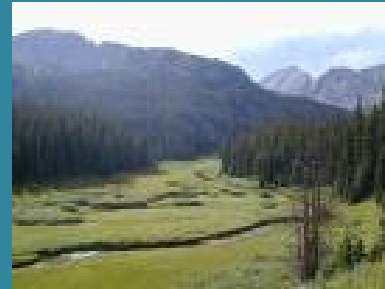
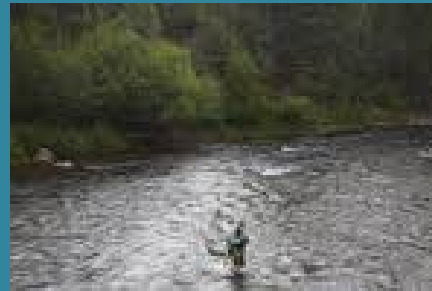


Source Water Assessment and Protection: Case Studies in Protecting Community Drinking Water Supplies Throughout Colorado

Colorado Watershed Assembly, October 2011



Colorado Rural Water Association
176 West Palmer Lake Drive
Pueblo, CO 81007
crwa.net



WHAT IS SOURCE WATER ASSESSMENT AND PROTECTION?

Two-phased process designed to assist public water supply systems in preventing accidental contamination of their untreated drinking water supply by developing protection plans.



WHY WOULD A COMMUNITY WANT A SOURCE WATER PROTECTION PLAN?

- To protect a valuable resource
- To protect public health
- To reduce risk of contamination
- To reduce cost for treatment
- To avoid expensive clean up costs
- To coordinate land use
- Obtain funding with grants and low interest loans

A Multi-Barrier Approach

To providing safe drinking water

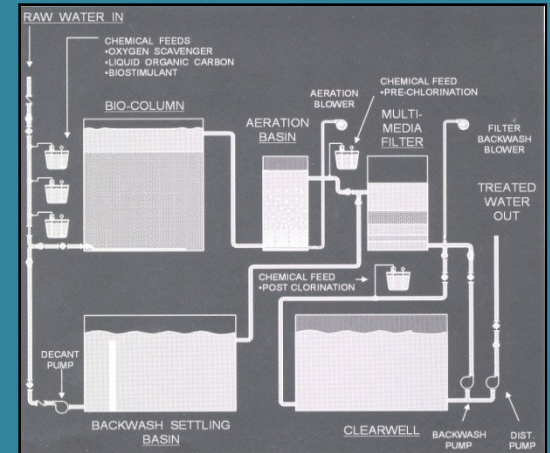
**Land
Uses**

1st line of defense
3rd line of defense

Water

2nd line of defense

**Treatment
Plant**





Ground Water Sources

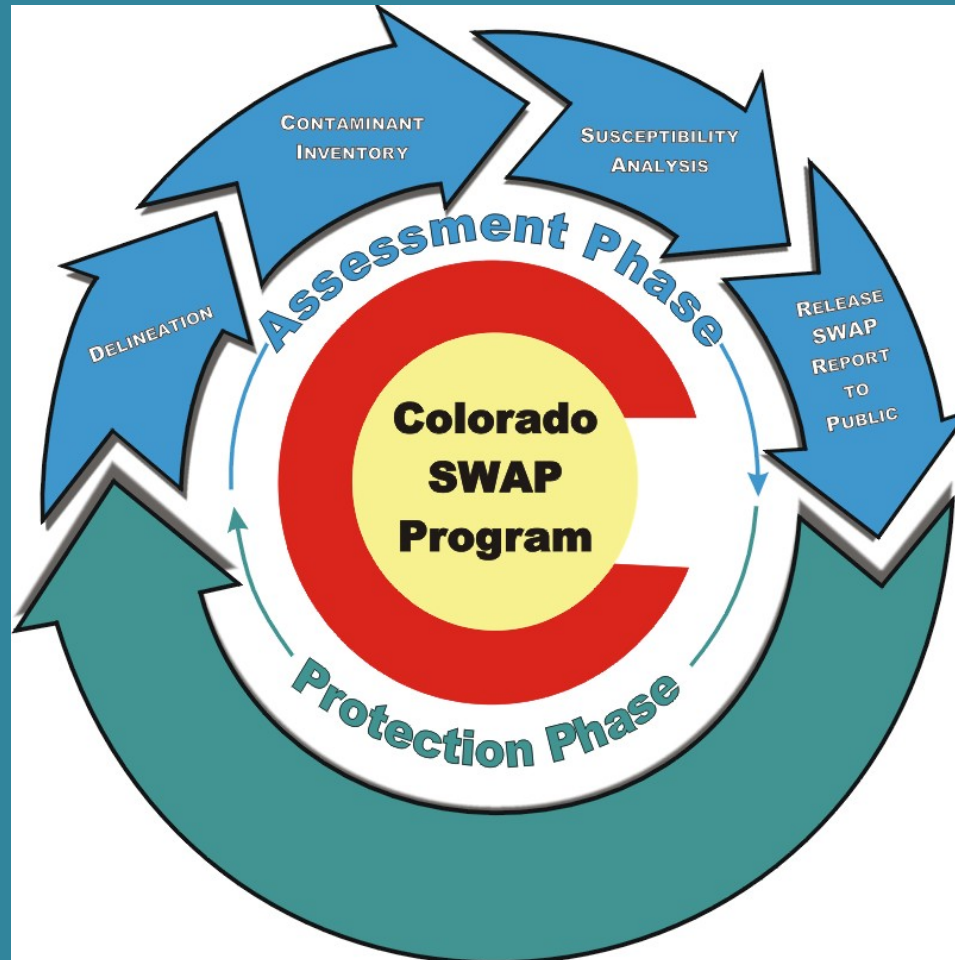


Surface Water Sources



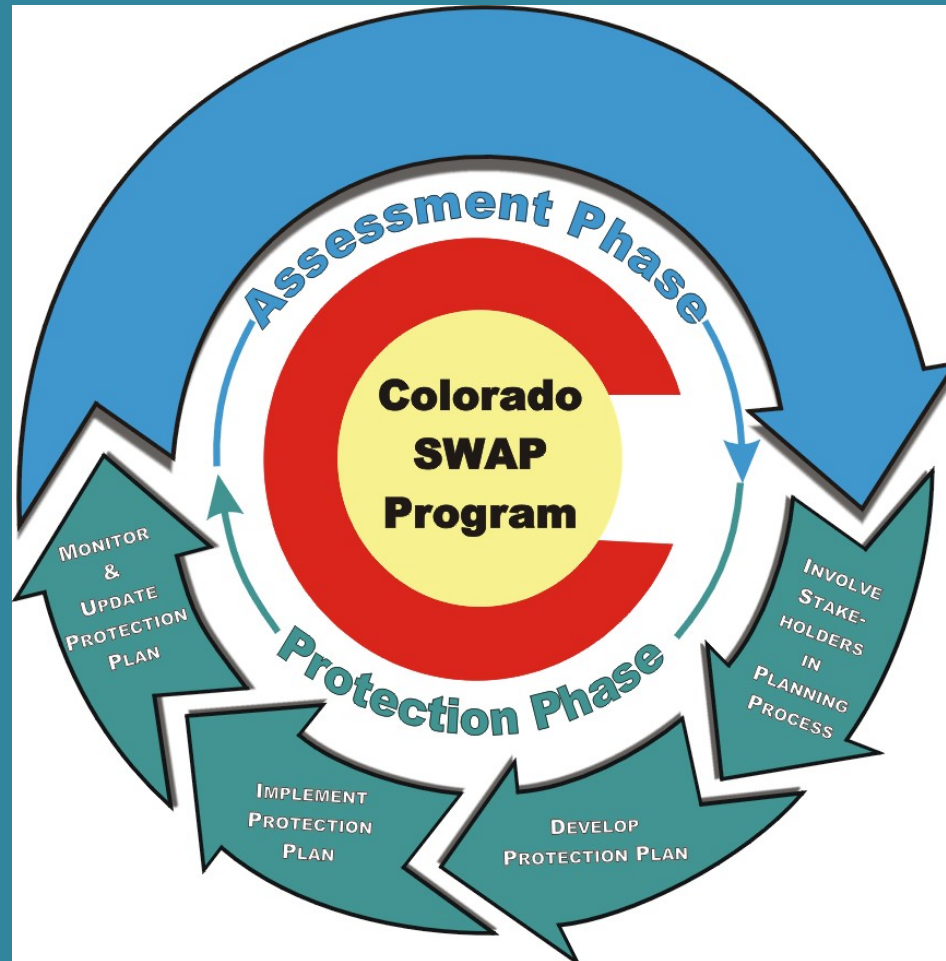
Colorado SWAP Program

Assessment Phase



Colorado SWAP Program

Protection Phase





Google: CDPHE SWAP

Colorado Welcome to... [Colorado.gov](#)

Live Help | Advanced Search [SEARCH](#)

Colorado Department of Public Health and Environment



Colorado Source Water Assessment and Protection

Colorado Source Water Assessment and Protection (SWAP) is a new program designed to provide you, the public consumer, information about your drinking water, as well as provide you and your community a way to get involved in protecting the quality of your drinking water. The program encourages community-based protection and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.

- [Protection Phase](#)
- [Assessment Phase](#)

Background

The 1996 Safe Drinking Water Act Amendments directed that each state develop a SWAP Program. Each state developed a SWAP program plan outlining how the state will conduct an assessment of all its public water supplies. Because SWAP is a community-based program, involving the public in development and implementation is a very high priority. Among other things, the state of Colorado has enlisted the aid of three citizen teams to help design the SWAP Program, and has held many public meetings to provide opportunities for public comment.

Assessment Report Update

The Water Quality Control Division (Division) completed the initial source water assessment reports for over 1700 public water systems in November 2004. The reports were sent to all the evaluated public water systems for their review and comments. The Division received feedback and corrections from several water systems throughout the state, and is in the process of incorporating the appropriate revisions. Approximately 23 public water system's reports remain in the revision process and their reports are **not** currently accessible on the website. If your public water system's report is being revised, the water system name will appear under the assessment report heading but the link will not be active, and the associated report can **not** be viewed.

