

# Protecting Source Water During Oil and Gas Development



Paul Hempel


Source Water Program Manager  
Colorado Rural Water Association



# CRWA:

## 36 Years of Water & Wastewater Operator Training and Certification



 <b>COLORADO WATER AND WASTEWATER FACILITY OPERATORS CERTIFICATION BOARD</b> Operator Certification Program Office 2170 S Parker Rd Ste 290 Denver, Colorado 80231				Information (303) 394-8994 Fax (303) 394-3450
<b>APPLICATION FOR WATER, WASTEWATER, INDUSTRIAL WASTEWATER COLLECTION, AND DISTRIBUTION CERTIFICATION EXAMS</b>				
READ INSTRUCTIONS CAREFULLY BEFORE COMPLETING APPLICATION. AN INCOMPLETE APPLICATION MAY RESULT IN DISQUALIFICATION.				
<b>1. Enter Level as noted in instructions. ONLY ONE SELECTION PER APPLICATION</b>	Water Treatment Level: _____ Water Distribution Level: _____	Wastewater Treatment Level: _____ Wastewater Collection Level: _____	Industrial Wastewater Treatment Level: _____ Small Systems <input type="checkbox"/> TNC <input type="checkbox"/> Water <input type="checkbox"/> Wastewater	
<b>2. Exam Date:</b> _____		<b>Location:</b> _____		
<b>3. GENERAL INFORMATION</b> <input type="checkbox"/> Check here if this is a change of information				
<b>NAME:</b> _____ (Last) _____ (First) _____ (Middle)				
<b>MAILING ADDRESS:</b> _____ (Street) _____ (City) _____ (State) _____ (Zip)				
<b>HOME PHONE #:</b> _____		<b>WORK PHONE #:</b> _____		<b>FAX #:</b> _____
<b>CELL PHONE #:</b> _____		<b>E-MAIL:</b> _____		<b>OPERATOR ID #</b> _____
<b>FACILITY PWSID#:</b> _____				<b>FACILITY PERMIT #:</b> _____

# Programs/Services

- Trainings
- Circuit Riders
  - Water
  - Wastewater
- Annual Conference
- Energy Efficiency Assessment
- Source Water Protection

# Colorado Rural Water Association's

## Source Water Assessment and Protection Program



Colorado Department  
of Public Health  
and Environment



# 1996 Safe Drinking Water Act Amendments





# What is Source Water Assessment and Protection?

Multi-step, two-phased process designed to assist public water supply systems in preventing accidental contamination of their untreated drinking water supply through the development and Implementation of source water protection plans.



# Colorado's SWAP Program

- **Voluntary/Non-Regulatory**
- **Main focus – stakeholder involvement, public education**
- **Two –phase Program**
  - Assessment Phase
  - Protection Phase







Source: CDPHE - WQCD



# Stakeholders Work Together to Develop and Implement the Source Water Protection Plan



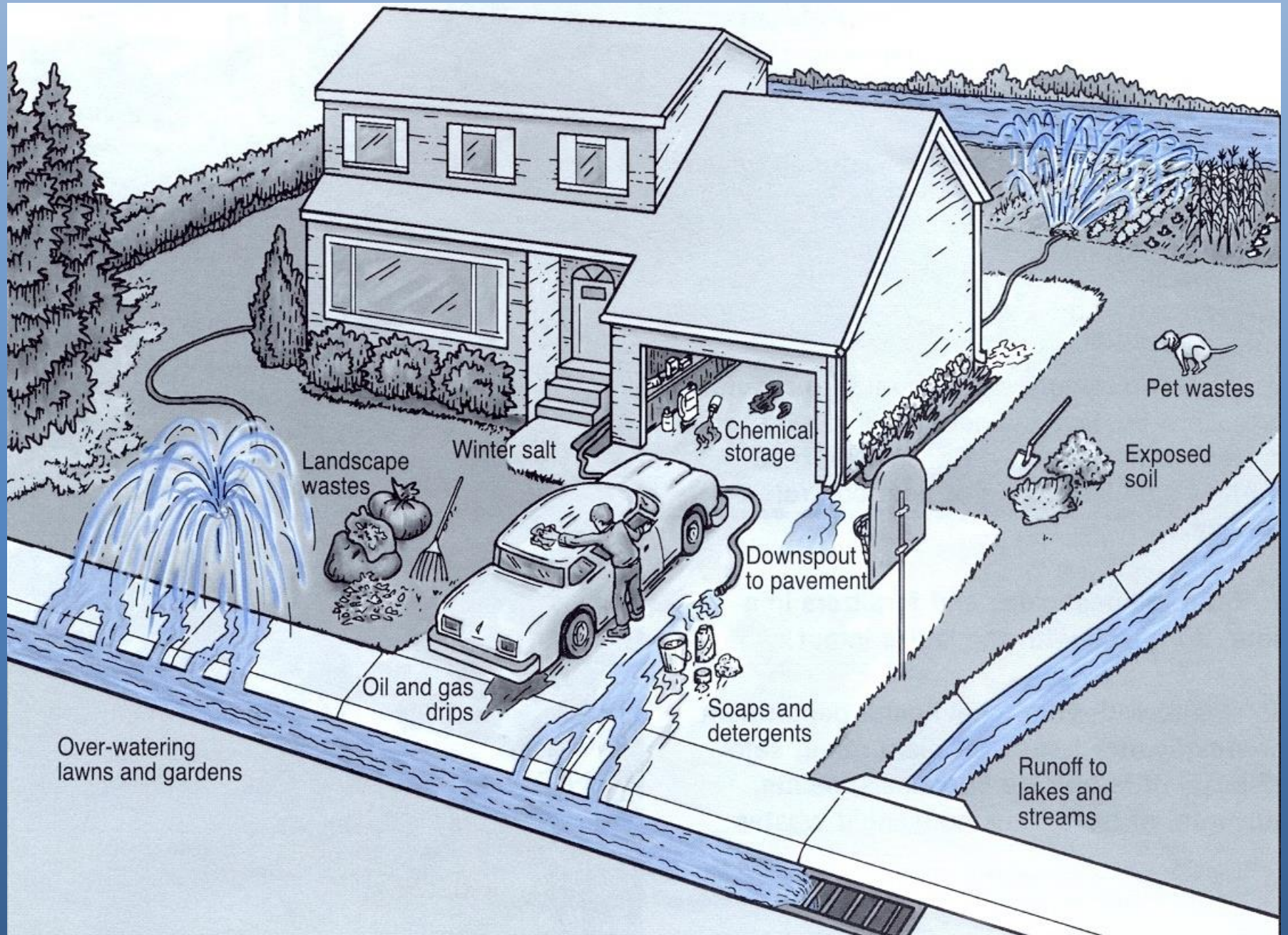
## Potential Contaminant Sources



## Drinking Water Supply







## Residential Practices





# Failing Septic Systems





# Questionable Agricultural Practices





# Wildfires





# Oil and Gas Development



This resource guide was  
a collaborative effort:



Intermountain Oil and  
Gas BMP Project

AirWaterGas



Sustainability  
Research  
Network



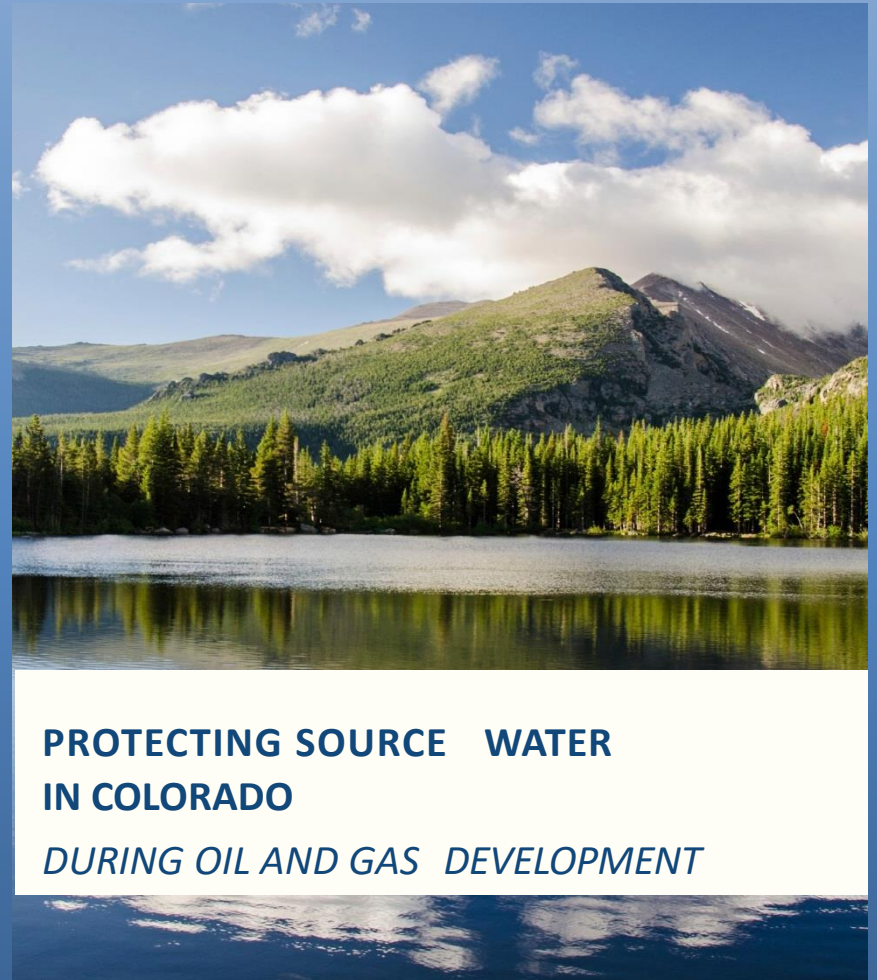
## PROTECTING SOURCE WATER IN COLORADO

*DURING OIL AND GAS DEVELOPMENT*



# A Guidance Document for Water Providers and Their Communities

- Review of Oil and Gas Development and Potential Risks to Source Water
- Regulatory and Non-Regulatory Approaches to Protecting Source Waters
- Assessing and Mitigating Potential Risks to Source Water



# **Risks to Water Quality from Oil and Gas Development**

# SPILLS

From 2013-2016, there was an average of 1.8 spills per day, with an average size of 171 gallons of oil & 1265 gallons of produced water per spill





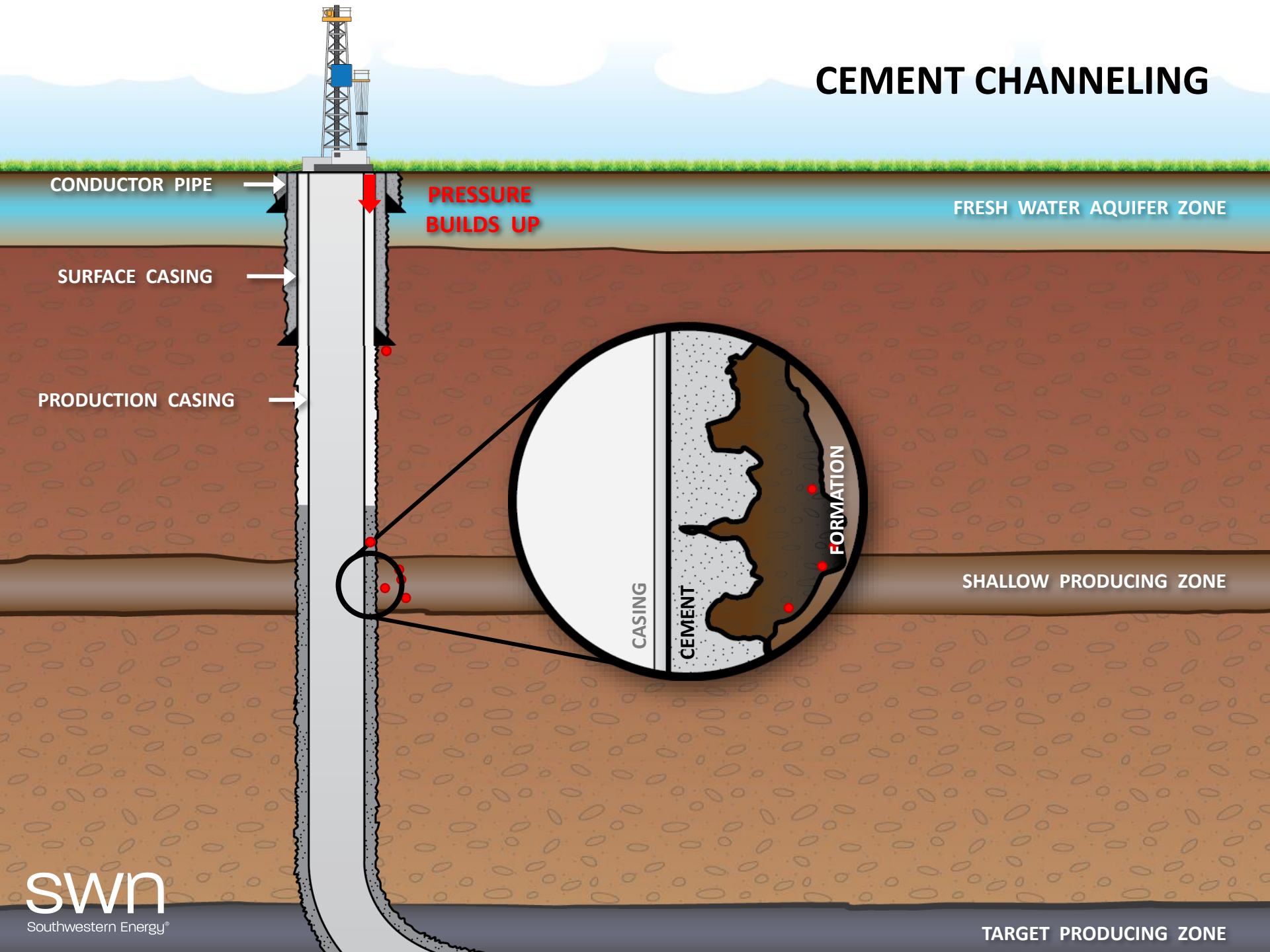








# CEMENT CHANNELING



# METHANE IN WELL WATER

Owen A. Sherwood, Jessica D. Rogers, Greg Lackey, Troy L. Burke, Stephen G. Osborn, and Joseph N. Ryan. 2016. "Groundwater Methane in Relation to Oil and Gas Development and Shallow Coal Seams in the Denver-Julesburg Basin of Colorado." Proc Natl Acad Sci USA. published ahead of print July 11, 2016, doi:10.1073/pnas.1523267113. Full text available: <http://www.pnas.org/content/early/2016/07/05/1523267113.full>

