

# Community Water System

**Study to MRPOA  
Update**

**6 Nov Mar 2004  
21 July 2007**

Dave Paldan, Homeowner  
Lot 51 Mogollon Ranch  
51 Twin Oaks Dr, Happy Jack, AZ 86024

# Summary Recommendation

1. Maintain system as multiple independent wells, under MRPOA management
2. Establish a Community Water System, per AZ ADEQ, Corporation Commission rules.
  - Water system continues as multiple independent wells, under MR CWS management
3. Establish a CWS (same as 2 plus). Integrate the system.
  - Modify the distribution system to connect the well and distribution system into one network
  - Utilize the existing storage tanks
  - Increase the size of distribution system pipes between storage tanks
  - The distribution pumps or plumbing must be modified to allow water flow in both directions in order for alternative well filling of a storage tank.
4. Establish a centralized water storage and distribution system (same as 3 plus)
  - Modify the distribution system
  - Add a large central storage tank

# Discussion of options 1 & 2

- According to the Safe Drinking Water Act, any water system that supplies more than 25 people or 15 service connections per day for at least 60 days per year is classified as a public water system.
- A community water system (CWS) is defined as a system that serves the same 25 or more year-round residents.
- For complete requirements for public water systems, please refer to Arizona Administrative Code Title 18, Chapter 4. Copies are available from the office of the Arizona Secretary of State or online at [www.sosaz.com](http://www.sosaz.com).

# Discussion of CWS and PWS rules

1. Capacity Development Approval. The Arizona Department of Environmental Quality (ADEQ) reviews **Community Water System** financial and technical capacity. Systems must obtain this approval before receiving an operating permit.
2. New Source Approval. New Source Approval is required for both groundwater and surface water sources.
3. Engineering Approval. Arizona law requires water system components, including wells, treatment plants, storage and pressure tanks, distribution mains, and booster pumps, to obtain approvals to construct and approvals of construction. The system must complete these applications and submit plans sealed by a Professional Engineer with required review fees.
4. Certified Operator. All **Public Water Systems** must obtain the services of a certified water operator. Operators monitor the water for various contaminants throughout the year, including bacteria, nitrate, nitrite, lead, and copper. A certified operator must inspect each well site a minimum of once per month
5. MAP. **Water Systems** that serve fewer than 10,000 people may be required to participate in ADEQ's Monitoring Assistance Program (MAP). MAP performs much of the required sampling for systems, but does not sample for bacteria, nitrate, nitrite, lead, and copper.
6. Operating Permit. After the **Water System** receives approval, the Department will assign a public water system identification number and send an application for a county water system permit. There is an annual permit fee.

# Governing Source

U.S. EPA, Safe Drinking Water Act, 1993

enforced by Arizona Department of Environmental Quality

- Governing U.S. Legislation Safe Drinking Water Act of 1974, Amended 1986, EPA 1993
- Arizona Response Framed by Pima Association of Governments, 1994
- Enforcing Agency Arizona Department of Environmental Quality (ADEQ)
  - Arizona Department of Water Resources regulates well drilling, well compliance. ADWR had little interest in number of connections or number of people on a well.
  - Arizona Corporation Commission regulates the community water system entity ACC had little interest in number of connections or number of people on a well.
- Legal basis
  - Rural communities provide safe and affordable drinking water as determined by existing quality of supply. To reduce water pollution risk, legislation was developed in Arizona to promote prevention, to regulate potentially polluting activities, and to require remediation when water supplies have been contaminated (Pima Association of Governments, Report, 1994).
  - The ability to provide safe and affordable drinking water is determined by treatment and delivery. Treatment and delivery is managed through a public water systems, defined by the U.S. EPA as a system which serves piped water to
    - at least 15 service connections
    - regularly serve an average of at least 25 people each day at least 60 days per year

# Primary Enforcement by ADEQ

## Water Quality Monitor & Remedy enforced through reports

- Federal SDWA regulates public water systems through drinking water standards for
  - contaminants,
  - treatment techniques,
  - sampling regimens,
  - record keeping procedures
  - public notification protocols when SDWA requirements are violated.
- In Arizona, primary enforcement responsibility is through ADEQ. EPA provides oversight through guidance, technical assistance, and some financing.
  - Enforcement relies heavily upon a **Community Water System (CWS)** demonstrating compliance through periodic sampling and testing requirements.
  - In the unlikely event that state enforcement is inadequate, emergency federal enforcement provisions are available to the EPA in the form of
    - issuing orders for public notification of SDWA violations,
    - mandating clean-up,
    - requiring the use of an alternative supply,
    - and/or imposing daily fines

