

Monitoring: The Practical Aspects

NVRWA Conference
March 14, 2013

Presented by:
Latricia Lord, Environmental Scientist III
Bureau of Safe Drinking Water
Wes Rubio, Environmental Health Specialist
Washoe County Health District

Why Do We Monitor For Contaminants?

Contaminant Effects:

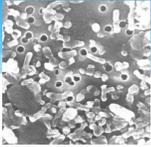
- ◆ Acute Health Effects
- ◆ Chronic Health Effects
- ◆ Aesthetic Concerns



Acute Health Effects:

Microbial

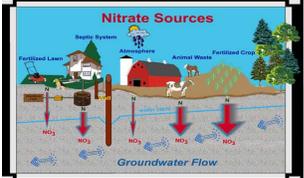
- Viruses (e.g. Norwalk Virus)
- Bacteria (e.g. *Shigella*, *E.coli*)
- Parasites, Protozoa or Cysts



Bacteria

Chemical

- Nitrate
- Nitrite



Nitrogen Sources

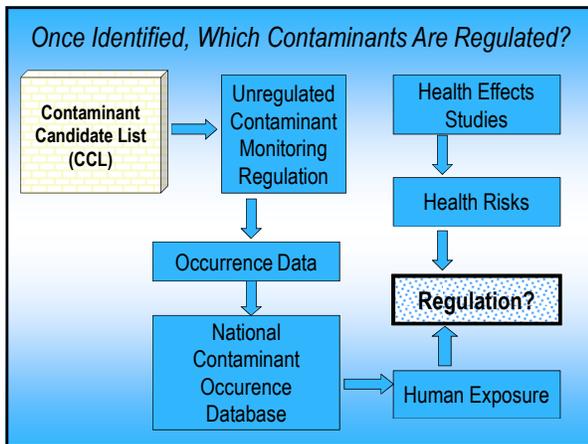
Chronic Health Effects:

- ◆ Volatile Organic Chemicals (VOCs)
- ◆ Inorganic Chemicals (IOCs)
- ◆ Synthetic Organic Chemicals (SOCs)
- ◆ Radionuclides



What and Where We Monitor?

How does USEPA determine which contaminants to regulate?



Source Water Monitoring: Entry Point to the Distribution System (After Treatment & Before 1st Customer)

- Inorganic Phase II & V
- Volatile Organic Phase I, II, V
- Synthetic Organic Phase II & V
- Radionuclides
- Secondary Drinking Water Contaminants
- Sodium
- Turbidity



PWS Monitoring Requirements

- * Distribution System
 - * Total Coliform Rule
 - * Disinfectant Residuals
 - * Disinfection Byproducts
 - * Most systems required to sample July 1st- Sept 30th
 - * Lead and Copper
 - * June 1st- Sept 30th
 - * Asbestos
 - * Surface Water due to source constantly changing
 - * If AC Pipe is present
- * At source:
 - * Ground Water Rule- Triggered by a Routine TC+ under TCR

Special Sodium Monitoring

- Community water systems
 - Groundwater systems must monitor and report sodium for each source at three year intervals
 - Surface water systems must monitor and report sodium annually for each plant

Turbidity

Community or non-community systems using surface water in whole or in part

	<u>Max. N.T.U.</u>
• Conventional/Direct	1
• Slow Sand	5
• Alternative Filters	5
• Diatomaceous Earth	5

Transient Non-Community

- Transient Non-Community (TNC)
 - Nitrate
 - Nitrite
 - Secondary (Excluding Fluoride)
 - Total Coliform Bacteria & Triggered Ground Water Rule Monitoring
 - Disinfectants & Disinfection Byproducts (If Disinfecting with Chlorine Dioxide)

Non-Transient Non-Community

- Non Transient Non Community (NTNC)
 - TNC Contaminants PLUS
 - IOC
 - SOC
 - VOC
 - Fluoride
 - Lead and Copper
 - Disinfectants & Disinfection Byproducts (If Disinfecting or Purchase Disinfected Water)

Community

- Community (CWS)
 - TNC + NTNC Contaminants PLUS
 - Radionuclides

Monitoring Frequency

Based on:

- Previous monitoring
- State/Federal mandated requirements
- Reduced monitoring
- Waivers
- Exceeding trigger levels or MCLs

