

# City of Cortez

## Source Water Protection Plan

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Montezuma County, Colorado  
April 13, 2021



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For the Community Water Provider:  
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**Cover photo description and acknowledgments.** This Source Water Protection Plan is a planning document and there is no legal requirement to implement the recommendations herein. Actions on public lands will be subject to federal, state, and county policies and procedures. Action on private land may require compliance with county land use codes, building codes, local covenants, and permission from the landowner. This SWPP for the City of Cortez was developed using version 16.09.09 of the Colorado Rural Water Association’s Source Water Protection Plan Template.

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## COMMON ACRONYMS

AST	Aboveground Storage Tank
BLM	Bureau of Land Management
BMP	Best Management Practice
CAP	Corrective Action Plan
CDLE	Colorado Department of Labor and Employment
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFS	Cubic Feet per Second
COSTIS	Colorado Storage Tank Information System
CRWA	Colorado Rural Water Association
DRMS	Colorado Division of Reclamation, Mining, and Safety
DWCD	Dolores Water Conservancy District
DWRF	Dolores Watershed Resilient Forest Collaborative
ECHO	EPA's Enforcement and Compliance History Online
EPA	Environmental Protection Agency
GIS	Geographic Information System
LEPC	Local Emergency Planning Committee
MCL	Maximum Contaminant Level
MCWD#1	Montezuma County Water District No. 1
MG	Million Gallon
MGD	Million Gallons per Day
MVIC	Montezuma Valley Irrigation Company
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OWTS	Onsite Wastewater Treatment System
PSOC	Potential Source of Contamination
RCRA	Resource Conservation and Recovery Act
SWAA	Source Water Assessment Area
SWAP	Source Water Assessment and Protection
SWPA	Source Water Protection Area
SWPP	Source Water Protection Plan
TOT	Time of Travel
UMUT	Ute Mountain Ute Tribe
USFS	United States Forest Service
UST	Underground Storage Tank
WFDSS	Wildland Fire Decision Support System
WWTF	Wastewater Treatment Facility

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## EXECUTIVE SUMMARY

There is a growing effort in Colorado to protect community drinking water sources from potential contamination. Many communities are taking a proactive approach to preventing the pollution of their drinking water sources by developing a source water protection plan. A source water protection plan identifies a source water protection area, lists potential contaminant sources and outlines best management practices to reduce risks to the water source. Implementation of a source water protection plan provides an additional layer of protection at the local level beyond drinking water regulations.

The City of Cortez values a clean, high quality drinking water supply and decided to work collaboratively with area stakeholders to develop a Source Water Protection Plan. The source water protection planning effort consisted of individual planning meetings with the water provider, email communication between the City of Cortez and Colorado Rural Water Association (CRWA), and a series of presentations to local stakeholder groups and agencies during the months of May 2019 to November 2019. CRWA was instrumental in this effort by providing technical assistance in the development of this Source Water Protection Plan.

The City of Cortez obtains its drinking water from a surface water diversion off the McPhee Reservoir on the Dolores River. The Source Water Protection Area (SWPA) for this water source is comprised of three protection zones in the upper reaches of the Upper Dolores Watershed, which are defined as:

- **SWPA Zone 1** is defined as a 1,000-foot-wide band on either side of the Dolores River and its contributing streams up to McPhee Reservoir.
- **SWPA Zone 2** extends 1/4 mile beyond each side of the boundary of zone 1 (2,320 feet from the streams).
- **SWPA Zone 3** is made up by the remainder of the watershed area and includes the HUC 10 watershed boundaries of the West Dolores River, East Dolores River, Dolores Basin, Lost Canyon Creek, and McPhee Reservoir.

This SWPA is the area that Cortez has chosen to focus its source water protection measures to reduce source water susceptibility to contamination. Cortez conducted an inventory of potential contaminant sources and identified other issues of concern within the SWPA

Cortez developed several best management practices to reduce the risks from the potential contaminant sources and other issues of concern. The best management practices are centered on the themes of building partnerships with community members, businesses, and local decision makers; raising awareness of the value of protecting community drinking water supplies; and empowering local communities to become stewards of their drinking water supplies by taking actions to protect their water sources.

The following list highlights the highest priority potential contaminant sources and/or issues of concern and their associated best management practices.

- Abandoned Mines
  - Continue monitoring water quality of Dolores River. Check 303d list for prioritization
  - Review data contained on the Mine Impacted Streams Task Force website (<https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force>) to

- determine priority mines in watershed, and partner with CDPHE, Ute Mountain Ute Tribe, Colorado Geological Society, and DRMS on abandoned mine reclamation.
- Coordinate with upstream water systems' SWPPs for data overlap
- **Wildfire**
  - Continue involvement in planning and wildfire mitigation projects in conjunction with other water systems, state and federal agencies, and other collaborative groups (including USFS, Dolores Watershed Resilient Forest Collaborative (DWRF), Bureau of Reclamation, etc.)
  - Continue supporting and implementing the Montezuma County Emergency Operations Plan (2017) that includes an attachment titled: "Dolores River Emergency Alert and Notification Plan."
  - If a wildfire were to occur, construct berms, diversion structures, or revegetation practices for flood mitigation, debris flow, and erosion control. The Montezuma County Debris Management Plan (currently being written) contains actions the county would take to deal with debris from a flooding situation.
  - Inventory water sources and critical infrastructure
  - Share values/assets at risk with the USFS and work with them to incorporate values into their Wildland Fire Decision Support System (WFDSS). Work with CRWA's Critical Water Infrastructure Data Collection & WFDSS Integration Program to accomplish this.
- **Public Education**
  - Develop public education campaigns for community members to explain the importance of source water protection
  - Work w/ CRWA and other agencies to find/create material
  - Post articles or educational materials on website, at Town Hall, or in local newspaper that explains the importance of source water protection
  - Hold public meetings to introduce citizens to the SWPP
  - Install CPDHE SWPA road signs at various locations within the SWPA
- **Aquatic Nuisance Species**
  - Support the boat inspection and outreach efforts by the Dolores Water Conservancy District, Colorado Parks & Wildlife, and Bureau of Reclamation
  - Begin/continue monitoring program for presence of Zebra and Quagga mussel larvae and other aquatic nuisance species
  - Support additional regulations of aquatic nuisance species in Colorado
  - Conduct public outreach with message that ties drinking water quality to recreation. Examples may include an article about water quality in location newspapers, postings on social media, water system website, CCRs, and water bill inserts.