Osborn SG, Vengosh A, Warner NR, Jackson RB. Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. Proc Natl Acad Sci USA. 2011;108:8172–8176. Available at: <http://www.nicholas.duke.edu/cgc/pnas2011.pdf>

# Addressing Potential Risks To Source Water From Oil and Gas Development

- **Location: The Most Important Protection of Source Water**
  - **Mitigation:**
    - Require Proper Casing and Well Construction
    - Use Pits to Store Water and Other Fluids
    - Provide extra protection around stream crossings
    - Conduct Baseline Water Quality Monitoring
- \* Water Wells and Intakes in Close-Proximity to Oil and Gas Wells Should Have Additional Protections

# **Regulatory and Non-regulatory Approaches to Source Water Protection**

*available to water providers and local governments*

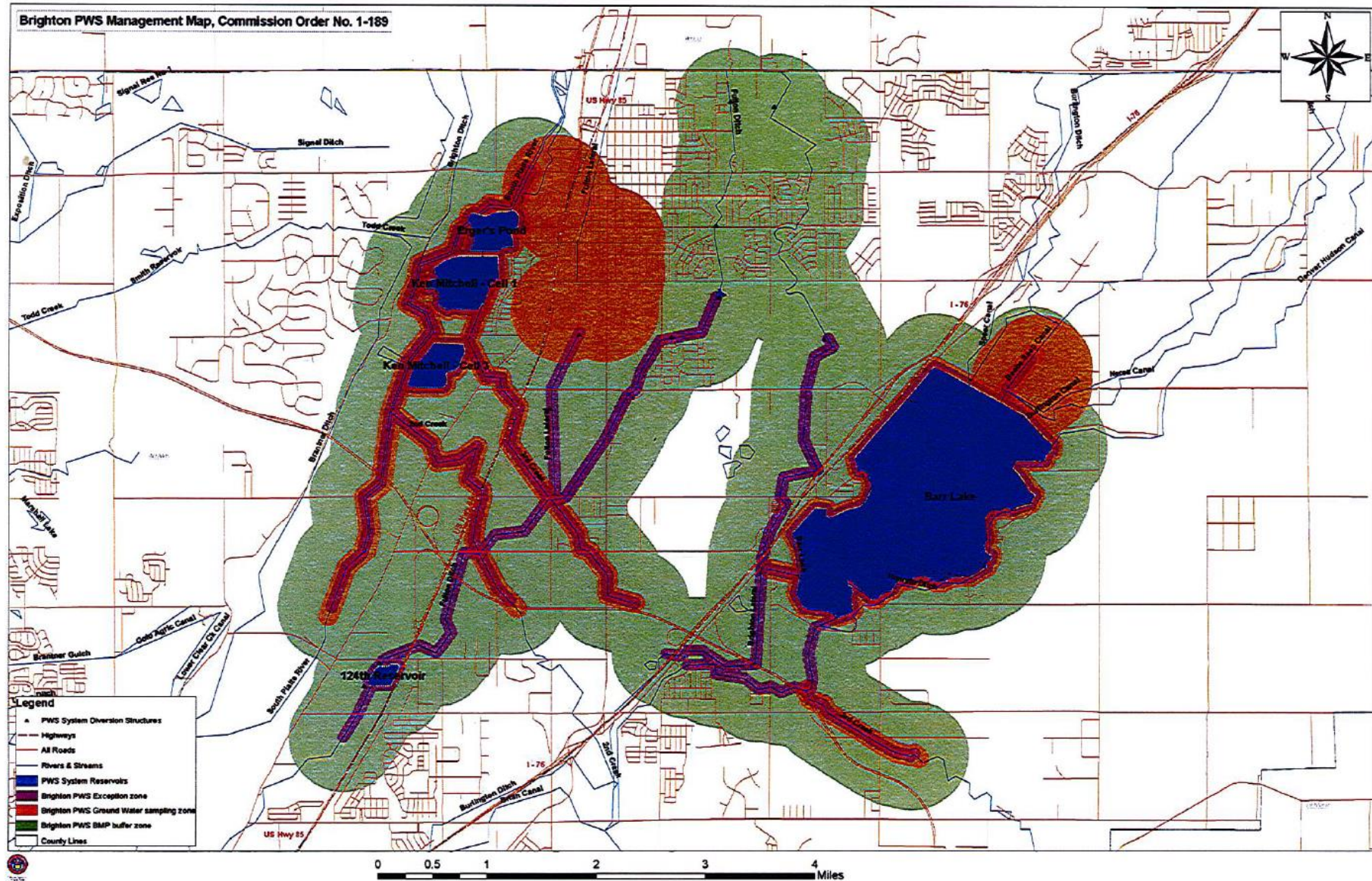
- Working through state permitting process
- Private party contracts
  - Oil and gas leases
  - Surface use agreements
- Watershed District Ordinances
- Memorandums of Understanding
- Collaborative planning approaches
- Recognition of Source Water Protection Areas

# City of Brighton COGCC Order

- Created an “Exception Zone” around the Brighton City water supply - does not allow oil and gas facilities within 500’ of its water wells or 300’ from rivers and streams.
- Created a “Ground Water Sampling Zone” from ½ mile from the City’s water supply as well as 500’ from rivers, lakes, and streams Brighton relies on for its water supply.
- Created a “Buffer Zone” that is within ½ mile of all water facilities where best management practices will be utilized to protect water quality.

