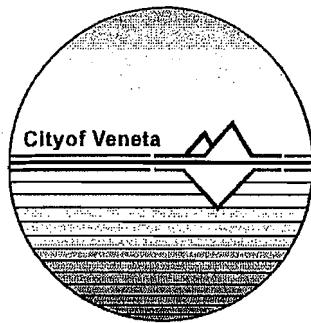


CITY OF VENETA

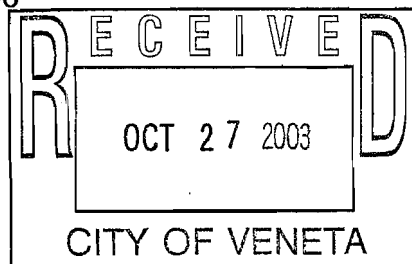
WATER MANAGEMENT & CONSERVATION PLAN



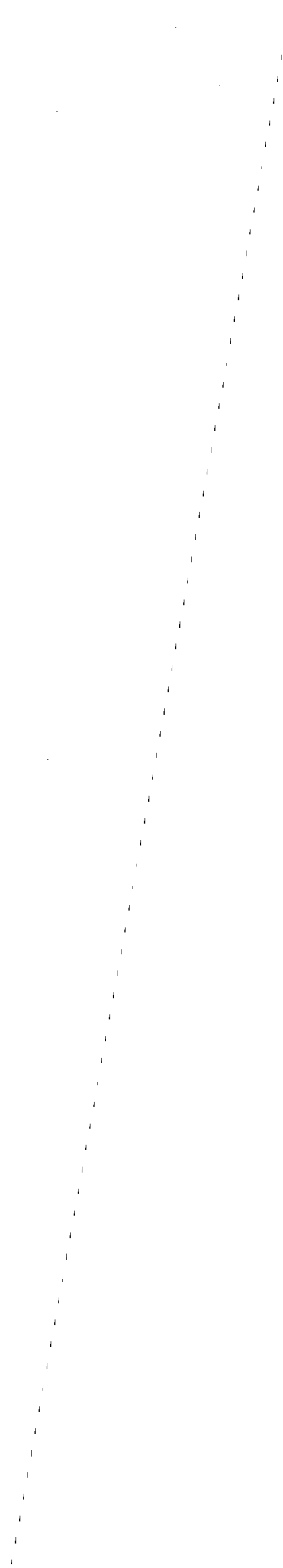
November 2003

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CHAPTER 1

WATER SYSTEM DESCRIPTION ELEMENT

690-86-140(1)(a)

Description of water sources, rights facilities, and exchange or intergovernmental agreements.

The City currently has two operating sources of supply water, Well #4 and Well #9. The City has also drilled and tested a pilot well and had filed a condemnation order to acquire access to the land for the well site. This is the proposed third well. A fourth well was also identified in the Water Master Plan (1998) and is in the planning stage. The two operating wells are physically separated by approximately one-half mile. The third well is scheduled to be located farther away from either of the current wells. In the event of the loss of one well, either of the other two would be capable of meeting an emergency demand for the city. The third well will also be equipped with it's own treatment unit, thus providing a degree of independence and redundancy with regard to operation and supply. The new Bolton Hill Reservoir (set for completion in November 2003) will provide additional days of storage and service so that in an emergency the City would have time to secure a temporary supply.

The City has developed a *short term emergency plan* and a *long term plan*. The plan develops the ideas presented in the Water Master Plan (1998). It includes a Water Curtailment Program that limits lawn watering and car washing along with other curtailment measures when water is in short supply. An Emergency Water Supply program is also developed to account for severe shortages.

Short Term Emergency Plan:

There is no direct interconnection with a nearby agency that is practical or possible because Veneta is isolated by many miles from any municipal or other community system. Thus, an emergency response plan necessitates the use of a bulk water transport system. The goal of the Emergency response plan is to provide a minimum of 20 gallons per day per person to the City's system. At the City's current population, about 64,000 gallons per day would be required for emergency supplies. By the end of the planning period 100,000 gallons per day will be required.

In order to provide 100,000 gallons per day, a fleet of 8 trucks would run 5 trips each per day over a 10-hour shift, for a total of 40 truck trips at a 2-hr round trip pace.

A local Bulk water supplier, Emerald Valley Water Supply (EVWS), is capable of supplying Veneta with 100,000 gallons per day in four tanker trucks; three 3,500-gallon and one 5,000-gallon tankers. EVWS's has a reliable source of supply in EWEB. EVWS can be contacted at:

Office: 747-5068

Bob Durbin: (541) 912-2582 (Cell)

Mark Durbin: (541) 913-2010-Cell ; (541) 726-1160-Home

Extended Backup Plan

If an emergency supply is required for an extended period of time or if more than 100,000 gallons per day are required it would be possible to use water from Fern Ridge Reservoir. Fern Ridge reservoir is relatively close and arrangements can be made for a quantity of raw water from the reservoir to be treated by a mobile unit.

A mobile unit under consideration is the Zenon Mobile Unit. ZENON makes a mobile unit that could be set up and operational in a reasonably short amount of time (3 days). The treatment unit would be capable of supplying potable water for an extended period. The Zenon unit would need to have a capacity of 167 gallons per minute in order to provide 100,000 gallons in a ten hour shift.

Contact information for ZENON:

ZENON WEST
5051 Commercial Circle, Suite B
Concord, California
94520 USA
Tel: 925-246-8190
Fax: 925-246-8199

Water Curtailment Program

The City's water curtailment program would have the following elements.

1. Institute water curtailment program.
2. Radio, newspapers, Fliers.
3. Decrease landscape watering, vehicle cleaning and non-necessary uses.
4. Odd-even watering restrictions
5. Reduce service pressure

The Water Curtailment Program is discussed in detail in Chapter 3.

Emergency Water Supply Plan

1. Notify citizens of water shortage. Inform of where to pickup emergency water rations – City Hall
2. Contact Emerald Valley Water Supply:
Office: 747-5068
Bob Durbin: (541) 912-2582 (Cell)
Mark Durbin: (541) 913-2010-Cell ; (541) 726-1160-Home

690-86-140(1)(b)

Description of System Capacity, Limitations, and Opportunities for Expansion under existing water rights.

Of the City's nine wells, only Well #4 and Well #9 are operational. The other wells have lacked productivity and/or experienced water quality problems. The remaining seven wells have been abandoned or are scheduled for abandonment.

The water right of Well #4 actually exceeds the capacity of the well by more than 100 gallons per minute. And the capacity of Well #9 exceeds the water right by approximately 100 gallons per minute.

Well #4 was rehabilitated in 1995. The rehabilitation increased the well yield from about 180 gallons per minute to over 220 gallons per minute but soon (less than a year) the capacity began to drop off. It currently provides 180 to 190 gallons per minute. It is estimated that a repeat rehabilitation of well #4 would yield about the same results. The City does not expect a rehabilitated well #4 to yield enough to satisfy long term demand. Table 1.1 provides the permit number for wells #4 and #9, the pump test results and their actual production capacity.

