State Water Resources Control Board

Division of Drinking Water

December 1, 2022 PWS No. CA4810013

Solano Irrigation District
810 Vaca Valley Pkwy Ste 201
Vacaville, CA 95688-8834

Rural North Vacaville Water District
3875 Joslin Avenue
Vacaville, CA 95688

Attention: Gordon Stankowski, RNVWD General Manager
Cary Keaten, SID General Manager

Subject: 2021 Sanitary Survey

Enclosed is the 2021 sanitary survey report for Rural North Vacaville Water District (RNVWD), supplemental to our sanitary survey findings letter issued to RNVWD on June 6, 2022.

The assistance provided by your staff during the sanitary survey is greatly appreciated. If you have any questions concerning the report, please contact Ms. Alla Lilichenko at Alla.Lilichenko@Waterboards.ca.gov or me at Marco.Pacheco@Waterboards.ca.gov.

Sincerely,

Digitally signed by Marco Pacheco
Date: 2022.12.01 09:03:56 -08'00'

Water Boards

Marco Pacheco, PE
Sr. Water Resource Control Engineer
San Francisco District

Enclosure: 2021 Sanitary Survey Report – Rural North Vacaville Water District

cc: Solano County Environmental Health Department (w/o enclosure)

Sanitary Survey Report

For The

Rural North Vacaville

System No. 4810013

October 2021

San Francisco District

Drinking Water Field Operations Branch

Alla Lilichenko, Sanitary Engineer

I. INTRODUCTION

1.1 Purpose of Report

On October 27, 2021, Ms. Alla Lilichenko, Sanitary Engineer with California's State Water Resources Control Board – Division of Drinking Water (Division), conducted a sanitary survey of the Rural North Vacaville water district (RNVWD). The survey covered the following:

1. Water source
2. Treatment
3. Distribution system
4. Pumping facilities
5. Finished water storage
6. Monitoring, reporting, and record retention
7. Management and operations
8. Operator compliance

This report provides a description of the water system and its operation, assesses compliance with applicable laws and regulations, identifies sanitary hazards, and makes recommendations.

1.2 Description

RNVWD is a community water system serving only unincorporated area of rural Solano County, north of Vacaville, CA. The surrounding land is mixed agricultural rural-residential comprised of the 22 square mile service area enveloping Cantelow Road, English Hills, Gibson Canyon, and Steiger Hill.

Based on the 2021 Annual Report submitted to the Division, the system provides drinking water for 398 metered service connections or approximately 1,130 people. The sources of supply are two groundwater wells, Well 01, Primary Station (PS) Code 4800753-001 and Well 02, PS Code 4800753-002. RNVWD wells are located approximately 1000 feet apart, drilled to a depth of 1,400 feet (ft). According to the pump tests performed on September 9, 2021, well 01 and well 02 are producing 414 and 307 gallons per minute (gpm), respectively. Well 02 continues to serve as an emergency standby source due to historical arsenic levels greater than the 10 µg/L maximum contaminant level (MCL). The wells are located in the Solano sub-basin of the Sacramento County Valley groundwater basin, DWR basin number 5-21.66.

1.3 Source of Information

Source of information used in this report include:

- Division's files
- Water System's files
- 2021 Annual Report
- Solano Irrigation District (SID) persons of interest present at the survey included:

    - Mr. Joshua Hendrickson, contracted SID State Certified Operator
    - Ms. Sue Murphy, contracted SID water quality contact

II. INVESTIGATIONS AND FINDINGS

2.1 Permit & Classification

2.1.1 Permit Status

The Division issued water supply permit no. 02-04-00P-4810013 on June 16, 2000. The water system is in compliance with the provisions of the domestic water supply permit.

2.1.2 Changes in System

RNVWD is actively making plans to treat the arsenic contamination at Well 02 for long-term sustainability. On August 2, 2021, Luhdorf & Scalmanini Consulting Engineers submitted an arsenic treatment update report to the Division notifying that the project is in progress and provided specific deadlines for completion. According to the submitted documentation, construction completion is behind schedule. Thus, Well 02 is remaining on standby status until the arsenic treatment is installed and a permit amendment is issued by the Division.

2.1.3 System Classification

RNVWD is classified as a community water system (CWS).

