



TOWN OF APPLE VALLEY

TOWN COUNCIL STAFF REPORT

To: Honorable Mayor and Town Council Date: October 24, 2017

From: Greg Snyder, Director of Public Works Item No: 8
Public Works Department

Subject: ADOPT RESOLUTION NO. 2017-32, A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF APPLE VALLEY, CALIFORNIA, CONFIRMING THE IMPLEMENTATION OF THE RECYCLED WATER PROGRAM BY THE TOWN OF APPLE VALLEY IN ACCORDANCE WITH THE STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR RECYCLED WATER (ORDER WQ 2016-0068-DDW) AND CONSISTENT WITH THE VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY RECYCLED WATER PROGRAM (ORDINANCE NO. 006)

T.M. Approval: _____ Budgeted Item: Yes No N/A

RECOMMENDED ACTION:

Adopt Resolution No. 2017-32, a Resolution of the Town Council of the Town of Apple Valley, California, confirming the implementation of the recycled water program by the Town of Apple Valley in accordance with the statewide general waste discharge requirements for recycled water (Order WQ 2016-0068-DDW) and consistent with the Victor Valley Wastewater Reclamation Authority recycled water program (Ordinance No. 006).

SUMMARY:

Victor Valley Wastewater Reclamation Authority (VWVRA) constructed satellite scalping plants within the wastewater collection system to produce disinfected tertiary recycled water closer to the end users to minimize overall production and distribution costs. One of these scalping plants is the Apple Valley Subregional Water Reclamation Plant (WRP). The initial recycled water production capacity of the WRP is 1.0 million gallons per day

(MGD), but it is designed for expansion to at least 2.0 MGD. Depending on the area growth and demand for recycled water, the WRP may eventually be expanded by up to 4.0 MGD.

The recycled water that will be produced at the Apple Valley WRP will be distributed to recycled water users by the Town of Apple Valley (Town). Initial plans for recycled water use include landscape irrigation at the Apple Valley Golf Course, Civic Center Park, Brewster Park and Thunderbird Park. Additional users and use sites will be considered as the program is developed. The Town is working with Larry Walker Associates to implement its recycled water program.

BACKGROUND:

Recycled water programs in the VVWRA service area are regulated under the General Order (Order WQ 2016-0068-DDW) and the Notice of Applicability issued to VVWRA and its member agencies. Operation of the WRP is regulated under Waste Discharge Requirements and Water Recycling Requirements (Order No. R6V-2013-0004).

VVWRA owns and operates the Regional WRP and Apple Valley Subregional WRP and is the recycled water “Producer” and “Recycled Water Program Administrator” for the VVWRA service area. The Town is the “Recycled Water Program Administrator” and recycled water “Distributor” within its service area.

VVWRA adopted a recycled water ordinance (Ordinance No. 006) that specifies how the Recycled Water Program is implemented by VVWRA and its member agencies. VVWRA, as the overall Recycled Water Program Administrator, has delegated authority to the Town to process Use Agreements and approve permit applications, establish recycled water Site Supervisors, designate use areas, specify application methods, dictate self-monitoring and reporting requirements, conduct site inspections, and provide notification of applicable regulatory requirements. VVWRA acts as a clearinghouse for the Town’s program; reviewing permit applications, approving permits, collecting self-monitoring reports, compiling site inspection reports, conducting water quality monitoring and preparing annual reports to the Regional Water Board.

FISCAL IMPACT:

Not applicable.

ATTACHMENTS:

1. Resolution No. 2017-32
2. Recycled Water Program Guidelines

RESOLUTION No. 2017-32

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF APPLE VALLEY, CALIFORNIA, CONFIRMING THE IMPLEMENTATION OF THE RECYCLED WATER PROGRAM BY THE TOWN OF APPLE VALLEY IN ACCORDANCE WITH THE STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR RECYCLED WATER (ORDER WQ 2016-0068-DDW) AND CONSISTENT WITH THE VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY RECYCLED WATER PROGRAM (ORDINANCE NO. 006)

WHEREAS, the Victor Valley Wastewater Reclamation Authority (“VWVRA”) currently produces “disinfected tertiary recycled water” which complies with Title 22 of the California Code of Regulations (“Recycled Water”) at its Westside Regional Water Reclamation Plant (“Regional WRP”), located in Victorville, California; and

WHEREAS, the VWVRA Board of Commissioners approved the construction of satellite scalping plants within the wastewater collection system operated by VWVRA to produce additional Recycled Water closer to the end users and, among other things, minimize overall production and distribution costs, with one such plant expected to commence operation in the Town of Apple Valley (Town) in 2017 (“Subregional WRP”); and

WHEREAS, the operation of the Subregional WRPs is regulated by Regional Water Quality Control Board under Waste Discharge Requirements and Water Recycling Requirements adopted in 2013 (Hesperia/Order No. R6V-2013-0005) and is intended to be used for a variety of users including landscape irrigation; and

WHEREAS, the SWRCB adopted General Water Reclamation Requirements for Recycled Water Use in June, 2016 (Order WQ 2016-0068-DDW) (“General Order”), to provide a mechanism to streamline the permitting process for the production, use and discharge of Recycled Water and to delegate the administration of such programs to the local producer of such Recycled Water in lieu of continuing regulation under the regional boards such as Lahontan; and

WHEREAS, the VWVRA adopted Ordinance No. 006 (“VWVRA Ordinance”) on November 19, 2015, to provide for the adoption of a recycled water program pursuant to the requirements of the General Order, as the same may be amended from time to time and to specify the authority of VWVRA as the “Producer” of such recycled water program; and

WHEREAS, the VWVRA acts as the “Administrator” of the recycled water program and the Town acts as a “Distributor” of Recycled Water, as such terms are defined in the General Order; and

WHEREAS, the Town has reviewed the requirements of the General Order and the VVWRA Ordinance, and believes such requirements provide valid basis for the implementation of the recycled water program.

NOW, THEREFORE, BE IT RESOLVED that the Town Council of the Town of Apple Valley, California, finds, determines and orders as follows:

1. Certifies that the Town will comply with the General Order and abide by its requirements; and
2. Certifies that the Town will implement its recycled water program as reflected in and in accordance with the VVWRA Ordinance.