# Public Drinking Water System

also called a Community Water Service (CWS)

MRPOA currently is nontransient noncommunity water service

- ADEQ regulates Public Drinking Water Systems.
  - A public drinking water system is a system for the distribution of water to the public for human consumption that serves at least 25 persons per day for at least 60 days a year or has 15 or more service connections.
  - There are three types of Public Water Systems: Community water systems, Nontransient noncommunity water systems, and Transient noncommunity water systems.
- **COMMUNITY WATER SYSTEMS**
  - A community water system is a public water system that serves 15 or more service connections used by year-round residents or that serves 25 or more year-round residents.
- **NONTRANSIENT NONCOMMUNITY WATER SYSTEMS**
  - A nontransient noncommunity water system serves 15 or more service connections that are used by the same persons for at least six months per year; or it serves the same 25 or more persons for at least six months per year. Examples include schools and workplaces.
- **TRANSIENT NONCOMMUNITY WATER SYSTEMS**
  - A transient noncommunity water system serves 15 or more service connections which does not serve the same persons for more than six months per year; or serves an average of at least 25 persons per day for at least 60 days per year but which does not serve the same 25 persons for more than six months per year. Examples include Rest Stops, Public Parks, Campsites and RV Parks.

# Community Water Service Required Activity

## Sample, test, record water quality

- There are three major types of requirements in the SDWA:
  1. sampling and reporting,
  2. Record keeping,
  3. public notification (U.S. EPA, 1993).
- Each supplier of water must
  - collect samples from the water system,
  - take them to a certified laboratory for analysis,
  - send the results to ADEQ.
- Each supplier of water must keep on file
  - laboratory results,
  - name of the person who collected the samples,
  - dates and locations of sampling points,
  - steps taken to correct problems,
  - sanitary survey reports,
  - other information
- Any time there is a violation of a requirement, the public must be notified

# ADEQ requirements to create a CWS

Hire engineer, do a plan, get a permit, follow plan, monitor

- ADEQ website indicates process
  - Request an inspection and classification (or re-classification)
  - ADEQ Regional Office
    - 1515 E. Cedar Ave, Suite F Flagstaff AZ 86004
    - Phone (928) 799-0313 or (877) 602-3675, Fax 928 773 2705
    - James Sedillo, Manager, Ext 2718
    - **WQ Engineering Kurt Harris** **main number, whom I talked with**
    - **Field Inspection – East Harley Hiatt** **Ext 2706**
    - Field Inspection – West Michael Howeth Ext 2701
    - <http://www.azdeq.gov/environ/water/dw/teu.html>
- ADEQ involved if do any modification to the water system – now or as a CWS
  - Hire an Engineer
  - Do a water modification plan – particulars are not regulated by ADEQ
    - Could be integrated Could be individual wells
  - Obtain a permit an approval to construct permit no fee is involved
    - Permit is on ADEQ web site, but engineer usually submits to ADEQ
  - Obtain approval to construct Construct to permit / plan
  - Schedule a review upon completion Obtain approval to operate
  - Monitor / report / record keep / notify users

# ADEQ assistance to a Community Water Service

Participation in MAP is required for a small CWS (<10k connects)

- ADEQ requires participation in MONITORING ASSISTANCE PROGRAM (MAP)
  - MAP provides for collection, transportation and analysis of samples from public water systems at a frequency sufficient to comply with federal Safe Drinking Water Act requirements.
  - All CWS serving less than 10k people or 10k connections **must** participate in MAP
    - Forms and Guidelines at <http://www.azdeq.gov/function/forms/appswater.html#sdw>
  - ADEQ charges a fee to a CWA to participate in MAP
    - ADEQ will schedule a visit, collect samples. We provide access to the water or to wells
    - Each system is charged a fee based on the number of service connections they supply
      - \$250 per year for CWS plus \$2.07 per connection
      - » Supposedly \$4000 worth of water quality testing for \$250
  - Chemicals not covered by the MAP program must be monitored as required by AZ State rules (Title 18 AAC, Chapter 4, Article 2). This is a responsibility of the public water system.
    - Monthly bacteria, total and fecal coliform
    - Annual nitrate nitrite, lead, copper, asbestos, radiochemicals
      - This testing charge is in addition to MAP charges
  - For MRPOA,
    - The trigger may be **1<sup>st</sup> well that exceeds (25) part-time people or (15) connections**
      - 17 independent wells = **17 CWS \* \$250 = \$4250** plus \$2.07 \* number of connects
    - We might argue that we are 1 CWS \* \$250 = \$250 plus \$2.07 \* number of connects
    - ADEQ might argue back the trigger is MRPOA exceeds (25) part-time people or (15) connections



