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**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

1.0 Urban Water Management Plan Preparation	2
1.1 Introduction.....	2
1.2 The Urban Water Management Planning Act.....	2
1.3 Plan Coordination.....	3
1.3.1 Public Participation.....	3
1.3.2 Agency Coordination.....	3
1.4 Plan Adoption.....	5
2.0 Water System Description	6
2.1 Geography.....	6
2.2 Climate.....	7
2.3 Regional Water System.....	8
2.4 Demographic Factors.....	8
2.5 Population Projection.....	9
3.0 Water System Demands	10
3.1 Current Water Demands.....	10
3.2 Future Water Demand Projections.....	11
3.2.1 Demand Projection Methodology .....	11
3.2.2 Projected Water Demand by Sector.....	12
3.3 Baselines and Targets .....	15
3.4 Water Use Reduction Plan.....	18
4.0 Water System Supplies	20
4.1 Water Supply Sources.....	20
4.2 Groundwater.....	23
4.3 Recycled Water.....	27
4.3.1 Wastewater System Description .....	27
4.3.2 Recycled Water.....	30
4.3.3 Potential Uses of Recycled Water.....	31
4.3.4 Encouraging Use of Recycled Water.....	31
4.3.5 Recycled Water Optimization Plan.....	34
4.4 Future Water Projects .....	36
4.5 Other Water Supply Opportunities .....	36
4.5.1 Transfer or Exchange Opportunities.....	36
4.5.2 Desalination.....	37
4.6 Water Quality.....	37
5.0 Water Supply Reliability and Water Shortage Contingency Planning	38
5.1 Water Supply Reliability.....	38
5.2 Water Shortage Contingency Plan.....	43
5.2.1 Preparation for Catastrophic Water Supply Interruption.....	43
5.2.2 Supplemental Water Supplies .....	44
5.2.3 Water Shortage Contingency Ordinance/Resolution .....	44
5.2.4 Stages of Action.....	45
5.2.5 Prohibitions, Consumption Reduction Methods and Penalties.....	47
5.2.6 Revenue and Expenditure Impacts and Measures to Overcome Impacts.....	49
5.2.7 Reduction Measuring Mechanism.....	50
5.3 Drought Planning.....	51
6.0 Demand Management Measures	52
6.1 DMM 1 -Water Survey Program .....	53
6.2 DMM 2 -Plumbing Retrofit.....	54





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

6.3 DMM 3 – System Water Audits, Leak Detection and Repair.....	55
6.4 DMM 4 – Metering with Commodity Rates.....	56
6.5 DMM 5 – Large Landscape Water Audits and Incentives.....	57
6.6 DMM 6 – Washing Machine Rebate.....	58
6.7 DMM 7 – Public Information.....	59
6.8 DMM 8 – School Education .....	61
6.9 DMM 9 – Commercial, Industrial, and Institutional Water Conservation.....	61
6.10 DMM 11 - Conservation Pricing .....	62
6.11 DMM 12 – Conservation Coordinator.....	63
6.12 DMM 13 – Water Waste Prohibition.....	63
6.13 DMM 14 – Residential Ultra-Low Flush Toilet Replacement .....	64
7.0 Completed UWMP Checklist .....	65
8.0 References.....	72
Appendix A: 60-day Notice Letters / Public Notice.....	1
Appendix B: 2010 UWMP Adoption Resolution.....	2
Appendix C: Emergency Action Plans.....	3
Appendix D: Muni-Code Chapter 13.09:Mandatory Water Conservation Regulations	4
Appendix E: Resolution to Declare a Water Shortage Emergency.....	5
Appendix G: Potable Water Rate Summary.....	7
Appendix H: Waste Water Rate Summary.....	8
Appendix I: Public Comments .....	9
Figure 1: Vicinity Map of City.....	7
Figure 2: Wastewater Treatment Facilities Location Map.....	29
Figure 3: Groundwater Trends.....	39
Table 1: Coordination With Appropriate Agencies.....	5
Table 2: Climate.....	7
Table 3: Population Projections.....	9
Table 4: Water Deliveries in 2005.....	10
Table 5: Water Deliveries in 2010.....	11
Table 6: Projected Water Deliveries in 2015.....	13
Table 7: Projected Water Deliveries in 2020.....	13
Table 8: Projected Water Deliveries in 2025 and 2030.....	14
Table 9: Summary of Actual and Projected Water Deliveries.....	14
Table 10: Low-Income Projected Water Demands.....	15
Table 11: Base Period Ranges .....	16
Table 12: 10-Year Range Base Daily Per Capita Water Use.....	17
Table 13: 5-Year Range Base Daily Per Capita Water Use .....	17
Table 14: 10- and 5-Year Baseline Demands.....	18
Table 15: Projected Per Capita Water Demands.....	19
Table 16: Current and Projected Water Supply.....	23
Table 17: Past Groundwater Pumped.....	25
Table 18: Projected Groundwater Pumped.....	25
Table 19:Recycled Water – Wastewater Collection and Treatment.....	28
Table 20:Secondary Treatment Standards.....	31
Table 21:Recycled Water – Non-Recycled Wastewater Disposal.....	33
Table 22:Projected Recycled Water Use.....	34
Table 23:Methods to Encourage Recycled Water Use.....	35
Table 24:Water Quality Data.....	37





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

Table 25:Factors That Could Affect/Impact Consistency of Supply.....	39
Table 26:Basis of Water Year Data.....	40
Table 27:Aquifer Supply Reliability – Historic Conditions .....	40
Table 28:Aquifer Supply Reliability – Current Water Sources .....	40
Table 29:Supply and Demand Comparison – Normal Year .....	41
Table 30:Supply and Demand Comparison – Single Dry Year .....	41
Table 31:Supply and Demand Comparison – Multiple Dry-Year Events .....	42
Table 32:Water Quality – Current and Projected Water Supply Impacts .....	42
Table 33:Preparation Actions for Catastrophe.....	43
Table 34:Rationing Stages.....	45
Table 35:Residential Health and Safety Water Quantity Calculation.....	46
Table 36:Water Shortage Contingency – Consumption Reduction Methods.....	47
Table 37:Mandatory Prohibitions by Stage.....	48
Table 38:Water Shortage Contingency – Penalties and Charges.....	49
Table 39:Revenue Impacts From Water Restrictions.....	50
Table 40:Demand Management Measures and Implementation Schedule.....	52
Table 41:Typical Water Savings.....	53
Table 42:Projected Water Survey Program Savings.....	54
Table 43:Projected Plumbing Retrofit Savings.....	55
Table 44:Projected Water Audits, Leak Detection and Repair Savings.....	56
Table 45:Water Rate Structure Breakdown by Meter Sizes.....	56
Table 46:Projected Metering with Commodity Rate Water Savings.....	57
Table 47:Projected Large Landscape Conservation Program & Incentive Water Savings.....	58
Table 47:Typical Municipal Water Use in USA.....	59
Table 48:Projected High-Efficiency Washing Machine Rebate Programs Water Savings.....	59
Table 49:Projected Public Information Program Expenditures.....	60
Table 50:Projected School Education Program Expenditures.....	61
Table 51:Projected Commercial, Industrial, and Institutional Water Conservation Program Savings.....	62
Table 52:Typical Water Rates.....	62
Table 53:Projected Water Conservation Coordinator Expenditures.....	63
Table 54:Projected Waste Water Prohibition Expenditures.....	64
Table 55:Projected Ultra-Low-Flush Toilet Replacement Program Expenditures...	64
Table 56:Urban Water Management Plan Checklist.....	65





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

# City of Greenfield 2010 Urban Water Management Plan Contact Sheet

Date plan submitted to the Department of Water Resources:

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The Water supplier is a: **Municipality**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **1.0 Urban Water Management Plan Preparation**

### **1.1 Introduction**

This Plan provides information and analyses specific to the City of Greenfield (City), and describes the regional context in which it operates. The City's current and projected water demands are considered over the next 20 years to ensure there will be sufficient water supply to meet these demands. Water shortage contingencies are discussed, as well as reliability of the water supply against various situations. The ability to meet conservation goals by 2020 is detailed. The Plan also reviews proposed projects and programs that will aim to protect the water supply and increase conservation efforts of the City.

Analysis of the City's current needs against future forecasting scenarios will allow the City to gauge sufficiency of the water supply available to them and plan for alternatives should a shortage occur.

The City plans on development and implementation of integrated master planning for water, wastewater and storm water. This plan would include deployment of water management tools. The effort would include a feasibility study for utilizing the neighboring City's water reclamation facility versus upgrading the City's existing wastewater treatment facility. In either case, options would become available for use of recycled water to offset potable demand currently used for irrigation limiting the amount of water pulled from the underlying aquifer. This holistic approach to water resource planning will allow the City to better prioritize its water resource related capital improvement projects with a focus on how to maximize water conservation efforts and ensure future sustainability of the City's potable water supply. The City has already implemented new water rates that will show progress toward meeting the conservation goals by 2020. Utilizing population projections, water use rate structures, and water budgets for large landscaped areas, the City will have a good grasp on where their supply and demand numbers need to be. Having management tools will ensure these numbers are measured and checked, and that conservation measures for various scenarios are ready for employment.

This Plan meets all requirements of the Water Code as described in the Department of Water Resources (DWR) "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan".





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

This section describes the requirements, purpose and contents of the Urban Water Management Planning Act (Act). This section also outlines the development and review process for this document, both internally and interactively with affiliated regional agencies and the public.

## **1.2 The Urban Water Management Planning Act**

This Urban Water Management Plan (UWMP) has been prepared in response to the Urban Water Management Planning Act (Act), Water Code Division 6, Part 2.6, Sections 10610 through 10656. This Act, which became effective in 1984 and has since had several amendments, requires that, "Every urban water supplier shall prepare and adopt an Urban Water Management Plan." An urban water supplier is defined by the Act as a, "Supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually."

The City of Greenfield's (City) water system currently provides water to more than 3,000 customers. This 2010 Urban Water Management Plan replaces the City's 2008 Plan due to the scope of regulatory changes needed to meet the 2010 plan requirements. Updated Plans will continue to be submitted each year ending in a 5 or 0, or every five years. It should be noted that no regional or basin-wide plan has been developed to date. The Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan (IRWMP) was adopted by Monterey County Water Resources Agency in 2006. That plan assumes that mid-county will continue to supply water needs with groundwater, so this Plan is consistent with the IRWMP.

## **1.3 Plan Coordination**

### **1.3.1 Public Participation**

#### **Law**

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

The City of Greenfield has actively encouraged community participation in its urban water management planning efforts. Notice of a public hearing was posted on the public bulletin board at City Hall on INSERT DATE HERE, and in local newspapers including the NEWSPAPER NAME (INSERT DATES HERE). The draft Plan was posted to the City's website and made available at Public Works for advance review and consideration on INSERT DATE HERE. A public hearing was held on INSERT DATE HERE to solicit comments and feedback from the community. No public comments on the Draft Report were received at the public hearing. City Council members asked questions regarding the UWMP. These questions were answered by the Public Works Director, and no changes to the document except the addition of this description were made as a result of the public hearing.

Revisions were made to the Plan as necessary and appropriate as a result of the public hearing, at which time the final Plan was reposted to the City's website.

A second public hearing was held INSERT DATE HERE, prior to adoption of the Plan. After adoption, the Final adopted Plan was reposted to the City's website.

### **1.3.2 Agency Coordination**

#### **Law**

10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

#### ***Coordination within the City***

The City's Public Works Department has worked closely with the City's Finance and Planning Departments and City Manager in the preparation of this Urban Water Management Plan. Additional coordination with outside City representatives (consultants) who have prepared and/or are preparing affiliated plans and studies has also been instrumental in preparing the Plan. The City Council has heard and reviewed the necessary Plan components to ensure the Plan is consistent with the City's ultimate local and regional goals as represented by the current General Plan, applicable General Plan Amendments and the most recent Water, Wastewater and Storm Water planning documents.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

***Interagency Coordination***

Affiliated agencies that were contacted and utilized as resources for the preparation of this Plan included the Monterey County Water Resources Agency (MCWRA), the Central Coast Regional Water Quality Control Board (RWQCB), the California Department of Public Health District 05 (CDPH), United States Geological Surveys (USGS), the Monterey County Resource Agency (RMA) and the nearby city of Soledad.

Each of these agencies was provided with a notice that this UWMP was being reviewed and updated on February 21, 2013. The notice included a schedule of public review and anticipated adoption dates. A copy of these letters is provided in Appendix A. Additional agencies or public entities that contributed to the UWMP update include AMBAG, the California Department of Water Resources (DWR) and the California Department of Finance (DOF).

**Table 1 Coordination With Appropriate Agencies**

<b>Table 1</b>							
<b>Coordination with appropriate agencies</b>							
<b>Coordinating Agencies</b>	<b>Participated in developing the plan</b>	<b>Commented on the draft</b>	<b>Attended public meetings</b>	<b>Was contacted for assistance</b>	<b>Was sent a copy of the draft plan</b>	<b>Was sent a notice of intention to adopt</b>	<b>Not involved / No information</b>
<b>Water mgmt agencies</b>							
-Monterey County Water Resources Agency						X	
-Regional Water Quality Control Board						X	
-Ca. Dept. of Public Health						X	
<b>Relevant public agencies</b>						X	
- City of Soledad						X	
- County of Monterey RMA						X	
- DOF				X			
-AMBAG				X			
-DWR				X	X		
-USGS						X	
<b>General public</b>						X	





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **1.4 Plan Adoption**

This Plan has been prepared by the City with the assistance of Price Consulting Firm. A list of City contacts is included at the front of this document.

The Urban Water Management Plan was adopted by City Council on \_\_\_\_\_ and submitted to the California Department of Water Resources by \_\_\_\_\_. The adopted Resolution may be found in Appendix B of this Plan.

