C A S E S T U D Y

Comprehensive Water Quality Improvement Case Study: Jumeirah Golf Estate Villa in Dubai

SANI SERVICE
The Swiss Concept of Indoor Environments

INDOOR SCIENCES
By Saniservice

This detailed case study examines the transformation of water quality in a 5-bedroom villa in Jumeirah Golf Estate, Dubai, highlighting the effectiveness of Saniservice's water tank cleaning and disinfection service combined with the cutting-edge Aquaporin A2O Pure water filtration system. The comprehensive approach resulted in dramatic improvements in water quality parameters, elimination of contaminants, and enhanced resident satisfaction with water taste and safety.

Background and Initial Situation

Cassandra W., owner of a 5-bedroom villa in Jumeirah Golf Estate, Dubai, contacted Saniservice regarding persistent water quality issues including metallic taste and visible suspended particles in her tap water. With a family of four including two young children, Cassandra was increasingly concerned about potential health implications of consuming and bathing in water of questionable quality. The family had resorted to purchasing bottled water for drinking and cooking, resulting in significant monthly expenses exceeding AED 600 and contributing to plastic waste.

Water Quality Challenges in UAE Residential Settings

Dubai residents face unique water quality challenges stemming from the region's water infrastructure and climate conditions. The city's reliance on desalinated water creates baseline issues including:

- High mineral content affecting taste and odor
- Risk of bacterial growth accelerated by the hot climate
- Potential contamination from water storage facilities
- Corrosion in domestic plumbing systems
- Inadequate maintenance of water tanks leading to sediment buildup
- Biofilm formation in pipes and fixtures

These factors collectively contribute to drinking water that may be technically safe by basic standards but fall short of optimal quality for daily consumption and household use.

Initial Assessment and Diagnosis

Water Quality Testing

Saniservice conducted comprehensive water quality testing at Cassandra's residence, analyzing physical, chemical, and microbiological parameters. The initial results revealed multiple concerning issues1:

Table 1: Initial Water Quality Parameters (Pre-Intervention)

Test Parameter	Result	Standard Limits	Status
pH at 25°C	8.47	6.5-8.5	Within limits but high
Total Suspended Solids (TSS)	15 mg/L	-	Significant contamination
Total Dissolved Solids (TDS)	134 mg/L	100-1000	Within limits
Chloride (Cl)	57 mg/L	250 max	Within limits
Total Hardness ($CaCO_3$)	<1 mg/L	300 max	Very soft water
Sodium (Na)	12.7 mg/L	200 max	Within limits
Potassium (K)	14.9 mg/L	-	Moderate level
Lead (Pb)	<0.01 mg/L	0.01 max	Borderline acceptable

Particularly concerning was the microbiological assessment which revealed1:

- Fungal count: 144 CFU (colony-forming units)
- Bacterial count: 389 CFU

These values indicated significant microbial contamination exceeding safety recommendations for drinking water.

Water Tank Inspection

Physical inspection of the residential water storage tank revealed substantial accumulation of dirt, silt, and biofilm formation1. The inspection identified:

- Sediment layer approximately 5cm thick at tank bottom
- Visible biofilm formation on tank walls
- Corrosion at pipe connection points
- Inadequate previous maintenance (tank had not been cleaned for over 18 months)
- Poor tank ventilation contributing to condensation issues

Comprehensive Intervention Strategy

Based on the assessment findings, Saniservice proposed and implemented a two-phase intervention strategy: (1) comprehensive water tank cleaning and disinfection and (2) installation of the advanced Aquaporin A2O Pure water filtration system.

Phase 1: Water Tank Cleaning and Disinfection

Saniservice executed a thorough cleaning and disinfection protocol following these steps1:

1. **Tank Drainage**: Complete removal of existing water to access accumulated sediment
2. **Interior Cleaning**: Thorough scrubbing of tank surfaces using plant and mineral-based cleaners that are environmentally friendly yet effective against biofilm
3. **Disinfection**: Application of Dubai Municipality-approved bio-sanitizer to eliminate microbial contamination
4. **System Flushing**: Complete flushing of the residential plumbing system to disinfect all pipes and water outlets
5. **Fixture Treatment**: Specialized cleaning and disinfection of individual taps, showers, and faucets to remove mold and biofilm buildup at terminal points

The process utilized biodegradable cleaning agents that effectively removed contaminants without introducing harmful chemicals into the water system. The Dubai Municipality-approved sanitizing agents provided maximum disinfection while meeting local regulatory standards for safety.