The City of Cortez recognizes that the usefulness of this Source Water Protection Plan lies in its implementation and will begin to execute these best management practices upon completion of this Plan.

This Plan is a living document that is meant to be updated to address any changes that will inevitably come. The City of Cortez will review this Plan at a frequency of once every three years or if circumstances change resulting in the development of new water sources and source water protection areas, or if new risks are identified.

## INTRODUCTION

Source water protection is a proactive approach to preventing the pollution of lakes, rivers, streams, and groundwater that serve as sources of drinking water. For generations water quality was taken for granted, and still today many people assume that their water is naturally protected. However, as water moves through and over the ground, contaminants may be picked up and carried to a drinking water supply.

While a single catastrophic event may wipe out a drinking water source, the cumulative impact of minor contaminant releases over time can also result in the degradation of a drinking water source. Contamination can occur via discrete (point source) and dispersed (nonpoint source) sources. A discrete source contaminant originates from a single point, while a dispersed source contaminant originates from diffuse sources over a broader area. According to the US Environmental Protection Agency, nonpoint source pollution is the leading cause of water quality degradation (Ground Water Protection Council, 2007).

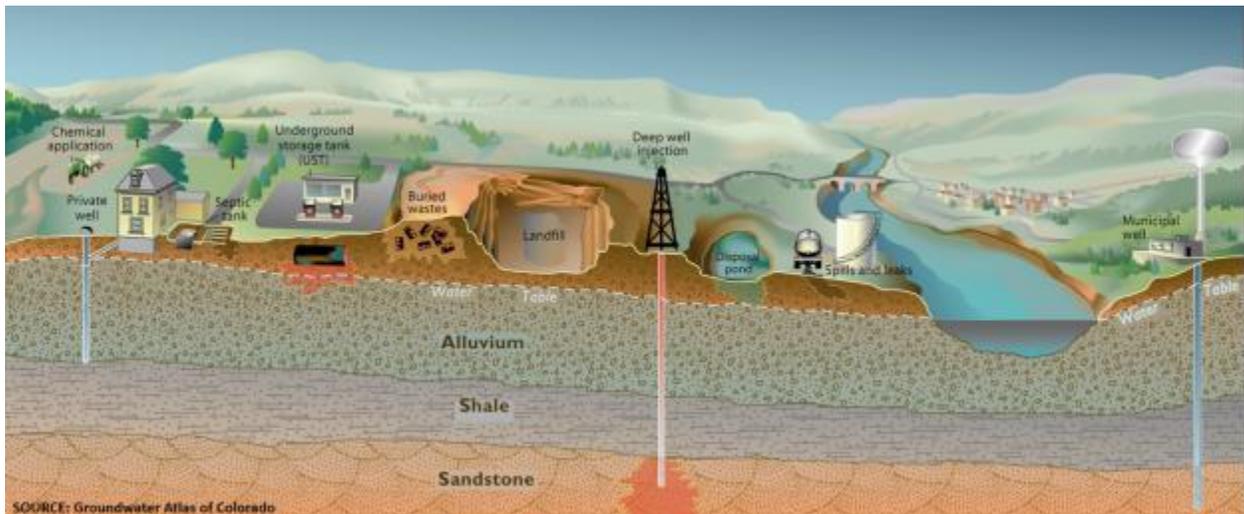


Figure 1: Schematic drawing of the potential source of contamination to surface and groundwater

The City of Cortez recognizes the potential for contamination of their drinking water sources and realizes that the development of this Source Water Protection Plan is the first step in protecting this valuable resource. Proactive planning is essential to protect the long-term integrity of the drinking water supply and to limit costs and liabilities. This SWPP demonstrates Cortez's commitment to reducing risks to their drinking water supply.



Figure 2: Location of City of Cortez's Water Sources in Montezuma County, Colorado

## Purpose of the Source Water Protection Plan

The Source Water Protection Plan (SWPP) is a tool for the City of Cortez to ensure clean and high-quality drinking water sources for current and future generations. This Source Water Protection Plan is designed to:

- Create an awareness of the community’s drinking water sources and the potential risks to surface water and/or groundwater quality within the watershed;
- Encourage education and voluntary solutions to alleviate pollution risks;
- Promote management practices to protect and enhance the drinking water supply;
- Provide for a comprehensive action plan in case of an emergency that threatens or disrupts the community water supply.

Developing and implementing source water protection measures at the local level (i.e. county and municipal) will complement existing regulatory protection measures implemented at the state and federal governmental levels by filling protection gaps that can only be addressed at the local level.

## Background of Colorado’s SWAP Program

Source water assessment and protection came into existence in 1996 as a result of Congressional reauthorization and amendment of the Safe Drinking Water Act. These amendments required each state to develop a source water assessment and protection (SWAP) program. The Water Quality Control Division, an agency of the Colorado Department of Public Health and Environment (CDPHE), assumed the responsibility of developing Colorado’s SWAP program and integrated it with the Colorado Wellhead Protection Program.