## **2.0 Water System Description**

### **Law**

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

## **2.1 Geography**

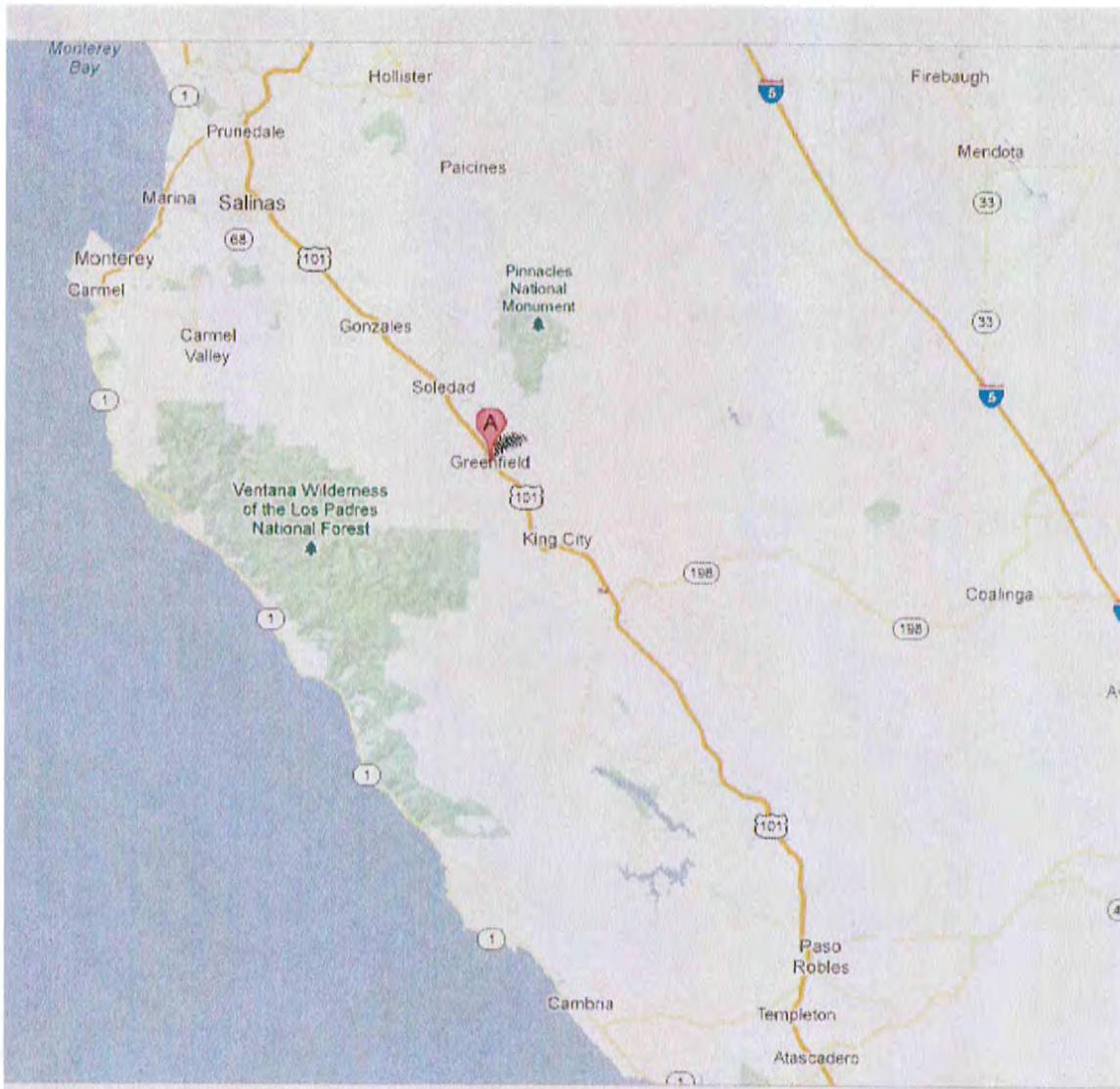
The City of Greenfield is (formerly, Clarke Colony) is a city in Monterey County, California, United States. Greenfield is located 33 miles (53 km) southeast of Salinas, at an elevation of 289 feet (88 m) in the highly agricultural Salinas Valley. The city of Greenfield is located between the Gabilan mountain range to the east and the Santa Lucia mountain range to the west. According to the United States Census Bureau, the city has a total area of 2.1 square miles (5.4 km<sup>2</sup>), all of it land.

It has no common boundaries with other municipalities, and is surrounded completely by unincorporated areas of Monterey County. The City's nearest neighbor is Soledad, approximately eight miles to the north. The main conduit of surface water within the region is the Salinas River, flowing to the northwest and discharging into Monterey Bay. The unconfined flow of water within the underlying groundwater basin exhibits the same general flow characteristics as the Salinas River, with flow primarily in the northwesterly direction.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013



**Figure A.1: Vicinity Map of City**

## **2.2 Climate**

Greenfield has a Mediterranean climate, exhibiting dry, warm summers and cool, wet winters. Nearly all of its 12.3 inches of annual rainfall occur between October and April, with virtually no rainfall in the summer months. Average monthly values for rainfall, evapo-transpiration (ET<sub>o</sub>), and temperature are shown in the tables below.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 2 Climate**

<b>Table 2 Climate</b>						
	<b>Jan.</b>	<b>Feb.</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
<b>Average ETo (in)</b>	1.83	2.20	3.42	4.84	5.61	6.26
<b>Average Rainfall (in)</b>	2.35	2.65	2.49	0.74	0.24	0.07
<b>Average Temperature (°F)</b>	63	66	69	75	78	83

	<b>July</b>	<b>August</b>	<b>Sept.</b>	<b>Oct.</b>	<b>Nov.</b>	<b>Dec.</b>	<b>Annual</b>
<b>Average ETo (in)</b>	6.47	6.22	4.84	3.66	2.36	1.83	<b>49.54</b>
<b>Average Rainfall (in)</b>	0.01	0.05	0.25	0.55	1.23	1.67	<b>12.3</b>
<b>Average Temperature (°F)</b>	85	85	85	80	69	63	

*Source: CIMIS Eto Data for Greenfield, weather.com for City of Greenfield Rainfall and Temperature Data*

### **2.3 Regional Water System**

The water supply for the Central Salinas Valley is derived almost exclusively from groundwater, and the City’s potable water supply is entirely groundwater. The City of Greenfield’s water source has historically been from groundwater resources, specifically the Salinas Valley Groundwater Basin. The City does not use surface water as a supply source. The City pumps groundwater from its three existing wells. One of the wells has been converted into a irrigation well for Patriot Park, while the other two wells are used for domestic production. The City overlays the Salinas Valley Groundwater Basin, specifically, the forebay sub-area.

Infiltration in the Salinas River channel is the principal source of groundwater recharge for the Salinas Valley groundwater basin. The recharge area is generally believed to end at a point between Chualar and the City of Salinas. Both natural runoff and conservation releases from Nacimiento and San Antonio Reservoirs contribute to the flow in the Salinas River. Infiltration from other smaller tributaries that drain the highland areas also provides recharge to the groundwater basin. The down-valley movement of this subsurface water is essential to the containment of saltwater intrusion into the Pressure sub-area. Higher elevations tend to have little potential for groundwater recharge due to either shallow or non-existent soils and steep slopes. These same characteristics pose problems for septic suitability and limit water availability.

Groundwater consumption in the Salinas Valley has increased over time as the amount of croplands under irrigation has continued to increase annually. Continued residential,





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

commercial and industrial development has also increased groundwater consumption. Agriculture continues to dominate, representing at least 90% of the area's water consumption. In some parts of the basin (although not the sub-area that the City is located in), agricultural and urban consumers are now using more water than is recharged annually, resulting in a groundwater overdraft.

## **2.4 Demographic Factors**

Since 2008 population growth has slowed considerably, dropping annually between 2009 and 2012 to an average of less than 1%. Residential population is expected to increase to less than the County average of 1.3% in the next 5 years, and is projected to potentially reach 36,000 at build out in the second half of this century.

The 2010 United States Census reported that Greenfield had a population of 16,330. The population density was 7,647.9 people per square mile (2,952.9/km<sup>2</sup>). The average household size was 4.71. There were 3,100 families (89.6% of all households); the average family size was 4.72.

There were 3,752 housing units at an average density of 1,757.2 per square mile (678.5/km<sup>2</sup>), of which 1,829 (52.9%) were owner-occupied, and 1,631 (47.1%) were occupied by renters. The homeowner vacancy rate was 3.4%; the rental vacancy rate was 5.9%. 7,874 people (48.2% of the population) lived in owner-occupied housing units and 8,427 people (51.6%) lived in rental housing units.

Greenfield is the second most populous city in the Salinas Valley and is the fifth most populous city in Monterey County. In 2006, Greenfield was the fourth fastest growing city in California growing 15.6%, from 13,270 in 2005, to 15,335 in 2006. As of the 2007 California Department of Finance estimate, there were 16,629 people, 2,643 households, and 2,360 families residing in the city. The population density was 9,781.76 people per square mile (3,779.32/km<sup>2</sup>). There were 2,726 housing units at an average density of 1,606.5 per square mile (619.1/km<sup>2</sup>).

## **2.5 Population Projection**

Residential, commercial, and industrial growth in the City has been affected by the recent economic downturn. Population growth during this period has been below that rate identified in the City's General Plan and the Department of Finance population growth projections which had the City growing to over 18,000 by 2014. The growth projections are now at 18,000 in 2030. As such, much of the development originally predicted to occur between 2005 and 2010 has not yet occurred.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

Current and projected population is shown in the table below. 2010 data is from the US Census. Projections are from the Department of Finance annual growth rates for Monterey County.

**Table 3 Population Projections**

Table 3						
Population — current and projected						
	2010	2015	2020	2025	2030	Data source
<b>Service area population</b>	16330	16722	17123	17568	18025	DOF

### 3.0 Water System Demands

#### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multi-family; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

**20x2020**

This section describes the City’s water system demands, including its calculated baseline (base daily per capita) water use and interim and urban water use targets.

#### 3.1 Current Water Demands

The City of Greenfield serves over 3,500 water meters. The overwhelming majority of the City’s water connections are for single family residential (SFR) accounts. SFR accounts make up 83% of the service connections; multi-family customers (apartments,





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

duplexes and trailer parks) make up approximately 11%; commercial (businesses, schools, churches and business parks) make up 4%; landscape (parks and medians) make up 1%; and 1% are “other” (fire protection, government, and hydrants).

Water deliveries by use sector for 2005 and 2010 are shown in 4 and Table 5, respectively.

**Table 4 Water Deliveries in 2005**

<b>Table 4</b>					
<b>Water deliveries — actual, 2005</b>					
	<b>2005</b>				
	<b>Metered</b>		<b>Not metered</b>		<b>Total</b>
<b>Water use sectors</b>	# of accounts	Volume	# of accounts	Volume	Volume
<b>Single family</b>	2267				unavailable
<b>Multi-family</b>	291				unavailable
<b>Commercial/ Institutional</b>	123		15		unavailable
<b>Industrial</b>	0				unavailable
<b>Landscape</b>	35				113.02
<b>Agriculture</b>	0				unavailable
<b>Other</b>	32				unavailable
<b>Total</b>	2748				1751.69

*Units : acre-feet per year    Source Greenfield Water System Statistics*





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5 Water Deliveries in 2010**

<b>Table 5</b>					
<b>Water deliveries — actual, 2010</b>					
Water use sectors	<b>2010</b>				
	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
<b>Single family</b>	3059	1349.58	0	0	1349.58
<b>Multi-family</b>	252	247.42	0	0	247.42
<b>Commercial/ Institutional</b>	101	193.66	0	0	193.66
<b>Industrial</b>	12	14.47	0	0	14.47
<b>Landscape</b>	50	59.12	0	0	59.12
<b>Other</b>	7	32.36	0	0	32.26
<b>Total</b>	3531	1896.61	0	0	1896.61
<b>Units : acre-feet per year Source: Greenfield Water System Statistics</b>					

### **3.2 Future Water Demand Projections**

The 20-year projection in this plan is 2093 ac-ft/yr, as discussed in the following sections. The reduction is due to the rapid decrease in the pace of development. As shown in the population projections in Table 3, the population projected for 2030 is 18,025; compared to the projection of 36,000 (complete City build out).

#### **3.2.1 Demand Projection Methodology**

In the most recent DOF population projections (Table 3), the City will experience an annual increase in population of about 2.5% every five years. At this rate, the City will reach its maximum build out population of 36,000 well beyond 2030. It was therefore assumed that the City will not reach its build out development potential in 2030. A linear interpolation of these values between 2010 and 2030 is assumed. The reasonableness of this linear interpolation was verified with current population and water statistics data in 2005 through 2010 wherever possible.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

### **3.2.2 Projected Water Demand by Sector**

#### ***Residential Sector***

The City water delivery statistics report residential water delivery in two categories: Single Family and multi-family. The average demand per unit was calculated (using 2010 data) for each of these use categories for future projections.

#### ***Industrial Sector***

The square footage of industrial area was projected based on a linear interpolation between existing 2010 values and 18,000 population achieved by 2030 rather than the build out of 36,000. The 2010 water use statistics were applied to future projections based on the Department of Finance growth projections for Monterey County.

#### ***Landscape / Recreational Sector***

The existing usage per area of landscape is calculated using the City's water use statistics from 2006-2010, and applied to future projections.

#### ***Commercial and Institutional / Government Sectors***

In the City water delivery records, commercial and institutional uses are combined. Water use was assumed to be linear for Commercial and institutional/government, and a use per acre calculated based on the 2010 water delivery statistics. The future demand projections applied these use per area values to future development.

