

# **Alamo Sewer & Water District**

## ***Water Conservation Plan***

### **Background / System Information**

The **Alamo Sewer & Water District** (hereinafter “DISTRICT”) serves customers within the town of Alamo and certain surrounding areas within the Pahranaagat Valley, an area of Lincoln County. Residential customers are metered. Meters are installed on new residential services, and on existing residential services pursuant to DISTRICT policies. Meters are also installed on all new commercial entities, as well as on existing commercial entities pursuant to DISTRICT policies. Both residential and commercial customers are billed pursuant to DISTRICT policies.

The Water System (hereinafter “SYSTEM”) is located in the Pahranaagat Valley. The SYSTEM is supplied from the following wells: Well #1, which is located adjacent to the Alamo County Annex Building; Well #3, which is located just west of the DISTRICT’S Office; Well #4, which is located further west of the Alamo Sewer and Water Office next to the Pahranaagat Valley High School Baseball Field and dugout; and Well #6, which is located adjacent to the Pahranaagat Valley High School vocational education building.

Above-ground storage consists of a 450,000 gallon reservoir, which holds 425,000 full to the set pressure float. Full-time disinfection has not been necessary and is not currently practiced. Part-time disinfection takes place in the months of June, July, and August to control algae growth in the reservoir, which growth occurs as a result of the heat.

Wastewater collected from the area is managed as follows: No runoff, only effluent; with said effluent flowing to the south of town and pumped directly to the treatment ponds to the south west of town. The DISTRICT does not utilize reclaimed water and there is no reclaimed water plant or other such system within the DISTRICT’S service area.

The DISTRICT has never had a full and complete water conservation plan. This plan is to be reviewed at five year intervals, with modifications occurring for the following reasons, which reasons include but are not limited to: meeting changing system conditions; the needs of the community; local, state and federal law; and the environment.

### **Plan Elements**

This plan describes the drinking water conservation and drought management efforts in the DISTRICT, along with implementation schedules. The plan components conform to Nevada regulations as outlined by the Nevada Department of Conservation and Natural Resource, Division of Water Resources and in

accordance with NRS 540.121 through NRS 540.151. Plan elements address the following areas:

- Methods of Public Education to:
  - Increase public awareness of the need to conserve water;
  - Encourage reduction in lawn sizes and use of arid and semiarid plants.
- Specific conservation measures required to meet the needs of the service area, including but not limited to, any conservation measures required by law.
- The management of water to:
  - Identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies;
  - Where applicable, increase the reuse of effluent.
- A contingency plan for drought conditions that ensures a supply of potable water.
- A schedule for carrying out the plan or joint plan.
- Plan Effectiveness
  - For each conservation measure specified in the plan or joint plan, an estimate of the amount of water that will be conserved each year as a result of the adoption of the plan or joint plan, stated in terms of gallons of water per person per day.
- The feasibility of charging variable rates for the use of water to encourage the conservation of water.
- How the rates that are proposed to be charged for the use of water in the plan or joint plan will maximize water conservation, including, without limitation, an estimate of the manner in which the rates will affect consumption of water.
- Incentives to encourage the following:
  - Water conservation
  - Retrofitting plumbing fixtures
  - water conserving landscaping

## **PUBLIC AWARENESS & EDUCATION**

### **Public Education**

The DISTRICT is determined to enhance public awareness of the need to conserve water, including the following:

- New customers will be provided with literature on conservation when they open a water service account. Examples include materials from the Turf Institute, American Water Works Association (AWWA), and USDA Agricultural Extension.
- Periodically, educational literature is placed in water bills, or messages appear printed in a quarterly news letter. Educational materials include tips on Conservation landscaping, 5 basic ways to conserving water, 25 things you can do to prevent water waste and water leak loss calculators.
- Participate in public outreach opportunities to raise public awareness of water use.

- Pamphlets & flyers that demonstrate how failure to conserve causes your bill to suffer.

### **Lawn sizes and use of arid and semiarid plants**

The DISTRICT encourages the public to practice turf management, and promotes the use of drip irrigation and climate-appropriate plant materials.