**Population and Service Connections from the 2021 Annual Report*

Residential Population	Residential Service Connections	Total Service Connections
1130	398	398

* Population taken from a Municipal Service Review Report for LAFCO using a 2.83 person per household in Solano County

2.2 Sources

2.2.1 Groundwater Sources

RNVWD has two approved groundwater sources, Well 01, PS Code 4810013-001-001 and Well 02, PS Code 4810013-002-002. Specifications, construction, surface features, and standard controls are shown below:

Specifications

Sources	Status	Capacity	Well Depth	Drilling Date	Pump
Well 01	Active	414 gpm	1391 feet	10/11/2011	75 hp vertical
Well 02	Standby	308 gpm	1284 feet	10/29/2001	75 hp vertical

Construction

Sources	Casing Material	Casing Diameter	Annular Seal Depth	Annular Seal Material
Well 01	Steel	16.625 inches	902 feet	Cement Grout
Well 02	Steel	16.625 inches	901 feet	Cement Grout

Surface

Source	Openings Sealed	Casing Vent	Air Relief Vent	Screen Intervals (feet below surface
Well 01	Yes	Yes	Yes	1017/1047; 1169/1189; 1245/1261; 1271/1291; 1351/1361
Well 02	No	Yes	Yes	1071/1099; 1210/1240

Standard controls

Sources	Check Valve	Flowmeter	Pump-to-Waste	Enclosure	Sample Tap
Well 01	Yes	Yes	Yes	Yes	Yes
Well 02	Yes	Yes	Yes	Yes	Yes

Prior inspection findings detailed an unsealed opening at the wellhead pump pedestal for Well 02. The deficiency was corrected, and photographic evidence was submitted to the Division on 1/19/2022.

2.2.2 Adequacy of Supply

RNVWD is required to have sufficient source capacity and storage to meet the Maximum Daily Demand (MDD) per Title 22, Section 64554 of the California Code of Regulations (22 CCR §64554).

In 2021, RNVWD reported an unusually high MDD of 1.788 MGD on July 6. Historically reported MDDs have been approximately 0.5 MGD. The total production capacity of the active Well 1 is approximately 0.600 MGD. Additional emergency source capacity from standby Well 02 supplies 0.443 MGD for a maximum of five consecutive days and fifteen total days per year, per 22 CCR §64414(c). RNVWD has a storage capacity of 0.6 MG and previously, when combined with production available, RNVWD had sufficient water available to meet its MDD and complied with the Waterworks Standards based on use of the Well 01 reliable source, storage, and Well 02 emergency supply capacity. The reported MDD of 1.788 MGD in 2021 should be checked for accuracy.

Water Production based on 2021 Annual Reports

Source Type	Maximum Day (MG)		Maximum Month (MG)		Annual Total (MG)
Groundwater	7/6/2021	1.788	August	8,470,000	60,730,000

2.2.3 Source Water Assessment and Protection (SWAP)

The latest source water assessment of the two groundwater sources was completed by Luhdorff & Scalmanini Consulting Engineers in March 2002, with later revision in 2021. The results of the assessment found no identifiable activities that were associated with contaminants in the groundwater supply that would impact the water supply wells. The

assessment goes on to identify nearby livestock grazing, low density septic systems, orchards, and irrigation wells as possible sources of contamination for Well 01 and 02. However, both wells were determined to have high physical barrier effectiveness based upon their construction and susceptibility to contamination.

Contaminating Activity Offset Distances

Sources	Distance from:			
	Sewer, Septic	Leaching Field	Cesspool	Animals
Well 01	> 50 ft	> 100 ft	> 150 ft	> 100 ft
Well 02	> 50 ft	> 100 ft	> 150 ft	> 100 ft

2.3 Treatment

2.3.1 Treatment Method

RNVWD chlorinates its water supply on a continuous basis. A supervisory control and data acquisition (SCADA) system monitors chlorine residual levels. The feed rate is controlled manually to provide delivered chlorine residual levels ranging between 0.5 and 0.8 mg/L. Using a double-walled containment for chemical storage, RNVWD stores 12.5% sodium hypochlorite with no dilution upwards of six months before refill. The treatment facility is stored in a secure shed adjacent to Well 01 and includes an eye wash station for emergencies. Each well has its own chlorine injection supplied by the centralized treatment located at Well 01 site. As a safety precaution, an eye wash station is located at each well site.

2.3.2 NSF Certification

The disinfection and oxidation chemical stored on site is 1087 Sodium Hypochlorite 9. The product is NSF/ANSI 60 Certified per 22 CCR §64590.

