BELLA VISTA WATER DISTRICT

2012 FEDERAL WATER MANAGEMENT PLAN

Prepared for:

United States Bureau of Reclamation
Mid-Pacific Region

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Abbreviations

ACID	Anderson Cottonwood Irrigation District
ADD	Annual Daily Demand (average daily water demand for the whole year)
AF	Acre-feet
AFY	Acre-feet per year
BMP	Best Management Practice (for water conservation)
BVWD	Bella Vista Water District
BW	Backwash
HCF	Hundred Cubic Feet
CF	Cubic Feet
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
CDPH	California Department of Public Health
COSL	City of Shasta Lake
CSA	Community Service Area
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CY	Calendar Year
District	Bella Vista Water District
DWR	(California) Department of Water Resources
ET	Evapotranspiration: the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues)—usually measured in inches of water.
ETc	Evapotranspiration for a specific crop in a specific location.
ETo	Reference evapotranspiration (for a reference grass). ET_o values are available from organizations such as CIMIS and are converted to ET_c values by use of an experimentally-determined conversion factor, K_c.
FWMP	Federal Water Management Plan
MDD	Maximum Day Demand (maximum daily water use rate during the year)
MGD	Million Gallons per Day
MHD	Maximum Hour Demand (maximum hourly water use rate during the year)
MMD	Maximum Month Demand (maximum monthly water use rate during the year)
M&I	Municipal & Industrial
OOT	Old Oregon Trail
PRV	Pressure Reducing Valve
RGWB	Redding Groundwater Basin
TCRCD	Tehama County Resources Conservation District
USBR	United States Bureau of Reclamation
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Section 1: Description of the District

District Name: Bella Vista Water District
Contact Name: David Coxey
Title: General Manager
Telephone: (530) 241-1085 x106
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Web Address: http://www.bvwd.org

1.A. History

1-A.1. District Formation Date and Size

Date formed:	June 4, 1957
Date of first Reclamation contract:	1964
Original size (acres):	27,375
Current year (last complete calendar year):	2012

1.A.2. Current size, population, and irrigated acres

	Year: 2012
Size (acres)	34,388
Population served	17,292
Irrigated acres	1,769

1.A.3. Water supplies received in current year

Water Source	*AF*[1]
Federal urban water (Table 1)	5,716
Federal agricultural water (Table 1)	5,841
State water (Table 1)	0
Other Wholesaler (define) (Table 1)	0
Local surface water (Table 1)	0
Upslope drain water (Table 1)	0
District groundwater (Table 2)	93
Banked water (Table 1)	0
Transferred water (Table 6)	0
Recycled water (Table 3)	0
Other (Transfers and Emergency Interties) (Table 1)	1,536
Total	13,186

1. Water use is for the 2012 Calendar-Year

1.A.4. Annual entitlement under each right and/or contract

Partner	*AFY*	*Source*	*Contract #*	*Availability Period(s)*
USBR Agriculture & M&I	24,578	USBR	14-060299-851A-LTR1	The contract water-year is for the period of March 1 through February 28
Anderson-Cottonwood Irrigation District (ACID)	1,536	USBR CVP Transfer	Letter of Agreement No. 10-WC-20-3982	April 1 through October 31 each year; 2010 through 2044

1.A.5. Anticipated land-use changes

The City of Redding, a portion of which lies within BVWD, has seen steady growth during the past 30 years. As the City of Redding expands into BVWD and formerly rural land is converted to denser residential use, additional water demand and service connections will result. Rural parcels outside of the City limits and within the unincorporated areas of Shasta County will likely continue to be divided into smaller lots but will remain zoned rural residential, which also create increased demand and require new connections. Other than these trends, no other significant cropping pattern or agricultural land-use changes have occurred in the past decade or are foreseen for the near future.

1.A.6. Cropping patterns (Agricultural only)

List of current crops (crops with 5% or less of total acreage can be combined in 'Other.'

Original Plan (1986)		*Previous Plan (1998)*		*Current Plan (2012)*	
Crop Name	*Acres*	*Crop Name*	*Acres*	*Crop Name*	*Acres*
Hay	183	Hay	176	Hay	323
Alfalfa	368	Alfalfa	217	Vegetables	29
Pasture	2,092	Pasture	2,813	Irrigated pasture	1,206
Fruits and nuts	50	Fruits and nuts	51	Grapes, wine	23
Aquaculture	48	Aquaculture	75	Other fruits	37
		Truck crops	16	Nuts	38
				Cereals	109
				Aquaculture	20
Other (<5%)	0	*Other (<5%)*	0	*Other (<5%)*	4
Total	2,741	Total	3,348	Total	1,789[1]

1. Total differs from table in Section 1.A.2 due to the inclusion of 20 acres of aquaculture.

1.A.7. Major irrigation methods (by acreage) (Agricultural only)

Original Plan (1986)		*Previous Plan (1998)*		*Current Plan (2012)*	
Irrigation Method	*Acres*	*Irrigation Method*	*Acres*	*Irrigation Method*	*Acres*
Sprinkler	2,693	Sprinkler	2,601	Sprinkler	1,574
Flood	48	Flood	52	Flood	105
				Drip	90
Other	0	*Other*	0	*Other*	0
Total	2,741	Total	2,653	Total	1,769

1.B. Location and Facilities

See Attachment A.1 for points of delivery, measurement locations, conveyance system, storage facilities, wells, pump stations, and water quality monitoring locations.

1.B.1. Incoming flow locations and measurement methods

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
Wintu Pump Station	Sacramento River, downstream of Sundial Bridge	Venturi meter	+/- 1%
Groundwater Wells	Well #1, #2, #3, #4, and #6	Propeller meter	+/- 3%
City of Redding Intertie	Near Water Treatment Plant	Turbine meter – 10-inch	+/- 1.5%
City of Redding Intertie	Old Alturas Rd at BVWD boundary	Turbine meter – 6-inch	+/- 1.5%
City of Redding Intertie	Edgewood Rd at BVWD boundary	Turbine meter – 8-inch	+/- 1.5%
Shasta Lake Intertie	Akrich St east of I-5	Turbine meter – 8-inch	+/- 1.5%

The District tests and calibrates the venturi meter at Wintu Pump Station annually during the winter months when the pump station can be taken off line for sufficient time to perform the calibration of both the low flow range and high flow range transducers. Testing of the larger meters at the District's pump stations and wells is performed every two years.

Testing of customers' water meters is undertaken if a customer disputes the accuracy of the meter readings. In addition, when meters are replaced a representative sample are tested to verify their accuracy. Please see Attachments C.1 through C.5 for documentation of calibration, standards of measurement device accuracy, meter warranties, and estimated meter lifespans.

1.B.2. Agricultural Conveyance System 2012 (shared with Urban Distribution System)

Miles Unlined Canal	*Miles Lined Canal*	*Miles Piped*	*Miles - Other*
0	0	234.2	0

1.B.3 Urban Distribution System 2012 (shared with Agricultural Distribution System)

Miles AC Pipe	*Miles CML Steel Pipe*	*Miles Ductile Iron Pipe*	*Miles PVC Pipe*	*Miles Other Pipe*
19.9	36.7	1.0	147.8	28.8

1.B.4. Storage facilities (tanks, reservoirs, regulating reservoirs)

Name	*Type*	*Capacity (AF)*	*Distribution or Spill*
Surge Tank (E)	Steel tank	0.71 AF	Surge protection. Emergency regulation storage.
Main Tank (E)	Steel tank	12.3 AF	Regulation storage.
Old Alturas Regulating Tank (E)	Concrete tank	0.57 AF	Regulation storage.
Old Oregon Trail Tank (E)	Steel tank	3.1 AF	Regulation storage.
Cow Creek Tank (E)	Steel tank	0.61 AF	Regulation storage.
WTP Pond 1 (E)	Earth embankment	5.4 AF	WTP backwash water settling pond (BW water is recycled)
WTP Pond 2 (E)	Earth embankment	5.5 AF	WTP backwash water settling pond (BW water is recycled)

(E) = Existing; (P) = Proposed

1.B.5. Description of the agricultural spill recovery system and outflow points

The District does not have an agricultural spill recovery system because there are no incidental spills originating from the distribution system. The distribution system is pressurized and allows water customers to take water on-demand. Also, due to the 2011 installation of a backwash water recovery pump station (see Section 2.F.2), filter backwash water is no longer released from into Dry Gulch from settling ponds at the District's water treatment plant.

1.B.6. Agricultural delivery system operation

On-demand	*Scheduled*	*Rotation*	*Other (describe)*
100%			

1.B.7. Restrictions on water source(s)

Source	*Restriction*	*Cause of Restriction*	*Effect on Operations*
CVP Sacramento River Supply	Total Volume & Flow Rate (Max. of 81 cfs)	Contractual & Water Treatment Capacity	Reduced surface water supplies during dry years, increased reliance on District wells.
Groundwater Wells #1, #2, #3, #4, & #6	Flow Rate	Physical	Can be used to augment surface water supplies.
City of Redding Intertie - near Water Treatment Plant	Pressure & Flow Rate, For Emergency Use	Physical, Contractual	Beneficial for receiving agency. Can sustain pressure and flow. Can operate in either direction.
City of Redding Intertie - Old Alturas Road at BVWD boundary	Pressure & Flow Rate, For Emergency Use	Physical, Contractual	Beneficial for receiving agency. Can sustain pressure and flow. Can operate in either direction.
City of Redding Intertie - Edgewood Road at BVWD boundary	Pressure & Flow Rate, For Emergency Use	Physical, Contractual	Beneficial for receiving agency. Can sustain pressure and flow. Can operate in either direction.
Shasta Lake Intertie	Pressure & Flow Rate, For Emergency Use	Physical, Contractual	Beneficial for receiving agency. Can sustain pressure and flow. Can operate in either direction.

1.B.8. Proposed changes or additions to facilities and operations for the next 5 years

Proposed changes and additions to the District's facilities in the next 5 years (2012-2016) are listed below. Implementation of the improvements will depend on available funding.

Facility	*Description*	*Schedule*
Surge Tank	Increase height of tank to accommodate increased flow rate from Wintu Pump Station	Depends on growth and recommendations of System Optimization Review
Old Oregon Trail Pressure Zone	Loop mains in distribution system to improve pressures	Depends on growth within the OOT Pressure Zone.
Old Oregon Trail Pressure Zone Tank	Construction of new 3.0 MG regulation tank to provide emergency and equalizing storage	Depends on growth within the OOT Pressure Zone.
Old Oregon Trail Pump Station No. 2	New pump station will provide increased capacity to Old Oregon Trail Pressure Zone	Depends on growth within the OOT Pressure Zone.
Old Oregon Trail Pump Station No. 2 PRV	New PRV will allow storage in Old Oregon Trail Pressure Zone to backup Main Pressure Zone	Depends on growth.
Hollow Lane Pressure Reducing Valve (PRV)	Install new PRV to improve fire flows in N/W portion of Simpson Pressure Zone and will supply this pressure zone with water if Simpson Pump Station fails	Depends on growth.
Simpson Pump Station	Upgrade capacity of pump station	Depends on growth within the Simpson Pressure Zone.
Old Alturas Equalization Tank	Construct a new 4 MG tank to reduce demand/improve pressure in Main Conduit and provide emergency capacity in Deschutes & Palo Cedro Pressure Zone	Depends on growth within the Main, Deschutes, Palo Cedro, and Cow Creek Pressure Zones.
Tamara Way Main Pipeline	Construction of 2,000 ft pipeline to loop water to Old Oregon Trail Reservoir	Depends on growth within the OOT Pressure Zone.
Simpson Zone Pump Station #2	Construct a new pump station to feed the portion of the Simpson Zone north of Highway 299.	Depends on growth.
New Cow Creek I Pressure Zone Tank	Construction of new regulation tank to provide emergency and equalizing storage	Depends on growth.

1.C. Topography and Soils

1.C.1. Topography of the District and its impact on water operations and management

The Bella Vista Water District is situated on a large, nearly flat eroded land surface (peneplain). The main streams, Cow Creek, Dry Creek, Stillwater Creek, Clough Creek, and Churn Creek drain in the same southerly direction today as they did during the peneplain development. Minor uplifting caused rejuvenation of the stream cutting resulting in the present entrenched creeks. The topography is characterized by a series of alternate, narrow stream valleys and relatively smooth terraces. The physiographic features can be grouped into two land form types: (1) old alluvial terraces, and (2) stream bottom flood plains.

The northern portion of the area has uneven terrain and shallow soils. The wooded, rolling hills in the north gradually give way to gently sloping treeless plains known locally as the Stillwater Plains to the south. To the east of these plains Cow Creek has entrenched, forming a long, narrow valley some 100 feet below the surface of Stillwater Plains. East of Cow Creek, the plateau continues at about the same elevation and is known locally as the Millville Plains.

Drainage is principally by Churn Creek, Stillwater Creek, and Cow Creek, which flow southerly through the area. The irrigated agriculture is found principally in the narrow valleys of these streams.

The most common soil association within the District is the Newtown series, and more specifically, the Newtown gravelly loam. The Newtown series consists of well-drained soils that formed in old alluvium from mixed sources and are usually on high terraces. The surface layer is generally gravelly loam mixed with gravelly clay about 18 inches thick. The subsoil usually consists of clay and clay loam. Areas of Newtown soils are generally used as rangeland, dry land pasture, and wildlife habitats.

Old alluvial terrace soils were formed in weathered gravelly alluvium from mixed sources. Soil textures range from fine to medium textures. The two predominant soil types occurring on the terraces are Redding and Red Bluff. These soils typically are acidic, have low fertility, and are reddish brown in color. They differ in that the Redding series possesses an iron silica hardpan at a depth generally of 16 inches and has a mound-basin type micro relief. The Red Bluff series generally is brush covered, free of hardpan, and has a smoother micro relief.

In a representative profile, the Redding series surface layer is strong brown, strongly acidic gravelly loam about 5 inches thick. The subsoil is mixed, reddish brown, and red, strongly acid clay that extends to a depth of about 13 inches. Below this layer is an indurated, very gravelly hardpan about 15 inches thick. Stratified mixed alluvial material is below the hardpan. The areas of Redding soils are used as range and pasture on slopes of 0 to 8 percent.

The Red Bluff series has in a representative profile, a brown surface layer, very strongly acid loam about 6 inches thick. The upper 22 inches of the subsoil is yellowish-red, and very strongly acid clay loam. The lower 29 inches of the subsoil is red, strongly acid heavy clay loam and light clay with a light brown, medium acid clay loam substratum that extends to a

depth of more than 60 inches. The areas of the Red Bluff soils are used as range, pasture, and home sites. Slopes are typically 0 to 8 percent.

The stream bottom flood plains have several soil types. In general, the lighter textured soils have been deposited near the stream while silts and clay soils are found in the lower and central parts of the valley. These soils are more fertile and have more favorable reaction making them more productive than the terrace soils. Two of these soil types are the Churn and the Vina, with the Churn being the predominant. These are typically Class 1 and Class 2 irrigation suitability land classification soils as defined by the U.S. Bureau of Reclamation.

The Churn series consists of well drained and moderately well drained soils with a representative profile having a light yellowish brown surface layer being medium acid, gravelly loam in texture about 9 inches thick. The upper part of the subsoil is light yellowish brown, medium acid gravelly loam about 4 inches thick. The lower parts of the subsoil are light yellowish brown and strong brown, medium acid gravelly clay loam that extends to a depth of more than 60 inches. These soils are typically used for irrigated and dryland crops.

The Vina series consists of well drained and moderately well drained soils that formed in dominantly basic alluvium. These soils are on low terraces and flood plains along the streams. In a representative profile, the surface layer is grayish brown and brown, neutral and slightly acid loam about 34 inches thick. Below this layer the substratum is yellowish brown, slightly acid loam to a depth of more than 60 inches. Much of the area of Vina soils are used for field crops and orchards, however, Vina soil exists only in small isolated areas within the District.

Elevations range from approximately 430 feet in the southeast (Cow Creek) to 760 feet above sea level in the north (Bear Creek Road). The District utilizes a pressurized pipeline distribution system with variable speed pumps and pressure/regulation tanks to provide water at service points with varying elevations.

1.C.2. District soil associations (Agricultural only) – Major soils within District

Soil Association	*Estimated Acres*
Newtown gravelly loam	7,716
Red Bluff gravelly loam	3,300
Churn gravelly loam	2,627
Perkins gravelly loam	2,020
Clough gravelly loam	1,964
Red Bluff loam	1,614
Anderson gravelly sandy loam	1,313
Redding gravelly loam	1,286
Churn loam	1,189
Redding-Red Bluff gravelly loams	1,109
Inks-Pentz complex	1,011
Total	25,149

See **Attachment A.2**, District Soils Map

1.C.3. Agricultural limitations resulting from soil problems (Agricultural only)

Soil Problem	*Estimated Acres*	*Effect on Water Operations and Management*
Salinity	0	
High-water table	0	
High or low infiltration rates (heavy soils)	7,300	Poor productivity, perched water table (Redding and Red Bluff soils)

1.D. Climate

1.D.1. General climate of the District service area

Hot, dry summers and cool, wet winters are characteristic of the general area. The average annual temperature is about 64 °F. The average maximum temperature in July is near 100 °F. Maximum temperatures typically reach 105 °F or higher in most of the area with a record high of 118 °F. Temperatures in winter are generally cool, with lows averaging in the middle 30's °F during the month of January. Though extreme low temperature readings can near 20 °F, these are not common. The average date of the last 32 °F freeze can be as early as the last part of February and the first 32 °F temperature of the Fall averages an occurrence typically in December. The District area enjoys a frost-free growing season ranging from 230-320 days.

Annual rainfall varies considerably from year to year and averages about 34 inches, of which approximately 80% occurs from November through April. Snowfall is very light at low elevations and only a few inches are recorded in an average year.

Wind speed is generally slow, except during thunderstorms that produce locally strong winds. The wind speed is eight miles per hour or less 50% of the time and 13 miles per hour or less 90% of the time. Winds of 32 miles per hour or more occur only 0.1% of the time.

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
Avg Precip	6.32	5.57	4.47	2.37	2.08	0.79	0.10	0.15	0.51	1.96	3.39	5.96	33.67
Avg Temp	46.0	49.4	53.6	58.6	67.0	75.6	82.3	80.0	74.8	64.2	52.1	45.6	62.4
Max. Temp °F	55.4	59.7	64.7	70.8	80.5	89.9	98.7	97.1	91.8	78.8	63.3	55.0	75.5
Min. Temp °F	36.6	39.1	42.5	46.3	53.5	61.2	65.9	62.8	57.8	49.6	40.9	36.1	49.4
ETo	1.04	1.81	3.46	5.03	6.62	7.91	8.73	7.40	5.75	4.06	1.80	1.13	54.74

Weather station ID: 047304 Data period: Year 1986 to Year 2013

Average annual wind velocity: 7.0 mph Annual frost-free days: 230-320

Climate data references:
Precipitation data: Western Regional Climate Center – Redding, California (1986-2013)
http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7304

ETo Data: CIMIS (2013, Station #224: Shasta College *http://wwwcimis.water.ca.gov/cimis/)*

Frost free days: USDA (*https://soilseries.sc.egov.usda.gov/OSD_Docs/R/REDDING.html*)

Wind Speed: Weatherbase.com (*http://www.weatherbase.com/weather/weather.php3?s=29527*)

1.D.2. Impact of microclimates on water management within the service area

Microclimates are not a significant factor in Bella Vista Water District.

1.E. Natural and Cultural Resources

1.E.1. Natural resource areas within the service area

Name	*Estimated Acres*	*Description*
Wetlands	1,844	Various vernal pools, vernal swales, and fresh water marshes throughout District. Some of these locations may contain rare or endangered plant or animal species.

1.E.2. Description of District management of these resources in the past or present

The District has and will site its proposed facilities to avoid stream channels and other wetlands. These areas are identified by the District prior to acquiring sites or easements for construction of its facilities. If such resources are located near or within a proposed facility, the District will consider alternative sites/corridors.

1.E.3. Recreational and/or cultural resources areas within the service area

Examples of recreational resources are sites used for rafting, boating, water skiing, and fishing. Examples of cultural resources are structures listed on the National Register of Historic Places, Native American archeological sites, or other sites of historic significance.

Name	*Estimated Acres*	*Description*
None	None	None

There are isolated cultural resources located within the District's service area; however none are named and the acreage is minimal. Cultural resources have also been identified near the District's Wintu Pump Station; however, these are not within the District's service area. There are no water-based recreational resource areas within the service area.

1.F. Operating Rules and Regulations

1.F.1. Operating rules and regulations

See **Attachment B**, Bella Vista Water District Policy Manual (water related)

1.F.2. Water allocation policy
(Agricultural only)

See **Attachment B**, Bella Vista Water District Policy Manual, Page 42

The District does not have formal water allocation guidelines for agricultural customers. The District delivers water to its customers "on-demand", with no active limitation on quantity. However, the District does have passive methods for allocating water, including limiting pipe and meter sizes to be appropriate for the anticipated demand at each turnout. The District uses the American Water Works Association (AWWA) "Recommended Maximum Rate for Continuous Operations" standard as a baseline for sizing pipes and meters for its customers.

If the District's available supplies cannot meet usage demands, the District also reserves the right to stagger the water hours and days or to limit the maximum flow so as to provide equal usage opportunities for all users on the same transmission line.

1.F.3 Official and actual lead times necessary for water orders and shut-off
(Agricultural only)

None – District utilizes an on-demand system.

1.F.4. Policies regarding return flows (surface and subsurface drainage from farms) and outflow (Agricultural only)

The District does not have a policy for agricultural drainage. However, water waste regulation is included in **Attachment B**, Bella Vista Water District Policy Manual, Page 8. Agricultural drainage is the landowners' responsibility. No return flows or drainage water is allowed back into the District's pressurized distribution system.

1.F.5. Policies on water transfers by the District and its customers

The District has historically transferred CVP water into the District during shortage years when CVP supply allocations are reduced, or in anticipation of a shortage year. Recently, the District requested and Reclamation approved a long-term transfer of up to 1,536 acre-feet of Central Valley Project water annually from the Anderson-Cottonwood Irrigation District, a Sacramento River Settlement Contractor, beginning April 1, 2010, and continuing through October 31, 2044. The purpose of the transfer is to secure more reliable water supply for existing development and to guard against possible multi-year shortages. The need for the transfer arises from shortages caused by a relatively inelastic demand and potential future

reduced allocations due to natural changes in hydrology and regulatory induced shortages. The transfer is part of an ongoing effort to optimize the use of water within the Redding area.

On April 13, 2009, the District adopted a Supplemental Water Program (Resolution 09-02) which provides the District's agricultural water customers, who bear a disproportionate share of curtailment in shortage years, the option of having the District obtain supplemental supply on their behalf on a subscription basis. It is anticipated that shortage year subscriptions for agricultural water will be fulfilled through CVP water transfers into the District pursuant to Section 3405(a) of Public Law 102-575, Title 34, of the Central Valley Project Improvement Act (CVPIA).

The District's USBR contract limits the District to providing water only within its contractual (District) boundary. The District does not permit its customers to transport, supply, resell or otherwise transfer water purchased from the District to any other person or property unless authorized by law and by the District's Board of Directors. However, owners of multiple-unit complexes (mobile home parks, apartment buildings, etc.) shall have the right to supply water to its tenants and charge a fee. See **Attachment B**, Bella Vista Water District Policy Manual, Page 8.

1.G. Water Measurement, Pricing, and Billing

1.G.1. Agricultural Customers

Information on water measurement for agricultural contractors can be found in Section 3.A.1.

1.G.2. Urban Customers[1]

Total number of connections 5,935[2]
Total number of metered connections 5,935
Total number of connections not billed by quantity NONE
Percentage of water that was measured at delivery point* 100%
Percentage of delivered water that was billed by quantity* 100%

**For purposes of accounting, in 2012 the District assumed that all unaccounted-for water was agricultural water. A revised procedure for allotting unaccounted for water was recently developed and is included as Attachment P.*

Urban Customers measurement device table

Meter Size and Type	*Number*	*Accuracy* (+/- %)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency*
5/8-3/4" Disc	1,651	+/-1.5%	Bi-monthly	None	20 year replacement
5/8-3/4" Multi-Jet	1,936	+/-1.5%	Bi-monthly	None	20 year replacement
1" Disc	842	+/-1.5%	Bi-monthly	None	20 year replacement
1" Multi-Jet	385	+/-1.5%	Bi-monthly	None	20 year replacement
1½" Disc	521	+/-1.5%	Bi-monthly	None	20 year replacement
1½" Multi-Jet	145	+/-1.5%	Bi-monthly	None	20 year replacement
2" Disc	298	+/-1.5%	Bi-monthly	None	20 year replacement
2" Multi-Jet	100	+/-1.5%	Bi-monthly	None	20 year replacement
3" Turbo	15	+/-3%	Bi-monthly	None	20 year replacement
4" Turbo	19	+/-3%	Bi-monthly	None	20 year replacement
6" Turbo	9	+/-3%	Bi-monthly	None	20 year replacement
8" Turbo	8	+/-3%	Bi-monthly	None	20 year replacement
10" Turbo	1	+/-3%	Bi-monthly	None	20 year replacement
6 -8" Compound	5	+/-1.5%	Bi-monthly	None	20 year replacement
Total	5,935				

* Accuracy for meters up to 2" and compound meters is per manufacturer's specifications. Accuracy of turbo

[1] Includes all customers that are not eligible to receive "Irrigation Water" under the District's Water Service Contract with the U.S. Department of the Interior, Bureau of Reclamation dated February 25, 2005. Less than one sixth (1/6) of the District's service area is within the city limits of the City of Redding and considered "urban." The remainder of the District's service area is zoned primarily for agricultural and rural residential purposes.

[2] Includes 1,563 "Rural" accounts (as of 12/31/2012) that do not meet the requirements to receive "Irrigation Water," many of which are zoned Rural Residential. Permitted uses under Shasta County's "Rural Residential" zoning designation include "agricultural uses" and "sale of agricultural products grown on the premises."

meters is based on a combination of their high flow and low flow accuracies per manufacturer's specs.

1.G.3. Agriculture and Urban Rates

1.G.3.a Current year agriculture and/or urban water charges - including rate structures and billing frequency

See **Attachment D.1**: Schedule of Bimonthly Water Rates, for current year rate ordinance. Water rates are adjusted annually (on March 1) in accordance with a rate resolution (Resolution 10-01) adopted on April 29, 2010.

The District purchases both irrigation and municipal and industrial (M&I) water from the Central Valley Project (CVP) through their USBR contract. Both types of water are defined in the contract, and USBR rates for irrigation water are significantly less than for M&I water. The District charges customers for water using four different customer classes and rate schedules: residential/commercial/public-institutional rate, rural rate, agricultural rate, and aquaculture rate. Each water rate schedule is broken down into two components; a base charge and a volumetric commodity charge. The bi-monthly base charge per service connection does not provide for any water, but only for offsetting the cost of providing water service and maintaining/improving the District facilities. The commodity charge is a unit charge for the amount of water used. Each rate schedule has different commodity charge rate tiers, with increasing unit water costs in the higher tiers. The tiered water pricing is mandated as a conservation measure by the District's water supply contract with the U.S. Bureau of Reclamation.

The residential/commercial/public-institutional rate is used for charging urban water customers. Nearly all customers with properties smaller than two acres are billed using this rate structure. All customers under the residential/ commercial/public-institutional rate pay the same base rate, but the residential/commercial customers have a different tiered volumetric charge than the public-institutional customers.

The rural rate is similar to the residential/commercial/public-institutional rate but is only available to properties at least two acres or larger and with a one-inch or larger meter. The rural rate was originally established for agricultural properties that did not quite meet the requirements for receiving irrigation water and was set at a level higher than the agricultural rate but lower than the residential rate. The rural usage rate schedule has a base rate that is the same as the residential/ commercial/public-institutional rate but has wider tiers at the same volumetric rates.

A summary of the 2012 rates is provided in the tables below.

Residential/Rural/Commercial/Public-Institutional Base Rates (effective March 1, 2012)

Meter Size	Bimonthly Base Rate
5/8”	$33.79
3/4”	$35.71
1”	$39.76
1.5”	$47.65
2”	$55.54
3”	$71.43
4”	$87.31
6”	$118.97
8”	$150.62
10”	$182.40

Residential/Commercial Rate Tiers (effective March 1, 2012)

Tier	Volume (100 CF)	Rate ($/HCF)
1	0 – 175	$0.465
2	175 – 245	$0.558
3	> 245	$0.651

Public-Institutional Rate Tiers (effective March 1, 2012)

Tier	Volume (100 CF)	Rate ($/HCF)
1	0 – 871	$0.465
2	871 – 1307	$0.558
3	> 1307	$0.651

Rural Rate Tiers (effective March 1, 2012)

Tier	Volume (100 CF)	Rate ($/HCF)
1	0 – 871	$0.465
2	871 – 1307	$0.558
3	> 1307	$0.651

The agricultural rate is used for customers owning properties eligible for USBR irrigation water, that is, land primarily used in the commercial production of agricultural crops or livestock, including incidental domestic use. Customers desiring to fall under the agricultural rate must have:

- a property with at least two acres of cultivated land under irrigation and dedicated to crop production;
- a meter at least a one-inch in size;
- a business plan;
- crops or livestock sales or documented barter;
- improvements to land, including, but not limited to buildings, irrigation systems, corrals, fencing, fruit or nut trees, vines, etc.

Agricultural Base Rates (effective March 1, 2012)

Meter Size	Bimonthly Base Rate
1”	$58.31
1.5”	$66.20
2”	$74.19
3”	$89.97
4”	$105.85
6”	$137.52
8”	$169.28

Agricultural Rate Tiers (effective March 1, 2012)

Tier	Volume (AF/acre)	Rate ($/AF)	Rate ($/HCF)
1	0 – 2.5	$39.21	$0.090
2	2.5 – 3.50	$47.05	$0.108
3	> 3.50	$54.89	$0.126

The aquaculture rate schedule has the same base rate as the agricultural rate but has wider tiers at the same volumetric costs. The aquaculture rate is available to customers involved in the production of fish or aquatic plants under controlled conditions, and does not include farm pond environments where fish are present and fee for fishing enterprises. There are less than five customers within the District using this rate.

Aquaculture Rate Tiers (effective March 1, 2012)

Tier	Volume (AF/acre)	Rate ($/AF)
1	0 – 6.25	$39.21
2	6.25 – 8.75	$47.05
3	> 8.75	$54.89

In addition to the above charges, the District assesses a $14.00 bi-monthly repayment charge for the Water Treatment Plant Improvements along with a special assessment that equates to approximately $0.37 per $100.00 of assessed land value. The special assessment may fluctuate year-to-year, but is used for purchasing water from the USBR, repaying the USBR for the cost of the District's water system, to operate and maintain the system, and to maintain a contingency reserve.

1.G.3.b Annual charges collected from customers (CY 2012 data)

2012 Fixed Charges				
Base Rate Category	*Bi-Monthly Charge/ Account*	*Annual Charge/ Account*	*# of Accounts*	*$ Collected*
Residential				
5/8" meter	$33.79	$202.74	565	$114,447
3/4" meter	$35.71	$214.26	2,718	$582,412
1" meter	$39.76	$238.56	438	$104,430
1 ½" meter	$47.65	$285.90	83	$23,658
2" meter	$55.54	$333.24	47	$15,746
Commercial				
5/8" meter	$33.79	$202.74	9	$1,825
3/4" meter	$35.71	$214.26	203	$43,548
1" meter	$39.76	$238.56	42	$9,960
1 ½" meter	$47.65	$285.90	12	$3,431
2" meter	$55.54	$333.24	15	$4,999
3" meter	$71.43	$428.58	8	$3,214
4" meter	$87.31	$523.86	2	$1,048
6" meter	$118.97	$713.82	1	$714
Rural				
1" meter	$39.76	$238.56	701	$167,231
1 ½" meter	$47.65	$285.90	393	$112,216
2" meter	$55.54	$333.24	418	$139,294
3" meter	$71.43	$428.58	16	$6,857
4" meter	$87.31	$523.86	18	$9,429
6" meter	$118.97	$713.82	8	$5,711
8" meter	$150.62	$903.72	3	$2,711

2012 Fixed Charges (continued)

Base Rate Category	*Bi-Monthly Charge/ Account*	*Annual Charge/ Account*	*# of Accounts*	*$ Collected*
Public Institutional				
5/8” meter	$33.79	$202.74	2	$405
3/4” meter	$39.76	$238.56	4	$954
1” meter	$47.65	$285.90	4	$835
1 ½” meter	$55.54	$333.24	10	$2,788
2” meter	$71.43	$428.58	17	$5,665
3” meter	$87.31	$523.86	11	$5,893
4” meter	$150.62	$903.72	9	$7,908
6” meter	$182.40	$1,094.40	3	$3,283
Agricultural				
1” meter	$58.31	$349.86	17	$6,035
1 ½” meter	$66.20	$397.20	52	$20,456
2” meter	$74.19	$445.14	132	$58,647
3” meter	$89.97	$539.82	16	$8,637
4” meter	$105.85	$635.10	27	$17,306
6” meter	$137.52	$825.12	16	$13,202
8” meter	$169.28	$1,015.68	3	$3,047
Aquiculture				
1 ½” meter	$66.20	$397.20	0	$0
3” meter	$89.97	$539.82	1	$540
4” meter	$105.85	$635.10	2	$1,270
8” meter	$169.28	$1,015.68	1	$1,016
		Totals:	6,025	$1,510,768

Volumetric Charges[1]			
Charge Units	*Charge/AF*[2]	*Total AF Billed During 2012*	*$ Collected*
Residential AF	$202.55	3,314	$671,217
Commercial AF	$202.55	485	$98,263
Public-Institutional AF	$202.55	1,140	$230,835
Rural AF	$202.55	2,648	$536,361
Construction	$202.55	10	$2,084
Run to Waste (flushing)	$0	2	$0
BVWD Yard & WTP 2" Meter	$0	13	$0
Agricultural/Aquaculture	$39.21	4,652	$182,408
Totals		12,264	$1,721,243

1. All deliveries were made within Tier 1 of the each customer type.
2. $202.55/AF = $0.465/HCF

1.G.3.c Contractor's record management system and water-use data accounting procedures

Water meters are installed for all customers and provide the basis for bimonthly billings. All customers are separated into two groups, Group 1 and Group 2, and are further divided into 44 meter reading routes based on geographical locations. The District utilizes an automated hand-held reading system referred to as ITRON and routes are downloaded into the "hand helds" from the inHANCE computerized utility billing system. Route schedules are prepared to organize the reading of meters on the various routes. The meters on each route are read once every two months. In 2009, all irrigation customers were separated into a separate single and distinct cycle (Cycle 4), which is also read bimonthly. This new cycle has assisted the District in monitoring activity and use as compared to crop demand. Bimonthly customer usage information has been maintained on the inHance utility billing system since the date of inception March 2007 and is available on demand and free of charge through the District's I-Web online billing system via the internet—see screenshot of a sample customer's online account information in **Attachment D.4**.

Sample water bills for each billing classification: Residential/Commercial, Public/Institutional, Rural and Agricultural can be found in **Attachments D.2-D.3.** The bills clearly show how much water was used and that it is billed on a volumetric basis. In addition, "audits" of customer meter readings are performed annually. During the audit, staff manually reads every meter at the same time that meter readings are collected using the hand held meter reader. Any differences are reconciled and work orders are written to correct any misreading meters. See **Attachment K**, *Records Retention Policy,* for details concerning the District's records management system in general.

1.H. Water Shortage Allocation Policies

1.H.1. Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated

See **Attachment E.1**, *BVWD Water Shortage Contingency Plan* for current year water shortage policies.

In 1992, the District developed and adopted a four stage "Drought Contingency Plan" that applies to all customers. Stage I of the plan encourages voluntary conservation whereas Stages II, III and IV have progressively more severe restrictions.

Stage I of the Drought Contingency Plan seeks to obtain a 10 percent reduction through voluntary programs. Many of these items in Stage I are communicated to District customers by way of billing inserts, newspaper advertising and by verbal communication as District Staff and personnel interact with the consumers. Stages II, III and IV use a combination of pricing surcharges for usage above base year allotments.

See **Attachment E.2,** Resolutions 09-01, 09-02, 09-03, 09-06 for details concerning a recent implementation of the Drought Contingency Plan.

1.H.2. Current year policies that address wasteful use of water and enforcement methods

The District's policy concerning wasting water is found in the District Policy Manual (**Attachment B**), Section 143, and states the following:

"No customer shall permit leaks or otherwise waste water, whether intentionally or negligently. In the event that water is wastefully or negligently used on a customer's premises, District shall have the right to discontinue service to the premises and shall have the right to enter upon the premises for the purpose of disconnecting the service."

In addition, the following sections of the District's Policy Manual detail the enforcement of District policies:

444. DISCONTINUANCE (NON-COMPLIANCE WITH REGULATIONS).

461. PROHIBITED ACTS.

462. DETERMINATION OF VIOLATION.

463. PENALTIES.

1.I. Evaluation of Policies of Regulatory Agencies

As a water provider fully reliant upon the Central Valley Project, the District is subject to significant water supply uncertainty and shortages due to dry hydrologic conditions, compounded by operational and regulatory constraints both directly and indirectly related to the Endangered Species Act. In addition, much of the previously available yield from the CVP is no longer available as a result of regulatory actions and court rulings. This reallocation of water supply over the last couple decades with no added storage means BVWD is likely to experience shortages more frequently and more severely in the future.

Reclamation should adopt a shortage policy that is comprehensive and provides the greatest possible clarity, certainty, and predictability as to how Reclamation will respond to various shortage situations as they arise. CVP Municipal and Industrial Contractors need to plan for infrastructure and make substantial investments decades in advance to provide for the water needs of communities, and must be able to make these decisions within a reasonable and consistent framework. This is particularly important for smaller communities and cities served by the CVP which have fewer resources for developing their water supplies. A copy of the draft CVP M&I Shortage Allocation Policy can be found in **Attachment M**.

In order to better manage the existing water supply and utilize available surface water storage, Reclamation should consider adopting a rescheduling or carryover program for Water Service Contractors within the Sacramento Valley. Such a program, as implemented elsewhere within the Central Valley Project would provide an incentive to conserve water in non-shortage years in order to better utilize existing infrastructure and storage facilities and to mitigate the uncertainty for those contractors most impacted by supply shortages.

Concerning water conservation in general, the inexpensive rates that the District and its customers pay for water combined with current water surpluses make water conservation a hard sell in the northern Sacramento Valley. In addition, low rates render investing in conservation programs such as low-volume toilet rebates not cost-effective. It would make more sense to have subsidies available to help defray costs of such conservation programs, possibly funded by third parties that would benefit from increased water supplies or by environmental advocacy groups and/or the government legislation itself that seeks to maintain minimum environmental flows in surface waters.

Section 2: Inventory of Water Resources

2.A. Surface Water Supply

2.A.1. Acre-foot amounts of surface water delivered to the water purveyor by each of the purveyor's sources

See **Section 5**: District Water Inventory Tables, Table 1.

2.A.2. Amount of water delivered to the District by each of the District sources for the last 10 years

See **Section 5**: Water Inventory Tables, Table 8.

2.B. Groundwater Supply

2.B.1. Acre-foot amounts of groundwater pumped and delivered by the District

See **Section 5**: Water Inventory Tables, Table 2

2.B.2 Groundwater basin(s) that underlies the service area

Name	*Size (Square Miles)*	*Usable Capacity (AF)*	*Safe Yield (AFY)*
Redding Groundwater Basin	510	5.5 million	Unknown[(1)]
Enterprise Sub-basin	95	unknown	332 [(2)]
Source: Shasta County Water Agency; Redding Groundwater Basin Management Plan EIR (2007)			

1. No safe yield has been established for the Redding Groundwater Basin, but groundwater modeling as part of the Coordinated AB3030 Groundwater Management Plan indicates that the RGWB is resilient to severe drought conditions and is able to recover with one year of normal rainfall. (Source: Shasta County Water Agency)
2. Represents the 2008-2012 annual average groundwater production by Bella Vista Water District, which had no detriment to other basin users.

The Enterprise Sub-basin comprises the portion of the Redding Groundwater Basin bounded on the west and southwest by the Sacramento River, on the north by the Klamath Mountains, and on the east by Little Cow Creek and Cow Creek. Annual precipitation within the basin ranges from 29 to 41 inches, increasing to the north. Recharge to the principal aquifer formation is mostly by infiltration of stream flows. Infiltration of applied water and stream flows, and direct infiltration of precipitation are the main sources of recharge in the sub-basin.

In general, there is a seasonal fluctuation of approximate 5 to 10 feet in groundwater levels and, for the semi-confined wells, between 10 to 15 feet for normal and dry years. Overall, there does not appear to be any increasing or decreasing trends in groundwater levels.

Estimates of groundwater extraction within the sub-basin were performed by a survey conducted by the California Department of Water Resources in 1995. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 4,449 and 4,127 acre-feet respectively. Deep percolation from applied water is estimated to be 3,788 acre-feet. Outside of the District's groundwater production that is accurately measured at each of its wells, the District has no way of identifying how much of this estimated water usage is from either for private urban usage or private agricultural usage within the District's service area.

2.B.3. Map of District-operated wells and managed groundwater recharge areas

See **Attachment A.3**: District Map of Groundwater Facilities.

The District owns no managed groundwater recharge facilities.

2.B.4. Description of conjunctive use of surface and groundwater

Conjunctive use of groundwater and surface water is vital to improve water supply reliability within the District during dry years. The District has five groundwater wells in service which can produce 2,400 to 2,800 acre feet of water annually combined. Operation of these wells is limited to drought periods, periods when surface source water (CVP water) turbidity exceeds economically feasible treatment parameters, and during peak demands in the summer when the District has difficulties maintaining water levels in the 4 MG Tank.

The combined maximum capacity of the five wells measures approximately 3,500 gallons per minute, or about 5 million gallons per day. However, the wells can only be utilized about 50 to 75% of the time due to operational constraints. The wells also act as a backup water supply when the Wintu Pump Station is not operating. Pumping and treating the well water is 1½ to 2 times more expensive than CVP water. The District controls monthly operation and maintenance cost by utilizing the wells on an as-needed basis, typically during the winter when river turbidity is high and District-wide water demand drops to approximately 3 to 4 million gallons per day. The full capacity of all the wells is greater than what can be used during the non-irrigation season. Assuming a 50 percent utilization, their annual capacity is approximately 2,800 acre feet.

2.B.5 Groundwater Management Plan

See **Attachment F**: "Coordinated AB 3030 Groundwater Management Plan for the Redding Groundwater Basin", updated May 2007

2.B.6. Groundwater Banking Plan

None. The District has little surplus water supplies available for use in a groundwater banking facility. Overall, there does not appear to be any increasing or decreasing trends in groundwater levels within the District. The District will consider future banking programs as needed in the future.

2.C. Other Water Supplies

2.C.1. "Other" water used as part of the water supply

"Other" water supplies that are currently being used or have been used in the past include CVP transfers from the McConnell Foundation, Anderson-Cottonwood Irrigation District, and other CVP contractors. Refer to Section 1.A.4 and Section 5 (Table 1) for additional details regarding these transfers.

2.D. Source Water Quality Monitoring Practices

All water delivered by the District to its customers is treated to the same standards, regardless whether the water is used for residential or agricultural purposes. The District currently operates under Domestic Water Supply Permit No. 01-02-08(P)002 through the California Department of Public Health. The permit establishes water quality testing program requirements, including daily chlorine disinfection inactivation calculations, weekly bacteriological water quality monitoring, quarterly chemical water quality monitoring (including disinfection by-products), annual nitrate sampling, lead and copper monitoring every 3 years, and asbestos monitoring every 9 years. The District collects all of the water samples and sends them to certified laboratories to perform analyses and tests in accordance with California Department of Public Health standards. The monitoring program is funded by District water sales revenue.

2.D.1 Potable Water Quality (Urban only)

See **Attachment H.1**: Bella Vista Water District 2012 Consumer Confidence Report
See **Attachment H.2**: Water Permit No. 01-02-08(P)002 Bella Vista Water District System No. 4510014

2.D.2. Agricultural water quality concerns: *Yes* _____ *No* _X_

2.D.3. Description of the agricultural water quality testing program and the role of each participant, including the District, in the program.

Not applicable—no additional testing beyond that performed for compliance with drinking water standards is necessary.

2.D.4 Current water quality monitoring programs for surface water by source 2.(Agricultural only)

Not applicable—no additional testing beyond that performed for compliance with drinking water standards is necessary. The water treated by the District's treatment plant is acceptable for irrigation use.

2.D.5 Current water quality monitoring programs for groundwater by source
(Agricultural only)

Not applicable—no additional testing beyond that performed for compliance with drinking water standards is necessary.

2.E. Water Uses within the District

2.E.1. Agricultural
See **Section V**: Water Inventory Tables, Table 5 - Crop Water Needs

2.E.2 Types of irrigation systems used for each crop in current year (2012)

Crop name	*Total Acres*	*Flood (Level Basin or Furrow, acres)*	*Sprinkler (acres)*	*Low Volume (acres)*	*Multiple methods (acres)*
Irrigated Pasture	1,205	15	1,190		
Other Hay	323		323		
Cereals	109	90	17	2	
Other Fruits	37		12	25	
Vegetables	30		15	15	
Nuts	38		13	25	
Grapes, Wine	23			23	
Other	4		4		
Total	1,769	105	1,574	90	

The principal irrigation method is by sprinkler, with smaller amounts of flood irrigation, “low volume” drip and micro-sprinkler.

2.E.3 Urban use by customer type in current year

Customer Type	*Number of Connections*[1]	*AF*[2]
Single-family/Multi-family	3,848	3,314
Multi-family	Included in Single-family	Included in Single-family
Commercial/Industrial	292	485
Industrial	Included in Commercial	Included in Commercial
Institutional	60	1,140
Landscape irrigation	Not tracked separately	Not tracked separately
Wholesale	None	None
Recycled	None	None
Other (Rural)	1,563	2,648
Other (Construction)	N/A	10
Other (District Yard)	1	13
Unaccounted for (fire protection)		Unknown
Total	5,764	7,610

1. *Connection quantities taken from District records as of December 31, 2012.*
2. *Water use is for the 2012 Calendar-Year*

All of the District's current M&I customers fall into one of the four following customer types: (1) Residential, (2) Rural, (3) Commercial, and (4) Public/Institutional. Note that the customer types are distinct from rate classifications. While there are a small number of dedicated landscape meters, currently some are classified as "Commercial" and some are classified as "Public/Institutional" and are therefore included in the totals for those categories. The District will be investigating the establishment of additional customer classifications (e.g., landscape irrigation and multi-family) in order to provide a better match with the customer types listed in the above table and enable the District to segregate these types of uses in the future.

Water used for "Construction" is metered using portable fire hydrant meters rented by contractors. These meters can be attached to any fire hydrant within the District, subject to the approval by the District

Water production values for 2012 are for the period of January 1, 2012 through December 31, 2012. Water consumption values for 2012 are based on the bimonthly meter readings performed during the period from January 2, 2012 to December 30, 2012. Meters reading reflect water usage over the approximately 60-day period since the previous reading. That is, a meters read on January 2 would reflect customers' water usage over the period from November 2 to January 2 (i.e., the period from 60 to 0 days before the meter reading). This often results in discrepancies between consumption and water production data over a short-term fixed period of time due to an average 30-day time lag between when water is produced and the metered usage is determined.

2.E.4. Urban Wastewater Collection/Treatment Systems serving the service area

Treatment Plant	*Treatment Level*	*AF*	*Disposal to / uses*
City of Redding: Stillwater WWTP[1,2]	Tertiary	4,508[3]	Sacramento River (4,083 AF); Irrigation (19 AF)
Shasta County Public Works CSA #8[4]	Secondary	101	Land application
Private septic systems	Primary	unknown	Private property leach fields
Total Wastewater Discharge Within District:		> 4,609	
Total discharged to ocean and/or saline sink		0	

1. *Source: City of Redding 2010 Urban Water Management Plan.*
2. *This wastewater treatment plant is operated by the City of Redding--it is not owned or operated by BVWD.*
3. *Total 2010 Stillwater WWTP effluent—includes service areas both within and outside of BVWD service area.*
4. *Source: Shasta County Public Works staff*

2.E.5 Groundwater recharge/management in 2012 (Table 6)

Recharge Area	*Method of Recharge*	*AF*	*Method of Retrieval*
None		0	
	Total	0	

2.E.6a. Transfers and exchanges into the service area in 2012

From Whom	*To Whom*	*AF*	*Use*
Anderson-Cottonwood I.D.	BVWD	1,536	M&I

2.E.6b. Transfers and exchanges out of the service area in 2012

From Whom	*To Whom*	*AF*	*Use*
BVWD	Inter-ties	0	N/A

2.E.7. Trades, wheeling, wet/dry year exchanges, banking or other transactions in 2012

From Whom	*To Whom*	*AF*	*Use*

2.E.8. Other uses of water in 2012

Other Uses	*AF*
Line Flushing	2

2.F. Outflow from the District

{Districts included in the drainage problem area, as identified in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (September 1990)," should also complete Water Inventory Table 7 and Attachment L} - **N.A.**

2.F.1. Surface and subsurface drain/outflow in current year

Outflow Point	Location Description	AF	Type of measurement	Accuracy (%)	% of Total Outflow	Acres Drained
None	No outflow exists					

WTP outflow is now recycled to the head of the plant and no known outflow of water exists within the District boundary.

2.F.2. Outflow Water Quality Testing Program

In 2011 the District completed construction of a backwash water pump station at the water treatment plant and therefore no longer releases water from its filter backwash settling ponds into Dry Gulch, a tributary of the Sacramento River. Previously, this water was released and stored in the settling ponds at the District's water treatment plant. After solids settled in the ponds, the waste water was discharged to Dry Gulch, Churn Creek and ultimately into the Sacramento River. Currently, the backwash recycling pumps return the supernatant from the settling ponds to the head of the plant, where it is combined with influent raw water. Prior to the pump station installation, the District followed the Monitoring and Reporting Program (No. R5-2004-0110) developed by the Regional Water Quality Control Board (RWQCB) for their water treatment plant (see Attachment H.3). The program specified what type of monitoring is required and where/when outflow samples were to be obtained and analyzed. The Program also established a monitoring program for the sludge developed in the settling ponds and designated appropriate disposal methods, which are still applicable and adhered to. Waste analyses on the sludge are performed by a laboratory certified for these analyses by the California Department of Public Health (CDPH).

2.F.3. Outflow (surface drainage & spill) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation*
N/A—No outflow in District	None	None	None	None

Outflow (subsurface drainage) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation*
None	None	None	None	None

2.F.4. Central Valley Water Quality Control Programs

The District completed construction of a filter backwash recycling system in 2011 to eliminate its effluent outflow, which contained copper and dichlorobromomethane, from the water treatment plant into Dry Gulch. The District has no routine discharges from any of its facilities into the waters of the state. However, discharges of water associated with line flushing, line breaks, and fire hydrant testing are subject to Central Valley RWQCB requirements. The District has notified the RWQCB of its intent to comply with the terms of General Order No. R5-2008-0081 for Dewatering and Other Low Threat Discharges to Surface Waters.

2.G. Water Accounting (Inventory)

The tables listed below can be found in Section 5: Water Inventory Tables.

2.G.1. Water Supplies Quantified

a. Surface water supplies, imported and originating within the service area, by month (Table 1)
b. Groundwater extracted by the District, by month (Table 2)
c. Effective precipitation by crop (Table 5)
d. Estimated annual groundwater extracted by non-District parties (Table 2)
e. Recycled urban wastewater, by month (Table 3)
f. Other supplies, by month (Table 1)

2.G.2. Water Used Quantified

a. Agricultural conveyance losses, including seepage, evaporation, and operational spills in canal systems (Table 4) or Urban leaks, breaks and flushing/fire uses in piped systems (Table 4)
b. Consumptive use by riparian vegetation or environmental use (Table 6)
c. Applied irrigation water - crop ET, water used for leaching/cultural practices (e.g., frost protection, soil reclamation, etc.) (Table 5)
d. Urban water use (Table 6)
e. Groundwater recharge (Table 6)
f. Water exchanges and transfers and out-of-District banking (Table 6)
g. Estimated deep percolation within the service area (Table 6)
h. Flows to perched water table or saline sink (Table 7)
i. Outflow water leaving the District (Table 6)
j. Other

2.G.3. Overall Water Inventory

a. Table 6

Section 3: Best Management Practices (BMPs) for Agricultural Contractors

3.A. Critical Agricultural BMPs

Measure the volume of water delivered by the District to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/- 6%.

Agricultural Customers[1]

Number of delivery points (turnouts and connections)	265
Number of delivery points serving more than one farm	0
Number of measured delivery points (meters and measurement devices)	265
*Percentage of delivered water that was measured at a delivery point**	100%
*Percentage of delivered water that was billed by quantity**	100%
Total number of delivery points not billed by quantity	0

**For purposes of accounting, in 2012 the District assumed that all unaccounted-for water was agricultural water. A revised procedure for allotting unaccounted for water was recently developed and is included as Attachment P.*

Delivery point measurement device table (Agricultural and Aquacultural only)

Measurement Type	*Number*	*Accuracy [2] (+/- %)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
Orifices	0				
Propeller meter	0				
Weirs	0				
Flumes	0				
Venturi	0				
Metered gates	0				
Acoustic doppler	0				
Other (Turbine >2", Disc<2")[1]	265	+/-3%	Bi-monthly	None[3]	20 - year replacement[2]
Total	265				

[1] *Includes only those agricultural customers meeting the eligibility requirements for the receipt of "Irrigation Water" contained in the District's Water Service Contract with the U.S. Department of the Interior, Bureau of Reclamation dated February 25, 2005.*

[2] *The warranty on meter bodies are often 20 years or more, though the warranty on moving parts is typically less. The District's water is filtered so it does not cause the wear that unfiltered water would. In addition, the District's water is not corrosive, so the meter components are not subject to damage due to the quality of the fluid being metered.* ***Attachment C.4*** *includes copies of warranty documents from Badger Meter, the District's current supplier and the manufacturer of the majority of the meters within the District.*

[3] *The District has aggressive meter replacement program. As part of the program the District tests a sample of the meters that are removed in order to determine their accuracy prior to replacement (see* ***Attachment Q****. The District will also be obtaining a clamp-on meter as part of a WaterSMART Grant which will be used to verify the accuracy of larger meters while they are in service.*

3.A.2. Water Conservation Coordinator

Designate a water conservation coordinator to develop and implement the Plan and develop progress reports.

Name: Don Groundwater *Title:* District Engineer
Address: 11368 E. Stillwater Way, Redding, CA 96003-9510
Telephone: (530) 241-1085 ext. 114 *E-mail:* dgroundwater@bvwd.org

Don Groundwater of Bella Vista Water District is the designated Conservation Coordinator. Don coordinates all District conservation activities and goals discussed in the Water Management Plan, including the coordinating the preparation of annual Water Management Plan updates. All these tasks further the goals and objectives in the USBR Best Management Practices Guidelines.

3.A.3. Water Management Services

Provide or support the availability of water management services to water users. See Attachment H: Notices of District Education Programs and Services Available to Customers.

3.A.3.a. On-Farm Evaluations

1) On farm irrigation and drainage system evaluations using a mobile lab type assessment

	Total in District	*# Surveyed 2011*	*# Surveyed in 2012*	*# Projected for 2013*	*# Projected for 2014*
Irrigated acres	1,769	0	0	20	20
Number of farms[1]	265	0	0	4	4

1. *Includes aquaculture customers.*

The Tehama County Resource Conservation District (TCRCD) provides mobile irrigation lab service and free water management assistance to growers in Tehama, Glenn, Shasta and Butte counties. The Mobile Lab services include:

- An analysis of an irrigation system's Distribution Uniformity (how evenly water is applied to the crop)
- Emitter/Sprinkler flow uniformity
- Catch-can uniformity (pattern of water application)
- Determination of water applied during an irrigation event
- System map of pressure and flow measurements
- Suggestions for system improvements and maintenance
- Irrigation scheduling assistance
- Flow meter readings (portable flow meter provided by the McConnell Foundation)

The District does not directly perform on-farm irrigation system evaluations. However, the District does encourage its growers to utilize the services of crop irrigation specialists—jincluding the University of California Cooperative Extension-Shasta County and the TCRCD

Mobile Irrigation Lab—in District newsletters and on the District's web site. The District will continue to advise growers of the opportunity to participate in irrigation efficiency tests and encourage their participation.

A brochure and sample on-farm evaluation performed by the TCRCD Mobile Irrigation Lab is included as **Attachment I.1**. A sample District newsletter encouraging growers to utilize on-farm evaluation services is included as **Attachment I.2**. In an effort to increase customer participation in this program, in 2014 the District is offering a special workshop to introduce customers to strategies to maximize water use efficiency—including the irrigation audits. A copy of the workshop flyer is included as **Attachment I.7**.

2) Timely field and crop-specific water delivery information to the water user

Bi-monthly water bills list the amount of water delivered to each service connection, but do not include crop-specific information. Sample water bills for each type of billing structure are included as **Attachments D.2-D.3**. Additionally, the District provides previous usage and billing information online via the internet through the District's i-Web system. Customers are able to access usage and billing information for the prior billing period and for previous years for comparison.

3.A.3.b. Real-time and normal irrigation scheduling and crop ET information

Numerous sources of real-time evapotranspiration (ETo) information are available to the growers, including online data and automatic e-mail updates from the California Irrigation Management and Information System (CIMIS). To assist the District's growers with irrigation scheduling, the District's website provides a link to the CIMIS website. A new CIMIS station at Shasta College (CIMIS Station #224) was activated on September 4, 2012, providing detailed local climate data such as air temperature, precipitation, wind speed and soil temperatures. As of May 6, 2013, the Shasta College Station also reports ETo data. As part of its BMP program (see Section 4), the District plans to advertise and encourage use of the Wateright website (http://www.wateright.org/), which provides customers with tools to easily apply the CIMIS station's data to everyday irrigation practices. In addition to disseminating information about the Wateright website in its bi-monthly online newsletters, the District plans to include free training on how to utilize the site during the second half of 2014 (see workshop flier, **Attachment I.7**).

3.A.3.c. Surface, ground, and drainage water quantity and quality data provided to users

All water delivered to customers within the District is treated to the same standard at the District's water treatment plant. The water quality is monitored and treated to drinking water standards established by the California Department of Public Health. The District publishes a yearly Consumer Confidence Report (CCR) which is posted on the District's website at www.bvwd.org. A notice of availability of the 2012 CCR was included as part of the May-June 2013 Bella Vista Water District Newsletter.

3.A.3.d. Agricultural water management educational programs and materials for farmers, staff, and the public

Program	*Co-Funders (If Any)*	*Yearly Targets*
Newsletter		Bi-monthly

See **Attachment I.2** for all 2012 issues of the BVWD newsletter. Effective July 1, 2013 the District's newsletter is no longer mailed out. It is posted online at www.bvwd.org with printed copies available upon request. Notification of the available online newsletter was regularly included on customers bi-monthly bills, though as of Spring 2014 that space has been taken over by the District's drought notice. The bill still, however informs the customer that more information is available at the District website, www.bvwd.org.

3.A.3.e. Other

Numerous links to other water conservation resources are provided on the District's website: www.bvwd.org.

3.A.4. Pricing Structure

The District currently bills customers a base rate charge (regardless of how much water is used) and a quantity-based water charge. For each type of water service (residential, rural, agricultural, etc.), the quantity-based water pricing structure is organized into several volumetric tiers of increasing cost. As customers consume more water, the cost per hundred cubic feet (or acre-foot) increases. This billing method provides growers monetary incentive to conserve water. Water bills sent to the growers include the volume of water used in the current billing period, the same billing period last year, and usage during the previous twelve months. The bills also include the amount of water used in each volumetric tier.

Refer to Section 1.G.3.a, entitled "Agriculture and Urban Customers - Current year agriculture and /or urban water charges - including rate structures and billing frequency" for additional details regarding the District's 2012 year pricing structure.

3.A.5. Pump Efficiency--evaluate and improve efficiencies of District pumps

Describe the program to evaluate and improve the efficiencies of the contractor's pumps.

	Total in District	*# Surveyed in 2011*	*# Surveyed in 2012*	*# Projected for 2013*
Wells	5	5	0	5
Wintu Pump Station Pumps (Sacramento River)	5	5	5	5
Lift/booster pumps	23	23	0	23

Note: See inspection program details in following paragraph.

The District's pumping facilities consist of the Wintu Pumping Station on the Sacramento River, eight pumping stations, one booster station, and five groundwater wells. The groundwater wells, booster station, and pumping stations are on a program of being tested for pumping efficiency on odd numbered years and balancing is checked on the motors every other year. The Wintu Pumping Station motors are balanced every year in the spring and are reconditioned on a rotating schedule on an average of every eight years.

3.B. Exemptible BMPs for Agricultural Contractors

3.B.1. Facilitate Alternative Land Use

Drainage Characteristic	*Acreage*	*Potential Alternate Uses*
High water table (<5 feet)	0	
Poor drainage	unknown	Fallow land
Groundwater Selenium concentration > 50 ppb	0	
Poor productivity	0	

A few of the ranches and ranchettes within the District are located in areas that have perched water tables beneath portion of the acreage. These owners have opted to fallow the land instead constructing artificial drainage systems. Given that the magnitude of the drainage problems within the District are small in comparison to the total farmed acreage and that the land owners have opted to fallow this land, no action will be taken. No program is necessary.

3.B.2. Recycled Water

Facilitate use of available recycled urban wastewater that otherwise would not be used beneficially, meets all health and safety criteria, and does not cause harm to crops or soils.

Sources of Recycled Urban Waste Water	*AFY Available*	*AFY Currently Used in District*
City of Shasta Lake Wastewater Treatment Plant	None at this time	NONE

The neighboring City of Shasta Lake (COSL) previously contemplated a joint project for conveyance of tertiary treated wastewater to one or more locations within BVWD for golf course (landscape) irrigation. The project, the subject of a 2009 feasibility study by a WaterWorks Engineers, would require approximately 2 miles of pipeline and one or more booster pump stations. An October 2011 technical report, also by WaterWorks Engineers, determined a negative economic impact of the project on the COSL—the recycled water would cost over $160 more per acre foot than the reliable water supply currently delivered to the golf course properties by BVWD. Since the golf course management had stipulated reduced irrigation costs as a condition for providing a site for the tertiary wastewater discharge and only 25% of capital costs would likely be covered by grants, debt service on loans to fund the project would necessarily fall on COSL rate payers in the form of increased sewer rates. The COSL has put the project on hold until such time as additional funding might be obtained that would more than cover the project's construction and annual O&M costs.

3.B.3. Finance Capital Improvements

Facilitate the financing of capital improvements for on-farm irrigation systems

Funding source Programs	*How provide assistance*
None	None

No program is planned.

The District has a pressurized distribution system from which the majority of the irrigation is accomplished with sprinkler type application. Another consideration is that a majority of the agricultural water use applications are on small parcels (2-10 acres). These two facts narrow the scope of possibilities when considering a program for funding on-farm irrigation systems. However, BVWD will stay apprised of State and Federal programs for funding on-farm irrigation efficiency improvements, and will relay this information to its agricultural customers through its newsletter and website.

3.B.4. Incentive Pricing

Structure of incentive pricing	*Related goal*
Volumetric pricing	Incentive to conserve water
Tiered pricing based on increased water consumption	Incentive to conserve water

The District currently uses tiered volumetric water pricing policies. These policies will be sustained.

Current Incentive Pricing Policies:

Volumetric Pricing
Volumetric pricing involves a water pricing structure for District water users based in part on quantity delivered (see Section 1.G). This billing method provides growers a monetary incentive to conserve water. Water bills sent to the growers include the volume of water used each billing period.

Tiered Pricing
The District provides incentive pricing by increasing water rates as a customer's water consumption increases beyond established volumetric thresholds. As a result, a water user is penalized if their water service consumption is excessive. Tiered water pricing is mandated as a conservation measure by the District's water supply contract with the U.S. Bureau of Reclamation.

3.B.5. Line or Pipe Ditches & Canals

a) Line or pipe ditches and canals: N/A – Completely piped system

Canal/Lateral (Reach)	*Type of Improvement*	*Number of Miles in Reach*	*Estimated Seepage (AF/Y)*	*Accomplished/ Planned Date*
N/A				

b) Construct/line regulatory reservoirs N/A – Completely piped system with no distribution operational spills.

Reservoir Name	*Annual Spill in Section (AFY)*	*Estimated Spill Recovery (AFY)*	*Accomplished/ Planned Date*
N/A			

3.B.6. Water Ordering

Increase flexibility in water ordering by, and delivery to, water users.

N/A – Completely piped system with on-demand water availability to all users at all times. However, users are asked to cooperate with District requests to minimize water consumption during peak-use periods in order to ensure that all customers have adequate pressure at their service connections.

3.B.7. Spill and Tailwater Recovery

Construct and operate District spill and tailwater recovery systems

Distribution System Lateral	*Annual Spill (AFY)*	*Quantity Recovered and Reused (AFY)*
Total	0	

Drainage System Lateral	*Annual Drainage Outflow (AFY)*	*Quantity Recovered and Reused (AFY)*
Total	0	

The District lateral facilities are completely piped and operate on an on-demand basis. In 2011, the District completed construction of a new backwash recycle pump station at the water treatment plant in order to eliminate the need to release filter backwash and filter-to-waste water from the water treatment plant setting ponds. In 2012, 530 AF of waste water was recycled by returning it to the plant head works. Previously this spent backwash water was released into Dry Gulch, a tributary of the Sacramento River.

3.B.8. Outflow Measurement—plan to measure outflow

Total # of outflow (surface) locations/points	*0*
Total # of outflow (subsurface) locations/points	*0*
Total # of measured outflow points	*0*
Percentage of total outflow (volume) measured during report year	*N/A*

Location & Priority	Estimated cost (in $1,000s)				
	2012	2013	2014	2015	2016
NONE					

The District currently has no outflows or spills as part of its treatment or distribution system.

3.B.9. Conjunctive Use of Surface & Groundwater

Optimize conjunctive use of surface and groundwater.

Conjunctive use of groundwater and surface water is vital to improve water supply reliability within the District during dry years. The District has five groundwater wells in service which can produce up to 2,800 acre feet of water annually. Operation of these wells is limited to drought periods, periods when surface source water (CVP water) turbidity exceeds economically feasible treatment parameters, and peak demand during the summer when the District has difficulties maintaining water levels in the 4 MG Tank.

The wells also act as a backup water supply when the Wintu Pump Station is not operating. Pumping and treating the well water is 1½ to 2 times more expensive than CVP water. Therefore, the District controls monthly operation and maintenance cost by utilizing the wells on an as needed basis, typically during the winter when river turbidity is high and District-wide water demand is approximately 3 to 4 million gallons per day.

The District is located over the north end of the Redding Groundwater Basin. The aquifers within the District have limited yield so it is impractical to significantly increase well production within the District. In addition, the soils within the District are most likely not advantageous for artificial recharge or spreading basins to store surplus surface in the groundwater basin due to areas of heavy, deep surface soils that may reduce percolation rates.

It may be possible to transfer water from other areas within the Redding Basin in the future and to practice conjunctive use in this manner. The District is a member of the Redding Area Water Council, which coordinated the preparation of a groundwater management plan for the Redding Groundwater Basin to better define the possibilities for its use to meet the needs of local districts. The plan and associated study determined that over the long term, the groundwater levels in the Redding Basin have remained steady and the basin does not appear to be in a state of groundwater overdraft. However, it is unclear how close the basin is to overdraft and precautions need to be taken to protect the groundwater resources within the basin.

Further, the County of Shasta enacted an ordinance (SCC 98-1, 1998) regarding the extraction and exportation of groundwater from the county. The ordinance mandates that a permit be required to export groundwater outside of the county in an attempt to protect the groundwater resources of the Redding Groundwater Basin and other areas within the county.

3.B.10. Automate Distribution and/or Drainage System Structures

All but one of the District's pump stations, all water storage tanks, and Wells 1 and 2 are connected to a central SCADA system, which facilitates more efficient use and transfer of water throughout most of the distribution system. The Palo Cedro Booster Pump Station--only run when Well 3 is pumping—and Wells 3, 4 and 6 are not connected to the District's SCADA network. The wells are not run on a regular basis, so the high cost of addingSCADA to these three wells is not economically justified. They can be run manually with the two wells that are on SCADA remotely controlled to meet system demands. The addition of SCADA to these wells will be revaluated when other major upgrades to the facilities are needed.

3.B.11. Water Customer Pump Testing & Evaluation

Facilitate or promote water customer pump testing and evaluation.

N/A – The District's distribution/transmission system provides pressure for nearly all on-farm irrigation systems. The District estimates that there are approximately 110 active private wells within its service area boundary. These wells are generally small and are either used by property owners that do not receive water service from the District or by District Customers to supplement District-supplied water if surface water supplies are reduced. Some customers may also have booster pumps to add additional pressure to the water supplied by the District for use within customer irrigation systems. However, there are no private large-scale groundwater pumping operations occurring within the District that have a significant impact on the region's energy demand.

3.B.12. Mapping

The District maintains GIS maps of their distribution system, groundwater wells, soils, and general District land use. The District uses NRCS data for soils maps and updates will not be needed.

Attachments A.1-A.4 include copies of District maps. In 2012, the District hired a full-time staff member to assist with GIS mapping within the District.

GIS maps	Estimated cost (in $1,000s)[1]				
	2013	2014	2015	2016	2017
Layer 1 – Distribution system	40	40	40	40	40
Layer 2 – Drainage system	N/A	N/A	N/A	N/A	N/A
Suggested layers:					
Layer 3 – Groundwater information	1	1	1	1	1
Layer 4 – Soils map	1	1	1	1	1
Layer 5 – Natural & cultural resources	N/A	N/A	N/A	N/A	N/A

GIS maps	Estimated cost (in $1,000s)[1]				
	2013	2014	2015	2016	2017
Layer 6 – Problem areas (pressure zones)	6	6	6	6	6
Layer 7 – District land use	1	1	1	1	1

1. Costs are in 2012 dollars and include estimates for labor, equipment, hardware and software.

3.C. Three-Year Budget for Implementing BMPs

3.C.1. Amount actually spent during current year (2012).

Year: 2012		*BMP Name*	*Expenses*	*Staff Hours*
BMP #				
A	1	Measurement	$17,330	1,141
	2	Conservation staff	$500	418
	3	a. On-farm evaluation/water delivery info	$520	11
		b. Irrigation scheduling	$0	0
		c. Water quality (water samples)	$7,510	85
		d. Demonstration Garden	$20	9
		Education Materials	$130	0
		Other Ag	$60	0
	4	Quantity pricing	$12,780	2,643
	5	Policy changes	$70	54
	6	Contractor's pumps	$13,130	70
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$660	77
	5	Line or pipe canals/install reservoirs	$0	0
	6	Increase delivery flexibility	$0	0
	7	District spill/tailwater recovery systems	$2,250	36
	8	Measure outflow	$0	12
	9	Optimize conjunctive use	$0	6
	10	Automate canal structures	$0	0
	11	Customer pump testing	$0	0
	12	Mapping	$5,520	323
		Total:	$60,480	4,884

3.C.2 Projected budget summary for the 2nd year (2013).

Year: 2013		*BMP Name*	*Expenses*	*Staff Hours*
BMP #				
A	1	Measurement	$17,680	1,140
	2	Conservation staff	$510	420
	3	a. On-farm evaluation/water delivery info	$530	10
		b. Irrigation scheduling	$0	0
		c. Water quality (water samples)	$7,660	90
		d. Demonstration Garden	$25	9
		Education Materials	$135	0
		Other Ag	$65	0
	4	Quantity pricing	$13,030	2,640
	5	Policy changes	$75	50
	6	Contractor's pumps	$13,390	70
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$675	80
	5	Line or pipe canals/install reservoirs	$0	0
	6	Increase delivery flexibility	$0	0
	7	District spill/tailwater recovery systems	$2,295	40
	8	Measure outflow	$0	10
	9	Optimize conjunctive use	$0	6
	10	Automate canal structures	$0	0
	11	Customer pump testing	$0	0
	12	Mapping	$5,630	320
		Total:	$61,700	4,885

3.C.3 Projected budget summary for 3rd year (2014).

Year: 2014		*BMP Name*	*Expenses*	*Staff Hours*
BMP #				
A	1	Measurement	$18,030	1,140
	2	Conservation staff	$520	420
	3	a. On-farm evaluation/water delivery info	$540	10
		b. Irrigation scheduling	$0	0
		c. Water quality (water samples)	$7,810	90
		d. Demonstration Garden	$30	9
		Education Materials	$140	0
		Other Ag	$70	0
	4	Quantity pricing	$13,290	2,640
	5	Policy changes	$80	50
	6	Contractor's pumps	$13,660	70
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$690	80
	5	Line or pipe canals/install reservoirs	$0	0
	6	Increase delivery flexibility	$0	0
	7	District spill/tailwater recovery systems	$2,340	40
	8	Measure outflow	$0	10
	9	Optimize conjunctive use	$0	6
	10	Automate canal structures	$0	0
	11	Customer pump testing	$0	0
	12	Mapping	$5,740	320
		Total:	$62,940	4,885

3.C.4 Projected budget summary for 4th year (2015).

Year: 2015		*BMP Name*	*Expenses*	*Staff Hours*
BMP #				
A	1	Measurement	$18,390	1,140
	2	Conservation staff	$530	420
	3	a. On-farm evaluation/water delivery info	$550	10
		b. Irrigation scheduling	$0	0
		c. Water quality (water samples)	$7,970	90
		d. Demonstration Garden	$35	9
		Education Materials	$150	0
		Other Ag	$75	0
	4	Quantity pricing	$13,560	2,640
	5	Policy changes	$85	50
	6	Contractor's pumps	$13,930	70
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$705	80
	5	Line or pipe canals/install reservoirs	$0	0
	6	Increase delivery flexibility	$0	0
	7	District spill/tailwater recovery systems	$2,390	40
	8	Measure outflow	$0	10
	9	Optimize conjunctive use	$0	6
	10	Automate canal structures	$0	0
	11	Customer pump testing	$0	0
	12	Mapping	$5,850	320
		Total:	$64,220	4,885

Section 4: Best Management Practices (BMPs) for Urban Contractors

The District's BMP descriptions and frequencies are presented in the table below. However, since the District's 2012 per capita water use of 710 GPCD keeps it on track for 20 x 2020 per capita water use compliance as determined using the California Urban Water Conservation Council (**Attachment L**), quantitative water conservation goals and targets for individual BMPs are not specified.

4.A. Urban BMPs

Foundational BMPs

4.A.1. BMP #1.1: Utilities Operations

1.1 Operations Practices
1.2 Water Loss Control
1.3 Metering
1.4 Water Loss Control

4.A.2 BMP #2: Education

2.1 Public Information Programs
2.2 School Education

(See tables on following pages for details concerning compliance with BMPs 1 & 2.)

BMP #1: UTILITY OPERATIONS (FOUNDATIONAL)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/Tracking/ Monitoring**
1.1.A	Conservation Coordinator	Agricultural conservation coordinator also serves as Urban coordinator—see Section 3.A.2	Coordinate conservation practices, file annual Water Management Plan Updates, annual CUWCC reporting
1.1.B	Water Waste Prevention	Written District policy forbids water waste (Attachment B, #143, p. 8)	Crews follow-up with property owners on water waste calls/tips
		Water waste door hanger (Attachment I.5)	Crews place door hangers at properties in which they notice water waste (broken sprinklers, water flowing off property, etc.)
1.2	Water Loss Control	Proactive replacement of aged portions of distribution system	The Bureau-owned distribution system, originally installed in the mid 1960's, is estimated to have a life span of 75-100 years. The District budgets money annually for reserve pipeline replacement/ rehabilitation fund. Replacement rate will be approximately 4% per year beginning in 2040. The District's 2013-2014 budget includes money for a detailed pipeline replacement/rehabilitation study.
		Efficient crew response to reports of system leaks	Whenever a leak is reported or identified, a work order is written and Distribution Department staff are sent out to investigate the leak. The staff promptly responds to all reported leaks, especially if it's reported that water is flowing either up through the ground or in the street. Typically staff can be on-site within 15 minutes). If the leak is reported outside of normal business hours, there is always an on-call person scheduled who is required to respond to the location within 30 minutes. No systematic leak detection program currently exists.

BMP #1: UTILITY OPERATIONS (FOUNDATIONAL)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/Tracking/ Monitoring**
1.2	Water Loss Control	Efficient crew response to reports of system leaks	Whenever a leak is reported or identified, a work order is written and Distribution Department staff are sent out to investigate the leak. The staff promptly responds to all reported leaks, especially if it's reported that water is flowing either up through the ground or in the street. Typically staff can be on-site within 15 minutes). If the leak is reported outside of normal business hours, there is always an on-call person scheduled who is required to respond to the location within 30 minutes. No systematic leak detection program currently exists.
		Annual calculation of system-wide water loss using AWWA water budget software.	% non-revenue water has been decreasing, down to 7.0% in 2012 from 11.7% in 2008. The District has been actively replacing the older and larger meters in the District, which is likely the major reason for the decrease in non-revenue water. The District has also been replacing water lines that have had a history of failures.
		Meter replacement program	The goal is to have all of the meters either replaced or rebuilt on a 20 year cycle. Annual meter replacement rate is 1/15 of total in order to overcome backlog and to reach equilibrium of replacing any given meter every 20 years. Smaller meters are typically replaced, while it can be more economical to rebuild larger meters. The District is also installing more compound meters or mag meters for the larger meters in order to register water usage at lower flow rates.

BMP #1: UTILITY OPERATIONS (FOUNDATIONAL)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/Tracking/ Monitoring**
1.3	Metering with Commodity Rates	All current and new connections are required to be metered (Attachment B #404, p. 22). Rates include volumetric component.	Rate schedule is updated annually and is easily accessible on District website; current and historical water use data is available to customers online when they sign into their account
1.4	Retail Conservation Pricing	Each billing category includes three increasingly expensive volumetric price tiers (see Rate Schedule, Attachment D)	Tiers provide customers with monetary incentive to conserve

BMP #2: EDUCATION (FOUNDATIONAL)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/Tracking/ Monitoring**
2.1	Public Information Programs	In 2012 the District newsletter was sent to customers six times per year (bi-monthly) with their bills. Starting in July 2013 the newsletter is published strictly online.	Includes seasonal water conservation tips, updates on water allocations, and District news concerning infrastructure improvement projects, board decisions, educational events and budgetary decisions.
		Co-sponsor (with City of Redding Water Utility) Water Smart Gardening web hosting, with link on the District's Web site	Proposed for implementation in calendar year 2013.
		Actively maintain District website: www.bvwd.org	Features a daily water saving tip, educational links, District news, policies, & rates; Website is currently undergoing an update and is due to re-launch in 2013
		California Water Series: an annual two-evening speaker series focusing on California water issues. Free to the public, four presentations each evening. Examples of 2012 topics: USBR proposal to raise Shasta Dam, water conservation in the rice farming industry, history of California's water system, and effects of Bay-Delta Conservation initiatives.	The events, held in September/ October of each year, are co-sponsored by multiple northern California water agencies, including Bella Vista Water District, the City of Redding, Anderson-Cottonwood Irrigation District (ACID), Association of California Water Agencies; California Agricultural Leadership Foundation; CH2M HILL; Northern California Water Association (NCWA); and Shasta County.
		Co-sponsor (with City of Redding) a water-conservation exhibit at Turtle Bay Museum	Negotiating with Turtle Bay for a water-related exhibit in calendar year 2013 or 2014.
		Tours of water treatment and pumping facilities to college students and District board members.	Though a Vulnerability Assessment recommended against promoting tours open to the general public, the District gives tours to Shasta College classes and BVWD board members on a regular basis in order to educate and increase awareness among current and future stakeholders and decision-makers in the water industry.

BMP #2: EDUCATION (FOUNDATIONAL)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/Tracking/ Monitoring**
2.1	Public Information Programs	Fix-a-leak classes/seminars—this program was hosted successfully by the City of Redding in March 2013, and BVWD plans to collaborate in order to hold two local workshops in 2014.	During the calendar year 2014, BVWD and the City of Redding Water Utility plan to hold two free "Fix-a-leak" workshops—one at Home Depot and one at Lowe's hardware. Both stores are EPA WaterSense partners. BVWD plans to become an EPA WaterSense partner as a result of investigating the best options for promoting conservation and complying with BMP requirements.
2.2	School Education Programs	Lending library available to and promoted among local elementary, middle, and high school teachers in both	BVWD plans to purchase grade-level appropriate, standards-correlated educational materials, through organizations such as Project Wet and watereducation.org, for classroom use. Resources will be promoted through periodic use of an educator email list procured through school administrators.
		School assembly presentations to reach a large number of students with the water conservation message.	BVWD plans to co-sponsor an educational theater company to visit the Redding area and provide water conservation assemblies to multiple local elementary and/or middle schools—academic year 2013-2014
		Poster/Photo/Video contest—promotes water conservation messages among elementary, middle and high school students.	BVWD and the City of Redding Water Utility plans to investigate working together and with local educators to hold a water-conservation themed poster/video/photo contest for area children and youth.

Programmatic BMPs

4.A.3 Residential

(see tables below and following page for details concerning compliance with BMP 3)

4.A.4 Commerical/Industrial/Institutional (CII)

(see tables below and following page for details concerning compliance with BMP 4)

4.A.5 Landscape

(see tables below and following page for details concerning compliance with BMP 5)

PROGRAMMATIC BMPs: RESIDENTIAL (#3), CII (#4), LANDSCAPE (#5)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/ Tracking/ Monitoring**
3.1	Residential Assistance Program	AMR (Automatic Meter Read) detects possible leaks by flagging 24-hour meter movement (no stopped meter for two consecutive hours)	When a flag is noticed, BVWD staff checks for leaks at the meter. If none are found the customer is notified of possible leak(s) on their side of the meter.
		Current and historical customer water use information is available to all BVWD customers upon signing into their online account.	See screenshots of online account information in Attachment D.4.
		Customer service representatives are available to answer customer questions and address concerns	During normal business hours, Monday through Friday.
3.2	Landscape Water Survey	BVWD will negotiate with two local irrigation contractors—Ewing and Amigo—about offering workshops on efficient landscape irrigation procedures and performing landscape irrigation audits to a few large water users.	Pending negotiations with contractors, implementation will begin in either 2013 or 2014.
3.3	High-efficiency Clothes Washers	BVWD will not be pursuing this program due to staffing and funding constraints. PG&E has a rebate program for District customers that use their services (those that live outside of the City of Redding).	
3.4	Water Sense Specification (WSS) toilets	BVWD will not be pursuing this program due to staffing and funding constraints.	
3.5	WSS for New Residential Development	All new construction must comply with Green Building Requirements that are a standard part of local, county and state building codes—such codes deal primarily with indoor fixtures.	BVWD is not involved in monitoring compliance with Green Building Requirements.

PROGRAMMATIC BMPs: RESIDENTIAL (#3), CII (#4), LANDSCAPE (#5)			
BMP #	**BMP Title**	**Current or Proposed Action(s)**	**Implementation/ Tracking/ Monitoring**
4	Commercial, Industrial, Institutional	Offer partial subsidies to several high-use commercial customers to cover water audits performed by a local Green Plumbing Certified plumbing company.	Implementation in 2013 or 2014 pending negotiations with plumbing company.
5	Landscape	Co-sponsor (with City of Redding) of water-efficient landscape classes, hosted by Turtle Bay, a local museum complex.	Proposed for implementation during calendar year 2013.
		Commercial/Institutional landscape surveys/audits	Tehama County Resource Conservation District (TCRCD) currently provides free audits to BVWD irrigation customers. BVWD will negotiate with TCRCD toward offering landscape audits to larger institutional customers for payment.
		Shasta College CIMIS Station (Station #224)—the District supplied initial materials and data collection instruments and will provide ongoing maintenance to the station.	The new station will provide BVWD customers with irrigation-related data and support to help improve irrigation water efficiency.

4.B. Three-Year Budget for Expenditures and Staff Effort for BMPs

Year: 2012 BMP #		BMP Name	Actual Expenses (not staff time)	Staff Hours
1	Utilities Operations			
	1.1	Operations Practices	$970	811
	1.2	Pricing	$26,000	5,279
	1.3	Metering	$140,180	9,228
	1.4	Water Loss Control	$42,750	680
2	Education			
	2.1	Public Information Programs	$1,590	166
	2.2	School Education	$1,200	
3	Residential			
4	CII			
5	Landscape			
		Total:	$212,790	16,165

Year: 2013 BMP #		BMP Name	Actual Expenses (not staff time)	Staff Hours
1	Utilities Operations			
	1.1	Operations Practices	$990	810
	1.2	Pricing	$26,520	5,280
	1.3	Metering	$142,980	9,230
	1.4	Water Loss Control	$43,600	680
2	Education			
	2.1	Public Information Programs	$1,620	170
	2.2	School Education	$1,220	
3	Residential			
4	CII			
5	Landscape			
		Total:	$216,930	16,170

Year: 2014 BMP #		BMP Name	Actual Expenses (not staff time)	Staff Hours
1	Utilities Operations			
	1.1	Operations Practices	$1,010	810
	1.2	Pricing	$27,050	5,280
	1.3	Metering	$145,840	9,230
	1.4	Water Loss Control	$44,470	680
2	Education			
	2.1	Public Information Programs	$1,650	170
	2.2	School Education	$1,250	
3	Residential			
4	CII			
5	Landscape			
		Total:	$221,270	16,170

Year: 2015 BMP #		BMP Name	Actual Expenses (not staff time)	Staff Hours
1	Utilities Operations			
	1.1	Operations Practices	$1,030	810
	1.2	Pricing	$27,590	5,280
	1.3	Metering	$148,760	9,230
	1.4	Water Loss Control	$45,360	680
2	Education			
	2.1	Public Information Programs	$1,680	170
	2.2	School Education	$1,280	
3	Residential			
4	CII			
5	Landscape			
		Total:	$225,700	16,170

Section 5: District Water Inventory Tables

Table 1: Surface Water Supply

Table 2: Groundwater Supply

Table 3: Total Water Supply
Precipitation & Evaporation Worksheets

Table 4: Agricultural Distribution System
Urban Distribution System

Table 5: Crop Water Needs

Table 6: 2012 District Water Inventory
Note: The results for total crop water needs results (see Table 5 and Attachment N) suggest that less agricultural water was delivered than the quantity needed to sustain the crops reported in the District's 2012 census. In addition to the fact that the crop coefficient calculation methodology has numerous built-in assumptions and approximations, the apparent insufficiency of irrigation water applied likely results from over-reporting of crop acreage by District customers.

Table 7: Influence on Groundwater and Saline Sink
Note: Bureau calculations in Table 7 suggest a 93 AF negative impact on groundwater storage by the District during 2012. However, the built-in USBR tabular calculations fail to take into account natural groundwater recharge due to precipitation and the various creeks that traverse the District. Both the 1998 Redding Area 3030 Groundwater Management Plan and a 1991 study by Lawrence and Associates concluded that the Redding Groundwater Basin recovers quickly (with one year of normal runoff) from dry-year conditions.

Table 8: Annual Water Quantities Delivered Under Each Right or Contract

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Year of Data	2012

Table 1

Surface Water Supply

2012 Month	**Federal Ag Water** (acre-feet)	**Federal non-Ag Water.** (acre-feet)	**State Water** (acre-feet)	**Local Water** (acre-feet)	**Other Water** (acre-feet)	**Transfers into District** (acre-feet)	**Upslope Drain Water** (acre-feet)	**Total** (acre-feet)
Method	M1	M1	M1	M1	M1	M1	M1	
January	0	342	0	0	0	0	0	342
February	68	209	0	0	0	0	0	277
March	0	209	0	0	0	0	0	209
April	153	200	0	0	0	0	0	353
May	1,216	345	0	0	0	0	0	1,561
June	1,174	750	0	0	0	0	0	1,924
July	1,311	561	0	0	0	512	0	2,384
August	1,105	762	0	0	0	512	0	2,379
September	754	611	0	0	0	512	0	1,877
October	60	1,086	0	0	0	0	0	1,146
November	0	347	0	0	0	0	0	347
December	0	294	0	0	0	0	0	294
TOTAL	5,841	5,716	0	0	0	1,536	0	13,093

Table 2

Ground Water Supply

2012 Month	**District Groundwater** (acre-feet)	**Private Urban Groundwater** *(acre-feet)	**Private Agric Groundwater** *(acre-feet)
Method	M1	estimated	estimated
January	0	6	
February	0	8	
March	88	8	
April	0	8	
May	0	8	
June	0	22	
July	0	22	
August	0	22	
September	0	22	
October	5	8	
November	0	8	
December	0	8	
TOTAL	93	150	0

*normally estimated

Table 3

Total Water Supply

2012 Month	**Surface Water Total** (acre-feet)	**District Groundwater** (acre-feet)	**Recycled M&I Wastewater*** (acre-feet)	**Total District Water Supply** (acre-feet)
Method	M1	M1	NA	M1
January	342	0	0	342
February	277	0	0	277
March	209	88	0	297
April	353	0	0	353
May	1,561	0	0	1,561
June	1,924	0	0	1,924
July	2,384	0	0	2,384
August	2,379	0	0	2,379
September	1,877	0	0	1,877
October	1,146	5	0	1,151
November	347	0	0	347
December	294	0	0	294
TOTAL	13,093	93	0	13,186

*Recycled M&I Wastewater is treated urban wastewater that is used for agriculture.

Table 3A

NOT APPLICABLE--DISTRICT OWNS NO OPEN CANALS OR RESERVOIRS, ALL WATER IS PIPED AND DELIVERED ON-DEMAND

2012 Precipitation Worksheet

	inches precip	ft precip	acres	AF/Year
Jan	0.00	0.00	0.00	0.00
Feb	0.00	0.00	0.00	0.00
Mar	0.00	0.00	0.00	0.00
Apr	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00
Jun	0.00	0.00	0.00	0.00
Jul	0.00	0.00	0.00	0.00
Aug	0.00	0.00	0.00	0.00
Sept	0.00	0.00	0.00	0.00
Oct	0.00	0.00	0.00	0.00
Nov	0.00	0.00	0.00	0.00
Dec	0.00	0.00		
TOTAL	**0.00**	**0.00**		

2012 Evaporation Worksheet

	inches evap	ft evap	acres	R
Jan	0.00	0.00	0.00	0.00
Feb	0.00	0.00	0.00	0.00
Mar	0.00	0.00	0.00	0.00
Apr	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00
Jun	0.00	0.00	0.00	0.00
Jul	0.00	0.00	0.00	0.00
Aug	0.00	0.00	0.00	0.00
Sept	0.00	0.00	0.00	0.00
Oct	0.00	0.00	0.00	0.00
Nov	0.00	0.00	0.00	0.00
Dec	0.00	0.00		
TOTAL	**0**	**0.00**		

Table 4

*Agricultural Distribution System**

2012 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
			0	0.0	0.0	0	0	0
TOTAL				0.0	0.0	0	0	0

*NOT APPLICABLE--DISTRICT OWNS NO OPEN CANALS OR RESERVOIRS, ALL WATER IS PIPED AND DELIVERED ON-DEMAND

*Urban Distribution System**

2012 Area or Line	Length (feet)	Leaks (acre-feet)	Breaks (acre-feet)	Flushing/Fire (acre-feet)	Total (acre-feet)
All	1,236,600	922	-	2	924
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
TOTAL	1,236,600	922	0	2	924

*The District has only one distribution system and it serves both Agricultural and Urban customers. The District has no way to measure the amount of water lost due to leaks or breaks in individual pipe segments. The number reported above for "Leaks" is all "Non-Revenue" (a.k.a. "Unaccounted for") water calculated using AWWA's Water Audit software. Non-Revenue water includes all leaks, breaks, water theft, and water that flows through customer's meters that is under registered.

Table 5

Crop Water Needs

2012 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Barley (feed)	5	2.1	0.0	0.0	0.33	9
Corn	10	3.0	0.0	0.0	0.74	23
Oats	82	2.1	0.0	0.0	0.33	148
Sorghums	12	3.2	0.0	0.0	0.96	27
Non-alfalfa hay	323	4.7	0.0	0.0	1.22	1,124
Irrigated pasture	1,206	4.0	0.0	0.0	1.16	3,402
Other field crops	3	2.1	0.0	0.0	1.01	3
Broccoli	1	2.0	0.0	0.0	1.03	1
Carrots	1	3.4	0.0	0.0	1.02	2
Cauliflower	1	2.0	0.0	0.0	0.35	2
Corn, sweet	1	3.0	0.0	0.0	0.51	2
Squash	1	3.3	0.0	0.0	0.81	3
Tomatoes	1	3.2	0.0	0.0	0.53	3
Other Vegetables	24	2.8	0.0	0.0	0.71	51
Cantaloupe	1	1.7	0.0	0.0	0.74	1
Grapes, wine	23	2.5	0.0	0.0	0.89	37
Pears	1	3.4	0.0	0.0	0.80	3
Strawberries	9	3.1	0.0	0.0	0.57	23
Other fruits	27	3.4	0.0	0.0	0.47	80
Almonds	3	3.4	0.0	0.0	0.65	8
Pecans	15	3.4	0.0	0.0	0.90	38
Pistachios	3	2.4	0.0	0.0	0.99	4
Walnuts	16	3.4	0.0	0.0	0.84	42
Crop Acres	1,769					5,036

Total Irrig. Acres 1,769 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2012 District Water Inventory

Water Supply		Table 3		13,186
Environmental Consumptive Use		(Distribution, Drain, etc.)	minus	
Groundwater recharge		(intentional - ponds, injection)	minus	
Seepage		Table 4	minus	0
Evaporation - Precipitation		Table 4	minus	0
Spillage		Table 4	minus	0
Leaks, Breaks, Flushing / Fire		Table 4	minus	924
Transfers out of District			minus	
Water Available for sale to customers				12,262
Actual Agricultural Water Sales	2012	From District Sales Records		4,652
Private Groundwater		Table 2	plus	0
Crop Water Needs		Table 5	minus	5,036
Drainwater outflow		(tail and tile not recycled)	minus	0
Percolation from Agricultural Land		(calculated)		(384)
M&I Actual Water Sales	2012	From District Records		7,610
Inside Use		Feb urban use x 12		2,751
Landscape / Outside Use		(calculated)		4,859
Unaccounted for Water		(calculated)		0

Table 7

Influence on Groundwater and Saline Sink

2012

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence on Groundwater	(93)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	1,769
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water (acre-feet)	Other Water (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2003	9,839	2,231	-	620	-	5,437	-	18,127
2004	11,830	835	-	753	-	5,400	-	18,817
2005	8,751	145	-	1,600	90	4,827	-	15,413
2006	9,249	988	-	988	0	5,339	-	16,564
2007	7,876	2,586	-	180	-	5,007	-	15,649
2008	7,653	4,897	-	523	39	3,290	-	16,402
2009	5,141	1,653	-	932	39	4,082	-	11,847
2010	5,104	4,627	-	77	-	1,536	-	11,344
2011	4,540	4,749	-	37	2	1,536	-	10,864
2012	5,841	5,716	-	93	-	1,536	-	13,186
Total	75,824	28,426	-	5,803	170	37,990	-	148,213
Average	7,582	2,843	-	580	17	3,799	-	14,821

ATTACHMENT A

DISTRICT MAPS:

A.1 District Location & Facilities Map
A.2 District Soils Map
A.3 District Map of Groundwater Aquifers
A.4 District Land Use Map

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ATTACHMENT A.1

DISTRICT LOCATION & FACILITIES MAP

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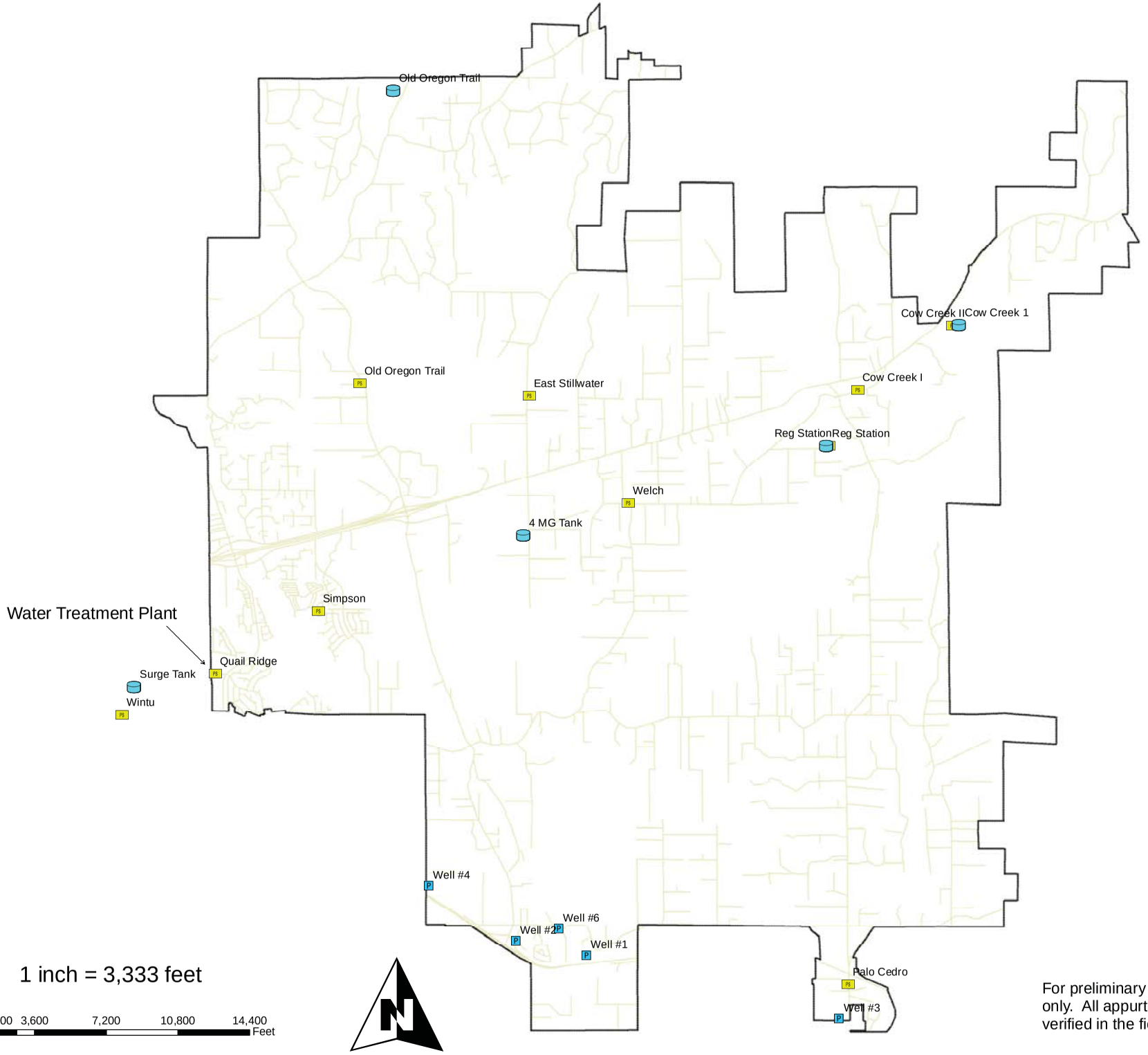

For preliminary planning purposes only. All appurtenances should be verified in the field.

ATTACHMENT A.2

DISTRICT SOILS MAP

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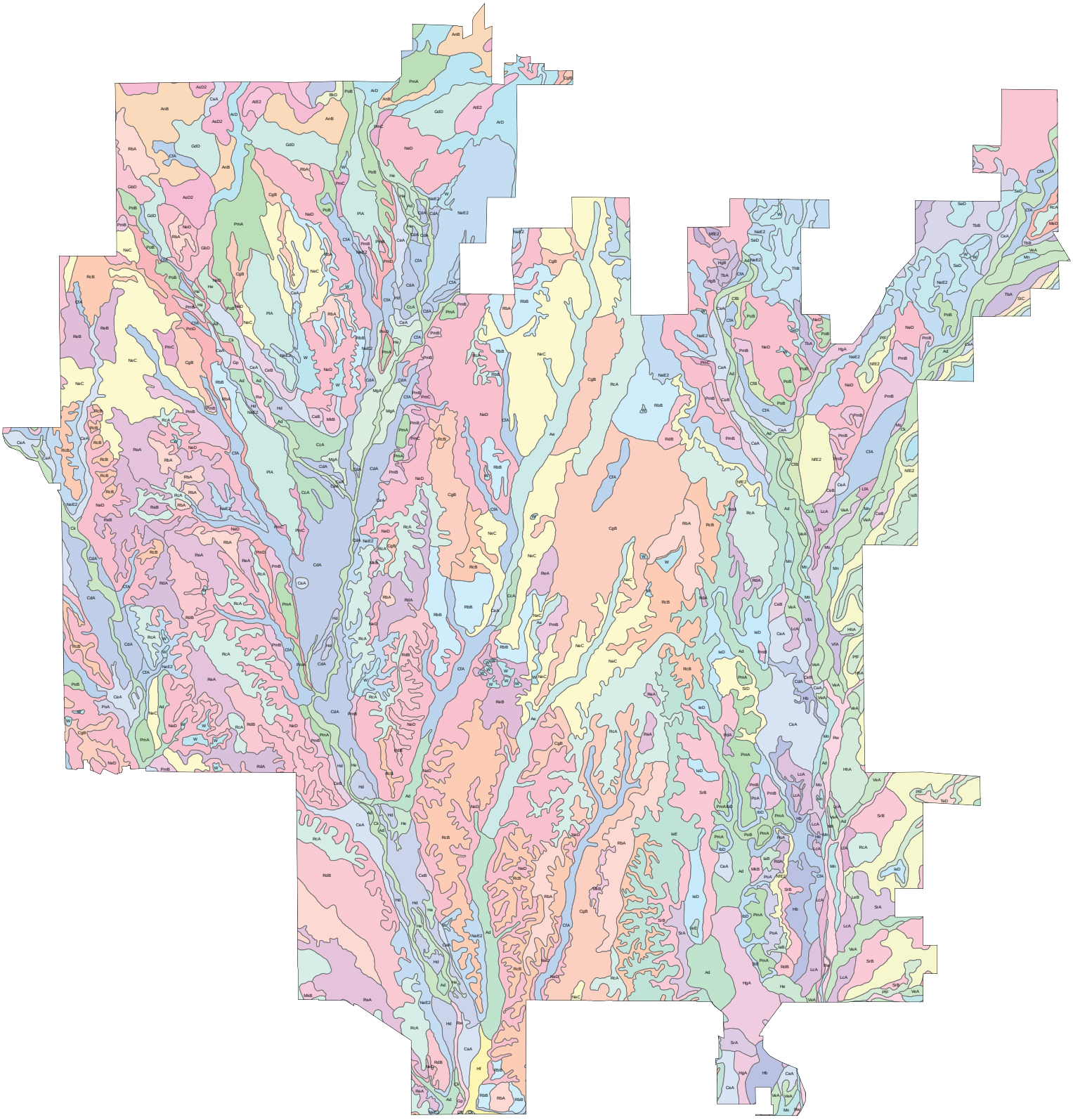
BVWD SOIL MAP



SoilMap_BVWD												
Ad	AnB	ArD	AsD2	AtE2	BkD	BkE	CcA	CdA	CeA	CeB	CfA	CfB
Ae												

Code	Name
Ad	Anderson gravelly sandy loam
Ae	Anderson gravelly sandy loam, moderately deep
AnB	Auburn loam, 0 to 8 percent slopes
ArD	Auburn very stony loam, 8 to 30 percent slopes
AsD2	Auburn clay loam, 8 to 30 percent slopes, eroded
AtE2	Auburn very stony clay loam, 30 to 50 percent slopes, eroded
BkD	Boomer gravelly loam, 15 to 30 percent slopes
BkE	Boomer gravelly loam, 30 to 50 percent slopes
CcA	Churn loam, 0 to 3 percent
CdA	Churn loam, slightly wet, 0 to 3 percent slopes
CeA	Churn gravelly loam, 0 to 3 percent slopes
CeB	Churn gravelly loam, 3 to 8 percent slopes
CfA	Churn gravelly loam, deep, 0 to 3 percent slopes
CfB	Churn gravelly loam, deep, 3 to 8 percent slopes
CgB	Clough gravelly loam, 3 to 8 percent slopes
Ck	Cobbly alluvial land, frequently flooded
GbD	Gaviota very rocky sandy loam, 0 to 30 percent slopes
GdD	Goulding very stony loam, 10 to 30 percent slopes
Gp	Gravel pits
Hb	Hillgate loam
Hd	Honcut loam
He	Honcut gravelly loam
Hf	Honcut gravelly loam, deep
HgA	Honn fine sandy loam, 0 to 3 percent slopes
HgB	Honn fine sandy loam, 3 to 8 percent slopes
HhA	Honn gravelly sandy loam, 0 to 3 percent slopes
IaB	Igo gravelly loam, 0 to 8 percent slopes
IbD	Inks gravelly loam, 8 to 30 percent slopes
IeD	Inks-Pentz complex, 5 to 30 percent slopes
IeE	Inks-Pentz complex, 30 to 50 percent slopes
LcA	Los Robles loam, 0 to 3 percent slopes
LcB	Los Robles loam, 3 to 8 percent
LeB	Los Robles loam, moderately deep, 0 to 5 percent slopes
LfA	Los Robles gravelly loam, 0 to 3 percent slopes
MeD	Millsholm gravelly loam, 3 to 30 percent slopes
MfE2	Millsholm very rocky loam, 30 to 50 percent slopes, eroded
MgA	Moda loam, 0 to 3 percent slopes
MkB	Moda loam, shallow, 0 to 5 percent slopes
Mm	Molinos sandy loam, channeled
Mn	Molinos fine sandy loam
Mo	Molinos fine sandy loam, seeped
NeC	Newtown gravelly loam, 8 to 15 percent slopes
NeD	Newtown gravelly loam, 15 to 30 percent slopes
NeE2	Newtown gravelly loam, 30 to 50 percent slopes, eroded
NfE2	Newtown stony loam, 8 to 50 percent slopes, eroded
PfF	Pentz-Supan complex, 50 to 70 percent slopes

PlA	Perkins loam, 0 to 3 percent slopes
PmA	Perkins gravelly loam, 0 to 3 percent slopes
PmB	Perkins gravelly loam, 3 to 8 percent slopes
PmC	Perkins gravelly loam, 8 to 15 percent slopes
PmD	Perkins gravelly loam, 15 to 30 percent slopes
PoA	Perkins gravelly loam, moderately deep, 0 to 3 percent slopes
PoB	Perkins gravelly loam, moderately deep, 3 to 8 percent slopes
RbA	Red Bluff loam, 0 to 3 percent slopes
RbB	Red Bluff loam, 3 to 8 percent slopes
RcA	Red Bluff gravelly loam, moderately deep, 0 to 3 percent slopes
RcB	Red Bluff gravelly loam, moderately deep, 3 to 8 percent slopes
RdA	Redding gravelly loam, 0 to 3 percent slopes
RdB	Redding gravelly loam, 3 to 8 percent slopes
ReA	Redding-Red Bluff gravelly loams, 0 to 3 percent slopes
ReB	Redding-Red Bluff gravelly loams, 3 to 8 percent slopes
Rw	Riverwash
RxF	Rockland
SeD	Sehorn silty clay, moderately deep, 8 to 30 percent slopes
SrA	Spreckels sandy loam, 0 to 3 percent slopes
SrB	Spreckels sandy loam, 3 to 8 percent slopes
StC	Supan gravelly loam, 5 to 15 percent slopes
StD	Supan gravelly loam, 15 to 30 percent slopes
StE	Supan gravelly loam, 30 to 50 percent slopes
TbA	Tehama loam, 0 to 3 percent slopes
TbB	Tehama loam, 3 to 8 percent slopes
TeD	Toomes very stony loam, 0 to 30 percent slopes
ThA	Tuscan cobbly loam, 0 to 3 percent slopes
ThB	Tuscan cobbly loam, 3 to 8 percent slopes
VeA	Vina loam, 0 to 3 percent slopes
VfA	Vina loam, seeped, 0 to 3 percent slopes
W	Water

ATTACHMENT A.3

DISTRICT MAP OF GROUNDWATER AQUIFERS

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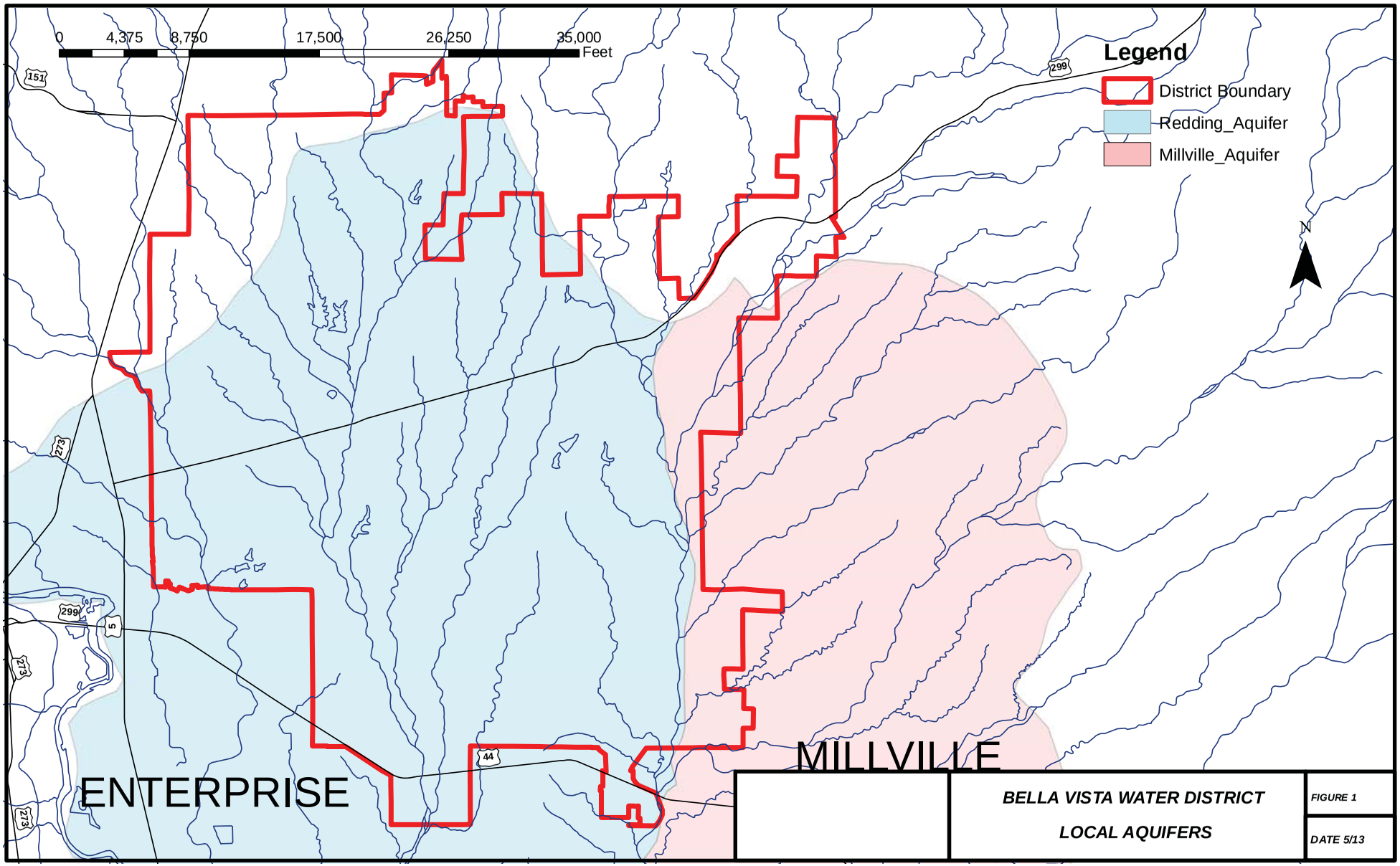
0 4,375 8,750 17,500 26,250 35,000
Feet
Legend
District Boundary
Redding_Aquifer
Millville_Aquifer
N
ENTERPRISE
MILLVILLE
151
299
273
44
15
BELLA VISTA WATER DISTRICT
LOCAL AQUIFERS
FIGURE 1
DATE 5/13

ATTACHMENT A.4

DISTRICT LAND USE MAP

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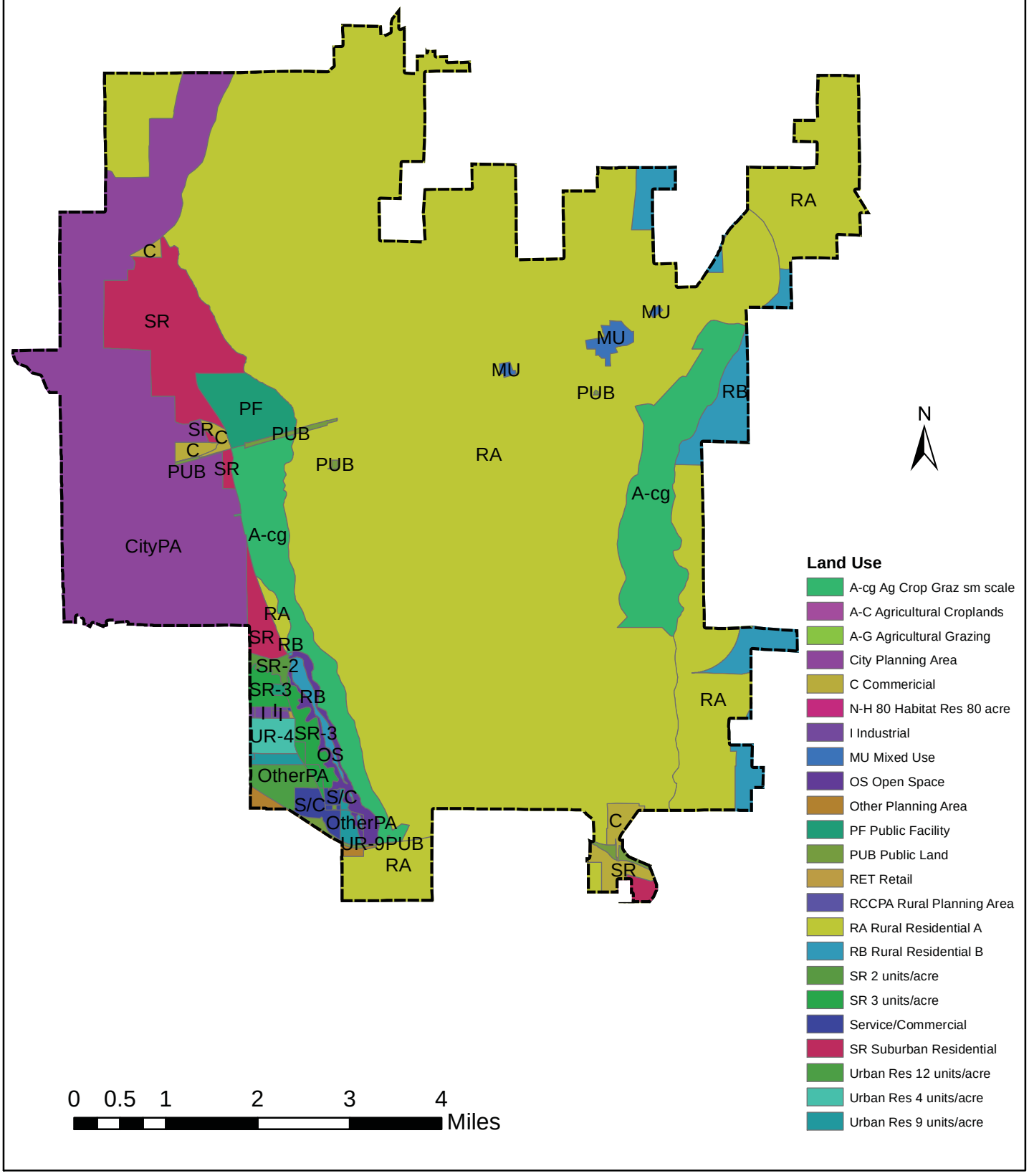
BVWD Land Use



ATTACHMENT B

BELLA VISTA WATER DISTRICT
POLICY MANUAL

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BELLA VISTA WATER DISTRICT

POLICY MANUAL

Adopted November 10, 1992

Latest Revision: March 1, 2013

BELLA VISTA WATER DISTRICT

POLICY, REGULATIONS, RULES, AND WATER RATES

Contents

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Appendix C Sample Rebate Agreement

Appendix D Meter Sizing

Appendix E Resolution of Adoption

Appendix F Revision History

BE IT HEREBY RESOLVED BY THE BOARD OF DIRECTORS

OF THE

BELLA VISTA WATER DISTRICT,

AS FOLLOWS:

ARTICLE I. GENERAL POLICY

110. PURPOSE. The Board of Directors deems it to be in the best interests of the District, its inhabitants and customers, that all rates and charges for water service and rules and regulations for the operation of the District's water supply system, together with procedures for furnishing water service, be set forth in writing for the guidance of the District and its consumers.

120. APPLICABLE LAWS AND REGULATIONS. The District will furnish water to property within the District pursuant to the provisions of the United States Bureau of Reclamation water contract, dated April 3, 1964, as amended from time to time; the regulations of the California Department of Health Services; applicable Federal, State and County laws and regulations and to the rules and regulations herein contained; and in accordance with amendments hereto and other applicable resolutions.

121. DISTRICT - DUTIES. The District shall be responsible for the operation, maintenance, repair and expansion of a water supply system; for enforcing the provisions of this Resolution; for collecting rates and charges for water service as herein set forth; and for administering and applying this Policy in accordance with the direction of the Board. In performing these duties, the District shall have and exercise all the powers given it by law in connection with its statutory purpose of supplying the inhabitants of the District with water for agricultural, rural, residential, industrial, commercial, and fire protection purposes as prescribed by the Board of Directors.

122. GENERAL MANAGER - DUTIES. The General Manager (Manager) is the executive officer of the District and is responsible for the management of the general

affairs of the District. The Manager shall be directly responsible to the Board and operate the District pursuant to the rules and regulations of this Policy, all amendments thereto, and other policies and directives of the Board.

122.1 The Board will endeavor to evaluate the General Manager at six month intervals and shall provide a written evaluation which shall be delivered and discussed with the Manager at least annually.

123. EMERGENCIES - REPAIR. The Manager shall promptly report any major problems to the Board. If the problem is an emergency, the Manager shall take whatever steps are necessary to maintain service to consumers and to protect persons and property pending action by the Board.

124. EXPERT ADVISORS. In the execution of actions ordered and authorized by the Board, the Manager shall have the assistance of the District's legal counsel, engineering and financial consultants, and other advisors as deemed reasonably necessary to conduct the business of the District.

125. PERSONNEL. The Board may, from time to time, employ additional personnel as it deems necessary to perform the duties of the District and pay such compensation for the services rendered as the Board deems proper.

126. WORDS AND PHRASES. For the purpose of this Policy, all words used herein in the present tense shall include the future tense, all words in the plural number shall include the singular number and all words in the singular number shall include the plural number.

127. ALTERATION OF THIS POLICY. This Policy may be amended, rescinded, deleted or otherwise altered by action of the Board at any regular or special meeting, by adoption of a resolution specifically setting forth the amendment, rescission, or deletion. Thereafter, the General Manager is directed to make any authorized revisions to the

original of this Policy and maintain an appropriate updated Policy Manual in the records of the District.

128. CONFLICTING PROVISIONS. If any section, subsection, sentence, clause or phrase of this Policy is, for any reason, deemed to be inconsistent with, or contrary to the constitution or any law of the State of California, or of the United States of America, or with any provision of the Bureau of Reclamation (Bureau) contract, the remaining portions of this Policy shall not be affected thereby.

129. BOOKS, RECORDS, AND REPORTS. Pursuant to Article 30 - Books, Records, and Reports of the Bureau contract with District and California Water District law, the District shall establish and maintain accounts and other books and records pertaining to its financial transactions, land use and crop production, water supply, water use, changes in project works, and as to such other matters as the Bureau and State law may require. The District shall furnish such reports to the Bureau and other responsible State and Federal agencies as required.

130. EQUAL EMPLOYMENT OPPORTUNITY. Pursuant to Title VII of the Civil Rights Act of 1964, the District agrees not to discriminate against any employee or applicant for employment because of race, creed, color, sex, religion or national origin. The full text of this agreement starts at Section 38, Page 51, and ends on Page 54 of the Bureau contract.

131. APPEALS. The General Manager is responsible for all day-to-day operations of the District, and as a part of such duty is empowered to implement this Policy in accordance with its terms. Customers or other persons doing business with the District shall submit all questions regarding such business to the General Manager for determination, whose decision shall be final, subject to appeal as provided in this section. Any customer or person may appeal the decision of the General Manager to the Board by filing a written notice of appeal within seven (7) days of notification by the General Manager of the decision for which appeal is sought (excepting billing disputes

which are governed by Section 421 of this Policy). A Notice of Appeal form shall be provided for that purpose by the District. Thereafter, the appeal hearing shall be set at the next regular Board meeting date. A party's failure to file a notice within the seven day period provided shall render the General Manager's decision final. After an appeal, the decision of the Board shall be final, subject to legal right to review by a court of law, if applicable. Staff shall prepare a memo for inclusion in Board information packets explaining the facts, the issues, and why the customer's request was denied.

132. NOTICE TO CUSTOMERS. Notices from the District to a customer shall normally be given in writing, and either delivered or mailed to the customer at the customer's last known address. Where conditions warrant, and in emergencies, the District may resort to notification by telephone or messenger.

133. NOTICE FROM CUSTOMERS. Notices from a customer to the District may be given by the customer or the customer's authorized representative in writing: delivered to the District office at 11368 E. Stillwater Way, Redding, CA 96003.

134. PENALTY FOR VIOLATION. The penalty for the failure of the customer to comply with all or any part of this Policy and amendments thereto, and any other applicable policy including policies fixing rates and charges of this District, shall be as specifically provided in this Policy or such other resolution, or as provided by law. In the case of violations for which a penalty has not been specified, the customer's service shall be disconnected, and water shall not be supplied to such customer until the customer has complied with the rules or regulations, rates or charges, which have been violated. In addition, the customer shall pay the District reconnection charges as provided in this Policy.

135. TAMPERING WITH DISTRICT PROPERTY. No one, except an employee or District representative shall, at any time, in any manner, operate valves, curb stops, or interfere with meters or their connections, pumps, regulators or other fittings or facilities

of the District. This shall include the making of taps and/or connections to District facilities.