### **SPECIFIC WATER CONSERVATION MEASURES**

Alamo has a climate similar to Las Vegas and it is reasonable to assume that the usage profile in that area is approximately the same. The Southern Nevada Water Authority (SNWA) has broken down residential water use in the Vegas area as follows:

- 70% Landscape outdoor use
- 8% Toilets
- 6% Laundry
- 5% Showers
- 5% Faucets
- 4% Leaks
- 2% Baths, Dishwashers, and other uses

Specific conservation measures to be implemented within the service area having the purpose of reducing all or some of these percentages include the following:

#### **Mandatory**

- During the warmest and driest months of the year, from May 1<sup>st</sup> through September 30<sup>th</sup>, Stage 1 of the Drought or Emergency plan, discussed in greater detail below, is in effect.

#### **Voluntary**

- Measures specified in educational materials, with emphasis on the retrofit of plumbing fixtures and the reduction in lawn size. The educational materials include conservation measures for all aspects of residential conservation.

The mandatory (drought stage) measures focus on outdoor conservation. The voluntary measures described in the educational materials encourage both indoor and outdoor conservation.

### **Estimated Amount of Water Conserved Due to Mandatory and Voluntary Measures**

Currently average water use in Alamo is 242.49 gallons per person per day (gpcd). This amount is based on the 2000 Census population of 1,096 and an average

annual (2007 and 2008) billed amount of 97 million gallons. The Alamo gpcd amount is greater than the State average of 200 gpcd.

Table 1 summarizes the application of the SNWA percentages to the estimated Alamo gpcd usage. It also includes an estimated reductions resulting from the implementation of mandatory and voluntary measures.

**Table 1  
Estimated Amount of Water Conserved**

|                 | Current gpcd  | % Reduction      |                  | New gpcd      | Conserved gpcd | Conserved Per year |
|-----------------|---------------|------------------|------------------|---------------|----------------|--------------------|
|                 |               | General Measures | Drought Measures |               |                |                    |
| Landscape/(70%) | 169.74        | 5.00%            | 10.00%           | 144.28        | 25.46          | 9,293.43           |
| Toilets/(8%)    | 19.40         | 5.00%            | 0.00%            | 18.43         | 0.97           | 354.04             |
| Laundry/(6%)    | 14.55         | 5.00%            | 0.00%            | 13.82         | 0.73           | 265.53             |
| Showers/(5%)    | 12.12         | 5.00%            | 0.00%            | 11.52         | 0.61           | 221.27             |
| Faucets/(5%)    | 12.12         | 5.00%            | 0.00%            | 11.52         | 0.61           | 221.27             |
| Leaks/(4%)      | 9.70          | 5.00%            | 5.00%            | 8.73          | 0.97           | 354.04             |
| Bath/Dish/(2%)  | 4.85          | 5.00%            | 0.00%            | 4.61          | 0.24           | 88.51              |
| <b>Total</b>    | <b>242.49</b> |                  |                  | <b>212.91</b> | <b>29.58</b>   | <b>10,798.08</b>   |

Table 2 shows potential savings resulting from plumbing retrofits depending upon the existing fixture installed.

**Table 2  
Potential Water Savings**

| Fixture*                 | Fixture Capacity         | WATER USE (gpd) |                 | WATER SAVINGS (gpd) |                 |
|--------------------------|--------------------------|-----------------|-----------------|---------------------|-----------------|
|                          |                          | Per Capita      | Per Household** | Per Capita          | Per Household** |
| <b>Toilets***</b>        |                          |                 |                 |                     |                 |
| Efficient                | 1.5 gal/flush            | 6.0             | 16.2            | N/A                 | N/A             |
| Low-Flow                 | 3.5 gal/flush            | 14.0            | 37.8            | 8.0                 | 21.6            |
| Conventional             | 5.5 gal/flush            | 22.0            | 59.4            | 16.0                | 43.2            |
| Conventional             | 7.0 gal/flush            | 28.0            | 75.6            | 22.0                | 59.4            |
| <b>Showerheads†§</b>     |                          |                 |                 |                     |                 |
| Efficient                | 2.5 [1.7] gal/min        | 8.2             | 22.1            | N/A                 | N/A             |
| Low-Flow                 | 3.0 to 5.0 [2.6] gal/min | 12.5            | 33.8            | 4.3                 | 11.7            |
| Conventional             | 5.0 to 8.0 gal/min       | 16.3            | 44.0            | 8.1                 | 22.0            |
| <b>Faucets†§</b>         |                          |                 |                 |                     |                 |
| Efficient                | 2.5 [1.7] gal/min        | 6.8             | 18.4            | N/A                 | N/A             |
| Low-Flow                 | 3.0 [2.0] gal/min        | 8.0             | 21.6            | 1.2                 | 3.2             |
| Conventional             | 3.0 to 7.0 gal/min       | 13.2            | 36.6            | 6.4                 | 17.2            |
| <b>Fixtures Combined</b> |                          |                 |                 |                     |                 |
| Efficient                | N/A                      | 21.0            | 56.7            | N/A                 | N/A             |
| Low-Flow                 | N/A                      | 34.5            | 93.2            | 13.4                | 36.4            |
| Conventional             | N/A                      | 54.5            | 147.2           | 33.5                | 90.4            |

