



January 22, 2010

Certified Mail Return Receipt Requested #7008 3230 0003 3235 4615

Mr. Art Stevens
16301 County Road 31.9
Weston, CO 81091-9749

RE: Complaint 200221077
Baseline Water Well Analysis
Well Permit 154735
SENE 29 32S, 67W Las Animas County, Colorado

Dear Mr. and Mrs. Lassiter:

In response to your request for a baseline water quality testing of your water well, the Colorado Oil and Gas Conservation Commission (COGCC) conducted a field visit to your property on October 27, 2009. The well head was screened for the presence of methane during the visit. Methane was not detected at the well head on October 27, 2009. Samples were collected on October 27, 2009 for general water quality parameters including dissolved methane analysis. These samples for analysis of inorganic parameters, volatile and semi-volatile organic compounds and dissolved methane analysis were received by ALS Laboratory Group in Fort Collins, Colorado on October 28, 2009. This letter summarizes the results of the chemical analyses and compares the laboratory data to published water quality standards. The results from sampling in 2009 are also compared to results of one previous sampling event at your domestic well that you conducted in 2001.

FIELD TESTING

I visited your property on October 27, 2009 and you and I went to your well and we screened at the casing of your well for methane with no methane detected on this day. You assisted me during sample collection. The well started pumping at approximately 9:24 at a flow of approximately 10 gallons per minute. We pumped water from an outdoor spigot located near your well until 09:36. I then collected samples for general inorganic water quality, dissolved methane, volatile organic compounds and BART kits. I did not observe bubbles in the water as it was pumped. The water was relatively clear and I did not notice any odor of hydrogen sulfide (rotten eggs) from the water.

COMPARISON OF INORGANIC ANALYTICAL RESULTS TO CDPHE INORGANIC STANDARDS

The Water Quality Control Commission (WQCC) of the Colorado Department of Public Health and Environment (CDPHE) has established "Domestic Use-Quality" human health standards and drinking water standards. Analytical data for the samples from your water well was compared to these standards. This information is summarized in Table 1 which is located in Attachment 1 and discussed in narrative form below. The records you provided to the COGCC show that samples were collected on one prior occasion from your current water well in the last 8 years and a comparison of results is shown in Table 2 in Attachment 4. Please keep in mind that these "Domestic Use-Quality Standards" were established for municipal public drinking water supplies and often people use and consume ground water from private wells that exceed these standards. The laboratory data reports from ALS Laboratory Group are included as Attachment 2.

- **Antimony (Sb):** The CDPHE human health standard for antimony is 0.006mg/l. Antimony is a contaminate metal.

Antimony was not detected in the sample collected from your water well (2009).

- **Arsenic (As):** The CDPHE human health standard for arsenic is 0.01 mg/l. Arsenic is a highly poisonous metal.

Arsenic was not detected in the sample collected from your water well (2009).

- **Barium (Ba):** The CDPHE human health standard for barium is 2.0 mg/l. Barium is a contaminate metal.

Barium was not detected in the sample collected from your water well (2009).

- **Beryllium (Be):** The CDPHE human health standard for beryllium is 0.004mg/l. Beryllium is a contaminate metal.

Beryllium was not detected in the sample collected from your water well (2009).

- **Cadmium (Cd):** The CDPHE human health standard for cadmium is 0.005 mg/l. Cadmium is a contaminate metal.

Cadmium was not detected in the sample collected from your water well (2009).

- **Chromium (Cr):** The CDPHE human health standard for chromium is 0.1 mg/l. Chromium is a contaminate metal.

Chromium was not detected in the sample collected from your water well (2009).

- **Lead (Pb):** The CDPHE human health standard for lead is 0.05 mg/l. Prolonged exposure to this metal can result in serious health effects.

Lead was not detected in the sample collected from your water well (2009).

- **Nickel (Ni):** The CDPHE human health standard for nickel is 0.1mg/l. Nickel is a contaminate metal.