SWAP Project News

The SWAP project is transitioning from the assessment phase to the protection planning phase. The Division is conducting regional source water protection planning throughout the state. The

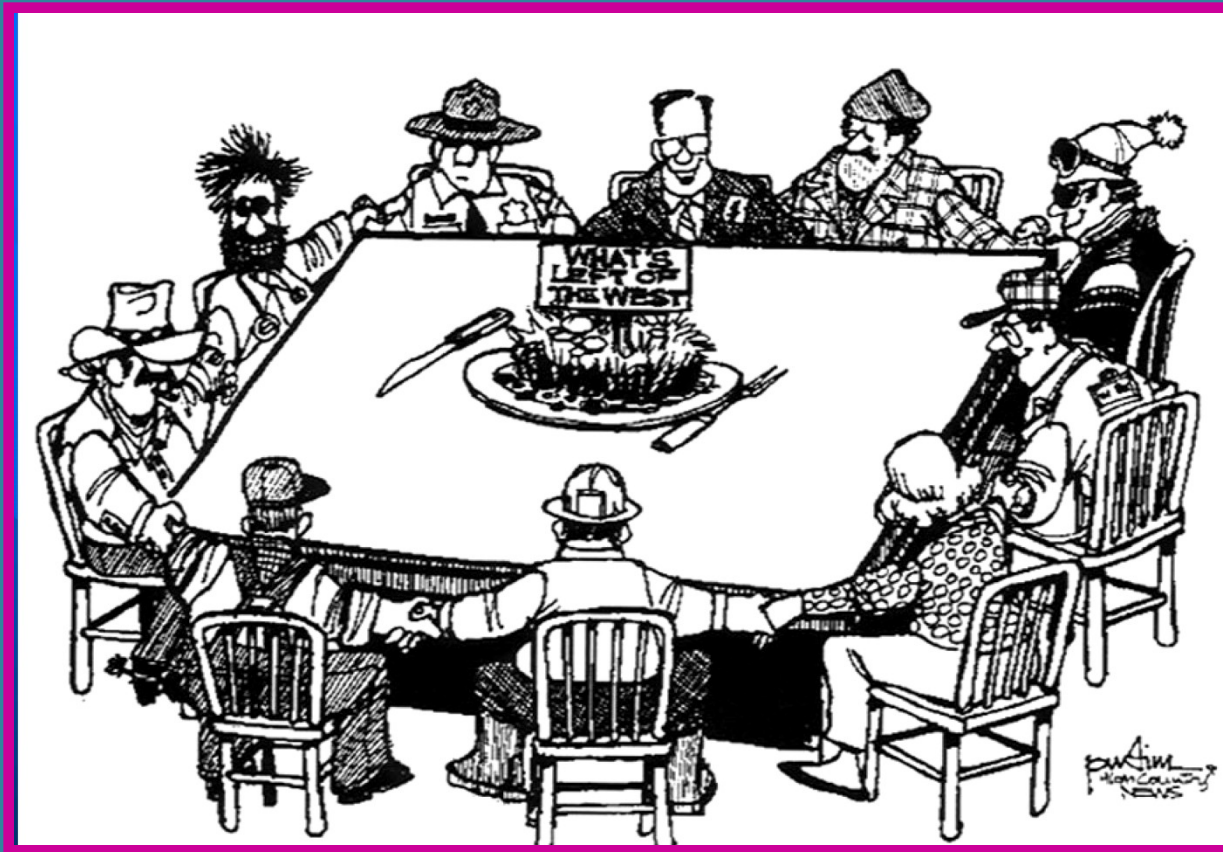
WHAT IS INCLUDED IN A PLAN?

- Stakeholder involvement
- A Steering Committee to develop and implement the plan
 - This is your plan!
- A map outlining the source water protection area
- An inventory of all ground and surface water intakes
- An inventory of potential Sources of Contamination
 - Discrete (point source) - Dispersed (non-point source)
- Identifying priority issues of concern
- Development and Implementation of protection measures (BMP's)
- A contingency plan for supplying safe water

Grant Money Available!

- ▶ \$5,000 grant money for:
 - Plan Development
 - BMP Implementation
 - Matching grant
 - Cash.....or.....
 - In-Kind





Building strong relationships with your stakeholder partners is a necessary ingredient to making a source water protection plan effective.

Plateau Valley Communities:

Town of Collbran

Mesa Water & Sanitation District

Powderhorn Metro 1 District



Source Water Protection Case Study



**2011 CWA Excellence Award
In Watershed Stewardship**



Steamboat
Springs

Fort Collins

Sterling

Boulder

Glenwood
Springs

Vail

Denver

Burlington

COLORADO



Plateau Valley SWPP:
Town of Collbran,
Mesa WDS,
Powderhorn Ski Area

Aspen

Colorado
Springs

Silverton

Pueblo

Cortez

Durango

Trinidad

Springfield

Plateau Valley Source Water Protection Plan

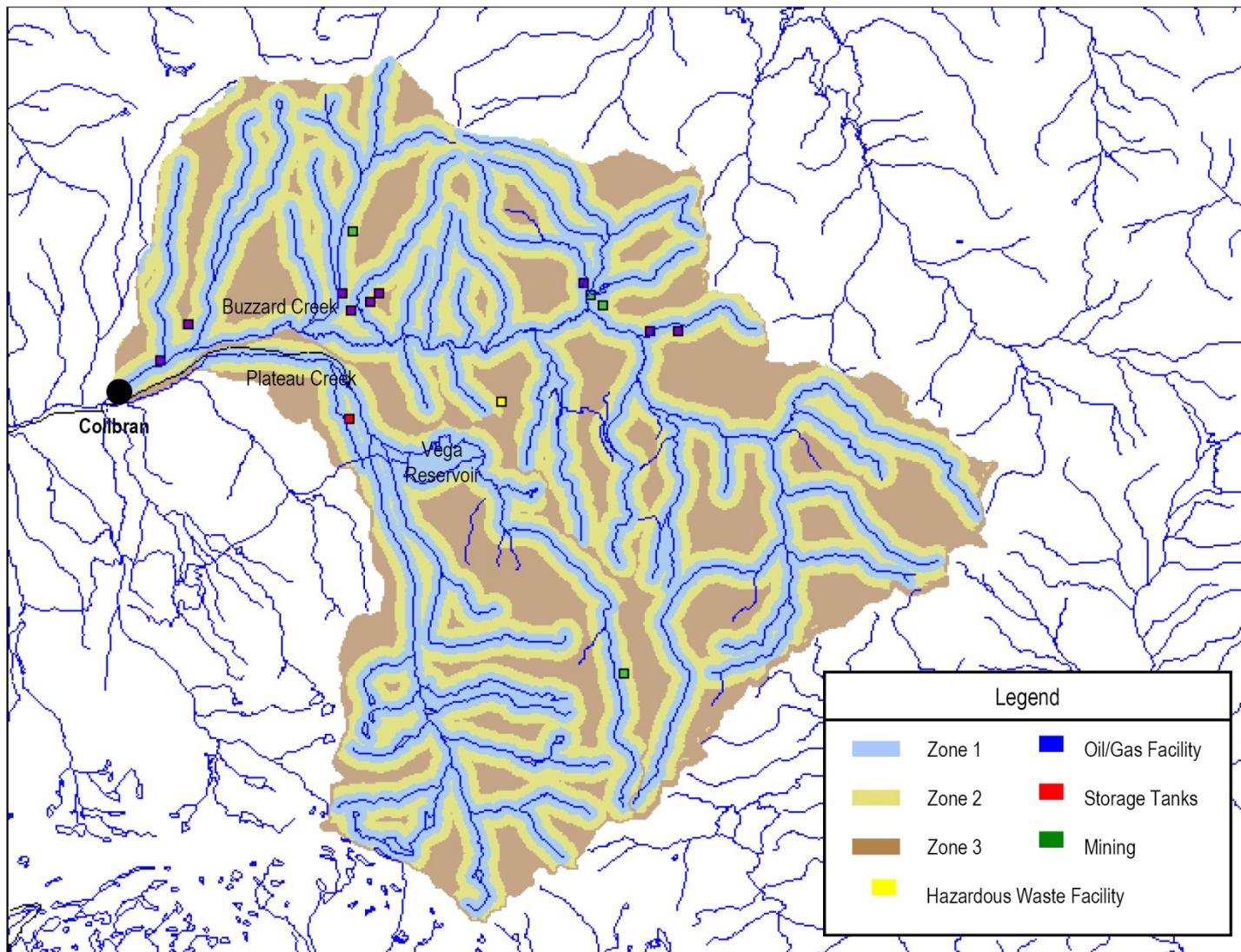
Step 1: Form a Stakeholder Group



Who should be involved?



Step 2: Delineated Source Water Protection Area



SOURCE: COLORADO WATER QUALITY CONTROL DIVISION

Step 3: Identify Potential Contaminant Sources



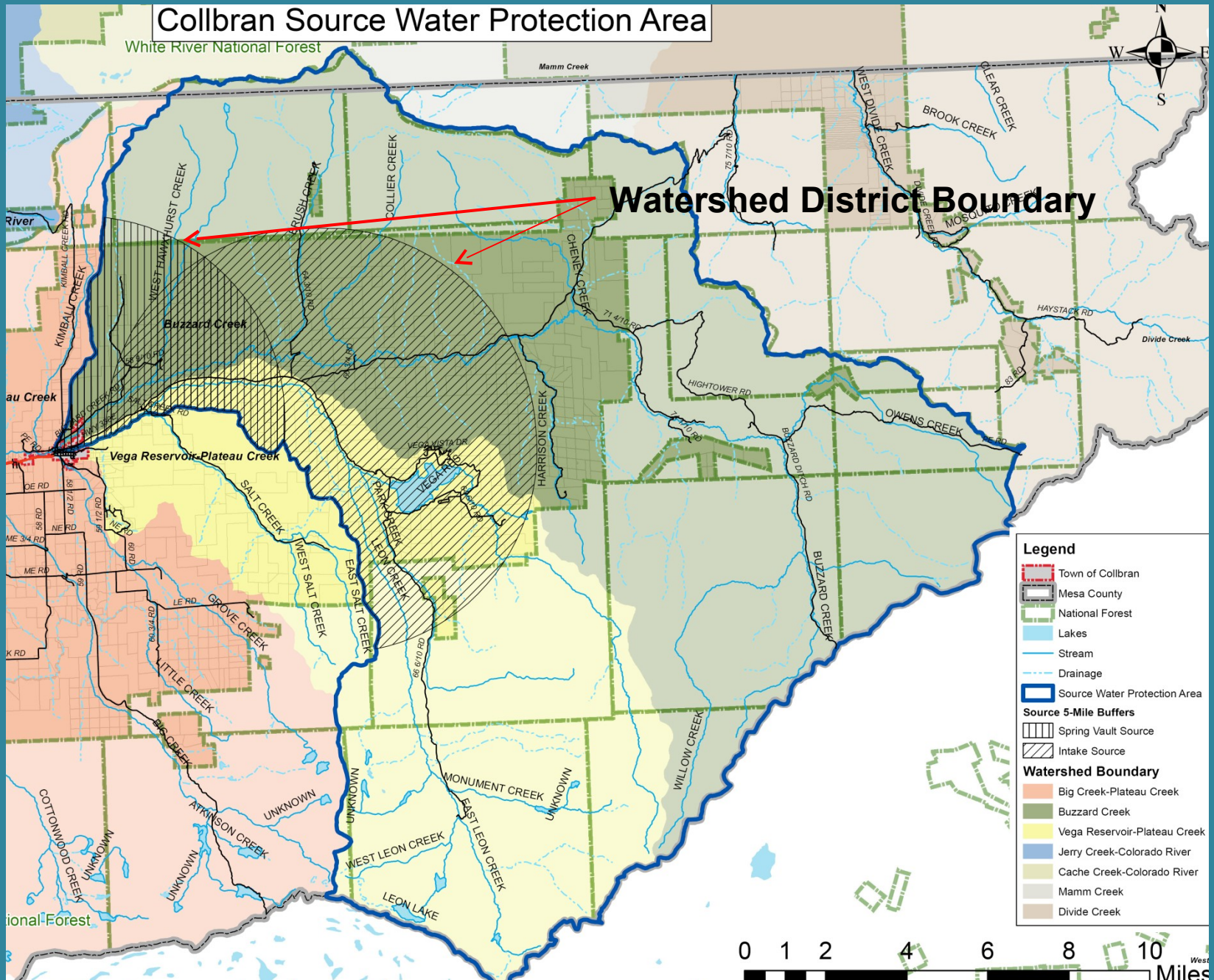
Step 4 : Develop Management Approaches

Step 5: Implement Management Plan

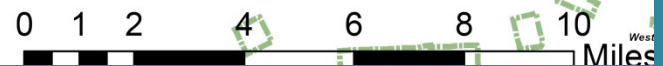
- County and Public Land managers overlays protection area on GIS maps
- Brochures mailed to residents of valley
- Dump around springs are cleaned up
- Signage on major roads identifying protection area and reporting spills
- Town of Collbran passed a Watershed District Ordinance



Collbran Source Water Protection Area



Watershed District Boundary



Roaring Fork Valley Communities:

Gateway MD

Little Elk Creek HOA

W/J Ranch MD

Woody Creek HOA

Sopris Village HOA

Red Table Acres HOA

Aspen Mesa HOA

Kings Row HOA

Colorado Mountain College

Mitchell Cooper Ditch and Pipe Co.