#### ***Unmetered Accounts***

The City's records indicated there are no unmetered accounts as of 2010, thus the future projections from 2015 on do not include unmetered accounts.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 6 Projected Water Deliveries in 2015 and 2020**

<b>Table 6</b>				
<b>Water deliveries — projected, 2025 and 2030</b>				
	<b>2015</b>		<b>2020</b>	
	<b>Metered</b>		<b>Metered</b>	
<b>Water use sectors</b>	# of accounts	Volume	# of accounts	Volume
<b>Single family</b>	3132	1381.97	3208	1415.14
<b>Multi-family</b>	258	253.36	264	259.44
<b>Commercial/ Institutional</b>	103	198.31	106	203.07
<b>Industrial</b>	12	14.82	13	15.17
<b>Landscape</b>	51	60.54	52	61.99
<b>Other</b>	7	33.03	7	33.83
<b>Total</b>	<b>3565</b>	<b>1942.03</b>	<b>3650</b>	<b>1988.63</b>

*Units : acre-feet per year*

**Table 7 Projected Water Deliveries in 2025 and 2030**

<b>Table 7</b>				
<b>Water deliveries — projected, 2025 and 2030</b>				
	<b>2025</b>		<b>2030</b>	
	<b>Metered</b>		<b>Metered</b>	
<b>Water use sectors</b>	# of accounts	Volume	# of accounts	Volume
<b>Single family</b>	3291	1451.93	3377	1489.68
<b>Multi-family</b>	271	266.18	278	273.1
<b>Commercial/ Institutional</b>	109	208.35	111	213.76
<b>Industrial</b>	13	15.57	13	15.97
<b>Landscape</b>	54	63.60	55	65.26
<b>Other</b>	8	34.71	8	35.61
<b>Total</b>	<b>3745</b>	<b>2040.34</b>	<b>3842</b>	<b>2093.39</b>

*Units : acre-feet per year*





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 8 Summary of Actual and Projected Water Deliveries**

<b>Table 8</b>						
<b>Total water use</b>						
<b>Water Use</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Total water deliveries</b>	1751.69	1896.61	1942.03	1988.63	2040.34	2093.39
<b>Sales to other water agencies</b>						
<b>Additional water uses and losses</b>	225.99	41.19	42.18	43.19	44.32	45.47
<b>Total</b>	1977.68	1937.8	1984.21	2031.82	2084.66	2138.86

*Units: acre-feet per year*

### **3.3 Baselines and Targets**

The calculation and selection of water conservation targets for the 2010 Urban Water Management Plan is required by the Water Conservation Act of 2009<sup>1</sup>. Commonly called the 20x2020 (‘Twenty by Twenty-Twenty’) plan, this legislation established a statewide goal of reducing urban water per capita water demands by 20 percent by the year 2020.

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of four methods. Three of these are defined in Section 10608.20(a)(1) of the Water Code, and the fourth was developed by the California Department of Water Resources (DWR). The 2020 water use target must be calculated using one of the following four methods:

- Method 1: Eighty percent of the water supplier’s *baseline per capita water use*.
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses.
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State’s April 30, 2009, draft 20x2020 Water Conservation Plan.
- Method 4: The provisional target method developed by DWR uses conservation Best Management Practices (BMP) to determine the potential water demand reductions in each water use sector. A Calculator spreadsheet was developed for this method, which requires detailed information on current water uses.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

A maximum conservation target, regardless of method used, is also defined as discussed below.

Gross water use is calculated as the total water entering the system minus wholesale water deliveries leaving the system. The City does not purchase or provide wholesale water, so the gross water use is simply the total well pumping for the period. Water suppliers may deduct from this total (1) recycled water use, (2) industrial process water use, and (3) agricultural irrigation use. The City does not currently directly re-use recycled water, nor provide agricultural irrigation water. Industrial process water is not separately metered from general industrial water uses, and so none of these deductions were made for the City's gross water use calculations.

*Baseline per capita water use* is calculated as the gross water use for a year divided by the average population during that year. Years may be defined by the water supplier as calendar year, fiscal year, or another 12-month reporting period. The water supplier will submit future compliance reports using the same reporting year. The City currently uses the calendar year for all water use reporting, and that method is utilized herein. Annual population for the City's service area is based on California Department of Finance estimates. A ten-year average water consumption rate must be calculated for a period ending not earlier than December 31, 2004 and not later than December 31, 2010. Ten years of water consumption data were not available, thus an average was developed according to the guidelines for the appropriate five year period. **Error! Reference source not found.** Table 9 shows the chosen time spans and the corresponding population, water use and resulting average demand rates for these periods. If the baseline demand is less than 100 gallons per capita per day (gpcd), no additional conservation reduction is required.

Conservation targets are established by choosing a representative baseline from the seven possible periods (ending in 2004-2010), and using one of the four methods. The City has adopted the average value of the 5-year period of 120 gpcd as the City baseline, from the period ending December 31, 2010.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 9 5-Year Range Base Daily Per Capita Water Use**

<b>Table 9</b>				
<b>Base daily per capita water use — 5-year range</b>				
<b>Base period year</b>		<b>Distribution System Population</b>	<b>Daily system gross water use (mgd)</b>	<b>Annual daily per capita water use (gpcd)</b>
<b>Sequence Year</b>	<b>Calendar Year</b>			
Year 1	2006	14309	1937048	135
Year 2	2007	15311	2040473	133
Year 3	2008	15850	1885412	119
Year 4	2009	15975	1754366	110
Year 5	2010	16330	1693187	104
<b>Base Daily Per Capita Water Use<sup>1</sup></b>				<b>120</b>

After calculating targets using one of the four methods, the targets are compared to the minimum water conservation target required under Section 10608.22 of the Water Code.

Method 1: The 2020 water demand target is 80% of the baseline demand ( 120 gpcd). This method yields a target of **96 gpcd**.

Method 2: This method consists of establishing separate water demand targets for indoor water use, landscape water use and commercial, industrial and institutional (CII) water use. The indoor residential demand target is established in the legislation as 55 gpcd. Landscape water demand must meet the requirements of the Model Water Efficient Landscape Ordinance. CII water demand targets may be set at 10% below the baseline demand. In order to apply this method, detailed information is required for all irrigated landscapes (area, date installed, vegetation type, and metered or estimated water use). Because the City does not have this level of data available, this method was not used.

Method 3: The 2020 water demand target is 95% of the hydrologic region target. The City is in Region 3, Central Coast, which already has the lowest per capita water demand in the state. In the 20x2020 Water Conservation Plan, the baseline demand for the Region 3 was calculated as 154 gpcd, and the 2020 urban water use target is 123 gpcd. The Method 3 target is 95% of 123 gpcd, or **116.9 gpcd**.

Method 4: This method is based upon estimating conservation savings using the CUWCC BMPs. The advantage of this method is that the CUWCC annual reports for





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

2015 and 2020 will serve as the interim and final compliance reports to DWR. A water savings calculator (workbook) is used to estimate the potential savings from programs targets at indoor, outdoor and commercial, industrial and institutional (CII) use sectors. As with Method 2, additional data will be required to use this method. Specifically, landscape irrigation demands must be segregated from residential and CII demands. Because this level of information is not available, targets were not calculated using this method.

Maximum Conservation Target: This method consists of calculating a five-year average water consumption rate for a period ending not earlier than December 31, 2007 and not later than December 31, 2010. The 2020 conservation target must be less than or equal to 95% of the 5-year base daily per capita usage, which, as shown in table 9 above, is 120 gpcd for the recommended baseline period ending December 31, 2010.

Using Method 1, the City may select the 80% target, since this meets the minimum 5% reduction requirement of the Water Conservation Act. The result of this analysis is a baseline period ending December 31, 2010. Utilizing the Method 1 approach, the City has established a **2020 conservation target of 96 gpcd**, and a 2015 interim target of **114 gpcd**.

### **3.4 Water Use Reduction Plan**

To reduce per capita demands below the compliance targets, the City has three strategies, in addition to the on-going water conservation efforts. First, the City is in the process of determining feasibility of implementing an urban recycled water project for landscape irrigation. Once the recycled water line is installed, all projected landscaping demands are expected to be met through recycled water delivery for the purpose of irrigation. This alone would reduce the potable water demand per capita below the water conservation target for 2020. Additionally, the City would implement a conservation landscape watering schedule and adopt a financial incentive to reduce water use. The City will monitor annual water demand, and adjust incentive programs as needed to meet the conservation targets.

The use of recycled water to serve non-potable demands is a conservation measure recognized in the 20x2020 State Conservation Plan. As detailed in Section 4, the City plans to build a recycled water transmission line to carry recycled water from the treatment plant to the City once funding is attained.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **4.0 Water System Supplies**

### **Law**

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.]

### **4.1 Water Supply Sources**

The City currently utilizes groundwater from the Salinas Valley Groundwater Basin as its sole potable water supply source. Recycled water is a potential new water source available to the City. The City of Greenfield is located approximately 95 miles south of San Jose, in the center of California's Salinas Valley, and is governed by a five-member elected City Council. The City owns and operates a public water system that supplies potable water to its approximately 16,000 residents.

#### ***Water Sources***

The City of Greenfield's water source has historically been from groundwater resources, specifically the Salinas Valley Groundwater Basin. The City does not use surface water as a supply source. The City pumps groundwater from its three existing wells. One of the wells has been converted into an irrigation well for Patriot Park, while the other two wells are used for domestic production.

#### ***Water Supply***

The City's water system contains two primary water production wells (well #1 and #6), one well converted to irrigation use, one water storage tank, a water booster pump station, and over 17 miles of water distribution pipelines. The combined capacity of the two domestic production wells is 4,760 AFY. Estimated water demand at build out requires three additional wells similar in capacity to the two existing wells. The City is currently in the process of constructing well #7, and it is expected to be operational in the near future.

#### ***Water Storage***

The water system contains a 1.0 MG ground level water storage tank. This provides water for the booster pumping plant that provides the City its required water pressure. The City's 2005- 2025 Water CIP forecasts a build out storage need of 3.75 MG. The City is in the process of designing a 1.5 MG storage tank.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

***Water Distribution***

The City's transmission and distribution pipelines vary from 4 to 16 inches in diameter and total more than 17 miles in length.

The SCADA system is programmed to use the water in the storage tanks down to fire protection levels before filling and only fill completely during periods of lowest use. The wells pump directly into the distribution system. Water not used to meet demands goes to fill reservoirs. The primary wells are far enough apart that they do not influence each other when pumping simultaneously. Any well can be used to meet demand anywhere in the City and to fill the reservoirs. The City rotates the use of the wells.

The Monterey County Water Resources Agency manages the Salinas Valley Groundwater Basin, but the basin is not adjudicated. There are currently no restrictions on how much water the City of Greenfield can pump, nor are any such restrictions expected in the future. The Salinas River Groundwater Basin (and all of the agencies within it), however, sat on the edge of adjudication in 1996-97 due to substantial saltwater intrusion near the coast. Ultimately local agencies were able to convince the State Water Resources Control Board that the local solution was the best option. This local solution eventually materialized as the Salinas Valley Water Project.

The City's water supply may be looked at in a variety of ways – there is the water supply available in the aquifer itself, the sustainable yield of the aquifer, discussed above, the water supply that the City has the capacity to pump, and the supply that it in fact pumps. The calculation to determine the amount of water available in the aquifer is described in Section 4.2, Groundwater.

The existing and projected ground water supply system of the City of Greenfield has been designed to produce water meeting the California Department of Public Health standards. The standards require that the groundwater well systems will be able to operate without the capacity of the largest well which allows the largest well to be out of service.

In addition to groundwater, the City of Greenfield will be evaluating the potential future use of recycled water. The details of these plans will be developed through a feasibility study to decommission their existing wastewater treatment plant and send the effluent via lift station and pipeline to the neighboring city's water reclamation facility versus a future expansion and upgrade of the existing facility at Greenfield. Additionally the City will develop an integrated master plan for all their water resources with sustainability and conservation at the forefront of the planning effort.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **4.2 Groundwater**

Greenfield falls within the Salinas Valley Groundwater Basin. The Basin follows the Salinas River, varying from 3 miles to 10 miles across and stretching through most of Monterey County. A map of the basin and its regions is shown in The basin is divided into four subareas: East Side, Pressure, Forebay, and Upper Valley. The City of Greenfield is in the Forebay Subarea, which has a total surface area of 94,000 acres. Greenfield draws its water from the unconfined shallow aquifer zone, and overdraft has not historically been a problem in the Forebay Subarea. Groundwater production for the City has steadily increased over time, and is projected to further increase in coming years as a result of new developments.

Infiltration in the Salinas River channel is the principal source of groundwater for the Salinas Valley Groundwater Basin. Flows from the Salinas River channel and its tributaries percolate through alluvial materials and porous geological structures, recharging the local aquifers. Overdraft in the basin has caused saltwater intrusion in areas closer to the coast, but has never been identified as a problem in the Forebay Subarea. While seawater intrusion does not directly affect the City of Greenfield, it is an issue for the Monterey County Water Resources Agency (MCWRA), which manages water resources throughout the county. The MCWRA Groundwater Management Plan was completed in May, 2006.

In the 2006 Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan (IRWMP), it was estimated that the SVGB is in overdraft, with pumping exceeding recharge by up to 4% a year. This condition affects groundwater users in the Pressure Subarea along the coast, where seawater is intruding into the aquifer. The Salinas Valley Water Project, described below, will increase annual recharge and reduce well-pumping in the Pressure Subarea, and is expected to reduce or eliminate the overdraft condition. The overdraft condition does not affect groundwater users in the Forebay Subarea.

In order to best manage the groundwater basin, the MCWRA owns and operates the Nacimiento and San Antonio reservoirs, both on tributaries of the Salinas River upstream of Greenfield. These reservoirs serve several purposes, one of which is to ensure that farms throughout the valley can have water year-round, particularly in the summertime when most crops are grown but rain is scarce. To do this, the reservoirs store excess winter flows and release them in the summer so that the Salinas River can recharge the groundwater basin throughout the year.

In addition to the City of Greenfield, the City of Greenfield and local farmers also draw from the Forebay Subarea. Outside of the City's UWMP, there have been no attempts to





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

quantify the total amount of water available to Greenfield, and data on the subject is limited. In the UWMP, the total volume of groundwater available to the City is estimated to be 1,500,000 acre-feet based on a proportional percent of the total aquifer volume.

A more accurate way to analyze the water available to the City in any given year is to estimate the safe yield of the aquifer. The Salinas Valley Groundwater Basin (SVGB) is a regional resource that serves the majority of Monterey County. Annual usage varies with rainfall, but over the last decade groundwater use has ranged from 440,000 AFY to 527,000 AFY. Pumping from the Forebay Subarea accounts for 29% of the total groundwater use from the SVGB. Agricultural irrigation accounts for 91% of SVGB water use, and 95% of the water use within the Forebay Sub-Area. Urban use accounts for the remaining five percent.