Nickel was not detected in the sample collected from your water well (2009).

- **Selenium (Se):** The CDPHE human health standard for selenium is 0.05 mg/l. Selenium is a contaminate metal.

Selenium was not detected in the sample collected from your water well (2009).

- **Silver (Ag):** The CDPHE human health standard for silver is 0.05 mg/l. Excess amounts of silver may cause a permanent gray discoloration of the skin.

Silver was not detected in the sample collected from your water well (2009).

- **Thallium (Tl):** The CDPHE human health standard for thallium is 0.002 mg/l. Thallium is a contaminate metal.

Thallium was not detected in the sample collected from your water well (2009).

- **Uranium (U):** The CDPHE human health standard for thallium is 0.03 mg/l. Uranium can be present due to erosion of natural deposits of this element.

Uranium was detected in the sample collected from your water well at a concentration of 0.00022mg/l (2009) which is below the CDPHE human health standard.

- **Fluoride (F):** The CDPHE human health standard for fluoride is 4.0 mg/l. Where fluoride concentrations are in the range of 0.7 mg/l to 1.2 mg/l health benefits such as reduced dental decay have been observed. Consumption of fluoride at concentrations of greater than 2.0 mg/l can result in mottling of teeth. Consumption of fluoride at concentrations greater than 4.0 mg/l can increase the risk of skeletal fluorosis or other adverse health effects. Fluoride occurs naturally in the ground water in many areas in Colorado at concentrations that exceed the drinking water standard.

Fluoride was detected in the sample collected from your water well at a concentration of 0.81mg/l (2009) which is below the CDPHE human health standard.

- **Nitrate (NO₃):** The CDPHE human health standard for nitrate is 10.0 mg/l. Nitrate can cause cyanosis in infants; a household water supply should not contain nitrate concentration in excess of 10 mg/l.

Nitrate was detected in the sample collected from your water well at a concentration of 0.52mg/l (2009) which is below the CDPHE human health standard.

- **Nitrite (NO₂):** The CDPHE human health standard for nitrite is 1.0 mg/l. Nitrite concentrations exceeding 1.0 mg/l should not be used for feeding infants.

Nitrite Nitrate was detected in the sample collected from your water well at a concentration of 0.16mg/l (2009) which is below the CDPHE human health standard.

- **Copper (Cu):** The CDPHE secondary drinking water standard for copper is 1 mg/l.

Copper was detected in the sample collected from your water well at a concentration of 0.022mg/l (2009) which is below the CDPHE human health standard.

- **Chloride (Cl):** The CDPHE secondary drinking water standard for chloride is 250mg/l. Chloride concentrations in excess of 250 mg/l usually produce a noticeable taste in drinking water.

Chloride was detected in the sample collected from your water well (2009) at a concentration of 23mg/l which is below the CDPHE drinking water standard.

- **Iron (Fe):** The CDPHE secondary drinking water standard for iron is 0.3mg/l. Small amounts of iron are common in ground water. Iron produces a brownish-red color in laundered clothing, can leave reddish stains on fixtures, and impart a metallic taste to beverages and food made with it. After a period of time iron deposits can build up in pressure tanks, water heaters, and pipelines, reducing the effective flow rate and efficiency of the water supply.

Iron was not detected in the sample collected from your water well in 2009.

- **Manganese (Mn):** The CDPHE secondary drinking water standard for manganese is 0.05mg/l. Manganese produces a brownish color in laundered clothing, may stain fixtures and affect the taste of coffee or tea.

Manganese was detected in the sample collected from your water well in 2009 at a concentration of 0.076mg/l which is above the CDPHE drinking water standard.

- **Sulfate (SO₄):** The CDPHE sulfate secondary standard for human drinking water is 250mg/l. Although CDPHE does not have an agricultural standard for sulfate, other agencies recommend a concentration below 1,500 mg/l for livestock watering. Waters containing high concentrations of sulfate, typically caused by the leaching of natural deposits of magnesium sulfate (Epsom salts) or sodium sulfate (Glauber's salt), may be undesirable because of their laxative effects.