Standardized Monitoring Framework

- Promulgated in the Phase II Rule on January 30, 1991
- Simplifies and consolidates monitoring requirements across groups
- The "Foundation" for sampling of Chemicals
 - * IOC's
 - * VOC's
 - * SOC's
 - * Radionuclides
 - * Sodium
- * Available at:
http://www.epa.gov/ogwdw/pws/pdfs/qrg_smonitoringframework.pdf

Chemical Monitoring

- Inorganic Contaminants
 - Nitrate
 - Nitrite
 - Arsenic
 - Asbestos
- Volatile Organic Contaminants
- Synthetic Organic Contaminants
- Radionuclides
- State Secondary

Maximum Contaminant Levels (MCL's)

- * Available in many locations:
 - * Lab reports (sometimes)
 - * BSDW website (<http://ndep.nv.gov/bsdw/oversight.htm>)
 - * EPA website (<http://water.epa.gov/drink/contaminants/index.cfm#List>)
 - * Call BSDW / Health Districts
- * For this presentation:

* Nitrate= 10 mg/L	Iron= 0.60 mg/L
* Nitrite= 1 mg/L	Uranium= 30 ug/L
* Arsenic= .010 mg/l or 10 ug/L	

Inorganic Contaminants Nitrate (MCL = 10 mg/L)

- Frequency
 - Routine Monitoring
 - One sample/year (possibly during QTR with highest historical result)
 - Increased Monitoring
 - $\geq \frac{1}{2}$ MCL triggers quarterly monitoring until the State determines reliably and consistently below the MCL
 - Then, monitor annually during quarter resulting in the highest analytical result
- No Waiver available

Inorganic Contaminants Nitrite (MCL= 1 mg/L)

- Frequency
 - Routine Monitoring
 - One sample every three years
 - Increased Monitoring
 - > ½ MCL triggers quarterly monitoring until the State determines reliably and consistently below MCL
 - Then, monitor annually during quarter with highest analytical result
- No waiver available

Inorganic Contaminants Nitrate & Nitrite

- * Sample > than MCL
 - * Confirmation Sample Required Within 24 Hrs.
 - * If no Confirmation Sample Taken, must issue Tier 1 Public Notice immediately
 - * Do Not Drink Order
 - * May have to make provisions to provide potable water
 - * Compliance based on average of Initial and Confirmation Sample

Nitrate/Nitrite Example Reports



ETEX
ANALYTICAL SERVICES
3905 HARRISON DR., STE #8
JES VEGAS, NV 89123
702) 387-1187 FAX 387-3021

**LABORATORY
REPORT**

Client: Sample No. 1231532

Location: Date: 02/20/13

Sampled By: Date: 02/12/13

Submitted By: Date: 02/12/13

Authorized By: _____

ANALYTICAL RESULTS						
Container	Parameter	Method	Class ID	Sample/Filter	Date Analyzed	Result
00	Nitrate as N, mg/L	SM 4500-NO3- F	1 W-01	1617	02/19/13	0.9
00	Nitrite as N, mg/L	SM 4500-NO2- F	1 W-01	1617	02/19/13	<0.05

Nitrate/Nitrite Example Reports

**Western Environmental Testing Laboratory
Analytical Report**

Date Printed: 1/8/2013
Order ID: 1301010

Elko, NV 89801
Attn: C
Phone:
Fax:

Customer Sample ID: PW-1 Collect Date/Time: 1/3/2013 10:50
WETLAB Sample ID: 1301059-001 Receive Date: 1/3/2013 09:30

Parameter	Method	Results	Units	Reporting Limit	Date Analyzed
Nitrate Nitrogen	EPA 380.0	1.8	mg/L	1.0	1/4/2013
Nitrite Nitrogen	EPA 380.0	<0.010	mg/L	0.010	1/4/2013

Inorganic Contaminants (EXCEPT ASBESTOS, NITRATE AND NITRITE)

- * Frequency
 - * Groundwater – one sample every three years
 - * Surface water – one sample every year
- * Exceeding the MCL
 - * Confirmation Sample
 - * State may require
 - * Must be within 2 weeks of original sample at same sample point
 - * Triggers quarterly monitoring until the State determines reliably and consistently below the MCL
- * Waiver available-Maximum interval is 9 years
 - * Phase II and V IOCs

