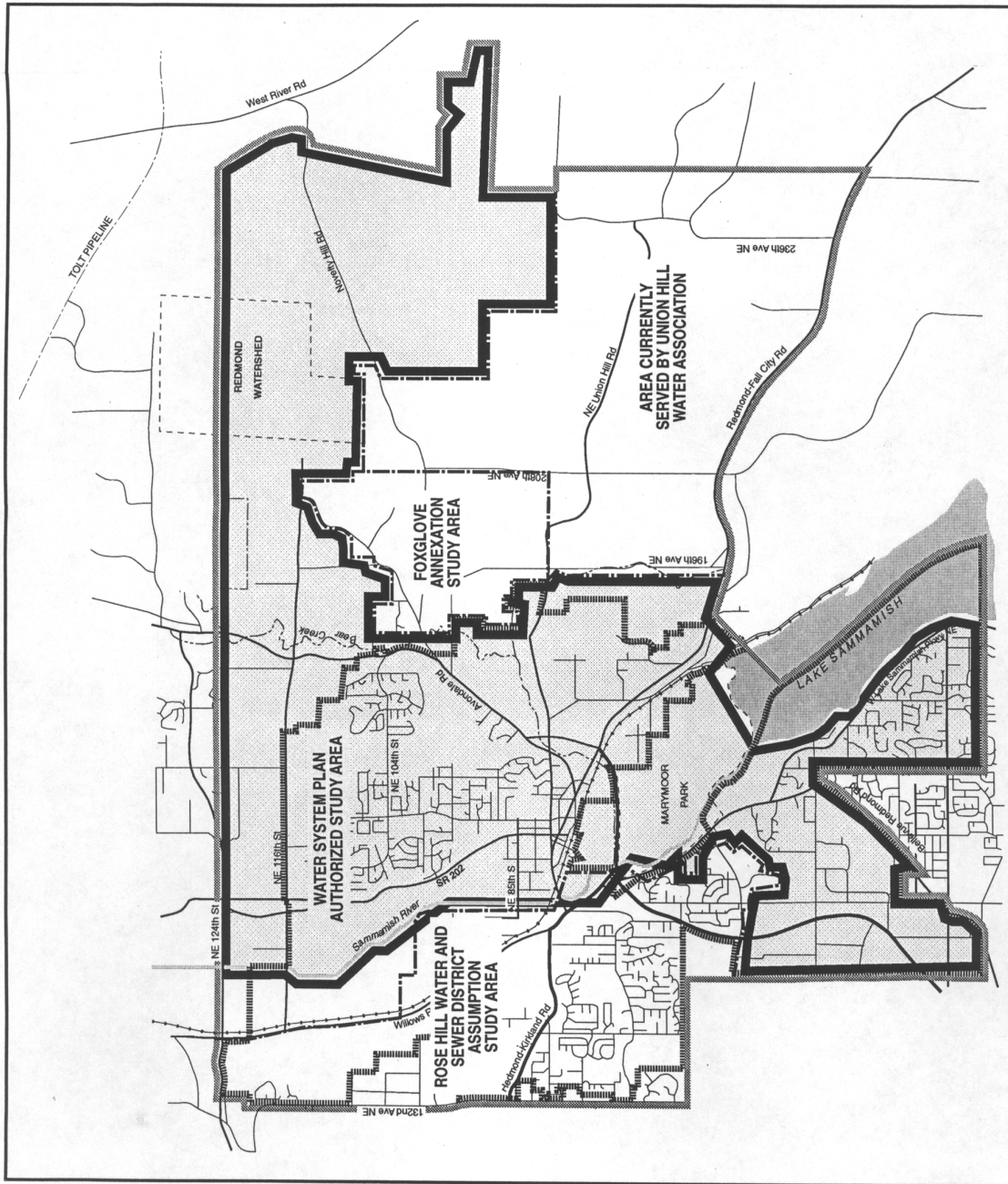


Figure 1
Water Service

SUPPLY AND DEMAND

SUPPLY SOURCES

The City of Redmond is supplied by wells and by purchases of water from the Cities of Seattle, Bellevue, and Kirkland. The City is divided into the following distinct areas; each served by different sources:

- Well service area – supplied primarily by four existing City wells with a wholesale connection to Seattle’s Tolt Pipeline No. 2 as a secondary source.
- Overlake area – supplied primarily by Seattle’s Tolt Eastside Supply Line (TESSL) through jointly owned and operated Redmond/Bellevue facilities. The City purchases water for Overlake area customers from Bellevue.
- Viewpoint area – supplied by metered connections to the City of Bellevue water system.
- Rose Hill area – supplied by Seattle’s Tolt Eastside Supply Line. The City purchases water for Rose Hill area customers from Kirkland.
- Redmond Ridge Urban Planned Development (UPD) – will be supplied by Seattle’s Tolt Pipeline No. 1 and Tolt Tie Line (service anticipated to begin in 1999).

DEMANDS

Tables 2 and 3 summarize supply and demand information provided by the City of Redmond as part of its CWA membership application packet. Table 2 converts meter distribution information into Cascade Equivalent Residential Units (CERUs), in accordance with methodology detailed in the June 16, 1998 draft Cascade Water Alliance Interlocal Contract.

Table 3 and Figure 2 show the average monthly supply and demand from 1995 through 1997. The wholesale sales listed in Table 3 include water supplied to the Union Hill Water Association to supplement the association’s own groundwater supply sources during periods of high demand.

Table 2
City of Redmond
CERU Information

Customer Class	No. of Living Units	No. of Meters	CERUs per Unit	CERUs
<i>Residential:</i>				
Single Family	9,112	1		9,112
Duplex		1		0
3+ Apt/Multi-family	10,444	0.64		6,684
			<i>Subtotal Residential</i>	15,796
<i>Commercial:</i>				
5/8" x 3/4" Meter		229	1	229
1" Meter		272	2.5	680
1.5" Meter		224	5	1,120
2" Meter		187	8	1,496
3" Meter		50	16	800
4" Meter		34	25	850
6" Meter ¹		4	50	200
8" Meter		1	80	80
10" Meter			115	0
12" Meter			160	0
			<i>Subtotal Commercial</i>	5,455
<i>Irrigation "</i>				
5/8" x 3/4" Meter		48	1	48
1" Meter		46	2.5	115
1.5" Meter		140	5	700
2" Meter		143	8	1,144
3" Meter		2	16	32
4" Meter		2	25	50
6" Meter			50	0
8" Meter			80	0
10" Meter			115	0
12" Meter			160	0
			<i>Subtotal Irrigation</i>	2,089
			Total CERUs	23,340

Table 3
CWA Audit Process
City of Redmond
Historical Supply and Demand Summary, mg

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Supply Sources	<----- Peak Season ----->												
<i>Wholesale Sources:</i>													
Kirkland													
1995	64	59	64	74	77	111	117	87	72	65	61	62	914
1996	50	54	55	47	70	84	110	118	69	60	56	63	837
1997	46	31	52	49	54	60	74	87	66	73	50	49	692
Average	53	48	57	57	67	85	100	98	69	66	56	58	814
Bellevue													
1995	18.3	19.6	19.8	19.8	30.4	41.7	54.6	43.7	39.0	31.9	19.2	21.7	360
1996	23.3	23.5	24.2	24.9	25.1	47.4	48.1	55.2	38.4	32.2	17.4	18.6	378
1997	22.0	20.7	19.8	26.4	21.6	34.2	32.2	58.0	48.6	34.1	21.6	25.4	365
Average	21.2	21.3	21.3	23.7	25.7	41.1	44.9	52.3	42.0	32.8	19.4	21.9	368
Seattle													
1995							20.4	34.5	12.8	0.1		0.0	68
1996					0.0		33.2	27.7	3.2				64
1997													
Average					0.0		17.9	20.7	5.3	0.0		0.0	44
<i>Independent Supplies:</i>													
1995	54.2	50.3	57.6	55.3	68.6	72.3	77.7	60.4	75.9	62.7	54.9	57.8	748
1996	44.7	42.2	47.5	44.7	46.3	67.4	59.4	49.6	54.2	49.4	44.1	45.9	595
1997	64.8	57.0	65.7	68.8	74.8	85.5	77.3	82.0	53.7	67.9	62.5	65.1	825
Average	55	50	57	56	63	75	71	64	61	60	54	56	723
Total Avg Source Production:	129	119	135	137	156	201	235	235	178	159	129	136	1948