Sulfate was detected in the sample collected from your water well in 2009 at a concentration of 210mg/l which is below the CDPHE drinking water standard.

- **pH:** pH is the measure of the hydrogen ion concentration in water. The pH of water in its natural state is generally from 5.5 to 9.0. The CDPHE standard for domestic and agricultural water is a range of 6.5 to 8.5. Seven (7) represents neutrality, while values less than 7 indicate increasing acidity and values greater than 7 indicate increasing alkalinity.

pH was measured in the water sample from your well (2009) with a value of 7.83 which is within the CDPHE drinking water and agricultural standard.

- **Total Dissolved Solids (TDS):** CDPHE's TDS standard for human drinking water is 500 milligrams per liter (mg/l). Although CDPHE does not have an agricultural standard for TDS, other agencies recommend concentrations below 1500 mg/l for irrigation, and below 5,000 mg/l for most livestock watering. TDS occurs naturally in the ground water in many areas of Colorado at concentrations that exceed the drinking water standard.

TDS was calculated from other measurements in the water sample collected from your well in 2009 at a concentration of 576mg/l which is above the drinking water standard.

- **Zinc (Zn):** CDPHE's Zn standard for human drinking water is 5 milligrams per liter (mg/l) and the agricultural standard is 2mg/l.

Zinc was not detected in the sample collected from your water well in 2009.

The following parameters were also measured as part of the laboratory analysis although there are no CDPHE standards.

- **Sodium (Na):** People on salt restricted diets should be aware of the sodium concentration in the water they drink. A concentration of less than 20 mg/l is recommended by some for people on salt restricted diets or for people suffering from hypertension or heart disease. Sodium occurs naturally in the ground water in many areas of Colorado at concentrations that exceed this health advisory level.

Sodium was detected in the water sample from your well (2009) at a concentration of 100mg/l which is above the recommended level.

- **Boron (B):**

Boron was not detected in the water sample collected from your well in 2009.

- **Calcium (Ca):**

The calcium concentration in the sample collected from your well in 2009 was 58mg/l.

- **Magnesium (Mg):**

The magnesium concentration in the sample collected from your well in 2009 was 4.5mg/l.

- **Potassium (K):**

The potassium concentration in the sample collected from your well in 2009 was 1.4mg/l.

- **Molybdenum (Mo):**

Molybdenum was not detected in the water sample collected from your well in 2009.

- **Bicarbonate (HCO₃):**

Bicarbonate alkalinity was measured in the sample collected from your well in 2009 at a concentration of 170mg/l.

- **Bromide (Br):**

Bromide was detected in the sample collected from your water well in 2009 at a concentration of 0.45mg/l.

METHANE GAS ANALYSIS

Methane was detected in the sample collected from your well in 2009 at a concentration of 0.1mg/l. The concentration of methane in the water produced from the well and entering your house is below the threshold level of 1.1mg/l that could theoretically allow methane to accumulate in confined, unventilated spaces and potentially be explosive.

SEMI-VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS

ALS Laboratories analyzed for 72 target semi-volatile organic compounds (SVOC) in the water samples collected from your domestic well. The lab did not detect any of the 72 compounds above the reporting limit in the samples from the three CBM wells. Toluene was identified as a tentatively identified compound. One other SVOC compound was noted as present in water samples from your well but could not be identified by the lab

VOLATILE ORGANIC COMPOUND ANALYSIS

A target list of 69 volatile organic compounds (VOC) was utilized during analysis of water from your well. Six of the target list compounds were present above the method detection limit in samples from your well. No tentatively identified compounds were detected during the volatile target list analysis of water from your domestic well. The table below summarizes the volatile organic compounds reported from your water well samples.