Inorganic Contaminants Arsenic (MCL 0.010 mg/L)

- Frequency
 - Groundwater
 - * One sample every three years
 - Surface Water
 - * One sample every year
- Exceeding the MCL
 - * Confirmation Sample
 - * State may require
 - * Must be within 2 weeks of original sample at same sample point
 - * Triggers quarterly monitoring until the State determines reliably and consistently below the MCL based on RAA
- No Waiver

Inorganic Contaminants Asbestos

- Frequency
 - Groundwater and Surface Water
 - Sample within the distribution system containing asbestos piping
 - Source Water if vulnerable to contamination
- Exceeding the MCL
 - Triggers quarterly monitoring
- Waiver
 - Available if distributions system contains no AC pipe

Volatile Organic Contaminants

- Frequency
 - GROUNDWATER
 - * One sample per year for three years, if no detects
 - * One sample every three year period
 - SURFACE WATER
 - * One sample every year
- Detection triggers quarterly monitoring:
 - until State determines reliably & consistently below MCL
 - then annually during quarter with highest result
- Waiver available-Maximum interval is 3 years

Synthetic Organic Contaminants

- Frequency for GROUND WATER and SURFACE WATER
 - Routine Monitoring:
 - Population $\leq 3,300$: One sample every three years
 - Population $> 3,300$: Two samples during one year of every three year period
- Detection triggers quarterly monitoring of detected analyte(s):
 - until State determines reliably & consistently below MCL
 - then annually during quarter with highest result
- Waiver available-Maximum interval is 9 years

Monitoring Radionuclides

- Frequency for GROUND WATER & SURFACE WATER
 - Initial Monitoring: Four consecutive quarterly samples
 - Subsequent monitoring based on average of initial monitoring
 - < detection: one every nine years
 - > detection but < 1/2 MCL: one every six years
 - > 1/2 MCL but < MCL: one every three years
 - > MCL: quarterly until 4 consecutive quarterly samples < MCL
 - Compliance determination based on annual average

Uranium Example Report

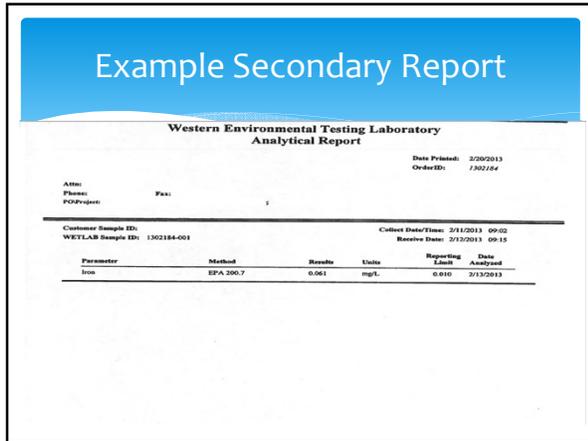
Copper	EPA 200.7	<0.02 mg/L	✓	0.02	1	0	09/26/12	SRice	
Fluoride	EPA 300.0	0.5 mg/L	✓	0.1	4	0	09/19/12	Vmiller	
Iron	EPA 200.7	<0.05 mg/L	✓	0.05	0	6	09/26/12	SRice	
Magnesium	EPA 200.7	<5 mg/L	✓	5	1	5	09/26/12	SRice	
Manganese	EPA 200.7	<0.02 mg/L	✓	0.02	0	1	09/26/12	SRice	
MBAS	SM 5540 C	<0.1 mg/L	✓	0.1	0	5	09/11/12	SRice	
Odor	SM 2150 B	0 TON	✓	3	0	0	09/11/12	abobadillo	
↳ result of zero indicates no odor observed									
pH	SM 4500 H B	7.94 SU	✓				09/12/12	Francis	
Temperature	SM 4500 H B	19.5 DegC	✓				09/12/12	Francis	
Silver	EPA 200.8	<1 ug/L	✓	1	1	0	10/03/12	abobadillo	
Sulfate	EPA 200.0	14 mg/L	✓	5	5	0	09/19/12	Vmiller	
Total Dissolved Solids	SM 2540 C	207 mg/L	✓	25	1	0	09/13/12	Francis	
Zinc	EPA 200.7	0.06 mg/L	✓	0.05	5	0	09/20/12	SRice	
Arsenic	EPA 200.8	6 ug/L	✓	3	10	0	09/14/12	abobadillo	
Sodium	EPA 200.7	26 mg/L	✓	5	0	0	09/26/12	SRice	
Uranium ICP-MS	EPA 200.8	39 ug/L	✓	1	30	0	10/03/12	abobadillo	