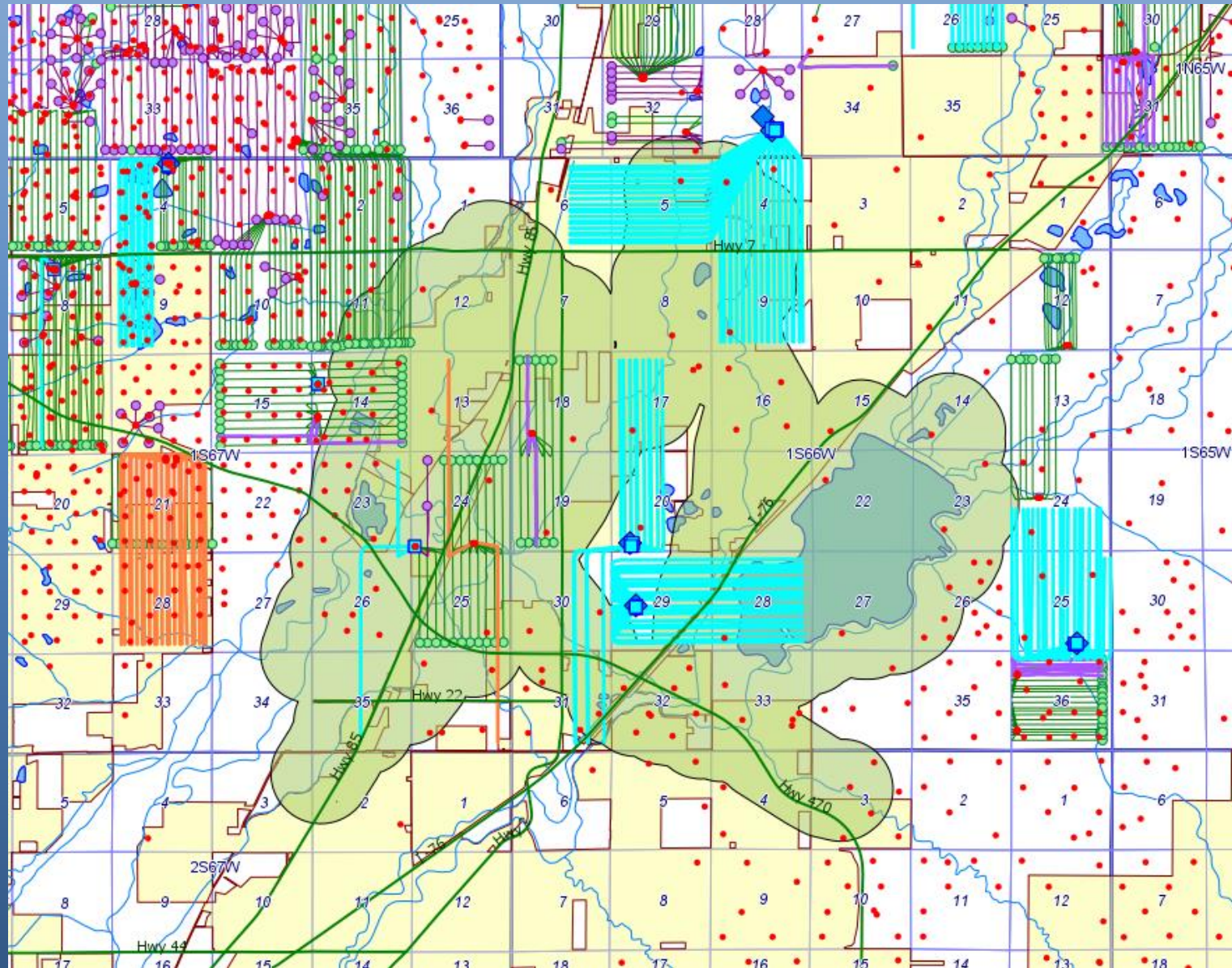


Brighton PWS Management Map, Commission Order No. 1-189





# Current Oil and Gas Development

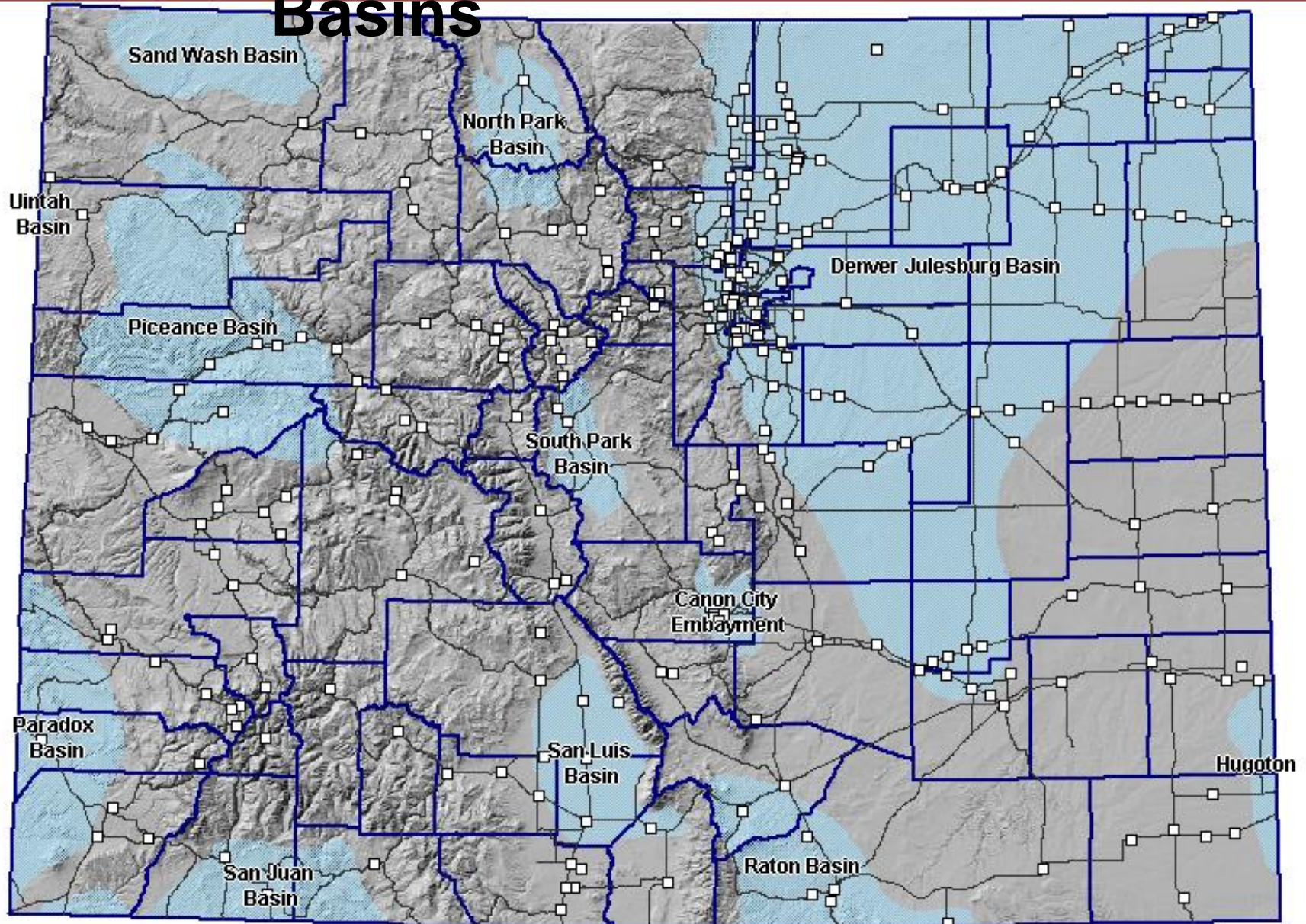


## **Case Studies:**

**Water providers and their  
communities working with the oil  
and gas industry during  
development of  
Source Water Protection Plans**



# Colorado's Oil and Gas Basins





## Plateau Valley Source Water Protection Plan



Mesa County, Colorado  
March 2008

Written by Colleen Williams  
Source Water Specialist  
Colorado Rural Water Association

For the communities of:  
Town of Collbran: ID # CO0139185  
Mesa Water and Sanitation District: ID # CO0139505  
Powderhorn Metro District 1 Ski Corporation: ID # CO0239618

The Town of Collbran is a small rural town located 40 miles east of Grand Junction, CO. The source waters for the Town of Collbran originate from springs in the Buzzard Creek watershed.