None of the six VOCs detected in samples from your well were detected in the method blank prepared and analyzed at the lab. Three of the results are flagged with a J which indicates the compound was detected as

present but the concentration reported is estimated because the reported value is less than the reporting limit established by the lab for that compound. None of the six VOCs detected in samples from your well were detected in the trip blank that accompanied your samples and was subsequently analyzed at the lab. The absence of these six VOCs in the blanks indicates that the report of these compounds in samples from your well is not likely to be caused by either lab contamination or artifacts from the collection or the transportation of the samples. Four of the compounds detected are known as trihalomethanes (THMs) and are considered to be disinfection by-products. The THMs are most likely present in your well because you have used chlorine or bleach in your water system as a disinfectant. Two other VOCs were reported as present in your well water. Both toluene and acetone are found in household products and their presence may be from use of glues and solvents at your home.

Analyte	Concentration µg/l	CDPHE WQCC Groundwater Standard µg/l (Drinking Water Standard µg/l)
chloroform (THM)	9.5	3.5 (80 as total THMs)
bromodichloromethane (THM)	1.4	0.56 (80 as total THMs)
dibromochloromethane (THM)	0.66 J	14 (80 as total THMs)
bromoform (THM)	0.17 J	4 (80 as total THMs)
acetone	8.6 J	No Standard (No Standard)
toluene	24	560 (1000)

BACTERIAL ANALYSIS

The COGCC collected samples to analyze for the presence of iron, slime and sulfur bacteria in your water well. Samples from your water well were tested for the presence of iron-related (IRB), sulfate reducing (SRB) and slime forming (SLYM) bacteria using Biological Activity Reaction Test (BART) kits. In addition to detecting the presence of bacteria the BART Kits allow for an estimation of the size of the population and/or the rate at which they can metabolize and/or grow through an observable change or reaction. This reaction rate is referred to as the “aggressivity” of the bacterial population. The aggressivity levels of the bacteria are described as **Not Detected, Background, Moderately Aggressive, Very Aggressive, or Extremely Aggressive Levels**. The results of the tests are provided below and documented in Photographs 1, 2 and 3. The progress of the bacterial growth one day after the cultures were started is seen in Photograph 1. Photograph 2 shows the progress of the bacterial tests four days after the cultures were started and Photograph 3 shows the progress of the bacterial tests nine days after the cultures were started.

- **Iron-Related Bacteria (IRB):** Although not harmful, iron-related bacteria can become a nuisance by plugging the well pump, causing red staining on plumbing fixtures and laundered clothing, building up red, slimy accumulations on any surface the water touches, and causing what appears to be a sheen on standing water. Signs that may indicate an iron bacteria problem include “yellowish, red or orange colored water, rusty deposits in toilet tanks and strange smells resembling fuel oil, cucumbers or sewage. Sometimes the odor will only be apparent in the morning or after other extended periods of non-use” (CDPHE, Laboratory Services Division).

IRB bacteria were detected in the water sample collected at this well at Moderately to Very Aggressive levels. IRB are present when an orange cloudy layer, at the bottom of the IRB tube (red cap) and foam at the top develop. The development of a foamy layer can be seen in Photograph 2.



Photograph 1. BART Kits October 28, 2009

- **Sulfate Reducing Bacteria (SRB):** Sulfate reducing bacteria are serious nuisance organisms in water since they can cause severe taste and odor problems. These bacteria reduce sulfate that occurs naturally in the water and generate hydrogen sulfide (H_2S) gas as they grow. In turn, the hydrogen sulfide (H_2S) gas is a nuisance because it smells like rotten eggs, initiates corrosion on metal surfaces and reacts with dissolved metals such as iron to generate black sulfide deposits.

SRB were not detected in your well water as shown by the lack development of black particulates at the bottom of the black capped vial in Photograph 3. The culture turns black if SRB are present.

- **Slime Forming Bacteria (SLYM):** Although not usually harmful, Slime Forming Bacteria (SFB) can become a nuisance by plugging well pumps and causing slimy accumulations on plumbing fixtures and standing water. Slimes are often gelatinous in nature and may range in color from white, to red, or black. As slime bacteria mats grow they create an environment in which complex associations of other strains of bacteria can develop.