Phase 2: Aquaporin A2O Pure Water Filtration Installation

Following the cleaning and disinfection process, Saniservice installed the innovative Aquaporin A2O Pure water filtration system under the kitchen sink to provide dedicated high-quality drinking water1.

Aquaporin A2O Pure Technical Specifications:

The A2O Pure utilizes revolutionary Aquaporin Inside® technology based on the Nobel Prize-winning discovery of natural aquaporin proteins—nature's own water channels. Key specifications include:

- **Flow Rate**: 2.1 liters per minute
- **Water Recovery Rate**: 65% (2:1 ratio), significantly higher than conventional RO systems
- **Membrane Capacity**: 126 L/h
- **Salt Rejection**: >90%
- **Power Consumption**: 95W
- **Dimensions**: 315 × 203 × 427 mm (compact under-sink design)
- **Filtration Components**:
    - Pre-filter: PP cotton + activated carbon (12-month lifespan)
    - DWRO Cartridge with Aquaporin membrane (24-month lifespan)
    - Post-filter: Activated carbon (12-month lifespan)

Advanced Features of the A2O Pure System:

The system includes multiple technological advantages:

- **Smart Controls**: WiFi connectivity with mobile app for monitoring water quality and filter status
- **Automatic Leak Detection**: System shutdown if leaks are detected to prevent home damage
- **Automatic Flushing**: Self-cleaning function to prevent membrane fouling
- **Direct Flow Design**: No storage tank, eliminating risk of bacterial growth in standing water
- **Space-Saving Installation**: Compact design with small footprint
- **Superior Contaminant Removal**: Effectively eliminates PFAS, pesticides, heavy metals, microplastics, viruses, hormones, and nitrates

Results and Outcome

Improved Water Quality Parameters

Following the complete intervention, Saniservice conducted follow-up testing that revealed dramatic improvements across all water quality parameters1:

Table 2: Water Quality Parameters (Post-Intervention)

Test Parameter	Pre-Intervention	Post-Intervention	Improvement (%)
pH at 25°C	8.47	8.47	0% (within limits)
Total Suspended Solids (TSS)	15 mg/L	0 mg/L	100%
Total Dissolved Solids (TDS)	134 mg/L	1 mg/L	99.3%
Sulphate (SO_4)	<5 mg/L	<1 mg/L	>80%
Chloride (Cl)	57 mg/L	1 mg/L	98.2%
Total Alkalinity	34.7 mg/L	1 mg/L	97.1%
Bicarbonate (HCO_3)	42.3 mg/L	0 mg/L	100%
Sodium (Na)	12.7 mg/L	0 mg/L	100%
Potassium (K)	14.9 mg/L	0 mg/L	100%