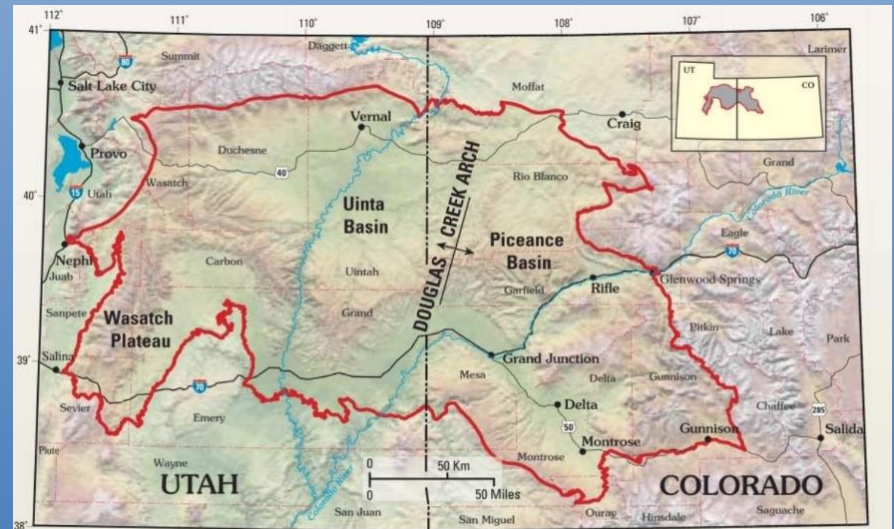
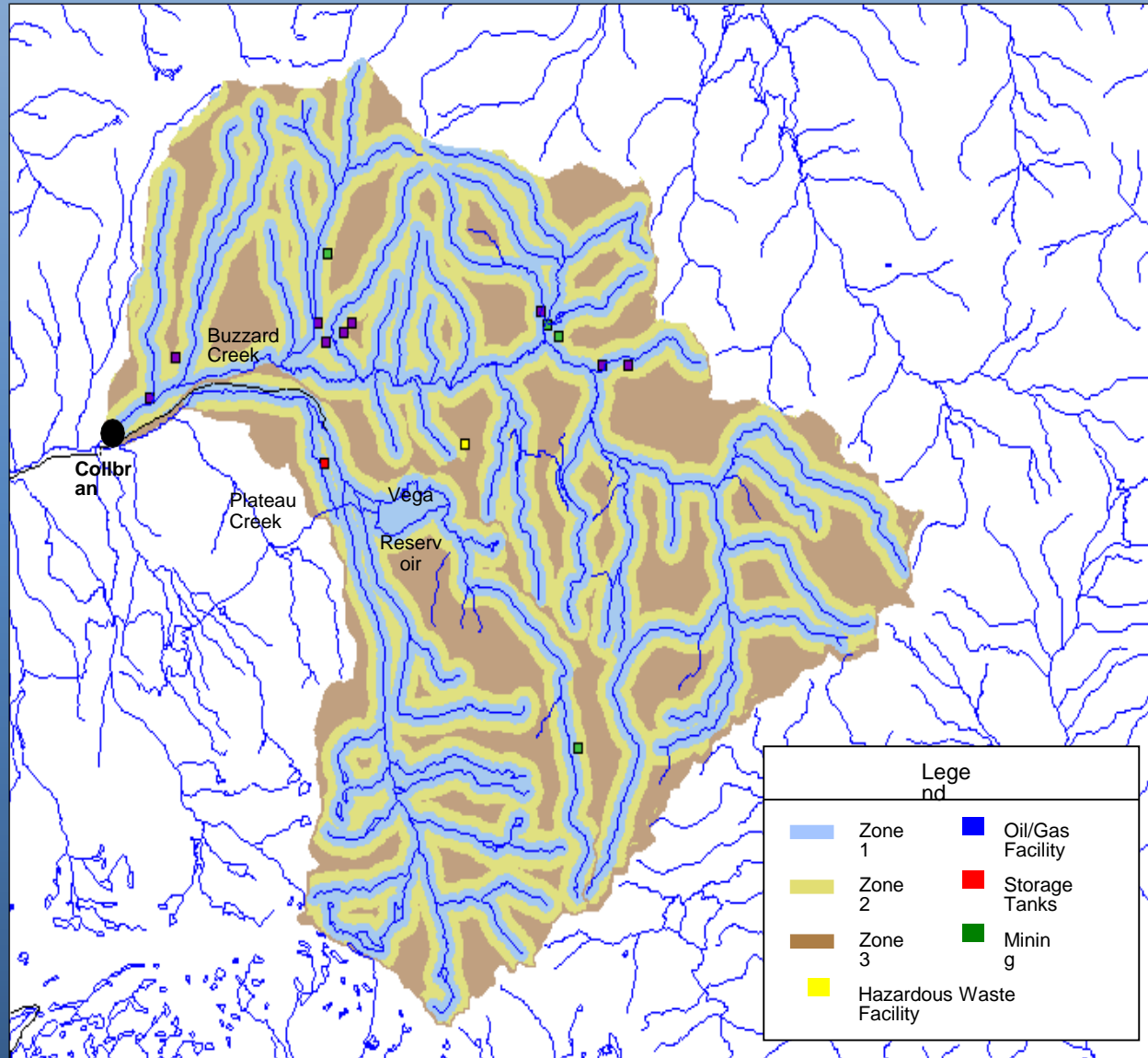


Figure 1. Uinta-Piceance Province located in northwestern Colorado and northeastern Utah. The Douglas Creek arch separates Piceance Basin from Uinta Basin. The Wasatch Plateau is included in this province.



# Town of Colbran Source Water Protection Areas





# Oil & Gas Management Approach

TOWN OF COLLBRAN, COLORADO  
ORDINANCE NO. 8  
SERIES OF 2010

A AN ORDINANCE OF THE TOWN OF COLLBRAN, COLORADO ADOPTING A NEW  
CHAPTER 9.15, "WATERSHED PROTECTION" TO TITLE 9 OF THE COLLBRAN  
MUNICIPAL CODE

WHEREAS, the Town of Collbran operates its water and sewer facilities using water rights derived in part from and collected by the Town in Buzzard Creek, Plateau Creek and Grove Creek; and

WHEREAS, the Town adopted the Plateau Valley Source Water Protection Plan dated March 2008 prepared by the Colorado Rural Water Association, which was prepared following numerous stakeholder meetings and identified the various impacts of activities to the Town's water resources including agricultural practices, oil and gas development, storage tanks, septic, transportation on roads, land uses, public lands, private wells, and residential practices; and

## **Stipulations Included:**

- A hydrologic study concerning the source of the aquifer feeding the springs,
- Full disclosure of all chemicals used in the operations,
- Improvements to the pipes that deliver water from the springs under the road,
- Provide the town with potable water in case the springs become contaminated,
- Produced water stored on site to reduce the number of trucks crossing over the spring's,
- Posting of a \$100,000.00 bond to the Town

Town of New Castle  
 Town of Silt  
 City of Rife  
 Town of Parachute  
 Talbott Enterprises

**Source Water Protection for the Colorado  
 River Partnership  
 Source Water Protection Plan**



**Garfield County, CO  
 January 2013**

Written by: Morgan Hill, Environmental Health Specialist  
 Garfield County Public Health

Coordinated by: Dylan Eiler, Source Water Specialist  
 Colorado Rural Water Association