SLYM bacteria were not detected in the water sample collected from this well as indicated by the clear yellow liquid seen in the green capped vial in Photograph 3 after nine days. If SLYM bacteria are present the culture turns cloudy.

The BART tests indicate the presence of at one type of bacteria in your well system. Once bacterial colonies are established they are difficult to eliminate; therefore, you may need to establish a schedule for periodic disinfection of your well system to help control the bacteria present in it. The chlorination process is more easily accomplished if you have a frost-proof hydrant near the well head that you can use to remove the chlorinated water from the well. One technique that water well professionals use is to re-circulate the

chlorine solution down the sides of the well shortly after adding the chlorine. This helps to kill bacteria on the sides of the well and on the pipes in the well. Odor and taste problems with water wells are frequently caused by the presence of bacteria in the system.



Photograph 2. BART Kits October 31, 2009

Pamphlets published by the CDPHE that provide more information concerning water well iron and sulfur bacteria and shock chlorination treatment of bacteria are included as Attachment 3. You may also want to contact a licensed water well contractor for additional information or for help in disinfecting your well and distribution system. Additional information and assistance can be provided through the State of Colorado Health Department. Contact information for the agency is provided below.

Colorado Department of Public Health and Environment
Colorado Drinking Water Program
4300 Cherry Creek Drive South
Denver, CO 80246-1530
Phone: 303-692-3500
Fax: 303-782-0390



Photograph 3. BART Kits November 5, 2009

CONCLUSIONS

As noted in the narrative discussion and summarized in Table 1, the overall quality of water produced from your well is acceptable. Methane concentrations measured in your water are at levels that should not pose an explosion hazard if water is brought directly into your home or other confined space. Table 1 illustrates that none of the parameters tested exceed the CDPHE groundwater and drinking water standards with the exception of Mn and TDS. You may want to consider shock chlorinating your well to lessen the bacterial activity in the well. Manganese can be brought into solution in the water in and around your well by the reducing conditions caused by the bacterial activity in the well.

Table 2 compares water chemistry from three samples collected from your water well since 2001. Total Dissolved Solids (TDS) and Mn concentrations were similar in 2001 to the most recent sampling and analysis event. Concentrations of the major cations (sodium, potassium, calcium and magnesium) and the major anions (chloride, sulfate and bicarbonate) have remained relatively constant since the sampling and analysis data from 2001 that you provided to me.

Produced water from coal bed methane (CBM) wells in the Raton Basin typically contain several times higher concentrations of total dissolved solids than your well water contains. CBM produced water in the Raton Basin is characteristically of a sodium-bicarbonate nature (with lesser chloride). CBM produced water in the Raton Basin typically contains little or no calcium and magnesium due to a natural evolution of groundwater chemistry in systems in contact with clay minerals. Your well water has characteristics of shallow alluvial groundwater. The presence of nitrate and nitrite in water from your well may indicate that the water in your well is in communication with septic systems or that wastes from livestock may be reaching the well as these two sources are the most common sources of nitrite and nitrite in shallow groundwater. The presence of a relatively shallow water table (20 feet) in the area of your well was seen when the well was first drilled twenty years ago and also that you reported the water level in the well was at approximately 25 feet below

ground surface. The cement seal around the 20 foot deep casing may not have formed a tight seal or that seal may have deteriorated since the well was completed. The overall composition of the water in your well does not indicate that the groundwater in and around your well has been impacted by nearby CBM operations.

At present there is no data that would indicate the water quality in your domestic well has been impacted by nearby CBM drilling and operations. If you have any questions or would like to discuss these matters further, please contact me at 719-846-3091 or by email at peter.gintautas@state.co.us.