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Water Demand:	<----- Peak Season ----->												
<i>Retail Sales:</i>													
1995	126	131	112	132	137	187	220	241	216	187	137	122	1947
1996	141	139	135	132	140	170	217	280	245	186	145	127	2056
1997	146	123	137	143	140	186	183	243	262	191	153	146	2054
Average	138	131	128	136	139	181	207	255	241	188	145	132	2019
<i>Wholesale Sales:</i>													
1995	0.0			0.0	0.0		2.9	9.4	0.3		0.0	0.0	13
1996			0.3	0.0		0.0	2.5	14.1	4.2	0.4	0.0	0.0	22
1997							5.1	2.1	13.1		0.0		20
Average	0		0	0	0	0	4	9	6	0	0	0	18
<i>Unaccounted for Water:</i>													
1995	10.2	-2.4	29.8	17.7	38.5	38.5	46.0	-24.1	-16.3	-27.1	-1.4	19.6	129
1996	-22.6	-19.2	-8.5	-15.1	1.0	29.7	31.6	-43.5	-84.6	-44.2	-27.4	0.4	-203
1997	-13.7	-14.3	0.4	0.7	10.6	-6.5	-5.0	-18.1	-106.1	-16.5	-18.5	-6.1	-193
Average	-8.7	-12.0	7.3	1.1	16.7	20.6	24.2	-28.6	-69.0	-29.3	-15.8	4.6	-89
Total Average Demand:	129	119	135	137	156	201	235	235	178	159	129	136	1948