Cattle Creek WUA

Canyon Creek Estates HOA

Westbank Mesa HOA

Westbank Ranch HOA





W/J Ranch Metro District

Assessment Results

The source water assessment for LOWE W J RANCH LLC rendered the following results:

- At the time of this assessment, the water supply consists of:
 - 4 active ground water sources
 - 0 active, purchased ground water sources
- Table 1 presents the cumulative results of the total susceptibility of the water source(s) to potential contamination from both discrete and dispersed contaminant sources. Water sources with total susceptibility ratings of Moderately High or High generally are at greater risk for potential contamination than those receiving lower ratings. As shown in Table 1, 4 active water source(s) was/were determined to have a Moderately High or High susceptibility to potential contamination.

There may be cases where the assessment was unable to verify the presence of discrete and dispersed contaminant sources based on the databases used for the contaminant inventory. In these cases, unless new information is identified and analyzed, the water source(s) is/are not currently known to be susceptible to potential contamination from any known discrete or dispersed contaminant sources. This situation is indicated in Table 1 by water sources receiving an overall susceptibility rating of "No Known Susceptibility."

Table 1. Total Susceptibility Ratings for Water Sources.

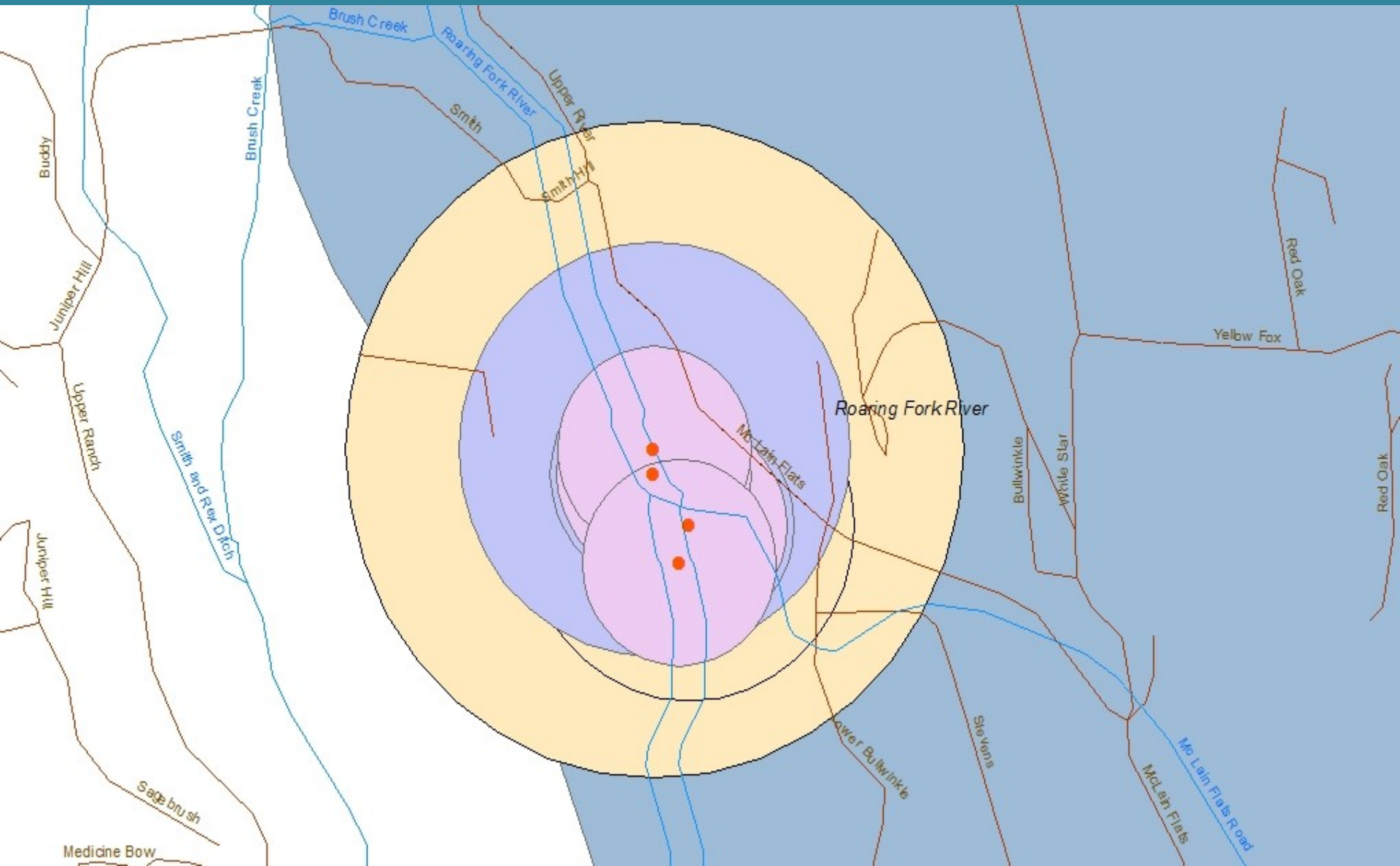
Number of Water Sources	Susceptibility Rating
0	No Known Susceptibility
0	Low
0	Moderately Low
0	Moderate
4	Moderately High
0	High

Figure 4 presents the statewide total susceptibility rating distribution plot for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of ground water sources throughout the state that received a specific qualitative rating. By comparing the results in Table 1 to Figure 4, one can see how the total susceptibility of the water source(s) in Table 1 compared to the total susceptibility of the other ground water sources throughout the state.

Table 3. Susceptibility of Water Source(s) to Dispersed Contaminant Sources.

Contaminant Source Type	Individual Susceptibility Rating Summary (cumulative count for all water sources)				
	Low	Mod. Low	Moderate	Mod. High	High
LAND USE / LAND COVER TYPES:					
Commercial/Industrial/Transportation	0	0	0	0	0
High Intensity Residential	0	0	0	0	0
Low Intensity Residential	0	0	0	0	0
Urban Recreational Grasses	0	0	0	0	0
Quarries / Strip Mines / Gravel Pits	0	0	0	0	0
Row Crops	0	0	0	0	0
Fallow	0	0	0	0	0
Small Grains	0	0	0	0	0
Pasture / Hay	0	0	0	4	0
Orchards / Vineyards / Other	0	0	0	0	0
Deciduous Forest	0	0	0	4	0
Evergreen Forest	0	0	0	0	4
Mixed Forest	0	0	0	4	0
OTHER TYPES:					
Septic Systems	0	0	0	1	3
Oil / Gas Wells	0	0	0	0	0
Road Miles	0	0	0	1	3
TOTAL:	0	0	0	14	10

Figure 6 presents the statewide rating distribution plot of the individual susceptibility to various types of dispersed contaminant sources for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of dispersed contaminant sources throughout the state that received a specific qualitative rating. By comparing the total count results in Table 3 to Figure 6, one can see how the individual susceptibility results of the water source(s) in Table 3 compared to the combined individual susceptibility results of the other ground water sources throughout the state.















INDEPENDENCE PRESS 305H
ROBERT A. JENSEN, DDS, PC 421F
KALLAS CONSTRUCTION 403
KIND WELLNESS CENTER 300B
THE KENNEDY STUDIO 307J
KING YOGA 408
KSPN/KNFO/KSNO/KKCH 402.D
LONE PINE CONSTRUCTION 111H
LOUIS' SWISS PASTRY 400
MACKIE ELECTRONIC SYSTEMS 209C
SALOISE MATKIN, DDS 421F
THE MARLOW GROUP 421
McCARTNEY PROPERTY MGMT. 421C
McLAUGHLIN RINCON 111P
MEDIA GROUP ASPEN 407P
MFA 309C
MILLER ELECTRICAL 305B
MOUNTAIN NATURALS 316B
MOUNTAIN RESORT CONSTRUCTION 119B
MOUNTAIN RESORT INTERIORS 119B
MOUNTAIN TEMP SERVICES, INC. 409A

PACIFIC SHEET METAL, INC. 401
THE RANCH 421A
RAYMOND JAMES FINANCIAL SERVICES 111Q
ROARING FORK TRADING 111L
ROXY'S MARKET 119H
SCHLUMBURGER CONSTRUCTION 314C
SCOTTOMOTIVE 408
SHERWIN-WILLIAMS 304
SILICH CONSTRUCTION 303J
SKI.COM 210AA
SLIDEMASTER 305E
SMIDDY LIMOUSINE CORP. 406F
STERLING INSURANCE, INC. 300G
TAILWAGGERS 300H
THURSTON KITCHEN & BATH 202
THE TRAVEL AGENTS 210E
UTE BUILDING SYSTEMS 209G
UTE CITY FIREPLACES, LLC 214

RICHARD WAX & ASSOCIATES 406H
WILLIAM H. WESSON, DDS 421F
DR. FRED WILSON, DC 300C
WORLD WIDE SKI CORPORATION 312D

11	AABC		
12	Ajax Pool & Spa	!pool chemicals on flatbed!	209 AABC
13	Aspen Airport Conoco & Car Wash	secondary containment on huge propane tank!	121 AABC
14		storage tank	
15	Aspen Total Automotive	!storage tank in pick up in back!	409K AABC
16	Aspen Rent All	heavy equipment	208 AABC
17	Bishop Plumbing and Heating	many trucks and other vehicles	407 H AABC
18	Bishop Plumbing and Heating	many trucks and other vehicles	407 H AABC
19	Comcast Cable	many trucks and other vehicles	201 AABC
20	Holy Cross Electric	many trucks and other vehicles - storage tank?	215 AABC
21	Other		
22	Aspen Animal Hospital	hospital waste	301 AABC
23	Aspen Car Care/Howards Auto	garage	121 AABC
24	Aspen Caterers	storage tank?	
25	Aspen Party Rentals	propane tanks (stored)	
26	Canyon Cleaners	small cleaners	111F AABC
27	Columbine Moving and Storage	big moving vans/trucks - garage	411 AABC
28	Cornerstone Property Management	many trucks and other vehicles	
29	Corporate Transportation Specialists	many limos and vans - garage	316A AABC
30	D&D Towing & Auto Repair	garage	406C AABC
31	Hanson Construction	trucks	310 AABC
32	High Mountain Taxi	taxis and cars	111C AABC
33	Independence Press	printing chemicals	305C AABC
34	Kallas Construction	trucks	403 AABC
35	Pacific Sheet Metal	shop - storage tank?	401 AABC
36	Pitco Off Road Center	garage	311A AABC
37			



Water Conservation Tips

Water conservation measures not only save the supply of our water source, but can also cut the cost of water treatment by saving energy. Here are some conservation measures you can take.

At Home:

1. Repair leaking faucets, pipes, toilets, etc.
2. Install water-saving devices in faucets, toilets and appliances.
3. Wash only full loads of laundry.
4. Don't use the toilet for trash disposal.
5. Don't let the water run while shaving, washing, or brushing teeth.
6. Run the dishwasher only when full.

Outdoors:

1. Water the lawn and garden as little as possible.
2. Choose plants that don't need much water.
3. Repair leaks in faucets and hoses.
4. Use water from a bucket to wash your car, and save the hose for rinsing.
5. Obey any and all water bans or regulations.