ENTERED
FEB 23 2013

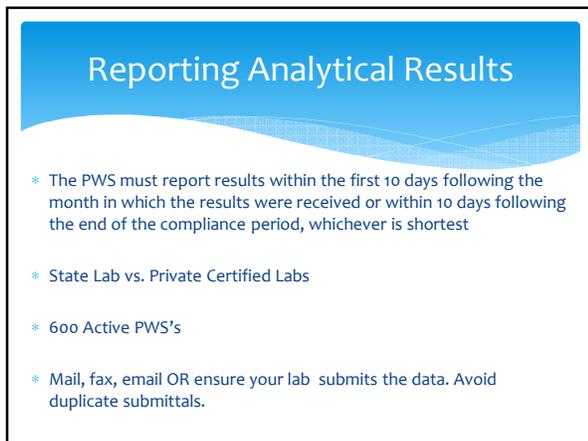
P = Pending Result
 RL = Reporting Limit
 MCL = Maximum Contaminant Level
 ND = Not Detected
 NOTE: Results displayed in BOLD, ITALIC TYPE have failed Nevada State health standards
 NOTE: This document will be destroyed at NSHL after 12 years, unless Client requests otherwise.

State Secondary

- Fluoride only monitored by CWS and NTNC
- One sample every 3 years
- Exceeding an MCL requires three additional samples within 90 days
 - Average the four analytical results to determine compliance
- Monitoring after exceedance determined by State
- Waiver not available







Reporting Results- COC's

- * Include PWS Name and Number
- * Help out our data entry staff!
- * Unique sample locations
- * Unique sample times
- * Please place Coliform samples out on a separate COC
- * Labs will be more stringent

CHAIN OF CUSTODY RECORD

Client Name: _____
 Address: _____
 Phone: _____
 Email: _____

Analysis Requested: _____
 Turnaround Time/Reference: _____

Date Sampled: _____

Signature: _____

Legend:
 1-Drinking Water, 2-Surface Water, 3-Ground Water, 4-Waste Water, 5-Soil, 6-SECA, 7-Other
 8-NACH, 9-NACH, 10-SECA, 11-NACH, 12-NACH, 13-NACH, 14-NACH, 15-NACH, 16-NACH, 17-Other

WETLAB

Client Name: _____
 Address: _____
 Phone: _____
 Email: _____

Analysis Requested: _____
 Turnaround Time/Reference: _____

Date Sampled: _____

Signature: _____

Legend:
 1-Drinking Water, 2-Surface Water, 3-Ground Water, 4-Waste Water, 5-Soil, 6-SECA, 7-Other
 8-NACH, 9-NACH, 10-SECA, 11-NACH, 12-NACH, 13-NACH, 14-NACH, 15-NACH, 16-NACH, 17-Other



Reporting Info

- * Bureau of Safe Drinking Water:
 - * Mailing Address: 901 S. Stewart, Suite 4001, Carson City, NV 89701
 - * Fax: 775-687-5699
 - * Email: E-data_BSDW@ndep.nv.gov
- * Washoe County District Health Department
 - * Mailing Address: PO Box 11130, Reno, NV 89520
 - * Fax (775) 325-8065
 - * Email: wrubio@washoecounty.us
- * Southern Nevada Health District
 - * Mailing Address: PO Box 3902, Las Vegas NV 89127
 - * Fax: (702) 380-2932
 - * Email: DiazN@SNHDmail.org

Facility Manager Contact Info

- * Nevada Bureau of Safe Drinking Water
 - * Andrea Seifert- 775-687-9526
 - * Bert Bellows- 775-687-9525
 - * Ross Cooper- 775-687-9522
 - * Jim Larson- (LV) 702-486-2850 x 253
 - * Latricia Lord- 775-687-9516
 - * Reggie Lang- 775-687-9528
- * Washoe County Health District
 - * Wes Rubio- 775-328-2381
 - * Bryan Tyre- 775-328-2430
- * Southern Nevada Health District
 - * Nate Diaz- 702-759-0541