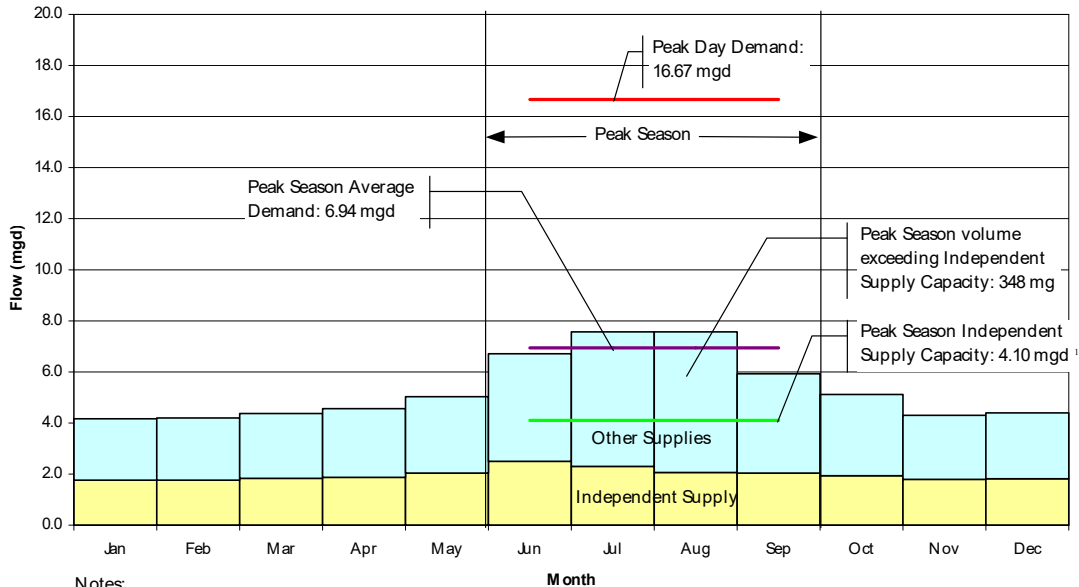
Table 3
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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
						←----- Peak Season -----→							
Supply Sources													
<i>Wholesale Sources:</i>													
Kirkland													
1995	2.06	2.10	2.07	2.48	2.48	3.71	3.77	2.82	2.42	2.09	2.04	1.99	2.50
1996	1.63	1.85	1.79	1.57	2.25	2.81	3.55	3.81	2.29	1.94	1.86	2.04	2.28
1997	1.47	1.11	1.68	1.63	1.76	2.00	2.39	2.81	2.22	2.35	1.67	1.58	1.89
Average	1.72	1.69	1.85	1.89	2.16	2.84	3.24	3.15	2.31	2.13	1.86	1.87	2.22
Bellevue													
1995	0.59	0.70	0.64	0.66	0.98	1.39	1.76	1.41	1.30	1.03	0.64	0.70	0.98
1996	0.75	0.81	0.78	0.83	0.81	1.58	1.55	1.78	1.28	1.04	0.58	0.60	1.03
1997	0.71	0.74	0.64	0.88	0.70	1.14	1.04	1.87	1.62	1.10	0.72	0.82	1.00
Average	0.68	0.75	0.69	0.79	0.83	1.37	1.45	1.69	1.40	1.06	0.65	0.71	1.00
Seattle													
1995							0.66	1.11	0.43	0.00		0.00	0.18
1996					0.00		1.07	0.89	0.11				0.17
1997													
Average					0.00		0.58	0.67	0.18	0.00		0.00	0.12
<i>Independent Supplies:</i>													
1995	1.75	1.80	1.86	1.84	2.21	2.41	2.51	1.95	2.53	2.02	1.83	1.86	2.05
1996	1.44	1.45	1.53	1.49	1.50	2.25	1.92	1.60	1.81	1.59	1.47	1.48	1.63
1997	2.09	2.04	2.12	2.29	2.41	2.85	2.49	2.64	1.79	2.19	2.08	2.10	2.26
Average	1.76	1.76	1.84	1.88	2.04	2.50	2.30	2.06	2.04	1.94	1.79	1.82	1.98
Total Avg Source Production:	4.16	4.20	4.37	4.56	5.03	6.71	7.57	7.57	5.93	5.12	4.30	4.39	5.33

Table 3
CWA Audit Process
City of Redmond
Historical Supply and Demand Summary, mgd

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
						←----- Peak Season -----→							
Water Demand:													
<i>Retail Sales:</i>													
1995	4.07	4.68	3.61	4.39	4.43	6.23	7.11	7.77	7.20	6.02	4.55	3.92	5.33
1996	4.55	4.78	4.37	4.39	4.52	5.65	6.99	9.03	8.17	5.99	4.83	4.10	5.61
1997	4.72	4.40	4.42	4.78	4.52	6.21	5.92	7.84	8.72	6.17	5.09	4.70	5.62
Average	4.44	4.62	4.13	4.52	4.49	6.03	6.67	8.21	8.03	6.06	4.82	4.24	5.52
<i>Wholesale Sales:</i>													
1995	0.00			0.00	0.00		0.09	0.30	0.01		0.00	0.00	0.03
1996			0.01	0.00		0.00	0.08	0.46	0.14	0.01	0.00	0.00	0.06
1997							0.17	0.07	0.44		0.00		0.06
Average	0.00		0.00	0.00	0.00	0.00	0.11	0.28	0.20	0.00	0.00	0.00	0.05
<i>Unaccounted for Water:</i>													
1995	0.33	-0.09	0.96	0.59	1.24	1.28	1.49	-0.78	-0.54	-0.87	-0.05	0.63	0.35
1996	-0.73	-0.66	-0.27	-0.50	0.03	0.99	1.02	-1.40	-2.82	-1.43	-0.91	0.01	-0.56
1997	-0.44	-0.51	0.01	0.02	0.34	-0.22	-0.16	-0.58	-3.54	-0.53	-0.62	-0.20	-0.53
Average	-0.3	-0.4	0.2	0.0	0.5	0.7	0.8	-0.9	-2.3	-0.9	-0.5	0.1	-0.25
Total Average Demand:	4.16	4.20	4.37	4.56	5.03	6.71	7.57	7.57	5.93	5.12	4.30	4.39	5.33