Any person who, with intent to obtain for himself or herself, obtains water services from Bella Vista Water District without paying the full lawful charge therefor, or with intent to enable another person to do so, or with intent to deprive Bella Vista Water District of any part of the full lawful charges for water services it provides, commits, authorizes, or solicits any of the following shall be liable to Bella Vista Water District for the penalties set forth in Appendix A:

a. Diverts or causes water to be diverted by any means whatsoever.

b. Prevents any water meter, or other device used in determining the charge for water services, from accurately performing its measuring function by tampering or by any other means, or bypasses any water meter to cause no measurement or inaccurate measurement of water actually delivered.

c. Tampers with any property owned by or used by Bella Vista Water District to provide water services.

d. Makes or causes to be made any connection with or reconnection to water service facilities owned or used by Bella Vista Water District to provide water services, and without the authorization or consent of the District.

e. Uses or receives the direct benefit of all or a portion of water services with knowledge or reason to believe that the diversion, tampering, or unauthorized connection existed at the time of that use, or that the use or receipt was otherwise without the authorization or consent of the District.

f. Uses any instrument, apparatus, or device to obtain District water supplies which device(s) is/are primarily designed to be used to obtain water service without paying the full lawful charge therefor.

g. Cuts or removes a seal on any meter or other water measuring device.

136. RESPONSIBILITY FOR EQUIPMENT ON CUSTOMER'S PREMISES. All facilities, including, but not limited to water meters, installed by the District on private or public property for the purpose of providing water service shall remain the property of the District. Excepted from the above are backflow prevention devices on meter service lines which remain the property of the customer. As a condition to providing water service, private property owners consent to such installations and consent to grant District personnel reasonable access at all times for the purposes of maintenance or repair, as necessary. Private property owners shall use due care not to damage any District owned facility. Damage caused by customer's failure to use due care shall be the responsibility of the customer. Customers shall not permit placement of any object or structure in a manner which will interfere with access to the facility as necessary, including unrestricted access to fire hydrants, meter boxes, and backflow prevention devices.

137. DAMAGE TO WATER SERVICE FACILITIES. The customer shall be liable for any damage to District owned facilities (e.g., meter box, service line, angle meter stop, meter, service valves, etc.) when such damage is caused by actions originating on or near the premises by an act of the customer or his/her tenants, agents, employees, contractors, licensees, or permittees, including the breaking or destruction of locks on or near a meter, and any damage to a meter that may result from hot water or steam from a boiler or heater on the customer's premises. The District shall be reimbursed by the customer for any such damage promptly on presentation of a bill.

138. GROUND WIRE ATTACHMENTS. Customers shall be liable for any damage to District property caused by the attachment of an electrical ground wire to the customer's plumbing or piping.

139. UNAUTHORIZED USE OF HYDRANTS. Tampering with any fire hydrant for the unauthorized use of water there from, or any other reason, is a misdemeanor as provided by California Penal Code Sections 148.4 and 498. Such actions are punishable by imprisonment in the County Jail, or a fine, or both. The District will prosecute any such actions to the fullest extent of the law.

140. DISTRICT NOT LIABLE FOR WATER SHORTAGES. There may occur, at times, a shortage during any year, in the quantity of water available to the District pursuant to Article 12 of the Bureau contract. If a shortage occurs and the Bureau does not supply the water to the District, in no event shall any liability accrue against the District or any of its officers, agents, or employees, for any damage, direct or indirect, arising from a shortage on account of errors in operation, droughts, or other causes.

141. RESPONSIBILITY FOR EQUIPMENT. Customers shall, at their own risk and expense, furnish, install and keep in good and safe condition, all service equipment and facilities that may be required on their premises for receiving, controlling, applying and utilizing water, and the District shall not be responsible for any loss or damage caused by the improper installation or use of such equipment and facilities, or the negligence or wrongful act of customers or of any of their tenants, agents, employees, contractors, licensees, or permittees in installing, maintaining, operating, or interfering with such equipment and facilities. For example, the District shall not be responsible for damage to property caused by faucets, valves, and other equipment that are open when water is turned on at the meter, either originally or when turned on after a temporary shutdown.

142. FREE WATER PROHIBITED. The District shall not give free water to any person, group, or organization. The District shall not trade water for labor or other services.

143. WASTEFUL USE OF WATER. No customer shall permit leaks or otherwise waste water, whether intentionally or negligently. In the event that water is wastefully or negligently used on a customer's premises, District shall have the right to discontinue service to the premises and shall have the right to enter upon the premises for the purpose of disconnecting the service.

144. RESALE OF WATER. No customer shall transport, supply, resell or otherwise transfer water purchased from the District to any other person or property unless authorized by law and authorized by the District's Board of Directors. Notwithstanding this restriction, owners of a mobile home park, apartment building, or other multiple-unit complex shall have the right to supply water to their tenants and to charge them for such water, provided that the water is not supplied to property other than the owner's property and provided that the charge for water does not exceed the actual expense to the owner of the multi-tenant property. No additional living units shall be connected to any service without prior application to the District in accordance with this Policy.

145. DOCUMENTS, PHOTOCOPIES, ETC. The District will provide copies of non-restricted material upon request at a cost as shown in Exhibit A. Normally such copies will be provided no later than 72 hours after requested.

146. PUBLIC USE OF BOARD ROOM. It is the policy of this District to make the Board Room at the District office available for use by the public at no cost to the District. The room may be used by government agencies, non-profit corporations, volunteer groups, and neighborhood groups that have a relationship to water distribution and use, or for the general public good.

Whenever the public uses the facility, a District employee shall be on the site to secure the building and assist the public.

Meetings during working hours may be held at no charge. Meetings outside of working hours will require that the District be reimbursed at the hourly rate shown in

Appendix A with a two-hour minimum charge to compensate the District for its out-of-pocket personnel expenses.

ARTICLE II. DEFINITIONS

200. AGRICULTURAL WATER. Water delivered to consumers for use primarily in the commercial production of agricultural crops or livestock including domestic use incidental thereto.

201. AIR-GAP SEPARATION. A physical break between a supply pipe and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel, in no case less than one inch.

202. APPLICANT. Any person, as defined herein, applying for water service.

203. APPROVED BACKFLOW PREVENTION ASSEMBLY. An assembly which has passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the California Department of Health Services. The District's construction standards includes a list of devices approved for use on District services.

204. APPROVED WATER SUPPLY. Any water supply whose potability is approved by a state or local health agency.

204.5 AQUACULTURE. Commercial production of fish or aquatic plants under controlled conditions. Does not include farm pond environments where fish are present and fee for fishing enterprises.

205. AUXILIARY SUPPLY. Any water supply on or available to the premises other than the approved water supply.

206. AWWA STANDARD. An official standard developed and approved by the American Water Works Association (AWWA).

207. BACKFLOW. A flow condition, caused by a differential in pressure that causes the flow of water or other substances into the distributing pipes of the District's water supply from any source other than an approved water supply source. Back-siphonage is one cause of backflow. Back pressure is the other cause.

208. BOARD. The Board of Directors of the Bella Vista Water District.

209. BUREAU. The United States Bureau of Reclamation.

210. BUREAU CONTRACT. The contract number 14-06-200-851a entered into between the Bella Vista Water District and the United States Bureau of Reclamation on April 3, 1964 and as amended and as renewed from time to time.

210.5 CAPITAL IMPROVEMENT FEE. Portion of installation charges used primarily for building system improvements.

211. Not Used

212. COMMERCIAL SERVICE. Delivery of water to customers engaged in trade, manufacturing and all other business and processing activities, including lodges, motels, hotels, trailer parks, home businesses, duplexes, triplexes, apartment houses etc., and other social or political organizations. Commercial service shall also include small businesses with living quarters attached thereto or served by the same meter.

212.5 CONNECTION FEE. That portion of the installation charges consisting of meter costs, service installation fee, and if applicable, a road crossing fee.

212.10 CONTAMINANT. Any physical, chemical, biological or radiological substance or matter in water.

213. CONTAMINATION. A degradation of the quality of the potable water by any foreign substance which creates a hazard to public health, or which may impair the usefulness or quality of the water.

214. COST. The total cost of labor, material, transportation, equipment rental, supervision, engineering, legal, and all other necessary overhead expenses.

215. Not Used

216. CROSS CONNECTION. Any unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other assemblies through which backflow could occur, shall be considered to be cross-connections.

217. CUSTOMER OR CONSUMER. A water user of record.

218. DATE OF PRESENTATION. The date upon which a bill or notice is mailed or delivered personally to the customer.

219. DEVELOPER. Any individual, firm, company, partnership, association, corporation, or institution who divides land into two or more parcels.

220. DISTRIBUTION MAINS. Installations starting from the turnouts provided in the "Main Conveyance" system extending to individual services throughout the District in the form of main or lateral extensions, to provide the customers with water service.

221. DISTRICT. Bella Vista Water District, the territory of the Bella Vista Water District, its directors, officers, employees, and facilities.

222. DIVERT. To change the intended course or path of water without the authorization or consent of Bella Vista Water District.

223. DOMESTIC OR RESIDENTIAL SERVICE. Water for all household purposes, including water for sprinkling lawns, gardens or shrubbery; washing vehicles and clothes; human consumption, sanitation; and other general and customary purposes.

224. DOUBLE CHECK VALVE ASSEMBLY. An assembly of two internally loaded, independently acting check valves, including shut-off valves on each end of the assembly and test cocks for testing the water tightness of each check valve.

225. ENR. Engineering News Record magazine.

226. GENERAL MANAGER OR MANAGER. The person employed by the District as its executive officer.

226.5 GROSS ACREAGE. Parcel size as shown on annual tax statement used for agricultural, aquaculture, and public/institutional water allocations.

227. HEALTH AGENCY. The California Department of Health Services.

227.1 INSTALLATION CHARGES. Includes the Capital Improvement Fee for system improvements, meter cost, service installation fee, and if applicable, a road crossing fee.

227.2 LAND DIVISION. Any adjusting or amending of a property or properties resulting in a change of tax liability, acreage size, or configuration such as a subdivision, property line adjustment, or parcel split.

228. LOCAL HEALTH AGENCY. The Shasta County Division of Environmental Health.

229. MAIN CONVEYANCE OR TRANSMISSION MAINS. The major pipeline and the laterals connected thereto, forming the basic system as provided for in the Bureau of Reclamation Contract.

230. MUNICIPAL AND INDUSTRIAL (M&I) WATER. Water delivered to the District by the U.S. Bureau of Reclamation for use primarily other than as agricultural water.

231. OFFICE. The office of the Bella Vista Water District located at 11368 East Stillwater Way, Redding, California.

232. PERSON. Any individual, firm, company, partnership, association, corporation, Federal, State and County governments, public utility, municipality or institution.

232.5 PERSON. Individual, corporation, company, association, partnership, or other public body or institution.

233. POTENTIAL CROSS CONNECTION. Capable of being a cross connection but not yet in existence.

234. PREMISES. A lot, parcel or acreage under single ownership, except that any separate structure shall be deemed a separate premises. Apartment houses, motels, office buildings and structures of like nature, may be classified as a single premise by the District.

235. PRIVATE FIRE PROTECTION SYSTEMS. Water service and facilities for building sprinkler systems, hydrants, hose reels and other facilities installed on private property for fire protection, excepting there from, meter connections for regular service and the appurtenant facilities thereto.

236. PUBLIC FIRE PROTECTION SERVICES. The services and facilities of the District, including the storage, transmission and distribution systems and the water there from to serve fire hydrants and fire fighting equipment.

236.5 PUBLIC/INSTITUTIONAL SERVICE. Any water using establishment dedicated to public services. This includes schools, golf courses, churches, hospitals, and government facilities.

237. PUBLIC WATER SYSTEM. The District system.

238. RECLAIMED WATER. A wastewater which, as a result of treatment, is suitable only for other than potable use.

239. RECONNECTION. Means the reconnection of water service by a customer, other person, or by the District after service has been disconnected by Bella Vista Water District.

240. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY. An assembly incorporating two internally loaded, independently operating check valves and an automatically operating differential relief valve located between the two checks, including shut-off valves on each end of the assembly, and equipped with necessary test cocks for testing the assembly.

241. RESIDENTIAL SERVICE. Delivery of water to a parcel of land which does not meet agricultural, commercial, or rural service requirements.

242. RURAL SERVICE. Water service available to parcels of land which do not meet agricultural or commercial service requirements and are two (2) acres or more in size and have a one-inch or larger meter.

242.5 SCHOOL. Any building used for educational purposes accredited by the Western Association of Schools and Colleges including K through 12, junior colleges, and universities. This definition shall not include buildings used for day-care purposes.

243. SERVICE. The pipeline and appurtenant facilities, such as curb stops, service lines, meter yokes, meter boxes, meter gate valve and fittings, all used to extend water service from a distribution main to the premises. Where services are divided at curbs or property lines to serve several customers, each branch service shall be deemed a separate service.

244. SERVICE CONNECTION. The point of connection of a user's piping to the water supplier's facilities.

244.1 SERVICE RECONNECTION CHARGE. Fees levied in cases where the District has previously turned off service for delinquent payment.

245. SINGLE DETECTOR CHECK ASSEMBLY. An assembly of an internally loaded check valve together with bypass and a water meter which records low flows.

245.1 SUBDIVISION. Any division of land, including, but not limited to, lot split, lot line adjustment or parcel map recordation, which results in any parcel served by the District being divided into two or more parcels as a result of such subdivision.

246. TAMPER. To rearrange, injure, alter, interfere with, or otherwise prevent a device from performing its normal or customary function.

247. TEMPORARY WATER SERVICE. Water service and facilities rendered for construction work and other uses of limited duration and the water and facilities available therefor.

248. WATER SERVICE. The provision of water by the Bella Vista Water District for compensation.

249. WATER SUPPLIER. The District.

249.1 WATER SYSTEM. Improvements installed within a tract of land for the purpose of providing water service to a subdivision.

249.2 WATER TURN-OFF AND TURN-ON CHARGE. Fees levied in cases where the customer requests to have their service turned off and on for their convenience. This fee does not apply to new customers or move-outs.

250. WATER USER. Person(s) using water for residential, commercial, rural, or agricultural purposes.

251. WATERLINE EXTENSION. Water main(s) installed for the benefit of existing parcels of land without previous water service.

ARTICLE III. BOARD OF DIRECTORS

354. MEETINGS. The Board of Directors shall hold regular meetings on the fourth Monday of each month at 5:30 o'clock p.m. at the District office. Provided that in the event any regular meeting falls on a holiday, as defined in Sections 6700, 6701 and 54954 of the Government Code, such regular meeting shall be held on the next business day.

Special Meetings may be called or held as provided in Section 34803 of the Water Code and Section 45956 of the Government Code and notice thereof shall be given as set forth in Section 34804 of the Water Code and Section 54956 of the Government Code.

Any regular or special meeting may be adjourned from time to time as provided in Section 54955 of the Government Code.

Individual meetings may be held at such other place in or near the District provided that notice of said meeting is posted at the District office at least 72 hours in advance.

Board meetings are not to continue past 8:00 p.m. unless there is pressing business at which time a majority vote will be required to extend the meeting.

356. OFFICERS. The officers of the District shall include the directors, secretary and treasurer. An officer need not be a resident or elector of the District; provided, however, that directors shall be holders of title to land within the District. Officers take office as soon as they qualify except that officers elected or appointed pursuant to the Uniform District Election Law shall take office at noon on the first Friday in December next following the general district election.

357. PRESIDENT, VICE-PRESIDENT. The Board of Directors shall choose from among its members a president, who shall preside at all meetings of the Board and shall perform all other duties incumbent on such office, and all duties required of the president by law or order of the Board of Directors. In the president's absence or inability to act, the president's duties shall devolve upon the vice-president, who shall be selected from their own number by the Board of Directors. The terms of office of the president and vice-president shall be one (1) year beginning at the first regular meeting in December of each year.

358. SECRETARY. The Board of Directors shall appoint a Secretary of the District to hold office at the pleasure of the Board. The office of the secretary shall be combined with the General Manager. The Secretary shall keep a record of all the proceedings at meetings of the Board and shall have charge of all documents pertaining to the District's affairs. The secretary shall perform all duties usually pertaining to such office and those required by law or by order of the Board.

359. POWERS OF THE BOARD. The Board of Directors shall have all powers conferred by law.

The Board of Directors may, by resolution, adopt rules and regulations not inconsistent herewith for the operation of the District and for the sale and distribution of water, and fix the rates to be charged for water.

360. COMPENSATION OF OFFICERS. Officers shall be compensated as follows: Each director shall receive compensation in the amount shown on Schedule A for each day's attendance at meetings of the Board or for each day's service rendered as a director by request of the Board, not exceeding a total of ten (10) days in any calendar month, together with any expenses incurred in the performance of his or her duties required or authorized by the Board; provided, however, that no mileage expenses shall be paid for traveling to or from Board meetings.

361. VACANCIES. If any office of the District shall become vacant by forfeiture, death, resignation or from any other cause, the same shall be filled by appointment by a majority of the Board of Directors, in accordance with the provisions and requirements of California Government Code Section 1780.

362. ELECTIONS. Elections shall be called by the Board of Directors every two years, and as provided in the California Elections Code. Elections shall be conducted pursuant to the provisions of the California Uniform District Election Law, Elections Code Sections 23500, and following. Votes cast shall be based on the acreage of land of each owner of land within the District, as provided by law.

The Secretary of the District shall provide a report to the Board regarding the make-up of the District with respect to non-agricultural land use versus agricultural and rural use as provided by law. At such time as at least 50% of the assessable area of the District is devoted to and developed for residential, industrial or nonagricultural commercial use, the District may adopt resident voter procedures, i.e., one vote per person.

364. WATER CODE. As to all matters concerning the affairs and business of the District not herein specifically set forth or provided, pertinent provisions of the Water Code of the State of California and other applicable laws of the State shall govern.

365. ATTENDANCE. Each director shall make all reasonable efforts to attend each regular or special meeting held or called by the Board. In the event that a director fails to attend three (3) consecutive regular meetings, such director's office may be declared forfeited and a successor appointed pursuant to Section 34707.5 of the Water Code and Section 1780 of the Government Code.

ARTICLE IV. WATER SERVICE, GENERAL

400. APPLICATION FOR WATER SERVICE. Applications for water service shall be made upon a form provided by the District. Such application will signify the customer's intent and willingness to comply with this and other rules and regulations relating to water service and to make payment for the water service required.

401. PAYMENT FOR PREVIOUS SERVICE. An application for new water service will not be acted upon by the District unless payment in full has been made for water service previously rendered to the applicant.

402. SECURITY DEPOSITS FOR WATER SERVICES. The District reserves the right to require a security deposit from new customers requesting water service.

403. INSTALLATION OF SERVICES. "District" shall install or authorize the installation of all meters pursuant to the rules and regulations established herein. The location of the meter shall not restrict District access to the meter at any time. Where practical, water services will be installed at the location desired by the applicant, after the necessary connection fees and installation charges have been paid by the applicant. Meters shall be placed upon the parcel they serve or within a recorded easement immediately adjacent to the parcel they serve. Exceptions to this provision must be made in written request form to the District and approved by the District's Board of Directors. Services installed in new subdivisions must be accepted by the applicant in the installed location.

Services and meters may be sealed by the District at the time of installation and no seal shall be altered or broken except by one of the District's authorized representatives.

403 (a) REQUIREMENTS FOR THE PURCHASE OF A WATER METER. The sale of a water service connection (i.e., a water meter and the capital improvement fee)

for non-agricultural purposes shall be contingent upon the property owner providing satisfactory proof of the existence of an existing dwelling unit, commercial or industrial building on the property or proof of the issuance of a building permit for the property at the time of purchase. The sale of a water service connection for agricultural purposes shall be contingent upon the property owner meeting all of the District's requirements for the receipt of irrigation water (i.e., an approved agricultural water application) at the time of purchase.

403 (b) WATER SERVICE AVAILABILITY REQUESTS. Prior to the installation of a new service the property owner shall complete a Water Service Availability Request in order for the District to research what will be required in order to provide water service to the property and the costs for the installation of the service and meter. The District will inform the requestor by letter once the research is completed. The price given for the water service installation shall be good for 60 days from the date of the letter unless an increase in the District's fees occurs within the 60 day period, in which case the price shall expire not more than 30 days after the date of the increase. When a water service availability request is submitted prior to an increase in Capital Improvement Fees and the results of the research are not provided to the requestor until after the fees have increased the pre-increase prices will be honored for 30 days from the date of the letter, provided that the requirements for purchase of a water meter (section 403 (a) were met prior to the date of the increase..

403 (c) FEES : CHANGES IN AMOUNT. Connection fees may be changed at any time. Ann applicant shall pay the connection fees existent when service commences regardless of when the connection fees are deposited or paid. "Service commences" when a request for service has been made and water can be first delivered to the applicant's property through District owned facilities and the bimonthly water services can be assessed. Service does not "commence" for the purpose of this section when construction water is provided through a temporary meter prior to the acceptance by the District of the water system serving the applicant's property.

404. METERING OF SERVICES. All water services within the District shall be metered with ownership of the meters retained by the District.

405. NEW SERVICE CONNECTIONS REQUIRING ADDITIONAL REAL PROPERTY ACCESS. When new service connections are requested from the District and it is determined by District staff that access rights to real property owned by the customer requesting service or another party will be required in order for the District to properly maintain the new water service facilities, the necessary rights-of-way shall be obtained. Access shall be in the form of an easement deed from the fee title owner of the property, or such other evidence as is satisfactory to the District.

A. If the distribution line to which the service connects is existing, the District will acquire the necessary rights-of-way for the distribution line either through voluntary grant, purchase, or eminent domain, as necessary. The District may allow the new service to be connected prior to obtaining the required rights of way.

B. If the distribution line to which the service will connect is to be constructed, the developer or person constructing the distribution line shall be responsible for providing the necessary access. No permanent water service shall be provided to a customer until such time as the foregoing requirements are met.

406. LONG SERVICES. The installation of a service line up to sixty (60) feet in length is included in the cost of a standard service installation. When the installation of a service line of more than sixty (60) feet in length is required additional fees will be applicable (as listed in Appendix A).

407. ROAD CROSSINGS. If it is necessary to cross a paved road during installation of a complete service a road crossing fee will be applicable.

408. Not Used.

409. CONTROL VALVE ON THE CUSTOMER'S PROPERTY. The District will provide a valve on the customer's side of the service installation, as close as is practicable to the meter location, to control the flow of water to the customer's premises. The customer shall use this valve and not the District's curb stop to turn the water off and on as required.

410. PRESSURE CONDITIONS. All customers receiving water service shall accept such conditions of pressure and service as are provided by the distribution system at the location of the proposed service connection, and shall hold the District harmless for any damages arising out of low pressure and/or high pressure conditions or interruptions in service. The District will endeavor to identify unusual pressure conditions at the time an application is received, but shall not be responsible for its failure to do so.

411. INTERRUPTIONS IN SERVICE. The District shall not be liable for damages which results from an interruption in service for any cause. Temporary shutdowns may be made by the District to make improvements and repairs to the District's facilities. Whenever possible and as time permits, all customers affected will be notified prior to making such shutdowns.

412. TEMPORARY SERVICE. All facilities for temporary service to the customer connection shall be made by the District and shall be operated according to District requirements.

413. TEMPORARY SERVICE DEPOSIT. All applicants shall deposit in advance, a sum sufficient to cover all installation and disconnection costs. Refund of any excess deposit shall be made by the District after the service is terminated and the system restored to its former condition. Applicant's shall pay all costs of installation and removal of any temporary service in accordance with Appendix A, Rates and Charges.

414. DURATION OF TEMPORARY SERVICE. Temporary service connections shall be disconnected and terminated not later than six (6) months after installation unless an extension of time is granted in writing by the District.

415. CONSTRUCTION WATER. When available, water for construction will be supplied from District hydrants. A construction water permit shall first be obtained from the District. Application for construction water shall be made on a form provided by the District and the applicant will be required to pay a security deposit in accordance with Appendix A. A meter rental fee and water usage will be billed bimonthly.

The District will provide the applicant with a hydrant meter. Care of the hydrant meter is the responsibility of the applicant who shall be responsible for any damage. If the meter is lost, the security deposit will not be refunded.

In cases where the amount of water to be used is minimal or the District is unable to provide a meter, the General Manager may waive the meter and security deposit and use a load count to determine usage.

416. SERVICE BEYOND DISTRICT BOUNDARIES. The determination of whether to serve water outside the exterior boundaries of the District shall be made by the Board. Such outside water service, the rates, installation and facilities installed therefor, shall be of a temporary nature only.

417. APPROVALS REQUIRED. If service outside District boundaries is permitted, approval from the Bureau must be secured pursuant to the water contract. Bureau approval is also required in order to annex territory to the District. Approval from the Local Agency Formation Commission will also be required in most cases.

418. OUTSIDE WATER RATES. Water rates for water delivered outside the District shall be one hundred fifty percent (150%) of the standard District residential rates.

419. BILLING FOR EACH METER. Separate bills will be provided for each service connection or meter installation except where the District has allowed the installation of two (2) or more meters to serve large quantities of agricultural or rural water on the same premises or on contiguous lands under one ownership. Where such installations are approved, the meter readings will be combined for billing purposes.

420. METER READING. Meters will be read as nearly as possible, on the same day bi-monthly. Billing periods containing fewer than fifty-eight (58) days and more than sixty-four (64) days, will be prorated. The regular billing period will be bimonthly.

421. PAYMENT OF BILLS. Bills are due and payable on the date of presentation and become delinquent twenty (20) days thereafter. Payment may be received at the District office by mail or in person. Each bill for water service shall contain the following statement which sets forth the process for bill disputes and delinquency bill disconnections:

> PAYMENTS All bills, if unpaid twenty (20) days after date of mailing, shall be deemed delinquent and service may be discontinued. The entire delinquent bill, plus a delinquent penalty charge, reconnection charge and any additional charges, shall be paid in full before service will be re-established.
>
> DISPUTED BILL PROCEDURE If you believe that your bill is incorrect, within five (5) days of receiving a disputed bill, please contact a Customer Service Representative during regular office hours, either in person, at 11368 E. Stillwater Way, or by telephone (241-1085) for an explanation. Office hours are 8:00 a.m. to 5:00 p.m., Monday through Friday, except holidays.
>
> If, after such explanation, you still believe this bill is wrong, within ten (10) days of such explanation, you may request a hearing with a review manager of the District. Any customer whose request for a hearing by the review

manager has resulted in an adverse determination may appeal to the Board of Directors within thirty (30) days after the review manager's determination.

All requests for an extension of a bill asserted to be beyond the means of the customer to pay in full during the normal period for payment shall be made prior to termination directly to a Customer Service Representative during regular office hours, either in person or by telephone (241-1085).

422. PENALTY CHARGES. Any customer requesting extended payment for water billing charges and other charges related to water service shall be subject to a 1-1/2% per month periodic charge rate on the past due balances.

Billings for water service which are not paid on or before twenty (20) days following the date of mailing shall be subject to a ten percent (10%) late payment fee.

423. OPENING AND CLOSING BILLS. Opening and closing bills for less than the normal billing period shall be prorated according to the fraction of the time of service. Closing bills may be estimated by the District for the final period as an accommodation to permit the customer to pay the closing bill at the time service is discontinued.

424. Not used.

425. NOTICE OF DELINQUENCY AND TERMINATION OF SERVICE. A customer(s) water service may not be terminated for nonpayment of a delinquent account unless the District first gives notice of the delinquency and intent to terminate service at least 10 days prior to the proposed termination date by a mailed notice, postage prepaid, to the delinquent customer. Such notice shall be mailed not earlier than 20 days from the date of mailing the bill, and the 10-day period after which service is terminated shall not commence until five days after the mailing of the notice.

In addition, the District shall make a reasonable, good faith effort to contact an adult person residing on the premises of the customer by telephone or personal contact, at least 48 hours prior to any termination of service, except that whenever telephone or personal contact cannot be accomplished, the District shall give by mail, in person, or by posting in a conspicuous location at the premises, a notice of termination at least 48 hours prior to termination.

Every notice of termination of service shall include all of the following information:

(1) The name and address of the customer whose account is delinquent.

(2) The amount of the delinquency.

(3) The date by which payment or arrangements for payment is required in order to avoid termination.

(4) The procedure by which the customer may initiate a complaint or request an investigation concerning service or charges.

If a customer fails to comply with an extended payment agreement, the District shall not terminate service without giving notice to the customer at least 48 hours prior to termination of the conditions the customer is required to meet to avoid termination, but such notice does not entitle the customer to further investigation by the District.

No termination of service may be affected without compliance with this section. Any service terminated without the notice required by this Policy shall be restored without charge.

426. Not used.

427. DISPUTE OF WATER SERVICE BILLING. Whenever a customer has filed a complaint or requested an investigation into his or her water bill within five days of receiving the disputed bill, water service will not be terminated for nonpayment while such complaint or investigation is pending.

The customer will be contacted by the District by telephone, in person, or via first class mail with an explanation of the disputed charges within a twenty-day period after receiving the complaint or request for investigation.

428. MASTER METER-NOTIFICATION OF NONPAYMENT TERMINATION. Whenever water services are furnished to customers through a master meter where the owner or manager is the customer, the District will make every good faith effort to inform the actual users of these services if the account becomes delinquent and subject to termination. Notification will be given to users at least 48 hours prior to the scheduled termination of services.

The District will continue to provide service to the actual users if one or more are willing to assume responsibility for the entire account and have met the District's conditions for service.

429. INABILITY TO PAY WATER BILLS. Any customer who has notified the Customer Service Department prior to termination for nonpayment that he or she is unable to pay a bill within the normal payment period will be allowed to amortize the unpaid amount over a reasonable period of time, not to exceed 12 months. The customer will be required to pay the amortized amount plus the current water service charges. Failure to pay the amortized amount plus the current charges each billing period will nullify the amortization agreement, and the customer will immediately thereafter be required to pay the entire outstanding balance.

430. MEDICAL CERTIFICATION OF LIFE-THREATENING SITUATION. Residential water services will not be terminated for nonpayment of any bill if the customer asserts that payment of such bill within the normal period of time is beyond his or her means, and the customer has provided a signed statement from a licensed physician or surgeon to the District prior to termination that such action would result in a life-threatening situation to the customer. Such charges shall, however, continue to accrue for actual usage and the District shall only provide water service under these conditions for a period of 12 months. After that date, water service will be terminated according to this Policy. Any and all unpaid charges shall become a lien against the real property served by the District, as provided in the Water Code.

431. RECONNECTION. Water service disconnected for nonpayment will be reconnected upon payment of the entire amount due, which shall include all delinquent charges, service reconnection charges, and other penalties. Water service will not be restored to a customer until all conditions for service have been satisfied.

A security deposit in the amount of the highest billing period charge during the past year may also be required for existing accounts with a history of delinquent payment. The security deposit will be credited to the customers billing account after the customer has paid bills for service for twelve consecutive months without having more than two past due bills. The District will refund the deposit upon request of the customer on disconnection of the service.

All new customers applying for water services at a location where water service has been terminated as a result of nonpayment of a prior account must provide the Customer Service Department with proper identification and a signed rental agreement from the property owner or landlord. New customers will be required to sign a water application/subscribers agreement.

In the event service is discontinued for non-compliance with regulations other than delinquency or nonpayment of water bills, there will be a service reconnection charge in accordance with Appendix A which must be paid prior to reinstating service.

432. NON-ALLOWABLE WATER SERVICE TERMINATION. The District has set forth the following restrictions on termination of a customer's water service for nonpayment of billing charges. No customer's service shall be terminated:

1. On Saturday, Sunday, legal holidays, or at any time during which the business office of the District is not open to the public.

2. For nonpayment of a delinquent account unless the District first gives notices of the delinquency and impending termination.

3. During the pending investigation by the District for a customer who has initiated a complaint or requested an investigation within five days of receiving a contested bill.

4. When a customer has been granted an extension of the period for payment of bill.

5. On the certification of a licensed physician that to do so will be life threatening to the customer and the customer is financially unable to pay for service within the normal payment period and is willing to enter into an amortization agreement with the District, not to exceed 12 months.

433. CLOSED DELINQUENT ACCOUNTS. A closing statement is deemed delinquent if unpaid 20 days after date of mailing.

If the delinquent bill has not been paid and an extension has not been approved by the District, accounts will receive a pre-collection due date demand,

commencement of legal action, and/or a 15-day notification of assignment to a collection agency if billing remains unpaid after the pre-collection due date.

All unpaid and uncollected accounts shall become a lien against the real property on which the water service was provided in accordance with the provisions of California Water Code 37212 and 37213.

434. Not used.

435. Not Used.

436. METER TEST - DEPOSIT FOR TEST. Customers requesting a meter test shall first pay a meter testing deposit, as shown in Schedule A, depending on the meter size. Should the meter register more than two percent (2%) fast the deposit will be refunded, but should the meter register less than two percent (2%) fast the deposit will be retained by the District.

437. ADJUSTMENTS ON BILLING FOR METER ERRORS. If a meter tested is found to be more than two percent (2%) fast, the excess charge for the time service was rendered, not to exceed six (6) months, shall be refunded to the customer. If a tested meter is found to be more than ten percent (10%) slow, the District may bill the customer for the amount of the undercharge for a period not to exceed six (6) months that the meter was in use.

438. WATER RATES FOR TEMP SERVICE. Meter water rates for temporary services will be charged at one hundred fifty percent (150%) of the rates set forth herein.

439. NON-REGISTERING METERS. If, for any reason, a meter is not registering, the charges for service shall be the minimum bimonthly rate as shown on Schedule A plus the cost of the estimated consumption. Such estimates shall be determined from

previous consumption for a comparable period or by such other reasonable method as is determined by the District.

440. FIRE PROTECTION SYSTEM RATE. Fire service installations in which a detector-check meter is employed shall pay a monthly maintenance fee equal to that shown in Appendix A. Overhead sprinklers and other private fire protection equipment in factories, supermarkets, schools, and similar structures shall be rated on the size requirements of the service desired.

441. Not Used

442. TEMPORARY SERVICE THROUGH A FIRE HYDRANT. If service is supplied through a fire hydrant, the applicant will, in addition to charges for water usage, be charged a flat charge per connection payable in advance, for both installation and removal of temporary facilities, including the meter, as shown in Appendix A.

443. Not used.

444. DISCONTINUANCE (NON-COMPLIANCE WITH REGULATIONS). Service may be discontinued for non-compliance with this Policy or any other rule or regulation relating to water service provided by the District. All applicable fees must be paid before service is reinstated.

445. DISCONTINUANCE (MORE THAN ONE SERVICE). A customer's water service may be discontinued if water service furnished at a previous location is not paid as required by this Policy. If a customer receives water service at more than one location and the bill for service at any one location is not paid within the time provided for payment, water service at all locations may be terminated.

446. Not used.

447. Not used.

448. TERMINATION OF SERVICE. Customers desiring to discontinue service should so notify the District two (2) days prior to vacating the premises or two (2) days prior to the date actual water turnoff is to take place. Failure to do so will result in the customer continuing to be liable for charges for water service whether or not water is used.

449. Not Used.

450. FIRE HYDRANTS. Any party using public fire hydrants, shall operate hydrants in accordance with instructions issued by the District. Unauthorized use of hydrants will be prosecuted according to law.

451. RESPONSIBILITY FOR METERS AND INSTALLATIONS. The customer shall use all possible care to prevent damage to the meter or to any other District facilities which are involved in furnishing water service or temporary services from the time they are installed until they are removed. If a meter or other facility is damaged, the cost of making repairs shall be paid by the customer. It is specifically prohibited to operate the valve of a hydrant by other than a spanner wrench.

451.1 METER SIZES. The District reserves the right to require the installation of a compound meter to provide accurate flow readings, prevent undue wear on the meter due to under sizing, or prevent other potential problems.

Sizing of water meters for multiple dwelling units shall be based on the number of fixture units and the landscaping demands for the property. The developer shall provide to the District a report prepared by a registered professional (civil or mechanical) engineer detailing the number of fixture units, landscaping demands, sizes of water lines to be installed, available water pressure, head losses, and resultant water pressures, as well as, the recommended size water meter (based on the AWWA's "Recommended Maximum Rate for Continuous Operation as listed in Appendix D). The District's Engineer will review the report provided and make the final determination of

the appropriate meter size for the building(s).

In the absence of an engineer's report justifying a particular meter size the maximum meter size that will be allowed for a parcel shall be the smallest meter size from Appendix D that will meet the household and irrigation needs of the property based on a 10 gpm household demand plus 5 gpm per acre.

452. UP SIZING. The total cost of a change in the size of a meter or other facility shall be paid for by the customer, including the differences in Capital Improvement Fees in effect at the time of change(see Appendix B for examples). A non-scheduled Ag meter may be converted to a larger scheduled Ag meter. The customer will pay for the difference in the current Capital Improvement Fee of the non-scheduled meter and the Capital Improvement Fee for the larger scheduled meter plus the installation cost. If the difference in Capital Improvement fees results in a credit to the customer no monetary compensation toward the new installation will be allowed; however, the difference in the Capital Improvement Fees may be used as a credit toward any future up-sizing of the same meter. The customer will be responsible for the installation costs.

453. METER DOWNSIZING - EXISTING PARCEL. If a meter is downsized, the property owner shall be credited the following: the difference between the current cost for a "meter set" and "service installation," if applicable, of the size being removed and the new meter size (see Appendix B for examples). No credit will be given for the difference in Capital Improvement Fee.

453.1 METER DOWNSIZING/EXCHANGE - SUBDIVISION. When an existing parcel is subdivided, the existing service shall be downsized so that the meter remaining on the parcel is properly sized. The maximum meter size for any of the parcels created by the subdivision shall be in accordance with the meter sizing criteria in Appendix D. The existing service can be downsized/ exchanged for up to a maximum of four smaller services providing that the combined meter flow rates for the new proposed services do not exceed the AWWA's Recommended Maximum Rate for Continuous Operations for

the original meter. When an exchange is made, no monetary compensation toward the new installation will be allowed.

The smaller meters must be located within the subdivision. The developer/owner will be required to pay the service installation costs and/or meter set costs, whichever is applicable. A meter that has been previously downsized in accordance with this section shall not be eligible for downsizing/exchange a second time.

454. Not Used.

455. METER REPLACEMENT. Before replacing any meter 3-inches or larger in size, the District will attempt to contact the owner of the property that the meter serves. The District will estimate the actual cost (labor and materials) to replace the meter with the same size meter and the cost to replace it with a smaller meter. The owner will then be given the opportunity to have a smaller size meter installed and be credited in conformance with Article 453 above.

456. CHANGE IN LOCATION OF METERS. Meters moved for the convenience of the customer will be relocated at the customer's expense. Meters can be relocated on an existing parcel but cannot be relocated to a different parcel.

456.A RELOCATION OF METERS. Meters relocated due to subdivision developments, parcel splits, or property line adjustments shall be relocated onto the properties that they serve. In the event a water main of adequate size onto which the meter can be relocated does not exist, the District shall make the determination to have a water main of adequate size installed or allow the service to remain at its existing location provided easements are granted to legitimize the water service's location. All costs to be borne by the proponent of the foregoing.

457. INGRESS AND EGRESS. The District is charged with the responsibility of maintaining a sanitary and potable supply of water for the public pursuant to law and the

rules and regulations herein. As a condition of water service, representatives of the District shall have the right of ingress and egress to the customer's premises at all reasonable hours for any purpose reasonably connected with the furnishing of water service, and as provided by California Water Code Section 35404.

458. STREET WIDENING, PAVING, ETC. Persons responsible for service and/or main locations being changed in connection with street realignment, paving, grading, widening, resurfacing, sewer or storm drainage construction and/or other works on streets, road, avenues, thoroughfares, highways, and easements shall also be responsible for all costs incurred by the District in regard to changes in the water facilities required by such activities.

459. UNSAFE APPARATUS. Water service may be refused or discontinued to any premises where apparatus or appliances are in use which cause excessive water hammer or otherwise might endanger or disturb service to other customers.

460. FRAUD OR ABUSE. Service may be discontinued, if necessary, to protect the District against fraud or abuse, e.g., name changes to avoid payment of bills.

461. PROHIBITED ACTS. Any person who, with intent obtains water services from Bella Vista Water District without paying the full lawful charge therefor, or with intent to enable another person to do so, or with intent to deprive Bella Vista Water District of any part of the full lawful charges for water services, provides, commits, authorizes, or solicits any of the following shall be liable to Bella Vista Water District for the penalties set forth in Section 463:

(1) Diverts or causes water to be diverted by any means whatsoever.

(2) Prevents any water meter, or other device used in determining the charge for water services, from accurately performing its measuring function by tampering or by any other means.

(3) Tampers with any property or equipment owned by or used by Bella Vista Water District to provide services.

(4) Makes or causes to be made any connection with or reconnection with property or equipment owned or used by Bella Vista Water District to provide water services without the authorization or consent of the District.

(5) Uses or receives the direct benefit of all or a portion of water services with knowledge or reason to believe that the diversion, tampering, or unauthorized connection existed at the time of that use, or that the use or receipt was otherwise without the authorization or consent of the District.

462. DETERMINATION OF VIOLATION. The Board of Directors of the District, after notice and opportunity to be heard, shall determine whether there has been a violation of the prohibitions of section 461. In that determination, if there are any of the following objects, circumstances, or conditions on premises controlled by the customer or by the person using or receiving the direct benefit of all or a portion of water services obtained in violation of this section, then the District may presume that the customer or person intended to, and did violate this section:

(1) Any instrument, apparatus, or device primarily designed to be used to obtain water services without paying the full lawful charge there for;

(2) Any water meter that has been altered, tampered with, or bypassed so as to cause no measurement or inaccurate measurement of water delivered; or.

(3) The cutting or removal of a seal on any meter or other water measuring device.

463. PENALTIES. In the event any person is found liable to the District for the violations set forth above in Section 461, each and every person involved in such violation shall be liable to Bella Vista Water District as follows:

(1) Fines for violations are payable upon demand thereby to the party so assessed, and shall be payable in the following amounts:

(i) First violation: cost of unauthorized water taken, plus a fine of up to $250.00;

(ii) Second violation: cost of unauthorized water taken, plus a find of up to $500.00;

(iii) Third and subsequent violations: cost of unauthorized water taken, plus a fine of up to $1,000.00 for each violation.

(2) In the event that a person violates the above-cited restrictions, and as a part of such violation tampers with a fire hydrant, due to the potential for increasing danger to life and property, such fire hydrant tampering will result in immediate assessment of a fine of up to $1,000.00 per incidence, plus, in the District's discretion, criminal charges may be pressed with appropriate authorities pursuant to the provisions of California Penal Code.

(3) Any repairs which are required to restore damaged facilities, shall be paid by either the customer to whom such facilities currently serve water, or by any new or different customer requesting water service through damaged facilities.

(4) The foregoing penalties shall be in addition to any such other penalty as is provided by law, including, but not limited to California Penal Code Section 498, and any other criminal violations that may result from the unlawful taking of District water supplies.

464. BILL STUFFERS. Upon request, the District will include written information to be inserted in the District's bills at no cost to the District. Such use will be limited to government agencies, non-profit corporations, and volunteer groups that have a relationship to water distribution and use. The information shall be of public interest and non-controversial, non-political, and for the benefit of residents of the District.

Prior to including any non-District information in the District's bills, the proponents shall provide the District with a sample copy which will be reviewed and approved by the Board of Directors. The following material shall be prohibited: material advocating passage or defeat of a measure appearing on any election ballot; advocating promotion or defeat of any candidate for nomination or election to public office; promoting or attempting to defeat the appointment of any person to any administrative or executive position in federal, state, or local government; promoting or advocating the defeat of any proposed change in federal, state, or local legislation or regulations; and/or anything that would constitute advertising for a "for profit" enterprise.

The information shall be provided to the District complete, including furnishing paper, printing, and folding so it can be added to the District's standard billing envelope without further manipulation by the District.

ARTICLE V. WATER SERVICE, AGRICULTURAL

500. AGRICULTURAL SERVICE. All agricultural service shall be with a meter size one-inch (1") and larger and shall meet all Bureau of Reclamation requirements for agricultural "Irrigation Water" service. See Definitions. All new applications must be for contiguous, cultivated and irrigated land of at least 2-acres.

501. DETERMINATION. The Manager shall review all applications for agricultural water. Eligible lands must comply with Federal Reclamation law, prior to receiving agricultural water in the form prescribed by the Bureau as provided in the Bureau contract.

502. AGRICULTURAL SERVICE ON UNIMPROVED LAND. Request for agricultural water service on unimproved qualified lands shall be granted at such time as irrigation demands for the commercial production of agricultural crops or livestock is necessitated. Prior to necessary improvements being established to warrant Federal agricultural water applications, such lands shall be eligible only for residential, commercial or rural water rates.

506. WATER MANAGEMENT PLAN. Agricultural customers shall be required to implement an irrigation water management plan. Plans shall state irrigation cycles and crop needs and shall be submitted with the application for agricultural water service.

507. WATER USERS CENSUS REPORT. Agricultural services shall be required to annually submit a Water Users Census Report. Failure to submit report by December 1 of each year may result in loss of the agricultural water rate. In addition, before receiving water at agricultural rates and thereafter annually with the Water Users Census Report the customer shall certify, on a form provided by the District, compliance with the criteria for receiving agricultural “Irrigation” water service.

530. FLOW REGULATION. The District reserves the right to limit pipe and meter sizes and if necessary, stagger the water hours and days or to limit the maximum flow so as to provide equal usage opportunities for all users on the same transmission line.

531. The District may restrict the flow through the meter to the recommended maximum rate for continuous in accordance with the applicable AWWA Standards. See Appendix D for the “AWWA Recommended Maximum Rate for Continuous Operations."

Appropriately sized meters are necessary to preserve the integrity of the metering equipment, ensure accurate water measurement and to reduce maintenance on the equipment.

545. DOMESTIC WATER. Domestic water incidental to production of agricultural crops or livestock, shall be included with the agricultural water.

ARTICLE VI. WATERLINE EXTENSIONS

600. DISTRICT TO COOPERATE. It shall be the policy of the District to cooperate with individuals or groups in the orderly development of waterline extensions.

601. DISTRICT CAN PROMOTE EXTENSIONS. Nothing herein shall prevent the District from initiating or promoting action on waterline extensions.

602. INDIVIDUALS OR GROUPS SHALL FURNISH MAPS AND INFORMATION. Proponents of an extension shall contact the District and provide maps showing the names and addresses of the benefited landowners identified by their respective parcels and such other information as the District may require. The District shall investigate the feasibility of including other contiguous lands within the proposal making certain that every landowner has an equal opportunity for participation.

603. DISTRICT TO PREPARE A ROUGH ESTIMATE. Upon the request of the proponent(s) the District shall prepare an estimate of the installation cost of the proposed extension and deliver this estimate to each of the effected landowners or designated representative.

604. PROPONENTS DECIDE TO INSTALL THE EXTENSION. After consideration of the estimate provided by the District, if the affected landowners determine to install the extension, the proponents shall retain a licensed civil engineer to prepare improvement plans for District review and approval. For line extensions where less than 100 feet of water main is to be installed, the developer may submit a sketch of the proposed construction in lieu of improvement plans to District standards. Following approval of the plans by the District, the proponent(s) shall have a licensed contractor provide a cost estimate of the project.

Design and construction of improvements shall be in conformance with adopted District's Design Standards, the District's Standard Specifications for the Construction of

Water System Improvements and the District's Standard Details in effect at the time of submission.

605. FINAL ESTIMATE. On notification that the proponents have elected to install the extension, the District shall review the final cost estimate. The District shall prepare a cost proposal for the distribution of all costs on a pro-rated basis for each landowner who will be benefited by the water service.

606. NOTICE OF HEARING. The final estimate and the cost distribution proposal shall be presented to the affected landowners at least fifteen (15) days before the Board meeting at which the matter will be considered.

607. HEARING. The District manager or engineer shall present to the Board the proponents' request for the installation of the waterline extension together with the cost estimates and other pertinent information. Effected landowners will be given an opportunity to address all or any part of the presentation before the Board. The Board, after consideration of such application and report, may reject, amend and/or approve the installation of the extension.

608. APPROVAL. Upon approval of the proposed extension by the Board, the project may commence, and upon completion of the facilities and acceptance by the Board, all such facilities constructed shall become the property of the District.

609. PAY ALL COSTS. Applicants for extensions must agree to construct each extension at their cost.

610. SERVICE CONNECTIONS. Service connection facilities shall be installed as part of the waterline extension. Service shall be installed in accordance with the District's standard drawings, Section 403 of the District's Policy, and shall consist of a service saddle and corporation stop, service pipe, angle meter stop, and a meter box.

611. EASEMENTS AND RIGHT-OF-WAYS. Prior to the start of construction of an extension, landowners must first grant, without cost to the District, all necessary easements and rights-of-way for present and future extensions.

612. MINIMUM PIPE SIZE. The minimum pipe size required for extensions is such size as called for by the District's Master Plan(s), or the larger of the following:

a. Six (6) inches in diameter, or
b. As determined necessary by the District to meet City or County fire flow requirements.

613. Not Used

614. COMPUTATION OF REBATES. Where one or more persons pay the installation costs of an extension, later applicants for water service directly from such extension (i.e., by tapping directly into the extension) shall pay to the original installers their prorata share of the extension cost plus interest. To be eligible for rebates the installers shall enter into a rebate agreement with the District, which shall include the terms and conditions under which the rebates are paid, the properties to be served, the names of the applicants (installers), cost, etc. A sample rebate agreement is shown in Appendix C.

615. REGISTER OF ORIGINAL INSTALLERS. The District shall maintain a register of each original installer for each extension. The register shall include the name and address of each original installer and it shall be the responsibility of each original installer to notify the District of any subsequent change of address.

616. PAYMENT OF REBATES BY THE DISTRICT. Upon receipt of funds the District shall notify the original installers in writing at the address listed on the register, which the District is holding for them, their prorata share setting forth the exact amount. Within 45 days after giving such notice, the District shall pay to those who respond to the

notice their respective prorata share. The District shall retain the share of those original installers who do not respond to the notice with 45 days. After which time the non-responding original installers' rights thereto are forfeited.

617. ASSIGNMENT OF EXTENSION REBATES. Any rebate anticipated may be assigned by any original installer. To be binding on the District, such assignment must be in writing, and must describe the extension to which it applies, and must be delivered to the District. The register shall be amended accordingly.

618. TIME LIMIT - EXTENSION OF REFUNDS. After the expiration of ten (10) years from the date of installation of any extension or when all the properties that can receive service from the extension are developed (which ever occurs first), the General Manager is authorized to declare the rebate account closed upon complying with the following condition:

Written notice of the District's intent to close a given extension account shall be provided to each original installer listed in the register of such extension. Such notice shall inform the original installer that unless a written appeal is taken to the Board setting forth the reasons for extending the refund period, the time of taking such an appeal shall be as set forth in the notice and shall be not less than thirty (30) days from the mailing of the notice.

619. NON-RESPONSIBILITY. The District is not obligated to:

a. Assure that the landowners making such lateral extensions receive full payment of costs therefor,
b. Initiate any action,
c. Incur any expense to collect any sum to be paid such landowners, nor
d. Provide any refund from revenue derived from water service.

620. DISTRICT CONTRACT INSTALLATIONS. For such sum as may be agreed upon the District may contract, as provided by law, to install distribution lines.

621. ASSESSMENT DISTRICTS. Assessment districts can be formed to pay for waterline extensions. Before action is taken to form such a district, interested persons shall contact the General Manager. The General Manager can preliminarily advise interested parties as to the general feasibility of the proposed assessment district and extension and what further action must be taken.

622. ADDITIONAL EXTENSIONS. The District may, at any time, add additional waterline extensions to any existing extension(s) without securing permission from the original installers who paid the original installation costs of the extension(s).

623. FRONT FOOTAGE FEE.

A. If a service connection is made directly into a main which has been previously constructed at District expense or which has not been constructed and financed through an assessment district or through any other means in which the applicant has a vested interest, or is not the subject of a line rebate agreement, there shall be paid by the applicant a front footage fee, calculated as set forth below.

B. The charge shall be computed on the front footage of the lot or logical divisible portion thereof to be connected, but no case less than sixty feet, multiplied by the front footage fee as established by the Board. The fee for corner lots shall be computed on the basis of the width of the lot parallel to the water main or where more than one side of the lot fronts water mains the width will be based on the average of the front and side lot widths. Flag lots, whether by easement or deeded access, shall be computed on the basis of the projected width of the lot parallel to the water main, irrespective of the portion used for access.

C. Where the front footage of the property exceeds 330 feet, the property owner will have the option of paying the total charge upon connection or paying an amount equal to 330 feet times the front footage rate and entering into an agreement with the District requiring payment for the balance of the front footage at such time as the property is subdivided.

D. Charges shall be due and payable prior to service being provided, unless the District has installed a new water main adjacent to a developed parcel with an existing private water well.

E. Where the District has installed a main adjacent to a developed parcel with an existing private water well, the property owner will have the option of paying the charges on connection or entering into an agreement with the District to amortize the charge over ten (10) years. The agreement shall be recorded as a lien against the property. The fees will be billed with the regular (bimonthly) water bill with the charges at 5 percent per year over 10 years. The balance may be paid at any time without a penalty and shall be due upon sale or further encumbrance of the property.

F. The front footage fee shall be as shown in Appendix A.

624. LICENSED CONTRACTORS. Only licensed, bondable general engineering (class "A") or underground contractors (class "C-34") in good standing will be permitted to perform construction of or alternations to water conveyance systems connected to the Bella Vista Water District system. Such licensed contractors shall be required to execute a written contract with the Bella Vista Water District setting forth the specifications and manner in which the work is to be performed.

625. LAWS GOVERNING. Contractors installing or modifying water conveyance facilities within Bella Vista Water District shall be required to comply with all applicable local, state and federal laws, including, but not limited to, the California Labor Code, and the California Public Contracts Code, where applicable.

626. INSURANCE. Prior to commencement of any work of improvement, the contractor shall provide Bella Vista Water District with proof of insurance and bonding, as required by the District General Manager, for the work to be performed, such proof naming Bella Vista Water District as an additional insured or loss payee. Insurance shall provide for a minimum aggregate coverage (as shown in Appendix A) for property damage and personal injury.

627. SUBSTANDARD FACILITIES. If any work of improvement constructed within the Bella Vista Water District fails to comply with the District specifications, or the contractor or entity performing such work fails to comply with the requirements set forth herein, Bella Vista Water District may, at its sole option, refuse to accept such facilities into the District until the facilities meet the required specifications, or the contractor complies with the above requirements.

ARTICLE VII. LAND DIVISIONS

700. APPLICATION. Any developer(s) desiring to construct water system improvements to provide water service to a tract of land which they propose to subdivide shall make application to the District by submittal of a tentative map or plan for District approval.

701. CONTENTS OF APPLICATION. The application shall state the name and number of the tract and its location. The application shall be accompanied by three (3) copies of the tentative subdivision map. All plans and specifications submitted to the District shall be signed by a Registered Engineer.

702. INVESTIGATION. Upon receiving the application, the District Staff shall make an investigation of the proposed subdivision and shall report the findings to the Board.

703. "WILL SERVE" LETTER. Upon written request by the applicant, the District will consider issuance of a "will serve" letter for properties within the District. The letter will be issued upon Board approval only when it can be demonstrated that the District reasonably expects to have sufficient water supplies available to serve the property without restriction over an extended period of at least 9 out of 10 years (90th percentile).

704. IMPROVEMENT PLANS. The location of proposed lines and services shall be as shown on the improvement plans prepared in accordance with the District's Design Standards and approved by the District. The actual construction will be done at the expense of and by the subdivider and inspected by the District. All water main construction in new land divisions shall extend to the limits of the property and shall include all looping and other supplementary lines that are necessary in order to insure that future contiguous land divisions and/or developments can connect directly onto such water mains, thus providing for the orderly development of the system.

705. SUBDIVISION AND IMPROVEMENT PLAN APPROVAL PROCESS FOR PROJECTS REQUIRING CONSTRUCTION OF WATER SYSTEM IMPROVEMENTS.

1. Subdivider(s) shall submit the following: (a) three (3) copies of the tentative map, (b) three (3) copies of improvement plans showing all utilities as proposed within the subdivision, (c) reconstruction necessary to the existing system to insure the most economical long-term operation of District facilities in the tributary area, (d) any other information as necessary to fully describe the project, and (e) a non-refundable plan check fee as shown in Appendix A.

2. Upon the recommendation of District Engineer, the subdivision map shall be presented to the General Manager for approval.

3. The General Manager may refer projects that will impose significant impacts to the District Board of Directors for approval. The Board reserves the right to make changes to the proposed water improvements as deemed necessary.

4. The improvement plans will be signed and dated for approval only after all the requested deficiencies or changes have been made to the plans.

706. PLAN CHECK FEES. Plan check fees will be charged to offset the cost incurred to review improvement plans either by District Staff or by a consulting engineer engaged by the District. A base fee and a per lot fee, as shown in Appendix A, shall be paid by developer with submittal of the plans.

707. CONSTRUCTION PERMIT. No construction shall begin until a construction permit is issued by the District. The permit shall be obtained by submitting three (3) sets of signed and dated improvement plans along with an engineer's estimate of the total cost of the water system improvements and deposit of an amount equal to the greater of $500 or one percent (1%) of the engineer's estimate of the total cost of

the water system improvements, to cover the cost for inspection fees (refer to section 709).

For subdivisions where less than 100 feet of water main is to be installed, the developer may submit a sketch of the proposed construction in lieu of improvement plans to District standards.

A copy of the permit is to be kept at the jobsite at all times work is being performed. The contractor shall notify the District at least 24 hours before commencing work.

708. Not Used.

709. CONSTRUCTION INSPECTION. During construction the District Engineer or representative will make periodic inspections of the work in progress to assure that the materials and workmanship conform to District standards. The engineer and any authorized representatives shall at all times have access to the work. Inspection of the work shall not relieve the contractor of the obligation to fulfill all conditions of the contract.

Such inspections are made for the benefit of the District only. The District does not undertake any responsibility or duty to the developer or property owners to select, review, inspect, supervise, pass judgment upon or inform such parties of the quality, adequacy or suitability of: (a) the Plans and Specifications; (b) the architects, contractor, subcontractors and material men employed or utilized in the construction; or (c) the progress or course of construction and its conformance or nonconformance with the Plans and Specifications or amendments, alterations and changes thereto. The District owes no duty of care to protect the developer or owner, or any other person against negligent, faulty, inadequate or defective work or construction.

710. INSPECTION FEES. Inspection fees will be billed at the hourly rates shown on Appendix A. The inspection time shall begin upon departure from the Bella Vista Water District office and the termination of time shall be upon the return to the Bella Vista Water District office. Inspection time will be logged for each development and billed after completion of the waterline project or as construction is progressing.

711. CONSTRUCTION APPROVAL PROCESS. After completion of the required construction, but prior to final acceptance by the Board, the following shall be submitted to the District:

(a) "as built" plans,
(b) summary of pipe footage by diameter size,
(c) cost of waterline installation (copy of construction bid is acceptable),
(d) copies of recorded waterline easements, and
(e) all inspection fees .

Note: no meters will be sold to parcels or lots within a subdivision or planned development until all the above requirements are satisfied.

712. COST AND EXPENSES. All costs and expenses incurred by the District under this Section, including the cost of investigation, inspection, legal and engineering services, shall be paid to the District prior to acceptance of the facilities by the District.

713. WARRANTY OF WORK. A one (1) year contractor's warranty period covering pipeline construction and water service facilities shall begin on the date of final acceptance by the Board of Directors or on the date the facilities are put to actual use by the District, whichever occurs first. Contractor will be notified of any deficiencies which occur during warranty period and will be required to promptly make all necessary corrections. If contractor does not correct the deficiency within 14 days, or if the deficiency is an emergency, District will cause the deficiency to be corrected and

contractor will be required to reimburse District for all District costs, including labor and materials.

714. PROPERTY OF DISTRICT. All water facilities installed shall be conveyed to the District and remain the property of the District. The facilities shall become the property of the District when the final inspection is performed on the subdivision or phase of subdivision construction, submittal of all information and fees required above, and/or acceptance by the Board of Directors.

715. SERVICE CONNECTIONS. The subdivider shall, at its own cost, provide and install the service connections, pipelines, curb stops, service lines, meter yokes, or line setters and meter boxes, as may be required by the District.

716. HOLD HARMLESS AGREEMENT. Any person applying to the District for the installation of a water system pursuant to this Section shall agree to hold the District harmless from any defect(s) in the installation of the system so installed and from any damage(s) resulting there from.

717. PIPE SIZING. Minimum pipe size shall be not less than six (6) inch diameter. The pipeline extensions are to be of sufficient size to serve present and future needs. The necessity of requiring a system loop shall be determined by the District. The District may require installation of larger size mains as necessary to provide required fire flows or to minimize pressure losses through the system.

ARTICLE VIII. ANNEXATIONS

800. POLICY. All annexations to the Bella Vista Water District shall be governed by the rules and regulations in this Policy, as amended from time to time.

801. DEFINITIONS. For the purposes of this policy the following definitions shall apply:

"Area" - means the total (gross) area of the territory proposed for annexation less the area that is unsuitable for development such as steep slopes, creeks, etc. as determined by the District.

"New sources of additional water" - means sources of water not presently available to the District (e.g., groundwater sources that will not interfere or compete with existing or planned District wells within the existing District boundaries, or new surface water supplies that would not otherwise be available to the District). Such new sources of water shall meet all required quality standards for municipal water supplies and shall be provided at no initial cost to the District and shall be available at a cost per unit (i.e., acre feet) that is reasonable in relation to existing sources of water to the District. The additional source should be available long term with first right of renewal and have shortage (drought) provisions at least as good as our existing supplies, i.e. the District's Bureau Contract.

802. CONTIGUOUS PROPERTY. Unless otherwise authorized by the Board, each annexing territory must be contiguous to the District and shall not result in the creation of islands, corridors, or peninsulas of District or non-District territory or cause or further distort existing District boundaries.

803. Not Used.

804. PRIOR AND FUTURE OBLIGATIONS. All land annexed to the District shall be subject to the repayment contract in effect between the United States Government and the District, and any other present or future obligations or indebtedness of the District following annexation.

805. RULES FOR ANNEXATIONS. The following rules shall apply to all annexations: a) All annexations are subject to the approval of the Bureau of Reclamation, and the Shasta County Local Agency Formation Commission, and shall conform to all Ordinances, Regulations, Resolutions, and Standards required by the District. b) Approval of annexation is conditioned upon the District having sufficient water at the time of annexation to supply water to all parcels of real property within the territory proposed for annexation. c) If the Board of Directors determines that the District does not have sufficient water to supply the new parcels, annexation will be considered only if the territory provides new sources of additional water to meet 110% of the average annual demand and 100% of the maximum daily demand of the annexed parcels (as determined under Section 806).

In lieu of providing new sources of additional water as specified in © above, a proponent may, upon approval by the Board, provide the water required for a single 3/4" meter and agree to be limited to a 3/4" meter for each parcel.

The proponent will be required to execute a recordable agreement with the District which provides that should the proponent or a subsequent owner of the property desire to increase water use to the parcel either by increasing the meter size or adding meters, the proponent will be required to provide sufficient water for the remainder of the parcel that would have been required had the parcel not been limited to a 3/4-inch water meter. No partial amount of water will be accepted and reducing the size of the parcel via a lot line adjustment will not reduce the amount of water required.

If the Board determines that an individual parcel should be included in a larger area to be annexed, the Board may deny the annexation if such parcel's owner declines to be included in the annexation.

806. ADDITIONAL WATER SUPPLIES. The amount of additional new water supplies to be provided under Section 805 shall be determined as follows:

Maximum daily demand:

$Q = A \times R \times 2.5 \times C_F$

Where:

Q = Quantity of water, in gallons per minute

A = Area of territory proposed for annexation, acres

R = Average annual demand, in feet per year for rural and residential usage = 2.0 ft/year

2.5 = Ratio of maximum daily demand to average daily demand

C_F = Conversion factor from ac ft/year to GPM
= 0.620

Therefore Q = 3.10 gpm/acre

Average annual demand:

Shall be based on 4.0 acre feet per acre for irrigated land or 0.75 acre feet per 3/4 - inch domestic service with includes 0.12 acres for irrigation.

For wells, the capacity would be based on the results of a 24-hour pump test with drawdown based on continuous pumping for 180 days.

807. IMPROVEMENTS REQUIRED. As a condition of annexation and at the request of the District, proponent(s) shall provide such pipe lines, water treatment facilities, booster pumps, storage tanks, regulating valves, supplemental water (with

capacities as directed by the District), connecting lines, in-tract improvements, area maps (showing the names and addresses of the property owners within said area to be annexed) and such other incidental information, facilities and requirements as the District may direct. All water supply improvements shall be designed and constructed in accordance with District standards. Design shall be submitted for District review prior to construction. Construction will be subject to inspection by District. Prior to final acceptance, "as-builts" for all facilities shall be provided to the District.

808. RIGHTS-OF-WAY REQUIRED. All owners of real property in each annexing territory shall grant and convey, without cost to the District, any rights-of-way requested by the District for the purposes of installing water pipes, storage tanks, booster pumps, and other facilities required for the distribution of water within the annexed territories and other places in the District, and for the maintenance thereof.

809. COSTS. All costs of annexation, including all legal, advertising, environmental review, engineering and all other incidental expenses shall be paid by the proponent(s). All costs and expenses of providing a complete water system, satisfactory to the District, shall be the responsibility of the proponent(s) of such annexation.

810. ANNEXATION FEES. The base fee per acre of property being annexed shall be equal to the value of the District's "capital assets, net" (fixed assets less accumulated depreciation) from the District's latest audited financial statements divided by the total acreage of the District (34,090 acres as of November 2004).

811. SPECIAL FUND. Annexation fees collected per section 810 shall be placed in the Capital Improvement Fund, the uses of which shall be directed toward:

a. Additional water supplies,
b. Water treatment improvements,
c. Water storage and transmission improvements, and

d. Improvements to District physical plant,

as described in the current Master Water Plan and Capital Improvement Budget or as determined by the Board of Directors.

812. ANNEXATION CREDITS. For annexations providing water supplies in excess of the amount required under Section 806, a credit will be allowed against the above annexation fees and/or Capital Improvement fees for the parcels.

The amount of credit for parcels bringing additional water supplies will be based on the following formula:

$$\text{Credit} = \text{Cost of Water Supplies} \times \frac{\text{Quantity of Surplus Water}}{\text{Total Water Supplies}}$$

where:

Cost of Water Supplies = the reasonable cost of development of the total water supplies (e.g., for well supplies the actual costs for land acquisition, well drilling, well pumping and water treatment facilities),

Surplus Water Supplies = the quantity of water available above and beyond the amount required under Section 806.

Total Water Supplies = the total long-term capacity (firm yield) of the water supply as determined by a qualified engineer or hydro geologist and approved by the District Engineer.

813. ANNEXATION PROCEDURE. All proposed annexations shall be subject to the approval of the Board. Proponents shall file an application for annexation with the District. The application shall include the following information:

a. Map showing the area of the proposed annexation.

b. The owner(s) of the land within the area of the proposed annexation.

c. If applicable, a description of the proposed source(s) of "new" water, including: (a) the location(s) of the source(s); (b) the quantity to be provided from each source; and (c) the point of delivery to the District's water system.

d. Prior to consideration of any annexation, the proponent(s) shall present a petition signed by at least sixty five (65) percent of the fee owners of land area of the territory requesting annexation.

e. Following review by District Staff, the proposed annexation will be presented to the Board for acceptance. If the application is accepted by the Board, an annexation agreement shall be prepared setting forth the obligations of the proponent(s) of the annexation and the District.

f. Following approval of the annexation agreement by the Board and execution of the annexation agreement, the proposal shall be presented to the Bureau of Reclamation, and the Shasta County Local Agency Formation Commission for approval.

g. Only after the proposed annexation is approved by both LAFCO and the Bureau of Reclamation shall the annexation be presented to the Board for final approval.

814. WATER DELIVERY. No water shall be delivered to an individual property within the annexed territory until such property owner has paid all fees due and has constructed all required water system improvements.

ARTICLE IX. DETACHMENT POLICY

900. GENERAL CONSIDERATIONS. It is the policy of the Bella Vista Water District to oppose detachments that would result in the creation of islands, corridors, or peninsulas of District or non-District territory or otherwise would cause or further the distortion of existing District boundaries.

901. SERVICE CATEGORIES. It is anticipated that parcels within the District requesting detachment will generally fall into one of the three categories listed below. District recommendations to either support or oppose detachment of existing parcels will generally be based of the following service categories:

Category 1 - The parcels currently receive full water service from the District (i.e., water produced from District sources, delivered through water mains owned by the District, through District meters, and billed by the District).

Category 2 - The parcels do not currently receive water service from the District but receive water service through temporary water services or water service agreements with another public water system.

Category 3 - The parcels currently do not receive water service from the District or any other public water system.

The following guidelines for each of the above categories will be used in the consideration of whether to oppose, support, or take no position on specific detachment requests:

Category 1 - Detachment of parcels currently receiving full water service from the District may negatively impact the District's ability to continue to maintain acceptable water service levels to customers that will remain in the District (due to a reduction in conveyance capacity and/or looping of water lines).

Detachment of these parcels may also have an adverse financial impact on the District resulting in an increased burden on the remaining District customers to discharge District bond and contract indebtedness.

For the above reasons the District will normally oppose all Category 1 detachment requests.

Category 2 and 3 - While detachment of parcels that currently do not receive full water service from the District will not impact the present water service level to other District customers, detachment may negatively impact the District's future ability to provide acceptable or improved water service levels to customers that will remain in the District (due to a reduction in planned conveyance capacity and/or looping of water lines).

Detachment of these parcels may also have an adverse financial impact on the District resulting in an increased burden on the remaining District customers to discharge District bond and contract indebtedness.

Depending on the potential impact on the District's future ability to maintain or improve the level of service provided to the remaining District customers, the District will determine whether to support, oppose, or take no position on Category 2 and 3 detachment requests on a case-by-case basis.

902. NON-CONTIGUOUS AREAS. Detachment of a parcel or multiple parcels that are not immediately adjacent to the existing District boundary will be opposed, inasmuch as, the detachment would result in the creation of islands, corridors or peninsulas of District or non-District territory or otherwise cause or further the distortion of existing boundaries.

903. WATER DELIVERY - CURRENT. Where a detachment will significantly impact the District's present ability to deliver water to one or more parcels that will

remain within the District (by the removal of either existing main lines or a reduction in the present looping of water lines) the District will not relinquish ownership of the existing water mains unless the water delivery capacity is maintained by the construction of a parallel main or additional looping of water lines. The construction of the new water main(s) shall be the responsibility of the parcel(s) being detached.

904. WATER DELIVERY - FUTURE. Where a detachment will significantly impact the District's future ability to deliver water to one or more parcels that will remain within the District by the elimination of planned main lines or planned looping of water lines (e.g., those shown in the current Water System Master Plan) either the owner(s) of the parcel(s) being detached may construct water mains of sufficient size to replace the lines being eliminated, or the District may increase the period of time over which continued special assessment fees will be payable to the District under Section 911 (below), as required to finance construction of such line(s).

905. MAJOR FACILITIES. Detachment of areas that include any major District facilities (i.e., wells, pump stations, control structures) either existing or shown in the current Water System Master Plan will be opposed.

906. COST OF FACILITIES. Where the District has constructed facilities (e.g., pump stations, storage reservoirs, and/or major pipelines) sized to serve the parcels being detached the District may require reimbursement for a proportionate share of the cost of such facilities or increase the period of time over which continued special assessment fees will be payable to the District under Section 911(b).

907. CONTINUED PAYMENTS. Where the detachment of a parcel or multiple parcels will require a significant increase in user rates for the remaining District customers, the District may increase (by up to 10 additional years) the period of time over which continued special assessment fees will be payable to the District under Section 911(b) to compensate for the loss in user fees.

908. INDIVIDUAL LOTS. Detachment of individual lots within a subdivision will be opposed. In order for the District to take a position other than opposition, the request for detachment within a subdivision must at a minimum include all lots within a single phase of a subdivision (i.e., all lots created under a separate tentative map).

909. LESS THAN 40 ACRES. The District will oppose all requests for detachment of parcels outside of subdivisions where the total area of the parcels is less than 40 acres.

910. PETITION. Detachment of a group of lots or parcels will not be considered without the submittal of a petition signed by the legal property owners representing a minimum of 75% of the lots on 75% of the total land area requesting detachment.

911. FEES. As a condition of detachment the owner(s) of parcel(s) requesting detachment will be required to pay the District the greater of the following amounts:

a) An amount equal to their proportionate share of the principal on all outstanding loans, special assessments and other debt (including, but not limited to, notes payable to the Department of the Interior and Rural Development, and any deficit accounts with the Bureau of Reclamation) for water system improvements that are either secured by a lien on the property or whose debt service is being paid in part by user fees, standby fees, or assessments on the property, or

b) An amount equal to the present value of the Bella Vista Water District's special assessment fees for a minimum period of 10 years or continued payment of the special assessment fees for a period of 10 years. The number of years over which the present value of the special assessment is calculated or the number of years over which continued payment of the

special assessment fees will be required may be increased by the Board as required per Sections 904, 906, and 907.

Calculation of the present value of the special assessment fees will be based on the following:

(1) The assessed value of the property(ies) at the time of detachment.

(2) The average District special assessment rate for the last 5 years.

(3) The average District-wide increase in assessed values for the last 5 years.

(4) A discount rate equal to the average interest rate earned by the District on its investments for the previous 12 months.

912. LAFCO FEES. The proponent will be responsible for the payment of all LAFCO filing and processing fees for consideration and approval of a detachment.

913. DOCUMENTATION. The proponent shall be responsible for the preparation of all documentation (e.g., maps, legal descriptions and CEQA compliance documentation) received by LAFCO and/or other federal, state and local agencies whose approval of the detachment is required.

914. DEVELOPER CONSTRUCTED IMPROVEMENTS. All developer constructed or financed improvements required by the District as a condition of tentative map approval, approval of improvement plans, or pursuant to a development agreement for the subdivision shall remain the property of the District. This includes funds deposited by the developer for facilities required to serve the subdivision project but not yet spent.

915. CREDITS. A credit of up to a maximum of 80% of the actual capital improvement fees, if any, paid to the District by individual property owners for the properties included in the detachment may be made by the District against the above amounts due to the District under item 911 (above). However to account for the depreciation of District facilities, the amount of the credit shall be reduced by 3.33% (1/30) for each year of service to the area to be detached starting with the date the first service was installed.

916. REFUNDS. In no case will the District be required to refund any money to the owners of properties being detached.

917. WATER RIGHTS. In no case will the District transfer with the parcels proposed to be detached any portion of its water rights, water allotments, or groundwater supplies.

ARTICLE X. MITIGATION OF INTERFERENCE FROM THE PUMPING OF NEW DISTRICT WELLS ON EXISTING RESIDENTIAL WELLS

1000. SEPARATION OF AQUIFERS. During the construction of each new well the District will seal off the upper water bearing formations, where practical, from the new well in order to preclude competing with typically shallower private wells.

1001. PUMP TESTS. Each new District well will be pump tested by the District. A hydrologist's report will be prepared documenting the findings of the pump testing and will calculate the potential interference (drawdown of the static water level) versus the distance from the pumping well.

1002. NOTIFICATION. The findings of the report will be made available for inspection by any interested party. In addition, the District will notify, by mail, all persons owning property within a distance from the District's new well where the potential interference from long-term pumping of the well is anticipated to result in significant drawdown, or within 1,000 feet of the District's new well, whichever is greater. For the purpose of this policy, significant drawdown is defined as a drawdown equal to, or greater than, twenty (20) feet. Notification shall include a copy of this Article and a summary of the findings of the hydrologist's report.

1003. REQUIRED INFORMATION. Owners of properties within the District's service area who have reason to believe that their wells may be significantly affected by pumping of District well(s) shall contact the District and provide the following:

a) Assessor's parcel number of the property on which the well is located,

b) Name, address, and phone number of the property owner,

c) Location of the well on the property,

d) Copy of well drillers log (if available) or the following information:

1) Date the well was drilled,

2) Name of the well drilling company,

3) Size of the well,

4) Depth of the well,

5) Estimated capacity of the well/well pump (typically in gallons per minute or hour),

6) Depth to water, and

7) Pump setting (distance from the top of the well casing).

1004. INSPECTIONS. Upon the request of the property owner the District will conduct an on-site inspection of the well to provide assistance to the property owner in the collection of the above requested information and to perform periodic measurement of ground water levels.

1005. CONNECTION OPTIONS.

A. If the property owner's well is (1) within the area of significant interference (as defined under this policy) and upon District review of the above information it can reasonably be determined that operation of the District well(s) will cause the property owner's well to run dry, or (2) within 500 feet of the District's well, the property owner will be given the option to connect to the District's water system provided that the District has a water line adjacent to the property. The District will waive the front footage fees and the capital improvement fee for a meter of equivalent size (capacity) to the property owner's existing well production. The property owner will remain responsible for payment of service installation fees and meter set charges, and fees for excess meter size required, if applicable.

B. If the distance from the District's well to the property owner's well is greater than 500 feet but less than 1000 feet, the property owner will be given the option to connect to the District's water system at reduced fees, provided that the District has a water line adjacent to the property. The District will waive the front footage fees and fifty percent (50%) of the Capital Improvement Fee for a meter with a capacity equal to or less

than that of the property owner's existing well production. The property owner will remain responsible for payment of service installation fees and meter set charges, if applicable.

1006. TIME LIMIT. The property owner must exercise the option to connect to the District system provided under this policy within five (5) years of commencement of operation of the new District pumping facilities or the option will expire.

1007. BACKFLOW PREVENTION. If the property owner connects to the District water system pursuant to this Section, the property owner shall either abandon the existing well (the cost of which will be borne by the District) or install an approved backflow prevention device (at the owner's expense).

1008. WATER CHARGES. Once connected to the BVWD water system the property owner will be responsible for all water charges incurred as a result of their use at the District's applicable rates.

1009. MONITORING. If the property owner does not qualify for a connection fee credit under Section 1005 above, and it cannot reasonably be determined that the operation of the District well(s) will cause the property owner's well to run dry, then the District will, upon the property owner's written request, periodically monitor the water level of the property owner's well to measure changes in the static water level. If within a period of 5 years it is determined that operation of the District well(s) has caused significant drawdown of the static water level at the property owner's well the owner will be given the option to immediately connect up to the District's water system as provided under Section 1005 (above).

1010. PARTIAL CREDIT. If the property owner does not qualify for the connection fee credit above and it cannot reasonably be determined that the operation of the District well(s) are causing the owner's well to run dry (per Section 1005, above) or be significantly impacted (per Section 1009, above), but it can be determined that operation of the District well(s) will cause drawdown of the ground water level at the owner's well of greater than 10 feet a partial credit toward the connection fee will be allowed according to the following schedule:

Drawdown	Credit
10 to 14.99 feet	40%

15 to 19.99 feet 80%

1011. ELIGIBILITY. Only property owners having operating water wells drilled prior to the completion of drilling of the District's well will be eligible for the credits set forth in this Policy.

1012. DRY WELLS. If a property owner's well runs dry following connection of the property to the District's water system no additional fee credits will be allowed to the property owner by the District.

1013. WELLS OUTSIDE OF DISTRICT. Owners of properties outside of the District service area boundaries will be given the same opportunity to connect to the District's water system as provided to District residents, however, such owners shall be required to agree to be annexed to the District and pay an annexation fee in accordance with the District's annexation policy, or if they are in the service area of another district or city, Bella Vista Water District will pay the proportionate cost, as provided in Sections 1005 or 1010 above, of that city or district's capital improvement fee.

1014. WATER MAIN EXTENSIONS. If there are no District mains adjacent to the owner's property and the owner desires water service from the District, the District (at its cost) will extend its mains to provide service to qualifying parcels within 500 feet of the District's well. The property owner(s) will be responsible for construction of any water main extensions required to serve properties more than 500 feet from the District's well.

ARTICLE XI. BACKFLOW PREVENTION

1100. PURPOSE. The purpose of this section is to protect the public water supply system from contamination due to potential/or actual cross-connections. This protection shall be provided by the establishment of a cross-connection control program as required by Federal and State regulations. This section is adopted pursuant to Public Law 99-339 (Safe Drinking Water Act Amendment of 1986) and Title 17, Sections 7583--7605, inclusive, of the California Code of Regulations, entitled "Regulations Relating to Cross-Connections." These regulations mandate that the District has the primary responsibility for water quality control.

1101. CROSS-CONNECTIONS. It is unlawful for any person, firm, or corporation to make or maintain temporarily or permanently, any cross-connection between plumbing pipes or water fixtures being served by the District, and any other source of water supply or other foreign substance. Bella Vista Water District hereby adopts the Manual of Cross Connection Control 9th Edition (1993) and subsequent revisions as produced by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research as providing development, implementation and enforcement standards for the Bella Vista Water District Cross Connection Control Program. In the case of conflict this Article shall prevail.

1102. CROSS-CONNECTION PROTECTION REQUIREMENTS.

A. General Provisions

1. Whenever backflow protection has been found necessary, the District will require the water user to install an approved testable backflow prevention assembly at the water user's expense. The type of assembly to be installed will be in accordance with the requirements of this Policy.

2. Wherever backflow protection has been found necessary on a water supply line entering a water users premises then all water supply lines from the District's mains entering such premises shall be protected by an approved backflow prevention assembly.

3. Wherever a backflow prevention assembly is installed, the District shall have unrestricted access to the device.

B. Where Protection is Required

1. Each service connection from the District water system for supplying water to premises having an auxiliary water supply shall be protected against backflow of water from such premises into the District's system unless the auxiliary water supply is accepted as an additional source by the District, and is approved by the public health agency having jurisdiction thereof.

2. Each service connection from the District water system for supplying water to any premises on which any substance other than potable water is handled in such fashion as may allow its entry into the water system shall be protected against backflow of the water from the premises into the public system. This shall include the handling of process waters and waters originating from the District water system which have been subjected to deterioration in sanitary quality.

3. Each service connection to any premises having intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, or where it cannot be determined where piping is located, making it impracticable or impossible to ascertain whether or not cross-connections exist shall be protected against backflow of water from such premises into the public system.

4. All commercial and public/institutional service connections, except the following: meeting halls with no kitchen, duplexes, triplexes, and apartment houses shall be protected against backflow of water from such premises into the public system.

C. Type of Protection Required

The type of protection provided shall be commensurate with the actual or potential degree of hazard on the consumer's premises. The type of protective assembly that may be required (listing in an increasing level of protection) includes: , Reduced Pressure Principle Backflow Prevention Assembly (RP), and an Air-gap separation (AG). The water user may choose a higher level of protection than required by the District. The minimum types of backflow protection required to protect the District's water supply, at the

user's water connection to premises with varying degrees of hazard are given in Table 1. Situations which are not covered in Table 1 shall be evaluated on a case by case basis and the appropriate backflow protection shall be determined by the District or health agency.

Internal property air-gap or other arrangements will not be allowed due to monitoring limitations. Material Safety Data Sheets may be used to provide the basis of individual backflow prevention justification requirements.

All premises protected with a backflow device shall have an approved pressure relief valve installed per Uniform Plumbing Code Section 1007c and a thermal expansion device installed on the customer's system to prevent potentially dangerous pressure buildup.

Table 1 - TYPE OF BACKFLOW PROTECTION REQUIRED

DEGREE OF HAZARD

(a)		**Sewage and Hazardous Substances**	
	(1)	Premises where the public water system is used to supplement the reclaimed water supply.	AG
	(2)	Premises where there is waste water pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single family residence that has a sewage lift pump. An RP may be provided in lieu of an AG, if approved by the DHS and the District.	AG
	(3)	Premises where reclaimed water is used and there is no interconnection with the potable water system. An RP may be provided in lieu of an AG, if approved by the DHS and the District.	AG
	(4)	Premises where hazardous substances are handled in any manner in which the substances may enter a potable water system. This does not include a single family residence that has a sewage lift pump. An RP may be provided in lieu of an AG if approved by the DHS and the District.	AG
	(5)	Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP
	(6)	Portable pressure sprayers, tanker trucks and cleaning units that have capacity of connecting to a public water system. A use permit shall be obtained from the District.	RP
	(7)	Premises where the service lines are located within 50 feet of a septic tank or leach field.	RP
(b)		**Auxiliary Water Supplies**	
		Premises where there is an unapproved auxiliary water supply. Backflow protection is required whether the auxiliary water supply is interconnected with the District's water system, or there are no interconnections with the District's water system.	RP
(c)		**Fire Protection Systems**	
		Fire protection systems are classified on the basis of water source and arrangement of supplies as follows:	
	(1)	Class 1 – Direct connection from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or additives of any kind; and all sprinkler drains discharging to the atmosphere of other safe outlets.	None req'd (see special condition exceptions below)
	(2)	Class 2 – Same as Class 1, except that booster pumps may be installed in the connections from the street mains.	Same as above
	(3)	Class 3 – Direct connection from public water supply main plus one or more of the following: elevated storage tanks; fire pumps taking suction from above-ground covered reservoirs or tanks; and pressure tanks. (All storage facilities are filled by or connected to public water only, the water in the tanks to be maintained in a potable condition. Otherwise, Class 3 systems are the same as Class 1).	RP
	(4)	Class 4 – Directly supplied from public mains similar to Classes 1 and 2, with an auxiliary water supply on or available to the premises; or an auxiliary supply located within 1,700 feet of the pumper connection.	RP
	(5)	Class 5 – Directly supplied from public mains, and interconnected with auxiliary supplies such as pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used.	RP

	(6)	Class 6 – Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.	RP or AG
	(7)	All other fire protection systems on private property where access is restrict to District. These premises are encouraged to install an RP device which may be required in the future.	None req'd
	(8)	Special Condition exceptions:	
		a. Underground fire sprinkler pipelines parallel to and within 10 feet horizontally of sewer pipelines or other pipelines carrying significantly toxic materials.	RP
		b. When water is supplied to a site or an area from two or more services of a water utility, or from two different water utilities, flow problems should be evaluated.	RP
		c. Occupancies (or changes in occupancies) which involve the use, storage, or handling of types and quantities of materials in a manner which could present a significant health hazard to the domestic water supply.	RP
		d. Premises where entry to all portions of the premises is not readily accessible for inspection purposes, or where it cannot be determined where piping is located, making it impracticable or impossible to ascertain whether or not cross-connections exist shall be protected against backflow of water from such premises into the public system.	RP
(d)		**Other Premises**	
	(1)	Premises where entry is restricted so that inspections for cross-connections cannot be made.	RP
	(2)	Premises where there is a precedent of cross-connections being established.	RP
	(3)	Premises where two or more services supply water from different street mains to the same building, or structure, through which an inter-street main flow may occur.	RP

1103. BACKFLOW PREVENTION ASSEMBLIES.

A. Approved Backflow Prevention Assemblies

1. Only backflow prevention assemblies which have been approved by the District shall be acceptable for installation by a water user connected to the District's potable water system.

2. The District will provide, upon request, to any affected customer a list of approved backflow prevention assemblies.

B. Backflow Prevention Assembly Installation.

1. The backflow assembly shall be located on the user's side of, and as close to, the service connection meter as is practical.

2. Backflow prevention assemblies shall be installed in a manner prescribed in Title 17 of the California Administrative Code and District Standards. The District shall have the final authority in determining the required location of a backflow prevention assembly.

3. Except as noted in Article 1103.C.3, backflow prevention assemblies, including the enclosure, will remain the property of the owner of the property they serve and shall be maintained by that owner at their cost.

a. Air-gap separation (AG). All piping from the service connection to the receiving tank shall be above grade and be entirely visible. No water use shall be provided from any point between the service connection and the air-gap separation. The water inlet piping shall terminate a distance of at least two (2) pipe diameters of the supply inlet, but in no case less than one (1) inch above the overflow rim of the receiving tank.

b. Reduced pressure principle backflow prevention assembly (RP). The assembly shall be installed in accordance with District's standards. The assembly shall be installed above ground and readily accessible for maintenance and testing.

C. Backflow Prevention Assembly Testing and Maintenance

1. Backflow prevention assemblies must be tested immediately after installation, relocation or repair and at least annually. The District may require a more frequent testing schedule if it is determined to be necessary. No assembly shall be placed back in service unless it is functioning as required.

2. The District will test a water user’s backflow prevention assembly annually to fulfill the requirements of this Policy. The District will notify affected customers when annual testing of an assembly is to be performed.

3. All costs of testing, repair (including repair of damage caused by vandalism, freezing, etc.) maintenance, and replacement shall be borne by the water user. The cost of annual testing shall be provided to the District via a bimonthly backflow testing charge on the customer's bill, as shown in Appendix A. The cost of replacing gaskets and check valve springs for any device and all other costs for repair and maintenance will be billed at the time of occurrence on the next regular water bill.

4. All devices installed by the District are guaranteed from defects in materials and workmanship for one year from the date of installation.

D. Backflow Prevention Assembly Removal

1. Approval must be obtained from the District before a backflow prevention assembly is removed, relocated, or replaced.

a. Removal: The use of an assembly may be discontinued and the assembly removed from service upon presentation of sufficient evidence to the District to verify that a hazard or potential hazard no longer exists;

b. Relocation: An assembly may be relocated following confirmation by the District that the relocation will continue to provide the required protection and satisfy installation requirements. A retest will be required following the relocation of the assembly;

c. Repair: An assembly may be removed for repair, provided the water use is either discontinued until repair is completed and the assembly is returned to service, or the service connection is equipped with other backflow protection approved by the District. A retest will be required following the repair and reinstallation of the assembly;

d. Replacement: An assembly may be removed and replaced provided the water use is discontinued until the replacement assembly is installed. All replacement assemblies must be approved by the District and must be commensurate with the degree of hazard involved. Replaced assemblies must be tested after installation as required by this Policy.

1103. A Well Deactivation

1. Each service connection from the District water system for supplying water to the premises having an active or inactive well may not be required to have backflow protection, provided the well is deactivated in a manner that is compliant with Department of Health Services standards for degree of hazard and has passed an on site inspection by an authorized District representative. The following are the approved alternatives for deactivation:

A. Pull the pump and weld a water tight seal on the top of the well casing.

B. All electrical connections must be disconnected and removed from the well location. In addition, the piping from the well head must also be disconnected and removed from the well site. Any plumbing remaining on the well head must also be disconnected and removed from the well site. Any plumbing remaining on the well head must be capped and welded such that an “easy” reconnect is not possible. Once this is completed, the well is no longer considered to be an auxiliary water supply.

C. Destroy the well per Shasta County Health Department requirements.

1104. ADMINISTRATION PROCEDURES.

A. Water System Survey

1. The District will survey all requests for new services to determine if backflow protection is needed. Plans and specifications may be required to be submitted to the District upon request for review of possible cross-connection hazards as a condition of service for new service requests. If it is determined that a backflow prevention assembly is necessary to protect the District's water system, the required assembly must be installed before service will be connected.

2. The District may, at its discretion, require an inspection of cross-connection hazards of any premises to which it serves water. Any water user who will not allow an on-site inspection of piping systems shall be required to install a backflow prevention assembly the District considers necessary.

B. Customer Notification - Assembly Installation

1. The District will notify the water user of the survey findings in writing, listing the corrective actions to be taken if any are required. If a backflow prevention assembly is required, the water user will be allowed 60 days to have the device installed and tested.

2. A second notice shall be sent to each water user who does not have the backflow prevention assembly installed and tested as prescribed in the first notice within the 60 day period allowed. The second notice gives the water user 14 days to comply. If no

action is taken within 14 days, the District may terminate water service to the effected water user until such assembly is installed and tested.

C. Customer Notification - Testing and Maintenance

1. The District will notify each affected water user in writing when it is time for the backflow prevention assembly installed on their service connection to be tested. This notice shall be given the water user a minimum of 5 days prior to testing the assembly.

D. Customer notification – Well deactivation

1. When an existing well is found to supply any premises with a connection to the District water supply, the District will notify the water user in writing, the option of deactivating the well or installing backflow protection. The water user will have 60 days to take corrective action. If no action is taken within 60 days, the district may terminate water service to the affected user.

1105. WATER SERVICE TERMINATION.

A. General. Whenever the District encounters water uses that represent a clear and immediate hazard to the potable water supply that cannot be immediately abated or the customer refuses to comply, the District shall discontinue water service and shall remove the water meter. The property will be credited with the meter for future re-installation.

B. Basis for Termination. Conditions or water uses that create a basis for water service termination shall include, but are not limited to, the following items:

1. Refusal to install a required backflow prevention assembly,

2. Refusal to allow testing or permit a test of a backflow prevention assembly,

3. Refusal to repair or replace a faulty backflow prevention assembly,

4. Direct or indirect connection between the public water system and a sewer system,

5. Unprotected direct or potential connection between the District's water system and a system or equipment containing contaminants,

6. Unprotected direct or potential connection between the District's water system and an auxiliary water system,

7. A situation which presents an immediate health hazard to the District's water system.

C. Water Service Termination Procedures

1. For conditions 1 , 2 and 3 above, the District will terminate service to a customer's premise after two (2) written notices have been sent specifying the corrective action needed and the time period within which to comply. If no action is taken within the time allowed, water service will be terminated.

2. For conditions 4 through 7 above the District will take the following steps to terminate water service immediately:

a. Make a reasonable effort to advise the water user of an intent to terminate water service; and

b. Terminate water service and lock the service valve and remove meter. The water service will remain inactive until correction of violations has been completed and approved by the District.

1106. REQUIREMENTS FOR THE CERTIFICATION AS A BACKFLOW PREVENTION DEVICE TESTER. Each applicant for certification as a tester of backflow prevention assemblies shall file an approved application with the District, together with an application fee as shown in Appendix A. Competency in all phases of backflow prevention assembly testing and repair must be demonstrated by means of education and/or experience in order to obtain certification. The following are minimum requirements:

A. Applicants shall have had at least two (2) years experience in plumbing, pipe fitting or equivalent qualifications.

B. Applicants shall hold a valid certification as a backflow prevention device tester from the America Water Works Association (A.W.W.A.) California-Nevada Section, from the University of Southern California Foundation for Cross-Connection Control, from a County certification program, or have equivalent training in the opinion of the District and the County Health Department.

C. Each applicant for certification as a tester of backflow prevention assemblies shall furnish evidence to show that he or she has available the necessary tools and equipment to properly test such assemblies. Applicants/testers shall be responsible for the competency and accuracy of all tests and reports. The certificate issued to any tester is valid for a period of one (1) year and may be revoked, suspended, or not renewed by the District for improper testing, repairs, and/or reporting.

1107. EXISTING BACKFLOW PREVENTION ASSEMBLIES.

All presently installed backflow prevention assemblies which do not meet the requirements of this section but were approved devices for the purposes described herein at the time of installation and which have been properly maintained, shall, except for the testing and maintenance requirements under Subsection 1103. C, be excluded from the requirements of these rules so long as the District is assured that they will satisfactorily protect the water purveyor's system. Whenever the existing device is moved from the present location or requires more than minimum maintenance or when the District finds that the maintenance constitutes a hazard to health, the unit shall be replaced by an approved, testable backflow prevention assembly meeting the current requirements of this Policy.

APPENDIX A

SCHEDULE OF RATES AND CHARGES

WATER RATES

Bimonthly W.T. Surcharge – for repayment of the District's Water Treatment Improvements, Safe Drinking Water / State Revolving Fund (SDWSRF) Loan $14.00

Construction Water

Construction Meter (Security Deposit) $750.00
Bimonthly Rental Fee.....$75.00
Each 100 cu ft (includes CVP surcharge) $1.00

Temporary Water

Per fill up (fill tank at District office).....$25.00

CROSS CONNECTION (BACKFLOW) CONTROL

Bimonthly Testing Fee (includes up to one hour of labor per year for repair) for required annual testing and repair of any size of backflow device, includes reduced pressure principle assemblies, double check detector check, and reduced pressure principle detector check assemblies.).....$10.00

New or replacement installations and repair of above noted devices for materials and labor are per current District rates.

Installation Costs for Backflow Devices (All sizes) ..... At cost + 15%

Steel Backflow Enclosures (all sizes) ..... At cost + 15%

Thermal Freeze Protection Blanket (all sizes) ..... At cost + 15%

PERMIT FEES

Backflow Prevention Permit (for portable pressure sprayers, tanker trucks and cleaning units that have capacity of connecting to a public water system) $10.00

Bacteriological Testing ..... Cost plus 15%

Inspection Fees [Note: Per Article 707, a deposit of one percent (1%) of the engineer's estimated cost of construction of the water system improvements shall be

paid prior to issuance of a Construction Permit.]

Plan Check Fees
Base Fee (includes first 3 lots).....$200.00
Plus Per Lot for each lot over 3 lots $24.00

LABOR & EQUIPMENT RATE SCHEDULE

Labor* (Labor rates vary significantly depending upon job classification and will be billed in quarter hour increments at cost using a multiplier of 1.95 times the employee's actual hourly wage to reflect the full labor burden, including benefits and accruals).. .....At cost

Equipment Rental is limited to availability and use by qualified employees.
Equipment rental rates shall be in accordance with "Caltrans Labor Surcharge and Equipment Rental Rates", current edition. www.dot.ca.gov/hq/construc/equipmnt.html

*NOTE: Overtime labor rates will apply to all hours worked other than during the normal workday, Monday through Friday. Overtime labor rates at one and one-half times the regular hourly rate will apply to all hours worked in excess of 8 hours in a single day. Overtime labor rates of two times regular hourly rates will apply to all hours worked in excess of 12 hours in a single day, and all holidays.

OTHER

After Hours Callout for Private (Customer) Water System..... $65.00/hr
(two hour minimum)

Agricultural Water Application Fee $50.00

Agricultural Water Reapplication Fee $25.00

Application sent to customer by fax or mail $5.00

Application by telephone $10.00

Bad Check Charge $30.00

Board Room Charge (use by public) $25.00/hour
(two hour minimum)

Credit Card Convenience Fee For Utility Bills (per transaction).....$3.00

Delinquent Payment Penalty Charge..... 1.5 % per month

Delinquent Penalty Notice (on site delivery of a delinquent notice) $30.00

Delinquent Service Turnoff $45.00

Delinquent Service Reconnection Charge (Reg. Business Hours) $30.00

Digital data provided on compact disk (CD or DVD /each) $10.00

Fire Hydrant Flow Testing $100.00

Fire Hydrant Installation..... actual cost plus 15%

Front Footage Fee ..... $16.00 per foot

Fire Protection Services .....(see surcharge rate on Page 86)

Hydraulic Modeling (fire flows or new waterlines).....actual cost plus 15%

Meter Removal (all sizes)..... actual cost

Meter Re-installation (all sizes)..... actual cost

Meter Testing Deposit $50.00

Photocopies
First five copies..... $0.25/per 8-1/2 x 11" sheet
Additional copies..... $0.15/per 8-1/2 x 11" sheet

Postage ..... actual cost

Service Transfer Fee (rate change by customer request) $10.00

Temp Services through Fire Hydrants
Installation & Removal $40.00

Water Service Turnoff (Customer Requested, Regular Hours) $30.00

Fines (per section 463). :

1. First violation.....$250.00
2. Second violation..... $500.00
3. Third and subsequent violations (for each violation) $1,000.00
4. Tampering with a fire hydrant.....$1,000.00

CONNECTION FEES (effective 1/1/2013)
Main, E. Stillwater, Welch, Deschutes, Quail Ridge, CC1, and CC2 Pressure Zones

Service Size	AWWA Rated Capacity[1] (gpm)	Household Equivalent Ratio	Meter[2, 8] Set Only	Service[3,6] Installation	Capital Improvement Fee (CIF)	Meter[4] Set + CIF	Complete[5] Service + CIF
	Residential, Rural, Commercial and Non-Scheduled Agricultural						
3/4"	15	1.5	$535	$957	$7,420	$7,955	$8,912
1.0"	25	2.5	$560	$957	$12,560	$13,120	$14,077
1.5"	50	5.0		$1,295	$25,120	All meters 1.5" and larger and all services 3" and larger at cost plus Capital Improvement Fee	
2.0"	80	8.0		$1,295	$40,190		
3.0"	220	22.0	All meters 1.5" and larger and all services 3" and larger at cost		$110,520		
4.0"	420	42.0			$211,000		
6.0"	865	86.5			$434,560		
8.0"	1600	160.0			$803,820		

CONNECTION FEES (effective 1/1/2013)
Simpson Pressure Zone

Service Size	AWWA Rated Capacity[1] (gpm)	Household Equivalent Ratio	Meter[2, 8] Set Only	Service[3,6] Installation	Capital Improvement Fee (CIF)	Meter[4] Set + CIF	Complete[5] Service + CIF
	Residential, Rural, Commercial and Non-Scheduled Agricultural						
3/4"	15	1.5	$535	$957	$11,530	$12,065	$13,022
1.0"	25	2.5	$560	$957	$19,220	$19,780	$20,737
1.5"	50	5.0		$1,295	$38,430	All meters 1.5" and larger and all services 3" and larger at cost plus Capital Improvement Fee	
2.0"	80	8.0		$1,295	$61,500		
3.0"	220	22.0	All meters 1.5" and larger and all services 3" and larger at cost		$169,110		
4.0"	420	42.0			$322,850		
6.0"	865	86.5			$664,920		
8.0"	1600	160.0			$1,229,910		

Notes:

1. AWWA Recommended Maximum Rate for Continuous Operations
2. Does not include service installation or CIF.
3. Does not include meter or CIF.
4. Does not include service installation.
5. All inclusive; meter set + service installation + CIF are included.
6. Road crossings, bores, and services over 60 feet long are an extra charge.
7. Capital Improvement Fees are adjusted annually in January per Resolution 93-09.
8. The District does not stock any meters larger than 1-inch; therefore Meter Set charges for 1.5-inch and larger will be at cost plus 15%.

CONNECTION FEES (effective 1/1/2013)
Old Oregon Trail Pressure Zone

Service Size	AWWA Rated Capacity[1] (gpm)	Household Equivalent Ratio	Meter[2, 8] Set Only	Service[3,6] Installation	Capital Improvement Fee (CIF)	Meter[4] Set + CIF	Complete[5] Service + CIF
	Residential, Rural, Commercial and Non-Scheduled Agricultural						
3/4"	15	1.5	$535	$957	$13,150	$13,685	$14,642
1.0"	25	2.5	$560	$957	$21,910	$22,470	$23,427
1.5"	50	5.0		$1,295	$43,820		
2.0"	80	8.0		$1,295	$70,120		
3.0"	220	22.0	All meters 1.5" and larger and all services 3" and larger at cost plus Capital		$192,830	All meters 1.5" and larger and all services 3" and larger at cost plus Capital Improvement Fee	
4.0"	420	42.0			$368,120		
6.0"	865	86.5			$758,160		
8.0"	1600	160.0			$1,402,370		

CONNECTION FEES (effective 1/1/2013)
Palo Cedro South Pressure Zone

Service Size	AWWA Rated Capacity[1] (gpm)	Household Equivalent Ratio	Meter[2, 8] Set Only	Service[3,6] Installation	Capital[9] Improvement Fee (CIF)	Meter Set[4] + CIF	Complete[5] Service + CIF
	Residential, Rural, Commercial and Non-Scheduled Agricultural						
3/4"	15	1.5	$535	$957	$4,220	$4,755	$5,712
1.0"	25	2.5	$560	$957	$7,030	$7,590	$8,547
1.5"	50	5.0		$1,295	$14,050	All meters 1.5" and larger and all services 3" and larger at cost plus Caplital Improvement Fee	
2.0"	80	8.0		$1,295	$22,480		

Notes:

1. AWWA Recommended Maximum Rate for Continuous Operations
2. Does not include service installation or CIF.
3. Does not include meter or CIF.
4. Does not include service installation.
5. All inclusive; meter set + service installation + CIF are included.
6. Road crossings, bores, and services over 60 feet long are an extra charge.
7. Capital Improvement Fees are adjusted annually in January per Resolution 93-09.
8. The District does not stock any meters larger than 1-inch; therefore, Meter Set charges for meters 1.5-inch and larger will be at cost plus 15%.
9. All connections in the Palo Cedro South Assessment District (south of Highway 44) are also subject to "Capital Facilities Charge" per Resolution 87-38 (ENR CCI = 4406). As of December 2011 (ENR CCI = 9173), this charge is currently $3,853.33 per acre. Properties that were not assessed at the time that the assessment district was formed will also be charged $4,418.20 per acre for facilities already installed as part of the assessment district. In December of each year these charges are adjusted based on the change in the ENR Construction Cost Index.

Scheduled-Agricultural 3 inches and larger (effective 4/1/2011)

Size	Meter Set Only	Complete Service Installation	Capital Improvement Fee	Meter Set + CIF	Complete Service + CIF
3.0"	All Meters and services		$ 10,135	All services 3" and	
4.0"	3" and larger at cost		$ 12,558	larger at cost plus	
6.0"			$ 16,848	Applicable Capital	
8.0"			$ 19,489	Improvement Fee	

Notes:

1. Based on Resolution 93-09 the Scheduled Ag Capital Improvement fee shall be adjusted on the anniversary date of the resolution (April 1) by the ratio of the ENR Construction Cost Index (CCI) in effect at that time (the March ENR CCI) to the ENR CCI in effect on of April 1, 1993. The March 1993 ENR CCI was = 5106. The March 2011 ENR CCI was 9011. The resulting ratio = 1.765.
2. The new rate is effective on April 1 of each year.

Fire Protection Service Rates

For dedicated fire service lines the charge = 1/3 of the bimonthly M&I base rate.

Appendix B

METER DOWNSIZING EXAMPLES

Allowable Downsizings/Exchanges:

Meter Size (inches)	AWWA "Recommended Maximum Rate for Continuous Operations" (gpm)	Allowable Downsizings @ the AWWA "Recommended Maximum Rate for Continuous Operations"		
		For 2 Meters	For 3 meters	For 4 meters
1	25	1 @ 3/4" & 66.7% credit on 2nd 3/4"	n/a	n/a
1 1/2	50	2 @ 1"	1 @ 1", 1 @ 3/4" & 66.7% credit on 2nd 3/4"	3 @ 3/4" 33.3% credit on 3rd 3/4"
			or 3 @ 3/4"	
		or any combination of smaller meters		
2	80	1 @ 1 1/2" & 1 @ 1"	1 @ 1 1/2" & 2 @ 3/4"	
			or 3 @ 1"	or 2 @ 1" & 2 @ 3/4"
		or any combination of smaller meters	or any combination of smaller meters	or any combination of smaller meters
3	220	2 @ 2"	2 @ 2" & 1 @ 1 1/2"	1 @ 2", 2 @ 1 1/2" & 1 @ 1" or 4 @ 1 1/2"
		or any combination of smaller meters	or any combination of smaller meters	or any combination of smaller meters
4	420	1 @ 3" & 1 @ 2"	1 @ 3" & 2 @ 2"	1 @ 3", 1 @ 2" & 2 @ 1 1/2" or 4 @ 2"
		or any combination of smaller meters	or any combination of smaller meters	or any combination of smaller meters
6	865	2 @ 4"	1 @ 4" & 2 @ 3"	1 @ 4", 1 @ 3" & 2 @ 2" 3 @ 3" & 1 @ 2"
		or any combination of smaller meters	or any combination of smaller meters	or any combination of smaller meters
8	1600	1 @ 6" & 1 @ 4"	1 @ 6", 1 @ 4" & 1 @ 3" 3 @ 4"	1 @ 6", 1 @ 4", 1 @ 3" & 1 @ 2" 3 @ 4" &1 @ 3"
		or any combination of smaller meters	or any combination of smaller meters	or any combination of smaller meters

Appendix C

Sample Rebate Agreement

BELLA VISTA WATER DISTRICT

WATER MAIN EXTENSION REBATE POLICY FOR APPLICANT INSTALLED FACILITIES

* * *

THIS AGREEMENT sets forth the terms and conditions under which the Applicant named below will be rebated for expenses incurred as a result of making water service available to other properties by installing a water main extension. The General Rebate Policy set forth in this Agreement has been adopted by the Board of Directors of the Bella Vista Water District, and shall control the party's rights and obligations with respect to any rebates available to the Applicant or party installing the water main.

1. GENERAL INFORMATION

Applicant/Installer
Name(s):_____

_____

Address:_____

_____

Location of Water System
Improvement:_____

_____

_____

General Description of Improvement (attach diagram if necessary):

_____

_____

_____

_____

Parcels to be served by new facility

Assessor Parcel No.	Parcel Size (acre)	Owners Name & Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Cost of Pipeline Extension

	Quantity	Units	Unit Cost	Amount
Pipeline Installation	_____	_____	_____	_____
Service Connections	_____	_____	_____	_____
Other (detail)	_____	_____	_____	_____
Total Estimated Cost				_____

Contractor's Name _____

Address _____

_____

Contractor License No._____

Others responsible for installation_____

_____

_____

_____

II. CONSTRUCTION REQUIREMENTS

Starting of Work and Time for Completion

Applicant shall commence work on the project within _____ calendar days after execution of this Agreement and, unless delayed by one of the causes mentioned below, all construction work shall be completed not later than _____ calendar days from the date hereof. Applicant's failure to so complete the construction to the satisfaction of Bella Vista Water District within the time stated above shall be considered a breach of this agreement and entitle Bella Vista Water District to demand payment under either the performance bond or letter of credit provided by Applicant to insure their performance hereunder, and Bella Vista Water district may thereafter complete the project in accordance with the plans and specifications.

Charges & Liens

The Applicant and/or its Contractor shall pay all charges and liens incurred for labor and materials used in the construction of the project as they become due. Should the Applicant or Contractor fail to pay any such charge, Bella Vista Water District may pay the same on behalf of the Contractor or Applicant and shall be reimbursed by the Contractor or Applicant for the payment, on demand.

Completion Guarantee

Prior to commencement of construction of the project the Applicant shall provide a good and sufficient performance bond for the benefit of Bella Vista Water District in the amount set forth above as the Total Estimated Cost in Part I. The purpose of such bond is to insure completion of the project should Applicant default in any of its obligations hereunder. Such bond as required under this paragraph may be in either of the following forms:

(1) Performance Bond issued to Bella Vista Water District, guaranteeing completion of the project on or before the required time of completion as required by this Agreement, the issuing surety to be approved prior to acceptance by Bella Vista Water District; or

(2) Irrevocable Letter of Credit naming Bella Vista Water District as beneficiary, and issued by a financial institution acceptable to Bella Vista Water District, with an expiration date not sooner than the required time of completion as required by this Agreement.

Installation According to District Approved Plans and Specs

The improvements installed in accordance with this Agreement shall be installed and completed in accordance with detailed plans and specifications prepared by a registered Civil Engineer and approved by the District prior to start of construction and the District retains the absolute discretion to determine the kind and quality of work and materials to be utilized. As the work progresses, the District reserves the right to amend

and adapt the plans and specifications to meet the conditions on the Job Site as they may develop. Any costs arising from such preparation and or revision of plans shall be the responsibility of the Applicant.

Standard Specifications

Bella Vista Water District adopts and maintains Standard Specifications for the purpose of setting forth the minimum applicable requirements for water works construction. Such Standard Specifications are applicable to *all projects* for which acceptance by the Bella Vista Water District will ultimately be requested. A copy of the current applicable Standard Specifications is delivered with this Agreement and its terms and conditions are incorporated in this Agreement in their entirety, as though fully set forth. By affixing their signatures to this Agreement, the Applicant and any and all contractors and material men who may participate in completion of the Project agree to be bound thereby.

Contractors Installing Facility

The installation applied for and all work done in connection therewith, shall be performed and completed by a contractor, licensed in the state of California, to perform underground construction to the satisfaction of the District. Applicant and its contractors shall permit District personnel access to the Job Site and the Project at all times to permit inspection and to insure that the Project is being completed both in a timely manner, and in accordance with the agreed upon plans and specifications.

Property and Rights-of-Way

No work shall be performed, nor installation made until all necessary and suitable real property accesses are secured and the necessary easements or fee interests are properly transferred to the District. In connection with this Requirement, Applicant shall secure such access by deeded easement or fee interest to the Bella Vista Water District, after first obtaining approval for the described access from District engineers. Applicant shall further provide a preliminary title report in connection with tendering the executed easement or grant deed, showing that the grantor named therein is vested with title to be transferred to Bella Vista Water District, subject only to real property tax liens not yet delinquent, and with necessary consents to subordination from other lien holders, if any.

Applicant's Responsibility

The Applicant shall take all responsibility for work under this Agreement including: all risk of loss resulting from (1) the nature or character of the work; (2) the nature of the ground in or on which the work is to be performed which is different from what is expected; (3) delays occasioned by weather, floods, unforeseen difficulties, accidents or any other causes.

Indemnity Agreement

Applicant further agrees to indemnify and hold harmless the District, its employees, agents, directors and officers from all claims of any kind arising from the performance of work under this Agreement, including claims for personal injury or death, claims for damage to property, and claims for loss of business, and including all such claims that may be presented or asserted by officers or employees of the Applicant, its contractors or subcontractors, officers or employees of the District, officers or employees of the Contractor or subcontractors, and third parties for failure to so provide in any contract it lets.

Insurance Requirements

Prior to commencement of construction of the Project, the Contractor or Applicant shall provide to Bella Vista Water District, insurance coverage in an amount not less than $1,000,000.00. Proposed insurance coverage shall be submitted to Bella Vista Water District prior to commencement of work, and the District's approval of this Agreement and permission to commence project construction shall be conditioned on the District's prior approval of the proposed insurance coverage. Such insurance coverage shall require that Bella Vista Water District is named as an additional insured and shall provide notice of at least thirty (30) days prior to any material change or cancellation of such coverage. The above-described coverage shall be in addition to any performance bond or letter of credit required herein with respect to the construction of the project as set forth above.

Delay or Failure to Complete

In the event of a failure to complete the project in a timely manner and as previously agreed upon, Bella Vista Water District will have the right to make a call on the letter of credit or performance bond furnished as a condition of this Project, and thereafter complete the project.

Unavoidable Delays and Defaults

Either party, Applicant or Bella Vista Water District, shall be excused for any delays or defaults by that party in the performance of this Agreement unavoidably caused by the act of the other, the act of any agent of the other, the act of any governmental authority, the act of any public enemy, acts of God, the elements, or other causes beyond that party's control. Each party shall use diligence to avoid any such delay or default and to resume performance under this Agreement as promptly as possible after any such delay or default.

Notice of Completion

Applicant shall execute and deliver to the District a notice of completion that the project is ready for final inspection and acceptance by the Bella Vista Water District. Upon

receipt of such notice, the District shall promptly inspect the facility and thereafter notify the Applicant of any defects or deficiencies that require correction (including real property access issues, if not previously resolved). If no such deficiencies are present, the District shall thereafter place acceptance of the facilities into the District on the agenda for the next available Board meeting for presentation and acceptance by the Board.

Workmanship Guarantee

Notwithstanding acceptance of the Project, Applicant guarantees that all work performed by Applicant or its Contractors, and all structures furnished and installed or constructed under this Agreement shall fully meet or exceed all requirements of the plans and specifications and the Standard Specifications in effect at the time the work is completed. Such guarantee shall extend for a period of twelve (12) months from the date the completed project is accepted by the District. To insure such guarantee, the District may require an extension of the performance bond or letter of credit given by Applicant, as set forth above for the entire warranty period.

Title

Immediately upon acceptance of the completed Project, all right, title and interest in and to the facility constructed in accordance with this Agreement shall vest in the Bella Vista Water District.

Area Not to be Served Before Acceptance

Nothing in this Agreement, nor the provision of temporary service by the District shall be construed as an agreement or undertaking to serve any area or person unless and until this Agreement has been performed in its entirety by Applicant and the facilities have been accepted by the District.

Other Agreements

Any supplemental or other agreements between Applicant and the District are set forth in Addenda to this Agreement and shall be attached hereto and executed by the party to be charged.

III. PIPELINE REBATE POLICY - GENERAL TERMS & CONDITIONS

General Policy

It shall be the policy of the Bella Vista Water District to require extensions attached to the water system to be of adequate size to serve all potential benefited landowners, allocating the cost as fairly as possible. For some installations, the District may require over sizing from that pipe size necessary to serve potential benefited landowners in order to comply with an orderly development of District facilities. Over sizing cost will be

chargeable to the Applicant, and is likewise available for rebates under the District over sizing policy as part of the total cost of the project installation. The determination of whether a particular line requires over sizing is within the sole discretion of the Bella Vista Water District, and subject to approval of its Board of Directors.

For the purpose of this Agreement, Applicant agrees that extension of the line installed under this Agreement to serve non contiguous lands do not constitute a "hook-up" and are not subject to this rebate agreement nor to any charges for the purpose of reimbursing the Applicant who paid for the original installation.

Cost Allocation

At such time as the District receives sufficient information, it shall prepare an estimate of the allocation of cost of the proposed extension. The allocation of cost to each potential benefited landowner shall be furnished to the Applicant upon demand. The allocation of cost for rebate purposes shall be on the basis of total potential acreage to be served, contiguous to the pipeline thereby calculating a per/acre rebate, and thereafter multiplying such amount by the actual parcel size requesting service.

Approval by Board of Directors

Prior to acceptance of this Agreement, the Board of Directors must approve the proposed extension. Prior to approval, the Board reserves the right to reject, amend, or order further study of any proposed extension. Upon approval of the proposed extension by the Board of Directors, the installation of specified water facilities will commence in accordance with the provisions set forth in the Agreement.

Applicant Paying for Original Installation

The District shall maintain a record of each person or entity paying for the original installation of the extension constructed pursuant to this Agreement. The record shall include the name and address of each such person or entity and it shall be the Applicant's responsibility to notify the District of any subsequent change of address or ownership. Failure to so notify the District of any subsequent address change shall result in a *waiver* of the right to receive any rebate that may be available under this Agreement.

Notice of Completion and Final Cost Estimate Provided to District

Upon completion and approval of the pipeline, the installer shall furnish the District with "as built" drawings of the pipeline along with the itemized total final cost for rebate purposes. If after ninety (90) days from acceptance of the facility by the Board of Directors into the Bella Vista Water District system the requested information is not supplied to the District office, the District may determine that the Applicant is ineligible for the rebates provided by this Agreement.

Notice of Available Service to Benefited Parcels

Upon completion of the installation of the pipeline, upon a final determination of its cost, upon acceptance into the District system, and upon receipt of the "as built" drawings required from the Applicant and final cost total, the District shall notify all landowners contiguous to the pipeline that water service is available, and it shall notify them of the repayment plan set forth in this Agreement. Potentially benefited landowners will have a period of ninety (90) days within which to respond to the notice, and within which to tender their proportionate share of the line installation cost in order to avoid the surcharge for later hookups, as described below.

Payment Received Within 90 Days

Any payment received within the 90 day period after notice is given to potentially benefited landowners shall be transmitted to Applicant without offset for bookkeeping charges, or other costs. Payments received thereafter shall be subject to a 10% bookkeeping charge, as set forth below, by the District for the maintenance of records necessary for implementation of this Agreement.

Surcharge for Late Hookups

District customers who request service from the line constructed by Applicant after the initial 90 day period, will be required to pay, in addition to their proportionate share of the cost, 5% annual interest on their proportionate share of the cost of installation, calculated from the date the project was accepted by the Board of Directors into the District's system. Such sums received shall thereafter be transmitted to the Applicant, less 10% of the amount received, which will be applied to District funds to compensate for bookkeeping time and materials. In the event a later customer was not considered a potential benefited landowner, the charge for hookup to the extension will be determined by the District and the amount forwarded to Applicant without interest, but less the 10% bookkeeping charge.

Waiver of Interest by Applicant

Applicant may waive the interest accrued on a late hookup to the line extension by providing the District with written notice thereof prior to any rebates being paid to Applicant. Such waiver shall be applicable for all rebates paid to Applicant under this Agreement, and is non-revocable.

Term of Agreement

The term of this Agreement and the District's obligation to account for, collect, and transmit rebates to the Applicant is ten (10) years from the date of this agreement by the Board of Directors. Thereafter, no rebates will be available to the Applicant.

No Other Agreement

The District does not undertake to reimburse any proponent of an extension except as specifically provided in this Agreement.

IV. GENERAL PROVISIONS

Notices

Any and all notices or other matters required or permitted by this Agreement or by law to be served on, given to, or delivered to either the District or the Applicant, by the other shall be given in writing and shall be deemed duly served, given, or delivered when personally delivered to the party to whom it is addressed, or in lieu of personal service, when deposited in the United States mail, first-class postage paid, addressed as follows:

Bella Vista Water District
11368 E. Stillwater Way
Redding, CA 96003

Future Line Extensions

For the purpose of this Agreement, Applicant agrees that further extension of the line installed under this Agreement to serve noncontiguous lands do not constitute a "hookup" and are not subject to this Rebate Agreement nor to any charges for the purpose of reimbursing the Applicant who paid for the original installation.

Sole and Only Agreement

This document constitutes the sole and only agreement of the parties to this Agreement relating to the project and correctly sets forth the rights, duties, and obligations of each to the other as of its date. Any prior agreements, promises, negotiations, or representations not expressly set forth in this document are of no force and effect. Any other documents which form part of this Agreement must be incorporated by reference.

Modifications or Amendments

Any modification or amendment to this Agreement must be in writing, signed by both parties and specifically reference that it modifies the terms of this Agreement. Such modifications may take the form of "change orders" or amendments. The Line Rebate Policy set forth in this Agreement shall control notwithstanding any subsequent amendments to the District's Line Rebate Policy at such future time.

Attorney's Fees

Should any litigation be commenced between the parties to this Agreement concerning the project, or any provision of this Agreement, or the rights and obligations of the parties in relation to this Agreement, the party prevailing in the litigation shall be entitled, in addition to such other relief as may be granted, to a reasonable sum as and for that party's attorney's fees in the litigation.

DATED THIS _____ DAY OF _____, 20____, AND EXECUTED AT REDDING, CALIFORNIA.

BELLA VISTA WATER DISTRICT APPLICANT(S)

_____ _____

David J. Coxey, General Manager

Appendix D

METER SIZING

As referenced in various sections of the Policy Manual water meters shall be sized in accordance with the following criteria.

Meter Sizing			
Meter Size (inches)	AWWA Recommended Maximum Rate for Continuous Operations (gpm)	Irrigable Acreage @ 10 gpm for household use plus 5 gpm/acre based on Recommended Max. Rates for Continuous Operations	Minimum Maximum Acreage For Meter Sizing
5/8	10	0.00	>0.25
3/4	15	1.00	0.25 – 0.99
1	25	3.00	1.00 - 2.99
1 1/2	50	8.00	3.00 - 7.99
2	80	14.00	8.00 - 13.99
3	220	42.00	14.00 - 41.99
4	420	82.00	42.00 - 81.99
6	865	171.00	82.00 – 170.99
8	1600	318.00	171.00 – 317.99

Appendix E
BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA, CALIFORNIA

Resolution No. 08-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
BELLA VISTA WATER DISTRICT
ADOPTING REVISED SCHEDULE OF CHARGES

****
**

RECITALS

WHEREAS, Bella Vista Water District, is a California Water District (BVWD) which was formed and operates pursuant to the California Water Code.