2.3.3 Equipment Specifications

A Prominent® control, chlorine analyzer, and chemical metering pumps inject chlorine through black polyethylene tubing downstream of the well's check valve. The operator stated the target residual fed to the well head is 1.5 mg/L free chlorine.

2.4 Storage

RNVWD has two storage tanks, 1 surge tank, and one hydropneumatic pressure tank. They are as follows:

Storage Facilities

Name	Location	Storage Capacity	Description
Surge Tank	Well 1	5,500 gallons	Pressure Tank
Tank 01	Station Site 3	300,000 gallons	Coated Steel (2004)
Tank 02	Station Site 4	300,000 gallons	Coated Steel (2004)
Pressure Tank	Station Site 4	5,500 gallons	Pressure Tank

2.5 Distribution System

2.5.1 History and Materials

The RNVWD distribution system is constructed on approximately 22 square miles in the rural hills of north Vacaville, serving 398 service connections across six pressure zones. Water is delivered through approximately 40.3 miles of water mains ranging from 4 inches to 12 inches in diameter, consisting of mostly Class 150 and 200 PVC piping. Security for the distribution system is adequate, as it includes chain linked fences, locked pump sheds, and storage tanks with locked ladders reducing risk of unauthorized entry, theft, or vandalism.

2.5.2 Pump Facilities

The well pumps are operated by the tank level controllers and operate in series to supply the distribution system. During sample collection, Well 02 pumps to waste as an adjacent farmer utilizes the water for irrigation purposes; therefore, no wastewater (NPDES) permit is required. Throughout the distribution system the pressure range varies between 60 and 130 psi due to terrain. The elevation in the system varies from 170 feet to 980 feet above sea level.

Finished Water Pump Facilities

Station Number	**Status**	**Pressure Zone Receive**	**Pressure Zone Served**	**Pump (HP)**	**Capacity (gpm)**	**Comments (condition, auxiliary power)**
3	Active	1	3	30	500	2 booster pumps
4	Active	3	4	20	500	2 booster pumps
None	Active	3	2			2 PRVs
None	Active	2	1			3 PRVs
5	Active	4	5	10	130	2 booster pumps

Finished water pumping stations in the distribution system are adequate, with each facility having at least two pumps. The pumps can alternate but can be activated to pump simultaneously to meet peak demands.

RNVWD utilizes supervisory control and data acquisition (SCADA) computer system to continuously monitor and remotely operate the system as needed. This feature allows the system to set pressure parameters throughout the distribution system to alarm in case of malfunction requiring further investigation.

2.5.3 Pressure Zones

The distribution system pressure zones, because of the steep elevation changes in the service area terrain, are supplied by pumped and gravity fed supply lines from station sites 3 and 4.

Pressure Zones

Pressure Zone	Pressure Range (psi)	Source Production (wells, pressure sta. etc.)	Storage Capacity	No. of Connections (Approx.)
1	40-131	Wells	300,000-gallon reservoir	164
2	40-140	PRV from Zone 3		129
3	40-120	Pumps at Station 3	300,000-gallon reservoir	52
4	40-80	Pumps at Station 4	5,000-gallon pressure tank	43
5	40-60	Pumps at Station 5		10
TOTAL				**398**

Pressure regulating valves are installed and maintained at each residential service connection to ensure a delivery pressure range of 40-80 psi. Additionally, RNVWD contains four pressure reducing valves located in Zone 2 supplying the greatest number of service connections along the English Hills service area.

2.5.4 Water Mains

Reportedly, there were no main or service connections breaks in the past year. There are no lead pipes, joints, and/or lead solder used in the distribution system.

Material	Amount @ %	Size, inch	Class/Gage	Condition
PVC	~100%	4, 6, 8, and 12	150 and 200	Excellent
CL&C	<1%	12		Excellent

2.5.5 Water Main Separation Practices

Each house has one septic. Reportedly, RNVWD separation practice complies with the California Waterworks Standards.

2.5.6 Valve Maintenance Program

Reportedly, all valves are exercised once a year. However, records are not kept.

2.5.7 Flushing Program

Reportedly, all dead-ends are flushed twice a year. However, records are not kept.

2.5.8 Main Disinfection Program

Reportedly, RNVWD follows the existing ANSI/AWWA C651-14 Disinfecting Water Mains standards.