Figure 2
City of Redmond 1995-1997 Average Supply and Demand



Notes:
 1. Peak Season Independent Supply Capacity assumes all wells are improved to CWA standards.

WATER QUALITY

As part of the City’s current purveyor agreement with the City of Seattle, Seattle responsible for the quality of water delivered through its system. The City maintains responsibility for the water quality of its independent supply sources. Water quality for both the wholesale supplies and the City’s independent sources complies with current state and federal rules and regulations. Regular water quality samples are taken at various locations throughout the City’s service area to verify compliance with state and federal regulations, including chemical and bacteriological parameters.

INDEPENDENT SOURCES AUDIT

As noted previously, the City of Redmond owns and operates four wells as independent water supply sources. A fifth well that was decommissioned and abandoned to accommodate construction of the City’s Public Safety Complex will soon be reconstructed in a new location. The existing physical and identified sustainable capacities for each of the City’s supply wells are summarized in Table 4 along with the water rights relevant to each supply source.

TABLE 4
WELL SOURCES

Well	Ground Water Certificate(s)	Current Capacity	Sustainable Capacity	Permitted Flow Rate	Permitted Yield
No. 1	1313 and G1-00130C	700 gpm	583 gpm	900 gpm	1,344 ac-ft/yr
No. 2	3420	440 gpm	367 gpm	500 gpm	605 ac-ft/yr
No. 3	6675	Under repair	400 gpm	480 gpm	400 ac-ft/yr
No. 4	G1-22608C	To be Relocated	667 gpm	800 gpm	1,280 ac-ft/yr
No. 5	G1-24204C	1,000 gpm	833 gpm	1,000 gpm	1,600 ac-ft/yr
TOTAL		2,140 gpm	2,850 gpm	3,680 gpm	

Note: Upon completion of the Well No. 3 repairs and the construction of Well No. 4, the current capacity will increase to 3,420 gpm.

As detailed in Table 4, there are two water rights certificates currently in place for Well No. 1. Certificate 1313 includes a permitted flow rate of 200 gpm and an annual yield of 224 acre-ft with a priority date of July 23, 1951, while Certificate G1-00130C has a priority date of February 3, 1972 with a permitted flow rate of 700 gpm and an 1,120 acre ft annual yield. It appears from the water rights documentation for Well No. 1 that a least a portion of the rights conveyed under Certificate G1-00130C may be supplementary to other rights, however it is unclear from the documentation to what extent this may be true.

Well No. 2 operates under Certificate 3420 with a priority date of July 25, 1958, a permitted flow rate of 500 gpm and an annual yield of 605 acre ft, of which 224 acre ft appear to have been originally issued as supplemental rights to Certificate 1313, and 381 acre ft appear to be primary rights. However, it appears from some of the documentation that some or all of the supplementary rights originally associated with Certificate 3420 may have been subsequently transferred to primary rights.

Water Right Certificate 6675 covers Well No. 3 with a priority date of November 27, 1968, a permitted flow rate of 480 gpm and an annual yield of 400 acre ft which appears to be entirely supplemental to other rights. Water Right Certificate G1-22608C covers Well No. 4 and includes an 800 gpm permitted flow rate and 1,280 acre ft annual yield with a priority date of November 5, 1975. Well No. 5's Water Right Certificate G1-24204C carries a November 17, 1982 priority date, a permitted flow of 1,000 gpm, and an annual yield of 1,600 acre ft.