Total pumping from the Forebay Subarea over the last decade ranges from 124,000 AFY to 161,000 AFY, with an average annual pumping of 149,000 AFY. Even during severe drought conditions, drawdown of the aquifer in the Forebay Subarea has generally been limited to 15 to 20 feet (see Section 5.1). In the IRWMP, the total use of groundwater in the Salinas Valley is projected to decrease as agricultural land is converted to urban use, which has a lower per acre water demand. Additionally, agricultural water demand is declining due to implementation of conservation methods. Although a sustainable yield has not been estimated for the Forebay Subarea, for the purposes of this report we will use the average usage rate of 149,000 acre-feet per year. Given the storage available in the aquifer, and the relative lack of impact that drought conditions have on water availability, this number is conservative.

and Table illustrates the past and projected pumped groundwater, which is significantly smaller than the amount available using the 149,000 acre-feet per year sustainable yield value. As described previously, currently 100% of the City's water supply is groundwater.

**Table 10 Projected Groundwater Pumped**

<b>Table 10</b>				
<b>Groundwater — volume projected to be pumped</b>				
<b>Basin name(s)</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Forebay Subarea (Sustainable Yield)	148,000	148,000	148,000	148,000
<b>City groundwater pumped</b>	1984	2032	2085	2139
<b>Percent of total water supply</b>	1.3%	1.4%	1.4%	1.4%

*Units : acre-feet per year*

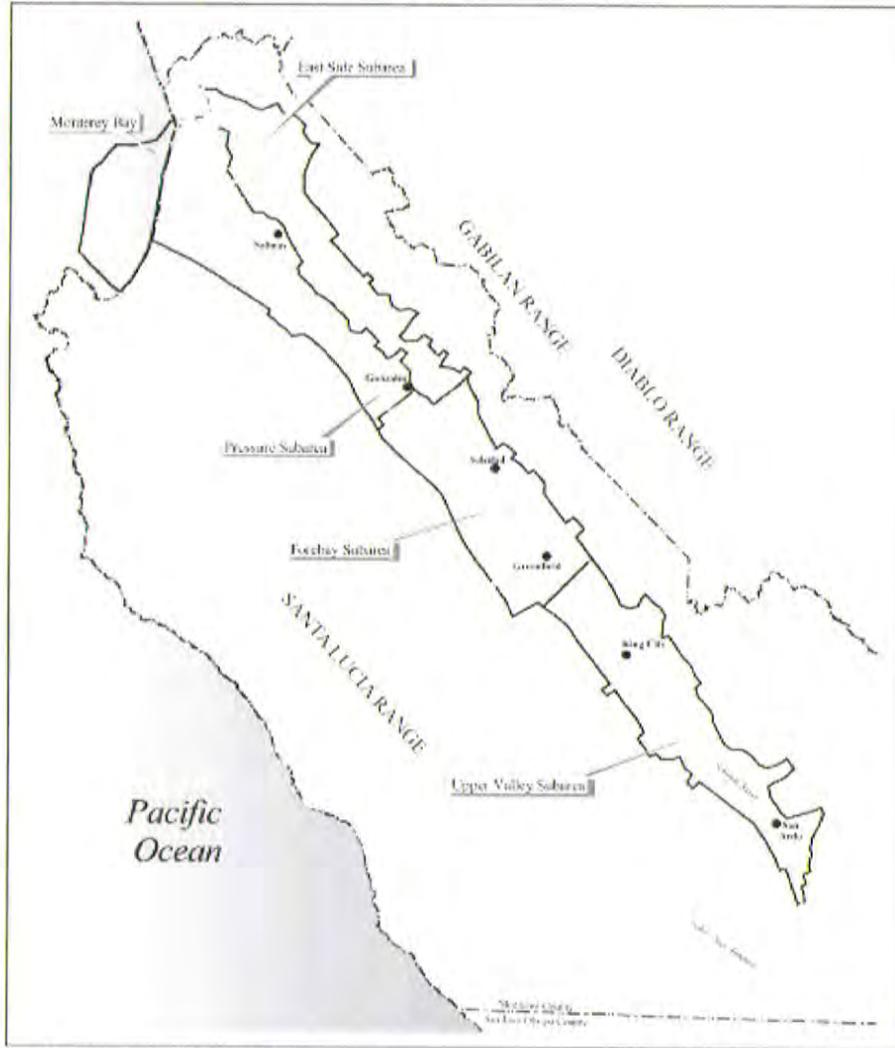




**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

*Note: The values above do not consider the effect that recycled water use may have on amount of water pumped.*

**Figure 4.1: Salinas Valley Groundwater Basin**



Source: Monterey County Water Resources Agency, 1997

Figure 3-2  
 Salinas Valley Ground Water  
 Basin SVIGSM Subareas  
SVIGSM

Salinas Valley Water Project EIR/EIS

Source: Salinas Valley Water Project EIR/EIS

The Salinas Valley Water Project was completed in 2010 and is now operational. The project consisted of a modification of the Nacimiento spillway to allow for increased flow in the Salinas River throughout the summer. It also includes a rubber inflatable dam near the City of Marina that is operational during summer months to increase surface

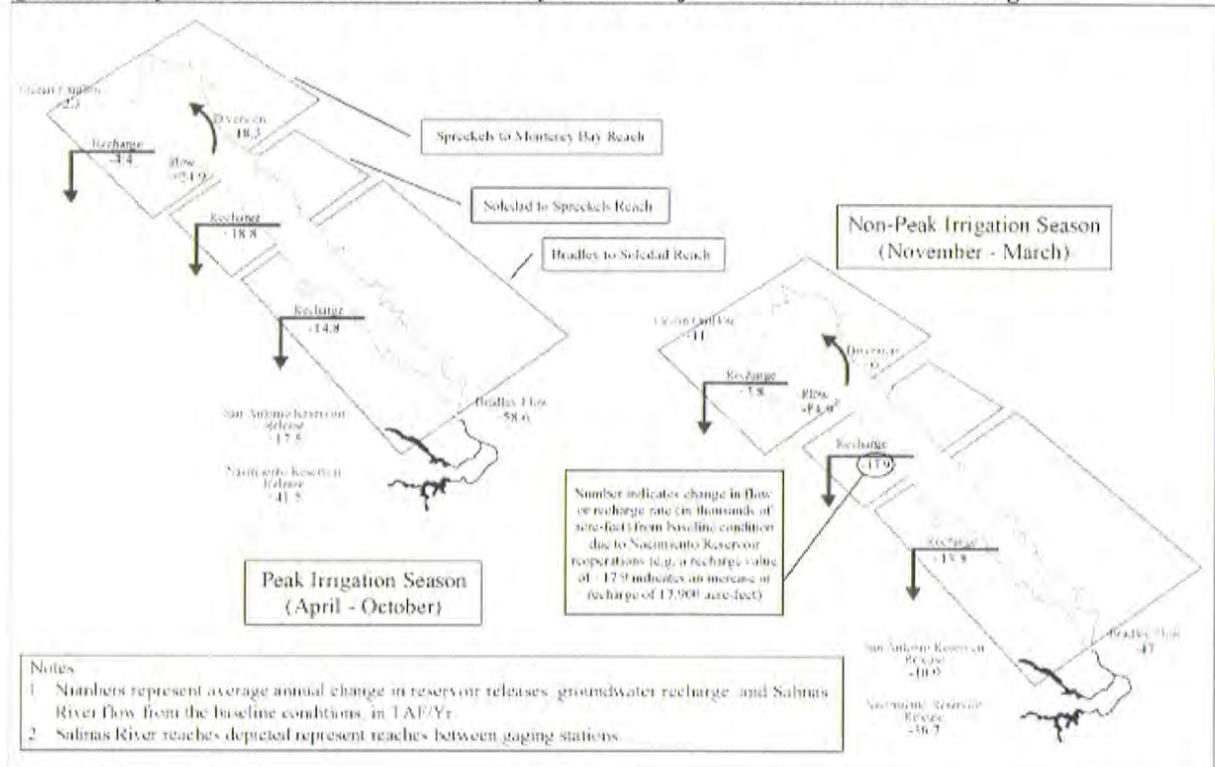




**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

water diversions for irrigation as a means to mitigate saltwater intrusion. The inflatable dam is downstream from Greenfield, however the altered reservoir releases are expected to increase recharge in the Forebay Subarea by approximately eighteen thousand acre-feet per year as shown in Figure 4.2.

**Figure 4.2: Expected Effects of the Salinas Valley Water Project on Groundwater Recharge**



Source: WRIWF, Inc., 2009

Figure 5.3.34

Salinas Valley Water Project EIR/EIS

**Effects of Reoperation:  
 Future Baseline (2030) Compared to Future Plus Alternative A**

4/2010





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## 4.3 Recycled Water

### 4.3.1 Wastewater System Description

#### Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area...

The City of Greenfield Wastewater Treatment Plant (WWTP) is located easterly of the City along the westerly banks of the Salinas River at the easterly terminus of Walnut Avenue.

The WWTP was reconstructed and completed in 1978. Additional plant improvements completed in 1993 increased the capacity to 1.0 million gallons per day (MGD). The plant had some improvements completed after 2009 increasing the capacity to 2.0 MGD. The plant provides treatment and disposal of sanitary wastewater contributed by the residents of the City.

Wastewater treatment and disposal is accomplished in accordance with the **Waste Discharge Requirements Order No. R3-2002 - 0062** that has been established by the California Regional Water Quality Control Board, Central Coast Region. This order allows the capacity of the facility to be increased upon submittal by the City and approval by the Board of documentation that sufficient improvements have been made to the facility.

The treatment process, generally considered primary treatment, is to remove a portion of the solids in the wastewater through a settling process. The solids collected are transferred to a basin in which they are reduced in a process know as aerobic digestion. After digestion, the solids are dried in a lagoon and then buried.

The basic disposal concept is to percolate all the wastewater into the ground in a manner that protects the public health, maintains or enhances the existing groundwater quality





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

and does not create a visual or odor nuisance. No wastewater effluent is discharged to any of the adjacent surface waters. The wastewater quantities are such that with the ample amount of land available, treatment and disposal of wastewater is quite simple and straightforward.

The major portion of the settleable solids are removed by settling in the primary sedimentation tank and then decomposed by aerobic digestion. The settled wastewater is then conveyed to a series of ponds where treatment of dissolved organic matter through a natural oxidation process occurs. Final effluent disposal is accomplished by percolation through the sandy soil into the ground, eventually reaching the groundwater underlying the area. In addition, a spray irrigation system with an estimated capacity of 1.0 MGD has been added to the disposal facilities.

The treatment facilities provide primary treatment for solids removal followed by oxidation and percolation.

The design of the major plant units generally follows conventional practice. The treatment structures are constructed of reinforced concrete and the pond embankments are constructed of compacted native soil. All wastewater flow through the plant is by gravity and the only process pumping used is for transferring sludge and scum from the sedimentation tank into the digestion tank. The plant water system includes a well on the plant site. Well water is pumped into a hydro-pneumatic tank.

According to a 2009 Wastewater System Capital Improvement Plan Update and Capacity Charge Study in 2009 the plant capacity was 1.0 MGD average daily flow. City has since made some capacity improvements and the facility now has a design treatment capacity of 2 MGD with disposal capacities 2MGD during high groundwater conditions. Future growth will require a capacity of about 3.5 MGD. The estimated cost of those improvements was \$17,400,000 in 2009 that recommended the plant be upgraded to a water reclamation facility at a capacity of 4.0MGD. The City therefore intends to have an integrated water resources master plan developed that will look at alternatives to plant expansion and treatment upgrade prior to the requisite 2015 UWMP update.

### ***COLLECTION SYSTEMS***

The City wastewater collection system includes more than 110,000 feet of gravity wastewater pipelines, ranging in diameter from 6 to 24 inches and two large 0.4 mgd and four small sewage pump stations.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

The wastewater collection system been extended over time as the City grew. Located in alleys and easements of the original downtown area, the sanitary sewer pipe is predominately 6-inch diameter clay pipe. New pipes in newer residential areas to the west and east of the downtown area tend to be 8-inch diameter polyvinyl chloride (PVC) pipe and are generally aligned in street right-of-ways. There is a network of trunk sewers greater than or equal to 12 inches in diameter that generally flow from west to east and discharge into the Greenfield Wastewater Treatment Plant at the eastern end of Walnut Avenue.

### 4.3.2 Recycled Water

#### Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the [...] methods of wastewater disposal.

10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

The City of Soledad very recently completed an upgrade of the City Plant which, in addition to increasing plant capacity to 5.5 mgd, also treats wastewater to meet the waste discharge requirement effluent limits adopted by the State Water Resources Control Board of California as well as Title 22 standards for recycled water use.

Greenfield would send all or a portion of its wastewater to the Soledad Plant then return the recycle water to Greenfield for its application on landscape irrigation as one option after completion of a recycle water and wastewater feasibility study that would determine





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

whether it makes more sense for the City of Greenfield to expand the current wastewater treatment facility and upgrade it to a water reclamation facility or complete plans and improvements to send the wastewater to the Soledad water reclamation facility for treatment.

#### **4.3.1 Recycled Water Currently Being Used**

Additional infrastructure is required to deliver recycled water to potential users. Currently, all effluent from the City Plant is disposed of via rapid infiltration basins and spray field irrigation. This water then percolates back into the aquifer. The city does not currently directly re-use any of its treated wastewater.

#### **4.3.2 Potential Uses of Recycled Water**

The amount of wastewater currently disposed of (i.e. infiltrated) in the City of Greenfield is approximately 1,000 acre-foot annually. It is anticipated that once the mechanism for producing recycled water is installed, all projected landscaping demands will be met through recycled water delivery. This is the minimum amount of recycled water that may be required since it may be feasible and desirable to use recycled water for residential and commercial landscaping as well. However, a complete analysis of potential recycled water use demands is not available at this time.