2.5.9 Cross Connection Control

RNVWD is required by Title 17, Section 7584 of the California Code of Regulations (17 CCR §7584) to implement a cross-connection control program. RNVWD has a comprehensive cross-connection control program including operating rules, surveys, backflow protection devices, personnel trained, annual backflow prevention device testing, and records maintenance. According to the Annual Report, the AWWA certified specialist, Josh Hendrickson, was recorded to have completed the cross-connection control survey in 2021.

2.5.10 Certified Operators

In accordance with 22 CCR §64413.3, RNVWD is classified as a D1 level distribution system. RNVWD meets the distribution system staff certification requirements of 22 CCR §64413.7 by contracting at least one D1 designated chief operator, and at least one D1 designated shift operator who are available to be contacted within one hour. RVVWD is in compliance with the requirement.

2.6 Water Quality & Monitoring

2.6.1 Distribution System Monitoring

2.6.1.1 Revised Total Coliform Rule

The distribution system bacteriological monitoring program is conducted in strict accordance with the bacteriological sample siting plan, dated November 1, 2021, and approved by the Division on November 15, 2021. The minimum required distribution system total coliform sampling frequency for RNVWD is two monthly samples based upon

population data. The review of bacteriological data from the past years indicates that the water system is in compliance with bacteriological quality requirements, 22 CCR §64423.

Sampling for chlorine residuals is required at the same time and at the same locations as for total coliform. Compliance is based on running annual average (RAA). The RNVWD is consistent in always keeping an adequate residual above 0.2 mg/L of free chlorine in the distribution system.

2.6.1.2 Disinfectant and Disinfection Byproducts Rule (D/DBP)

In accordance with Chapter 15.5 Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors, Title 22, CCR, RNVWD is required to conduct routine distribution system monitoring for two groups of DBPs, trihalomethanes (TTHM) and haloacetic acids (HAA5), in accordance with the DBPR monitoring plan. Lately, RNVWD sampled its distribution system in 2020 with the results below 0.040 mg/L for TTHM and below 0.030 mg/L for HAA5. According to Table 64534.2-D, Title 22, CCR, the water system is allowed to monitor once every three years. Next sampling event should be scheduled in 2023 during the warm months.

RNVWD is required by 22 CCR §64534.4 to sample for chlorine residual at the same time and location as distribution system total coliform sampling. Running annual average (RAA) for chlorine is detectable and is below the maximum residual disinfectant level (MRDL) of 4.0 mg/L.

2.6.1.3 Groundwater Rule

USEPA promulgated the Ground Water Rule (GWR) in October 2006. Beginning on December 1, 2009, RNVWD is required to conduct triggered source water monitoring whenever a distribution system TCR sample is total coliform positive. Triggered source water monitoring involves sampling directly from the well head for the presence of E. coli bacteria prior to chlorination treatment for all wells that were supplying the system at the time of any total coliform positive distribution system sample. RNVWD has included the monitoring requirements for the Groundwater Rule in its Bacteriological Sample Siting Plan (BSSP).

2.6.1.4 Lead Copper Rule

According to Section §64675, CCR, and based on the served population of 1,313, RNVWD is required to collect 10 samples in the distribution system and analyze them for Lead and Copper every three years. RNVWD has completed initial and subsequent monitoring for lead and copper within the distribution system during the years of 2003, 2004, 2005, 2006, 2009, 2012, 2015, 2018, 2020 and 2021. All sampling events' results prior to 2020 showed the results for lead and copper to be below the 90th percentiles action levels of 0.015 mg/L and 1.3 mg/L respectively.

However, during the 2020 sampling event, the 90th percentile action level for Lead was equal to the action level of 1.3 mg/L. RNVWD was required to initiate a standard tap monitoring at 20 sites for two periods 6 (six) month each. Both sampling events, conducted in January-March 2022 and August – September 2022 indicated the 90th

percentile levels did not exceed the state reduced monitoring criteria levels for lead (0.005 mg/L) and copper (0.65 mg/L). Based on these results, the water system is required to sample once every three years at the reduced number of sites to 10 (ten) locations in accordance with Section 64675.5(a)(1), Title 22, CCR. The next sampling event should be scheduled during the months of June, July, August and no later than **September 30, 2025**.

2.6.2 Source Monitoring

Due to high arsenic levels, RNVWD continues to use Well 02 for emergency standby uses only, in accordance with 22 CCR §64414. Actions are taken to address the arsenic issue in Well 02 with an intention to return it an active status.