Colorado’s SWAP program is an iterative, two-phased process designed to assist public water systems in preventing potential contamination of their untreated drinking water supplies. The two phases include the Assessment Phase and the Protection Phase as depicted in the upper and lower portions of Figure 3, respectively.



Source: CDPHE - WQCD

Figure 3: Source Water Assessment and Protection Phases

### Source Water Assessment Phase

The Assessment Phase for all public water systems was completed in 2004 and consisted of four primary elements:

1. Delineating the source water assessment area for each of the drinking water sources;
2. Conducting a contaminant source inventory to identify potential sources of contamination within each of the source water assessment areas;
3. Conducting a susceptibility analysis to determine the potential susceptibility of each public drinking water source to the different sources of contamination;
4. Reporting the results of the source water assessment to the public water systems and the general public.

A Source Water Assessment Report (Appendices B & C) was provided to each public water system in Colorado in 2004 that outlines the results of this Assessment Phase.

### Source Water Protection Phase

The Protection Phase is a non-regulatory, ongoing process in which all public water systems have been encouraged to voluntarily employ preventative measures to protect their water supply from the potential sources of contamination to which it may be most susceptible. The Protection Phase can be used to take action to avoid unnecessary treatment or replacement costs associated with potential contamination of the untreated water supply. Source water protection begins when local decision makers use the source water assessment results and other pertinent information as a starting point to develop a protection plan. As depicted in the lower portion of Figure 3, the source water protection phase for all public water systems consists of four primary elements:

1. Involving local stakeholders in the planning process;
2. Developing a comprehensive protection plan for all of their drinking water sources;
3. Implementing the protection plan on a continuous basis to reduce the risk of potential contamination of the drinking water sources; and
4. Monitoring the effectiveness of the protection plan and updating it accordingly as future assessment results indicate.

The water system and the community recognize that the Safe Drinking Water Act grants no statutory authority to the Colorado Department of Public Health and Environment or to any other state or federal agency to force the adoption or implementation of source water protection measures. This authority rests solely with local communities and local governments.

The source water protection phase is an ongoing process as indicated in Figure 3. The evolution of the SWAP program is to incorporate any new assessment information provided by the public water supply systems and update the protection plan accordingly.

## **SOURCE WATER SETTING**

### **Location and Description**

The City of Cortez is located in Montezuma County in southwestern Colorado. Just below the Town of Dolores, the Dolores River has been diverted for agricultural use since the 19<sup>th</sup> century. In the mid-1880s, private ditch companies constructed both a tunnel and what is called the Great Cut diversion to divert water from the Dolores River basin into the Montezuma Valley. The City of Cortez was founded in the late 1880s to house the men who would complete the elaborate network of tunnels, irrigation ditches, and laterals required to divert water out of the Dolores River and into the Montezuma Valley.

In the early days, water for Cortez was hauled from Mitchell Springs located two miles south of town. In time, a well was dug in the center of Main Street but it was dry. Reservoirs and flumes were built and the struggle to maintain a continuous and reliable flow of water into the valley has been a reoccurring theme throughout the town's history (City of Cortez, 2017).

By 1920, the private ditch companies were broke, and their systems were in disrepair. Montezuma Valley Irrigation Company (MVIC) was formed in 1920 to consolidate several water systems, rehabilitate them and continue to operate and maintain them. All went well, except there never was enough late season water.

The Dolores Water Conservancy District (DWCD) was formed in November 1961 to address the issue of no late season agricultural water. The DWCD was successful in obtaining authorization of the Dolores Project in 1968. Located in the Dolores and San Juan River Basins in southwestern Colorado, the Project develops water from the Dolores River for irrigation, municipal and industrial users, recreation, fish and wildlife, and hydroelectric power. The Project also provides municipal water to the Dove Creek area, central Montezuma Valley area, and to the Towaoc area on the Ute Mountain Ute Indian Reservation.

Construction of McPhee Dam and Reservoir, the central aspect of the Project, began in 1980 and was completed in 1984. McPhee dam impounds about 381,000 acre-feet of Dolores River water and maintains 229,000 acre-feet of active storage. By 1986 irrigators in Montezuma Valley, the Ute Tribe and Dolores Project farmers finally had a long term, dependable supply of water.

Historically, MVIC contracted to provide conveyance facilities for the delivery of municipal and domestic water for Cortez, Towaoc and Montezuma Water Company which services the rural areas surrounding Cortez. These water rights are all junior to the rights of the MVIC which has pre-1922 Colorado Compact water rights. Now, water conveyance facilities are provided by the Dolores Project.

Currently, the largest of the municipal water allocations in McPhee Reservoir is that of the City of Cortez (2,300 acre-feet). This water is used to supplement the City's senior direct flow water rights out of the Dolores River. The water would be delivered through the Dolores Tunnel (WDID 714675) and recorded by the division engineer under WDID 320680. Municipal water for the Town of Dove Creek (allocated 600 acre-feet in McPhee Reservoir) is delivered via the Dove Creek Canal and the Indian M&I Water (allocated 1,000 acre-feet in McPhee Reservoir) is delivered through the Dolores Tunnel where it is treated by the City of Cortez. The water then is delivered through a pipeline to Towaoc (Dolores River Source Water Protection Plan Steering Committee, 2013).