APPROVED and **ADOPTED** by the Town Council of the Town of Apple Valley this 24th day of October 2017.

Scott Nassif, Mayor

ATTEST:

La Vonda M. Pearson, Town Clerk



SEPTEMBER 25, 2017

Town of Apple Valley

Recycled Water Program Guidelines

Prepared by:
LARRY WALKER ASSOCIATES

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1. Introduction

This document was developed to assist the Town of Apple Valley with implementation of a recycled water program that will be in compliance with the Statewide General Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW, General Order) and the Notice of Applicability (NOA) issued by the Lahontan Regional Water Quality Control Board on January 11, 2017. The guidelines address the procedures for issuing permits to recycled water users and explains the operational, reporting, and monitoring requirements for regulatory compliance, including roles and responsibilities of the Recycled Water Program Administrator, Distributor, and Users along with the necessary training procedures of their respective personnel.

The Town of Apple Valley is a member agency of the Victor Valley Wastewater Reclamation Authority (VWVRA). VWVRA is a joint powers authority and public agency of the State of California. In addition to the Town of Apple Valley, the VWVRA member agencies include the City of Hesperia, the County of San Bernardino Service Areas 42 and 64, and the City of Victorville. VWVRA owns and operates the Apple Valley Subregional Water Reclamation Plant (WRP). Recycled water produced at the Apple Valley Subregional WRP is distributed to recycled water users by the Town of Apple Valley (Town). Initial plans for recycled water use include landscape irrigation at the Apple Valley Golf Course, Apple Valley Civic Center Park, Brewster Park, and Thunderbird Park. Additional uses and use sites will be considered as the program is developed.

1.1 Background

To augment and optimize its water recycling capabilities, VWVRA constructed satellite scalping plants within the wastewater collection system to produce disinfected tertiary recycled water closer to the end users to minimize overall production and distribution costs. One of these scalping plants is the Apple Valley Subregional WRP. The initial recycled water production capacity of the WRP is 1.0 million gallons per day (MGD), but it is designed for expansion to at least 2.0 MGD. Depending on area growth and demand for recycled water, the WRP may eventually be expanded up to 4.0 MGD.

The Apple Valley Subregional WRP treats wastewater extracted from the VWVRA collection system. The liquid stream treatment consists of influent pumping, fine screening, potential future grit removal, activated sludge biological treatment, membrane filtration by a membrane bioreactor (MBR) system, and UV disinfection. Effluent not used as recycled water is either discharged to percolation ponds near the WRPs or returned to the VWVRA collection system. During routine operation, it is expected that most if not all of the recycled water produced will be utilized, so recycled water storage/disposal is expected to be minimal and seasonal. The ponds are not intended for groundwater recharge and modifications to the groundwater adjudication will be required before they can be used for this purpose. Solids generated during treatment are returned to the VWVRA collection system for anaerobic digestion and energy production at the Regional WRP. The Apple Valley Subregional WRP is located on the north side of Otoe Road, between Dale Evans Parkway and Cheyenne Road, as shown in **Figure 1**.



Figure 1. Apple Valley Subregional WRP

1.2 Applicable Regulations and Ordinances

Recycled water programs in the VVWRA service area are regulated under the General Order (Order WQ 2016-0068-DDW) and NOA issued to VVWRA and its member agencies. Operation of the Apple Valley Subregional WRP is regulated under Waste Discharge Requirements and Water Recycling Requirements (Order No. R6V-2013-0004).

VVWRA submitted a Notice of Intent (NOI) and CCR Title 22 Engineering Report on February 28, 2015. Regional Water Board staff provided comments on the NOI and Engineering Report on March 20, 2015, and the Division of Drinking Water (DDW) provided comments on April 15, 2015. VVWRA revised the documents to address these comments and submitted a revised technical report on January 4, 2016. DDW approved the NOI and Engineering Report on April 25, 2016 with specific conditions. On January 11, 2017, the Regional Water Board issued a NOA to enroll the VVWRA under the General Order.

VVWRA owns and operates the Regional WRP and Apple Valley Subregional WRP and is the recycled water “Producer” and “Recycled Water Program Administrator” for the VVWRA service area. The Town of Apple Valley is the “Recycled Water Program Administrator” and recycled water “Distributor” within its service area.

VVWRA adopted a recycled water ordinance (Ordinance No. 006) that specifies how the VVWRA Recycled Water Program is implemented by VVWRA and its member agencies. VVWRA, as the overall Recycled Water Program Administrator, has delegated authority to the Town of Apple Valley to process Use Agreements and approve permit applications, establish recycled water Site Supervisors, designate use areas, specify application methods, dictate self-monitoring and reporting requirements, conduct site inspections, and provide notification of

applicable regulatory requirements. VVWRA acts as a clearinghouse for the Town's program; reviewing permit applications, approving permits, collecting self-monitoring reports, compiling site inspection reports, conducting water quality monitoring, and preparing annual reports to the Regional Water Board.

2. Types of Use and User-Specific Rules and Regulations

Currently, recycled water produced at the Apple Valley Subregional WRP is solely applied for the purpose of landscape irrigation.

Landscape Irrigation

At present, four sites are scheduled to receive recycled water from the Apple Valley Subregional WRP, shown in **Table 1**. Sites are all considered Administrator Controlled Users and are owned and operated by the Town of Apple Valley. Contracted User Sites that are not owned and operated by the Town may be considered in the future. While both Administrator Controlled and Contracted Users are subject to the same requirements and operational guidelines, only Contracted Users will be required to apply for a permit.

Table 1. List of recycled water use sites

Recycled Water Use Site	Type of Use	Owner/Operator	User Type
Apple Valley Golf Course	Landscape Irrigation	Town of Apple Valley	Administrator Controlled User
Apple Valley Civic Center Park	Landscape Irrigation	Town of Apple Valley	Administrator Controlled User
Brewster Park	Landscape Irrigation	Town of Apple Valley	Administrator Controlled User
Thunderbird Park	Landscape Irrigation	Town of Apple Valley	Administrator Controlled User

3. Regulatory Procedures

The Town of Apple Valley implements a program designed by VVWRA that ensures recycled water is safely and legally applied at the recycled water use sites. The program establishes recycled water site supervisors, designates use areas, specifies application methods, dictates self-monitoring and reporting requirements, and provides notification of applicable regulatory requirements to ensure regulatory compliance. If needed, VVWRA and the Town of Apple Valley will secure recycled water Use Agreements with Contracted Users through the use of a permit. The specific requirements for recycled water use, excerpted from CCR Title 17 and 22, and the provisions of Order WQ 2016-0068-DDW will be provided to each User and reviewed during their initial training event.