Table 1.1 Active Wells

Well #	Permit #	Water Right			Pump Test		Actual Capacity	
		cfs*	gpm*	gpd*	gpm	gpd	gpm	gpd
#4	G 6355	0.67	301	433,002	274	394,560	180-190	259,200
#9	G 11551	1.11	498	717,362	600	864,000	600	864,000
	Total	1.78	799	1,150,364	874	1,258,560	780	861,120

*cfs = cubic feet per second, gpd = gallons per day, gpm = gallons per minute

Table 1.2 shows the current status of the remaining wells in the City of Veneta.

Table 1.2 Inactive Wells

Well #	Permit #	Water Right			Pump Test		Actual Capacity	
		cfs	gpm	gpd	gpm	gpd	gpm	gpd
#1	G-3968				180	259,200	90	129,600
#2	G-3968				185	266,400	?	?
#3	Unknown	N/A*	N/A*	N/A*	100	144,000	?	?
#5	Unknown	N/A*	N/A*	N/A*	85	122,400	1.5	2,160
#6	Unknown	N/A*	N/A*	N/A*	?	?	?	?
#7	Unknown	N/A*	N/A*	N/A*	30	43,200	?	?
#8	Unknown	N/A*	N/A*	N/A*	170	244,800	?	?

*N/A = Not Available / ? = Can not be determined from the records.

(cfs = cubic feet per second, gpd = gallons per day, gpm = gallons per minute)

Table 1.3 compares current capacity to projected demand based on the existing and projected population of the City. Historical records show that maximum day demand is approximately 330 gallons per capita per day. As Table 1.3 shows, the City currently does not have the capacity to keep up with the maximum day demand. During hot weather, the City struggles to maintain adequate storage in the main reservoir. In July 2003 the City's elevated storage capacity was depleted by 65-70%.

Table 1.3 Capacity and Demand

Projected Population		Current Capacity		Projected Demand Maximum Day		Total Deficit	
Year	#	gpm	gpd	gpm	gpd	gpm	gpd
Current	2,996	598	861,120	680	978,450	N/A	117,330
2010	4,261	598	861,120	976	1,406,130	196	545,010
2020	5,727	598	861,120	1,312	1,889,910	532	1,028,790

(gpd = gallons per day, gpm = gallons per minute)

To meet current demand, the City needs to transfer 100 gpm of Well #4 water right (permit # G 6355), to Well #9 (permit # G 11551). Pump tests have confirmed that Well #9 is capable of producing 100 gallons per minute more than the water right allows and it is currently plumbed for the additional capacity (600 gallons per minute).

Even with the proposed water right transfer, future water demand will exceed the City's current production capability. The recent sanitary sewer system expansion has allowed for the lifting of a building moratorium and resulted in a rapid rate of growth (See Table 1.4 for housing starts).

Table 1.4: Housing Starts

Housing Starts	
Year	#
1999-00	24
2000-01	27
2001-02	47
2002-03	82

To meet the future water demand, the City concludes that a new well or wells must be developed and the associated water rights must be acquired or transferred.

690-86-140(1)(c)

Description of current average annual water use, peak seasonal demand, average and peak day demands, and quantities of water used from each source.

The information presented in the following tables is the basis for understanding the demand on water supply. It shows peak and seasonal demands. It can assist planners in evaluating various conservation measures for potential benefit, cost and feasibility. For Veneta, it is particularly relevant to evaluate the cost of developing future wells against implementing conservation measures that may mitigate the need for new supplies. The following tables describe characteristics of the system in accordance to the requirements of the rule.

Table 1.5 Current Average Water Usage

Peak Seasonal Demand (gpm)	Avg Day Demand (gpm)	Seasonal Peaking Factor	Peak Day Demand (gpm)
429	267	1.6	677

Table 1.6 Water Usage per Source and Season

Year	Spring (Apr, May, Jun)			Summer (Jul, Aug, Sep)			Fall (Oct, Nov, Dec)			Winter (Jan, Feb, Mar)		
	Well #4 Daily Ave (gpm)	Well #9 Daily Ave (gpm)	Total	Well #4 Daily Ave (gpm)	Well #9 Daily Ave (gpm)	Total	Well #4 Daily Ave (gpm)	Well #9 Daily Ave (gpm)	Total	Well #4 Daily Ave (gpm)	Well #9 Daily Ave (gpm)	Total
2001-2002	94	165	259	152	277	429	128	68	196	169	14	183
2000-2001	140	95	235	120	244	364	128	40	168	169	0	169
1999-2000	66	202	268	148	203	351	203	50	253	140	83	223
1998-1999	159	127	286	173	258	431	222	0	222	223	0	223
1997-1998	155	78	233	150	273	423	185	29	214	207	0	207

Table 1.7 Water Use Characterization by Season.

Use	Winter	Spring	Summer	Fall
	% of total use	% of total use	% of total use	% of total use
Irrigation Meters,	0.20%	0.40%	4.10%	0.40%
City Irrigation, City Hall	0.60%	0.40%	10.30%	3.50%
Residential/Multi Res Combined	84.10%	78.10%	72.50%	78.10%
Com/Multi Comm Combined	13.50%	16.70%	12.20%	16.70%



Other	1.60%	4.40%	0.90%	1.30%
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690-86-140(1)(d)

Description of customers served including the estimated numbers and general water use characteristics of residences, commercial and industrial facilities, and other uses.

Section 4, *Planning Criteria*, of the 1998 Water Master Plan and the City's water use records describe water use in Veneta as primarily residential with some commercial use. The Commercial category includes industrial use. The data show that industrial use is not significant in Veneta. The following table distinguishes water use by Veneta's billing categories.

Table 1.8: Yearly Average by Category of Use

City Usage Category	Yearly Average
Residential /Multi Res. Combined	79.0%
Commercial /Multi Comm. Combined	14.8%
City Irrigation, City Hall	4.5%
Metered Commercial Irrigation	1.3%

Sections 4.1, *Study Area*, and Section 4.4, *Population and Service Connections*, of the 1998 Water Master Plan describe the customer base and provides numbers of meters serving dwellings. Table 1.9 shows the population projections of the 1998 WMP.

Table 1.9: Projected Water Service Population

Year	Anticipated	Projected
1997	5%	2,902
2000	3%	3,171
2010	3%	4,261
2020	3%	5,727
2021 to 2050	2%	10,374

By far, the bulk of water use in Veneta is residential. Likewise, the best conservation opportunities are in the residential sector. Table 1.10 lists the estimated distribution values for the type of indoor use in a residential household. The values are listed are generally accepted standards based on studies performed in many locations, they will be used for evaluating various conservation measures, especially retrofitting. The indoor usage patterns typically do not vary by season.

Table 1.10: Typical Indoor Household Water-Use Distribution

Use	Percent
Baths	1.7
Clothes Washers	21.6
Dishwashers	1.4
Faucets	15.7
Leaks	13.7
Showers	16.7
Toilets	26.7
Other Domestic	2.3
Total	100

690-86-140(1)(e)

Identify interconnections with other municipal supply systems.