The Board of Directors, is authorized pursuant to Water Code Section 34807 to manage and conduct the business affairs of the District.

Pursuant to law, BVWD is empowered to generally perform all acts necessary or proper to carry out the provisions of the Water Code, and specifically may acquire, plan, construct, improve, operate and keep in repair the necessary works for the production, storage, transmission and distribution of water for irrigation, domestic, industrial and municipal purposes.

BVWD passed and adopted its ordinances entitled "District Policy, Rules, Regulations, and Water Rates" on September 27, 1979 (hereafter the "Policy").

The Board of Directors has determined that the rates and charges need to be amended to conform with today's costs.

The Board held a public hearing on February 25, 2008, which was noticed in the Redding "Record Searchlight." The Board further discussed these proposed changes at a Regular Board meeting on January 28, 2008.

RESOLUTION

NOW THEREFORE, IT IS HEREBY RESOLVED AS FOLLOWS:

1. That the modifications to the Policy, Rules, Regulations and Water Rates of the Bella Vista Water District presented on February 25, 2008, are hereby adopted by the Board of Directors in the form attached hereto as Exhibit "A" incorporated herein by this reference.

2. The Board may, by future action amend or revoke any provision of the Policy by proper action, and such revocations and amendments shall thereafter be attached to the Policy in order to maintain a single reference source for review by the District and the Public.

3. To the extent that any policy, rule, or regulation set forth in the attached Exhibits are inconsistent with prior policies, rules, or regulations, the latter shall control.

4. The effective date of these increases will be March 1, 2008, and will be charged on all water service accounts billed after that date.

PASSED AND ADOPTED this 25 day of February 2008 by the following vote:

Ayes: Noes: Absent: Abstain:

BELLA VISTA WATER DISTRICT

By:_____
Jeff Thompson, President of the Board of Directors

ATTEST:

_____
David J. Coxey, Secretary

Appendix F

Revision History

Revised August 10, 1993
Revised October 26, 1993
Revised February 8, 1994
Revised March 8, 1994
Revised July 12, 1994
Revised November 8, 1994
Revised January 3, 1995
Revised February 14, 1995
Revised May 14, 1996
Revised July 23, 1996
Revised November 12, 1996
Revised January 14, 1997
Revised September 9, 1997
Revised November 13, 1997
Revised January 6, 1998
Revised January 5, 1999
Revised March 9, 1999
Revised April 20, 1999
Revised May 16, 2000
Revised August 8, 2000
Revised January 11, 2001
Revised June 12, 2001
Revised January 11, 2002
Revised June 11, 2002
Revised January 1, 2004
Revised March 1, 2005
Revised April 30, 2007
Revised February 25, 2008
Revised January 26, 2009
Revised August 24, 2009
Revised December 28, 2009
Revised December 20, 2010
Revised January 1, 2012
Revised March 5, 2012

ATTACHMENT C.1

WINTU PUMP STATION VENTURI METER TESTING RESULTS

JANUARY 22, 2013

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· DIRECTORS ·
BOB NASH
JEFF THOMPSON
JEFF O. STEPPAT
LYNETTE BLAISDELL
LEIMONE WAITE

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

January 22, 2013

Brian Person, Area Manager
U.S. Bureau of Reclamation
Northern California Area Office
16349 Shasta Dam Blvd.
Shasta Lake, CA 96019-8400

Re: Meter Used to Measure Bureau Supplied Water for Payment

Dear Brian:

The following is the information requested by your office.

1. Location: Wintu Pump Plant
   580 Hilltop Drive, Redding, CA 96003

2. Manufacturers:

Recorder	GE Fanuc
Flow Transmitter	Fischer-Rosemount – Model No. 3051S1CD1A2E12A1AM5TC1 Low Flow Serial #0297339 High Flow Serial #0298086

3. Model number of recorder: GE 90/30 PLC CPU 374

4. Measurement scale: Recording - 120 cfs = 100%, Totalizer

5. Method used to compute Federal water in acre feet: Direct Read

6. Date installed: Recorder – March 2006; Transmitters – March 2008

We are an equal opportunity employer.

7. (a) Date of last testing: January 18, 2013
   (b) Meter Tester: Phil Alleman, BVWD Electrical/Instrumentation Technician

8. Description of maintenance schedule: daily visual inspection, cleaning when necessary, lubrication and calibration annually.

9. Who reads the meter: District water treatment operators: Will Markword, Mark Maty, Joe Pedersen, Brad Solso, Tom Zaharris and Electrician, Phil Alleman.

If you require further information, please contact me at (530) 241-1085 ext. 114.

Sincerely,

Don M. Groundwater, PE
District Engineer

cc: Phil Alleman

Meter Used to Measure Bureau Supplied Water for Payment

1. Location:	Wintu Pump Station 580 Hilltop Drive Redding, CA 96003
2. Flow Meters:	Rosemount Model #3051S1CD1A2E12A1AM5T1C1 Low Flow Serial #0297339 High Flow Serial #0298086
3. Recorder:	GE Fanuc Model 90/30 PLC CPU 374
4. Measurement Scale:	120 CFS = 100% Totalizer
5. Method used to total:	Direct Read
6. Date Installed:	Recorder March 2006 Transmitters March 2008
7. Date of last testing:	January 18, 2013 Phil Alleman E&I Tech, BVWD

WINTU PUMP STATION
VENTURI DP FLOW METER VERIFICATION

DATE OF VERIFICATION: January 18, 2013

Listed below are the milliamp, transmitter water column readings and the calculated CFS. The first line is the BIF factory settings the second line is the actual field readings during verification.

Low Range Transmitter	14.820 mA	2"	12.92 CFS
CTP - 4 2" WC	14.93 mA	1.98 "	
High Range Transmitter	5.722 mA	2"	12.92 CFS
CTP - 4 2" WC	5.72 mA	2.00 "	
Low Range Transmitter	19.302mA	4"	18.27 CFS
CTP – 3 4" WC	19.35 mA	4.01 "	
High Range Transmitter	6.436 mA	4"	18.27 CFS
CTP - 3 4" WC	6.436 mA	4.00 "	
High Range Transmitter	7.851mA	10"	28.88 CFS
CTP - 2 10" WC	7.85 mA	10.00 "	
High Range Transmitter	20.000mA	172.61 "	120 CFS
CTP – 1 172.61" WC	19.96 mA	172.41 "	

ATTACHMENT C.2

WINTU PUMP STATION VENTURI METER TESTING RESULTS

MARCH 19, 2012

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· DIRECTORS ·
BOB NASH JEFF THOMPSON
JEFF O. STEPPAT LYNETTE BLAISDELL
ROBERT SIMS

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

March 20, 2012

Brian Person, Area Manager
U.S. Bureau of Reclamation
Northern California Area Office
16349 Shasta Dam Blvd.
Shasta Lake, CA 96019-8400

Re: Meter Used to Measure Bureau Supplied Water for Payment

Dear Brian:

The following is the information requested by your office.

1. Location: Wintu Pump Plant
   580 Hilltop Drive, Redding, CA 96003

2. Manufacturers:

Recorder	GE Fanuc
Flow Transmitter	Fischer-Rosemount – Model No. 3051S1CD1A2E12A1AM5TC1 Low Flow Serial #0297339 High Flow Serial #0298086

3. Model number of recorder: GE 90/30 PLC CPU 374

4. Measurement scale: Recording - 120 cfs = 100%, Totalizer

5. Method used to compute Federal water in acre feet: Direct Read

6. Date installed: Recorder – March 2006; Transmitters – March 2008

7 (a) Date of last testing: March 19, 2012
(b) Meter Tester: Phil Alleman, BVWD Electrical/Instrumentation Technician

8. Description of maintenance schedule: daily visual inspection, cleaning when necessary, lubrication and calibration annually.

9. Who reads the meter: District water treatment operators: Mark Maty, Joe Pedersen, Brad Solso, Tom Zaharris and Electrician, Phil Alleman.

If you require further information, please contact me at (530) 241-1085 ext. 114.

Sincerely,

Don M. Groundwater, PE
District Engineer

cc: Phil Alleman
File No. 20000-69

Meter Used to Measure Bureau Supplied Water for Payment

1. Location:	Wintu Pump Station 580 Hilltop Drive Redding, CA 96003
2. Flow Meters:	Rosemount Model #3051S1CD1A2E12A1AM5T1C1 Low Flow Serial #0297339 High Flow Serial #0298086
3. Recorder:	GE Fanuc Model 90/30 PLC CPU 374
4. Measurement Scale:	120 CFS = 100% Totalizer
5. Method used to total:	Direct Read
6. Date Installed:	Recorder March 2006 Transmitters March 2008
7. Date of last testing:	March 19, 2012 Phil Alleman E&I Tech, BVWD

WINTU PUMP STATION
VENTURI DP FLOW METER VERIFICATION

DATE OF VERIFICATION: March 19, 2012

Listed below are the milliamp, transmitter water column readings and the calculated CFS. The first line is the BIF factory settings the second line is the actual field readings during verification.

Low Range Transmitter	14.820 mA	2"	12.92 CFS
CTP - 4 2" WC	14.95 mA	1.99 "	
High Range Transmitter	5.722 mA	2"	12.92 CFS
CTP - 4 2" WC	5.72 mA	2.00 "	
Low Range Transmitter	19.302mA	4"	18.27 CFS
CTP – 3 4" WC	19.38 mA	4.02 "	
High Range Transmitter	6.436 mA	4"	18.27 CFS
CTP - 3 4" WC	6.433 mA	4.04 "	
High Range Transmitter	7.851mA	10"	28.88 CFS
CTP - 2 10" WC	7.84 mA	9.99 "	
High Range Transmitter	20.000mA	172.61 "	120 CFS
CTP – 1 172.61" WC	19.97 mA	172.44 "	

ATTACHMENT C.3

AWWA C701-12, Table A.1:

AWWA Average Recommended Intervals Between Meter Tests

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Table A.1 Average recommended intervals between meter tests

Meter Size		Years Between Tests
in.	*(mm)*	
3/4	(20)	5
1	(25)	5
1½	(40)	4
2	(50)	4
3	(80)	3
4	(100)	2
6	(150)	1
8	(200)	1
10	(250)	1

ATTACHMENT C.4

Meter Warranty Documents

1. **Badger Meter: E-Series Ultrasonic Meter**
2. **Badger Meter: Recordall Compound Series Meters**
3. **Badger Meter: Bronze Disc Meters**
4. **Badger Meter: Recordall Turbo Series Meters**

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Badger Meter

E-Series® Ultrasonic Meter

Cold Water Lead-Free Meters, 5/8", 5/8" x 3/4", 3/4", 1"

PRODUCTS

This warranty shall apply to all Badger Meter E-Series® Ultrasonic lead-free meters (stainless steel or engineered polymer), sizes 5/8", 5/8" x 3/4", 3/4", and 1", when used to measure potable water and the internal register/encoder and battery used with these meters (collectively "Product"), sold on or after April 1, 2013. This warranty is not transferable and is extended only to utilities, municipalities, other commercial users and authorized distributors, hereafter referred to as "Customer" and does NOT apply to consumers or any person or entity who is not an original customer of Badger Meter or its authorized distributors.

MATERIALS AND WORKMANSHIP

Badger Meter, Inc. ("Badger Meter") warrants Product to be free from defects in materials and workmanship appearing within the earlier of the following time frames.

Lead-Free Housings

Twenty (20) years and six (6) months after shipment from Badger Meter.

Electronics, Battery, Transducers, and Register/ Encoder Supplied with the Meters Listed Herein

Twenty (20) years and six (6) months, prorated, after shipment from Badger Meter.

This warranty is prorated as follows: the first ten (10) years of the warranty and at prorated price discounts during the last ten (10) years of the warranty. Badger Meter will apply these prorated price discounts to the Product list prices in effect at the time of Product return and according to the following prorated price discount schedule: Years 11 through 12 — 75% discount; Years 13 through 15 — 50% discount; Year 16 — 40% discount; Year 17 — 30% discount; Year 18 — 20% discount; and Years 19 through 20 — 10% discount.

Specifically, Badger Meter will repair or replace, at its discretion, a non-performing Product at no cost during the first ten (10) years of the warranty and at prorated price discounts during the last ten (10) years of the warranty. Badger Meter will apply these prorated price discounts to the Product list prices in effect at the time of Product return and according to the following prorated price discount schedule:

- Years 11 through 12—75% discount;
- Years 13 through 15—50% discount;
- Year 16—40% discount;
- Year 17—30% discount;
- Year 18—20% discount; and
- Years 19 through 20—10% discount.

METER ACCURACY

The meter product will meet or exceed meter accuracy of ±1.5% between the gallons per minute (gpm) "minimum flow rate" to "maximum flow rate" for twenty (20) years from date of shipment:

5/8" and 5/8" x 3/4" Meter
0.1 gpm to 25 gpm

3/4" Meter
0.1 gpm to 32 gpm

1" Meter
0.4 gpm to 55 gpm

EXTENDED LOW-FLOW METER ACCURACY

Badger Meter further warrants the meter product to meet or exceed extended low-flow accuracy of ±3% from the following "extended low-flow rates" to the "minimum flow rate" for twenty (20) years from date of shipment:

5/8" and 5/8" x 3/4" Meter
0.05 gpm up to 0.1 gpm

3/4" Meter
0.05 gpm up to 0.1 gpm

1" Meter
0.25 gpm up to 0.4 gpm

PRODUCT RETURNS

Any Product proved to the satisfaction of Badger Meter to have failed the foregoing warranties will, at the option of Badger Meter, be repaired or replaced without charge to the Customer. The Badger Meter obligation hereunder shall be limited to such repair and replacement and shall be conditioned upon Badger Meter receiving written notice of any alleged defect within ten (10) days after its discovery. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Badger Meter is willing and able to replace defective products or issue a credit to purchaser within a reasonable time of proof to Badger Meter that a defect is involved. Product returns must be shipped by the Customer prepaid F.O.B. to the nearest Badger Meter factory or distribution center. The Customer shall be responsible for all direct and indirect costs associated with removing the original Product and reinstalling the repaired or replacement Product.

LIMITS OF LIABILITY

This warranty shall not apply to Product repaired or altered by parties other than Badger Meter. The foregoing warranty applies only to the extent that the Product is installed, serviced and operated strictly in accordance with AWWA Standard C700 and AWWA M6 Manual, as applicable. The warranty shall not apply and shall be void with respect to Product exposed to conditions other than those detailed in the Badger Meter Product technical literature and Installation and Operation Manuals (IOMs), or

which have been subject to vandalism, negligence, accident, acts of God, alteration, improper installation, operation or repair, or other circumstances which are beyond the reasonable control of Badger Meter. With respect to Product not manufactured by Badger Meter, the warranty obligations of Badger Meter shall in all respects conform and be limited to the warranty extended to Badger Meter by the supplier.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE **(except warranties of Title).**

Any description of Product, whether in writing or made orally by Badger Meter or its agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets, or similar materials used in connection with any Customer's order are for the sole purpose of identifying Product and shall not be construed as an express warranty. Any suggestions by Badger Meter or its agents regarding use, application or suitability of Product shall not be construed as an express warranty unless confirmed to be such in writing by Badger Meter.

Exclusion of Consequential Damages and Disclaimer of Other Liability

Badger Meter liability with respect to breaches of the foregoing warranty shall be limited as stated therein. Badger Meter liability shall in no event exceed the contract price. BADGER METER SHALL NOT BE SUBJECT TO AND DISCLAIMS: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY BADGER METER, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL AND CONTINGENT DAMAGES WHATSOEVER.

E-Series is a registered trademark of Badger Meter, Inc. Other trademarks appearing in this document are the property of their respective entities.
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China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412

Legacy Document Number: ESM-W-01

Badger Meter

Recordall® Compound Series Meters
Sizes 2"…6"

PRODUCTS COVERED
This warranty shall apply to all Recordall® Compound Series Meters, sizes 2"…6", and the local registers used with these meters (collectively "Product") sold on or after July 1, 2013. This warranty is extended only to utilities, municipalities, other commercial users and authorized Badger Meter, Inc. distributors, hereafter referred to as "Customer" and does NOT apply to consumers or any person or entity who is not an original customer of Badger Meter or its authorized distributors.

MATERIALS AND WORKMANSHIP
Badger Meter warrants Product to be free from defects in materials and workmanship appearing within the following time frames:

Bronze Housings

One (1) year and six (6) months after shipment from Badger Meter.

Local Registers for Low Flow Registration (Disc Measuring Element) Supplied with the Meters Listed Herein

Twenty-five (25) years and six (6) months after shipment from Badger Meter.

Local Registers for High Flow Registration (Turbo Measuring Element) Supplied with the Meters Listed Herein

Five (5) years and six (6) months after shipment from Badger Meter.

METER ACCURACY
The meter Product will meet or exceed accuracy standards of AWWA Standard C702 for one (1) year and six (6) months after shipment from Badger Meter.

PRODUCT RETURNS
Any Product proved to the satisfaction of Badger Meter to have failed the foregoing warranties will, at the option of Badger Meter, be repaired or replaced without charge to the Customer. The obligation hereunder of Badger Meter shall be limited to such repair and replacement and shall be conditioned upon Badger Meter receiving written notice of any alleged defect within ten (10) days after its discovery. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Badger Meter is willing and able to replace defective products or issue a credit to purchaser within a reasonable time of proof to Badger Meter that a defect is involved. Product returns must be shipped by the Customer prepaid F.O.B. to the nearest Badger Meter factory or distribution center. The Customer shall be responsible for all direct and indirect costs associated with removing original product and reinstalling the repaired or replacement Product.

LIMITS OF LIABILITY
This warranty shall not apply to Product repaired or altered by any party other than Badger Meter. The foregoing warranty applies only to the extent that the Product is installed, serviced and operated strictly in accordance with AWWA Standard C702 and AWWA M6 Manual. The warranty shall not apply and shall be void with respect to Product exposed to conditions other than those detailed in Badger Meter Product technical literature, or which have been subject to vandalism, negligence, accident, acts of God, improper installation, operation or repair, alteration, or other circumstances which are beyond the reasonable control of Badger Meter. With respect to Product not manufactured by Badger Meter, the warranty obligations of Badger Meter shall in all respects conform and be limited to the warranty extended to Badger Meter by the supplier.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (except warranties of title).

Any description of the Product, whether in writing or made orally by Badger Meter or Badger Meter agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets or similar materials used in connection with any Customer's order are for the sole purpose of identifying the Product and shall not be construed as an express warranty. Any suggestions by Badger Meter or agents of Badger Meter regarding use, application, or suitability of the Product shall not be construed as an express warranty unless confirmed to be such in writing by Badger Meter.

Exclusion of Consequential Damages and Disclaimer of Other Liability. The liability of Badger Meter with respect to breaches of the foregoing warranty shall be limited as stated herein. The liability of Badger Meter shall in no event exceed the contract price. **BADGER METER SHALL NOT BE SUBJECT TO AND DISCLAIMS: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY, (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY BADGER METER, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, AND CONTINGENT DAMAGES WHATSOEVER**.

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Legacy Document #: RCS-W-1-EN

Badger Meter | Lead-Free Bronze Disc Meters

PRODUCTS COVERED

This warranty shall apply to all Recordall® Lead-Free Bronze Disc Meters, models LP through 170, when used to measure potable water, including the registers and encoders used with these meters (collectively "Product") sold on or after November 1, 2012. This warranty is extended only to utilities, municipalities, other commercial users and authorized Badger Meter, Inc. distributors, hereafter referred to as "Customer" and does NOT apply to consumers or any person or entity who is not an original customer of Badger Meter or its authorized distributors.

MATERIALS AND WORKMANSHIP

Badger Meter warrants Product to be free from defects in materials and workmanship appearing within the following time frames and those listed in the table below:

Housings
Twenty-five (25) years and six (6) months after shipment from Badger Meter.

Local Registers Supplied with the Meters Listed Herein
Twenty-five (25) years and six (6) months after shipment from Badger Meter.

	AWWA New Meter Accuracy	AWWA Repaired Meter Accuracy (AWWA M6 Manual)	Badger Meter Extended Low Flow Meter Accuracy
Recordall Meter Model, Size	*The meter product will meet or exceed new meter accuracy standards set forth in AWWA Standard C700 for the following periods:*	*The meter product will meet or exceed repaired meter accuracy standards set forth in AWWA Manual M-6, Chapter 5, Table 5.3 for the following periods:*	*Badger Meter further warrants the meter product to meet or exceed the following extended low flow accuracies in excess of AWWA standard:*
Model LP, 5/8" and 5/8" x 3/4"	Five (5) years from date of shipment or registration of 750,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 2,500,000 gallons, whichever occurs first, with a 20 gpm safe maximum operating capacity and a 10 gpm maximum rate for continuous operation.	—
Model 25, 5/8" and 5/8" x 3/4"	Five (5) years from date of shipment or registration of 750,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 2,500,000 gallons, whichever occurs first, with a 25 gpm safe maximum operating capacity and a 15 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 98.5% at a rate of 1/4 gpm and low flow accuracy of 95.0% at a rate of 1/8 gpm for five (5) years from date of shipment or registration of 675,000 gallons, whichever occurs first.
Model 35, 3/4"	Five (5) years from date of shipment or registration of 750,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 2,500,000 gallons, whichever occurs first, with a 35 gpm safe maximum operating capacity and a 25 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 97% at a rate of 3/8 gpm for five (5) years from date of shipment or registration of 675,000 gallons, whichever occurs first.
Model 55, 1"	Five (5) years from date of shipment or registration of 1,000,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 3,000,000 gallons, whichever occurs first, with a 55 gpm safe maximum operating capacity and a 40 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 95% at a rate of 1/2 gpm for three (3) years from date of shipment or registration of 575,000 gallons, whichever occurs first.
Model 70, 1"	Five (5) years from date of shipment or registration of 1,100,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 3,250,000 gallons, whichever occurs first, with a 70 gpm safe maximum operating capacity and a 50 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 95% at a rate of 3/4 gpm for three (3) years from date of shipment or registration of 1,100,000 gallons, whichever occurs first.
Model 120, 1-1/2"	Two (2) years from date of shipment or registration of 1,600,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 5,600,000 gallons, whichever occurs first, with a 120 gpm safe maximum operating capacity and a 80 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 95% at a rate of 1-1/4 gpm for two (2) years from date of shipment or registration of 1,440,000 gallons, whichever occurs first.
Model 170, 2"	Two (2) years from date of shipment or registration of 2,100,000 gallons, whichever occurs first.	Fifteen (15) years from date of shipment or registration of 10,400,000 gallons, whichever occurs first, with a 170 gpm safe maximum operating capacity and a 100 gpm maximum rate for continuous operation.	Badger Meter warrants Product low flow accuracy of 95% at a rate of 1-1/2 gpm for two (2) years from date of shipment or registration of 1,890,000 gallons, whichever occurs first.

PRODUCT RETURNS

Any Product proved to the satisfaction of Badger Meter to have failed the foregoing warranties will, at the option of Badger Meter, be repaired or replaced without charge to the Customer. The obligation hereunder of Badger Meter shall be limited to such repair and replacement and shall be conditioned upon Badger Meter receiving written notice of any alleged defect within ten (10) days after its discovery. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Badger Meter is willing and able to replace defective products or issue a credit to purchaser within a reasonable time of proof to Badger Meter that a defect is involved. Product returns must be shipped by the Customer prepaid F.O.B. to the nearest Badger Meter factory or distribution center. The Customer shall be responsible for all direct and indirect costs associated with removing original product and reinstalling the repaired or replacement Product.

LIMITS OF LIABILITY

This warranty shall not apply to Product repaired or altered by any party other than Badger Meter. The foregoing warranty applies only to the extent that the Product is installed, serviced and operated strictly in accordance with AWWA Standard C700 and AWWA M6 Manual. The warranty shall not apply and shall be void with respect to Product exposed to conditions other than those detailed in Badger Meter Product technical literature and Installation and Operation Manuals (IOMs), or which have been subject to vandalism, negligence, accident, acts of God, improper installation, operation or repair, alteration, or other circumstances which are beyond the reasonable control of Badger Meter. With respect to Product not manufactured by Badger Meter, the warranty obligations of Badger Meter shall in all respects conform and be limited to the warranty extended to Badger Meter by the supplier.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (except warranties of title).

Any description of the Product, whether in writing or made orally by Badger Meter or Badger Meter agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets or similar materials used in connection with any Customer's order are for the sole purpose of identifying the Product and shall not be construed as an express warranty. Any suggestions by Badger Meter or Badger Meter agents regarding use, application, or suitability of the Product shall not be construed as an express warranty unless confirmed to be such in writing by Badger Meter.

Exclusion of Consequential Damages and Disclaimer of Other Liability. The liability of Badger Meter with respect to breaches of the foregoing warranty shall be limited as stated herein. The liability of Badger Meter shall in no event exceed the contract price. **BADGER METER SHALL NOT BE SUBJECT TO AND DISCLAIMS: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY, (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY BADGER METER, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, AND CONTINGENT DAMAGES WHATSOEVER**.

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Legacy Document Number: RD-W-4-AWWA-EN

Badger Meter

Recordall® Turbo Series Meters

PRODUCTS COVERED

This warranty shall apply to all Recordall® Turbo Series Meters, sizes 1-1/2"…20", and the local registers used with these meters (collectively "Product") sold on or after July 1, 2013. This warranty is extended only to utilities, municipalities, other commercial users and authorized Badger Meter, Inc. distributors, hereafter referred to as "Customer" and does NOT apply to consumers or any person or entity who is not an original customer of Badger Meter or its authorized distributors.

MATERIALS AND WORKMANSHIP

Badger Meter warrants Product to be free from defects in materials and workmanship appearing within the following time frames:

Bronze Housing

One (1) year and six (6) months after shipment from Badger Meter.

Local Registers Supplied with the Meters Listed Herein

Five (5) years and six (6) months after shipment from Badger Meter.

METER ACCURACY

The meter Product will meet or exceed accuracy standards of AWWA Standard C701 for one (1) year and six (6) months after shipment from Badger Meter. AWWA does not provide a standard for 1-1/2" turbo meters. However, the typical operating range for the 1-1/2" turbo meter meets the accuracy requirements of this standard.

PRODUCT RETURNS

Any Product proved to the satisfaction of Badger Meter to have failed the foregoing warranties will, at the option of Badger Meter, be repaired or replaced without charge to the Customer. The obligation hereunder of Badger Meter shall be limited to such repair and replacement and shall be conditioned upon Badger Meter receiving written notice of any alleged defect within ten (10) days after its discovery. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Badger Meter is willing and able to replace defective products or issue a credit to purchaser within a reasonable time of proof to Badger Meter that a defect is involved. Product returns must be shipped by the Customer prepaid F.O.B. to the nearest Badger Meter factory or distribution center. The Customer shall be responsible for all direct and indirect costs associated with removing original product and reinstalling the repaired or replacement Product.

LIMITS OF LIABILITY

This warranty shall not apply to Product repaired or altered by any party other than Badger Meter. The foregoing warranty applies only to the extent that the Product is installed, serviced and operated strictly in accordance with AWWA Standard C701 and AWWA M6 Manual. The warranty shall not apply and shall be void with respect to Product exposed to conditions other than those detailed in Badger Meter Product technical literature, or which have been subject to vandalism, negligence, accident, acts of God, improper installation, operation or repair, alteration, or other circumstances which are beyond the reasonable control of Badger Meter. With respect to Product not manufactured by Badger Meter, the warranty obligations of Badger Meter shall in all respects conform and be limited to the warranty extended to Badger Meter by the supplier.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (except warranties of title).

Any description of the Product, whether in writing or made orally by Badger Meter or Badger Meter agents, specifications, samples, models, bulletins, drawings, diagrams, engineering sheets or similar materials used in connection with any Customer's order are for the sole purpose of identifying the Product and shall not be construed as an express warranty. Any suggestions by Badger Meter or agents of Badger Meter regarding use, application, or suitability of the Product shall not be construed as an express warranty unless confirmed to be such in writing by Badger Meter.

Exclusion of Consequential Damages and Disclaimer of Other Liability. The liability of Badger Meter with respect to breaches of the foregoing warranty shall be limited as stated herein. The liability of Badger Meter shall in no event exceed the contract price. **BADGER METER SHALL NOT BE SUBJECT TO AND DISCLAIMS: (1) ANY OTHER OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY, (2) ANY OBLIGATIONS WHATSOEVER ARISING FROM TORT CLAIMS (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR ARISING UNDER OTHER THEORIES OF LAW WITH RESPECT TO PRODUCTS SOLD OR SERVICES RENDERED BY BADGER METER, OR ANY UNDERTAKINGS, ACTS OR OMISSIONS RELATING THERETO, AND (3) ALL CONSEQUENTIAL, INCIDENTAL, AND CONTINGENT DAMAGES WHATSOEVER**.

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ATTACHMENT C.5

AWWA C701-12 Standard for Customer Turbine Meters

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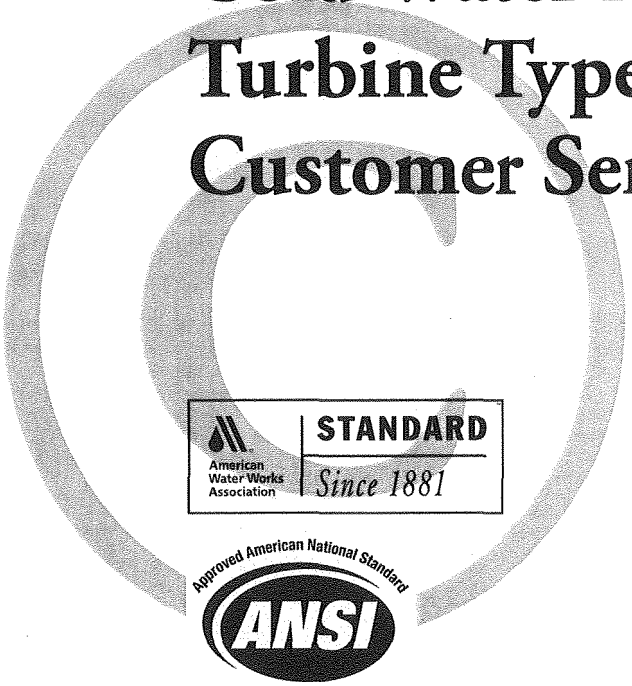
ANSI/AWWA C701-12
(Revision of ANSI/AWWA C701-07)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Cold-Water Meters—Turbine Type, for Customer Service



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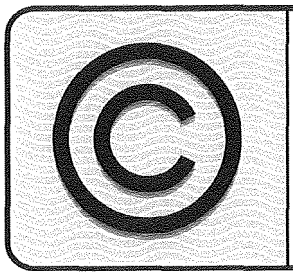

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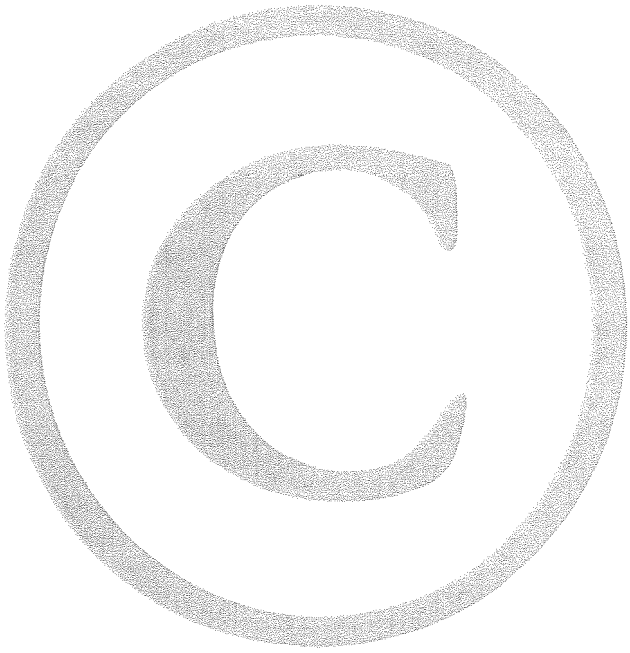

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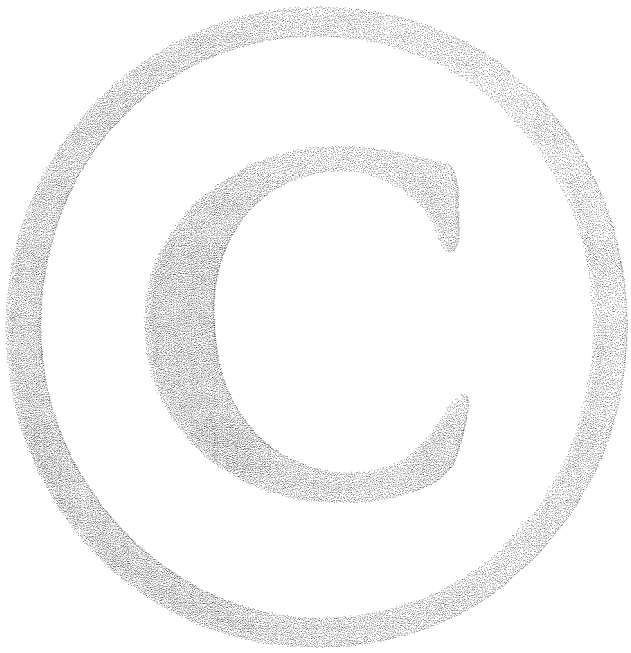

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C701.*

I. Introduction.

I.A. *Background.* A booklet published in Hamburg, Germany, in 1790 by Benjamin Gottlob Hoffman described a form of current meter developed by Reinhard Woltmann that may be considered the first practical meter for measuring flowing air and water. Originally, it was thought that the meter could not be adapted for use in enclosed pipe. However, through substantial changes in design and construction, the present current meter evolved.

I.B. *History.* The first AWWA standard specifications for water meters of various types were published in 1923. These were revised in later years, and the first standard that dealt solely with current-type meters was approved as tentative on Jan. 14, 1946, with the designation 7M.2-T. It was approved as a standard on July 25, 1947, and given the designation AWWA C701-47, Standard Specifications for Cold-Water Meters—Current Type. The standard was revised in 1970 and designated as ANSI/AWWA C701-70, Standard for Cold-Water Meters—Turbine Type, for Customer Service. It was approved by the AWWA Board of Directors on Jan. 26, 1970. Subsequent editions of C701 were approved on June 30, 1978; June 19, 1988; Jan. 20, 2002; and Jan. 21, 2007. This edition was approved Jan. 22, 2012.

Between 1923 and 1947, the propeller-type current meter was developed for pump-station discharge, irrigation, and main-line measurement. This meter differs from the original design in that it does not use a measuring cage around the turbine. The propeller operates directly within the pipeline itself or within the main meter body. The propeller-type meters had operating characteristics different from current-type meters. These differences led to the development of AWWA C704-50, Standard Specifications for Cold-Water Meters—Current Type, Propeller Driven. This standard was revised in 1970 and designated as ANSI/AWWA C704-70, Standard for Cold-Water Meters—Propeller Type for Main Line Applications. The 1970 version was reaffirmed without revision in 1975 and 1984 and revised in 1992 and 2002.

The 1978 revision of ANSI/AWWA C701 included an added distinction between class I and class II types of turbine meters. Class I meters are those previously covered by ANSI/AWWA C701-70, and class II meters are the newer in-line high-velocity

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type characterized by lower head loss, greater low-flow sensitivity, and tighter accuracy tolerances over a wider flow range. Details of the performance differences are listed in Table 1 of ANSI/AWWA C701.

The 2002 revision of ANSI/AWWA C701 expanded Table 1 for class I meters to show the operating characteristics for low-velocity horizontal-type meters and vertical shaft-type meters separately.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (AwwaRF, now Water Research Foundation) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state, local, and provincial agencies may use various references, including

1. An advisory program formerly administered by USEPA, Office of Drinking Water discontinued on Apr. 7, 1990.
2. Specific policies of the state or local agency.
3. Two standards developed under the direction of NSF, NSF†/ANSI‡ 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
4. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,§ and other standards considered appropriate by the state, local, or provincial agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 61. Individual states or local agencies have authority to accept

* Persons outside the United States should contact the appropriate authority having jurisdiction.
† NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48105.
‡ American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.
§ Both publications available from National Academy of Sciences, 500 Fifth Street, N.W., Washington, DC 20001.

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or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI 61 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

In an alternative approach to inadvertent drinking water additives, some jurisdictions (including California, Maryland, and Vermont, at the time of this writing) are calling for reduced lead limits for materials in contact with potable water. Various third-party certifiers have been assessing products against these lead content criteria, and a new ANSI-approved national standard, NSF/ANSI 372, Drinking Water System Components—Lead Content, was published in 2010.

ANSI/AWWA C701 does not address additives requirements. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues. The meters described in this standard are not designed to be used in water service piping intended to extinguish fire. Requirements for commercial and industrial applications in this regard are contained in ANSI/AWWA C703. Requirements for residential fire service products and combined residential domestic/fire service products are currently being developed as a part of a new ANSI/AWWA water meter standard.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* The following information should be provided by the purchaser:

1. Standard used—that is ANSI/AWWA C701, Cold-Water Meters—Turbine Type, for Customer Service, of latest revision.
2. Whether compliance with NSF/ANSI 372, Drinking Water System Components—Lead Content, NSF/ANSI 61, Drinking Water System Components—Health Effects, or an alternative lead content criterion is required.

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3. If specific warranty provisions will be required.

4. Meter class—class I or class II (Sec. 1.1).

5. Details of other federal, state or provincial, and local requirements (Sec. 4.1).

6. Whether main casings are to be made of copper alloy; cast iron or fabricated steel treated for corrosion resistance; or cast or fabricated stainless steel (Sec. 4.1.2).

7. Whether there is a preference for the materials specified for the various meter components (Sec. 4.1.3 through 4.1.10).

8. Size of meter (Sec. 4.2.1 and Tables 1 and 2) and quantity required.

9. Type of connections for 1½-in. (40-mm) and 2-in. (50-mm) meters, whether couplings (tailpieces) are to be provided on meters with spuds, and whether round or oval flanges are required on flanged meters (Sec. 4.3.3).

10. Whether companion flanges, gaskets, bolts, and nuts (Sec. 4.3.4) are to be provided with flanged meters.

11. Details of register (Sec. 4.3.5) to be provided, including

   a. unit of measure—US gallons, cubic feet, or cubic meters.

   b. position—permanently sealed or open.

   c. test hand—with or without sweep test hand.

   d. register type—mechanical display type or electronic display type.

12. Whether a direct-reading remote register or an encoder-type register is required, including specification details (Sec. 4.3.6).

13. Whether an affidavit of compliance (Sec. 6.3) and certificate of testing for accuracy (Sec. A.3.3) are required.

14. Special materials required, if any, to resist corrosion if water is highly aggressive (Sec. A.5.3).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. The major revisions to the standard in this edition include the following:

1. Class I meters of the low-velocity, horizontal type are no longer addressed in the standard.

2. Foreword Sec. I.C provides information on lead content criteria and the new NSF/ANSI Standard 372, Drinking Water System Components—Lead Content.

3. Foreword Sec. II cites that the meters described in this standard are not designed to be used in water service piping intended to extinguish fire. The requirements for residential fire service-type meters are not addressed in this standard.

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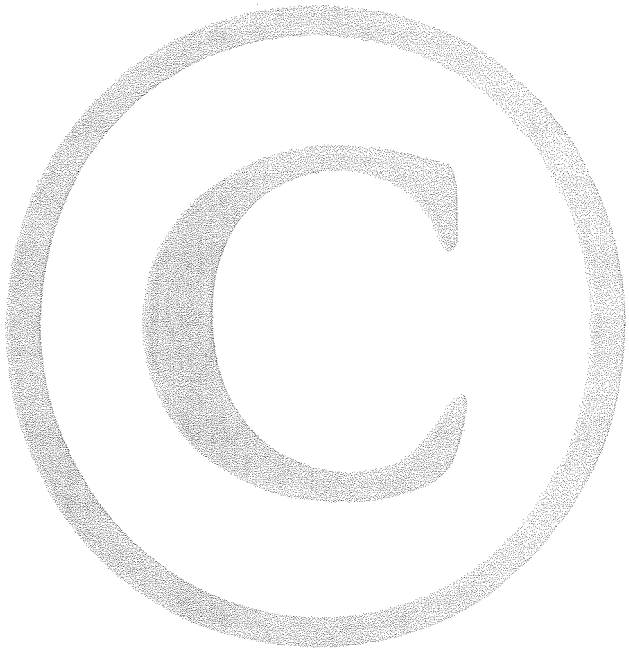
4. Sec. 4.1.2, Meter and strainer main casing, provides for cast or fabricated austenitic stainless steel as listed in ASTM A276.

5. Sec. 4.3.5.2, Electronic display registers, has been expanded to include more comprehensive language and greater details on the requirements for electronic display registers.

6. Editorial clarifications have been provided throughout the standard.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.



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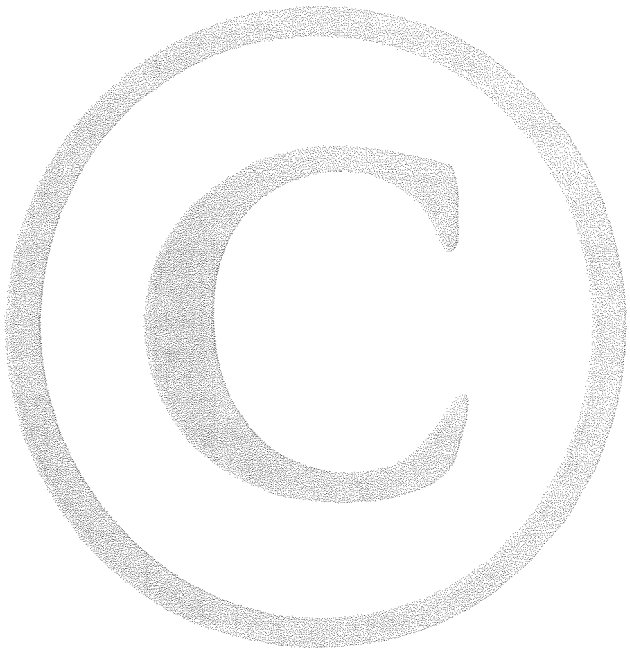

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American Water Works Association

AWWA Standard

Cold-Water Meters—Turbine Type, for Customer Service

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the various classes of cold-water turbine meters in sizes 3/4 in. (20 mm) through 20 in. (500 mm) for water supply customer service, mainline metering, and custody transfer of water among purveyors, and the materials and workmanship employed in their fabrication. The turbine meters described in this standard are divided into class I and class II meters. Both classes of meters register by recording the revolutions of a turbine set in motion by the force of flowing water striking its blades.

Class I meters are the vertical-shaft models. Class II meters are the in-line, horizontal-axis, high-velocity-type turbines characterized by lower head loss and a wider normal operating flow range than class I models.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for cold-water, turbine-type meters, including materials and design.

Sec. 1.3 Application

This standard can be referenced in specifications for purchasing and receiving cold-water, turbine-type meters and can be used for manufacturing this type of

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meter. The stipulations of this standard apply when this document has been referenced and then only to cold-water, turbine-type meters.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within this standard. In any case of conflict, the requirements of this standard shall prevail.

ANSI*/AWWA C115/A21.15—Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges.

ANSI/AWWA C207—Steel Pipe Flanges for Waterworks Service—Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).

ANSI/AWWA C213—Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.

ANSI/AWWA C550—Protective Interior Coatings for Valves and Hydrants.

ANSI/AWWA C706—Direct-Reading, Remote-Registration Systems for Cold-Water Meters.

ANSI/AWWA C707—Encoder-Type Remote-Registration Systems for Cold-Water Meters.

ASME† B1.20.1—Pipe Threads, General Purpose (Inch).

ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings.

ASME B16.24—Cast Copper Alloy Pipe Flanges and Flanged Fittings Class 150.

ASTM‡ A48/A48M—Standard Specification for Gray Iron Castings.

ASTM A126—Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

ASTM A153/A153M—Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.
† ASME International, Three Park Avenue, New York, NY 10016.
‡ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

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ASTM A269—Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

ASTM A276—Standard Specification for Stainless Steel Bars and Shapes.

ASTM A536—Standard Specification for Ductile Iron Castings.

ASTM A570/A570M—Standard Specification for Steel, Sheet and Strip, Carbon, Hot Rolled.

ASTM A580—Standard Specification for Stainless Steel Wire.

ASTM B176—Standard Specification for Copper-Alloy Die Castings.

ASTM B584—Standard Specification for Copper Alloy Sand Castings for General Applications.

ASTM D3935—Standard Specification for Polycarbonate (PC) Unfilled and Reinforced Material.

ASTM D4066—Standard Classification System for Nylon Injection and Extrusion Materials (PA).

ASTM D4101—Standard Specification for Polypropylene Plastic Injection and Extrusion Materials.

ASTM D4181—Standard Specification for Acetal (POM) Molding and Extrusion Materials.

ASTM D4203—Standard Specification for Styrene-Acrylonitrile (SAN) Injection and Extrusion Materials.

ASTM D4349—Classification System and Basis for Specification for Polyphenylene Ether (PPE) Materials.

ASTM E527—Standard Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS).

AWWA Manual M6—*Water Meters—Selection, Installation, Testing, and Maintenance.* AWWA, Denver, Colo.

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Electronic display-type register:* A register that uses stationary flat panel numerals driven by electronic signals.

2. *Manufacturer:* The party that manufactures, fabricates, or produces materials or products.

3. *Mechanical display-type register:* A register that uses rotating numeral wheels driven by mechanical gearing, indexing pinions, or both.

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4. *Purchaser:* The person, company, or organization that purchases any materials or work to be performed.

5. *Supplier:* The party that supplies material or services. A supplier may or may not be the manufacturer.

SECTION 4: REQUIREMENTS

Sec. 4.1 Materials

Materials shall comply with the requirements of the Safe Drinking Water Act and other federal requirements.

4.1.1 *Choice of materials.* The composition of alloys in this section is subject to commercially accepted tolerances.* Sec. 4.1.2 through 4.1.10 do not require any one specific material but cite examples of materials typically used in the construction of water meters. The listings are not intended to be all-inclusive and should not be used to limit the use of other materials that have been shown to meet the requirements of this standard.

Materials shall be selected for their strength and resistance to corrosion.†

4.1.2 *Meter and strainer main casing.* Main casings for meters and strainers, if provided, shall be made of either a copper alloy containing not less than 75 percent copper, such as UNS‡ C84400, UNS C83600, or UNS C89520, or a similar copper alloy as listed in ASTM B584; or of cast iron as listed in ASTM A126 or ASTM A536; or of cast or fabricated austenitic stainless steel as listed in ASTM A276; or of fabricated steel as listed in ASTM A570 that is protected by a corrosion-resistant coating, such as fusion-bonded epoxy or other corrosion-resistant treatment.

Cast iron and fabricated carbon steel bodies and parts shall be coated with a polymerized coating or shall be hot-dip galvanized in conformance with ASTM A153. The use of synthetic coatings on ferrous bodies and parts shall be subject to approval by the purchaser. This approval applies not only to the specific use but also to the coating and application process.

The protective coating shall be composed of materials referenced in ANSI/AWWA C213, ANSI/AWWA C550, or other materials acceptable for use with

* The Safe Drinking Water Act limits the lead content in pipe and pipe fittings to a maximum 8 percent lead.

† See Sec. I.C in the foreword for additional guidance.

‡ Unified numbering system as described in ASTM E527.

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potable water.* The manufacturer shall provide documentation verifying compliance with the applicable standard when requested.

Materials used in the construction of meter and strainer main cases shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 105°F (40°C) and shall not permanently warp or deform when exposed to temperatures up to 150°F (66°C) for 1 hr.

4.1.2.1 Strainer screen. If an external mainline strainer is provided, the screen shall be made of stainless steel in accordance with ASTM A240 or copper alloy containing not less than 85 percent copper, such as UNS C83600 or a similar copper alloy as listed in ASTM B584.

4.1.3 *Register-box rings and covers.* Register-box rings and covers shall be made of a copper alloy containing not less than 57 percent copper, such as UNS 85800 or a similar copper alloy as listed in ASTM B176, or of a suitable engineering plastic, such as polycarbonate (PC) in accordance with ASTM D3935 or propylene in accordance with ASTM D4101.

Materials used in the construction of register-box rings and lids shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 105°F (40°C) and shall not permanently warp or deform when exposed to temperatures up to 150°F (66°) for 1 hr.

4.1.4 *Measuring cages.* Measuring cages shall be made of a copper alloy containing not less than 85 percent copper, such as UNS C83600 or a similar copper alloy as listed in ASTM B584; or of a suitable engineering plastic, such as polyphenylene ether (PPE) in accordance with ASTM D4349; or of cast iron in accordance with ASTM A126 or fabricated steel protected by a corrosion-resistant coating; or have other corrosion-resistant treatment as required by the purchaser.

Measuring cages shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 80°F (27°C) and shall not warp or deform when exposed to operating temperatures of 100°F (38°C).

4.1.5 *Measuring turbines.* Turbines shall be made of a suitable engineering plastic, such as styrene-acrylonitrile (SAN) in accordance with ASTM D4203 or propylene in accordance with ASTM D4101, so that the specific gravity approximately equals that of water. Turbines shall have sufficient dimensional stability to retain working dimensions at working temperatures up to 80°F (27°C) and shall not warp or deform when exposed to operating temperatures of 100°F (38°C).

* See Sec. I.C in the foreword for additional guidance.

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4.1.6 *Turbine spindles.* Turbine spindles shall be made of phosphor bronze; stainless steel in accordance with ASTM A580 or ASTM A276 (austenitic); tungsten carbide; ceramic; or other suitable corrosion-resistant material.

Turbine spindles shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 80°F (27°C) and shall not warp or deform when exposed to operating temperatures of 100°F (38°C).

4.1.7 *Gear trains.* Gear trains exposed to water shall be made of a copper alloy containing not less than 85 percent copper; or stainless steel in accordance with ASTM A580, ASTM A276 (austenitic), or ASTM A269 (austenitic); other suitable corrosion-resistant metals; ceramic; or of a suitable engineering plastic, such as polyphenylene ether in accordance with ASTM D4349, nylon in accordance with ASTM D4066, or acetal in accordance with ASTM D4181. If not to be exposed to water, gear trains may also be made of other suitable materials.

Gear trains shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 80°F (27°C) and shall not warp or deform when exposed to operating temperatures of 100°F (38°C).

4.1.8 *External fasteners (casing bolts, nuts, screws, and washers).* Casing bolts, nuts, screws, and washers shall be made of a copper alloy containing not less than 57 percent copper; or stainless steel, such as ASTM A580 or ASTM A276 (austenitic); or of steel treated to resist corrosion by a process to be accepted by the purchaser. Fasteners for nonpressure assemblies may be made of a suitably engineered plastic.

4.1.9 *Coupling tailpieces and nuts.* Coupling tailpieces and nuts shall be made of a copper alloy containing not less than 75 percent copper, such as UNS C84400 or UNS C83600 or a similar copper alloy as listed in ASTM B584.

4.1.10 *Companion flanges.* Companion flanges shall be made of cast iron, such as those listed in ASTM A48, ASTM A126, ASTM A276 or ASTM A536; or, when required by the purchaser, of a copper alloy containing not less than 75 percent copper, such as alloys UNS C84400, UNS C83600, or UNS C89520, or a similar copper alloy as listed in ASTM B584.

Sec. 4.2 General Design

4.2.1 *Size.* The nominal sizes of meters (see Table 1) shall be the same as the nominal sizes of the casing connections.

4.2.2 *Capacity.* The nominal capacity ratings and the related pressure-loss limits shall be the same as those shown in Table 1 for the safe maximum operating capacities.

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Table 1 Operating Characteristics

Nominal Meter Size		Safe Maximum Operating Capacity*		Maximum Rate for Continuous Duty		Maximum Loss of Head at Safe Maximum Operating Capacity†		Normal Test-Flow Limits	
in.	*(mm)*	*gpm*	*(m^3/h)*	*gpm*	*(m^3/h)*	*psi*	*(kPa)*	*gpm*	*(m^3/h)*
Class I—Vertical-Shaft Type									
3/4	(20)	30	(7)	20	(5)	15	(103)	1.5–30	(0.3–7.0)
1	(25)	50	(11)	35	(8)	15	(103)	2–50	(0.5–11.0)
1½	(40)	100	(23)	65	(15)	15	(103)	3–100	(0.7–23.0)
2	(50)	160	(36)	100	(23)	15	(103)	4–160	(0.9–36.0)
3	(80)	350	(80)	220	(50)	15	(103)	6–350	(1.4–79.0)
4	(100)	630	(140)	420	(96)	15	(103)	8–630	(1.8–140.0)
6	(150)	1,300	(290)	865	(200)	15	(103)	15–1,300	(3.4–290.0)
Class II—In-Line (High-Velocity) Type									
1½	(40)	120	(27)	90	(20)	7	(48)	4–120	(0.9–27.0)
2	(50)	190	(43)	160	(36)	7	(48)	4–190	(0.9–43.0)
3	(80)	435	(99)	350	(80)	7	(48)	8–435	(1.8–99.0)
4	(100)	750	(170)	650	(150)	7	(48)	15–750	(3.4–170.0)
6	(150)	1,600	(360)	1,400	(320)	7	(48)	30–1,600	(6.8–360.0)
8	(200)	2,800	(640)	2,400	(550)	7	(48)	50–2,800	(11.0–640.0)
10	(250)	4,200	(950)	3,500	(790)	7	(48)	75–4,200	(17.0–950.0)
12	(300)	5,300	(1,200)	4,400	(1,000)	7	(48)	120–5,300	(27.0–1,200.0)
16	(400)	7,800	(1,770)	6,500	(1,470)	7	(48)	200–7,800	(45.0–1,770.0)
20	(500)	12,000	(2,730)	10,000	(2,270)	7	(48)	300–12,000	(68.0–2,730.0)

*Safe Maximum Operating Capacity is the maximum flow rate for intermittent service and should not exceed 33 percent usage (8 hr/day).

†Does not include strainer, which may be required in some applications. Maximum head loss listed for class II meters is at Maximum Rate for Continuous Duty.

4.2.3 *Length, width, and height.* Maximum overall meter length, face to face of spuds or flanges, shall not be greater than shown in Table 2. A filler piece may be used to increase the length of a shorter meter to meet this requirement. Meter width and height shall not be greater than shown in Table 2. The distance from the centerline of the meter outlet to the lowest point on the meter bottom shall not be greater than shown in Table 2.

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Table 2 Meter dimensions for class I and class II turbine-type meters

Maximum Dimensions									
Meter Size		Length*		Width		Height		Centerline of Outlets to Base	
in.	*(mm)*	*in.*	*(mm)*	*in.*	*(mm)*	*in.*	*(mm)*	*in.*	*(mm)*
3/4 (screw NPSM)	(20)	9	(229)	3 3/4	(95)	5	(127)	11 3/16	(46)
1 (screw)	(25)	10 3/4	(273)	4 1/4	(108)	5 1/2	(140)	2 3/8	(60)
1 1/2 (screw)	(40)	12 3/4	(324)	9	(229)	17	(432)	6 1/2	(165)
1 1/2 (flange)	(40)	13	(330)	9	(229)	17	(432)	6 1/2	(165)
2 (screw)	(50)	15 1/2	(394)	9 1/2	(241)	20	(508)	8 1/2	(216)
2 (flange)	(50)	17	(432)	9 1/2	(241)	20	(508)	8 1/2	(216)
3	(80)	24	(607)	14	(356)	28	(711)	13 1/2	(343)
4	(100)	29	(737)	15 1/2	(394)	28	(711)	14	(356)
6	(150)	36 1/2	(927)	21	(533)	31	(787)	15 1/2	(394)
8	(200)	43 3/4	(1,111)	27 1/2	(699)	31	(787)	16	(406)
10	(250)	60	(1,524)	29	(737)	35	(889)	20 1/2	(521)
12	(300)	68	(1,727)	31	(787)	42	(1,067)	21	(533)
16	(400)	30	(762)	23 1/2	(597)	28	(711)	12 1/2	(318)
20	(500)	32	(812)	29	(737)	32	(812)	14 1/2	(368)

*For meters 2 in. and less, the meter lengths are nominal lengths.

4.2.4 *Test plugs.* The test plug is optional for the manufacturer. Test plugs provide a means to obtain water pressure readings and an approximation of lower flow rate meter accuracy.

4.2.5 *Pressure requirement.* Meters supplied according to this standard shall operate without leakage or damage to any part when operated continuously at a working pressure of 150 psi (1,050 kPa).

4.2.6 *Accessibility.* Meters shall be designed for easy removal of interior parts without disturbing the connections to the pipeline. Straightening vanes need not be removable while the meter case is still connected in line.

4.2.7 *Registration accuracy.* Meters shall meet the following requirements for accuracy with water at a temperature less than 80°F (27°C).

4.2.7.1 Class I. Class I meters shall register not less than 98 percent and not more than 102 percent of the water that actually passes through at any rate of flow within the normal test flow limits stated in Table 1.

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4.2.7.2 Class II. Class II meters shall register not less than 98.5 percent and not more than 101.5 percent of the water that actually passes through at any rate of flow within the normal test flow limits stated in Table 1.

Sec. 4.3 Detailed Design

4.3.1 *Main case.* Meters shall have an outer case with a separate, removable measuring chamber or cage in which the turbine operates. Castings shall not be repaired in any manner. The inlet and outlet shall have a common axis. Connection flanges shall be parallel.

4.3.2 *External-case screws, bolts, nuts, and washers.* External screws, bolts, cap bolts, nuts, and washers shall be designed for easy removal after long service.

4.3.3 *Main-case connections.*

4.3.3.1 ¾-in. (20-mm) and 1-in. (25-mm) meters. Main case connections for ¾-in. (20-mm) and 1-in. (25-mm) meters shall be spuds having NPSM screwed ends on both ends unless otherwise specified by the purchaser.

4.3.3.2 ½-in. (40-mm) and 2-in. (50-mm) meters. Main-case connections for 1½-in. (40-mm) and 2-in. (50-mm) meters shall be either spuds on both ends or flanges on both ends, as specified by the purchaser.

4.3.3.2.1 Meter spuds shall be tapped 1½ in. (40 mm) and 2 in. (50 mm), as required, with ASME B1.20.1 internal-taper pipe thread.

4.3.3.2.2 Flanged connections shall be faced and drilled and shall be of the round or oval type, as specified by the purchaser. The number of bolt holes and the diameter of the bolt holes and bolt circle shall be as stated in Table 3. Flange faces shall be parallel, and the inlet and outlet shall have a common axis.

4.3.3.2.3 Meter couplings (tailpieces) shall be provided if specified by the purchaser.

4.3.3.3 3- (80-) through 20- (500-) in. (mm) meters. Main-case connections for 3- (80-), 4- (100-), 6- (150-), 8- (200-), 10- (250-), 12- (300-), 16- (400-), and 20- (500-) in. (mm) meters shall be flanges. The flanges shall be of the round type, faced and drilled, and shall conform to ASME B16.1 cast-iron pipe flange, class 125; ANSI/AWWA C207, steel plate flange, class D; or ASME B16.24 bronze pipe flange class 150. (ANSI/AWWA C115/A21.15 flanges also match class 125 ASME B16.1 flanges.) See Table 3 for diameter and drilling.

4.3.4 *Companion flanges.*

4.3.4.1 1½- (40-) and 2- (50-) in. (mm) meters. Companion flanges shall be faced, drilled, and tapped, 1½ in. (40 mm) or 2 in. (50 mm), as required, with ASME B1.20.1 internal-taper pipe thread.

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Table 3 Meter connections—companion flange dimensions

Meter Size		Meter Coupling Tailpiece Length		Bolt Hole Circle Diameter		Number of Bolt Holes	Bolt Hole Diameter		Minimum Thickness			
									At Bolt Hole		At Hub	
in.	*(mm)*	*in.*	*(mm)*	*in.*	*(mm)*		*in.*	*(mm)*	*in.*	*(mm)*	*in.*	*(mm)*
¾	(20)	2½	(63)	—	—	—	—	—	—	—	—	—
1	(25)	2⅝	(67)	—	—	—	—	—	—	—	—	—
1½ (flanged oval)	(40)	—	—	4	(102)	2	11/16	(17)	9/16	(14)	13/16	(21)
1½ (screw)	(40)	2⅞	(73)	—	—	—	—	—	—	—	—	—
2 (flanged oval)	(50)	—	—	4½	(114)	2	¾	(19)	⅝	(16)	⅞	(22)
2 (flanged round)	(50)	—	—	4¾	(121)	4	¾	(19)	*	*	*	*
2 (screw)	(50)	3	(76)	—	—	—	—	—	—	—	—	—
3	(80)	—	—	6	(152)	4	¾	(19)	*	*	*	*
4	(100)	—	—	7½	(190)	8	¾	(19)	*	*	*	*
6	(150)	—	—	9½	(241)	8	⅞	(22)	*	*	*	*
8	(200)	—	—	11¾	(298)	8	⅞	(22)	*	*	*	*
10	(250)	—	—	14¼	(362)	12	1	(25)	*	*	*	*
12	(300)	—	—	17	(432)	12	1	(25)	*	*	*	*
16	(400)	—	—	21¼	(540)	16	1⅛	(29)	*	*	*	*
20	(500)	—	—	25	(635)	20	1¼	(32)	*	*	*	*

*Per ASME B16.1, cast-iron pipe flange; ANSI/AWWA C207, steel plate flange; or ASME B16.24, bronze pipe flange.

4.3.4.2 3- (80-), 4- (100-), 6- (150-), 8- (200-), 10- (250-), 12- (300-), 16- (400-), and 20- (500-) in. (mm) meters. Companion flanges shall be faced, drilled, and tapped with ASME B1.20.1 cast-iron pipe thread and shall conform to ASME B16.1 cast-iron pipe flange, class 125; or ANSI/AWWA C207, steel plate flange, class D.

4.3.5 *Registers.* Registers shall be straight-reading, either permanently sealed by the manufacturer or open, and shall read in US gallons, cubic feet, or cubic meters, as specified by the purchaser. The register mechanism shall not be in contact with the water that is being measured. As specified by the purchaser, the register shall be a mechanical display-type register or an electronic display-type register.

4.3.5.1 Mechanical display-type registers. If a mechanical display-type register is provided, the register shall meet the following requirements.

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Table 4 Maximum indication on initial dial and minimum register capacity

Meter size		Maximum Allowable Indication on Initial Dial			Minimum Allowable Capacity of Register (millions)		
in.	*(mm)*	ft^3	*gal*	m^3	ft^3	*gal*	m^3
3/4	(20)	1	10	1	1	10	0.01
1	(25)	1	10	1	1	10	0.01
1 1/2	(40)	10	100	1	10	100	0.10
2	(50)	10	100	1	10	100	0.10
3	(80)	10	100	1	10	100	0.10
4	(100)	100	1,000	10	10	100	1.00
6	(150)	100	1,000	10	100	1,000	1.00
8	(200)	1,000	10,000	100	100	1,000	10.00
10	(250)	1,000	10,000	100	1,000	1,000	10.00
12	(300)	1,000	10,000	100	1,000	10,000	10.00
16	(400)	10,000	100,000	100	1,000	10,000	10.00
20	(500)	10,000	100,000	100	1,000	10,000	10.00

4.3.5.1.1 The numerals on the odometer wheels shall not be less than 5/32 in. (4 mm) in height and should be readable at a 45° angle from the vertical.

4.3.5.1.2 If the register is permanently sealed, gears and pinions shall run free on fixed shafts or shall be fixed on shafts that run free in the register frame, register plates, or both, and they shall be constructed so that they cannot become unmeshed. Pinions may operate between odometer wheels mounted on partition plates.

4.3.5.1.3 The maximum indication of digits appearing on the first odometer wheel and the minimum capacity of the register shall conform to Table 4.

4.3.5.1.4 Standard straight-reading registers. Direct-reading meters shall be equipped with a straight-reading register containing an odometer and a test circle with a sweep test hand, prominently displayed on the dial face of the register and graduated in 100 equal parts, each tenth graduation numbered to enable the meter to be tested in accordance with AWWA Manual M6.* Register construction shall conform to all applicable requirements of Sec. 4.3.5.

4.3.5.2 Electronic display registers. If an electronic display register is provided, the register shall meet the following requirements:

* *Water Meters—Selection, Installation, Testing, and Maintenance.* AWWA Manual M6. AWWA, Denver, Colo.

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4.3.5.2.1 The electronic display register digits shall not be less than 5/32 in. (4 mm) in height and shall be readable at a 45° angle from the vertical position.

4.3.5.2.2 For the purposes of meter testing, the electronic display register shall be capable of directly displaying 1/1000 of the value listed in the initial dial in Table 4.

4.3.5.2.3 The totalized consumption shall be displayed with leading zeros so that all digits capable of displaying are readable.

4.3.5.2.4 The delimiter in the totalized display shall be in the form of a period (.) or comma (,).

4.3.5.2.5 The electronic display register shall clearly distinguish digits used for customary billing units.

4.3.5.2.6 The electronic display register shall be straight reading and shall read in US gallons, cubic feet, or cubic meters, as required by the purchaser.

4.3.5.2.7 The electronic display register shall be permanently sealed so that moisture does not impede the register's operation and readability.

4.3.5.2.8 If a battery is used as the primary power source, the electronic display register shall provide indication of low battery voltage and shall be designed to provide at least 180 days of useful life from the initial low-battery voltage indication to the end of the battery's life.

4.3.5.2.9 If rate of flow is part of the register's functionality, the electronic display register shall meet the following additional requirements:

4.3.5.2.9.1 The display shall be capable of automatically toggling between totalized flow and flow rate if the same digits are used.

4.3.5.2.9.2 The display shall have indication to clearly designate when the display is in rate mode.

4.3.5.2.9.3 The display shall be capable of providing flow rate information—volume (US gallons, cubic feet, or cubic meters) per unit time (per second, per minute, or per hour)—in the purchaser's preferred units of measurement, as required by the purchaser.

4.3.5.2.10 Other alarm indicators, such as "reverse flow," "backflow," "flow direction," or "leak," may be displayed as required by the purchaser.

4.3.6 *Register boxes.* The lid shall be recessed and shall overlap the register box to protect the lens. The lens shall be securely held in place. Compartments of meters that have stuffing boxes exposed to the atmosphere shall be provided with 1/8-in. (3.2-mm) diameter drain holes. When a meter is equipped with a remote register, the register-box lid may be omitted. Provision shall be made to adapt

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encoder-type registers in accordance with ANSI/AWWA C707 or direct-reading remote-type registers in accordance with ANSI/AWWA C706, if these registers are specified by the purchaser.

4.3.7 *Gear trains.* Gear trains may be mounted on the measuring chamber or cage or in the main casing. When not exposed to water, they may be combined with or adjacent to the register gearing. Gear trains located in the line of flow shall be of the oil-enclosed type or shall be constructed of self-lubricating materials. They shall have separate housings or shall form housings with the main casing or measuring chamber and shall operate in a suitable lubricant.

4.3.8 *Measuring chambers or cages.* The measuring chambers or cages shall be self-contained units, firmly seated and easily detached and removed from the main case. Chambers or cages with turbines that have revolving spindles shall have removable bearings. Chambers or cages with stationary spindles, on which the turbine revolves, shall have rigid, centrally located fastenings for the spindles and bushings or the bearings shall be replaceable.

4.3.9 *Strainers.* Meters may be provided with strainers. Strainers, if provided, shall incorporate screen elements that are rigid, easily removable, and have an effective straining area at least double that of the meter main-case inlets.

4.3.10 *Tamper-resistant features.* Register-box screws, locking pins, main-case top, adjustment vanes, and inlet and outlet coupling nuts, if provided, shall be equipped with tamper-resistant features. If drilled for seal wires, seal-wire holes shall not be less than 3/32 in. (2.4 mm) in diameter.

SECTION 5: VERIFICATION

Sec. 5.1 Basis for Rejection

Meters that do not comply with the requirements of this standard and the purchaser's documents shall be rejected. The manufacturer shall replace or satisfactorily correct meters rejected for failure to comply with this standard.

SECTION 6: DELIVERY

Sec. 6.1 Marking

The size, model, and direction of flow through the meter shall be cast on the outer case. When specified by the purchaser, the meter serial number shall be

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permanently indicated on the external surface of the meter. When specified by the purchaser, the meter serial number shall be permanently indicated on the upper main case cover of the meter. Meters that conform to class II shall have this designation permanently indicated on the external surface of the meter.

6.1.1 *Register boxes.* The name of the manufacturer shall be permanently marked on the lid of the register box. The serial number of the meter shall be imprinted on the lid. If the lid is omitted because the meter is equipped with a remote register, the serial number and name of the manufacturer shall be imprinted on the upper main-case cover.

Sec. 6.2 Packaging and Shipping

This standard has no applicable information for this section.

Sec. 6.3 Affidavit of Compliance

The purchaser may require an affidavit from the manufacturer or supplier that the meters provided comply with all applicable requirements of this standard.

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APPENDIX A

Supplemental Information

This appendix is for information only and is not a part of ANSI/AWWA C701.

SECTION A.1: UNITS OF MEASURE

The majority of water meters currently in service in the United States register in either US gallons or cubic feet. With the availability of the metric system, the user may select from three units of measure—US gallons, cubic feet, or cubic meters.

SECTION A.2: REGISTER TYPES

Water-meter registers must be of the straight-reading (odometer) type on new meters. Although the round-reading register is no longer manufactured, many are still in use throughout the United States in various water utilities' systems.

The round-reading register is more often misread than the straight-reading register, and the problem is further complicated if more than one make of meter is used in a single water system. It is also more difficult to print postcards for customers to record meter readings when two or more makes of meters with round-reading registers are used. It is recommended that the straight-reading (odometer) type of register be adopted as standard to eliminate these difficulties.

SECTION A.3: TESTS

Sec. A.3.1 Capacity and Pressure-Loss Tests

Capacity tests are tests of the meter design. Once a meter of each size of a given design has been tested for pressure loss at safe maximum operating capacity, it should not be necessary to test others of the same design. If a strainer is included in the meter assembly, care should be taken to account for additional pressure loss through the strainer, which is in addition to the pressure loss through the meter.

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The pressure loss should be determined using two identical piezometer rings of the same diameter as the nominal size of the meter being tested. The piezometer rings must be free from any burrs where the holes are drilled through the wall of the ring. No fewer than four holes should be provided, drilled in pairs on diameters at right angles to each other. The inlet ring should be set close to the meter at a distance of eight diameters or more below the nearest upstream stop valve or fitting. The outlet ring should be placed at a distance of 8–10 diameters from the outlet of the meter. The diameter of the inlet and outlet pipe should be the same as the nominal size of the meter to be tested. The rings are to be connected to a suitable differential pressure cell or manometer with measurement capability of 0.1 psi (0.7 kPa). If a manometer is used, provisions should be made for the complete removal of air from the apparatus, and the installation should be such that air will rise to the air outlets.

Provisions must be made for traps to prevent accidental expulsion of mercury into the test line when using mercury manometers. If measurements of U-tube manometers are to be made at relatively high flow rates, it is necessary to read both sides of the manometer column simultaneously to avoid errors caused by fluctuations. Other appropriate types of manometers may be used. The pressure loss of inlet and outlet piping from meter to piezometer rings shall be deducted in determining meter pressure loss.

Sec. A.3.2 Pressure Tests

A pressure test should be made on each size of a particular design of meter provided. The test pressure should be 300 psi (2,100 kPa) static, which may be produced using a hand pump or any other available device. The meter should be tested for accuracy before and after it has been pressure tested to determine whether there has been any distortion that could affect the registration. If satisfactory results are obtained, it is unnecessary to make more than one pressure test on each size of a given design of meter.

Sec. A.3.3 Accuracy Tests

Meters should be tested for accuracy of registration at flow rates and test-flow quantities in accordance with AWWA Manual M6. If the purchaser does not have suitable means for testing, the manufacturer should be requested to provide a certificate showing that each meter has been tested for accuracy of registration and that each meter complies with the accuracy and capacity requirements of ANSI/AWWA C701 when tested in accordance with AWWA Manual M6.

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SECTION A.4: TESTING EQUIPMENT

The measuring device that is used to determine the amount of water discharged when testing should be designed to provide measuring accuracy to within 0.25 percent of the actual quantity. Tanks and scales should be tested and recalibrated at least once a year, and records of these tests and calibrations should be kept. The master meter used when field testing should be tested and calibrated periodically (3–6 months) to ensure accurate measurements. The meter should be capped and handled with care when not in use.

SECTION A.5: REGISTRATION ACCURACY

In a turbine meter, the motion of the turbine is transmitted to the register by a system of gearing, which records the flow in convenient units of measurement. The gearing translates the motion of the turbine into the unit of measurement indicated by the register. The registration is, therefore, directly dependent on the number of revolutions of the turbine. The registration is a true measure of flow only when the meter has been properly calibrated. After proper calibration, the meter will continue to register correctly only as long as the turbine continues to make the proper number of cycles for each unit of quantity that passes through the meter. If any condition develops whereby the turbine is compelled to make fewer than the proper number of cycles per unit of quantity passed through the meter, the meter will underregister. If it is compelled to make more than the proper number of cycles, it will overregister. Under ordinary working conditions, several factors may cause inaccurate registration after comparatively short intervals. The more important of these are excessive wear, extreme temperatures, corrosion, improper installation, materials in suspension, and the presence of entrained air in the lines.

Sec. A.5.1 Excessive Wear

To avoid excessive wear, the meter should be set in a horizontal position, be provided with proper flow conditioning in accordance with the manufacturer's recommendations, and be sized large enough for the water demand so that it is not run at excessive speeds. The results of excessive wear of the turbine or measuring chamber are slippage and underregistration. Excessive wear of the gear train may cause the gears to slip or bind. In either case, if the meter does not stop

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entirely, underregistration will result. The safe maximum operating capacities given in Table 1 of ANSI/AWWA C701 are the maximum rates of flow at which water should pass through the meter for only short periods of time at infrequent intervals. Maximum flow rates, if continuous, could be destructive to the meter. For continuous 24-hr service, meters of the turbine type should not be operated at flows greater than those shown in column 3, Table 1, ANSI/AWWA C701.

Sec. A.5.2 Temperature Extremes

Cold-water meters are not affected by temperatures up to 80°F (27°C). For temperatures higher than 80°F (27°C), meters with slightly larger clearances than usual should be used, and the accuracy limits stated in Sec. 4.2.7 of ANSI/AWWA C701 may have to be modified. High temperatures can cause expansion of a turbine and create unusual friction or bind the turbine in its chamber. The result is slippage and underregistration or complete stoppage of the meter. Lower temperatures have no noticeable effect on the working parts of the meter unless the water freezes, which may cause damage to the meter. To avoid problems caused by temperature extremes, meters should be located where they are protected from heat and freezing.

If the authority having jurisdiction so requires, at locations where hot water from heating systems is not allowed to expand back through the meter, a backflow-prevention device consistent with the degree of hazard and a pressure- and temperature-relief valve should be installed sufficiently downstream of the meter.

Sec. A.5.3 Corrosion

Metals used in the construction of a meter are affected by the corrosive action of water, although the action is very slow with most potable waters. It should be recognized, however, that when meters are used in highly aggressive waters, it may be necessary to use materials that are more resistant to corrosive attack. The solution to the corrosion problem requires a high degree of experience and knowledge, and the manufacturer should be consulted for assistance.

Sec. A.5.4 Improper Installation

Turbine-meter registration accuracy can be ensured only when the meter has been properly installed and calibrated in accordance with the manufacturer's recommendations, AWWA Manual M6, or both. Accuracy of registration and longevity of turbine meters depends on a swirl-free, uniform flow-velocity profile both upstream and downstream of the meter (see AWWA Manual M6).

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Sec. A.5.5 Materials in Suspension

Foreign material carried in suspension has a tendency to fill the space between the turbine vanes and cause overregistration. Such overregistration is not limited to turbine-type meters. Meters provided with strainers will retain the larger particles in suspension, but the strainer will soon become clogged if the water is not kept reasonably free of suspended matter. A partially clogged strainer can cause uneven flow distribution through the meter, resulting in error of registration. Sand is especially destructive, and care should be exercised to keep sand from reaching meters.

Sec. A.5.6 Entrained Air

Water meters described in this standard will record the presence of entrained air in the lines as inaccurate registration; this inaccuracy may result in a substantial overregistration in certain circumstances. In addition, entrained air can cause meter damage and premature wear; precautions should be taken to either eliminate or minimize this condition.

SECTION A.6: PERIODIC TESTS

Meters properly selected as to size and type will give satisfactory service over a long period of time without attention only if operated under ideal conditions. Under ordinary conditions, meters must be given some care if they are to function properly. In most cases, it is impossible to ascertain without actual testing whether a meter in service is registering with the required degree of accuracy. Consequently, to ensure reliable meter measurements, it is essential that all meters be subjected to periodic tests. The interval between tests and the method of conducting them must be governed largely by local conditions. Many state regulatory commissions specify intervals between tests on the basis of time or quantity. Under average conditions, the intervals between tests should not exceed the limits stated in Table A.1.

SECTION A.7: METER STORAGE

Meters should be stored in a location that is not subject to unduly high or low temperatures. If meters are stored outdoors for an extended period of time, they should be covered to protect them from direct sunlight.

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Table A.1 Average recommended intervals between meter tests

Meter Size		Years Between Tests
in.	*(mm)*	
3/4	(20)	5
1	(25)	5
1½	(40)	4
2	(50)	4
3	(80)	3
4	(100)	2
6	(150)	1
8	(200)	1
10	(250)	1
12	(300)	1
16	(400)	1
20	(500)	1

SECTION A.8: INSTALLATION

Instruction manuals supplied by the manufacturer should be reviewed in detail before installation of meters. It is recommended that new service lines be flushed prior to installing the water meter. A spool piece the length of the meter to be installed should be used in place of the installed meter when flushing. An old meter with the measuring element removed could be used in place of the spool piece.

Sec. A.8.1 Electrical Grounded Pipe Systems

"AWWA opposes the systematic interchange of stray electric current between electrical distribution systems and water distribution systems, as well as the use of the water pipe system as an essential part of any electrical system. AWWA does not object, however, to the connection of all interior piping of a building to the electrical service neutral and to a separate grounding electrode, provided that such interior pipe systems and grounding connections are electrically isolated from the water utility pipe system."* At the time this edition of ANSI/AWWA C701 was

* Statement of Policy on Public Water Supply Matters: Grounding of Electrical Circuits on Water Pipe. American Water Works Association, Denver, Colo. (2009).

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published, the latest revision to the policy statement of AWWA on the grounding of electrical circuits to water pipes had been adopted on Jan. 25, 2009. However, it must be recognized that many pipe systems continue to be used as a grounding electrode system.

Section 260-81 (A) of the National Electrical Code (NEC) requires that "continuity of the grounding path or bonding connection to interior piping shall not rely on water meters."* Most utilities require a permanent conductive meter setting or a grounding strapping around meters to prevent accidents to workers changing meters. Meters should be installed in a permanent metallic meter setter or provided with permanently grounded strapping. This is especially important in the case of plastic main cases or plastic meter couplings, which are nonconductors of electricity.

Sec. A.8.2 Misaligned Pipes

Meters should be set in a horizontal position, protected from freezing, damage, and tampering. The line opening, between inlet and outlet valves and other appurtenances, in which the meter is to be set should be large enough to accommodate the laying length of the meter, coupling gaskets, strainer (if installed), and straight piping necessary for proper flow conditioning both upstream and downstream of the meter. (See AWWA Manual M6 regarding class I or class II turbine-meter installations for a detailed discussion of turbine-meter installation considerations.) The meter should not be used to straighten misaligned pipes because of the potential for damage to the meter. Proper alignment of piping during installation and prior to the meter installation can be facilitated by the use of a spool piece of the proper length.

Sec. A.8.3 Placing Meter in Service

After the service line has been thoroughly flushed and the meter installation completed, filling the service line and meter with water should be accomplished by slowly opening the inlet valves and allowing entrapped air to be released slowly at the highest point available. Rapid expulsion of large slugs of entrained air should be avoided because of possible damage to the meter's internal measuring mechanism.

* Available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

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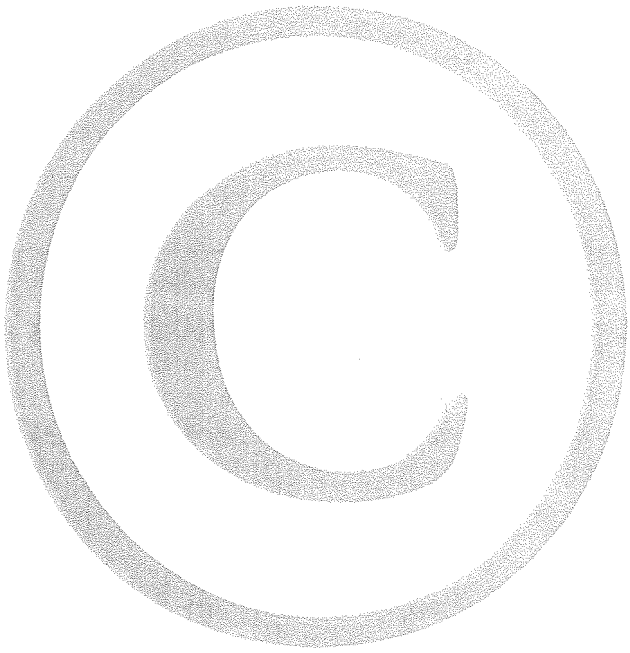

AWWA is the authoritative resource for knowledge, information, and advocacy to improve the quality and supply of water in North America and beyond. AWWA is the largest organization of water professionals in the world. AWWA advances public health, safety, and welfare by uniting the efforts of the full spectrum of the entire water community. Through our collective strength, we become better stewards of water for the greatest good of people and the environment.

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ATTACHMENT D

RATES AND SAMPLE BILLS:

D.1 BVWD Schedule of Bimonthly Water Rates
D.2 Sample Bill: Residential/Commercial/Rural/Institutional Customers
D.3 Sample Bill: Agricultural Customer
D.4 Screenshot: Customer Account Information Available Online

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ATTACHMENT D.1

BELLA VISTA WATER DISTRICT
SCHEDULE OF BIMONTHLY WATER RATES

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BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY
REDDING, CA 96003
(530) 241-1085 ♦ (530) 241-8354
www.bvwd.org

SCHEDULE OF BIMONTHLY WATER RATES
TIERED BLOCK WATER PRICING PROGRAM

MUNICIPAL & INDUSTRIAL WATER

Residential / Rural / Commercial / Public Institutional Base Rates

5/8" Meter	$33.79
3/4	$35.71
1.0	$39.76
1.5	$47.65
2.0	$55.54
3.0	$71.43
4.0	$87.31
6.0	$118.97
8.0	$150.62
10.0	$182.40

Residential / Commercial Usage Tiers

Tier 1: 0 – 175 HCF	$.465 per HCF (hundred cubic feet)
Tier 2: 175 – 245 HCF	$.558
Tier 3: > 245 HCF	$.651

Rural UsageTiers (Per acre of land)

Tier 1: 0 – 871 HCF	$.465 per HCF (hundred cubic feet)
Tier 2: 871 – 1307 HCF	$.558
Tier 3: > 1307 HCF	$.651

Public Insitutional Usage Tiers (Per acre of land)

Tier 1: 0 – 871 HCF	$.465 per HCF (hundred cubic feet)
Tier 2: 871 – 1307 HCF	$.558
Tier 3: > 1307 HCF	$.651

Water Treatment Plant Improvement Loan Repayment

$14.00 bimonthly for all customers.

Note: Rural rates require a 1.0 inch meter or larger.

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY
REDDING, CA 96003
(530) 241-1085 ♦ (530) 241-8354
www.bvwd.org

SCHEDULE OF BIMONTHLY WATER RATES
TIERED BLOCK WATER PRICING PROGRAM

IRRIGATION WATER

Agricultural and Aquaculture Base Rates

1.0" Meter	$58.31
1.5	$66.20
2.0	$74.19
3.0	$89.97
4.0	$105.85
6.0	$137.52
8.0	$169.28

Agricultural Usage Tiers (Per acre of land)

Tier 1: 0 – 2.5 acre feet/acre	$39.21 per acre foot
Tier 2: 2.5 – 3.50 acre feet/acre	$47.05
Tier 3: > 3.50 acre feet/acre	$54.89

Aquaculture Usage Tiers (Per acre of land)

Tier 1: 0 – 6.25 acre feet/acre	$39.21 per acre foot
Tier 2: 6.25 – 8.75 acre feet/acre	$47.05
Tier 3: > 8.75 acre feet/acre	$54.89

Water Treatment Plant Improvement Loan Repayment

$14.00 bimonthly for all customers.

NDU Credit

Agricultural and aquaculture accounts that have no domestic use will receive a $4.00 bimonthly base charge reduction referred to as a NDU credit.

Note: Agricultural and aquaculture rates require a 1.0 inch meter or larger.

WATER EQUIVALENTS TABLE

1 Cubic Foot = 7.48 gallons	=	62.4 pounds of water
1 Acre Foot = 43,560 cubic feet	=	325,900 gallons

An acre foot covers (1) foot of land (1) foot deep

1 cubic foot per second (cfs) = 450 gallons per minute/646,320 gallons per day

For 24 hours	=	1.983 acre feet
For 30 days	=	59.5 acre feet
For one year	=	724 acre feet

PROCEDURE FOR METER READING

If register lens is dirty, a light wipe with a damp cloth will clear lens for an accurate reading. Always remember to close the register cover after reading meter to avoid exposure to cracking or scratching of lens.

One of the most important factors in a correct reading is to note the proper number of digits. Read the meter register from left to right.

EXAMPLE OF A CUBIC FOOT METER:

Low Flow Indicator, aka Leak Indicator

This small dial will rotate if water is passing through the meter. It is an indication of very small flows that would be visually undetectable on the regular sweep hand. If no one is using water, but the dial is turning, you may have an undiscovered leak in your plumbing system.

Sweep Hand

On This meter, one rotation of the sweep hand is equal to one cubic foot or 7.48 gallons

Cubic Foot Odometer

Usually, the last numbers (in black) on the odometer are non-rotating or printed. For every 100 rotations of the sweep hand, the white digits on the odometer will increase by one to reflect 100 cubic feet of water use (748 gallons)

BILLING: The water meter will be read as nearly as possible on the same day every two (2) months. You will be billed for water service bimonthly. The bills are due and payable on the date of receipt and become delinquent twenty-two (22) days thereafter. Payments can be made to the District office by mail, in person, or online at: http://epay.bvwd.org

OFFICE HOURS: The district office is open from 8:00 a.m. to 5:00 p.m., Monday through Thursday, and 8:00 a.m. to 4:00 p.m. on Fridays, except holidays. For after-hour emergencies, there is an answering service on duty for your needs.

ATTACHMENT D.2

SAMPLE BILL:

RESIDENTIAL, COMMERCIAL, RURAL &
PUBLIC/INSTITUTIONAL CUSTOMERS

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How Do I Read My Residential, Rural, Commercial or Public Institutional Water Bill?

1

BELLA VISTA WATER DISTRICT
11368 E. STILLWATER WAY • REDDING, CA 96003-9510
(530) 241-1085 • FAX (530) 241-8354

PLEASE RETURN THIS STUB WITH PAYMENT

2 DUE DATE	AMOUNT DUE BY DUE DATE 3
8/01/2012	109.79
ACCOUNT NUMBER	
4 54896	

Ima Conserver
1234 Flood Street
Drought, CA 96003

5 **Parcel #: 000-000-000-000**

Please fold along perforation, detach and return the top portion with your payment.

6 **Previous Balance for ALL Locations : 80.61** **Payments: 80.61**
Beginning Balance as of 7/7/2012 : 0.00

7 **1234 FLOOD STREET** **Balance Forward** **Current Charges**
Parcel # 000-000-000-000

Usage History (in Hundreds of Cubic Feet)
8 **Usage This Period Last Year : 145**
Usage This Period This Year : 135
Usage Prior 12 Months : 573

BVWD 5/6/2012 - 7/3/2012 (meter 0016770750) 9

10	Previous	Current
Readings	3347	3482

	BASE RATE 3/4" Residential			0.00	35.71
	USAGE			0.00	64.54
Usage - Tier 1	HCF	116@0.465	= 53.94		
Usage - Tier 2	HCF	19@0.558	= 10.60		
	TREATMENT DEBT SERV.			0.00	14.00
	CVP RESTORATION FEES			0.00	3.11

11 12 13 14

Total for BVWD	**0.00**	**117.36**
Total for 1234 Flood Street		**117.36**

THE DISTRICT'S 2012 CONSUMER CONFIDENCE REPORT IS NOW AVAIALABLE ON-LINE. IT CONTAINS IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER. PLEASE VISIT THE FOLLOWING URL TO VIEW THE 2012 CONSUMER CONFIDENCE REPORT: http://www.bvwd.org/files/pdf/2012_CCR_Published.pdf

Account Number : 54896 **Invoice Date** : 7/11/2012
Name : IMA CONSERVER
Due Date : 8/01/2012 **TOTAL AMOUNT DUE** **117.36**

BELLA VISTA WATER DISTRICT • 11368 E. STILLWATER WAY • REDDING, CA 96003-9510 • (530) 241-1085 • FAX (530) 241-8354

1. Payment Address
Payments should be made payable to Bella Vista Water District or BVWD and sent to 11368 E. Stillwater Way, Redding, CA 96003-9510.

2. Due Date
Payments should be submitted by the due date in order to avoid penalty charges of 1.5% per month (18% per annum).

3. Amount Due
This is the total balance due on your account at the time of billing.

4. Account Number
This is your unique identifier and is also referred to as your customer number. Please reference this number on all payments, and when calling the district with questions regarding your account.

5. Parcel Number
The identifying number provided by Shasta County Assessor for the parcel in which water service is being provided. It is more commonly referred to as APN or Assessor's Parcel Number.

6. Previous and Beginning Balances
This reflects the previous balance for all service locations on the account, any payments made during the previous billing cycle and the beginning balance of the current billing cycle. This is the total amount owing as of the date of the invoice.

7. Service Location
This is the physical location where water service is being provided.

8. Usage History
This section reflects your usage history. Usage this period last year reflects the same two-month billing period one year ago. Usage this Period This year is usage used during the current billing cycle. Usage Prior 12 months is a rolling total that combines usage from the last 6 billing cycles.

9. Reading Dates and Meter Number
These dates represent the beginning and ending of the current billing cycle. The meter number is the meter serial number of the actual device located at the service location.

10. Readings
These are the readings from your meter when it was read at the beginning and end of the cycle. The first reading is subtracted from the second to determine the total usage in hundred cubic feet (HCF) or acre-feet (AF).

11. Base Rate
The base rate charge is a flat charge depending on the size of the meter and type of service, i.e. residential, rural, etc. This charge is used to offset the cost of providing service and maintaining the water system.

12. Usage
Shows the total amount billed for water usage. Usage is billed in tiers if it exceeds 116 HCF for Residential, Commercial or Public Institutional customers. Rural customers can use 314 HCF before usage is billed in the high tiers. A breakdown of the tiers is shown below:

Residential / Commercial
Usage Tier 1 is usage between 0 – 175 HCF and is billed at the rate of $0.465 per HCF.
Usage Tier 2 is usage between 175 – 245 HCF and is billed at the rate of $0.558 per HCF.
Usage Tier 3 is usage above 245 HCF and is billed at the rate of $0.651 per HCF

Rural
Usage Tier 1 is usage between 0 – 871 HCF and is billed at the rate of $0.46 per HCF.
Usage Tier 2 is usage between 871 – 1307 HCF and is billed at the rate of $0.51 per HCF.
Usage Tier 3 is usage above 1307 HCF and is billed at the rate of $0.56 per HCF

13. Treatment Debt Service
This charge is used to repay a $10 million loan from the California Department of Water Resources used to make improvements to the district's treatment process. These improvements were mandated by the California Department of Public Health to meet the new, more stringent federal requirements for drinking water.

14. CVP Restoration
Customers on residential, rural, commercial or public institutional rates pay the Central Valley Project Improvement Act Restoration. This fee was authorized by Section 3407 of Title XXXIV of the Act on October 30, 1992, and is otherwise known as the Central Valley Project Improvement Act. The Act requires that Central Valley Project water and power customers make payments to the federal government for mitigation and restoration of fish and wildlife. The fee is currently charged at the rate of $0.023 per 100 cubic feet.

ATTACHMENT D.3

SAMPLE BILL:
AGRICULTURAL CUSTOMER

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How Do I Read My Agricultural Water Bill?

1

BELLA VISTA WATER DISTRICT
11368 E. STILLWATER WAY • REDDING, CA 96003-9510
(530) 241-1085 • FAX (530) 241-8354

PLEASE RETURN THIS STUB WITH PAYMENT

2 DUE DATE	AMOUNT DUE BY DUE DATE 3
7/23/2012	228.70
ACCOUNT NUMBER	
4 94535	

Ima Conserver
1234 Water Street
Drought, CA 96003

5 **Parcel #: 000-000-000-000**

Please fold along perforation, detach and return the top portion with your payment.

6 **Previous Balance for ALL Locations : 113.78** **Payments: 113.78**
Beginning Balance as of 7/2/2012 : 0.00

7 **1234 WATER STREET** **Balance Forward** **Current Charges**
Parcel # 000-000-000-000

Usage History (in Hundreds of Cubic Feet)
8 **Usage This Period Last Year : 1520**
Usage This Period This Year : 1561
Usage Prior 12 Months : 4737

9

BVWD 4/27/2012 - 6/28/2012 (meter 0000028322)

10	Previous	Current
Readings	3347	4908

	BASE RATE 2" Agricultural	0.00	74.19
	USAGE	0.00	140.51
Usage - Tier 1	3.5836 AF @ 39.21 = 140.51		
	TREATMENT DEBT SERV.	0.00	14.00

11 12 13

Total for BVWD	**0.00**	**228.70**
Total for 1234 Water Street		**228.70**

THE DISTRICT'S 2012 CONSUMER CONFIDENCE REPORT IS NOWAVAIALABLE ON-LINE. IT CONTAINS IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER. PLEASE VISIT THE FOLLOWING URL TO VIEW THE 2012 CONSUMER CONFIDENCE REPORT: http://www.bvwd.org/files/pdf/2012_CCR_Published.pdf

Account Number : 94535 **Invoice Date** : 7/2/2012
Name : IMA CONSERVER
Due Date : 7/23/2012 **TOTAL AMOUNT DUE** **228.70**

BELLA VISTA WATER DISTRICT • 11368 E. STILLWATER WAY • REDDING, CA 96003-9510 • (530) 241-1085 • FAX (530) 241-8354

1. Payment Address
Payments should be made payable to Bella Vista Water District or BVWD and sent to 11368 E. Stillwater Way, Redding, CA 96003-9510.

2. Due Date
Payments should be submitted by the due date in order to avoid penalty charges of 1.5% per month (18% per annum).

3. Amount Due
This is the total balance due on your account at the time of billing.

4. Account Number
This is your unique identifier and is also referred to as your customer number. Please reference this number on all payments, and when calling the district with questions regarding your account.

5. Parcel Number
The identifying number provided by Shasta County Assessor for the parcel in which water service is being provided. It is more commonly referred to as APN or Assessor's Parcel Number.

6. Previous and Beginning Balances
This reflects the previous balance for all service locations on the account, any payments made during the previous billing cycle and the beginning balance of the current billing cycle. This is the total amount owing as of the date of the invoice.

7. Service Location
This is the physical location where water service is being provided.

8. Usage History
This section reflects your usage history. Usage this period last year reflects the same two-month billing period one year ago. Usage this Period This year is usage used during the current billing cycle. Usage Prior 12 months is a rolling total that combines usage from the last 6 billing cycles.

9. Reading Dates and Meter Number
These dates represent the beginning and ending of the current billing cycle. The meter number is the meter serial number of the actual device located at the service location.

10. Readings
These are the readings from your meter when it was read at the beginning and end of the cycle. The first reading is subtracted from the second to determine the total usage in hundred cubic feet (HCF) or acre-feet (AF). Once the HCF total is computed, divide that figure by 435.6 to determine the total number of AF used.

11. Base Rate
The base rate charge is a flat charge depending on the size of the meter and type of service, i.e. agricultural or aquaculture. This charge is used to offset the cost of providing service and maintaining the water system.

12. Usage
Shows the total amount billed for water usage.

13. Treatment Debt Service
This charge is used to repay a $10 million loan from the California Department of Water Resources used to make improvements to the district's treatment process. These improvements were mandated by the California Department of Public Health to meet the new, more stringent federal requirements for drinking water.

ATTACHMENT D.4

SCREENSHOT:

CUSTOMER ACCOUNT INFORMATION AVAILABLE ONLINE

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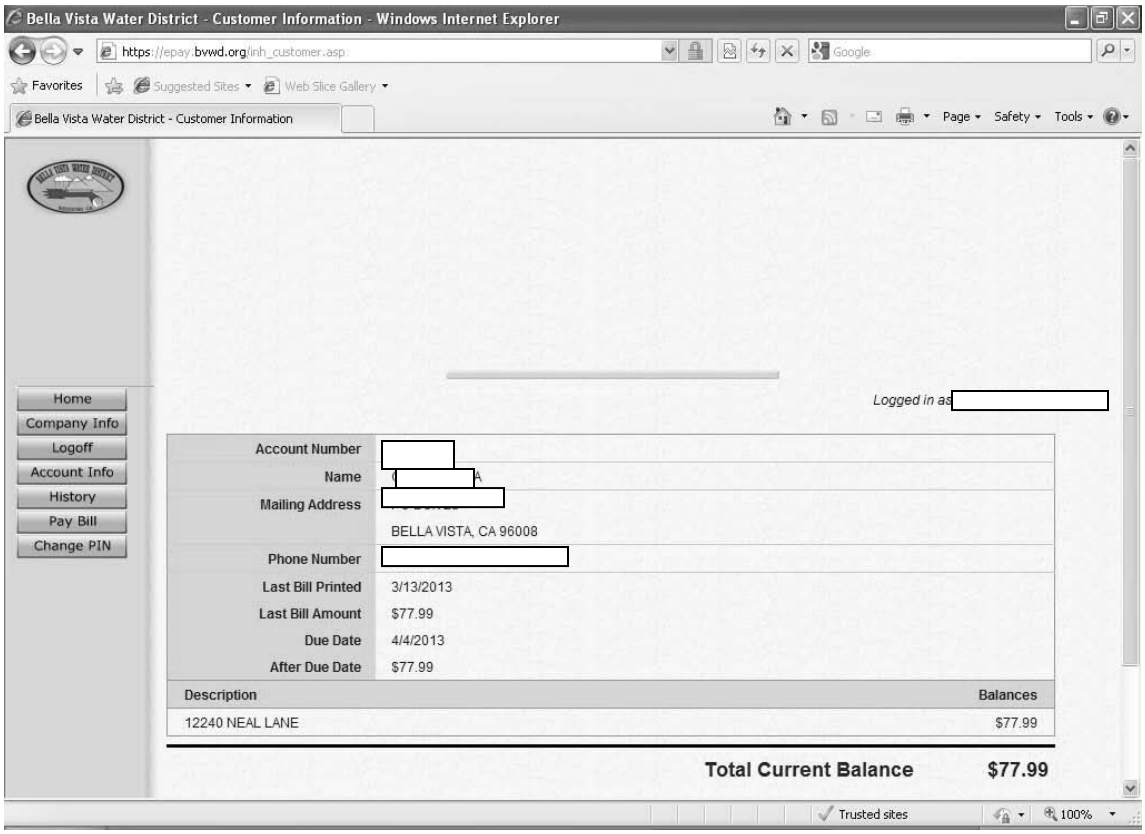

A screen shot of the customer's main screen, from which they can navigate to pay their bill, see usage history, etc.

ATTACHMENT E

E. 1 BVWD WATER SHORTAGE CONTINGENCY PLAN (1992)

E.2 BVWD EXAMPLE WATER SHORTAGE RESOLUTIONS (2009)

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ATTACHMENT E.1

BVWD WATER SHORTAGE CONTINGENCY PLAN (1992)

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BELLA VISTA WATER DISTRICT

WATER SHORTAGE CONTINGENCY PLAN

APRIL 1992

Prepared by: Robert Dietz, General Manager
Paul Weaver, Technician IV

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SECTION 1. INTRODUCTION

Under recent legislation, each California urban water supplier providing municipal water directly or indirectly to more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually, must prepare, adopt, and send a Water Shortage Contingency Plan to the California Department of Water Resources.

The Bella Vista Water District was formed on June 4, 1957, pursuant to California Water District law. The District was formed for the purpose of obtaining a Federal Central Valley Project Water supply. The primary water source for the District is from the Sacramento River pursuant to a contract from the U.S. Bureau of Reclamation. This water is authorized from the Cow Creek Unit of the Trinity River Project, a portion of the United States Bureau of Reclamation's Central Valley Project. The contract allows diversions of up to 24,000 acre feet annually, subject to reductions during drought years.

The District also has four existing wells used primarily for emergencies and to provide a supplemental supply during drought years when the District's normal surface water supply has been reduced.

Spurred by significant reductions in the District's surface water source, a substantial effort has been undertaken by the District to develop an additional supplemental groundwater supply. Two other wells have been drilled. The District is proceeding to complete treatment facilities on one of these (Well #6) but has determined not to complete the other (Well #5) at this time due to the low yield. The District is continuing to pursue other additional wells.

SECTION 2. COORDINATED PLANNING

The District has coordinated the preparation of its plan with other water suppliers and public agencies in the area. The parties involved are listed below:

1. U.S. Bureau of Reclamation (Bureau)
2. California Department of Water Resources
3. Shasta County Water Agency
4. City of Redding
5. Shasta Dam PUD
6. Clear Creek CSD
7. Mountain Gate CSD
8. Centerville CSD
9. Anderson-Cottonwood Irrigation District
10. Shasta CSD
11. State of California Department of Public Health.

Most transfers of water to the District from other sources must receive prior approval from the Bureau.

In 1990 the District requested transfer water from the City of Redding but the transfer was not approved by the Bureau of Reclamation. The District was able in 1991 to transfer supplemental water from the City of Redding and the Clear Creek CSD. Transfers have been requested from other agencies for 1992.

SECTION 3. HISTORICAL WATER USE (1978 - 1991)

District records of production (surface and groundwater quantities) and consumption (individual metered usage) from 1978 to 1990 are summarized in Table I. As can be seen from the table, production records kept were good but consumption records were virtually unavailable. These were analyzed during the course of preparing the District's Master Water Plan, which was completed in December 1990. The data was evaluated to help determine system demand trends and also calculate average design values. Design values, coupled with growth rate estimates, allow a projection of future water demands.

The maximum annual demand on the system was 18,692 acre feet in 1987. The system currently has connections serving an estimated population of 10,000. Not included in this estimate are Shasta and Simpson Colleges who serve approximately 5,500 students (ADA) and 425 employees.

The District has had a steady five percent per year increase in the number of service connections in the 10 year period from 1978 to 1988. However, during 1989, 301 services were added and in 1990 352 services were added, which yields a 10± percent per year growth rate. Within the past 12 year period the annual production of surface and groundwater has increased at a similar rate of about five percent per year, although the current drought conditions make it difficult to estimate. The District growth rate slowed to seven percent in 1991, probably due to economic factors.

1978 through 1989 represent more normal times prior to mandatory drought reductions. 1990 and 1991 were years of severe reductions in supply from the Federal project, 50% and 75% reductions, respectively.

Production rates vary from year to year depending on the irrigation demand which is greatly influenced by the timing and amount of summer precipitation and by temperature. The annual production substantially declined from 18,692 acre feet in 1987 to 15,045 acre feet in 1989. This reduction is attributable to three factors. First, a review of rainfall data indicates that 1987 had considerably less rainfall during the irrigation season than 1989. The year 1987 had 0.84 inches vs. 14.19 inches in 1989. Second, one large farming operation with a consumption demand of 2,000 acre feet per year went out of production in 1988. Third, 1989 was a moderate drought year. Early projected contract supply reductions were anticipated by the Bureau of Reclamation due to low carryover supplies in the Central Valley Project. This information was provided to District customers to allow them to plan accordingly for the irrigation season. Fortunately, March precipitation totals allowed Reclamation to supply the full contract amount to the District but many conservation minded customers voluntarily conserved throughout the year.

Table II represents monthly summaries of production by source and facility for the critical 1990 drought year and the more critical 1991 drought year. The District's surface water contract was reduced to 50% of normal supply in 1990, or 12,000 acre feet. In 1991 the contract was reduced to 25% of normal supply plus a carryover of 420 acre feet being allowed by the Bureau into the 1991 water year for a 6,420 acre feet supply. Use of the Districts groundwater resource in 1990 represented 12 percent of the year's total production. 1991 groundwater production was 30 percent of the total District production.

The District currently has 3,898 service connections as listed in Table III. Although only 19 percent of the total service connections are devoted to agricultural they represent about 85 percent of the total water consumption in a normal year.

The water demand in 1988, shown in Table III, was 13,889 acre feet. Excluded from this total is 2,901 acre feet of unaccounted for water which represents 18 percent of the total 1988 production. Through an aggressive program to replace large non-functioning meters (4-inch through 8-inch) and controlling construction water, these losses were reduced to less than 8 percent in 1991.

SECTION 4. PROJECTED WATER USE (1992 - 1994) WITH NORMAL WATER SUPPLY

Projected consumption for the next three years (1992-1994) is estimated to increase at an annual rate of 2.5 percent overall. Table III shows the historical and projected water use assuming a normal supply is available. Residential demands have increased an average of 11.4 percent per year from 1988 through 1991. The 1991 residential consumption, as shown, was increased by 25% to normalize the amount to an estimate of non-drought year usage and then increased by 10 percent per year.

Commercial type demands have increased an average of five percent per year from 1988 through 1991. The commercial consumption total was normalized by the same methodology as the residential and then compared to the 1988 consumption to arrive at the average per cent of demand increase. There is a new college within the District that could increase this demand by eight percent if allowed to receive water in non-drought conditions. Additionally, a new elementary school is in the improvement plan review stage and is due to be opened in the fall of 1993, further adding to an increased commercial demand. For projection purposes, five percent is used.

Rural consumption has increased from about five percent in 1988 to about 10 percent in 1990. It was assumed that a 10 percent increase should remain constant for the duration of the projection. The 1991 rural consumption total was increased by 35 percent to normalize the amount to an estimate of non-drought year usage, and then increased by 10 percent per year.

Agricultural water demands have been decreasing at a four percent rate since 1988. This is due to customers being switched from agriculture rates to rural rates because they no longer qualify for the subsidized rate and the meter replacement

program. The new meters more accurately measure on farm deliveries thereby allowing for greater awareness of consumption by the user. It is anticipated that fewer customers will be switched from agricultural use in the future. The 1991 agricultural total, as shown, was increased by 35 percent to normalize the amount to an estimate of non-drought year usage which is projected to remain steady during the next two years.

SECTION 5. WORST CASE WATER SUPPLY AVAILABILITY FOR 1992, 1993, AND 1994

The Bella Vista Water District contracts with the Bureau of Reclamation for its surface water source. The annual contracted diversion amount is for 24,000 acre feet with varying degrees of reduction during drought years. Table IV reflects a projection of the District's worst case water supply availability for 1992, 1993, and 1994. The assumption is predicated on a 25 percent water supply from the Bureau of Reclamation for the surface source with supplemental supplies coming from four existing groundwater wells. One new 600 gpm well will be coming on line mid-year 1992. In 1993 and 1994 two new wells are projected to come on line each year.

Should this worst case scenario become a reality, the District would be forced to reduce projected consumption levels by 40 percent in 1992, 32 percent in 1993, and 24 percent in 1994.

Early projections (February 1992) of water deliveries from the Bureau of Reclamation for water year 1992, indicate that there would be municipal and industrial (M&I) deliveries of at least 50 percent of the District's 1987, 1988, and 1989 averaged delivery with a consideration for growth. Indications were that agricultural deliveries would be zero.

Later projections increased the amounts to 50% M&I and 15% agricultural and, finally at the time of this writing, to 75% M&I and 25% agricultural water. The worst case surface water deliveries were computed using a 25% supply with an increase for growth. The 1992 surface source supply was increased by a 2.5 percent growth rate for 1993. The 1993 estimate was again increased by 2.5 percent for the 1994 projection assuming a 25% supply was declared. The growth demand would be accommodated by

hardship water from the Bureau.

Projections for utilization of existing and newly constructed groundwater wells are summarized in Table V, projected well production in 1992.

The District currently has four production wells operational with the newly drilled Well No. 6 due to come on line mid-year of 1992.

SECTION 6. STAGES OF ACTION

The Bella Vista Water District has developed, and adopted a four stage Drought Contingency Plan. Stage I of the plan encourages voluntary conservation whereas Stages II, III and IV have restrictions which are progressively more severe.

Stage I of the Drought Contingency Plan seeks to obtain a 10 percent reduction through voluntary programs. Many of these items in Stage I are communicated to District customers by way of billing inserts, newspaper advertising and by verbal communication as District Staff and personnel interact with the consumers.

Stages II, III and IV use a combination of pricing surcharges for usage above 1989 base year allotments to the Customer and District operation decisions that directly affect water production.

A copy of the Drought Contingency Plan is located in Appendix A at the end of this report.

Table IV shows at which supply level different stages of the Drought Contingency Plan are triggered. The base year for determining the stages and their percent of reduction is 1989, as this was the last pre-drought year in which the District has both production and consumption records.

SECTION 7. MANDATORY PROHIBITIONS ON WATER USE

Mandatory prohibitions on water use are triggered when Stage II of the District's Drought Contingency Plan is enacted by resolution of the District's Board of Directors. These mandatory prohibitions carryover into Stages III and IV.

With a moderate 25 percent reduction, new agricultural endeavors are prohibited as well as new commercial irrigation, landscaping of new common areas, and divider strips associated with new construction.

Under a severe (Stage III) 38 percent reduction, flow restrictors can be placed on any agricultural service that exceeds 60 percent plus 20 acre feet or 75 percent of their base year use, whichever is less. Flow restrictors may be placed on any rural service that exceeds 60 percent plus 3.33 acre feet or 75% of their base year use, whichever is less. The same applies on any residential or commercial account that exceeds 125 percent of their base year use.

SECTION 8. CONSUMPTION LIMITS

The District has adopted, by resolution, an allocation method for each customer type based on a percentage reduction of their base year (1989) usage. The Drought Contingency Plan in Section 6 outlines the reductions per user class.

The individual customer allotments are based on their actual 1989 consumption. This base year is used because the most accurate view of District wide customer consumption was obtained during this period due to a new computer billing program and this was the last pre-drought (normal) supply year. The allocations are provided to each individual water user.

Appendix C is a typical notification to the customer showing their 1989 water use and their current allocations.

SECTION 9. PENALTIES OR CHARGES FOR EXCESSIVE USE

The Bella Vista Water District's current rate structure per hundred cubic feet of usage is provided in Table VII. A customer who exceeds their established allotment shall pay a surcharge based upon the stage of the Drought Contingency Plan in effect at the time of the usage as indicated in the Table.

SECTION 10. ANALYSIS OF REVENUE AND EXPENDITURE IMPACTS

The District's annual income from water sales was $971,002 in 1989, $1,100,187 in 1990 and $1,089,319 in 1991. Table VIII is the projected range of water sales by Stage. Table IX indicates the sources, types and quantities of water to supply the various stages. Table X shows the District revenue and expenditures and projected fiscal impacts of increased costs and reduced revenues due to shortages of water based on Table VIII sales ranges.

Establishment of a Rate Stabilization Fund. In order to mitigate the financial impacts of a water shortage, the District is establishing a Water Rate Stabilization Fund. The goal is to maintain the Fund at 75 percent of normal water revenue (excluding the base rate). This fund will be used to stabilize rates during periods of water shortages or disasters affecting the water supply. The District will not have to increase rates as much or as often during a prolonged or severe shortage.

However, even with the emergency fund, rate increases may be necessary during a prolonged water shortage. As described in Section 6 of this Plan, a Stage II shortage requires a 25 percent reduction in water deliveries while a Stage III requires a 35 percent reduction. The experiences of California water purveyors during the 1990-91 drought shortage demonstrated that actual water use reductions by customers are usually considerably larger than those requested by the supplier. During the 1990-91 drought shortage it was also politically difficult for many agencies to adopt the rate increases necessitated by a 20 to 50 percent reduction in sales. When a Water Shortage Emergency is declared, the supply shortage will trigger the appropriate rationing stage and may also trigger a rate increase.

Water rates increase by the following when the indicated stages are implemented:

Stage I	no rate increase
Stage II	a $2.50 per month service charge
Stage III	a $5.00 per month service charge
Stage IV	a $7.50 per month service charge.

SECTION 11. IMPLEMENTATION OF THE PLAN

The Bella Vista Water District has adopted resolutions to declare a water shortage emergency which implemented the Drought Contingency Plan (please see the Appendix).

SECTION 12. WATER USE MONITORING PROCEDURES

Normal Monitoring Procedure. In normal water supply conditions, production figures are recorded daily. Totals are reported weekly to the Water Treatment Facility Supervisor. Totals are reported monthly to the District Engineer and incorporated into the water supply portion of the monthly report.

Water Shortages. During a declared water shortage weekly production figures are reported to the District Engineer. The District Engineer compares the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports are forwarded to the Manager. Monthly reports are sent to the Board of Directors. If reduction goals are not met, the Manager will alert the Board of Directors so that corrective action can be taken.

SECTION 13. PLAN ADOPTION

The Bella Vista Water District prepared its Water Shortage Contingency Plan during the spring of 1990. Resolutions enacting specific stages have been adopted as follows:

Stage	Action	Date
I	Adopt	March 13, 1990
II	Adopt	June 12, 1990
III	Adopt	March 12, 1991
III	Modification	September 10, 1991

The amended plan was considered by the Board of Directors on April 28, 1992. The amended plan meets the requirements of subdivision (e) of California Water Code Section 10631.

Public meetings and the availability of copies of the initial plan were properly noticed in the Redding Record Searchlight. The District held public meetings and Board meetings on the plan on the following dates:

May 22, 1990	Stage II	Board meeting
June 12, 1990	Stage II	Public hearing
September 26, 1990	Moratorium	Public hearing
October 9, 1990	Moratorium	Board meeting
December 11, 1990	Stage II Amendments	Board meeting
March 12, 1991	Stage III	Public hearing
September 10, 1991	Stage III Modification	Board meeting
April 28, 1992	The Plan	Public hearing

- Two meetings focused on a possible moratorium.
- Five meetings focused on water rationing options.

This revised Water Shortage Contingency Plan was formally adopted by the District's Board of Directors on April 28, 1992.

APPENDIX A

DROUGHT CONTINGENCY PLAN SUMMARY

BELLA VISTA WATER DISTRICT

DROUGHT CONTINGENCY PLAN

STAGE I ALERT - MINOR (10%) REDUCTIONS REQUIRED - VOLUNTEER PROGRAM

a) Notification/Education Programs (press releases, newsletters, meetings, literature and discussions).

b) Warnings for waste, over-watering and leaks.

c) Encourage new development to postpone landscaping and/or to plant water conserving plants.

d) Encourage evening, night and early morning watering.

e) Encourage use of private wells where approved cross-connection devices are available.

f) Reduce flushing of lines.

g) Some use of standby wells (500 ac ft).

h) Backwash filters less often.

i) Encourage use of efficient irrigation systems (drip, sprinkler, etc.)

j) Encourage water reducing methods in household use (hand wash dishes, low flow shower heads, patio sweeping, etc.)

k) Encourage unnecessary filling of ponds, pools, etc.

STAGE II ALERT - MODERATE (25%) REDUCTIONS REQUIRED

a) Price surcharge after 75% of base year use.

b) Additional warnings for waste.

c) Additional use of supplemental well supplies (1500 ac ft).

d) No filling of new ponds.

e) No new irrigation water and no new commercial (common areas, divider strips, etc.) landscaping.

f) Flush lines only upon severe problems.

g) No jetting of trenches.

h) Reduced allotment for new customers.

STAGE III ALERT - SEVERE (38%) REDUCTIONS REQUIRED

a) Agriculture and Rural water use shall be reduced to 60% of base year use.

For annual Agricultural use above 60% but less than 67.5%, a surcharge of $165 per ac ft shall apply. For use above 67.5% a surcharge of $330 per ac ft shall apply.

For Rural bimonthly use above 60% but less than 60% + 1.67 ac ft, a surcharge of $165 ac ft shall apply. For bimonthly use above 60% + 1.67 ac ft a surcharge of $330 per ac ft shall apply.

Residential (municipal and industrial) and commercial water use shall be reduced to 75% of base year bimonthly use.

For bimonthly use above 75% but less than 100%, a surcharge of $0.50 per 100 cu ft shall apply. For bimonthly use above 100% a surcharge of $1.00 per 100 cu ft shall apply.

b) A $5.00 per month drought service charge will be assessed to all accounts except this service charge shall be waived in any bimonthly billing period where the usage is less than 300 gallons per service.

c) Adjust minimums to eliminate base allotment to reward conservation.

d) Additional use of supplemental well supplies (3000 ac ft).

e) Flow restrictors to one gallon per minute will be placed on any Agricultural service that exceeds 60% + 20 ac ft or 75% of their base year use, whichever is less and on any rural service that exceeds 60% + 3.33 ac ft or 75% of their base year use, whichever is less, and on any residential or commercial account that exceeds 125% of their base year use and for new customers, the amount granted by the District's Drought Resolution.

f) No flushing of lines except for extreme emergencies.

g) No water for construction (provide water to contractors as available from filter backwash ponds).

h) Further reduction of new customer allotment to 300 gallons per house per day. (No change in allotments for customers who connected during Stage II.)

i) District to drill new wells (4,000 ac ft).

STAGE IV ALERT - SEVERE (50%) REDUCTIONS REQUIRED

a) Surcharges along with severe penalties ($$$) for anyone exceeding their allotment.

b) No filling of ponds (except for commercial aquaculture).

c) Increase in drought service charge.

d) No new hookups.

APPENDIX B

RESOLUTION 90-10

STAGE II DROUGHT EMERGENCY PLAN

BELLA VISTA WATER DISTRICT

RESOLUTION NUMBER 90-10

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELLA VISTA WATER DISTRICT ENACTING STAGE II OF THE DROUGHT EMERGENCY PLAN.

WHEREAS, the Bella Vista Water District has contracted with the U.S. Bureau of Reclamation for a water supply from the Sacramento River in the annual amount of 24,000 acre feet;

WHEREAS, California is experiencing drought conditions for the fourth straight year;

WHEREAS, the U.S. Bureau of Reclamation has notified the Bella Vista Water District that the District will only be supplied 12,000 acre feet of water from Federal facilities during the 1990 calendar year;

WHEREAS, the District used a total of almost 15,000 acre feet during 1989 and expects to use more during 1990 due to the extremely dry weather, along with an increase in the number of customers since 1989;

WHEREAS, it is the desire of the Board of Directors to set forth its policy for a drought emergency plan and a declaration that a water shortage emergency exists;

WHEREAS, the Board of Directors has determined that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply available to Bella Vista Water District to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

NOW, THEREFORE, be it resolved by the Board of Directors of the Bella Vista Water District and hereby declared that there is a water shortage emergency and that the following policy to manage the emergency, numbers I through VI, shall be enacted and shall read as follows:

I. PURPOSE

The purpose of this Resolution is to establish a Drought Emergency Plan to equitably distribute the available water to the District's customers and to ensure an adequate supply for human consumption, sanitation and fire protection. This Resolution is adopted pursuant to Water Code Section 350 and following, and Section 375 and following.

II. RESTRICTIONS

All District agricultural customers shall reduce their annual usage of District water to 75 percent of the amount used by that customer/property during the previous year.

Exception: Where the customer does not exceed the amounts shown below, no surcharge shall apply:

Meter Size	Acre Feet
1" & 1-1/2"	3.0
2" & 3"	3.75
4"	7.5
6"	15.0
8" & Larger	37.5

All District rural customers shall reduce their usage of District water each bi-monthly billing period to a maximum of 75 percent of the amount used by that customer/property during the same bi-monthly period last year (1989).

Exception: Where the customer does not exceed the amounts shown below, no surcharge shall apply:

Meter Size	Cubic Feet
1" & 1-1/2 "	21,780
2" & 3"	27,225
4"	54,450
6"	108,900
8" & Larger	272,250

All District municipal/domestic and commercial (or a combination) customers shall reduce their usage of District water each bi-monthly billing period to a maximum of either seventy-five percent (75%) of the amount used by that customer during the same bi-monthly period last year (1989) or to the amounts shown for new customers below, whichever is greater.

All new customers shall be granted the following (based on 75 percent of average municipal/domestic use for 1989):

5600 cubic feet (customers billed July 16 - Sept. 15)
5500 cubic feet (customers billed Sept. 16 - Nov. 15)
2300 cubic feet (customers billed Nov. 16 - Jan. 15)

(New customers are new meter installations purchased after date of this Resolution).

The following restrictions will apply to all water use:

a. No filling of new ponds or new lakes and no new commercial irrigation or agricultural irrigation shall be permitted.

b. No transfer of water will be allowed between existing customers or to other locations.

General Manager shall report a summary of compliance to the Board at each Regular Board Meeting.

III. SURCHARGE FOR EXCESSIVE USAGE

Beginning June, 1990, and each month thereafter for the duration of the enforcement of this Resolution, every customer shall, in addition to the existing rates, pay a surcharge for usage of water in excess of amounts allowed in Section II. The cost of this water surcharge above the amount as determined by the recorded meter reading shall be as listed below:

Municipal/Domestic & Commercial	$ 0.25	per 100 cubic feet
Rural	$ 0.11	per 100 cubic feet
Agricultural	$47.00	per acre foot

IV. EXCEPTIONS AND/OR VARIANCES

For hardship cases only, variances may be granted from any of the above restrictions upon application in writing stating in detail the circumstances warranting special consideration. Appeals of decisions made by the General Manager may be taken to the District's Drought Committee. Applications will only be accepted after the customer has received a bill with at least 60 days billing following the date of adoption of this ordinance.

This ordinance shall not apply to residences within the Parkwood V and Willowbrook Subdivisions who are temporarily being served water by the City of Redding.

V. PUBLIC NOTICE

a. The Secretary of the Board is directed to publish this Resolution in accordance with Government Code Section 6061 and Water Code Section 375.

b. The Secretary of the Board is directed to send by direct mail a summary of this Resolution to each customer in the District.

VI. DURATION

These restrictions shall remain in full force and effect until the rescission of this Resolution, or modification of a part thereof, by the Board of Directors.

PASSED AND ADOPTED by the Board of Directors of the Bella Vista Water District, 4015 Highway 299 East, Redding, California, County of Shasta, this 12th day of June, 1990.