#### **4.3.3 Encouraging Use of Recycled Water**

##### **Law**

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

Once the City ascertains the appropriate approach to produce and distribute recycle water. The City will be pursuing funding to complete the infrastructure required to provide recycled water to existing residential, agricultural, and recreational uses. In





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

addition, the City of Greenfield intends to promote recycled water use by installing a reclaimed water distribution system in new residential developments. The use of recycled water through this “purple pipe” will be encouraged for outdoor water uses within the development, ensuring that the reclaimed water will be used. There is more uncertainty concerning the reclaimed water that will be distributed for agricultural purposes from the existing treatment facilities.

The City would adopt a recycled water ordinance once funding is acquired and a project timeline established. The ordinance would set forth the following City policies:

- Recycled water shall be encouraged for any and all purposes approved by State regulations for recycled water use.
- Recycled water will be the primary source of supply for commercial and industrial uses, whenever the City determines that such use is available and/or feasible.
- Recycled water shall be used within the jurisdiction of the City whenever and wherever there is not an alternative higher or better use for the recycled water and its use is consistent with legal requirements, preservation of public health, the safety and welfare of the public, and protection of the environment.

**Table 22 Methods to Encourage Recycled Water Use**

Methods	Methods Used
Subsidized costs	✓
Grants	✓
Dual Plumbing Standards	
Regulatory Relief	✓
Regional Planning	✓
Incentive Program	
Long-Term Contracts (Price/Reliability)	✓
Rate Discounts	✓
Prohibit specific fresh water uses	
Low interest loans	
Public education	
Other (“guarantee” recycled water supply reliability)	





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

#### **4.3.4 Recycled Water Optimization Plan**

**Law**

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

The City's plans for optimizing recycled water use will be included in the integrated water resources planning effort.

#### **4.3 Future Water Projects**

**Law**

10631 (h) Include a description of all water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (l) of subdivision (f), that the urban water supplier may implement to increase the amount of water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The City does not plan to develop any new sources of water other than adding ground water wells and water storage, but it does intend to continue making upgrades and expansions to its current system to keep up with current and future development. This includes wells, generators, new distribution lines and pump stations, as summarized in the table below. These could be modified in the update of the 2009 Water Master Plan anticipated in year 2013 in the integrated planning effort.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**RECOMMENDED CAPITAL IMPROVEMENT PROJECTS (CIP)**

The recommended capital improvement projects are indicated in the table below.

<b>Recommended Water System Capital Improvement Projects</b>	
<b>Facility</b>	<b>Estimated Cost</b>
Water Supply Wells	\$ 2,400,000
Reservoirs	\$ 1,800,000
Pump Stations	\$ 1,750,000
Pipelines	\$ 6,948,000
SCADA	\$ 300,000
<b>Total Construction Cost</b>	<b>\$13,198,000</b>
<b>Contract Administration, Engineering &amp; Contingencies</b>	<b>\$ 3,959,400</b>
<b>Land Acquisition</b>	<b>\$ 100,000</b>
<b>Total Capital Improvement Cost</b>	<b>\$17,257,400</b>
<b>Administration (1.5% of total costs)</b>	<b>\$ 258,861</b>
<b>Total Water Capacity Charge Costs</b>	<b>\$17,516,261</b>

**Source:** City of Greenfield Executive Summary Water Capital Improvement Plan Update And Capacity Charge Study 2009

#### **4.4 Other Water Supply Opportunities**

Other water supply opportunities will be fully discussed in the Integrated water resources master plan that will be completed in 2013.

##### **4.4.1 Transfer or Exchange Opportunities**

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The City does not currently buy or sell water to other agencies. The City has the potential to provide recycled water on a wholesale or retail basis to the state prison, local farms or nearby communities in the future. It is too early within the recycled water project to forecast external sales.

##### **4.4.2 Desalination**

There are currently no opportunities for development of desalinated water. The City is over 40-miles from the ocean and does not overlie a brackish groundwater source. Since the City has an abundant source of groundwater the transport of desalinated water is not expected to be necessary.





**FINAL DRAFT**  
**City of Greenfield 2010 Urban Water Management Plan**  
**FEBRUARY 21, 2013**

## 4.5 Water Quality

### Law

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

City water quality data can be seen in the table below. Contaminants of local concern are pesticides, **Biochemical Oxygen Demand (BOD)** and Total Dissolved Solids (TDS). The City also recognizes that pollutants of concern in common urban runoff may include sediments, non-sediment solids, nutrients, pathogens, BOD, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, pesticides and herbicides. The City routinely tests all its wells to ensure that the groundwater pumped meets EPA and CDPH drinking water standards. The water quality of the primary wells is good and meets all standards.

**SUMMARY OF WATER QUALITY DATA FOR THE YEAR 2010 - WELLS 1 - 8 AND 7**

Parameter	Unit	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	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## **5.0 Water Supply Reliability and Water Shortage Contingency Planning**

### **Law**

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (c) Provide data for each of the following:

(1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

### **5.1 Water Supply Reliability**

Greenfield falls in the Forebay Subarea of the Salinas Valley Groundwater Basin. The MCWRA reports that in all its years of measurement (since the 1950's), there has never been an instance of overdraft in the Forebay Subarea. Because Greenfield falls just downstream of the confluence of the Salinas River and Arroyo Seco, its groundwater levels are particularly high and no overdraft is expected in the future. In fact, due to the above, no safe yield number has ever been calculated for the Forebay Subarea.

Average depth to groundwater throughout the Forebay Subarea, where 1985 represents an average year and 1991 represents the final year of a three-year drought. While the groundwater table dropped between 90 and 100 feet in the areas near the coast, drawdown in the Forebay Subarea was generally limited to 15 to 20 feet. Since there is very little rainfall in the summer months, the groundwater table is generally ten feet

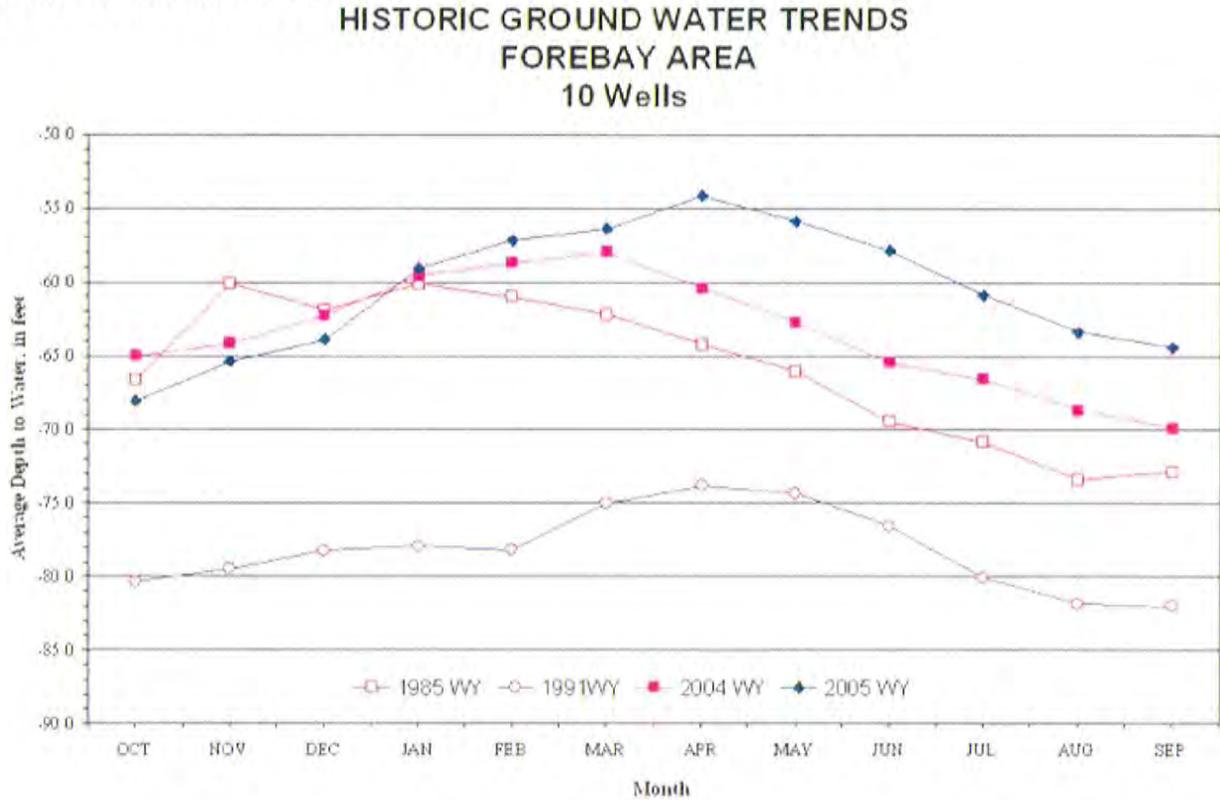




**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

lower during the summer than during the winter as can be seen. Regardless, Greenfield's water supply has not proven vulnerable to seasonal changes.

**Figure 5.1: Groundwater Trends**



Source: *MCWRA Website*.

There are several factors that could yield an inconsistency of supply. Earthquakes are common in coastal California, and could potentially disrupt water supply. Contamination is also possible. The City's responses to the above are discussed in the City's Emergency Response Plan in Appendix \_\_\_\_. There are currently no legal threats to Greenfield's access to its water supply.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5.1 Factors That Could Affect/Impact Consistency of Supply**

<b>Table 29</b>						
<b>Factors resulting in inconsistency of supply</b>						
<b>Water supply sources</b>	<b>Specific source name</b>	<b>Limitation quantification</b>	<b>Legal</b>	<b>Environmental</b>	<b>Water quality</b>	<b>Climatic</b>
Groundwater	Forebay Area		None	Earthquake	Contamination	Drought

The total water volume available to the City was estimated as 1,500,000 acre-feet. As the culmination of a three-year drought, 1991 is the driest year on record, with the groundwater table lowered by about 15 feet. The period of 1989-1991 was thus considered representative of three subsequent dry years, with the water table dropping five feet per year. To determine the total quantity lost in a dry year, the fall in groundwater was multiplied by the surface area in question (24,600 acres) and then by a porosity value of 0.4. The following tables illustrate the aquifer supply reliability, and confirm the abundance of water supply available to the City far into the future, including during drought scenarios. Within the last decade, rainfall and pumping records are inversely proportional. Since the majority of water use in the forebay area is agricultural, this is logical. Despite this increased pumping during dry years, the ability to pump in subsequent years is unaffected, and drawdown levels of the aquifer have not been significant.

**Table 5.2 Basis of Water Year Data**

<b>Table 27</b>	
<b>Basis of water year data</b>	
<b>Water Year Type</b>	<b>Base Year(s)</b>
<b>Average Water Year</b>	1985
<b>Single-Dry Water Year</b>	1991
<b>Multiple-Dry Water Years</b>	1989-1991

Source: *MCWRA Website*:





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5.3 Aquifer Supply Reliability**

<b>Table 28</b>					
<b>Supply reliability — historic conditions</b>					
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
Aquifer Volume = 1,500,000	1,450,800	1,450,800	1,401,600	1,352,400	1,303,200
Sustainable Yield = 148,000	148,000	148,000	148,000	148,000	148,000
Percent of Average/Normal Year (sustainable yield):	100.0%	100.0%	100.0%	100.0%	100.0%

**Table 5.4 Supply and Demand Comparison – Multiple Dry-Year Events**

<b>Table 34</b>					
<b>Supply and demand comparison — multiple dry-year events</b>					
		2015	2020	2025	2030
<b>Multiple-dry year first year supply</b>	<b>Supply totals (Sustainable Yield)</b>	148,000	148,000	148,000	148,000
	<b>Demand totals</b>	1,984	2,032	2,085	2,139
	<b>Difference</b>	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%
<b>Multiple-dry year second year supply</b>	<b>Supply totals (Sustainable Yield)</b>	148,000	148,000	148,000	148,000
	<b>Demand totals</b>	1,984	2,032	2,085	2,139
	<b>Difference</b>	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%
<b>Multiple-dry year third year supply</b>	<b>Supply totals (Sustainable Yield)</b>	148,000	148,000	148,000	148,000
	<b>Demand totals</b>	1,984	2,032	2,085	2,139
	<b>Difference</b>	146,016	145,968	145,915	145,861
	Difference as % of Supply	99%	99%	99%	99%
	Difference as % of Demand	7,360%	7,357%	7,355%	7,352%

*Units: acre-feet per year*





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **5.2 Water Shortage Contingency Plan**

### **5.2.1 Preparation for Catastrophic Water Supply Interruption**

#### **Law**

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

The City of Greenfield has prepared a Water System Emergency Response Plan (ERP). The purpose of the ERP is to provide the City of Greenfield with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of natural or man-made origin.

The goals of the ERP are:

- Rapidly restore water service after an emergency.
- Ensure adequate water supply for fire suppression.
- Minimize water system damage.
- Minimize impacts and loss to customers.
- Minimize negative impacts on public health and employee safety.
- Provide emergency public information concerning customer service.

The City of Greenfield has considered the threats posed by natural events and weather related phenomena. Specific action plans AP(s) have been developed to guide a timely and prudent response should such threats be realized. These detailed APs are found in Appendix C. See Table 5.5 for considered catastrophes.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5.5 Preparation Actions for Catastrophe**

<i>Preparation Actions for Catastrophe</i>			
Possible Catastrophe	Check if Discussed	Primary AP No.	Secondary AP No.
<i>Natural Disasters</i>			
Earthquake	✓		
Floods	✓		
Winter Storm	✓		
Hurricane	✓		
Power Outage	✓		

The City of Greenfield has developed specific AP documents. These AP documents are not included in Appendix C due to the sensitive and confidential nature of the information. They can be found in Appendix A of the City of Greenfield's Water System Emergency Response Plan, a confidential document kept at City offices.

<b>Continued Preparation Actions for Catastrophe</b>			
Possible Catastrophe	Check if Discussed	Primary AP No.	Secondary AP No.
<i>Man-made Threats</i>			
Threat of contamination to water system	✓		
Confirmed contamination to water system	✓		
Structural Damage from explosive device	✓		
Employee Assaulted with weapon	✓		
SCADA System Intrusion	✓		
IT System Intrusion	✓		
Chemical Release	✓		
Water Supply Interruption	✓		
Bomb Threat	✓		





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

### **5.2.2 Supplemental Water Supplies**

The City of Greenfield's Water System ERP identifies alternate water resources, emergency water supply calculations and emergency equipment and supplies. The City of Greenfield has two alternate and independent raw water sources in the event of the failure of all four City wells, which is highly unlikely:

- Water Source 1: Ag well (s) near City (need details)
- Water Source 2: Salinas River

Each of these raw water services can supplement the water supply if the other sources are compromised. For additional information please refer to the City of Greenfield's Water System ERP.