Veneta's water system is physically isolated and is not adjacent to any municipal water systems. Thus, Veneta has no interconnections with any other municipal supply systems.

690-86-140(1)(f)

(Provide) Schematic of the water system and service area.

See Appendix A for water system schematic, water sources, and service area.
(WMP 3-3, 3-8, 4-3.)

CHAPTER 2

WATER SYSTEM DESCRIPTION ELEMENT

Prior to the 1998 Water Master Plan, the City did not have an approved Water Management & Conservation Plan. With the 1998 Water Master Plan submitted to the WRD, several water conservation measures that the City implements were described. In the 2001 Modified Water Master Plan, the City's approach to water conservation practices were described. The City was also required to further evaluate specific water conservation measures as required by OAR 690-86 Rules. The following is an update of the City's activity with regard to conservation. Chapter 2 provides evaluations for use by City planners in managing Veneta's water resources.

The 690-86 rules require communities to evaluate the following water conservation method:

1. Low-water-use landscaping
2. Incentive programs that encourage conservation
3. Retrofitting or replacement of existing inefficient water using fixtures
4. Evaluate the adoption of rate structures that support and encourage water conservation
5. Reuse Opportunities
6. Other conservation measures identified by the supplier

To evaluate the water saving potential of the water conservation measures considered in this document, the City's water consumption patterns are assumed to be similar to patterns displayed by Eugene, Oregon. Other numbers used in this chapter are based on studies done involving various North American cities. The studies produced numbers that can be used for characterizing indoor vs. outdoor use, and classifying typical indoor water uses. Indoor vs. Outdoor is found to vary a great deal from season to season. Indoor use does not vary much by time of year.

Capital improvement costs have not figured into this cost saving analysis for individual conservation measures because no one measure alone will impact the City's need to fully develop Well #10. However, it may be that in combination with a number of other measures, a reduction in the demand growth will occur that impacts the development plans of Well #11.

It is possible that the need to develop future supplies can be mitigated, delayed or even eliminated by adoption of these measures. It is up to the future Council to determine whether adoption of these measures or a combination of these measures is appropriate for the community. In this chapter, relevant information and an evaluation of the measures is provided on which City planners can base their decisions.

690-86-140(2)(b)

Description of water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR 690, Division 85.

Veneta came into compliance with the water use reporting standards in 1998. The measurement system employs flow meters that are approved under Division 85 at Well #4 and Well #9.

690-86-140(2)(c)

Description of other conservation measures, if any, currently implemented by the water supplier.

Currently, the City audits water production on a monthly and annual basis, performs meter testing and maintenance, and conducts a leak detection program based on water accounting and system repair.

The water production reports contain information on total water production at the water treatment plant. Metered water service measurements are submitted monthly to the city engineer for review.

Along with the audits, a regularly scheduled meter testing and maintenance program has been in place since 1993. Hundreds of meters in Veneta have been replaced. Additionally, all leaking services replaced since 1993 have been made with more reliable (copper) materials. Regular meter reading and inspection is the city's most viable option for keeping leakage in check. The City has managed to significantly reduce overall leakage (typically below 10%). This decrease is attributed to diligent system repair by city staff.

The city also maintains a modest public education program that includes water conservation messages, educational pamphlets and fliers, and periodical news paper articles.

EVALUATION OF WHETHER IMPLEMENTATION OF CONSERVATION MEASURES ARE FEASIBLE AND APPROPRIATE FOR ENSURING THE EFFICIENT USE OF WATER AND THE PREVENTION OF WASTE

690-86-140(2)(d) (A) Evaluation of system-wide leak repair program or line replacement to reduce system leakage to 15 percent, and if a reduction of 15% is found to be reasonable and appropriate, to reduce system leakage to 10%.

As reported in the 1998 Water Master Plan, Veneta's leakage, or unaccounted for water is between 6-8% of the water produced. Veneta has in recent years met the state goal of less than 10% unaccounted for water. This indicates that the City has effectively implemented their leak detection and repair program. The City continues to operate this program.

690-86-140(2)(d) (B) Evaluate programs to encourage low-water-use landscaping.

Low-water-use landscaping installations can result in water savings of up to 20%. Savings depend on the type of plant installed and the type of landscaping that was replaced and the irrigation patterns of the existing landscape. Commercial, municipal, and residential landscape irrigation in Veneta is generally confined to summer months, June through September.

CITY PROPERTY IRRIGATION

City property is irrigated in the summer months (June-Sep) at a rate of approximately 650,000-1.2 million gallons per month, representing 4-6% of the total average monthly demand for that

seasonal period. As would be expected, in other months, the irrigation demand is significantly less and makes up a smaller percentage of the overall demand (0.4-0.9%).

Opportunities for landscape changes that would impact irrigation really exist at only two locations. What is called the "Intersection" is the primary entry to the City of Veneta, at the intersection of Hwy 126 and Territorial Hwy. The usage in the prime summer months peaks at between 460,000-485,000 gallons per month (August), if irrigated regularly. Low-water-use landscaping installation in this area could expect to yield a savings of 92,000-97,000 gallons per month for the driest months.

Typically, what occurs is that when supply gets low, the City implements a curtailment measure and irrigation at those sites is halted. This is distinguished from a "conservation measure". This curtailment measure lowers water usage at the "Intersection" to between 20,000 and 350,000 gallons per month depending on the severity of the shortage. For example, July, '03 usage was 107,000 gallons, which represents a 78% reduction in usage from the normal irrigation schedule.

At City Hall usage peaks at about 110,000 gallons per month in the summer months of June, July and August. This presents an opportunity, with xeriscaping, to save 0.5-0.7%, of the overall summer demand.

The cost savings to the City in water costs would be in the range of \$2,500-\$3,000 per year. To install xeriscaping would require re-landscaping the areas being considered. The total area is approximately 2-3 acres of irrigable land. The costs for such landscaping would be in the range of \$15,000 to \$20,000 for a modest landscape plan. This would include eliminating the existing landscaping. The price would increase with special additions, such as larger, more mature plants and decorative ground covering. This measure would require a change in the landscape planning codes adopted by the city.

Other irrigated areas are primarily parks that have grass playing fields and recreation areas. These areas do not present low-water-use landscaping opportunities.

COMMERCIAL IRRIGATION

The City maintains four metered commercial irrigation accounts; for West Lane Shopping Center, Bi-Mart, Lane Fire Station, and Oregon Dome. During the summer months demand from these accounts makes up 2.7-4.4% of the City's total usage. The usage reported from those accounts in the prime summer months (Jun-Sep) peaks at between 480,000-780,000 gallons per month, which is an average pumping rate of 11-18 gallons per minute. Other months water usage is insignificant (0.3%).

A xeriscaping requirement for existing commercial and industrial properties might be expected to reduce the total water usage during summer months by 1-3%. City records show that in other times of the year, the water saving would be minimal. Any cost savings to the City most likely would be offset by the lost revenue. The City charges more than their production cost for the water.

The existing commercial establishments have landscaping that is considered pleasing and was selected for aesthetic qualities. The City Council would need to determine whether

adoption of this type of measure is feasible and appropriate from a political and practical point of view.