3.1 Use Agreement for Recycled Water Users

Recycled water Users in Apple Valley will be connected to a recycled water distribution pipeline. The complete regulatory process required to obtain and maintain a recycled water Use Agreement or permit is shown in **Figure 1**. For each Use Site, the following information needs to be provided:

- Site layout;
- Plans to combine recycled water with other water sources (e.g., well water, process water);
- Proposed use of water (landscape irrigation, crop irrigation, cooling water, etc.);
- Type of irrigation system;
- Operation of on-site recycled water storage facilities;
- Procedures for cross-connection control; and
- Identification of a Recycled Water Site Supervisor.

As indicated above, Users must identify a Recycled Water Site Supervisor that will be the contact person at the Use Site and the person responsible for day-to-day operation of the recycled water system. The designated individual will have complete knowledge of the storage/irrigation system and will be available at all times to respond to emergencies or calls for assistance from the Town.

An Application for Recycled Water Use Permit is provided in **Appendix A**. Although a permit application doesn't need to be submitted for Administrator Controlled Users, they are subject to the same requirements as Contracted Users and, therefore, the Permit Application presented in Appendix A can be used as a check list to make sure all the needed information is collected. In addition, although a formal written agreement isn't needed for Administrator Controlled Users, there are site specific terms and conditions (e.g., monitoring locations, contact information, descriptions of operations) that Site Supervisors will provide to staff designated by the Town's Program Administrator. These terms and conditions are referred to as a Use Agreement in the remainder of this document.

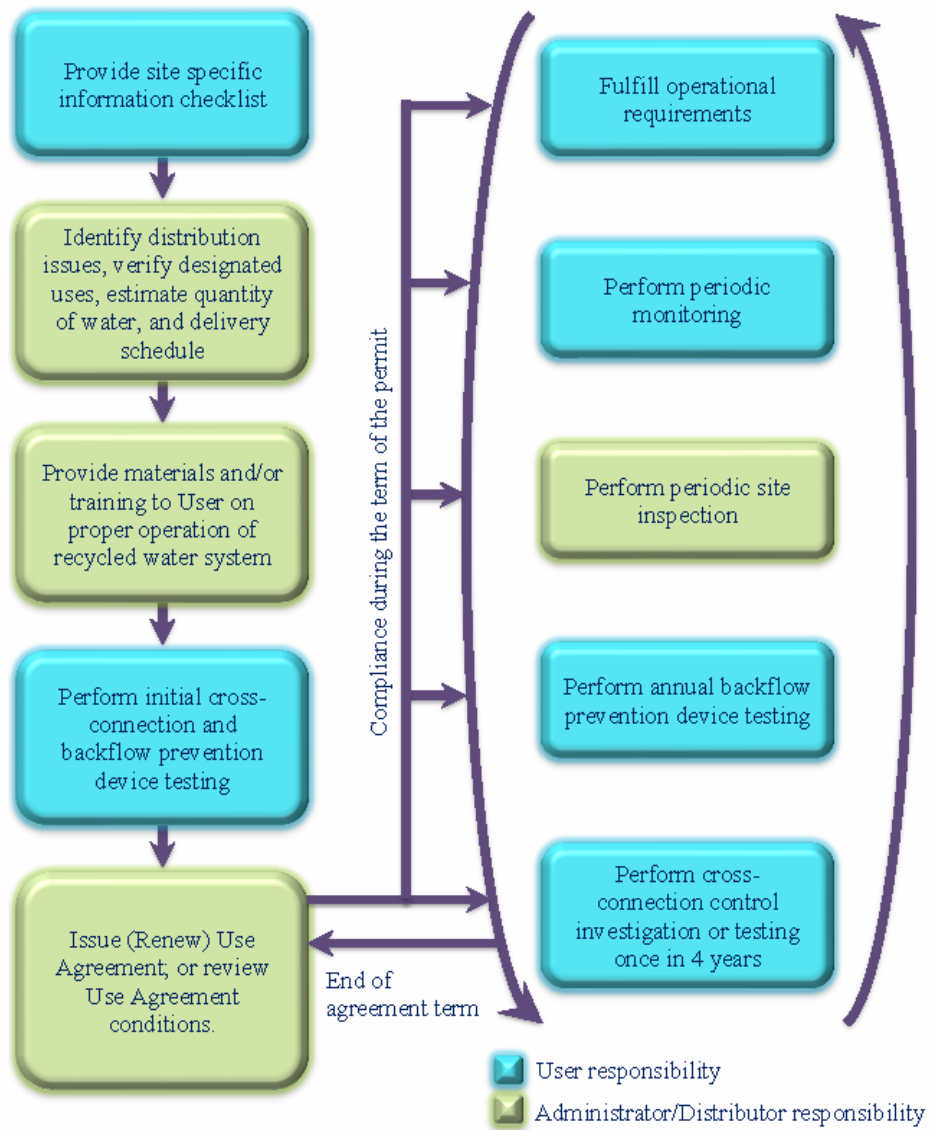


Figure 1. Regulatory framework for issuing and renewing Recycled Water Use Agreements

The Town will verify information provided by the User through a site visit and discussions with the potential User. Any distribution issues will be resolved by the User and the Town and incorporated into the Use Agreement or, if needed, a Recycled Water Use Permit (Appendix A). Reference materials with information on the proper operation and maintenance of the recycled water system will be provided to the User during the initial training and processing of the Use Agreement. These materials will include, but not necessarily be limited to, Recycled Water Program Rules and Regulations (Appendix B), CCR Titles 17 and 22, and Order WQ 2016-0068-DDW.