Thus, while all the City's sources appear to be adequately covered under existing water right certificates, there appear to be some minor discrepancies in the

documentation regarding the primary and supplementary status of some of the rights, which might be best addressed by an attorney specializing in water rights.

METHODOLOGY

Each independent supply source has been evaluated according to a consistent set of criteria and design standards. The evaluation criteria included current Washington State Department of Health and Washington State Department of Ecology regulations and design standards for water supply sources, and supplemental standards established by the Cascade Water Alliance according to established design practices. These criteria require all independent water supply sources to include the following:

- Well construction and completion consistent with Chapter 173-160 of the Washington Administrative Code, Minimum Standards for Construction and Maintenance of Wells,
- Facility design, construction, and water quality consistent with Chapter 246-290 of the Washington Administrative Code, Group A Public Water Systems as well as current Washington State Department of Health design standards and policies,
- Water Rights consistent with Title 90 of the Revised Code of Washington, Water Rights-Environment,
- Continuous flow metering,
- Chlorine disinfection equipment,
- Fluoridation equipment,
- Automatic and remote telemetry and control systems,
- Auxiliary power capability with automatic transfer switch,
- Concrete block or brick buildings and enclosures,
- Site security fencing,
- Completed Wellhead Protection Plan, Aquifer Protection Plan, and/or Watershed Control Plan.

AUDIT RESULTS

Tables 5 through 9 show how values were established for each of the City's independent supply sources. Each valuation presents the typical construction costs and the current remaining value for the various supply source components according to the remaining useful life and the source's established sustainable supply capacity. The cost of any anticipated upgrades or improvements required to conform with established design criteria and standards are also included.

The City of Redmond is currently undertaking a complete redevelopment program for its four existing wells. Well No. 4, which was decommissioned when the City's Public Safety Complex was constructed, is also being relocated and is currently under design. As all of the Redmond's wells will soon be redeveloped and updated, the City has indicated that for CWA audit purpose, each of its sources should be considered to be a new facility in compliance with established standards.

**Table 5
Well No. 1 Valuation**

Item	Useful Life (years)	Useful Life (years)	Percent of Base Value	Weighted Life (years)	Construction Cost (New)	Remaining Value
Peak Source Capacity: 700 gpm						
Sustainable Capacity: 583 gpm						
Well	50	23	21%	4.8	\$ 120,000	\$ 55,200
Pumps, Piping, and Mechanical	20	20	21%	4.3	\$ 123,000	\$ 123,000
Electrical, Instrumentation, and Controls	20	20	14%	2.7	\$ 78,000	\$ 78,000
Auxiliary Power	20	20	14%	2.9	\$ 83,000	\$ 83,000
Building and Structural	50	50	21%	10.5	\$ 120,000	\$ 120,000
Site Improvements	50	50	9%	4.4	\$ 50,000	\$ 50,000
Existing Facility Subtotal					\$ 574,000	\$ 509,200
Required Upgrades:						
Required Upgrades Subtotal					\$ -	\$ -
Facility Total including Required Upgrades			100%	29.5	\$ 574,000	\$ 509,200
Facility Useful Life (If New)				35.2		
Existing Facility Value less Required Upgrades						\$ 509,200

Note: Assumes City of Redmond upgrades well to CWA standards.

**Table 6
Well No. 2 Valuation**

Item	Useful Life (years)	Useful Life (years)	Percent of Base Value	Weighted Life (years)	Construction Cost (New)	Remaining Value
Peak Source Capacity: 440 gpm						
Sustainable Capacity: 367 gpm						
Well	50	10	22%	2.2	\$ 110,000	\$ 22,000
Pumps, Piping, and Mechanical	20	20	22%	4.3	\$ 108,000	\$ 108,000
Electrical, Instrumentation, and Controls	20	20	12%	2.4	\$ 59,000	\$ 59,000
Auxiliary Power	20	20	12%	2.5	\$ 62,000	\$ 62,000
Building and Structural	50	50	22%	11.0	\$ 110,000	\$ 110,000
Site Improvements	50	50	10%	5.0	\$ 50,000	\$ 50,000
Existing Facility Subtotal					\$ 499,000	\$ 411,000
Required Upgrades:						
Required Upgrades Subtotal					\$ -	\$ -
Facility Total including Required Upgrades			100%	27.4	\$ 499,000	\$ 411,000
Facility Useful Life (If New)				36.2		
Existing Facility Value less Required Upgrades						\$ 411,000

Note: Assumes City of Redmond upgrades well to CWA standards.