Because growth (building construction) in Veneta is almost entirely residential, an ordinance imposing a low-water-use landscaping requirement for *new* commercial building would not significantly impact overall future water demand.

RESIDENTIAL IRRIGATION

To evaluate the water saving potential of low-water use landscaping to save water, assumptions must be made about the water use patterns of Veneta's residents. Table 2.1 describes the water use distribution patterns; the usage distribution by percentage of indoor vs. outdoor use in two northwest cities with comparable climates to Veneta. The table shows outdoor use is about 40% indoor about 60%. This estimate is likely representative of use in Veneta where winter use is about half of summer use (depending on months compared). It is assumed that winter use is mostly indoor and the increase in summer use is mostly due to increased outdoor use in the summer months; irrigation, lawn watering, and swimming pool. This approximation is used as the basis of some of this sections assumptions about summer time usage. The increase in summer time usage in Veneta can be attributed almost entirely to outdoor usage;

The majority of water usage in Veneta is classified as residential, 75-85% depending on the season. This amounts to approximately 16.5 million gallons per month (370 gallons per minute) of residential usage in the peak month. As expected, water demand peaks in the summer months. The peaking factor for the average seasonal demand is about 2. The peak for residential demand is about 2.2 from average winter demand to summer demand. From Table 2.1, it is assumed that about 40% of the 16,500 k-gallons is for outdoor use, primarily for landscape irrigation. Peak month landscaping water use is estimated to be about 6600 k-gallons (150 gallons per minute). This represents a significant percentage of the overall peak month demand. Research shows that on average in 80-90% of outdoor residential water usage is for lawn watering. In Veneta, it is estimated that 120-135 gallons per minute of the summer production goes to lawn watering.

Residential irrigation is assumed insignificant in the off-summer months (Oct – May). Table 1.5 shows that in the off-summer seasons water production averages in the low 200 gallons per minute range. Only in the summer months does the total system demand increase significantly.

Table 2.1: Annual indoor and outdoor water use percentages for two northwest cities.

Study Site	Indoor	Outdoor
Eugene, OR	59.2%	40.8%
Seattle, WA	61.8%	38.2%

Several conservation measures can be applied with effectiveness toward lawn watering. Low water use schemes imposed on residents could soften the peak demand of the summer months. The potential for water savings is significant; research shows that 20-50% water savings can be achieved by residences that convert to low-water use landscaping. This would impact Veneta in the summer season. Depending of course, on the severity of the restrictions

imposed, it is reasonable over time, to expect that between 0-20% reduction in summer water use could be achieved in the next planning period if low-water use landscaping became common. This would amount to a summer water use saving 0-135 gallons per minute by 2010.

Educational programs that make residents aware of the benefits of low-water use landscaping can be readily incorporated into the City Web page, news paper articles, and in the building plan review process. It has been shown in a previous section that these costs are minimal.

Incentive programs for residential landscape irrigation measures are discussed and evaluated in Section 2.2.3

The City has in the past strongly expressed that it is important for the residents of Veneta to be able to maintain the character of the residential neighborhoods, and to not hinder and limit the residential developments in a way that would lower the perceived quality of life for the residents of the town. Thus, the City does not intend to legislate the type of landscaping allowed in the residential neighborhoods. However, through less severe measures that encourage conservation, such as public education and incentive measures, the city residents may increasingly choose alternative landscapes, which would reduce demand for water during the peak summer months.

690-86-140(2)(d) (C)

Evaluate Incentive Programs That Encourage Conservation.

An incentive measure is designed to motivate water users to implement various conservation measures. Incentive measures can be educational, regulatory, and financial.

EDUCATIONAL INCENTIVES

The concept of an educational incentive is to provide instruction about the benefits of water conservation and motivate customers to implement conservation measures. Education measures appropriate to the community are described in Section 2.2.12. Fliers, pamphlets, and an internet web page are discussed. These types of programs costs are modest. For example, the costs for the web page described in 2.2.12 is estimated to be about \$250 to \$500 initially, and a yearly or bi-yearly cost to update of about \$100 to \$150. The savings attributable to education incentives are difficult to quantify in terms of gallons saved, but it is assumed that the efforts have a positive overall effect on conservation efforts, and are critical to the success of any conservation program.

Another education incentive available is the use of Television and Radio spot announcements regarding water conservation. In a way, Veneta already has a program because they are in the same media market as nearby Eugene. The Eugene Water and Electric Board (EWEB) has actively run conservation program advertisements in both Radio and TV for the last 5 years. During the last two years EWEB has worked closely with the media to secure public service announcements. For water curtailment periods EWEB is poised to spend as much as \$5,000 per month on spot advertisements. We reviewed the possibility of Veneta working cooperatively with EWEB on future announcements.

REGULATORY INCENTIVES

Regulatory incentives motivate by providing negative consequences for not adhering to rules, regulations or City ordinances. Usually, these penalties are in the form of fines. For example, the City of Veneta has an ordinance prohibiting wasteful watering, which is usually enforced by the public works department. Typically, for first time offenders, a warning is issued to residents when water runs off the property while watering. Fines may be imposed for repeat violations, at the discretion of the City.

It is difficult to quantify the costs and benefits of regulatory measures. Costs depend on the level of enforcement and the number of personnel involved. But, excessive and inefficient landscape watering is a common problem for many communities and can significantly increase the peak season water demand. Enforcing this type of ordinance would yield some level of water savings.

A common regulatory ordinance limits summer lawn watering to early morning or evening. For example, no watering is allowed between 9 a.m. and 5 p.m. or 7 a.m. to 7 p.m. This is to decrease water lost to evaporation and is considered efficient watering practice. Some communities find this regulation to be helpful. The water savings for this type of ordinance are not easily estimated. The costs of enforcement depend on the number and types of personnel dedicated to enforcing the regulation. The City has some experience enforcing these types of measures, which were imposed during curtailment actions.

Along with water wasting ordinances, some municipalities impose an even/odd landscape irrigation ordinance. Under this type of regulation, landscape irrigation days are assigned every other day depending on the address number. Recent literature review indicates that even/odd schemes do not decrease overall water use and may actually increase it in some cases. It is not recommended.

There is potential for saving some water with regulatory incentives; research shows that up to 20-30% of total summer water use can be saved by applying conservation measures to lawn watering. The results depend on the severity of the restrictions imposed and the level of enforcement action. For Veneta savings could be as much as 150 gallons per minute on a summer day.

The potential for water savings with increased management of landscape irrigation is significant. Research shows that 20-50% water savings (60-150 gallons per minute) can be achieved by households that implement conservation measures such as low water use landscaping or by practicing efficient and conservation oriented landscape irrigation.

FINANCIAL INCENTIVES

Financial incentives provide positive and negative motivations to customers to conserve. Positive methods include, rebates and/or bill credits, for customers that install new water saving devices, replace or retrofit old inefficient fixtures, or install water saving landscaping. These measures can save the customer money, at least in the long run. Negative inducements, such as higher rates for excessive use, provide motivation to use water more efficiently.