# 03063 STARLIGHT WATER COMPANY

## POE 001 CO 150 G 1995

- **RAD FREQ**
  - 4000 GROSS ALPHA 1
- **NIT FREQ**
  - 1041 NITRITE 1
- **IOC FREQ**
  - 1005 ARSENIC 1
  - 1010 BARIUM 1
  - 1015 CADMIUM 1
  - 1020 CHROMIUM 1
  - 1024 CYANIDE 1
  - 1025 FLUORIDE 1
  - 1035 MERCURY 1
  - 1036 NICKEL 1
  - 1045 SELENIUM 1
  - 1052 SODIUM 1
  - 1074 ANTIMONY, TOTAL 1
  - 1075 BERYLLIUM, TOTAL 1
  - 1085 THALLIUM, TOTAL 1
- **ASB FREQ**
  - 1094 ASBESTOS 1

## MRPOA Well #4 Detected contaminants

	<u>Well 4</u>	<u>Fed Limit</u>
• Barium	75 ug/L	2000 ug/L
• Chromium	20 ug/L	100 ug/L
• Copper	48 ug/L	1300 ug/L
• Flouride	0.1 mg/L	4.0 mg/L
• Turbidity	<b>3.0 NTU</b>	0.3 NTU

All others were not detected

Source: Lot 51 test report #151360 6/26/07

## Tested June 2007 Health Effect

Health Related Contaminants – Some people could

- Over years, experience an increase in their blood pressure.
- Over years, experience allergic dermatitis.
- Copper is an essential nutrient. Over a relatively short amount of time, experience gastrointestinal distress. Over many years, suffer liver or kidney damage. People with Wilson's Disease should consult a doctor.
- Over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.
- No health effects. Turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Source:

<http://www.azdeq.gov/environ/water/dw/health.html>

<http://www.azdeq.gov/environ/water/dw/download/mcls.pdf>

## MRPOA Well #4 Detected contaminants

## Tested June 2007 Aesthetic or Health Effect

	<u>Well 4</u>	<u>Fed Limit</u>	Aesthetic Related Contaminants
• Total Alkalinity	270 mg/L	not designated	• A measure of the acid-neutralizing capacity of water. Some Alkalinity is good. Acid water corrodes pipes. High Alkalinity + high pH leads to scale formation in pipes. 270 is very high. Also causes skin to feel excessively 'dry'.
• Total Hardness	370 mg/L	not designated	• A measure of dissolved minerals. 'Temporary' hardness is released on pressure change or heating and results in scale on taps, sinks, tea kettles and pots. Soap leaves a curd.
• Iron	0.2 mg/L	0.3 mg/L	• Dissolved metal. A level of 0.3 mg/L results in rust residue under faucets or in standing water
• Manganese	6.1 ug/L	50 ug/L	• Black residue under faucets
• Sodium	3.6 mg/L	not designated	• Over years, may experience an increase in blood pressure.
• Dissolved Solids	460 mg/L	500 mg/L	• A mix of the above
• Sulfate	68 mg/L	250 mg/L	• Reduces effectiveness of UV sanitizers. Side effects slime, smell, odor
• Zinc	650 ug/L	5000 ug/L	• ?