### **5.2.3 Water Shortage Contingency Ordinance/Resolution**

#### **Law**

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (h) A draft water shortage contingency resolution or ordinance.

The City adopted Mandatory Water Conservation Regulations in 1995, which can be found in Chapter 13.09 of the City of Greenfield's Municipal Code and are attached as Appendix A of the adopted Water Shortage Contingency Plan. The City of Greenfield has developed a formal water-rationing plan consistent with the City's adopted Water Shortage Contingency Plan. Additionally a model resolution is included as Appendix B of the adopted Water Shortage Contingency Plan that will be adopted in the case of an impending water shortage.

### **5.2.4 Stages of Action**

#### **Law**

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

The City of Greenfield utilizes a five-stage rationing plan to invoke during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage.

**Table 5.6 Rationing Stages**

<b>Table 35</b>		
<b>Water shortage contingency — rationing stages to address water supply shortages</b>		
<b>Stage No.</b>	<b>Water Supply Conditions</b>	<b>% Shortage</b>
1	Levels in wells reach 220-235 feet below surface	5-10%
2	Levels in wells reach 235-250 feet below surface	10-20%
3	Levels in wells reach 250-265 feet below surface	20-30%
4	Levels in wells reach 265-280 feet below surface	30-40%
5	Levels in wells reach 280-300 feet below surface	40-50%

Levels in wells are recorded by the Distribution Operator on a semi-annual basis. In case of a water shortage (Stages 3 and higher), the levels will be recorded weekly.

**Stage 1**

Greenfield maintains an ongoing public information campaign consisting of distribution of literature, speaking engagements, monthly bill inserts, and conservation messages printed in the city’s local newspapers. The City of Greenfield’s Mandatory Water Conservation Regulations are in place.

**Stage 2**

This stage is voluntary for high commercial and industrial uses of water and mandatory for water use within the City’s control, wherein a 50% reduction of potable water use is required in all parks, medians, and public landscaped areas. In addition, the public will be encouraged to participate in water conservation practices by changing their water use habits and installing water efficient devices in their homes. Outreach will primarily be through informational means including news media and water conservation literature. Per the residential health and safety water quantity calculations found below, habit changes alone result in a 26% reduction of total water consumption, while replacement of standard fixtures with conserving fixtures within the home can result in a 43% reduction.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

Therefore, expected reduction due to these efforts far exceeds the required reduction at this level.

**Table 5.7 Residential Health and Safety Water Quantity Calculation**

<b>Fixture</b>	<b>Non-Conserving</b>	<b>Habit Changes</b>	<b>Conserving Fixtures</b>
Toilets	4 flushes x 6gpf 24 gpcd	3 flushes x 6gpf 18 gpcd	4 flushes x 1.5gpf 6.0 gpcd
Shower	6 min. x 4gpm 24 gpcd	4 min. x 4gpm 16 gpcd	6 min. x 2.5gpm 15 gpcd
Laundry	11 gpcd	9 gpcd	10 gpcd
Kitchen	9 gpcd	7 gpcd	8 gpcd
<b>Total gcd</b>	<b>68</b>	<b>50</b>	<b>39</b>

Source: *Wastewater Rate Study and Municipal Code Chapter 13.09 (Conserving Fixture gpf/gpm data.)*

### Stage 3

At this level, the City would eliminate its public potable water uses (City landscaping) entirely. The City would also notify schools, developers, and industrial water users of a water shortage, encouraging them to conserve. With continued public outreach, habit changes and fixture replacements, the demand reduction at this level will again far exceed the amount required.

### Stage 4

In order to supplement actions taken at the previous level, the City may temporarily increase water rates. Water rate increases will discourage use of water and prevent or defer installation of new landscaping. Additionally, further water use prohibitions will be required.

### Stage 5

This level would represent a true critical water shortage. The City would pass their model resolution prescribing additional rate increases, prohibiting unmetered usage including fire hydrants, and placing a ban on water use for any and all irrigation.

Stages 1-5 are summarized in Table 5.8.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5.8 Water Shortage Contingency – Consumption Reduction Methods**

<b>Table 37</b>		
<b>Water shortage contingency — consumption reduction methods</b>		
<b>Consumption Reduction Methods</b>	<b>Stage When Method Takes Effect</b>	<b>Projected Reduction (%)</b>
Additional rate increases, prohibition of unmetered usage including fire hydrants, and ban on water use for any and all irrigation.	1	10%
Industrial and commercial - voluntary reduction. City - mandatory 50% reduction in all parks, medians, and public landscaped areas. Public - encouraged to participate in water conservation practices by changing their water use habits and installing water efficient devices in their homes.	2	20%
City will eliminate public landscaping water use entirely and notify schools, developers, and industrial water users of a water shortage, encouraging them to conserve.	3	30%
City may temporarily raise water rates to discourage water use.	4	40%
Additional rate increases, prohibition of unmetered usage including fire hydrants, and ban on water use for any and all irrigation.	5	50%

## 5.2.4 Prohibitions, Consumption Reduction Methods and Penalties

### Law

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632 (f) Penalties or charges for excessive use, where applicable.

The City of Greenfield’s Mandatory Water Conservation Regulations (see Appendix D) includes **current and ongoing** restrictions and prohibitions on various wasteful water uses such as:

- Cleaning of Structures
- Cleaning of Surfaces
- Construction Activities utilizing water for cleanup or dust control
- Commercial Car Washes
- Fountains
- Leakage and Repair Program
- New Construction requiring water connection activation
- Public & Quasi-Public Entities
- Repair of Plumbing, Sprinkler and Irrigation Systems
- Retrofitting Existing Hotels and Motels
- Swimming Pools and Spas
- Use of Hydrants
- Visitor Serving Facilities
- Washing of Vehicles
- Water Spillage

**Table 5.9 Mandatory Prohibitions by Stage**

<b>Table 36</b> <b>Water shortage contingency — mandatory prohibitions</b>	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Using potable water for street washing	Stage 1
50% reduction required in all parks, medians and public landscaped areas	Stage 2
All public landscaping water use	Stage 3
Unmetered usage such a fire hydrants	Stage 5





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

***Current & Ongoing Procedures***

- 1) In order to encourage cooperative efforts to achieve water conservation, it is the policy of the City of Greenfield to issue a written warning notice when an alleged violation is first noted. Such warning shall include an explanation of the alleged violation. Any individual provided with such notice will then be given an opportunity to correct the identified problem.
- 2) Any violation that occurs or continues from one day to the next shall be deemed a separate violation, for each day during which such violation occurs or continues to occur.
- 3) The fine for the first violation of this chapter shall be fifty dollars.
- 4) The fine for second violation and each subsequent violation of Municipal Code Chapter 13.09 within a period of twelve months, regardless of the specific section or subsection violated shall be one hundred dollars.

***Shortage Stage Procedures***

- 1) Issue a written warning notice when an alleged violation is first noted. Such warning shall include an explanation of the alleged violation. Any individual provided with such notice will then be given an opportunity to correct the identified problem.
- 2) If the violation is not corrected after one written warning notice, the City shall install a flow restrictive device on the service line of any customer observed by Greenfield's personnel to be using water for any non-essential or unauthorized use.
- 3) Repeated violations of unauthorized water use will result in discontinuance of water service.

These procedures are summarized in

**Table 5.10.**





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 5.10 Water Shortage Contingency – Penalties and Charges**

<b>Table 38</b>	
<b>Water shortage contingency — penalties and charges</b>	
<b>Penalties or Charges</b>	<b>Stage When Penalty Takes Effect</b>
Penalty for excess use	Stage 1
Charge for excess use	Stage 1
\$50 fine for first violation of Muni Code 13.09	Stage 1
\$100 fine for subsequent violations of Muni Code 13.09	Stage 1
If violation is not corrected after one written warning notice, the City shall install a flow restrictive device on the customer's service line	Stage 1
Repeated violations will result in discontinuance of service	Stage 1

### **5.2.5 Revenue and Expenditure Impacts and Measures to Overcome Impacts**

**Law**

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier...

10632 (g) [An analysis of the impacts of each of the] proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

Imposing water restrictions on customers would have an impact on City revenues. The following table shows the estimated impacts on revenues resulting from implementing various levels of restrictions.

**Table 5.11 Revenue Impacts From Water Restrictions**

<b>Revenue Impacts From Water Restrictions</b>		
<b>Rationing Stage</b>	<b>Revenue Reduction</b>	<b>Percent of Total Annual Revenue</b>
<b>Stage 1 ( 5-10%)</b>	\$27,000	2.5%
<b>Stage 2 ( 10-20%)</b>	\$54,000	5.0%
<b>Stage 3 ( 20-30%)</b>	\$81,000	7.5%
<b>Stage 4 ( 30-40%)</b>	\$108,000	10.0%
<b>Stage 5 ( 40-50%)</b>	\$135,000	12.5%

Revenue reduction = percent decrease times projected normal revenue.

Based on a three month period of drought

Source: Finance Department

The City currently maintains a capital replacement reserve fund and has recently adjusted its user rates to include building an operating reserve amounting to \$77,000 in its water operations budget in case of emergencies.

Under long-term drought conditions, it may be necessary to institute temporary increases to rates to cover increased operating expenses. One option that the City could utilize would be to adopt a surcharge or flat rate increase over a specific time period to cover increased operating expenses while under water shortage. This measure would allow the City to implement various levels of rate increases after City Council, by resolution, has declared a threatened shortage of funds due to water shortage or other emergency.

Conditions of drought and the implementation of water restrictions would also impact expenditures. Reduced availability of groundwater would produce higher energy bills. The difference in groundwater elevation would lengthen the pumping time required to produce the same amount of groundwater. A detailed study on how a drought would impact City expenditures has not been completed at this time.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **5.2.6 Reduction Measuring Mechanism**

### **Law**

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Under normal water supply conditions, potable water production figures are recorded daily. Totals are reported weekly to the Water treatment Facility Supervisor. Totals are reported monthly to the Water Department Manager and incorporated into the water supply report.

During a Stage I or Stage II water shortage, daily production figures read from wellhead meters will be reported to the Utilities Department. The Supervisor compares the weekly production to the target weekly production to verify that the reduction goal is being met. Monthly reports will be sent to the City Council. If reduction goals are not met, the manager will notify the City Council so that corrective action can be taken. During a Stage III or Stage IV water shortage, the procedure listed above will be followed, with the addition of monitoring production figures by sector and furthermore by consumer.

During emergency shortages Stage V, production figures will be reported to the Supervisor hourly and to the Manager and the Water Shortage Response Team daily. Daily reports will also be provided to the City Council and the Monterey County Office of Emergency Services.

## **5.3 Drought Planning**

As previously described (Section 5.1), the City water supply (i.e. water available in the aquifer) is significantly greater than the anticipated demand even during a multi-year drought scenario. As such, the City does not have specific drought planning measures other than what has been described in the mandatory water conservation and planning measures described above. That said, the City does employ several ongoing water conservation measures and is working towards utilizing significant amount of recycled water, as described elsewhere in this report.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

## 6.0 Demand Management Measures

### Law

10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

- (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:.....

The City became a member of the California Urban Water Conservation Council (CUWCC) in 2011. The annual AB 1420 Self-Certification Statement Tables 1 & 2 were sent to the California Department of Water Resources on \_\_\_\_\_. Because the City is such a recent member of the CUWCC, they have not yet completed an annual report. As such, for the 2010 UWMP, the each required Demand Management Measure (DMM) is discussed in detail below. A copy of the Self-Certification Tables is included in Appendix F. It is anticipated that in future Plan updates, the City will submit a copy of their CUWCC annual report in lieu of describing DMMs within the Plan. Further, each DMM is discussed following the table.

**Table 6.1 Demand Management Measures and Implementation Schedule**

DMM #	DMM Name	Scheduled Implementation Start Date	Fully Implemented By Date
1.	Water Survey Program		
2.	Plumbing Retrofit		
3.	Water System Audits		
4.	Metering w/ Commodity Rates		
5.	Large Landscape Program		
6.	Washing Machine Program		
7.	Public Information Program		
8.	School Education Program		
9.	Commercial, Industrial, Institutional Program		
10.	Wholesaler Assistance		
11.	Conservation Pricing		
12.	Conservation Coordinator		
13.	Water Waste Prohibition		
14.	Residential ULFT Program		





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

### **6.1 DMM 1 - Water Survey Program**

The City is in the process of developing and conducting an indoor and outdoor water survey for single/multi-family residential customers. This effort began in \_\_\_\_, and is anticipated to be complete by \_\_\_\_\_. The effort is currently approximately \_\_\_\_% complete. The survey questionnaire is still in development, and shall include solicitation of information such as:

- Type and age of residence
- Number of connections to the water system
- Number of household individuals
- Specific to landscaping, description of area(s) broken down by grass, hardscape, landscape, and garden, approximate slope, type of irrigation and sprinkler heads used, and amount of shade.
- Description of in-home toilets, faucets, showers (including flow rate and leaks)
- Quantification of frequency and duration of showers, baths, washer and dishwasher loads, and car washes.
- Description of pool or spa.
- Amount of utility bills for past 12 months
- Whether or not the residence is a working home such as a day care.

The questionnaire will be posted to the City website by \_\_\_\_, with participation encouraged through announcements included in two consecutive utility billings. Also by \_\_\_\_\_ a procedure for reviewing and following-up on the responses will be developed.