Indoor Use

Rebate programs for domestic plumbing fixture retrofits are most commonly associated with the following fixtures:

- High-volume or leaking toilets,
- Low-flow showerheads
- Clothes washers
- Low-flow faucets.
- Dishwashers

These programs can be implemented for residential and commercial customers. Veneta's primary opportunity to realize water savings would be in the residential sector.

Toilets

Toilet flushing is the largest indoor use, typically at about 27%. A high volume or inefficient toilet is one that uses more than 1.6 gallons per flush. A rebate program that includes replacement of high-volume with low volume toilets is evaluated below.

City records indicate that 80% of total usage is residential. There are about 1200 residential connections in Veneta. The city's base use (typical indoor use and incidental outdoor use) is about 150 gallons per day per connection. A typical residential toilet will use an estimated 35-40 gallons per day. This is consistent with research showing that a typical domestic use is about 18-20 gallons per person per day. Research shows that low-volume toilets can reduce toilet consumption by about 50% when older units are replaced with modern low flush toilets. This reduces toilet consumption down to about 20 gallons per day. It is difficult to predict the level of participation in a program of this nature, it depends on variables such as the percentage of high-volume units currently in use, the value of the rebates, and marketing etc. A 25 % participation rate could be considered a successful program, which in Veneta would mean replacing about 600 units, (about 2 units/residence) at a cost of \$50 per unit (approximately 50-70% of cost to customer). Total cost to the City would be about \$30,000. The estimated water savings of this measure would be about 6000 gallons per day. This number would be consistent throughout the year. It represents 1-2% of total water demand. An advantage to this program is that the installation of the low flush units would assure continued water conservation well after the program was discontinued.

The literature estimates that about 14% of household water consumption (about 9-10 gallons per day) is attributed to leaks in fixtures. The main source of that is toilet leaks. Leaks come from internal parts in the gravity tank, worn flapper valve, ball cock, valve seals, refill valves etcetera. These parts can generally be replaced for a few dollars each. To replace a flapper valve, ball cock assembly, overflow pipe and refill tube, and handle rod would cost from \$18 to \$53, depending on the make of the toilet. To evaluate this measure we assumed that 5 gallons per day, could be saved for each connection. For 1200 connections, 6000 gallons per day would be saved overall. This amounts to 1-2% of total water demand (4 gallons per minute). The reader should keep in mind that after this program is discontinued that new replaced parts will age and leaks will return. That is, the water savings will erode over time unless a replacement program is reinitiated.

The low-volume toilet rebate and parts rebate programs, though similar in description, are distinctly different. A high-volume toilet is not necessarily a leaking toilet. It may be well maintained and in good condition but it uses more water than necessary for its function because that is how it was designed to work. A low-volume toilet (1.6 gallons per flush) is designed for efficiency (by conventional standards) and may even be new, but the parts may be cheap or not be in good repair and it may leak.

A high proportion of the commercial establishments in Veneta were built more recently and are assumed to be in better condition. That, coupled with the low percentage of commercial use, indicates a toilet rebate program would not expect to yield significant water savings, less than 0.2%.

Low-Flow Shower Heads

Shower use typically accounts for about 17% of domestic water use (See table 1.9). Water savings associated with low-flow showerhead programs is dependent on several variables:

- Flow rate of existing showerheads,
- Number of minutes per shower and
- Showers per day.

The number of minutes per shower and showers per day for Veneta residences, if typical, would be about 5.3 minutes per shower and 0.75 uses per day. Showerheads are manufactured in 2.5, 2.75, 3.0, 4.0 and 8.0 gallons per minute. A device rated low-flow is considered to use about 2.5 gallons per minute at 80 psi.

To figure the amount of water savings assume half of the residential connections (600) have 1980-1994 shower heads at an average rating of 3.5 gallons per minute. A typical household that replaces a 3.5 gallons per minute unit with a 2.5 gallons per minute unit would reduce water use in showers 29%. This would reduce overall water use by nearly 5% in participating households, or an estimated 7.5 gallons per day.

With a 50% participation rate in a replacement program and assuming that half of the homes in Veneta have shower heads rated at an average of 3.5 gallons per minute or higher, Veneta might be able to reduce consumption by 2250 gallons per day. In the summer, this measure could reduce peak demand by about 0.35%. The yearly reduction in overall use would be 0.6%.

Clothes Washers

Clothes washers, dishwashers, and faucets make up 21%, 16%, and 1.4%, respectively, of typical residential indoor use. Rebate, incentive programs are possible for all three categories.

An incentive program that involves washing machines typically is structured as a rebate program that reimburses a percentage of the purchase price of a "high-efficiency" washing machine. Generally the rebate programs recommend is \$50-\$100 per machine. A high-efficiency machine is generally defined as a machine that uses 27 gallons or less for an 8 pound load. These machines are typically energy efficient and therefore a customer would realize additional savings in energy costs. When initiating a appliance rebate program some consideration must be given to who owns the retired or replaced machine. Some method may be considered so that these machines are not sold on the local used market and end up back in a neighboring home.

A high-efficiency machine will save about 10 to 20 gallons per load. In Veneta 10 % participation would be considered successful. A successful program could expect to yield 1000 to 2000 gallons per day in water savings. This would be consistent throughout the year. The cost to the City at a reimbursement rate of \$50 per machine would be estimated at \$6000.

Faucets

Water savings from faucet retrofits can come from faucet replacement with "low-volume" faucets (1.5 to 2.5 gallons per minute), retrofit with devices such as aerators and flow restrictors that reduce flow rates, and leak repairs. Faucet use accounts for nearly 16% of household residential use, or 20 to 25 gallons per day. Although, in houses with older, pre-1980 faucets that use up to 7.0 gallons per minute, the average use from faucets is much higher. It is assumed that in Veneta there are relatively few faucets installed or remaining from before 1980.

Research shows that a 2.5 gallons per minute faucet can save about 7.1 gallons per household per day. A 25 % replacement program in Veneta would result in an estimated savings of 2000 gallons per day. Costs vary a great deal in this type of program because the different values associated with the different measures. Replacing faucets can be relatively expensive with costs ranging from \$50 to \$100 per home. Washer replacements, however, are inexpensive.

Leaky faucets are a common source of water waste. Repair tips should be provided in the education program, along with information about the costs of leaking faucets. For example, a slow drip can waste 10 gallons per day, a fast drip 30 gallons per day, which is about 20% of average daily indoor use.

Dishwashers

Dishwashers constitute about 1.4% of indoor use. Water savings for a dishwasher rebate program would yield probably less than 1/10 of a percent water savings.

Outdoor Use

During a peak demand period, the average single-unit residential connection consumes about 440 gallons per day. Of this 240 to 290 gallons per day goes to outside use. Research shows that a xeriscape (low-water use, native plants) rebate program, that reimburses residents an amount per square foot to replace landscape, could contribute to a water savings. For a rebate of \$150 maximum at \$0.05/square foot for a maximum of 3000 square feet might reduce summer watering by up to 200 gallons per day in the summer on converted landscapes. This would result in a reduction of overall water use of about 45% for residences that participate in this type of program.