Authorization to use recycled water will be issued to a User only after completion of a Cross-Connection Control Investigation or Testing to identify and remove any connections between recycled and potable water supplies (Cross-Connection control program is discussed in detail in **Section 0**). The Town will review the investigation and test results to ensure that the necessary repairs are made before issuing the permit to Contracted Users or authorizing Controlled Users. If needed, "Additional Permit Terms and Conditions" will be attached to the Use Agreement or permit to outline required monitoring sites and frequencies, and any site-specific conditions that may be necessary. During the term of the Use Agreement or the permit, Users are required to:

- Fulfill operational requirements by assuming the responsibilities outlined in **Section 0**.
- Perform the required monitoring and reporting as indicated in **Section 5**.
- Perform annual backflow prevention device testing and submit applicable reports to the Town.
- Perform cross-connection control investigation or testing once every four years and submit applicable reports to the Town.

The Town will perform periodic site visits and inspections and assess compliance with conditions specified in the Use Agreements.

4. Fulfilling Operational Requirements

The recycled water Users and the Town must fulfill operational requirements and follow the guidelines outlined below.

4.1 User Responsibilities

The User is responsible for operating and maintaining all recycled water equipment located beyond the delivery point (the recycled water meter). An onsite Recycled Water Site Supervisor is designated for each Use Site. The Site Supervisor ensures safe usage of recycled water at the Use Site.

The Recycled Water Site Supervisor is responsible for operation, maintenance, self-monitoring, and cross-connection control at each use site. The Site Supervisor will also be responsible for communicating with the Town and conducting periodic staff education/training sessions. Site Supervisors must attend a Site Supervisor training arranged by the Town prior to receiving recycled water. Site Supervisors should maintain a current training certificate or an indication of the completion of the training.

One of the main responsibilities of the Site Supervisor is to ensure operational compliance of the facility. This entails supervising the fulfillment of all User responsibilities included in this section as operational requirements (i.e., site control, irrigation application, maintenance, monitoring and testing).

The Site Supervisor is also responsible for training all employees that interact with recycled water and developing a precautionary safety plan for employees that repair/replace recycled water equipment. Employee training is verified by the Town during Use Site inspections. Additional training of User employees is provided by the Town if particular issues are noted.

4.1.1 Site Control

Cross Connection and Backflow Prevention

A cross-connection is an unintended connection between the potable water system and the recycled water system. A cross-connection exposes the community water supply system to possible intrusion of recycled water and the Users to the possibility of ingestion of recycled water.

Prior to authorization of a Recycled Water Use and every four years thereafter (or more frequently if necessary), a Certified Cross-Connection Control Specialist (as described in CCR Title 17, Section 7605) must conduct a site investigation and test the recycled water system to identify any cross-connections. The Site Supervisor must be present during the test.

On an annual basis, the User must provide access to all relevant site locations and equipment by a Certified Backflow Prevention Device Tester and Town staff for backflow prevention device testing.

The investigation and testing results will be recorded by the Specialists on the forms in **Appendix F** and any deficiencies will be noted along with the prescribed corrective actions. The User must address any deficiencies noted by the Specialists within a deadline specified by the Town in order to initiate or continue delivery of recycled water. If during a test any cross-

connection is found to exist, an emergency procedure as detailed in **Section 7** should be immediately initiated and completed.

Unapproved Use of Recycled Water

Use of recycled water for any purpose other than those explicitly allowed in the Recycled Water User agreement (or permit) is strictly prohibited. The Site Supervisor is responsible for ensuring appropriate use of the recycled water and should initiate an emergency procedure as detailed in **Section 7** if any unapproved use is detected.

Labeling and Advisory Signage

All Use Sites that are accessible to the public must be posted with clearly visible signs to inform the public that recycled water is used at that location. Signs shall meet the requirements of CCR Title 22, Section 60310 (g): measure no less than 4 inches high by 8 inches wide, include the words “Recycled Water – Do not Drink,” and display an international symbol for no consumption. It is recommended that signs be posted at least every 500 ft with a minimum of a sign at each corner and at each access road.

All recycled water facilities and equipment should be marked or color-coded with purple, purple pipe, purple color paint or wrapping with purple color adhesive tape.

4.1.2 Irrigation Application

Coverage Test

The Site Supervisor is responsible for minimizing overspray, runoff, and ponding from the recycled water irrigation system.

Protection of Drinking Fountains and Outdoor Eating Areas

Drinking fountains, outdoor eating areas, and other similar facilities located within the use area must be protected from overspray or contact with recycled water. Relocating or modifying parts of the irrigation system or those facilities may resolve the issue. If not, shielding devices must be installed to protect drinking water fountains and other facilities.

Protection of Potable Water Systems and Aquifers

No irrigation with recycled water may take place within 50 ft of a domestic water supply well unless specific well protections are installed and verified. No recycled water impoundments may occur within 100 ft of a domestic water supply well. In addition, separation of potable and recycled water piping shall be maintained to the greatest extent possible in both new construction and retrofit applications. The California Department of Public Health Guidance Memo No. 2003-02, “Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines” includes methods and standards for protecting potable water pipelines.

Irrigation Schedule (Hours of Operation)

Irrigation shall occur during the hours of least use by the public and (if applicable) as indicated on the individual Recycled Water Use Agreement (or permit). The Site Supervisor is responsible for maintaining a schedule that conforms to this requirement.

Irrigation at Agronomic Rates

The General Order requires “application of recycled water to use area(s) at an agronomic rate¹ that takes into account soil, climate, and plant demand. In addition, application of recycled water and use of fertilizers shall be at a rate that takes into consideration nutrient levels in recycled water and nutrient demand by plants.”

The Town follows the approach described by VVWRA in the NOI and will use the process outlined in **Table 2** to conservatively estimate the volume of recycled water required for irrigation. The crop coefficients, sprinkler efficiency, and 2013 weather conditions are presented in Table 2 as an example. The spreadsheet calculations take into account local weather conditions, the type of vegetation being irrigated, crop evapotranspiration, and sprinkler efficiency (large applicators will be expected to achieve the highest sprinkler efficiency that is possible). The total annual irrigation requirement of 6.0 ft/yr calculated for local grass in 2013(**Table 2**) assumes leaching of salts or deep percolation (if needed) to maintain healthy turf conditions will be done with potable or other supplies of irrigation water. As described below, actual conditions will be used to complete the agronomic rate calculation for each site.