AYES: Jeff Bryant, Nancy Polk, Kenneth Elwood

NOES: None

ABSENT: Elmer Persing, Jim McCollum

ABSTAINED: None

Chairman

Vice Chairman

Director

APPENDIX C

RESOLUTION 91-7

STAGE III DROUGHT EMERGENCY PLAN

BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA, CALIFORNIA

Resolution No. 91-7

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELLA VISTA WATER DISTRICT ENACTING STAGE III OF THE DROUGHT EMERGENCY PLAN

****

RECITALS

A. The Bella Vista Water District has previously enacted and adopted its Resolution 90-10, entitled "Stage II of the Drought Emergency Plan." Adoption of the Drought Emergency Plan was based on the following findings:

(1) The Bella Vista Water District has contracted with the United States Bureau of Reclamation for a water supply from the Sacramento River in the annual amount of 24,000 acre feet.

(2) California is experiencing drought conditions for the fourth straight year.

(3) The District used a total of nearly 15,000 acre feet during 1989, and expects to use more during 1990 due to the extremely dry weather, along with an increase in the number of customers since 1989.

(4) The Board of Directors determined that the ordinary demands and requirements of water consumers could not be satisfied without depleting the water supply available to the Bella Vista Water District to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

(5) That the Board of Directors has determined that there is a water shortage emergency.

B. Resolution 90-10 was adopted by the Board on June 12, 1990, and pursuant to Water Code Sections 350, and following, a water shortage emergency was declared. Such declaration of a water shortage emergency has not been revoked or amended since the date of its declaration.

C. Part of the basis for declaration of a water shortage emergency during 1990 was the mandatory cut-back imposed by the United States Bureau of Reclamation. The Bureau imposed a 50% reduction in available supply to the Bella Vista Water District for 1990, thereby making only 12,000 acre feet of water available from the District's normal contract allotment.

D. Because of the continuing severity of the drought into the Winter of 90-91, the United States Bureau of Reclamation has, as of February 14, 1991, imposed a 75% mandatory reduction on contracts in order to preserve the existing supply. As a result, the Bella Vista Water District will have available only 6,000 acre

feet of its normal 24,000 acre foot contract allotment from Bureau supplies at the Sacramento River. In the absence of substantial and continuous rainfall, the Bureau has predicted that its water supplies from the Central Valley Project may be nearly depleted. Predictions are that by September 1991, the Central Valley Project will have less than 3% of the total capacity of the project remaining in storage. If Bureau supplies are depleted to the levels predicted, it is probable that the Bella Vista Water District will receive little or no water from the Bureau during the 1991-92 water year.

E. The Board of Directors has previously determined that the ordinary demands and requirements of water consumers within the District cannot be satisfied without depleting the water supply available to the Bella Vista Water District to the extent that there would be insufficient water for human consumption, sanitation and fire protection under current conditions. The Board hereby reaffirms that determination.

* * * * *

RESOLUTION

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the Bella Vista Water District as follows:

1. **Enactment of Stage III:** Due to the continuing severity of the drought, and based in part on the conditions set forth above, the Board of Directors hereby enacts "Stage III" of the Drought Contingency Plan.

2. **Restrictions:**

(a) Agricultural. All District agricultural customers shall reduce their annual usage of District water to 60% of the amount used by that customer/property during 1989. For annual agricultural use above 60% but less than 67.5%, a surcharge of $165 per acre foot shall apply. For use above 67.5%, a surcharge of $330 per acre foot shall apply.

(b) Rural. All District rural customers shall reduce their usage of District water each bimonthly period to a maximum of 60% of the amount used by that customer/property during the same bimonthly period in 1989. For Rural bimonthly use above 60% but less than 60% + 1.67 acre feet, a surcharge of $165 per acre foot shall apply. For bimonthly use above 60% + 1.67 acre feet, a surcharge of $330 per acre foot shall apply.

(c) Municipal and Industrial. Any District municipal, industrial and commercial (or a combination) customer who was receiving BVWD service prior to adoption of this Resolution shall continue their reduced usage of District water each bimonthly period to a maximum of 75% of the amount used by that customer during the same bimonthly period in 1989.

Customers connected to the system after adoption of Stage II shall be granted the following (based on 75% of average municipal/domestic use for 1989):

2500 cubic feet (customers billed January 16 - March 15)
3500 cubic feet (customers billed March 16 - May 15)
4500 cubic feet (customers billed May 16 - July 15)
5600 cubic feet (customers billed July 16 - September 15)
5500 cubic feet (customers billed September 16 - November 15)
2300 cubic feet (customers billed November 16 - January 15)

For bimonthly use above 75% but less than 100%, a surcharge of $0.50 per 100 cubic feet shall apply. For bimonthly use above 100%, a surcharge of $1.00 per 100 cubic foot shall apply.

(d) New Customers. New customers connecting to the BVWD system after the date of this Resolution shall be granted a maximum daily usage of 300 gallons per house, irrespective of the type of installation or the meter size installed. Any new customers exceeding the foregoing maximum daily use shall be surcharged $1.00 for each additional 100 cubic foot of water used in excess of the maximum daily use.

(e) Drought Service Charge. All customers will receive a $5.00 per month drought service charge. This charge will be waived for any customer account using less than 300 gallons per house per day or 2400 cubic feet bimonthly.

(f) Rate Adjustments. All rates are hereby adjusted to eliminate minimum allotments as shown in Exhibit "A" hereto.

(g) Other Restrictions. No water for construction shall be supplied, except for any excess supply that might be available to contractors from the District filter backwash ponds. Such water may be supplied only on an "as available" basis.

3. **Penalties.** In addition to the surcharges provided for above, in the event a District customer exceeds the maximum usage amounts set forth in paragraphs 2(a) through (e) or violates any other applicable restriction in this Resolution, or in the Stage II restrictions previously adopted, the District reserves the right to install water flow restriction devices on such customer's connections as follows:

(a) Agricultural and Rural. Flow restrictors of one gallon per minute shall be installed on any agricultural service that exceeds 60% + 20 acre feet or 75% of their base year use, whichever is less, and on any rural service that exceeds 60% + 3.33 acre feet or 75% of their base year bimonthly use, whichever is less.

(b) Municipal and Industrial. Flow restrictors of one gallon per minute shall be installed on any municipal, industrial or commercial water service (which includes residential and any new service connection) that exceeds 125% of their base year bimonthly use, or in the case of new customers, 125% of the amount granted under this Resolution.

4. **Interpretation of Stage III Provisions:** In the event any of the restrictions set forth in this Resolution are in conflict with the provisions of Stage II of the Drought Emergency Plan, as adopted in Resolution No. 90-10, the terms in this Resolution shall control. All other provisions of Stage II of the Drought Emergency Plan not specifically amended by this Resolution remain in full force and effect.

5. **Public Notice.** Notice as required by law in connection with adoption of Stage II of the Drought Emergency Plan has been given. To the extent that the restrictions contained in this Resolution are greater than those in Stage II, the Secretary of the Board is hereby directed to send a direct mail summary of the terms of applicable restrictions to each customer in the District.

6. **Duration.** These restrictions (and the restrictions set forth in Stage II are effective as of the date hereof, and shall remain in full force and effect until the rescission of this Resolution, or further modification of a part thereof, by the Board of Directors.

PASSED AND ADOPTED by the Board of Directors of the Bella Vista Water District this 12th day of March 1991 by the following vote:

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

BELLA VISTA WATER DISTRICT

By: _____
Nancy L. Polk,
President of the Board of Directors

ATTEST:

_____
Robert W. Dietz,
Secretary

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, ROBERT W. DIETZ, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at the Regular Meeting of said Board of Directors by the following vote:

Ayes: 5

Noes: None

Absent: 0

Abstained: None

Robert W. Dietz,
Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, ROBERT W. DIETZ, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 91-7 of said Board of Directors, and that the same has not been amended or repealed.

Robert W. Dietz,
Secretary of the
Board of Directors

BELLA VISTA WATER DISTRICT

RESIDENTIAL BIMONTHLY DROUGHT WATER RATE SCHEDULE

EFFECTIVE MARCH 12, 1991

All existing customers shall reduce their usage to 75% of the amount used during the same bimonthly period of 1989.

A restrictor will be installed where usage is above 125%.

STANDARD RATE SCHEDULE

5/8" and 3/4" Meter	Base Rate	$25.00
	Each 100 cu ft	0.25
1" Meter	Base Rate	$22.50
	Each 100 cu ft	0.25
1-1/2" Meter	Base Rate	$20.00
	Each 100 cu ft	0.25
2" Meter	Base Rate	$15.00
	Each 100 cu ft	0.25
Additional Units	Base Rate, per Unit	$25.00

DROUGHT CHARGE SCHEDULE

Drought Service Charge:

Use above 2,400 cu ft bimonthly	$10.00

Surcharges:

Use above 75% - each 100 cu ft	0.50
Use above 100% - each 100 cu ft	1.00

A restrictor will be installed where usage is above 125%

JMR12

BELLA VISTA WATER DISTRICT

RURAL BIMONTHLY DROUGHT WATER RATE SCHEDULE

EFFECTIVE MARCH 12, 1991

All existing customers shall reduce their usage to 60% of the amount used during the same bimonthly period of 1989.

STANDARD RATE SCHEDULE

1" and 1-1/2" Meter	Base Rate	$ 42.39
	Each 100 cu ft	0.055
2" and 3" Meter	Base Rate	$ 44.21
	Each 100 cu ft	0.055
4" Meter	Base Rate	$ 46.74
	Each 100 cu ft	0.055
6" Meter	Base Rate	$ 48.48
	Each 100 cu ft	0.055
8" Meter	Base Rate	$ 53.99
	Each 100 cu ft	0.055
Additional Units	Base Rate, per Unit	$28.90

DROUGHT CHARGE SCHEDULE

Drought Service Charge:

Use above 2,400 cu ft bimonthly	$ 10.00

Surcharges:

Use above 60%, per acre foot	165.00
Use above 60% + 1.67 acre foot, per acre foot	330.00

A restrictor will be installed where usage is above 60% + 3.33 acre feet or 75%, whichever is less.

JMR12

BELLA VISTA WATER DISTRICT

AGRICULTURAL DROUGHT WATER RATE SCHEDULE

EFFECTIVE MARCH 12, 1991

All District agricultural customers shall reduce their annual usage of District water to 60% of the amount used by that customer/ property owner during 1989.

BIMONTHLY RATE SCHEDULE

All Meter Sizes	Base Rate	$ 45.00
	Each acre foot	8.50
Additional Units	Base Rate, per Unit	$ 30.00

DROUGHT CHARGES

Drought Service Charge	$ 10.00

Surcharges:

For annual agricultural use above 60% of the 1989 Base allotment the following surcharges shall apply:

Use above 60%, per acre foot	$165.00
Use above 67.5%, per acre foot	330.00

A restrictor will be installed where usage is above 60% + 20 acre feet or 75%, whichever is less.

JMR12

BELLA VISTA WATER DISTRICT

COMMERCIAL BIMONTHLY DROUGHT WATER RATE SCHEDULE

EFFECTIVE MARCH 12, 1991

All existing customers shall reduce their usage to 75% of the amount used during the same bimonthly period of 1989.

STANDARD RATE SCHEDULE

5/8", 3/4" and 1" Meter		Base Rate	$32.60
	Step 1.	First 5,600 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
1-1/2" Meter		Base Rate	$35.00
	Step 1.	First 12,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
2" Meter		Base Rate	$34.00
	Step 1.	First 16,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
3" Meter		Base Rate	$33.00
	Step 1.	First 24,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
4" Meter		Base Rate	$31.00
	Step 1.	First 38,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
6" Meter		Base Rate	$28.34
	Step 1.	First 52,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
8" Meter		Base Rate	$35.00
	Step 1.	First 70,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
10" Meter		Base Rate	$42.00
	Step 1.	First 82,000 C.F, per 100 C.F.	0.15
	Step 2.	Each additional 100 C.F.	0.25
Additional Units		Base Rate, per Unit	$25.00

DROUGHT CHARGE SCHEDULE

Drought Service Charge:		
Use above 2,400 cu ft bimonthly		$10.00
Surcharges:	Use above 75% - each 100 cu ft	0.50
	Use above 100% - each 100 cu ft	1.00

A restrictor will be installed where usage is above 125%.

JMR12

BELLA VISTA WATER DISTRICT

NEW CUSTOMERS BIMONTHLY DROUGHT WATER RATE SCHEDULE

EFFECTIVE MARCH 12, 1991

All new customers shall reduce their usage to 300 gallons per day per household or 2,400 cubic feet per billing period.

STANDARD RATE SCHEDULE

All Meter Sizes	Base Rate	$25.00
	Each 100 cu ft	0.25
Additional Units	Base Rate, per Unit	$25.00

DROUGHT CHARGES

Drought Service Charge:

Use above 2,400 cu ft	$10.00

Surcharge:

Use above 2,400 cu ft, per 100 cu ft	1.00

A restrictor will be installed where usage is above 125%.

JMR12

APPENDIX D

TYPICAL CUSTOMER NOTIFICATION

BELLA VISTA WATER DISTRICT

AREA NUMBER 03 GROUP NUMBER 2 PROPERTY NUMBER _____

CUSTOMER NUMBER _____ METER SEQUENCE NUMBER 33000

METER DIAL TYPE C.F. NUMBER OF DIGITS 10

TYPE OF SERVICE AG METER SIZE 2"

AGRICULTURAL WATER USE INFORMATION:

1989 BASE YEAR ANNUAL WATER USE 3.03 ACRE FEET

60% OF THE AMOUNT SHOWN ABOVE 1.82 ACRE FEET

* *

1991 DROUGHT YEAR ALLOTMENT 2.40 ACRE FEET

MONTH	A.F. BIMONTHLY USAGE	A.F. AMOUNT REMAINING
FEBRUARY	.04	2.36
APRIL		
JUNE		
AUGUST		
OCTOBER		
DECEMBER		

* *

COMMENTS: _____

JMR13 3/22/91

BELLA VISTA, CA
96008 - 0000

BELLA VISTA WATER DISTRICT

[LABEL]

AREA NUMBER 83 GROUP NUMBER 2 PROPERTY NUMBER _____

CUSTOMER NUMBER _____ METER SEQUENCE NUMBER 33000

METER DIAL TYPE C.F. NUMBER OF DIGITS 6

TYPE OF SERVICE RU. METER SIZE 2"

YEAR 1989	1989 USAGE	1991 ALLOWANCE	
JANUARY			
FEBRUARY	17755	133116	
MARCH			
APRIL	23495	176021	
MAY			
JUNE	17323	12992	
JULY			
AUGUST	24770	18578	
SEPTEMBER			
OCTOBER	12945	9709	
NOVEMBER			
DECEMBER	59023	44267.	
TOTALS			

COMMENTS: _____

DROUGHT2.CON REV. 12/90

BELLA VISTA, CA 96008

ATTACHMENT E.2

BVWD EXAMPLE WATER SHORTAGE RESOLUTIONS (2009)

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BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA

Resolution No. 09-01

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELLA VISTA WATER DISTRICT ENACTING STAGE IV OF THE DISTRICT'S WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Bella Vista Water District has contracted with the U.S. Bureau of Reclamation for a water supply from the Central Valley Project via the Sacramento River in the annual amount of 24,578 acre feet; subject to shortage provisions;

WHEREAS, California is experiencing dry conditions for a third year and 2009 has been designated a "critically dry" year type by the U.S. Bureau of Reclamation for Central Valley Project Water Allocation Purposes;

WHEREAS, the U. S. Bureau of Reclamation has notified the Bella Vista Water District that the District will likely receive no Irrigation water and only 3,194 acre-feet of contracted Municipal and Industrial (M&I) Project Water from the Central Valley project during the 2009 water year, defined as March 1, 2009 through February 28, 2010;

WHEREAS, the District used a total of 15,559 acre feet during water year March 1, 2007 to February 28, 2008 and, without cutbacks by District customers, would expect to use more during the 2009 water year due to dry conditions;

WHEREAS, the Board of Directors has determined that voluntary water conservation measures will not be adequate to accommodate the anticipated demand for water without depleting the water supply available to Bella Vista Water District to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

NOW, THEREFORE, be it resolved by the Board of Directors of the Bella Vista Water District and hereby declared that there is a water shortage emergency and that the following plan to manage the emergency, numbers I through V, shall be enacted and shall read as follows:

I. PURPOSE

The purpose of this Resolution is to establish a Water Shortage Contingency Plan to equitably distribute the available water to the District's customers and to ensure an adequate supply for human consumption, sanitation and fire protection. This Resolution is adopted pursuant to Water Code Section 350 and following, and Section 375 and following.

For all stages of this plan, the Water Allocation Year is from March 1 through February 28. The Water Consumption figures of the 2007 water year will be the base year figures used for allocation throughout this water shortage.

II. RESTRICTIONS, PROHIBITIONS AND SURCHARGE

Beginning March 3, 2009, all District Rural and Residential customers shall be charged a drought surcharge of $2.04 per hundred cubic foot for all water usage above sixty seven percent (67%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

Beginning March 3, 2009, all District Commercial and Public Institutional customers shall be charged a drought surcharge of $2.04 per hundred cubic foot for all water usage above eighty percent (80%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

Beginning March 3, 2009, all District Agricultural and Aquacultural customers will receive no Irrigation water; however, they will receive at a charge equal to current M&I rates an allocation of M&I water for public health and safety use purposes equal to the amount set forth below for new residential customers. As a result they shall be charged a first tier drought surcharge of $0.41 per 100 cubic feet for all water usage up to the amounts set forth below for public health and safety use purposes. All usage above the allocations shown in the table below shall be charged an additional surcharge of $2.04 per 100 cubic feet at the second tier of the drought surcharge for a total surcharge of $2.45 per 100 cubic feet (a total cost of $2.50 per 100 cubic feet). In addition, all consumption will be charged in 100 cubic feet increments.

New service applications may be granted upon the condition that the water shall be used for internal household purposes only and that landscaping must be delayed until drought conditions are lifted.

All new Residential customers and existing Agricultural and Aquacultural customers shall be granted the following allocation for public health and safety use purposes:

19 hundred cubic feet (customers billed March 16 - May 15)
39 hundred cubic feet (customers billed May 16 - July 15)
57 hundred cubic feet (customers billed July 16 - September 15)
62 hundred cubic feet (customers billed September 16 - November 15)
18 hundred cubic feet (customers billed November 16 - January 15)
12 hundred cubic feet (customers billed January 16 - March 15)

(Applicable to all current existing Agricultural and Aquacultural customers, to all existing services with no previous consumption history, and to all new meter installations purchased after the date of this Resolution).

The following restrictions will apply to all water use:

a. No filling of new ponds or new lakes and no new commercial irrigation or agricultural irrigation shall be permitted
b. No outside watering during daytime hours
c. No new landscaping for new development
d. Construction and hauled water is $2.50 per hundred cubic feet and limited to construction activities and use within the District.
e. No water deliveries for any use whatsoever outside the District. This includes property owners filling up water tanks that do not reside within the District.

The General Manager shall provide a summary report of compliance to the Board at each Regular Board Meeting. Any customer who willfully neglects to adhere to the prohibitions will be issued a written warning, and automatically referred to the District's Board of Directors for corrective action necessary to insure compliance.

III. EXCEPTIONS AND/OR VARIANCES

For residential hardship cases only, variances may be granted from any of the above restrictions upon application, addressed to the General Manager in writing, stating in detail the circumstances warranting special consideration. Applications will only be accepted after the customer has received a bill with at least 60 days of billing following the date of adoption of this ordinance. Appeals of decisions made by the General Manager may be taken to the District's Drought Committee.

For all other hardship cases, variances may be granted only by the Board of Directors. It must be recognized that due to the water shortage emergency the District has very limited ability to grant exceptions and/or variances to the Water Shortage Contingency Plan.

IV. PUBLIC NOTICE

a. The Secretary of the Board is directed to publish this Resolution in accordance with Government Code Section 6061 and Water Code Section 375.

b. The Secretary of the Board is directed to publish a summary of this Resolution on the District's internet web site (www.bvwd.org) and include it in the newsletter sent to each customer in the District.

V. DURATION

These restrictions shall remain in full force and effect until the rescission of this Resolution, or modification of a part thereof, by the Board of Directors.

Passed and Adopted this 23rd day of February 2009, by the following vote:

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

BELLA VISTA WATER DISTRICT

By: _____
Todd R. Sikes, President of the Board of Directors

ATTEST:

_____
David J. Coxey, Secretary

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at a Regular Meeting of said Board of Directors by the following vote:

Ayes: 5

Noes: 0

Absent: 0

Abstained: 0

David J. Coxey, Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 09-01 of said Board of Directors, and that the same has not been amended or repealed.

David J. Coxey, Secretary of the
Board of Directors

BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA

Resolution No. 09-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
BELLA VISTA WATER DISTRICT ADOPTING SUPPLEMENTAL WATER PROGRAM

WHEREAS, the Bella Vista Water District has contracted with the U.S. Bureau of Reclamation for a water supply from the Central Valley Project (CVP) via the Sacramento River in the annual amount of 24,578 acre feet; subject to shortage provisions;

WHEREAS, California is experiencing dry conditions for a third year and 2009 has been designated a "critically dry" year type by the U.S. Bureau of Reclamation for Central Valley Project water supply allocation Purposes.

WHEREAS, the U. S. Bureau of Reclamation has notified the Bella Vista Water District that the District will likely receive only a 5 percent allocation for agricultural purposes and only 55 percent of Municipal and Industrial (M&I) use from the Central Valley project during the 2009 water year, defined as March 1, 2009 through February 28, 2010;

WHEREAS, the District will not receive a full contract supply in this and perhaps in subsequent years due to physical drought conditions, the implementation of the Central Valley Project Improvement Act, the Endangered Species Act and numerous environmental regulations. These regulatory measures have substantially reduced the reliability and available water supply to the CVP.

WHEREAS, the Board of Directors has determined that it is necessary to augment the District's supply and has demined that a voluntary, subscription based Supplemental Water Program for Agricultural and Aquacultural customers is necessary and appropriate in order to facilitate the water supply needs of those customer classes that have had their supply most significantly reduced.

NOW, THEREFORE, be it resolved by the Board of Directors of the Bella Vista Water District the adoption of a subscription based Supplemental Water Program to be utilized in shortage years and attached hereto as Exhibit A or as revised or superseded.

Passed and Adopted this 13th day of April 2009, by the following vote:

Ayes: 3 Noes: 0 Absent: 2 Abstain: 0

BELLA VISTA WATER DISTRICT

By: _____
Todd R. Sikes, President of the Board of Directors

ATTEST:

_____
David J. Coxey, Secretary

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at a Regular Meeting of said Board of Directors by the following vote:

Ayes: 3

Noes: 0

Absent: 2

Abstained: 0

David J. Coxey, Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 09-02 of said Board of Directors, and that the same has not been amended or repealed.

David J. Coxey, Secretary of the
Board of Directors

BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA

Resolution No. 09-03

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELLA VISTA WATER DISTRICT ENACTING WATER SHORTAGE EMERGENCY MEASURES

WHEREAS, the Bella Vista Water District is a public water agency empowered to provide water service within its boundaries; and

WHEREAS, the Bella Vista Water District has contracted with the U.S. Bureau of Reclamation for a water supply from the Central Valley Project via the Sacramento River in the annual amount of 24,578 acre feet; subject to shortage provisions;

WHEREAS, California is experiencing dry conditions for a third year and 2009 has been designated a "critically dry" year type by the U.S. Bureau of Reclamation based on the Sacramento Valley Index for Central Valley Project Water Allocation Purposes;

WHEREAS, the U. S. Bureau of Reclamation has notified the Bella Vista Water District that the District will receive a Project Water supply of only 65 percent of Historic Use for Municipal and Industrial (M&I) purposes and only 15 percent for Agricultural purposes, based on the Bureau of Reclamations Draft M&I Shortage Policy, for the 2009 water year, defined as March 1, 2009 through February 28, 2010;

WHEREAS, the District used a total of 15,559 acre feet during water year March 1, 2007 through February 28, 2008 and, without cutbacks by District customers, would expect to use more during the 2009 water year due to dry conditions;

WHEREAS, the Board of Directors has determined that voluntary water conservation measures will not be adequate to accommodate the anticipated demand for water making it necessary to adopt and enforce necessary drought measures.

NOW, THEREFORE, be it resolved by the Board of Directors of the Bella Vista Water District and hereby declared that there is a water shortage emergency and that the following plan to manage the emergency, numbers I through V, shall be enacted and shall read as follows:

I. PURPOSE

The purpose of this Resolution is to supersede previously adopted water shortage emergency measures and establish a Water Shortage Contingency Plan to equitably distribute the available water to the District's customers and to ensure an adequate supply for human consumption, sanitation and fire protection. This Resolution is adopted pursuant to Water Code Section 350 and following, and Section 375 and following.

For all stages of this plan, the Water Allocation Year is from March 1st through February 28. The Water Consumption figures of the 2007 water year will be the base year figures used for allocation throughout this water shortage.

II. SURCHARGES, RESTRICTIONS AND PROHIBITIONS

A. Beginning May 1, 2009, all District Rural and Residential customers shall be charged a drought surcharge of $0.35 per hundred cubic foot (HCF) for all water usage above seventy percent (70%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

B. Beginning May 1, 2009, all District Commercial and Public Institutional customers shall be charged a drought surcharge of $0.35 per hundred cubic foot (HCF) for all water usage above eighty percent (80%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

C. Beginning May 1, 2009, all District Agricultural and Aquacultural customers shall be charged a drought surcharge of $330 per acre-foot for all water usage above thirty five percent (35%) of the cumulative amount used by that customer during the base year (March 1, 2007 through February 28, 2008).

D. New service applications may be granted; upon the condition that the water shall be used for internal household purposes only, and that landscaping must be delayed until drought conditions are lifted. All new Residential customers shall be granted the following allocation:

19 hundred cubic feet (customers billed March 16 - May 15)
39 hundred cubic feet (customers billed May 16 - July 15)
57 hundred cubic feet (customers billed July 16 - September 15)
62 hundred cubic feet (customers billed September 16 - November 15)
18 hundred cubic feet (customers billed November 16 - January 15)
12 hundred cubic feet (customers billed January 16 - March 15)

(Applicable to all existing services with no previous consumption history, and to all new meter installations purchased after the date of this Resolution).

Customers subject to and exceeding the quantities above shall be charged a drought surcharge of $0.35 per hundred cubic foot (HCF) for all water usage above the listed amounts per bimonthly billing period.

E. The following restrictions will apply to all water use:

a. No filling of new ponds or new lakes and no new commercial irrigation or agricultural irrigation shall be permitted;
b. Construction and hauled water shall be $2.50 per hundred cubic foot (HCF) and limited to construction activities and use within the District;
c. With the exception of active fire fighting operations, there shall be no water deliveries outside the District. This includes hauled water for property owners that do not reside within the District.

F. The District strongly encourages its customers to:

a. Adjust sprinklers and irrigation systems to avoid overspray, runoff and waste;
b. Avoid watering lawns in the hot part of the day (i.e., between 9 a.m. and 7 p.m.) and on windy days;
c. Install new drought tolerant landscaping, and efficient irrigation systems;
d. Not hose down driveways, sidewalks and other paved surfaces, except when necessary for health or sanitary reasons;
e. Install pool and spa covers to minimize water loss due to evaporation;
f. Not allow the hose to run while washing any vehicle and to use a bucket or a hose with an automatic shutoff valve;
g. Retrofit indoor plumbing fixtures with low-flow devices; and

h. Check faucets, toilets and pipes, both indoor and outdoor, including house service laterals and sprinkler piping, for leaks and repair them immediately, or upon demand of the District.

G. Any customer who willfully neglects to adhere to the prohibitions herein or utilizes water in a wasteful or unreasonable manner will be issued a written warning. A Second offense will result in a penalty of $200. A third offense will result in the termination of water service until remedied to the satisfaction of the General Manager.

H. The General Manager shall provide a water supply update and summary of compliance to the Board at each Regular Board Meeting.

III. EXCEPTIONS AND/OR VARIANCES

For residential hardship cases only, variances may be granted from any of the above restrictions upon application, addressed to the General Manager in writing, stating in detail the circumstances warranting special consideration. Applications will only be accepted after the customer has received a bill with at least 60 days of billing following the date of adoption of this ordinance. Appeals of decisions made by the General Manager may be taken to the District's Drought Committee.

For all other hardship cases, variances may be granted only by the Board of Directors. It must be recognized that due to the water shortage emergency the District has very limited ability to grant exceptions and/or variances to this Plan.

IV. PUBLIC NOTICE

A. The Secretary of the Board is directed to publish this Resolution in accordance with Government Code Section 6061 and Water Code Section 375.

B. The Secretary of the Board is directed to publish this Resolution on the District's internet web site (www.bvwd.org) and to include a summary in the newsletter sent to each customer in the District.

V. DURATION

These restrictions shall remain in full force and effect until the rescission of this Resolution, or modification of a part thereof, by the Board of Directors.

BE IT FURTHER RESOLVED that if critical water shortages continue and supplies of water are reduced, the District will consider further action to curtail water use, including mandatory conservation measures, to prevent water waste.

Passed and Adopted this 27th day of April 2009, by the following vote:

Ayes: 4 Noes: 0 Absent: 1 Abstain:

BELLA VISTA WATER DISTRICT

By: Lynette Blaisdell
Lynette Blaisdell, Vice-President of the Board of Directors

ATTEST: David J. Coxey
David J. Coxey, Secretary

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at a Regular Meeting of said Board of Directors by the following vote:

Ayes: 4

Noes: 0

Absent: 1

Abstained: 0

David J. Coxey, Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 09-03 of said Board of Directors, and that the same has not been amended or repealed.

David J. Coxey, Secretary of the
Board of Directors

BELLA VISTA WATER DISTRICT
COUNTY OF SHASTA

Resolution No. 09-06

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELLA VISTA WATER DISTRICT ENACTING WATER SHORTAGE EMERGENCY MEASURES

WHEREAS, the Bella Vista Water District is a public water agency empowered to provide water service within its boundaries; and

WHEREAS, the Bella Vista Water District has contracted with the U.S. Bureau of Reclamation for a water supply from the Central Valley Project via the Sacramento River in the annual amount of 24,578 acre feet; subject to shortage provisions;

WHEREAS, California is experiencing dry conditions for a third year and 2009 has been designated a "critically dry" year type by the U.S. Bureau of Reclamation based on the Sacramento Valley Index for Central Valley Project Water Allocation Purposes;

WHEREAS, the U. S. Bureau of Reclamation has notified the Bella Vista Water District that the District will receive a Project Water supply of only 75 percent of Historic Use for Municipal and Industrial (M&I) purposes and only 40 percent for Agricultural purposes, based on the Bureau of Reclamations Draft M&I Shortage Policy, for the 2009 water year, defined as March 1, 2009 through February 28, 2010;

WHEREAS, the District used a total of 15,559 acre feet during water year March 1, 2007 through February 28, 2008 and, without cutbacks by District customers, would expect to use more during the 2009 water year due to dry conditions;

WHEREAS, the Board of Directors has determined that voluntary water conservation measures will not be adequate to accommodate the anticipated demand for water making it necessary to adopt and enforce necessary drought measures; and

WHEREAS, on February 23, 2009 District's Board of Directors adopted Resolution 09-01 Enacting Stage IV Of The District's Water Shortage Contingency Plan and on April 27, 2009 the District's Board of Directors adopted Resolution 09-03 Enacting revisions to Stage IV Of The District's Water Shortage Cont1ngency Plan.

NOW, THEREFORE, be it resolved by the Board of Directors of the Bella Vista Water District and hereby declared that (1) there is a continuing water shortage emergency, (2) Resolutions 08-04, 09-01 and 09-03 are hereby superseded, and (3) the following plan to manage the emergency, numbers I through V, shall be enacted and shall read as follows:

I. PURPOSE

The purpose of this Resolution is to supersede previously adopted water shortage emergency measures and establish a Water Shortage Contingency Plan to equitably distribute the available water to the District's customers and to ensure an adequate supply for human consumption, sanitation and fire protection. This Resolution is adopted pursuant to Water Code Section 350 and following, and Section 375 and following.

For all stages of this plan, the Water Allocation Year is from March 1st through February 28. The Water Consumption figures of the 2007-08 water year will be the base year figures used for allocations throughout this water shortage.

II. SURCHARGES, RESTRICTIONS AND PROHIBITIONS

A. Beginning June 1, 2009, all District Rural and Residential customers shall be charged a drought surcharge of $0.26 per hundred cubic foot (HCF) for all water usage above eighty percent (80%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

B. Beginning June 1, 2009, all District Commercial and Public Institutional customers shall be charged a drought surcharge of $0.26 per hundred cubic foot (HCF) for all water usage above eighty percent (80%) of the amount used by that customer during the same bimonthly period during the base year (March 1, 2007 through February 28, 2008).

C. Beginning May 1, 2009, all District Agricultural and Aquacultural customers shall be charged a drought surcharge of $144.00 per acre-foot for all water usage above eighty percent (80%) of the cumulative amount used by that customer during the base year (March 1, 2007 through February 28, 2008).

D. All new Residential customers shall be granted the following allocation:

19 hundred cubic feet (customers billed March 16 - May 15)
39 hundred cubic feet (customers billed May 16 - July 15)
57 hundred cubic feet (customers billed July 16 - September 15)
62 hundred cubic feet (customers billed September 16 - November 15)
18 hundred cubic feet (customers billed November 16 - January 15)
12 hundred cubic feet (customers billed January 16 - March 15)

(Applicable to all existing services with no previous consumption history and to all new meter installations purchased after May 12, 2008).

Customers subject to and exceeding the quantities above shall be charged a drought surcharge of $0.26 per hundred cubic feet (HCF) for all water usage above the listed amounts per bimonthly billing period.

E. The following restrictions will apply to all water use:
1. No new agricultural irrigation shall be permitted;
2. Construction and hauled water shall be $1.26 per hundred cubic feet (HCF).

F. The District encourages its customers to:
1. Adjust sprinklers and irrigation systems to avoid overspray, runoff and waste;
2. Avoid watering lawns in the hottest part of the day (i.e., between 9 a.m. and 7 p.m.) and on windy days;
3. Install new drought tolerant landscaping, and efficient irrigation systems;
4. Not hose down driveways, sidewalks and other paved surfaces, except when necessary for health or sanitary reasons;
5. Install pool and spa covers to minimize water loss due to evaporation;
6. Not allow the hose to run while washing any vehicle and to use a bucket or a hose with an automatic shutoff valve;
7. Retrofit indoor plumbing fixtures with low-flow devices; and
8. Check faucets, toilets and pipes, both indoor and outdoor, including house service laterals and sprinkler piping, for leaks and repair them immediately, or upon demand of the District.

G. Any customer who willfully neglects to adhere to the prohibitions herein or utilizes water in a wasteful or unreasonable manner will be issued a written warning. A Second offense will result in a penalty of $200. A third offense will result in the termination of water service until remedied to the satisfaction of the General Manager.

H. The General Manager shall provide a water supply update and summary of compliance to the Board at each Regular Board Meeting.

III. EXCEPTIONS AND/OR VARIANCES

For residential hardship cases only, variances may be granted from any of the above restrictions upon application, addressed to the General Manager in writing, stating in detail the circumstances warranting special consideration. Applications will only be accepted after the customer has received a bill with at least 60 days of billing following the date of adoption of this ordinance. Appeals of decisions made by the General Manager may be taken to the District's Drought Committee.

For all other hardship cases, variances may be granted only by the Board of Directors. It must be recognized that due to the water shortage emergency the District has very limited ability to grant exceptions and/or variances to this Plan.

IV. PUBLIC NOTICE

A. The Secretary of the Board is directed to publish this Resolution in accordance with Government Code Section 6061 and Water Code Section 375.

B. The Secretary of the Board is directed to publish this Resolution on the District's internet web site (www.bvwd.org) and to include a summary in the newsletter sent to each customer in the District.

V. DURATION

These restrictions shall remain in full force and effect until the rescission of this Resolution, or modification of a part thereof, by the Board of Directors.

BE IT FURTHER RESOLVED that if critical water shortages continue and supplies of water are reduced, the District will consider further action to curtail water use, including mandatory conservation measures, to prevent water waste.

Passed and Adopted this 26th day of May 2009, by the following vote:

Ayes: 3 Noes: 0 Absent: 2 Abstain: 0

BELLA VISTA WATER DISTRICT

By: _____
Todd R. Sikes,
President of the Board of Directors

ATTEST: _____
David J. Coxey, Secretary

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at a Regular Meeting of said Board of Directors by the following vote:

Ayes: 3

Noes: 0

Absent: 2

Abstained: 0

David J. Coxey, Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 09-06 of said Board of Directors, and that the same has not been amended or repealed.

David J. Coxey, Secretary of the
Board of Directors

ATTACHMENT F

COORDINATED AB 3030 GROUNDWATER MANAGEMENT PLAN

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Coordinated AB 3030
Groundwater Management Plan
for the
Redding Groundwater Basin

Prepared for the
Redding Area Water Council

Prepared by
Shasta County Water Agency

November 1998

Updated May 2007

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Appendix “A” – Ordinance SCC 98-1

Appendix “B” – DWR Groundwater Information

Chapter 1 - Introduction

Background and Authority of AB 3030

Section 1.01. On January 1, 1993, California Assembly Bill 3030, the Groundwater Management Act, was codified into California law. California Water Code Sections 10750 et seq., allow local water agencies to adopt local groundwater management plans. Local public and private entities are encouraged by Water Code Section 10755.2 to adopt and implement a coordinated AB 3030 Plan, such as this plan for the Redding Groundwater Basin.

Section 1.01.A. On September 16, 2002, the California Legislature passed Senate Bill 1938. This act amended Water Code Sections 10753.4 and 10795.4; amended and renumbered Sections 10753.7, 10753.8, and 10753.9; and added Sections 10753.1 and 10753.7.

Section 1.02. Development of an AB 3030 Plan under Water Code Sections 10750, et seq., allows local entities to efficiently manage groundwater supplies, assure long-term water supplies, and distribute costs, benefits, and water sharing in a locally determined equitable manner.

Section 1.03. The Department of Water Resources (“DWR”) defines a "Groundwater Management Plan" as "planned use of the groundwater basin yield, storage space, transmission capability, and water in storage."

Section 1.04. Water Code Section 10750 et seq., defines "Groundwater Management Program” as “a coordinated and ongoing activity undertaken for the benefit of a groundwater basin pursuant to a Groundwater Management Plan as specified in AB 3030."

Section 1.05. The Redding Area Water Council (“Water Council”) is an association of numerous public and private entities within the Redding Groundwater Basin area who have determined by Memorandum of Understanding (MOU) dated August 1998 to jointly prepare, adopt, and implement an AB3030 Plan for the Redding Basin.

The Shasta County Water Agency (SCWA), an authorized groundwater management agency as defined in Water Code Section 10753, was authorized by the Water Council MOU to serve as the lead agency in preparing, adopting, and implementing this AB 3030 Groundwater Management Plan. The MOU also designated the Water Council to serve in a policy making oversight capacity for this planning effort. Accordingly, this plan has been undertaken by agreement of the public and private entities comprising the Water Council, as permitted by Water Code Sections 10750.7, 10753 and 10755.2. (See Table 1 for a list of Water Council members.)

Section 1.06. By executing the MOU, each of the participating entities has found and declared that management of the groundwater within their combined jurisdictions, by joint preparation, adoption and implementation of this AB3030 Plan, is in the public interest and will be of common benefit to water users within the Plan Area described in Chapter 2 of this Plan.

Section 1.07. The Water Council has determined that the adoption of this plan will provide immediate and long-term benefits for all beneficial uses of water.

Management Objectives

Section 1.08. The purposes of this Groundwater Management Plan can be summarized as follows:

A. To avoid or minimize conditions that would adversely affect groundwater availability and quality within the Plan area.

B. To develop a groundwater management program that addresses data collection and which protects and enables reasonable use of the groundwater resources of the Redding Basin.

Section 1.09. The Plan will not intrude upon, diminish, or negate in any manner, the existing authority of each affected agency, except as may be expressly provided. This Plan is intended to supplement and strengthen individual agency authority, while building on coordination efforts through the public/private entity partnership established by the above-referenced MOU. Elements of the Groundwater Management Plan will be achieved by Basin-wide consensus, wherever possible.

Coordinated Implementation

Section 1.10. The Water Council shall implement this AB 3030 Plan, with SCWA serving as the lead agency, consistent with the MOU establishing the Water Council. Accordingly, SCWA, working with and at the direction of the Water Council Policy Advisory Committee, will coordinate with all affected water purveyors and other interested parties to implement this Plan within the defined Plan Area.

Section 1.11. Upon its adoption by majority vote of the Water Council, and upon meeting all regulatory prerequisites, this Plan will be effective within the entire jurisdictional boundary of each participating public entity except where the jurisdictional boundaries are outside of Shasta County or the Redding Groundwater Basin (as shown schematically in Figure 1).

TABLE 1
Redding Area Water Council

Member Agencies
City of Anderson
City of Redding
City of Shasta Lake
Shasta County Water Agency
Anderson-Cottonwood Irrigation District
Bella Vista Water District
Clear Creek Community Services District
Centerville Community Services District
Cottonwood Water District
Shasta Community Services District
Mountain Gate Community Services District
McConnell Foundation – Advisory Only

Chapter 2 - Plan Area

Location

Section 2.01. The AB 3030 Plan Area Encompasses the cities of Shasta Lake, Redding, and Anderson, and the lands served by the numerous other water districts, agencies and purveyors in Shasta County and northern Tehama County comprising the Water Council. The Plan Area is the Redding Groundwater Water Basin (shown on Figure 1), including the service areas of the public water purveyors (shown on Figure 2).

Physiography and Geology

Section 2.02. The Redding Basin is bounded on the east by the dissected alluvial terraces, which form the foothills of the Cascade Range. The low hills and dissected uplands of the Coast Range stretch for the length of the western Shasta and Tehama County borders. The interior of the Redding Basin is characterized by stream channels, floodplain, and natural levees of the Sacramento River and its tributaries. Alluvial fans are also present near the confluence of tributaries with the Sacramento River.

Section 2.03. The Redding Groundwater Basin consists of a sediment-filled, southward-plunging, symmetrical trough (Department, 2001). Simultaneous deposition of material from the Coast Range and the Cascade Range resulted in two different formations, which are the principal freshwater-bearing formations in the basin. The Tuscan Formation, in the east, is derived from Cascade Range volcanic sediments, and the Tehama Formation, in the western and northwest portion of the basin, is derived from Coast Range sediments. These formations are up to 2,000 feet thick near the confluence of the Sacramento River and Cottonwood Creek; the Tuscan Formation is generally more permeable and productive than the Tehama Formation (Department, 2001). Groundwater recharge occurs in the higher elevations through stream seepage and direct infiltration of precipitation. Rivers and streams transition to gaining streams at lower elevations and receive direct groundwater discharge. Areas of riparian vegetation occur along surface water features throughout the basin.

Section 2.04. The oldest rock unit exposed in the area is the Upper Cretaceous Chico Formation. This unit consists of sandstone, conglomerates, and shale, which are of marine origin. In most areas of the Redding Basin, the Chico Formation contains salt water under artesian pressure. The Chico Formation is overlain by the Tuscan Formation in the eastern portion of the basin and by the Tehama Formation in the eastern portion.

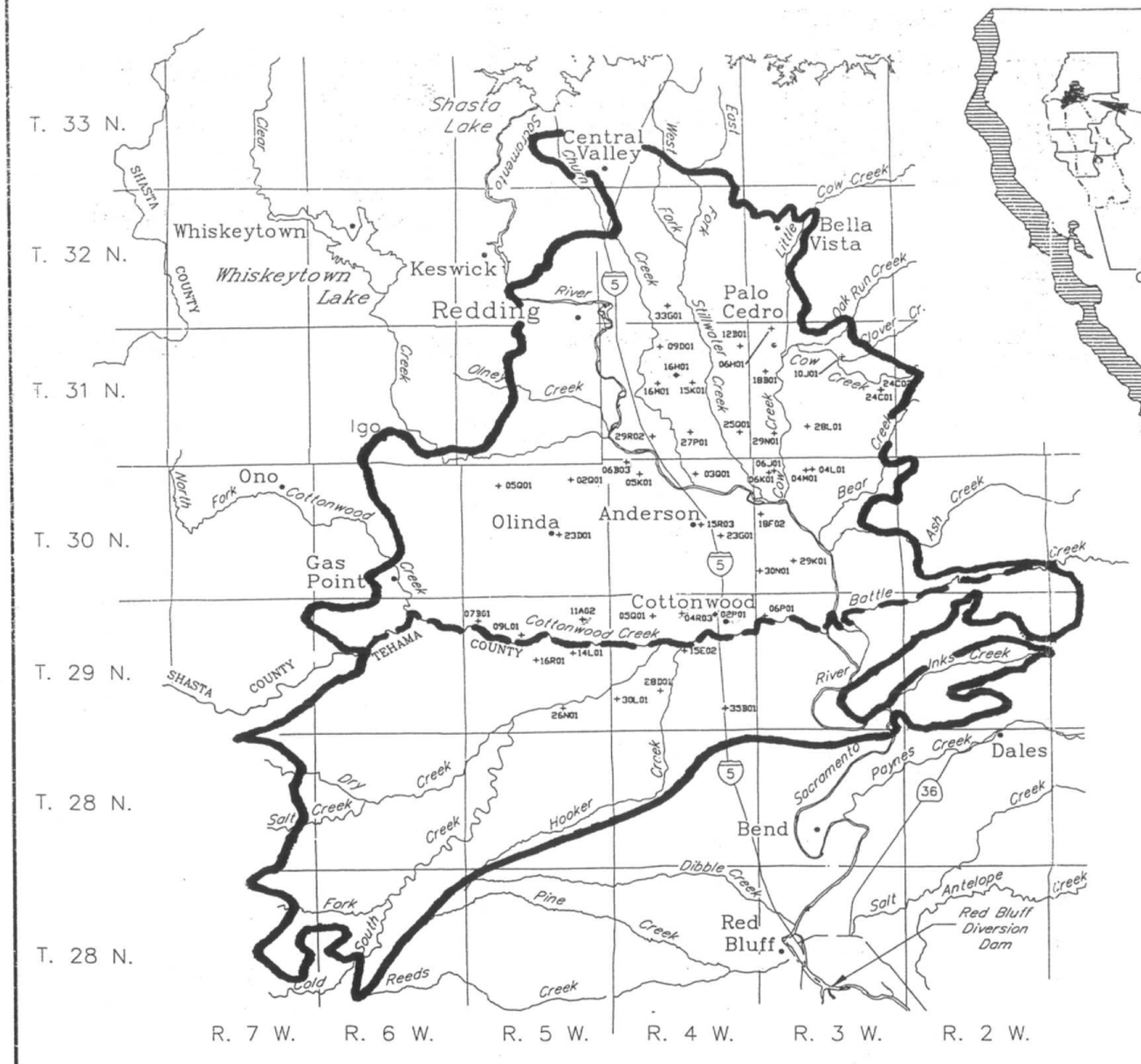
Section 2.05. The Tuscan Formation is Pliocene in age, and consists of tuff breccia, tuffaceous sandstone and conglomerate, and tuffaceous silt and clay (Anderson, 1933). The mudflow deposits are generally of low permeability, but in many areas of the Redding Basin, the mudflows were eroded, sorted, and redeposited shortly after eruption. These reworked deposits are composed of thick, highly permeable sand and gravel strata. These units of the Tuscan Formation are the most prolific aquifers of the Redding Basin.

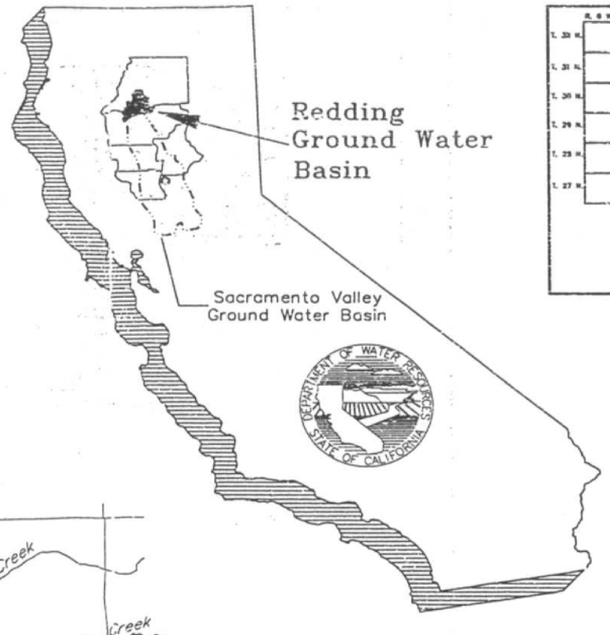
Section 2.06. The valley fill sediments that were eroded from the finer- grained rocks of the Coast Range that bound the Redding Basin to the west comprise the Pliocene Tehama Formation. The Tehama Formation is comprised of silt, sand, gravel, and clays of fluvial origin, and have been observed to be locally cemented (Russel, 1931). The Tehama Formation is another principal water-bearing formation in the Redding Basin, and contains groundwater under both confined and unconfined conditions. While parts of the Tehama Formation appear to be younger in age than the Tuscan Formation, the two formations interfinger in the central portion of the basin, indicating that these portions of the two formations are equivalent in age.

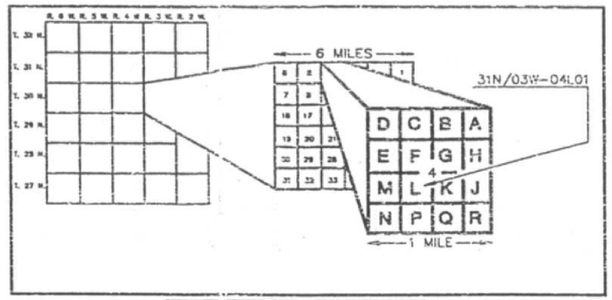
(See Figure 3 for an illustrative depiction of a typical geologic cross-section view looking from west to east across the Redding Basin.)

Section 2.07. The Red Bluff Formation unconformably overlies most of the interbedded Tehama and Tuscan Formations. It is composed primarily of coarse gravels and boulders in a reddish sand, silt, and clay matrix, and outcrops to the west of the Sacramento River (Pierce, 1983). These materials may have been originally deposited by debris-laden, turbid streams draining glacial areas. (Bulletin 118-6, DWR, 1978) The Red Bluff Formation is poorly to moderately permeable, and, in general, areas of outcrop are above the zone of saturation.

Section 2.08. Alluvial deposits of varying age underlie the floodplain along the Sacramento River and its tributaries. These flood-deposited materials generally appear as thin layers of gravel, sand, silt, and clay that occur in thicker beds along the channel of the Sacramento River. The deposit is unconsolidated and the permeability is generally moderate but locally, where gravels predominate, may be very high (Pierce, 1983).







State Well Numbering System

EXPLANATION

- \+ Semi-Annually Monitored Well
- • Monthly Monitored Well
- 09A01 Section Number, Tract, and Sequence Number of State Well Number. Combined with the Township and Range to Determine the Entire State Well Number.
- Shasta County Line
- Approximate Ground Water Basin Boundary

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
NORTHERN DISTRICT

Ground Water Levels in the Redding Ground Water Basin

LOCATION OF GROUND WATER LEVEL MONITORING WELLS
February 1994

0 2 4 6 8 10
Miles

FIGURE 1

Page -5-

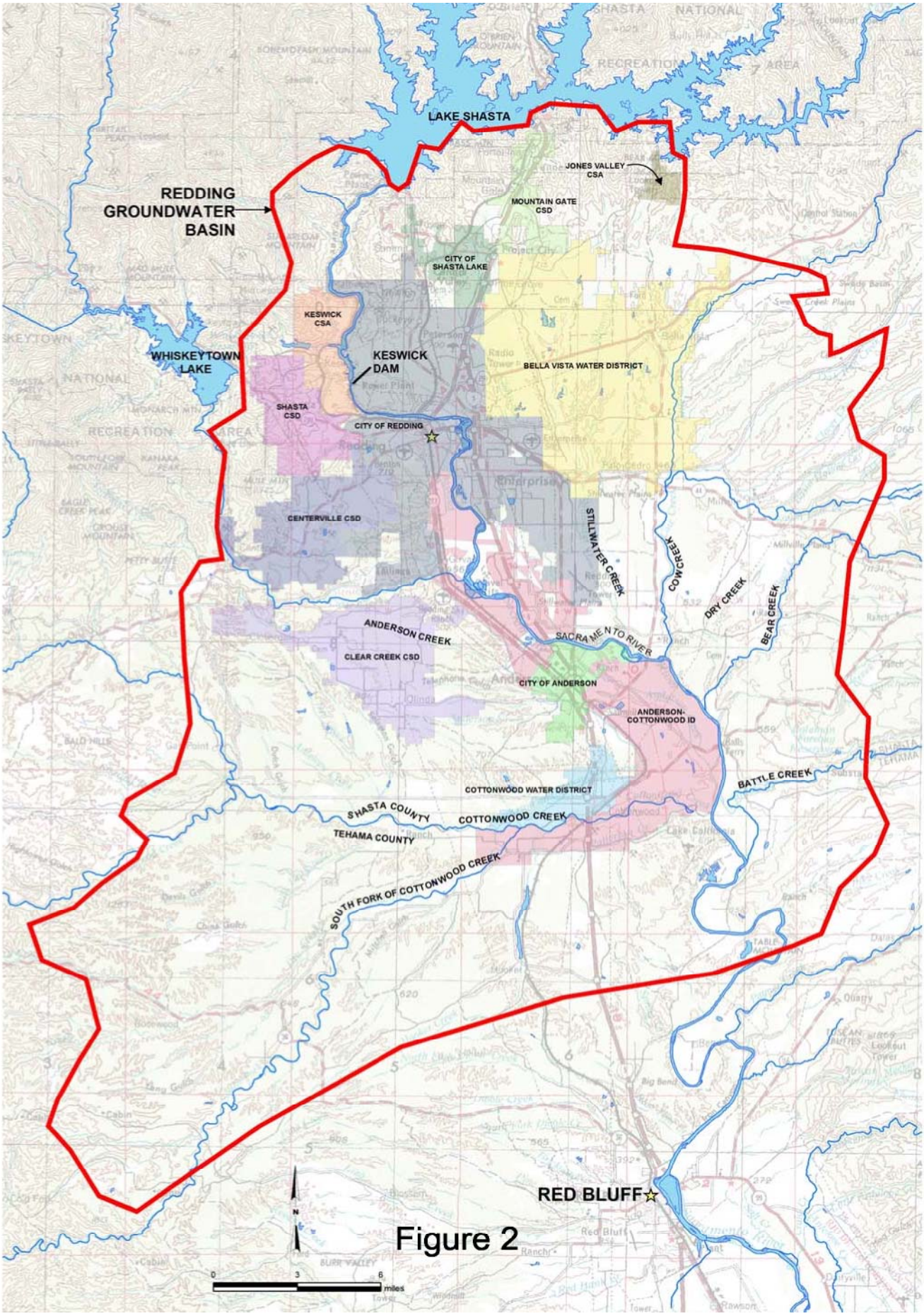
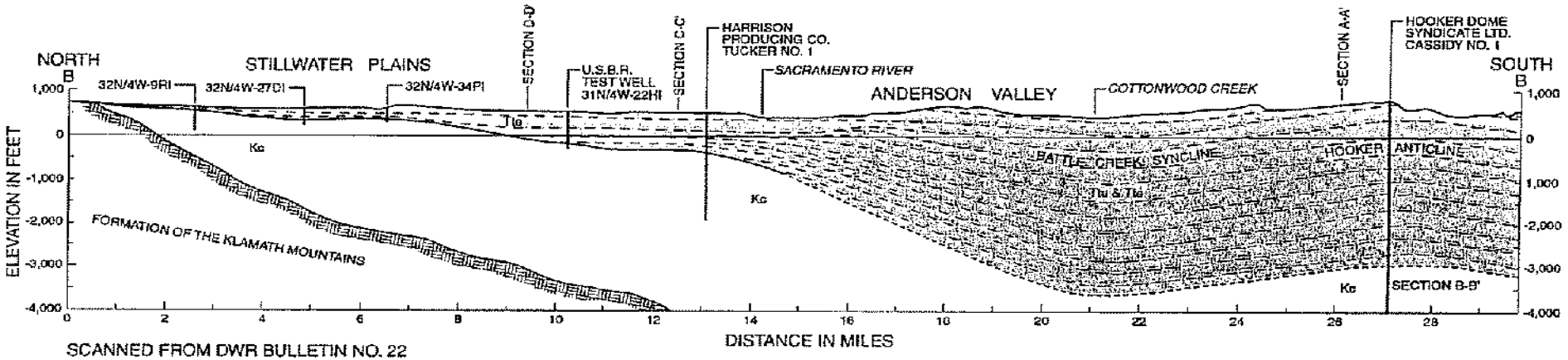

LAKE SHASTA
REDDING GROUNDWATER BASIN
JONES VALLEY CSA
MOUNTAIN GATE CSD
CITY OF SHASTA LAKE
KESWICK CSA
KESWICK DAM
WHISKEYTOWN LAKE
BELLA VISTA WATER DISTRICT
SHASTA CSD
CITY OF REDDING
CENTERVILLE CSD
STILLWATER CREEK
COW CREEK
DRY CREEK
BEAR CREEK
ANDERSON CREEK
SACRAMENTO RIVER
CLEAR CREEK CSD
CITY OF ANDERSON
ANDERSON-COTTONWOOD ID
BATTLE CREEK
COTTONWOOD WATER DISTRICT
SHASTA COUNTY
COTTONWOOD CREEK
TEHAMA COUNTY
SOUTH FORK OF COTTONWOOD CREEK
RED BLUFF
N
0
3
6
miles

Figure 2



SCANNED FROM DWR BULLETIN NO. 22

FIGURE 3

GENERALIZED CROSS SECTION ACROSS THE SACRAMENTO VALLEY

REDDING GROUNDWATER BASIN, SHASTA COUNTY

2478_07 (7/7/98)

Climate

Section 2.09. Shasta County exhibits a wide range of precipitation and temperature due to the relatively large elevation difference between the valley floor and the highlands in the extreme eastern and western portions of the County adjacent to the Redding Basin. Precipitation and temperature data from Redding, representing typical valley floor climate parameters in the Redding Basin, demonstrate that the valley lands encompassing the Redding Basin experience hot dry summers and mild winters.

Section 2.10. Typical temperatures in the Redding area are summarized in Table 2. Mean annual precipitation in Shasta County (from the Shasta County Hydrology Manual) is shown on Figure 4.

Section 2.11. The major portion of annual precipitation generally occurs from November through April; very little rainfall typically occurs between May and October. Average annual rainfall in the Redding Basin varies from approximately 25 to 50 inches.

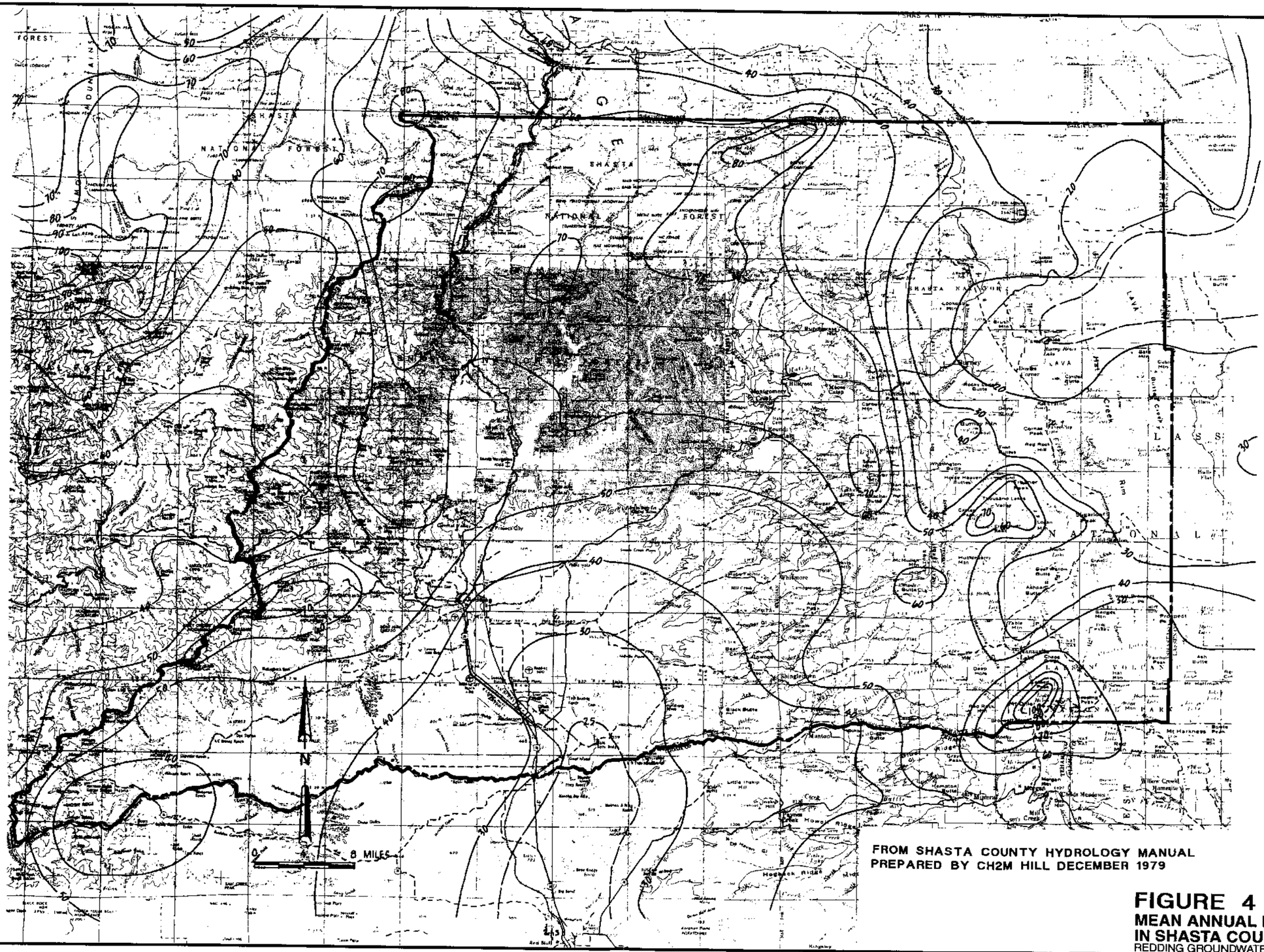
Section 2.12. The population within the Redding Basin is growing at a much higher rate than in the surrounding areas, in part because of the availability of public services, including public water supplies. The development of public water systems has resulted in a variety of high intensity land uses, including urban, residential, agriculture, riparian and native vegetation, and recreation. The three incorporated cities in the Redding Basin—Redding, Shasta Lake, and Anderson—currently account for about sixty-six percent (66%) of the total population within the Redding Basin. (See Shasta County Water Resources Master Plan—Phase 1 Report, SCWA (1997), Appendix C). Long-term population growth rates in the Redding Basin have been relatively uniform since World War II

TABLE 2

Historic Climatic Data for Redding, California

Month	[1]Normal Mean Temperature (EF)	[2]Highest Temperature of Record (EF)	[2]Lowest Temperature of Record (EF)	[2]Average Sunshine
Jan	45.5	77	19	73%
Feb	50.7	83	21	83%
Mar	52.2	85	28	84%
Apr	58	94	33	90%
May	66.4	104	36	91%
Jun	76.1	111	42	94%
Jul	81.5	118	54	97%
Aug	79.5	115	51	97%
Sep	74.1	116	40	94%
Oct	63.5	105	33	92%
Nov	51.8	88	23	84%
Dec	45	74	17	73%
Annual Average	62	118	17	88%

[1]Period of record: 1961 through 1990
[2]Data through 1995



FROM SHASTA COUNTY HYDROLOGY MANUAL
PREPARED BY CH2M HILL DECEMBER 1979

FIGURE 4
MEAN ANNUAL PRECIPITATION IN SHASTA COUNTY
REDDING GROUNDWATER BASIN, SHASTA COUNTY

2478_11 (7/7/98)

Economy

Section 2.13. The economy of Shasta County and the Redding Basin is directly tied to water supply. Lack of reliability in the water supplies has resulted in severe impacts within the service areas of purveyors who rely on federal water contracts for all or a major portion of their water supplies. Since 1991, there have been cutbacks of as much as 75 percent of agricultural allocations and 25 percent of municipal and industrial allocations. These cutbacks have resulted in substantial uncertainty and related constraints on the short-term and long-term planning needed for the orderly development of the Redding Basin.

Local Interest

Section 2.14. In late 1996, the SCWA, acting as a lead agency in this coordinated planning process, hired CH2M HILL, a water resources consulting firm, and retained legal counsel specializing in water, environmental, and regulatory law to assist with development and implementation of the Groundwater Management Plan. Working together, the Water Council members prepared the "Shasta County Water Resources Master Plan Phase 1 Report" (October 1997), which addresses current and future water needs in Shasta County and the Redding Basin. The Water Council members, by terms of the June 1998 MOU, have agreed to continue with this joint planning effort, including the preparation of an integrated surface and groundwater management plan for the Redding Groundwater Basin.

List of Participants

Section 2.15. The Water Council includes the major public and private water users in the Redding Basin. Water use for 1995 by type of use and purveyor or major user in the Redding Basin is shown in Table 3.

Section 2.16. In addition to the above referenced public and private stakeholders, key interest groups will be encouraged to participate in Plan implementation, including public education.

Section 2.17. The success of this Groundwater Management Plan, as prepared pursuant to Water Code Section 10750 et seq., will largely be dependent on the extent of coordination between all affected public entities and other interested parties. As required under Water Code Section 10750 et seq., a notice of public hearing will be published to consider whether to implement a Groundwater Management Plan.

Legal, Financial and Political Considerations

Section 2.18. In Shasta County, as in other parts of California, water resources management is governed by a complex system of local, state, and federal laws. Water use, development, and allocation are controlled by legal contracts and agreements, common law principles, statutes, constitutional provisions, and court decisions. These legal considerations, in combination with the jurisdictional powers of the various local governing agencies and the private property rights of groundwater users, form the framework that governs water resources management in Shasta County and the Redding Basin. A more thorough overview of the institutional framework for water resource management in California is provided in Chapter 2 of *The California Water Plan Update* (DWR Bulletin 160-98).

TABLE 3
1998 Annual Water Needs Summary
Redding Basin
(acre-feet x 1,000, except as noted)

	Major Public Purveyors						Small Purveyors	Private Users		
	ACID Gravity	BVWD Pressure	Clear Creek CSD Pressure	Anderson City Pressure	Redding City Pressure	Shasta Lake City Pressure	Others[a] Pressure	HWUI[b] Pressure	Irrigators, 50% Gravity, 50% Pressure	Totals
Water-Using Lands										
Irrigated Agriculture										
Permanent Crops	5.40	0.24	3.10	0.00	0.14	0.00	0.00	0.00	0.04	8.92
Grain and Field Crops	1.04	0.63	0.09	0.00	0.45	0.00	0.00	0.21	1.31	3.73
Pasture	45.93	10.35	3.57	0.00	0.00	0.04	0.10	1.38	13.82	75.19
Truck	0.14	0.02	0.04	0.00	0.04	0.00	0.00	0.00	0.30	0.54
Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rural Urban (1 to 5 acres)	8.48	4.18	0.00	0.00	0.00	0.00	0.08	0.00	0.00	12.74
Total	**60.99**	**15.42**	**6.80**	**0.00**	**0.63**	**0.04**	**0.18**	**1.59**	**15.47**	**101.12**
Urban										
Urban	0.00	2.07	0.56	1.34	15.66	2.06	0.93	0.00	2.44	25.06
Rural Urban Domestic (1 to 5 acres)	0.00	0.98	0.95	0.09	1.51	0.02	1.44	0.00	1.63	6.62
Total	**0.00**	**3.05**	**1.51**	**1.43**	**17.17**	**2.08**	**2.37**	**0.00**	**4.07**	**31.68**
Commercial and Industrial										
Commercial	0.00	0.25	0.07	0.16	1.16	0.02	0.04	0.00	0.11	1.81
Industrial	0.00	1.70	0.14	0.07	0.60	0.00	0.12	14.67	0.71	18.01
Total	**0.00**	**1.95**	**0.21**	**0.23**	**1.76**	**0.02**	**0.16**	**14.67**	**0.82**	**19.82**
Recreational and Environmental										
Water Bodies	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Parks and Golf Courses	0.00	0.68	0.00	0.16	0.87	0.08	0.02	0.00	0.24	2.05
Riparian Vegetation	4.67	0.30	0.03	0.00	3.53	0.00	0.00	0.00	3.14	11.67
Total	**4.67**	**0.98**	**0.03**	**0.16**	**4.40**	**0.08**	**0.02**	**0.00**	**3.38**	**13.72**
Diversions to Other Counties	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
Total	**30.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**30.00**
Total Water Delivery Demands, acre-feet per year	95.66	21.40	8.55	1.82	23.96	2.22	2.73	16.26	23.74	196.34
Conveyance Losses (acre-feet per year)	79.34	1.06	0.43	0.09	1.02	0.11	0.14	0.81	1.16	84.16
Current Diversion Requirements (acre-feet per year)[c]	**175.00**	**22.46**	**8.98**	**1.91**	**24.98**	**2.33**	**2.87**	**17.07**	**24.90**	**280.50**

a Centerville CSD, Shasta County CSD, Keswick CSA, Mountain Gate CSD, Cottonwood Water District and Jones Valley CSA.

b Heavy Water Usage Industrial (Simpson Paper Company, Sierra Pacific Industries, and Wheelabrator).

c Includes 20,000 acre-feet per year delivered to Tehama County and 10,000 acre-feet delivered to downstream users.

Section 2.19. The Water Council will adopt rules and regulations to implement provisions of this AB 3030 Plan. All such rules and regulations shall be adopted pursuant to Water Code Section 10753.8.

Section 2.20. Though permitted pursuant to Water Code Section 10754 et seq., no fees or assessments to finance AB 3030 Plan expenses, such as administrative and operating costs, will be considered by the Water Council unless a future need is demonstrated.

Condition of the Groundwater Basin

Redding Groundwater Basin and Sub-Basins

Section 2.21. The boundaries of the Redding Basin roughly approximate the eastern and western edges of the Sacramento Valley floor. (See Figure 1, showing the Basin and Plan Area.) The foothill areas that constitute the eastern and western portions of Shasta and Tehama Counties adjacent to the Redding Basin are designated as "highland" areas, and are noted for their relative scarcity of groundwater resources. Sub-basins and areas within the Redding Basin with unique characteristics will be identified and evaluated in AB 3030 Plan implementation.

Existing Monitoring

Section 2.22. Since the late 1920s, the State Department of Water Resources (DWR) and the United States Bureau of Reclamation have measured groundwater levels for 48 wells in the Redding Basin. Currently, 35 wells are monitored semi-annually and 5 wells are measured on a quarterly basis.

Section 2.23. The DWR issues periodic reports that relate to the monitoring program in the Redding Basin. These reports include groundwater hydrographs for the monitored wells. Appendix “B” contains access information for DWR Groundwater levels.

Section 2.24. Most wells in the monitoring program are measured by DWR semi-annually, usually in March and October. These monitoring periods provide an indication of groundwater levels before and after the typical agricultural irrigation season.

Section 2.25. In addition to recording water levels, the DWR reports also include, for each well, information on the producing aquifer(s), degree of certainty associated with the groundwater body classification, the hydrogeologic unit, and the applied use of the extracted groundwater.

Section 2.26. The data from these historic and ongoing monitoring efforts will be considered and reflected in the ongoing development of a Redding Basin computer model.

Historic Variations in Groundwater Levels

Section 2.27 Groundwater levels in the Redding Basin fluctuate seasonally in response to the quantities of discharge from, and recharge to, the groundwater basin that occurs in a particular year. The primary source of groundwater discharge from the aquifer is groundwater pumping, along with a small quantity of subsurface outflow from the basin, while the main sources of recharge are deep percolation of precipitation and applied water, along with leakage from surface streams.

Section 2.28. Monthly measurements of groundwater show that water levels start dropping in early spring (usually April) and continue to decline through the summer until early September. Maximum levels are usually reached by February.

Section 2.29. Over the long term, groundwater levels in the Redding Basin have remained steady. There are seasonal fluctuations (summer to winter), and there are some fluctuations caused by climatic patterns (wet or dry years), but overall, groundwater levels have not changed significantly throughout the period of record.

Historic Groundwater Pumpage

Section 2.30. In the earlier parts of this century, little groundwater was used in Shasta County and the Redding Basin. The Sacramento River and its primary tributaries provided the source of water for most irrigation. A notable exception is along Cottonwood Creek, where substantial groundwater extraction occurred over several decades, largely ending in the 1980s.

Section 2.31. In the early 1970s, approximately 5 percent of all irrigation water came from groundwater, and approximately 95 percent came from surface-water sources. In 1995, approximately 12.5 percent of all water used in the Redding Basin was derived from groundwater. The vast majority of groundwater extracted is put to municipal and industrial uses. Groundwater is the principal source of water supply for areas outside of the service areas of the 14 water districts within the basin.

Groundwater Quality

Section 2.32. The general quality of groundwater in the Redding Basin is considered good to excellent (TDS between 95 and 424 mg/L) for most uses, except for that water from shallow depths along the margin of the basin where pre-Tertiary formations may be tapped. Some wells in those areas yield water with constituents that are above limits for drinking (primarily metals, TDS, chloride and sulfate). This water is likely derived from the Chico Formation (Pierce, 1983).

Section 2.33. Additional review of existing and potential groundwater quality problems in the Redding Basin is needed. This will occur in AB 3030 Plan implementation.

Need for Groundwater Management Plan

Section 2.34. There is a substantial, but undefined, supply of groundwater in the Redding Basin. The Redding Basin does not appear to be in a state of groundwater overdraft; however, at this time there is no certainty as to how close the Redding Basin is to overdraft, what constitutes a “safe annual yield,” and when and how frequently well interference problems may arise in the future.

The Redding Groundwater Basin has been estimated to contain up to 3,500,000 AF of groundwater in storage (DWR Bulletin 118, 1975). Groundwater levels in wells within the Basin are depressed seasonally, but fully recover over the winter months in all but the driest rainfall years. However, further study is necessary to determine the effects of a prolonged, severe drought on regional groundwater levels.

Section 2.35. The need for an AB 3030 Plan is documented in the Shasta County Water Resources Master Plan Phase 1 Report (October 1997) “Phase 1 Report,” which was prepared for the Water Council. As indicated in that report, additional study of the Redding Basin’s characteristics is needed to better understand and evaluate the occurrence, movement, origin, and destination of groundwater in the Redding Basin, and what constitutes reasonable use thereof.

Section 2.36. This plan is intended to provide a mechanism for both the public and private stakeholders in the Redding Basin to evaluate, manage, protect, and preserve this valuable local groundwater resource.

Replace Figures 5-11 with citations to Appendix B in 2.22-2.36. Appendix B would contain appropriate web links to historic documents.

Chapter 3 - Elements of the AB 3030 Plan

AB 3030 Plan Elements

Section 3.01. The approach to groundwater management reflected in this AB 3030 Plan will generally be based on voluntary cooperation between water agencies, purveyors, and interested private parties in the Redding Basin, with an information gathering and monitoring emphasis. This plan includes the following elements: (1) Data Development/Groundwater Monitoring; (2) Public Entity Coordination and Reporting; (3) Public Information and Education; (4) Export Limitations; (5) Water Quality; (6) Wellhead Protection; (7) Land Use; (8) Conjunctive Use Operations; (9) Groundwater Management Facilities; and (10) Groundwater Overdraft and Well Interference. These elements are further described below.

Data Development/Groundwater Monitoring

Section 3.02. To ensure that its actions are taken in accordance with the public interest, and to further prevent the use of unnecessary and potentially burdensome management techniques, SCWA will work with Water Council participants to collect data and will conduct or receive necessary and relevant studies, for the purpose of further documenting the existing quality and quantity of groundwater within the Redding Basin. This SCWA activity will be undertaken in a scope and manner consistent with the Water Council MOU, including the preparation and maintenance of a linked surface water and groundwater computer-based model.

Section 3.03. SCWA will serve as the Water Council's information and data collection coordinator, and will collect and conduct, or have conducted, technical investigations to carry out this plan, including computer model development. All data collection and technical investigations authorized under this plan shall be carried out by SCWA in consultation with the Water Council Policy Advisory Committee.

Section 3.04. One of the goals in the data collection and evaluation process will be to determine the Redding Basin's long-term safe annual yield. For the purpose of this plan, "long-term safe annual yield" shall be as defined in Appendix A, which defines this and other key AB 3030 Plan and implementing regulation terms. The determination shall estimate the safe annual yield of the total Redding Basin under various hydrologic conditions and the probable boundaries of the sub-basin hydrologic units.

Section 3.05. The Water Council shall prepare a report on the status of the Redding Basin no less than bi-annually. The report shall include an estimate of annual recharge, pumping, and groundwater discharge to surface streams. The report shall include any other information that the Water Council deems relevant and necessary to the effective management of groundwater within the Plan Area, including estimated changes in water levels.

A. Collection and Analysis of Data/Preparation of Reports on Hydrologic Conditions. Data related to the hydrologic inventory of the Redding Basin will be collected and reviewed as a component of the periodic report to be prepared by the Water Council. Principal factors to be considered will include surface water imported to and exported from the Redding Basin, evapotranspiration, the estimated groundwater recharge, discharge, and extractions from the Redding Basin, and subterranean outflow.

B. Preference for Use of Existing Databases. To avoid incurring unnecessary costs, the Water Council shall utilize data and models developed for the Redding Basin Management Planning effort and further determine the status of additional studies and monitoring programs carried out within the Redding Basin by federal, state, and local agencies. Where possible, information from pre-existing data collection programs, and new data derived from the computer model to be developed for the Water Council and other sources, will be incorporated into the report.

C. Expansion of Data Collection Efforts. Where significant and important data are missing or incomplete, the Water Council will determine methods to acquire a more complete database.

Section 3.06. The Water Council, using its Technical Advisory Committee as it determines appropriate, may prepare or receive reports on groundwater and supplemental water supplies, groundwater quality, and other conditions within the Plan Area. The Water Council may identify information useful to a water replenishment or conjunctive use project and prepare reports on the utility of these types of projects within the Plan Area.

Section 3.07. To protect and/or enhance the quality and quantity of water within the Redding Basin, the Water Council shall develop and implement a Redding Basin monitoring program. The monitoring program may consist of the measures identified in these sections and will be implemented by the adoption of rules and regulations, as determined appropriate by the Water Council Policy Advisory Committee.

A. Monitoring Redding Basin Conditions. The previous and ongoing collection and analysis of basic hydrologic data are important elements of the Management Plan. Monitoring is essential to characterize Redding Basin conditions and to provide the technical information needed to make decisions regarding the optimal use and management of the Redding Basin. Monitoring of the Redding Basin will allow the Water Council to: (1) identify reliable sources of information; (2) identify changing conditions; (3) develop and implement specific groundwater management programs as may be determined necessary in the future; and (4) document the accomplishments of the management program.

B. Use of Existing Monitoring Data. The Water Council shall coordinate with the DWR, Northern District Office, Anderson-Cottonwood Irrigation District, and other appropriate entities to use and supplement their existing semi-annual well water level measurement program. Monitoring of water levels will allow the Water Council to gauge the status of the groundwater resource in response to changing hydrologic conditions and water use practices. The number and location of these wells will be determined by the Water Council Policy Advisory Committee.

C. Monitoring Groundwater Quality Conditions. The Water Council shall include one or more monitoring wells within the Redding Basin, and in each sub-basin where feasible, for the purpose of measuring water quality conditions within the Redding Basin. The number and location of these wells will be determined by the Water Council Policy Advisory Committee. Efforts will be made to use existing wells that are subject to water quality testing to minimize costs associated with the water quality-monitoring program.

Section 3.08. The Water Council shall prepare an annual estimate of the amount of water extracted within the Plan Area and of the total cumulative groundwater extractions within the Redding Basin.

Public Entity Coordination and Reporting

Section 3.09. The Water Council shall strive at all times to coordinate with all agencies having jurisdiction over water-related matters in and adjacent to the Redding Basin.

Section 3.10. The Water Council will coordinate with the Regional Water Quality Control Board, U.S. Environmental Protection Agency, the State Office of Drinking Water, and other state and local regulatory agencies to monitor and develop information concerning groundwater quality compliance with applicable standards, and to otherwise manage and ensure reasonable use of Plan Area groundwater.

Public Information and Education

Section 3.11. It is essential to involve the public, agricultural, industrial, and business communities early in the development of the Groundwater Management Plan. Throughout the implementation of this plan, public education and community relations will be integral to successful groundwater management in the Redding Basin.

Section 3.12. The Water Council shall provide public outreach through public presentations, published information items, and references to groundwater data available through other public agencies, as determined by the Policy Advisory Committee.

Export Limitations

Section 3.13. In order to preserve and protect Redding Groundwater Basin resources, and to ensure their reasonable and beneficial use in a way that is not detrimental to the Basin and its local users, County of Shasta Ordinance No. SCC 98-1, as adopted by the Shasta County Board of Supervisors on January 27, 1998, is fully incorporated into this AB 3030 Plan by reference, and shall apply throughout the AB 3030 Plan area except: (1) as otherwise provided by this Plan; or (2) as it may be superceded by adoption of one or more local ordinances within individual public agency boundaries. That groundwater extraction and export ordinance, which is codified as Chapter 18.08 of the Shasta County Code, is attached to this Plan as Appendix A.

The term “Shasta County” as used in Exhibit “A” for the purpose of requiring a permit for the export of ground water outside of the County, shall mean the AB 3030 Plan area.

The term “Commission” as used in Exhibit “A” shall be the Water Council Technical Advisory Committee, as established by MOU, unless otherwise designated and appointed by the Water Council.

The terms “Clerk of the Board” and “Board” as used in Exhibit “A” for the purpose of appeals from Commission actions on permit applications, shall mean the “Director” as therein defined and the full Water council, Respectively.

Water Quality

Section 3.14. The Water Council, working with members and non-member entities shall develop a program to assess, monitor, and protect the quality of groundwater in the Redding Basin to ensure the quality is acceptable for all beneficial uses.

Wellhead Protection

Section 3.15. Abandoned wells provide the potential for pollutants or contaminants to enter and/or spread into the Redding Basin groundwater. As such, well abandonment represents a

key concern in groundwater management. The Water Council shall coordinate with the County Division of Environmental Health to obtain written notice concerning well abandonment projects.

Section 3.16. Improperly constructed and abandoned wells can impair yields and increase the potential for groundwater contamination. The Water Council supports the California Model Well Code standards, and the Shasta County well construction and destruction ordinance and regulations, and will work with the County Division of Environmental Health to provide information to well owners throughout the Basin regarding proper well construction and abandonment procedures.

Land Use

Section 3.17. To improve coordination among Water Council members and jurisdictions having land use authority, the Water Agency will request notification and circulation of CEQA documents for projects in the basin that identify potentially significant effects to groundwater quality. The Water Agency will notify members of the Water Council that may be affected and collaborate to assess the risk of groundwater contamination.

Conjunctive Use Operations

Section 3.18. The Water Council shall evaluate options and develop a program for conjunctive use of Redding Basin water sources in an effort to increase or maintain Redding Basin water supplies.

Groundwater Management Facilities

Section 3.19. The Water Council will assess the need for short- and long-term facilities, such as conjunctive use facilities, and develop plans as may be determined appropriate.

Groundwater Overdraft and Well Interference

Section 3.20. A mitigation and prevention program will be developed to address potential overdraft, well interference, and similar problems that would adversely affect the groundwater resources in the Plan area. This program will identify strategies and actions that will promote reasonable groundwater usage in the Redding Basin.

Section 3.21. The Water Council Policy Advisory Committee shall review this AB 3030 Plan and its implementation on a bi-annual basis and shall report its findings to all MOU participants.

Chapter 4 - Implementation

Procedure

Section 4.01. A Groundwater Management Plan developed pursuant to Water Code Section 10750 et seq., must be conducted according to the procedure show in Table 4.

TABLE 4 Procedure to Implement Groundwater Management Plan
1. Publish notice of public hearing to consider whether to adopt resolution of intent.
2. Conduct a hearing on whether to adopt a resolution of intent to adopt a Groundwater Management Plan.
3. Adopt a resolution of intention to adopt a Groundwater Management Plan.
4. Publication of notice.
5. Prepare a Groundwater Management Plan within 2 years.
6. Hold a second hearing after plan preparation is complete.
7. Consider protests at conclusion of second hearing.
8. If protests are received from landowners representing more than 50% of assessed value of property in the County occurs, the Plan shall not be adopted.
9. If protests are received from landowners representing less than 50% of assessed value of property in the Redding Basin Plan area occurs, the AB 3030 Plan may be adopted within 35 days after Step 6.

Plan Administration

Section 4.02. The Water Council will administer the AB 3030 Plan throughout the Plan Area in accordance with the adopted Water Council MOU. As reflected in that MOU, successful implementation of the AB 3030 Plan must involve the ongoing participation of, and coordination between, all Redding Basin agencies which are empowered with groundwater-related duties and other interested local entities.

Section 4.03. Consistent with Water Council objectives in preparing this AB 3030 Plan, it is intended that this Plan will apply to the service areas of all local water purveyors within its stated boundaries. However, any local agency, investor-owned utility, or mutual water company which may decline to have the plan made applicable within its service area will be exempt from this plan within its jurisdiction, as stated in the MOU or applicable law.

Section 4.04. Any local water agencies within the boundaries of the AB 3030 plan area that decline to participate in cooperative management of the Redding Basin within its agency boundary shall be encouraged to adopt their own groundwater management plans and coordinate with the Water Council to the extent possible.

Section 4.05. This AB3030 Plan shall be funded, with respect to implementation and maintenance, as provided in the Water Council MOU as may be amended.

Section 4.06. In accordance with the California Groundwater Management Act, the Water Council will develop rules and regulations from time to time, to implement provisions of this plan, as it may be amended consistent with the Water Council MOU. These rules and regulations shall be adopted by the Water Council by resolution.

Section 4.07. All meetings of the Policy Advisory Committee and/or Technical Advisory Committee will be publicly noticed in print media of general circulation. Parties that have requested will be notified of meetings in the same manner as the Policy Advisory Committee and/or Technical Advisory Committee.

A. Time will be allotted during meetings of the Policy Advisory Committee and/or Technical Advisory Committee for public comment. The amount of time will be at the discretion of the Water Committee member conducting the meeting.

B. Written comments germane to the Policy Advisory Committee and/or Technical Advisory Committee meeting will be considered if received before the close of business 5 working days after the meeting.

Section 4.08. All known water purveyors whose boundaries overlie the Redding Groundwater Basin will be notified of meetings of the Policy Advisory Committee and/or Technical Advisory Committee in the same manner as members of the Water Committee.

A. Time will be allotted during meetings of the Policy Advisory Committee and/or Technical Advisory Committee for purveyor comment. The amount of time will be at the discretion of the Water Committee member conducting the meeting.

B. Written comments germane to the Policy Advisory Committee and/or Technical Advisory Committee meeting will be considered if received before the close of business 10 working days after the meeting.

Chapter 5 - Plan Amendments

Section 5.01. This AB3030 Plan shall be periodically updated, based on changed circumstances within the Redding Basin, as determined by the Water Council.

Section 5.02. Plan Amendments shall occur in the manner established in the Water council MOU, as may be amended.

Section 5.03. The Water Council shall endeavor to publicly distribute, and educate the public concerning any AB3030 Plan amendments adopted resulting in more than mere technical changes.

APPENDIX "A"

SHASTA COUNTY GROUNDWATER
EXTRACTION AND EXPORT ORDINANCE

ATTACHMENT H

WATER QUALITY DOCUMENTS

H.1 BVWD 2012 Consumer Confidence Report
H.2 BVWD Water Permit No. 01-02-08(P)002
H.3 Water Treatment Plant Monitoring & Reporting Program
H.4 District Land Use Map

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ATTACHMENT H

WATER QUALITY DOCUMENTS

H.1 BVWD 2012 Consumer Confidence Report
H.2 BVWD Water Permit No. 01-02-08(P)002
H.3 Water Treatment Plant Monitoring & Reporting Program
H.4 District Land Use Map

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ATTACHMENT H.1

BELLA VISTA WATER DISTRICT
2012 CONSUMER CONFIDENCE REPORT

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BELLA VISTA WATER DISTRICT – 2012 CONSUMER CONFIDENCE REPORT

(Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.)

The District is pleased to present this year's Consumer Confidence Report. Our unvarying goal is to provide a safe and dependable supply of drinking water to all of our customers. Last year, as in years past, your tap water met all EPA and State drinking water health standards. Once again we are proud to report that our water system has never violated a maximum contaminant level or any other water quality standard.

WHERE OUR WATER COMES FROM

In 2012 our water sources include surface water from the Sacramento River and groundwater from our five wells.

In 2012, surface water from the Sacramento River made up 99.3% of the treated water supply, or approximately 4.27 billion gallons (compared with 96.3% of the treated water supply and 3.53 billion gallons in 2011). The maximum daily flow through the Water Treatment Plant in 2012 was 28.6 million gallons on August 13th. In 2012 the District captured and recycled approximately 173 million gallons (530 acre-feet) of water filter backwash water, supplying approximately 4% of the treated water supply in 2012. This recycled water reduces the amount of water that the District diverts from the Sacramento River or pumps from groundwater wells and provides a reliable source of much needed water during water shortages.

The District's wells draw from the Redding groundwater basin. The wells made up 0.7% of the total supply, or approximately 30.8 million gallons in 2012 (compared with 0.3% of the treated water supply and 11.6 million gallons in 2011). The treatment process at each of the five wells consists of oxidation of iron and manganese using chlorine, followed by absorption of the iron and manganese oxides in pressure filters. A chlorine residual is carried through the entire process to aid in maintaining a chlorine residual in the distribution system. No iron or manganese was detected in any of the treated well water samples collected in 2012. Well water is warmer than the treated surface water and has a different taste due to its higher mineral content. At times, the mixing of chlorinated well water with treated river water in the distribution system generates a more noticeable taste due to the different physical and chemical properties of the waters. To ensure the safety of the water the same microbiological testing is completed weekly at various sites throughout the water distribution system, regardless of the source.

The District received no water, through its interties during all of 2012.

Source water assessments were performed by the Department of Public Health between January 2002 and April 2003. The District's Sacramento River source is considered most vulnerable to the following activities associated with contaminants detected in the water supply: 1) metal plating/finishing/fabricating, 2) wood/ pulp/paper processing and mills, and 3) drinking water treatment plants. The source is considered most vulnerable to the following activities not associated with any detected contaminants: 1) concentrated aquatic animal production facilities, 2) historic waste dumps/landfills, 3) landfills/dumps, 4) historic mining operations, and 5) wastewater treatment plants and disposal facilities (above Shasta Dam). The District's well sources are considered most vulnerable to the following activities not associated with any detected contaminants: 1) lumber processing and manufacturing, 2) septic systems - low density, 3) sewer collection systems, 4) historic waste dumps/landfills, 5) automobile - gas stations, and 6) utility stations - maintenance areas.

A copy of the complete assessment may be viewed at Bella Vista Water District, 11368 E. Stillwater Way, Redding, CA 96003. You may request a summary of the assessment be sent to you by contacting the Administrative Assistant @ (530) 241-1085, ext. 105.

In 1989 the Federal Surface Water Treatment Rule set forth specific regulations requiring proper treatment of surface waters, as well as specific license requirements for water treatment operators. Although the regulations have changed dramatically, the overall process has not. Currently the District's staff includes 8 individuals with state certification as water treatment operators and 18 with certification as water distribution operators (including 10 individuals with certification as both) who operate and maintain the District's facilities 365 days per year.

CONTAMINANTS IN WATER

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and in some cases radioactive material and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.

STATE AND FEDERAL REGULATIONS

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

The tables in this report list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The Department of Public Health allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of our water quality, are more than one year old.

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Act Hotline at 1-800-426-4791.

A NOTE TO THE IMMUNO-COMPROMISED FROM THE UNITED STATES EPA

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

REGARDING LEAD IN DRINKING WATER

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Bella Vista Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

ARSENIC IN THE DISTRICT'S WATER

Analysis of the District's surface and well waters has shown that it contains low levels of arsenic (less than 10 parts per billion). The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

ABOUT THE WATER QUALITY TABLES

Bella Vista Water District routinely monitors for constituents in your drinking water according to federal and state laws. The tables in this report show the results of our monitoring for the period through December 31, 2012. Where contaminants are monitored less than once per year, the values included in the report tables represent the results of the most recent analyses. In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms, the following definitions are provided:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not detectable at current testing limits.

Parts per million (ppm) or Milligrams per liter (mg/L) - one part per million corresponds to one minute in 1.9 years or a single penny in $10,000.

Parts per billion (ppb) or Micrograms per liter (µg/L) - one part per billion corresponds to one minute in 1,900 years, or a single penny in $10,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Microsiemens per centimeter (µS/cm) is a unit for reporting the specific electrical conductance of the water.

Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements. Turbidity in excess of 5 NTU is just noticeable to the average person.

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Public Health Goal or PHG – The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standards (PDWS) - MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.

2012 RESULTS OF WATER QUALITY ANAYSES

Results of Sampling for Microbial Contamination					
Contaminant	**MCL**	**Unit of Measurement**	**PHG (MCLG)**	**Highest Number of Detections**	
				Treated Surface Water	**Treated Well Water**
1. Total Coliform Bacteria (Total Coliform Rule)	Presence of coliform bacteria in no more than one sample per month	presence/ absence	0	None	None
2. Fecal coliform and *E.coli* (Total Coliform Rule)	A routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	presence/ absence	0	None	None
3. Fecal Indicators (*E.coli*, enterococci or coliphage) (Total Coliform Rule)	Treatment Technique	n/a	n/a	None	None

Sampling Results Showing Treatment of Surface Water Source (Sacramento River)					
Contaminant	**Performance Standard / MCL (Treatment Technique)**	**Unit of Measurement**	**Level Found**	**Range**	**Violations**
4. Turbidity	(1) Shall at no time exceed 1 NTU	Based on measurements made at 4 hour intervals while the plant is in operation	Less than 1 NTU at all times	0.020 NTU to 0.135 NTU	None
	(2) Less than 0.1 NTU in 95% of the measurements taken each month	Lowest Monthly % of measurements meeting the standard	100	100	None
	(3) Reduction in turbidity of 80% or more	Average monthly percentage reduction in turbidity	98.1	96.9 – 99.8	None
Note: Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.					

Sampling Results Showing the Detection of Contaminants With a <u>Primary</u> Drinking Water Standard							
Contaminant	**MCL**	**PHG (MCLG)**	**Unit of Measure-ment**	**Sacramento River***		**Well Water****	
				Average Value	**Range**	**Average Value**	**Range**
5. Gross Alpha	15	(0)	pCi/L	ND	-	0.4	ND - 2.1
6. Aluminum	1	0.6	ppm	ND	-	ND	All ND
7. Arsenic	10	0.004	ppb	2	-	4	2 - 6
8. Barium	1	2	ppm	ND	-	0.1	ND - 0.3
9. Chromium	50	(100)	ppb	ND	-	1	ND - 4
10. Fluoride	2.0	1	ppm	ND	-	0.1	0.1 - 0.4
				Sacramento River and Well Water			
				2012 Highest Running Annual Average		**2012 Range**	
11. TTHM [Total trihalomethanes]	80	N/A	ppb	43		32 – 43	
12. HAA5- Haloacetic acids	60	N/A	ppb	44		32 – 52	
Note: TTHM and HAA5 results are from samples collected from the Distribution System which may include water from both the river and wells.							

* All results from the surface water source (which represents 99.3% of the water produced by the District in 2012) are from samples collected in 2012.

**Well water results reflect the latest results taken from each well; the results include samples collected over the period 2003 through 2012. The dates of the latest samples may be obtained by contacting the District's office.

Sampling Results Showing the Detection of Contaminants With a Secondary Drinking Water Standard (Aesthetic standards, established by the California Department of Public Health - Division of Drinking Water)							
Contaminant or Analyte	**MCL**	**PHG (MCLG)**	**Unit of Measure-ment**	**Sacramento River***		**Well Water****	
				Average Level Detected	**Range**	**Average Level Detected**	**Range**
13. Foaming Agents (MBAS)	500	N/A	µg/L	ND	-	2	ND - 10
14. Total dissolved solids	1,000	N/A	mg/L	97	-	199	149 – 236
15. Specific conductance	1,600	N/A	µS/cm	121	-	316	245 - 399
16. Chloride	500	N/A	mg/L	4	-	36	11 - 56
17. Sulfate	500	N/A	mg/L	3.5	-	2.1	0.7 – 4.9

Sampling Results for Unregulated Contaminants (Unregulated contaminant monitoring helps the USEPA and the California Department of Public Health to determine where certain contaminants occur and whether the contaminants need to be regulated.)							
18. Boron	Notification Level = 1000 ppb	N/A	ppb	ND***	-	498	208 - 996
19. Vanadium	Notification Level = 50 ppb	N/A	ppb	4***	-	0.4	ND - 1

Sampling Results for Sodium, Hardness and pH							
20. Sodium	N/A	N/A	ppm	7	-	41	25 - 60
21. Hardness	N/A	N/A	ppm	48	-	60	40 – 87
22. pH	6.5 - 8.5	N/A	pH units	7.9	-	7.8	7.8 - 7.9

* All results from the surface water source (which represents 99.3% of the water produced by the District in 2012) are from samples collected in 2012.

**Well water results reflect the latest results taken from each well; the results include samples collected over the period 2003 through 2012.

*** Not sampled in 2012; the results include samples collected over the period 2002 through 2012.

The dates of the latest samples may be obtained by contacting the District's office.

Sampling Results Showing the Detection of Lead and Copper						
Contaminant	**PHG (MCLG)**	**Action Level (AL)**	**90th percentile level detected**	**No. of samples collected**	**No. of Sites exceeding AL**	**Typical Source of Contaminant**
Lead (ppb)	0.2	15	ND	32	0	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppb)	300	1300	299	32	0	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives
Note: The District is required to conduct lead and copper sampling every three years. These results are from the most recent round of sampling conducted in June 2010.						

Disinfectant Residuals found in the Distribution System during 2012							
Contam-inant	**MCL [MRDL]**	**Unit of Measure-ment**	**PHG (MRDLG)**	**Average Value**	**Range**	**Major Sources in Drinking Water**	**Health Effects**
Chlorine	4.0 (as $Cl_{2)}$	ppm	4	.93	0.26 to 1.44	Drinking water disinfectant added for treatment	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

MRDL = Maximum Residual Disinfectant Level (The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminanats.)

MRDLG = The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

TYPICAL SOURCES OF DETECTED CONTAMINANTS	
Contaminant	**Typical Source of Contaminant**
1. Total Coliform Bacteria	Naturally present in the environment
2. Fecal Coliform and *E. coli*	Human and animal fecal waste
3. Fecal	Human and animal fecal waste
4. Turbidity	Soil runoff
5. Gross Alpha	Erosion of natural deposits
6. Aluminum	Erosion of natural deposits; residue from some surface water treatment processes
7. Arsenic	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
8. Barium	Discharge of oil drilling wastes and from metal refineries; erosion of natural deposits
9. Chromium	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
10. Fluoride	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
11. TTHM [Total trihalomethanes]	By-products of drinking water chlorination
12. Haloacetic Acids	By-products of drinking water chlorination
13. Foaming Agents (MBAS)	Municipal and industrial waste discharges
14. Total dissolved solids	Runoff/ leaching from natural deposits
15. Specific conductance	Substances that form ions when in water; seawater influence
16. Chloride	Runoff/leaching from natural deposits; seawater influence
17. Sulfate	Runoff/leaching from natural deposits; seawater influence
18. Boron	Laundry products, sewage, agricultural chemicals and fertilizers, coal combustion mining and glass and ceramics manufacturing
19. Vanadium	Natural sources and from the burning of fuel oils

OTHER TEST RESULTS OF INTEREST	
Constituent	**Description and Source Information**
20. Sodium	Refers to the salt present in the water and is generally naturally-occurring
21. Hardness	Is the sum of polyvalent cations present in the water, generally magnesium and calcium. These cations are generally naturally-occurring.
22 . pH	The pH of a water is a measure of its hydrogen ion activity or acidity. By definition the pH of pure water is 7.0. The pH range of most natural waters is about 6.0 to 8.5.

YOUR VIEWS ARE WELCOME

If you have any questions about this report, please contact Don Groundwater, your District Engineer, at (530) 241-1085, ext. 114. We want our valued customers to be informed about their water district. If you want to learn more, please visit the District's web site: www.bvwd.org or attend any of our regularly scheduled Board of Directors meetings. The meetings are held on the fourth Monday of each month at 5:30 p.m. at the District office, located at 11368 E. Stillwater Way, Redding, CA 96003.

Bella Vista Water District is an equal opportunity employer and provider.

ATTACHMENT H.2

BELLA VISTA WATER DISTRICT
WATER PERMIT NO. 01-02-08(P)002

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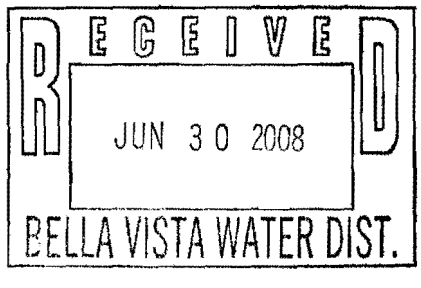
WATER PERMIT NO. 01-02-08(P)002
Bella Vista Water District
System No. 4510014

Shasta County
June 2008



State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

June 27, 2008

Bella Vista Water District
11368 E. Stillwater Way
Redding, CA 96003-9510

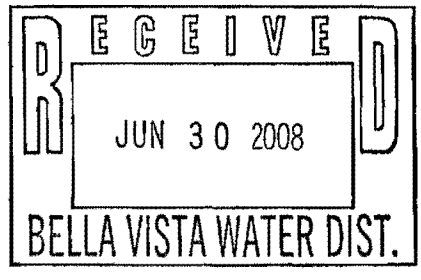
Attention: Board of Directors

Subject: Domestic Water Supply Permit **[Permit #*01-02-08(P)002*]** for the Bella Vista Water District Public Water System PWS # 4510014

I am pleased to present you with your Domestic Water Supply Permit for the District's Public Water System. The Permit and the supporting Engineering Report are enclosed.

This Permit allows you to operate the Bella Vista Water District's community water system as described in the Engineering Report and subject to the conditions listed in the Permit.

Michael J. McNamara, P.E.
Lassen District Engineer
California Department of Public Health
Drinking Water Program-Field Operations



Enclosure

cc: Kim Wilhelm, P.E., Chief
Northern California Region

gls

STATE OF *CALIFORNIA*

DOMESTIC WATER SUPPLY PERMIT

Issued To

BELLA VISTA WATER DISTRICT

Public Water System No. 4510014

By The

California Department of Public Health

Division of Drinking Water & Environmental Management

PERMIT NUMBER: 01-02-08(P)002 **DATE: June 27, 2008**

WHEREAS:

1. The Bella Vista Water District was granted a domestic water supply permit on January 1976, to serve domestic water to the unincorporated area north of Redding in Shasta County. The permit authorized the District to pump water from the Sacramento River via the Wintu Pumping Plant in Redding. Treatment of the approved surface water supply consisted of chlorination treatment only. A groundwater source (Well #1) was approved for use as a supplemental source during the irrigation season.

2. The Bella Vista Water District was granted a permit amendment in July of 1979 for the operation of the newly constructed Well #2.

3. The Bella Vista Water District submitted a domestic water supply permit amendment application, dated June 1, 2004, to the California Department of Health Services, now California Department of Public Health (CDPH), to amend the existing water supply permit to '*construct improvements to the District's Wintu Pump Station, Water Treatment Plant, Quail Ridge Pump Station, and water distribution system per the plans and specifications titled "Wintu Pump Station and Water Treatment Plant Expansion Project".*' The proposed improvements, for which the permit amendment application was submitted, were to be constructed under the Safe Drinking Water Revolving Fund (SDWSRF) program. The application was submitted in accordance with the California Health and Safety Code, Section 116550.

4. This public water system is known as the BELLA VISTA WATER DISTRICT, whose headquarter is located at 11368 East Stillwater Way in Redding, California. The mailing address is 11368 East Stillwater Way, Redding, CA 96003-9510.

5. The legal owner of the Bella Vista Water District's Water System is the BELLA VISTA WATER DISTRICT. The BELLA VISTA WATER DISTRICT, therefore, is responsible for compliance with all statutory and regulatory drinking water requirements and the conditions set forth in this permit.

6 The public water system for which the water supply permit amendment application has been submitted is as described briefly below (a more detailed description of the permitted system is described in the attached Permit Engineering Report):

> Bella Vista Water District provides agricultural, municipal and industrial water to approximately 16,500 people in Shasta County.
>
> This system is supplied from one surface water treatment plant and five active groundwater sources.
>
> The source of raw water for the surface water treatment plant comes from the Sacramento River.
>
> There are approximately 6,000 active service connections, serving an estimated population of 16,500.
>
> The service area maintains 8 Booster Stations, 10 Pressure Zones with 5 pressure reducing stations, and approximately 421 dead ends.

5. The service area of the Bella Vista Water District is shown on the service area map in APPENDIX B of the Permit Engineering Report.

And WHEREAS:

1. The Bella Vista Water District has submitted all of the required information relating to the proposed operation of the Water System.

2. The California Department of Public Health has evaluated all of the information submitted by the Bella Vista Water District and has conducted a physical investigation of the proposed Water System.

3. The California Department of Public Health has the authority to renew, reissue, revise, or amend any domestic water supply permit whenever the Department deems it necessary for the protection of public health whether or not an application has been filed, pursuant to Health and Safety Code Section 116525.

THEREFORE: The California Department of Public Health has determined the following:

1. The Bella Vista Water District's (hence **BVWD**) Water System meets the criteria for and is hereby classified as a ***community*** water system.

2. The BVWD has sufficient water rights to supply the Water System for the foreseeable future.

3. The design of the water system improvements comply with the California Water Works Standards and all applicable regulations.

4. The applicant, BVWD, has demonstrated adequate technical, managerial, and financial capacity to reliably operate the existing water system.

5. The BVWD's surface water treatment is classified as a direct filtration process. However, the District demonstrated that it can meet the Department's Policy for approved in-line filtration by operating the surface water treatment plant in an in-line mode. Hence, the Department has concluded that the in-line filtration process can be considered equivalent to direct filtration.

6. Provided the following conditions are complied with, the BVWD's Water System should be capable of providing water to consumers that is pure, wholesome, and potable and in compliance with statutory and regulatory drinking water requirements at all times.

*THE **Bella Vista Water District** IS HEREBY ISSUED THIS DOMESTIC WATER SUPPLY PERMIT TO OPERATE THE BVWD's (Community) Water System.*

The BVWD's Water System shall comply with the following permit conditions:

1. The only source of water approved for potable supply for the BVWD's surface water treatment plant shall come from the Sacramento River.

2. The approved groundwater sources for the BVWD shall be Wells 1, 2, 3, 4 and 6, as described in the Permit Engineering Report. Well #5 shall be approved for active use when the district submits plans and specifications for the installation of the pumping and treatment paraphernalia.

3. The BVWD shall apply for an amended water supply permit prior to installing pumping and treatment paraphernalia and completing and/or activating Well #5.

4. The BVWD shall operate the surface water treatment plant to consistently achieve the Cryptosporidium Action Plan (CAP) goal of 0.1 NTU for combined filter effluent. If the CAP goal is not consistently met in two consecutive months, the District shall be required to perform a self-assessment of the filters within 60 days. If the District continues to fail to achieve the CAP goal, then the District will be required to address what improvements and/or modifications are necessary in order to consistently meet the CAP goal.

5. The BVWD shall change the stock chlorine solution at each well site at least once each month. In lieu of changing the stock chlorine solution monthly, the District may use a method, acceptable to the Department, of testing the stock solution that will show any change in the concentration of the solution. If a change in the

concentration of the stock solution has been determined, the District will re-adjust the stock solution strength to the required concentration. The District will report to the Department monthly, verifying the actual strength of the stock solution at each well site.

6. BVWD shall submit to the Department an Annual Report on the status and condition of the system as directed by the Department. The report shall be presented in the format requested by the Department and shall be submitted by the deadline established by the Department.

7. BVWD shall, within 24 hours, report to the Department any water outage that caused a drop to 5 psig or less in distribution system pressure. After any system pressure loss to less than five psig, the District shall collect water quality samples that are representative of the area affected by the low pressure. The results of the analyses shall be reported to the Department, in form and manner specified by the Department, as soon as the results are known.

8. BVWD shall monitor the raw water bacteriological water quality at the surface water treatment plant and at the District's Wells based on a frequency schedule that has been approved by the Department.

9. BVWD shall perform an annual leakage test of the sewer lateral serving the toilet facility at Well #2, and shall report the results of same leakage test to the Department's Redding District Office.

This permit supersedes all previous domestic water supply permits issued for this public water system and shall remain in effect unless and until it is amended, revised, reissued, or declared to be null and void by the California Department of Public Health. This permit is non-transferable. Should the Bella Vista Water District undergo a change of ownership, it would require that he new owner apply for and receive a new domestic water supply permit.

Any change in the source of water for the water system, any modification of the method of treatment as described in the Permit Engineering Report, or any addition of distribution system storage reservoirs shall not be made unless an application for such change is submitted to the California Department of Public Health.

This permit shall be effective as of the date shown on the front page of the Permit.

FOR THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

Michael J. McNamara June 27, 2008

Michael J. McNamara, P.E. **Date**
Lassen District Engineer
Drinking Water Field Operations
Branch

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
DRINKING WATER FIELD OPERATIONS BRANCH

ENGINEERING REPORT

In the Matter of the Permit Application
From

BELLA VISTA WATER DISTRICT

(PUBLIC WATER SYSTEM No. 4510014)
Shasta County
2008

Report Prepared By: Gunther L. Sturm
Gunther L. Sturm, P.E.

Report Reviewed & Approved By: Mark J. McNamara
Michael J. McNamara, P.E.
Lassen District Engineer
California Department of Public Health
Drinking Water Program-Field Operations

Engineering Report
For Consideration of an Operating Permit
For
Bella Vista Water District
Shasta County
June 2008

Prepared By
California Department of Public Health
Division of Drinking Water and Environmental Management
Drinking Water Field Operations
Lassen District

Michael J. McNamara, P.E., Lassen District Engineer

I. INTRODUCTION

A. Purpose of Report

The Bella Vista Water District (District) submitted a domestic water supply permit amendment application, dated June 1, 2004, to the Department of Health Services, now the Department of Public Health (Department), to '*construct improvements to the District's Wintu Pump Station, Water Treatment Plant, Quail Ridge Pump Station, and water distribution system per the plans and specifications titled "Wintu Pump Station and Water Treatment Plant Expansion Project*".' The proposed improvements for which the District submitted the June 1, 2004, permit amendment application were to be funded by the Safe Drinking Water State Revolving Fund (SDWSRF) program.

On March 18, 1969, the State Board of Public Health granted a temporary water supply permit to the Bella Vista Water District. The temporary permit was granted "*for a two year period to allow study of the quality of water being delivered by this system.*" The permit stipulated that "*if the water delivered during this two year period is pure, wholesome, and potable; and in particular, meets the Public Health Services Drinking Water Standards as to coliform bacteria, turbidity, and taste and odor, said temporary permit will be extended from year to year for the succeeding three years. At the end of this period of time, consideration will be given to issuance of a regular domestic water permit if delivered water quality has been satisfactory.*"

On February 4, 1974, the California Department of Health granted the Bella Vista Water District a domestic water supply permit to serve domestic water to the unincorporated area north of Redding in Shasta County. The permit authorized the District to pump water from the Sacramento River via the Wintu Pumping Plant in Redding. Treatment of the approved surface water supply consisted of chlorination treatment only. However, the permit stipulated that the District proceed diligently with the construction

of a surface water filtration system. The permit also authorized the use of a groundwater source, Well #1, as a supplemental source during the irrigation season.

On July 25, 1979, the Department of Health Services granted a permit amendment to the District for the operation of the newly constructed Well #2.

Since the original permit and permit amendment were granted to the District, and up to the time that the District applied for the major and significant water system improvements and changes proposed under the SDWSRF program, the District also added four more groundwater sources and constructed treatment facilities for all five of the active groundwater sources. Hence, considering the significant changes and improvements to the Bella Vista Water District's water system, the Department determined that a revised and updated, full water supply permit should be processed for the District.

The purpose of this investigative report is to describe and evaluate the Bella Vista Water District's facilities, operations and management, and to make a recommendation regarding the issuance of a full domestic water supply operating permit.

A copy of the District's application for a domestic water supply permit amendment, and the Department's letter of acknowledgement, is included in APPENDIX A.

B. Brief History and Description of System

The Bella Vista Water District was organized as a California Water District on June 17, 1957. In 1964, the District's voters approved financing for water supply facilities that were planned, financed and constructed under the direction and control of the U.S. Bureau of Reclamation to supply irrigation water, with secondary domestic and industrial use to an approximate 53 square mile unincorporated area north-east of the City of Redding. (Plate 1, located in APPENDIX B, and prepared by Pace Engineering shows, shows the District's Pressure Zones and outlines the District's Service Area).

The topography of the area served varies from relatively steep brush covered slopes to flat valley areas at elevations ranging from 500 to 850 feet. The climate is characterized by long hot and dry summers with generally low humidity. The winters are generally wet and cold, with relatively little snow. The average precipitation is about 39 inches annually, most of it occurring during the period between November and March of each year.

Agricultural uses, primarily pasture, and cattle raising comprised the major industry in the early operating years; however, in recent years, the service area has experienced rapid urban and suburban development. In 1968, with only about 185 service connections, the District supplied almost 100% of its water for agricultural purposes. Currently, according to the 2007 Annual Report to the Drinking Water Program, the District supplies domestic, municipal and irrigation water to an approximate population

of 15,000 through 6,076 metered service connections, and its agricultural usage accounts for 42% of the water delivered.

The District's primary source of water is derived from the Sacramento River. Sixteen dual media pressure filters provide direct filtration of the surface water. The water is distributed through approximately 220 miles of transmission and distribution mains. Aside from one surge tank and one pressure regulating tank, the District has three storage tanks or reservoirs, with a combined capacity of 5.2 million gallons (MG. In addition to the surface water form the Sacramento River, the District also maintains five active deep wells. A sixth well has been drilled, but has not been outfitted with any pumping paraphernalia. The water from the active wells is treated for iron and manganese removal. All sources are disinfected with chlorine.

The District maintains 8 pumping stations that serve the 10 pressure zones in the District's service area (see APPENDIX B for a copy of Pace Engineering's Figure 1, which shows the District's ten pressure zones). The District also maintains interties with the City of Redding, the City of Shasta Lake and Shasta County Service Area # 8.

The District contracts with the U.S. Bureau of Reclamation to purchase Sacramento River water. The contract specifically defines the difference between "Agricultural Water" and "*Municipal and Industrial Water*". Agricultural water is defined in the contract as water used primarily for the commercial production of crops or livestock on parcels of land of more than two acres and the incidental domestic use thereto. Municipal and Industrial Water, which is approximately 9 times as expensive as Agricultural Water, is defined as all water that is not agricultural water.

II. INVESTIGATION FINDINGS

A. Source of Information

Information for the preparation of this report was obtained from Tom J. Zaharris, Bella Vista Water District's Water Treatment Superintendent; from files in the Lassen District Office of the Drinking Water Field Operations Branch (DWFOB); and field inspections made by Gunther L. Sturm, P.E., Department of Public Health, DWFOB.

Additional information was obtained from reports prepared by Pace Civil Engineering, Inc. of Redding, California.

B. Description of System Changes

Surface Water Sources

The primary source of water is derived from the Sacramento River. The diversion facilities, known as the Wintu Pumping Station, are located on the north bank of the Sacramento River, west of Highway 5 and South of Hilltop Drive, approximately 1 mile

downstream from the North Market Bridge in Redding, CA. APPENDIX W includes a copy of the Wintu Pumping Station Data Sheet.

The raw river water is pumped to the water treatment facilities located on 700 Canby Way. A 0.23 million gallon (MG) Surge Tank, located on Hilltop Drive, north of the raw water intake, functions as a standpipe to abate energy due to River intake pumps turning on and off. Sixteen dual media pressure filters treat the river water before it is distributed throughout the District's approximate 220 miles of distribution pipe lines.

As indicated above, the initial water system operating permit granted to the District in October of 1968, did not include filtration facilities. At the time, the raw river water received chlorination treatment only. Thus, the initial permit was granted for a two year trial period, during which time the District had to provide documentation to the Department that it could meet minimum public health drinking water standards, primarily for turbidity and coliform bacteria. The findings showed that the District could not meet standards for domestic use without filtration of the Sacramento River. While the District was able to use groundwater during the non-irrigation season in the late fall, winter and early spring, it was not able to do so during the irrigation season, when the river water was needed to supply the system demands. River water turbidities always exceeded standards for domestic water, especially after heavy rain storms. This raised concerns that chlorination provided only marginal protection against public health hazards, such as bacteria and viruses. Thus, when the Department granted a full permit to the District in 1974, it stipulated that the District diligently and expediently pursue construction of surface water treatment facilities.

In 1977, the District constructed the initial 10 dual media pressure filters. The plant's capacity was rated at 43 Million Gallons Per Day (MGD). The Wintu Pumping Station, which was constructed in 1965, had four 1,000 horsepower (Hp) vertical turbine pumps. Each pump was capable of delivering approximately 11,200 gallons per minute (GPM).

The most recently completed addition and changes to the surface water treatment and raw water diversion infrastructures were completed in 2007. These improvements were necessary for the District to meet the new Surface Water Treatment Rule. The following is a summary of the improvements and changes:

Added 2 new 600 Hp variable speed pumps at the Wintu Pumping Plant.
Added a 2,200 kW diesel powered emergency generator.
Added pre-treatment facilities at the Wintu Pumping Plant and improved the electrical control building.
Added 6 new (10 foot diameter by 50 foot length) dual media pressure filters.
Installed new chemical dosing equipment at Wintu Pumping Plant.
Installed new SCADA system to monitor and control the water treatment plant, Wintu Pump Station, reservoirs and Wells.
Made general improvements to the treatment facilities which included; Individual filter flow meters. Filter to waste and improvements to the Quail Ridge pump station for CT requirements.

The water system improvements and expansion were funded through the Safe Drinking Water State Revolving Fund (SDWSRF) program.

Groundwater Sources

The District maintains five active and one inactive groundwater sources. The active wells are fully operational and each active well is equipped with iron and manganese removal facilities consisting of pressure filters and hypochlorination. The full permit issued to the District in 1974 included approval to use and operate Well #1. The permit amendment granted to the District in 1979, authorized the use and operation of Well #2. No permit amendments were processed for Wells #3, #4 or #6. No permit amendments were processed for the installation and operation of the iron and manganese treatment facilities at Wells #1, #2, #3, #4, or #6.

This permit will describe and evaluate the addition of Wells #3, #4, and #6, and makes a recommendation regarding the issuance of a full domestic water supply operating permit for these wells, including the iron and manganese treatment facilities.

Well #3 was drilled in 1989. Wells #4 and #5 were drilled in 1991, but only Well #4 was completed with the iron and manganese filtration system. Well #5 was determined to be a very poor producer and hence was not equipped with pumping or treatment paraphernalia. The District has no plans to convert Well #5 into an active source.

Well #6 was drilled in 1992 and it is operational.

APPENDIX C contains the Well Data Sheets for each well. The data sheets provide complete information on the construction details of each well source.

C. Proposed System Changes

The District's service area has experienced rapid growth and development in recent years. To meet the demands generated by this rapid growth, the District has developed a Master Plan, outlining proposed system improvements. These plans call for expansion of the distribution mains including the construction of 2,000 feet or 14 inch mains. The plan also calls for the construction of a new groundwater source (Well #7) with facilities to treat for iron and manganese removal. It also calls for the construction of a 3.0 MG reservoir for the Old Oregon Trail Pressure Zone and a 4.0 MG equalizing tank, as well as adding another pumping station. The District needs to submit applications for amended permits to the Department for any of these major water system improvements and expansions.

D. Consumer and Production Data

Population Served

The District has experienced significant growth in recent years. Based on the information submitted by the District, the population served in 1997 was reportedly 12,891. In 2007, the District reportedly served an estimated population of 16,500, a growth rate of about 28 % in 10 years. In 1997, the District reported 3,875 residential service connections. In 2007, the reported number of residential service connections had grown to approximately 6,000.

Water Production and Demand

Historical water use data serves as a useful tool in evaluating future water demands and assessing the need for sizing and staging future water facilities. Historical water demand data, combined with demographic projections provide the basis for estimating future water requirements.

The tabulation below shows the annual, maximum month, and maximum day production for the past 5 years. It also shows the maximum daily gallons per minute per service connection usage and the maximum daily gallons per day per service connection usage for the same 5 year period. The data as shown was reportedly taken from the Annual Reports submitted to the Department.

Year	Annual MG	Max Month MG	Max Day MG	No. Conn.	Pop.	Max Day gpm/conn	Max Day gpm/conn
2003	5,668	1,095	38.5	5,596	14,100	4.78	8,880
2004	6,111	1,122	44.0	5,725	14,100	5.34	7,686
2005	5,058	1,046	43.9	5,879	14,500	5.18	7,467
2006	5,376	1,027	39.3	5,937	16,500	4.60	6,620
2007	5,119	906	35.3	6,009	16,700	4.07	5,875

The data in the table is somewhat skewed as it includes the agricultural demand. Although the agricultural use has declined since the District first started its operation, the annual usage for agriculture still represents approximately 41% of the District's water usage. By adjusting the maximum monthly agricultural usage to calculate the maximum monthly M&I water usage, the maximum monthly gallons per minute per M&I connection for 2003 was 2.7; for 2004 it was 2.6 and for 2005, 2006 and 2007 it was 1.87, 1.82 and 1.85, respectively. In 1997, the calculated maximum month residential usage was 1.8 gallons per minute. In 2004, this usage increased to 2.6 gallons per minute per residential service connection. In 2007, the same value was calculated to be 1.85.

In 2006, the District produced 4.97 billion gallons or 92.5% from its surface water source. In 2007, the District produced 5,119 million gallons (MG); almost all was produced by the surface water treatment plant. The wells produced 58 million gallons (MG). The District purchased approximately 0.15 MG.

The District's water filtration facility has the capacity to produce 60 MG per day (2006 consumer report said 52.5 mgd based on Wintu pumping capacity of 3-1000hp pumps

plus 1-600hp pump and hydraulic limitations of surge tank) with two filters out of service. The combined production capacity of the 5 active wells is reportedly 5 MG per day. Thus, the District's total production capacity is 65 MG per day. In the 2006 Annual Report to the Department, the District reported a maximum day production of 39.3 MG in the month of July. The maximum day production in 2007 occurred in the month of July, and amounted to 35.3 MG.