One must recognize that xeriscape landscaping and parts and washer replacement programs can result in only temporary savings. The new washers do wear out and leaks re-appear. With xeriscape programs when the property is sold or if the disposal income of the homeowner changes the low water use landscaping may be replaced with other plants.

690-86-140(2)(d)(D) Evaluate Retrofitting or Replacement of Existing Inefficient Water Using Fixtures.

See Section 690-86-140(2)(d) (C) for an evaluation of retrofitting/replacement of existing fixtures.

690-86-140(2)(d)(E) Evaluate the Adoption of Rate Structures that Support and Encourage Water Conservation.

The City adopted its current a water rates in 1995. The rate has a base rate minimum charge of \$7.00 per residential connection and \$14.00 for commercial connection. The city charges an additional flat rate of \$1.75 per 1,000 gallons. The consumption rate is the same for commercial and residential users.

The following rate comparison is based on monthly charges for specified levels of water service for several providers in Lane County. As shown in Table 2.2, Veneta's rates are comparable, but generally higher, than those of other providers in Lane County. The table shows theoretical monthly billings for several providers for consumption of 6,000 and 10,000.

Column 1 shows the monthly minimum charge per customer. This amount is generally paid as a base charge for any number of gallons up to a specified amount. The base number of gallons is shown in *Column 2*.

Some providers charge the base rate (minimum charge, column 1) for any amount up to a set usage. They then assess a higher price for use over the set usage allocation. This is called an increasing block rate. Some providers charge a rate per unit on all water used up to the base amount in addition to the base rate. Veneta charges a base rate (sometimes called an access charge) in addition to the base amount. This additional cost is shown in *Column 3*.

Column 4 shows the costs charged for the first 6000 gallons of use. Six k-gal reflects a home that experiences indoor use of 80 gallons per person per daycd and another 50 gallons per day of outdoor and incidental use. In Veneta, for this level of consumption the bill would be \$17.50. This bill is comparatively high for the area, 60% higher than Eugene, and 69% higher than Springfield. The \$1.75 per k-gal flat rate is a significantly higher rate than most providers charge for "high-volume" usage, see Table 2.3. Veneta's rate structure, though not an increasing block rate, is considered conservation oriented pricing by virtue of the high flat rate charged for all levels of use. This approach provides financial incentive to the consumer to conserve with respect to both indoor and outdoor use and at all usage levels.

Column 6 shows, for all providers studied, the bill for 10,000 gallons used in a month. Veneta's rates are comparatively high for this usage level, also. The high flat rate reflects Veneta's overall conservation oriented approach to pricing. This statement is particularly valid with respect to residential use, which accounts for up to 84% of the water demand in Veneta.

Veneta has a comparatively high rate for the incremental usages shown in *Column 5* and *Column 7*, the price per additional unit (1000 gallons - *Column 5*) and the price for an additional 4,000 gallons over the base amount (*Column 7*). This second level of service generally represents households that use more than a typical 80 gallons per person per day indoor and 50 gallons per day outdoor. At this higher level of use Coburg charges the highest rate. However, Veneta charges a significantly higher rate (\$1.75 per 1000 gallons) than the

rest of the providers studied, 29% higher than Springfield (\$1.35 per 1000 gallons), 57% higher than Eugene (1.11 per 1000 gallons), 61% higher than Cottage Grove (1.09 per 1000 gallons), and 79% higher than Junction City (\$0.98 per 1000 gallons).

Table 2.3 shows the water rates for high levels of water uses. These higher rates, depending on base consumption, are generally intended for commercial/industrial users. For various reasons, the prices differ greatly. Some providers charge a higher (increasing) rate for high-volume users, some a flat rate, and some a lower (decreasing) rate. These decisions are made by the provider for reasons unique to the community.

Table 2.2: Comparative Water Rates for Providers in Lane County.

Provider	1 Minimum Charge	2 Base Consumption Amount (gallons)	3 Added cost/kgal* to Min Charge for: 0 gal to Base Amount	4 1st kgal	5 Price/kgal for amount over Base Amount	6 Cost for 10kgal	7 Cost for 4000 gallons from 6k-10k
Coburg	\$30.00	5,236	\$0.00	\$32.00	\$2.62	\$42.62	\$10.48
Veneta	\$7.00	0	\$1.75	\$17.50	\$1.75	\$24.50	\$7.00
Heceta	\$12.00	8,000	\$1.40	\$20.40	\$1.40	\$26.00	\$5.60
Eugene	\$6.00	8,000	\$0.82	\$10.93	\$1.11	\$14.79	\$4.44
Cottage Grove	\$10.91	1,000	\$1.09	\$16.36	\$1.09	\$20.72	\$4.36
Springfield	\$6.00	8,228	\$0.73	\$10.38	\$1.35	\$14.40	\$4.02
Junction City	\$8.83	2,992	\$0.00	\$11.78	\$0.98	\$15.70	\$3.92

*kgal = 1000 gallons

Table 2.3: Rates for High Volume Water Use

	Base Consumption (gallons)	Price /kgal	
Coburg	>5236	\$2.62	Flat
Eugene	>30,000	\$1.89	Increasing
Veneta	>6000	\$1.75	Flat
Heceta	>8000	\$1.40	Flat
Cottage Grove	>1000	\$1.09	Flat
Springfield	>74,800	\$0.62	Decreasing
Junction City	>182,512	\$0.39	Decreasing

Veneta's rate is among the highest for commercial/industrial users and has an inherent conservation incentive built in to the flat rate. Consequently, increasing the flat rate by moderate amounts is not likely to have a significant impact on commercial use, and being only 15% of the total use, not likely to significantly impact overall demand.

Rate Structure Summary



The rate comparison shows that Veneta's price structure promotes conservation for all consumers, levels, and types of use. The pricing likely tends to encourage conservation mostly for residential customers that use less than 6000 gal/month) and commercial users. The high rate, when compared to neighboring communities, provides financial incentive especially for moderate income residents and commercial users to stay below the 6,000 gallons per month level and to perhaps implement indoor and outdoor conservation measures. The 1990 census data showed that greater than 50.1 percent of the community households were at or below the poverty level. Although the community has changed and matured from that time, the nature of the community is not such that a considerable amount of disposable income is available to most people. So the likelihood of significant water use or consumption patterns changing are low.

A higher rate would help conservation somewhat in the second level of residential use (over 6000 gal). However, there is evidence to suggest that residents who tend to use a lot of water tend to live in larger houses and tend to have more elaborate landscaping. And, these types of customers tend to be more affluent, less influenced by cost, and tend to use water less discriminately.

Increasing block rate structures can cause significant changes in revenue. Whatever rate plan is adopted the City needs to ensure that a mechanism remains to ensure that sufficient revenue comes into the program to continue to pay basic operation and maintenance expenses.

690-86-140(2)(d)(F) Evaluate Reuse Opportunities.