Local precipitation and evapotranspiration data will be obtained from the Victorville California Irrigation Management Information System (CIMIS) station #117 at the end of each month. The recycled water Users will submit monthly reports to the Town that include the area(s) irrigated each month, type of vegetation under cultivation, and sources/volume of other irrigation water applied. The Town will maintain a spreadsheet (similar to **Table 2**) to compare actual use with the calculated agronomic rate. Applicable crop coefficients will be identified and utilized. The assessment will be conducted over three month periods and, if necessary, Users will be contacted and provided recommendations to reduce recycled water irrigation rates or change operations. If needed to ensure application at agronomic rates and prevent runoff/ponding, site- specific Irrigation Management Plans will be developed by the Users for review and approval by the Town. The Irrigation Management Plans may include downloading evapotranspiration data from CIMIS Station #117 on a daily or weekly basis to better inform irrigation system operation.

To avoid application above nitrogen agronomic rates, use of recycled water and fertilizers must be at a rate less than or equal to the nitrogen requirement of the crop under cultivation. For example, to maintain high quality Bermuda grass, it must be mowed frequently and 0.5 lb N/1,000 ft should be applied each month (Pettygrove and Asano, 1988; Duble, R., Undated). If applying nitrogen at this monthly rate, 262 lb N/acre-yr is required to support Bermuda grass.

The process outlined in **Table 3** will be used to determine the total nitrogen loading resulting from irrigation of grass with 100% recycled water. The effluent nitrogen concentrations presented in **Table 3** are based on the design criteria for the Subregional WRPs. Based on 2013 weather conditions, Subregional WRP effluent nitrogen design criteria, the total nitrogen loading for irrigating Bermuda grass with Subregional WRP recycled water would be approximately 130 lb N/acre-yr. Based on the 2013 assessment, estimated nitrogen loading from the Subregional WRPs would have been less than 50% of the threshold value identified for Bermuda grass (262 lb N/acre-year).

¹ An agronomic rate is the rate of application of recycled water to plants necessary to satisfy the plants' evapotranspiration requirements, considering allowances for supplemental water (e.g., effective precipitation), irrigation distribution uniformity, and leaching requirement, thus minimizing the movement of nutrients below the plants' root zone.

Table 2. Estimated Grass Water Use in Victorville Area (Based on 2013 weather conditions)

Month	Eto, Victorville (in./mo) ¹	Precipitation, Victorville (in./mo) ²	Eto-P (in./mo) ¹	Crop Coefficient (grass) ³	Sprinkler Efficiency ⁴	Grass Water Use (in./mo) ⁵
January	2.12	0.72	1.40	0.44	0.73	0.84
February	3.06	0.2	2.86	0.43	0.73	1.68
March	5.56	0.13	5.43	0.67	0.73	4.98
April	7.02	0	7.02	0.76	0.73	7.31
May	8.23	0	8.23	0.74	0.73	8.34
June	9.42	0	9.42	0.89	0.73	11.48
July	8.87	0	8.87	0.89	0.73	10.81
August	8.68	0	8.68	0.82	0.73	9.75
September	6.75	0	6.75	0.82	0.73	7.58
October	4.6	0	4.60	0.77	0.73	4.85
November	2.44	0	2.44	0.81	0.73	2.71
December	2.1	0	2.10	0.51	0.73	1.47
Total (in./yr)	68.85	1.05	67.80	--	--	71.82
Total (ft./yr)	5.74	0.09	5.65	--	--	6.00

¹ Eto, 2013 monthly totals from CIMIS Victorville Station #117 (downloaded from CIMIS website on 11/20/14).
² Precipitation, 2013 monthly total from CIMIS Victorville Station #117 (downloaded from CIMIS website on 11/20/14).
³ Kc, determined for Bermuda grass/perennial rye at golf courses in Las Vegas, NV. (Devitt et al, 1992)
⁴ Solid set sprinkler efficiency ranges from 70 to 80%. Minimum efficiencies can be expected in hot climates, low humidity, and high average wind speeds. (Pettygrove and Asano, 1988)
⁵ The calculated irrigation requirement does not include a leaching factor.

The recycled water Users will provide information on the volume of recycled water applied, area irrigated, type of vegetation under cultivation, and any other source/type of fertilizer used. The Town will use this information to calculate actual nitrogen loading which will be compared to applicable crop thresholds using hydraulic agronomic rate requirements. The assessments will be conducted over three month periods and, if necessary, the Town will contact the User and provide recommendations to reduce nitrogen loading rates or change operations. If needed to ensure application at nitrogen agronomic rates, site-specific Irrigation Management Plans will be developed by the Users for review and approval by the Town. The Irrigation Management Plans may include monitoring fertilizer application on a daily or weekly basis to improve fertilization practices and inform irrigation system operation.

Table 3. Estimated Total Nitrogen Loading (Based on 2013 Grass Water Use and Subregional WRP design criteria)¹

Month	2013 Grass Water Use (in./mo)	Subregional WRP	
		Total Nitrogen (mg/L) ³	Total Nitrogen Applied (lb N/acre)
January	0.84	8	1.53
February	1.68	8	3.05
March	4.98	8	9.02
April	7.31	8	13.23
May	8.34	8	15.10
June	11.48	8	20.78
July	10.81	8	19.57
August	9.75	8	17.64
September	7.58	8	13.72
October	4.85	8	8.78
November	2.71	8	4.90
December	1.47	8	2.65
Total (lb N/acre)	--	--	130.0

¹ Total Nitrogen = TKN + nitrate + nitrite

³ Total nitrogen loading based on design criteria of 8 mg/L TN.