## Hydrologic Setting

The City of Cortez has one surface water diversion off McPhee Reservoir, located on the Dolores River. The Upper Dolores River watershed (Hydrologic Unit Code (HUC) 14030002) encompasses approximately 4,620 square miles in southwestern Colorado and southeastern Utah. Most of the lands within the watershed are managed by the Bureau of Land Management and the U.S. Forest Service. The Dolores River begins in the high elevations of the San Juan Mountains of southwest Colorado, flows southwest into McPhee Reservoir near Dolores, Colorado, and continues north where it is joined by the San Miguel River to the east, which is its main tributary. Once joined with the San Miguel, the Dolores River flows northwest into Utah and eventually joins the Colorado River. Total discharge from the Dolores River into the Colorado River historically is approximately 544,000 acre-feet per year.

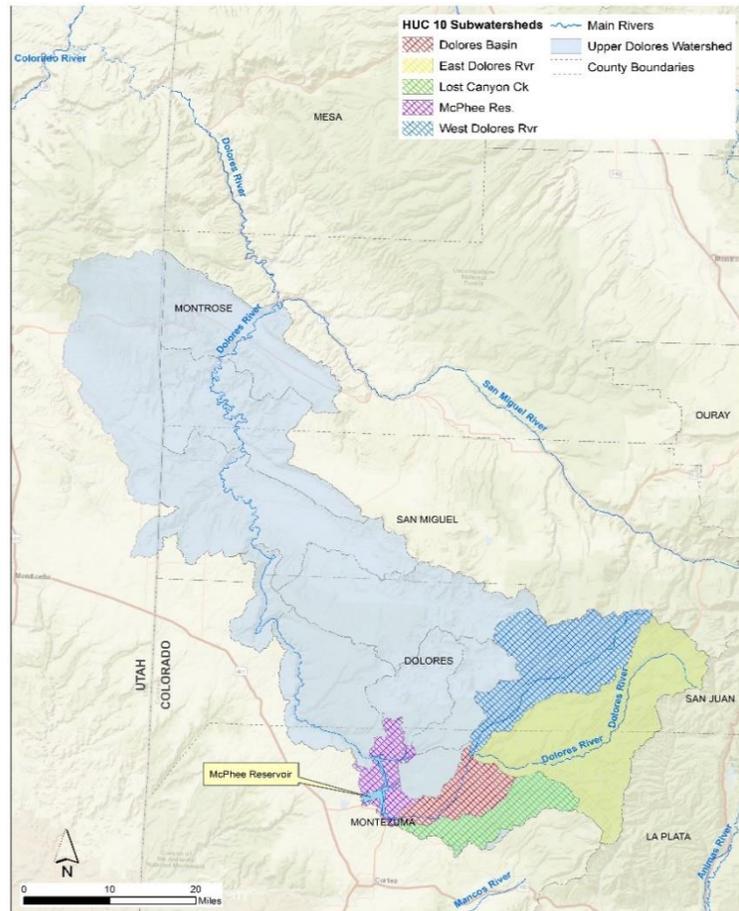


Figure 4: HUC 10 Sub-Watersheds in Upper Dolores Watershed

For purposes of this SWPP, the City of Cortez is concerned with activities in the upper reaches of the watershed above McPhee Reservoir, which include the following sub-watersheds as shown in Figure 4 above:

- West Dolores River (HUC 1403000201)
- East Dolores River (HUC 1403000202)
- Dolores Basin (HUC 1403000203)
- Lost Canyon Creek (HUC 1403000204)
- McPhee Reservoir (HUC 1403000208)

Discharge records for the Dolores River have been kept since 1896 at the town site of Dolores, Colorado via USGS Gage No. 916650. The only impoundment upstream of the gage is Groundhog Reservoir, a small reservoir of a minor tributary to the Dolores. As shown by the gage, discharge is driven by snow melt with median flows greater than 1,000 cubic feet per second (cfs) in June and minimum flows less than 50 cfs in the winter months of December through February. Flows are also highly variable with a peak high of 6,950 cfs recorded in May 1922 and a minimum flow of 10 cfs recorded December 2008 (Dolores River Source Water Protection Plan Steering Committee, 2013).

## DRINKING WATER SUPPLY OPERATIONS

### Water Supply and Infrastructure

The City of Cortez’s water treatment system supplies potable water to the residents of Cortez plus the Ute Mountain Ute Tribe (UMUT) and Montezuma County Water District No. 1 (MCWD#1). The water supply is drawn from McPhee Reservoir situated on the Dolores River. The initial water delivery is provided by the Dolores Project facilities constructed by the Bureau of Reclamation and operated by the Dolores Water Conservancy District. Water is transferred from McPhee Reservoir through the Project’s tunnel and then flows in a canal for approximately one mile to Cortez’s 30-inch raw water pipe intake. The pipeline begins as a 30-inch transmission pipe for several miles then changes to a 24-inch pipe for the remaining distance to a 20 million gallon (MG) settling reservoir at the plant site. Water is then fed to the Cortez Water Treatment Plant through pipelines from the reservoir.

The Cortez Water Treatment Plant provides a series of treatment processes. The pretreatment processes include coagulation, flocculation, and sedimentation provided by a clarifier. The treatment process is then followed by filtration through a multimedia granular filter or through a submerged membrane microfiltration system operating in parallel with the media filters. Final processes are chlorine disinfection and pH control provided as water leaves the Plant. Maximum treatment capacity is approximately 10 million gallons per day (MGD). Current peak day production is about 6.5 MGD with the average daily use of 2.6 MGD and the low winter demand of approximately 1.3 MGD.

The Plant has three steel 2 MG water tanks for finished water storage. The upper two tanks closest to the plant provide storage to supply the UMUT’s system. These tanks also supply the lower third tank which feeds the City of Cortez and MCWD#1. Cortez and MCWD#1 are served by three transmission lines to Cortez and then one transmission line from Cortez to MCWD#1 which abuts Cortez on the southwest corner of the City. UMUT’s transmission line extends approximately 11 miles to Towaoc where it is stored in four tanks for use as needed.