The City completed construction of a new wastewater treatment facility in spring of 2002. During summer months, treated water from the facility is used to irrigate a 117-acre poplar plantation and the open and landscaped areas adjacent to the plant. The poplars are to be harvested for commercial use. Treated effluent is used for treatment plant makeup and wash down water. It is estimated that as much as 18,000 gallons per day of water is reused for internal operations at the plant.

The City is completing (fall 2003) new iron removal water treatment facilities as part of their water system upgrade. The iron removal uses conventional sand filtration. Filter backwash water is collected in a tank that has the capacity to retain and re-filter as much as 30,000 gallons per day. After the solids remaining from the backwash process settle out of solution, the water is decanted and recycled back in to the raw water supply and treated for domestic use. This amount represents as much as 10-15% of demand on some days. The City expended over 55,000 dollars on this water recycle system.

Reuse of treated effluent for other purposes in Veneta such as irrigation, is not feasible at this time. A reuse program would require a high capital investment in storage, treatment, and distribution facilities and a commitment to a higher level of operation and maintenance for the wastewater management program. There is no industrial application, such as cooling water, in Veneta that would benefit from reuse facilities.

The uses for recycled water in Veneta are limited to the water and wastewater treatment plants, and the City is taking full advantage of those opportunities. Landscape irrigation on city property is not appropriate because the level of treatment required for irrigation water that has



the potential to come into contact with humans, mandated by the Oregon Department of Environmental Quality, is an extremely high standard. Any irrigation to a non-controlled sited, such as at parks and on the "intersection", and shopping centers would require the high level of treatment. The City has already invested in its treated effluent application area. An investment in a storage and distribution system for landscaping and extended water reuse would require an abandonment of the capital already invested in the land application areas committed for wastewater management.

690-86-140(2)(d) (G)

Evaluate any other conservation measures identified by the supplier that would improve water use efficiency.

All measures identified by the City have been evaluated elsewhere in this document or the previous plans. No other measures have been identified by the City at this time.

690-86-140(2)(e)(A)

Description and implementation schedule for an annual audit of all water supplied.

The City primary auditing process consists of monthly production reports. The water tracking is done by the Public Works department. The basic methodology consists of comparing well production logs to meter readings on a monthly basis. The monthly reports show unaccounted for water. This is an ongoing practice. The City worksheet of the monthly audit is included as an appendix.

690-86-140(2)(e)(D)

Description of a program to fully meter the water service system.

As reported in the 1998 Water Master Plan, Veneta's water system is fully metered, the City has completed this program to retrofit existing connections. All new connections to the system are fully metered at the time of installation.

690-86-140(2)(e)(D)

Description of a regularly scheduled leak detection program for the transmission and distribution system.

The City's unaccounted for water is usually less than 10% of water production, typically around 5%, according to monthly reports. This is mainly attributed to the program that investigated and replaced leaking plastic service connections with copper tubing and new service taps. This program brought the unaccounted for water rate into conformance with state standards.

Occasionally, a spike in unaccounted for water occurs. The cause is investigated promptly. Usually the cause is faulty meters. Soil types and the configuration of the water lines in Veneta are such that leaks in the transmission main will typically surface and puddle and are readily apparent. The City public works staff repairs any such leaks immediately and replaces the leaking pipe with ductile iron pipe.

The City's procedure for monitoring unaccounted for water has produced an efficient system that is in good repair. The system meets state standards and recommendations with regard to leaks and unaccounted water.

690-86-140(2)(e)(D)

Description of meter testing and maintenance program

The City has implemented an aggressive meter replacement program beginning in 1993. The meters are replaced when the manufacturer's warranty period expires or at any time a service connection is worked on. The City has replaced all meters so as to be touch read. The City is in the process of standardizing the system. All meters that are broken or require service are replaced.

690-86-140(2)(e)(D)

Description of a public education program, and implementation schedule, on efficient water use.

A public education program is critical to any conservation program. The City's current education program is modest. It incorporates a simple water conservation message with each water bill. Educational pamphlets and fliers are made available in the front office of City Hall (where many residents drop off payments). The City maintains a relationship with the community news paper, West Lane News, and periodically assists with the publishing of educational articles related to water use and conservation. These measures encourage water conservation and increase public awareness of water conservation issues. The costs are moderate and the City will continue these programs.

Several inexpensive programs are also available to the City. Typically, 80-90 % of outdoor summer residential use is for landscape irrigation. Public education opportunities are available to inform customers on methods of how to improve irrigation efficiency. A City web page was described in Section 690-86-140(2)(d) (C) as an educational incentive. The web page links described give useful tips on lawn watering efficiency.

The City shares a radio and television market with the larger and nearby Eugene Water and Electric Board (EWEB) and the Springfield Utility Board (SUB). Those large utility companies air advertisements and public service announcements during summer to encourage water conservation and efficient use. Veneta listeners benefit from these messages, but if Veneta were to partner with the larger utilities and contribute to the message, it may have more influence on Veneta's residents.

All the items presented in this document would require additional budgeting and planning (staffing, delegation, etc) to implement. This process includes scheduling for budget committee review, a City Council vote on the implementation measure. After approval, the items will be budgeted and planned. At that point implementation of the various measures will begin.

CHAPTER 3

WATER CURTAILMENT ELEMENT

The City must be able to maintain water delivery under drought, natural disaster, source contamination or other conditions that may contribute to an emergency water shortage. Curtailment measures are designed to preserve water supplies in the event of a shortage and ensure that delivery can be maintained. There are three levels of alert of differing severity that trigger the curtailment measures. Chapter 3 describes the conditions of each level of alert and the actions required at each level.

The curtailment plan addresses temporary and sustained shortages. An emergency backup supply plan was presented earlier. The City's curtailment actions focus primarily on public, commercial, and residential landscape watering.

690-86-140(3)(a)

A description and magnitude of supply deficiencies within the past 10 years and current capacity limitation, including assessment of ability to maintain delivery during long-term drought

The 1998 Water Master Plan documents the City's water supply deficiencies. The Plan states "1992 was the last time the City experienced a supply deficiency". In other words, that was the last time the City imposed a curtailment action. In that case, the supply deficiency was not "severe" and the curtailment action was moderate. The City imposed lawn watering restrictions. The public cooperation was good, and extensive enforcement was not necessary. The restrictions were monitored by the staff of the Public Works Department.

Since 1998, no official curtailment actions have been taken that required public participation. However, in the summer the City often halts irrigation of public landscaping when demand outpaces production capacity. This is generally sufficient to regain an adequate stored supply. If not for the supply deficiency, these areas would be irrigated. Hence, this is considered a form of curtailment action and not a "conservation measure".

The City recognizes the need for additional source capacity to meet demand and to supply a safeguard in the event of drought. The City is pursuing a third production well. A well site study has been selected and recommendations for supply development have been made. The City will be in a position to address further supply needs as development occurs and the actual production gained by the new well and treatment plants are incorporated into the Plan.

690-86-140(3)(b)

List three or more stages of alert for potential or water service difficulties (water shortages).

- Level 1: Mild Alert Condition
- Level 2: Moderate Alert Condition
- Level 3: Severe Alert

These three levels are reviewed in the following section.