It appears that the District's water capacity is sufficient to meet demands for the foreseeable future, at least for the next 15 years under non drought conditions. Assuming the historic growth and demand rate continues at the present level, the District may reach existing plant capacity by around 2030. Ironically, this estimate coincides with the predicted growth and demand forecast by Pace Civil Engineering, Inc., as outlined in their 2005 Master Plan. Pace stated in their Plan that at an "*annual increase of 238 acre-feet per year, it is projected that the District's average annual demand will reach the existing USBR contract of 24,578-acre-feet per year by approximately 2032.*"

E. Water Rights

The primary source of water for the Bella Vista Water District system comes from the Sacramento River. In very general terms, the Bella Vista Water District receives its water through the Central Valley Project, which is administered by the U.S. Bureau of Reclamation (USBR). According to the Bella Vista Water District 2005 Master Plan, the "*District has a post 1914 water contract obligation of 24,578 acre-feet of water through the Cow Creek Unit, Trinity River Division of the Central Valley Project for irrigation, municipal, domestic, and rural purposes. The newest contract was issued in 2005 and is valid for 25 years to 2030.*"

The District's contractual water right with the USBR is limited in that the Bureau can reduce the District's allocation of water during periods of drought. Reportedly, during the drought period in the early 1990s, the Bureau reduced the District's allocation by about 50 percent. On April 25, 2008, the USBR announced a 25% reduction in the water supply allocation for the Central Valley Project, indicating that Bella Vista Water District will receive a 75% supply allocation based on that last three years of unconstrained deliveries for municipal and industrial purposes and a 45% supply for agricultural purposes based on the District's remaining quantity of 24,578 acre-feet from the Central Valley Project. This reduction in supply allocation has seriously impacted the District's ability to meet its demands. On May 12, 2008, the District convened a public hearing to consider a declaration of a water shortage emergency. Extended periods of drought with associated reduction in the allocation of supply would have potentially serious problems for the District to meet water demands.

F. Water Sources

There are two sources of water available to the District. The primary source comes from the Sacramento River. A secondary source of water comes from the District's 5 active wells.

Sacramento River Source

Sacramento River water quality at the Wintu Pumping Plant is affected by Shasta Lake and Trinity Project releases, as well as local watershed runoff between Shasta Dam and the Wintu Intake Pumps.

In 1976, the Department made an assessment of the Sacramento River above the District's Wintu diversion and stated that "*Several cities and a number of smaller communities and resorts are located on the watersheds above Shasta Lake and/or the Trinity Project reservoirs. A number of resorts, campgrounds and other recreational use areas are located along or near the lake and reservoir shorelines. Recreational uses include camping, boating, fishing and water contact sports.*

Individual sewage disposal systems on the watersheds are controlled by the County ordinances while community type waste systems are regulated by the Regional Water Quality Control Boards. The Central Valley Water Quality Control Board has adopted resolutions prohibiting sewage discharges to Shasta Lake, Keswick Reservoir and Whiskeytown Reservoir. Shasta Lake use also is regulated by a County ordinance. US Forest Service use permit regulates developments in the Shasta-Trinity National Forest which includes much of the watershed and shoreline of the lake and reservoirs.

Shasta Lake and Trinity Project water is discharged to Keswick Reservoir, located about 3-1/2 miles above the Wintu Pumping Plant at Redding. Several creeks in the 40 square mile Keswick Reservoir watershed also affect the river during heavy local storms. The effect of the Spring Creek mine drainage and runoff have been minimized with a debris dam just upstream from Keswick Reservoir.

The immediate watershed between the Wintu Pumping Plant and Keswick Dam covers about 18 square miles. Several small creeks on the immediate watershed and part of the Redding street drainage affect the Sacramento River during heavy local storms. Two City of Redding sewage pumping stations are located on the local watershed about one mile and two and a half miles, respectively, above the Wintu intake. Both sewage pumping stations have emergency bypass ponds, standby generator units and an electrical failure alarm system.

High intensity storms on the local watersheds between Shasta Dam and Redding affect the Sacramento River quality, particularly turbidity at the Wintu intake. Such local storms affect the river for a few hours to a few days, depending on duration and intensity of the rainfall. Intense storms which muddy Shasta Lake and the Trinity

Project Reservoirs have caused turbidity in the Sacramento River for up to eight months."

The bacteriological quality of the Sacramento River is primarily determined by the Trinity Project and Shasta Lake releases, and is generally satisfactory. During the rainy season, local runoff also affects the bacteriological water quality. In 2005, the District collected nine raw water bacteriological samples from the Sacramento River. The level of total coliform in these samples ranged from a low of 9.2 per 100 ml in April to a high of 220 per 100 ml in June. The level of E coli in these raw water samples varied from a low of less than 2 per 100 ml in August and November 1999, April and October of 2001, and March of 2003, to a high of 30 per 100 ml in December 1999, and January 2000. The raw water bacteriological results for samples collected at the Wintu Pumping Plant intake from January 1999 through March 2008 are located in APPENDIX D.

The chemical quality of the Sacramento River at the Wintu Pumping Plant intake is generally very good.

Recreation, land runoff, mine tailings and roadside drainage are significant potential contamination activities affecting the water quality of the Sacramento River at the Wintu Pumping Plant intake. Spill hazards due to road and railroad crossings are also an ever-present concern.

The Department performed a "source water assessment" between January 2002 and April 2003. The findings of that source water assessment showed that the Sacramento River was particularly vulnerable to contaminants associated with the following activities: metal plating/finishing/fabricating; wood/pulp/paper processing and mills; and drinking water treatment plants. The assessment also determined that the river source is considered most vulnerable to the following activities not associated with any detected contaminants: concentrated aquatic animal production facilities; historic waste dumps/landfills; historic mining operations; and wastewater treatment plants above Shasta Dam and disposal facilities.

In summary, while the raw water is generally of good chemical quality, it is subject to significant levels of recreational, sewage and run-off hazards. Complete and adequate treatment before distributing the water for human consumption is absolutely necessary.

Groundwater Source

The District maintains 5 active deep wells and one inactive deep well. The wells are known as Wells Nos. 1, 2, 3, 4, 5 and 6. The location of the wells is shown on the map prepared by Pace Civil Engineering located in APPENDIX E. Groundwater makes up a small percent of the District's overall water production. In 2006, groundwater made up approximately 405 million gallons or about 7.5% of the total supply. In 2007, the groundwater supplied about 58 million gallons or about 1.1% of the total supply.

The District's wells draw from a basin that has been identified as the Redding Groundwater Basin. It is an un-adjudicated groundwater source. The groundwater is of generally good bacteriological quality. The chemical quality meets drinking water standards, except for the secondary standards of iron and manganese. The most current chemical analyses for each groundwater source can be located in APPENDIX F.

The water source assessment conducted by the Department for each of the District's groundwater sources, stated that the District's well sources are most vulnerable to the following activities not associated with any detected contaminants: lumber processing and manufacturing; septic systems-low density; sewer collection systems; historic waste dumps/landfills; automobile-gas stations; and utility stations-maintenance areas.

G. Water Sources and Treatment

Surface (Sacramento River) Source

The Sacramento River water receives treatment consisting of pre-chlorination, coagulant addition, pressure filtration and post-chlorination as needed. A total of five turbine pumps are available to divert Sacramento River water at the Wintu Pumping Station. Three are 1000 Hp turbine pumps and two are 600 Hp variable frequency drive pumps.

The raw water is injected with an aluminum chlorohydate (ACH) coagulant and it is pre-chlorinated in a 54-inch diameter transmission main. The water is pumped through the large diameter transmission main for about one mile to the surface water treatment plant, located on Canby Road. A 0.23 MG standpipe floats on the transmission main and acts as a surge tank to suppress or abate energy due to the river intake pumps turning on and off. At the Canby Road location, the water is split into 16 dual media pressure filters, each 10 foot in diameter and 50 feet long. Each filter contains approximately two feet of gravel support media, two feet of filter sand, and two feet of anthracite. If needed, the filtered water is post-chlorinated with a 12% liquid sodium hypochlorite solution. The Surface Water Filtration Rule disinfection performance standard requires that the system provide a free chlorine residual of at least 0.2 ppm going into the distribution system and requires a distribution system trace residual in 95% of the samples taken each month.

The pre-chlorination facilities at the Wintu Pumping Station consist of four one ton cylinders connected to Wallace and Tiernan vacuum gas chlorinators. Two cylinders are active at all times and automatic switch-over valves connect the active cylinders to the two standby cylinders. The system is also equipped with a manual bypass switch-over controller and piping. Two cylinders provide sufficient chlorine for approximately one week during high demand summer season, and last about two months during the winter. The chlorine gas is supplied under vacuum and automatic shut off valves are installed between the chlorine tanks and the vacuum system. The automatic shut off valves activate at any indication of a chlorine gas leak.

The typical dosage at the Wintu Pumping Plant varies between 1.7 ppm and 2.0 ppm, resulting in a typical filter effluent residual of about 1.0 ppm to 1.3 ppm. The flow through the 54-inch diameter pipe from the Wintu Pumping Plant to the District's surface water treatment plant and between the water treatment plant and the first customer provides needed contact time (CT).

The post-chlorination treatment at the surface water filtration facilities consist of two ¼ Hp injection pumps, each rated at 21 gallon per hour. The pumps draw from a 350-gallon plastic storage tank. 12.5% Chlorine solution supplied by Chem Quip - sodium hypochlorite is used.

The District's surface water treatment process is classified as a **direct filtration** process. In February 2003, the District completed a demonstration study, using a pilot filter and two existing filters, to demonstrate that the filter plant can reliably and consistently meet the 2-log particle count removal in the 2-5 micron (um) size range, while operating in the in-line filtration mode. The result of the study however did not support the contention that the District can meet those criteria at all operating levels. Hence, the Department stipulated that the District operate the filtration plant in a direct filtration mode by installing a coagulant station, including adequate rapid mix facilities, at the Wintu Pumping Station and by using the large diameter transmission main as a pipe flocculator. Diffusers at the injection point provide the rapid mix.

Although the treatment is classified as a direct filtration process, the District operates the facilities as an **In-line filtration** process during the low flow, or winter period. The reason for operating the system in an in-line filtration mode during the low flow winter periods is necessary to mitigate the negative impact of solids settling out in the main during the low flow conditions. The District has demonstrated that operating the plant in an in-line mode, it can meet the Department's Policy for approved in-line filtration. This policy stipulates that the filtered water meets a finished turbidity of 0.1 NTU in 95% of the samples recorded. In meeting these criteria, the in-line filtration process can be considered equivalent to direct filtration.

Thus, during high flow periods the raw river water is injected with chlorine and a polymer coagulant at the Sacramento River Wintu Pumping Plant. The large 54-inch diameter transmission main which runs from the Wintu Pumping Plant to the District's Water Treatment Plant, is used as a pipe flocculator. (Prior to the recent improvements, primarily the installation of the 600 Hp variable speed intake pumps, the system operated as an in-line filtration plant. The reason for operating the plant as an in-line filtration plant was the problem of solids settling out in the main during low flow conditions or during times when the plant had to be shut down.)

At the District's surface water treatment plant, the pre-treated water is split onto 16 pressure filters. Each filter is equipped with a throttling valve and flow meter to ensure that the flow through the treatment plant is evenly distributed across each filter and that the filter loading rate is maintained at a maximum of 5.5 gallons per minute per square foot (gpm/ft^2) of filter area. In order to avoid frequent start-ups and shut-downs during

the low demand periods, the District installed two 600 Hp variable speed turbine pumps at the Wintu Pumping Station.

Each filter is equipped with a surface wash system. To allow each filter to be monitored individually, a Hach 1720D or 1720E turbidimeter has been installed at each filter. Individual filters are continuously monitored by the Supervisory Control & Data Acquisition System (**SCADA**). All have alarm set points and will be automatically taken off line if the turbidity goes above an entered set point. The raw water turbidity is monitored continuously at both the Wintu Pumping Station and the water treatment plant using a Hach Surface Scatter 6 ratio turbidimeter. The combined effluent turbidity is continuously monitored with two redundant Hach 1720D turbidimeters that are checked against each other continuously by the (SCADA). Raw and combined effluent turbidities are recorded in the SCADA system. If the turbidimeters report turbidities differing by more than a set point entered into the SCADA system, the operator is notified and the turbidimeters are checked to verify the correct turbidity and if warranted, the problem is corrected. High, low and average raw water turbidities for each day are recorded. Also, the filter combined effluent turbidity is recorded every four hours.

The District uses the streaming current monitor that is tied into the SCADA system and adjusts dosages automatically to optimize the coagulant dose at the water treatment plant.

In February of 2002, the District submitted a "Water Treatment Study and Pre-Design Report for the Bella Vista Water District, Shasta County, California." Based on this study, the Department concluded that the dual media pressure filters are allowed to operate between 3 gpm/ft^2 and 6 gpm/ft^2. The District has elected to limit the maximum filtration rate at 5.5 gpm/ft^2.

All filters are equipped with filter-to-waste provisions and automatically do so after every backwash. Historically, filter backwashing was initiated based on run time with adjustments for operating conditions. Currently the District is using a method it has developed. The District's developed "filter loading rate method" uses the product of flow through the filter times the raw water turbidity, with backwash initiated when the cumulative loading on the filter reaches the filter loading set point established by the District. The loading backwash method is set up on SCADA, However, the built in flexibility allows the District to change the method or frequency of backwashing the filters.

The water that is used to backwash the filters is treated system water. Filter backwash effluent is discharged to backwash ponds. At present, the District does not recycle the filter backwash or filter to waste effluent. Filter rates are gradually increased after backwashing.

Reportedly, the filter design criteria for the backwash flow rate for each filter are 8,000 gpm or 16 gpm/ft^2. The backwash time can be adjusted. Currently it ramps up for 2 minutes, backwashes for 8 minutes, and ramps down for 2 minutes. The filter design

criteria for the surface wash flow rate for each filter are 350 gpm or 0.7 gpm/ft^2. The surface wash runs at the same time as the backwash.

APPENDIX U includes a copy of the District's Filtration Plant Data Sheet.

Groundwater Sources

The District operates 5 active, deep drilled, and cased wells. A 6th well, Well #5, has been drilled, but has not been equipped with pumping and/or treatment paraphernalia. The District has no immediate plans to do anything with this well. Detailed well construction information can be found in APPENDIX C, where the individual well data sheets are located. The chemical analyses for each groundwater source can be found in APPENDIX F.

The groundwater sources represent a small fraction of the District's overall water production. However, the wells have been used during periods of construction and in past years, whenever the river water turbidity was high. Two of the five active wells are tied into the District's SCADA system and can be monitored from the control room located at the Surface Water Treatment Plant. Until now, all wells have been classified as **active,** although, as indicated above, the use of the groundwater sources has been infrequent, for the reasons stated above.

When in operation, each well receives treatment consisting of chlorination and filtration for iron and manganese removal.

At each well, the water from the well is injected with a sodium hypochlorite solution prior to entering the "activated" silica sand filters used for the removal of oxidized iron and manganese. Each well treatment plant is equipped with 42 gallon per day Pulsatron metering pumps, which drafts from a 100-gallon capacity covered plastic storage tank. The tank is marked in 5 gallon increments. A Sanichlor 12.5% sodium hypochlorite solution is injected at Wells #1, #2, #3 and #6. At Well #4, the solution is diluted to 6.25% due to the much lower flow rate from this well.

The combined maximum capacity of the five active wells is reportedly 5 million gallons or 3,500 gpm. In the past, the wells had been used relatively infrequently. Operating costs and consumer dissatisfaction were the major reasons for the District not using the wells on a more frequent basis. With the expansion of the surface water treatment plant, the need to operate the wells has become even less. Some of the wells are set to come on automatically, based on pre-set system pressure.

In the past, the chlorine stock solution at each well was not replaced or changed periodically and may have been sitting for months before the well was activated and the chlorine solution was injected. This is not an acceptable practice, as the solution strength may vary over a period of time.

The chlorine residual is monitored continuously when the wells are in operation. The goal is to maintain a free chlorine residual of 0.5 ppm leaving the iron and manganese removal filters. At Well #1 the chlorine dosage is automatically adjusted based on the chlorine residual. The chlorine residual at the other wells is adjusted manually based on the measured chlorine residual.

The treatment facilities for iron and manganese removal at each active well consist of hypochlorination at 1 to 2 ppm followed by sand media, pressure filtration. The hypochlorite treatment is for the purpose of oxidizing the iron and manganese for removal in the filters. Filter loading rates range from 5 gpm/ft^2 to 6 gpm/ft^2. Backwash is initiated manually when the pressure differential due to headloss reaches 8 to 10 pounds per square inch (psi). Backwash water is captured in an on-site storage tank. The removed solids are allowed to settle and the decanted supernatant is recycled. The settled sludge is removed and ultimately disposed of in a landfill.

The chemical monitoring results show that the iron and manganese levels in the treated water consistently meet secondary maximum contaminant levels of 0.300 and 0.050 mg/L or iron and manganese, respectively.

All the wells are housed in concrete block buildings. The instrumentation and chemical feed equipment is located in the building at each site. The filters are located on the outside, except for Well #3. At this site, the well and the filters are located in the concrete block building. This well also has a 5,000-gallon hydro-pneumatic tank. The tank is located in the building.

The well sites, for the most part, are satisfactorily located, away from any man made or natural hazards. The exceptions are Wells #2 and #3. Both wells are of some concern. These wells are housed in buildings that include toilet facilities. The toilets and the sewer laterals serving the respective toilets are within 20 feet of the wells. The Water Works Standards prohibit any sewer or sewer lateral within a 50 foot radius of any domestic water supply well. This has been discussed with the District and a more comprehensive assessment of this issue is presented in the APPRAISAL OF SANITARY HAZARDS AND SAFEGUARDS section of this report.

With the exception of the high iron and manganese levels in the groundwater from which the District's wells draw, the overall chemical water quality meets minimum contaminant levels for general mineral, organic and inorganic constituents. Sampling for radiological water quality has shown that these wells meet drinking water standards.

H. Storage Capacity

The District maintains five steel reservoirs and a welded 5,000-gallon hydro pneumatic steel tank at Well #3 in Palo Cedro. Two of the five large capacity reservoirs are not considered storage and their primary function is for surge suppression and pressure regulation. The 0.23 MG standpipe, located between the Wintu Pumping Plant and the District's surface water treatment plant, functions primarily as a surge suppressor to

abate the water surges caused by the river intake pumps turning on and off. It provides no system storage. Similarly, the Old Alturas Regulating Tank is primarily a pressure regulating reservoir. It has a capacity of 185,000 gallons.

The remaining reservoirs are considered storage and have a combined capacity of 5.2 MG. The largest tank is the 4.0 MG Main Pressure Zone Tank. The tank is 80 feet in diameter and 113 feet in height. Reportedly, system hydraulics limits the available or useable storage to approximately 1 MG. Operating the tank levels below the tanks static water surface elevation of 735 feet, reduces the pressure in the Main Zone to unacceptable levels. Three million gallons of the tank's remaining volume is available for emergency use, but at reduced pressures.

The Oregon Trail Tank is a 1 MG capacity steel tank, located near the intersection of Old Oregon Trail and Bear Mountain Road. The tank controls the booster pumps at the Old Oregon Trail Pumping Station.

The Cow Creek I Tank is located adjacent to the Cow Creek II Pumping Station, east of Bella Vista on Highway 299. This steel reservoir has a capacity of 0.2 MG.

The reservoirs are in generally good condition. The Cow Creek I Tank was recoated in March 2008.

Based on an evaluation of the system's storage adequacy, the Department evaluated the each pressure zone, using the California Waterworks Standards, and concluded that the District has sufficient ability to move water between pressure zones to meet Waterworks Standards in each zone for source and storage capacity. Nevertheless, the Department concluded that the tables for determining required storage capacity are based on typical water usage patterns throughout the State, which may not be an accurate representation of the District's requirements given the large agricultural and other high demand users. Therefore, the Department recommended that the District move forward with plans to provide additional storage in order to meet future source and storage requirements.

APPENDIX G contains Reservoir Data Sheets that show the specific construction details of each reservoir.

I. Transmission and Distribution Facilities

The District's approximate 220 mile distribution system consists of mains ranging in size from 4 to 54 inches in diameter. Reportedly, the pipe materials consist of 13% cement lined steel pipe, about 10% asbestos cement (AC) pipe and the remainder consisting of PVC (C-900) pipe. The cement lined steel pipe ranges in size from 16 to 54 inches in diameter, whereas the PVC pipe ranges in size from 4 to 12 inches in diameter. The District reports that the distribution system is in overall good condition. All distribution and transmission mains are constructed according to Waterworks Standards.

There are no known lead pipes, joints or solder used in the distribution system. The District has a well organized distribution main maintenance program and keeps records of all distribution system repairs. Although the District is aware of the Department's water and sewer main separation policy and in general, adheres to the separation criteria, it has failed to do so in allowing sewer laterals to be constructed within the 50 foot radius of Wells #2 and #3. (See discussion under Groundwater Sources and general discussion under Appraisal of Sanitary Hazards and Safeguards.)

There are 10 Pressure Zones and 5 Pressure Reducing Stations. Pressures within the system can vary from a low of 25 pounds per square inch (psi) to a high of 110 psi, under normal operating conditions. The tables below list the pressure zones and pressure reducing stations, briefly describing the facilities with an explanation of their location and operating relationships.

Pressure Reducing Stations:

Station	Size	Status	From Zone	To Zone	Comments
PRS #1	10 inch	inactive	Zone A-2	Zone C	On Boyle near Deschutes Rd
PRS #2					Removed
PRS #3	10 inch	removed	City of SL	Zone B	Intertie with City of Shasta Lake (SL)
PRS #4	10 inch	Active	Zone C	Zone C-1	At Palo Cedro P.S.
PRS #5	8 inch	Active	Zone A	Zone A-1	Rugby Hills Drive

Pressure Zones:

Pressure Zone	Pressure (psi)	Water Source	Storage Capacity	# Conn.
Zone A (Main)	25-45	WTP, Wells 1,2,4,6	4 MG	1,160
Zone A-1 (East Stillwater)	35-90	East Stillwater PS	None	270
Zone A-2 (Old Alturas Rd)	76-127	Zone A	None	524
Zone B (Old Oregon Tr)	45-95	Old Oregon Tr PS	1 MG	1,038
Zone C (Deschutes)	35-100	Regulating Sta & PRS #1	0.18 MG	833

Zone C-1 (Palo Cedro)	40	Well 3 & PRS #4	5,000 gal	22
Zone D (Lower Cow Crk)	40-90	Cow Crk #1 PS	0.22 MG	168
Zone D-1 (Upper Cow Crk)	40-105	Cow Crk #2 PS	5,000 gal	66
Zone E-1 (Quail/Edgewood)	45-90	Quail Ridge PS	None	673
Zone E-2 (Hawley/Simpson)	70-110	Simpson PS	6,000 gal	1,255

APPENDIX H contains a map of the District's distribution system. The map was prepared by Pace Engineering, Inc. APPENDIX V contains the data sheets for each of the District's Booster Pumping Stations.

Main Flushing Program

There are reportedly about 421 dead end lines in the District's distribution system. The District does have a structured flushing program. A copy of the District's "Standard Operating Procedures for Flushing Water Mains" is located in APPENDIX Z. Dead end lines are flushed on an "as needed" basis in response to customer complaints. Most dead ends have blow-off valves or nearby hydrants for flushing purposes. The benefit of the District's main installation program will help reduce the existing dead end lines.

A Distribution System Data Sheet is located in APPENDIX I.

Main Disinfection Program

The District follows AWWA Standard C651-05 for the disinfection of water mains during repairs if the mains to be repaired are depressurized, as well as for all new main installations. A portable chlorinator is available to the repair crew in the field. New mains are generally disinfected by the contractor using the tablet method. Bacterial testing is performed after all repairs where the pipe has been depressurized and after disinfection of new mains. The District maintains records of tests and repairs. A standard form is completed which describes the repair work, the location of the repair and who made the repair.

Valve Maintenance Program

Valves are located in the field by measuring cross-ties to permanent landmarks. Most valves' triangulated locations are in valve books, by section. The District has an active

program to locate valves that are not yet in the book. Starting this year, the District is in the process of locating all valves using the Global Positioning System (GPS). Hydrants and water meters have already been located with GPS. Locating and identifying valves, hydrants and meters using the GPS will greatly benefit the District's maintenance program.

Reportedly there are approximately 1800 valves in the District's system, ranging in size from 4 to 54 inches in diameter; in addition to about 800 auxiliary valves that are part of the fire hydrants. The District attempts to exercise all valves on a 2 year rotation schedule. The valve data is entered in a database, including fire hydrants and air valves. Defective valves are repaired or replaced as needed.

It appears that the number and location of the valves and the District's valve maintenance program is satisfactory.

System Problems

For the calendar year 2007, the District reported 15 low water pressure complaints; 19 service connection breaks/leaks and 11 "significant" main breaks or leaks. Reportedly, none of the main breaks or leaks affected more than 5 service connections. The District does not report main breaks/leaks to the Department if 5 or less service connections are involved. Hence, the Department was not notified of any of these reported "significant" main breaks. All main breaks/leaks were unplanned.

The District's policy is to repair such breaks or leaks without notification to the Department. The District follows accepted procedures for repairing main breaks, including taking samples following the repair. However, the District has not notified the Department following main breaks that may have caused the system pressures to fall below 5 psig. Customers are generally notified if a main break occurred, but that notification may not happen in a timely manner, especially if the main break happens during evening or night time hours.

The District reported no scheduled outage due to main repair replacement.

J. Watershed Sanitary Survey

Title 22, CCR, Chapter 17 (Surface Water Treatment Rule), requires all public water systems that are using surface water sources to have a sanitary survey of the watershed performed by January 1, 1996, and to have an update of the survey completed every 5 years. BVWD, jointly with the City of Redding, Centerville CSD, Clear Creek CSD, Mountain Gate CSD, Shasta CSA #8, Shasta CSD, City of Shasta Lake and Whiskeytown NRA, completed its initial sanitary survey of the Upper Sacramento River and Trinity River watersheds, and submitted the report to the Department on December 13, 2002, six years after the regulatory deadline. The Department directed the District to complete and submit the first 5 year update by

January 1, 2006. The first 5 year update was completed in March 2007. The District is now in compliance with this requirement.

K. Operations and Maintenance

Emergency/Disaster Response Plan (ERP)

Under the Federal Public Health Security and Bioterrorism Preparedness and Response Act of 2002, a system serving a population between 3,301 and 49,999 persons, is required to submit an ERP within six months of submitting its Vulnerability Assessment to the US Environmental Protection Agency (EPA), but no later than December 31, 2004. A copy of the District's initial ERP is dated December 29, 2004. The Department reviewed the initial report and forwarded its comments on May 23, 2005. The District's updated ERP is dated September 29, 2005.

Emergency Disinfection Plan

The District's Emergency Disinfection Plan is dated November 30, 2006. The Plan adequately addresses how the system will be operated in the event of a disinfection failure to prevent delivery to the distribution system of any undisinfected or inadequately disinfected water. The Plan was approved by the Department on March 20, 2007.

A copy of the plan is located in APPENDIX J.

Emergency Notification Plan (ENP)

A copy of the District's ENP is located in APPENDIX K. It is dated October 6, 2005, and has been approved by the Department.

Operations Plan

A copy of the District's Operations Plan is located in APPENDIX L. The Plan, which contains useful general and specific information regarding the District's operation, will serve as a practical reference manual for both seasoned and new operators. The Plan was reviewed by the Department and found to be acceptable on March 20, 2007.

Bacteriological Sample Siting Plan

The coliform monitoring regulations require that an updated sample-siting plan be submitted at least every 10 years, and at any time the plan no longer ensures representative monitoring of the system (Section 64422 of Title 22, CCR). The District's current sample-siting plan, dated January 2007, can be found in APPENDIX M.

Cross-Connection Control Program

The BVWD has an effective cross-connection control program. The District's Cross-Connection Program is located in the District's Policy Manual.

There are approximately 247 backflow prevention devices installed within the District's water system. Reportedly, all devices are tested annually and records are maintained of all devices. Devices are tested by a certified backflow prevention device tester employed by the District.

The District requires Reduced Pressure Principle (RPP) backflow prevention devices on all commercial service connections, as well as on any service connections where there is an auxiliary source of water available, i.e., well. All requests for service are evaluated for potential cross connections, whether it is a new owner at an existing property served by the District or a new construction.

Complaints

Complaints are received at the District office and a detailed form is completed and forwarded to the appropriate department, with leak complaints being forwarded to the distribution department and water quality complaints are routed to the treatment plant operators. The details of the complaint, such as nature of the complaint, the location and person's phone number and address. The type of response and the District's response time is recorded.

In the calendar year 2007 (January through December), the District received 20 complaints. The following is a list of the types of complaints and the number:

Taste and Odor:	1
Color:	1
Turbidity:	1
Low Pressure:	15
Illness:	0
Other:	2

Historically, taste and odor complaints have been generally associated with the operation of the District's wells. The groundwater is much more mineralized and thus, customers readily notice the change. The District usually flushes mains in the complaint area to help reduce taste and odor. Since the District has been using surface water almost exclusively, and the wells have been in operation for limited times, the taste and odor complaints have dropped noticeably.

System Plans and Records

BVWD maintains complete and up to date information on the operation and maintenance of the water system. System maps and plans are up to date.

Consumer Confidence Report

A Consumer Confidence Report (CCR) must be distributed to all customers by the July 1st of each calendar year. The report must detail the quality of the water delivered during the previous calendar year. The District's CCR was received by the Department on May 9, 2008. A copy of the District's CCR for the calendar year 2007, is enclosed in APPENDIX N.

L. Monitoring and Sampling

Bacteriological Water Quality Monitoring

The District is in compliance with the bacteriological water quality sampling and monitoring requirements. Currently, the District collects five bacteriological water quality samples per week. The analyses are performed in a commercial laboratory. There are 21 routine sample sites located in 9 of the 10 pressure zones. In 2005, the District collected 208 routine bacteriological water quality samples. None showed positive for either total or fecal coliform bacteria. In 2006, the District collected approximately 208 samples. In 2007, the District collected approximately 260 samples. None of the samples showed positive for either total or fecal coliform.

The District's bacteriological sample siting plan is located in APPENDIX M .

Chemical Water Quality Monitoring

The Bella Vista Water District is in compliance with the chemical, physical, and radiological water quality monitoring requirements. The District has not been required to monitor for Synthetic Organic Contaminants (SOCs). The District is continuing to monitor for all Volatile Organic Contaminants (VOCs) as listed in Title 22, CCR, on a 6 year cycle.

According to federal regulations, a public water system may conduct reduced monitoring on a 9-year schedule if the average of the initial four quarterly samples or the analysis results for the composite sample is below the detection limit (DLR) of 1.0 pCi/L for uranium and 3.0 pCi/L for gross alpha. The District conducted Radionuclide monitoring for the Sacramento River water source. The monitoring results showed Radionuclid levels below the DLR. Therefore, the Department granted reduced monitoring for gross alpha and uranium to once every nine years for the Sacramento River raw water and for the District's groundwater sources.

In January 1999, the Department requested that the District monitor the Sacramento River water and the District's groundwater sources for MTBE on a quarterly schedule. The results obtained in 1999, 2000 and 2001 showed non-detect for MTBE.

In summary, the water produced by the District's wells meets all primary drinking water standards, but exceeds the secondary standard for manganese at Wells #1, #2, #3 and

#6. Well #1 exceeds the secondary standard for iron. Treatment for the removal of iron and manganese at all well sites ensures that the primary and secondary standards for drinking water are consistently met. The water produced by the District's surface treatment plant meets all primary and secondary drinking water standards. District personnel work closely with the Department staff to ensure that required chemical monitoring is performed in a timely manner. The District is current on its chemical monitoring.

The most recent complete chemical analyses for the District's surface and groundwater sources are included in APPENDIX O.

Annual Nitrate Sampling

Regulations require a minimum of an annual sampling for nitrate. If any nitrate result is ≥ ½ of the Maximum Contaminant Level (MCL) of 45 mg/L (i.e., a result of ≥ 23 mg/L nitrate) then quarterly monitoring must be initiated. The District has completed this requirement every year.

Lead and Copper

Based on serving a population of more than 10,000, but less than 100,000, the District was required to sample 60 sites under the standard sampling requirements. The District complied with the required lead and copper monitoring. The results of all monitoring were in compliance with the action levels for lead and copper. The action level for lead is 0.015 mg/L and the action level for copper is 1.3 mg/L. Since the 90th percentile results for all lead and copper were less than the action levels, the District was not required to perform additional corrosion control treatment. The District was also granted a reduced annual monitoring schedule under the USEPA guidance. The most recent tab water samples were collected in July of 2007. The results of the analyses showed a 90th percentile result for lead as 0.092 mg/L and for copper as 0.202 mg/L. The entire test results are tabulated and can be located in APPENDIX P.

Asbestos

Since the District is using surface water, which is automatically vulnerable to asbestos contamination, and the District's distribution system also contains some asbestos cement pipes, the District is required to monitor for asbestos in its distribution system at least once every 9 years. The asbestos samples collected to date have not shown any asbestos fibers with detection limit of 0.19 MFL (million fibers per liter). The MCL for asbestos is 7 MFL for fibers exceeding 10 micro meters (um) in length.

Trihalomethanes (TTHM)

The Bella Vista Water District serves more than 10,000 people, and is therefore required to collect quarterly total trihalomethane samples at points in the distribution system which reflects the quality of the water from the surface water treatment plant.

The District started to monitor for TTHMs in 1982. In 1999, under the Disinfection/Disinfection By-product Rule, the District started to monitor for haloacitic acids (HAA5). In 1999, the District was required to take four routine samples per quarter. Because the District's TTHM results were less than 40 ug/L, and the HAA5 results were less than 30 ug/L, for the Sacramento River source, the District qualified for reduced monitoring. However, the reduced monitoring also required that the source water total organic carbon (TOC) level before any treatment must be less than 4.0 mg/L. The District was advised to collect one TOC source sample by January 32, 2002, in order to qualify for reduced monitoring. The Department accepted the TOC results collected by the City of Redding from the source water. Thus, based on those results, the District was allowed to reduce the monitoring to one sample per quarter.

The following tabulation shows the average TTHM levels for the past five years:

2003 48 ug/L
2004 30 ug/L
2005 33 ug/L
2006 31 ug/L
2007 39 ug/L

The results are well below the 80 ug/L set forth in the disinfection byproduct rule.

The average HAA5 levels for the same five year period are summarized in the following tabulation:

2003 32 ug/L
2004 26 ug/L
2005 23 ug/L
2006 23 ug/L
2007 26 ug/L

The results are well below the 60 ug/L set forth in the disinfection byproduct rule.

Disinfection Inactivation Requirements

Title 22, Section 64656(a) requires each public water system to perform calculations that show compliance with the disinfection inactivation requirements. The District performs daily calculations at the surface water treatment plant to establish compliance. A copy of the daily calculations is stored in the District's SCADA system.

The District's chlorine disinfection data is located in APPENDIX Q.

In the past, the District was not able to provide the required 1-log inactivation for Giardia cysts prior to the first service connection in the Quail Ridge Pressure Zone. The recently completed system improvements included the installation of 2,300 feet of 16-inch diameter "contact pipe" between turnout 3.1N on the 54-inch diameter transmission

main and the Quail Ridge Pump Station. This installation gives the District the ability to provide a 4-log virus inactivation and a 1-log Giardia cyst inactivation.

M. Compliance with Existing and Proposed Regulations

Enhanced Surface Water Treatment Rule

The Interim Enhanced Surface Water Treatment Rule (ISWTR) revised the turbidity performance criteria to 0.3 nephelometric turbidity units (NTUs) in 95% of the measurements. No measurement may exceed 1 NTU. The rule also required continuous monitoring of individual filter effluent turbidity. It set a maximum contaminant level goal (MCLG) of zero for *Cryptosporidium* and required a 2-log (99%) reduction of *Cryptosporidium*. The District is in compliance with the requirements of the ISWTR for its surface water treatment plant.

The District is presently collecting raw water Cryptosporidium samples in compliance with the Long Term 2 Enhanced Water Treatment Rule's mandate.

Stage1 and 2 Disinfectant/Disinfection By-products (D/DBP) Rule

Raw water monitoring of the Sacramento River water has shown that the TOC results are generally less than 2.0 mg/L. Enhanced coagulation is not required for the water treatment process at the Bella Vista Water District's WTP.

The Stage 2 D/DBP rule requires distribution system sampling results for TTHM/HAA5 (total trihalomethane/haloacitic acids) results to be less than 80 and 60 ug/L, respectively. Data collected by the District show that this rule will pose no problem. (see discussion above under TTHM monitoring)

Arsenic Rule

The federal Arsenic Rule, which went into effect in 2006, will have no impact on the District's surface water treatment system. All intake and ambient data show no results at or above the detection limit.

Well water analyses for arsenic showed an average value of 3.4 ppb (parts per billion), ranging from 2 to 6.1 ppb.

N. Operation and Maintenance

Personnel

The District's has competent and conscientious staffs, who strive to operate the system in compliance with all state and federal drinking water regulations. System improvements are made in accordance with the Waterworks Standards. The District's

staff is certified in water treatment and water distribution operation. The chief operator is a Grade T5 and the shift operator is a minimum Grade T3. The chief distribution operator is a Grade D3 and the shift distribution operator is a minimum Grade D1.

The District is in compliance with the operator certification requirements.

Plans, Maps and Records

The District maintains up-to-date system maps and records. Valves and relevant piping paraphernalia are maintained in up-to-date valve books, copies of which are kept in each District vehicle.

Complaints are processed in a responsive and timely manner. Records of cross-connection devices, valve maintenance and main disinfection are well maintained. The District's program for testing backflow prevention devices, exercising valves and planning main extension and replacement is satisfactory.

Emergency Power

The District is well equipped to provide continuous water delivery service when there is a major power failure. The Wintu water intake facilities are equipped with an emergency generator, capable of powering two of the 1,000 Hp pumps and one 600 Hp pump. Provisions to hook up portable generating units exist at the Old Oregon Trail Pump Station, at the Quail Ridge Pump Station, at the Simpson Pump Station, Cow Creek I Pump Station, Cow Creek II Pump Station and at the Welch Pump Station. However, the East Stillwater Pump Station and the Old Alturas Pump Station have no provisions to hook up an emergency generator. Something the District needs to address in future improvements. Palo Cedro Pump Station can be bypassed.

III. APPRAISAL OF SANITARY HAZARDS AND SAFEGUARDS

The Bella Vista Water District is in compliance with all current drinking water regulations. The water system is well maintained and operated.

In 2007, the District completed a major water system improvement project that addressed numerous historic Surface Water Treatment Rule deficiencies. The approximate 8 million dollar project was funded by the Safe Drinking Water State Revolving Fund (SDWSRF) program. As a result of this project, the District has achieved compliance with the Surface Water Treatment Rule and has successfully met the requirements of the 1994 Compliance Agreement between the Department and the District.

Although the District's surface water treatment is classified as a **direct filtration process**, the District operates the facilities as an **in-line filtration** process during the low flow, or winter period. The **in-line filtration** process is <u>not</u> an approved technology per Title 22, Section 64653(a). Thus section 64654 and 64653, subsections f, g, and h

must be met in order to obtain approval by the Department. The District demonstrated that by operating the plant in an in-line mode, it can meet the Department's Policy for approved in-line filtration. This policy stipulates, and the condition of this permit requires, that the filtered water meets a finished turbidity of 0.1 NTU in 95% of the samples recorded. In meeting these criteria, the in-line filtration process can be considered equivalent to direct filtration.

A copy of the Department's Policy and the District's supporting data to show that it can indeed meet the Department's Policy for approved in-line filtration is included in APPENDIX R.

The District's treatment facilities showcase a "state of the art" SCADA system set up with its own alarm system. It provides redundancy on the communication system and all pumps and chemical systems in addition to automatic generators at both the Wintu pump station and the water treatment plant.

All facilities have 6 foot chain link fencing with three strands of barbed wire and all equipment is housed in concrete block buildings with entry alarms. All tank sites have high security locks on both the access ladders and the hatches.

The District's groundwater sources represent a small fraction of the District's overall water production. The wells have been classified as **active**. However, the operation of the wells follows more or less a standby pattern. Historically, the use of the wells has resulted in consumer taste and odor complaints.

It is imperative that the District review its practice of mixing chlorine stock solutions at each well site. Until now, the chlorine stock solution at each well was not replaced or changed periodically and may have been sitting for months before the well was activated and the chlorine solution was injected. The Department does not consider this an acceptable practice, as the solution strength may vary over a period of time. The District needs to initiate a program to change or replace the chlorine solution at each well site frequently, depending on the planned operation of the wells.

Two of the District's wells are of concern. Both wells are housed in buildings that include toilet facilities. The toilet and the sewer laterals serving the respective toilets are within 20 feet of the wells. The Waterworks Standards prohibit any sewer or sewer lateral within a 50 foot radius of any domestic water supply well. The two wells in question are Wells #2 and #3.

Well #2 was drilled in March 1979. The permit amendment issued to the District in 1979 authorized the use of this well. In 1994, the District proposed treatment facilities for Well #2, including the construction of a control building to house the well.

The plans and specifications were reviewed by Department's Redding District Office. In a memorandum report, dated January 18, 1995, the District Office commented that the "*plans show a bathroom with flush toilet located approximately 13 feet from the well. A*

4-inch ABS sewer lateral carries the wastewater to a sewer in the street." The District Office recommended that the bathroom facilities be deleted from the project.

However, since the project had already gone to bid and reportedly, the deletion of the bathroom facilities would have incurred additional costs, the District Office recommended that special construction features be incorporated to "*help ensure that potential leakage from the lateral is contained and does not contaminate the well."* The District Office noted that the facility would receive infrequent use and would therefore present a much lesser hazard than a typical residential sewer lateral. Furthermore, the District Office documented that the "*underlying soils at the site have a very slow permeability which provides further protection to the groundwater and well."* Finally, the District Office stipulated that:

- The sewer lateral within 50 feet of the well must be schedule 40 ABS pipe with glued joints.

- The sewer lateral beneath the slab and within 50 feet of the well must be sleeved with ASTM 3034, PVC sewer pipe, SDR 41 minimum, with solvent cemented or elastomeric gasket type joints. An impervious barrier must be constructed in the pipe trench at the end of the sleeve so that if leakage occurs it is inhibited from seeping through the bedding materials towards the well. Due to the slow permeability of the clayey soils at the site, it appears the barrier could be made from the clayey soils provided it is free of rocks and gravel.

- The lateral must be routed directly away from the well until it is 50 feet away.

- It is understood that the County Building Department will require leakage testing of the interior plumbing as well as the lateral to the sewer main, and therefore, the Department will not require any additional leakage testing.

There is no written record to confirm that the District complied with the above listed requirements. However, in a meeting with the District Engineer, District Manager and Water Treatment Superintendent, on March 4, 2008, the District verbally confirmed that these requirements had been followed. Based on the above stated information, it was agreed to leave the existing facilities in place. However, this permit will reflect a condition that requires the District to conduct an annual leakage test of the sewer lateral and to report the results to the Department's Redding District Office.

Well #3 is located in Palo Cedro. It was drilled in November 1988, and was originally intended to serve the Palo Cedro Pressure Zone year around. The Well, the hydropneumatic tank, and the pressure filter units are housed in a block building. Similarly to Well #2, a toilet facility was installed in the building. The District did not apply for a domestic water system permit amendment for this facility. Hence, the installation of the toilet facilities was not approved by the Department. The Department, in a meeting with the District Manager, District Water Treatment Superintendent and the

District's Engineer, on March 4, 2008, agreed that the toilet facilities need to be removed. In a letter, dated May 30, 2008, Tom W. Warnock, the District's consulting engineer, proposed to remove the toilet and the sewer lateral. Tom proposed that the sewer lateral serving the toilet facility be "exposed just before it ties into the main in the dirt area just south of the pavement of Gilbert Drive." He proposed that "*the exposed line be cut and the remaining stub from the main and the severed connection to Well No. 3 be capped.*" The toilet would be removed and the concrete floor would be patched. The Department accepted the District's proposal.

The District's surface water supply is adequate to meet current and future water demands during normal or non-draught conditions. However, during draught periods, such as such as occurred in the early 1990s, and again during current year, the District's water supply allocations were reduced by 50% and 25%, which impacted the District's ability to provide normal service and meet it demands.

In this current situation, the U.S. Bureau of Reclamation announced on April 25, 2008, that the water supply allocation for the Central Valley Project, including Bella Vista Water District, will receive a 75% supply allocation based on that last three years of unconstrained deliveries for municipal and industrial purposes, including a 45% supply for agricultural purposes based on the District's remaining contract quantity.

The District was notified that it will receive less than 13,000 acre-feet of its total contract quantity of 24,578 acre-feet from the Central Valley Project, which prompted the District to declare a water shortage emergency.

In response to the USBR's announcement, the District Board of Directors convened a Special Board Meeting and public hearing on May 12, 2008, to consider a declaration of a water shortage emergency, pursuant to California Water Code sections 350 and 375, and to enact stage II of the District's Water Shortage Contingency Plan. Fortunately, the District was able to secure additional, although more expensive, supplemental water supplies this year. It was therefore not necessary to impose mandatory rationing. However, to recover the additional costs for supplemental water the District imposed a drought surcharge effective June 1, 2008. This surcharge is expected to remain in place until the water supply outlook improves.

Future reductions due to extended draught conditions could have some potentially serious impact on the District's ability to meet its demands.

As discussed above, a number of the District's booster pump stations are without the provisions of auxiliary power. The District needs to continue its efforts to provide such emergency support at those pumping stations.

The District also needs to review its practices of responding to unscheduled water outages. The District's operating procedures should address water outage response issues. It needs to be very clear that any outage that results in system pressures falling below 5 psig must be reported to the Department, irrespective of the number of

customers involved. The operating procedure should outline public notification, testing and repair procedures.

In summary, it is recommended that the Bella Vista Water District be granted a permit to operate the Bella Vista Water District's public water system, subject to the following conditions:

1. The only source of water approved for potable supply for the BVWD's surface water treatment plant shall come from the Sacramento River.

2. The approved groundwater sources for the BVWD shall be Wells 1, 2, 3, 4 and 6, as described in the Permit Engineering Report. Well #5 shall be approved for active use when the district submits plans and specifications for the installation of the pumping and treatment paraphernalia.

3. The BVWD shall apply for an amended water supply permit prior to installing pumping and treatment paraphernalia and completing and/or activating Well #5.

4. The BVWD shall operate the surface water treatment plant to consistently achieve the Cryptosporidium Action Plan (CAP) goal of 0.1 NTU for combined filter effluent. If the CAP goal is not consistently met in two consecutive months, the District shall be required to perform a self-assessment of the filters within 60 days. If the District continues to fail to achieve the CAP goal, then the District will be required to address what improvements and/or modifications are necessary in order to consistently meet the CAP goal.

5. The BVWD shall change the stock chlorine solution at each well site at least once each month. In lieu of changing the stock chlorine solution monthly, the District may use a method, acceptable to the Department, of testing the stock solution that will show any change in the concentration of the solution. If a change in the concentration of the stock solution has been determined, the District will re-adjust the stock solution strength to the required concentration. The District will report to the Department monthly, verifying the actual strength of the stock solution at each well site.

6. BVWD shall submit to the Department an Annual Report on the status and condition of the system as directed by the Department. The report shall be presented in the format requested by the Department and shall be submitted by the deadline established by the Department.

7. BVWD shall, within 24 hours, report to the Department any water outage that caused a drop to 5 psig or less in distribution system pressure. After any system pressure loss to less than five psig, the District shall collect water quality samples that are representative of the area affected by the low pressure. The results of the analyses shall be reported to the Department, in form and manner specified by the Department, as soon as the results are known.

8. BVWD shall monitor the raw water bacteriological water quality at the surface water treatment plant and at the District's Wells based on a frequency schedule that has been approved by the Department.

9. BVWD shall perform an annual leakage test of the sewer lateral serving the toilet facility at Well #2, and shall report the results of same leakage test to the Department's Redding District Office.

APPENDIX A

STATE OF CALIFORNIA
APPLICATION
FOR
DOMESTIC WATER SUPPLY PERMIT AMENDMENT
FROM

Applicant: Bella Vista Water District
(Enter the name of legal owner, person(s) or organization)

Address: 11368 East Stillwater Way, Redding, CA 96003

System Name: Bella Vista Water District

System Number: 4510014

TO: Department of Health Services
Drinking Water Field Operations Branch
Lassen District
415 Knollcrest Drive, Suite 110
Redding, CA 96001

Pursuant and subject to the requirements of the California Health and Safety Code, Division 104, Part 12, Chapter 4 (California Safe Drinking Water Act), Article 7, Section 116550, relating to changes requiring an amended permit, application is hereby made to amend an existing water supply permit to construct improvements to the District's Wintu Pump Station,
(Applicant must state specifically what is being applied for - whether to construct new works, make alterations or additions in works or sources, or change or modify treatment.)
Water Treatment Plant, Quail Ridge Pump Station, and water distribution system per the plans and specifications titled "Wintu Pump Station and Water Treatment Plant Expansion Project."

FOR OFFICIAL USE

Date Received:

RECEIVED
DHS - REDDING
JUN - 1 2004
DRINKING WATER
FIELD OPS BRANCH

I (We) declare under penalty of perjury that the statements on this application and on the accompanying attachments are correct to my (our) knowledge and that I (we) are acting under authority and direction of the responsible legal entity under whose name this application is made.

Signed By: [signature]

Title: District Engineer

Address: 11368 E. Stillwater Way
Redding, CA 96003

Telephone: 530-241-1085

Dated: June 1, 2004

DDW: 05/2000

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

January 15, 2008

Bella Vista Water District
11368 Stillwater Way
Redding, CA 96003-9510

Attention: David J. Coxey, General Manager

Subject: **Public Water System #4510014--Domestic Water Supply Permit**

On January 1976, the California Department of Health Services (CDHS), now California Department of Public Health (CDPH), granted Bella Vista Water District (District) a domestic water supply permit to serve domestic water to the unincorporated area north of Redding in Shasta County. The permit authorized the District to pump water from the Sacramento River via the Wintu Pumping Plant in Redding. Treatment of the approved surface water supply consisted of chlorination treatment only. A groundwater source (Well #1) was approved for use as a supplemental source during the irrigation season. In July of 1979, the CDHS granted a permit amendment to the District for the operation of the newly constructed Well #2.

On June 1, 2004, the District submitted a Domestic Water Supply Permit Amendment Application to 'construct improvements to the District's Wintu Pump Station, Water Treatment Plant, Quail Ridge Pump Station, and water distribution system per the plans and specifications titled "Wintu Pump Station and Water Treatment Plant Expansion Project".' The proposed improvements for which the District submitted the June 1, 2004, permit amendment application were to be funded by the Safe Drinking Water State Revolving Fund (SDWSRF) program.

Division of Drinking Water and Environmental Management
415 Knollcrest Drive, Suite 110, Redding, CA 96002
(530) 224-4800 Fax (530) 224-4844
Internet Address: www.cdph.ca.gov

The California Health and Safety Code, Article 7, Section 116550, mandates that "No person operating a public water system shall modify, add to or change his or her source of supply or method of treatment of, or change his or her distribution system as authorized by a valid existing permit issued to him or her by the department unless the person first submits an application to the department and receives an amended permit as provided in this chapter authorizing the modification, addition, or change in his or her source of supply or method of treatment."

The California Health and Safety Code, Article 7, Section 116525, also specifies that the "department may renew, reissue, revise, or amend any domestic water supply permit whenever the department deems it to be necessary for the protection of public health whether or not an application has been filed."

Since the original permit and permit amendment were granted to the District, and up to the time that the District applied for the major and significant water system improvements and changes proposed under the SDWSRF program, the District also added three more groundwater sources and constructed treatment facilities for the groundwater sources. Hence, considering the significant changes and improvements to the Bella Vista Water District's water system, the CDPH hereby determines that a revised and updated, full permit should be processed for the District.

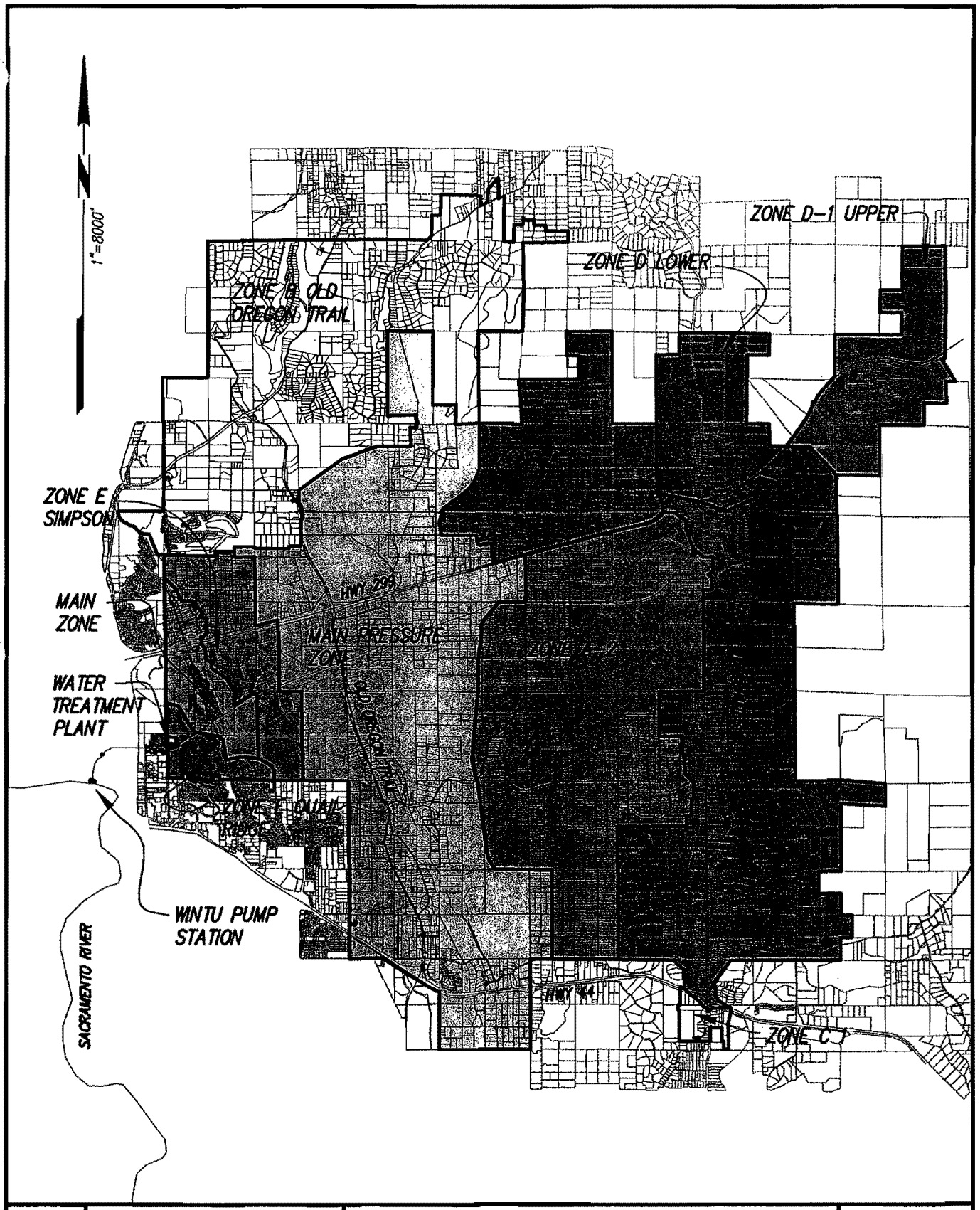
Gunther Sturm will be the project engineer for your new permit. Gunther will be in contact with you to start the permit investigative process. If you have questions, please call me at 224-4873 or call Gunther at 224-4866.

Michael J. McNamara, P.E.
Lassen District Engineer
Drinking Water Field Operations
Branch

cc: Don M. Groundwater, P.E.
-District Engineer
Carl Lischeske, P.E., Chief
-Northern California Region

GLS

APPENDIX B



DATE		BELLA VISTA WATER DISTRICT	FIGURE 1
12/04	PACE CIVIL, INC. REDDING, CALIFORNIA	PRESSURE ZONE MAP	JOB # 453.91

APPENDIX C

WELL DATA SHEET (Page 1 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
* *Indicates items required for Source Water Assessment*		
** *Indicates additional items required for assessments and Ground Water Rule*		
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	BVWD	*from DHS database*
System Number	4510014	*from DHS database*
Source of Information *(well log, DHS/County files, system, etc)*	Department of Public Health	Actual
Organization Collecting Information *(DHS, County, System, other)*	Other	
Date Information Collected/Updated	8-Mar	Actual
WELL IDENTIFICATION		
* Well Number or Name	Well No. 2	*from DHS database*
* DHS Source Identification Number (FRDS ID No.)		
DWR Well Log on File? ("YES" or "NO")	YES	Actual
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active;Standby	*from DHS database*
WELL LOCATION		
Latitude	40d33'42.69"N	*from DHS database*
Longitude	122d17'55.43"W	*from DHS database*
Ground Surface Elevation (ft above Mean Sea Level)	570	Actual
Street Address	3050 Crossroads Dr.	Actual
Nearest Cross Street	Old 44 Dr.	Actual
City	Redding	Actual
County	Shasta	Actual
* Neighborhood/Surrounding Area *(see Note 1)*	RU	Actual
Site plan on file? ("YES" or "NO")	YES	Actual
DWR Ground Water Basin	Redding	*to come from DWR*
DWR Ground Water Sub-basin	Milville	*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)		
Distance to Active Wells (ft)	None	Actual
Distance to Abandoned Wells (ft)	None	Actual
Distance to Surface Water (ft)	None	Actual
** Size of controlled area around well (square feet)	9300	Actual
* Type of access control to well site *(fencing, building, etc)*	Fencing	Actual
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	YES	Actual
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	28/22/6	Actual
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	NO	Actual
* Drainage away from well? ("YES" or "NO")	YES	Actual
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	Building	Actual
Floor material	Concrete	Actual
Located in Pit? ("YES" or "NO")	NO	Actual
Pit depth (feet) (if applicable)	NONE	Actual
WELL CONSTRUCTION		
Date drilled	23-Mar-79	Actual
Drilling Method	Rotary Drilled	Actual
Depth of Bore Hole (feet below ground surface)	485	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.		
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	16	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	Steel	Actual
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
WELL CONSTRUCTION (continued)		
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	YES	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	UNKNOWN	Actual
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	220	Actual
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened		
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	225	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	YES	Actual
* Depth of Annular Seal (ft)	50	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement Grout	Actual
Gravel pack, Depth to top (ft below ground surface)	50	Actual
Total length of gravel pack (ft)	435	Actual

WELL DATA SHEET (Page 2 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
* *Indicates items required for Source Water Assessment*		
** *Indicates additional items required for assessments and Ground Water Rule*		
AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Sand; Clay; Gravel	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	0.2	Default
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	YES	Actual
Thickness of confining layer, if known (ft)	63; 10; 38	Actual
Depth to confining layer, if known (ft below ground)	135; 250; 322	Actual
* Static water level (ft below ground surface)	123	Actual
Static water level measurement: Date/Method	5-6-08/Transducer	Actual
Pumping water level (ft below ground surface)	180	Actual
Pumping water level measurement: Date/Method	5-6-08/Transducer	Actual
WELL PRODUCTION		
Well Yield (gpm)	900	Actual
Well Yield Based On (i.e., pump test, etc.)	Pump Test	Actual
Date measured	March 6 2008	Actual
Is the well metered? ("YES" or "NO")	YES	Actual
Production (gallons per year)	34,000,000	Actual
Frequency of Use (hours/year)	720	Estimated
Typical pumping duration (hours/day)	24	Estimated
PUMP		
Make	Peerless Pump	Actual
Type	Line Shaft Rotary	Actual
Size (hp)	125	Actual
* Capacity (gpm)	3000	Actual
Depth to suction intake (ft below ground surface)	298.5	Actual
Lubrication Type	Grease	Actual
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	Actual
Auxiliary power available? ("YES" or "NO")	NO	Actual
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Tank Level	Actual
Pump to Waste capability? ("YES" or "NO")	YES	Actual
Discharges to: *(i.e., distribution system, storage, etc.)*	Distribution System	Actual
NOTES		
1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other		
2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.		
3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".		
Please Note:		
The information on this Well Data Sheet is considered confidential. To allow the information to be included		
in the permit report, or made available subject to a public information act request, the waiver clause below has		
to to be signed and dated by the owner (public water system). In lieu of this signature, the WDS has to be		
retained in a confidential file, or the information shown in the shaded rows has to be "blacked out."		
I/We, (Name)_____, certify that I/Weam/are the present owners of the well described on this well data sheet. I/We have reviewed the information presented on this well data sheet and I/We take no exception to having the information inlcuded in the Department of Health Services' Engineering Report. I/We understand that by including the well data sheet in the Engineering Report, it will be part of a public document that can be reviewed and copied subject to a Public Information Act request.		
_____ _____		
(Signature) (Date)		

WELL DATA SHEET (Page 3 of 3)

Well Data Sheet Supplement		
REMARKS AND DEFECTS		
(Use or note these items as appropriate)		
(** indicates items pertinent to Ground Water Rule)		
Distance (ft) to other sanitary concerns:		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
Raw Water Quality concerns? (Yes or No)		
** Microbiological (coliform)		
Chemicals		
Other (list)		
** Continuous Chlorination provided? (Yes or No)		
Condition of enclosure or housing		
Pit Drained? (if applicable)		
Pitless Adaptor? Make and Model		
Height of pump base (inches)		
Casing Vent? (yes or no)		
Air/Vacuum Release? (yes or no)		
Sampling Taps? (yes or no)		
Location of sampling taps		
Wellhead Riser? (yes or no); height above well		
Other		

WELL DATA SHEET (Page 1 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
** Indicates items required for Source Water Assessment*		
*** Indicates additional items required for assessments and Ground Water Rule*		
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	BVWD	*from DHS database*
System Number	4510014	*from DHS database*
Source of Information *(well log, DHS/County files, system, etc)*	DWR; PG&E Agricultural Services, Pump Test Report	Actual
Organization Collecting Information *(DHS, County, System, other)*	Other	
Date Information Collected/Updated	8-Mar	Actual
WELL IDENTIFICATION		
* Well Number or Name	3 Production	*from DHS database*
* DHS Source Identification Number (FRDS ID No.)		
DWR Well Log on File? ("YES" or "NO")	YES	Actual
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active;Standby	*from DHS database*
WELL LOCATION		
Latitude	40d33'04.68"N	*from DHS database*
Longitude	122d14'24.01"W	*from DHS database*
Ground Surface Elevation (ft above Mean Sea Level)	452	Actual
Street Address	21931 Gilbert Dr.	Actual
Nearest Cross Street	Stillwater Road	Actual
City	Palo Cedro	Actual
County	Shasta	Actual
* Neighborhood/Surrounding Area *(see Note 1)*	RU	Actual
Site plan on file? ("YES" or "NO")	YES	Actual
DWR Ground Water Basin	Redding	*to come from DWR*
DWR Ground Water Sub-basin	Milville	*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	None	Actual
Distance to Active Wells (ft)	None	Actual
Distance to Abandoned Wells (ft)	None	Actual
Distance to Surface Water (ft)	None	Actual
** Size of controlled area around well (square feet)	4557	Actual
* Type of access control to well site *(fencing, building, etc)*	Fencing;Building	Actual
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	YES	Actual
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	14.8/16/6	Actual
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	No	Actual
* Drainage away from well? ("YES" or "NO")	YES	Actual
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	Building	Actual
Floor material	Concrete;Gravel	Actual
Located in Pit? ("YES" or "NO")	NO	Actual
Pit depth (feet) (if applicable)	NONE	Actual
WELL CONSTRUCTION		
Date drilled	19-Nov-88	Actual
Drilling Method	Mud Rotary	Actual
Depth of Bore Hole (feet below ground surface)	455	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	0/160; 160/360	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	12;10	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	Stainless; Stainless	Actual
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
WELL CONSTRUCTION (continued)		
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	YES	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	UNKNOWN	Actual
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	160	Actual
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened	160/360	Actual
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	200	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	YES	Actual
* Depth of Annular Seal (ft)	50	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement Grout; Bentonite	Actual
Gravel pack, Depth to top (ft below ground surface)	50	Actual
Total length of gravel pack (ft)	320	Actual

WELL DATA SHEET (Page 2 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
* *Indicates items required for Source Water Assessment*		
** *Indicates additional items required for assessments and Ground Water Rule*		
AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Silt; Clay; Gravel	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	0.2	Default
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	No	Actual
Thickness of confining layer, if known (ft)	158;70	Actual
Depth to confining layer, if known (ft below ground)	0;266	Actual
* Static water level (ft below ground surface)	49.7	Actual
Static water level measurement: Date/Method	June 12, 1990/ Pump Test	Actual
Pumping water level (ft below ground surface)	73.4	Actual
Pumping water level measurement: Date/Method	June 12, 1990/ Pump Test	Actual
WELL PRODUCTION		
Well Yield (gpm)	700	Actual
Well Yield Based On (i.e., pump test, etc.)	Pump Test	Actual
Date measured	June 12, 1990	Actual
Is the well metered? ("YES" or "NO")	YES	Actual
Production (gallons per year)	34,000,000	Actual
Frequency of Use (hours/year)	720	Estimated
Typical pumping duration (hours/day)	24	Actual
PUMP		
Make	U.S.	Actual
Type	Submersible	Actual
Size (hp)	75	Actual
* Capacity (gpm)	700	Actual
Depth to suction intake (ft below ground surface)	155±	Actual
Lubrication Type	Grease	Actual
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	Actual
Auxiliary power available? ("YES" or "NO")	NO	Actual
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Pressure	Actual
Pump to Waste capability? ("YES" or "NO")	YES	Actual
Discharges to: *(i.e., distribution system, storage, etc.)*	Distribution System	Actual
NOTES		
1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other		
2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.		
3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".		
Please Note:		
The information on this Well Data Sheet is considered confidential. To allow the information to be included		
in the permit report, or made available subject to a public information act request, the waiver clause below has		
to to be signed and dated by the owner (public water system). In lieu of this signature, the WDS has to be		
retained in a confidential file, or the information shown in the shaded rows has to be "blacked out."		
I/We, (Name)_____, certify that I/Weam/are the present owners of the well described on this well data sheet. I/We have reviewed the information presented on this well data sheet and I/We take no exception to having the information inlcuded in the Department of Health Services' Engineering Report. I/We understand that by including the well data sheet in the Engineering Report, it will be part of a public document that can be reviewed and copied subject to a Public Information Act request.		
_____ _____		
(Signature) (Date)		

WELL DATA SHEET (Page 3 of 3)

Well Data Sheet Supplement		
REMARKS AND DEFECTS		
(Use or note these items as appropriate)		
(** indicates items pertinent to Ground Water Rule)		
Distance (ft) to other sanitary concerns:		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
Raw Water Quality concerns? (Yes or No)		
** Microbiological (coliform)		
Chemicals		
Other (list)		
** Continuous Chlorination provided? (Yes or No)		
Condition of enclosure or housing		
Pit Drained? (if applicable)		
Pitless Adaptor? Make and Model		
Height of pump base (inches)		
Casing Vent? (yes or no)		
Air/Vacuum Release? (yes or no)		
Sampling Taps? (yes or no)		
Location of sampling taps		
Wellhead Riser? (yes or no); height above well		
Other		

WELL DATA SHEET (Page 1 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
** Indicates items required for Source Water Assessment*		
*** Indicates additional items required for assessments and Ground Water Rule*		
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	BVWD	*from DHS database*
System Number	4510014	*from DHS database*
Source of Information *(well log, DHS/County files, system, etc)*	DWR	Actual
Organization Collecting Information *(DHS, County, System, other)*	Other	
Date Information Collected/Updated	Mar-08	Actual
WELL IDENTIFICATION		
* Well Number or Name	4 Production	*from DHS database*
* DHS Source Identification Number (FRDS ID No.)		
DWR Well Log on File? ("YES" or "NO")	YES	Actual
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active; Standby	*from DHS database*
WELL LOCATION		
Latitude	40d34'09.67"N	*from DHS database*
Longitude	122d18'51.69"W	*from DHS database*
Ground Surface Elevation (ft above Mean Sea Level)	575	Actual
Street Address	2067 Abernathy Lane	Actual
Nearest Cross Street	Viking Way	Actual
City	Redding	Actual
County	Shasta	Actual
* Neighborhood/Surrounding Area *(see Note 1)*	RU	Actual
Site plan on file? ("YES" or "NO")	YES	Actual
DWR Ground Water Basin	Redding	*to come from DWR*
DWR Ground Water Sub-basin	Milville	*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	None	Actual
Distance to Active Wells (ft)	None	Actual
Distance to Abandoned Wells (ft)	None	Actual
Distance to Surface Water (ft)	None	Actual
** Size of controlled area around well (square feet)	11700	Actual
* Type of access control to well site *(fencing, building, etc)*	Fencing	Actual
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	YES	Actual
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	20/20/6	Actual
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	NO	Actual
* Drainage away from well? ("YES" or "NO")	YES	Actual
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	Building	Actual
Floor material	Concrete	Actual
Located in Pit? ("YES" or "NO")	NO	Actual
Pit depth (feet) (if applicable)	N/A	N/A
WELL CONSTRUCTION		
Date drilled	May 20, 1991	Actual
Drilling Method	Mud Rotary	Actual
Depth of Bore Hole (feet below ground surface)	375	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	+1/200; 200/370	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	14; 12	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	Steel; Stainless	Actual
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
WELL CONSTRUCTION (continued)		
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	YES	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	YES	Actual
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	200	Actual
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened	200/370	Actual
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	170	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	YES	Actual
* Depth of Annular Seal (ft)	186	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement Grout; Bentonite	Actual
Gravel pack, Depth to top (ft below ground surface)	186	Actual
Total length of gravel pack (ft)	189	Actual

WELL DATA SHEET (Page 2 of 3)

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** Indicates items required for Source Water Assessment*		
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AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Sand; Silt; Clay; Gravel	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	0.2	Default
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	YES	Actual
Thickness of confining layer, if known (ft)	14; 12	Actual
Depth to confining layer, if known (ft below ground)	100; 130	Actual
* Static water level (ft below ground surface)	169	Actual
Static water level measurement: Date/Method	May 8, 2008	Actual
Pumping water level (ft below ground surface)	139	Actual
Pumping water level measurement: Date/Method	5/6/2008/ Pump Test	Actual
WELL PRODUCTION		
Well Yield (gpm)	300	Actual
Well Yield Based On (i.e., pump test, etc.)	Pump Test	Actual
Date measured		
Is the well metered? ("YES" or "NO")	YES	Actual
Production (gallons per year)	21,000,000	Actual
Frequency of Use (hours/year)	720	Estimated
Typical pumping duration (hours/day)	24	Estimated
PUMP		
Make	U.S.	Actual
Type	Line Shaft Turbine	Actual
Size (hp)	40	Actual
* Capacity (gpm)	300	Actual
Depth to suction intake (ft below ground surface)	258.6	Actual
Lubrication Type	Grease	Actual
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	Actual
Auxiliary power available? ("YES" or "NO")	NO	Actual
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Manual	Actual
Pump to Waste capability? ("YES" or "NO")	YES	Actual
Discharges to: *(i.e., distribution system, storage, etc.)*	Distribution System	Actual
NOTES		
1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other		
2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.		
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(Signature) (Date)		

WELL DATA SHEET (Page 3 of 3)

Well Data Sheet Supplement		
REMARKS AND DEFECTS		
(Use or note these items as appropriate)		
(** indicates items pertinent to Ground Water Rule)		
Distance (ft) to other sanitary concerns:		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
Raw Water Quality concerns? (Yes or No)		
** Microbiological (coliform)		
Chemicals		
Other (list)		
** Continuous Chlorination provided? (Yes or No)		
Condition of enclosure or housing		
Pit Drained? (if applicable)		
Pitless Adaptor? Make and Model		
Height of pump base (inches)		
Casing Vent? (yes or no)		
Air/Vacuum Release? (yes or no)		
Sampling Taps? (yes or no)		
Location of sampling taps		
Wellhead Riser? (yes or no); height above well		
Other		

WELL DATA SHEET (Page 1 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
* *Indicates items required for Source Water Assessment*		
** *Indicates additional items required for assessments and Ground Water Rule*		
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	BVWD	*from DHS database*
System Number	4510014	*from DHS database*
Source of Information *(well log, DHS/County files, system, etc)*	State of California Well Completion Report	Actual
Organization Collecting Information *(DHS, County, System, other)*	Other	
Date Information Collected/Updated	Mar-08	Actual
WELL IDENTIFICATION		
* Well Number or Name	6 Production	*from DHS database*
* DHS Source Identification Number (FRDS ID No.)		
DWR Well Log on File? ("YES" or "NO")	YES	Actual
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active; Standby	*from DHS database*
WELL LOCATION		
Latitude	44d33'48.61"N	*from DHS database*
Longitude	122d17'26.66"W	*from DHS database*
Ground Surface Elevation (ft above Mean Sea Level)	517.5	Actual
Street Address	2067 Abernathy Lane	Actual
Nearest Cross Street	Viking Way	Actual
City	Redding	Actual
County	Shasta	Actual
* Neighborhood/Surrounding Area *(see Note 1)*	RU	Actual
Site plan on file? ("YES" or "NO")	YES	Actual
DWR Ground Water Basin	Redding	*to come from DWR*
DWR Ground Water Sub-basin	Milville	*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	176	Actual
Distance to Active Wells (ft)	None	Actual
Distance to Abandoned Wells (ft)	None	Actual
Distance to Surface Water (ft)	150	Actual
** Size of controlled area around well (square feet)	8095	Actual
* Type of access control to well site *(fencing, building, etc)*	Fencing	Actual
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	YES	Actual
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	20/20/6	Actual
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	NO	Actual
* Drainage away from well? ("YES" or "NO")	YES	Actual
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	Building	Actual
Floor material	Concrete	Actual
Located in Pit? ("YES" or "NO")	NO	Actual
Pit depth (feet) (if applicable)	N/A	N/A
WELL CONSTRUCTION		
Date drilled	February 7, 1992	Actual
Drilling Method	Reverse Circulation	Actual
Depth of Bore Hole (feet below ground surface)	420	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	+3/165; 225/280	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	24; 24	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	Steel; Steel	Actual
	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
WELL CONSTRUCTION (continued)		
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	YES	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	NO	Actual
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	165	Actual
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened Interval, etc.	165/225; 280/360	Actual
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	140	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	YES	Actual
* Depth of Annular Seal (ft)	120	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement Grout	Actual
Gravel pack, Depth to top (ft below ground surface)	120	Actual
Total length of gravel pack (ft)	300	Actual

WELL DATA SHEET (Page 2 of 3)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
* *Indicates items required for Source Water Assessment*		
** *Indicates additional items required for assessments and Ground Water Rule*		
AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Sand; Silt; Clay; Gravel; Rock	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	0.2	Actual
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	YES	Actual
Thickness of confining layer, if known (ft)	47; 60	Actual
Depth to confining layer, if known (ft below ground)	75; 220	Actual
* Static water level (ft below ground surface)	121.5	Actual
Static water level measurement: Date/Method	2/06/92 Pump Test	Actual
Pumping water level (ft below ground surface)	162	Actual
Pumping water level measurement: Date/Method	February 6, 1992	Actual
WELL PRODUCTION		
Well Yield (gpm)	600	Actual
Well Yield Based On (i.e., pump test, etc.)	Pump Test	Actual
Date measured		
Is the well metered? ("YES" or "NO")	YES	Actual
Production (gallons per year)	58,300,000	Actual
Frequency of Use (hours/year)	720	Estimated
Typical pumping duration (hours/day)	24	Estimated
PUMP		
Make	Floway	Actual
Type	Line Shaft Turbine	Actual
Size (hp)	100	Actual
* Capacity (gpm)	600	Actual
Depth to suction intake (ft below ground surface)	420	Actual
Lubrication Type	Oil	Actual
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	Actual
Auxiliary power available? ("YES" or "NO")	NO	Actual
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Manual	Actual
Pump to Waste capability? ("YES" or "NO")	YES	Actual
Discharges to: *(i.e., distribution system, storage, etc.)*	Distribution System	Actual
NOTES		
1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other		
2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.		
3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".		
Please Note:		
The information on this Well Data Sheet is considered confidential. To allow the information to be included		
in the permit report, or made available subject to a public information act request, the waiver clause below has		
to to be signed and dated by the owner (public water system). In lieu of this signature, the WDS has to be		
retained in a confidential file, or the information shown in the shaded rows has to be "blacked out."		
I/We, (Name)_____, certify that I/Weam/are the present owners of the well described on this well data sheet. I/We have reviewed the information presented on this well data sheet and I/We take no exception to having the information inlcuded in the Department of Health Services' Engineering Report. I/We understand that by including the well data sheet in the Engineering Report, it will be part of a public document that can be reviewed and copied subject to a Public Information Act request.		
_____ _____		
(Signature) (Date)		

WELL DATA SHEET (Page 3 of 3)

Well Data Sheet Supplement		
REMARKS AND DEFECTS		
(Use or note these items as appropriate)		
(** indicates items pertinent to Ground Water Rule)		
Distance (ft) to other sanitary concerns:		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
** Type of Sanitary Concern: _____		
Raw Water Quality concerns? (Yes or No)		
** Microbiological (coliform)		
Chemicals		
Other (list)		
** Continuous Chlorination provided? (Yes or No)		
Condition of enclosure or housing		
Pit Drained? (if applicable)		
Pitless Adaptor? Make and Model		
Height of pump base (inches)		
Casing Vent? (yes or no)		
Air/Vacuum Release? (yes or no)		
Sampling Taps? (yes or no)		
Location of sampling taps		
Wellhead Riser? (yes or no); height above well		
Other		

APPENDIX D

Sacramento River Raw Water
Coliform Results
January 1998 - March 2008

Work Order	Sample Date	MPN 10-5-5		MPN 15		Quantitray	MPN 5-5-5-5		MPN 5-5-5		MPN 10		Colilert Coliform	
		RL: 1.1 MPN/100 ml		RL: 2 MPN/100 ml		RL: 1 MPN/100 ml	MPN/100 ml		MPN/100 ml		RL: 1.1 MPN/100 ml		Present/Absent	
		Total	Fecal	Total	Fecal	Total	Total	E.coli	Total	E.coli	Total	Fecal	Total	E.coli
8030019-01	03/03/08	27.0	22.0											
8020078-01	02/04/08	23.0	16.1											
8010027-01	01/02/08	30.0	16.1											
7120034-01	12/03/07	50.0	50.0											
7110120-01	11/05/07	30.0	30.0											
7100058-01	10/01/07	16.1	6.9											
7080211-01	08/06/07	80.0	22.0											
7070017-02	07/02/07	70.0	3.6											
7060541-01	06/18/07	70.0	3.6											
7050033-01	05/01/07	50.0	5.1											
7040026-01	04/02/07			900	4									
7030109-01	03/05/07	70.0	30.0											
7020124-01	02/05/07	110	16.1											
7010063-01	01/03/07	240	130											
6120059-01	12/04/06	130	80.0											
6110082-01	11/02/06	300	22.0											
6100047-01	10/02/06	210	23.0											
6090100-01	09/05/06	220	21.0											
6080268-01	08/07/06	30.0	2.2											
6070025-06	07/03/06	130	30.0											
6040025-05	04/03/06	500	50.0											
6030483-01	03/13/06	70.0	7.0											
6020175-01	02/06/06	110	21.0											
6010659-05	01/23/06	170	<1.1											
5100023-01	10/03/05	170	49.0											
5090133-01	09/06/05	49.0	5.1											
5080018-01	08/01/05	170	23.0											
5070091-01	07/05/05	110	33.0											
5060189-01	06/06/05	220	12.0											
5050026-01	05/02/05	46.0	3.6											
5040366-01	04/11/05	9.2	1.1											
5030583-01	03/16/05	33.0	2.2											
5020251-01	02/07/05	49.0	23.0											
4120019-01	12/01/04	30.0	23.0											
4100317-01	10/11/04	95.0	79.0											
4090399-01	09/13/04	130	46.0											
4070114-01	07/06/04	80.0	1.1											
4060262-01	06/07/04	240	17.0											
4050504-01	05/12/04	50.0	17.0											
4040102-01	04/05/04	140	3.6											
4020017-01	02/02/04	≥1600	240											
4010034-01	01/05/04			50	50									
3120025-01	12/01/03	240	22.0											

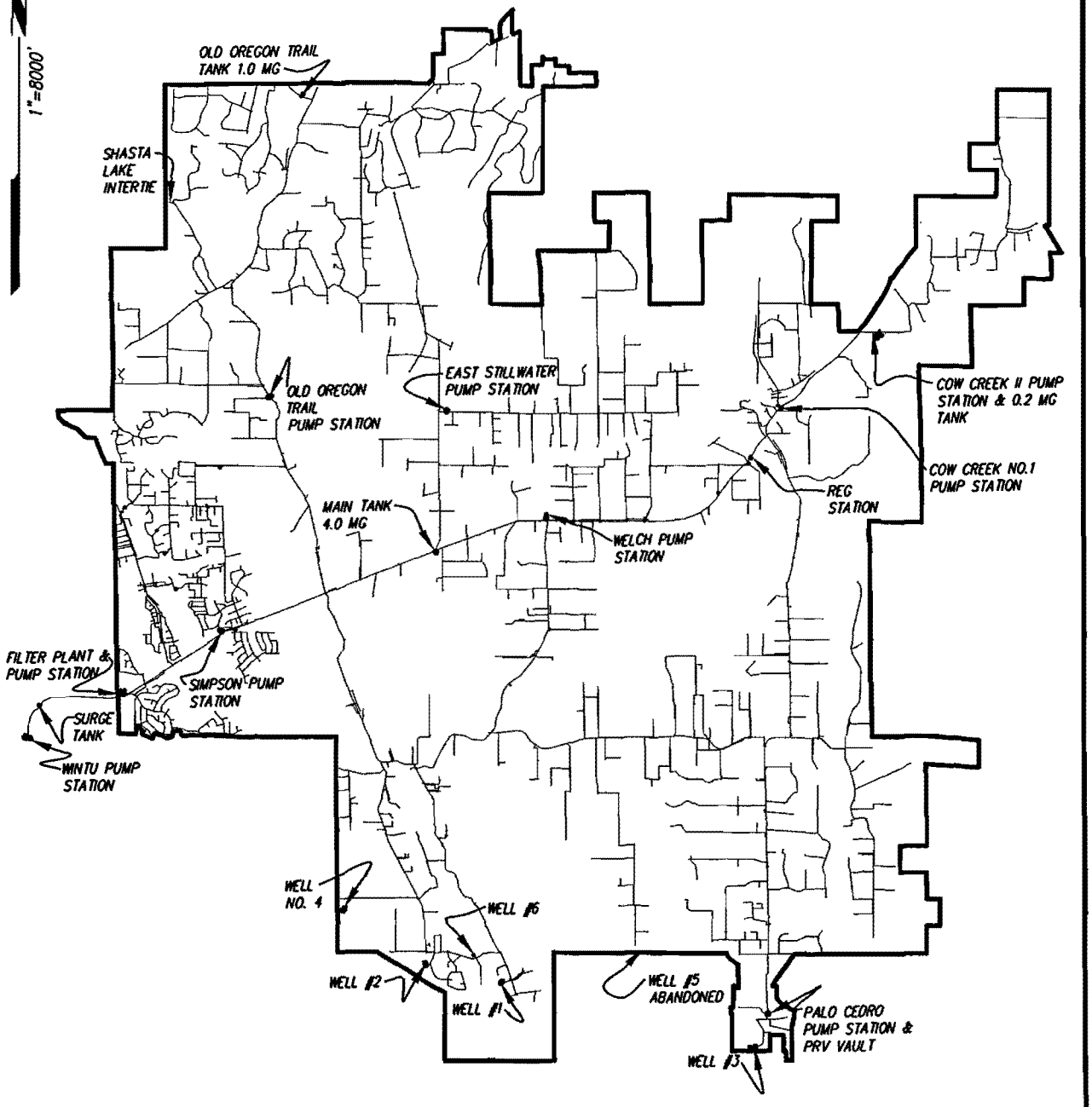
Sacramento River Raw Water
Coliform Results
January 1998 - March 2008

Work Order	Sample Date	MPN 10-5-5		MPN 15		Quantitray	MPN 5-5-5-5		MPN 5-5-5		MPN 10		Colilert Coliform	
		RL: 1.1 MPN/100 ml		RL: 2 MPN/100 ml		RL: 1 MPN/100 ml	MPN/100 ml		MPN/100 ml		RL: 1.1 MPN/100 ml		Present/Absent	
		Total	Fecal	Total	Fecal	Total	Total	E.coli	Total	E.coli	Total	Fecal	Total	E.coli
3110598-01	11/17/03	350	50.0											
3100185-01	10/06/03	90.0	17.0											
3090722-01	09/22/03			300	9									
3080079-01	08/04/03			300	8									
3070819-01	07/28/03	26.0	6.9											
3060746-01	06/23/03	30.0	3.6											
0305826-01	05/28/03			70	7									
0304748-01	04/28/03			≥1600	90									
0304200-01	04/07/03	900	6.9											
0303292-01	03/10/03			2	<2									
0302017-01	02/03/03			170	4									
0301544-01	01/20/03	130	16.1											
0212024-01	12/02/02			240	11									
0211054-01	11/04/02			80	9									
0210229-01	10/07/02			170	<2									
0208122-01	08/05/02					1200								
0207039-01	07/01/02			80	8									
0206474-01	06/17/02			500	2									
0205137-01	05/06/02			900	8									
0202132-01	02/05/02			14	8									
0112259-01	12/10/01			300	2									
0111523-01	11/19/01			70	13									
200109585-01	09/25/01			50	4									
200108698-01	08/27/01			23	4									
200104399-01	04/16/01			900	<2									
200103644-01	03/31/01			500	2									
200103634A-01	03/30/01			70	7									
200103627-01	03/30/01			110	11									
200103569-01	03/28/01			17	2									
200103569-02	03/28/01			30	2									
200002510-01	02/22/00						1700	13						
200002141-01	02/07/00								80	4				
200001381-01	01/18/00								≥1600	30				
200001010-01	01/03/00								300	30				
9912259-01	12/13/99								240	30				
9911519-01	11/29/99								900	11				
9911319-01	11/15/99								1600	30				
9911009-01	11/01/99								70	<2				
9910333-01	10/18/99								≥1600	4				
9910021-01	10/04/99								900	2				
9909398-01	09/20/99								900	11				
9909110-01	09/07/99								≥1600	2				
9908409-01	08/16/99								≥1600	<2				

Sacramento River Raw Water
Coliform Results
January 1998 - March 2008

Work Order	Sample Date	MPN 10-5-5		MPN 15		Quantitray	MPN 5-5-5-5		MPN 5-5-5		MPN 10		Colilert Coliform	
		RL: 1.1 MPN/100 ml		RL: 2 MPN/100 ml		RL: 1 MPN/100 ml	MPN/100 ml		MPN/100 ml		RL: 1.1 MPN/100 ml		Present/Absent	
		Total	Fecal	Total	Fecal	Total	Total	E.coli	Total	E.coli	Total	Fecal	Total	E.coli
9908062-01	08/02/99								≥1600	2				
9907364-01	07/19/99								240	4				
9907071-01	07/06/99								900	<2				
9906476-01	06/21/99										16.1	9.2		
9906138-01	06/07/99								37	2				
9905395-01	05/17/99								300	2				
9905049-01	05/03/99								1600	11				
9904346-01	04/19/99								900	<2				
9904040-01	04/05/99												P	P
9903090-01	03/02/99										>23	1.1		
No samples taken in 1998														

APPENDIX E



DATE		
12/04	PACE CIVIL, INC. REDDING, CALIFORNIA	BELLA VISTA WATER DISTRICT DISTRIBUTION MAP

FIGURE 2

JOB # 453.91

APPENDIX F

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-003 WELL 01 - CLOUGH CREEK

Source Number: 003

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)	
INORGANIC							
ALUMINUM	01105	108	2002/07/30		.000	2011/07	
ANTIMONY	01097	108	2008/03/04		.000	2017/03	
ARSENIC	01002	108	2000/07/26		2.000	2009/07	
ASBESTOS	81855	WAIVED					
BARIUM	01007	108	2006/11/08		164.700	2015/11	
BERYLLIUM	01012	108	2008/03/04		.000	2017/03	
CADMIUM	01027	108	2006/11/08		.000	2015/11	
CHROMIUM (TOTAL)	01034	108	2002/07/30		.000	2011/07	
CYANIDE	01291	WAIVED					
FLUORIDE (F) (NATURAL-SOURCE)	00951	108	2003/07/24		.000	2012/07	
LEAD	01051	WAIVED	1997/01/06		.000		
MERCURY	71900	108	2006/11/08		.000	2015/11	
NICKEL	01067	108	2008/03/04		.000	2017/03	
PERCHLORATE	A-031	6	2008/03/04	<	4.000	2008/09	
SELENIUM	01147	108	2006/11/08		.000	2015/11	
THALLIUM	01059	108	2008/03/04		.000	2017/03	
NITRATE/NITRITE							
NITRATE (AS NO3)	71850	12	2008/03/04		.000	2009/03	
NITRITE (AS N)	00620	36	2008/03/04		.000	2011/03	
RADIOLOGICAL							
GROSS ALPHA	01501	108	2004/05/24		.000	2013/05	
GROSS BETA	03501	WAIVED					
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED					
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED					
RADIUM 226	09501	WAIVED					
RADIUM 228	11501	3	**2006/02/02**		.000	**2006/05**	**DUE**
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED					
STRONTIUM-90	13501	WAIVED					
TRITIUM	07000	WAIVED					

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-003 WELL 01 - CLOUGH CREEK

Source Number: 003

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL						
URANIUM (PCI/L)	28012	WAIVED				
REGULATED SOC						
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED				
2,4,5-TP (SILVEX)	39045	WAIVED	1989/10/13	<	1.000	
2,4-D	39730	WAIVED	1989/10/13	<	10.000	
ALACHLOR	77825	WAIVED	2002/06/18		.000	
ATRAZINE	39033	WAIVED	2002/06/18		.000	
BENTAZON	38710	WAIVED				
BENZO (A) PYRENE	34247	WAIVED	2002/06/18		.000	
CARBOFURAN	81405	WAIVED				
CHLORDANE	39350	WAIVED	1989/07/18	<	.100	
DALAPON	38432	WAIVED				
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED	2002/06/18		.000	
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED	2002/06/18		.000	
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED	1989/10/13	<	.500	
DINOSEB	81287	WAIVED				
DIQUAT	78885	WAIVED				
ENDOTHALL	38926	WAIVED				
ENDRIN	39390	WAIVED	1989/10/13	<	.010	
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED	1989/10/13	<	.500	
GLYPHOSATE	79743	WAIVED				
HEPTACHLOR	39410	WAIVED	1989/07/18	<	.010	
HEPTACHLOR EPOXIDE	39420	WAIVED				
HEXACHLOROBENZENE	39700	WAIVED				
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED				
LINDANE	39340	WAIVED	1989/10/13	<	.400	
METHOXYCHLOR	39480	WAIVED	1989/10/13	<	10.000	
MOLINATE	82199	WAIVED	2002/06/18		.000	
OXAMYL	38865	WAIVED				

**Testing interval is in months;*
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System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-003 WELL 01 - CLOUGH CREEK

Source Number: 003

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC						
PENTACHLOROPHENOL	39032	WAIVED				
PICLORAM	39720	WAIVED				
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED				
SIMAZINE	39055	WAIVED	2002/06/18		.000	
THIOBENCARB	A-001	WAIVED	2002/06/18		.000	
TOXAPHENE	39400	WAIVED	1989/10/13	<	.500	
REGULATED VOC						
1,1,1-TRICHLOROETHANE	34506	72	2008/03/04		.000	2014/03
1,1,2,2-TETRACHLOROETHANE	34516	72	2008/03/04		.000	2014/03
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	72	2008/03/04		.000	2014/03
1,1,2-TRICHLOROETHANE	34511	72	2008/03/04		.000	2014/03
1,1-DICHLOROETHANE	34496	72	2008/03/04		.000	2014/03
1,1-DICHLOROETHYLENE	34501	72	2008/03/04		.000	2014/03
1,2,4-TRICHLOROBENZENE	34551	72	2008/03/04		.000	2014/03
1,2-DICHLOROBENZENE	34536	72	2008/03/04		.000	2014/03
1,2-DICHLOROETHANE	34531	72	2008/03/04		.000	2014/03
1,2-DICHLOROPROPANE	34541	72	2008/03/04		.000	2014/03
1,3-DICHLOROPROPENE (TOTAL)	34561	72	2008/03/04		.000	2014/03
1,4-DICHLOROBENZENE	34571	72	2008/03/04		.000	2014/03
BENZENE	34030	72	2008/03/04		.000	2014/03
CARBON TETRACHLORIDE	32102	72	2008/03/04		.000	2014/03
CIS-1,2-DICHLOROETHYLENE	77093	72	2008/03/04		.000	2014/03
DICHLOROMETHANE	34423	72	2008/03/04		.000	2014/03
ETHYLBENZENE	34371	72	2008/03/04		.000	2014/03
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	72	2008/03/04		.000	2014/03
MONOCHLOROBENZENE	34301	72	2008/03/04		.000	2014/03
STYRENE	77128	72	2008/03/04		.000	2014/03
TETRACHLOROETHYLENE	34475	72	2008/03/04		.000	2014/03
TOLUENE	34010	72	2008/03/04		.000	2014/03

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-003 WELL 01 - CLOUGH CREEK

Source Number: 003

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	72	2008/03/04	.000	2014/03
TRICHLOROETHYLENE	39180	72	2008/03/04	.000	2014/03
TRICHLOROFLUOROMETHANE	34488	72	2008/03/04	.000	2014/03
VINYL CHLORIDE	39175	72	2008/03/04	.000	2014/03
XYLENES (TOTAL)	81551	72	2008/03/04	.000	2014/03
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2003/12/11	10.700	
BICARBONATE ALKALINITY	00440	108	2003/12/11	115.000	2012/12
CALCIUM	00916	108	2003/12/11	10.900	2012/12
CARBONATE ALKALINITY	00445	108	2003/12/11	.000	2012/12
CHLORIDE	00940	108	2003/12/11	9.440	2012/12
COLOR	00081	108	2007/02/27	.000	2016/02
COPPER	01042	108	2003/12/11	.000	2012/12
FOAMING AGENTS (MBAS)	38260	108	2003/12/11	.000	2012/12
HARDNESS (TOTAL) AS CACO3	00900	108	2003/12/11	75.000	2012/12
HYDROXIDE ALKALINITY	71830	108	2003/12/11	.000	2012/12
IRON	01045	12	2008/03/04	430.000	2009/03
MAGNESIUM	00927	108	2003/12/11	8.650	2012/12
MANGANESE	01055	12	2008/03/04	167.000	2009/03
ODOR THRESHOLD @ 60 C	00086	108	2007/02/27	.000	2016/02
PH, LABORATORY	00403	108	2003/12/11	7.700	2012/12
SILVER	01077	108	2003/07/24	.000	2012/07
SODIUM	00929	108	2003/12/11	44.400	2012/12
SPECIFIC CONDUCTANCE	00095	108	2003/12/11	353.000	2012/12
SULFATE	00945	108	2003/12/11	.930	2012/12
TOTAL DISSOLVED SOLIDS	70300	108	2003/12/11	229.000	2012/12
TURBIDITY, LABORATORY	82079	108	2007/02/27	1.170	2016/02
ZINC	01092	108	2003/12/11	.000	2012/12

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-004 WELL 02 - OLD OREGON TRAIL

Source Number: 004

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)	
INORGANIC							
ALUMINUM	01105	108	2001/03/01		.000	2010/03	
ANTIMONY	01097	108	2001/03/01		.000	2010/03	
ARSENIC	01002	108	2001/03/01		2.000	2010/03	
ASBESTOS	81855	WAIVED	1996/12/04		.000		
BARIUM	01007	108	2001/03/01		236.000	2010/03	
BERYLLIUM	01012	108	2001/03/01		.000	2010/03	
CADMIUM	01027	108	2001/03/01		.000	2010/03	
CHROMIUM (TOTAL)	01034	108	2002/07/10		1.000	2011/07	
CYANIDE	01291	WAIVED					
FLUORIDE (F) (NATURAL-SOURCE)	00951	108	2001/03/01		.140	2010/03	
LEAD	01051	WAIVED	2001/03/01		.000		
MERCURY	71900	108	2001/03/01		.000	2010/03	
NICKEL	01067	108	2001/03/01		.000	2010/03	
PERCHLORATE	A-031	6	2008/03/04	<	4.000	2008/09	
SELENIUM	01147	108	2001/03/01		.000	2010/03	
THALLIUM	01059	108	2001/03/01		.000	2010/03	
NITRATE/NITRITE							
NITRATE (AS NO3)	71850	12	2008/03/04		.000	2009/03	
NITRITE (AS N)	00620	36	2008/03/04		.000	2011/03	
RADIOLOGICAL							
GROSS ALPHA	01501	108	2001/11/14	<	1.000	2010/11	
GROSS BETA	03501	WAIVED					
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED					
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED					
RADIUM 226	09501	WAIVED					
RADIUM 228	11501	3	**2006/02/02**		.000	**2006/05**	DUE
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED					
STRONTIUM-90	13501	WAIVED					
TRITIUM	07000	WAIVED					

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-004 WELL 02 - OLD OREGON TRAIL

Source Number: 004

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL						
URANIUM (PCI/L)	28012	WAIVED				
REGULATED SOC						
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED				
2,4,5-TP (SILVEX)	39045	WAIVED	1989/10/13	<	1.000	
2,4-D	39730	WAIVED	1989/10/13	<	10.000	
ALACHLOR	77825	WAIVED	1989/07/18	<	.020	
ATRAZINE	39033	WAIVED	1989/10/13	<	1.000	
BENTAZON	38710	WAIVED				
BENZO (A) PYRENE	34247	WAIVED				
CARBOFURAN	81405	WAIVED				
CHLORDANE	39350	WAIVED	1989/07/18	<	.100	
DALAPON	38432	WAIVED				
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED				
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED				
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED	1989/10/13	<	.500	
DINOSEB	81287	WAIVED				
DIQUAT	78885	WAIVED				
ENDOTHALL	38926	WAIVED				
ENDRIN	39390	WAIVED	1989/10/13	<	.010	
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED	1989/10/13	<	.500	
GLYPHOSATE	79743	WAIVED				
HEPTACHLOR	39410	WAIVED	1989/07/18	<	.010	
HEPTACHLOR EPOXIDE	39420	WAIVED				
HEXACHLOROBENZENE	39700	WAIVED				
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED				
LINDANE	39340	WAIVED	1989/10/13	<	.400	
METHOXYCHLOR	39480	WAIVED	1989/10/13	<	10.000	
MOLINATE	82199	WAIVED	1989/07/18	<	2.000	
OXAMYL	38865	WAIVED				

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-004 WELL 02 - OLD OREGON TRAIL

Source Number: 004

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC						
PENTACHLOROPHENOL	39032	WAIVED				
PICLORAM	39720	WAIVED				
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED				
SIMAZINE	39055	WAIVED	1989/10/13	<	1.000	
THIOBENCARB	A-001	WAIVED	1989/07/18	<	.800	
TOXAPHENE	39400	WAIVED	1989/10/13	<	.500	
REGULATED VOC						
1,1,1-TRICHLOROETHANE	34506	72	2008/03/04		.000	2014/03
1,1,2,2-TETRACHLOROETHANE	34516	72	2008/03/04		.000	2014/03
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	72	2008/03/04		.000	2014/03
1,1,2-TRICHLOROETHANE	34511	72	2008/03/04		.000	2014/03
1,1-DICHLOROETHANE	34496	72	2008/03/04		.000	2014/03
1,1-DICHLOROETHYLENE	34501	72	2008/03/04		.000	2014/03
1,2,4-TRICHLOROBENZENE	34551	72	2008/03/04		.000	2014/03
1,2-DICHLOROBENZENE	34536	72	2008/03/04		.000	2014/03
1,2-DICHLOROETHANE	34531	72	2008/03/04		.000	2014/03
1,2-DICHLOROPROPANE	34541	72	2008/03/04		.000	2014/03
1,3-DICHLOROPROPENE (TOTAL)	34561	72	2008/03/04		.000	2014/03
1,4-DICHLOROBENZENE	34571	72	2008/03/04		.000	2014/03
BENZENE	34030	72	2008/03/04		.000	2014/03
CARBON TETRACHLORIDE	32102	72	2008/03/04		.000	2014/03
CIS-1,2-DICHLOROETHYLENE	77093	72	2008/03/04		.000	2014/03
DICHLOROMETHANE	34423	72	2008/03/04		.000	2014/03
ETHYLBENZENE	34371	72	2008/03/04		.000	2014/03
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	72	2008/03/04		.000	2014/03
MONOCHLOROBENZENE	34301	72	2008/03/04		.000	2014/03
STYRENE	77128	72	2008/03/04		.000	2014/03
TETRACHLOROETHYLENE	34475	72	2008/03/04		.000	2014/03
TOLUENE	34010	72	2008/03/04		.000	2014/03

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-004 WELL 02 - OLD OREGON TRAIL

Source Number: 004

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	72	2008/03/04	.000	2014/03
TRICHLOROETHYLENE	39180	72	2008/03/04	.000	2014/03
TRICHLOROFLUOROMETHANE	34488	72	2008/03/04	.000	2014/03
VINYL CHLORIDE	39175	72	2008/03/04	.000	2014/03
XYLENES (TOTAL)	81551	72	2008/03/04	.000	2014/03
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2005/12/20	10.800	
BICARBONATE ALKALINITY	00440	108	2005/12/20	139.000	2014/12
CALCIUM	00916	108	2005/12/20	9.360	2014/12
CARBONATE ALKALINITY	00445	108	2005/12/20	.000	2014/12
CHLORIDE	00940	108	2005/12/20	56.100	2014/12
COLOR	00081	108	2005/12/20	.000	2014/12
COPPER	01042	108	2005/12/20	.000	2014/12
FOAMING AGENTS (MBAS)	38260	108	2005/12/20	.010	2014/12
HARDNESS (TOTAL) AS CACO3	00900	108	2005/12/20	40.000	2014/12
HYDROXIDE ALKALINITY	71830	108	2005/12/20	.000	2014/12
IRON	01045	12	2008/03/04	.000	2009/03
MAGNESIUM	00927	108	2005/12/20	5.400	2014/12
MANGANESE	01055	12	2008/03/04	87.900	2009/03
ODOR THRESHOLD @ 60 C	00086	108	2005/12/20	.000	2014/12
PH, LABORATORY	00403	108	2005/12/20	7.790	2014/12
SILVER	01077	108	2004/06/30	.000	2013/06
SODIUM	00929	108	2005/12/20	59.900	2014/12
SPECIFIC CONDUCTANCE	00095	108	2005/12/20	399.000	2014/12
SULFATE	00945	108	2005/12/20	.700	2014/12
TOTAL DISSOLVED SOLIDS	70300	108	2005/12/20	234.000	2014/12
TURBIDITY, LABORATORY	82079	108	2005/12/20	.220	2014/12
ZINC	01092	108	2005/12/20	.000	2014/12

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-005 WELL 03 - PALO CEDRO

Source Number: 005

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)	
INORGANIC							
ALUMINUM	01105	108	2007/02/27		.000	2016/02	
ANTIMONY	01097	108	2006/12/18		.000	2015/12	
ARSENIC	01002	108	2000/07/26		4.300	2009/07	
ASBESTOS	81855	WAIVED					
BARIUM	01007	108	2007/02/27		105.300	2016/02	
BERYLLIUM	01012	108	2006/12/18		.000	2015/12	
CADMIUM	01027	108	2006/12/18		.000	2015/12	
CHROMIUM (TOTAL)	01034	108	2002/07/10		1.000	2011/07	
CYANIDE	01291	WAIVED					
FLUORIDE (F) (NATURAL-SOURCE)	00951	108	2006/12/18		.400	2015/12	
LEAD	01051	WAIVED	1997/01/06		.000		
MERCURY	71900	108	2006/12/18		.000	2015/12	
NICKEL	01067	108	2003/09/16		.000	2012/09	
PERCHLORATE	A-031	6	2008/03/04	<	4.000	2008/09	
SELENIUM	01147	108	2006/12/18		.000	2015/12	
THALLIUM	01059	108	2003/09/16		.000	2012/09	
NITRATE/NITRITE							
NITRATE (AS NO3)	71850	12	2008/03/04		.000	2009/03	
NITRITE (AS N)	00620	36	2008/03/04		.000	2011/03	
RADIOLOGICAL							
GROSS ALPHA	01501	108	2001/11/14	<	1.000	2010/11	
GROSS BETA	03501	WAIVED					
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED					
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED					
RADIUM 226	09501	WAIVED					
RADIUM 228	11501	3	**2006/02/02**		.000	**2006/05**	**DUE**
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED					
STRONTIUM-90	13501	WAIVED					
TRITIUM	07000	WAIVED					

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-005 WELL 03 - PALO CEDRO

Source Number: 005

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL						
URANIUM (PCI/L)	28012	WAIVED				
REGULATED SOC						
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED				
2,4,5-TP (SILVEX)	39045	WAIVED	1990/05/23	<	1.000	
2,4-D	39730	WAIVED	1990/05/23	<	10.000	
ALACHLOR	77825	WAIVED				
ATRAZINE	39033	WAIVED	1990/05/23	<	1.000	
BENTAZON	38710	WAIVED				
BENZO (A) PYRENE	34247	WAIVED				
CARBOFURAN	81405	WAIVED				
CHLORDANE	39350	WAIVED				
DALAPON	38432	WAIVED				
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED				
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED				
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED				
DINOSEB	81287	WAIVED				
DIQUAT	78885	WAIVED				
ENDOTHALL	38926	WAIVED				
ENDRIN	39390	WAIVED	1990/05/23	<	.010	
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED				
GLYPHOSATE	79743	WAIVED				
HEPTACHLOR	39410	WAIVED				
HEPTACHLOR EPOXIDE	39420	WAIVED				
HEXACHLOROBENZENE	39700	WAIVED				
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED				
LINDANE	39340	WAIVED	1990/05/23	<	.400	
METHOXYCHLOR	39480	WAIVED	1990/05/23	<	10.000	
MOLINATE	82199	WAIVED				
OXAMYL	38865	WAIVED				

**Testing interval is in months;*
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999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-005 WELL 03 - PALO CEDRO

Source Number: 005

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC						
PENTACHLOROPHENOL	39032	WAIVED				
PICLORAM	39720	WAIVED				
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED				
SIMAZINE	39055	WAIVED	1990/05/23	<	1.000	
THIOBENCARB	A-001	WAIVED				
TOXAPHENE	39400	WAIVED	1990/05/23	<	.500	
REGULATED VOC						
1,1,1-TRICHLOROETHANE	34506	72	2007/02/27		.000	2013/02
1,1,2,2-TETRACHLOROETHANE	34516	72	2007/02/27		.000	2013/02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	72	2007/02/27		.000	2013/02
1,1,2-TRICHLOROETHANE	34511	72	2007/02/27		.000	2013/02
1,1-DICHLOROETHANE	34496	72	2007/02/27		.000	2013/02
1,1-DICHLOROETHYLENE	34501	72	2007/02/27		.000	2013/02
1,2,4-TRICHLOROBENZENE	34551	72	2007/02/27		.000	2013/02
1,2-DICHLOROBENZENE	34536	72	2007/02/27		.000	2013/02
1,2-DICHLOROETHANE	34531	72	2007/02/27		.000	2013/02
1,2-DICHLOROPROPANE	34541	72	2007/02/27		.000	2013/02
1,3-DICHLOROPROPENE (TOTAL)	34561	72	2007/02/27		.000	2013/02
1,4-DICHLOROBENZENE	34571	72	2007/02/27		.000	2013/02
BENZENE	34030	72	2007/02/27		.000	2013/02
CARBON TETRACHLORIDE	32102	72	2007/02/27		.000	2013/02
CIS-1,2-DICHLOROETHYLENE	77093	72	2007/02/27		.000	2013/02
DICHLOROMETHANE	34423	72	2007/02/27		.000	2013/02
ETHYLBENZENE	34371	72	2007/02/27		.000	2013/02
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	72	2007/02/27		.000	2013/02
MONOCHLOROBENZENE	34301	72	2007/02/27		.000	2013/02
STYRENE	77128	72	2007/02/27		.000	2013/02
TETRACHLOROETHYLENE	34475	72	2007/02/27		.000	2013/02
TOLUENE	34010	72	2007/02/27		.000	2013/02

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-005 WELL 03 - PALO CEDRO

Source Number: 005

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	72	2007/02/27	.000	2013/02
TRICHLOROETHYLENE	39180	72	2007/02/27	.000	2013/02
TRICHLOROFLUOROMETHANE	34488	72	2007/02/27	.000	2013/02
VINYL CHLORIDE	39175	72	2007/02/27	.000	2013/02
XYLENES (TOTAL)	81551	72	2007/02/27	.000	2013/02
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2003/09/16	10.600	
BICARBONATE ALKALINITY	00440	108	2003/09/16	134.000	2012/09
CALCIUM	00916	108	2003/09/16	12.200	2012/09
CARBONATE ALKALINITY	00445	108	2003/09/16	.000	2012/09
CHLORIDE	00940	108	2003/09/16	9.860	2012/09
COLOR	00081	108	2006/12/18	.000	2015/12
COPPER	01042	108	2003/09/16	.000	2012/09
FOAMING AGENTS (MBAS)	38260	108	2003/09/16	.030	2012/09
HARDNESS (TOTAL) AS CACO3	00900	108	2003/09/16	75.000	2012/09
HYDROXIDE ALKALINITY	71830	108	2003/09/16	.000	2012/09
IRON	01045	12	2008/03/04	.000	2009/03
MAGNESIUM	00927	108	2003/09/16	6.770	2012/09
MANGANESE	01055	12	2008/03/04	291.100	2009/03
ODOR THRESHOLD @ 60 C	00086	108	2006/12/18	.000	2015/12
PH, LABORATORY	00403	108	2003/09/16	7.500	2012/09
SILVER	01077	108	2003/09/16	.000	2012/09
SODIUM	00929	108	2003/09/16	17.800	2012/09
SPECIFIC CONDUCTANCE	00095	108	2003/09/16	252.000	2012/09
SULFATE	00945	108	2003/09/16	5.100	2012/09
TOTAL DISSOLVED SOLIDS	70300	108	2003/09/16	175.000	2012/09
TURBIDITY, LABORATORY	82079	108	2006/12/18	.160	2015/12
ZINC	01092	108	2003/09/16	.000	2012/09

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-007 WELL 04 - ABERNATHY LN

Source Number: 007

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)	
INORGANIC							
ALUMINUM	01105	108	2005/03/02		.000	2014/03	
ANTIMONY	01097	108	2005/03/02		.000	2014/03	
ARSENIC	01002	108	2005/03/02		3.000	2014/03	
ASBESTOS	81855	WAIVED					
BARIUM	01007	108	2005/03/02		311.000	2014/03	
BERYLLIUM	01012	108	2005/03/02		.000	2014/03	
CADMIUM	01027	108	2005/03/02		.000	2014/03	
CHROMIUM (TOTAL)	01034	108	2005/03/02		4.000	2014/03	
CYANIDE	01291	WAIVED					
FLUORIDE (F) (NATURAL-SOURCE)	00951	108	2005/03/02		.100	2014/03	
LEAD	01051	WAIVED	2005/03/02		.000		
MERCURY	71900	108	2005/03/02		.000	2014/03	
NICKEL	01067	108	2005/03/02		.000	2014/03	
PERCHLORATE	A-031	6	2008/03/04	<	4.000	2008/09	
SELENIUM	01147	108	2005/03/02		.000	2014/03	
THALLIUM	01059	108	2005/03/02		.000	2014/03	
NITRATE/NITRITE							
NITRATE (AS NO3)	71850	12	2008/03/04		.000	2009/03	
NITRITE (AS N)	00620	36	2008/03/04		.000	2011/03	
RADIOLOGICAL							
GROSS ALPHA	01501	108	2006/02/02		.000	2015/02	
GROSS BETA	03501	WAIVED					
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED					
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED					
RADIUM 226	09501	WAIVED					
RADIUM 228	11501	3	**2006/02/02**		.000	**2006/05**	**DUE**
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED					
STRONTIUM-90	13501	WAIVED					
TRITIUM	07000	WAIVED					

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-007 WELL 04 - ABERNATHY LN

Source Number: 007

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL						
URANIUM (PCI/L)	28012	WAIVED				
REGULATED SOC						
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED				
2,4,5-TP (SILVEX)	39045	WAIVED	1991/05/31	<	.100	
2,4-D	39730	WAIVED	1991/05/31	<	1.000	
ALACHLOR	77825	WAIVED				
ATRAZINE	39033	WAIVED				
BENTAZON	38710	WAIVED				
BENZO (A) PYRENE	34247	WAIVED				
CARBOFURAN	81405	WAIVED				
CHLORDANE	39350	WAIVED	1991/05/31	<	.200	
DALAPON	38432	WAIVED				
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED				
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED				
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED				
DINOSEB	81287	WAIVED				
DIQUAT	78885	WAIVED				
ENDOTHALL	38926	WAIVED				
ENDRIN	39390	WAIVED	1991/05/31	<	.060	
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED				
GLYPHOSATE	79743	WAIVED				
HEPTACHLOR	39410	WAIVED	1991/05/31	<	.020	
HEPTACHLOR EPOXIDE	39420	WAIVED	1991/05/31	<	.050	
HEXACHLOROBENZENE	39700	WAIVED				
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED				
LINDANE	39340	WAIVED				
METHOXYCHLOR	39480	WAIVED				
MOLINATE	82199	WAIVED				
OXAMYL	38865	WAIVED				

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-007 WELL 04 - ABERNATHY LN

Source Number: 007

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC						
PENTACHLOROPHENOL	39032	WAIVED				
PICLORAM	39720	WAIVED				
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED				
SIMAZINE	39055	WAIVED				
THIOBENCARB	A-001	WAIVED				
TOXAPHENE	39400	WAIVED	1991/05/31	<	1.000	
REGULATED VOC						
1,1,1-TRICHLOROETHANE	34506	72	2007/02/27		.000	2013/02
1,1,2,2-TETRACHLOROETHANE	34516	72	2007/02/27		.000	2013/02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	72	2007/02/27		.000	2013/02
1,1,2-TRICHLOROETHANE	34511	72	2007/02/27		.000	2013/02
1,1-DICHLOROETHANE	34496	72	2007/02/27		.000	2013/02
1,1-DICHLOROETHYLENE	34501	72	2007/02/27		.000	2013/02
1,2,4-TRICHLOROBENZENE	34551	72	2007/02/27		.000	2013/02
1,2-DICHLOROBENZENE	34536	72	2007/02/27		.000	2013/02
1,2-DICHLOROETHANE	34531	72	2007/02/27		.000	2013/02
1,2-DICHLOROPROPANE	34541	72	2007/02/27		.000	2013/02
1,3-DICHLOROPROPENE (TOTAL)	34561	72	2007/02/27		.000	2013/02
1,4-DICHLOROBENZENE	34571	72	2007/02/27		.000	2013/02
BENZENE	34030	72	2007/02/27		.000	2013/02
CARBON TETRACHLORIDE	32102	72	2007/02/27		.000	2013/02
CIS-1,2-DICHLOROETHYLENE	77093	72	2007/02/27		.000	2013/02
DICHLOROMETHANE	34423	72	2007/02/27		.000	2013/02
ETHYLBENZENE	34371	72	2007/02/27		.000	2013/02
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	72	2007/02/27		.000	2013/02
MONOCHLOROBENZENE	34301	72	2007/02/27		.000	2013/02
STYRENE	77128	72	2007/02/27		.000	2013/02
TETRACHLOROETHYLENE	34475	72	2007/02/27		.000	2013/02
TOLUENE	34010	72	2007/02/27		.000	2013/02

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-007 WELL 04 - ABERNATHY LN

Source Number: 007

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	72	2007/02/27	.000	2013/02
TRICHLOROETHYLENE	39180	72	2007/02/27	.000	2013/02
TRICHLOROFLUOROMETHANE	34488	72	2007/02/27	.000	2013/02
VINYL CHLORIDE	39175	72	2007/02/27	.000	2013/02
XYLENES (TOTAL)	81551	72	2007/02/27	.000	2013/02
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2005/03/02	11.400	
BICARBONATE ALKALINITY	00440	108	2005/03/02	140.000	2014/03
CALCIUM	00916	108	2005/03/02	13.000	2014/03
CARBONATE ALKALINITY	00445	108	2005/03/02	.000	2014/03
CHLORIDE	00940	108	2005/03/02	12.000	2014/03
COLOR	00081	108	2005/03/02	.000	2014/03
COPPER	01042	108	2005/03/02	.000	2014/03
FOAMING AGENTS (MBAS)	38260	108	2005/03/02	.000	2014/03
HARDNESS (TOTAL) AS CACO3	00900	108	2005/03/02	50.000	2014/03
HYDROXIDE ALKALINITY	71830	108	2005/03/02	.000	2014/03
IRON	01045	12	2008/03/04	.000	2009/03
MAGNESIUM	00927	108	2005/03/02	4.000	2014/03
MANGANESE	01055	12	2008/03/04	.000	2009/03
ODOR THRESHOLD @ 60 C	00086	108	2005/03/02	.000	2014/03
PH, LABORATORY	00403	108	2005/03/02	7.780	2014/03
SILVER	01077	108	2005/03/02	.000	2014/03
SODIUM	00929	108	2005/03/02	30.000	2014/03
SPECIFIC CONDUCTANCE	00095	108	2005/03/02	259.000	2014/03
SULFATE	00945	108	2005/03/02	2.900	2014/03
TOTAL DISSOLVED SOLIDS	70300	108	2005/03/02	167.000	2014/03
TURBIDITY, LABORATORY	82079	108	2005/03/02	.090	2014/03
ZINC	01092	108	2005/03/02	.000	2014/03

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-006 WELL 06 - STILLWATER CREEK

Source Number: 006

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)		LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)	
INORGANIC							
ALUMINUM	01105	108	2007/02/27		.000	2016/02	
ANTIMONY	01097	108	2007/02/27		.000	2016/02	
ARSENIC	01002	108	2006/11/02		6.400	2015/11	
ASBESTOS	81855	WAIVED					
BARIUM	01007	108	2007/02/27		127.200	2016/02	
BERYLLIUM	01012	108	2007/02/27		.000	2016/02	
CADMIUM	01027	108	2007/02/27		.000	2016/02	
CHROMIUM (TOTAL)	01034	108	2007/02/27		.000	2016/02	
CYANIDE	01291	WAIVED					
FLUORIDE (F) (NATURAL-SOURCE)	00951	108	2007/02/27		.200	2016/02	
LEAD	01051	WAIVED	1998/11/04		.000		
MERCURY	71900	108	2007/02/27		.000	2016/02	
NICKEL	01067	108	2007/02/27		.000	2016/02	
PERCHLORATE	A-031	6	2008/03/04	<	4.000	2008/09	
SELENIUM	01147	108	2007/02/27		.000	2016/02	
THALLIUM	01059	108	2007/02/27		.000	2016/02	
NITRATE/NITRITE							
NITRATE (AS NO3)	71850	12	2008/03/04		.000	2009/03	
NITRITE (AS N)	00620	36	2008/03/04		.000	2011/03	
RADIOLOGICAL							
GROSS ALPHA	01501	108	2006/02/02		2.100	2015/02	
GROSS BETA	03501	WAIVED	1999/12/20		1.900		
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED					
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED					
RADIUM 226	09501	WAIVED					
RADIUM 228	11501	3	**2006/02/02**		.000	**2006/05**	**DUE**
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED					
STRONTIUM-90	13501	WAIVED					
TRITIUM	07000	WAIVED					

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-006 WELL 06 - STILLWATER CREEK

Source Number: 006

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED	1992/02/07	.000	
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED	1992/02/07	.000	
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED	1992/02/07	.000	
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED	1992/02/07	.000	
HEPTACHLOR EPOXIDE	39420	WAIVED	1992/02/07	.000	
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED	1992/02/07	.000	
METHOXYCHLOR	39480	WAIVED	1992/02/07	.000	
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-006 WELL 06 - STILLWATER CREEK

Source Number: 006

Source Status: ACTIVE RAW

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC					
PENTACHLOROPHENOL	39032	WAIVED			
PICLORAM	39720	WAIVED			
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED			
SIMAZINE	39055	WAIVED			
THIOBENCARB	A-001	WAIVED			
TOXAPHENE	39400	WAIVED	1992/02/07	.000	
REGULATED VOC					
1,1,1-TRICHLOROETHANE	34506	72	2007/02/27	.000	2013/02
1,1,2,2-TETRACHLOROETHANE	34516	72	2007/02/27	.000	2013/02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	72	2007/02/27	.000	2013/02
1,1,2-TRICHLOROETHANE	34511	72	2007/02/27	.000	2013/02
1,1-DICHLOROETHANE	34496	72	2007/02/27	.000	2013/02
1,1-DICHLOROETHYLENE	34501	72	2007/02/27	.000	2013/02
1,2,4-TRICHLOROBENZENE	34551	72	2007/02/27	.000	2013/02
1,2-DICHLOROBENZENE	34536	72	2007/02/27	.000	2013/02
1,2-DICHLOROETHANE	34531	72	2007/02/27	.000	2013/02
1,2-DICHLOROPROPANE	34541	72	2007/02/27	.000	2013/02
1,3-DICHLOROPROPENE (TOTAL)	34561	72	2007/02/27	.000	2013/02
1,4-DICHLOROBENZENE	34571	72	2007/02/27	.000	2013/02
BENZENE	34030	72	2007/02/27	.000	2013/02
CARBON TETRACHLORIDE	32102	72	2007/02/27	.000	2013/02
CIS-1,2-DICHLOROETHYLENE	77093	72	2007/02/27	.000	2013/02
DICHLOROMETHANE	34423	72	2007/02/27	.000	2013/02
ETHYLBENZENE	34371	72	2007/02/27	.000	2013/02
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	72	2007/02/27	.000	2013/02
MONOCHLOROBENZENE	34301	72	2007/02/27	.000	2013/02
STYRENE	77128	72	2007/02/27	.000	2013/02
TETRACHLOROETHYLENE	34475	72	2007/02/27	.000	2013/02
TOLUENE	34010	72	2007/02/27	.000	2013/02