The City of Cortez has approximately 3990 service connections consisting of single-family residents, multi-family units, commercial users, and institutional users. The usage breakdown of the treated water between the three entities is 76% for Cortez, 20% for UMUT, and 4% for MCWD#1.

*Table 1: Surface Water Supply Information*

Water System Facility Name	Water System Facility Number	Surface Water Source	Constructed Date
Dolores Tunnel		Dolores River	1986

### Water Supply Demand Analysis

The City of Cortez serves an estimated 3,990 connections and approximately 9,007 residents and other users in the service area annually. The water system has the current capacity to produce ten million gallons per day. Current estimates indicate that the average daily demand is approximately 2.6 million gallons per day, and that the average peak daily demand is approximately 6.5 million gallons per day.

Using these estimates, the water system has a surplus average daily demand capacity of 7.4 million gallons per day and a surplus average peak daily demand capacity of 3.5 million gallons per day.

Based on the estimates above, the City of Cortez has determined that if the McPhee Reservoir supply become disabled for an extended period of time due to contamination, the City of Cortez may not be able to meet neither the average nor the peak daily demand of its customers. The ability of City of Cortez to meet either of these demands for an extended period of time is also affected by the amount of treated water the water system has in storage at the time a water source(s) becomes disabled.

The potential financial and water supply risks related to the long-term disablement of one or more of the community's water sources are a concern to the City of Cortez. As a result, they believe the development and implementation of a source water protection plan can help to reduce the risks posed by potential contamination of its water source(s). Additionally, the City of Cortez has developed an emergency response plan to coordinate rapid and effective response to any emergency incident that threatens or disrupts the community water supply.

## SOURCE WATER PROTECTION PLAN DEVELOPMENT

The Colorado Rural Water Association’s (CRWA) Source Water Protection Specialist, Kimberly Mihelich, helped facilitate the source water protection planning process. The goal of CRWA’s Source Water Protection Program is to assist public water systems in minimizing or eliminating potential risks to drinking water supplies through the development and implementation of Source Water Protection Plans.

The source water protection planning process took place during the months of May 2019 through November 2019 and consisted of an individual planning meeting with the water provider, email communication between the City of Cortez and CRWA, and a series of presentations to local stakeholder groups and agencies within the source water protection area. Information discussed at the meetings helped the City of Cortez develop an understanding of the issues affecting source water protection for the community as well as potential best management practices that may be incorporated into the SWPP. In addition to the planning meetings, data and other information pertaining to the source water protection area was gathered via internal and public documents, internet research, phone calls, emails, and field trips to the protection area. A summary of the meetings is represented below.

*Table 2: Planning Meetings*

Date	Purpose of Meeting
May 22, 2019	<u>Planning Meeting Between City of Cortez and CRWA</u> : Review CDPHE’s Source Water Assessment for City of Cortez and the “Dolores River Group draft SWPP”; Determine Source Water Protection Area delineation; Develop potential sources of contaminant source inventory and assess risk; Discussion on timeline for completion of SWPP and presentations to local stakeholder groups.
7/12/2019	<u>Presentation to the City Water Conservation (VCAP) Committee</u> : Present draft SWPP and gather feedback to incorporate into final document
8/7/2019	<u>Presentation to Dolores Watershed and Resilient Forest Collaborative</u> : Present draft SWPP and gather feedback to incorporate into final document
11/18/2019	<u>Presentation to Cortez City Council</u> : Present draft SWPP and gather feedback to incorporate into final document

### Dolores River Group Source Water Protection Plan

Between 2009 and 2013, City of Cortez began the development of their SWPP as a member of the Dolores River Group, a consortium of five public water systems within the Dolores River watershed. Those water systems included the City of Cortez, Town of Dolores, Town of Dove Creek, Town of Rico, and the Montezuma Water Company. A draft SWPP was created by the Dolores River Group in 2013 but was never finalized. The City of Cortez has utilized information from that draft SWPP for the purposes of creating their own individual plan as detailed in this document.

## Stakeholder Participation in the Planning Process

Local stakeholder participation is vitally important to the overall success of Colorado’s SWAP program. Source water protection was founded on the concept that informed citizens, equipped with fundamental knowledge about their drinking water source and the threats to it, will be the most effective advocates for protecting this valuable resource. Local support and acceptance of the SWPP is more likely when local stakeholders have actively participated in its development.

Because of the existence of several stakeholder groups in the area that have similar goals, as well as the previous development of the Dolores River Group SWPP, the City of Cortez decided to hold internal planning meetings prior to the development of a final SWPP. Local stakeholders and internal city staff were notified initially of the planning process and a draft SWPP was presented to DWRF and DWCD for additional comments and revisions. The City of Cortez and the Colorado Rural Water Association are very appreciative of the participation and expert input from the following participants.

*Table 3: Stakeholders*

Stakeholder	Title	Affiliation
Rich Landreth	Water Superintendent	City of Cortez
Randy Hunt	Water Treatment Plant Operator	City of Cortez
Phillip Johnson	Public Works Director	City of Cortez
Chad Hill	City Engineer	City of Cortez
Nicolas Stoker	Assistant Engineer	City of Cortez
Tracie Hughes	City Planner	City of Cortez
Danny Margoles	Coordinator	DWRF
Ken Curtis	Manager	DWCD
Mike Pasquin	Emergency Manager	Montezuma County

## Source Water Assessment Report Review

The City of Cortez reviewed the Source Water Assessment Report which was used as a starting point to guide the development of appropriate management approaches to protect the source water of Cortez from potential contamination. A copy of the Source Water Assessment Report for the City of Cortez can be obtained by contacting the City or by downloading a copy from the CDPHE’s SWAP program website located at: <https://www.colorado.gov/cdphe/source-water-assessment-and-protection-swap>.