690-86-140(3)(c)

A description of pre-determined levels of severity or shortage or water service difficulties that will trigger the curtailment actions under each stage of alert.

To initiate a curtailment action, the City Council must assemble and pass a resolution declaring an alert condition and authorize staff to implement curtailment measures.

Level 1 Mild Alert Conditions

This level of shortage can be expected to occur in a typical summer and therefore would be a fairly common occurrence. A mild alert condition is experienced and declared when full reservoir recovery cannot be achieved overnight. This occurs when or system demand is high during the peak summer season or the city experiences the loss of a supply well. Public Works staff initiates the actions required for a level 1 alert.

Level 1 is also declared when a "drought" year is predicted. During such drought periods the announcement of Level 1 curtailment actions will be repeated throughout the season.

Level 2 Moderate Alert Conditions

Level 2 is declared when the water service reservoirs are unable to sustain a service level that allows for full fire flow and emergency storage. For Veneta, this would be total reservoir storage at less than half of existing capacity. Level 2 alert will also be declared when there is concern that industrial water demands can not be sustained (loss of jobs) or agriculture production will be lost.

Level 3 Severe Alert

Level 3 alert is declared when the water service system is in severe jeopardy. Such service conditions might occur when well production is reduced to less than half of the demand, during sustained drought, or when other severe water supply conditions exist.

690-86-140(3)(d)

A description of specific stand-by water use curtailment actions for each stage of alert.

Level 1 Measures

During a Level 1 alert, the following measure will be implemented.

- The City will halt watering of public property when water demand exceeds capacity.
- Radio and newspaper public service announcements.

Generally, this is the first level of curtailment action. This step is taken at the discretion of the public works department. A level 1 implementation action saves from 20,000 to 200,000 gallons per day or 20% of summer demand. This is usually sufficient to restore storage to a satisfactory level during short-term, high-demand periods.

The Level 1 radio and newspaper public service announcements will provide information regarding the deficiency. An appeal will be made to water users to implement household conservation measures that optimize water use. Residents will be encouraged to adopt a



landscape-watering schedule of every fifth day. Water use for vehicle cleaning and other non-necessary water uses will be discouraged.

Level 2 Measures

Moderate alert conditions will not occur in a typical year. The curtailment actions required for Level 2 include:

- Landscape-watering restrictions (every 5th day watering for even-odd addresses)
- Prohibited car washing, pavement, and sidewalk washing
- Placement of notices of the alert on all service connections.
- Public service announcements and newspaper announcements.

Level 3 Measures

Level 3 measures implementation would include reinforcement and continued operation of all the measures used in Levels 1 and 2. The city will add a prohibition on outdoor watering, filling of swimming pools with city water, and possibly reduce service delivery pressure and limit all extraneous water uses other than those required for public health.

**CHAPTER 4
LONG RANGE
WATER SUPPLY ELEMENT**

690-86-140(4)(a)

A description of the water supplier's expected future service area and an estimate of long-range water demand projections for 10-20 years with supporting methodology demonstrating compatibility with the local comprehensive land use plans.

The 1998 Water Master Plan provides a complete description of the expected service area and estimates of long-range water demand.

690-86-140(4)(b)

A comparison of the projected water needs and system capacity and size and reliability of water rights, permits or other current water supply contracts held

The Water Master Plan projects water needs and describes system capacity and water sources.

690-86-140(4)(c) (A) If future projections indicate that additional water will be required within the next 20 years, include a comparison between the potential sources of additional water, including conservation, reuse, and interconnection with other systems which considers costs, availability, reliability, and likely environmental costs.

Future projections of demand indicate that supply will not meet demand. Growth will come primarily in the residential sector. Water use patterns and characterization of usage that are described in Chapter 1 are assumed to remain relatively constant throughout the planning period.

The Water Master Plan, provided projections for population, service connections and water demand. Tables 4-1 and 4-2 shown below are the basis for planning. The estimates are based on the assumptions made in the Master Plan.

TABLE 4.1 Future Population & Services

Year	1997	2010	2020
Population	2,870	4,262	5,727
# of Services	872	1,330	1,788

Table 4.2 Projected Water Demand

Year	1990-1996		2010		2020	
	gpd	gpm	gpd	gpm	gpd	gpm
Ave Day Demand (ADD)	357,000	248	588,000	408	791,000	549
Max Month (MMD)	597,000	415	984,000	683	1,322,000	918
Max Day Demand (MDD)	854,000	593	1,408,000	978	1,893,000	1,315
Peak Hour (PKHR)	1,708,000	1,186	2,817,000	1,956	3,786,000	2,629

gpd = gallons per day, gpm = gallons per minute



In Chapter 1, Water Description Element, the status of the City's supply wells was discussed. The City's current maximum supply limit, taking into account well capacity and water rights is 678 gallons per minute. A comparison of values in Table 4.2 shows that the City's maximum day demand is close to, or has exceeded the available supply. This is confirmed by experience; the City typically implements some Level 1 curtailment measure during the summer months. The City is pursuing an alternative source of supply. No other supply is currently available.

Table 4.3 shows an estimate of the water savings that might reasonably be expected from implementing the conservation measures as described. The estimates are based on the measures presented in Chapter 2 of this document and apply to current consumption patterns.

Table 4.3 Water Conservation Savings

Conservation Measure	Overall Savings*	
	%	gpm
Leak-Repair Program	0.0%	0
Low-Water-Use Landscaping		
Residential	10.0%	68
Public	2.8%	17
Commercial	1.0%	6
Incentives		
Educational	0.0%	0
Regulatory	0.0%	0
Financial	2.1%	12
Rate Structures	0.0%	0
Total	15.9%	103

* based on Maximum Day Demand, gpm = gallons per minute

The conservation measures could be expected to yield similar savings of about 15% projected through the planning period. Table 4.4 shows projected demand that incorporates water conservation measures.

Year	Current		2010		2020	
	gpd	gpm	gpd	gpm	gpd	gpm
Max Day Demand (MDD)	725,900	504	1,196,800	831.3	1,609,050	1,118

gpd = gallons per day, gpm = gallons per minute

This shows that by implementing conservation measures, and when considering the new treatment and storage capacity, Veneta could reduce its peak demand over the next few years and perhaps relieve some pressure to regularly impose Level 1 curtailment measures. The growth rate in Veneta shows that at some point between 2003 and 2010 Veneta will outgrow its supply.



690-86-140(4)(c) (B)

Include an estimated schedule for development of any new sources of water identified in (A) above to meet the demand projections, and the criteria used to select the source(s).

The Water Master Plan discusses a time schedule for development of additional increments of supply to meet projected demand. A new supply source is critical. Veneta is expected to outgrow supply by 2010, even if conservation measures are implemented.

690-86-140(5)(a and (b)

Describe a proposed date for submittal of an updated Water Management and Conservation Plan based on the proposed schedule for implementation of conservation measures, other community planning activities, or expected changes in rate of growth, etc., or an explanation of why an update is unnecessary and should not be required.

The schedule for submittal will be consistent with Division 86 rules which requires updated plans every 5-years.