Source: Amy Vickers, "Water Use Efficiency Standards for Plumbing Fixtures: Benefits of National Legislation", *American Water Works Association Journal*. Vol 82 (May 1990): 53

\*Efficient = post-1994, Low-Flow = post-1980, Conventional = pre-1980; \*\*Assumes 2.7 persons per household.

\*\*\*Assumes four flushes per person per day. Does not include losses through leakage.

†For showerheads and faucets: maximum rated fixture capacity [measured fixture capacity]. Measured capacity equals about 2/3 the maximum.

§Assumes 4.8 shower-use-minutes per person per day and 4.0 faucet-use-minutes per person per day.

## **WATER MANAGEMENT**

### **Plan to identify and reduce leakage**

- The DISTRICT has in place a capital improvement plan to replace distribution lines at the anticipated life-cycle end.
- Monthly, we audit production vs. sales to determine the amount of unaccounted water and infrastructure leakage index. We also compare current to historical same-month production. When production increases unexpectedly, we initiate a leak survey.
- It is our written policy to repair leaks in a timely manner. All large leaks are repaired immediately and small leaks (less than 1 gallon per minute) within 48 hours.

## **Reuse of effluent**

Effluent flows to the south of town and is pumped to the treatment ponds which are located to the south west of town. Currently, there are no plans in place to reuse effluent within the service area.

Incentives for the customers of DISTRICT to use water conserving landscaping are demonstrated through educational pamphlets, flyers, and bill stuffers.

## **DROUGHT CONTINGENCY PLAN**

Nevada is an arid state, and Lincoln County is continuing to grow and water requirements are increasing. The area is subject to drought cycles; therefore, it is necessary to have a drought contingency plan. The objective of our plan is to manage the available resources to insure continued supply of potable water during periods of drought. The DISTRICT monitors water levels at its well sites and keeps record of the information. The DISTRICT works together with the community to insure adequate supplies are available.

When the DISTRICT has found that a water scarcity condition exists or is likely to exist and has proclaimed the existence of a drought or emergency condition, it shall also declare an appropriate drought or emergency stage for its service area which may be Stage 1, Stage 2, Stage 3, or Stage 4, described as follows:

### **Stage 1 Drought or Emergency**

1. Water from the DISTRICT's water system allowed to pool, pond, or run-off of applied areas is considered a waste of water and as such is not permitted.
2. Leaks occurring on the customer side of each meter in the DISTRICT's water system are considered a waste of water and as such are not permitted.
3. Water from the DISTRICTS's water system which runs down the street due to excessive watering or poorly maintained sprinklers is considered a waste of water and as such, is not permitted. If a sprinkler system is broken and left on for more than two (2) hours, the water will be shut off by the Town until it is fixed.
4. During a Stage 1 Drought or Emergency, lawn watering, including landscaping and the watering of a garden, will NOT be permitted between the hours of 9:00 am and 5:00 pm.

### **Stage 2 Drought or Emergency**

- 1 Water from the DISTRICT's water system allowed to pool, pond, or run-off of applied areas is considered a waste of water and as such is not permitted.