## Defining the Source Water Protection Area

A source water protection area is the surface and subsurface areas within which contaminants are reasonably likely to reach a water source. The purpose of delineating a source water protection area is to determine the recharge area that supplies water to a public water source. Delineation is the process used to identify and map the area around a pumping well that supplies water to the well or spring, or to identify and map the drainage basin that supplies water to a surface water intake. The size and shape of the area depends on the characteristics of the aquifer and the well, or the watershed. The source water assessment area that was delineated as part of the City of Cortez's Source Water Assessment Report provides the basis for understanding where the community's source water and potential contaminant threats originate, and where the community has chosen to implement its source water protection measures in an attempt to manage the susceptibility of their source water to potential contamination.

After carefully reviewing their Source Water Assessment Report and the CDPHE's delineation of the Source Water Assessment Area for each of the City of Cortez's sources, modifications were made before accepting it as the Source Water Protection Area for this SWPP. The original SWAA did not include the watershed drainage into McPhee Reservoir, so the HUC 10 watershed was added to create the final Source Water Protection Area.

The City of Cortez's Source Water Protection Area is defined as:

- **Zone 1** is defined as a 1,000-foot-wide band on either side of the Dolores River and its contributing streams up to McPhee Reservoir.
- **Zone 2** extends 1/4 mile beyond each side of the boundary of zone 1 (2,320 feet from the streams).
- **Zone 3** is made up by the remainder of the SWAA area and includes the HUC 10 watershed boundaries of the West Dolores River, East Dolores River, Dolores Basin, Lost Canyon Creek, and McPhee Reservoir

The Source Water Protection Area is illustrated in the following map.

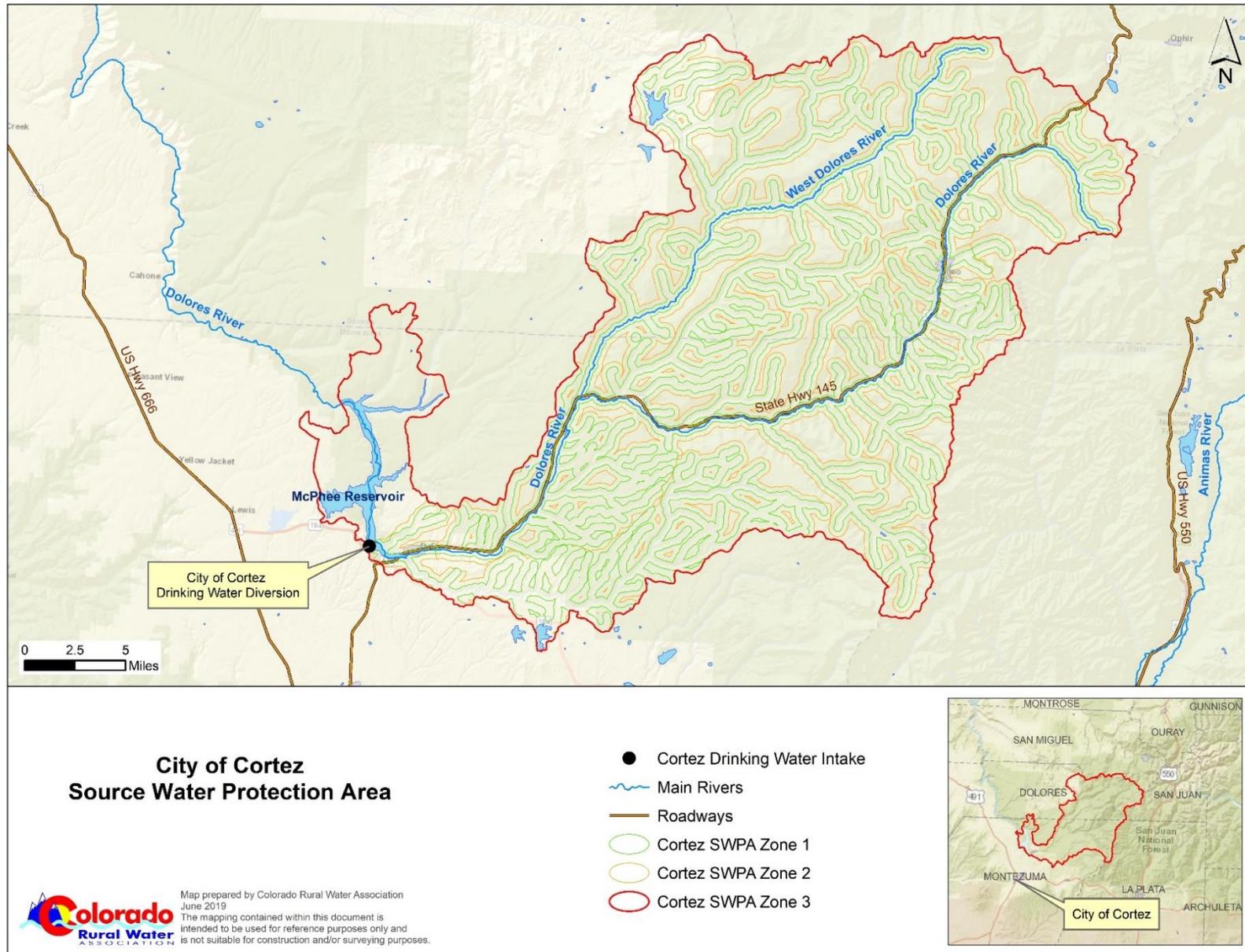


Figure 5: City of Cortez Source Water Protection Area

## **Inventory of Potential Contaminant Sources and Other Issues of Concern**

In 2001 – 2002, as part of the Source Water Assessment Report, a contaminant source inventory was conducted by the Colorado Department of Public Health and Environment to identify selected potential sources of contamination that might be present within the source water assessment areas. Discrete and dispersed contaminant sources were inventoried using selected state and federal regulatory databases, land use / land cover and transportation maps of Colorado. The contaminant inventory was completed by mapping the potential contaminant sources with the aid of a Geographic Information System (GIS).