Based on the existing conditions of the City, it is projected that approximately \_\_\_\_% of returned surveys will belong to single and multi family homes that were built before 1980, and \_\_\_\_% of surveys will belong to those homes built after 1980. The intended goal is to have 15% of each residential category return their surveys by \_\_\_\_\_, and the City is projecting that at least 5% of returned surveys will retrofit their homes. Ultimately the surveys will be used to target households for outreach to receive conservation tips and suggestions specific to their household, resulting in lower overall water consumption. Effectiveness will be measured by comparing historic use with current use for those customers targeted. The following table represents water savings that may be achieved through this program:





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 6.2 Typical Water Savings**

	<b>Pre-1980 Construction</b>	<b>Post-1980 Construction</b>
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd
Leak repair	0.5 gcd	0.5 gcd
Landscape survey (outdoor use reduction)	10%	10%

**Table 6.3 Projected Water Survey Program Savings**

<b>Planned Measures</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Number Single Family Surveys	4,004	-	-
Number Multifamily Surveys	2,449	-	-
Projected Expenditures (\$)	\$5,334	\$1,800	\$1,000
Projected Water Savings(AFY)	-	0.24	1.72

## **6.2 DMM 2 - Plumbing Retrofit**

The City began developing their plumbing retrofit program in 1994 under Chapter 13.09 Municipal Code Requirements. Under code regulations, retrofitting of toilets and showerheads is required upon change of ownership or use for existing residential structures, while retrofitting of toilets is required upon change of ownership or use for existing commercial and industrial structures. Additionally, the City is currently beginning implementation of an ULFT program as described under DMM 14 – Residential ULFT.

Utilizing DMM 1, the City will be able to track which homes are lacking water saving devices so that it is flagged during the transfer of ownership and/or change of use process. Each year the number of homes without conserving fixtures will decrease. This program may go into effect immediately once returned water surveys are processed, or no later than beginning\_\_\_\_\_.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

Based on the existing conditions of the City, it is projected that approximately \_\_\_% of returned surveys will belong to single multi family homes that were built before 1994, and \_\_\_% of surveys will belong to those homes built after 1994. Of the 15% of each residential category that return their surveys by \_\_\_\_\_ (same survey as described in DMM 1), the City is projecting that at least \_\_\_% of returned surveys will have their homes sold in the year 2009, and again in 2010 of the Pre- and Post-1994 construction. Of those homes sold, \_\_\_% of the Pre-1994 construction require retrofits, while only \_\_\_% of the Post-1994 construction require retrofits.

Utilizing internal resources (city housing data), the City may determine the number of pre- and post-'94 homes (consistent with construction stipulations per the City's Municipal Code Section 13.09) so that the City may additionally target 5% of the pre-1994 single family homes and multi-family homes every two years for showerheads and ultra-low flush toilet replacements. Of the 2.5% targeted each year, the City is assuming that half will require retrofit. Typical water savings from Table 14A is used in this analysis.

The City has not tracked the number of Pre-1992 single and multi family residential accounts thus far; as described above, a distinction will be determined (albeit for the year 1994 used as the cutoff since this is consistent with when the City's retrofit ordinance went into effect) and utilized in the future for this DMM.

**Table 6.4 Projected Plumbing Retrofit Savings**

<b>Planned Measures</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Number Single Family Devices	-	133	142
Number Multifamily Devices	-	81	96
Projected Expenditures (\$)	\$5,300	\$1,841	\$1,891
Projected Water Savings(AFY)	0.00	1.53	1.70

**6.3 DMM 3 – System Water Audits, Leak Detection and Repair**

Per the requirements stipulated in the City Municipal Code Chapter 13.09, the Public Works Director shall maintain in effect a distribution system leakage detection and repair program. The City initiated this program in \_\_\_\_\_, and the System Audit is currently underway, and anticipated to be completed in \_\_\_\_\_.

As part of this program, the City will install scada software which tracks water use and flags users with significant increases in their water usage. The City is in the process of





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

developing a program of investigating and communicating with the owners of these flagged accounts to detect if a leak is occurring and initiate repair measures.

Additionally, the City has appointed the Maintenance Department to handle and schedule physical audits and repairs. The Maintenance Department is currently developing a system for implementing testing agents within the distribution pipelines to determine where specifically a leak exists when the physical audit indicates a substantial (greater than 6%) loss. Discovered leaks will then be slated for repairs, although thus far the audit has not discovered any significant leaks within the system.

Documentation of each incidence and/or detected leak will be kept along with the date repairs are made. Once a repair is made, a minimum of two month's follow up of well production versus use data will be tracked to determine the total amount of water savings through said repair.

The auditing system would be automated for efficient tracking via the scada once installed in 200X. Annual reviews shall be conducted. Effectiveness will be evaluated by seeing a marked decrease in losses each year until losses fall below the threshold 6% value. The Public Works Director will submit annual reports to the City Council, per Code requirements. Ultimately the City will see an estimated savings of 150 AFY once the 6% threshold is reached.

In order to project system needs without having formal audit information to work off of, the City anticipates that for each of the planned implementation years, the primary (and necessary) focus will be on the 4" lines located mainly in the older part of town that exhibit the most deterioration of the system. It is anticipated that 10% of all 4" lines will be surveyed each year, and 50% of those lines will require replacement until the 6% threshold is achieved (approximated to occur by 2013 per table below).

**Table 6.5 Projected Water Audits, Leak Detection and Repair Savings**

<b>Planned</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
% of unaccounted water	13%	9%	4%	4%
Miles of main surveyed	0.39	0.39	0.39	0.39
Miles of lines repaired	0.19	0.19	-	-
Projected Expenditures (\$)*	\$2,632	\$2,709	\$2,785	\$2,862
Projected Water Savings(AFY)	18.21	21.47	-	-

\*Does not include costs of labor or materials associated with construction.

Table 6.5 does not include the costs of design or construction of system repairs. The City has budgeted \$\_\_\_\_\_ for the total costs of DMM 3.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**6.4 DMM 4 – Metering with Commodity Rates**

The City is fully metered for all customer sectors, including separate meters for single-family residential, commercial, large landscapes, and all institutional/governmental facilities. Implementation of DMM 4 began in \_\_\_\_\_ with a physical reading of all operational meters for water auditing purposes. The City requires meters for all new connections. Water billing is based on volume of use pursuant to the newly adopted water rates.

**Table 6.6 Water Rate Structure**

Monthly Service Charges	Prevailing Rates	Proposed Adjustments to Rates				
		2011/12	2012/13	2013/14	2014/15	2015/16
Projected Revenue from Rates	\$900,000	\$1,080,000	\$1,296,000	\$1,595,200	\$1,864,064	\$1,780,607
Annual Change		20.00%	20.00%	20.00%	7.00%	7.00%
Average Monthly Bill - Single Family Home (1)	\$16.89	\$20.27	\$24.32	\$29.19	\$31.23	\$33.42
<b>Rates for Customers Within City Limits:</b>						
<b>Base Service Charge:</b>						
5/8 x 3/4" meter	\$7.59	\$9.11	\$10.93	\$13.12	\$14.03	\$15.02
1" meter	\$6.46	\$10.15	\$12.18	\$14.62	\$15.64	\$16.74
1 1/2" meter	\$10.48	\$12.58	\$15.09	\$18.11	\$19.38	\$20.73
2" meter	\$12.46	\$14.95	\$17.94	\$21.53	\$23.04	\$24.65
3" meter	\$26.83	\$32.20	\$38.64	\$46.36	\$49.61	\$53.08
4" meter	\$32.93	\$39.52	\$47.42	\$56.90	\$60.89	\$65.15
6" meter	\$86.05	\$103.26	\$123.91	\$148.69	\$159.10	\$170.25
<b>Variable Consumption Rate per 1,000 gallons:</b>						
0 to 5,000	\$0.40	\$0.48	\$0.58	\$0.69	\$0.74	\$0.79
5,001 to 10,000	\$0.65	\$0.78	\$0.94	\$1.12	\$1.20	\$1.29
10,001 to 15,000	\$0.81	\$0.97	\$1.17	\$1.40	\$1.50	\$1.60
15,001 to 20,000	\$0.95	\$1.14	\$1.37	\$1.64	\$1.76	\$1.88
20,001 to 25,000	\$1.00	\$1.20	\$1.44	\$1.73	\$1.85	\$1.98
25,001 and up	\$1.50	\$1.80	\$2.16	\$2.59	\$2.77	\$2.97
<b>Monthly Base Service Charge for Fire Protection Services:</b>						
1 1/2" meter	\$7.96	\$9.55	\$11.46	\$13.75	\$14.72	\$15.75
2" meter	\$9.38	\$11.26	\$13.51	\$16.21	\$17.34	\$18.56
3" meter	\$10.60	\$12.96	\$15.55	\$18.68	\$19.97	\$21.37
4" meter	\$12.22	\$14.66	\$17.60	\$21.12	\$22.59	\$24.16
6" meter	\$15.50	\$18.60	\$22.32	\$26.78	\$28.66	\$30.67
<b>Water Usage Rates for 3-inch Fire Hydrant Meter</b>						
For first 9,000 gallons	\$48.50	\$58.20	\$69.84	\$83.61	\$89.67	\$95.95
For each 1,000 gallons above 9,000 gallons (Deposit is two times the usage fee)	\$1.28	\$1.54	\$1.84	\$2.21	\$2.37	\$2.53
<b>Rates for Customers Outside City Limits:</b>						
<b>Base Service Charge:</b>						
5/8 x 3/4" meter	\$15.18	\$18.22	\$21.86	\$26.23	\$28.07	\$30.03
1" meter	\$16.92	\$20.30	\$24.36	\$29.24	\$31.28	\$33.48
1 1/2" meter	\$20.96	\$25.15	\$30.18	\$36.22	\$38.75	\$41.47
2" meter	\$24.92	\$29.90	\$35.88	\$43.06	\$46.08	\$49.30
3" meter	\$53.06	\$64.39	\$77.27	\$92.72	\$99.22	\$106.16
4" meter	\$65.86	\$79.03	\$94.84	\$113.81	\$121.77	\$130.30
6" meter	\$172.10	\$206.52	\$247.82	\$297.39	\$318.21	\$340.49
<b>Variable Consumption Rate per 1,000 gallons:</b>						
0 to 5,000	\$0.82	\$0.98	\$1.18	\$1.42	\$1.52	\$1.62
5,001 to 10,000	\$1.35	\$1.56	\$1.87	\$2.25	\$2.40	\$2.57
10,001 to 15,000	\$1.62	\$1.94	\$2.33	\$2.80	\$3.00	\$3.21
15,001 to 20,000	\$1.90	\$2.28	\$2.74	\$3.28	\$3.51	\$3.76
20,001 to 25,000	\$2.00	\$2.40	\$2.88	\$3.46	\$3.70	\$3.96
25,001 and up	\$3.00	\$3.60	\$4.32	\$5.18	\$5.55	\$5.94
<b>Monthly Base Service Charge for Fire Protection Services:</b>						
1 1/2" meter	\$12.22	\$14.66	\$17.60	\$21.12	\$22.59	\$24.18
2" meter	\$15.50	\$18.60	\$22.32	\$26.78	\$28.66	\$30.67
3" meter	\$18.23	\$21.88	\$26.25	\$31.50	\$33.71	\$36.07
4" meter	\$21.60	\$25.92	\$31.10	\$37.32	\$39.64	\$42.13
6" meter	\$27.81	\$33.37	\$40.05	\$48.06	\$51.42	\$55.02
<b>Water Usage Rates for 3-inch Fire Hydrant Meter</b>						
For first 9,000 gallons	\$97.17	\$116.60	\$139.92	\$167.91	\$179.66	\$192.25
For each 1,000 gallons above 9,000 gallons (Deposit is two times the usage fee)	\$2.58	\$3.10	\$3.72	\$4.46	\$4.77	\$5.10

1) Average monthly bill based on consumption of 15,000 gallons and a 5/8 x 3/4" meter.





### **6.5 DMM 5 – Large Landscape Water Audits and Incentives**

A large landscape water auditing and incentive program will be developed by the City that includes irrigation surveys solicited of the City’s large landscape customers (to be defined as three acres or greater). The program will incorporate calculations of water budgets for the site based on the size of the landscape and the climate, and compared against the water allotment for that site. Any water use which exceeds the water budget will be billed at a higher rate. On-site follow-up evaluations will be recommended for customers whose annual water use exceeds their water budget.

This program was initiated in \_\_\_\_ and will be implemented over the next five years. The City projects they’ll conduct 12 surveys for developing site-specific budgets in the year of \_\_\_\_\_. The follow up inspections will start in 2014.

It is projected that the landscape areas maintained by the Landscape Assessment District will be part of this DMM. Several parks and landscape strips are included in the landscape Assessment District, accounting for approximately \_\_\_\_ acres of land. Another possible landscape customer will be the School District that currently has \_\_\_\_ schools in Greenfield. It is projected that 80% of each area will have lawn areas and will use a sprinkler system as an irrigation tool, with the remaining 20% assumed to have vegetation consuming a relatively insignificant amount of water. Computer programs such as AutoCAD and GIS were used to project the areas covered by the large landscape customers within the City limits.

It is expected that large sized landscapes upgraded based on survey recommendations could result in a 15% reduction in water demand.<sup>2</sup>

**Table 6.7 Projected Large Landscape Conservation Program & Incentive Water Savings**

<b>Planned</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Number of Surveys Completed		0	0	0	
Number of Budgets Developed		0	0	0	
Number of Follow-up Visits		0	0	0	
Projected Expenditures (\$)		0	0	0	
Projected Water Savings(AFY)		0	0	0	

With construction of the infrastructure necessary to connect existing ‘purple pipe’ to the wastewater treatment facility, the City anticipates replacing potable water with recycled water for all of the City owned landscape area, and many of the private landscaped areas





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

as well. These water reductions have not been included in Table 6.7, since they are captured in the Recycled Water (Section 4.1) discussion herein.

The City will also investigate the existence of a nearby California Irrigation Management Information System (CIMIS) weather station where daily climatological data (temperatures, relative humidity, wind velocity, and precipitation) are documented. This data may ultimately be used to develop irrigation schedules that will help to maximize water use by adjusting timing, quantity, and frequency of watering.