2.6.2.1 Well 01 - Active Well

Inorganic chemicals are monitored once every three years. Nitrate is monitored annually. Radiological chemicals are monitored for gross alpha once every nine (9) years. VOCs and SOCs are monitored once every three years. RNVWD is in compliance with existing federal and state regulations. There were no MCL exceedances since the previous sanitary survey.

Well 01 PS Code 4810013-001-001			
Chemical Group	Monitoring Frequency	Last Sample	Next Sample
Secondary Standards	1/3 years	10/17/2019	2022
IOC	1/3 years	10/17/2019	2022
Arsenic 5.6 – 7.7 mg/L	Quarterly	latest 7/12/2022	2023
Nitrate Around 1 mg/L	Once per year	7/20/2021	2022
Nitrite	1/3 years	10/17/2019	2022
Radionuclides	1/9 years	2/4/2019	2031
VOC	1/3 years	10/17/2019	2022
SOC	1/3 years	7/16/2020	2023

2.6.2.2 Well 02 – Standby Well

Well 02 is required to be sampled for inorganic, organic and radiological contamination every compliance cycle (9 years).

Well 02 PS Code 4810013-002-002 Stand-by			
Chemical Group	Monitoring Frequency	Last Sample	Next Sample
Secondary Standards	Once in 9 years	10/14/2018	2027
IOC	Once in 9 years	10/3/2016	2025
Arsenic 15-18 mg/L	Monthly or quarterly	Latest 7/12/2022	2022 (study purposes)
Nitrate Around 0 mg/L	Once in 9 years	7/20/2021	2030
Nitrite	Once every 9 years	2016	2025
Radionuclides	Once in 9 years	10/17/2019 and in 2018	2028
VOC	1/9 years	5/20/2013	2022
SOC 1,2,3 TCP are good in 2018	1/9 years	2 quarters in 2018	2027

2.7 Management and Reporting

RNVWD is a Community Services District formed under Government Code Section 61000 et. Seq. to develop and provide a public water distribution system. RNVWD is managed by the all-volunteer elected Board of Directors, who reside within the District. The water operation is managed by RG West Builder's, Gordon Stankowski, as the General Manager who reports directly to the board. The physical operation and maintenance of the water system is contracted with Solano Irrigation District (SID) providing all required functions to keep the system in running order.

2.7.1 *Organization and Personnel*

Name	Title	Description & Contact
Gordon Stankowski	General Manager	Company - R.G. West Builders, RNVWD Contact (707) 447-8420
Solano Irrigation District	Contracted Operators	Facility Phone (707) 448-6847
Cary Keaten	SID General Manager	Direct Line (707) 455-4009

2.7.2 Operations Plan

The current RNVWD operations plan is not on record with the Division. The Division recommends having a description of the treatment plan performance monitoring program, equipment maintenance program, how and when each unit process is operated, procedures used to determine chemical dose rates, and reliability features including the frequencies of generator exercise, valve exercise, and flushing of the system.

2.7.3 Annual Reports (eAR)

Per Section 116530 of the California Health & Safety Code, public water systems are required to submit reports detailing system activities and changes made during the year. RNVWD submits Annual Reports to the Division promptly each year.

2.7.4 Consumer Confidence Report

As specified in 22 CCR §64480, RNVWD is required to prepare and distribute an annual Consumer Confidence Report by July 1st of each year. The system has historically met the deadline to submit the consumer confidence report to its consumers and the Division.

2.7.5 Emergency Notification Plan

Per Section 116460 of the California Health & Safety Code, public water system shall obtain an Emergency Notification Plan which will provide for immediate notice to the customers of the public water system of any significant rise in the bacterial count of water or other failure to comply with any primary drinking water standard that represents an imminent danger to the health of the water users. RNVWD follows the regulation requirements.

III. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

RNVWD continues to be capable of meeting the requirements of the California Safe Drinking Water Act and provides a reliable and adequate supply of drinking water. The water system complies with regulations and permit conditions.

3.2 Deficiencies

There were no significant deficiencies identified during the sanitary survey. Revised Disinfection Byproduct Rule (DBPR) monitoring plan was submitted by Solano Irrigation District on October 25, 2022, as it was required by Sanitary Survey letter issued by the Division on June 6, 2022.