Table 7
Well No. 3 Valuation

Item	Useful Life (years)	Useful Life (years)	Percent of Base Value	Weighted Life (years)	Construction Cost (New)	Remaining Value
Peak Source Capacity: 480 gpm						
Sustainable Capacity: 400 gpm						
Well	50	13	22%	2.8	\$ 110,000	\$ 28,600
Pumps, Piping, and Mechanical	20	20	22%	4.3	\$ 110,000	\$ 110,000
Electrical, Instrumentation, and Controls	20	20	12%	2.4	\$ 62,000	\$ 62,000
Auxiliary Power	20	20	13%	2.6	\$ 66,000	\$ 66,000
Building and Structural	50	50	22%	10.8	\$ 110,000	\$ 110,000
Site Improvements	50	50	10%	4.9	\$ 50,000	\$ 50,000
Existing Facility Subtotal					\$ 508,000	\$ 426,600
Required Upgrades:						
Required Upgrades Subtotal					\$ -	\$ -
Facility Total including Required Upgrades			100%	27.9	\$ 508,000	\$ 426,600
Facility Useful Life (If New)				35.9		
Existing Facility Value less Required Upgrades						\$ 426,600

Note: Assumes City of Redmond upgrades well to CWA standards.

Table 8
Well No. 4 Valuation

Item	Useful Life (years)	Useful Life (years)	Percent of Base Value	Weighted Life (years)	Construction Cost (New)	Remaining Value
Peak Source Capacity: 800 gpm						
Sustainable Capacity: 667 gpm						
Well	50	50	20%	10.0	\$ 120,000	\$ 120,000
Pumps, Piping, and Mechanical	20	20	21%	4.3	\$ 129,000	\$ 129,000
Electrical, Instrumentation, and Controls	20	20	14%	2.8	\$ 84,000	\$ 84,000
Auxiliary Power	20	20	15%	3.0	\$ 90,000	\$ 90,000
Building and Structural	50	50	22%	10.8	\$ 130,000	\$ 130,000
Site Improvements	50	50	8%	4.1	\$ 50,000	\$ 50,000
Existing Facility Subtotal					\$ 603,000	\$ 603,000
Required Upgrades:						
Required Upgrades Subtotal					\$ -	\$ -
Facility Total including Required Upgrades			100%	34.9	\$ 603,000	\$ 603,000
Facility Useful Life (If New)				34.9		
Existing Facility Value less Required Upgrades						\$ 603,000

Note: Assumes City of Redmond rebuilds well to CWA standards.

Table 9
Well No. 5 Valuation

Item	Useful Life (years)	Useful Life (years)	Percent of Base Value	Weighted Life (years)	Construction Cost (New)	Remaining Value
Peak Source Capacity: 1,000 gpm						
Sustainable Capacity: 833 gpm						
Well	50	35	20%	7.0	\$ 130,000	\$ 91,000
Pumps, Piping, and Mechanical	20	20	22%	4.3	\$ 140,000	\$ 140,000
Electrical, Instrumentation, and Controls	20	20	15%	3.0	\$ 96,000	\$ 96,000
Auxiliary Power	20	20	16%	3.2	\$ 103,000	\$ 103,000
Building and Structural	50	50	20%	10.0	\$ 130,000	\$ 130,000
Site Improvements	50	50	8%	3.9	\$ 50,000	\$ 50,000
Existing Facility Subtotal					\$ 649,000	\$ 610,000
Required Upgrades:						
Required Upgrades Subtotal					\$ -	\$ -
Facility Total including Required Upgrades			100%	31.3	\$ 649,000	\$ 610,000
Facility Useful Life (If New)				34.3		
Existing Facility Value less Required Upgrades						\$ 610,000

Note: Assumes City of Redmond upgrades well to CWA standards.