4.1.3 Maintenance, Monitoring, and Testing

Site Supervisors must perform monitoring and preventive maintenance to ensure the recycled water system remains in compliance. This includes observation of site conditions and verification of proper operation of recycled water distribution system at locations included in the Recycled Water Use Agreement (or permit). The site inspection and maintenance program must at least include:

- Confirming appropriate usage of recycled water as designated in the Recycled Water Use Agreement (or permit) and estimating the use amount.
- Performing inspections of recycled water system equipment and facilities for leaks, breaks, overflows, etc., and immediately repair any defections.
- Checking for occurrences of recycled water ponding or runoff and estimate their respective volumes.
- Checking all signs and labels for their proper placement and legibility, and replace or add signs and labels wherever needed.
- Maintain accurate record keeping system of all inspections, modifications, and repair work for inclusion in monthly Self-Monitoring reports (Appendix E).

4.2 Distributor Responsibilities

The Town (Distributor) is responsible for operating and maintaining the recycled water distribution equipment between the Subregional WRP and the delivery point (the recycled water meter). The Town also has administrative responsibilities delegated from VVWRA for authorizing Controlled Uses, issuing and renewing permits for Contracted Users, site supervisor training, and site inspections, cross-connection control, and reporting results to VVWRA.

4.2.1 Handling the Effects of Recycled water on Equipment

Recycled water may contain higher levels of chlorine, sodium, and potentially ammonia and nitrates than potable water. The Distributor should be aware of the effects of such constituents in higher concentrations on the distribution system and implement mitigation strategies that will handle such effects and deteriorations.

4.2.2 Cleaning Tanks and Pipelines

Recycled water tanks and pipelines require more frequent cleaning than potable water tanks and pipelines due to higher nutrient concentration. Before cleaning tanks and pipes it is important to determine where the discharges from the cleaning operations will go. When cleaning recycled water tanks, it is important to provide adequate ventilation and cleaning equipment. For pipeline cleaning, the Distributor may consider a directional flushing program.

4.2.3 Public Notice

The distributor should provide reasonably timed notices to the Users and public prior to performing system shutdowns.

4.2.4 Personnel Training

Town employees must be given an initial training on recycled water program operation, regulatory requirements, and safety precautions. The Recycled Water Program Rules and Regulations, Order WQ 2016-0068-DDW, CCR Titles 17 and 22, the recycled water ordinance (if adopted), and O&M Manual sections on recycled water equipment should be reviewed by all employees that interact with the recycled water program. The training will include:

- A facility tour to demonstrate recycled water production and distribution
- Proper handling of recycled water and safety precautions
- Review of maintenance procedures and proper use of tools
- Color coding and labeling recycled water facilities
- Cross-connection control procedures
- Measures to implement in the event of a recycled water discharge
- Emergency procedures

A tour of the use sites should also be conducted to introduce staff to Recycled Water Site Supervisors, identify site characteristics, and locate storage and distribution equipment. Follow-up training should be provided every 2 years or more often if needed.

4.2.5 Labeling and Advisory Signage

All Use Sites that are accessible to the public must be posted with clearly visible signs to inform the public that recycled water is used at that location. Signs shall meet the requirements of CCR Title 22, Section 60310 (g): measure no less than 4 inches high by 8 inches wide, include the words “Recycled Water – Do not Drink,” and display an international symbol for no consumption. It is recommended that signs be posted at least every 500 ft with a minimum of a sign at each corner and at each access road.

All recycled water facilities and equipment should be marked or color-coded with purple, purple pipe, purple color paint or wrapping with purple color adhesive tape.

4.2.6 Site Supervisor Training

Once a Recycled Water Use is authorized, a training session must be held with the designated Recycled Water Site Supervisor regarding recycled water regulations, safety precautions for personnel handling recycled water, how to complete the program forms, and when to submit the required information. A copy of the Recycled Water Program Rules and Regulations, Order WQ 2016-0068-DDW, and CCR Titles 17 and 22 must be provided to facilitate understanding of the regulatory requirements. The same training session must be held following the issuance of a Recycled Water Use Permit to a Contracted User.

4.2.7 Periodic Site Inspections

The Town must perform unannounced, randomly timed inspections of Use Sites at least once per year. Observations will be recorded on the Site Inspection Report (Appendix C). The observations are used to verify information reported in the User Self-Monitoring Reports and include such items as recycled water use, operation of storage and irrigation systems, placement of warning signs, and evidence of runoff or ponding.

All site inspection reports and User Self-Monitoring Reports must be provided to VVWRA for submittal to the Regional Water Board in the Recycled Water Annual Report, or sooner if any violations of conditions occur.

4.2.8 Backflow Testing and Cross-Connection Control Program

The Town will implement the Cross-Connection Control Program by sending annual and every four year testing notices to the Users, reviewing test results, and enforcing compliance. The Town ensures CCR Title 17 requirements are met at each Use Site and that backflow prevention devices are installed at all potable water supply wellheads and connections. If deficiencies are noted by a Certified Specialist, the Town will establish a deadline for compliance and assist with re-inspections to identify when corrections are completed.

The results of User investigations and testing are incorporated into the User’s file and may be included in the Recycled Water Annual Report to the Regional Water Board. A recycled water shutdown test is required prior to reauthorization of a Recycled Water Use and every four years if potential problems are identified. Interim testing may be conducted if a User installs new equipment, significantly changes its recycled water operation, or a possible cross-connection is identified at the Use Site. The same requirements are observed if a Recycled Water Use Permit is issued for a future Contracted User.

5. Monitoring and Reporting Requirements

5.1 Town (Administrator/Distributor)

5.1.1 Monitoring Requirements

As the Distributor, the Town is responsible for transport of recycled water from the WRP to the Use Sites. WRP operations are continuously scrutinized to ensure production of high quality recycled water. Use Sites are randomly inspected at least once a year to ensure proper usage of recycled water. Details of the two types of Administrator/Distributor monitoring are presented below.

VVWRA and the Town monitor the quantity of recycled water leaving the WRP and delivered to the Use Sites. Meters installed at each delivery point record the total number of gallons distributed to each User. These metered amounts, recorded on a monthly basis, are used to quantify the monthly delivery to each User.

VVWRA monitors the quality of recycled water leaving the WRP. Therefore, VVWRA measures the concentrations of constituents of concern for landscape irrigation.¹ The results will be reported to Users on an annual basis, so they can utilize this information to determine fertilizer application rates or incorporate soil amendments. VVWRA collects samples after disinfection and prior to recycled water pumping. Samples from this location are representative of the recycled water quality being distributed to the Users. If the limits specified in CCR Title 22 are exceeded, VVWRA will notify the Regional Water Board within 24 hours and halt distribution until the violations have been corrected.