For the community water providers:  
 Town of New Castle: ID# CO0123538  
 Talbott Enterprises: ID# CO0123734  
 Town of Silt: ID# CO0123710  
 City of Rifle: ID# CO0123676  
 Town of Parachute: ID# CO0123602

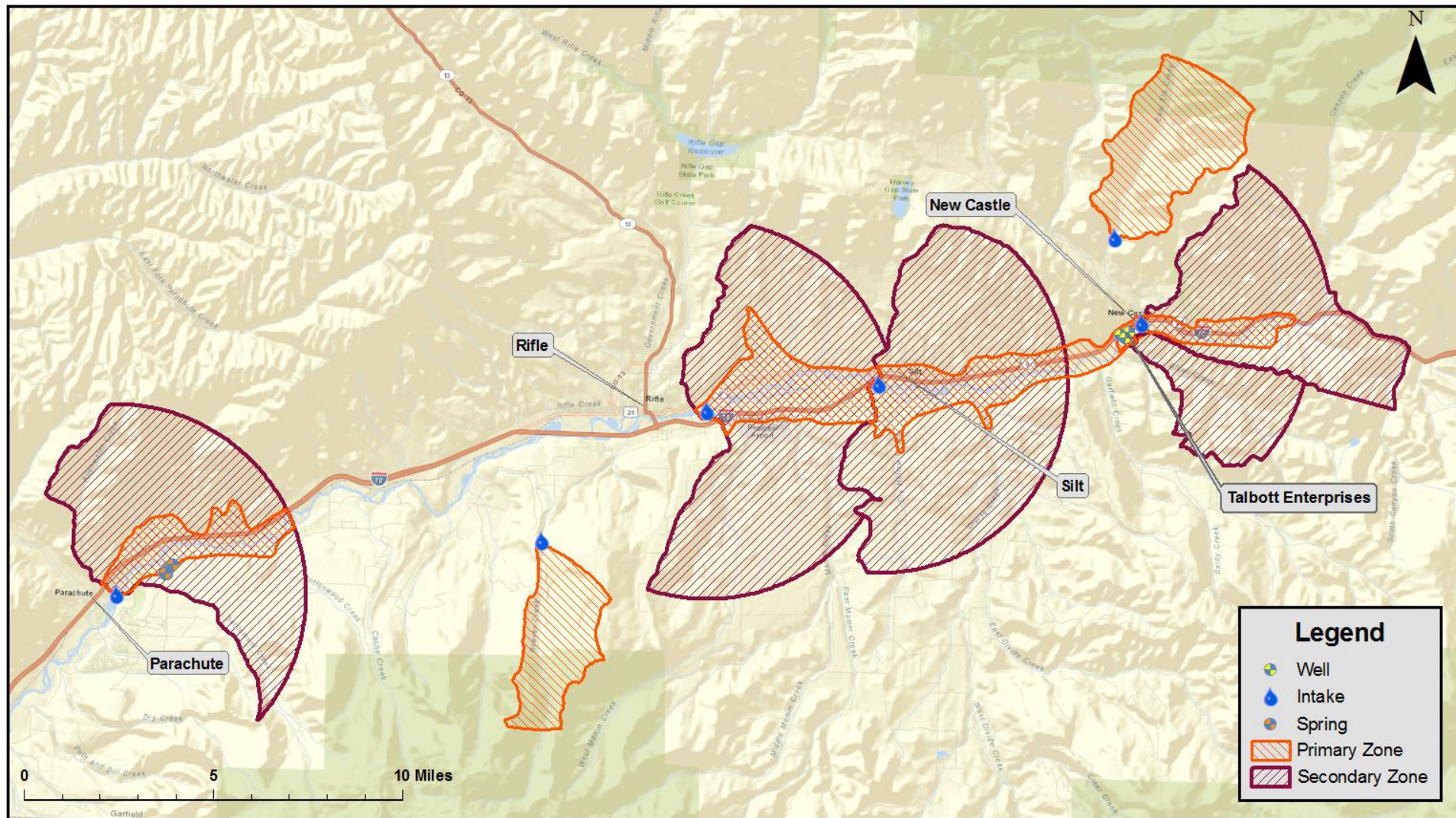


Town of  
 Talbott  
 Town  
 City  
 Town of Parachute





## Mid Colorado Partnership Source Water Protection Areas



# Oil & Gas Management Approach

The Steering Committee recognized that extensive regulations for the oil and gas industry were already in place.

The focus was on opening the channels of communication between the energy industry field workers and the water operators.

**Town of Silt**  
Emergency Response Notification  
PWSID# CO0123710


**Business Address:** 500 W. River Frontage Road  
Silt, CO 81652

**Mailing Address:** P.O. Box 70  
Silt, CO 81652

**Business Phone:** (970) 876-2353  
**Operations Phone:** (970) 969-0041 (Jack Castle cell)

**Description of Drinking Water Supply Operation and Protection Area:**

- Surface Water System:
  - o Colorado River intake: located just west of the primary downtown area, at these coordinates:
    - 39.542818 latitude
    - -107.668213 longitude
  - o Note that as of March 2013, there are plans to develop three shallow alluvial wells 100 feet from the Colorado River bank in the same location. One well has been drilled and the other two are waiting for approval.



**Please notify the Town of Silt if the following occur:**

- Spills, line breaks, or other accidents related to oil and gas operations that have the potential to enter the drinking water supply
- Railroad accidents resulting in a train car derailment or other material spills
- Any major incident on I-70, Highway 6 & 24, or adjacent county roads such as County Road 311 and 335.
- Any incidences of contamination that may occur in gravel mining operations operating in the Colorado River alluvium.

**Important Contact Information:**

<b>Garfield County Dispatch (emergency):</b>	911
Colorado Environmental Release and Incident Reporting Hotline:	1-877-518-5608
Garfield County Dispatch (non-emergency):	(970) 625-9095
Garfield County Sheriff (Lou Vajango):	(970) 285-9127
Emergency Phone- Silt Police Department:	(970) 876-2735
Source Gas (gas):	(303) 243-3580
Xcel Energy (electric):	1 (800) 895-1999



Oak Meadows Service Company provides water to a small rural subdivision located in Garfield County in western Colorado south of the City of Glenwood Springs