2. Leaks occurring on the customer side of each meter in the DISTRICT's water system are considered a waste of water and as such are not permitted.
3. No hard surfaces including sidewalks, driveways, parking areas, or decks may be washed or hosed down with water supplied through the DISTRICT's potable water system unless required by health and safety requirements.
4. No washing of vehicles with hoses is permitted with the DISTRICT's water supplied through the DISTRICT's potable water system, except with hoses equipped with an automatic shut off device or at facilities designated on the DISTRICT's billing records as a commercial vehicle wash.
5. Water used for watering vegetation, including lawns, landscaping, and gardens is limited as follows:
  - a. Residences with even numbered addresses: Monday, Wednesday, & Saturday;
  - b. Residences with odd numbered addresses: Tuesday, Thursday & Sunday;
  - c. Commercial and Industrial Customers: Tuesday and Friday; and Sunday;
  - d. All watering of lawns, landscaping, and gardens is prohibited between the hours of 9:00 am and 5:00 pm
6. No use of water for any decorative purpose is permitted.

### **Stage 3 Drought or Emergency**

1. Water from the DISTRICT's water system allowed to pool, pond, or run-off of applied areas is considered a waste of water and as such is not permitted.
2. Leaks occurring on the customer side of each meter in the DISTRICT's water system are considered a waste of water and as such are not permitted.
3. No hard surfaces including sidewalks, driveways, parking areas, or decks may be washed or hosed down with water supplied through the DISTRICT's potable water system unless required by health and safety requirements.
4. No washing of vehicles with hoses is permitted with the DISTRICT's water supplied through the DISTRICT's potable water system, except with hoses equipped with an automatic shut off device or at facilities designated on the DISTRICT's billing records as a commercial vehicle wash.

5. Water used for watering vegetation, including lawns, landscaping, and gardens is limited as follows:
  - a. Residences with even numbered addresses: Wednesday & Saturday;
  - b. Residences with odd numbered addresses: Tuesday & Sunday;
  - c. Commercial and Industrial Customers: Tuesday & Friday;
  - d. All watering of lawns, landscaping, and gardens is prohibited between the hours of 9:00 pm and 5:00 pm.
6. No use of water for any decorative purpose is permitted.
7. Water from the town's potable water system used for general construction or maintenance activities, including dust control, compaction and concrete curing, is considered a waste of water and as such is not permitted.

#### **Stage 4 Drought or Emergency**

1. Water from the DISTRICT's water system allowed to pool, pond, or run-off of applied areas is considered a waste of water and as such is not permitted.
2. Leaks occurring on the customer side of each meter in the DISTRICT's water system are considered a waste of water and as such are not permitted.
3. No hard surfaces including sidewalks, driveways, parking areas, or decks may be washed or hosed down with water supplied through the DISTRICT's potable water system unless required by health and safety requirements.
4. No washing of vehicles with hoses is permitted with the DISTRICT's water supplied through the DISTRICT's potable water system, except with hoses equipped with an automatic shut off device or at facilities designated on the DISTRICT's billing records as a commercial vehicle wash.
5. Water used for watering vegetation, including lawns, landscaping, and gardens is limited as follows:
  - a. No watering from December through February;
  - b. Watering will only be allowed one day per week during March, April & May.



- c. Watering will be allowed two days per week from June 1<sup>st</sup> through August 15<sup>th</sup>:
    1. Residences with even numbered addresses: Wednesday & Saturday;
    2. Residences with odd numbered addresses: Tuesday & Sunday;
    3. Commercial and Industrial Customers: Tuesday & Friday;
  - d. One day per week August 16<sup>th</sup> through September;
  - e. All watering of lawns, landscaping, and gardens is prohibited between the hours of 9:00 am and 5:00 pm
6. No use of water for any decorative purpose is permitted.
  7. Water from the town's potable water system used for general construction or maintenance activities, including dust control, compaction and concrete curing, is considered a waste of water and as such is not permitted.
  8. During a Stage 4 Drought or Emergency, the planting or installing of new lawns is prohibited from July through September.

### **IMPLEMENTATION SCHEDULE**

All of the Water Management and Drought Contingency Plan elements listed above are currently in place.