### **6.6 DMM 6 – Washing Machine Rebate**

The City is evaluating developing their washing machine rebate program. The City recognizes that high-efficiency washers use approximately 25 gallons per load, versus 40 to 50 gallons per load for top loader machines. The washing machine is the second biggest water-user in most households; only the toilet will use more water (see below table). The next washing machine you buy will have an enormous effect on the amount of water you'll use over the next 10 years. The City proposes to provide customers with a **\$100 rebate** on their water bill when a customer purchases a qualifying high-efficiency washing machine. Similar to the toilet rebate, a customer must complete a rebate form.

**Table 6.8 Typical Municipal Water Use in USA**

Device	Percentage
Shower	21.20%
Faucet	11.70%
Toilet	28.40%
Clothes- Washer	21.20%
Toilets Leaks	5.50%
Baths	8.95%
Dishwashers	3.10%

The City proposes to develop the rebate form and a list of washing machines that qualify under this program. The program should be developed by \_\_\_\_\_, pending Council approval. At this time, the City anticipates offering 50 rebates per year to its customers depending upon each year's budgets. As a starting point, 95% of single family homes are assumed to own washing machines; of those it is expected that 30% are energy-efficient. Likewise for multi-family homes, 65% are assumed to own washing machines; of those it is expected that 5% are energy-efficient.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 6.9 Projected High-Efficiency Washing Machine Rebate Programs Water Savings**

<b>Planned</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
\$ per Rebate	\$100	\$100	\$100	\$100	\$100
Projected Number of Rebates to be Paid	50	50	50	50	50
Projected Expenditures (\$)	\$5,000	\$7,281	\$7,866	\$8,089	\$7,917
Projected Water Savings (AFY)	0.00	33.50	33.50	33.50	33.50

### **6.7 DMM 7 – Public Information**

The City is currently implementing a public information program newly developed as an element of the City’s UWMP. It is anticipated that through education on water usage and saving tips that there would be a reduction in water used and influent to the wastewater plant. Public outreach includes the following:

#### Utility Bills

Monthly utility bills are sent to each customer in the City. Included as part of the billing process is the ability to include a short notice (less than 32 characters) on each bill. The City will utilize this space to include water conservation messages on each of the utility bills in both English and Spanish. Below is a listing of past and potential future messages:

1. We need your help to conserve
2. Help conserve, use less water
3. Fix toilet leaks & save water
4. Less flushes reduces flow
5. Wash full loads of clothes
6. Install low flow devices
7. Quick showers, flush less
8. Don’t waste, conserve water
9. Don’t throw trash in toilets
10. Fix dripping water/shower faucets
11. Capture tap water/ reuse on plants





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

Articles in Local newspaper

As part of the process to inform the public as to the City's water supply situation and conservation efforts, the following will be done:

1. Articles run in English and Spanish on the City situation and its effects on the public and growth.
2. Monthly articles are run updating the public as to the City's situation.
3. Weekly factoids are run on tips to reduce flow to the Wastewater Treatment Plant.

Articles in Local newspaper

Another outreach effort is to inform the public as to the City's situation via the Greenfield Times:

1. An article is run in English and Spanish with tips to reduce flow to the plant. (To be run each first quarter newsletter)
  - a. Installation of low flow equipment.
  - b. Installation of hot water recirculating unit
2. Quarterly articles are run each second quarter updating the public as to the City's situation and reiterating tips to reduce flow to the plant.

Public Outreach

Varied methods to inform the public on any Wastewater Plant Upgrades, Recycle Water Efforts, Storm Water Plans and Water System Plans and upgrades, and methods they can take to help the situation will be implemented, including:

1. A power point presentation on the City's situation. City Staff present to different non-profit organizations, businesses and schools each month.
2. Door hangers will be made with information on the City's situation and tips on how citizens can help reduce flow to the plant.
  - a. Use of High School Students to deliver
  - b. Use of CSUMB students to deliver
3. Tips will be continuously posted to reduce flow to plant on Greenfield's Local Channel.
  - a. Rather than having all tips Staff will create "Tip of the Week" and change the tip each week.
4. Information will be placed on the City's website with links on conservation measures.
5. Direct mailings to all citizens on conservation measures will be initiated during drought conditions.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

The City will track the commentary regarding the information provided, and effectiveness will be gauged by increased awareness.

Projected costs shown in the below table are based upon approximate amount of time required of Staff as well as associated materials and expenditures.

**Table 6.10 Projected Public Information Program Expenditures**

<b>Planned Outreach</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Paid Advertisement - News Paper (ea)	12 \$581	12 \$598	12 \$616	12 \$633	12 \$650
Public Service Announcement - Local TV Channel (ea)	52 \$807	52 \$831	52 \$855	52 \$879	52 \$810
Utility Bills Announcements (ea)	12 \$255	12 \$262	12 \$270	12 \$278	12 \$285
Other newspaper articles announcements (ea)	4 \$509	4 \$525	4 \$540	4 \$555	4 \$570
Door Hangers with information & Tips (ea)	1 \$592	1 \$610	1 \$628	1 \$646	1 \$664
Presentations at Business & Non-profit organizations (ea)	12 \$1,535	12 \$1,581	12 \$1,627	12 \$1,673	12 \$1,719
Brochures (ea)	1 \$326	1 \$336	1 \$346	1 \$355	1 \$365
Direct Information send to customers (ea)	1 \$1,991	1 \$2,051	1 \$2,111	1 \$2,170	1 \$2,230
Web Information (ea)	4 \$933	4 \$961	4 \$989	4 \$1,017	4 \$1,045
<b>Projected Expenditures \$</b>	<b>\$7,529</b>	<b>\$7,755</b>	<b>\$7,981</b>	<b>\$8,207</b>	<b>\$8,432</b>

### 6.8 DMM 8 – School Education

The City will be working on a school education program to promote water conservation and water conservation related benefits by the fall of 2013. The City will develop educational materials such as water conservation posters and classroom presentations.





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

The City plans to put on water conservation programs for elementary school children beginning in 2013. They plan to visit 3<sup>rd</sup> to 5<sup>th</sup> grade classrooms on a quarterly basis. Once an elementary school water conservation program is established additional water conservation programs will be developed to include grade appropriate materials for middle and high school students. The City plans to have a complete school education program in place by the 2014 school year.

All materials prepared for distribution or presentation to the students will be from an approved source, such as from the California Environmental Protection Agency's website or other.





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table 6.11 Projected School Education Program Expenditures**

<b>Projected</b>	<b># Classes/Periods</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>Grades K-3rd</b>						
<b>Grades 4th - 6th</b>						
<b>Grades 7th - 8th</b>						
<b>High School</b>						
<b>Projected Expenditures \$</b>						

In order to evaluate the effectiveness of this program the City will survey the institutions and educators on the number of programs, materials and attendance at water conservation activities.

The City has no method to quantify the water savings associated with this DMM but believes that this program is in the public’s interest, and that awareness alone will result in significant savings.

**6.9 DMM 9 – Commercial, Industrial, and Institutional Water Conservation**

The City is fully metered for all customer sectors, including commercial, industrial and institutional accounts. (The reader is directed to





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

**Table** for a breakdown of accounts by sector.) The City began developing their plumbing retrofit program in 1994 under Chapter 13.09 Municipal Code Requirements (Included in Appendix D). Under code regulations, retrofitting of toilets is required upon change of ownership or use for existing commercial and industrial structures. In order to accelerate this process the City will implement an Accelerated Fixture Replacement Program (AFRP).

The City will utilize the survey results from DMM 1 to identify and rank commercial, industrial, and institutional accounts that will be targeted to participate in the AFRP. It is projected that 15% of commercial, industrial, and institutional accounts will return their surveys, and at least 5% of the owners of those returned surveys will retrofit. Incentive Programs will be evaluated once water saving success is measured with those DMMs targeting rebate programs for fixture replacements.

The AFRP will accelerate replacement of existing high water using toilets with ultra low flush (1.6 gallons or less). The number of commercial, industrial and institutional accounts with water conserving fixtures is expected to increase annually. The City will begin implementing this DMM in 2013 with an annual target rate of 5% increase in use of water conserving fixtures for at least the next five years.

The City will evaluate the effectiveness of this DMM by annual review of customers' water use, and by offering on-site follow-up evaluations to customers whose total water use exceeds their total annual water budget. Projected expenditures for DMM 9 are illustrated at Table 6.12.

**Table 6.12 Projected Commercial, Industrial, and Institutional Water Conservation Program Savings**

<b>Planned Measures</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Number of Surveys Completed	436	442			
Projected Incentives?*	No	No			
Number of Follow-up Visits	3	22			
Projected Expenditures (\$)	\$524	\$539			
Projected Water Savings(AFY)	0.03	0.11			

\*City will evaluate water saving success of DMM 6 & DMM 14 in considering appropriate incentive options





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

### **6.10 DMM 11 - Conservation Pricing**

The City is fully metered for all customer sectors, including separate meters for single-family residential, commercial, large landscapes, and all institutional/governmental facilities.

The City has a tiered water use rate structure put into effect in 2012. More information is found under DMM 4.

Water savings effectiveness will be measured through periodic review of customer water use, comparing current water use per capita with historic data.

New wastewater and water service rate charges for the City of Greenfield was implemented in 2012. Appendix G shows the breakdown for each category for the newly adopted rates for water and wastewater rate increases that the City has implemented.

### **6.11 DMM 12 – Conservation Coordinator**

Conservation Coordination efforts will be overseen by the Public Works Department. The City has designated the **Public Works Director** as the Water Conservation Coordinator. The Director is currently Dale Lipp. Duties for the Conservation Coordinator position include, but are not limited to, the following:

- Coordination and oversight of conservation programs, DMMs and BMP implementation.
- Keeping a log of conservation practices conducted throughout the City and point person(s) assigned to each area.
- Acting as the point of contact to the Public for general inquiries and requests for information.
- Preparation and submittal of the Council BMP Implementation Report
- Communication and promotion of water conservation issues to City senior management; coordination of City conservation programs with operations and planning staff; preparation of annual conservation budget; participation in the Council, including regular attendance at Council Meetings.

It is projected that the Conservation Coordinator will spend 3% working in this capacity. The City is anticipating that only one Conservation Coordinator will manage and enforce the water demand management measures.





**Table 6.13 Projected Water Conservation Coordinator Expenditures**

<b>Projected</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>Number of Full Time Positions</b>	0	0	0	0	0
<b>Number of Part Time Positions</b>	1	1	1	1	1
<b>Projected Expenditures \$</b>	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000

**6.12 DMM 13 – Water Waste Prohibition**

The City established mandatory restrictions on water waste in 1994 that require repair of plumbing, sprinkler, and irrigation systems within seventy-two hours after such the property owner first learns of the problem in their Municipal Code Chapter 13.09 (Appendix D). The regulations stipulated therein are actively enforced through issuance of warnings and penalties.

The City has not formally tracked expenditures for administering to their waste ordinance to this point. The City has budgeting an annual staff cost of \$3,000 for expenditures for administering the existing waste ordinance. See table below.

**Table 6.14 Projected Waste Water Prohibition Expenditures**

<b>Projected</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>Waste Ordinance in effect?</b>	Yes	Yes	Yes	Yes	Yes
<b>Projected Number of On-Site Visits</b>	12	12	12	12	12
<b>Projected Expenditures \$</b>	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000

**6.13 DMM 14 – Residential Ultra-Low Flush Toilet Replacement**

Please see DMM 2 discussing the regulations in place for replacing toilets to ULFT’s upon change of ownership or use. In addition, the City plans to develop a residential ultra-low flush toilet replacement program wherein single family and multifamily owners are eligible to receive a rebate on their water bills, for replacement of a 3.0 gpf toilet with a ULFT (1.6 gpf), in an established amount per toilet. – To be eligible for a rebate the property owner is solely responsible for purchase of toilet, installation arrangements, and payment. A Rebate certification form must be completed and returned to the City by the





**FINAL DRAFT**  
 City of Greenfield 2010 Urban Water Management Plan  
 FEBRUARY 21, 2013

proposed expiration date to be valid. As a condition of the rebate, customer agrees not to alter the toilets and/or showerheads in order to increase the flow of water through the fixtures. Customer must agree to allow City inspector access to verify installation if selected for random inspection. Lastly, customer agrees that rebate(s) will be through credit(s) on his/her water bill over a two billing cycle. In all cases, customer should ensure funds are available for a rebate by calling City Hall Public Works Department before replacing toilet(s).

The program will be initialized by July 2013, and fully implemented by July 2014. The City is projecting that 50 rebates will be available for the customers pending Council approval. Half of the rebates will be available for single family and the other half for multi family customers. Information on the program will be advertised in the local newspaper.

Table 6.15 projects the future water savings that will be achieved by the replacement of a 3.0 gpf toilet with a ULFT.

**Table 6.15 Projected Ultra-Low-Flush Toilet Replacement Program Expenditures**

Planned Measures	2012	2013		2014		2015		2016	
		Single Family	Multi Family						
Number of ULF Rebates	-	38	13	38	13	38	13	38	13
Number of ULF Customer Installs	-	38	13	38	13	38	13	38	13
Number of ULF CBO Installs	0	0	0	0	0	0	0	0	0
Projected Expenditures (\$)	0	\$10,123		\$10,418		\$10,713		\$11,007	
Projected Water Savings(AFY)	-	2.37	0.79	2.36	0.79	2.35	0.78	2.34	0.78





**FINAL DRAFT**  
City of Greenfield 2010 Urban Water Management Plan  
FEBRUARY 21, 2013

## **7.0 Completed UWMP Checklist**

This Plan meets all requirements of the Water Code as described in the Department of Water Resources (DWR) “Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan”.

## **8.0 References**

**Appendix A: 60-day Notice Letters**

**Appendix B: 2010 UWMP Adoption Resolution**

**Appendix C: Emergency Action Plans**

WUERM (Water Utility Emergency Response Manager)

**Appendix D: Municipal Code Chapter 13.09: Mandatory Water Conservation Regulations & Water Shortage Contingency Plan & Resolution to Declare a Water Shortage Emergency**

**Appendix E: Water Rate Study**

**Appendix F: Waste Water Rate Study**

**Appendix G: City Data**

**Appendix H: Public Comments**

On April 23, 2013, the Greenfield City Council held a second public hearing on the Final Draft 2010 Urban Water Management Plan. The comments and/or questions raised during the Public Comment / City Council meeting are summarized below.