## OAK MEADOWS SERVICE COMPANY Source Water Protection Plan

Garfield County, Colorado  
October 22, 2013

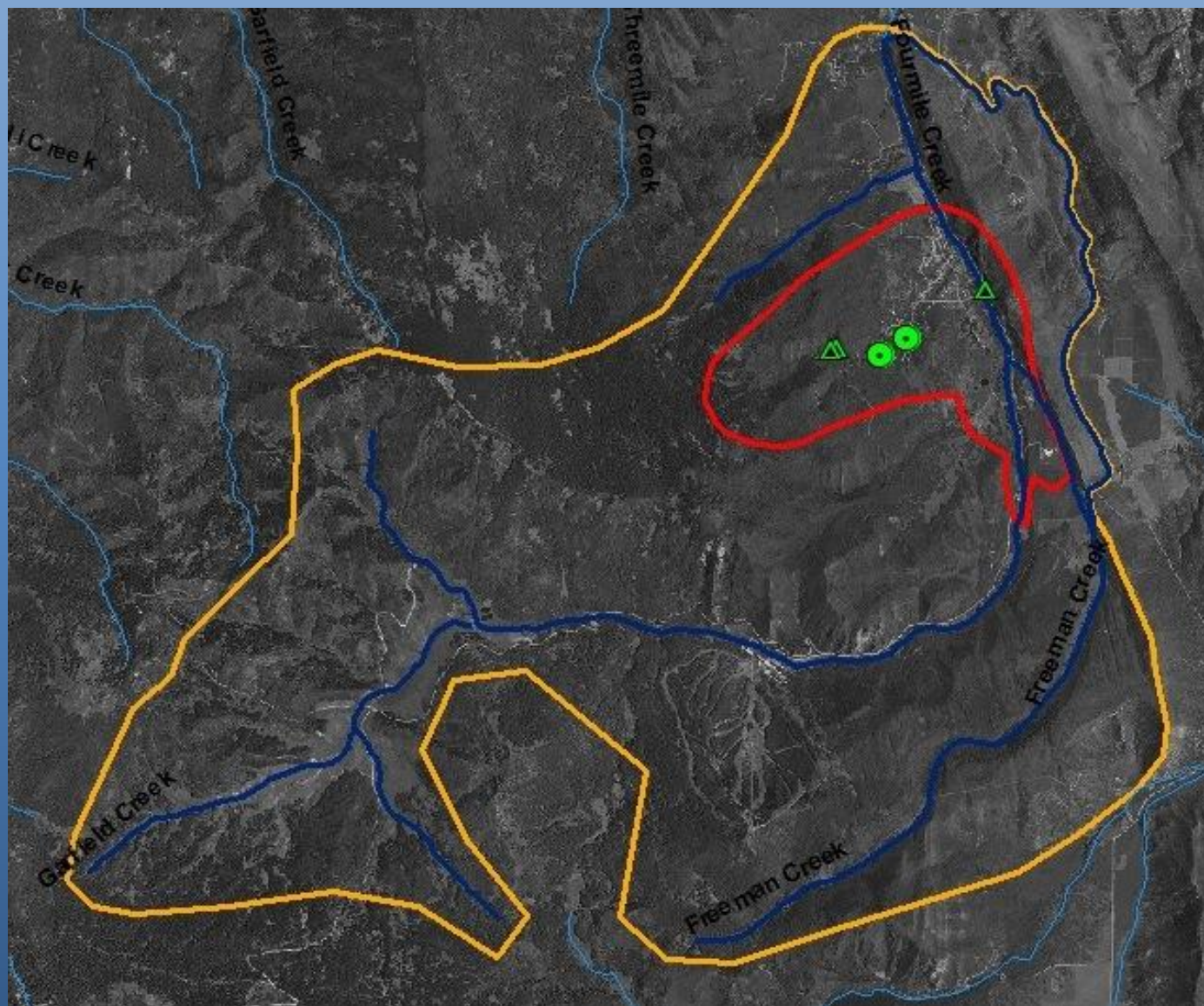


Written by: Mary Leslie  
Environmental Process Control  
and  
Paul Hempel  
Colorado Rural Water Association  
For the Community Water Provider:  
Oak Meadows Service Company, PWSID# CO 0123566  
revised 6/23/14





## Oak Meadows Water Association Source Water Protection Areas







## Oil & Gas Management Approach

- OMSCO sent a letter to the BLM, the USFS District Ranger and the WRNF Supervisor outlying their concerns.
- OMSCO provided copies of the final SWPP to the COGCC, SG Interests and Garfield and Pitkin Counties.
- Due to increased public involvement, US Senator Michael Bennet introduced the Thompson Divide Withdrawal and Protection Act in the United States Senate. The bill offers a middle-ground solution to the ongoing conversation about the Thompson Divide's future. If passed, the legislation would, among other things, withdraw unleased public minerals in the area.
- The USFS final EIS for the White River National Forest included a ban on any future oil and gas leases in the Thompson Divide area
- The Bureau of Land Management has formally proposed to cancel 25 leases in the Thompson Divide including lease #066688. A final record of decision is expected to come at any time.

## Morgan County Quality Water Source Water Protection Plan



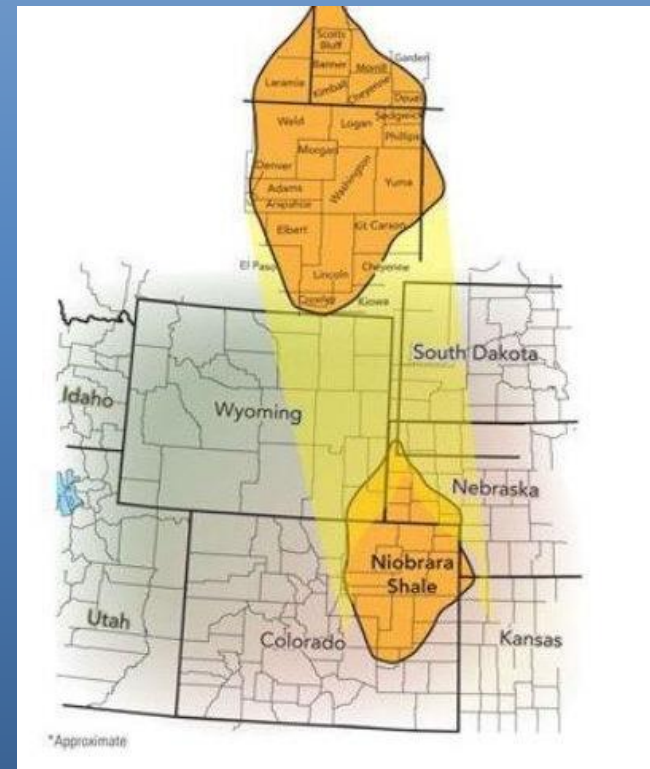
Morgan County, Colorado

September 2009

Written by Colleen Williams  
Source Water Specialist  
Colorado Rural Water Association