This plan is to be reviewed every five years, and updated as system needs change.

### **PLAN EFFECTIVENESS**

As stated above, all of the Water Management and Drought Contingency Plan elements listed above are currently in place. Moreover, the management and plan elements have been in place for a number of years, and the town has undergone significant relative growth since their implementation. Therefore, it is difficult to ascertain to what degree the average annual consumption has been effected by said Water Management and Drought Contingency Plan elements.

Additionally, it has also been stated above that all customers are metered. It should be noted that the DISTRICT is in the process of increasing its rates over the next three (3) to five (5) years to address the issues of continued growth, ongoing maintenance, and capital improvement. It is the DISTRICT's understanding, based on

historical evaluations and information provided by other water providers, that metering is the primary driving force behind conservation, as it is the best way to raise the awareness of water use at the individual account level. The DISTRICT believes that metering alone provides a ten (10) percent reduction in water use. The DISTRICT further believes that metering, coupled with its rate structure change, and with the public education elements, should provide an overall reduction of approximately fifteen (15) percent reduction in water use at the individual account level.

### **Variable Pricing**

All customers are billed at a base plus progressive unit charge basis. As stated above, the DISTRICT is in the process of increasing its rates over the next three (3) to five (5) years to address the issues of continued growth, ongoing maintenance, and capital improvement. There are no plans to change the rate structure *only* to promote conservation. Rates are scheduled to be reviewed annually and adjusted to meet budgeted costs. Each time rates are altered, the water usage patterns will be analyzed to determine price sensitivity. The amount of water conserved as a result of actual price changes will be used in future analyses.

### **Rate structure impact on water conservation**

At this time, the DISTRICT believes it is feasible to utilize variable metering rates as a means of encouraging conservation of water. However, the DISTRICT does not anticipate the immediate implementation of rate structure alterations as a means of water conservation. The DISTRICT will continue to monitor the water usage in its service area and will re-visit this issue at each rate modification.

## **INCENTIVES TO ENCOURAGE WATER CONSERVATION**

### **Incentives to encourage water conservation**

Because of budget limitations, the primary conservation measures for the District are the inclining block rate structure (financial incentive) and educational measures including the distribution of literature produced by the agricultural extension and the AWWA (educational incentive). Inclining-block rate structures are known to encourage conservation. The rate structure for Alamo is summarized in the following table:

**Table 3  
Alamo Water Rates**

| Meter Size | Base Rate | Rate per 1000 Gallons |                  |          |
|------------|-----------|-----------------------|------------------|----------|
|            |           | 7,501 – 50,000        | 50,001 – 100,000 | >100,000 |
| ¾"         | \$27.00   | \$0.50                | \$0.60           | \$0.70   |
| 1"         | \$38.00   | \$0.50                | \$0.60           | \$0.70   |
| 1 ½"       | \$49.60   | \$0.50                | \$0.60           | \$0.70   |
| 2"         | \$78.00   | \$0.50                | \$0.60           | \$0.70   |
| 3"         | \$110.00  | \$0.50                | \$0.60           | \$0.70   |
| 4"         | \$378.00  | \$0.50                | \$0.60           | \$0.70   |
| 6"         | \$567.00  | \$0.50                | \$0.60           | \$0.70   |
| 8"         | \$783.00  | \$0.50                | \$0.60           | \$0.70   |

**Educational incentives to retrofit plumbing fixtures**

The AWWA pamphlets "Water Conservation at Home" and "55 Facts Figures & Follies of Water Conservation" include information regarding plumbing retrofit. These pamphlets or others including similar information will be distributed to new customers and periodically included in water bills. Additional water conservation related messages will appear in the quarterly news letter.

**Incentives for water conserving landscaping**

Educational incentives regarding lawn size reduction are included in pamphlets produced by the Cooperative extension service. These pamphlets have other landscape related information such as guidance on fertilizer use, irrigation system installation and maintenance, and lists of low water-use plants. These pamphlets can also be distributed to new customers and through the billing system.

**Public Inspection of this Plan**

Per NRS 540.151.4(a), this Plan will be available for inspection during District office hours at:

100 W. Broadway  
Alamo, Nevada 89001  
Phone: (775) 725-3377