**Testing interval is in months;*
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999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
PS Code / Name:					
4510014-006 WELL 06 - STILLWATER CREEK					
Source Number: 006					
Source Status: ACTIVE RAW					
Water type: GROUNDWATER OR WELL					
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	72	2007/02/27	.000	2013/02
TRICHLOROETHYLENE	39180	72	2007/02/27	.000	2013/02
TRICHLOROFLUOROMETHANE	34488	72	2007/02/27	.000	2013/02
VINYL CHLORIDE	39175	72	2007/02/27	.000	2013/02
XYLENES (TOTAL)	81551	72	2007/02/27	.000	2013/02
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2007/02/27	11.200	
BICARBONATE ALKALINITY	00440	108	2007/02/27	112.000	2016/02
CALCIUM	00916	108	2007/02/27	8.180	2016/02
CARBONATE ALKALINITY	00445	108	2007/02/27	.000	2016/02
CHLORIDE	00940	108	2007/02/27	51.500	2016/02
COLOR	00081	108	2007/02/27	.000	2016/02
COPPER	01042	108	2007/02/27	.000	2016/02
FOAMING AGENTS (MBAS)	38260	108	2007/02/27	.020	2016/02
HARDNESS (TOTAL) AS CACO3	00900	108	2007/02/27	43.300	2016/02
HYDROXIDE ALKALINITY	71830	108	2007/02/27	.000	2016/02
IRON	01045	12	2008/03/04	156.000	2009/03
MAGNESIUM	00927	108	2007/02/27	5.700	2016/02
MANGANESE	01055	12	2008/03/04	90.000	2009/03
ODOR THRESHOLD @ 60 C	00086	108	2007/02/27	.000	2016/02
PH, LABORATORY	00403	108	2007/02/27	7.900	2016/02
SILVER	01077	108	2007/02/27	.000	2016/02
SODIUM	00929	108	2007/02/27	47.200	2016/02
SPECIFIC CONDUCTANCE	00095	108	2007/02/27	327.000	2016/02
SULFATE	00945	108	2007/02/27	1.400	2016/02
TOTAL DISSOLVED SOLIDS	70300	108	2007/02/27	208.000	2016/02
TURBIDITY, LABORATORY	82079	108	2007/02/27	.630	2016/02
ZINC	01092	108	2007/02/27	.000	2016/02

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-008 WELL 04 TREATMENT PLANT - TREATED

Source Number: 008

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
INORGANIC					
ALUMINUM	01105	WAIVED			
ANTIMONY	01097	WAIVED	2001/03/01	.000	
ARSENIC	01002	WAIVED			
ASBESTOS	81855	WAIVED			
BARIUM	01007	WAIVED			
BERYLLIUM	01012	WAIVED	2001/03/01	.000	
CADMIUM	01027	WAIVED			
CHROMIUM (TOTAL)	01034	WAIVED			
CYANIDE	01291	WAIVED			
FLUORIDE (F) (NATURAL-SOURCE)	00951	WAIVED			
LEAD	01051	WAIVED			
MERCURY	71900	WAIVED			
NICKEL	01067	WAIVED	2001/03/01	.000	
PERCHLORATE	A-031	WAIVED			
SELENIUM	01147	WAIVED			
THALLIUM	01059	WAIVED	2001/03/01	.000	
NITRATE/NITRITE					
NITRATE (AS NO3)	71850	WAIVED	2003/08/28	.000	
NITRITE (AS N)	00620	WAIVED	2001/03/01	.000	
RADIOLOGICAL					
GROSS ALPHA	01501	WAIVED			
GROSS BETA	03501	WAIVED			
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED			
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED			
RADIUM 226	09501	WAIVED			
RADIUM 228	11501	WAIVED			
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED			
STRONTIUM-90	13501	WAIVED			
TRITIUM	07000	WAIVED			

**Testing interval is in months;*
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System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-008 WELL 04 TREATMENT PLANT - TREATED

Source Number: 008

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED			
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED			
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED			
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED			
HEPTACHLOR EPOXIDE	39420	WAIVED			
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED			
METHOXYCHLOR	39480	WAIVED			
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

**Testing interval is in months;*
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999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-008 WELL 04 TREATMENT PLANT - TREATED

Source Number: 008

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC					
PENTACHLOROPHENOL	39032	WAIVED			
PICLORAM	39720	WAIVED			
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED			
SIMAZINE	39055	WAIVED			
THIOBENCARB	A-001	WAIVED			
TOXAPHENE	39400	WAIVED			
REGULATED VOC					
1,1,1-TRICHLOROETHANE	34506	WAIVED	2001/03/01	.000	
1,1,2,2-TETRACHLOROETHANE	34516	WAIVED	2001/03/01	.000	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	WAIVED	2001/03/01	.000	
1,1,2-TRICHLOROETHANE	34511	WAIVED	2001/03/01	.000	
1,1-DICHLOROETHANE	34496	WAIVED	2001/03/01	.000	
1,1-DICHLOROETHYLENE	34501	WAIVED	2001/03/01	.000	
1,2,4-TRICHLOROBENZENE	34551	WAIVED	2001/03/01	.000	
1,2-DICHLOROBENZENE	34536	WAIVED	2001/03/01	.000	
1,2-DICHLOROETHANE	34531	WAIVED	2001/03/01	.000	
1,2-DICHLOROPROPANE	34541	WAIVED	2001/03/01	.000	
1,3-DICHLOROPROPENE (TOTAL)	34561	WAIVED	2001/03/01	.000	
1,4-DICHLOROBENZENE	34571	WAIVED	2001/03/01	.000	
BENZENE	34030	WAIVED	2001/03/01	.000	
CARBON TETRACHLORIDE	32102	WAIVED	2001/03/01	.000	
CIS-1,2-DICHLOROETHYLENE	77093	WAIVED	2001/03/01	.000	
DICHLOROMETHANE	34423	WAIVED	2001/03/01	.000	
ETHYLBENZENE	34371	WAIVED	2001/03/01	.000	
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	WAIVED	2001/03/01	.000	
MONOCHLOROBENZENE	34301	WAIVED	2001/03/01	.000	
STYRENE	77128	WAIVED	2001/03/01	.000	
TETRACHLOROETHYLENE	34475	WAIVED	2001/03/01	.000	
TOLUENE	34010	WAIVED	2001/03/01	.000	

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-008 WELL 04 TREATMENT PLANT - TREATED

Source Number: 008

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	WAIVED	2001/03/01	.000	
TRICHLOROETHYLENE	39180	WAIVED	2001/03/01	.000	
TRICHLOROFLUOROMETHANE	34488	WAIVED	2001/03/01	.000	
VINYL CHLORIDE	39175	WAIVED	2001/03/01	.000	
XYLENES (TOTAL)	81551	WAIVED	2001/03/01	.000	
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED			
BICARBONATE ALKALINITY	00440	WAIVED	2001/03/01	136.000	
CALCIUM	00916	WAIVED	2001/03/01	9.000	
CARBONATE ALKALINITY	00445	WAIVED	2001/03/01	.000	
CHLORIDE	00940	WAIVED	2001/03/01	69.100	
COLOR	00081	WAIVED	2001/03/01	.000	
COPPER	01042	WAIVED	2001/03/01	.000	
FOAMING AGENTS (MBAS)	38260	WAIVED	2001/03/01	.000	
HARDNESS (TOTAL) AS CACO3	00900	WAIVED	2001/03/01	44.000	
HYDROXIDE ALKALINITY	71830	WAIVED			
IRON	01045	WAIVED	2008/03/04	.000	
MAGNESIUM	00927	WAIVED	2001/03/01	6.000	
MANGANESE	01055	WAIVED	2008/03/04	.000	
ODOR THRESHOLD @ 60 C	00086	WAIVED	2001/03/01	.000	
PH, LABORATORY	00403	WAIVED	2001/03/01	7.450	
SILVER	01077	WAIVED			
SODIUM	00929	WAIVED	2001/03/01	73.000	
SPECIFIC CONDUCTANCE	00095	WAIVED	2001/03/01	383.000	
SULFATE	00945	WAIVED	2001/03/01	1.750	
TOTAL DISSOLVED SOLIDS	70300	WAIVED	2001/03/01	234.000	
TURBIDITY, LABORATORY	82079	WAIVED			
ZINC	01092	WAIVED	2001/03/01	.000	

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-009 WELL 01 TREATMENT PLANT - TREATED

Source Number: 009

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
INORGANIC					
ALUMINUM	01105	WAIVED			
ANTIMONY	01097	WAIVED			
ARSENIC	01002	WAIVED			
ASBESTOS	81855	WAIVED			
BARIUM	01007	WAIVED			
BERYLLIUM	01012	WAIVED			
CADMIUM	01027	WAIVED			
CHROMIUM (TOTAL)	01034	WAIVED			
CYANIDE	01291	WAIVED			
FLUORIDE (F) (NATURAL-SOURCE)	00951	WAIVED			
LEAD	01051	WAIVED			
MERCURY	71900	WAIVED			
NICKEL	01067	WAIVED			
PERCHLORATE	A-031	WAIVED			
SELENIUM	01147	WAIVED			
THALLIUM	01059	WAIVED			
NITRATE/NITRITE					
NITRATE (AS NO3)	71850	WAIVED			
NITRITE (AS N)	00620	WAIVED			
RADIOLOGICAL					
GROSS ALPHA	01501	WAIVED			
GROSS BETA	03501	WAIVED			
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED			
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED			
RADIUM 226	09501	WAIVED			
RADIUM 228	11501	WAIVED			
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED			
STRONTIUM-90	13501	WAIVED			
TRITIUM	07000	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-009 WELL 01 TREATMENT PLANT - TREATED

Source Number: 009

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED			
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED			
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED			
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED			
HEPTACHLOR EPOXIDE	39420	WAIVED			
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED			
METHOXYCHLOR	39480	WAIVED			
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)

PS Code / Name:

4510014-009 WELL 01 TREATMENT PLANT - TREATED

Source Number: 009

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

REGULATED SOC

PENTACHLOROPHENOL	39032	WAIVED
PICLORAM	39720	WAIVED
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED
SIMAZINE	39055	WAIVED
THIOBENCARB	A-001	WAIVED
TOXAPHENE	39400	WAIVED

REGULATED VOC

1,1,1-TRICHLOROETHANE	34506	WAIVED
1,1,2,2-TETRACHLOROETHANE	34516	WAIVED
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	WAIVED
1,1,2-TRICHLOROETHANE	34511	WAIVED
1,1-DICHLOROETHANE	34496	WAIVED
1,1-DICHLOROETHYLENE	34501	WAIVED
1,2,4-TRICHLOROBENZENE	34551	WAIVED
1,2-DICHLOROBENZENE	34536	WAIVED
1,2-DICHLOROETHANE	34531	WAIVED
1,2-DICHLOROPROPANE	34541	WAIVED
1,3-DICHLOROPROPENE (TOTAL)	34561	WAIVED
1,4-DICHLOROBENZENE	34571	WAIVED
BENZENE	34030	WAIVED
CARBON TETRACHLORIDE	32102	WAIVED
CIS-1,2-DICHLOROETHYLENE	77093	WAIVED
DICHLOROMETHANE	34423	WAIVED
ETHYLBENZENE	34371	WAIVED
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	WAIVED
MONOCHLOROBENZENE	34301	WAIVED
STYRENE	77128	WAIVED
TETRACHLOROETHYLENE	34475	WAIVED
TOLUENE	34010	WAIVED

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-009 WELL 01 TREATMENT PLANT - TREATED

Source Number: 009

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	WAIVED			
TRICHLOROETHYLENE	39180	WAIVED			
TRICHLOROFLUOROMETHANE	34488	WAIVED			
VINYL CHLORIDE	39175	WAIVED			
XYLENES (TOTAL)	81551	WAIVED			
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED			
BICARBONATE ALKALINITY	00440	WAIVED			
CALCIUM	00916	WAIVED			
CARBONATE ALKALINITY	00445	WAIVED			
CHLORIDE	00940	WAIVED			
COLOR	00081	WAIVED			
COPPER	01042	WAIVED			
FOAMING AGENTS (MBAS)	38260	WAIVED			
HARDNESS (TOTAL) AS CACO3	00900	WAIVED			
HYDROXIDE ALKALINITY	71830	WAIVED			
IRON	01045	WAIVED	2008/03/04	.000	
MAGNESIUM	00927	WAIVED			
MANGANESE	01055	WAIVED	2008/03/04	.000	
ODOR THRESHOLD @ 60 C	00086	WAIVED			
PH, LABORATORY	00403	WAIVED			
SILVER	01077	WAIVED			
SODIUM	00929	WAIVED			
SPECIFIC CONDUCTANCE	00095	WAIVED			
SULFATE	00945	WAIVED			
TOTAL DISSOLVED SOLIDS	70300	WAIVED			
TURBIDITY, LABORATORY	82079	WAIVED			
ZINC	01092	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)

PS Code / Name:

4510014-010 WELL 02 TREATMENT PLANT - TREATED

Source Number: 010

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

INORGANIC					
ALUMINUM	01105	WAIVED			
ANTIMONY	01097	WAIVED			
ARSENIC	01002	WAIVED			
ASBESTOS	81855	WAIVED			
BARIUM	01007	WAIVED			
BERYLLIUM	01012	WAIVED			
CADMIUM	01027	WAIVED			
CHROMIUM (TOTAL)	01034	WAIVED			
CYANIDE	01291	WAIVED			
FLUORIDE (F) (NATURAL-SOURCE)	00951	WAIVED			
LEAD	01051	WAIVED			
MERCURY	71900	WAIVED			
NICKEL	01067	WAIVED			
PERCHLORATE	A-031	WAIVED			
SELENIUM	01147	WAIVED			
THALLIUM	01059	WAIVED			
NITRATE/NITRITE					
NITRATE (AS NO3)	71850	WAIVED			
NITRITE (AS N)	00620	WAIVED			
RADIOLOGICAL					
GROSS ALPHA	01501	WAIVED			
GROSS BETA	03501	WAIVED			
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED			
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED			
RADIUM 226	09501	WAIVED			
RADIUM 228	11501	WAIVED			
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED			
STRONTIUM-90	13501	WAIVED			
TRITIUM	07000	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-010 WELL 02 TREATMENT PLANT - TREATED

Source Number: 010

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED			
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED			
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED			
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED			
HEPTACHLOR EPOXIDE	39420	WAIVED			
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED			
METHOXYCHLOR	39480	WAIVED			
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)

PS Code / Name:

4510014-010 WELL 02 TREATMENT PLANT - TREATED

Source Number: 010

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

REGULATED SOC

PENTACHLOROPHENOL	39032	WAIVED			
PICLORAM	39720	WAIVED			
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED			
SIMAZINE	39055	WAIVED			
THIOBENCARB	A-001	WAIVED			
TOXAPHENE	39400	WAIVED			

REGULATED VOC

1,1,1-TRICHLOROETHANE	34506	WAIVED			
1,1,2,2-TETRACHLOROETHANE	34516	WAIVED			
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	WAIVED			
1,1,2-TRICHLOROETHANE	34511	WAIVED			
1,1-DICHLOROETHANE	34496	WAIVED			
1,1-DICHLOROETHYLENE	34501	WAIVED			
1,2,4-TRICHLOROBENZENE	34551	WAIVED			
1,2-DICHLOROBENZENE	34536	WAIVED			
1,2-DICHLOROETHANE	34531	WAIVED			
1,2-DICHLOROPROPANE	34541	WAIVED			
1,3-DICHLOROPROPENE (TOTAL)	34561	WAIVED			
1,4-DICHLOROBENZENE	34571	WAIVED			
BENZENE	34030	WAIVED			
CARBON TETRACHLORIDE	32102	WAIVED			
CIS-1,2-DICHLOROETHYLENE	77093	WAIVED			
DICHLOROMETHANE	34423	WAIVED			
ETHYLBENZENE	34371	WAIVED			
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	WAIVED			
MONOCHLOROBENZENE	34301	WAIVED			
STYRENE	77128	WAIVED			
TETRACHLOROETHYLENE	34475	WAIVED			
TOLUENE	34010	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-010 WELL 02 TREATMENT PLANT - TREATED

Source Number: 010

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	WAIVED			
TRICHLOROETHYLENE	39180	WAIVED			
TRICHLOROFLUOROMETHANE	34488	WAIVED			
VINYL CHLORIDE	39175	WAIVED			
XYLENES (TOTAL)	81551	WAIVED			
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED			
BICARBONATE ALKALINITY	00440	WAIVED			
CALCIUM	00916	WAIVED			
CARBONATE ALKALINITY	00445	WAIVED			
CHLORIDE	00940	WAIVED			
COLOR	00081	WAIVED			
COPPER	01042	WAIVED			
FOAMING AGENTS (MBAS)	38260	WAIVED			
HARDNESS (TOTAL) AS CACO3	00900	WAIVED			
HYDROXIDE ALKALINITY	71830	WAIVED			
IRON	01045	WAIVED	2008/03/04	.000	
MAGNESIUM	00927	WAIVED			
MANGANESE	01055	WAIVED	2008/03/04	.000	
ODOR THRESHOLD @ 60 C	00086	WAIVED			
PH, LABORATORY	00403	WAIVED			
SILVER	01077	WAIVED			
SODIUM	00929	WAIVED			
SPECIFIC CONDUCTANCE	00095	WAIVED			
SULFATE	00945	WAIVED			
TOTAL DISSOLVED SOLIDS	70300	WAIVED			
TURBIDITY, LABORATORY	82079	WAIVED			
ZINC	01092	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-011 WELL 03 TREATMENT PLANT - TREATED

Source Number: 011

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
INORGANIC					
ALUMINUM	01105	WAIVED			
ANTIMONY	01097	WAIVED			
ARSENIC	01002	WAIVED			
ASBESTOS	81855	WAIVED			
BARIUM	01007	WAIVED			
BERYLLIUM	01012	WAIVED			
CADMIUM	01027	WAIVED			
CHROMIUM (TOTAL)	01034	WAIVED			
CYANIDE	01291	WAIVED			
FLUORIDE (F) (NATURAL-SOURCE)	00951	WAIVED			
LEAD	01051	WAIVED			
MERCURY	71900	WAIVED			
NICKEL	01067	WAIVED			
PERCHLORATE	A-031	WAIVED			
SELENIUM	01147	WAIVED			
THALLIUM	01059	WAIVED			
NITRATE/NITRITE					
NITRATE (AS NO3)	71850	WAIVED			
NITRITE (AS N)	00620	WAIVED			
RADIOLOGICAL					
GROSS ALPHA	01501	WAIVED			
GROSS BETA	03501	WAIVED			
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED			
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED			
RADIUM 226	09501	WAIVED			
RADIUM 228	11501	WAIVED			
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED			
STRONTIUM-90	13501	WAIVED			
TRITIUM	07000	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-011 WELL 03 TREATMENT PLANT - TREATED

Source Number: 011

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED			
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED			
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED			
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED			
HEPTACHLOR EPOXIDE	39420	WAIVED			
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED			
METHOXYCHLOR	39480	WAIVED			
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-011 WELL 03 TREATMENT PLANT - TREATED

Source Number: 011

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC					
PENTACHLOROPHENOL	39032	WAIVED			
PICLORAM	39720	WAIVED			
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED			
SIMAZINE	39055	WAIVED			
THIOBENCARB	A-001	WAIVED			
TOXAPHENE	39400	WAIVED			
REGULATED VOC					
1,1,1-TRICHLOROETHANE	34506	WAIVED			
1,1,2,2-TETRACHLOROETHANE	34516	WAIVED			
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	WAIVED			
1,1,2-TRICHLOROETHANE	34511	WAIVED			
1,1-DICHLOROETHANE	34496	WAIVED			
1,1-DICHLOROETHYLENE	34501	WAIVED			
1,2,4-TRICHLOROBENZENE	34551	WAIVED			
1,2-DICHLOROBENZENE	34536	WAIVED			
1,2-DICHLOROETHANE	34531	WAIVED			
1,2-DICHLOROPROPANE	34541	WAIVED			
1,3-DICHLOROPROPENE (TOTAL)	34561	WAIVED			
1,4-DICHLOROBENZENE	34571	WAIVED			
BENZENE	34030	WAIVED			
CARBON TETRACHLORIDE	32102	WAIVED			
CIS-1,2-DICHLOROETHYLENE	77093	WAIVED			
DICHLOROMETHANE	34423	WAIVED			
ETHYLBENZENE	34371	WAIVED			
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	WAIVED			
MONOCHLOROBENZENE	34301	WAIVED			
STYRENE	77128	WAIVED			
TETRACHLOROETHYLENE	34475	WAIVED			
TOLUENE	34010	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-011 WELL 03 TREATMENT PLANT - TREATED

Source Number: 011

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	WAIVED			
TRICHLOROETHYLENE	39180	WAIVED			
TRICHLOROFLUOROMETHANE	34488	WAIVED			
VINYL CHLORIDE	39175	WAIVED			
XYLENES (TOTAL)	81551	WAIVED			
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED			
BICARBONATE ALKALINITY	00440	WAIVED			
CALCIUM	00916	WAIVED			
CARBONATE ALKALINITY	00445	WAIVED			
CHLORIDE	00940	WAIVED			
COLOR	00081	WAIVED			
COPPER	01042	WAIVED			
FOAMING AGENTS (MBAS)	38260	WAIVED			
HARDNESS (TOTAL) AS CACO3	00900	WAIVED			
HYDROXIDE ALKALINITY	71830	WAIVED			
IRON	01045	WAIVED	2008/03/04	.000	
MAGNESIUM	00927	WAIVED			
MANGANESE	01055	WAIVED	2008/03/04	.000	
ODOR THRESHOLD @ 60 C	00086	WAIVED			
PH, LABORATORY	00403	WAIVED			
SILVER	01077	WAIVED			
SODIUM	00929	WAIVED			
SPECIFIC CONDUCTANCE	00095	WAIVED			
SULFATE	00945	WAIVED			
TOTAL DISSOLVED SOLIDS	70300	WAIVED			
TURBIDITY, LABORATORY	82079	WAIVED			
ZINC	01092	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-012 WELL 06 TREATMENT PLANT - TREATED

Source Number: 012

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
INORGANIC					
ALUMINUM	01105	WAIVED			
ANTIMONY	01097	WAIVED	2001/03/01	.000	
ARSENIC	01002	WAIVED	2006/11/02	6.100	
ASBESTOS	81855	WAIVED			
BARIUM	01007	WAIVED			
BERYLLIUM	01012	WAIVED	2001/03/01	.000	
CADMIUM	01027	WAIVED			
CHROMIUM (TOTAL)	01034	WAIVED	2002/08/01	.000	
CYANIDE	01291	WAIVED			
FLUORIDE (F) (NATURAL-SOURCE)	00951	WAIVED			
LEAD	01051	WAIVED			
MERCURY	71900	WAIVED			
NICKEL	01067	WAIVED	2001/03/01	.000	
PERCHLORATE	A-031	WAIVED			
SELENIUM	01147	WAIVED			
THALLIUM	01059	WAIVED	2001/03/01	.000	
NITRATE/NITRITE					
NITRATE (AS NO3)	71850	WAIVED	2002/08/01	.000	
NITRITE (AS N)	00620	WAIVED	2002/08/01	.000	
RADIOLOGICAL					
GROSS ALPHA	01501	WAIVED			
GROSS BETA	03501	WAIVED			
RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0	A-080	WAIVED			
RA-226 OR TOTAL RA BY 903.0 C.E.	A-081	WAIVED			
RADIUM 226	09501	WAIVED			
RADIUM 228	11501	WAIVED			
RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0	A-082	WAIVED			
STRONTIUM-90	13501	WAIVED			
TRITIUM	07000	WAIVED			

**Testing interval is in months;*
0 = No data for this constituent and is DUE NOW
999 = Waived testing (not required)

System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
PS Code / Name:					
4510014-012 WELL 06 TREATMENT PLANT - TREATED					
Source Number: 012					
Source Status: ACTIVE TREATED					
Water type: GROUNDWATER OR WELL					
RADIOLOGICAL					
URANIUM (PCI/L)	28012	WAIVED			
REGULATED SOC					
2,3,7,8-TCDD (DIOXIN)	34676	WAIVED			
2,4,5-TP (SILVEX)	39045	WAIVED			
2,4-D	39730	WAIVED			
ALACHLOR	77825	WAIVED			
ATRAZINE	39033	WAIVED			
BENTAZON	38710	WAIVED			
BENZO (A) PYRENE	34247	WAIVED			
CARBOFURAN	81405	WAIVED			
CHLORDANE	39350	WAIVED			
DALAPON	38432	WAIVED			
DI(2-ETHYLHEXYL)ADIPATE	A-026	WAIVED			
DI(2-ETHYLHEXYL)PHTHALATE	39100	WAIVED			
DIBROMOCHLOROPROPANE (DBCP)	38761	WAIVED			
DINOSEB	81287	WAIVED			
DIQUAT	78885	WAIVED			
ENDOTHALL	38926	WAIVED			
ENDRIN	39390	WAIVED			
ETHYLENE DIBROMIDE (EDB)	77651	WAIVED			
GLYPHOSATE	79743	WAIVED			
HEPTACHLOR	39410	WAIVED			
HEPTACHLOR EPOXIDE	39420	WAIVED			
HEXACHLOROBENZENE	39700	WAIVED			
HEXACHLOROCYCLOPENTADIENE	34386	WAIVED			
LINDANE	39340	WAIVED			
METHOXYCHLOR	39480	WAIVED			
MOLINATE	82199	WAIVED			
OXAMYL	38865	WAIVED			

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System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-012 WELL 06 TREATMENT PLANT - TREATED

Source Number: 012

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED SOC					
PENTACHLOROPHENOL	39032	WAIVED			
PICLORAM	39720	WAIVED			
POLYCHLORINATED BIPHENYLS, TOTAL, AS DCB	39516	WAIVED			
SIMAZINE	39055	WAIVED			
THIOBENCARB	A-001	WAIVED			
TOXAPHENE	39400	WAIVED			
REGULATED VOC					
1,1,1-TRICHLOROETHANE	34506	WAIVED	2001/03/01	.000	
1,1,2,2-TETRACHLOROETHANE	34516	WAIVED	2001/03/01	.000	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	81611	WAIVED	2001/03/01	.000	
1,1,2-TRICHLOROETHANE	34511	WAIVED	2001/03/01	.000	
1,1-DICHLOROETHANE	34496	WAIVED	2001/03/01	.000	
1,1-DICHLOROETHYLENE	34501	WAIVED	2001/03/01	.000	
1,2,4-TRICHLOROBENZENE	34551	WAIVED	2001/03/01	.000	
1,2-DICHLOROBENZENE	34536	WAIVED	2001/03/01	.000	
1,2-DICHLOROETHANE	34531	WAIVED	2001/03/01	.000	
1,2-DICHLOROPROPANE	34541	WAIVED	2001/03/01	.000	
1,3-DICHLOROPROPENE (TOTAL)	34561	WAIVED	2001/03/01	.000	
1,4-DICHLOROBENZENE	34571	WAIVED	2001/03/01	.000	
BENZENE	34030	WAIVED	2001/03/01	.000	
CARBON TETRACHLORIDE	32102	WAIVED	2001/03/01	.000	
CIS-1,2-DICHLOROETHYLENE	77093	WAIVED	2001/03/01	.000	
DICHLOROMETHANE	34423	WAIVED	2001/03/01	.000	
ETHYLBENZENE	34371	WAIVED	2001/03/01	.000	
METHYL-TERT-BUTYL-ETHER (MTBE)	46491	WAIVED	2001/03/01	.000	
MONOCHLOROBENZENE	34301	WAIVED	2001/03/01	.000	
STYRENE	77128	WAIVED	2001/03/01	.000	
TETRACHLOROETHYLENE	34475	WAIVED	2001/03/01	.000	
TOLUENE	34010	WAIVED	2001/03/01	.000	

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System Number / Name:

4510014 BELLA VISTA WATER DISTRICT

PS Code / Name:

4510014-012 WELL 06 TREATMENT PLANT - TREATED

Source Number: 012

Source Status: ACTIVE TREATED

Water type: GROUNDWATER OR WELL

	STORET NUMBER	TESTING INTERVAL (MONTHS)*	LAST TEST DATE (yyyy/mm/dd)	LAST RESULT REPORTED	NEXT TEST DATE (yyyy/mm)
REGULATED VOC					
TRANS-1,2-DICHLOROETHYLENE	34546	WAIVED	2001/03/01	.000	
TRICHLOROETHYLENE	39180	WAIVED	2001/03/01	.000	
TRICHLOROFLUOROMETHANE	34488	WAIVED	2001/03/01	.000	
VINYL CHLORIDE	39175	WAIVED	2001/03/01	.000	
XYLENES (TOTAL)	81551	WAIVED	2001/03/01	.000	
SECONDARY/GP					
AGGRSSIVE INDEX (CORROSIVITY)	82383	WAIVED	2001/03/01	10.500	
BICARBONATE ALKALINITY	00440	WAIVED	2001/03/01	136.000	
CALCIUM	00916	WAIVED	2001/03/01	9.000	
CARBONATE ALKALINITY	00445	WAIVED	2001/03/01	.000	
CHLORIDE	00940	WAIVED	2001/03/01	69.100	
COLOR	00081	WAIVED	2001/03/01	.000	
COPPER	01042	WAIVED	2001/03/01	.000	
FOAMING AGENTS (MBAS)	38260	WAIVED	2001/03/01	.000	
HARDNESS (TOTAL) AS CACO3	00900	WAIVED	2001/03/01	44.000	
HYDROXIDE ALKALINITY	71830	WAIVED	2001/03/01	.000	
IRON	01045	WAIVED	2008/03/04	.000	
MAGNESIUM	00927	WAIVED	2001/03/01	6.000	
MANGANESE	01055	WAIVED	2008/03/04	.000	
ODOR THRESHOLD @ 60 C	00086	WAIVED	2001/03/01	.000	
PH, LABORATORY	00403	WAIVED	2001/03/01	7.450	
SILVER	01077	WAIVED			
SODIUM	00929	WAIVED	2001/03/01	73.000	
SPECIFIC CONDUCTANCE	00095	WAIVED	2001/03/01	383.000	
SULFATE	00945	WAIVED	2001/03/01	1.750	
TOTAL DISSOLVED SOLIDS	70300	WAIVED	2001/03/01	234.000	
TURBIDITY, LABORATORY	82079	WAIVED			
ZINC	01092	WAIVED	2001/03/01	.000	

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APPENDIX G

State of California	Department of Public Health

Reservoir Data

(Use For All Distribution Storage, Chlorine Contact Tanks, Etc)

System Name:	Bella Vista Water District	
System Number:	4510014	
Source of Information:	BVWD Master Plan	
Collected By:	Pace Civil	Date: 3/08
Reservoir Number Or Name:	Old Oregon Trail Tank	
Location		
Cross Streets:	13412 Oregon Trail	
Neighborhood:	RU	
Size Of Lot:	73.600 ft^2	
Fencing:	NO	
Construction		
Date Constructed/Refurbished:	1989 - Refurbished	
Purpose (Storage, Chlorine Contact, Etc.):	Storage	
Design Capacity (MG):	1	
Operating Capacity (MG):	0.96	
Construction Type:	Welded Steel	
Shape:	Cylinder	
Construction Materials:	Steel	
Sides:	Steel	
Floor:	Steel	
Cover Or Roof:	Steel	
Interior Coating Type:	Coal Tar Epoxy	
Dimensions		
Dimensions (H x L x W) Or (H & Diameter)(feet):	39 & 66	
Tank Bottom Elevation (feet):	836.5	
Height Of Tank (feet):	39	
Surface Drainage To Reservoir Possible?	N	
Ventilation		
Screened (Y/N):	Y	
Cathodic Protection:	N	
Inlet Description		
Distance Above Bottom (feet):	0.5	
Receives Water From:	Main Aqueduct	
Outlet Description		
Distance From Inlet (feet):	0 Common Inlet/Outlet	
Distance Above Bottom (feet):	0.5	
Delivers Water To:	Main Aqueduct	
Pressure Zone Served:	Old Oregon Trail Pressure Zone	
Drain Location		
Distance Above Floor (feet):	0	
Discharge Location:	Ground Surface	
Overflow Location		
Overflow Elevation (feet):	875.5	
Distance Above Bottom (feet):	38.9	
Discharge Location:	Ground Surface	

State of California	Department of Public Health

Reservoir Data (Cont'd)

If Hydropneumatic Tank
Capacity (gal):
Site Glass:
Air Vent:
Pressure Gage:
Comments

State of California		Department of Public Health
Reservoir Data *(Use For All Distribution Storage, Chlorine Contact Tanks, Etc)*		
System Name:	Bella Vista Water District	
System Number:	4510014	
Source of Information:	Tom Zaharris; Plans; Master Plan	
Collected By:	Pace Civil	Date: 3/08
Reservoir Number Or Name:	Cow Creek I Tank	
Location		
Cross Streets:	Old Ranch Rd.	
Neighborhood:	RU	
Size Of Lot:	6967 ft^2	
Fencing:	Y	
Construction		
Date Constructed/Refurbished:	1979	
Purpose (Storage, Chlorine Contact, Etc.):	Storage	
Design Capacity (MG):	0.2	
Operating Capacity (MG):	0.19	
Construction Type:	Welded Steel	
Shape:	Cylinder	
Construction Materials:	Steel	
Sides:	Steel	
Floor:	Steel	
Cover Or Roof:	Steel	
Interior Coating Type:	Coal Tar Epoxy	
Dimensions		
Dimensions (H x L x W) Or (H & Diameter)(feet):	29 &34	
Tank Bottom Elevation (feet):	716	
Height Of Tank (feet):	29	
Surface Drainage To Reservoir Possible?	No	
Ventilation		
Screened (Y/N):	Y	
Cathodic Protection:	N	
Inlet Description		
Distance Above Bottom (feet):	0.5	
Receives Water From:	Main Aquaduct	
Outlet Description		
Distance From Inlet (feet):	0 Common Inlet/Outlet	
Distance Above Bottom (feet):	0.5	
Delivers Water To:	Main Aquaduct	
Pressure Zone Served:	Zone D: Cow Creek I Pressure Zone	
Drain Location		
Distance Above Floor (feet):	0	
Discharge Location:	Ground Surface	
Overflow Location		
Overflow Elevation (feet):	747	
Distance Above Bottom (feet):	29.5	
Discharge Location:	Ground Surface	

State of California	Department of Public Health

Reservoir Data (Cont'd)

If Hydropneumatic Tank
Capacity (gal):
Site Glass:
Air Vent:
Pressure Gage:
Comments

State of California	Department of Public Health

Reservoir Data

(Use For All Distribution Storage, Chlorine Contact Tanks, Etc)

System Name:	Bella Vista Water District
System Number:	4510014
Source of Information:	Plans; Master Plan; Tom Zaharris
Collected By:	Pace Civil | Date: 3/08
Reservoir Number Or Name:	Main Tank
Location	
Cross Streets:	11368 E Stillwater Way
Neighborhood:	RU
Size Of Lot:	217,800 ft^2
Fencing:	Y
Construction	
Date Constructed/Refurbished:	1965
Purpose (Storage, Chlorine Contact, Etc.):	Storage
Design Capacity (MG):	4.2
Operating Capacity (MG):	4.1
Construction Type:	Welded Steel
Shape:	Cylinder
Construction Materials:	High Strenghth Alloy
Sides:	High Strenghth Alloy
Floor:	High Strenghth Alloy
Cover Or Roof:	High Strenghth Alloy
Interior Coating Type:	Red Lead
Dimensions	
Dimensions (H x L x W) Or (H & Diameter)(feet):	111 & 80
Tank Bottom Elevation (feet):	650
Height Of Tank (feet):	111
Surface Drainage To Reservoir Possible?	N
Ventilation	
Screened (Y/N):	Y
Cathodic Protection:	N
Inlet Description	
Distance Above Bottom (feet):	2.2
Receives Water From:	Main Aqueduct
Outlet Description	
Distance From Inlet (feet):	0 Common Inlet/Outlet
Distance Above Bottom (feet):	4
Delivers Water To:	Main Aqueduct
Pressure Zone Served:	Zone A - Main Pressure Zone
Drain Location	
Distance Above Floor (feet):	0
Discharge Location:	Ground Surface
Overflow Location	
Overflow Elevation (feet):	762.5
Distance Above Bottom (feet):	111.5
Discharge Location:	Ground Surface

State of California	Department of Public Health

Reservoir Data (Cont'd)

If Hydropneumatic Tank
Capacity (gal):
Site Glass:
Air Vent:
Pressure Gage:
Comments

State of California	Department of Public Health

Reservoir Data

(Use For All Distribution Storage, Chlorine Contact Tanks, Etc)

System Name:	Bella Vista Water District	
System Number:	4510014	
Source of Information:	Tom Zaharris; Don Groundwater; Master Plan	
Collected By:	Pace Civil	Date: 3/08
Reservoir Number Or Name:	Old Alturas Regulating Tank	
Location		
Cross Streets:	Intersection of Old Alturas and Deschutes Rd.	
Neighborhood:	RU	
Size Of Lot:	56,628 ft^2	
Fencing:	Y	
Construction		
Date Constructed/Refurbished:	1964	
Purpose (Storage, Chlorine Contact, Etc.):	Pressure-Breaking Device; Minimal Storage	
Design Capacity (MG):	0.2	
Operating Capacity (MG):	0.185	
Construction Type:	Concrete	
Shape:	Cylinder	
Construction Materials:	Concrete	
Sides:	Concrete	
Floor:	Concrete	
Cover Or Roof:	Concrete	
Interior Coating Type:	Concrete	
Dimensions		
Dimensions (H x L x W) Or (H & Diameter)(feet):	13 & 50	
Tank Bottom Elevation (feet):	675	
Height Of Tank (feet):	13.5	
Surface Drainage To Reservoir Possible?	No	
Ventilation		
Screened (Y/N):	Y	
Cathodic Protection:	N	
Inlet Description		
Distance Above Bottom (feet):	0.5	
Receives Water From:	Main Conduit	
Outlet Description		
Distance From Inlet (feet):	34.5	
Distance Above Bottom (feet):	0.5	
Delivers Water To:	Main Aqueduct	
Pressure Zone Served:	Zone C - Deschutes Pressure Zone	
Drain Location		
Distance Above Floor (feet):	0	
Discharge Location:	Ground Surface	
Overflow Location		
Overflow Elevation (feet):	688.5	
Distance Above Bottom (feet):	13.6	
Discharge Location:	Ground Surface	

State of California	Department of Public Health

Reservoir Data (Cont'd)

If Hydropneumatic Tank
Capacity (gal):
Site Glass:
Air Vent:
Pressure Gage:
Comments

State of California **Department of Public Health**

Reservoir Data

(Use For All Distribution Storage, Chlorine Contact Tanks, Etc)

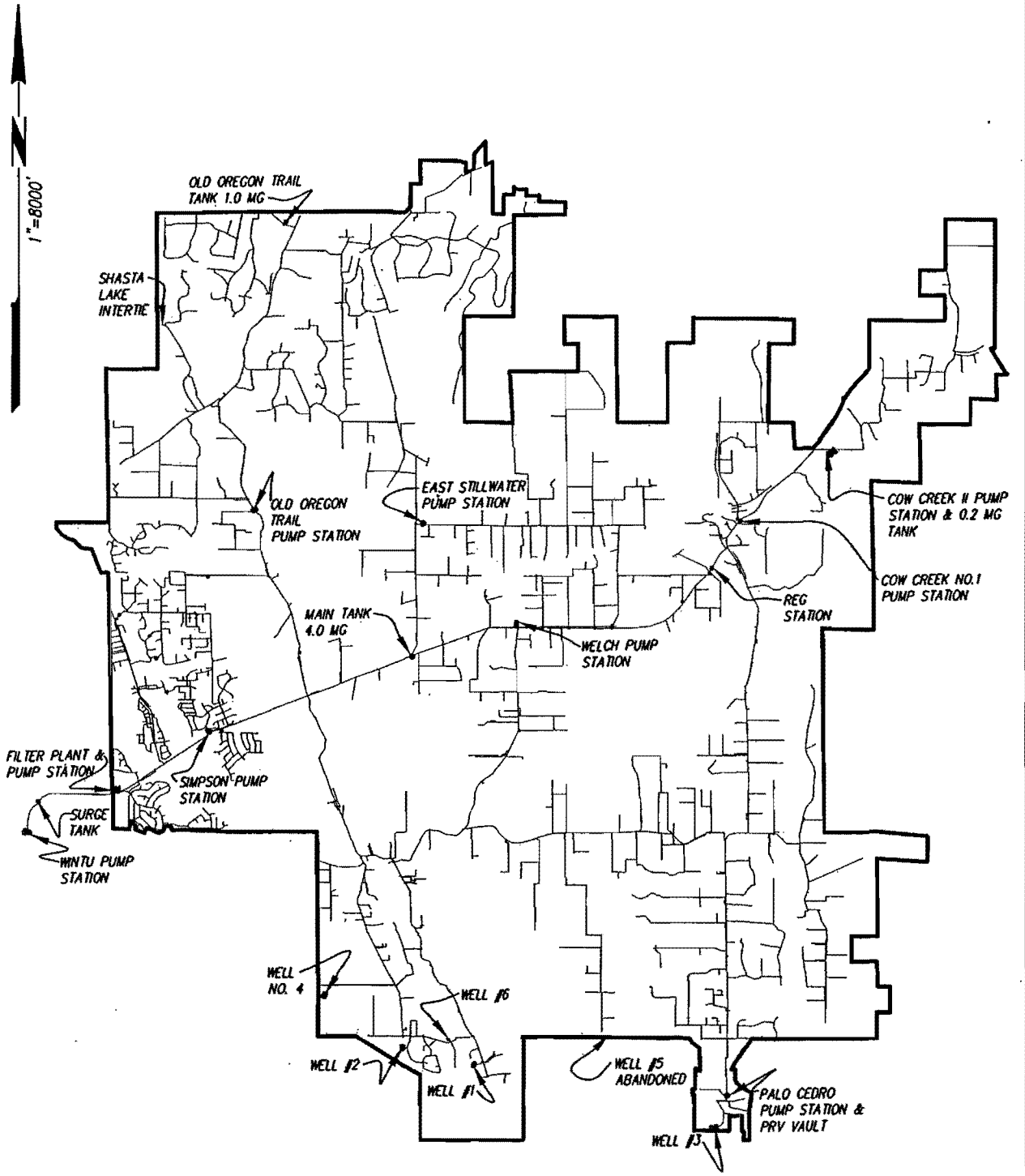
System Name:	Bella Vista Water District	
System Number:	4510014	
Source of Information:	James P. Turman - Manager; Master Plan; Plans	
Collected By:	Pace Civil	Date: 3/08
Reservoir Number Or Name:	Surge Tank	
Location		
Cross Streets:	Hiltop Drive and Palisades Ave	
Neighborhood:	RU	
Size Of Lot:	54,450 ft^2	
Fencing:	9ft non-climbable	
Construction		
Date Constructed/Refurbished:	Jul-66	
Purpose (Storage, Chlorine Contact, Etc.):	Surge Protection	
Design Capacity (MG):	0.23	
Operating Capacity (MG):	0.22	
Construction Type:	Welded Steel with Stainless Steel Liner	
Shape:	Cylinder	
Construction Materials:	Steel;Stainless Steel	
Sides:	Steel;Stainless Steel	
Floor:	Stainless Steel Supported by Concrete	
Cover Or Roof:	Rafter Supported Welded Steel	
Interior Coating Type:	Stainless Steel Cladding	
Dimensions		
Dimensions (H x L x W) Or (H & Diameter)(feet):	100 & 20	
Tank Bottom Elevation (feet):	694	
Height Of Tank (feet):	98	
Surface Drainage To Reservoir Possible?	N	
Ventilation		
Screened (Y/N):	Y	
Cathodic Protection:	N	
Inlet Description		
Distance Above Bottom (feet):	0	
Receives Water From:	Main Aqueduct	
Outlet Description		
Distance From Inlet (feet):	0 Common Inlet/Outlet	
Distance Above Bottom (feet):	0	
Delivers Water To:	Main Conduit	
Pressure Zone Served:	Raw Transmission Zone	
Drain Location		
Distance Above Floor (feet):	0	
Discharge Location:	Ground Surface	
Overflow Location		
Overflow Elevation (feet):	792	
Distance Above Bottom (feet):	98	
Discharge Location:	Ground Surface	

State of California	Department of Public Health

Reservoir Data (Cont'd)

If Hydropneumatic Tank
Capacity (gal):
Site Glass:
Air Vent:
Pressure Gage:
Comments

APPENDIX H



DATE			
12/04	PACE CIVIL, INC. REDDING, CALIFORNIA	BELLA VISTA WATER DISTRICT DISTRIBUTION MAP	FIGURE 2 JOB # 453.91

APPENDIX I

State of California **Department of Health Services**

DISTRIBUTION DATA

System Name: BVWD **System Number:** 4510014
Source of Information: Jeff Tuchalski (Distribution Superintendent)
Collected By: Pace Civil Date: 5/08

Number of Service Connections	6,000
Pressure Range	30-100 psi
Type of Pipe	
Steel-Tar Coated & Wrapped	
Steel-Cemented Lined, Cement Coated	18%
Steel-Cement Lined	
Ductile Iron	1%
Asbestos Cement	6%
Galvanized	
Cast Iron	
PVC	75%
ABS	
Polyethylene (PE)	
Minimum Size of New Mains	6"
Amount Less Than 4" Diameter	Approx. 3.75 Miles
Condition of Mains	Good to Excellent
Minimum Depth of cover (Inches)	36"
Copper	30%
Plastic (Type & %)	20% PVC, 10%Poly B, 30% Poly E
Lead	0
Distance of Mains from Sewers	10' Minimum Horizontal
Disinfection Method - New Mains (Describe Procedure)	Spray, Swab, Slug, or Tablet (depending on length) flush and sample
Disinfection Method After Repairs (Describe Procedure)	Spray or Swab, Flush and Sample
Infiltration Hazard (Relation to Groundwater Table)	No Data Available
Dead Ends	
How Many?	421
Flushing Valves Installed?	400, 21 Terminate to Water Service
Flushing Program (Describe)	Attached
Growth and Sludge in Mains	None Observed
Valves	1800+
Sufficient Number	No
Valve Maps Maintained	YES
Valve Exercise Program	YES
Defects and Remarks	In the past the district had a practice of tapping services of large transmission mains. Lost or destroyed records. Originally designed as an irrigation system

BELLA VISTA WATER DISTRICT

To: State of California, Dept. of Health Services

From: Jeff Tuchalski

Date: 1-16-02

Subject: Distribution system flushing

Copies: General Manager and file

The Bella Vista Water District was originally designed and built as a tree system to supply large amounts of agricultural water. Over the years efforts have been made and continue to be made to eliminate dead ends by looping mains. Historically irrigation demands from April thru October create flow velocities that result in natural flushing in most areas of the District. Currently the districts flushing program is a reactive process caused by a sequence of events such as new main construction, water main repair, customer water quality complaints, or a process failure creating a necessity to flush mains. The steps involved are first to identify the extent of the area affected and the cause. Mitigate the source of the contamination then directionally flush mains to remove the contaminant while trying to affect the least amount of customers. We have identified the southernmost portion of our system as a problem area due to previous accumulations of iron and manganese sediment in the pipelines from wells that supplement our water supply from the south end of our District. We have added filtration to all of our wells so the problem isn't continuing to be compounded. We are in the process of developing a plan to flush these areas to remove the existing sediments. With engineering data on flow directions and velocities in the existing system we can calculate the amount of flow needed to create the desired velocities to flush the pipelines adequately. The goal is to implement a unidirectional flushing plan, which by opening and closing certain valves a reversal of normal flow direction can be created and a desired flow velocity can be attained of 6fps, which would minimize water loss and flushing time necessary to cause the desired effect of cleaning the pipeline. Of course in some areas we will continue directional flushing as system design dictates. Another facet of this flushing plan may be the necessity to install additional fire hydrants as flushing outlets. We are also in the process of identifying dead end mains that have low use due to seasonal demands or due to the size and/or number of services and their associated usage that may result in stagnant water, which would require periodic flushing. Attached is a copy of our standard operating procedure for flushing mains.

STANDARD OPERATING PROCEDURE

Flushing Water Mains

Revision: *Effective Date: 1-3-2000* *Written by JST*

Scope and Application:

Flushing mains to improve water quality.

Interference:

Traffic, time of day, available personnel, erosion problems, and available water supply.

Apparatus and Materials:

Confined space trailer, gas tester, traffic control equipment, valve position plugs, valve operating tools, pitot gage to measure flow, hydrant diffuser, pocket colorimeter for chlorine, and de-chlorinating apparatus.

Reagents:

DPD free chlorine reagent and de-chlorinating tablets or solution.

Calibration:

The confined space gas tester should be calibrated monthly and the colorimeter is factory calibrated.

Procedures:

Determine the area to be flushed and/or isolated, the direction of water flow, and the amount of water to be displaced using District maps to minimize flushing time. If possible notify customers that may be affected. Attach flushing apparatus and start flush being aware of possible erosion and use methods to mitigate if erosion becomes a problem. Check free chlorine levels of flushing water and de-chlorinate if necessary. Be aware of your proximity to creeks, roadways, private property, and other situations that may restrict the method of flushing you use in that area. Flush at a calculated rate and time to exchange the water and obtain an acceptable chlorine level. Note amount of water flushed and fill out a water to waste log form. Secure area and monitor for customer feedback. If a chlorine residual is difficult to obtain it may be necessary to take water samples for bacteria as a precautionary measure.

Safety:

Maintain a safe work zone at all times for yourself and the public. Be aware of pedestrian traffic, auto traffic, obstacles, time of day, and terrain. Wear reflective safety vest, hardhat, gloves, boots, safety glasses, and use barricades, cones, traffic control, and lighting as necessary.

Quality Control:

Minimize erosion, observe water clarity, measure chlorine residual, and de-chlorinate if necessary.

References:

AWWA water distribution operator training handbook, AWWA introduction to water distribution, principles and practices of water supply operations, volume 3, and the CSU, Sacramento, Ken Kerri, Water Distribution System Operation And Maintenance Manual.

Approved by:

Distribution Superintendent **Date :** 1-3-2000

Safety Officer **Date :**

APPENDIX J

STANDARD OPERATING PROCEDURE

WINTU EMERGENCY DISINFECTION ACTION PLAN

Revision: 1 *Effective Date: 11/30/06* *Written By: TZ*

Scope and Application:

You must follow these steps in order to maintain the proper chlorine residual leaving the Water Treatment Plant.

Interference:

A possible Chlorine gas release.
High summertime flows.

Apparatus and Materials:

Hach hand held color comparator.

Reagents:

DPD for color comparator.

Calibration:

Chlorine analyzers.

Procedures:

When any alarm is detected the following occurs: SCADA Alarm dials a programmed set of phone numbers, one every three minutes and won't stop dialing until the alarm is acknowledged. The program set is 1) Treatment pagers, 2) Treatment cell phone 3) First on call operator's home 4) Second on call operator's home 5) Treatment superintendent 6) Electrical Instrumentation technician.

If one or both chlorine residual analyzers detect a residual below .45mg/l, a low chlorine residual warning alarm is sent through SCADA alarm.

If both chlorine analyzers detect a chlorine residual below .30mg/l, a partial shut down occurs allowing only one 1000 HP motor to run. A low, low residual shut down alarm is sent through SCADA alarm. Note: It will take approximately one hour with one 1000 Hp motor running for the low, low chlorine residual to reach the water treatment plant.

If any of these alarms occur during summer high flows, immediately call the second on call operator.

The operator then responds to Wintu paying close attention to the chlorine gas detector lights on the back or the chemical building upon arrival. If the lights are all green, proceed to assess the problem. If any of the lights are yellow or red, immediately call your second on call operator and follow the emergency chlorine response SOP.

First check the residual by using the Hach hand held color comparator. If chlorine residual is found, check the chlorine analyzer for proper operation. If no chlorine residual is found, notify the second on call operator. In summer, immediately call your supervisor.

Sequence of operations to find malfunction are to check:

Vacuum gauge; if high, check ball valves, switch over valves or chlorine tanks; if low, check for vacuum leaks or chlorinator failure.

Chlorinator; if problem, switch to back-up chlorinator.

Injection flow meter; If low or no flow, switch to back-up booster pump. If still no flow, check injection water screen, chlorinator valve actuators or all ball valves.

If high pressure chlorine system has failed, switch to gravity chlorine injection into the pump bays by closing the valves from the booster pumps and to the injection quill. Open the valves to the manual spin through filters and individual pump bay valves. Then open the valve to the bay that the pump is running on.

If the chlorine problem is resolved and there is no residual in the pipeline then follow raw water to waste SOP until the correct residual reaches the Water Treatment Plant.

Note:

Unless an emergency, no unchlorinated water should leave the Water Treatment Plant. If unchlorinated water is pumped into the distribution system at any time the Superintendent, the General Manager and the Department of health Services shall be notified immediately. The Emergency notification plan will be initiated with boil water notices. The system will be sampled at various locations to determine the extent of the unchlorinated water. Portions of the distribution system may need to be flushed to remove the unchlorinated water. Multiple bacteriological samples shall be taken in all areas found to be unchlorinated.

If the 4mgt level is dropping you will need to start the Wells and open interties. Depending on how long it has been you will need to shut down the pumps at Wintu before any unchlorinated water reaches the Water Treatment Plant. If the Tank continues to drop you will need to notify large water users and request to stop using water and notify the Distribution on call operator, the General Manager and the Department of Health Services.

If the chlorination system has completely failed at Wintu and the demands exceed the output of the Wells and interties, the procedure is as follows:

- Provide emergency chlorination at the source in a manual mode.
- Using a 600hp low flow pump(6,000gpm) and the sodium hypochlorite pump at the Water Treatment Plant at maximum output (0.11 gallons per minute), would be a dose of 2.2 mg/l. Depending on the chlorine demand, you should be able to meet the CT requirements.
- If a 1,000 hp pump is needed, Inject sodium Hypochlorite in the pump bays or pipe line before filtration and after at various locations.
- Activate Emergency notification plan.

Safety:

Do not get in a hurry. Follow all chlorine safety practices.

Quality Control:

Remember cause and effect.

References:

N/A

Approved By:

Water Treatment Superintendent	**Date**
Safety Officer	**Date**

APPENDIX K

State of California—Health and Human Services Agency
California Department of Public Health
Division of Drinking Water and Environmental Management
415 Knollcrest Drive, Suite 110
Redding, CA 96002
(530) 224-4800 FAX (530) 224-4844
Internet Address: www.dhs.ca.gov

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

WATER QUALITY EMERGENCY NOTIFICATION PLAN

Name of Utility: Bella Vista Water District	System No. 4510014
Mailing Address: 11368 E. Stillwater Way Redding CA 96003	FAX No: 530.241.8354
Street Address: (if different than mailing address)	E-mail address: tzaharris@bvwd.org

The following persons have been designated to implement the plan upon notification by the State Department of Health Services, Division of Drinking Water, that an imminent danger to the health of water users exists:

WATER SYSTEM PERSONNEL OR SYSTEM CONTACT

NAME	TITLE	DAY PHONE	CELL PHONE	EVENING PHONE
1. Tom Zaharris	Water Treatment Superintendent	530.224.6501	530.356.7006	530.549.3751
2. Don Groundwater	District Engineer	530.241.1085	530.949.5233	530.549.5211
3. David Coxey	General Manager	530.241.0185	530.227.6923	530.547.4584
4.				

The implementation of the plan will be carried out with the following State Health Department Personnel

STATE HEALTH DEPARTMENT PERSONNEL

NAME	TITLE	DAY PHONE	EVENING PHONE
Michael L. Ricks	Associate Engineer	(530) 224-4870	(530) 246-7583
Michael J. McNamara	District Engineer	(530) 224-4873	(530) 244-7511
Steve Watson	Drinking Water Engineer	(530) 224-4824	(530) 242-6474
Sandi Tenney	Associate Engineer	(530) 224-4876	(530) 336-5608
Michael T. Burgess	Drinking Water Engineer	(530) 224-6506	(530) 222-5651

If the above personnel cannot be reached, contact:
Office of Emergency Services Warning Center (24 hrs) (800) 852-7550 or (916) 845-8911
When reporting a water quality emergency to the Warning Center, please ask for the California Department of Health Services-Drinking Water Program Duty Officer

NOTIFICATION PLAN

Describe methods or combinations of methods to be used (radio, television, door-to-door, sound truck, etc.). For each section of your plan give an estimate of the time required, necessary personnel, estimated coverage, etc. Consideration must be given to special organizations, particularly non-English speaking groups, and outlying water users. (Use the other side of this form or attach a written description, if necessary).

Please see attached.

Plan Prepared by: Tom Zaharris (Print Name) Title: Water Treatment Superintendent

Signature: Tom Zaharris Date: 4/28/08

WATER QUALITY EMERGENCY NOTIFICATION PLAN

The following methods will be used to alert the District's customers of a water quality emergency.

1. In the case of an emergency where immediate notification is required, i.e., immediate health hazard, the District will notify local radio, television, and newspapers serving the area by facsimile describing the emergency and steps to be taken by the consumer for their protection as well as giving them a telephone number to contact for additional information.
   Estimated time - 30 min. Personnel required - 1.

2. If the above emergency is of a nature that drinking the water could have severe consequences the District will follow-up the fax notification by telephone notification to give the news media the urgency of the message and verify that they received the fax.
   Estimated time - 1 hours. Personnel required - 2.

3. The District will also dispatch its personnel for door-to-door contact leaving flyers where individuals are not home. Additionally, the District will initiate telephone contact with customers in the area on a priority basis beginning with the schools in the area.
   Estimated time - depends on area exposed. Personnel required - unknown.

The District has no outlying water users and no known non-English speaking groups.

Attached is a list of the news media serving our local area along with their phone and fax numbers.

Record Searchlight	243-2424 225-8236 (fax direct to reporter)
KRCR TV Channel 7R	243-7777 243-9382 - Fax
KHSL TV Channel 12	241-1288 226-6626 - Fax
KSHA, KQMS	221-1400 221-6653 - Fax
East Valley Times Sharyn Cornelius	547-3788 547-2038 - Fax

APPENDIX L

OPERATIONS PLAN FOR BELLA VISTA WATER DISTRICT

Brief description:

The Bella Vista Water District (District) is a publicly owned water agency governed by a five member Board of Directors. There are currently 28 full time employees.

The District supplies potable water for both agricultural irrigation and domestic water within a 54 square mile area. The Water Treatment Plant (WTP) has the capacity to produce 53 Million Gallons per Day.

The District was formed in 1964 to serve agricultural irrigation. The appropriated water is authorized from the Cow Creek Unit of the Trinity River Project, a portion of the U.S. Bureau of Reclamation, Central Valley Water Project. In 1965, the Wintu Pump Station was built along with the Chlorination Station, Surge Tank, 4 Million Gallon Tank, several miles of large diameter pipe, pressure regulation Station, Well #1, and the District office.

In 1977, the District constructed the WTP to meet increasing domestic demands. Over the years four additional wells have been added along with several pump stations to feed ten pressure zones. In 1995 the District upgraded the WTP to keep up with ever stricter Federal and State drinking water regulations.

In 2001, the District started a major expansion of the Wintu Pump Station and Water Treatment Plant in order to comply with new drinking water regulations, increase reliability and optimize processes. In May of 2006 the Bella Vista Water District completed the project and is now in full compliance with all State and Federal Drinking Water Standards.

Bella Vista Water District mission is to provide safe and dependable water for a variety of present and future uses, quality customer service and a safe, harmonious working environment.

The District will always have:

- One certified Distribution operator on call with the ability to contact a D3 or higher 24 hours a day, seven days a week (24/7).
- One certified Electrical/Instrumentation person on call 24/7.
- One certified Treatment operator (T3 or higher) "first" on call to respond to all alarms and work weekends and holidays 24/7.
- One certified Treatment operator (T3 or higher) "second" on call to respond to alarms when needed 24/7.

This is a list of expected responsibilities of the "first" on call Water Treatment Operator (If you go home sick, scheduled off or on another project, it is also your responsibility to see these things are all delegated appropriately.).

- All operations! This includes but is not limited to the following:
  - Daily reads @ W.T.P. and Wintu.
  - Bacteriological and pond samples.

- Chemical feed systems and proper dosage.
- Chlorine cylinder change and ordering.
- Treated water turbidities.
- Backwash monitoring.
- Checking historical screens.
- Watching and monitoring all treatment processes.
- Alarm set points.
- Weekly rounds.

- Know what wells are on:
  - Daily reads.
  - Samples.
  - Enough Chlorine to get through the weekend.
  - Watching and monitoring all treatment processes.
  - Dip the well at least once a week.
  - Sludge level.

- Watch and monitor all facilities on SCADA:
  - Pump Stations (are they doing what they are suppose to do?).
  - Historical screens (have they been doing what they are suppose to do?).
  - Wells.
  - Set points.

- Alarm log:
  - List all alarms during working hours.
  - List all alarms during call outs.

- Daily log:
  - You make the daily entries.
  - You log all set point changes.

- Weekly cleanings:
  - Wintu.
  - W.T.P.
  - Trucks.

- Be prepared on Monday morning with the alarm log and an update on how the weekend went.

The goal is that the first on call operator is doing nothing but operations. This way the first on call is fully aware of all the operations, set points and current situations of all the districts facilities. The second on call needs to be involved as much as possible with the first on call.

All Employees need to follow the written Standard Operating Procedure when applicable. (Index attached)

- **Routine Operational Procedures for Wintu Pump Station**:

A. Daily.
   1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem).
   2. Check the pumps, chemical systems and instruments for proper operation.
   3. Complete log sheets 1-3 (see attached).

B. Weekly.
   1. Run the Generator for 10 minutes.
   2. Clean and calibrate Chlorine analyzers, clean surface scatter and prepare everything for the weekend.
   3. Complete daily logs and Friday log (see attached).
   4. Rotate Chlorinators and metering pumps.

C. Monthly.
   1. Load test the Generator for one hour.
   2. Complete Chlorine safety training.
   3. Take a raw water MPN sample.
   4. Clean and verify chlorine sensors.

D. Quarterly.
   1. Calibrate the Surface Scatter.
   2. Clean the injection water screen.

E. Bi-Annually.
   1. Lube the raw water screens and 1000hp pumps.

F. Annually.
   1. Change motor oils.
   2. Rebuild all chlorination equipment and replace worn PVC piping.
   3. Clean all electrical equipment.
   4. Replace chlorine sensors.
   5. Replace surface scatter bulbs.
   6. Test all alarms.
   7. Replace ASOV batteries.
   8. Calibrate flow meter.

G. Every other year.
   1. Rebuild a 1000hp or 600hp motor.
   2. Rebuild a pump.

- **Routine operational procedures for the Water Treatment Plant**:

A. Daily.
   1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem).
   2. Check the pumps, chemical systems and instruments for proper operation.
   3. Complete log sheets 1-4 (see attached).
   4. Enter any needed manual data on the reports computer.
   5. Check the SCADA system for current chlorine residuals, turbidities, tank levels, pressures, filter run times, alarm set points and anything out of the ordinary at all District facilities.
   6. Check the historical trends at all facilities for proper operation.
   7. Log any and all activity including set point changes, alarms, or maintenance.

B. Weekly.
   1. Bacteriological samples (follow site plan).
   2. Pond samples (RWQCB).
   3. Clean and calibrate Chlorine analyzers, clean surface scatter and prepare everything for the weekend.
   4. Rotate metering pumps.
   5. Run generator half hour.

C. Monthly.
   1. Verification of all the turbidimeters.

D. Quarterly.
   1. Calibration of all turbidimeters.
   2. Required DHS and RWQCB samples.

E. Bi-Annually.
   1. Lube motors and pumps.

F. Annually.
   1. Filter inspections (see attached).
   2. Replace light bulbs on all turbidimeters.
   3. Clean all electrical equipment.
   4. Test all alarms.
   5. Inspect and rebuild chlorine system as needed.
   6. Generator load test one hour.
   7. Replace UPS batteries.

- **Routine operational procedures for the Wells**:

A. Daily (Only if the well is running).
   1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem).

2. Check the pumps, chemical systems and instruments for proper operation.
3. Complete log sheet (see attached).
4. Back wash filters if needed.
5. Check chlorine supply and add or order more if needed.
6. Check drip leg rate and level.
7. Check sludge depth-Sample and pump if needed.

B. Weekly (Tuesday and Thursday).
1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet.
3. Record the well level.
4. Drain the water from the compressor if well has been running.
5. Clean and calibrate chlorine analyzer.

C. Monthly (If well is running).
1. Take an influent and effluent Iron and Manganese sample.
2. Take a raw water MPN sample.

D. Annually.
1. Take needed DHS samples.
2. Do complete well maintenance (see attached).
3. Clean electrical systems.
4. Test alarms.

E. Every other year.
1. Inspect all filters (see attached).

- **Routine operational procedures for the pump stations**:

A. Daily.
1. Check and monitor on the SCADA system.

B. Weekly (Tuesday and Thursday).
1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet (see attached).

C. Quarterly.
1. Lube motors and pumps.

D. Annually.
1. Vibration test.
2. Clean electrical systems.
3. Test alarms.

- **Routine operational procedures for the Tanks**:

A. Daily.
1. Check and monitor on the SCADA system.

B. Weekly (Tuesday and Thursday).

1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet (see attached).

D. Annually.
1. Inspect interior.
2. Flush and calibrate pressure transducer.

- **Monitoring and Reporting.**

A. **BACTERIOLOGICAL MONITORING**; as per approved Sample Siting Plan (attached), required monthly, report to the Department by the 10th of each month, following the sample.
1. If sample positive, take four repeat samples at once.
2. Take five routine samples the month following a positive sample.
3. Keep bacteriological results for five years.
4. Keep any corrective action for sampling for three years.

B. **CHEMICAL MONITORING**; as required by the Department, forward results to the Department.
1. Keep chemical results for ten years.
2. Keep variance and exemptions for five years.

- **Response to violations.**

A. **PUBLIC NOTIFICATION** of violation required.
1. Notification shall be given as per "Emergency public notification" method on record with the Department (attached), or in a manner directed by the Department.
2. State problem and what has been done to correct it.
3. Send a copy of the notification to the Department.

- **Consumer complaint response procedures.**

A. **CONSUMER COMPLAINT** procedures.
1. Record in complaint log (name, address and nature of the problem).
2. Investigate the complaint.
3. Verify or dismiss the complaint.
4. Record the steps taken to address or correct the problem.
5. Notify complainant of action taken.
6. Keep complaint records with corrective action for five years.

- **Emergency Operational Practices.** *(See Emergency/Disaster Plan for complete description).*

OPERATIONS PLAN FOR BELLA VISTA WATER DISTRICT

Brief description:

The Bella Vista Water District (District) is a publicly owned water agency governed by a five member Board of Directors. There are currently 28 full time employees.

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In 1977, the District constructed the WTP to meet increasing domestic demands. Over the years four additional wells have been added along with several pump stations to feed ten pressure zones. In 1995 the District upgraded the WTP to keep up with ever stricter Federal and State drinking water regulations.

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This is a list of expected responsibilities of the "first" on call Water Treatment Operator (If you go home sick, scheduled off or on another project, it is also your responsibility to see these things are all delegated appropriately.).

- All operations! This includes but is not limited to the following:
  - Daily reads @ W.T.P. and Wintu.
  - Bacteriological and pond samples.

- **Routine operational procedures for the Water Treatment Plant**:

A. Daily.
   1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem).
   2. Check the pumps, chemical systems and instruments for proper operation.
   3. Complete log sheets 1-4 (see attached).
   4. Enter any needed manual data on the reports computer.
   5. Check the SCADA system for current chlorine residuals, turbidities, tank levels, pressures, filter run times, alarm set points and anything out of the ordinary at all District facilities.
   6. Check the historical trends at all facilities for proper operation.
   7. Log any and all activity including set point changes, alarms, or maintenance.

B. Weekly.
   1. Bacteriological samples (follow site plan).
   2. Pond samples (RWQCB).
   3. Clean and calibrate Chlorine analyzers, clean surface scatter and prepare everything for the weekend.
   4. Rotate metering pumps.
   5. Run generator half hour.

C. Monthly.
   1. Verification of all the turbidimeters.

D. Quarterly.
   1. Calibration of all turbidimeters.
   2. Required DHS and RWQCB samples.

E. Bi-Annually.
   1. Lube motors and pumps.

F. Annually.
   1. Filter inspections (see attached).
   2. Replace light bulbs on all turbidimeters.
   3. Clean all electrical equipment.
   4. Test all alarms.
   5. Inspect and rebuild chlorine system as needed.
   6. Generator load test one hour.
   7. Replace UPS batteries.

- **Routine operational procedures for the Wells**:

A. Daily (Only if the well is running).
   1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem).

2. Check the pumps, chemical systems and instruments for proper operation.
3. Complete log sheet (see attached).
4. Back wash filters if needed.
5. Check chlorine supply and add or order more if needed.
6. Check drip leg rate and level.
7. Check sludge depth-Sample and pump if needed.

B. Weekly (Tuesday and Thursday).
1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet.
3. Record the well level.
4. Drain the water from the compressor if well has been running.
5. Clean and calibrate chlorine analyzer.

C. Monthly (If well is running).
1. Take an influent and effluent Iron and Manganese sample.
2. Take a raw water MPN sample.

D. Annually.
1. Take needed DHS samples.
2. Do complete well maintenance (see attached).
3. Clean electrical systems.
4. Test alarms.

E. Every other year.
1. Inspect all filters (see attached).

- **Routine operational procedures for the pump stations**:

A. Daily.
1. Check and monitor on the SCADA system.

B. Weekly (Tuesday and Thursday).
1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet (see attached).

C. Quarterly.
1. Lube motors and pumps.

D. Annually.
1. Vibration test.
2. Clean electrical systems.
3. Test alarms.

- **Routine operational procedures for the Tanks**:

A. Daily.
1. Check and monitor on the SCADA system.

B. Weekly (Tuesday and Thursday).

1. Check for the following; leaks, openings, lubricants, electrical hazards, chemical hazards, vandalism, etc. (record observations and correct problem.
2. Complete log sheet (see attached).

D. Annually.
1. Inspect interior.
2. Flush and calibrate pressure transducer.

- **Monitoring and Reporting.**

A. **BACTERIOLOGICAL MONITORING**; as per approved Sample Siting Plan (attached), required monthly, report to the Department by the 10th of each month, following the sample.
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2. Take five routine samples the month following a positive sample.
3. Keep bacteriological results for five years.
4. Keep any corrective action for sampling for three years.

B. **CHEMICAL MONITORING**; as required by the Department, forward results to the Department.
1. Keep chemical results for ten years.
2. Keep variance and exemptions for five years.

- **Response to violations.**

A. **PUBLIC NOTIFICATION** of violation required.
1. Notification shall be given as per "Emergency public notification" method on record with the Department (attached), or in a manner directed by the Department.
2. State problem and what has been done to correct it.
3. Send a copy of the notification to the Department.

- **Consumer complaint response procedures.**

A. **CONSUMER COMPLAINT** procedures.
1. Record in complaint log (name, address and nature of the problem).
2. Investigate the complaint.
3. Verify or dismiss the complaint.
4. Record the steps taken to address or correct the problem.
5. Notify complainant of action taken.
6. Keep complaint records with corrective action for five years.

- **Emergency Operational Practices.** *(See Emergency/Disaster Plan for complete description).*

APPENDIX M

BACTI SAMPLE SITES

ZONE	SITE NO.	SITE	ALTERNATE
A	1.	4 MGT	
	2.	Columbia Elementary	
	3.	E. Stillwater P/S	
	4.	Old Oregon Trail/Wintu Way	Old Oregon Trail P/S
	5.	Stillwater Heights	
A-1	6.	Alice Lane	
	7.	Fawn Dr.	
A-2	8.	Welch P/S	
	9.	Logan Rd.	Welch P/S
B	10.	Bernard/Padani	
	11.	Old Oregon Trail P/S	
	12.	1 MGT	Old Oregon Trail P/S
	13.	Tierra Oaks Dr.	
	14.	Manzillo	
C.	15.	Regulating Station	
	16.	Bishop Quinn School	
	17.	N. Cow Creek Elementary	
C-1	18.	Palo Cedro Booster	
	19.	Grand Estates	Palo Cedro Booster
D	20.	Cow Creek P/S No. 1	
	27.	Oak Knolls Rd.	Cow Creek P/S No. 1
	21.	Blue Sky	
	22.	Cow Creek P/S No. 2	
E-1	23.	Boulder Creek Elementary	
	24.	Quail Ridge P/S	
	25.	Whistling/Springer	Quail Ridge P/S
E-2	26.	Simpson P/S	
	28.	Posey Lane	
	29	Mercy Oaks Dr.	Simpson P/S
	30.	Julian St.	

STANDARD OPERATING PROCEDURE

COLIFORM SAMPLING (BACTI)

Revision: 2.0 Effective Date: Written by: BJ

Scope and Application

Routine coliform sampling. There are five sample sites to be sampled weekly. If a holiday occurs on a Monday (normal sample day), take the samples on Tuesday (the next day). The sample sites and their alternatives are located in the WTP Operations Binder Volume 1, Section 1 T, Tab E for sample sites and Tab G for alternate sites.

Interference

1. Wind
2. Rain
3. Main line break
4. No chlorine residual
5. Damaged sample tap.

Apparatus and Materials

1. New sealed Bacti bottles
2. Chlorine test kit
3. Reagents
4. Cooler with ice pack
5. Chain of custody form
6. Extra bottles.

Reagents

DPD powder pillows.

Calibration

None.

Procedure

1a. Refer to the WTP Operations Plan Binder Volume 1, for the sites to be sampled. They are in order month-to-month and week-to-week.

1b. Check the weather. If it is windy or it is raining, use a designated alternative sample site if needed.

14. Keep the samples in a cooler at all times.

15. Once you have taken all the samples, deliver them directly to Basic Lab (2218 Railroad Ave., Redding 243.7234).

16. Have the lab technician give you a copy of the chain of custody.

17. Give the copy of the chain of custody to the sample coordinator at the Water Treatment Plant.

Safety

1. Drive safely while sampling.

2. Watch for dogs and snakes.

Quality Control

When in doubt dump it out

1. Only use sealed sterile bacti bottles.

2. If windy or rainy, refer to sample site alternate list.

3. If using an alternate site, put the site name on the chain of custody than put (alt.) next to the site so everyone knows that an alternative site was used.

4. Do not overfill the sample bottle, if you do, dump it out and re-sample using a new sample bottle.

5. Take samples directly to the lab.

References

Water Treatment Plant Operations Binder, Volume No. 1.

Approved

By: Tom Zahn — Date: 7-2-07
Water Treatment Superintendent

By: [signature] — Date: 8/30/07
Safety Officer

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Ave., Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #:

CLIENT NAME: **BELLA VISTA WD - WATER TREATMENT**

PROJECT NAME:

PROJECT #:

SAMPLE TYPE:

ADDRESS: **11368 EAST STILLWATER WAY, REDDING , CA 96003**

REQUESTED COMP. DATE:

STATE FORMS? ☐

OF SAMPLES:

TURN AROUND TIME: STD ☐ RUSH ☐

PAGE____ OF____

PROJECT MANAGER: **TOM ZAHARRIS**

PHONE: **241-1085** FAX: **224-6511** E-MAIL:

INVOICE TO: PO#:

SPECIAL MAIL ☐ E-MAIL ☐ FAX ☐ EDT ☐

REP: **ODW**

ID#:

SYSTEM#: **4510014**

GLOBAL ID #:

QC = 1 2 3 4

DATE	TIME	WATER	COMP	SOIL	SAMPLE DESCRIPTION	# OF BOTTLES	SAMPLE TYPE *	CHLORINE RESIDUAL	ANALYSIS REQUESTED								LAB ID	REMARKS

PRESERVED WITH: HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ ZnAce/NaOH ☐ HCL ☐ NaThio ☐ OTHER_____ ☐

SAMPLED BY (PRINT):	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (SAMPLES UNVERIFIED)	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY LAB: (VERIFIED)	DATE/TIME:	SAMPLES SHIPPED VIA: UPS FEDEX POST BUS OTHER_____	

* 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL, 5 = RAW

BACTERIOLOGICAL SAMPLE SITING PLAN REQUIREMENTS

Department of Health Services
DRINKING WATER FIELD OPERATIONS BRANCH

The following outlines the minimum requirements that should be included in any bacteriological sample siting plan submitted to the Department of Health Services, Field Operations Branch District Office for approval and acceptance.
If you have questions about preparing an acceptable siting plan, please call your District Office.

GENERAL REQUIREMENT

The bacteriological sample siting plan must be representative of the water distribution system; it must describe sample rotation procedures; and it must include a statement about the training of the sample collector.

SYSTEM MAP

The system map can be a one-page engineering drawing of the distribution system and water system facilities or it can be a street map or system schematic.

The system map must identify/locate the following:

a. All sources of water supply

b. All treatment facilities

c. All storage facilities

d. Dead ends (if dead ends cannot be specifically identified, e.g., use of a schematic, then the total number of dead ends in the system, with address locations should be listed).

e. All pressure zones in the distribution system

f. All booster stations

g. All pressure reducing stations, other than individual house service PR valves

h. ALL SAMPLE POINTS (distinguish between routine, follow-up and/or special sample points)

NOTE:

For each routine sample point, there must be an identified follow-up sample point, located within five (5) services "upstream" and "downstream" of the routine sample point. If the water system has "dedicated" specially designed and installed sample points, the "upstream" and "downstream" follow-up sample points will be the closest dedicated routine sample point on either side.

OTHER

The bacteriological sample siting plan must also include the following:

a. Current number of service connections and/or number of population served

b. Description of each sample point e.g., hose bibb, sink faucet, goose neck type copper tube with pet cock, etc.

c. Address of each sample point

d. Proposed sampling schedule for each identified routine sample point, e.g., weekly, every other week, monthly, quarterly, etc.

e. Sampler's name (state experience and training)

f. Standby/Relief sampler

g. State certified laboratory doing the analyses

General Note:

When selecting a sampling tap, it is important to ensure that the tap is located in a clean environment. Consider protection from contamination by humans, animals, airborne materials or other sources. Use outside faucets that are clean, have been in frequent use, are at least 18 inches above the ground and discharge downward. Do not sample from a hose. Do not sample deadends.

DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT
District Office Name, Address, Phone)

BACTERIOLOGICAL SAMPLE SITING PLAN

System Information:

Name of Facility:_____ System Number:_____
Street Address:_____ Ph. No.:_____
Mailing Address:_____ Fax:_____
Service Connections:____ Population Served:_____ Sampling Frequency:_____

Sample Collection:

All water samples will be collected by: _____

Name of Laboratory:_____

Mailing Address:_____

State Lab Code:_____ Phone #:_____ Fax #:_____

The Laboratory was sent a copy of this plan on:_____

Raw Water Sampling:

Is water continuously treated with chlorine? ☐ YES ☐ NO

Systems which provide continuous chlorine treatment are required to take samples of water prior to the addition of chlorine (raw water samples) on a quarterly basis. Please list below the sources which are continuously treated and the months when raw water samples will be taken:

1._____ Months sampled:_____

2._____ Months sampled:_____

Map of System:

A map of the distribution system showing the source (well, spring, etc.), storage tanks, treatment facilities, distribution piping, routine sample locations, and follow-up (repeat) sample locations is required. Have you enclosed this map? ☐ YES ☐ NO

(OVER)

BACTERIOLOGICAL SAMPLE SITING PLAN (cont.)

Sample Locations:

The following describes each routine sample location, what months the location will be sampled, and where follow-up (repeat) samples will be taken in the event of a "positive" routine sample:

Routine Sample Location:

1. _____
(location name or address)

Water samples will be collected from this location during the months of (circle):

1st Qtr: Jan. Feb. Mar.
2nd Qtr: Apr. May Jun.
3rd Qtr: July Aug. Sept.
4th Qtr: Oct. Nov. Dec.

Description:_____
(hose bib, sink faucet, etc.)

Follow-up (repeat) Sample Location:

1. _____
(routine sample location name or address)

2. _____
(location name or address up-stream)

3. _____
(location name or address down-stream)

4. _____
(source)

Routine Sample Location: (if required)

2. _____
(location name or address)

Water samples will be collected from this location during the months of (circle):

1st Qtr: Jan. Feb. Mar.
2nd Qtr: Apr. May Jun.
3rd Qtr: July Aug. Sept.
4th Qtr: Oct. Nov. Dec.

Description:_____
(hose bib, sink faucet, etc.)

Follow-up (repeat) Sample Location:

1. _____
(routine sample location name or address)

2. _____
(location name or address up-stream)

3. _____
(location name or address down-stream)

4. _____
(source)

Routine Sample Location: (if required)

3. _____
(location name or address)

Water samples will be collected from this location during the months of (circle):

1st Qtr: Jan. Feb. Mar.
2nd Qtr: Apr. May Jun.
3rd Qtr: July Aug. Sept.
4th Qtr: Oct. Nov. Dec.

Description:_____
(hose bib, sink faucet, etc.)

Follow-up (repeat) Sample Location:

1. _____
(routine sample location name or address)

2. _____
(location name or address up-stream)

3. _____
(location name or address down-stream)

4. _____
(source)

Report Prepared by:_____

Signature and Title:_____ **Date:**_____

APPENDIX N

Received
CDPH Redding
MAY 09 2008
Drinking Water
Field Ops Branch

BELLA VISTA WATER DISTRICT

2007 CONSUMER CONFIDENCE REPORT

(Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.)

The District is pleased to present this year's Consumer Confidence Report. Our constant goal is to provide a safe and dependable supply of drinking water. We want you to understand the efforts that we make to continually improve the water treatment process and to protect our water. This report shows our water quality and what it means.

POSTED

WHERE OUR WATER COMES FROM

Our water sources include surface water from the Sacramento River, groundwater from five wells, and emergency intertie connections with the City of Redding, and the City of Shasta Lake. With the addition of the two 600 Hp variable speed pumps as part of the recent upgrades at the District's Wintu Pumping Plant (located on the Sacramento River) the District is able to pump and treat river water under conditions that, in the past, had required us to shut the pump station down and run our wells. The ability to pump at much lower flow rates (down to approximately four million gallons per day versus the previous minimum pumping rate of fifteen million gallons per day) and improvements at the Water Treatment Plant have allowed us to pump and treat water during storm events that, previously, would have required us to shut these facilities down and rely on our wells. Therefore, in 2007 the District ran its wells only when the Wintu Pump Station had to be shut down for short periods in order to perform major improvements and scheduled maintenance.

In 2007, with the ability to run the Wintu Pump Station and the Water Treatment Plant throughout the winter, surface water made up 98.8% of the treated water supply, or approximately 4.92 billion gallons (compared to 92.5% of the treated water supply and 4.97 billion gallons in 2006). With the improvements at the Wintu Pumping Plant and the Water Treatment Plant the District can now pump up to 52.5 million gallons per day (mgd) through its treatment facilities (up from 45 mgd).

The District's wells draw from the Redding groundwater basin. Groundwater made up 1.2% of the total supply, or approximately 58.5 million gallons in 2007 (compared to 7.5% of the treated water supply and 405 million gallons in 2006). The treatment process at each of the five wells consists of oxidation of iron and manganese using chlorine, followed by absorption of the iron and manganese oxides in pressure filters. A chlorine residual is carried through the entire process to aid in maintaining a chlorine residual in the distribution system. No iron or manganese was detected in any of the treated well water samples collected in 2007. Well water is warmer than the treated surface water and has a different taste due to its higher mineral content. At times, mixing of chlorinated well water with treated river water in the distribution system generates a more noticeable taste due to the different physical and chemical properties of the waters. To ensure the safety of the water the same microbiological testing is completed weekly at sites in the water distribution system, regardless of the source.

The District received less than 0.003% of its total supply or approximately 0.15 million gallons of water, through its interties during all of 2007.

Source water assessments were performed by the Department of Public Health between January 2002 and April 2003. The District's Sacramento River source is considered most vulnerable to the following activities associated with contaminants detected in the water supply: 1) metal plating/finishing/fabricating, 2) wood/pulp/paper processing and mills, and 3) drinking water treatment plants. The source is considered most vulnerable to the following activities not associated with any detected contaminants: 1) concentrated aquatic animal production facilities, 2) historic waste dumps/landfills, 3) landfills/dumps, 4) historic mining operations, and 5) wastewater treatment plants and disposal facilities (above Shasta Dam). The District's well sources are considered most vulnerable to the following activities not associated with any detected contaminants: 1) lumber

A NOTE TO THE IMMUNO-COMPROMISED FROM THE UNITED STATES EPA

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791) or on their website at http://www.epa.gov/safewater.

ABOUT THE WATER QUALITY TABLES

Bella Vista Water District routinely monitors for constituents in your drinking water according to federal and state laws. The tables in this report show the results of our monitoring for the period through December 31, 2007. Where contaminants are monitored less than once per year, the values included in the report tables represent the results of the most recent analyses. All drinking water, including some bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. The presence of these constituents does not necessarily pose a health risk. In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms, the following definitions are provided:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not detectable at current testing limits.

Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in 1.9 years or a single penny in $10,000.

Parts per billion (ppb) or Micrograms per liter (µg/L) - one part per billion corresponds to one minute in 1,900 years, or a single penny in $10,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Microsiemens per centimeter (µS/cm) is a unit for reporting the specific electrical conductance of the water.

Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements. Turbidity in excess of 5 NTU is just noticeable to the average person.

Maximum Contaminant Level (MCL) - Highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Primary Drinking Water Standards (PDWS) - MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS) - MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect health at the MCL levels.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal or PHG – The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Regulatory Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT) - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

Sampling Results Showing the Detection of Contaminants With a Secondary Drinking Water Standard

(Aesthetic standards, established by the California Department of Health Services - Division of Drinking Water)

Contaminant or Analyte	MCL	PHG (MCLG)	Unit of Measure-ment	Sacramento River		Well Water	
				Average Level Detected	Range	Average Level Detected*	Range*
12. Foaming Agents (MBAS)	500	N/A	ppb	30	-	8	ND - 30
13. Total dissolved solids	1,000	N/A	ppm	93	-	203	167 - 234
14. Specific conductance	1,600	N/A	µS/cm	117	-	318	252 - 399
15. Chloride	500	N/A	ppm	3.0	-	35.3	9.9 - 56.1
16. Sulfate	500	N/A	ppm	2.9	-	2.2	0.7 - 5.1

Sampling Results for Unregulated Contaminants

(Unregulated contaminant monitoring helps the USEPA and the California Department of Health Services to determine where certain contaminants occur and whether the contaminants need to be regulated.)

17. Boron	Action Level = 1000 ppb	N/A	ppb	ND	-	498	208 - 996
18. Vanadium	Action Level = 50 ppb	N/A	ppb	4	-	0.4	ND - 1

Sampling Results for Sodium, Hardness and pH

19. Sodium	N/A	N/A	ppm	5.79	-	40	18 - 60
20. Hardness	N/A	N/A	ppm	42	-	57	40 - 75
21. pH	6.5 - 8.5	N/A	pH units	7.8	-	7.7	7.5 - 7.9

* Values shown include the latest data for each of the wells. Not all of the results are from samples collected in 2007.

Sampling Results Showing the Detection of Lead and Copper

Contaminant	PHG (MCLG)	Action Level (AL)	90th percentile level detected	No. of samples collected	No. Sites exceeding AL	Typical Source of Contaminant
Lead (ppb)	2	15	ND	31	0	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppb)	170	1300	202	31	0	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives

Note: The District is required to conduct lead and copper sampling every three years. These results are from the most recent round of sampling conducted in 2007.

APPENDIX Q

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Well #1
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	4.8
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	1.37 MGD
Maximum Daily	1.37 MGD
Peak Hourly Flow	57000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #2
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	5.1
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	1.15 MGD
Maximum Daily	1.15 MGD
Peak Hourly Flow	48000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #3
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	4.7
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	.94 MGD
Maximum Daily	.94 MGD
Peak Hourly Flow	39000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #4
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidzer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	2
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	.58 MGD
Maximum Daily	.58MGD
Peak Hourly Flow	24000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	DPD
Type of Instrumentation	Hach Hand held
Continuous/Grab	Grab
Where Tests Made	Filter Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	None
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Well #6
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidzer
Point of Application	Pump Station Discharge
Mixing	Injection Diffuser
Contact Time (Minutes)	5.8
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	0.94 MGD
Maximum Daily	0.94 MGD
Peak Hourly Flow	39000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Wintu Pump Station
Type of Disinfection Used	Chlorine Gas
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	54" Pipe
Mixing	Injection Diffuser
Contact Time (Minutes)	Varies w/ Flow
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	
Average Daily	13.5 MG
Maximum Daily	39.7 MGD
Peak Hourly Flow	50.4 MGD
Machine	
Make	Wallace & Tiernan V 10K
Type	Vacuum
Capacity	500 gal per day
Condition	Excellent
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	100%
Cylinder or Crock Capacity	2000 Lbs
Stock on Hand	12000 Lbs
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Gas Sensors/ Alarm/ Asov's
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Daily
Residual Tests	Continuous / Daily
Tests Made (DPD, etc.)	Online / DPD
Type of Instrumentation	Amperametric / Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Onsite
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly / Daily
Reliability Features	Backup online continuous
Auxiliary Power	Yes
Automatic Switchover	Yes
Condition of Scales	3 Years Old
Alarms	Yes

Defects or Remarks	None

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Water Treatment Plant
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Treated
Oxidant Demand Character	Strong Oxidizer
Point of Application	42" Pipe
Mixing	Injection Diffuser
Contact Time (Minutes)	Varies w/ Flow
Minimum Contact Time Before Residual Test	300 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	
Average Daily	13.5 MG
Maximum Daily	39.7 MGD
Peak Hourly Flow	50.4 MGD
Machine	
Make	Alldos
Type	Positive Displacement
Capacity	4.2 gal per hour
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	1.2%
Cylinder or Crock Capacity	N/A
Stock on Hand	500 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	High & Low Free CL_2 res. Alarms
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Daily
Residual Tests	Continuous / Daily
Tests Made (DPD, etc.)	Online / Titration
Type of Instrumentation	Amperametric
Continuous/Grab	Both
Where Tests Made	Lab
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly / Daily
Reliability Features	
Auxiliary Power	Yes
Automatic Switchover	Yes - PLC Controlled
Condition of Scales	N/A
Alarms	Yes

Defects or Remarks	None

APPENDIX P

BVWD 2007 Lead and Copper Sampling Results

	Sample No.	Lead	Copper		Sample No.	Lead		Sample No.	Copper			
1	7060368-01	n	0.105		7060368-01	0		7060368-05	0.000	1		3.2%
2	7060368-02	n	0.106		7060368-02	0		7060368-20	0.000	2		6.5%
3	7060368-03	n	0.091		7060368-03	0		7060368-24	0.000	3		9.7%
4	7060368-04	n	0.202		7060368-04	0		7060368-15	0.052	4		12.9%
5	7060368-05	n	n		7060368-05	0		7060368-12	0.056	5		16.1%
6	7060368-06	9.2	0.290		7060368-07	0		7060368-22	0.061	6		19.4%
7	7060368-07	n	0.165		7060368-08	0		7060368-10	0.067	7		22.6%
8	7060368-08	n	0.199		7060368-09	0		7060368-27	0.085	8		25.8%
9	7060368-09	n	0.205		7060368-10	0		7060368-03	0.091	9		29.0%
10	7060368-10	n	0.067		7060368-11	0		7060368-29	0.092	10		32.3%
11	7060368-11	n	0.123		7060368-12	0		7060368-01	0.105	11		35.5%
12	7060368-12	n	0.056		7060368-13	0		7060368-02	0.106	12		38.7%
13	7060368-13	n	0.144		7060368-14	0		7060368-17	0.108	13		41.9%
14	7060368-14	n	0.197		7060368-15	0		7070210-01	0.117	14		45.2%
15	7060368-15	n	0.052		7060368-16	0		7060368-19	0.121	15		48.4%
16	7060368-16	n	0.153		7060368-17	0		7070210-02	0.122	16		51.6%
17	7060368-17	n	0.108		7060368-18	0		7060368-11	0.123	17		54.8%
18	7060368-18	n	0.158		7060368-19	0		7060368-21	0.136	18		58.1%
19	7060368-19	n	0.121		7060368-20	0		7060368-28	0.137	19		61.3%
20	7060368-20	n	n		7060368-21	0		7060368-26	0.140	20		64.5%
21	7060368-21	n	0.136		7060368-22	0		7060368-13	0.144	21		67.7%
22	7060368-22	n	0.061		7060368-24	0		7060368-30	0.151	22		71.0%
23	7060368-24	n	n		7060368-25	0		7060368-16	0.153	23		74.2%
24	7060368-25	n	0.242		7060368-26	0		7060368-18	0.158	24		77.4%
25	7060368-26	n	0.140		7060368-27	0		7060368-07	0.165	25		80.6%
26	7060368-27	n	0.085		7060368-28	0		7060368-14	0.197	26		83.9%
27	7060368-28	n	0.137		7060368-29	0		7060368-08	0.199	27		87.1%
28	7060368-29	n	0.092		7060368-30	0		7060368-04	0.202	28	90th percentile	90.3%
29	7060368-30	n	0.151		7070210-01	0		7060368-09	0.205	29		93.5%
30	7070210-01	n	0.117		7070210-02	0		7060368-25	0.242	30		96.8%
31	7070210-02	n	0.122		7060368-06	9.2		7060368-06	0.290	31		100.0%
					Min	0			0			
					Max	9.2			0.29			

LEAD AND COPPER RULE MONITORING RESULTS

	Lead - 90th Percentile	Copper - 90th Percentile
First Round Results July-December 1992	9.0 $\mu g/\ell$	627 $\mu g/\ell$
Second Round Results January-June 1993	7.1 $\mu g/\ell$	633 $\mu g/\ell$
Third Round Results January-June 1994	8.6 $\mu g/\ell$	462 $\mu g/\ell$
Fourth Round Results January-June 1995	9.0 $\mu g/\ell$	519 $\mu g/\ell$
Fifth Round Result January-June 1998	5.8 $\mu g/\ell$	182 $\mu g/\ell$
Sixth Round Result January-June 2001	ND	313 $\mu g/\ell$
Seventh Round Result January-June 2004	ND	293 $\mu g/\ell$
Eighth Round Results January-June 2007	ND	202 $\mu g/\ell$

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BOB NASH TODD R. SIKES
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Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

July 26, 2007

Called w/ Mess MR 7-30-07 see note

Ms. Karol Enferadi
Department of Health Services
Office of Drinking Water, Room 113
2151 Berkeley Way
Berkeley, CA 94704

Re: Federal Lead and Copper Corrosion Rule Monitoring Results

Dear Ms. Enferadi:

The Bella Vista Water District has completed the eighth round of the sampling for lead and copper. The District solicited the cooperation of 30 of the prior round sampling point residences. Rather than select all of the sites from Tier 1's, we chose to include four Tier 2 sites and one Tier 3 site. These sites had previously manifested detectable amounts of lead in the water. We felt it was necessary to continue monitoring these sites to fairly represent the previous rounds of lead and copper sampling and as a courtesy to our customers.

This eighth round process began on June 1 and sampling was completed by July 6. The "90th percentile" concentration level for lead was non-detectable and the "90th percentile" concentration level for copper was 202 ppb.

If you have any questions or require further clarification of our sampling process, please call me at (530) 241-1085.

Sincerely,

Don M. Groundwater, P.E.
District Engineer

Enclosures

cc: Michael Ricks, DHS Redding ✓

Received
DHS-Redding

JUL 2 7 2007

Drinking Water
Field Ops Branch

APPENDIX Q

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Well #1
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	4.8
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	1.37 MGD
Maximum Daily	1.37 MGD
Peak Hourly Flow	57000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #2
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	5.1
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	1.15 MGD
Maximum Daily	1.15 MGD
Peak Hourly Flow	48000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #3
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	4.7
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	.94 MGD
Maximum Daily	.94 MGD
Peak Hourly Flow	39000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Tom Zaharris
Collected By:	Pace Civil Date: 4/08

Location:	Well #4
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidzer
Point of Application	Pump Station Discharg
Mixing	Injection Diffuser
Contact Time (Minutes)	2
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	.58 MGD
Maximum Daily	.58MGD
Peak Hourly Flow	24000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	DPD
Type of Instrumentation	Hach Hand held
Continuous/Grab	Grab
Where Tests Made	Filter Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxiliary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	None
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Well #6
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidzer
Point of Application	Pump Station Discharge
Mixing	Injection Diffuser
Contact Time (Minutes)	5.8
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	No
Average Daily	0.94 MGD
Maximum Daily	0.94 MGD
Peak Hourly Flow	39000 gal
Machine	
Make	Pulsatron Series E
Type	Positive Displacement
Capacity	42 gal per day
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	12%
Cylinder or Crock Capacity	N/A
Stock on Hand	150 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Yes
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Weekly
Residual Tests	Yes
Tests Made (DPD, etc.)	Continuously / DPD
Type of Instrumentation	Amperametric / Hach Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Plant Effluent
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly When Running
Reliability Features	
Auxillary Power	No
Automatic Switchover	N/A
Condition of Scales	N/A
Alarms	Low and High Free CL_2
Defects or Remarks	N/A

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Wintu Pump Station
Type of Disinfection Used	Chlorine Gas
Application:	
Water Treated (Raw, Filtered, etc.)	Raw
Oxidant Demand Character	Strong Oxidizer
Point of Application	54" Pipe
Mixing	Injection Diffuser
Contact Time (Minutes)	Varies w/ Flow
Minimum Contact Time Before Residual Test	10 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	
Average Daily	13.5 MG
Maximum Daily	39.7 MGD
Peak Hourly Flow	50.4 MGD
Machine	
Make	Wallace & Tiernan V 10K
Type	Vacuum
Capacity	500 gal per day
Condition	Excellent
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	100%
Cylinder or Crock Capacity	2000 Lbs
Stock on Hand	12000 Lbs
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	Gas Sensors/ Alarm/ Asov's
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Daily
Residual Tests	Continuous / Daily
Tests Made (DPD, etc.)	Online / DPD
Type of Instrumentation	Amperametric / Hand held
Continuous/Grab	Continuous / Grab
Where Tests Made	Onsite
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly / Daily
Reliability Features	Backup online continuous
Auxiliary Power	Yes
Automatic Switchover	Yes
Condition of Scales	3 Years Old
Alarms	Yes

Defects or Remarks	None

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DISINFECTION DATA - CHLORINATION

System Name:	BVWD **System Number: 4510014**
Source of Information:	Operation and Maintenance Manual
Collected By:	Pace Civil Date: 4/08

Location:	Water Treatment Plant
Type of Disinfection Used	Sodium Hypochlorite
Application:	
Water Treated (Raw, Filtered, etc.)	Treated
Oxidant Demand Character	Strong Oxidizer
Point of Application	42" Pipe
Mixing	Injection Diffuser
Contact Time (Minutes)	Varies w/ Flow
Minimum Contact Time Before Residual Test	300 sec
How Was Contact Time Measured or Determined	V/Q=T
Water Flow Variation	
Average Daily	13.5 MG
Maximum Daily	39.7 MGD
Peak Hourly Flow	50.4 MGD
Machine	
Make	Alldos
Type	Positive Displacement
Capacity	4.2 gal per hour
Condition	Good
Housing (Type)	PVC
Insulation	N/A
Heating	N/A
Chemical Added	N/A
% Available Disinfection, Form	1.2%
Cylinder or Crock Capacity	N/A
Stock on Hand	500 gal
Safety features (Locks, Lighting, Ventilation, Alarms, etc.)	High & Low Free CL_2 res. Alarms
Operation and Maintenance	Annually
Spare Parts on Hand	Yes
Ability to Make Repairs	Yes
Equipment Inspection Frequency	Daily
Residual Tests	Continuous / Daily
Tests Made (DPD, etc.)	Online / Titration
Type of Instrumentation	Amperametric
Continuous/Grab	Both
Where Tests Made	Lab
Type (Total, Free, Combined, other)	Free
Records	Yes
Frequency of Equipment Calibration	Weekly / Daily
Reliability Features	
Auxiliary Power	Yes
Automatic Switchover	Yes - PLC Controlled
Condition of Scales	N/A
Alarms	Yes

Defects or Remarks	None

APPENDIX R

According to the DPH's September 22, 2006, memorandum regarding "In-Line Filter Guidance" one of the criteria for demonstrating that our treatment plant can provide 2-log cryptosporidium removal is as follows:

"1. Determine whether the plant's performance meets the Cryptosporidium Action Plan goals: specifically, whether the effluent turbidity is able to "consistently achieve an effluent turbidity of 0.1 NTU"[1]. For purposes of this demonstration, "consistently" will be taken to mean that not more than 5% of the turbidity samples collected in any month shall exceed 0.1 NTU. The demonstration study should be twelve months long, after which time the permit should be amended to require continued conformance to this criteria, and to add this to the monthly monitoring report submitted to the Department. The other performance requirements would not be affected by this addition."

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[1] California Department of Health Services, Cryptosporidium Action Plan, January 2000 (Appendix A, p.4)

Attached is a copy of a spreadsheet showing the 90th, 95th, 98th, and 99th "Percentile Values" for the Water Treatment Plant's effluent turbidity that come from the DPH's reporting form titled the "Monthly Summary of Monitoring for Surface Water Treatment regulations" (that is included in the monthly report to the DPH every month). The spreadsheet includes the values for the period from January 2005 through December 2007. During much of this period the Wintu Pump Station and Water Treatment Plant Expansion Project was under construction (construction started in September 2004 and was completed earlier this year). With the exception of the first day of initial startup period for the new PLC and SCADA programming for Wintu and the WTP (April 25, 2006) the treatment facilities have been able to consistently meet or exceed the required performance criteria.

The following contains additional details regarding operation of these facilities during this period:

- The Wintu Pump Station (WPS) and the Water Treatment Plant (WTP) were taken off-line on December 22, 2004, and put back on-line March 7, 2005, for construction of portions of the Wintu Pump Station and Water Treatment Plant Expansion Project.
- The WTP was operated in the In-Line Filtration mode during the entire period from March 7, 2005, to November 5, 2005.
- The WPS and WTP went off-line for construction on November 5, 2005 and were put back on-line on April 23, 2006 after flushing the main aqueduct and filtering to waste during initial startup of the new facilities.
- The WTP was operated in the In-Line Filtration mode during the period from April 23, 2006 until May 29, 2006 when the District switched to "High-Flow" mode and started adding coagulant at the WPS. The WTP was operated in this manner until October 15, 2006, when the operation was switched back to the "Low Flow" mode and the addition of coagulant at the WPS was discontinued.
- The WTP was operated in the In-Line Filtration mode during the period from October 15, 2006, until May 29, 2007, at which time the operation was switched back to "High-Flow" (Direct Filtration) mode and the the addition of coagulant at the WPS was restarted. The WTP was operated in this manner until October 11, 2007, when the operation was once again switched back to the "Low Flow" mode and the addition of coagulant at the WPS was discontinued.
- With the return of warmer weather and higher water demands the WTP was switched back to the High Flow mode on May 13, 2008, and operated in this mode until rains (and reduced flows) forced the District to switch back to the low flow mode on May 23.

Bella Vista Water District
Water Treatment Plant
Effluent Turbidity Data

	Percentile NTU Values														
Year	2005												Average	Range	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
90th Percentile	offline	offline	0.07	0.06	0.05	0.06	0.06	0.05	0.05	0.04	0.04	offline	0.05	0.04	0.07
95th Percentile	offline	offline	0.09	0.07	0.06	0.07	0.07	0.06	0.06	0.04	0.04	offline	0.06	0.04	0.09
98th Percentile	offline	offline	0.09	0.08	0.07	0.09	0.08	0.07	0.07	0.05	0.04	offline	0.07	0.04	0.09
99th Percentile	offline	offline	0.13	0.09	0.07	0.12	0.08	0.07	0.07	0.05	0.05	offline	0.08	0.05	0.13
Year	2006														
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Range	
90th Percentile	offline	offline	offline	0.10	0.06	0.06	0.06	0.06	0.05	0.04	0.03	0.03	0.05	0.03	0.10
95th Percentile	offline	offline	offline	0.13	0.06	0.06	0.06	0.06	0.06	0.05	0.04	0.04	0.06	0.04	0.13
98th Percentile	offline	offline	offline	0.13	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.07	0.05	0.13
99th Percentile	offline	offline	offline	0.13	0.07	0.08	0.06	0.06	0.08	0.08	0.05	0.06	0.07	0.05	0.13
Year	2007														
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Range	
90th Percentile	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04
95th Percentile	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.05
98th Percentile	0.06	0.06	0.06	0.06	0.04	0.04	0.04	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.06
99th Percentile	0.07	0.08	0.07	0.08	0.04	0.04	0.05	0.04	0.04	0.05	0.03	0.04	0.05	0.03	0.08

Operated the entire month in the In-Line Filtration Mode
Operated part of the month in the In-Line Filtration Mode and part in the Direct Filtration Mode
Operated the entire month in the Direct Filtration Mode

APPENDIX S

Bella Vista Water Treatment Plant
Online CT Calculations

Maximum Plant Flow Rate	10.27	**MGD**
Quail Ridge Flow Rate	0	**gpm**
Number of Filters Online	4	
WTP Raw Water Chlorine Residual	1.49	**mg/l**
Treated Water Chlorine Residual	1.72	**mg/l**
Simpson Chlorine Residual	1.06	**mg/l**
pH	7.87	**pH**
Temperature	9.90	**deg C**
Giardia Log Reduction	1.00	
Virus Log Reduction	4.00	

Date: 1/1/2008
Time: 2:28 AM

Giardia CT Calculation

Location	Volume/ Unit (Gallons)	Units Online	Total Volume (Gallons)	Flow (gpm)	HRT (min)	T10/HRT	T10 (min)	Chlorine Residual (mg/l)	CT Credited (min*mg/l)	CT Required (min*mg/l)	CT Ratio	
54" Pipe - Wintu to WTP Sample Pt.	678,277	1	678,277	7,133	95.09	1.00	95.09	1.49	141.68	54.96	2.578	CT Raw
Sample Pt. To 42" Header at Filter #1	18,745	1	18,745	7,133	2.63	1.00	2.63	1.72	4.52	56.16	0.080	
18" Filter Influent to top of filter	476	4	1,904	7,133	0.27	1.00	0.27	1.72	0.46	56.16	0.008	
Filters	16,236	4	64,944	7,133	9.10	0.70	6.37	1.72	10.96	56.16	0.195	
Filter Effluent Piping to 54" Pipe	4,586	1	4,586	7,133	0.64	1.00	0.64	1.72	1.11	56.16	0.020	
54" Pipe to Lateral 1.3N	277,800	1	277,800	7,133	38.95	1.00	38.95	1.06	41.28	52.22	0.790	
Lateral 1.3N to Simpson Pump Station	448,600	1	448,600	7,133	62.89	1.00	62.89	1.06	66.66	52.22	1.277	
Total							**206.84**		**308.19**		**4.948**	CT Total
												CT Treated=Total - Raw
												2.371

Virus CT Calculation

Location	Volume/ Unit (Gallons)	Units Online	Total Volume (Gallons)	Flow (gpm)	HRT (min)	T10/HRT	T10 (min)	Chlorine Residual (mg/l)	CT Credited (min*mg/l)	CT Required (min*mg/l)	CT Ratio	
54" Pipe - Wintu to WTP Sample Pt.	678,277	1	678,277	7,133	95.09	1.00	95.09	1.49	141.68	6.04	23.457	CT Raw
Sample Pt. To 42" Header at Filter #1	18,745	1	18,745	7,133	2.63	1.00	2.63	1.72	4.52	6.04	0.748	
18" Filter Influent to top of filter	476	4	1,904	7,133	0.27	1.00	0.27	1.72	0.46	6.04	0.076	
Filters	16,236	4	64,944	7,133	9.10	0.70	6.37	1.72	10.96	6.04	1.815	
Filter Effluent Piping to 54" Pipe	4,586	1	4,586	7,133	0.64	1.00	0.64	1.72	1.11	6.04	0.183	
54" Pipe to Lateral 1.3N	277,800	1	277,800	7,133	38.95	1.00	38.95	1.06	41.28	6.04	6.835	
Lateral 1.3N to Simpson Pump Station	448,600	1	448,600	7,133	62.89	1.00	62.89	1.06	66.66	6.04	11.037	
Total							**206.84**		**308.19**		**44.152**	CT Total
												CT Treated=Total - Raw
												20.694

APPENDIX T

SURFACE WATER SOURCE DATA SHEET (Page 1 of 2)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
** Indicates items required for Source Water Assessment*		
	(separate multiple entries in field with semi-colon)	Actual, Estimated or
GENERAL INFORMATION		
System Name	Bella Vista Water District	*from DHS data*
System Number	4510014	*from DHS data*
Source of Information *(well log, DHS/County files, system, etc)*	BVWD 2005 Master Plan; System; Plans	
Organization Collecting Information *(DHS, County, System, other)*	Pace Civil Inc.	
Date Information Collected/Updated	8-Mar	
SOURCE IDENTIFICATION		
* Source Name	Wintu Pump Station	*from DHS data*
* DHS Source Identification Number (**FRDS ID No.**)		*from DHS data*
Source Status (Active, Standby, Inactive)	Active	*from DHS data*
SOURCE LOCATION		
Inlet Ground Surface Elevation (ft above Mean Sea Level)	490.5	
Street or Road	580 Hilltop Drive	
Nearest Cross Street	Sand Point Drive	
City	Redding	
County	Shasta	
Site plan on file? ("YES" or "NO")	YES	
TYPE OF SOURCE		
Type of Source: (Lake, Reservoir, River, Stream, Creek, Other)	River	
Production (gallons per year)	35 MG	
Frequency of Use (hours/year)	Continuous	
LAKE/RESERVOIR DATA (If Applicable)		
Name of Lake or Impounding Reservoir	N.A.	
Date Dam Constructed	N.A.	
Dam Length (feet)	N.A.	
Dam Height (feet)	N.A.	
Dam Width - Base (feet)	N.A.	
Dam Width - Top (feet)	N.A.	
Surface Area when full (acres)	N.A.	
Capacity (acre-feet)	N.A.	
Reservoir Yield (gallons per day)	N.A.	
Yield Reliability (% of time the above yield can be supplied)	N.A.	
Outlet Location	N.A.	
Outlet Level(s) (distance below maximum water surface) (feet)	N.A.	
Multiple Outlet Depths Available? "YES" or "NO"	N.A.	
Outlet Distance to Inflow (feet)	N.A.	
Algae Control Measures	N.A.	
Type of Recreational Activities in Reservoir *(list all that apply: boating, swimming, fishing, water skiing, etc.)*	N.A.	
Distance to Nearest Sewage Facilities to Outlet (feet)	None	
STREAM INTAKE DATA (If Applicable)		
Name of River, Stream or Creek	Sacramento River	
Intake Location	Wintu Pump Station	
Stream Flow - Maximum (ft3/sec)	70900	
Stream Flow - Minimum (ft3/sec)	2570	
Stream Flow - Average (ft3/sec)	11200	
Date Diversion Structure Constructed	1962	
Diversion Structure Type (direct, infiltration gallery, etc.)	Direct	
Distance to Nearest Sewage Facilities to Diversion Structure (feet)	None	

SURFACE WATER SOURCE DATA SHEET (Page 2 of 2)

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.		
** Indicates items required for Source Water Assessment*		
WATERSHED DATA		
Area of Watershed (acres)	41600	
Area Owned or Controlled by Water System (acres)	N.A.	
Primary Tributaries	Pit River; McCloud; Squaw Creek	
Topography *(list all that apply: flat terrain, hilly, mountainous, etc.)*	Flat terrain, Hilly, Mountainous	
Percent slopes (range)	0-100%	
Geology	Igneous	
Watershed prone to landslides? "YES" or "NO"	NO	
Predominant Soil Types *(list all that apply: sand, loam, silt, clay, gravel, rock, fractured rock)*	Cravel, Rock, Fractured Rock	
Predominant Vegetation *(list all that apply: grass, shrubs, chaparral, trees, forested, etc.)*	Grass, Shrubs, Chaparral, Trees, Forested	
Watershed prone to erosion? "YES" or "NO"	NO	
Mean Seasonal Precipitation (inches/year)	45	
Significant Ground water Recharge? "YES" or "NO"	YES	
* Neighborhood/Surrounding Area *(see Note 1)*	RU	
Wastewater measures (septic systems, sewer treatment, etc.)	Septic Systems	
Watershed control measures	NO	
INTAKE PIPE		
Material	N.A.	
Diameter	N.A.	
Length	N.A.	
Depth	N.A.	
Pumped or Gravity flow	N.A.	
Discharges to: *(i.e., distribution system, storage, etc.)*	N.A.	
INTAKE PUMP INFORMATION		
Number	5	
Make	Floway; Floway; Johnson; Johnson; Johnson	
Type	Verticle Turbine	
Size (hp)	600;600;1000;1000;1000	
* Capacity (gpm)	6000;6000;11200;11200;11200	
Lubrication Type	Grease	
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	
Auxiliary power available? ("YES" or "NO")	YES	
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Pressure; Level in Tank	
REMARKS AND DEFECTS (use additional sheets as necessary)		
See Redding Area Water Sanitary Survey, Pace Civil Inc., Dec. 2006		
NOTES		
1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other		

APPENDIX U

State of California		Department of Health Services

Filtration Plant Data

System Name:	Bella Vista Water District	
System Number:	4510014	
Source of Information:	Tom Zaharris; Micro-Chem Laboratoris Filter Media Analysis; Plan	
Collected By:	Pace Civil Inc. | Date: 3/08	
Name Of Water Treatment Plant:	Water Treatment Plant	
Treatment Classification:	Direct Filtration	
Plant Capacity:	48000 gpm	
Design Flow (mgd):	60	
Maximum Flow (mgd):	69	
How Is The Flow Measured?	Flow meter	
Flow Variations:	2750gpm-40000gpm	
Year Operation Began:	1977	
Frequency Plant Checked:	Daily	
Raw Water Pumps:	5	
Type And Method Of Control:	Vertical Turbine; Automatic-PLC	
Capacity Of Each:	6000;6000;11200;11200;11200	
Pump #1 600 (hp)	6000(gpm)	8.64(mgd)
Pump #2 600 (hp)	6000(gpm)	8.64(mgd)
Pump #3 1000 (hp)	11200(gpm)	16.13(mgd)
Pump #4 1000 (hp)	11200(gpm)	16.13(mgd)
Pump #5 1000 (hp)	11200(gpm)	16.13(mgd)
Influent Turbidity Measured Continuously?	YES	
Excessive Influent Turbidity Alarm?	YES	
What Turbidity Level Triggers Alarm?	20 NTU	
Automatic Shutdown At High Turbidity?	YES	
Chemical Data		
Type:	Chlorine Gas; NaOCl; ACH Polymer	
Purpose:	Pre-Filtration; Post Filtration; Coagulation	
Strength of Chemical Injected (%):	100%	
Rate Injected Into System:	Flow Based	
Dosage (mg/l):	Flow Based	
Is Chemical Added Continuously?	YES	
Feeding and Injection Equipment		
Type: Dosing Pumps (2)		
Make: Alldos; Alldos		
Model: 43;42		
Capacity: 13.7 gallons per hour; 7.6 gallons per hour		
What Determines Dose Level Used? PLC Flow Paced; Streaming Current Monitor		
Are Jar Tests Performed? YES		
How Often? Annually		
Chemical Storage		
Capacity:	Coagulant	Chlorine
Days Of Storage:	.5 yrs	.5 yrs
Chemical Form When Added To System?	Neat	Neat
Points Of Application:	Pre-Filtration	Post-Filtration
Low Level Chemical Alarm Provided?	YES	

Filtration Plant Data-(cont'd)

Flash Mixing		
Type:	N.A.	
Number:	N.A.	
Mixing Energy (G):	N.A.	
Nominal (sec^-1):	N.A.	
Maximum (sec^-1):	N.A.	
Nominal Mixing Time (sec):	N.A.	
Flocculation Basins		
Number Of Basins:	54 in Diameter Pipe From Wintu Pump Station to Water Treatment Plant	
Stages Of Flocculation:	N.A.	
Inside Dimensions of Each Stage (LxW in feet):	N.A.	
Stage 1:	N.A.	
Stage 2:	N.A.	
Stage 3:	N.A.	
Average Water Depth (ft):	N.A.	
Volume Of Each Stage (ft^3):	N.A.	
Stage 1:	N.A.	
Stage 2:	N.A.	
Stage 3:	N.A.	
Volume Of Each Basin (ft^3):	N.A.	
Total Volume (ft^3):	N.A.	
Total Flocculation Time (sec):	N.A.	
Velocity Gradient (fps/ft):	N.A.	
Type Of Flocculators:	N.A.	
Number Of Flocculators:	N.A.	
Stage 1:	N.A.	
Stage 2:	N.A.	
Stage 3:	N.A.	
Number Per Basin:	N.A.	
Total Number:	N.A.	
Mixing Energy (G):	N.A.	
Stage 1-High: N.A.	(sec^-1)	Stage 1-Low: N.A.
Stage 2-High: N.A.	(sec^-1)	Stage 2-Low: N.A.
Stage 3-High: N.A.	(sec^-1)	Stage 3-Low: N.A.
Total GT For Flocculation Step:	N.A.	
Flocculator Power (Each):	N.A.	
Stage 1 (hp): N.A.	Stage 2 (hp):	N.A.
Stage 3 (hp): N.A.		
Flocculator Equipment Failure Alarm?	N.A.	
Alarm Triggered By What?	N.A.	

State of California		Department of Health Services
Filtration Plant Data-(cont'd)		
Sedimentation	N.A.	
Number Of Basins:	N.A.	
Inside Dimensions Of Each Basin (ft x ft):	N.A.	
Average Water Depth (ft):	N.A.	
Volume Of Each Basin (ft^3):	N.A.	
Total Sedimentation Volume (ft^3):	N.A.	
Horizontal Velocity (fpm):	N.A.	
Average: N.A.	Maximum: N.A.	
Detention Time (min):	N.A.	
Average: N.A.	Maximum: N.A.	
Surface Loading Rate (gpm/ft^2):	N.A.	
Average: N.A.	Maximum: N.A.	
Weir Overflow Rate (gpm/ft^2):	N.A.	
Average: N.A.	Maximum: N.A.	
Method Of Sludge Withdrawal:	N.A.	
Filters		
Type:	Pressure Filters	
Number Of Filters:	16	
Filter Inside Dimensions (ft x ft):	10x50	
Filter Media	Filter 1	
Anthracite Coal		
Depth (in): 16	Effective Size:	0.89
Uniformity Coefficient: 1.29	Specific Gravity:	1.65
Fine Sand		
Depth (in): 18	Effective Size:	0.72
Uniformity Coefficient: 1.39	Specific Gravity:	2.64
Coarse Sand		
Depth (in):0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 2	
Anthracite Coal		
Depth (in): 14	Effective Size:	0.78
Uniformity Coefficient:1.44	Specific Gravity:	1.65
Fine Sand		
Depth (in): 18	Effective Size:	0.66
Uniformity Coefficient: 1.44	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	

Filter Media	Filter 3	
Anthracite Coal		
Depth (in): 16	Effective Size:	0.89
Uniformity Coefficient: 1.38	Specific Gravity:	1.65
Fine Sand		
Depth (in): 15	Effective Size:	0.63
Uniformity Coefficient: 1.44	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 4	
Anthracite Coal		
Depth (in): 15	Effective Size:	0.81
Uniformity Coefficient: 1.43	Specific Gravity:	1.65
Fine Sand		
Depth (in): 15	Effective Size:	0.63
Uniformity Coefficient: 1.52	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 5	
Anthracite Coal		
Depth (in): 13	Effective Size:	0.85
Uniformity Coefficient:	Specific Gravity:	1.65
Fine Sand		
Depth (in): 11	Effective Size:	0.63
Uniformity Coefficient:	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 6	
Anthracite Coal		
Depth (in): 16	Effective Size:	0.82
Uniformity Coefficient: 1.41	Specific Gravity:	1.65
Fine Sand		
Depth (in): 15	Effective Size:	0.6
Uniformity Coefficient: 1.48	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	

Filter Media	Filter 7	
Anthracite Coal		
Depth (in): 13	Effective Size:	0.88
Uniformity Coefficient: 1.39	Specific Gravity:	1.65
Fine Sand		
Depth (in): 10	Effective Size:	0.63
Uniformity Coefficient: 1.40	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 8	
Anthracite Coal		
Depth (in): 16	Effective Size:	0.85
Uniformity Coefficient: 1.47	Specific Gravity:	1.65
Fine Sand		
Depth (in): 14	Effective Size:	0.61
Uniformity Coefficient: 1.44	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 9	
Anthracite Coal		
Depth (in): 13	Effective Size:	0.92
Uniformity Coefficient: 1.26	Specific Gravity:	1.65
Fine Sand		
Depth (in): 15	Effective Size:	0.62
Uniformity Coefficient: 1.23	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 10	
Anthracite Coal		
Depth (in): 10	Effective Size:	0.85
Uniformity Coefficient: 1.4	Specific Gravity:	1.65
Fine Sand		
Depth (in): 13	Effective Size:	0.64
Uniformity Coefficient: 1.39	Specific Gravity:	2.64
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	

Filter Media	Filter 11	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 12	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 13	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 14	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	

Filter Media	Filter 15	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filter Media	Filter 16	
Anthracite Coal		
Depth (in): 18	Effective Size:	0.89
Uniformity Coefficient: 1.49	Specific Gravity:	1.72
Fine Sand		
Depth (in): 18	Effective Size:	0.55
Uniformity Coefficient: 1.29	Specific Gravity:	2.56
Coarse Sand		
Depth (in): 0	Effective Size:	
Uniformity Coefficient:	Specific Gravity:	
Gravel-Number Of Layers: 0	Total Depth:	
Media Area Per Filter (ft^2):	Total Media Area (ft^2):	
Filtration Rate at Design Flow		
All Filters In Service (gpm/ft^2):	96	
One Filter Not In Service (gpm/ft^2):	90	
How Is Filtration Rate Controlled?	Automatic-PLC	
Turbidimeters At Each Filter?	YES	
Do Excessive Turbidities Trigger An Alarm?	YES	
At What Turbidity?	1 NTU during first hour, .3NTU after first hour	
Continuous Measurement And Recording Of Finished Water Turbidity?	YES	
Location:	At Combined Effluent	
Type Of Device:	1720 D HACH Low Range Turbidimeter	
Frequency Of Calibration:	3 months	
High Turbidity Alarm: Y	Activated At:	.3 (NTU)
Who Is Alerted?	On-Call Operator	

State of California | Department of Health Services

Filtration Plant Data-(cont'd)

Filter Backwash	
What Determines Backwash Interval?	Filter Run Time; Filter Turbidity Loading; High Filter Turbidity
Filter To Waste Capability?	YES
Source Of Backwash Water?	Remaining Filters
Can Spent Backwash Water Be Visually Observed?	YES
Underdrain Type:	Perforated PVC; Wedge Wire
Maximum Backwash Rate (gpm/ft^2):	18
Percent Expansion During Backwash:	20
Backwash Duration (min):	8
Can Backwash Time Be Shortened Or Lengthened?	YES
What Determines Length Of Backwash?	Turbidity
Quantity Of Backwash Generated Each Day (mgd):	.032 mgd/online filter
Supplemental Backwash Tank	
Type:	N.A.
Volume (gal):	N.A.
Number Of Backwashes Per Volume:	N.A.
Filter Surface Wash	
Type:	Rotary Arms
Surface Wash Rate (gpm/ft):	0.6
Surface Wash Rate (gpm):	300
Surface Wash Rate (mgd):	0.432
Surface Wash Duration (min):	7
Waste Washwater Basins	
Type:	Pond
Number Of Basins:	2
Total Volume (MG):	8.36
Volume Of Wastewater Per Backwash (gal	64000
Washwater Disposal:	To Boulder Creek
Sludge Disposal:	Local Landfill
Clearwell	N.A.
Type:	N.A.
Capacity (MG):	N.A.
Detention Time (Hr):	N.A.