Sincerely,
Colorado Oil and Gas Conservation Commission

Peter Gintautas
Environmental Protection Specialist

Attachments: Attachment 1 - Table 1 - Analytical Summary 2009
Attachment 2 - ALS Laboratory Group Data Reports
Attachment 3 - CDPHE pamphlets
Attachment 4 - Table 2 - Analytical Summary 2001-2009

cc: David Neslin, COGCC Director w/o attachments
Debbie Baldwin, COGCC Environmental Protection Manager w/o attachments
Steve Lindblom, COGCC Environmental Protection Supervisor w/o attachments

TABLE 1
ANALYTICAL SUMMARY
Complaint 200221017
Stevens Water Well

Parameter	Water Well Sample		CDPHE Standards		
	Sample Date				
	27-Oct-09				
	Result	Unit	Domestic	Agriculture	Units
Antimony	ND(<0.0003)	mg/l	0.006	NS	mg/l
Boron	ND(<0.1)	mg/l	NS	0.75	mg/l
Copper	0.022	mg/l	1	0.2	mg/l
Arsenic	ND(<0.002)	mg/l	0.01	0.1	mg/l
Barium	ND(<0.1)	mg/l	2.0	NS	mg/l
Beryllium	ND(<0.002)	mg/l	0.004	0.1	mg/l
Cadmium	ND(<0.0003)	mg/l	0.005	0.01	mg/l
Calcium	58	mg/l	NS	NS	
Chromium	ND(<0.01)	mg/l	0.1	0.1	mg/l
Iron	ND(<0.1)	mg/l	0.3	5	mg/l
Lead	ND(<0.0005)	mg/l	0.05	0.1	mg/l
Lithium	0.022	mg/l	NS	NS	
Magnesium	4.5	mg/l	NS	NS	
Manganese	0.076	mg/l	0.05	0.2	mg/l
Molybdenum	ND(<0.001)	mg/l	0.035	NS	mg/l
Nickel	ND(<0.02)	mg/l	0.1	0.2	mg/l
Potassium	1.4	mg/l	NS	NS	
Selenium	ND(<0.001)	mg/l	0.05	0.02	mg/l
Silver	ND(<0.0001)	mg/l	0.05	NS	mg/l
Sodium	100	mg/l	NS	NS	
Strontium	1.2	mg/l	NS	NS	
Thallium	ND(<0.0002)	mg/l	0.002	NS	mg/l
Uranium	0.00022	mg/l	0.03	NS	mg/l
Zinc	ND(<0.02)	mg/l	5	2	mg/l
Chloride	23	mg/l	250	NS	mg/l
Nitrite	0.16	mg/l	1.0	10	mg/l
Nitrate	0.52	mg/l	10.0	100	mg/l
Total Nitrite/Nitrate	0.68	mg/l	10.0	100	mg/l
Fluoride	0.81	mg/l	4.0	NS	mg/l
Total Dissolved Solids (calc.)	576	mg/l	400	*1500	mg/l
pH	7.83	No units	6.5 - 8.5	6.5 - 8.5	No units
Sulfate	210	mg/l	250	NS	mg/l
Bromide	0.45	mg/l	NS	NS	
Total Alkalinity	170	mg/l	NS	NS	
Bicarbonate	170	mg/l	NS	NS	
Carbonate	ND(<20)	mg/l	NS	NS	
Conductivity	810	umhos/cm	NS	NS	
methane	0.1	mg/l	NS	NS	
Total Organic Carbon	2.7	mg/l	NS	NS	
SAR	3.4	ratio	NS	NS	

Notes

CDPHE

Domestic

Agriculture

mg/l

umhos/cm

NA

ND

NS

Colorado Department of Public Health and the Environment.

Water Quality Control Commission 5 CCR 1002-41, Regulation No. 41 - The Basic Standards For Ground

* Standards for agriculture complied from CDPHE and other of sources.

milligrams per liter (ppm or parts per million).

micromhos per centimeter

Not analyzed.

Not detected.

No Standard.