The well valuations represent estimated typical construction costs for developing similar independent supply sources in the greater Puget Sound area according to the established design standards and criteria. The values for the various source component categories are based on representative data from the United States Environmental Protection Agency's Standardized Costs for Water Supply Distribution Systems, the R.S. Means construction cost guides, and other relevant cost estimating data. Values for water treatment systems, as applicable, were developed using CWC Engineering Software's *W/W Costs and Design Criteria Guidelines*. All costs were updated and adjusted as necessary to January 1999 dollars for the Seattle Region using current ENR cost indices.

Table 10 shows the aggregate life of the City's independent supplies.

Table 10
City of Redmond
Independent Supply Aggregate Remaining Life

Source	Sustainable Capacity	Remaining Life (years)	Remaining Life x Capacity	Life if New (years)	Life if New x Capacity
Well No. 1	583	29.5	17,199	35.2	20,522
Well No. 2	367	27.4	10,056	36.2	13,285
Well No. 3	400	27.9	11,160	35.9	14,360
Well No. 4	667	34.9	23,278	34.9	23,278
Well No. 5	833	31.3	26,073	34.3	28,572
Total	2,850		87,766		100,017
		Divided by:	2,850	Divided by:	2,850
Aggregate Life (years):			30.8		35.1

WATER CONSERVATION

The City of Redmond has established policies and programs that strive to make efficient use of water, and the City is a participant in development and implementation of future regional and local water conservation programs. The City’s conservation measures meet the requirements of SPU, EKC-CWSP and the Department of Health.

MINIMUM SERVICE STANDARDS

The City currently meets all minimum service standards set forth by the Department of Health.

Minimum hydraulic gradients to be maintained by the City of Seattle are identified in the Water Purveyor contract between The City of Seattle and City of Redmond. A copy of this information is included in the City’s 1992 Water System Plan.

WATER AUDIT FINDINGS

Tables 10 and 11 summarize findings of the water audit of the City of Redmond water system.

Table 11
City of Redmond
Independent Supply Summary

	Capacity	Avg. 1995- 1997
Independent Supplies (mgd)		
Annual	4.105	1.978
Peak Season	4.105	2.228
Peak Day	4.921	3.770
Costs to Reliably Meet Supply Capacity		
Water Quality	\$ -	
Water Quantity	\$ -	
Reliability	\$ -	
TOTAL	\$ -	

Notes:

1. Historical peak day supply estimated based on capacity of existing wells without Well No. 4 active.
2. Independent supply capacity assumes Well No. 4 is constructed and in use.
3. Peak season independent supply capacity is based on running all wells at capacity for 20 hours per day.
4. Annual well capacity is the sustainable well capacity.
5. Costs to reliably meet supply capacity are based on the assumption that the City's wells will be upgraded to CWA standards.

Table 12
City of Redmond
Demand Summary

	Avg. 1995- 1997	Year 2000	Year 2010	Year 2020
Current and Projected Demands				
Annual	5.325	6.02	7.61	9.27
Peak Season	6.944	7.83	9.89	12.05
Peak Day	16.665	18.79	23.75	28.91

Notes:

1. 2000 and 2010 Annual demands based on SPU 1995 Annual Purveyor Survey, SPU Demand Projections. 2020 annual demands based on 1992 City of Redmond Water System Plan.
2. Future peak season demands based on current peaking factors of 1.3.
3. Peak day demands are estimated using a peaking factor of 2.4 (1992 City of Redmond Water System Plan).
4. Demand projections include wholesale sales to other customers.

APPENDICES

APPENDIX A
BACKGROUND INFORMATION FOR CWA APPLICATION AUDIT