Comments

APPENDIX V

State of California **Department of Health Services**

Booster Station Data

System Name:	BVWD	**System Number: 4510014**
Source of Information:	BVWD Master Plan	
Collected By:	Pace Civil	**Date:** 3/08

Number or Name	Welch Pump Station	
Date Constructed	2000	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	10000	
Location:		
Specific Location (Cross Streets, etc.)	21500 Old Alturas Rd.	
Neighborhood	RU	
Size of Lot	33,106 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Main Pressure Zone	
Deliver Water To:	Welch Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	4	
Make	Peerless;Peerless;Peerless;Peerless;	
Capacity (gpm)	1500;3000;3000;3000	
Lubrication	Grease	
Power	50;200;200;200	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number:** 4510014
Source of Information: BVWD Master Plan; Tom Zaharris
Collected By: Pace Civil **Date:** 3/08

Number or Name	Cow Creek I Pump Station	
Date Constructed	1979	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	3800	
Location:		
Specific Location (Cross Streets, etc.)	22576 Old Alturas Rd.	
Neighborhood	RU	
Size of Lot	2900 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	N	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	Y	
Relation to System		
Receives Water From:	Deschutes Pressure Zone	
Deliver Water To:	Cow Creek I Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	Y	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	2	
Make	Crane-Deming;Crane-Deming	
Capacity (gpm)	2800;2800	
Lubrication	Grease	
Power	75;75	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name:	BVWD	**System Number:** 4510014
Source of Information:	BVWD Master Plan; Tom Zaharris	
Collected By:	Pace Civil	**Date:** 3/08

Number or Name	Cow Creek II Pump Station	
Date Constructed	1990	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	3800	
Location:		
Specific Location (Cross Streets, etc.)	22497 Highway 299 E	
Neighborhood	RU	
Size of Lot	16,117 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Cow Creek I Pressure Zone	
Deliver Water To:	Cow Creek II Pressure Zone	
Portable Pump Connections Available	N	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	Y	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	3	
Make	Peerless; Peerless; Peerless	
Capacity (gpm)	600;1600;1600	
Lubrication	Grease	
Power	30;75;75	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan; Tom Zaharris
Collected By: Pace Civil **Date:** 3/08

Number or Name	East Stillwater Pump Station	
Date Constructed	1984	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	3000	
Location:		
Specific Location (Cross Streets, etc.)	12001 E. Stillwater Way	
Neighborhood	RU	
Size of Lot	4,356 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Deschutes Pressure Zone	
Deliver Water To:	Cow Creek I Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	3	
Make	Paco;Paco;Paco	
Capacity (gpm)	1000;1000;1000	
Lubrication	Grease	
Power	40;40;40	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan
Collected By: Pace Civil **Date:** 3/08

Number or Name	Old Alturas Regulating Pump Station	
Date Constructed		
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	750	
Location:		
Specific Location (Cross Streets, etc.)	21926 Hidden Acre Rd.	
Neighborhood	RU	
Size of Lot	151,588 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	Y	
Flood Hazard	N	
Relation to System		
Receives Water From:	Palo Cedro Pressure Zone	
Deliver Water To:	Main Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	1	
Make	PACO	
Capacity (gpm)	750	
Lubrication	Grease	
Power	20	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan; Tom Zaharris
Collected By: Pace Civil **Date:** 3/08

Number or Name	Old Oregon Trail Pump Station	
Date Constructed	1976	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	4300	
Location:		
Specific Location (Cross Streets, etc.)	12054 Old Oregon Trail Rd.	
Neighborhood	RU	
Size of Lot	17,424 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Main Pressure Zone	
Deliver Water To:	Old Oregon Trail Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	Y	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	3	
Make	Peerless;Peerless;Peerless;	
Capacity (gpm)	2500;2500;2500	
Lubrication	Grease	
Power	100;100;100	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan; Tom Zaharris
Collected By: Pace Civil **Date:** 3/08

Number or Name	Palo Cedro Booster Pump Station	
Date Constructed	1990	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	700	
Location:		
Specific Location (Cross Streets, etc.)	Plazo Drive	
Neighborhood	RU	
Size of Lot	0	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Deschutes Pressure Zone	
Deliver Water To:	Palo Cedro Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	1	
Make	Cornell	
Capacity (gpm)	700	
Lubrication	Grease	
Power	25	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan
Collected By: Pace Civil **Date:** 3/08

Number or Name	Quail Ridge Pump Station	
Date Constructed	1990	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	1000	
Location:		
Specific Location (Cross Streets, etc.)	700 Canby Rd	
Neighborhood	RU	
Size of Lot	197,762 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Main Pressure Zone	
Deliver Water To:	Quail Ridge Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	3	
Make	Cornell;Cornell;Cornell;	
Capacity (gpm)	250;1500;1500	
Lubrication	Grease	
Power	10;50;50	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

State of California **Department of Health Services**

Booster Station Data

System Name:	BVWD	**System Number: 4510014**
Source of Information:	BVWD Master Plan	
Collected By:	Pace Civil	**Date:** 3/08

Number or Name	Simpson Pump Station	
Date Constructed	1990	
Purpose(system pressure, standby, etc)	System Pressure	
Total Pumping Capacity (gpm)	5000	
Location:		
Specific Location (Cross Streets, etc.)	2000 Cilantro Dr.	
Neighborhood	RU	
Size of Lot	1,481,040 ft^2	
Enclosure:		
Type	Building	
Floor	Concrete	
Insulation	N	
Heating	Y	
Drainage	Y	
Flood Alarm	N	
Flood Hazard	N	
Relation to System		
Receives Water From:	Main Pressure Zone	
Deliver Water To:	Simpson Pressure Zone	
Portable Pump Connections Available	Y	
Station has Capacity to Reduce Pressure From High Side to Low Side of Booster	N	
Standby Power Available on Site	N	
Portable Standby Generator Connection Available	N	
Instrumentation and Control	Automatic-PLC	
Pumping Units:	4	
Make	Cornell;Crane-Deming;Crane-Deming;Crane-Deming	
Capacity (gpm)	500;2000;2000;2000	
Lubrication	Grease	
Power	50;200;200;2000	
Sewer of Other Hazardous Connections (s)	N	
Defects and Remarks		

APPENDIX W

State of California **Department of Health Services**

Pumping Station Data

System Name: BVWD **System Number: 4510014**
Source of Information: BVWD Master Plan; Tom Zaharris
Collected By: Pace Civil Date: 3/08

Number or Name:	Wintu
Date Constructed:	1965
Purpose:	Water Source Access
Location:	580 Hiltop Drive
Housing	Open-Air Roof
Insulation:	N
Heating	N
Pit Depth (if any):	N
Drainage	Y
Relation to System:	
Receives From:	Sacramento River
Deliver To:	Main Conduit
Outlet Pressure:	110 psi
Maximum Capacity:	59 MGD or 41000 GPM
Flood Hazard:	N
Pumping Units:	5
Make:	Floway;Floway; Johnson;Johnson;Johnson
Type:	Vertical Turbine
Capacity (gpm):	6000;6000;11200;11200;11200
Lubrication:	Grease
Auxiliary Power:	Y
Control:	Automatic-PLC
Frequency of Use:	Continuous
Defects and Remarks	

APPENDIX X

Tom

State of California—Health and Human Services Agency
DEPARTMENT OF PUBLIC HEALTH
Division of Drinking Water and Environmental Management
415 Knollcrest Drive, Suite 110
Redding, CA 96002
(530) 224-4800 FAX (530) 224-4844
Internet Address: www.dhs.ca.gov/ps/ddwem

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

FINAL For 2007
Completed 2008

To:

Bella Vista Water District
#4510014 (C)
Attn: David Coxey
11368 East Stillwater Way
Redding, CA 96003

Return completed form to:

CDPH-Drinking Water Field Operations
415 Knollcrest Drive, Suite #110
Redding, CA 96002

by May 2, 2008

2007 ANNUAL REPORT TO THE DRINKING WATER PROGRAM FOR COMMUNITY WATER SYSTEMS OVER 200 SERVICE CONNECTIONS FOR YEAR ENDING DECEMBER 31, 2007

1. **CHANGE OF SYSTEM NAME OR MAILING ADDRESS** *(If Different from above)* — N/A

2. **WEBSITE ADDRESS** *(If Available)* — www.bvwd.org

3. **ORGANIZATION**

A. **Primary Contact** (This person will receive all general correspondence from the Drinking Water Program.)

Name and Title	David J. Coxey, General Manager
Address *(If Different from above)*	
Telephone / Fax Numbers *(Include Area Code)*	530-241-1085 x 106 / 530-241-8354
E-mail Address	dcoxey@bvwd.org

B. **Billing Contact** (This person will receive all bills and billing inquiries from the Drinking Water Program.)

Name and Title	Connie M. Wade, Office Manager
Address *(If Different from above)*	
Telephone / Fax Numbers *(Include Area Code)*	530-241-1085 x 107 / 530-241-8354
E-mail Address	cwade@bvwd.org

C. **Water Quality Monitoring Contact** (This person will receive water quality monitoring schedules via e-mail.)

Name and Title	Tom Zaharris, Treatment Superintendent
E-mail Address	tzaharris@bvwd.org

D. Specify to which of the above e-mail addresses the Department should use to send notices of security threats, warnings, emergency information etc.: dcoxey@bvwd.org; dgroundwater@bvwd.org; tzaharris@bvwd.org

7. FINISHED WATER PRODUCED, PURCHASED AND SOLD

	Finished Water Produced (million gallons)		Water Purchased	Water Sold
	Groundwater	Surface Water	(million gals.)	(million gals.)
Maximum Day	1.22	34.4	N/A	N/A
Max. Month (Specify Month & Amount)	August --- 4.31	August --- 884.7	January --- 0.11	June --- 4.14
Annual Total	58.5	4,922	0.152	6.23

Please list the other public water systems (PWS) that your water system sold water to, or purchased water from, in 2007.

City of Shasta Lake (purchased and sold)
Mountain Gate Community Services. District (sold only)
City of Redding (purchased only)
Shasta County CSA #8 (sold only)

8. ANNUAL NITRATE SAMPLING

Regulations require a minimum of **annual** sampling for nitrate. If any nitrate result is ≥ 1/2 the MCL of 45 mg/l (i.e., a result of ≥ 22.5 mg/l nitrate) then quarterly monitoring must be initiated. Has your system conducted monitoring for nitrate during 2007 from each source? Yes **X** No ☐
Attach a copy of the 2007 results for each source to this report if not already submitted through electronic data transfer(EDT) and/or provide a summary of sample dates and results.

9. BACTERIOLOGICAL SAMPLE SITING PLAN

Regulations require that an updated sample siting plan at least every 10 years, and at any time the plan no longer represents the entire distribution system. Please **submit a copy** of the siting plan **if** it was modified in 2007 and has not already been approved by the Department. Date of current sample siting plan: 1/8/07

10. DIRECT ADDITIVES

All chemicals, including chlorine, added directly to the drinking water must meet the ANSI/NSF Standard 60. Please complete the following table for each chemical utilized in 2007. If you are not sure whether a chemical utilized met this standard, contact the manufacturer or distributor of the chemical. If no chemicals are added to the drinking water, please check the appropriate box below:

List each chemical used in treatment process	Enter the name of the manufacturer(s)	Enter the purpose for using the chemical(s)	Does Chemical Meet ANSI/NSF Standard 60? (Yes/No)
Cationic Polymer	JENCHEM, Inc.	Coagulant	Yes
Sodium Hypochlorite	Chem Quip	Disinfectant	Yes
Chlorine Gas	Olin Chlor Alkali	Disinfectant	Yes

Check here if no chemicals are added to the drinking water: ☐

If chlorine is being used, is it used on a continuous basis? Yes ☒ **No** ☐

7. FINISHED WATER PRODUCED, PURCHASED AND SOLD

	Finished Water Produced (million gallons)		Water Purchased	Water Sold
	Groundwater	Surface Water	(million gals.)	(million gals.)
Maximum Day	1.22	34.4	N/A	N/A
Max. Month (Specify Month & Amount)	August --- 4.31	August --- 884.7	January --- 0.11	June --- 4.14
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Regulations require a minimum of **annual** sampling for nitrate. If any nitrate result is ≥ 1/2 the MCL of 45 mg/l (i.e., a result of ≥ 22.5 mg/l nitrate) then quarterly monitoring must be initiated. Has your system conducted monitoring for nitrate during 2007 from each source? Yes **X** No ☐
Attach a copy of the 2007 results for each source to this report if not already submitted through electronic data transfer(EDT) and/or provide a summary of sample dates and results.

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List each chemical used in treatment process	Enter the name of the manufacturer(s)	Enter the purpose for using the chemical(s)	Does Chemical Meet ANSI/NSF Standard 60? (Yes/No)
Cationic Polymer	JENCHEM, Inc.	Coagulant	Yes
Sodium Hypochlorite	Chem Quip	Disinfectant	Yes
Chlorine Gas	Olin Chlor Alkali	Disinfectant	Yes

Check here if no chemicals are added to the drinking water: ☐

If chlorine is being used, is it used on a continuous basis? Yes ☒ No ☐

11. BACKFLOW PREVENTION PROGRAM

	Total Number in System	Number Installed in 2007	Number Tested in 2007	Number Failed in 2007	Number Repaired/ Replaced
Backflow Devices	310	11	321	3	3
Air-gap Backflow Installations					

Cross Connection Control Program Coordinator: Erick Ruste / Fred Nostrand

Certification Number (if any) 10684 / 12022 Telephone number 530-241-1085

Certification or training received (if any) Backflow Prevention Assembly General Tester

Date of last cross-connection control survey Continuous

12. EMERGENCY NOTIFICATION PLAN

Please review your Emergency Notification Plan and **submit a revised plan,** if there any changes. Date of the Emergency Notification Plan 4/25/08.

13. SURFACE WATER TREATMENT PLANTS ONLY

Date of current Operations Plan: 12/1/06

Does your Operations Plan accurately reflect your current operations? Yes **X** No ☐

Please **submit a copy** of your current Operations Plan, if changes were made to the plan in 2007.

Date of your current Emergency Disinfection Plan (EDP) 11/30/06

Please **submit a copy** of your current EDP if changes were made to the plan in 2007.

Date of last Watershed Sanitary Survey or update 12/4/06

Note: Regulations require the Watershed sanitary survey to be updated **every 5 years**, beginning in 1996.

14. CONSUMER CONFIDENCE REPORT

The next CCR must be distributed to your customers by July 1, 2008. It is recommended that you submit a copy for review before the CCR is distributed to avoid the possibility of additional distribution if there are errors or omissions. If available, please submit a copy of the CCR you plan to distribute along with this report.

By October 1, 2008, you are also required to submit a certification to the Department that the CCR has been distributed to customers and that the information is correct.

Guidance for large and small water systems, a copy of the CCR template, and a copy of the certification form can be obtained from the Department of Health Services web site at:
http://ww2.cdph.ca.gov/certlic/drinkingwater/Pages/CCR.aspx

15. OPERATOR CERTIFICATION

A. Please list the State certified water **treatment plant operators** employed by your water system.

Name	Operator Number	Grade of Operator	Renewal/ Expiration Date
Chief / Tom Zaharris	18952	T5	4/1/09
Don Groundwater	10510	T5	10/1/10
Joe Pedersen	13688	T4	2/1/09
Charles Lukens	00609	T5	10/1/10
Brian Johnson	16486	T4	7/1/09
Steve Wilkie	12481	T3	8/1/09
Phil Alleman	16407	T3	11/1/08

B. Please list the State certified water **distribution operators** employed by your water system.

Name	Operator Number	Grade of Operator	Renewal/ Expiration Date
Chief / Jeff Tuchalski	5697	D4	7/1/09
Bud Wanbaugh	7192	D3	7/1/09
Steve Lowery	5692	D3	6/1/09
Floyd Woolam	14219	D3	5/1/09
Mark Maty	32646	D2	10/1/10
Fred Nostrand	29788	D2	6/1/09
Eric Ruste	23462	D2	6/1/09
Josh Sexton	32936	D1	5/1/10
Brad Solso	31655	D2	12/1/09
Darren Duvall	23284	D1	12/1/08
Mike Grandmain	5688	D2	8/1/09
Tom Zaharris	8585	D4	5/1/09
Don Groundwater	9468	D3	4/1/09
David Coxey	24125	D2	12/1/10
Joe Pedersen	4684	D4	5/1/09
Charles Lukens	2155	D2	4/1/09
Brian Johnson	5546	D3	6/1/09
Phil Alleman	5993	D3	5/1/09

16. WATER SYSTEM IMPROVEMENTS

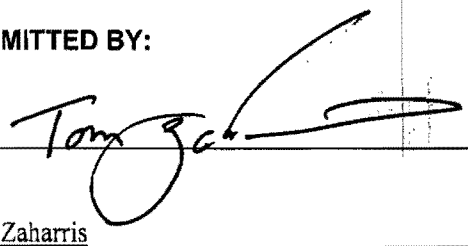
Identify any major changes, additions, or improvements in the water system facilities or system operation that were completed during 2007 and that are planned for 2008.

Completed in 2007: Upgrade to motor controls at the Wintu Pump Station; replacement of the surface wash arms and piping in filters 1-10 at the Water Treatment Plant; new chlorine room exhaust fans at the Wintu Pump Station; upgrade of the electrical switchgear, PLC and SCADA equipment at Cow Creek Pump Station No. I.

Planned for 2008: Recoat the interior and exterior of the Cow Creek tank; relocation of water mains in Ridgewood Road and at Highway 299 East and La Honda Road.

Please **submit a copy** of your plan with this annual report if it was updated during 2007, and has not already been submitted.

REPORT SUBMITTED BY:

Signature 

Name Tom Zaharris
(Print)

Title Water Treatment Superintendent

Date: April 30, 2008

ATTACHMENT H.3

WATER TREATMENT PLANT
MONITORING & REPORTING PROGRAM:

WASTE DISCHARGE REQUIREMENTS

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0110

NPDES NO. CA 0080799

WASTE DISCHARGE REQUIREMENTS FOR BELLA VISTA WATER DISTRICT WATER TREATMENT PLANT SHASTA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter, the Regional Board) finds that:

1. The Bella Vista Water District (Discharger) submitted an Application/Report of Waste Discharge, dated 13 May 2003, and applied to renew its permit to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Bella Vista Water Treatment Plant located in Shasta County.

2. The Discharger owns and operates a water treatment plant (Facility), that produces up to 45 million gallons per day (mgd) of treated, potable water for domestic, municipal, and agricultural purposes. The Facility is located in Section 29, Township 32 North, and Range 4 West of the Mt. Diablo Base Line and Meridian on Assessor's Parcel No. 117-290-05 as shown on Attachment A, a part of this Order. The Facility discharges settled filter backwash water to Dry Gulch, a water of the United States at Discharge Point 001 (Discharge 001), approximately located at latitude 40° 36' 01" N and longitude 122° 21' 08" W. Dry Gulch, in succeeding order, is tributary to Boulder Creek, Churn Creek, and the Sacramento River.

3. Source waters for the Facility are the Sacramento River and local groundwater. The Facility chlorinates raw water from the Sacramento River and pumps it approximately one mile to the water treatment plant where it is treated by multi-media filters. An aluminum based coagulant is added to the raw water prior to filtering in order to increase removal efficiency. The filters are regularly backwashed for cleaning. The backwash water enters one of two unlined settling ponds that overflow to a lower pond constructed in Dry Gulch. Sludge has periodically been scraped and stockpiled in the settling ponds for the last approximately 12 years. The Discharger is currently arranging for characterization and disposal of this stockpiled sludge. The Discharger has stated that future sludge management will include characterization and disposal of sludge approximately every two years. The design capacity of the backwash settling ponds is 1.5 mgd.

4. When necessary, the Sacramento River supply is augmented with groundwater from five wells, which are connected directly to the Discharger's potable water distribution system. As needed, wells are brought online, and untreated groundwater is periodically "run to waste" for a short duration upon start up. Groundwater from the wells is chlorinated and filtered for iron and manganese removal. Filter backwash is discharged to onsite holding/settling tanks, where clarified backwash water is returned to the front of the filters.

Sludge from the settling tanks is periodically characterized and disposed at an appropriate facility.

5. Monitoring data from 1999 through May 2003 characterize the wastewaters discharged from the Facility as follows:

	1999	2000	2001	2002	2003
Flow[a] (mgd)					
Monthly Avg.	0.64	0.30	0.26	0.32	0.17
Monthly Max.	1.22	0.61	0.54	0.51	0.38
pH Range	6.7 – 8.7	6.5 – 9.2	6.3 – 9.3	5.8 – 9.5	6.7 – 8.8
Set. Solids (mL/L)					
Monthly Avg.	0.0	0.0	0.0	0.0	0.0
Monthly Max.	0.0	0.0	0.0	0.0	< 0.1
Chlorine (mg/L)					
Max.	0.0	0.0	0.0	0.0	0.0

[a] Filter backwash is measured and reported as effluent flow.

6. The water treatment plant is in the Enterprise Flat Hydrologic Area (No. 508.16), as depicted on interagency hydrologic maps prepared by the California Department of Water Resources (DWR) in August 1986. The mean annual rainfall in the area is approximately 35 inches, based on information from the U.S. Geological Survey and DWR.

7. The Regional Board adopted a *Water Quality Control Plan, Fourth Edition,* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plans, as amended, designate beneficial uses, establish water quality objectives, and contain implementation plans and policies for waters of the Basins. Pursuant to the California Water Code (CWC) Section 13263(a), waste discharge requirements must implement the Basin Plans.

8. The United States Environmental Protection Agency (USEPA) adopted the *National Toxics Rule* (NTR) on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the *California Toxics Rule* (CTR) on 18 May 2000, which was amended on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board (State Board) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP) on 2 March 2000, which contains policies and procedures for implementation of the NTR and the CTR.

RECEIVING WATER BENEFICIAL USES

9. The Basin Plan on page II-2.00 states that: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." The beneficial uses of the Sacramento River are specifically identified in the Basin Plan, however, the beneficial uses of Dry Gulch, Boulder Creek, and Churn Creek are not individually identified in the Basin Plan. Dry Gulch, Boulder Creek, and Churn Creek are tributary to the Sacramento River between Shasta Dam and the Colusa Basin Drain, and therefore, in accordance with the Basin Plan, the beneficial uses of the Sacramento River are applicable to these tributary streams. The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning..." and with respect to disposal of wastewaters states that "...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

10. The Basin Plan identifies the following beneficial uses for the Sacramento River between Shasta Dam and the Colusa Basin Drain: municipal and domestic supply; agricultural supply; industrial service supply; hydropower generation; water contact and noncontact recreation; warm and cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; navigation; ground water recharge; and freshwater replenishment. In addition, State Board Resolution No. 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution No. 89-056, requires the Regional Board to assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in Table II-1.

11. Upon review of the flow conditions, habitat values, and beneficial uses of Dry Gulch, Boulder Creek, and Churn Creek (Churn Creek and its tributaries), the Regional Board finds that the beneficial uses identified in the Basin Plan for the Sacramento River between Shasta Dam and the Colusa Basin Drain are applicable to Churn Creek and its tributaries based upon the following facts:

    a. *Municipal and Domestic Supply, Agricultural Supply, Industrial Service Supply*

    The State Board has issued water rights to existing water users along Churn Creek and its tributaries and the Sacramento River downstream of the discharge for multiple uses including domestic, agricultural, and industrial service supply. Because Churn Creek and its tributaries are intermittent streams, the creeks likely provide groundwater recharge during periods of low flow. Domestic water supply in the area is generally provided by municipal entities using treated surface water. Although the use of area groundwater as domestic supply is limited, the potential for expanded use exists. In addition to the existing water uses, growth in the area downstream of the discharge is

expected to continue, which presents a potential for increased domestic, agricultural, and industrial uses of groundwater and the water in Churn Creek and its tributaries.

b. *Hydropower Generation, and Navigation*

Although no records of existing hydropower generation and navigation uses were found on Churn Creek and its tributaries, these uses do exist in the Sacramento River to which Churn Creek is tributary. The very nature of these uses depends on the presence of flow from tributary streams and therefore these uses are protected by including them as beneficial uses in streams tributary to the Sacramento River. Furthermore, considering the likely future value of electricity generation, it is not unreasonable to expect that new technologies for small hydropower projects may make hydropower generation uses on Churn Creek and its tributaries desirable.

c. *Water Contact and Noncontact Recreation*

The Regional Board finds that Churn Creek and its tributaries flow through rural and residential areas and that there is ready public access. Contact and noncontact recreational activities exist and are likely to increase as the population in the area grows. Prior to discharge into the Sacramento River, Churn Creek and its tributaries flow through areas of general public access. The Sacramento River also offers recreational opportunities.

d. *Warm and Cold Freshwater Habitat, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, and Wildlife Habitat*

Churn Creek and its tributaries flow to the Sacramento River. The California Department of Fish and Game (DFG) has verified that the fish species present in Churn Creek and its tributaries are consistent with both cold and warm water fisheries. There is a potential for anadromous fish migration necessitating a cold water designation and cold water salmonid species have been found in Churn Creek and its tributaries. The Basin Plan (Table II-1) designates the Sacramento River from Shasta Dam to Colusa Basin Drain as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Churn Creek and its tributaries. The cold water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L. The Discharger is not, however, required to improve the naturally occurring dissolved oxygen level. The riparian areas along Churn Creek and its tributaries support wildlife habitat.

e. *Groundwater Recharge, and Freshwater Replenishment*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since Churn Creek and its tributaries are at times dry, it is reasonable to assume that the stream flow is not present at its source, or the

water is lost by evaporation, flow downstream, and percolation to groundwater providing a source of municipal and irrigation water supply. When flow is present in Churn Creek and its tributaries, there is hydraulic continuity between it and the Sacramento River. During periods of hydraulic continuity, Churn Creek and its tributaries add to the water quantity and may impact the quality of water flowing down stream in the Sacramento River.

12. The Regional Board also finds that based on the available information and on the Discharger's application, that Dry Gulch, Boulder Creek and Churn Creek are intermittent streams. The intermittent nature of Churn Creek and its tributaries means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Churn Creek and its tributaries support the aquatic life. Both conditions may exist within a short time span, where Churn Creek and its tributaries would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Sacramento River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect beneficial uses. Significant dilution may occur for limited duration during and immediately following high rainfall events.

GROUNDWATER

13. The beneficial uses of groundwater, as identified in the Basin Plan, are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

REASONABLE POTENTIAL ANALYSIS AND EFFLUENT LIMITATIONS

14. USEPA regulations at 40 CFR 122.4 (d) require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numerical water quality standard. Besides water quality criteria contained in the CTR, applicable numerical and narrative water quality objectives are contained in the Basin Plan. The SIP contains guidance on implementation of the CTR and for determining reasonable potential for CTR pollutants. To determine reasonable potential for non-CTR pollutants, the Regional Board relies on methodology presented in USEPA's *Technical Support Document for Water Quality Based Toxics Control* (TSD) (EPA/505/2-90-001, 1991). For interpretation of narrative water quality objectives, the Regional Board also uses its *Compilation of Water Quality Goals* (2000) as a resource.

15. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations),

304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

16. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board, using methodology described in Section 1.3 of the SIP, finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above applicable water quality standards for copper and dichlorobromomethane. Effluent limitations for these constituents are included in this Order, as described below. Lead and silver were detected in receiving water samples, however insufficient information exists to determine reasonable potential for these pollutants as discussed below. Bis-2-ethylhexylphthalate was detected in receiving water samples, but may be due to sampling and/or laboratory contamination, as discussed below.

Copper

The CTR and Basin Plan include hardness-dependent standards for the protection of freshwater aquatic life for copper. Freshwater aquatic habitat is a beneficial use of the receiving water. USEPA recommends conversion factors (translators) to translate dissolved concentrations of certain metals to total recoverable concentrations. The translator for copper in freshwater is 0.960 for both the acute and the chronic criteria. Using a water hardness of 23 mg/L as $CaCO_3$ (the lowest hardness value observed in the receiving water), the most stringent applicable water quality standards for copper are 2.6 and 3.4 µg/L (dissolved) based on the CTR chronic and Basin Plan acute criteria, respectively, for protection of aquatic life. In samples collected on 20 May 2002 and 15 April 2003, copper (total recoverable) was measured at 3.4 and 3.1 µg/L in the receiving water and at 4.0 and 2.8 µg/L in the effluent, respectively. After applying the translator, the highest effluent and receiving water samples concentrations exceed the water quality standards and therefore, effluent limitations are required. Determination of reasonable potential and calculation of effluent limits is further explained in the attached Information Sheet for this Order.

The effluent limitation for copper is a new requirement in this Order. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" However, in accordance with the Regional Board's *Policy for Application of Water Quality Objectives*, presented in Chapter IV of the Basin Plan, schedules for compliance with final effluent limitations for copper, which are based on water quality criteria adopted before 25 September 1995, may not be authorized in an NPDES permit. Therefore, the final effluent limits established in this Order for copper, become immediately applicable on the effective date of this Order. However, the Regional Board may adopt other Orders, such as a Cease and Desist Order, allowing the Discharger a period of time to fully comply with the effluent limit for copper.

Lead

The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for lead. The Basin Plan includes a water quality objective for lead that is independent of water hardness, for waters with a beneficial use designation of MUN. Freshwater aquatic habitat and municipal and domestic supply are beneficial uses of the receiving water. USEPA recommends conversion factors (translators) to translate dissolved concentrations of certain metals to total recoverable concentrations. The conversion factor for lead in freshwater is, itself, hardness dependent. At a hardness of 23 mg/L as $CaCO_3$, the translator for lead is equal to 1.0. Using a water hardness of 23 mg/L as $CaCO_3$ (the lowest hardness value observed in the receiving water), the most stringent applicable water quality standards for lead are 0.5 µg/L and 12.6 µg/L (dissolved) based on the CTR chronic and acute criteria, respectively. At higher water hardness values (above approximately 26 mg/L as $CaCO_3$), the CTR acute criteria exceeds the Basin Plan water quality objective that is independent of hardness. Therefore the Basin Plan water quality objective of 15 ug/L for lead is a cap on the acute water quality standard. In receiving water samples collected on 20 May 2002 and 15 April 2003, lead was measured at a maximum concentration of 0.8 ug/L (total recoverable). Lead was not detected in the effluent samples collected on the same dates. After applying the translator, the highest lead concentration in the upstream receiving water samples exceeds the CTR chronic criterion. The SIP, in Section 1.3, Step 8, provides that, "If data are unavailable or insufficient...the Regional Board shall establish interim requirements...that require additional monitoring for the pollutant in place of a water quality-based effluent limitation." The Regional Board finds that, at this time, there is insufficient information to determine if an effluent limit for lead is appropriate. Therefore, the Discharger is required to conduct additional monitoring and reporting for lead, as specified in the attached Monitoring and Reporting Program, to provide sufficient information. If, after sufficient information has been collected, the Regional Board finds that an effluent limit for lead is necessary, then this Order may be reopened and modified to include an appropriate effluent limit for lead.

Silver

The CTR includes an acute hardness-dependent criterion for the protection of freshwater aquatic life for silver. The Basin Plan also includes an acute water quality objective for silver that is independent of hardness, but is significantly higher than the CTR criterion (at all reasonable water hardness values) and is therefore not used. Freshwater aquatic habitat is a beneficial use of the receiving water. USEPA recommends conversion factors (translators) to translate dissolved concentrations to total recoverable concentrations. The translator for silver in freshwater is 0.85 for the acute criterion. Using a water hardness of 23 mg/L as $CaCO_3$ (the lowest hardness value observed in the receiving water), the corresponding CTR acute criterion is 0.28 µg/L (dissolved). In receiving water samples collected on 20 May 2002 and 15 April 2003, silver was measured at a maximum concentration of 0.58 ug/L (total recoverable). Silver was not detected in the effluent samples collected on the same dates. After applying the translator, the highest concentration in the upstream receiving water samples exceeds the CTR acute criterion. The SIP, in Section 1.3, Step 8,

provides that, "If data are unavailable or insufficient...the Regional Board shall establish interim requirements...that require additional monitoring for the pollutant in place of a water quality-based effluent limitation." The Regional Board finds that, at this time, there is insufficient information to determine if an effluent limit for silver is appropriate. Therefore, the Discharger is required to conduct additional monitoring and reporting for silver, as specified in the attached Monitoring and Reporting Program, to provide sufficient information. If, after sufficient information has been collected, the Regional Board finds that an effluent limit for silver is necessary, then this Order may be reopened and modified to include an appropriate effluent limit for silver.

Bis-2-ethylhexylphthalate

The CTR includes criteria for the protection of human health based on consumption of water and organisms for bis-2-ethylhexylphthalate. Municipal and domestic supply is a beneficial use of the receiving water. The criterion for waters from which both water and organisms are consumed is 1.8 µg/L. In samples collected on 20 May 2002 and 15 April 2003, bis-2-ethylhexylphthalate was measured at a maximum concentration of 2.0 ug/L in the upstream receiving water. Bis-2-ethylhexylphthalate was not detected in samples of the effluent. Bis-2-ethylhexylphthalte was detected at concentrations above the CTR criterion. However, bis-2-ethylhexylphthalate is a common contaminant of sample containers, sampling apparatus, and analytical equipment, and it is therefore possible that the contaminant is not truly present in the receiving water or effluent discharge. This Order requires the Discharger to take steps to assure that sampling containers and apparatus are not the source of this contaminant. If changes in sampling and/or analytical procedures and equipment indicate that bis-2-ethylhexylphthalate is not actually present in the effluent or receiving water samples at concentrations that trigger reasonable potential according to the SIP, then effluent limits are not necessary. If bis-2-ethylhexylphthalate continues to be detected in the effluent and/or receiving water, then this Order may be reopened and modified to include an appropriate effluent limitation for bis-2-ethylhexylphthalate.

Dibromochloromethane

The CTR includes criteria for the protection of human health based on consumption of water and organisms for dibromochloromethane. Municipal and domestic supply is a beneficial use of the receiving water. The criterion for waters from which both water and organisms are consumed is 0.56 µg/L. In samples collected on 20 May 2002 and 15 April 2003, dibromochloromethane was measured at a maximum concentration of 1.5 ug/L in the effluent. Dibromochloromethane has not been detected in the upstream receiving water. Dibromochloromethane was detected at concentrations above the CTR criterion and therefore effluent limitations for dibromochloromethane are included in this Order.

This Order also contains an interim, performance based, maximum daily effluent limitation of 4.7 µg/L for dibromochloromethane for discharges to Dry Gulch. This limitation is based on maintaining the dibromochloromethane loading at the current level and was derived using the maximum observed effluent dibromochloromethane concentration. The interim

limitation will become effective only if the Discharger submits appropriate justification for interim limits in accordance with provisions in this Order. If such justification is not submitted, the final effluent limits will become immediately applicable. If interim limits become effective, the final effluent limits shall not become applicable until **5 years** after the effective date of this Order in accordance with provisions in this Order. Determination of reasonable potential and calculation of effluent limits is further explained in the attached Information Sheet for this Order.

17. As stated in the above Findings, the USEPA adopted the NTR and the CTR, which contain water quality standards applicable to this discharge, and the SIP contains guidance on implementation of the NTR and CTR. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must: be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year; and be included in the Provisions. The interim limitations in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations would be established as the mean plus 3.3 standard deviations of the available data. If actual sampling showed an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration would be established as the interim limitation. When there are fewer than ten sampling data points available (as is the case for this Order), the TSD recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed sampling point to obtain the daily maximum interim limitation (*TSD, Table 5-2*). The Regional Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with NTR- and CTR-based effluent limitations cannot immediately be achieved in the existing discharge. Discharge of constituents in concentrations in excess of the final effluent limitations, but in compliance with the interim effluent limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. For example, USEPA states in the Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper, that it will take an unstressed system approximately three years to recover from a pollutant in which exposure to copper exceeds the recommended criterion. The interim

limitations, however, establish an enforceable ceiling concentration until compliance with the final effluent limitations can be achieved.

18. The Discharger utilizes aluminum based coagulants in its operation. In the *Filter Backwash Recycling Rule Technical Guidance Manual* (EPA 816-R-02-014, December 2002), the USEPA Office of Ground Water and Drinking Water has cited studies that report higher levels of aluminum, attributable to carryover from aluminum coagulants, in spent filter backwash than found in both raw waters and raw waters after chemical addition. The Basin Plan requires the Regional Board to consider information submitted by the Discharger and other interested parties, and numerical criteria and guidelines developed by other agencies and organizations, in determining what numeric limitations will properly implement the narrative toxicity objective. USEPA developed National Recommended Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for aluminum at 87 ug/L as a four-day average (chronic) and 750 ug/L as a one-hour average (acute). USEPA's 2002 National Recommended Water Quality Criteria summary document notes that these criteria were developed at low hardness values. It also states that aluminum is substantially less toxic at higher hardness values, but the effects of hardness on the criteria are not well quantified at this time. In samples collected on 15 April 2003 by the Discharger, hardness in Dry Gulch was very low at 23 mg/L as $CaCO_3$. Aluminum exists as aluminum silicate in suspended clay particles, which USEPA acknowledges might be less toxic than other forms of aluminum. Correspondence with USEPA indicates that the criterion is not intended to apply to aluminum silicate particles. Therefore, a monitoring method that excludes clay particles is likely to be more appropriate. The use of acid-soluble analysis for compliance with the aluminum criterion appears to satisfy USEPA. Current monitoring data is insufficient to determine reasonable potential for aluminum. In accordance with California Water Code Section 13267, this Order establishes monitoring requirements for aluminum. If after review of the monitoring results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality standard, this Order may be reopened and effluent limitations added for aluminum.

19. The Discharger discharges clean or relatively pollutant free waters from well development water, construction dewatering, pump/well testing, pipeline/tank pressure testing, pipeline/tank flushing or dewatering, condensate discharges, other water supply system discharges, and other miscellaneous dewatering/low threat discharges during its normal operation and maintenance activities. These discharges occur at multiple locations and at variable quantity and duration. These discharges are currently required to be regulated by Order No. 5-00-175, General Order for Dewatering and Other Low Threat Discharges to Surface Waters. This Order includes requirements regarding such discharges, and upon adoption of this Order, the Discharger does not need to seek coverage under the General Permit for Dewatering and Other Low Threat Discharges to Surface Waters for these discharges.

20. USEPA promulgated regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The regulations define specific categories of industrial activities that are required to seek coverage under an NPDES permit for storm water discharges associated with industrial activity. If applicable, the Discharger shall seek coverage for discharges of storm water under State Water Resources Control Board Water Quality Order No. 97-03-DWQ (NPDES General Permit No. CAS000001), Waste Discharges Requirements for Discharges of Storm Water Associated with Industrial Activities, or its revision/replacement.

21. The Discharger periodically stockpiles sludge from the settling ponds at the treatment plant site. This sludge must be properly characterized and disposed of in a timely manner. This Order requires that the Discharger develop and implement a Sludge Management and Disposal Plan for the ongoing management of sludge **within 6 months** of the effective date of this Order.

22. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

23. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

24. This Order requires monitoring for the purposes of assessing compliance with permit limitations and water quality objectives and gathering information to evaluate the need for additional limitations.

25. Section 13267 of the California Water Code states, in part, "(a) A regional board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region" and "(b) (1) In conducting an investigation..., the regional board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." The attached Monitoring and Reporting Program is issued pursuant to California Water Code Section 13267.

26. The Discharger is currently regulated pursuant to Waste Discharge Requirements Order No. 98-124 (NPDES No. CA0080799), adopted by the Regional Board on 5 June 1998.

27. The USEPA and the Regional Board have classified this discharge as a minor discharge.

28. The Regional Board has considered the information in the attached Information Sheet in developing the findings of this Order. The attached Information Sheet and Monitoring and Reporting Program and Attachments A and B are all parts of this Order.

29. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

30. The Regional Board, in a public meeting, has heard and considered all comments pertaining to the discharge.

31. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect 10 days from the date of the final public hearing regarding this Order, provided USEPA has no objections.

IT IS HEREBY ORDERED that Order No. 98-124 is rescinded and the Bella Vista Water District, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastewater and low threat discharges, at locations or in a manner different from that described by this Order is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13 [see attached *Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)*, February 2004].

3. The discharge of untreated wastes from water treatment operations to surface waters is prohibited.

4. The discharge of hazardous or toxic substances, which may include laboratory and water treatment chemicals, solvents, or petroleum products (including oil, grease, gasoline and diesel) to surface waters or groundwater is prohibited.

5. Discharge of hazardous waste, as defined at Title 23, Division 3, Chapter 15, Article 2, Section 2521 of the California Code of Regulations or designated waste, as defined at Section 13173 of the California Water Code, is prohibited.

B. Effluent Limitations

1. Discharge 001

   a. Effluent from Discharge 001 shall not exceed the following limits.

Constituent	Units	AMEL (30-Day Avg)	MDEL (Max Daily)
Settleable Solids	mL/L	0.1	0.2
Suspended Solids	mg/L	30	50
	lbs/day[a]	375	625
Chlorine	mg/L	0.01	0.02
	lbs/day[a]	0.1	0.3
Dichlorobromomethane[b]	µg/L	0.6	1.1
	lbs/day[a]	0.008	0.01
Copper	µg/L	Variable based on water hardness. Must calculate. **See Attachment B.**	
	lbs/day[a,c]		

[a] Based on a design flow through wastewater handling and treatment systems of 1.5 mgd.
[b] Final effluent limitations. Interim effluent limits may supercede as described in this Order.
[c] To calculate lbs/day, multiply ug/L limit by 8.34, then multiply by 1.5 (design flow), then divide by 1000.

   b. The discharge shall not have a pH less than 6.0 nor greater than 9.0.

   c. Survival of aquatic organisms in 96-hour acute bioassays of undiluted waste shall be no less than:

      Minimum for any one bioassay ---------- 70%
      Median for any three or more consecutive bioassays -- 90%

   d. The maximum daily discharge flow shall not exceed 1.5 million gallons.

2. Interim effluent limits are established for the following constituent. This interim limit may supercede the final limit, above, as described in this Order. The interim effluent discharge from Discharge 001 shall not exceed the following limit:

Constituent	Units	Max Daily
Dichlorobromomethane	µg/L	4.7

3. Low Threat Discharges

   a. Low threat discharges shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average	Daily Maximum
Flow[a]	mgd			0.25
Total Suspended Solids	mg/L	10	15	30
Settleable Solids	mL/L			0.1

[a] If greater than four months in duration.

b. Low threat discharges shall not contain chlorine in excess of 0.02 mg/L (instantaneous maximum).

C. Receiving Water Limitations

Receiving water limitations are based upon water quality objectives contained in the Basin Plan, and as such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/L. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation. The Discharger is not required to improve background dissolved oxygen conditions in the receiving water.

2. Oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the water surface or on objects in the water, or otherwise adversely affect beneficial uses.

3. Discoloration that causes nuisance or adversely affects beneficial uses.

4. Ambient pH to be depressed below 6.5, nor raised above 8.5, nor changes in normal ambient pH levels to be exceeded by more than 0.5 units.

5. Biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

6. Floating material in amounts that cause nuisance or adversely affect beneficial uses.

7. Suspended sediment load and suspended sediment discharge rate altered in such a manner to cause nuisance or adversely affect beneficial uses.

8. Suspended sediment concentrations that cause nuisance or adversely affect beneficial uses.

9. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

10. The turbidity to increase as follows:

    a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

    c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

    d. More than 10 percent where natural turbidity is greater than 100 NTUs

11. The ambient temperature in the receiving water to increase more than 5° F above natural receiving water temperature.

12. Deposition of material that causes nuisance or adversely affects beneficial uses.

13. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

14. Toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This applies regardless of whether toxicity is caused by a single substance or the interactive effect of multiple substances.

15. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Board pursuant to the CWA and regulations adopted thereunder.

16. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

17. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 mL or cause more than 10 percent of total samples to exceed 400 MPN/100 mL.

18. Upon adoption of any applicable water quality standard for receiving waters by the Regional Board or the State Board pursuant to the CWA or regulations adopted thereunder, this permit may be reopened and receiving water limitations added.

D. Discharge Requirements for Low Threat Discharges

1. The following discharges are authorized by this Order provided they do not contain significant quantities of pollutants, and they do not exceed 0.25 mgd unless four months or less in duration.

   a. Well development water including testing or start up;

   b. Construction dewatering;

   c. Pump/well testing;

   d. Pipeline/tank pressure testing;

   e. Pipeline/tank flushing or dewatering;

   f. Condensate discharges;

   g. Miscellaneous water supply system discharges; and,

   h. Other miscellaneous dewatering/low threat discharges.

2. Collected screenings and other solids removed from piping, tanks, and other equipment prior to discharge shall be disposed of in a manner consistent with Title 23 of the California Code of Regulations Chapter 15, Division 3.

3. The Discharger shall prepare a Pollution Prevention, Monitoring, and Reporting Plan (PPMRP) for Low Threat Discharges, to address all expected discharges. The PPMRP should address or include the following:

   a. The PPMRP shall provide a general description of the raw water supply and distribution systems, types and frequency of potential discharges, potential discharge locations, possible pollutant types, possible flow rates and duration, and receiving waters.

   b. The Plan shall identify best management practices (BMPs) for each type of discharge that will be used to prevent or minimize the discharge of pollutants. Where appropriate, BMPs shall include, but not be limited to the following.

      i. Prior to testing or flushing of empty tanks and pipelines, solid wastes shall be removed for proper disposal.

ii. Erosion and sedimentation control practices at discharge point(s) shall be implemented, if necessary. Discharges shall adhere to applicable State and local recommended procedures for erosion and sediment control.

iii. The discharge of waters must be controlled to the lowest possible rate to minimize potential impacts on aquatic life and to reduce erosion. Adequate dewatering structures and velocity dissipation devices shall be used when necessary to prevent and minimize erosion, stream scouring, increases in turbidity, and any other potential damage to receiving waters. Such devices may include splash pads, straw bales, silt fences, and vegetated buffer zones. The discharge shall not cause downstream flooding conditions.

iv. Discharges shall be conducted to avoid potential pollution to private or public water wells.

v. Dechlorination methods shall be used to assure that discharges to surface waters do not contain a chlorine residual in excess of 0.02 mg/L.

vi. The Discharger shall evaluate the need for treatment of low threat waters before discharge to meet the effluent limitations and requirements of this Order. Possible treatment technologies to evaluate include filtration, settling ponds, and/or pumping to upland areas.

c. Develop a representative sampling and monitoring program

i. The Pollution Prevention, Monitoring, and Reporting Plan for Low Threat Discharges shall include a monitoring schedule for low threat discharges. The plan shall include the following provisions:

- The discharge (rate of flow and duration) shall be estimated for all discharges.

- Sampling and analyses are not required for every dewatering water and other low threat discharge, if the Discharger can provide reasonable assurance that discharges will comply with the prohibitions and limitations of this Order. However, a sampling and analysis program shall be developed and implemented to monitor a representative selection of low threat discharges to verify that the discharges comply with this Order.

- When reasonable assurance cannot be provided that a discharge will comply with the prohibitions and limitations of this Order, at least one sample of the discharge shall be collected per day at a location prior to its entry into a receiving body of water. The sample shall be collected to reflect the character

of the discharge during the first 1,000 gallons of the discharge. This sample shall be analyzed for chlorine and settleable and suspended solids.

- When reasonable assurance cannot be provided that a discharge will comply with the prohibitions and limitations of this Order, and the discharge will be greater than 50,000 gallons, at least two samples shall be collected per day at a location prior to its entry into a receiving body of water. Samples shall be collected to reflect the character of the discharge during the first and last 1,000 gallons of the discharge. These samples shall be analyzed for chlorine and settleable and suspended solids.

- When reasonable assurance cannot be provided that a discharge will comply with the prohibitions and limitations of this Order, observations of the discharge and of the receiving water shall be made and recorded on a daily basis and reflect the worst-case conditions observed in terms of: floating or suspended matter, discoloration and turbidity, erosion, odors, films, sheens, and other potential nuisance conditions.

d. Records and Reporting

i. The Discharger shall make a record of each discharge event. The record shall include: the date, time, location, and duration of the discharge event; source of the water being discharged; a measurement or estimate of the total flow volume; observations as to the appearance of the discharge and erosion that resulted; best management practices that were used; and analyses performed, if any. When analytical results are received, they shall be included in the record.

ii. Analyses and observations shall be recorded and reported to the Regional Board in a timely manner within the monthly Discharge Monitoring Reports. Reporting shall also identify any violations of this Order, corrective action steps taken to comply with the Order, and complaints received from neighbors or other interested parties.

e. The PPMRP shall be revised and updated as necessary to reflect applicable changes in the Discharger's practices.

4. The Discharger shall meet all other requirements and conditions of this Order.

E. Sludge Handling and Disposal

1. Screenings, sludges, and other solids collected and generated on site shall be disposed of in a manner approved by the Regional Board and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste* as set forth in Title 27, Division 2, Subdivision 1 of the California Code of Regulations.

2. Any proposed change in sludge use or disposal practices shall be reported to the Regional Board at least 90 days in advance of the change.

3. **Within 180 days** of the effective date of this Order, the Discharger shall prepare and submit to the Regional Board a Sludge Disposal Plan, which will describe:

   a. Sources and amounts of sludge generated annually.

   b. Location(s) of on site storage and a description of the containment area.

   c. Plans for ultimate disposal. For landfill disposal include the Regional Board's waste discharge requirement numbers that regulate the particular landfill; the present classification of the landfill; and the name and location of the landfill. For land application, include the location of the site; the Regional Board's waste discharge requirement numbers that regulate the site; the anticipated sludge application rate in lbs/acre/year (specify wet or dry); and the land use.

   d. Proposed frequency and time schedule for removing sludge from the site.

F. Ground Water Limitations

1. The discharge shall not cause the underlying groundwater to be degraded.

G. Provisions

1. The Discharger shall comply with *Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)* (February 2004), which are a part of this Order. This attachment and its individual provisions are referred to as "Standard Provisions."

2. The Discharger shall comply with the attached Monitoring and Reporting Program, No. R5-2004-0110, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.

If requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be not later than the submittal date specified in the Monitoring and Reporting Program.

3. If applicable, the Discharger shall comply with the requirements of Division 20, Chapter 6.67 of the Health and Safety Code, known as the Aboveground Petroleum Storage Act. These requirements include preparation of a Spill Prevention Control and Countermeasure Plan in accordance with 40 CFR Part 112.

4. **Bis-2-ethylhexylphthalate Verification**
In order to verify if bis-2-ethylhexylphthalate is truly present in the receiving water or effluent discharge, the Discharger shall take steps to assure that sample containers, sampling apparatus, and analytical equipment are not sources of the detected contaminant. If changes in sampling and/or analytical procedures and equipment indicate that bis-2-ethylhexylphthalate is not present in the effluent or receiving water samples at concentrations that cause reasonable potential as defined by the SIP, then effluent limits are not necessary. If bis-2-ethylhexylphthalate continues to be detected in the effluent and/or receiving water, then this Order may be reopened and modified by adding an appropriate effluent limitation for bis-2-ethylhexylphthalate.

5. **Dibromochloromethane Interim Effluent Limits and Compliance Time Schedule:**
This Order establishes effluent limitations based on water quality criteria contained in the CTR for dibromochloromethane. The Discharger shall complete and submit justification for interim limits and a compliance time schedule **within 90 days** of the effective date of this Order. Justification for interim limits and a compliance time schedules shall include all of the following items (from Section 2.1 of the SIP):

   a. Documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts;
   b. Documentation of source control and/or pollution minimization efforts currently underway or completed;
   c. A proposed schedule for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and
   d. A demonstration that the proposed schedule is as short as practicable.

   If adequate justification for interim limits and a compliance time schedule is not completed and submitted by the Discharger, then the final effluent limits for dibromochloromethane shall become effective immediately following **90 days** after the effective date of this Order. If adequate justification for interim limits and a compliance time schedules is submitted, then the interim effluent limits will become effective and the final effluent limits shall not become effective until **5 years** after the effective date of this Order. As this compliance time schedule is greater than one

year, the Discharger shall submit annual progress reports by **15 July** of each year until the Discharger achieves compliance with the final effluent limits for dibromochloromethane.

Compliance Time Schedule for Dichlorobromomethane

Task	Compliance Date
1. Identify potential sources by water quality monitoring of raw water, product water at various stages of treatment, and the various wastewater streams.	**12 months** after the effective date of this Order.
2. Prepare a Pollutant Minimization Plan	**2 years** after the effective date of this Order.
3. Implement pollutant minimization measures and evaluate treatment upgrades necessary to achieve compliance with final effluent limitations.	**3 years** after the effective date of this Order.
4. Implement selected operational measures and/or treatment upgrades. Final effluent limitations become effective.	**5 years** after the effective date of this Order.

6. The Discharger shall conduct the monitoring and reporting specified in the attached Monitoring and Reporting Program. If sufficient information is collected and indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numerical water quality standard, then this Order may be reopened to include effluent limit(s) to achieve water quality standards. Additionally, if pollutants are detected in discharges from the Discharger's facility, but insufficient information exists to establish an effluent limit or determine if an effluent limit is necessary, the Discharger may be required to conduct additional monitoring to provide sufficient information.

7. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation and/or limitations for the specific toxicants identified in the TRE shall be included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened.

8. This Order expires on **1 September 2009** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than **180 days** in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

9. In the event of any change in control or ownership of land or waste discharge facilities, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Board.

   To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the succeeding owner or operator's full legal name; the State of incorporation if a corporation; the name, address, and the telephone number of the persons responsible for contact with the Regional Board; and a statement that the new owner or operator assumes full responsibility for compliance with this Order. The application shall comply with the signatory paragraph of Standard Provision D.6. Continued discharge without submission of a request to transfer shall be considered an unauthorized discharge in violation of the California Water Code. Transfer will be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 September 2004.

FOR
THOMAS R. PINKOS, Executive Officer

BJS

ATTACHMENT I

NOTICES OF BVWD EDUCATION PROGRAMS AND SERVICES AVAILABLE TO CUSTOMERS:

I.1 Brochure and Sample Report—Tehama County Resources Conservation District On-Farm Irrigation Evaluations
I.2 Sample BVWD 2010 Newsletter
I.3 Informative Links on District Website (bvwd.org)
I.4 Free landscape irrigation audit invitation to customers
I.5 Door Hangers
I.6 BVWD Website Screen Shot—How to Find a Leak
I.7 Invitation to Customers: Water Conservation/Usage Workshop

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ATTACHMENT I.1

TEHAMA COUNTY RESOURCES CONSERVATION DISTRICT
BROCHURE AND SAMPLE REPORT:
ON-FARM IRRIGATION EVALUATION SERVICES

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The Tehama County RCD Mobile Irrigation Lab provides free water management assistance to growers in Tehama, Glenn, Shasta, and Butte counties.

A publication of

Tehama County Resource Conservation District
2 Sutter Street, Suite D
Red Bluff, CA 96080
(530) 527-3013, Ext. 3
www.tehamacountyrcd.org
tcrcd@tehamacountyrcd.org

Mobile Irrigation Lab
Sponsors & Cooperators

Bureau of Reclamation
Butte County RCD
Corning Water District
Department of Water Resources
Glenn County RCD
Natural Resources Conservation Service
Sacramento River Watershed Program
University of California Cooperative Extension
Western Shasta RCD

design & photography
by
Kevin Greer

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Resource Conservation District
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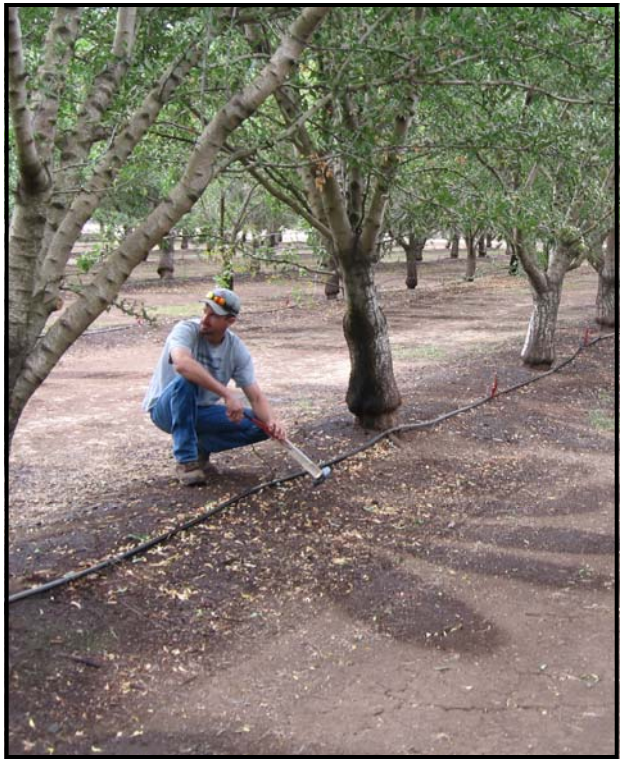
Mobile Irrigation Lab

Serving Tehama, Glenn, Butte, and Shasta Counties

A-590



Improve on-farm water management

The Mobile Lab provides:

- An analysis of the system's Distribution Uniformity (How evenly water is applied to the crop)
- Emitter/Sprinkler Flow Uniformity
- Catch-can uniformity (pattern of water application)
- Determination of water applied during an irrigation event
- System map of pressure and flow measurements
- Suggestions for system improvements and maintenance
- Irrigation scheduling assistance
- Flow meter readings (portable flow meter provided by the McConnell Foundation)

We can help you ...

Increase water and energy savings

At your request and convenience, a Mobile Lab Technician will meet with you for a few minutes to discuss your system. The Technician will then spend from four to six hours checking the operation of pumps, filters, emitters and sprinklers. Finally, a confidential report on your system's performance will be delivered and personally discussed with you.

Improve crop yields

For more information, or to schedule an evaluation, please contact:

Kevin Greer
Tehama County Resource Conservation District
2 Sutter Street, Suite D
Red Bluff, CA 96080
(530) 527-3013, Ext. 102
kevin@tehamacountyrcd.org

ATTACHMENT I.2

SAMPLE:
BELLA VISTA WATER DISTRICT NEWSLETTER

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· DIRECTORS ·
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JEFF O. STEPPAT LYNETTE BLAISDELL
ROBERT SIMS

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

Volume 24 – No. 1 NEWSLETTER Jan-Feb 2012

DELTA STEWARDSHIP COUNCIL SEEKS PUBLIC COMMENT

The Delta Stewardship Council, the state agency charged with developing a comprehensive, long-term and legally enforceable management plan for the Sacramento-San Joaquin Delta, is seeking public input on the draft Program Environmental Impact Report (EIR) for the Delta Plan. The Delta Plan's fundamental purpose is to meet the state-mandated coequal goals of "providing a more reliable water supply for California and protecting, restoring and enhancing the Delta ecosystem … in a manner that protects and enhances the unique cultural, recreational, natural resource and agricultural values of the Delta as an evolving place." (CA Water Code §85054)

Released Nov. 4, 2011, the draft EIR analyzes the environmental impacts of the draft Delta Plan, which includes 12 regulatory policies and 61 recommendations designed to guide state and local agencies regarding land, water, air and other systems in the Delta. The EIR also examines five alternative plans, including: a no project alternative, two alternatives with increased emphasis on water supply reliability, one alternative with increased emphasis on Delta ecosystem restoration and one alternative with increased emphasis on protection and enhancement of Delta communities and culture. Comments on the draft EIR are currently being accepted electronically, by mail and at field hearings scheduled throughout California in January. The Northern California meeting is scheduled for January 19th in Willows. Meetings will include a brief overview of the Delta Plan followed by public comments related to the draft EIR. The deadline for submitting written comments on the draft EIR is February 2, 2012. It is critically important that whatever alternative is selected does not "fix" one portion of the state at the expense or detriment of another. Additional information and documents can be found at www.deltacouncil.ca.gov.

POLL SHOWS WATER STILL A CONCERN FOR CALIFORNIANS

Though the economy is the dominant issue for Californians, voters remain concerned about the state's water supply and agree California should make major investments to upgrade and modernize its water supply system, according to a recently released statewide survey released by the Association of California Water Agencies. The survey, conducted in late November by Field Research Corporation found that three in four voters (75%) are concerned about water, with 28% extremely concerned and 47% somewhat concerned. In addition, an overwhelming majority (84%) agrees the state has major water problems and must invest in its water infrastructure to ensure reliable water now and in future years. Six in 10 voters (62%) believe investing billions of dollars in a state bond package such as the one on the November 2012 ballot would be worth it to ensure reliable water supplies, according to the survey. That figure includes 40% who strongly agree and 22% who somewhat agree. Field Research Corporation conducted the survey of 1,000 registered voters in English and Spanish from Nov. 15-27, 2011. The survey findings are available online at www.acwa.com.

DISTRICT PROJECTS COMPLETED AND UNDERWAY

The District recently completed the replacement of approximately 700 feet of waterline in the Bear Mountain Road / Bernard Way area, which had been prioritized for replacement due to its history of line breaks, vulnerability and limited winter access. Local contractor Cox and Cox was the successful bidder and they utilized a trenchless, pipe-bursting methodology to replace the old 12-inch pipe with new pipe of the same size.

District crews have recently installed two new 24-inch valves on Swede Creek Road at each end of the Cow Creek Bridge to accommodate the installation of a replacement pipeline to be constructed with County's upcoming bridge replacement project. The District and County have entered into an agreement to jointly accomplish this work. The new valves will allow the District to isolate the old section of pipe that runs under the bridge through the creek and switch over to the new pipe once it's installed.

District crews are continuing with an aggressive water meter replacement program as well as performing maintenance and exercising of distribution system valves and hydrants. Annual backflow device testing will begin in January.

DID YOU KNOW….IT IS EASY TO CHECK FOR LEAKS USING YOUR METER

It is a good idea to check for leaks at least annually and it could save you money and costly property damage. A leak as small as a pencil lead, at a pressure rate of 40 psi, can result in usage of 8,000 gallons (1,070 cf) per day. To check for leaks, turn all water off indoors and outdoors. This includes any devices such as ice makers, washing machines, sprinklers, etc. Once water is off, verify whether the water meter's *Low Flow Indicator(aka Leak Indicator)* is moving. This small dial will rotate if water is passing through the meter. It is an indication of very low flows that would be visually undetectable on the regular sweep hand of the meter. If no one is using water, but the dial is turning, you may have an undiscovered leak in your plumbing system. If the meter shows no obvious movement, note the reading and return in a few hours to see if there has been any change. If any water is used during that time, the meter reading will change. If you find that there is movement on the meter when there should not be, this may due to a leak. Check all appliances (dishwasher, clothes washer, and ice maker), faucets, toilets, pool systems, and irrigation systems.

If you need assistance locating your meter, contact the District office at (530) 241-1085 during normal business hours.

OFFICE HOURS

The District's regular office hours are: Monday thru Thursday 8:00 am – 5:00 pm and Friday – 8:00 am - 4:00 pm.

BOARD MEETINGS

Board of Directors meetings are open to the public and are held on the fourth Monday of each month beginning at 5:30 pm at the District office.

Information, including Board meeting agendas, prior meeting minutes as well as this and previous newsletters digitally with active links can be reviewed online at: www.bvwd.org.

· DIRECTORS ·
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JEFF O. STEPPAT LYNETTE BLAISDELL
ROBERT SIMS

DAVID J. COXEY
Secretary/Treasurer/General Manager

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Volume 24 – No. 2 NEWSLETTER Revised Mar - Apr 2012

CENTRAL VALLEY PROJECT 2012 SUPPLY ALLOCATION INCREASED TO 100%

On April 13, 2012, the U.S. Bureau of Reclamation updated the 2012 Central Valley Project (CVP) water supply allocation as follows:

Central Valley Project Initial WY 2012 Supply Allocation
February 22, 2012

Probability of Exceedence	Water Year Type and Percentage of Average Runoff	North-of-Delta (Percentages of Contracted Water Supply)				South-of-Delta (Percentages of Contracted Water Supply)			
		AG	**M&I*** **	**R***	**WR****	**AG**	**M&I*** **	**R***	**WR****
90% Conservative Forecast	(Dry) 73% of Average	**100**	**100**	100	100	40	75	100	100
50% Median Forecast	(Dry) 78% of Average	100	100	100	100	40	75	100	100

* The allocation for wildlife refuges applies to Level 2 water supplies only. A full water supply to the refuges (including both Level 2 and incremental Level 4 water) would be about 555,500 acre-feet. Level 2 is 422,251 acre-feet, which accounts for approximately three-fourths of a full refuge supply. The allocation for wildlife refuge contractors is tied to pre-established Shasta inflow criteria.
** The allocation for water rights contractors is based on pre-CVP held water rights and is tied to pre-established Shasta inflow criteria.
*** The allocation shown is a percentage of historic use and may be adjusted to meet public health and safety needs.

The Bureau of Reclamation's press release and allocation information is available on their website: http://www.usbr.gov/mp/pa/water

DISTRICT SUPPLY AND CONSERVATION REQUIREMENTS FOR 2012

The District relies upon the Central Valley Project (CVP) and a water service contract for the vast majority of its water supply which is diverted and pumped from the Sacramento River, filtered and disinfected to meet and exceed all drinking water standards. Additionally, the District has five groundwater wells and in recent years has secured a long-term transfer from another water agency in order to diversify supply and supplement the supply in shortage years. Following a very dry winter, improved precipitation in March and April combined with good carryover storage from last year have resulted in a full (100%) CVP supply allocation for 2012! It will therefore not be necessary to require drought or shortage measures beyond voluntary conservation.

Unfortunately, since other regions of the CVP will not receive a full supply this year there will be financial consequences to all CVP customers resulting from less water deliveries to allocate project expenses. Much of the previously available yield from the CVP for use by water agencies and their agricultural and municipal customers is no longer available as a result of regulatory actions and court rulings. This reallocation of water supply over the last couple of decades with no added storage means we are likely to experience shortages more frequently and more severely in the future.

For water conservation ideas, visit the District web site and review the water conservation fact sheet: http://www.bvwd.org/pdf/fact-sheets/Water-Conservation.pdf

FINAL 2012 CVP WATER RATES

The U.S. Bureau of Reclamation has published the final 2012 CVP Water Rates with a slight decrease in the municipal/industrial water rate and a slight increase in the agricultural rate. The published rate schedules are available online at: http://www.usbr.gov/mp/cvpwaterrates/ratebooks/index.html

2012 DISTRICT COMMODITY AND BIMONTHLY BASE RATES

The rate study adopted on April 29, 2010 (Resolution 10-01) provides for annual adjustments to the District's water rates as follows:

- Pass through increases or decreases of wholesale water costs annually for both Irrigation (agriculture) and M&I water types on a volume basis.
- Rates (excluding the wholesale water cost component) shall be adjusted annually based on the Consumer Price Index (CPI-U) plus up to two percent as a contingency for higher increases in energy, chemicals, and other District expenses. Note: the adjustment for 2012 is based on CPI-U plus one percent.
- The inclusion of the extraordinary operations and maintenance 20-Year pipeline replacement program phased-in 20 percent per year for a period of five years. The Board of Directors decided to postpone this year's phase-in, which will therefore remain at 40-percent of funding for the planned replacement costs.
- The inclusion of a volumetric charge for Agriculture and Aquaculture rates to address the prior and ongoing operations and maintenance (O&M) deficits as determined by the U.S. Bureau of Reclamation beginning with $2.00/AF and increasing by up to $2.00/AF annually for a maximum of $8.00/AF in 2013 as recommended in the rate study. We are now at $6.00/AF.

A revised summary of water commodity and bimonthly base rates is available online at http://www.bvwd.org/rates-information.htm or at the District office.

PERSONNEL

Please join us in welcoming our newest team member, Customer Service Representative, Ashley Lindell.

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Volume 24 – No. 3 NEWSLETTER May - Jun 2012

CENTRAL VALLEY PROJECT 2012 SUPPLY ALLOCATION INCREASED TO 100%

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For water conservation ideas, visit the District web site and review the water conservation fact sheet: http://www.bvwd.org/pdf/fact-sheets/Water-Conservation.pdf

PERSONNEL

Please join us in welcoming our newest team member, Water Treatment Operator T-2, Will Markword.

OFFICE HOURS

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BOARD MEETINGS

Board of Directors meetings are open to the public and are held on the fourth Monday of each month beginning at 5:30 p.m. at the District office. However, the board meeting for May will be held on Monday May 21, 2012.

BELLA VISTA WATER DISTRICT – 2011 CONSUMER CONFIDENCE REPORT

(Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.)

The District is pleased to present this year's Consumer Confidence Report. Our unvarying goal is to provide a safe and dependable supply of drinking water to all of our customers. Last year, as in years past, your tap water met all EPA and State drinking water health standards. Once again we are proud to report that our water system has never violated a maximum contaminant level or any other water quality standard.

WHERE OUR WATER COMES FROM

Our water sources include surface water from the Sacramento River, groundwater from five wells, and emergency intertie connections with the City of Redding, and the City of Shasta Lake.

In 2011, surface water from the Sacramento River made up 96.3% of the treated water supply, or approximately 3.53 billion gallons (compared with 99.3% of the treated water supply and 3.67 billion gallons in 2010). The maximum daily flow through the Water Treatment Plant in 2011 was 26.6 million gallons on August 10th. In May 2011 the District completed construction of facilities at its water treatment plant that allow the District to capture and recycle filter backwash water that previously was discharged to waste. These facilities recycled approximately 125 million gallons (383 acre-feet) of water, supplying approximately 3.4% of the treated water supply in 2011. This additional water reduces the amount of water that the District diverts from the Sacramento River or pumps from groundwater wells and will provide a reliable source of much needed water during future shortages.

The District's wells draw from the Redding groundwater basin. The wells made up 0.3% of the total supply, or approximately 11.6 million gallons in 2011 (compared with 0.7% of the treated water supply and 27 million gallons in 2010). The treatment process at each of the five wells consists of oxidation of iron and manganese using chlorine, followed by absorption of the iron and manganese oxides in pressure filters. A chlorine residual is carried through the entire process to aid in maintaining a chlorine residual in the distribution system. No iron or manganese was detected in any of the treated well water samples collected in 2011. Well water is warmer than the treated surface water and has a different taste due to its higher mineral content. At times, the mixing of chlorinated well water with treated river water in the distribution system generates a more noticeable taste due to the different physical and chemical properties of the waters. To ensure the safety of the water the same microbiological testing is completed weekly at various sites throughout the water distribution system, regardless of the source.

The District received less than 0.01% of its total supply or approximately 0.3 million gallons of water, through its interties during all of 2011.

Source water assessments were performed by the Department of Public Health between January 2002 and April 2003. The District's Sacramento River source is considered most vulnerable to the following activities associated with contaminants detected in the water supply: 1) metal plating/finishing/fabricating, 2) wood/ pulp/paper processing and mills, and 3) drinking water treatment plants. The source is considered most vulnerable to the following activities not associated with any detected contaminants: 1) concentrated aquatic animal production facilities, 2) historic waste dumps/landfills, 3) landfills/dumps, 4) historic mining operations, and 5) wastewater treatment plants and disposal facilities (above Shasta Dam). The District's well sources are considered most vulnerable to the following activities not associated with any detected contaminants: 1) lumber processing and manufacturing, 2) septic systems - low density, 3) sewer collection systems, 4) historic waste dumps/landfills, 5) automobile - gas stations, and 6) utility stations - maintenance areas.

A copy of the complete assessment may be viewed at Bella Vista Water District, 11368 E. Stillwater Way, Redding, CA 96003. You may request a summary of the assessment be sent to you by contacting the Administrative Assistant @ (530) 241-1085, ext. 105.

In 1989 the Federal Surface Water Treatment Rule set forth specific regulations requiring proper treatment of surface waters, as well as specific license requirements for water treatment operators. Although the regulations have changed dramatically, the overall process has not. Currently the District's staff includes 10 individuals with state certification as water treatment operators and 18 with certification as water distribution operators (including 10 individuals with certification as both) who operate and maintain the District's facilities 365 days per year.

CONTAMINANTS IN WATER

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and in some cases radioactive material and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.

STATE AND FEDERAL REGULATIONS

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

The tables in this report list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The Department of Public Health allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of our water quality, are more than one year old.

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Act Hotline at 1-800-426-4791.

A NOTE TO THE IMMUNO-COMPROMISED FROM THE UNITED STATES EPA

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Center for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

REGARDING LEAD IN DRINKING WATER

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Bella Vista Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

ARSENIC IN THE DISTRICT'S WELL WATER

Analysis of the District's well water has shown that it contains low levels of arsenic (less than 10 parts per billion). While this source makes up a very small portion of your drinking water and meets the federal and state standards for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

ABOUT THE WATER QUALITY TABLES

Bella Vista Water District routinely monitors for constituents in your drinking water according to federal and state laws. The tables in this report show the results of our monitoring for the period through December 31, 2011. Where contaminants are monitored less than once per year, the values included in the report tables represent the results of the most recent analyses. In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms, the following definitions are provided:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not detectable at current testing limits.

Parts per million (ppm) or Milligrams per liter (mg/L) - one part per million corresponds to one minute in 1.9 years or a single penny in $10,000.

Parts per billion (ppb) or Micrograms per liter (µg/L) - one part per billion corresponds to one minute in 1,900 years, or a single penny in $10,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Microsiemens per centimeter (µS/cm) is a unit for reporting the specific electrical conductance of the water.

Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements. Turbidity in excess of 5 NTU is just noticeable to the average person.

Maximum Contaminant Level (MCL) – The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal or PHG B The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standards (PDWS) - MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.

YOUR VIEWS ARE WELCOME

If you have any questions about this report, please contact Don Groundwater, your District Engineer, at (530) 241-1085, ext. 114. We want our valued customers to be informed about their water district. If you want to learn more, please visit the District's web site: www.bvwd.org or attend any of our regularly scheduled Board of Directors meetings. The meetings are held on the fourth Monday of each month at 5:30 p.m. at the District office, located at 11368 E. Stillwater Way, Redding, CA 96003.

2011 RESULTS OF WATER QUALITY ANAYSES

Results of Sampling for Microbial Contamination					
Contaminant	**MCL**	**Unit of Measurement**	**PHG (MCLG)**	**Highest Number of Detections**	
				Treated Surface Water	**Treated Well Water**
1. Total Coliform Bacteria (Total Coliform Rule)	Presence of coliform bacteria in no more than one sample per month	presence/ absence	0	1	None
2. Fecal coliform and *E.coli* (Total Coliform Rule)	A routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	presence/ absence	0	None	None
3. Fecal Indicators (*E.coli*, enterococci or coliphage) (Total Coliform Rule)	Treatment Technique	n/a	n/a	None	None

Sampling Results Showing Treatment of Surface Water Source (Sacramento River)					
Contaminant	**Performance Standard / MCL (Treatment Technique)**	**Unit of Measurement**	**Level Found**	**Range**	**Violations**
4. Turbidity	(1) Shall at no time exceed 1 NTU	Based on measurements made at 4 hour intervals while the plant is in operation	Less than 1 NTU at all times	0.020 NTU to 0.258 NTU	None
	(2) Less than 0.1 NTU in 95% of the measurements taken each month	Lowest Monthly % of measurements meeting the standard	98.9	98.9 to 100	None
	(3) Reduction in turbidity of 80% or more	Average monthly percentage reduction in turbidity	98.7	98.3 - 99.2	None
Note: Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.					

Sampling Results Showing the Detection of Contaminants With a Primary Drinking Water Standard							
Contaminant	**MCL**	**PHG (MCLG)**	**Unit of Measure-ment**	**Sacramento River***		**Well Water****	
				Average Value	**Range**	**Average Value**	**Range**
5. Gross Alpha	15	(0)	pCi/L	ND	-	0.42	ND - 2.1
6. Aluminum	1	0.6	ppm	ND	-	ND	All ND
7. Arsenic	10	0.004	ppb	ND	-	3.7	2 - 6.1
8. Barium	1	2	ppm	ND	-	0.148	ND - 0.311
9. Chromium	50	(100)	ppb	1	-	1.0	ND - 4
10. Fluoride	2.0	1	ppm	ND	-	0.18	0.07 - 0.40
				Sacramento River and Well Water			
				2011 Highest Running Annual Average		**2011 Range**	
11. TTHM [Total trihalomethanes]	80	N/A	ppb	50.0		32.5 – 51.9	
12. HAA5- Haloacetic acids	60	N/A	ppb	37.1		26.4 – 47.2	
Note: TTHM and HAA5 results are from samples collected from the Distribution System which may include water from both the river and wells.							

* All results from the surface water source (which represents 99.7% of the water produced by the District in 2011) are from samples collected in 2011.

**Well water results reflect the latest results taken from each well; the results include samples collected over the period 2003 through 2011. The dates of the latest samples may be obtained by contacting the District's office.

Sampling Results Showing the Detection of Contaminants With a Secondary Drinking Water Standard (Aesthetic standards, established by the California Department of Public Health - Division of Drinking Water)							
Contaminant or Analyte	**MCL**	**PHG (MCLG)**	**Unit of Measure-ment**	**Sacramento River***		**Well Water****	
				Average Level Detected	**Range**	**Average Level Detected**	**Range**
13. Foaming Agents (MBAS)	500	N/A	µg/L	ND	-	8	ND - 30
14. Total dissolved solids	1,000	N/A	mg/L	66	-	203	167 - 234
15. Specific conductance	1,600	N/A	µS/cm	114	-	318	252 - 399
16. Chloride	500	N/A	mg/L	4	-	35	10 - 56
17. Sulfate	500	N/A	mg/L	3.7	-	2.2	0.7 - 5.1

Sampling Results for Unregulated Contaminants (Unregulated contaminant monitoring helps the USEPA and the California Department of Public Health to determine where certain contaminants occur and whether the contaminants need to be regulated.)							
18. Boron	Notification Level = 1000 ppb	N/A	ppb	ND***	-	498	208 - 996
19. Vanadium	Notification Level = 50 ppb	N/A	ppb	4***	-	0.4	ND - 1

Sampling Results for Sodium, Hardness and pH							
20. Sodium	N/A	N/A	ppm	6	-	40	18 - 60
21. Hardness	N/A	N/A	ppm	46	-	57	40 - 75
22. pH	6.5 - 8.5	N/A	pH units	7.9	-	7.7	7.5 - 7.9

* All results from the surface water source (which represents 99.7% of the water produced by the District in 2011) are from samples collected in 2011.

**Well water results reflect the latest results taken from each well; the results include samples collected over the period 2003 through 2011.

*** Not sampled in 2011; the results include samples collected over the period 2003 through 2011.

The dates of the latest samples may be obtained by contacting the District's office.

Sampling Results Showing the Detection of Lead and Copper						
Contaminant	**PHG (MCLG)**	**Action Level (AL)**	**90th percentile level detected**	**No. of samples collected**	**No. of Sites exceeding AL**	**Typical Source of Contaminant**
Lead (ppb)	0.2	15	ND	32	0	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppb)	300	1300	299	32	0	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives
Note: The District is required to conduct lead and copper sampling every three years. These results are from the most recent round of sampling conducted in June 2010.						

Disinfectant Residuals found in the Distribution System during 2011							
Contam-inant	**MCL [MRDL]**	**Unit of Measure-ment**	**PHG (MRDLG)**	**Average Value**	**Range**	**Major Sources in Drinking Water**	**Health Effects**
Chlorine	4.0 (as Cl_2)	ppm	4	.93	0.17 to 1.8	Drinking water disinfectant added for treatment	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

MRDL = Maximum Residual Disinfectant Level (The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminanats.)

MRDLG = The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

TYPICAL SOURCES OF DETECTED CONTAMINANTS	
Contaminant	**Typical Source of Contaminant**
1. Total Coliform Bacteria	Naturally present in the environment
2. Fecal Coliform and *E. coli*	Human and animal fecal waste
3. Fecal	Human and animal fecal waste
4. Turbidity	Soil runoff
5. Gross Alpha	Erosion of natural deposits
6. Aluminum	Erosion of natural deposits; residue from some surface water treatment processes
7. Arsenic	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
8. Barium	Discharge of oil drilling wastes and from metal refineries; erosion of natural deposits
9. Chromium	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
10. Fluoride	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
11. TTHM [Total trihalomethanes]	By-products of drinking water chlorination
12. Haloacetic Acids	By-products of drinking water chlorination
13. Foaming Agents (MBAS)	Municipal and industrial waste discharges
14. Total dissolved solids	Runoff/ leaching from natural deposits
15. Specific conductance	Substances that form ions when in water; seawater influence
16. Chloride	Runoff/leaching from natural deposits; seawater influence
17. Sulfate	Runoff/leaching from natural deposits; seawater influence
18. Boron	Laundry products, sewage, agricultural chemicals and fertilizers, coal combustion mining and glass and ceramics manufacturing
19. Vanadium	Natural sources and from the burning of fuel oils

OTHER TEST RESULTS OF INTEREST	
Constituent	**Description and Source Information**
20. Sodium	Refers to the salt present in the water and is generally naturally-occurring
21. Hardness	Is the sum of polyvalent cations present in the water, generally magnesium and calcium. These cations are generally naturally-occurring.
22 . pH	The pH of a water is a measure of its hydrogen ion activity or acidity. By definition the pH of pure water is 7.0. The pH range of most natural waters is about 6.0 to 8.5.

· DIRECTORS ·
BOB NASH JEFF THOMPSON
JEFF O. STEPPAT LYNETTE BLAISDELL
LEIMONE WAITE

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

Volume 24 – No. 4 NEWSLETTER Jul - Aug 2012

DIRECTOR APPOINTMENT

The Bella Vista Water District is governed by a five member Board of Directors elected to staggered four year terms. At their meeting of May 21, 2012, the Board of Directors appointed Leimone Waite to the Board to fulfill the remaining term of Robert Sims who resigned from the Board in April.

2012-13 BUDGET ADOPTED

The District's budget for the 2012-2013 fiscal year was adopted by the Board of Directors at their meeting of June 25, 2012. The $5.87 million balanced budget includes all projected expenses for routine operations and maintenance items including water purchased from the Central Valley Project, labor, power, fuel, chemicals, permits and regulatory fees and charges. The special assessment rate being requested remains at $0.37 per $100 of assessed land valuation.

The planned 2012-2013 extraordinary maintenance and replacement projects include an overhaul of the Wintu Pumping Plant Unit 3 pump and motor. Unit 3 is one of four units originally installed with the construction of the Wintu Pumping Plant in 1965. The overhaul will include a tear down and overhaul of the 1,000 hp synchronous motor and tear down and machine work of the 25 cfs vertical turbine pump in order to restore the pumping capacity and efficiency. Other scheduled projects include two pump overhauls for the Cow Creek 1 Pump Station, installation of a 16-inch valve on Lateral 7.5 north; valve and actuator replacements at the Water Treatment Plant, repair and paving of the Wintu Pumping Plant access road along with slope and drainage improvements. Planned pipeline replacements include the replacement of 300 feet of 24-inch pipe crossing the Swede Creek Road Bridge at Cow Creek and replacement of 1,400 feet of 8–inch pipe on Olympia Way. Lastly, the District plans to replace one 1-ton service truck.

PROJECTS ACOMPLISHED OR IN PROGRESS

The District has completed the installation and integration of new "fish friendly" intake screens for the Wintu Pumping Plant on the Sacramento River. The new retractable, stainless steel, wedge wire cylindrical screens were manufactured and installed by Intake Screens Inc., from Freeport, California. The manufacture and installation of the screens was funded entirely by a grant administered by the Family Water Alliance. Funding for the project was provided from the Central Valley Project Improvement Act's Anadromous Fish Screen Program, administered by the U.S. Bureau of Reclamation and the CALFED Ecosystem Restoration Program, administered by the California Dept. of Fish and Game. The project is currently featured on the Family Water Alliance's Fish Forum web site: http://fwafishforum.com/

The District was also the recipient of a Water Use Efficiency Grant award in the amount of $70,986 from the U.S. Bureau of Reclamation for implementation of new water metering technology and a number of water use efficiency program elements that will benefit District customers. This will be the second year of this two year grant and project. Additional accomplishments that occurred during the prior fiscal year includes: repaving of the Old Oregon Trail Tank access road; the replacement and right sizing of approximately 450 water meters to address metering inaccuracies; continued valve actuator replacements at the Water Treatment Plant; replacement of 700 feet of 12-inch water main near Bear Mt. Road; installation of 24-inch and 18-inch valves to accommodate the future replacement crossing of Cow Creek at Swede Creek Road. All of these projects were required in order to improve water service reliability by replacing or extending the useful life of critical infrastructure to serve our customers. Additionally, the District completed implementation of a geographical information system (GIS) for asset management and the creation of an "intelligent" mapping system which utilizes and layers assessor's parcel geometry, orthophoto imagery, District facilities as well as other geographic data. Lastly, the District reorganized staff and absorbed the duties of the Field Technician, reducing the department by one full-time employee.

CALL BEFORE YOU DIG!

Every person planning to dig (using hand tools, power operated or power driven equipment) should notify USA North at 811 / 1-800-227-2600 / www.usanorth.org. USA North provides a FREE "Call Before You Dig" service to all landowners and contractors. The one call to USAN in advance of your dig will automatically notify all USA Members who may have underground facilities at your work site. In response, USA Members (including Bella Vista Water District) will mark or stake the horizontal path of their underground facilities, provide critical information and give clearance to dig if there are no interferences. This simple service protects you from personal injury and liability. Please call two (2) working days to 14 calendar days before your planned digging, notify USA North at 811 / 1-800-227-2600 / www.usanorth.org.

WILDFIRE DANGER SEASON HAS ARRIVED

Summer has arrived along with an increased risk of wildfire. We encourage you to know where the nearest fire hydrants are and ensure they are visible and accessible by fire crews at all times. CAL FIRE strongly recommends you maintain a defensible space of 100 feet around your home and prepare and practice for a wildfire event by having an evacuation plan. Additional information for protecting your family, home and property from wildfires can be found at: www.fire.ca.gov.

DISTRICT PERSONNEL

Please join us in congratulating Matt Leggee for his promotion to a Water Distribution Operator.

OFFICE HOURS

The District's regular office hours are: Monday thru Thursday 8:00 am – 5:00 pm and Friday – 8:00 am - 4:00 pm.

BOARD MEETINGS

Board of Director Meetings are open to the public and are held on the fourth Monday of each month beginning at 5:30 p.m. at the District office. Information, including Board Meeting Agendas and prior meeting Minutes, can be reviewed online at: www.bvwd.org.

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Volume 24 – No. 5 NEWSLETTER Sep – Oct. 2012

GOVERNOR, SECRETARY OF THE INTERIOR, JOINTLY ANNOUNCE BAY-DELTA PROCESS

On July 25, 2012, California Governor Edmund G. Brown Jr., Secretary of the Interior Ken Salazar, and National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Fisheries Eric Schwaab outlined revisions to the proposed Bay Delta Conservation Plan (BDCP). "In the coming months a range of alternative proposals will undergo a rigorous public environmental review process." In announcing the plan to move forward with an enhanced BDCP process, the officials emphasized that California's water system is unsustainable from both an environmental and economic perspective, and that the BDCP is a key part of a comprehensive solution to achieve the dual goals of a reliable water supply for California and a healthy California Bay Delta ecosystem that supports the State's economy. "A healthy Delta ecosystem and a reliable water supply are profoundly important to California's future," said Governor Brown. "This proposal balances the concerns of those who live and work in the Delta, those who rely on it for water and those who appreciate its beauty, fish, waterfowl and wildlife." The joint announcement outlined actions that must be pursued to achieve these co-equal goals, including construction and operation of isolated conveyance facilities ("Peripheral Tunnels" by some critics). "As broken and outdated as California's water system is, we are also closer than ever to forging a lasting and sustainable solution that strengthens California's water security and restores the health of the Delta," said Secretary Salazar. "Through our joint federal-state partnership, and with science as our guide, we are a taking a comprehensive approach to tackling California's water problems when it comes to increasing efficiency and improving conservation."

State law requires that state and federal agencies present a plan by late 2012 that will better protect the Delta's ecosystem and improve water supply reliability for millions of Californians. The Delta Reform Act requires a plan that reduces reliance on the Delta and promotes water conservation, water recycling, conjunctive use and desalination. The BDCP's preferred approach is to draw water out of the Sacramento River using several large pumps and move that water south through two large tunnels underneath the Delta.

The joint announcement certainly doesn't represent final action. Numerous issues requiring detailed analysis and policy decisions must be addressed. Chief among these issues is how the conveyance facilities proposed by the Governor and the Secretary will be financed and which public water agencies will pay for the facilities. Unaddressed in the announcement is the issue of additional water storage and potential for redirected impacts. Reactions to the announcement varied with the strongest support from those most reliant upon the Delta for water supply. A coalition of environmental groups, local, state and

federal elected officials representing the Delta area, and the Pacific Coast Federation of Fishermen's Associations promptly launched their campaign against the "Peripheral Tunnels". Opponents have pointed out "fatal flaws" of the tunnels they said would damage water, the environment, fish, and farming and impose billions of dollars of increases on water ratepayers. Restoration of Delta habitat, a key element of the overall plan, depends largely on a bond issue that has been withdrawn from the 2012 California state ballot.

For additional information, visit the Bay Delta Conservation homepage:
http://baydeltaconservationplan.com/Home.aspx

DISTRICT PERSONNEL

Please join us in congratulating…

- Bud Wanbaugh, Distribution Technician, for completing 20 years of service with the District
- Mark Maty, Treatment Operator, for passing his state exam and receiving his T-3 Water Treatment Operator Certification
- Ashley Lindell, for receiving a promotion to the Accounts Payable Clerk position

CUSTOMER RECORDS

The District urges all customers to maintain and update their contact information, as necessary, with the District. This information can be critical in the event of water outages. Please notify the Customer Service Department at the District office to update your information.

OFFICE HOURS

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Volume 24 – No. 6 NEWSLETTER Nov – Dec 2012

U.S. BUREAU OF RECLAMATION SEEKS WRITTEN COMMENTS ON DRAFT REPORT ON ENLARGING SHASTA DAM AND RESERVOIR

In February, Reclamation released its draft feasibility report which examined the potential costs, benefits and impacts of enlarging Shasta Dam and Reservoir. Reclamation has been studying the feasibility of alternative dam raises ranging from 6.5 feet to 18.5 feet. Raising the dam to those heights would result in corresponding increases in reservoir storage from 256,000 acre-feet to 634,000 acre-feet. The additional storage capacity would be used to improve the reservoir's ability to provide colder water for winter-run Chinook salmon during drought years. It also would increase water supply reliability for agricultural and municipal water users in the state, the report asserts. Reclamation also is studying the alternative to take no action on the dam. Reclamation has received comments since the draft report was released in February and is now requesting additional written comments from all interested individuals, agencies and organizations. All comments received will be considered as Reclamation completes remaining engineering, environmental, economic and financial studies and reports. Reclamation also is preparing a formal draft environmental impact statement on the Shasta Dam and Reservoir enlargement scenarios and will establish a separate formal public review and comment process once that document is released to the public. A decision to raise the dam and enlarge the reservoir requires complex and intricate analyses, Reclamation stated in a press release. As the decision-making process continues, Reclamation seeks to address public and agency concerns and comply with all applicable federal, state and local laws, the release added. The draft feasibility report is available on Reclamation's website at http://www.usbr.gov/mp/slwri/index.html.

Written comments may be submitted via email to BOR-MPR-SLWRI@usbr.gov or mailed to the following address: Katrina Chow, Project Manager, Bureau of Reclamation, 2800 Cottage Way, MP-720, Sacramento, CA 95825-1893. For questions contact Katrina Chow at 916 978-5067.
Source: ACWA Water News - Pamela Martineau, 10/29/2012

TIME TO RESET IRRIGATION TIMERS AND WINTERIZE WATER SYSTEMS

Adjusting your watering schedule to match water demands is key to efficient water use. Making frequent adjustments to watering times saves water, money and is better for plants. It may seem obvious to turn off irrigation timers and systems once rain arrives, but it can be easy to forget until an unnecessarily high usage billing arrives. Fall is the time to reset, or turn off, irrigation timers and reduce irrigation run times to match the greatly reduced irrigation demands when dormancy and rain arrives.

As freezing temperatures approach, it is necessary to winterize your system piping and components to prevent freeze damage. Even if you have drained some water out of your system, the remaining water can freeze, expand and crack piping and system components such as valves and backflow devices. Following are some suggestions to avoid the costly damage freezing conditions can cause.

- You can turn off automatic sprinkler timers altogether once freezing temperatures arrive and deciduous plants and trees are dormant and don't require irrigation.
- Insulate all above ground piping (including the water line coming out of the ground that feeds into your house) and items such as hose bibs, backflow devices and valves.
- If you have a frozen pipe, the most popular and safest pipe-thawing option is to use warm water. Wrap and secure a heavy towel or burlap bag around the pipe to concentrate and hold heat against it. Place a bucket under the pipe to catch runoff water, and then pour hot water over the towel. Avoid using torches or heat guns, which create a risk of fire. Too much heat too quickly can expand the pipe material and cause it to burst.
- For irrigation systems that will not be utilized through the winter, it is best to drain or otherwise purge the waterlines with air.

THE BEST VALUE AROUND

On average, a gallon of clean, safe Bella Vista Water District tap water costs less than one sixteenth of a cent! Alternatively, that is more than 16 gallons for 1 penny! When compared with the cost of other products we use every day, tap water is clearly one of the best values around.

A GALLON OF	A GALLON OF	A GALLON OF	A GALLON OF	A GALLON OF
$45.00	**$16.00**	**$11.00**	**$4.00+**	**$3.50**

DISTRICT PERSONNEL

Please join us in welcoming…

- Jennifer Enriquez, our newest Customer Service Representative; and
- Clinton Andreasen who will join the District staff as an Engineering/GIS Technician

CUSTOMER RECORDS

The District urges all customers to maintain and update their contact information, as necessary, with the District. This information can be critical in the event of water outages or other emergencies. Please notify a Customer Service Representative to update your contact and billing information.

OFFICE HOURS

The District's regular office hours are: Monday thru Thursday 8:00 am – 5:00 pm and Friday – 8:00 am - 4:00 pm.

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ATTACHMENT I.3

SAMPLE:
INFORMATIVE LINKS ON DISTRICT WEBSITE (bvwd.org)

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Links

Industry Related

- American Water Works Association
  http://www.awwa.org/
- Aquafornia Water News Blog
  http://aquafornia.com
- Association of California Water Agencies
  http://www.acwa.com/
- California Farm Bureau Federation
  http://www.cfbf.com/
- California Irrigation Management Information System (CIMIS)
  http://www.cimis.water.ca.gov/cimis/welcome.jsp
- California Water Plan
  http://www.waterplan.water.ca.gov/
- North State Water Alliance
  http://northstatewater.org/
- Northern California Water Association (NCWA)
  http://www.norcalwater.org/
- Tehama County Resource Conservation District Mobile Irrigation Lab
  http://www.tehamacountyrcd.org/services/lab2.html
- U.C. Davis - Crop Cost Studies
  http://coststudies.ucdavis.edu/
- U.C. Water Resources Center Archives
  http://library.ucr.edu/wrca/
- Underground Service Alert North
  http://www.usanorth.org/
- University of California Cooperative Extension (UCCE)
  http://ceshasta.ucdavis.edu/

- Water Conservation Ideas
  http://www.h2ouse.org/index.cfm
- Water Education Foundation
  http://www.water-ed.org/
- Water For Tomorrow Magazine
  http://www.waterfortomorrowmag.com/
- Water Sense – Conservation Tips from U.S. EPA
  http://www.epa.gov/watersense/
- Western Water Blog
  http://westernwaterblog.typepad.com/

Local Government

- City of Redding
  http://www.ci.redding.ca.us/
- Shasta County
  http://www.co.shasta.ca.us/index.aspx

State & Federal Government

- Bay Delta Conservation Plan (BDCP)
  http://baydeltaconservationplan.com/Home.aspx
- CA Department of Public Health
  http://www.cdph.ca.gov/healthinfo/environhealth/water/Pages/default.aspx
- CA Department of Water Resources (DWR)
  http://wwwdwr.water.ca.gov/
- CA Environmental Protection Agency
  http://www.calepa.ca.gov/
- CALFED Bay-Delta Authority
  http://calwater.ca.gov/
- Central Valley Regional Water Quality Control Board
  http://www.swrcb.ca.gov/rwqcb5/
- Delta Stewardship Council
  http://www.deltacouncil.ca.gov/
- Federal Legislation
  http://thomas.loc.gov/
- State Assembly
  http://www.assembly.ca.gov/defaulttext.asp
- State Legislation
  http://www.leginfo.ca.gov/
- State Senate
  http://www.sen.ca.gov/
- State Water Resources Control Board
  http://www.swrcb.ca.gov/
- U.S. Bureau of Reclamation
  http://www.usbr.gov/
- U.S. Bureau of Reclamation - Central Valley Operations
  http://www.usbr.gov/mp/cvo/
- U.S. Bureau of Reclamation - Mid-Pacific Region

http://www.usbr.gov/mp/

- U.S. Environmental Protection Agency
  http://www.epa.gov/

ATTACHMENT I.4

INVITATION TO CUSTOMERS:
FREE LANDSCAPE IRRIGATION AUDIT

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· DIRECTORS ·
BOB NASH JEFF THOMPSON
JEFF O. STEPPAT LYNETTE BLAISDELL
LEIMONE WAITE

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

August 13, 2012

Subject: Free Onsite Water Audit

Dear Customer:

As one of the District's highest water use customers, you have been selected for a free onsite landscape irrigation audit. This program is currently offered free of charge for a limited time to select customers through a WaterSMART grant awarded to the District by the U.S. Bureau of Reclamation in order to improve water use efficiency and in partnership with the Shasta College Agriculture and Natural Resources Department. The program objective is to improve water use efficiency by providing customers with assistance to determine their irrigation system application rate, distribution uniformity, develop an appropriate irrigation schedule as well as identifying any system deficiency, and cost effective improvements. The goal is to provide you with information and "tools" to improve your water use efficiency that can save you money on subsequent water bills.

The irrigation audit will be performed by a certified Landscape Irrigation Auditor and a Shasta College student participating in the Worksite Learning Program. Access and assistance to operate the irrigation system will be necessary and require your cooperation. The auditor will review the irrigation system equipment, observe and verify system operation, operating pressures, identify system deficiencies, and determine application rates and uniformity. The auditor will then provide you with a written report detailing the findings, recommendations and develop a customized irrigation schedule based on your system application rates. The information will be strictly confidential and only used to assist the customer in improving water use efficiency.

This program is offered for a limited time on a first-come, first-served basis and is limited to one audit per customer/account for the top landscape irrigation customers. If interested, please contact Patty Breedlove, at extension 110 at the District office to schedule an appointment.

Sincerely,

C. Wade

Connie M. Wade
Office Manager

We are an equa' opportunity employer.

ATTACHMENT I.5

DOOR HANGERS:

- **Response to Work Order, Customer Not Home**
- **Water Waste Prevention**
- **Imminent Service Shut-off—New Customer**

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BELLA VISTA WATER DISTRICT

Date: _____ Time: _____

☐ Customer Request (Work Order No._____)

☐ Sorry I missed you. Will call again on_____ at _____ AM/PM

☐ Please call the office at:
241-1085 - 8 a.m. to 5 p.m. Mon -Thur
241-1085 - 8 a.m. to 4 p.m. Fri
241-1085 - After 5 p.m. and holidays

☐ Could not turn water service
☐ ON ☐ OFF Please call office

☐ Water service is now ☐ ON ☐ OFF

☐ Found leak on _____.

☐ Repair is required on your property and needs to be made by your plumber.

☐ Took pressure reading of _____PSI and is: normal / is not normal. Will be corrected.

☐ Water meter checked and found: in good order / will be replaced. Please call office.

☐ Water will be turned OFF for repairs

on _____

From _____ AM/PM to _____AM/PM

☐ Other:_____

Comments: _____

_____

_____

_____

Service by _____
(Name)

PLEASE NOTIFY IF PROBLEM RECURS

A-622

Bella Vista Water District

Excessive outside water use reduces the District's precious water supply. We are asking water users to observe the following conservation tips:

☐ DO NOT allow water to run off into the gutter or onto down slope property.
☐ Avoid irrigating during the heat of the day. Schedule irrigation and timers for early morning (before 6 am) or late evening (after 9 pm) to reduce water waste through evaporation and to avoid peak water and energy use times.
☐ Do not water in one location longer than necessary to prevent runoff and deep percolation (below the root zone). If possible, use a timer and adjust irrigation duration seasonally.
☐ Use a shut-off nozzle on garden hoses to prevent waste.
☐ Periodically inspect irrigation system operation and repair and adjust sprinklers and components.
☐ Water crops and landscaping, not paved or concrete areas.
☐ Consult with a local irrigation, crop or landscape specialist to learn about water saving techniques and how to use less water while also improving plant health.
☐ Make sure hoses and faucets do not leak and connections are tight.
☐ Do not water out of habit, check soil moisture (dampness) first.
☐ Adjust irrigation time and timers seasonally.
☐ Please do your part to conserve water.

If you have questions or if we can be of assistance, call our office at (530) 241-1085 or visit our website at www.bvwd.org.

BELLA VISTA WATER DISTRICT

11368 East Stillwater Way
Redding, CA 96003-9510
(530) 241-1085

Date: _____

Location: _____

*****APPLICATION FOR WATER SERVICE*****

The water service at this location was to be locked off today at the request of the previous consumer.

However, for your convenience, the District has left the water service on. You need to come to the District Office within the next forty-eight (48) hours to complete an Application for Water Service, and pay a $200 security deposit to secure continuation of water.

Failure to meet these requirements shall result in disconnection of water service. **THERE WILL BE NO FURTHER NOTICE POSTED.**

OFFICE HOURS ARE:
8:00 a.m. to 5:00 p.m. Monday –Thursday
8:00 a.m. to 4:00 p.m. Friday
CLOSED HOLIDAYS

If you have any questions regarding this notice please contact the District Office at the address or telephone number listed above. Thank you for your cooperation.

LOOKING FORWARD TO SERVING YOU

A-624

ATTACHMENT I.6

ONLINE INSTRUCTIONS TO CUSTOMERS: HOW TO FIND A LEAK
(Website screenshot)

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- Home
- District Information
- Water Quality Reports
- Rates Information
- Policies
- Links
- FAQ
- Contact Us

Frequently Asked Questions

Fact Sheets

- How do I get to your office?
- How do I read my bill and what are your fees?
- Is your Water Service Application online?
- What payment options are available for paying my bill?
- How do I read my meter?
- How do I know if I have a leak? How can I find out?
- What is in your water? Do you put fluoride in your water?
- Is your Agricultural Water Service Application online?
- What are the Agricultural rate qualification guidelines?
- What is a cross-connection charge?
- What is the Special Assessment I see on my tax bill?
- What are water equivalents for converting into different measurement units?

- **How do I get to your office?**

  You can get directions to our office on our Contact Us page.

- **How do I read my bill and what are your fees?**

  The District's water rates are broken down into two parts; a base charge and a unit or commodity charge. Any activated service incurs a base charge. The base charge is a standard bimonthly charge which varies with the size of the meter and type of service, i.e., residential, agricultural, etc. This base charge does not provide for any water. The charge is used to offset the cost of providing service and maintaining the service and the water system, irrespective of the amount of water delivered. Costs include planning; meeting regulatory requirements; maintaining the system in good repair; meter replacements, etc.

  The commodity charge is a unit charge for the amount of water used. This charge is made to recover the direct costs of supplying water, which includes water purchases, treatment, pumping, and other costs attributable directly to the amount of water used.

  The District's policy is to do a cost-based study once every five years to determine a goal for setting the rates. The rates are adjusted annually to reflect the costs.

- **How do I know if I have a leak? How can I find out?**

  The best method for determining whether a leak exists is to take actual water meter readings. This method checks the entire internal plumbing system for water leaks. Take a water meter reading just before going to bed or when no one will use any water for several hours. Take another meter reading in the morning before any water is used or after a few hours of non-use. In theory, the two readings should be the same. If they are not and you cannot account for the use by a humidifier, ice cube maker, toilet flush, or water softener, you have a leak and further investigation is recommended.

  From our experience, 90 percent of the leaks in residential plumbing systems are found at the toilet tank. Malfunctioning water softeners and humidifiers run a distant second and third. We encourage you to check for a leak. Toilets leak at the bottom of the tank around the flapper plug or at the top of the tank at the overflow tube. To test the flapper plug, carefully remove the lid from the toilet tank and mark the water level in each toilet tank with a pencil. Shut off the water supply to the toilet. If the water remains on the mark you made for 10 minutes, the flapper plug is not leaking. If the water level drops below the mark you made, the flapper plug is leaking and should be repaired or replaced. The water level in the toilet tank should be at least one inch below the top of the overflow tube. If the water level in the toilet tank is at the top of the overflow tube, that is where a leak may be occurring and the float that controls the water level in the tank should be adjusted so that the water level in the tank is at least one inch below the top of the tube. Toilet tank leaks typically result from worn parts or misalignment of some part of the flushing mechanism. Most repairs can be done by an experienced do-it-yourselfer. If you are not sure you can handle the job, call a plumber. It is important to stop the leak because water leaks are costly.

- **What is in your water? Do you put fluoride in your water?**

  The District publishes a Water Quality Report, also know as a Consumer Confidence Report, annually in May of each year. See Water Quality. The District does not add fluoride to the water.

- **Is your Agricultural Water Service Application online?**

  Yes you may access the application online [Agricultural Water Service Application]

- **What are the Agricultural rate qualification guidelines?**

  Agricultural water rate eligibility is not transferable to new property owners. A new owner must apply for the agricultural rate based on current Federal and District guidelines.

  Definitions:

  - Agricultural Water:

    Water delivered to consumers for use primarily in the commercial production of agricultural crops or livestock including domestic use incidental thereto.

  - Agricultural Service:

    All agricultural service requires a meter size of one-inch (1") or larger and shall meet all Bureau of Reclamation requirements for agricultural "Irrigation Water" service. All applications must be for contiguous and cultivated land with an irrigated crop area of at least 2-acres.

  - Criteria:

    Eligibility to obtain Irrigation Water can be obtained if the property to be irrigated meets certain criteria as required by the District's Water Service Contract (i.e. "...must be used primarily in the production of crops or livestock for sale or documented barter (in quantities consistent with a commercial agricultural business endeavor) beyond the quantity needed for personal use.") Items considered for qualification: (a) Must have a 1" meter or larger; (b) have a minimum of two acres of cultivated land under irrigation and dedicated to crop production; (c) have a business or development plan; (d) have crops or livestock

ATTACHMENT I.7

INVITATION TO CUSTOMERS:

WATER CONSERVATION/USAGE WORKSHOP

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DIRECTORS
TED BAMBINO **BOB NASH**
JIM SMITH **JEFF O. STEPPAT**
LEIMONE WAITE

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

June XX, 2014

Mr. and Mrs.
12345 Main Street
Redding, CA 96003

Dear Mr. and Mrs.:

I would like to invite you to a Water Use Efficiency Workshop being hosted by the District. The workshop will be held on July 8th at 6 pm at the District office. The purpose of the workshop is to provide expert information and strategies to maximize water use efficiency.

The District will have two presenters. John Tiedeman, Civil/Agricultural Engineer and Kevin Greer. Mr. Tiedeman is also a District agricultural customer. Mr. Greer is the Irrigation Lab Manager for the Tehama County Resources Conservation District. Both of these individuals are experts in their field and bring a great deal of knowledge and experience in all aspects of irrigation efficiency.

Following are some of the main points that will be discussed.

- Are you under-watering or over-watering? Both can damage landscaping and agricultural crops!
- Learn how to diagnose and correct irrigation system deficiencies and improve distribution uniformity
- Learn methods for scheduling irrigations (time and intervals)
- Learn how to manage your irrigation to maximize benefits while minimizing water costs

The impacts of the 2013-2014 drought are some of the worst recorded in California history. The District recognizes that water is a limited resource, and we have no guarantee that the drought will end this year. Bella Vista Water District, USDA Natural Resources Conservation Service, and Tehama County Resource Conservation District have combined efforts to put the best available tools and information in your hands to help you become more efficient with your irrigation.

We encourage you to attend this workshop and would request that you RSVP either electronically or by telephone to Clint Andreasen (candreasen@bvwd.org / 530-241-1085 ext. 112) no later than Thursday, July 3rd if able to attend.

Sincerely,

Don M. Groundwater

Don M. Groundwater, P.E.
District Engineer

ATTACHMENT J

WATER ORDERING:

J.1 District Supplemental Water Program
J.2 District Supplemental Water Program Application 2010

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ATTACHMENT J.1

BELLA VISTA WATER DISTRICT
SUPPLEMENTAL WATER PROGRAM

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SUPPLEMENTAL WATER PROGRAM

Adopted: April 13, 2009

BELLA VISTA WATER DISTRICT
SUPPLEMENTAL WATER PROGRAM

The District may, at the discretion of the Board and depending upon availability and price, acquire water in addition to the Central Valley Project water supply allocation from the U.S. Bureau of Reclamation (Reclamation) exclusively on behalf of its Agricultural and Aquacultural customers that would otherwise be subjected to significant shortages. It is the intent of the District that all expenses related to this program be borne solely by the program participants. If the District is able to secure such an additional supply it will be equitably distributed based on the principals set forth in this Supplemental Water Program and adopted by Resolution 09-02 or as subsequently amended. Such water is referred to hereinafter as "Supplemental Water".

1. Application for Supplemental Water – In order to avoid a situation in which the District acquires water in addition to the normal allocation from Reclamation, which the water users in the District do not utilize (and for which the District is required to pay), the District will provide such water pursuant to the following requirements:

   a. Content of Form – At least annually, the Board shall adopt a form Application for Supplemental Water. The Application for Supplemental Water shall set forth the quantity of Supplemental Water desired by the applicant and the maximum price per acre-foot the applicant is willing to pay.

   b. Eligibility – Any Agricultural or Aquacultural water user that is a landowner within the District can apply for a supply of Supplemental Water for a minimum quantity of at least four (4) acre-feet, or more, in one (1) acre-foot increments. In order for an application to be considered for any particular allocation, the applicant must be otherwise eligible to receive water from the District, including but not limited to having no delinquent accounts with the District, being a landowner within the District and having an active service connection. An Application for Supplemental Water will not be considered valid unless it is fully completed, signed by the landowner applicant, and accompanied by the required deposit.

   c. Deposit – At the time each year that the Board adopts the form Application for Supplemental Water, the Board will determine the initial amount of a deposit per acre-foot that must accompany each application. The amount of the deposit may be changed by the Board during the course of the year depending upon the price of the water available to the District.

2. Revision – At any time during the application request period any applicant may, upon written request, revise a previously submitted application for increases only. A revision that increases the requested quantity must include payment of the additional required deposit. No decreases in requested quantities will be allowed whatsoever once the application has been processed and no refunds will be issued. In such cases, the applicant will be charged the full cost of Supplemental Water for the quantity initially requested.

3. Allocation of Supplemental Water – At least once each year, the Board will determine the quantity of Supplemental Water available and the price of this water. The District will allocate the Supplemental Water based on the information contained on the Applications for Supplemental Water. In the event Supplemental Water acquired by the District is less than the total requested; the available Supplemental Water shall be proportionately allocated based on the amounts requested by each applicant. Different allocations of Supplemental Water may take place during the year and each allocation may have a different price.

4. Use and Payment for Supplemental Water – Supplemental Water will be utilized before all other water supply categories and billed on a bimonthly basis following usage. District billings will be delinquent 22 days after the date of billing. For accounts with invoices remaining unpaid 22 days following the date of billing (1) the applicant's account will be considered delinquent and (2) water service will be suspended until delinquent charges are paid.

5. Surplus Supplemental Water – If Supplemental Water is available and the demand from all applicants willing to pay the price of the available Supplemental Water has been met, then remaining Supplemental Water may be sold on a first-come-first-serve basis at a price established by the Board.

ATTACHMENT J.2

BELLA VISTA WATER DISTRICT
SUPPLEMENTAL WATER PROGRAM APPLICATION 2010

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BELLA VISTA WATER DISTRICT
Application for 2009 Supplemental Water
Pool 1

Agricultural and Aquacultural Landowners may use this application to request Supplemental Water for delivery at each metered service and for use beginning May 1, 2009 through February 2010. Although, the District cannot guarantee acquisition of the requested supply, we will make every effort to do so. The Supplemental Water program is administered in accordance with the District's adopted Supplemental Water Program. Following are some key elements applicable to every Application:

1. Applications must include a quantity (minimum of (4) acre-feet) in whole acre-feet increments, maximum price, account number, signature, and be accompanied by a $50 per acre-foot of request deposit. The Supplemental Water request period will close May 18, 2009.

2. If the District is unable to acquire the entire requested quantity of Supplemental Water, the supply will be allocated on a pro-rata, per acre-foot of request, basis to all eligible Applicants.

3. Once the District processes the application, applicants are obligated to purchase the Supplemental Water.

4. Supplemental Water cannot be transferred or resold by the landowner participant to any other Customer, entity or party either within or outside the District's boundaries, or returned for credit.

5. Each applicant will be notified of their Supplemental Water allocation following the Board of Directors meeting on May 27, 2009, which will establish the price for Supplemental Water.

I_____ hereby apply for the quantity of Supplemental Water at the price specified below. I recognize that the price I have stated below represents the maximum amount I am willing to pay for the acquisition of Supplemental Water and that this price does not include any of the applicable delivery charges (i.e. base rate, commodity charge, CVP Restoration Fee, Treatment Debt Service).

I acknowledge that I have read and understand the provisions set-forth in this Application. Further, I acknowledge that I am aware that the District has adopted Policies governing various aspects of the District's relationship with its landowners and water users, and that such Policies may be amended or revised from time to time by the District's Board of Directors. Said policies may be reviewed via the District's web site as follows: http://www.bvwd.org/policies.htm I am familiar with the District's Policies in effect as of the date of this application, and will diligently review all future amendments and revisions thereof. At all times, and as a condition to the availability of Supplemental Water to me from the District, I agree to be bound by and comply with the District's Policies as they may be amended or revised from time to time.

Quantity Requested: _____ AF Enclosed Deposit ($50/AF) x AF = $_____

Maximum Price per acre-foot I will pay exclusive of District charges: $_____/AF

ATTACHMENT K

BELLA VISTA WATER DISTRICT
RECORDS RETENTION POLICY

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BELLA VISTA WATER DISTRICT

RECORDS RETENTION POLICY

Adopted October 8, 1996

Amended March 11, 1997

Amended September 24, 2007

Bella Vista Water District
Records Retention Policy

1. Automatic Data Processing
   - A. Automatic Data Processing Records
   - B. Program Documentation

2. General Accounting Records
   - A. General Ledgers
   - B. Journal and Journal entries
   - C. Cash books
   - D. Purchase Orders
   - E. Accounts Receivables
   - F. Accounts Payables

3. Personnel
   - A. Payroll Records
   - B. Personnel Records
   - C. Employee Benefit Records
   - D. Employee Information
   - E. Employee Health and Safety Records
   - F. Employee DMV and Drug Test Records

4. Insurance
   - A. Insurance Records

5. Inventory
   - A. Inventory Records

6. Customer Service Information and Billing Data
   - A. Customer Service Applications and Contracts
   - B. Applications in Lieu of Contracts
   - C. Rate Schedules
   - D. Deposits
   - E. Meter Reading Information
   - F. Miscellaneous Billing Data
   - G. Revenue Summaries
   - H. Collection Reports & Uncollectible Accounts

7. Tax
   - A. Income Tax Returns

8. Miscellaneous
   - A. Bank Records
   - B. Financial Reports - Monthly
   - C. Financial Reports - Annually
   - D. Budget Information
   - E. Federal & State Regulatory Reports

F. Board Minutes
G. Correspondence
H. Conflict of Interest - Disclosure Statement
I. Elections
J. Reclamation Reform Act Landholder Forms

9. Water Treatment
   A. Complaints
   B. Bacteriological Analysis
   C. Chemical Analysis
   D. Records & Corrective Action
   E. Sanitary Surveys
   F. Variances & Exemptions

10. Operations and Maintenance
   A. Production Water Supply
   B. Transmission and Distribution
   C. Customer Service
   D. Maintenance Work Orders

1. Automatic Data Processing

Description	Reference Citation	Retention
A. Magnetic tapes, disks, etc, or other media records used to store information relating to the accounting records.	NARUC 9(a)	Reserved. (To be determined if being used as disk storage rather than paper storage of records - 50 years).
B. Program documentation and revisions thereto (information received from Apollo indicating program changes to the AS400 system.	NARUC 9(b)	Retain for as long as the system is in place.

2. General Accounting Records

Description	Reference Citation	Retention
A. General ledgers, ledgers subsidiary or auxiliary to general ledgers, indexes to general ledgers and subsidiary ledgers, and trial balance sheets.	NARUC 10(a), et seq.	50 years.
B. Journals: General and subsidiary which include disbursement journals and general journals and entries.	NARUC 11, et seq.	50 years.
C. Cash books.	NARUC 13(a)	10 years after close of fiscal year.
D. Purchase orders and material requisitions (customarily attached with accounts payable records).	NARUC 15(a)	6 years.
E. Accounts Receivables: See item 6 “Revenue Accounting and Collecting”.		
F. Original bills and invoices for materials, services, paid checks and receipts for payment and authorizations for payment.	NARUC 15(a), et seq.	6 years.

3. **Personnel Records**

Description	Reference Citation	Retention
A. Payroll sheets or registers of payments of salaries and wages or records showing the distribution thereof. Time sheets showing hours worked used as a basis for payment of salaries and wages. Pay checks, employee status information, i.e., wage increases, records for authorizing deductions, etc.	NARUC 18(b)	3 years
B. Personnel records: 1. Employees' service record, personnel file, etc. 2. Job applications, requests for medical examination, medical reports and other miscellaneous records pertaining to the hiring of employees.	NARUC 21, et seq.	3 years after termination of employment. 1 year.
C. Employee benefit information (includes medical retirement, savings, deferred comp plan, pension plan).	NARUC 27(a), et al.	7 years after termination of plans.
D. Employee bulletins or memorandums.	NARUC 29(c)	Destroy at option.
E. Employee health and safety records for each individual employee. (If these records are maintained within personnel files then this applies to personnel files also).	29CFR1902.2 et seq.	Employment + 30 years.
F. (a) Employee test results indicating a breath alcohol concentration of 0.02 or greater. Verified positive drug test results. Refusals to submit to required alcohol or drug tests. Substance abuse professional's evaluations and referrals. Annual calendar year summary. (b) Negative and canceled drug test results. Alcohol test results indicating a breath alcohol concentration less than 0.02.	JPIA JPIA	5 years. 1 year.

4. Insurance Records

Description	Reference Citation	Retention
A. Insurance Records: 1. Insurance policies, binders, etc., showing coverage, premiums paid and expiration dates.	NARUC 21	Destroy at option after expiration of policy.
2. Records of amounts recovered in connection with losses and of claims.		6 years.
3. Insurance records relating to injuries and damages.		3 years after settlement.
4. Worker compensation cases related to injuries.		5 years.

5. Inventory Records

Description	Reference Citation	Retention
A. General inventory accounting records are defined as Inventory Value Report, Monthly Inventory file kept by accounting department containing withdrawal slips, copies of inventory items purchased, adjustments, Inventory sheet deal (physical counts).	NARUC 44(a)	3 years.

6. Customer Service Information

Description	Reference Citation	Retention
A. Applications for utility service for which contracts have been executed.	NARUC 45(a)	3 years.
B. Applications for utility service used in lieu of contracts.	NARUC 45(b)	Destroy at Option
C. Rate schedules.	NARUC 46(a)	Retain until receipt of auditor's report or 2 years after auditor's exit conference, whichever occurs first.
D. Customers' deposit ledger or receipt.	NARUC 47(a)	3 years after termination of service or refund of deposit.

E. Meter Reading Information (sheet, re-read sheets, customers' reading card, connection and disconnection notices).	NARUC 48(a), et seq.	3 years.
F. Miscellaneous billing data which includes copies of customer contracts, inspection orders for which customers are billed, authorizations for charges, standard billing sheets or schedules.	NARUC 50(a), et seq.	3 years.
G. Revenue summaries showing monthly billings.	NARUC 51(a)	6 years.
H. Collection reports and records and/or uncollectible account information.	NARUC 54(a), et seq.	4 years.

7. Tax

Description	Reference Citation	Retention
A. Includes income tax returns, withholding returns, forms W-4 and W-E, Federal unemployment tax act records, property tax returns, sales and use taxes, gasoline tax returns, etc.	NARUC 57, et seq.	7 years after settlement

8. Miscellaneous

Description	Reference Citation	Retention
A. Bank records which include: copies of deposit slips, advice of deposit notices, bank statements, reconciliation of statements, notices of interest credits.	NARUC 59(a), et seq.	Destroy at option after completion of annual audit by independent accounts.
B. Financial and operating reports which are prepared **monthly** and stamped unaudited.	NARUC 61(b)	2 years.
C. Financial and operating reports which are prepared **annually** and stamped unaudited.	NARUC 61(b)	10 years.
D. Budget Information	NARUC 62	3 years.
E. Reports to Federal and State regulatory commissions (annual financial, operating and statistical reports).	NARUC 65(a)	Life of agency.
F. Board Minutes (includes all committee meetings).	NARUC 6(a)	50 years or termination of agencies existence, whichever comes first.