Contaminants that may be present in source water include:

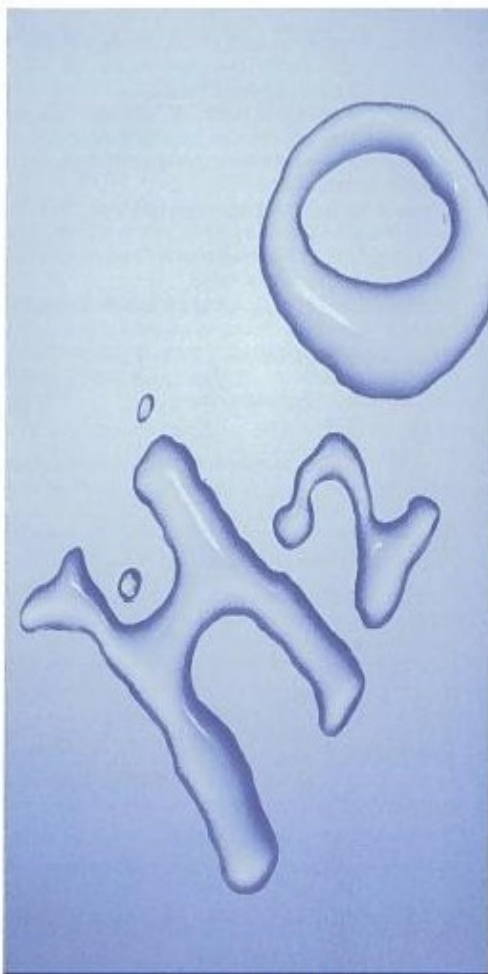
Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.



Annual Water Quality Report for the calendar year 2010

Snowmass Water & Sanitation
District

PWS ID# CO-0-149717

Snowmass Water & Sanitation District

PWS ID #CO-0-149717

970-923-2056

What's the Quality of My Water?

Snowmass Water & Sanitation is pleased to share this water quality report with you. It describes to you, the customer, the quality of your drinking water. This report covers January 1 through December 31, 2010. Snowmass Village's drinking water supply surpassed the strict regulations of both the State of Colorado and the U.S. Environmental Protection Agency (EPA), which requires all water suppliers to prepare reports like this every year.

In 2010 our water department distributed approximately 587.9 million gallons of water to our customers. Snowmass Village relies on four surface water sources. East Snowmass Creek Spring is our primary source of water, which is supplemented by East Snowmass Creek when required by demand. The West Fork of Brush Creek is another source, and Snowmass Creek is the fourth source and only used when water is in large demand.

Snowmass Village treats your water using filtration and disinfection to remove or reduce harmful contaminants that may come from the source water. Potential sources of contamination in our source water area come from natural causes such as runoff, weather, wildfire, wildlife, small grains, pasture/hay, forests, septic systems, and road miles.

The Source Water Assessment Report provides a screening-level evaluation of potential contamination that could occur. It does not mean that the contamination has or will occur. We can use this information to evaluate the need to improve our current water treatment capabilities and prepare for future contamination threats. This can help us ensure that quality finished water is delivered to your homes. In addition, the source water assessment results provide a starting point for developing a source water protection plan.

Potential sources of contamination in our source water area come from: Natural causes such as runoff, weather, wildfire, and wildlife.

The Colorado Department of Public Health and Environment has provided us with a Source Water Assessment for our water supply. You may obtain a copy of the report by visiting www.cdphc.state.co.us/wq/sw/swaphom.html or by contacting Dean Wieser at 970-923-2056.

If you have any questions about this report or concerning your water utility, please contact Dean Wieser at 970-923-2056 or by writing to this address: P.O. Box 5700; Snowmass Village, CO 81615. We want our valued customers to be informed about their water utility. You can attend Board meetings on the third Wednesday of each month, at 8:30 a.m. in the Administration Offices at 0177 Clubhouse Drive.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Snowmass Village Water & Sanitation District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.



Cattle Creek WUA

Assessment Results

The source water assessment for CATTLE CREEK WUA rendered the following results:

- At the time of this assessment, the water supply consists of:
 - 1 active ground water sources
 - 0 active, purchased ground water sources
- Table 1 presents the cumulative results of the total susceptibility of the water source(s) to potential contamination from both discrete and dispersed contaminant sources. Water sources with total susceptibility ratings of Moderately High or High generally are at greater risk for potential contamination than those receiving lower ratings. As shown in Table 1, 0 active water source(s) was/were determined to have a Moderately High or High susceptibility to potential contamination.

There may be cases where the assessment was unable to verify the presence of discrete and dispersed contaminant sources based on the databases used for the contaminant inventory. In these cases, unless new information is identified and analyzed, the water source(s) is/are not currently known to be susceptible to potential contamination from any known discrete or dispersed contaminant sources. This situation is indicated in Table 1 by water sources receiving an overall susceptibility rating of "No Known Susceptibility."

Table 1. Total Susceptibility Ratings for Water Sources.

Number of Water Sources	Susceptibility Rating
0	No Known Susceptibility
0	Low
0	Moderately Low
1	Moderate
0	Moderately High
0	High

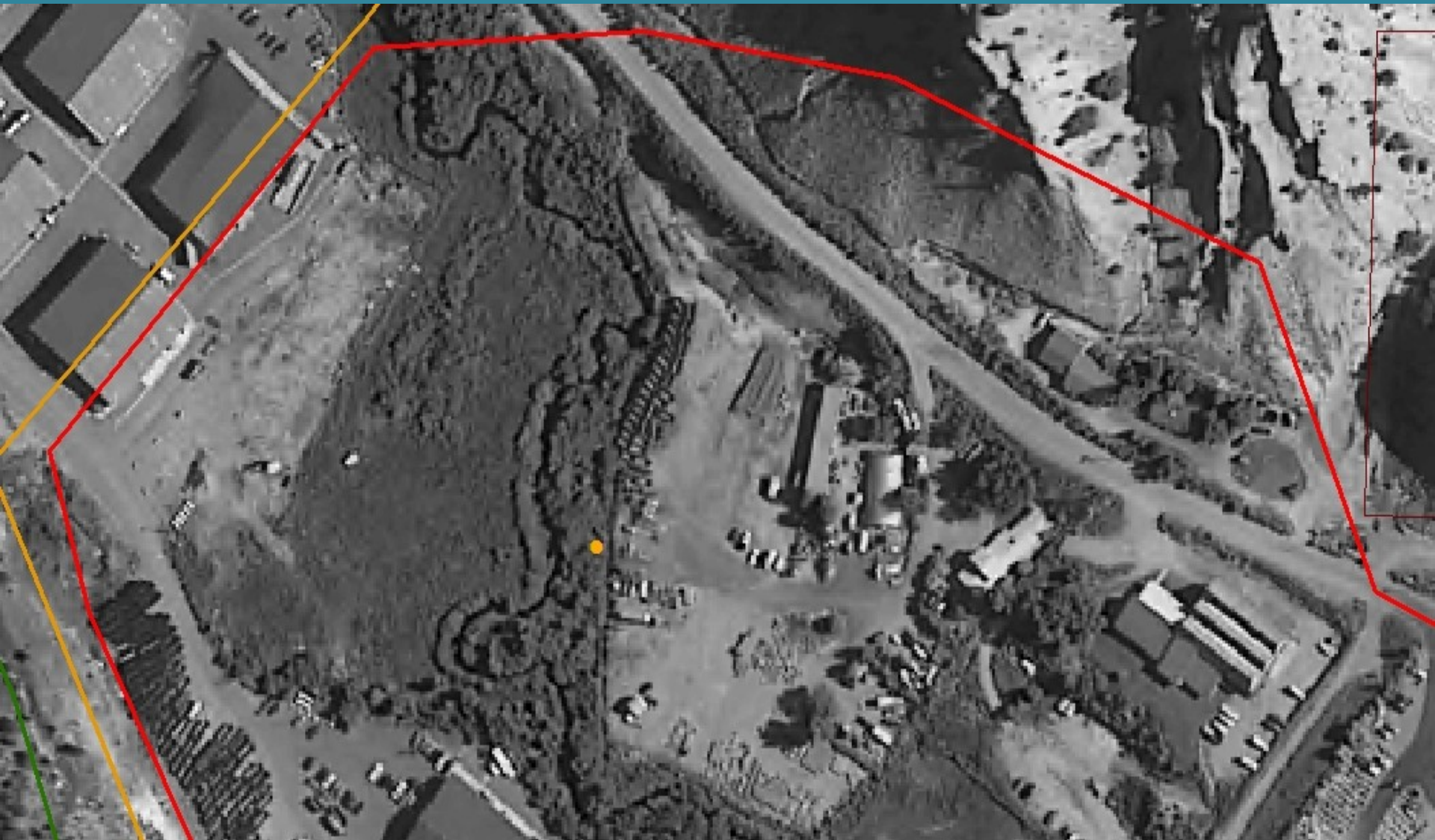
Figure 4 presents the statewide total susceptibility rating distribution plot for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of ground water sources throughout the state that received a specific qualitative rating. By comparing the results in Table 1 to Figure 4, one can see how the total susceptibility of the water source(s) in Table 1 compared to the total susceptibility of the other ground water sources throughout the state.

Table 3. Susceptibility of Water Source(s) to Dispersed Contaminant Sources.

Contaminant Source Type	Individual Susceptibility Rating Summary (cumulative count for all water sources)				
	Low	Mod. Low	Moderate	Mod. High	High
LAND USE / LAND COVER TYPES:					
Commercial/Industrial/Transportation	0	0	0	0	0
High Intensity Residential	0	0	0	0	0
Low Intensity Residential	0	0	0	0	0
Urban Recreational Grasses	0	0	0	0	0
Quarries / Strip Mines / Gravel Pits	0	0	0	0	0
Row Crops	0	1	0	0	0
Fallow	0	0	0	0	0
Small Grains	0	0	0	0	0
Pasture / Hay	0	1	0	0	0
Orchards / Vineyards / Other	0	0	0	0	0
Deciduous Forest	0	0	0	0	0
Evergreen Forest	0	1	0	0	0
Mixed Forest	0	0	0	0	0
OTHER TYPES:					
Septic Systems	0	0	0	0	0
Oil / Gas Wells	0	0	0	0	0
Road Miles	0	0	0	0	1
TOTAL:	0	3	0	0	1

Figure 6 presents the statewide rating distribution plot of the individual susceptibility to various types of dispersed contaminant sources for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of dispersed contaminant sources throughout the state that received a specific qualitative rating. By comparing the total count results in Table 3 to Figure 6, one can see how the individual susceptibility results of the water source(s) in Table 3 compared to the combined individual susceptibility results of the other ground water sources throughout the state.







Assessment Results

The source water assessment for WESTBANK RANCH HOA rendered the following results:

- At the time of this assessment, the water supply consists of:
 - 3 active ground water sources
 - 0 active, purchased ground water sources
- Table 1 presents the cumulative results of the total susceptibility of the water source(s) to potential contamination from both discrete and dispersed contaminant sources. Water sources with total susceptibility ratings of Moderately High or High generally are at greater risk for potential contamination than those receiving lower ratings. As shown in Table 1, 1 active water source(s) was/were determined to have a Moderately High or High susceptibility to potential contamination.

There may be cases where the assessment was unable to verify the presence of discrete and dispersed contaminant sources based on the databases used for the contaminant inventory. In these cases, unless new information is identified and analyzed, the water source(s) is/are not currently known to be susceptible to potential contamination from any known discrete or dispersed contaminant sources. This situation is indicated in Table 1 by water sources receiving an overall susceptibility rating of "No Known Susceptibility."