All others were not detected

Source Lot 51 test report #151360 6/26/07

# MRPOA Well #4

## Contaminant

Tested June 2007

## Remedy

	<u>Well 4</u>	<u>Fed Limit</u>
• Barium	75 ug/L	2000 ug/L
• Chromium	20 ug/L	100 ug/L
• Copper	48 ug/L	1300 ug/L
• Flouride	0.1 mg/L	4.0 mg/L
• Turbidity	3.0 NTU	0.3 NTU
• Total Alkalinity	270 mg/L	not designated
• Total Hardness	370 mg/L	not designated
• Iron	0.2 mg/L	0.3 mg/L
• Manganese	6.1 ug/L	50 ug/L
• Sodium	3.6 mg/L	not designated
• Dissolved Solids	460 mg/L	500 mg/L
• Sulfate	68 mg/L	250 mg/L
• Zinc	650 ug/L	5000 ug/L

### Health Related Contaminants – Some people could

- Reverse Osmosis
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- Hard to fix. High quality water conditioner (=expensive) has well packed beads which blocks Turbidity
- Hard to fix. Live with it in AZ.
- Water Softener
- Water Softener
- Reverse Osmosis
- Reverse Osmosis      Water Softener adds Sodium
- Reverse Osmosis removes larger, passes smaller. Effectiveness is rejection rate of membrane (high is good) 1% membrane (high) would pass 4.6 mg/L of the 460
- Reverse Osmosis
- Reverse Osmosis

# Operator Training

ADEQ offered - Send the designated operator in for a 1 hour briefing  
That individual would then know enough to support testing.  
Not certified, but adequate to the task

- Operator training offered by ADEQ
  - <http://www.azdeq.gov/environ/water/dw/opcert.html>
  - **Coconino Community College**  
2800 S. Lone Tree Rd. Flagstaff, AZ 86001  
Eva Jones Phone: (928) 226-4206 Fax: (928) 226-4103
  - **Northland Pioneer College**  
P. O. Box 610 Holbrook, AZ 86025  
Peggy Belknap Phone: (800) 266-7845 Fax: (928) 524-9055
  - **Technical Learning College** <http://www.tlch20.com>  
P.O Box 420 Payson, AZ 85547  
Melissa Durbin Phone: (866) 557-1746 Fax: (928) 468-0675
    - Operator course      \$150      correspondence and 40h on site contact
    - Basic course      \$50      correspondence and 10h on site contact
    - Certification      4 \* \$85      relevant water treatment courses
      - The online course outline is very informative, without even taking the course. 100+ pages for basic course, 400+ for operator course
      - Many other courses are available      *Activated Sludge* sounds intriguing
      - Classes offered in Camp Verde, Payson, Tempe (? How odd), Phoenix

# Benchmarks

- ADEQ defines system by size
  - medium size as serving between 3,301 and 50,000 individuals
  - small systems serving less than 3,300 individuals.
- In a 1995 survey of performance,
  - 46% of medium systems were non-compliant
  - 51.5% of small systems were non-compliant

# Arizona Corporation Commission

CWS could remain private, owned & operated by HOA

ACC provides formal structure to define water operation

- Information is incomplete.
  - A Private Water Company may be regulated through ACC Utility Compliance Department. However, this department is apparently too busy to return my calls. Facts from ACC web site.
  - *Comments from ADEQ*
    - If a CWS sells water to an external entity, then ACC regulation and compliance applies.
    - Processing takes about 6 months for new CCN, a rate & tariff review, any tariff change.
- If ACC regulation applies a Certificate of Convenience and Necessity (CCN) is required
  - CV of applicant operating company, certified operator & applicant manager,
  - Numbers of customers      by year      by type      for next 5 years
  - Rates, charges      by gallon      by meter size
  - Service charges, tariffs      by service type
  - Balance sheet      assets      fixed assets      mainly value of water plant  
   liabilities      debt      capital
  - income      expenses      depreciation
  - Service location      county, section, township, range      connections per

Comment: The information required is fairly extensive, but consistent with good business practice. This is all information that the MRPOA should have for operation review.

# Summary Recommendation

1. Become a CWS
2. Join ADEQ MAP program      monitor water quality per AZ regulation
3. Train an operator                      Obtain the necessary certificates for operation
  
4. Implement cost accounting methods typical for small community water service
  - a. Determine value of assets & liabilities applicable to water facility
  - b. Determine usage as operating expenses in order to recover variable costs  
Breakdown by connection type - ¾", 1", 1½"      by electric use
  - c. Determine maintenance expenses to accurately predict future spending requirements  
Breakdown by maintenance type      MAP, other testing, wear & tear, repair
  - d. Determine replacement expenses**  
**Water plant component lifetime, replacement schedule, replacement cost**
  
5. Identify & recover costs independent of other MRPOA costs
  - a. Recover all usage operating expenses quarterly                      electric, test, repair
  - b. Recover all fixed costs quarterly based on estimates                      update estimate annually
  - c. Establish a Water System reserve account to prepare for the future