The City of Cortez was asked, by CDPHE, to review the inventory information, field-verify selected information about existing and new contaminant sources and provide feedback on the accuracy of the inventory. Through this Source Water Protection Plan, Cortez is reporting its findings to the CDPHE.

After much consideration, discussion, and input from local stakeholders, the City of Cortez has developed a more accurate and current inventory of contaminant sources located within the SWPA that may impact the drinking water sources.<sup>1</sup> In addition to the discrete and dispersed contaminant sources identified in the contaminant source inventory, Cortez has also identified other issues of concern that may impact the drinking water sources. Upon completion of this contaminant source inventory, the City of Cortez has decided to adopt it in place of the original contaminant source inventory provided by the CDPHE.

### **City of Cortez’s Inventory of Potential Contaminant Source and Other Issues of Concern:**

- Abandoned Mines
- Fuel Storage Tanks
- Stormwater Runoff
- Chemical Storage
- Gravel Pits Along Dolores River
- Onsite Wastewater Treatment Systems
- Spills/Accidents on Roads
- Wildfire
- Agricultural Practices
- Public Education
- Residential Practices
- Future Land Use
- Public Land Management
- Sanitary Sewer
- Recreation
- Aquatic Nuisance Species

A more in-depth discussion on each potential source of contamination and issue of concern can be found in Chapter 5 “DISCUSSION OF POTENTIAL CONTAMINANT SOURCES AND ISSUES OF CONCERN”

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<sup>1</sup> The information contained in this Plan is limited to that available from public records and the City of Cortez at the time that the Plan was written. Other potential contaminant sites or threats to the water supply may exist in the Source Water Protection Area that are not identified in this Plan. Furthermore, identification of a site as a “potential contaminant site” should not be interpreted as one that will necessarily cause contamination of the water supply.

## Risk Assessment & Level of Control of Potential Contaminant Sources and Other Issues of Concern

After developing a contaminant source inventory and list of issues of concern that is more accurate, complete and current, The City of Cortez assessed the risk level and level of control of each item. The level of risk for each contaminant source is a measure of the water source's potential exposure to contamination. Cortez utilized CRWA's *SWAP Risk Assessment Matrix* (Figure 6), which calculates the level of risk by estimating the following:

- **Probability of Impact** – The risk to the source waters increases as the relative probability of damage or loss increases. The probability of impact is determined by evaluating the number of contaminant sources, the migration potential or proximity to the water source and the historical data. The following descriptions provide a framework to estimate the relative probability that damage or loss would occur within one to ten years.
  - **Certain:** >95% probability of impact
  - **Likely:** >70% to <95% probability of impact
  - **Possible:** >30% to <70% probability of impact
  - **Unlikely:** >5% to <30% probability of impact
  - **Rare:** <5% probability of impact
- **Impact to the Public Water System** – The risk to the source waters increases as the impact to the water system increases. The impact is determined by evaluating the human health concerns and potential volume of the contaminant source. CDPHE developed information tables to assist with this evaluation (Appendices D-G). The following descriptions provide a framework to estimate the impact to the public water system.
  - **Catastrophic** - irreversible damage to the water source(s). This could include the need for new treatment technologies and/or the replacement of existing water source(s).
  - **Major** - substantial damage to the water source(s). This could include a loss of use for an extended period of time and/or the need for new treatment technologies.
  - **Significant** - moderate damage to the water source(s). This could include a loss of use for an extended period of time and/or the need for increased monitoring and/or maintenance activities.
  - **Minor** - minor damage resulting in minimal, recoverable, or localized efforts. This could include temporarily shutting off an intake or well and/or the issuance of a boil order.
  - **Insignificant** - damage that may be too small or unimportant to be worth consideration but may need to be observed for worsening conditions. This could include the development of administrative procedures to maintain awareness of changing conditions.