Table 1. Total Susceptibility Ratings for Water Sources.

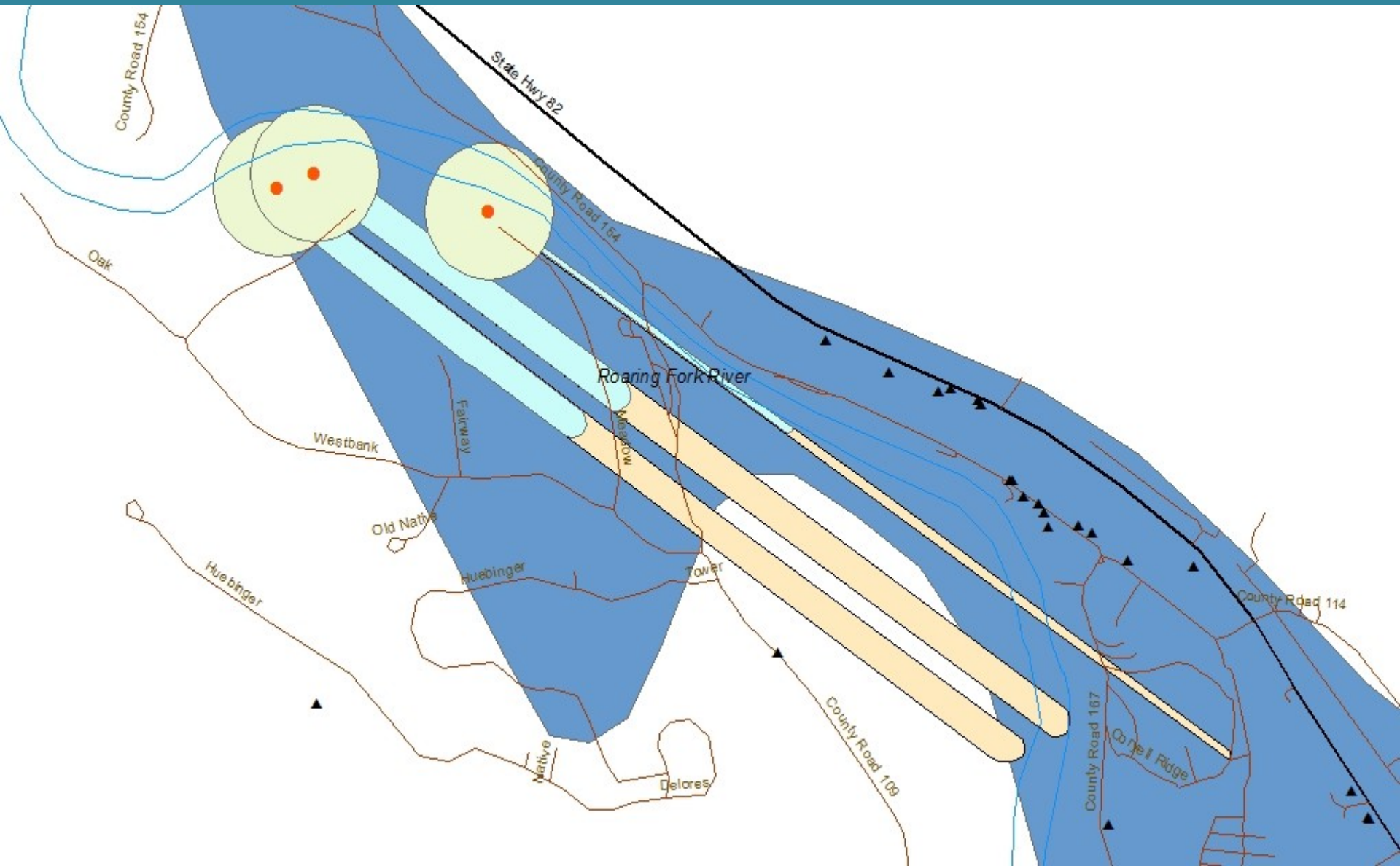
Number of Water Sources	Susceptibility Rating
0	No Known Susceptibility
0	Low
0	Moderately Low
2	Moderate
1	Moderately High
0	High

Figure 4 presents the statewide total susceptibility rating distribution plot for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of ground water sources throughout the state that received a specific qualitative rating. By comparing the results in Table 1 to Figure 4, one can see how the total susceptibility of the water source(s) in Table 1 compared to the total susceptibility of the other ground water sources throughout the state.

Table 3. Susceptibility of Water Source(s) to Dispersed Contaminant Sources.

Contaminant Source Type	Individual Susceptibility Rating Summary (cumulative count for all water sources)				
	Low	Mod. Low	Moderate	Mod. High	High
LAND USE / LAND COVER TYPES:					
Commercial/Industrial/Transportation	0	0	0	0	0
High Intensity Residential	0	0	0	0	0
Low Intensity Residential	0	1	1	0	0
Urban Recreational Grasses	0	0	0	0	0
Quarries / Strip Mines / Gravel Pits	0	0	0	0	0
Row Crops	0	1	2	0	0
Fallow	0	0	0	0	0
Small Grains	0	0	0	0	0
Pasture / Hay	0	0	1	2	0
Orchards / Vineyards / Other	0	0	0	0	0
Deciduous Forest	0	1	2	0	0
Evergreen Forest	0	1	2	0	0
Mixed Forest	0	0	0	0	0
OTHER TYPES:					
Septic Systems	0	0	0	0	2
Oil / Gas Wells	0	0	0	0	0
Road Miles	0	0	0	2	1
TOTAL:	0	4	8	4	3

Figure 6 presents the statewide rating distribution plot of the individual susceptibility to various types of dispersed contaminant sources for all ground water sources that were analyzed. The rating distribution plot presents the numerical scoring ranges associated with a given rating category, and the number of dispersed contaminant sources throughout the state that received a specific qualitative rating. By comparing the total count results in Table 3 to Figure 6, one can see how the individual susceptibility results of the water source(s) in Table 3 compared to the combined individual susceptibility results of the other ground water sources throughout the state.

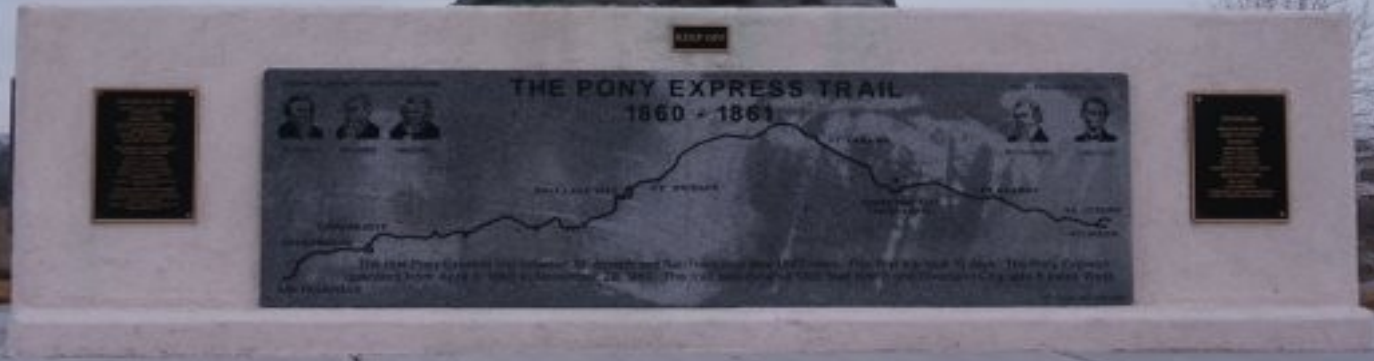




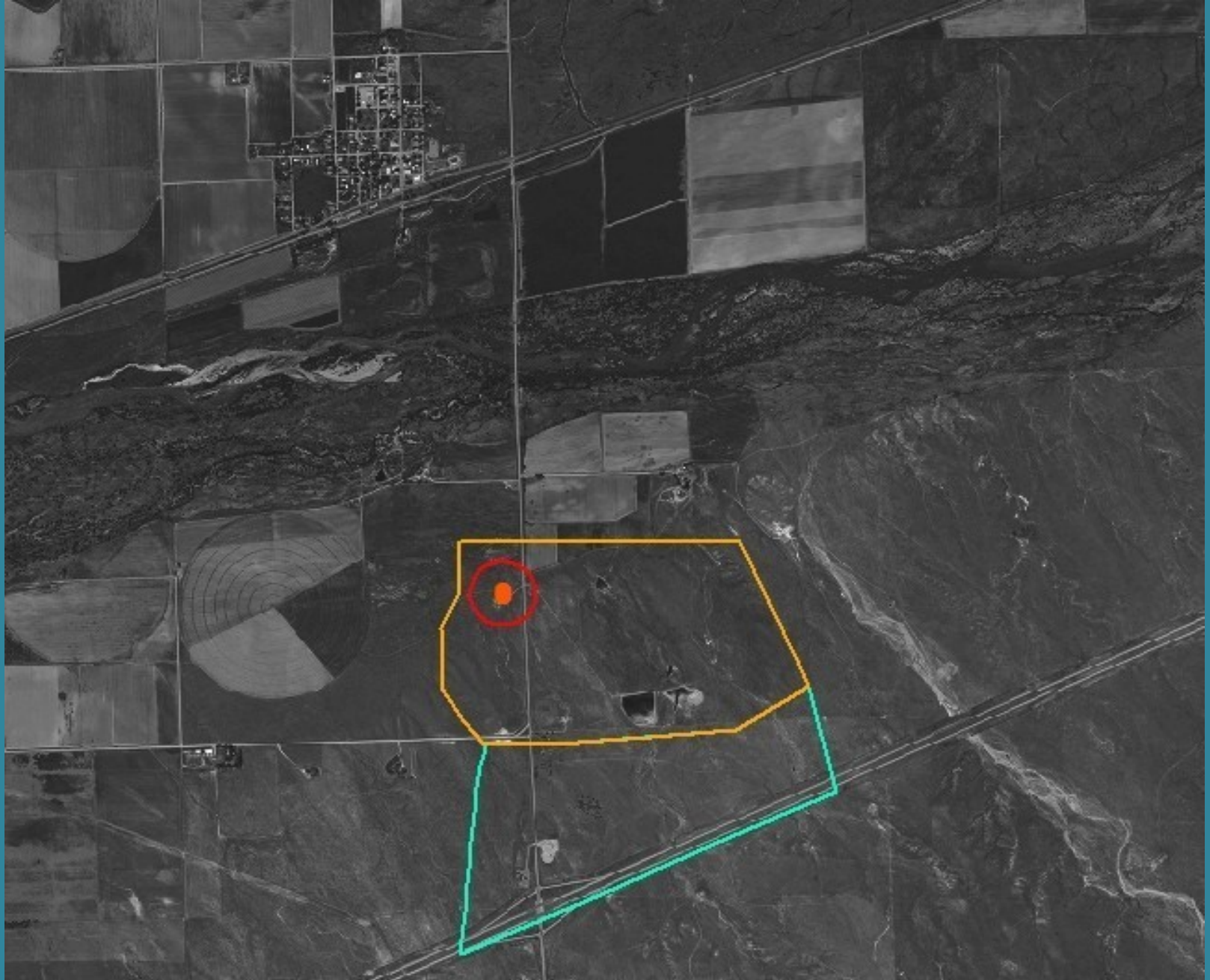


Sedgwick County Communities:

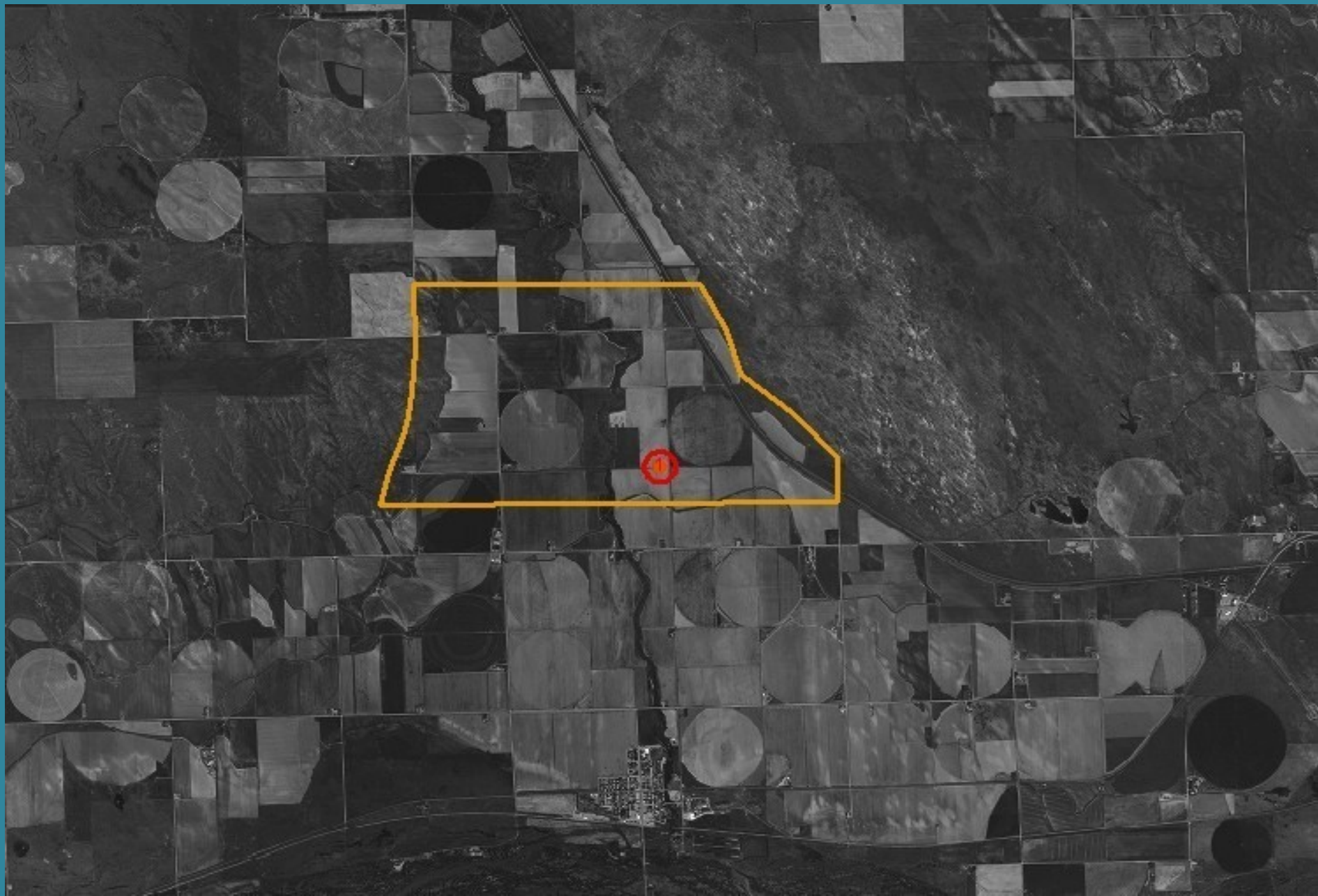
Town's of Sedgwick, Ovid and Julesburg







Town of Sedgwick



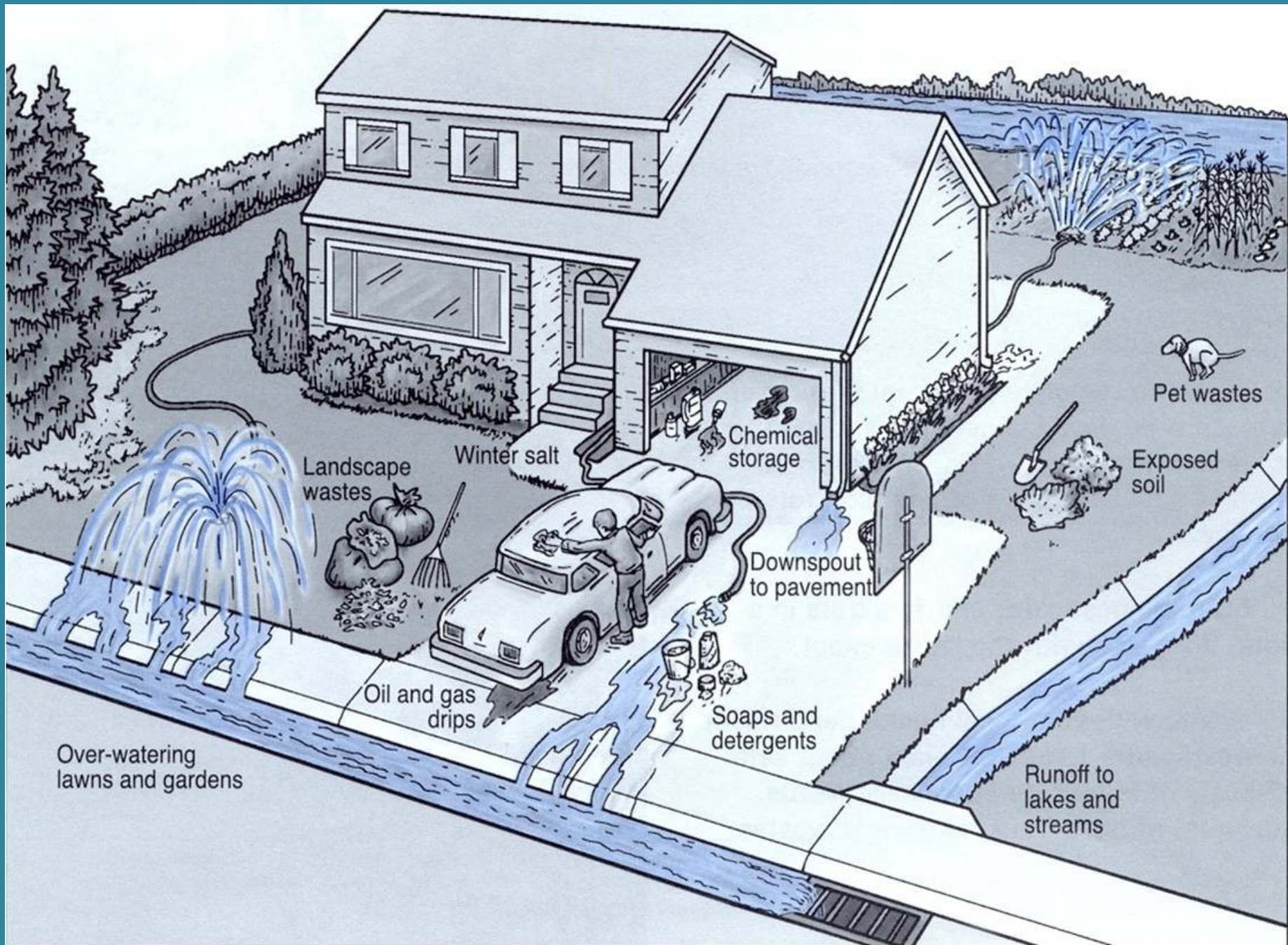
Town of Ovid



Town of Julesburg

SWP Goals for Implementation:

- **Public outreach:** brochures, displays, mailings
- **Land use decisions:** county, local, and public lands; supplying GIS maps to Planning and Road Departments
- **Public Health decisions:** working with Environmental Health Departments
- SWP's included in Watershed Plans, Master Plans and Forest Plans



Pet wastes

Exposed soil

Chemical storage

Downspout to pavement

Winter salt

Landscape wastes

Oil and gas drips

Soaps and detergents

Runoff to lakes and streams

Over-watering lawns and gardens

Homeowner's GUIDE

To Pesticide Use Around the Home and Garden

XCM-220

Pesticides can serve a useful purpose around the home and garden by reducing some of the problems we face from pests. But they can harm our drinking water supplies if handled improperly.

Pesticides include insect killers (insecticides), weed killers (herbicides), and fungus killers (fungicides). The ingredients that make these chemicals toxic to pests also can be harmful to people and animals, and in some cases, they can also contaminate water supplies.

This can happen even when pesticides are used according to the label. Water contamination is costly to remedy, and homeowners who use pesticides need to follow some common sense guidelines to avoid these unintended consequences.

Before You Buy a Pesticide

Pest-free homes and gardens are expensive, impractical, and environmentally unsound. The urge for a chemical "quick fix" for every problem around the home should be re-evaluated. Instead, maintaining weeds or garden insects at non-damaging levels is a more realistic goal. Allowing low levels of pests to survive will actually help maintain a population of natural enemies.

There are a number of strategies homeowners can use to manage pests without chemicals. Evaluate all your options such as non-toxic sprays, biological controls, changes in cultural practices, or even doing nothing before you purchase a chemical. In some



Colorado
State
University
Cooperative
Extension

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Pipeline

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Small Community Wastewater Issues Explained to the Public

Pharmaceuticals and Personal Care Products: An Overview

It just makes sense to want clean, safe water. The thought of drinking polluted water or bathing in a murky mess is very distasteful. Because our desire to have safe water sources is so strong, we have developed increasingly sophisticated methods for monitoring and detecting pollutants in the water.

Having these improved tests means that groundwater and surface water contamination can be detected at lower and lower levels—even down to nanograms per liter. And that has led to an emerging public awareness about pollutants. Pharmaceuticals and personal care products (PPCPs) are some of these emerging contaminants.

Lately new information about PPCPs turning up in the environment has been making headlines and raising questions about potential human health risks. And all of this attention has led scientists to realize that they don't know much about the kinds of impacts PPCPs may have.

According to the U.S. Environmental Protection Agency (EPA), two classes of PPCPs are considered therapeutics: antibiotics and steroidal hormones. Antibiotics may cause resistance among pathogens, making some bugs difficult to kill. Steroidal hormones overlap with another



Watersheds supply our drinking water, provide habitat for plants and animals, and serve as sources for recreation and relaxation. Researchers are examining the possible impact of pharmaceuticals and personal care products (PPCPs) on water quality.



How Citizens Can Help Control Stormwater Pollution



Stormwater Fact Sheet No. 9

This fact sheet is part of a series for local government officials and citizens on stormwater runoff problems and control strategies. The series covers:

1. Stormwater Problems And Impacts
2. Control Principles And Practices
3. Rules And Regulations
4. Local Program Elements And Funding Alternatives
5. Municipal Pollution Prevention Planning
6. Managing Stormwater In Small Communities: How To Get Started
7. Maintaining Wet Detention Ponds
8. Plan Early For Stormwater In Your New Development
9. How Citizens Can Help Control Stormwater Pollution



Land-Of-Sky Regional Council
25 Heritage Drive
Asheville, NC 28906
(704) 251-6622

What Is Stormwater Runoff?

Stormwater runoff is the rain or snowmelt that runs off streets, rooftops, parking lots, lawns and other land surfaces. As communities develop, more impervious surfaces are created and less rainfall can soak into the ground. This increases flooding and streambank erosion.