The Town will perform unannounced, randomly timed inspections of Use Sites at least once per year. Observations are recorded on the Site Inspection Report (**Appendix C**). The observations are used to verify information reported in the User Self-Monitoring Reports and include such items as recycled water use, operation of storage and irrigation systems, placement of warning signs, and evidence of runoff or ponding.

All monitoring results will be submitted to the Regional Water Board in the Recycled Water Annual Report, or sooner if any violations of the conditions occur.

5.1.2 Reporting Requirements

The Town is required to provide documents to VVWRA that summarize operation of the Recycled Water Program, report any violations of the General Order, document actions taken or planned to correct the violations and prevent future violations. The documents help VVWRA assess compliance with the General Order and facilitate compilation of the Recycled Water Annual Report for submittal to the Regional Water Board. The required documents include Site Inspection Reports, User Self-Monitoring Reports, Significant Violation Reports, and Agronomic Rate Assessments. If there exist any Contracted Users, Application for Recycled Water Use Permit must be included, as well.

¹ pH, Chloride, Boron, Electrical Conductivity, Nitrate, Nitrite, Ammonia, Total Nitrogen, Total Kjeldahl Nitrogen.

Recycled Water Annual Report

VVWRA submits the Recycled Water Annual Report to the Regional Water Board that describes operation of and changes to the Recycled Water Program. The Town will provide the following information for its service area to VVWRA to be included in the Recycled Water Annual Reports:

- A summary table of all recycled water Users and use areas. Maps may be included to identify use areas. Newly authorized recycled water Users and use areas shall be identified.
- Volume of recycled water distributed and used (acre-ft).
- A summary table of all inspections and enforcement activities initiated by the Town. Included in the report will be a discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into compliance with the Notice of Intent (NOI) and/or General Order. Copies of any enforcement actions taken by the Administrator shall be provided.
- Information on how Irrigation Management Plans are being implemented and whether large applicators have applied both recycled water and nutrients at agronomic rates. Any adjustments or modifications will be identified for the upcoming year to ensure appropriate amounts are applied.
- Summary of training events conducted and the number of participants.
- The number and severity of any violations found during the reporting period, actions planned/taken to resolve violations, and the penalty of perjury statement.

Significant Violation Report

If the General Order provisions are violated, the Town must notify the Regional Water Board by phone within 24 hours. The information to be provided is outlined in the Significant Violation Report (Appendix D). When the violations have been corrected or the User has been removed from service, the Regional Water Board will be notified of the final resolution.

5.2 User Responsibilities

5.2.1 Self-Monitoring and Reporting Requirements

Users are required to perform monthly observations of site conditions and verify proper operation of their recycled water distribution system. Monitoring locations are specified by the Town's Program Administrator for Controlled Users and would be specified in the Permit for Contracted User. Both land sites and pond (or impoundment) observation sites may be specified. The Users must perform the observations and data collection identified in **Table 4** and record the results in the Recycled Water User Self-Monitoring Report (Appendix E). A copy of the monitoring report must be submitted to the Town within 15 days after the end of the calendar quarter.

Although submittal of User Self-Monitoring Reports is required on a quarterly basis, User awareness must be continuous to note any violations of recycled water use requirements. If a violation or adverse condition is noted, the User must contact the Town immediately by telephone. The User also has a responsibility to discuss any planned operational changes with the Town prior to implementation. Depending on the nature of the changes, the Town will inform

VVWRA and the Regional Water Board and may change the terms and conditions of the Recycled Water Use Agreement.

Table 4. Recycled Water Program Use Area Monitoring Requirements

Constituent	Units	Sample Type	Monitoring Frequency
Acreage Applied ¹	Acres	Calculated	Monthly ²
Recycled Water Applied ³	Acre-ft.	Measured	Monthly ²
Fertilizer Applied ⁴	lb N/acre	Measured	Monthly ²
Backflow or Cross-Connection Incident	--	By Occurrence	By Occurrence
Soil Saturation/Ponding ⁵	--	Observation	Monthly ²
Nuisance Odors/Vectors ⁵	--	Observation	Monthly ²
Discharge Off-Site ⁵	--	Observation	Monthly ²
Notification Signs ⁶	--	Observation	Monthly ²
Any Other Condition of Note	--	Observation	Monthly ²

¹ Acreage applied" is the total number of acres to which recycled water is applied during the monitoring period.

² Monthly when recycled water is used. Adverse conditions should be immediately reported to the Administrator.

³ If known, report the amount of recycled water applied to each irrigation block or industrial process.

⁴ Amount of commercial fertilizers applied.

⁵ Note if any of these conditions occurred during the monitoring period.

⁶ Verify notification signs are in place according to CCR Title 22, section 60310 (g).

6. Compliance Program

The Regional Water Board is guaranteed access, for inspection and monitoring purposes, to premises where recycled water is being produced or used. Records maintained for the Recycled Water Program will be made available to the Regional Water Board upon request. Each User is responsible for implementing the Recycled Water Program Rules and Regulations (Appendix B), CCR Titles 17 and 22, Order WQ 2016-0068-DDW, and the recycled water ordinance.

Compliance activities and notification triggers are shown schematically in **Figure 2**. The Users perform self-monitoring by routinely observing operation of the recycled water storage facilities and distribution system. If any possible violations of the conditions in their Use Agreement are noted, the Users must contact the Town immediately. At that time, the Town will assess the incident, inspect the site (if necessary), and determine if a violation has occurred. In addition, the California Office of Emergency Services (Cal OES) must be notified by telephone as soon as possible of any release of hazardous materials to surface waters. If the incident is determined to be a violation, the Town will notify VVWRA and the Regional Water Board (and Cal OES, as appropriate) of the violation within 24 hours. The Town and User will discuss the cause of the violation, and the approach/timing for correction. If a violation has occurred, the Town will prescribe actions and deadlines. The Regional Water Board will be copied on any correspondence concerning non-compliance between the Town, VVWRA and the User. The Town will conduct a site inspection on the deadline date to determine if compliance has been achieved. If the User fails to implement the prescribed actions, the Town has the authority to shut off the recycled water supply to the site. The delivery of recycled water shall not be resumed until all conditions which caused the violations have been corrected.