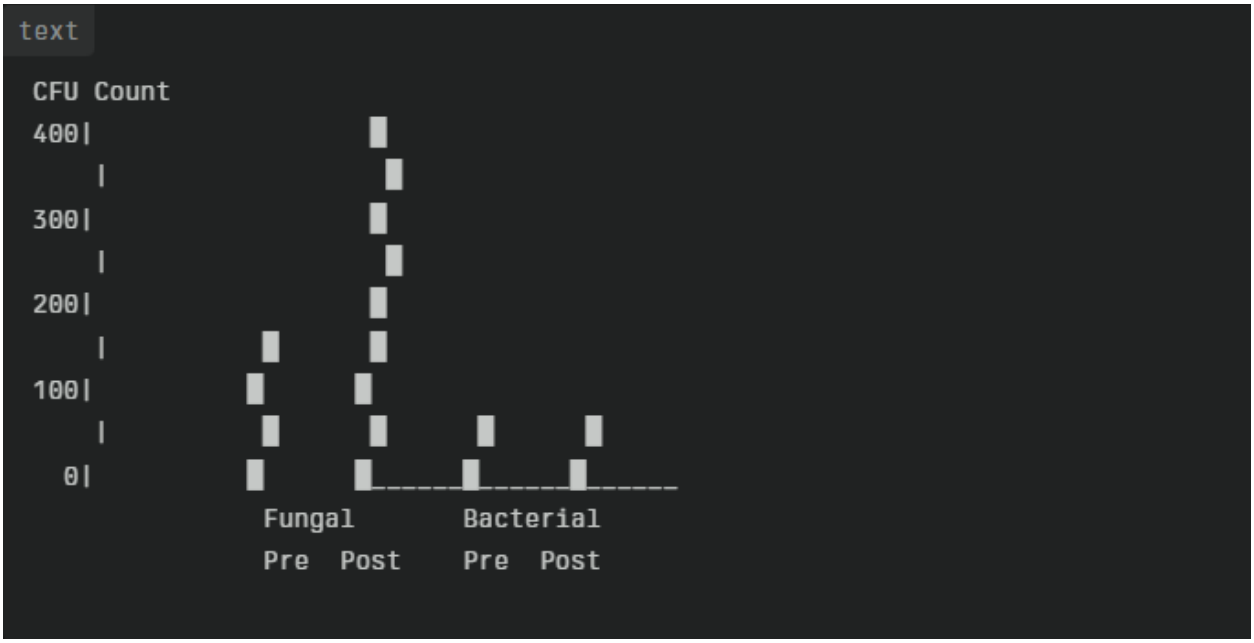
Microbial Contamination Elimination

The most significant improvement was observed in microbial contamination levels1:

Figure 1: Microbial Contamination Before and After Intervention

text

CFU Count



- **Fungal Count**: Reduced from 144 CFU to 0 CFU (100% elimination)
- **Bacterial Count**: Reduced from 389 CFU to 4 CFU (99% reduction)

Economic Benefits Analysis

Beyond the immediate water quality improvements, the intervention created significant economic benefits for the household:

Table 3: Economic Impact Analysis (Projected Annual Savings)

Category	Before Intervention	After Intervention	Annual Savings
Bottled Water Expenses	AED 7,200	AED 0	AED 7,200
Appliance Maintenance	AED 1,500	AED 500	AED 1,000
Water Heater Efficiency	Low	High	AED 800
Filter Replacements	-	AED 750	-AED 750
Net Annual Savings			**AED 8,250**

Customer Satisfaction Outcomes

Two months after the intervention, Cassandra reported multiple quality-of-life improvements:

- Complete elimination of metallic taste in water
- Crystal clear appearance with no visible particles
- Enhanced confidence in water safety for family use
- Improved taste of beverages prepared with filtered water
- No more water spots on glassware after washing
- Reduced soap usage for cleaning and personal hygiene
- Elimination of bottled water purchases
- Reduced plastic waste generation (estimated 960 fewer plastic bottles annually)

Conclusion and Recommendations

The comprehensive approach combining professional water tank cleaning and disinfection with the installation of the cutting-edge Aquaporin A2O Pure filtration system demonstrated remarkable effectiveness in resolving complex water quality issues in this Jumeirah Golf Estate residence.

The case highlights several key findings:

1. **Root Cause Identification**: The dual problems of tank contamination and distribution system biofilm required comprehensive intervention rather than point solutions.
2. **Technological Advantage**: The Aquaporin Inside® technology demonstrated superior contaminant removal compared to conventional filtration systems, particularly for dissolved solids and chemical contaminants.

3. **Economic Justification**: The investment in water quality solutions delivers significant return through eliminated bottled water expenses, appliance longevity, and reduced maintenance costs.
4. **Environmental Impact**: The intervention significantly reduced plastic waste generation while using environmentally friendly cleaning agents.

Maintenance Recommendations

To ensure continued optimal water quality, Saniservice recommended:

1. **Biannual Tank Cleaning**: Professional water tank cleaning and disinfection every 6 months
2. **Timely Filter Replacement**: Following the manufacturer's schedule for A2O Pure filter replacement
3. **Quarterly Water Testing**: Regular water quality monitoring to detect any emerging issues
4. **Annual System Inspection**: Complete checkup of the filtration system to ensure optimal performance

These maintenance practices would preserve the exceptional water quality achieved through the intervention and extend the lifespan of both the water storage infrastructure and the filtration system.

This case study demonstrates the effectiveness of Saniservice's integrated approach to water quality management in residential settings in the UAE, combining state-of-the-art technology with professional cleaning services to deliver measurable improvements in water quality and household economics.