Stormwater Is Not Clean Water!

Stormwater also picks up pollutants as it flows across land surfaces. Pollutants include:

- Sediment from bare areas like construction sites
- Pesticides and fertilizers from lawns, parks and roadsides
- Bacteria and disease causing organisms from pet waste and failing septic systems
- Oil and grease from car leaks, gas stations and industrial areas
- Salt used on roads and driveways, and
- Toxic chemicals from leaks, spills and auto wear and exhaust.



Did You Know That Oil Dumped Into The Storm Sewer Pollutes Our Water?

Sometimes pollutants (e.g., used oil, paint thinners, etc.) are illegally dumped directly into storm drains and waterways.

Where Does Stormwater Go?

Stormwater typically flows into storm drains on parking lots and street curbs where it enters underground pipes called storm sewers. Unlike sanitary sewers, storm sewers do not lead to a treatment plant. So stormwater runoff directed to storm sewers usually receives no treatment before entering our streams, rivers, lakes and coastal waters. The result can be the contamination of our drinking water supplies or shellfishing waters, prohibitions on swimming, fishing or boating uses and injury to aquatic plants and animals.



Drinking Water From Household Wells



EXCUSE ME.



DID YOU DROP SOMETHING?

Dog poop. It's a serious health problem. Why? Because it contains disease-carrying bacteria that can make people sick. And because there are 3 million dog owners in LA. Do the math. Then do this. Pick up after your pooch. Remind your neighbors to pick up after theirs. Good manners, great health policy. Want more tips? Call 1-888-CLEAN-LA today. Or visit www.erasethewaste.com. Your dog can't help it. But you can.

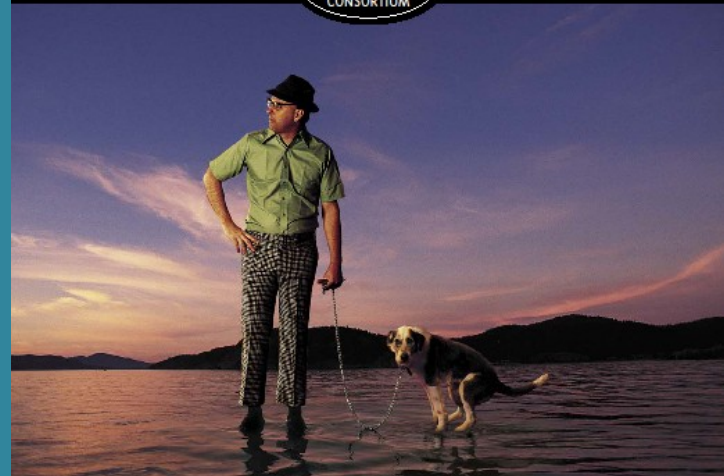
Erase the
Waste

Brought to you by the State Water Resources Control Board

WHEN YOUR PET GOES ON THE LAWN,

REMEMBER IT DOESN'T JUST

GO ON THE LAWN.



When our pets leave those little surprises, rain washes all that pet waste and bacteria into our storm drains. And then pollutes our waterways. So what to do? Simple. Dispose of it properly (preferably in the toilet). Then that little surprise gets treated like it should.

A cooperative venture between the Puget Sound Action Team, Department of Ecology, King County and the cities of Bellevue, Seattle and Tacoma.



Do You Need All Your USTs?

Do you need as much storage capacity as you now have? Do you have two tanks—in case of delivery delays or some other problem—when one would be enough under normal conditions? Rather than maintaining two or more tanks and bearing the cost of bringing all of them into compliance, why not keep just one and make an arrangement with a nearby service station to refuel your vehicles when necessary?

Need Information On USTs?

To order free publications, get more information about UST requirements, or identify state regulatory authorities call EPA's toll-free Hotline at 800-424-9346. Remember, requirements and deadlines may be different in some states, so check with your state UST program office.

You can also find UST publications, links to state regulatory authorities, and other information on USTs at EPA's Office of Underground Storage Tanks Web site at <http://www.epa.gov/OUST/>.

Here are descriptions of some of the EPA publications you may find useful:

Musts For USTs: A Summary Of Federal Regulations For USTs
Comprehensive and easy-to-read summary of federal UST requirements for installation; release detection; spill, overfill, and corrosion protection; corrective action; closure; reporting; and record-keeping. [36 pages] Also available in Spanish as *Normas Y Procedimientos Para T.S.A.*



Closing USTs: Brief Facts

Trifold leaflet presents "brief facts" on properly closing USTs in order to comply with federal closure requirements.

Dollars And Sense: Financial Responsibility Requirements For USTs

Clear explanation of the "financial responsibility" required of UST owners and operators by federal UST regulations. [16 pages]

Don't Wait Until 1998: Spill, Overfill, And Corrosion Protection For USTs

Easy-to-read booklet explains how UST owners and operators can comply with the 1998 deadline for upgrading, replacing, or closing USTs installed before December 1988. Booklet surveys spill, overfill, and corrosion protection equipment and methods, as well as replacement and closure options, and provides a quick compliance checklist. [16 pages] Also available in Spanish as *No Espere Hasta El 1998*.

Straight Talk On Tanks: Leak Detection Methods For Petroleum USTs And Piping

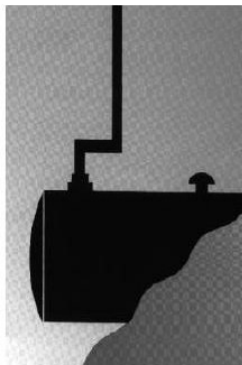
Easy-to-read booklet describes the basic requirements for federally allowed release detection methods: secondary containment with interstitial monitoring, automatic tank gauging systems, vapor monitoring, groundwater monitoring, statistical inventory reconciliation, tank tightness testing with inventory control, manual tank gauging, and leak detection for underground piping. [26 pages]

United States
Environmental Protection
Agency

EPA 510-F-97-005
June 1997

Solid Waste and Emergency Response (5401G)

EPA Underground Storage Tanks Requirements And Options



Printed on Recycled Paper

United States
Environmental Protection
Agency

Office of Water
(4806)

EPA 916-F-01-022
July 2001



Source Water Protection Practices Bulletin Managing Above Ground Storage Tanks to Prevent Contamination of Drinking Water

Above ground storage tanks (ASTs) are tanks or other containers that are above ground, partially buried, bunkered, or in a subterranean vault. These can include floating fuel systems. This fact sheet focuses on the management of facilities with ASTs to prevent contamination of drinking water sources (ground water and surface water used as public drinking water supplies).

ABOVE GROUND STORAGE TANK USE

The majority of storage tanks contain petroleum products (e.g., motor fuels, petroleum solvents, bearing oil, lubricants, used oil). Oil storage facilities with ASTs are typically found in marketing terminals, refineries, and fuel distribution centers. Storage tanks may also be found in airports, school bus barns, hospitals, automotive repair shops, military bases, farms, and industrial plants. Discharges of chemicals, petroleum, or non-petroleum oils from storage tanks can contaminate source water. Product spilled, leaked, or lost from storage tanks may accumulate in soils or be carried away in storm runoff.



Some of the causes for storage tank releases are holes from corrosion, failure of piping systems, and spills and overfills, as well as equipment failure and human operational error. The Spill Prevention Control and Countermeasures (SPCC) regulations require owners or operators of certain above ground oil storage facilities to prepare and comply with written, site-specific, spill prevention plans (see 40 CFR Part 112):

- Facilities with a total above ground oil storage capacity of more than 1,320 gallons;
- Single above ground tanks with an oil storage capacity of more than 660 gallons; and
- Facilities with a combined underground oil storage capacity greater than 42,000 gallons.



Above ground storage tanks



Runoff from confined animal feedlots can contaminate our streams without proper treatment



Source Water Protection Practices Bulletin Managing Agricultural Fertilizer Application to Prevent Contamination of Drinking Water

If improperly managed, elements of fertilizer can move into surface water through field runoff or leach into ground water. The two main components of fertilizer that are of greatest concern to source water quality (ground water and surface water used as public drinking water supplies) are nitrogen (N) and phosphorus (P). This fact sheet focuses on the management of agricultural fertilizer applications; see the fact sheets on managing agricultural pesticide use, animal waste, and storm water runoff for other prevention measures that relate to agriculture.

FERTILIZER USE IN AGRICULTURE

Fertilizer application is required to replace crop land nutrients that have been consumed by previous plant growth. It is essential for economic yields. However, excess fertilizer use and poor application methods can cause fertilizer movement into ground and surface waters. While fertilizer efficiency has increased, Colorado State University estimated that about 25 percent of all preplant nitrogen applied to corn is lost through leaching (entering ground water as nitrate) or denitrification (entering the atmosphere as nitrogen gas).



Fertilizer spreading

WHY IS IT IMPORTANT TO MANAGE FERTILIZER USE NEAR THE SOURCES OF YOUR DRINKING WATER?

Improper or excessive use of fertilizer can lead to nitrate pollution of ground or surface water. Nitrogen fertilizer, whether organic or inorganic, is biologically transformed to nitrate that is highly soluble in water. In this soluble form, nitrate can readily be absorbed and used by plants. On the other hand, soluble nitrate is highly mobile and can move with percolating water out of the soil, thus making it unavailable for plant uptake. Crop producers, therefore, need to match nitrogen applications to crop uptake to minimize nitrate leaching and maximize efficiency.

Use of nitrogen-containing fertilizers can contribute to nitrates in drinking water. Consumption of nitrates can cause methemoglobinemia (blue baby syndrome) in infants, which reduces the ability of the blood to carry oxygen. If left untreated, methemoglobinemia can be fatal for affected infants. Due to this health risk, EPA set a drinking water maximum contaminant level (MCL) of 10 milligrams per liter (mg/l) or parts per million (ppm) for nitrate measured as nitrogen.



clean water starts at home

www.uri.edu/coe/healthylandscapes

Livestock on Small Acreages Protecting Water Resources and Health

Holly K. Burdett
W. Michael Sullivan

Fact sheet 1, Small Acreage
Livestock Series, April 2005

Many small acreage livestock owners live within or close to high density residential areas. Unlike rural properties that are spacious and buffered by woodlands and fields, residential properties usually consist of smaller lots in close proximity to water resources such as ponds, streams, drinking water wells, storm drains and ditches. The amount of land per animal is typically very small, which often creates problems with manure storage, handling and utilization. As rain and snowmelt travel over the land surface and soak down into the groundwater, it can carry pollutants associated with livestock manure and related activities. These pollutants can harm nearby water resources including your own drinking water well or your neighbor's.

What are the concerns?

Livestock manure. As with human and pet waste, livestock manure contains pathogens and nutrients. They can degrade water resources making them unsafe and undesirable for drinking, swimming, boating, fishing, shell fishing, scenic value, and aquatic life. Bacteria and other pathogens such as viruses and parasites can cause disease. Livestock are especially at risk for continuous parasite infestations when manure, livestock yards and pastures are improperly managed. Nutrients, primarily nitrogen and phosphorus, cause a decline in surface water quality by promoting the growth of algae and weeds. In addition, nitrate-nitrogen is a drinking water contaminant that can cause methemoglobinemia (Blue Baby Syndrome) in infants as well as animals of all ages. Elevated nitrate-nitrogen levels can also cause reproductive problems in humans and animals. Federal Drinking Water Standards allow for a maximum of 10 milligrams per liter (mg/l) of nitrate-nitrogen in drinking water, however, levels as low as 5 mg/l can affect animal health.