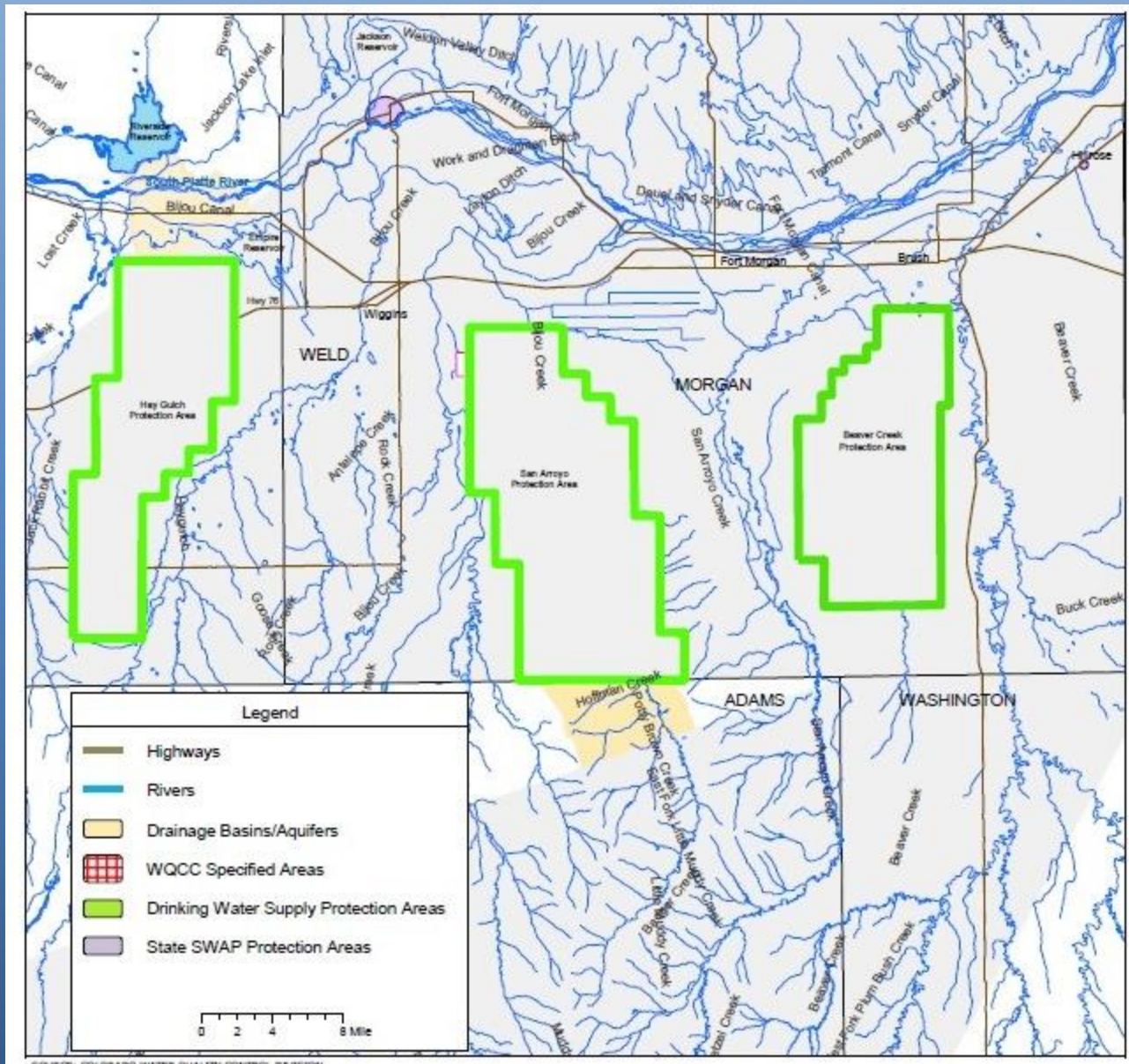
For the community water provider  
Morgan County Quality Water: ID # CO0144020

Morgan County Quality Water is a “Special District” water provider that supplies drinking water to residents in rural Morgan County, Colorado. The main source of their water is from 9 groundwater wells located within 3 different well fields.





# Morgan County Quality Water Source Water Protection Areas



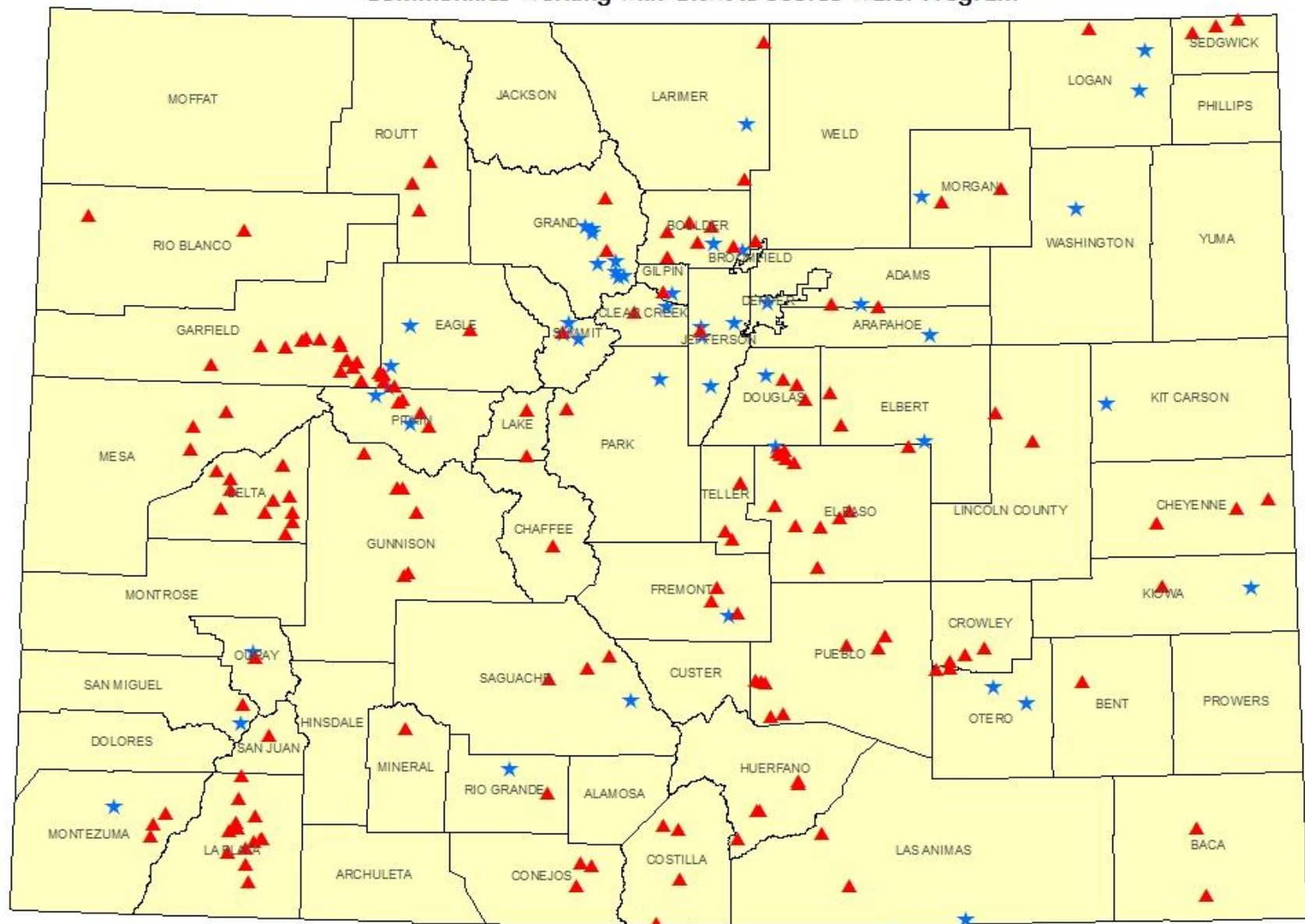
# **In Review...**

## **Protecting Source Waters During Oil and Gas Development**

- **Develop a Source Water Protection Plan**
- **Define your source water protection areas**
- **Know the decision-makers**
- **Track oil and gas development**
- **Understand and mitigate risks**
- **Get involved in the process**
  - **Private contracts**
  - **Local, state and federal government processes**
    - **Legal and Collaborative**



## Communities Working with CRWA's Source Water Program



# Thank-you!

Paul Hempel – Colorado Rural Water Association

[paul.hempel@hotmail.com](mailto:paul.hempel@hotmail.com)

719-565-8007