Health Advisory.

Human health standard.

Secondary standard.

calc. = calculated from other results

TABLE 2
ANALYTICAL SUMMARY 2001 to 2009
Complaint 200221017
Stevens Water Well

Parameter				CDPHE Standards		
	Sample Date	Sample Date				
	9-Apr-01	27-Oct-09				
	Result	Result	Unit	Domestic	Agriculture	Units
Antimony	NA	ND(<0.0003)	mg/l	0.006	NS	mg/l
Boron	NA	ND(<0.1)	mg/l	NS	0.75	mg/l
Copper	NA	0.022	mg/l	1	0.2	mg/l
Arsenic	NA	ND(<0.002)	mg/l	0.01	0.1	mg/l
Barium	NA	ND(<0.1)	mg/l	2.0	NS	mg/l
Beryllium	NA	ND(<0.002)	mg/l	0.004	0.1	mg/l
Cadmium	NA	ND(<0.0003)	mg/l	0.005	0.01	mg/l
Calcium	59	58	mg/l	NS	NS	
Chromium	NA	ND(<0.01)	mg/l	0.1	0.1	mg/l
Iron	0.15	ND(<0.1)	mg/l	0.3	5	mg/l
Lead	NA	ND(<0.0005)	mg/l	0.05	0.1	mg/l
Lithium	NA	0.022	mg/l	NS	NS	
Magnesium	6	4.5	mg/l	NS	NS	
Manganese	0.19	0.076	mg/l	0.05	0.2	mg/l
Molybdenum	NA	ND(<0.001)	mg/l	0.035	NS	mg/l
Nickel	NA	ND(<0.02)	mg/l	0.1	0.2	mg/l
Potassium	1	1.4	mg/l	NS	NS	
Selenium	NA	ND(<0.001)	mg/l	0.05	0.02	mg/l
Silver	NA	ND(<0.0001)	mg/l	0.05	NS	mg/l
Sodium	102	100	mg/l	NS	NS	
Strontium	NA	1.2	mg/l	NS	NS	
Thallium	NA	ND(<0.0002)	mg/l	0.002	NS	mg/l
Uranium	NA	0.00022	mg/l	0.03	NS	mg/l
Zinc	NA	ND(<0.02)	mg/l	5	2	mg/l
Chloride	15	23	mg/l	250	NS	mg/l
Nitrite	NA	0.16	mg/l	1.0	10	mg/l
Nitrate	<0.05	0.52	mg/l	10.0	100	mg/l
Total Nitrite/Nitrate	NA	0.68	mg/l	10.0	100	mg/l
Fluoride	NA	0.66	mg/l	4.0	NS	mg/l
Total Dissolved Solids (calc.)	567	576	mg/l	400	*1500	mg/l
pH	7.9	7.83	No units	6.5 - 8.5	6.5 - 8.5	No units
Sulfate	207	210	mg/l	250	NS	mg/l
Bromide	NA	0.45	mg/l	NS	NS	
Total Alkalinity	163	170	mg/l	NS	NS	
Bicarbonate	163	170	mg/l	NS	NS	
Carbonate	<1	ND(<20)	mg/l	NS	NS	
Conductivity	920	810	µmhos/cm	NS	NS	
methane	NA	0.1	mg/l	NS	NS	
Total Organic Carbon	NA	2.7	mg/l	NS	NS	
SAR	3.4	3.4	ratio	NS	NS	

Notes

CDPHE

Domestic

Agriculture

mg/l

µmhos/cm

NA

ND

NS

Colorado Department of Public Health and the Environment.

Water Quality Control Commission 5 CCR 1002-41, Regulation No. 41 - The Basic Standards For Groundwater.

* Standards for agriculture complied from CDPHE and other of sources.

milligrams per liter (ppm or parts per million).

micromhos per centimeter

Not analyzed.

Not detected.

No Standard.

Health Advisory.

Human health standard.

Secondary standard.

calc. = calculated from other results