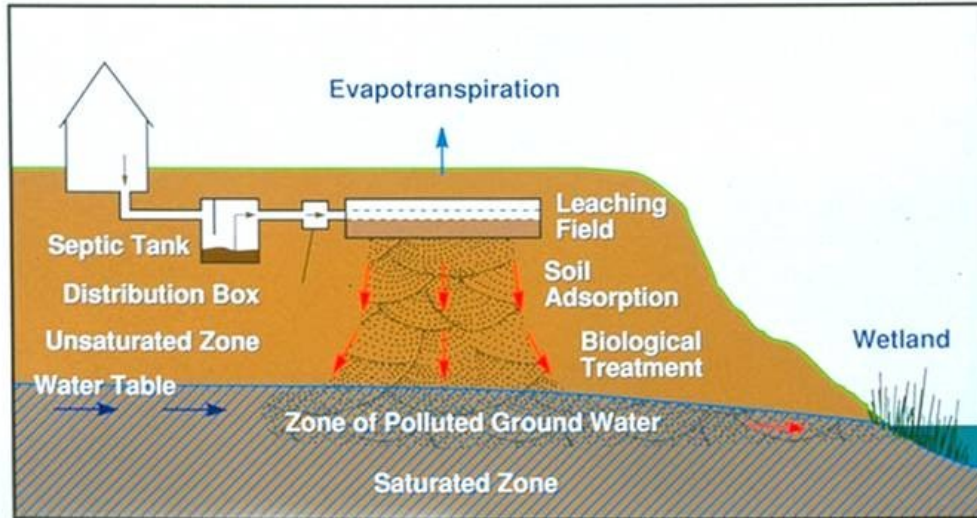
Photo courtesy of USDA NRCS

Do you know?

- One average 1,000 pound horse generates 8-10 tons of manure each year. This contains the same amount of nutrients generated by 13 people or four households, annually.
- It takes one to two acres of land to support:
 - One 1,000 pound horse or cow
 - Or 5 to 10 sheep or goats
 - Or 2 to 5 pigs
- Properly managed manure storage areas, livestock yards, pastures and eliminating direct animal access to surface waters protects nearby water resources, including your own drinking water well. It also protects the health of your family and animals. Proper management is the key to minimizing risks and adverse impacts.
- A properly managed pasture provides feed through the months of April to October. It needs to have rest periods during that time to allow for vegetative re-growth. Is your pasture really just a large livestock yard?

Refer to fact sheet 4 and our self-assessment worksheets 1 and 2 to evaluate your own livestock management activities.

On-Site Septic and Plume Generation



Your Septic System is your responsibility!

Did you know that as a homeowner you're responsible for maintaining your septic system? Did you know that maintaining your septic system protects your investment in your home? Did you know that you should periodically inspect your system and pump out your septic tank?

If properly designed, constructed and maintained, your septic system can provide long-term, effective treatment of household wastewater. If your septic system isn't maintained, you might need to replace it, costing you thousands of dollars. A malfunctioning system can contaminate groundwater that might be a source of drinking water. And if you sell your home, your septic system must be in good working order.

This guide will help you care for your septic system. It will help you understand how your system works and what steps you can take as a homeowner to ensure your system will work properly. To help you learn more, consult the resources listed at the back of this booklet. A helpful checklist is also included at the end of the booklet to help you keep track of your septic system maintenance.

How does it work?

Components

A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it eventually reaches groundwater.



Typical septic system

Top Four Things You Can Do to Protect Your Septic System

1. Regularly inspect your system and pump your tank as necessary.
2. Use water efficiently.
3. Don't dispose of household hazardous wastes in sinks or toilets.
4. Care for your drainfield.

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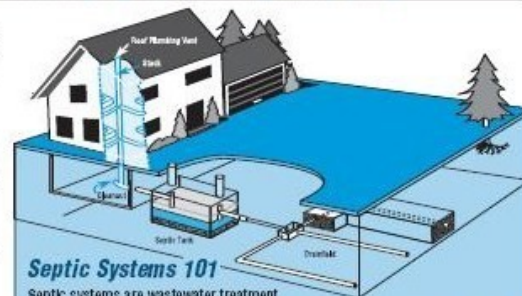
Pipeline

Small Community Wastewater Issues Explained to the Public

Septic Systems and Source Water Protection *Homeowners Can Help Improve Community Water Quality*

If your home has a septic system, you are no doubt aware that this is a common way to treat residential wastewater. In fact, septic systems and related forms of treatment that experts call decentralized wastewater treatment systems (septic systems, private sewage systems, onsite sewage disposal systems) are some of the most common waste dispersal methods in the country.

According to the U.S. Environmental Protection Agency (EPA), decentralized wastewater treatment systems collect, treat, and release about four billion gallons of effluent per day from an estimated 26 million homes and businesses. The percentage of homes and businesses served by these systems varies from state to state, from a high of about 55 percent in Vermont to a low of about 10 percent in California. Nationwide, approximately 40 percent of the new homes being built will rely on some kind of onsite system to treat wastewater. (Ground Water Report to the Nation: A Call to Action, 2007)



Septic Systems 101

Septic systems are wastewater treatment systems that collect, treat, and disperse of wastewater generated by your home or business. The wastewater is treated onsite, rather than collected and transported to a centralized community wastewater treatment plant.


A typical septic system consists of two main parts: a septic tank and a soil absorption system, also known as a drainfield, leachfield, or disposal field. Underground pipes connect the entire system.

The septic tank is a buried, watertight container usually made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow the solids to settle out and the fats, oil, and grease to float to the surface. It also allows partial decomposition of the solid materials. Effluent from the middle layer flows out to the drainfield for further treatment in the soil.

Septic systems can contribute to source water contamination for various reasons including improper location of the system, poor design, faulty construction, incorrect operation, and poor or no maintenance of the system.

By following the basic recommendations previously mentioned, you can help ensure that your system continues to function properly.

As many of us migrate further from central cities and occupy homes served by decentralized treatment systems, septic system care is more important than ever. By keeping your onsite system in top working condition, you can save money, increase the value of your home, and also feel good that you've helped your community both now and for future generations.

A	B	C	D	E	F	G	H	I
			Onsite Wastewater Treatment Systems (OWTS) Inspection and Maintenance Form					
			Recommended by: Pitkin County Environmental Health Department 0405 Castle Creek Road, Suite 10, Aspen, CO 81611 Phone: 970-920-5070 Fax: 970-920-5077 Website: www.aspenpitkin.com/ehnr					
Inspection and maintenance form may be completed by homeowner or Pitkin County Licensed Systems Inspector.								
Owner's Name:								
Property Address:								
Parcel Number:								
Inspection Date:								
Inspector's Name:								
Phone Number								
Email:								
QUESTIONS FOR PROPERTY OWNER <i>PRIOR TO</i> INSPECTION:								
Is the home currently occupied?					YES	NO		
If NO, how long has the home been vacant?								
How many bedrooms are in the home?								
Number of people living in the home?								
Date of last inspection?								
Name of inspector:								

COLORADO



**DRINKING
WATER
PROTECTION
AREA**

TOWN OF
WALSENBURG

TO REPORT SPILLS:
DIAL 911

**DRINKING
WATER**



**PROTECTION
AREA**

SPILL RESPONSE 911

Developing a Contingency Plan

Who are your
Emergency
Responders?

What is the chain of
command?

How will you inform
your community?

What are your
alternative water
supplies?



Contingency Plan







Colorado Rural Water Association's

Source Water Protection Program



crwa.net

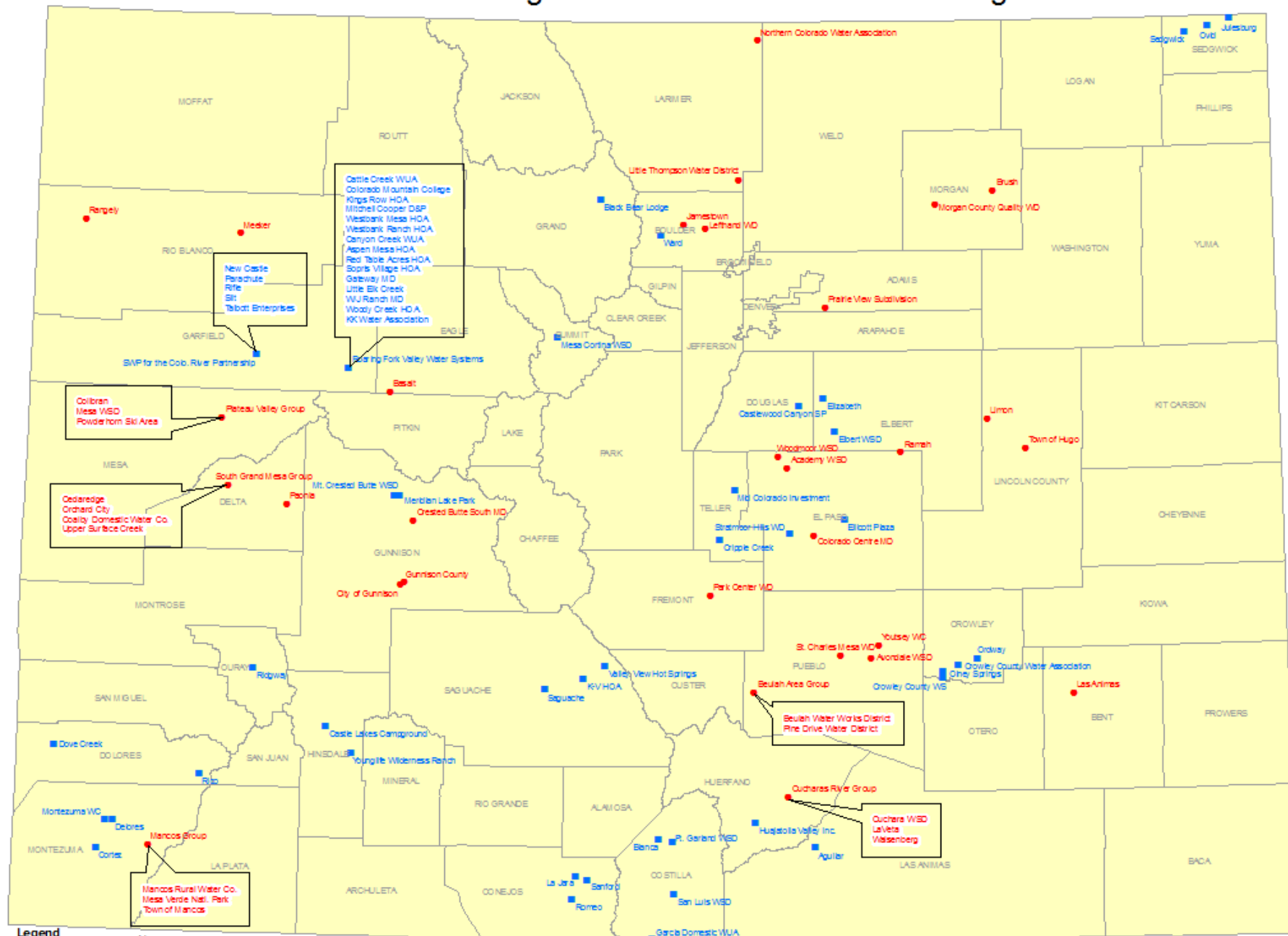
Funded by:



Colorado Department
of Public Health
and Environment

USDA & EPA

Communities Working with CRWA's Source Water Program



Legend

- SWPPs In Progress
- Completed SWPPs
- County Boundaries

Mission of CRWA



“To help small and rural communities provide a safe, dependable, quality water at affordable cost to their customers.”

Website:

crwa.net