Inspections of Use Sites will be conducted at random during times of recycled water use. During the visit, the Town will verify site operation according to Use Agreement conditions. If violations are noted, the actions described above will be implemented. The Town will notify VVWRA and the Regional Water Board (and Cal OES, as appropriate), prescribe corrective actions, establish a deadline, and verify implementation. When the violations have been corrected or the User has been removed from service, the Regional Water Board will be notified of the final resolution.

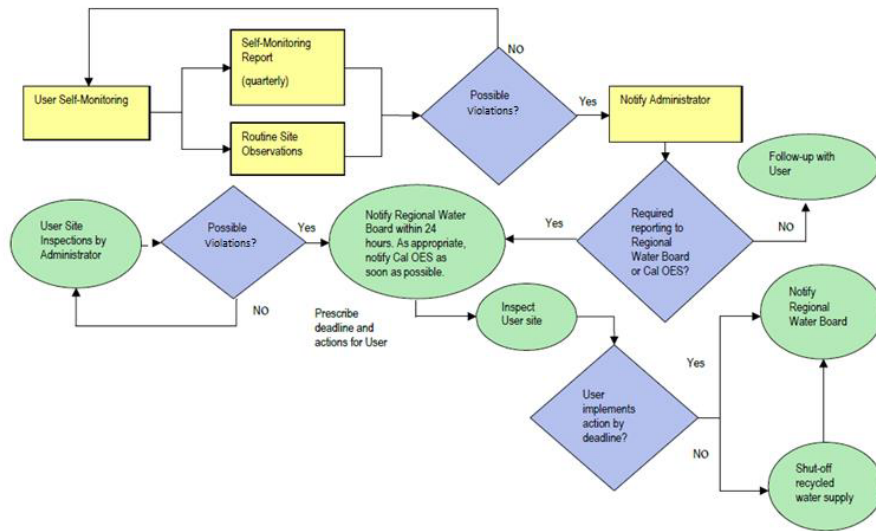


Figure 2. Recycled Water Program Schematic Representation of Compliance Activities

7. Emergency Procedures and Notification

Emergencies, such as equipment failures, cross-connections, earthquakes, and power outages, may occur at Use Sites or at the WRP. In the event of such emergencies, notification of the VVWRA, the Town, or the User (as applicable) must take place as soon as possible. An immediate change in operation or termination of flow may be required to minimize risks to human health. Emergency procedures are detailed in the following sections. Emergency contact information for the Distributor and the Recycled Water Site Supervisors is presented in **Table 5**. The list will be posted at Town offices updated when Use Agreements are reviewed and administered.

Table 5. Emergency Contacts

Recycled Water Program Administrator and Distributor	Contact	Contact Information
Town of Apple Valley	Lance Miller, Director of Public Works	Phone: 760-240-7000 ext. 7500
VVWRA Coordinator (Emergency Contact Person)		Phone: 760-246-8638
Recycled Water Users	Contact	Contact Information
Apple Valley Golf Course	Town needs to provide this for each of the users listed.	
Apple Valley Civic Center Park		
Brewster Park		
Thunderbird Park		

7.1 Distributor Emergency Procedures

If a system failure occurs at the Subregional WRP and properly treated recycled water cannot be guaranteed to the User, the VVWRA will shut off the recycled water supply pumps. The water will be stored in on-site and off-site basins or sent to the Regional WRP until the problems have been corrected. The Users will be notified by telephone by the Town as soon as possible of the flow termination, the nature of the failure, and an estimation of the required down-time. If inadequately treated water was already delivered to the User, precautions will be prescribed (limitation of public access, avoidance of contact, prevention of runoff, etc.).

In case of a recycled water emergency within the distribution system (i.e., pipe break, pump failure), the Town will contact VVWRA with the details and request flow termination. The VVWRA Coordinator is the primary contact person and is knowledgeable about the Recycled Water Program and its facilities, included in **Table 5**. The VVWRA Operations Center is available 24 hours a day, 7 days a week for recycled water emergencies.

7.2 User Emergency Procedures

In case of a recycled water emergency at a Use Site, the Town must be contacted in order to terminate flow to the site. Depending on the nature of the emergency, the User may also be

directed to shut down the potable water system. The Town's emergency contact information is provided to each Site Supervisor.

8. References

1. California State Water Resources Control Board (2016). Water Reclamation Requirements for Recycled Water Use, Order WQ 2016-0068-DDW, Sacramento, California.
2. California Department of Health Services (2001). "Guidelines for the Preparation of an Engineering Report for the Production, Distribution, and Use of Recycled Water," prepared by the Department of Health Services, Division of Drinking Water, Recycled Water Unit, Sacramento, California.
3. California Department of Health Services (2003). "Guidance Memo No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines" prepared by the Department of Health Services, Division of Drinking Water and Environmental Management, Sacramento, California.
4. Devitt, D.A., Morris, R.L. and Bowman, D.C. (1992). "Evapotranspiration, crop coefficients, and leaching fractions of irrigated desert turf grass systems." *Agron. J.* 84:717-723.
5. Duble, R. (Undated). "Bermuda Grass - The Sports Turf of the South," Texas A&M Agrilife Extension, Aggie Horticulture.
<http://aggie-horticulture.tamu.edu/archives/parsons/turf/publications/bermuda.html>
6. Mojave Water Agency (2015), "Mojave Salt and Nutrient Management Plan," prepared by Kennedy/Jenks Consultants and Todd Engineers.
7. Pettygrove, G.S., Asano, T. (1988). *Irrigation with Reclaimed Municipal Wastewater*, Lewis Publishers, Inc.

Appendix A. Recycled Water Permit Application

Appendix B. Recycled Water Program Rules and Regulations

Appendix C. Site Inspection Report

Appendix D. Significant Violation Report

Appendix E. User Self-Monitoring Report

**Appendix F. Cross-Connection Test Report and
Backflow Prevention Device Test Report**

Appendix G. Recycled Water Use Permit and Conditions