G. Correspondence not relating to an ongoing issues, secretarial notes and/or dictational recordings.	NARUC 63, et seq.	Destroy at Option
H. Conflict of Interest - Disclosure Statements.	FPPA	7 yrs. - Original Statements 4 yrs. - Copies of Statements
I. Election materials including voted polling place ballots, absent voter ballots, absent voter identification envelopes, spoiled ballots, canceled ballots, unused absent voter ballots and ballot receipts.	Elections Code 17302.	6 months from date of election.
J. Reclamation Reform Act landholder certification and reporting forms. Districts must retain superseded landholder certifications and reporting forms for 6 years; thereafter, districts may destroy such superseded forms, except: **1. Districts must keep on file the last fully completed standard certification or reporting form, in addition to the current verification form; or** **2. If Reclamation specifically requests a district to retain superseded forms beyond six years.**	**43 CFR 426.19(e)**	**6 years or upon Reclamation request, retain superseded forms beyond 6 years.**

9. <u>Water Treatment Records</u>

Description	Reference Citation	Retention
A. Water Quality and system water outage complaints and corrective action taken.	CCR, Title 22	5 years.
B. Bacteriological Analysis	CCR, Title 22	5 years.
C. Chemical Analysis	CCR, Title 22	10 years.
D. Records and corrective actions.	CCR, Title 22	3 years following final action to correct.
E. Sanitary survey reports, summaries or communications.	CCR, Title 22	10 years following completion.
F. Variances or exemptions.	CCR, Title 22	5 years following expiration.

10. Operation and Maintenance

Description	Reference Citation	Retention
A. Production Water Supply		
1. Pump room logs including supporting data.	NARUC 22.4(c)	3 years.
2. Equipment failure reports.	NARUC 22.4(d)	3 years.
3. Pumping output logs with supporting data.	NARUC 22.4(e)	6 years.
4. Station output records.	NARUC 22.4(f)	6 years.
5. Water logs.	NARUC 22.4(h)	3 years.
6. Gauge-reading reports.	NARUC 22.4(i)	3 years.
7. Recording instrument charts.	NARUC 22.4(j)	3 years.
B. Transmission & Distribution		
1. Line logs	NARUC 23.1(a)	3 years.
2. Reports of operation.	NARUC 23.1(b)	3 years.
3. Apparatus failure reports.	NARUC 23.1(f)	6 years.
4. Records of meter tests.	NARUC 23.1(k)	Until superseding test but not less than 2 years.

C. <u>Customer Service</u>		
1. Reports of inspections of customers' premises.	NARUC 24(a)	3 years.
2. Records and reports of customers' service complaints.	NARUC 24(b)	3 years.
3. Survey of customers' premises to determine type of service and equipment to be installed.	NARUC 24(c)	3 years or until equipment is installed.
4. Records of installed customers' applicance.	NARUC 24(d)	50 years.
D. <u>Maintenance Work Orders</u>		
1. Authorization for expenditures for maintenance to be covered by work orders, including memoranda showing estimates of costs to be incurred.	NARUC 26(a)	6 years.
2. Work order sheets to which are posted in detail the entries for labor, material, and other charges in connection with maintenance and other work pertaining to utility operations.	NARUC 26(b)	6 years.
3. Summaries of expenditures on maintenance and job orders and clearances to operating and other accounts (exclusive of plant accounts).	NARUC 26(c)	6 years.

* NARUC – National Association of Regulatory Utility Commissioners
CFR - Code of Federal Regulations
CCR - California Code or Regulations
FPPC - Fair Political Practices Commission

ATTACHMENT L:

Bella Vista Water District BMP Compliance—GPCD Method

L.1 BVWD Gallons Per Capita Day (GPCD) Water Use Calculations, 1995-2012

L.2 Best Management Practices (BMP) GPCD Compliance Calculation Results—Using California Urban Water Conservation Council (CUWCC) Excel-based GPCD Tool

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ATTACHMENT L.1

BELLA VISTA WATER DISTRICT

GALLONS PER CAPITA DAY (GPCD)
WATER USE CALCULATIONS

1995-2012

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Calculation #1 for "Method+B5:G27ology 1" (CWC § 10608.20)
Bella Vista Water District

Base Years	Population	Gross Water Use (af/yr)	Daily Per Capita Use (gpcd)	10-Year Avg. Base Daily Per Capita Use	
				Period	gpcd
1995	11,521	12,762	989		
1996	11,810	14,815	1120		
1997	12,182	16,318	1196		
1998	12,307	13,795	1001		
1999	12,935	16,372	1130		
2000	13,300	14,826	995		
2001	13,994	17,472	1115		
2002	14,478	19,386	1195		
2003	15,001	18,126	1079		
2004	15,463	18,817	1086	1995-2004	1091
2005	15,980	15,413	861	1996-2005	1078
2006	16,212	16,564	912	1997-2006	1057
2007	16,407	15,649	851	1998-2007	1023
2008	16,459	16,403	890	1999-2008	1011
2009	16,495	11,847	641	2000-2009	963
2010	16,539	11,344	612	2001-2010	924
2011	16,550	10,864	586		
2012	16,577	13,186	710		

ATTACHMENT L.2

BEST MANAGEMENT PRACTICES (BMP)
GPCD COMPLIANCE CALCULATION
RESULTS

USING CALIFORNIA URBAN WATER CONSERVATION
COUNCIL (CUWCC) EXCEL-BASED GPCD TOOL

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California Urban Water Conservation Council

TARGETS / COMPLIANCE
(CUWCC MOU)

Baseline / Initial GPCD
(Use option buttons to select)

GPCD in 2006 ○	912.1
Baseline GPCD (1997 to 2006) ◉	1057.0
GPCD in 2012	710.1
GPCD Target for 2018	866.7

Potable Water GPCD for each Year in the Baseline Period

Year	GPCD
2006	912.1
2005	861.1
2004	1086.4
2003	1078.7
2002	1195.4
2001	1114.6
2000	995.2
1999	1130.0
1998	1000.7
1997	1195.8

Biennial GPCD Compliance Table

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	1018.9	100%	1057.0
2012	2	92.8%	980.9	96.4%	1018.9
2014	2	89.2%	942.8	92.8%	980.9
2016	4	85.6%	904.8	89.2%	942.8
2018	5	82.0%	866.7	82.0%	866.7

Monthly GPCD Data for Weather Normalization

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2012	710.1	710.1	710.1	710.1	710.1	710.1	710.1	710.1	710.1	710.1	710.1	710.1
Baseline avg*	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0	1057.0

* The average for each month is based on the baseline period 1997 to 2006

ATTACHMENT M

UNITED STATES BUREAU OF RECLAMATION
CVP DRAFT M&I SHORTAGE ALLOCATION POLICY (2001)

GRAPH ILLUSTRATING CVP DRAFT M&I SHORTAGE POLICY

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D R A F T

Central Valley Project
M&I Water Shortage Policy
September 11, 2001

The CVP (Central Valley Project) is operated under Federal statutes authorizing the CVP and by the terms and conditions of water rights acquired pursuant to California law. During any year, there may occur constraints on the availability of CVP water for an M&I (municipal and industrial) contractor under its contract. Thus, the purposes of this policy are to:

- Define water shortage terms and conditions applicable to all CVP M&I contractors
- Establish a minimum water supply level that (a) with M&I contractors' drought water conservation measures and other water supplies would sustain urban areas during droughts, and (b) during severe or continuing droughts would, as much as possible, protect public health and safety
- Provide information to help M&I contractors develop drought contingency plans

Currently, many M&I contractors are not using the full M&I portion of their contract total. If the M&I water shortage allocation were applied to full contract entitlements, the resulting allocation for some contractors would exceed their current demand. M&I water demands within the CVP are continually increasing. Therefore, the provision for "75 percent M&I reliability" will be applied to a contractor's *historical use*, with certain adjustments, up to the CVP projected M&I demand as of September 30, 1994. Reclamation recognizes that as water conservation measures are implemented there is a hardening of demand that lessens an M&I contractor's ability to reduce demand during shortages.

The capability of the CVP to meet the water supply levels addressed by this policy is subject to the availability of CVP water supplies. M&I water shortage allocation may differ between divisions of the CVP. Generally, the allocation (percentage) to the various divisions will be the same, unless specific operational constraints on Reclamation require otherwise.

Reclamation explored the concept of two tiers of M&I water supply reliability as proposed by contractors in the CVPIA (Central Valley Project Improvement Act) Administrative Proposal on Urban Water Supply Reliability. Although Reclamation determined not to adopt two tiers, it will facilitate the sale of CVP water from willing sellers to M&I contractors when necessary.

Definitions

Historical use - The average quantity of CVP water put to beneficial use within the service area during the last 3 years of water deliveries, unconstrained by the availability of CVP water. Reclamation and the contractor will negotiate the calculated historical use, to be outlined in a contract exhibit that can be modified during the contract period (but that will not require formal contract amendment). Reclamation recognizes that certain circumstances may require adjustment of the historical use such as growth, extraordinary water conservation measures, or use of non-CVP water supplies. Also, Reclamation may agree to adjust the historical use on the basis of unique circumstances, after consultation with the contractor. An example of a unique circumstance is the year following a drought year, in which water users are still using extraordinary water conservation measures, or the converse, in which a contractor may use more water than historically used in order to recharge ground water.

Adjusted for growth - An adjustment to the contractor's historical use quantity to account for demand increases within the contractor's service area to include (but not be limited to) increases due to population growth and to the number or demand of industrial, commercial, and other entities the contractor serves, provided the contractor provides required documentation to Reclamation.

Adjusted for extraordinary water conservation measures - An adjustment to the contractor's historical use quantity to account for conservation measures that exceed applicable best management practices adopted by the California Urban Water Conservation Council. A water conservation measure considered extraordinary in 2001 may be a mandatory best management practice in 2010 and thus would not be considered extraordinary in 2010.

Adjusted for Non-CVP water - An adjustment to the contractor's historical use quantity to account for water sources other than the CVP used to satisfy M&I demand within the contractor's service area, subject to written documentation from the contractor that shows the extent to which use of the non-CVP water actually reduced the contractor's use of CVP water in other years.

Public health and safety - M&I uses to which water is allocated consistent with criteria established by the State of California, or as established by Reclamation consistent with criteria applied by similarly situated California M&I water supply entities, as applicable, during declared water shortage emergencies.

Terms and Conditions

1. Allocation of M&I water will be based on a contractor's historical use of CVP M&I water, adjusted for (a) *growth*, (b) *extraordinary water conservation measures,* and (c) *non-CVP water*,subject to Term and Condition 3. At the contractor's request, Reclamation will consult

with the contractor to adjust the contractor's historical use on the basis of (a) growth, (b) extraordinary water conservation measures, and (c) use of non-CVP water. Term and Condition 1 is intended to encourage contractors to use non-CVP water first and rely on CVP water as a supplemental supply. Reclamation will adjust the historical-use calculation to reflect the effect of non-CVP water used in lieu of use of the contractor's CVP water. Crediting for this non-CVP water will be based on 1 acre-foot for 1 acre-foot, unless Reclamation and the contractor agree otherwise in considering unique circumstances. The contractor must fully document use of non-CVP water to clearly show how much that water use actually reduced the contractor's use of CVP water in other years, and submit the documentation in writing to Reclamation.

2. For an M&I contractor to be eligible for the "minimum shortage allocation" of 75 percent of adjusted historical use, the contractor's water service contract must reference M&I water shortage policy. In addition, the water service contractor must (a) have developed and be implementing a water conservation plan that meets CVPIA criteria and (b) be measuring such water consistent with section 3405(b) of the CVPIA. Reclamation intends to incorporate in all new, renewed, and amended water service contracts, a provision that references the CVP M&I water shortage policy.

3. This M&I water shortage policy applies only to that portion of the CVP water identified as projected M&I demand as of September 30, 1994, as shown for year 2030 on Schedule A-12 of the 1996 Municipal and Industrial Water Rates book and for those contract quantities specified in section 206 of Public law 101-514. Subject to these limitations, except as provided for public health and safety levels (Term and Condition 7), irrigation water transferred or converted to M&I use after September 30, 1994, will be subject to shortage allocation as irrigation water. For CVP water transferred or assigned, a CVP contractor may request that the CVP water so obtained be eligible for M&I reliability. Before Reclamation may approve such a request, the transferee or assignee must fully mitigate any adverse impacts to agricultural water supplies. Further, for CVP water converted, an M&I contractor may request a permanent conversion from agricultural shortage criteria to M&I shortage criteria, provided there are no adverse impacts to agricultural or other M&I water supply contracts .

4. Before allocation of M&I water to a contractor will be reduced, allocation of irrigation water will be reduced below 75 percent of contract entitlement, as shown here:

Irrigation Allocation	**M&I Allocation**
100%	100%
95%	100%
90%	100%
85%	100%
80%	100%

75%	100%

5. When allocation of irrigation water has been reduced below 75 percent and still further water supply reductions are necessary, both the M&I and irrigation allocations will be reduced by the same percentage increment. The M&I allocation will be reduced until it reaches 75 percent of adjusted historical use, and the irrigation allocation will be reduced until it reaches 50 percent of contract entitlement. The M&I allocation will not be further reduced until the irrigation allocation is reduced to below 25 percent of contract entitlement, as shown in the following tabulation.

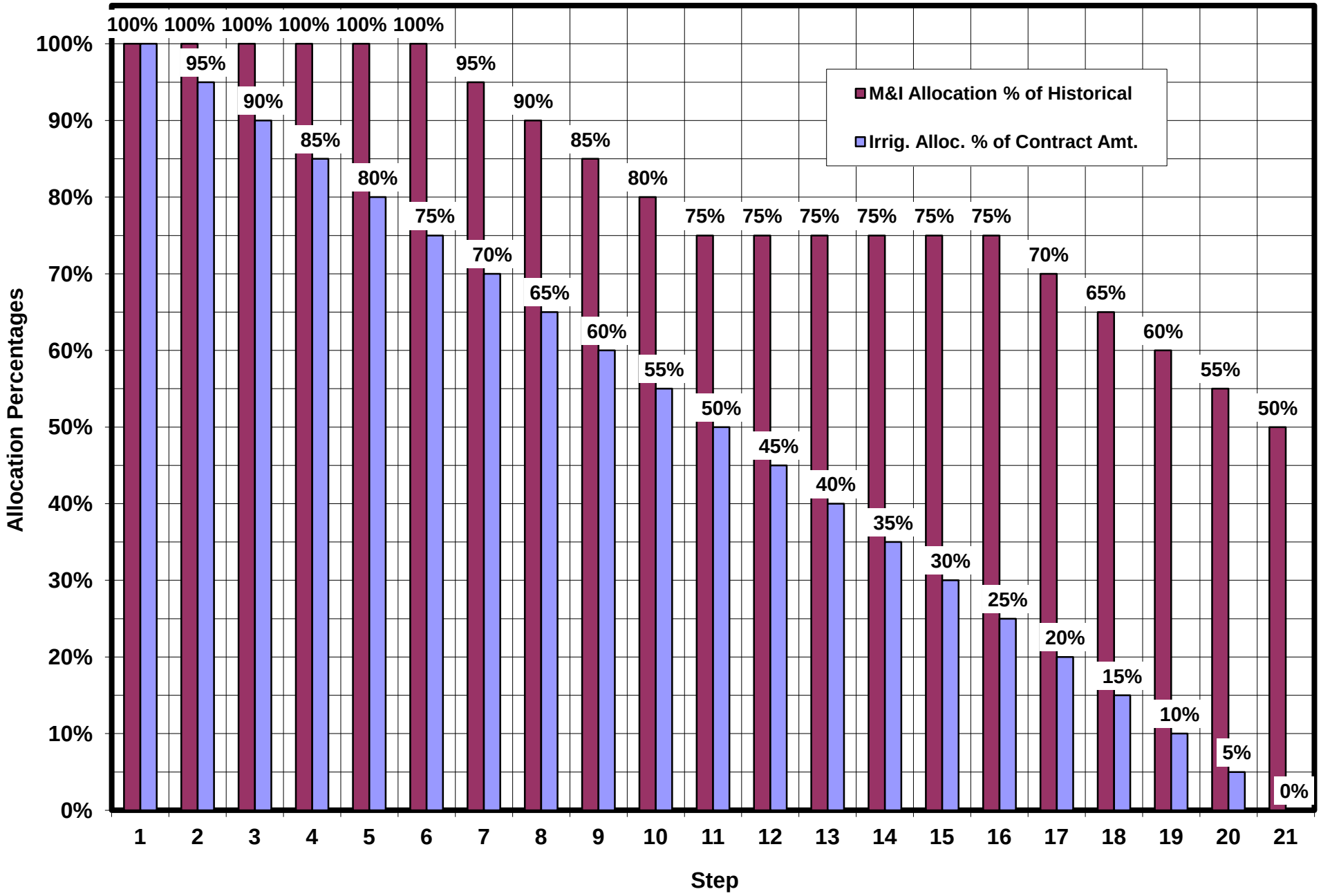
Irrigation Allocation	**M&I Allocation**
70%	95%
65%	90%
60%	85%
55%	80%
50%-25%	75%

6. When allocation of irrigation water is reduced below 25 percent of contract entitlement, Reclamation will reassess both the availability of CVP water supply and CVP water demand. Due to limited water supplies, during these times M&I water allocation to contractors may be reduced below 75 percent of adjusted historical use.

7. Reclamation will deliver CVP water to an M&I contractor at not less than a *public health and safety* water supply level, provided CVP water is available, if (a) the Governor declares an emergency due to water shortage applicable to that contractor or (b) Reclamation, in consultation with the contractor, determines that an emergency exists due to water shortage. The contractor will calculate the public health and safety level using criteria developed by the State of California and submit the calculated level to Reclamation along with adequate support documentation for review. Reclamation will ensure that the calculated level is consistent with such criteria. If State criteria do not exist, the contractor will apply criteria developed by Reclamation (in consultation with the contractor) that will be consistent with relevant criteria used by similarly situated California M&I water entities. Reclamation will provide a water supply at the public health and safety level to all CVP M&I contractors, including contractors with allocation of irrigation water transferred or converted to M&I use after September 30, 1994. At times of extraordinary circumstance, Reclamation may determine that it is necessary to vary the allocation of M&I water among contractors, taking into consideration a contractor's available non-CVP water.

8. Each M&I contractor will provide to Reclamation its drought contingency plan designed to protect public health and safety. The contractor may provide a copy of its Urban Water Management Plan (UWMP) or water conservation plan (WCP) to Reclamation in lieu of a separate drought contingency plan so long as the UWMP or WCP contains the contractor's drought contingency plan.

CVP M&I Shortage Policy
Water Allocation Schedule



ATTACHMENT N

CALCULATION OF DISTRICT IRRIGATION WATER REQUIREMENTS

N.1 Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Agronomic Crops, Grasses and Vegetable Crops

N.2 Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Trees and Vines

N.3 Explanation of Table 5 Calculation Methodology

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ATTACHMENT N.1

USING REFERENCE EVAPOTRANSPIRATION (ETo) AND CROP COEFFICIENTS TO ESTIMATE CROP EVAPOTRANSPIRATION (ETc) FOR AGRONOMIC CROPS, GRASSES AND VEGETABLE CROPS

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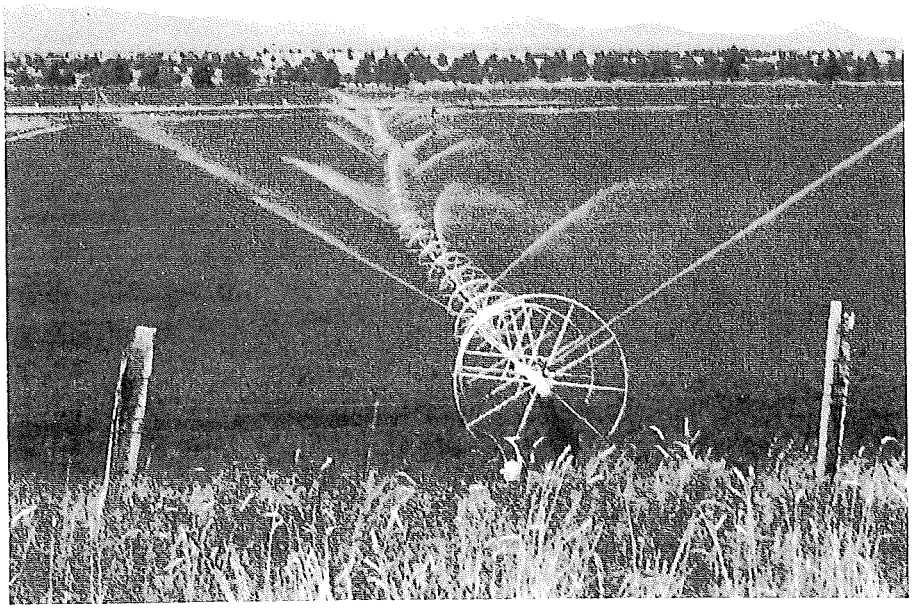
Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Agronomic Crops, Grasses, and Vegetable Crops



Reference evapotranspiration (ETo) information is now available in many agricultural areas of California through the California Irrigation Management Information System (CIMIS). Direct access to real-time (daily) weather and ETo information through a computer dialup service can be obtained by writing:

California Department of Water Resources
Office of Water Conservation
P.O. Box 942836
Sacramento, CA 94236-0001

These daily real-time ETo estimates are used by growers to determine a refined irrigation schedule that can optimize profits relative to the use of water.

Cooperative Extension **University of California**
Division of Agriculture and Natural Resources
Leaflet 21427

Historical average or "normal" ETo values are useful in determining an average or normal irrigation schedule for your crop that will give good results in most years. Daily normal ETo for many locations within California can be determined using the method and average monthly ETo accumulations given in Determining Daily Reference Evapotranspiration, UC Leaflet 21426. For locations not listed in Leaflet 21426, mean monthly ETo in mm/day can be obtained for any location in the state by interpolation using ETo isoline maps provided in Reference Evapotranspiration (ETo) for California, UC Bulletin 1922.

The real-time and normal ETo estimates approximate the evapotranspiration (ET) of a 4- to 7-inch tall, cool-season grass (an uncut pasture) that is not water stressed. The information can be used to estimate the ET of a crop (ETc) by multiplying the ETo values by factors (crop coefficients or Kc values) that account for the difference in ET between the crop and ETo. Daily changes in ETo, in response to variation in evaporative demand, affect the estimated ETc which is calculated as:

$$ETc = ETo \times Kc \qquad (1)$$

Although crop coefficients vary from day to day, depending on many factors, they are mainly a function of crop growth and development. The rate of crop growth and development will change from year to year, but the crop coefficient corresponding to a particular growth and development stage is fixed from year to year. This leaflet provides a method to determine daily Kc values to use corresponding to the growth and development of many agronomic crops, grasses, and vegetable crops grown in California.

General Crop Coefficient Curves

The Kc value on any given day is equal to the ratio of the ETc to the ETo on that day. Figure 1 shows measured values of ETo (ET grass) and ETc for beans from research done at the University of California at Davis. The ETo values vary from day to day but they are reasonably constant during the summer months shown. The ETc of beans start at a low value, increase to slightly higher than ETo during midseason, and then decrease to a low value at maturity when transpiration ceases. Most agronomic and vegetable crops have Kc trends similar to the beans.

> Ground shading is subjectively estimated as the percentage of the ground surface area shaded by a crop at midday.

The method used to determine Kc values involves separating the cropping season into specific growth and development periods consisting of the following:

Initial growth is the period from planting to about 10 percent ground shading by the crop. For alfalfa hay, it is from greenup or cutting to 10 percent ground shading.

Rapid growth is the period from approximately 10 percent to peak or 75 percent ground shading, whichever occurs first.

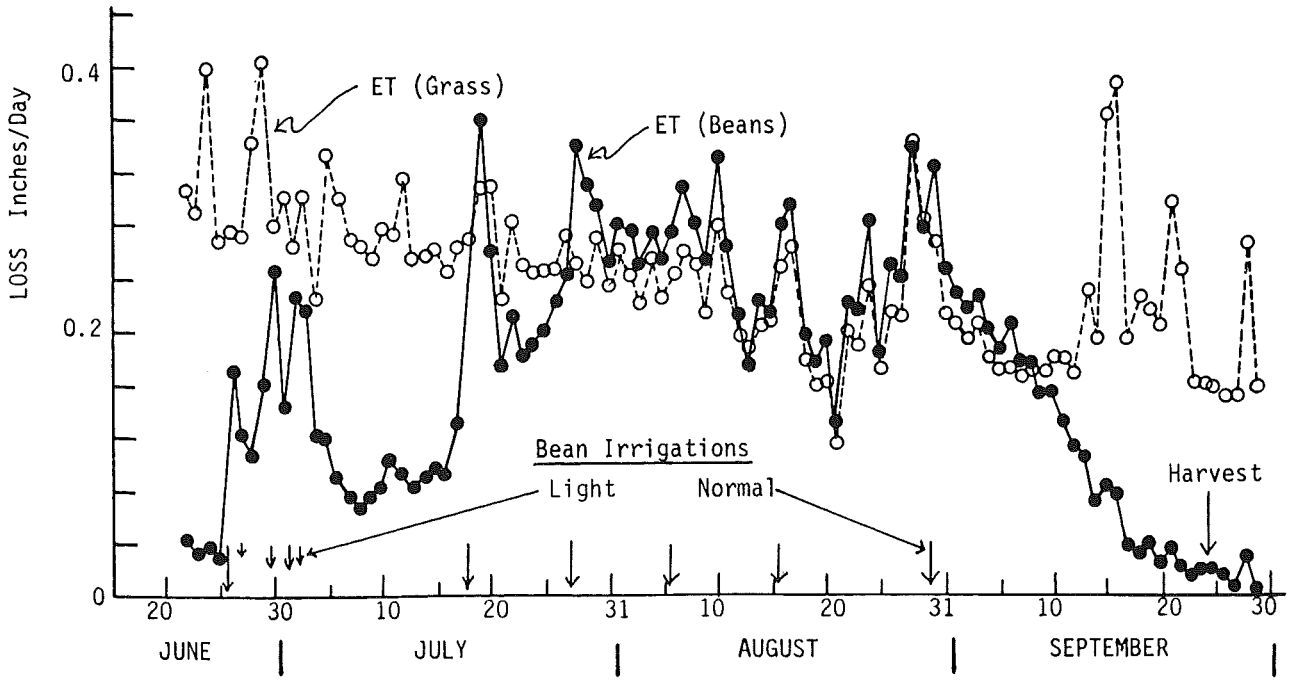


Fig. 1. Daily ET data for beans and grass measured using two lysimeters 20 feet in diameter, Davis, California, 1968. Unpublished data from W. O. Pruitt.

Midseason is the period from peak or 75 percent ground shading to when the crop transpiration begins to decrease due to aging. The end of midseason growth is difficult to identify visually but the ratio of days from planting until the end of midseason to days from planting until maturity is similar for a selected crop, regardless of where it is grown. Ratios for California crops are given as a percentage in the last two digits of the code in table 1.

Late season is the period from when the crop coefficient begins to decline due to crop aging until harvest or when transpiration ceases. For alfalfa, the Kc does not decline during late season unless it is being grown for seed.

Daily Kc Estimation

The letters A, B, C, D, and E represent the dates preceding initial growth (planting), rapid growth, midseason, late season, and at the end of late season, respectively. Table 1 gives crop coefficients that are expected on dates B, C, and E for many California crops and locations. These Kc values and the corresponding growth and development dates are used to determine Kc values on any date during the season.

The following sections will discuss Kc determination during each growth period. Beans planted on April 1 near Modesto in the San Joaquin Valley will serve as an example. The dates A, B, C, and E are April 1, April 30, May 25, and July 31, respectively, and the percentage of the growing season to date D is P = 74, which is listed as the last two digits of the code in table 1. The Kc values on dates B, C, and E are 0.14, 1.15, and 0.30, respectively.

Initial growth from date A to B

An estimate of the crop coefficient (Kc1) to use during initial growth is given in the Kc1 column of table 1 by crop and location in California. The corresponding planting dates are given in column A under growth dates. The Kc1 value for beans planted on April 1 in the San Joaquin Valley is 0.14, and it is plotted as the Kc during initial growth of dry beans in figure 2.

The Kc1 values provided in table 1 are typical for the region specified, but the value during initial growth can be affected by the frequency of rainfall or sprinkler irrigation. When the soil surface is exposed to sunlight and wet, the surface evaporation rate is greater and the Kc is higher. To adjust for these factors, figure 3 is used to estimate Kc1 based on the interval between irrigations or rainfall and on the average ETo during initial growth. For example, if the average ETo during the period is 0.15 inch per day and the recurrence interval is 10 days then Kc1 is 0.38. Equation 2 can also be used to calculate Kc1, where the recurrence interval in days is substituted for R and the average ETo is substituted for E in the equation.

$$Kc1 = 1.28 - 0.07515R + 0.001848R^2 \qquad (2)$$
$$+ (-0.0493 - 0.01091R + 0.0004684R^2)\ (25.4E)$$
$$+ (0.0015 + 0.00075R - 0.0000302R^2)\ (25.4E)^2$$

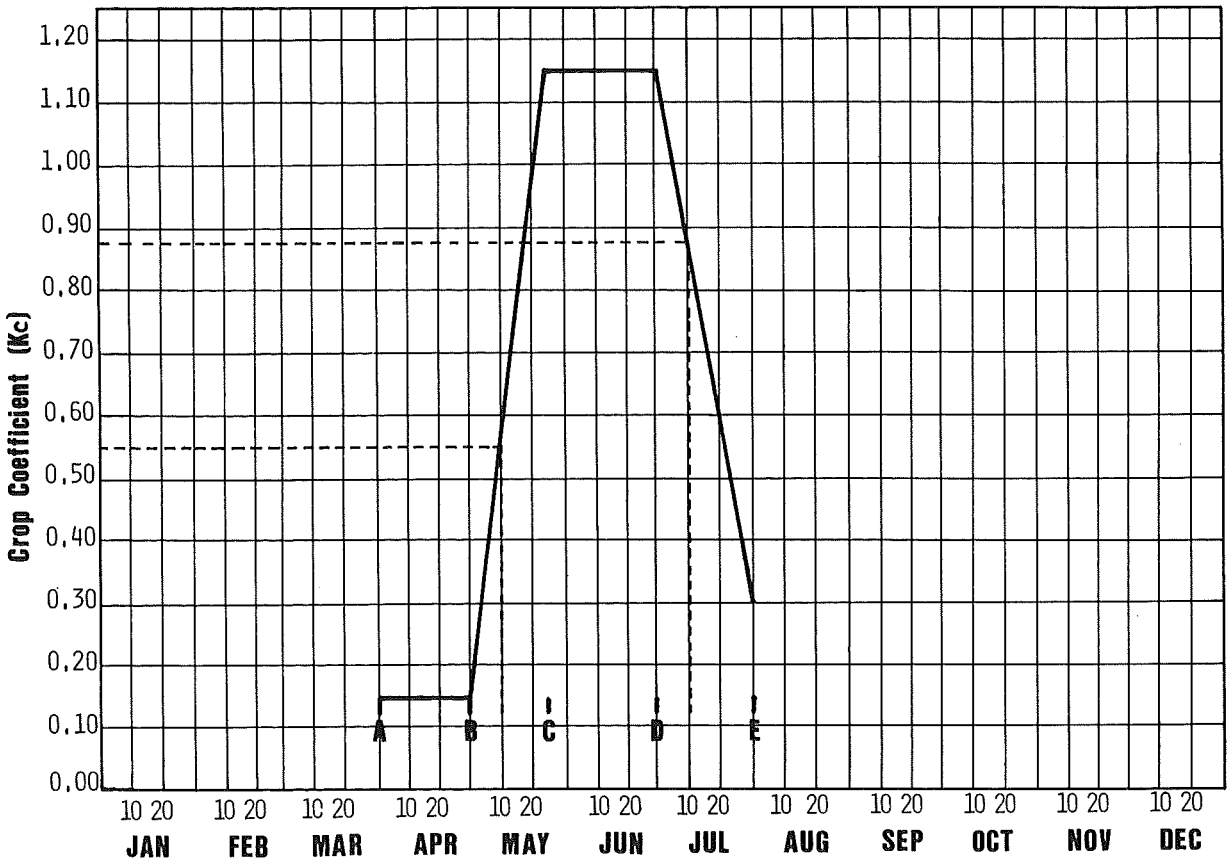


Fig. 2. Crop coefficient (Kc) curve for beans grown in the San Joaquin Valley with planting on April 1, 10 percent ground shading on April 30, 75 percent ground shading on May 25, and maturity on July 31.

If the average ETo exceeds 0.4 inch/day or the recurrence interval exceeds 20 days, values obtained from equation 2 will be inaccurate due to the limits of the equation. Under these conditions, use extrapolations of figure 3 to estimate Kc1 or use the Kc1 values in table 1.

Rapid growth from date B to C

Crop coefficients on each day during rapid growth are estimated by assuming the Kc changes linearly from Kc1 on date B to Kc2 on date C. A value for Kc1 is selected from table 1 or it is estimated using equation 2 or figure 2. For your crop and location, Kc2 is chosen from table 1. A line is drawn from Kc1 to Kc2 between dates B and C on a graph as shown in figure 3 for dry beans. To estimate the Kc value on a given date during rapid growth, locate the date on the bottom scale and move vertically up to the Kc line. Then follow a horizontal line to the left-hand scale and read the Kc for that day. For example, the Kc value on May 10 is 0.55.

Crop coefficients during rapid growth can also be estimated mathematically by determining the slope (b) of the Kc line as:

$$b1 = (Kc2 - Kc1) \div BC \qquad (3)$$

where BC is the number of days from date B to date C. Then the Kc on a date that is d1 days after date B during rapid growth is calculated as:

$$Kc = Kc1 + (b1 \times d1) \qquad (4)$$

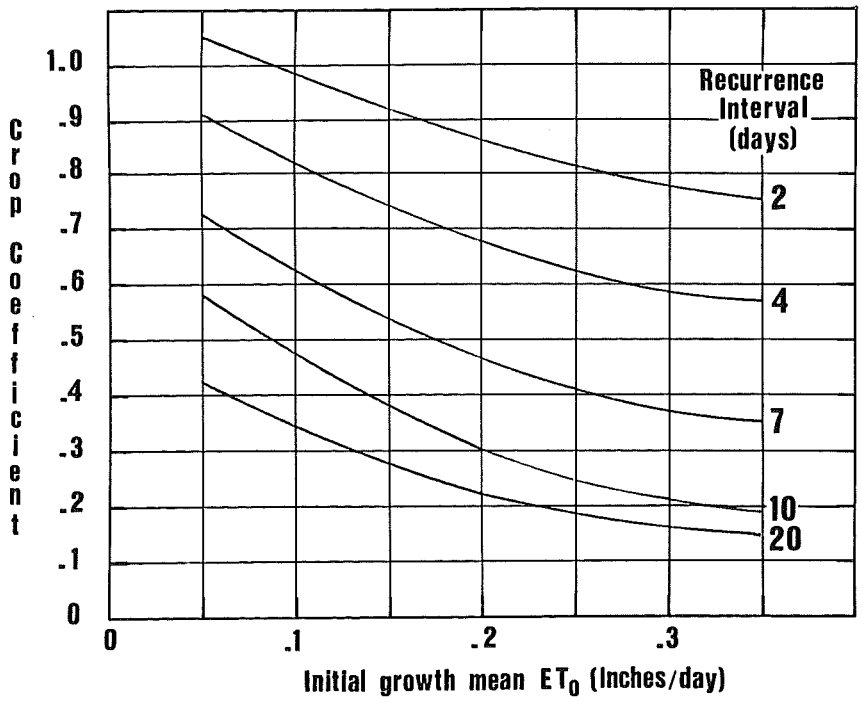


Fig. 3. Crop coefficients during initial growth of annual crops as a function of mean ETo during the period and recurrence interval of sprinkler irrigation or rainfall.
(Adapted from Doorenbos and Pruitt, 1977)

Midseason from date C to D

The Kc during midseason is set equal to Kc2. During this time, the crop ET rate is at its maximum in relation to ETo, and the Kc value is assumed to be constant. The end of midseason (date D) is determined as:

$$D = (P \div 100) \times AE \qquad (5)$$

where P is the percentage of the season from date A to D extracted from the last two digits of the code in table 1 and AE is the number of days in the growing season. For the beans example, late season begins at P = 74 percent of the season and the season is 121 days long so date D occurs (74 ÷ 100) x 121 = 90 days after planting or on June 30. A similar procedure would be used for other crops and locations.

Late season from date D to E

Crop coefficients during late season are assumed to change linearly from Kc2 on date D to Kc3 on date E. Kc2 and Kc3 are both estimated from table 1 for your crop and location. Late season Kc values are estimated graphically as shown in figure 3. A date during late season is located on the bottom scale and a line is followed upward to the Kc line. Then a horizontal line is followed from the intersection with the Kc line to the left-hand scale. For example, the Kc on July 10 is 0.88.

Crop coefficients during late season can also be determined mathematically by estimating the slope (b2) as:

$$b2 = (Kc3 - Kc2) \div DE \qquad (6)$$

where DE is the number of days from date D to date E. Then the Kc on a date d2 days after date D during late season is calculated as:

$$Kc = Kc2 + (b2 \times d2) \qquad (7)$$

Many combinations of crop coefficient and growth and development dates are given in table 1, but not every possibility is included. Use the information only as a guide to select subjectively the Kc values and growth and development dates.

Alfalfa and grass Kc estimates

Alfalfa growth stages were estimated, assuming that the cumulative ETc during a cutting cycle will equal the cumulative ETo during the same time period. After cutting on date A and at the beginning of midcycle, the Kc values were set to 0.4 and 1.2, respectively. The beginning of midcycle (date C) was fixed half way between cuttings and date B was varied until the cumulative ETc equaled cumulative ETo during the cycle. Usually, date B (10 percent ground shading) was one day after date A (cutting), or it was a few days after greenup. The Kc remains at 1.2 during late season, so selection of any P less than 100 percent or greater than 50 percent will not affect ETc estimation. Several agencies and researchers have recommended using ETo directly as a method to estimate alfalfa ETc. Using the growth dates and Kc values suggested in this leaflet, however, should improve accuracy.

Irrigated pasture that is 4 to 6 inches (10 to 15 cm) tall should use water at the ETo rate. Hence, ETc equals ETo and the Kc is equal to 1.0. Taller or shorter pasture grass will likely use slightly more or less than ETo and the Kc should be adjusted accordingly.

Turfgrasses are shorter than an irrigated pasture and use less water. A Kc of 0.80 will provide reasonably accurate estimates of ETc for a cool-season species. Warm-season turfgrasses use less water and a Kc of 0.60 will give good estimates of ETc. Often turfgrasses are a mixture of cool-season and warm-season species and a Kc of 0.7 may be sufficient for estimating ETc.

Conclusions

This information can be used to estimate daily crop coefficients for agronomic crops, grasses, and vegetable crops. These Kc values can be multiplied by normal or real-time (current) ETo values to obtain estimates of crop evapotranspiration.

Crop coefficient information provided here is based on measurements or estimates of crop water use and reference evapotranspiration. Crop ET can vary depending on irrigation method, crop variety, and irrigation management. Some trial and error is required to refine the information for a particular crop, location, and management.

It is important to note that evapotranspiration only provides information on how much water was depleted from the soil through the evapotranspiration process. Knowing how much water to apply also depends on uniformity of application, infiltration rates, runoff, water movement below the root zone, and contributions from other sources, such as water tables, dew, and precipitation. It is recommended that (1) the irrigation method or system be tested for application rate and efficiency and (2) the soil water or plant water status be monitored as a check against the evapotranspiration scheduling method.

Using ETc to estimate water use on fields with high water tables will often lead to overestimation of soil water depletion because water tables contribute an unknown quantity of water towards crop water use. The irrigation requirement is usually less than indicated by ETc in cropped fields with high water tables. Thus, an estimate of the water table contribution or a site-specific calibration of soil water depletions relative to ETc is required in these situations.

Table 1. Agronomic crop, vegetable crop, and miscellaneous coefficients for date B (Kc1), date C (Kc2), and date E (Kc3) with approximate growth dates. Growth dates are A = planting, B = 10 percent ground shading, C = 75 percent ground shading, and E = transpiration ceases or harvest. Select the data corresponding closely with your planting date for a first estimate of Kc and growth data for estimating ETc. Adjust the data as needed.

Region	Crop	Crop Coefficient[a]			Growth dates				Code[b]
		Kc1	Kc2	Kc3	A	B	C	E	
Imperial Valley	Alfalfa	0.40	1.20	1.20	11/15	11/19	12/09	01/15	275
		0.40	1.20	1.20	01/15	01/20	02/17	03/15	275
		0.40	1.20	1.20	03/15	03/16	04/04	04/14	275
		0.40	1.20	1.20	04/15	04/16	05/20	05/15	275
		0.40	1.20	1.20	05/15	05/16	06/01	06/15	275
		0.40	1.20	1.20	06/15	06/16	07/01	07/15	275
		0.40	1.20	1.20	07/15	07/16	07/31	08/15	275
		0.40	1.20	1.20	08/15	08/16	08/31	09/15	275
		0.40	1.20	1.20	09/15	09/16	10/09	11/15	275
	Asparagus	0.25	0.95	0.25	01/01	03/30	05/01	12/31	286
	Barley	0.23	1.04	0.10	11/30	12/16	02/02	05/31	261
		0.30	1.11	0.10	12/31	01/02	03/06	05/31	273
	Cantaloupe	0.42	0.96	0.90	01/31	03/01	04/15	05/31	291
		0.15	0.97	0.30	07/31	08/08	10/02	11/30	272
	Carrots	0.43	1.06	0.75	09/30	10/27	12/21	04/30	269
	Cotton	0.40	0.86	0.40	03/31	04/30	08/28	10/31	282
	Lettuce	0.17	1.02	0.45	08/31	09/20	10/31	12/31	271
		0.30	0.83	0.45	10/31	11/20	01/15	03/31	264
	Onions	0.75	1.03	0.20	12/31	02/15	04/01	05/31	265
	Sorghum (forage-cut 1)	0.14	1.01	0.15	03/31	04/25	05/21	08/31	256
	Sorghum (forage-cut 2)	0.57	1.20	0.30	07/30	08/11	09/07	11/30	243
	Sorghum (grain)	0.10	1.15	0.10	02/28	03/15	04/02	07/31	233
	Sorghum (grain)	0.09	1.19	0.10	05/31	06/12	07/06	10/31	237
	Squash	0.19	0.85	0.80	08/31	09/15	10/27	12/31	296
		0.45	1.30	0.05	12/31	01/21	02/21	04/30	246
	Sugarbeets	0.18	1.14	0.70	06/30	07/15	09/27	04/30	262
		0.28	1.10	0.75	09/30	10/17	12/06	06/30	283

Continued

Table 1. Continued

Region	Crop	Crop Coefficient[a]			Growth dates				Code[b]
		Kc1	Kc2	Kc3	A	B	C	E	
Imperial Valley (cont'd)	Tomatoes (processing)	0.41	1.20	0.60	01/31	03/07	04/18	06/30	279
	Tomatoes (marketing)	0.45	1.12	0.30	12/31	02/15	04/15	05/31	270
	Wheat	0.38	1.07	0.15	12/31	01/15	02/13	05/31	279
Northern Mountain Valleys	Alfalfa (4 cuttings)	0.40	1.20	1.20	04/01	04/07	04/30	05/25	275
		0.40	1.20	1.20	05/25	05/26	06/16	07/05	275
		0.40	1.20	1.20	07/05	07/06	07/26	08/15	275
		0.40	1.20	1.20	08/15	08/16	08/28	09/10	275
	Alfalfa (3 cuttings)	0.40	1.20	1.20	04/01	04/07	05/01	05/31	275
		0.40	1.20	1.20	05/31	06/01	06/26	07/15	275
		0.40	1.20	1.20	07/15	07/16	08/06	08/31	275
	Barley	0.27	1.15	0.10	04/30	05/10	06/14	08/31	269
	Potatoes	0.08	1.20	0.70	04/30	06/10	08/20	09/30	282
Sacramento Valley	Alfalfa	0.40	1.20	1.20	02/12	02/23	03/03	03/31	275
		0.40	1.20	1.20	04/01	04/03	04/18	05/15	275
		0.40	1.20	1.20	05/06	05/07	05/20	06/04	275
		0.40	1.20	1.20	06/05	06/06	06/18	07/02	275
		0.40	1.20	1.20	07/03	07/05	07/16	07/31	275
		0.40	1.20	1.20	08/01	08/02	08/16	08/31	275
		0.40	1.20	1.20	09/01	09/02	09/16	10/04	275
	Beans (pinto)	0.15	1.09	0.22	04/30	05/23	06/06	08/18	275
		0.08	1.08	0.30	06/03	06/11	07/14	09/22	276
	Corn	0.20	1.15	0.50	04/02	04/25	06/18	08/25	278
		0.20	1.15	0.48	04/30	05/24	07/07	09/08	273
		0.18	1.15	0.55	06/17	07/04	08/05	10/20	274
	Rice	0.95	1.24	1.00	05/13	06/12	07/17	10/31	280
	Small grains	0.20	1.23	0.10	10/14	11/06	01/10	06/02	273
		0.31	1.23	0.10	11/15	12/16	02/18	07/04	270
		0.25	1.20	0.15	12/16	01/12	03/30	08/04	271
	Sorghum (grain)	0.14	1.10	0.73	05/13	06/15	07/14	09/29	266
		0.13	1.12	0.43	06/17	07/13	08/05	10/27	262
		0.14	1.13	0.62	07/01	07/27	08/21	10/31	268
	Sugarbeets	0.25	1.10	1.00	01/29	03/19	05/15	08/25	292
		0.20	1.12	0.95	03/01	04/01	05/24	11/01	286
		0.11	1.14	0.83	04/02	04/15	06/29	12/31	287

Continued

Table 1. Continued

Region	Crop	Crop Coefficient[a]			Growth dates				Code[b]
		Kc1	Kc2	Kc3	A	B	C	E	
Sacramento Valley (cont'd.)	Tomatoes	0.26	1.11	0.73	02/26	04/22	06/11	08/11	282
		0.25	1.10	0.63	04/02	05/15	06/24	09/08	277
		0.25	1.14	0.90	04/30	05/25	07/07	09/22	272
		0.20	1.14	0.80	06/03	06/18	07/31	09/29	275
San Joaquin Valley	Alfalfa	0.40	1.20	1.20	02/12	02/22	03/07	03/21	275
		0.40	1.20	1.20	04/01	04/03	04/18	04/30	275
		0.40	1.20	1.20	05/06	05/07	05/20	06/04	275
		0.40	1.20	1.20	06/05	06/06	06/18	07/02	275
		0.40	1.20	1.20	07/03	07/04	07/15	07/31	275
		0.40	1.20	1.20	08/01	08/02	08/14	08/31	275
	Beans	0.14	1.15	0.30	04/01	04/30	05/25	07/31	274
		0.14	1.12	0.35	05/01	05/18	06/08	08/15	268
		0.14	1.07	0.20	06/16	07/01	07/26	09/30	274
	Corn	0.19	1.17	0.40	03/16	04/12	05/27	08/15	272
		0.19	1.17	0.40	04/01	04/25	06/14	08/31	268
		0.18	1.10	0.45	04/16	05/07	06/28	09/15	274
		0.19	1.06	0.55	05/16	06/07	07/16	09/30	277
		0.26	1.07	0.30	06/16	06/21	07/25	10/15	269
	Cotton	0.12	1.20	0.30	04/01	05/03	07/01	09/30	279
		0.16	1.18	0.40	04/16	05/18	07/06	10/15	269
		0.19	1.15	0.30	05/01	05/24	07/07	10/31	268
	Melons	0.14	1.10	0.10	02/15	03/31	04/30	06/30	279
		0.18	1.11	0.08	03/16	04/17	05/23	07/31	275
		0.18	1.10	0.10	04/16	05/09	06/22	08/15	278
	Onions	0.30	1.14	0.63	03/01	04/11	05/24	08/31	263
		0.18	1.15	0.78	09/16	10/06	01/01	05/31	272
		0.27	1.11	0.55	11/16	12/12	02/01	07/31	284
	Potatoes	0.51	1.15	0.75	12/01	02/24	03/26	05/15	287
		0.43	1.18	0.40	02/01	02/29	04/12	06/15	275
		0.55	1.21	0.40	03/01	03/21	04/26	06/30	269
	Rice	0.95	1.25	0.95	04/01	04/26	05/28	08/31	259
	Small grains	0.25	1.20	0.40	11/01	12/14	01/25	05/15	274
		0.22	1.17	0.38	12/01	12/24	03/02	05/31	275
		0.23	1.18	0.18	12/16	01/20	03/16	06/30	274
		0.30	1.17	0.20	01/01	02/01	03/22	06/30	272

Continued

Table 1. Continued

Region	Crop	Crop Coefficient[a]			Growth dates				Code[b]
		Kc1	Kc2	Kc3	A	B	C	E	
San Joaquin Valley (cont'd.)	Sorghum (grain)	0.16	1.05	0.45	05/01	06/04	07/04	09/30	265
		0.14	1.08	0.30	06/16	07/12	08/10	10/31	263
		0.13	1.06	0.30	07/01	07/29	08/22	11/15	268
	Sugarbeets	0.24	1.13	0.90	02/01	03/27	05/13	08/31	270
		0.15	1.11	0.95	03/16	04/10	06/07	09/15	263
		0.20	1.07	1.00	05/01	05/20	07/13	12/15	289
		0.23	1.10	0.95	06/16	07/06	08/13	03/15	284
	Tomatoes	0.25	1.16	0.70	03/01	04/28	06/10	08/15	272
		0.24	1.12	0.70	04/01	05/08	06/28	08/31	271
		0.25	1.12	0.68	05/01	05/22	07/18	09/15	269
	Tomatoes	0.20	1.00	0.80	03/23	04/23	05/30	08/02	275
Statewide	Open water surfaces	1.10	1.10	1.10	-	01/01	05/01	12/31	375
	Wet light soil	1.05	1.05	1.05	-	01/01	05/01	12/31	375
	Wet dark soil	1.10	1.10	1.10	-	01/01	05/01	12/31	375
	Grazed pasture	0.90	0.90	0.90	-	01/01	05/01	12/31	375
	Grass-clover	1.05	1.05	1.05	-	01/01	05/01	12/31	375

[a]Crop coefficients were estimated from Fereres et al. (1981), Doorenbos and Pruitt (1977), Letey and Vaux (1984), CDWR (1986), Phene et al. (1985), and Pruitt and Snyder (1984).

[b]The first digit of the code identifies the crop type (2 = annual crop or alfalfa; 3 = constant year-round Kc). The last two digits are the percentage of the growing season from date A and to date D. Date D is the date when the Kc values begin to decline due to crop aging. When the crop type is equal to 3, the precentage to date D is set to 99.

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ATTACHMENT N.2

USING REFERENCE EVAPOTRANSPIRATION (ETo) AND CROP COEFFICIENTS TO ESTIMATE CROP EVAPOTRANSPIRATION (ETc) FOR TREES AND VINES

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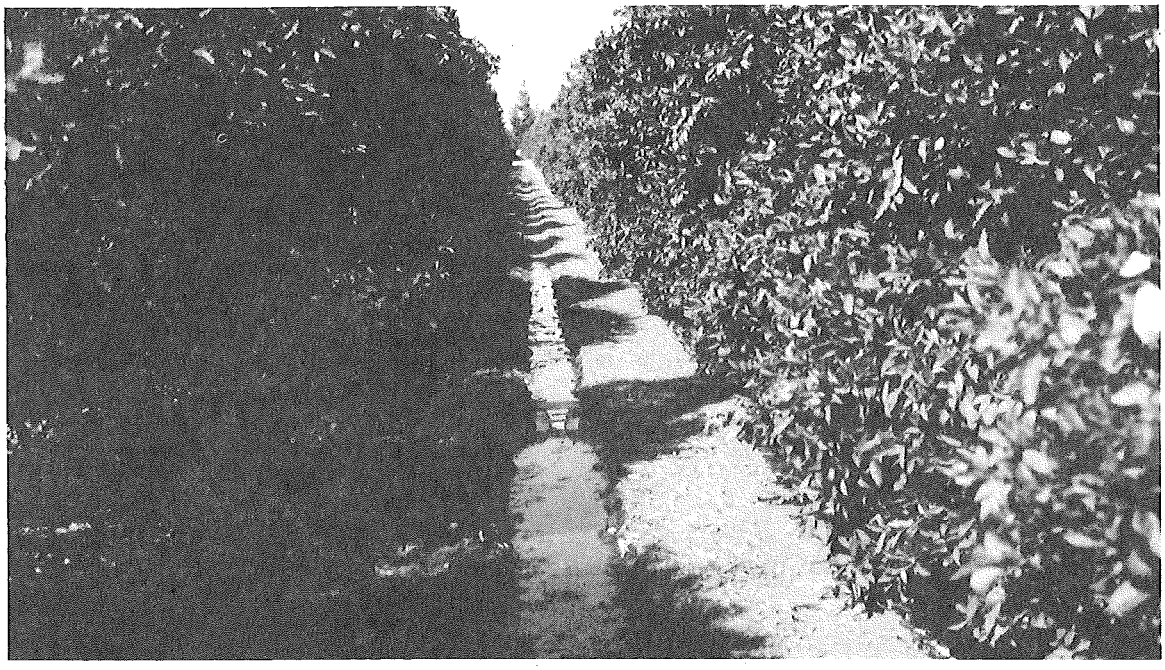
Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Trees and Vines



Introduction

Reference evapotranspiration (ETo) information is now available in many agricultural areas of California through the California Irrigation Management Information System (CIMIS). Direct access to real-time (daily) weather and ETo information through a computer dialup service can be obtained by writing:

California Department of Water Resources
Office of Water Conservation
P.O. Box 942836
Sacramento, CA 94236-0001

These daily real-time ETo estimates are used by growers to determine a refined irrigation schedule that can optimize profits relative to the use of water.

Historical average or "normal" ETo values are useful in determining an average or normal irrigation schedule for your crop that will give good results in most years. Daily normal ETo for many locations within California can be determined using the method and average monthly ETo accumulations given in Determining Daily Reference Evapotranspiration, UC Leaflet 21426.

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Division of Agriculture and Natural Resources
Leaflet 21428

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For locations not listed in Leaflet 21426, mean monthly ETo in mm/day can be obtained for any location in the state by interpolation using ETo isoline maps provided in Reference Evapotranspiration (ETo) for California, UC Bulletin 1922.

The real-time and normal ETo estimates approximate the evapotranspiration (ET) of a 4- to 7-inch tall, cool-season grass (an uncut pasture) that is not water stressed. The information can be used to estimate the ET of a crop (ETc) by multiplying the ETo values by factors (crop coefficients or Kc values) that account for the difference in ET between the crop and ETo. Although crop coefficients vary from day to day, depending on many factors, they are mainly a function of crop growth and development. The rate of crop growth and development will change from year to year, but the crop coefficient corresponding to a particular growth and development stage is assumed to be constant from year to year. Daily changes in ETo, in response to variation in evaporative demand, affect the estimated ETc which is calculated as:

$$ETc = ETo \times Kc \qquad (1)$$

This leaflet provides a method to determine daily Kc values to use corresponding to the growth and development of tree and vine crops grown in California.

General Crop Coefficient Curves

The Kc value on any given day is equal to the ratio of ETc to ETo on that day. Figure 1 shows average ETo and ETc curves for almonds grown near Bakersfield in the San Joaquin Valley. The ETc curve was determined using crop coefficients from table 1 assuming no ground cover and a leafout date of March 1. Figure 2 shows the Kc curve for the almond example calculated as the ratio of ETc to ETo on each day. Most deciduous tree and vine crops have similarly shaped Kc trends during a growing season. If the crop has a ground cover during the spring and fall, the early and late season Kc values are higher and there would be less change in Kc values over the season.

The method used to estimate Kc values involves separating the cropping season into the following growth and development periods.

Rapid growth is the period from leafout to when the leaves grow to near their maximum size and vegetative growth has slowed. Some sample dates for the end of rapid growth are given by crop and leafout date in table 1.

Midseason is the period from the end of rapid growth to when the crop transpiration begins to decrease due to aging. The end of midseason growth is difficult to visually identify, but the ratio of number of days from leafout until the end of midseason to the number of days from leafout until the time when transpiration ceases is nearly constant for a crop regardless of where it is grown. Ratios for California crops, are given as a percentage in the last two digits of the code in table 1.

Late season is the period from when transpiration begins to decline due to aging until crop transpiration ceases or leaf drop occurs.

The letters B, C, D, and E represent the dates preceding rapid growth, midseason, late season, and at the end of late season, respectively. Table 1 gives crop coefficients and typical growth and development dates for many California crops and locations. It is not possible to list Kc values for all crops and varieties, so those given in table 1 should be used only as a guide for choosing the correct information.

The following sections will discuss daily Kc estimation during each growth period using almonds grown near Bakersfield in the San Joaquin Valley as an example. Growth dates B, C, and E are March 1, May 28, and October 31, respectively, from table 1. The percentage of the season from leafout to date D is P = 78, which is listed as the last two digits of the code in table 1. The Kc values on the selected dates B, C, and E are 0.52, 0.87, and 0.65, respectively, for almonds without a cover crop. If a cover crop was grown in the spring and fall, the Kc1 and Kc3 values would need to be adjusted upward according to the table 1 footnote to 0.82 and 0.85, respectively. However, no cover crop is assumed in this example.

Rapid growth from date B to C

Crop coefficients on each day during rapid growth are estimated by assuming the Kc changes linearly from Kc1 on date B to Kc2 on date C as shown in figure 2. The values 0.52 and 0.87 were selected for Kc1 and Kc2 from table 1. To estimate the Kc value on an intermediate date, locate the date on the bottom scale and follow a line up to the Kc line. Then follow a line horizontally to the left-hand scale and read the Kc for that day. For example, the Kc value on March 31 is approximately 0.64.

Crop coefficients during rapid growth can also be estimated mathematically by determining the slope (b1) of the Kc line as:

$$b1 = (Kc2 - Kc1) \div BC \qquad (2)$$

where BC is the number of days from date B to date C. Then the Kc on a date that is d1 days after date B during rapid growth is calculated as:

$$Kc = Kc1 + (b1 \times d1) \qquad (3)$$

Midseason from date C to D

The Kc during midseason is set equal to Kc2 (figure 2). The end of midseason (date D) is determined as:

$$D = (P \div 100) \times AE \qquad (4)$$

where P is the percentage of the growing season from date B to date D, given as the last two digits of the code in table 1 and AE is the number of days during the growing season. For the almond example, late season begins at P = 78 percent of the season and the season is 244 days long, so date D occurs at: (78 ÷ 100) x 244 = 190 days after leafout, or on September 7.

Late season from date D to E

Crop coefficients during late season are assumed to change linearly from Kc2 on date D to Kc3 on date E. Late season Kc values can be determined graphically using figure 2. A date during late season is located on the bottom scale and a line is followed upward to the Kc line. Then a line is horizontally followed from the intersection with the Kc line to the left-hand scale. For example, the Kc on September 30 is approximately 0.78.

Crop coefficients during late season can also be determined mathematically by estimating the slope (b2) as:

$$b2 = (Kc3 - Kc2) \div DE \qquad (5)$$

where DE is the number of days from date D to date E. Then the Kc on a date d2 days after date D during late season is calculated as:

$$Kc = Kc2 + (b2 \times d2) \qquad (6)$$

Cover Crops

Cover crops in orchards and vineyards increase the evapotranspiration from a crop during rapid growth and late season because the cover crop will transpire more water than would evaporate from a bare soil surface. Note that Kc values for deciduous trees in table 1 are for orchards with no cover crop and they should be adjusted upward if a cover crop is grown. Guidelines on the adjustment are given in the footnotes for table 1.

Correction for immature deciduous trees

Evapotranspiration rates depend on the percentage of ground shaded by a crop, and immature crops use less water. Ground shading is determined by subjectively estimating the percentage of ground surface area shaded by the crop canopy at midday during midseason. Cover crop shading is not included in estimates of shading by the orchard or vineyard. Figure 3 can be used to adjust estimated ETc for a mature crop to that of an immature crop. Find the percentage ground shading by the crop at midseason on the bottom scale; go upward to the curve and then to the left-hand scale to read what percentage of mature ETc will be used by the crop. The percentage of mature ETc can also be determined using equation 7 for percent ground shading up to 61%,

$$PER = 3.050 + 2.558\ G - 0.016\ G^2 \qquad (7)$$

where PER is the percentage of mature ETc and G is the percent ground shading. Note that this correction is based on studies of drip-irrigated deciduous trees and corrections for other crops and irrigation systems might be different.

Citrus

The Kc values for citrus are treated differently from those for deciduous trees and vines. A reasonably accurate estimate of citrus ETc can be made assuming a constant Kc of 0.65 or 0.56 for the entire year in the Central Valley or southern California desert, respectively. No definitive information is available on the water use of immature citrus. However, a correction similar to that for deciduous trees might be reasonable if updated as the trees grow during the season.

Conclusions

The information provided here can be used to estimate daily crop coefficients for tree and vine crops. These Kc values can be multiplied by normal or real-time daily ETo values to obtain estimates of crop evapotranspiration (ETc).

Averaging daily Kc values over a period of time and multiplying by accumulated ETo will give estimates of accumulated ETc. However, accuracy decreases as length of time period increases during rapid growth or late season.

Crop coefficient information given here is based on measurements or estimates of crop water use and reference evapotranspiration. Crop ET can vary, depending on irrigation method, crop variety, and irrigation management. Some trial and error is required to refine the information for a particular crop, location, and management.

Evapotranspiration estimates only provide information on how much water was depleted from the soil by a crop. Knowing how much water to apply also depends on uniformity of application, infiltration rates, runoff, water movement below the root zone, and contributions from other sources such as water tables, dew, and precipitation. It is recommended that (1) the irrigation method or system be tested for application efficiency, and (2) soil water or plant water status be monitored as a check against the evapotranspiration scheduling method.

Using ETc to estimate water use on fields with high water tables will often lead to overestimation of soil water depletion because water tables contribute an unknown quantity of water towards crop water use. The irrigation requirement is usually less than indicated by ETc in cropped fields with high water tables. Thus, an estimate of the water table contribution or a site-specific calibration of soil water depletions relative to ETc is required in these situations.

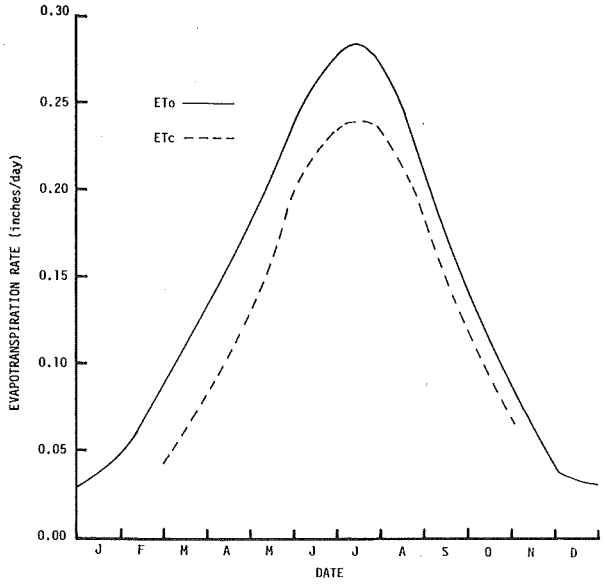

Fig. 1. Normal reference evapotranspiration (ETo) and crop evapotranspiration (ETc) for almonds with no cover crop grown near Bakersfield, California.

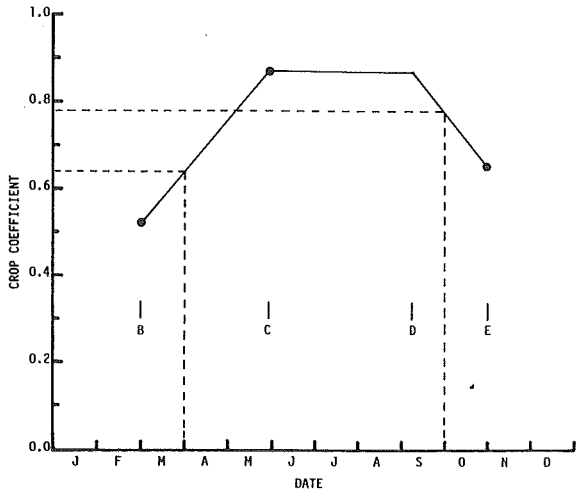

Fig. 2. Crop coefficient (Kc) curve for almonds grown with no cover crop in the San Joaquin Valley with leafout (date B) on March 1, 60 percent ground shading (date C) on May 28, and leafdrop (date E) on October 31.

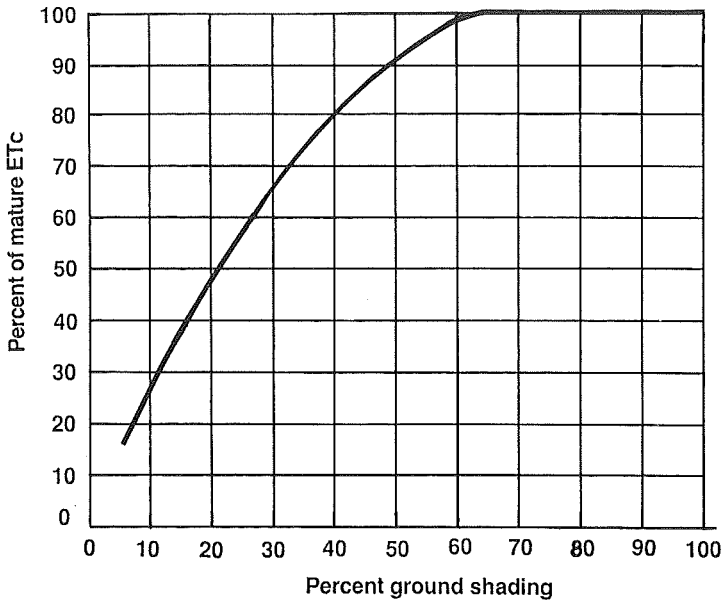

Fig. 3. Relationship between the percent ground area shaded by tree canopy in midsummer and ETc of drip-irrigated young trees as a percent of ETc of mature orchards (estimated from figure 8 in UC Leaflet 21259).

Table 1. Tree and vine coefficients[a] for date B (Kc1), date C (Kc2), and date E (Kc3) with approximate growth dates. Crop coefficients given for deciduous trees are for no cover crop. See the footnotes to correct Kc values for cover crops. Choose the crop coefficients and growth dates corresponding most closely to leafout date (B) for your crop to obtain a first estimate of the Kc values and dates to use for calculating ETc.

		Crop Coefficient			Growth dates			
Region	Crop	Kc1	Kc2	Kc3	B	C	E	Code[b]
Imperial Valley	Citrus	0.56	0.56	0.56	01/01	05/01	12/31	375
	Deciduous orchard	0.55	0.95	0.70	02/28	06/24	10/31	186
	Guayule	0.28	0.72	0.50	01/01	07/24	12/31	166
Central Valley	Deciduous[c] orchard	0.50	0.91	0.48	02/12	05/30	11/03	175
		0.55	0.92	0.52	02/26	06/24	11/10	174
		0.52	0.87	0.65	03/01	05/28	10/31	178
		0.50	0.86	0.75	03/16	06/09	11/15	180
	Deciduous[d] orchard	0.50	1.01	0.53	02/12	05/30	11/03	175
		0.55	1.02	0.57	02/26	06/24	11/10	174
		0.52	0.93	0.88	04/15	06/10	11/10	190
		0.52	0.97	0.85	03/01	05/28	10/31	178
		0.50	0.96	0.80	03/16	06/09	11/15	180
		0.50	0.85	0.80	04/01	06/02	11/30	190
	Grapes	0.35	0.81	0.27	03/12	05/30	09/22	172
		0.25	0.80	0.27	03/26	05/25	10/06	171
		0.27	0.82	0.32	04/30	07/06	11/10	169
		0.06	0.78	0.20	03/01	05/10	09/30	173
		0.07	0.80	0.30	03/16	05/30	10/15	164
		0.07	0.76	0.12	04/16	06/24	11/15	175
	Kiwifruit	0.31	1.05	1.05	04/15	06/01	10/31	175
	Citrus	0.65	0.65	0.65	01/01	05/01	12/31	375
	Olives	0.58	0.80	0.80	03/31	06/19	10/31	175
	Pistachio	0.04	1.12	0.33	03/31	06/04	08/07	161
Statewide	Evergreen shrubbery	1.15	1.15	1.15	01/01	05/01	12/31	375
	trees	1.20	1.20	1.20	01/01	05/01	12/31	375

[a]Crop coefficients were estimated from Fereres, et al. (1981), Doorenbos and Pruitt (1977), Letey and Vaux (1984), CDWR (1986), Goldhamer, et al. (1985), Pruitt and Snyder (1984), and Buchner, Shaw and Schulbach (1985).

[b]The first digit of the code identifies the crop type (1 = deciduous; 3 = constant year-round Kc). For deciduous crops, the last two digits are the percentage of the season from leafout (date B) to date D when the Kc begins to decline due to aging. When the crop type is equal to 3, the Kc values do not decline and the last two digits of the code set equal to 99.

[c]Includes peaches, apricots, pears, plums, almonds and pecans without a cover crop. Add 0.30 to Kc1, 0.25 to Kc2, and 0.20 to Kc3 for orchards with an active cover crop.

[d]Includes apples, cherries, and walnuts without a cover crop. Add 0.40 to Kc1, 0.30 to Kc2, and 0.30 to Kc3 for orchards with an active cover crop.

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ATTACHMENT N.3

EXPLANATION OF TABLE 5 CALCULATION METHODOLOGY

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Explanation of Table 5 Calculation Methodology

Evapotranspiration Rates

References:

1. *Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Trees and Vines*; Cooperative Extension, University of California Division of Agriculture and Natural Resources, Leaflet #21428.

2. *Using Reference Evapotranspiration (ETo) and Crop Coefficients to Estimate Crop Evapotranspiration (ETc) for Agronomic Crops, Grasses, and Vegetable Crops*; Cooperative Extension, University of California Division of Agriculture and Natural Resources, Leaflet #21428.

Definitions:

ETo: reference crop evapotranspiration (for a 4-7 inch tall, cool season grass that is not water-stressed)
ETc: estimated evapotranspiration of a particular crop in a particular location
Kc: Crop coefficient—depends on climate, effective precipitation, crop variety, and length of growing season.
Kc1: coefficient for a particular crop during its initial growth period—between dates A and B in the example Figure 2 below (Reference #2, p. 4).
Kc2: maximum coefficient for a particular crop, occurs during mid-season—between dates C and D in the example Figure 2 below (Reference #2, p. 4).
Kc3: Harvest/post harvest coefficient—date E in the example Figure 2 below (Reference #2, p. 4).

Fundamental Equation: $ETc = ETo \times Kc$

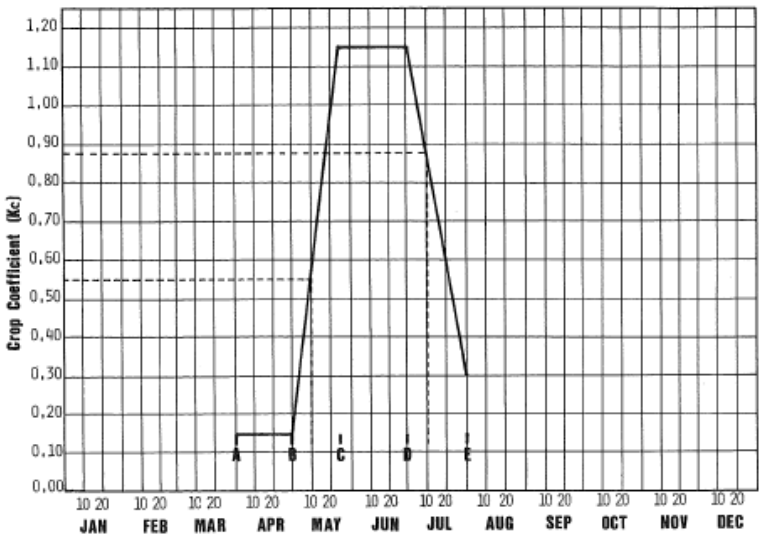

Fig. 2. Crop coefficient (Kc) curve for beans grown in the San Joaquin Valley with planting on April 1, 10 percent ground shading on April 30, 75 percent ground shading on May 25, and maturity on July 31.

For California's Sacramento Valley and northern mountain valleys, References 1 & 2 give estimated values for Kc1, Kc2, Kc3 and approximate key growing season dates for crops grown within the District's service area (Table 5a). Where coefficients were not listed for a particular crop, approximations were assumed and noted in column 1 of Table 5a. "Other" categories refer to acres planted with a particular category of crop, according to the District's 2012 census, but not identified as containing a specific crop within that category. The Kc values for Rapid Growth (B-C) and Late Season (D-E) periods were calculated using the slope of the Kc1-Kc2 and Kc2-Kc3 lines on a time vs Kc plot (such as Figure 2 above).

Table 5a: Crop Coefficients and Growing Season Dates

(*Reference #1, p. 9-10 and Reference #2, p. 7)*

				A-B	B-C	C-D	D-E	E
	Kc1	Kc2	Kc3	Kc1 (planting)	Rapid growth	Maturity (Kc2)	Late Season	Kc3 (harvest)
Barley (feed)	0.27	1.15	0.10	30-Apr	10-May	14-Jun	21-Jul	31-Aug
Corn	0.20	1.15	0.50	2-Apr	25-Apr	18-Jun	22-Jul	25-Aug
Oats (used barley data)	0.27	1.15	0.10	30-Apr	10-May	14-Jun	21-Jul	31-Aug
Sorghums	0.14	1.10	0.73	13-May	15-Jun	14-Jul	10-Aug	29-Sep
Non-alfalfa hay	0.40	1.20	1.20	1-Apr	7-Apr	30-Apr	11-May	25-May
Irrigated pasture	0.90	0.90	0.90		1-Jan	1-May	28-Sep	31-Dec
Other field crops (used barley data)	0.27	1.15	0.10	30-Apr	10-May	14-Jun	21-Jul	31-Aug
Broccoli (use beans data)	0.15	1.09	0.22	1-Apr	30-Apr	25-May	30-Jun	31-Jul
Carrots (used onion data)	0.30	1.14	0.63	1-Mar	11-Apr	24-May	22-Jun	31-Aug
Cauliflower (use beans data)	0.15	1.09	0.22	1-Apr	30-Apr	25-May	30-Jun	31-Jul
Corn, sweet	0.20	1.15	0.50	2-Apr	25-Apr	18-Jun	22-Jul	25-Aug
Squash	0.25	0.80	0.80	1-Apr	30-Apr	25-May	24-Jun	31-Jul
Tomatoes	0.25	1.10	0.63	2-Apr	15-May	24-Jun	31-Jul	8-Sep
Other Vegetables (average vegetable data)	0.22	1.06	0.50	1-Apr	30-Apr	25-May	30-Jun	31-Jul
Cantaloupe	0.18	1.10	0.10	16-Apr	9-May	22-Jun	17-Jul	15-Aug
Grapes, wine	0.25	0.80	0.27		26-Mar	25-May	7-Aug	6-Oct
Pears (no frosts)	0.52	0.87	0.65		1-Mar	28-May	4-Sep	31-Oct
Strawberries	0.25	0.80	0.80	1-Apr	26-Apr	26-Jun	14-Aug	1-Oct
Other fruits	0.52	0.87	0.65		1-Mar	28-May	4-Sep	31-Oct
Almonds	0.52	0.87	0.65		1-Mar	28-May	4-Sep	31-Oct
Pecans	0.52	0.87	0.65		1-Mar	28-May	4-Sep	31-Oct
Pistachios (no cover)	0.04	1.12	0.33		31-Mar	4-Jun	16-Jun	7-Aug
Walnuts (no cover)	0.52	0.87	0.65		1-Mar	28-May	4-Sep	31-Oct

Monthly ETo values for the last twelve months were obtained from the CIMIS (California Irrigation Management Information System) website, http://wwwcimis.water.ca.gov/cimis, for CIMIS Station #224 at Shasta College (see Table 5b).

Table 5b: ETo Values and Growing Phase Dates for Irrigated Pasture

Values used for all crops				Example values for irrigated pasture[1,2]					Est. ETc (in)	Est. ETc (AF/Ac)
	Precipitation (in, avg)	Eto (CIMIS #224, inches/month)	Eto (inches/day)	# Days at Kc1	# Days at (Kc1 + Kc2)/2	# Days at Kc2	# Days at (Kc2 + Kc3)/2	# Days at Kc3		
Jan	5.96	2.27	0.07		31				2.04	0.17
Feb	5.69	1.56	0.06		28				1.40	0.12
Mar	4.37	2.96	0.10		31				2.66	0.22
Apr	2.48	4.86	0.16		30				4.23	0.35
May	1.85	5.53	0.18			31			4.98	0.42
Jun	0.69	7.61	0.25			30			6.63	0.55
Jul	0.09	8.53	0.28			31			7.68	0.64
Aug	0.18	7.23	0.23			31			6.51	0.54
Sep	0.64	5.17	0.17			27	3		4.50	0.38
Oct	2.10	3.91	0.13				31		3.52	0.29
Nov	4.48	2.28	0.08				30		1.99	0.17
Dec	6.27	1.84	0.06				31		1.66	0.14
Total	34.80	51.48	0.14						47.8	**4.0**

1. *Irrigated pasture was selected as an example because it represents, by far, the crop with the largest number of irrigated acres within the District.*
2. *As shown in Table 5a, the estimated growth phase transitions are:*
   - *January 1: Rapid growth begins, average Kc of (Kc1+Kc2)/2*
   - *May 1: Maturity reached (Kc constant at Kc2)*
   - *September 28: Late season Kc decline, average Kc of (Kc2 + Kc3)/2*
   - *December 31: Harvest (Kc3)*

   For irrigated pasture, the assumption was made that the cycle is continuous, i.e. that the number of days spent at exactly Kc3 (harvested, dormant) is equal to zero.

Monthly ETc values for each crop were obtained by multiplying the monthly Shasta College CIMIS ETo by the sum of the products of appropriate Kc values and the number of days spent by the crop in question in that growing phase (Kc value) during that particular month. Monthly ETc values were then summed to obtain annual estimates for each crop:

$$ETc_i(in/month) = ETo_i\left(\frac{in}{day}\right)\times\left[Kc1\times(\#EarlyGrowthDays)+\left(\frac{Kc1+Kc2}{2}\right)\times(\#RapidGrowthDays)\right]$$

$$+ ETo_i\left(\frac{in}{day}\right)\times\left[Kc2\times(\#Days@Maturity)+\left(\frac{Kc2+Kc3}{2}\right)\times(\#LateSeasonDays)+Kc3\times(OffSeasonDays)\right]$$

Effective Precipitation

Monthly effective precipitation for each crop was calculated as a function of monthly precipitation (Table 5a) and crop-specific ETc, calculated as discussed above:

$$Eff\ \Pr ecipitation\left(\frac{in}{month}\right) = 0.60 \times \left[Monthly\ \Pr ecipitation(in) - 0.5(in)\right]$$ or ETc for that month

(e.g. Table 5b), whichever is less. Monthly precipitation values are as given in the body of the FWMP, Section 1.D.1, and were obtained from the Western Regional Climate Center Database.

ATTACHMENT N.4

CIMIS Data for Stations #224 (Shasta College) and #24 (Northeast Plateau)

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CIMIS (California Irrigation Management Information System)

Monthly Report

Rendered in ENGLISH Units.
May 1, 2013 - April 30, 2014
Printed on May 21, 2014
See the bottom of this report for a legend for all flag values.

Northeast Plateau - McArthur - #43

Month Year	Tot ETo (in)	Tot Precip (in)	Avg Sol Rad (Ly/Day)	Avg Vap Pres (mBars)	Avg Max Air Tmp (F)	Avg Min Air Tmp (F)	Avg Air Tmp (F)	Avg Max Rel Hum (%)	Avg Min Rel Hum (%)	Avg Rel Hum (%)	Avg Dew Point (F)	Avg Wind Speed (mph)	Avg Soil Temp (F)
May 2013	6.60	0.97 K	620 K	8.5 K	71.3	40.8 K	56.7	81	33	54 K	39.4 K	5.8 K	56.7
Jun 2013	7.29	0.63	636	10.7	80.8 K	47.1 K	65.0	82	30	50	45.5	5.1 K	63.3
Jul 2013	8.48	0.19	665	11.8 K	90.5	50.6 K	71.3	81	23	45 K	48.5 K	4.7	67.8
Aug 2013	6.81 K	0.38	570	10.5 K	83.7	45.0	64.7	84	28	50 K	45.4 K	4.7 K	66.2
Sep 2013	4.82 K	0.66	455	9.7 K	75.7 K	41.5 K	58.7	85	34	57 K	43.2 K	5.2 K	61.8
Oct 2013	3.17 K	0.17 K	360 K	5.9	67.1 K	28.0	46.2 K	85 K	29 K	56	30.9	4.2 K	52.6
Nov 2013	1.65	0.91	220	5.4	56.9	24.4	38.9	86	40	66	28.1	3.8 K	46.5
Dec 2013	1.05 K	0.13	187	3.6 K	45.5 K	11.5 K	26.6 K	85 K	42 K	71 K	18.1 K	3.4 K	43.6 K
Jan 2014	1.37	0.19	200	4.4	53.2 K	19.4	34.1	86	38	65	23.3	3.4	42.9 K
Feb 2014	1.59	2.85 K	232 K	6.2 K	51.8	29.2 K	39.7	89	51	72 K	31.2 K	5.2 K	44.2
Mar 2014	3.06	3.69 K	347	6.4	57.2	31.2	43.8	86	45	66	32.4	5.8 K	47.0
Apr 2014	4.88	0.76	505 K	7.0	64.8	34.4	49.7	86	36	59	35.2	5.5 K	51.4
Totals/Avgs	50.77	11.53	416	7.5	66.5	33.6	49.6	85	36	59	35.1	4.7	53.7

Sacramento Valley - Shasta College - #224

Month Year	Tot ETo (in)	Tot Precip (in)	Avg Sol Rad (Ly/Day)	Avg Vap Pres (mBars)	Avg Max Air Tmp (F)	Avg Min Air Tmp (F)	Avg Air Tmp (F)	Avg Max Rel Hum (%)	Avg Min Rel Hum (%)	Avg Rel Hum (%)	Avg Dew Point (F)	Avg Wind Speed (mph)	Avg Soil Temp (F)
May 2013	5.53	0.41	611	10.5 K	81.5	51.2 K	66.9	82	27	47 K	44.5 K	3.8	67.2
Jun 2013	7.61 K	0.89	677 L	12.5	91.0 K	58.4 K	76.1 K	77 K	24 K	42	49.5	3.9	69.2
Jul 2013	8.53	0.00	670	13.8 K	99.8 K	61.0 K	81.0 K	81 K	16 K	38 K	52.7 K	3.4	75.5 K
Aug 2013	7.23 K	0.00	590 K	12.3	94.2 K	56.2	75.4 K	82 K	18 K	41	49.8	3.4	76.8 K
Sep 2013	5.17 K	0.38	446	11.5	85.7 K	53.0 K	69.7 K	82 K	26 K	48	47.6	3.9	71.5 K
Oct 2013	3.91 K	0.04	370 K	7.3	78.8 K	41.8 K	59.3 K	80 K	21 K	43	36.1	3.7	60.5 K
Nov 2013	2.28 K	0.58 K	227	6.8 K	69.2	36.6 K	51.1	83	28	54 K	33.4 K	3.5	52.8
Dec 2013	1.84	0.14 K	196	4.9 K	63.0 K	27.4 K	43.2	86	25	52 K	25.4 K	3.7	43.4
Jan 2014	2.27 K	0.16 K	221 K	5.2 K	69.4 K	33.5 K	50.2 K	76 K	22 K	45 K	27.0 K	3.7 K	45.2 K
Feb 2014	1.56	2.71 K	226 L	8.4 K	60.8 K	37.8 K	49.8 K	93 K	49 K	68	38.8	3.8 K	48.6 K
Mar 2014	2.96	2.61 K	312	8.7 K	66.5 K	40.9	54.0	91	42	63 K	39.7 K	3.9	54.4
Apr 2014	4.86 K	0.13	493 K	9.4	75.2 K	43.1	59.5	93	32	56	42.7	3.5	60.4
Totals/Avgs	53.75	8.05	420	9.3	77.9	45.1	61.4	84	28	50	40.6	3.7	60.5

M - All Daily Values Missing
K - One or More Daily Values Flagged
J - One or More Daily Values Missing
L - Missing and Flagged Daily Values

W/sq.m = Ly/day/2.065	inches * 25.4 = mm	C = 5/9 * (F - 32)
m/s = mph * 0.447	kPa = mBars * 0.1	

ATTACHMENT P

REPLACEMENT METER TESTING

P..1 Standard Operating Procedure for Replacement Meter Testing

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ATTACHMENT P.1

STANDARD OPERATING PROCEDURE FOR REPLACEMENT METER TESTING

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STANDARD OPERATING PROCEDURE

Replacement Meter Testing

Scope and Application:

Testing replaced meters for accuracy.

Frequency:

To be done at the conclusion of each meter route replacement.

Interference:

Meter testers not properly calibrated, not having proper fittings, adapters, etc.

Apparatus and Materials:

Nuts, bolts, meter gaskets, hoses, adapters, meter testers, flow benches. Worksheet for recording the results.

Reagents:

N/A

Calibration:

Make sure testing devices have been properly calibrated.

Procedures:

Select a 10% representative sample of the meters removed and at least one of each meter type (i.e. disk, multi-jet, turbo, etc.) for testing. For meters up to 1" use the Mars MUN-1 meter tester. For meters 1½" and larger use the Badger 2½" tester. Set the test area up at the Water Treatment Plant Recycle Pond so the water used for testing will flow into the pond to be recycled. Determine the proper type of fittings, adapters etc. for the meter to be tested. Connect the meter to the proper tester. Determine the type of meter being tested and conduct the flow test using AWWA manual for meter testing M6, table 5-3 for proper flow rates. Record testing results and turn records into the Engineering Department.

Safety:

Be aware of surroundings; make sure all fittings and hoses are secure.

Quality Control:

Accurate flow tests. Using proper tables for type of meter.

References:

AWWA Manual of Practice, M6 Water Meters – Selection, Installation, Testing, and Maintenance, 5th ed.

Approved By:

_____	_____
Water Distribution Superintendent	**Date :**
_____	_____
Safety Officer	**Date :**

Elements of a Meter Test

Accuracy denotes the comparison between a meter's indicated quantity of water passing through it as compared to the actual quantity of water passing through it as determined by the test system, or proving system. In the water industry, the meter's accuracy is most commonly called the *percent registration* (% registration). A water meter that has 101% accuracy, or a percent registration of 101%, at a given flow rate indicates that 1% more water is registered on the meter than is actually delivered (this error is called 1% fast); in this case, the meter over-registers by 1%. Conversely, a meter that has 99% accuracy indicates that 1% less water is registered on the meter than is actually delivered (i.e., 1% slow); the meter under-registers by 1%.

Flow range is the maximum, intermediate, and minimum flow rates established by the manufacturer of the meter being tested and closely represented by the flow rates listed in Table 5-3. The range is sometimes expressed as a ratio where the maximum flow rate is compared to the minimum flow rate. A meter capable of being accurate from 20 gpm (4.5 m^3/h) to 200 gpm (45 m^3/h) would have a 10:1 flow range as an example.

A meter's characteristic accuracy curve (also called a performance curve) is a continuous curve drawn between all accuracy points over the meter's flow range. Most water meter manufacturers' literature contains a performance curve for their particular meter model. Generally speaking, all meters of the same general type (disc, piston, multijet, compound, or turbine) will exhibit the same or similar characteristic accuracy curve.

Accuracy Issues

Repeatability is the measure of deviation of a series of accuracy tests from the test's mean value where all of these accuracy tests were conducted under exactly identical conditions. This term can be applied to either the test system or the meter under test.

Precision usually refers to the combined sources of all errors in a test system, which may include data presentation and operator interpretation errors as well as the combined proving system repeatability errors of each component. In addition to these sources of error, a test system might have a bias where the test system indicated proof quantity is displaced from the true value at one or all proof quantities.

The following are the three basic elements of a meter test:

1. The number of different rates of flow over the operating range of a meter required to determine overall meter efficiency.
2. The quantities of water necessary at the various test rates to provide reasonable resolution of meter registration accuracy.
3. Accuracy limits that meters must meet on the different rates to be acceptable for use.

Test Rates

The three rates of flow necessary to properly test displacement, compound, propeller, and other types of water meters are maximum, intermediate, and minimum. At least one additional test, preferably more, is necessary within the changeover range of flows of compound and fire-service meters to determine overall operational efficiency and accuracy of registration.

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Table 5-3 Test requirements for new, rebuilt, and repaired cold–water meters*

Displacement Meters (AWWA C700 and C710)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
½	8	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
½ × ¾	8	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
⅝	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
⅝ × ¾	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
¾	25	100	10	98.5–101.5	3	10	1	98.5–101.5	½	10	1	95–101	90
1	40	100	10	98.5–101.5	4	10	1	98.5–101.5	¾	10	1	95–101	90
1½	50	100	10	98.5–101.5	8	100	10	98.5–101.5	1½	100	10	95–101	90
2	100	100	10	98.5–101.5	15	100	10	98.5–101.5	2	100	10	95–101	90

Multijet Meters (AWWA C708)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
⅝	15	100	10	98.5–101.5	1	10	1	98.5–101.5	¼	10	1	97–103	90
⅝ × ¾	15	100	10	98.5–101.5	1	10	1	98.5–101.5	¼	10	1	97–103	90
¾	25	100	10	98.5–101.5	2	10	1	98.5–101.5	½	10	1	97–103	90
1	35	100	10	98.5–101.5	3	10	1	98.5–101.5	¾	10	1	97–103	90
1½	70	100	10	98.5–101.5	5	100	10	98.5–101.5	1½	100	10	97–103	90
2	100	100	10	98.5–101.5	8	100	10	98.5–101.5	2	100	10	97–103	90

Singlejet Meters (AWWA C712)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
⅝	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101.5	90
⅝ × ¾	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101.5	90
¾	25	100	10	98.5–101.5	3	10	1	98.5–101.5	½	10	1	95–101.5	90
1	40	100	10	98.5–101.5	4	10	1	98.5–101.5	¾	10	1	95–101.5	90
1½	50	100	10	98.5–101.5	8	100	10	98.5–101.5	½	100	10	95–101.5	90
2	100	100	10	98.5–101.5	15	100	10	98.5–101.5	½	100	10	95–101.5	90
3	160	500	50	98.5–101.5	20	100	10	98.5–101.5	½	100	10	95–101.5	90
4	250	500	50	98.5–101.5	40	100	10	98.5–101.5	¾	100	10	95–101.5	90
6	500	1,000	100	98.5–101.5	60	100	10	98.5–101.5	1½	100	10	95–101.5	90

Fluidic–Oscillator Meters (AWWA C713)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
½	8	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
½ × ¾	8	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
⅝	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90
⅝ × ¾	15	100	10	98.5–101.5	2	10	1	98.5–101.5	¼	10	1	95–101	90

(continued)

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Table 5-3 Test requirements for new, rebuilt, and repaired cold-water meters* (continued)

Fluidic–Oscillator Meters (AWWA C713)

¾	25	100	10	98.5–101.5	3	10	1	98.5–101.5	½	10	1	95–101	90
1	40	100	10	98.5–101.5	4	10	1	98.5–101.5	¾	10	1	95–101	90
1½	50	100	10	98.5–101.5	8	100	10	98.5–101.5	1½	100	10	95–101	90
2	100	100	10	98.5–101.5	15	100	10	98.5–101.5	2	100	10	95–101	90

Class I Turbine Meters, Vertical–Shaft Type (AWWA C701)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
¾	30	100	10	98–102	3	10	1	98–102	1½	10	1	98–102	—
1	50	100	10	98–102	5	10	1	98–102	2	10	1	98–102	—
1½	100	500	50	98–102	10	100	10	98–102	3	100	10	98–102	—
2	160	500	50	98–102	16	100	10	98–102	4	100	10	98–102	—
3	350	1,000	100	98–102	35	100	10	98–102	6	100	10	98–102	—
4	600	1,500	200	98–102	60	100	10	98–102	8	100	10	98–102	—
6	1,250	4,000	500	98–102	125	1,000	100	98–102	15	1,000	100	98–102	—

Class II Turbine Meters, In–Line (High–Velocity) Type (AWWA C701)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
1½	100	500	50	98.5–101.5					4	100	10	98.5–101.5	—
2	160	500	50	98.5–101.5					4	100	10	98.5–101.5	—
3	350	1,000	100	98.5–101.5					8	100	10	98.5–101.5	—
4	630	1,500	200	98.5–101.5					15	100	10	98.5–101.5	—
6	1,400	4,000	500	98.5–101.5					30	1,000	100	98.5–101.5	—
8	2,400	7,000	900	98.5–101.5					50	1,000	100	98.5–101.5	—
10	3,800	10,000	1,300	98.5–101.5					75	1,000	100	98.5–101.5	—
12	5,000	15,000	2,000	98.5–101.5					120	1,000	100	98.5–101.5	—
16	10,000	30,000	4,000	98.5–101.5					200	1,000	100	98.5–101.5	—
20	15,000	40,000	5,000	98.5–101.5					300	1,000	100	98.5–101.5	—

Propeller Meters (AWWA C704)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
2	100	300	40	98–102					35	200	25	98–102	90
3	250	800	100	98–102					40	200	25	98–102	90
4	500	1,500	200	98–102					50	250	30	98–102	90
6	1,200	2,500	300	98–102					90	500	60	98–102	90
8	1,500	3,000	400	98–102					100	500	60	98–102	90
10	2,000	4,000	500	98–102					125	500	60	98–102	90
12	2,800	6,000	800	98–102					150	750	100	98–102	90
14	3,750	8,000	1,000	98–102					250	1,000	130	98–102	90
16	4,750	10,000	1,300	98–102					350	1,500	200	98–102	90
18	5,625	12,000	1,600	98–102					450	2,000	250	98–102	90
20	6,875	15,000	2,000	98–102					550	2,500	300	98–102	90
24	10,000	20,000	2,500	98–102					800	4,000	500	98–102	90
30	15,000	30,000	4,000	98–102					1,200	6,000	800	98–102	90
36	20,000	40,000	5,000	98–102					1,500	7,500	1,000	98–102	90

(continued)

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Table 5-3 Test requirements for new, rebuilt, and repaired cold-water meters* (continued)

Propeller Meters (AWWA C704)

42	28,000	40,000	5,000	98–102	2,000	10,000	1,300	98–102	90
48	35,000	50,000	6,000	98–102	2,500	12,500	1,500	98–102	90
54	45,000	60,000	8,000	98–102	3,200	16,000	2,000	98–102	90
60	60,000	70,000	9,000	98–102	4,000	20,000	2,500	98–102	90
66	75,000	80,000	11,000	98–102	4,750	25,000	3,000	98–102	90
72	90,000	90,000	12,000	98–102	5,500	28,000	3,500	98–102	90

Compound Meters (AWWA C702)§

	Maximum Rate (All Meters)					Change Over Point (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits		Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*		*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
				Class I	Class II									
2	160	400	50	97–103	98.5–101.5				90–103				95–101	90
3	320	1,000	100	97–103	98.5–101.5				90–103				95–101	90
4	500	1,500	200	97–103	98.5–101.5				90–103				95–101	90
6	1,000	3,000	400	97–103	98.5–101.5				90–103				95–101	90
8	1,600	4,000	500	97–103	98.5–101.5				90–103				95–101	90
10	2,300	4,000	500	97–103	98.5–101.5				90–103				95–101	90

Fire–Service Type, Type I and Type II (AWWA C703)
(Test at intermediate rate not necessary.)§

	Maximum Rate (All Meters)					Change Over Point (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits		Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*		*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
				Type I	Type II									
3	350	700	100	97–103	98.5–101.5									90
4	700	1,500	200	97–103	98.5–101.5				Not less				Not less	90
6	1,600	3,000	400	97–103	98.5–101.5				than 85%				than 95%	90
8	2,800	5,000	700	97–103	98.5–101.5									90
10	4,400	9,000	1,200	97–103	98.5–101.5									90

Fire Service Type, Type III (AWWA C703)

	Maximum Rate (All Meters)				Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				Minimum (Repaired)
Size	Flow Rate†	Test Quantity††		Accuracy Limits	Flow Rate**	Test Quantity††		Accuracy Limits	Flow Rate	Test Quantity††		Accuracy Limits	Accuracy Limits
in.	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*gpm*	*gal*	*ft³*	*percent*	*percent (min)*
3	350	700	100	98.5–101.5	10	100	10	98.5–101.5	4	100	10	95–101.5	—
4	700	1,500	200	98.5–101.5	30	500	50	98.5–101.5	10	100	10	95–101.5	—
6	1,600	3,000	400	98.5–101.5	60	1000	100	98.5–101.5	20	1000	100	95–101.5	—
8	2,800	5,000	700	98.5–101.5	70	1000	100	98.5–101.5	30	1000	100	95–101.5	—
10	4,400	9,000	1,200	98.5–101.5	110	1000	100	98.5–101.5	35	1000	100	95–101.5	—

* A rebuilt meter is one that has had the measuring element replaced with a factory–made new unit. A repaired meter is one that has had the old measuring element cleaned and refurbished in a utility repair shop.

† These are suggested test flows and test quantities. Testing for high rates of flow can be achieved by testing the meter at 25% of the meters rating if the manufacturer's original test certificate indicates a linear curve between 25% and 100% of the rated flow range.

†† Quantity should be one or more full revolutions of the test hand but not less than 3 min running. When limited test capabilities force the use of smaller test quantities, the resultant increase in total test uncertainties and errors need to be recognized when establishing acceptance criteria tolerance.

§ The bypass meter should be tested in accordance with the appropriate test requirements for the type of meter used.

** As this rate varies according to manufacturer, it should be determined for each type of meter tested.

Metric Conversions: in. × 25.4 = mm, gal × 0.003785 = m^3, gpm × 0.2268 = m^3/h, ft^3 × 0.02831 = m^3.

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Tests for full-flow accuracy do not need to be made at the "safe maximum capacity" rate shown in the applicable AWWA standard. Registration curves of water meters show that meters in good operating condition follow a general pattern of registration. The specific profile of the accuracy curve can be different for each type of meter. Usually, there will be an intermediate point of maximum registration above the low-flow-metering zone. Depending on the size and type of meter, this point may vary between 3 to 10 percent of the rated meter capacity. At rates above that of maximum registration, the accuracy curve is fairly flat so that there is little difference in accuracy over a wide range of flows. Selection of the maximum rate of flow at which meters are tested is, therefore, not of major importance. Maximum-rate test flows of 25 percent or more, if desired by the owner, of rated capacity are practical, because meters are seldom operated at rated capacity. This lower test rate is advantageous with multiple testing of small meters and is possible with pressures and testing equipment usually available.

The intermediate rate of flow should be at or near the high point of registration to ensure against over-registration of the meter on any rate of flow and, therefore, should be approximately 10 percent of rated capacity. The minimum-rate-flow test discloses operational ability and proficiency of meter repair more than either the maximum- or intermediate-flow tests. All three, however, are necessary to evaluate overall meter accuracy. Test rates of flows should be measured in actual units, such as gallons per minute. Rates based on size of orifice are not reliable because of possible enlargement of the orifice from wear or changes in pressure in the supply line.

Test Quantities

The quantity of water required to provide acceptable accuracy depends on the accuracy and resolution of the test equipment, as well as the desired accuracy of the test results. Commercial calibrated tanks with visually adjustable read height scales can provide overall equipment error of less than 0.25 percent if the scale reading error is small compared to the final height of the collected water. Measuring tanks based on weight, referred to as the gravimetric method, can provide even higher accuracy (e.g., 0.10 percent) using class II or class III precision scales and load cells. In both systems, the use of digital equipment can reduce instrument reading error to zero and improve overall system accuracy.

Test Requirements

When choosing the quantity of water to be collected for any test, refer to Table 5-3 of this manual or the applicable AWWA standard for the meter type being tested.

Where large quantities of water are used for testing large meters, it is more expedient to employ gravimetric means involving the use of computers and electronics with load cells. These procedures make possible testing "on the fly," thereby eliminating the effects of valve opening and closing, particularly at high flows, and allow adequate test accuracy even with compressed test quantities, as long as adequate reading resolution is possible for the meter under test.

Table 5-4 is intended for ascertaining the percentage of true quantity indicated by the meter, when the meter is run for a measured tank volume of 20, 30, 40, 50, or 60 gal.

It must be stressed that the test volumes associated with the various meter sizes, types, and flow rates indicated in Table 5-3 be followed to minimize measurement system error. Compressed volumetric testing at lesser volumes can result in significant errors and is not recommended.

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Meter Testing Data

Date: _____

Time: _____

Person(s) performing the test: _____

Meter used for calibration: _____

Final Reading: _____

Initial Reading: _____

Difference: _____

Rate of Test: Minimum Flow: _____ Intermediate Flow: _____ Maximum Flow: _____

Meters being tested:	1	2	3	4	5	6	7	8	9	10
Meter No.:										
Meter Type:										
Meter Size:										
Date Installed:										
Date Removed:										
Final Reading:										
Initial Reading:										
Difference:										

Comments: _____

ATTACHMENT Q

ALLOCATION OF MONTHLY WATER PRODUCTION BETWEEN IRRIGATION WATER AND MUNICIPAL & IINDUSTRIAL WATER

Q.1 **Calculation Methodology for Allocation of Monthly Water Production between Irrigation Water and Municipal & Industrial Water**

Q.2 **Example of Calculation Methodology using CY2013 and BVWD FY2013-14 Water Production & Consumption Excel Spreadsheet**

Q.3 **Graphs of CY2013 and BVWD FY2013-14 Water Production & Consumption using Calculation Methodology from Q.1.**

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ATTACHMENT Q.1

CALCULATION METHODOLOGY FOR ALLOCATION OF MONTHLY WATER PRODUCTION BETWEEN IRRIGATION WATER AND MUNICIPAL & INDUSTRIAL WATER

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1. For each month:
    a. Calculate the monthly M&I usage total (equals the total of the following user categories).
        i. Commercial
        ii. Residential
        iii. Rural
        iv. Public/Institutional
        v. Construction
        vi. Inter-Tie Water (Out to Customers)
        vii. BVWD Yard and WT 2" Meter
        viii. Other
    b. Calculate the monthly Irrigation usage total (equals the total of the following user categories).
        i. Agriculture
        ii. Aquaculture
        iii. Run to Waste
    c. Calculate the total monthly usage (equals the sum of the monthly totals of “a” & “b” above).

2. Calculate the 2-month running averages for:
    a. M&I usage (using the current and previous months totals from “1.a.” above),
    b. Irrigation usage (using the current and previous months totals from “1.b.” above), and
    c. Total usage (using the current and previous months’ totals from “1.c” above).

3. Use the 2 month running averages (from Step 2) to calculate the percentage of the water production to be attributed to M&I and Irrigation as follows:
    a. Unadjusted M&I Percentage = “2.a.” divided by “2.c.”
    b. Unadjusted Irrigation Percentage = “2.b.” divided by “2.c.”
    c. Calculate the Adjusted M&I and Irrigation Percentages (to account for the known meter under-registration and of the larger agricultural propeller and turbine meters compared to the primarily positive displacement meters used on the smaller M&I services) as follows:
        i. Adjusted M&I Percentage = “3.a.”minus 2.0%
        ii. Adjusted Irrigation Percentage = “3.b.” plus 2.0%
    d. Calculate the monthly production quantities as follows:
        i. Monthly M&I Production = Total Monthly Production times the Adjusted M&I Percentage (from “3.c.i.”)
        ii. Monthly Irrigation Production = Total Monthly Production times the Adjusted Irrigation Percentage (from “3.c.ii.”).

4. If the monthly groundwater production is less than the monthly M&I production quantity calculated in Step 3.d.i., assign all groundwater production to M&I. If the amount of the

groundwater production exceeds the monthly production quantity calculated in Step 3.d.i., assign the excess production to Irrigation.

5. After accounting for all groundwater production, assign surface water production to any remaining available transferred water sources being careful to only assign M&I water production quantities to water transferred for M&I purposes and to only assign Irrigation water production quantities to water transferred for Irrigation purposes. [Note: if any "4.f." water was made available to the District during the month, it should be used ahead of any transferred water and ahead of the District's contract water supplies.]

6. Any water production in excess of transferred water quantities shall then be assigned to the District's CVP Contract water supplies and categorized either as M&I or Irrigation as needed to bring the M&I and Irrigation totals up to the quantities calculated in Step 3.

Note: See attached spreadsheet for the 2013 calendar-year and 2013-14 fiscal year.

ATTACHMENT Q.2

EXAMPLE OF CALCULATION METHODOLOGY USING CY2013 AND BVWD FY2013-14 WATER PRODUCTION & CONSUMPTION EXCEL SPREADSHEET

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	Dec '12	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14
Water Produced															
Wintu Pumping Plant (pw) (Incls. McConnell Water)	299	99	302	428	767	1591	1959	2362	2243	1608	1144	606	389	470	282
Injection Water	-5	-3	-3	-5	-5	-4	-5	-7	-5	-4	-6	-6	-5	-5	-4
Wintu (Net)	294	96	299	423	762	1587	1954	2355	2238	1604	1138	600	384	465	278
Well No. 1	0	43	0	0	3.89	0	0	0	0	0	0	0	0	0	0
Well No. 2	0	48	0	0	2.64	0	0	0	0	0	0	0	0	0	0
Well No. 3	0	49	0	0	5.68	0	0	0	0	0	0	0	0	0	0
Well No. 4	0	24	0	0	1.15	0	0	0	0	0	0	0	0	0	0
Well No. 6	0	52	0	0	5.02	0	0	0	0	0	0	0	0	0	0
Inter-ties	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Acre Feet	**294**	**312**	**299**	**423**	**780**	**1,587**	**1,954**	**2,355**	**2,238**	**1,604**	**1,138**	**600**	**384**	**465**	**278**
Reported Use															
Project															
Agriculture	0	0	0	0	471	1104	1004	1302	955	547	146	0	0	61	0
M & I	294	96	299	423	291	483	950	541	771	545	992	600	384	404	278
Groundwater															
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M & I	0	216	0	0	18	0	0	0	0	0	0	0	0	0	0
Transfers															
McConnell - AG	0	0	0	0	0	0	0	0	0	0	0	0	0		
McConnell - M & I	0	0	0	0	0	0	0	0	0	0	0	0	0		
ACID M & I	0	0	0	0	0	0	0	512	512	512	0	0	0	0	0
ACID AG														0	0
Clear Creek - Irrigation															
McConnell-Wheeled Water															
Glen-Colusa Irrigation															
M & I (City of Redding)														0	0
Inter-ties (Incoming)															
AG	0	0	0	0	0	0	0	0	0	0	0	0	0		
M & I	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Irrigation	0	0	0	0	471	1104	1004	1302	955	547	146	0	0	61	0
Total M & I	294	312	299	423	309	483	950	1053	1283	1057	992	600	384	404	278
Total Wheeled	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Acre Feet	**294**	**312**	**299**	**423**	**780**	**1587**	**1954**	**2355**	**2238**	**1604**	**1138**	**600**	**384**	**465**	**278**
Bimonthly Consumption															
Wheeled Water (M & I)															
Commercial	47	10.07	21.32	8.4	35.25	15.79	77.59	27.96	105	28.61	93.12	29.18	43.81	13.76	33.38
Residential	127	123.58	64	128.82	103.64	279.51	302.98	537.01	416	595.72	332.52	368.05	157.38	196.78	98.21
Rural	124	50.14	79.23	61.8	112.8	118.34	411.07	282.91	583	322.88	450.25	180.88	208.55	90.17	124.3
Public/Institutional	41	25.81	19.31	24.84	38.31	67.18	154.7	198.8	179	220.16	113.56	121.65	40.85	39.78	27.53
Construction	0	0.3	0	0.24	0.74	2.64	3.29	3.92	2	2.01	2.89	1.41	0	-3.26	0.07
Inter-Tie Water (Out to Customers)	0	0	0	0	0	0	0	2.13	0	0	0	0.03	0.03	0	0
BVWD Yard and WT 2" Meter	0	0.7	0.12	0.11	0	0.15	0.52	0.4	0	0.4	0.05	0.03	0.05	0.08	0.01
Run to Waste	0	0.01	0	0.13	0.01	0.13	0.55	0.08	0.43	0	0.09	0	0.01	0.03	0
Agriculture	57	0.03	41.15	0.01	195.72	0	1145.02	0.11	1571	4.3	1037.39	0	233.16	0	133.76
Aquaculture	21	1	23.7	0	24.97	0	45.7	0	48.88	0	33.66	0	15.64	0	7.07
Other															
Total Acre Feet	**417.37**	**211.64**	**248.83**	**224.35**	**511.44**	**483.74**	**2,141.42**	**1,053.32**	**2,905.31**	**1,174.08**	**2,063.53**	**701.23**	**699.48**	**337.34**	**424.33**
M & I Totals	340.10	210.60	183.98	224.21	290.74	483.61	950.15	1053.13	1285.00	1169.78	992.39	701.23	450.67	337.31	283.50
Irrigation Totals	77.27	1.04	64.85	0.14	220.70	0.13	1191.27	0.19	1620.31	4.30	1071.14	0.00	248.81	0.03	140.83
TOTAL WATER BILLED	417.37	211.64	248.83	224.35	511.44	483.74	2141.42	1053.32	2905.31	1174.08	2063.53	701.23	699.48	337.34	424.33

		Dec '12	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14		
2-Month Rolling Average - M&I		340.10	275.35	197.29	204.10	257.48	387.18	716.88	1001.64	1169.07	1227.39	1081.09	846.81	575.95	393.99	310.41		
Percentage - M&I		81.5%	87.6%	85.7%	86.3%	70.0%	77.8%	54.6%	62.7%	59.1%	60.2%	66.8%	61.3%	82.2%	76.0%	81.5%		
2-Month Rolling Average - Irrig.		77.27	39.16	32.95	32.50	110.42	110.42	595.70	595.73	810.25	812.31	537.72	535.57	124.41	124.42	70.43		
Percentage - Irrig.		18.5%	12.4%	14.3%	13.7%	30.0%	22.2%	45.4%	37.3%	40.9%	39.8%	33.2%	38.7%	17.8%	24.0%	18.5%		
2-Month Running Avg. -Total		417.37	314.51	230.24	236.59	367.90	497.59	1312.58	1597.37	1979.32	2039.70	1618.81	1382.38	700.36	518.41	380.84		
Percentage - Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
																	CY 2013	
Production - M&I		240	273	256	365	546	1,235	1,067	1,477	1,322	965	760	368	316	353	227	8,949	65.4%
Production - Irrig.		54	39	43	58	234	352	887	878	916	639	378	232	68	112	51	4,725	34.6%
Production - Total		294	312	299	423	780	1,587	1,954	2,355	2,238	1,604	1,138	600	384	465	278	13,674	
																	WY 2013-14	
															Production - M&I		9,000	65.2%
															Production - Irrig.		4,806	34.8%
															Production - Total		13,806	
Split (Ag / M&I)																		
2-Month Rolling Average - M&I	---	340.10	275.35	197.29	204.10	257.48	387.18	716.88	1001.64	1169.07	1227.39	1081.09	846.81	575.95	393.99	310.41		
Percentage - M&I	---	81.5%	87.6%	85.7%	86.3%	70.0%	77.8%	54.6%	62.7%	59.1%	60.2%	66.8%	61.3%	82.2%	76.0%	81.5%		
2-Month Rolling Average - Irrig.	---	77.27	39.16	32.95	32.50	110.42	110.42	595.70	595.73	810.25	812.31	537.72	535.57	124.41	124.42	70.43		
Percentage - Irrig.	---	18.5%	12.4%	14.3%	13.7%	30.0%	22.2%	45.4%	37.3%	40.9%	39.8%	33.2%	38.7%	17.8%	24.0%	18.5%		
2-Month Running Avg. -Total	---	417.37	314.51	230.24	236.59	367.90	497.59	1312.58	1597.37	1979.32	2039.70	1618.81	1382.38	700.36	518.41	380.84		
Percentage - Total	---	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
																	CY 2013	
Production - M&I	---	240	273	256	365	546	1,235	1,067	1,477	1,322	965	760	368	316	353	227	8,949	65.4%
Production - Irrig.	---	54	39	43	58	234	352	887	878	916	639	378	232	68	112	51	4,725	34.6%
Production - Total	---	294	312	299	423	780	1,587	1,954	2,355	2,238	1,604	1,138	600	384	465	278	13,674	
																	WY 2013-14	
															Production - M&I		9,000	65.2%
															Production - Irrig.		4,806	34.8%
															Production - Total		13,806	

ATTACHMENT Q.3

GRAPHS OF CY2013 AND BVWD FY2013-14 WATER PRODUCTION & CONSUMPTION USING CALCULATION METHODOLOGY FROM Q.1

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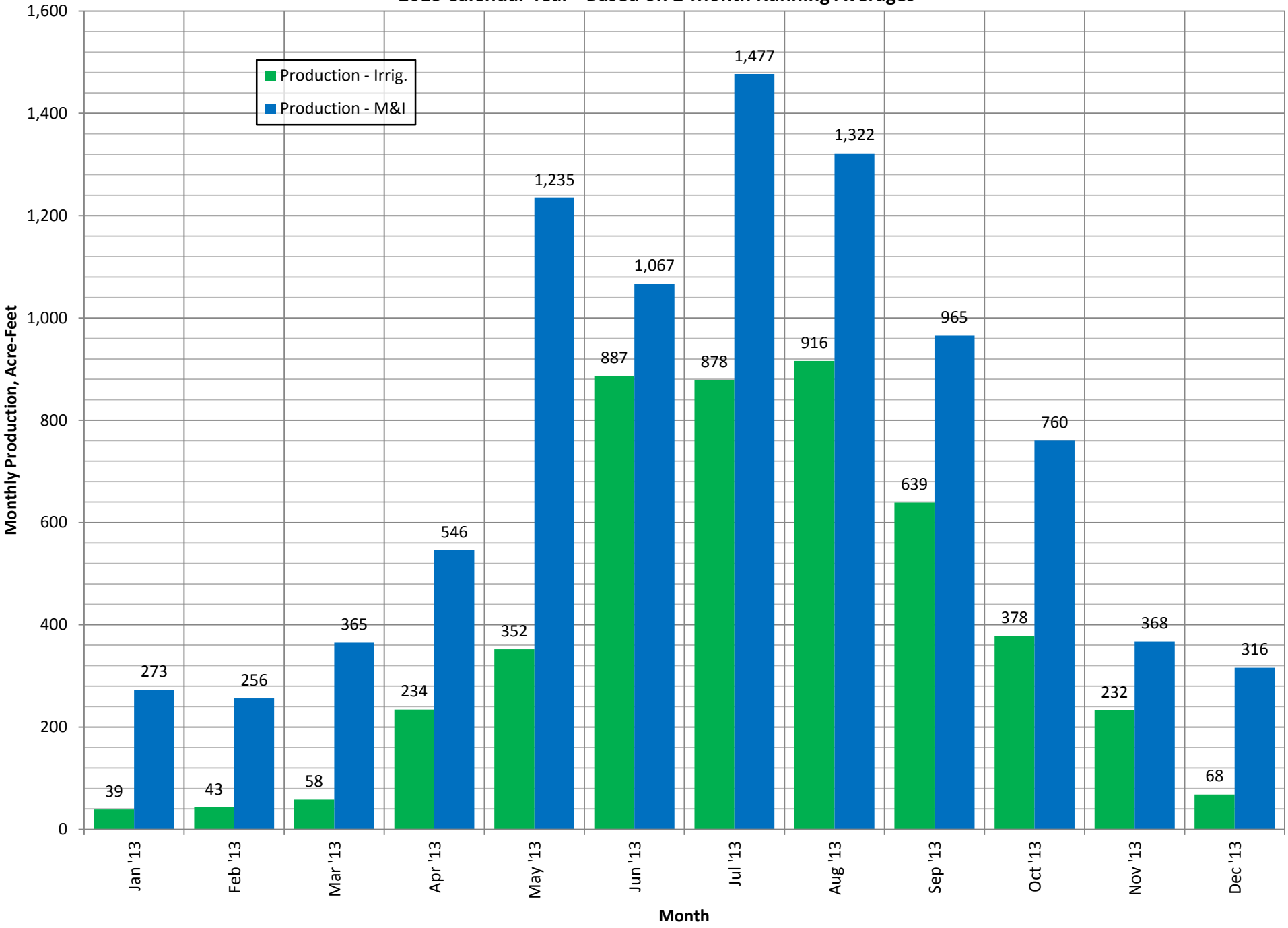
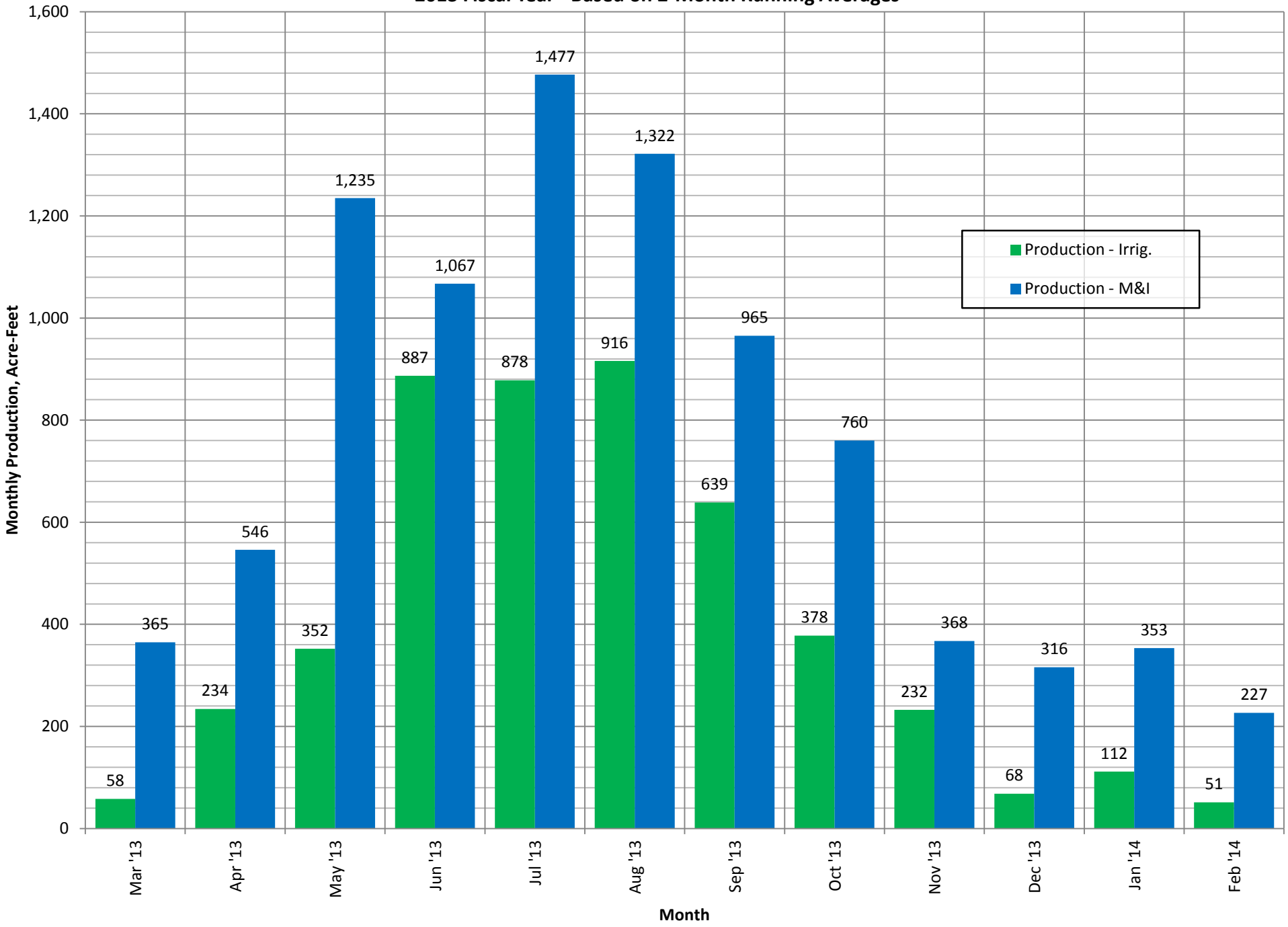
Assignment of Water Production (Acre-Feet)

2013 Calendar Year - Based on 2-Month Running Averages



Assignment of Water Production (Acre-Feet)

2013 Fiscal Year - Based on 2-Month Running Averages



BELLA VISTA WATER DISTRICT

RESOLUTION 15-07

A RESOLUTION OF THE BOARD OF DIRECTORS OF BELLA VISTA WATER DISTRICT APPROVING THE DISTRICT'S UPDATE WATER MANAGEMENT PLAN

WHEREAS, Reclamation Law and the Central Valley Project Improvement Act require the District to prepare and implement a Water Management Plan (WMP) to be updated every five years; and

WHEREAS, District staff with the support of consulting services prepared a draft 2012 WMP five year update incompliance with 2011 Plan Criteria developed by the United States Bureau of Reclamation (USBR); and

WHEREAS, USBR has reviewed and approved the District's draft 2012 WMP attached hereto as Exhibit A; and

WHEREAS, the Board of Directors has reviewed the 2012 WMP and finds that it accurately describes the District's water management objectives and practices.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Bella Vista Water District as follows:

Section 1. Declaration of the Board. The facts stated in the recitals above are true and correct, and the Board so finds, determines and orders.

Section 2. Water Management Plan. The Board of Directors adopts and approves the 2012 WMP as presented.

Section 3. Further Actions. Subject to approval by USBR, the General Manager is hereby authorized to amend the WMP as may be deemed necessary or advisable in order to give effect to and comply with the intent of the Resolution and the WMP.

Passed and Adopted this 22nd day of June 2015 by the following vote:

AYES: Bambino, Nash, and Smith

NOES:

ABSENT: Steppat and Waite

ABSTAIN;

Bella Vista Water District

Ted Bambino, President of the Board of Directors of Bella Vista Water District

Attest:

David J. Coxey, Secretary of the Board of Directors of Bella Vista Water District

BELLA VISTA WATER DISTRICT

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Directors of said District at a Regular Meeting of said Board of Directors by the following vote:

AYES: Bambino, Nash, and Smith

NOES: 0

ABSENT: Steppat and Waite

ABSTAINED: 0

David J. Coxey, Secretary of the
Board of Directors

STATE OF CALIFORNIA)
) ss
COUNTY OF SHASTA)

I, DAVID J. COXEY, Secretary of the Bella Vista Water District DO HEREBY CERTIFY that the foregoing is a full and correct copy of Resolution No. 15-07 of said Board of Directors, and that the same has not been amended or repealed.

David J. Coxey, Secretary of the
Board of Directors