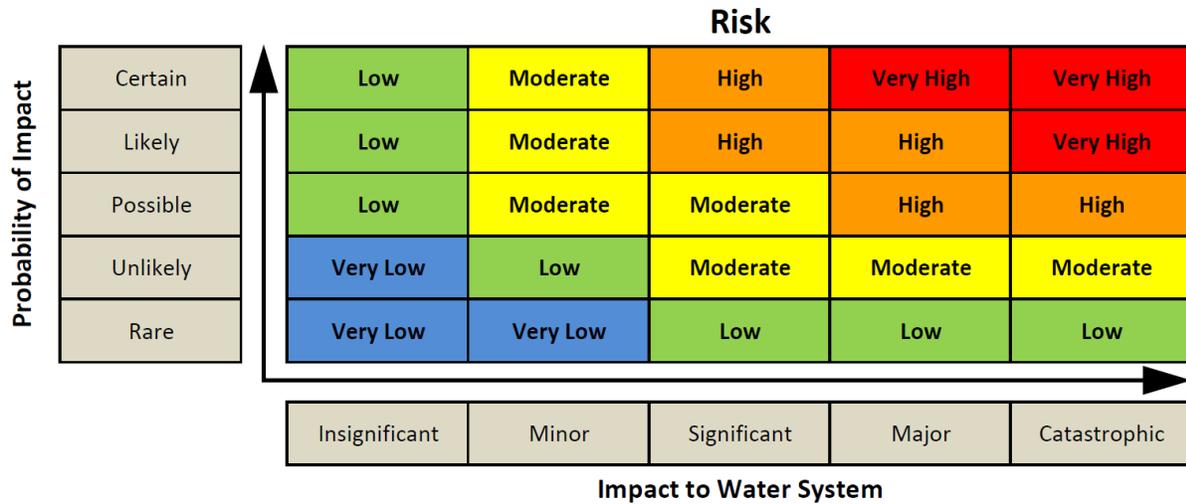


Figure 6: CRWA’s SWAP Risk Assessment Matrix

The level of water system control describes the ability of the water system to take measures to prevent contamination or minimize impact. A potential contaminant source that falls within a water system’s jurisdiction (i.e. direct control), may be of higher priority since they can take direct measures to prevent contamination or minimize the impact.

- **Direct Control** – The water system can take direct measures to prevent.
- **Indirect Control** – The water system cannot directly control the issue but can work with another person or entity to take measures to prevent.
- **No Control** – The PSOC or issue of concern is outside the control of the public water system and other entities.

The City of Cortez ranked the potential contaminant source inventory and issues of concern in the following way:

Table 4: Risk of Assessment and Control Level of Potential Contaminant Sources & Issues of Concern

Potential Contaminant Source or Issue of Concern	Probability of Impact (Rare, Unlikely, Possible, Likely, Certain)	Impact to Water System (Insignificant, Minor, Significant, Major, Catastrophic)	Risk (Very Low, Low, Intermediate, High, Very High)	Control (Direct, Indirect, No)
Abandoned Mines	Possible	Major	High	Indirect
Leaking Fuel Storage Tanks	Possible	Significant	Moderate	Indirect
Stormwater Runoff	Likely	Minor	Moderate	Indirect
Chemical Storage	Possible	Minor	very Low	Indirect
Gravel Pits Along Dolores River	Unlikely	Minor	Low	Indirect
Onsite Wastewater Treatment Systems	Possible	Minor	Moderate	Indirect
Spills/Accidents on Roads	Possible	Significant	Moderate	No
Wildfire	Likely	Major	High	No
Agricultural Practices	Likely	Insignificant	Low	Indirect
Public Education	N/A	N/A	N/A	Direct
Residential Practices	Likely	Insignificant	Low	Direct
Future Land Use	N/A	N/A	N/A	Indirect
Public Land Management	N/A	N/A	N/A	Indirect
Sanitary Sewer	Possible	Minor	Moderate	Indirect
Recreation	Rare	Insignificant	Very Low	Indirect
Aquatic Nuisance Species	Likely	Major	High	Indirect

### Identifying Best Management Practices

Best Management Practices (BMPs) are the actions that can be taken within the Source Water Protection Area to help reduce the potential risks of contamination to the community’s source waters. The City of Cortez reviewed and discussed several possible best management practices that could be implemented within the SWPA to help reduce the potential risks of contamination to the community’s source water. Cortez established a “common sense” approach in identifying and selecting the most feasible source water management activities to implement locally. The best management practices were obtained from multiple sources including: Environmental Protection Agency, Colorado Department of Public Health and Environment, Natural Resources Conservation Service and other SWPPs.

The City of Cortez recommends that the best management practices listed beginning on page 48 be considered for implementation.

After identifying best management practices for each potential contaminant source and issue of concern, the City of Cortez prioritized issue to guide the implementation efforts upon completion of this SWPP. The prioritization ranking factored in the level of risk, the water system control, as well as the feasibility of implementing the BMPs that Cortez developed. The City of Cortez assigned each issue a priority ranking of “High”, “Moderate”, or “Low” as shown in Table 5 below.

*Table 5: Priority Ranking of Potential Contaminant Sources & Issues of Concern*

Potential Contaminant Source or Issue of Concern	Priority Ranking
Abandoned Mines	High
Leaking Fuel Storage Tanks	Moderate
Stormwater Runoff	Low
Chemical Storage	Moderate
Gravel Pits Along Dolores River	Moderate
Onsite Wastewater Treatment Systems	Low
Spills/Accidents on Roads	Moderate
Wildfire	High
Agricultural Practices	Moderate
Public Education	High
Residential Practices	Low
Future Land Use	Low
Public Land Management	Moderate
Sanitary Sewer/Combined Sewer Overflows	Moderate
Recreation	Low
Aquatic Nuisance Species	High

## DISCUSSION OF POTENTIAL CONTAMINANT SOURCES AND ISSUES OF CONCERN

The following section provides a brief description of potential contaminant sources and issues of concern that have been identified in this plan, describes the way in which they threaten the water source(s) and outlines best management practices.

### **Abandoned mines**

*Priority Ranking: High*

Early mining practices in Colorado allowed mine owners to simply abandon mines without consideration of the impact on streams, water quality, slope stability and safety. Many old mining properties contain abandoned mine workings, mine waste and/or mill tailings. Active and inactive mining operations have a potential to contaminate drinking water supplies from either point source discharges (i.e. mine drainage tunnels or flowing adits) or nonpoint source discharges from run-off over waste rock or tailing piles. Acidic, metal-laden water emanating from inactive mines and waste rock piles has a potential to impair aquatic life and to a lesser degree threaten human drinking water.

The Colorado Division of Reclamation, Mining, and Safety (DRMS) Inactive Mine Reclamation Program was initiated in 1980 with the goals of identifying hazards and environmental problems arising from abandoned mines; designing appropriate closure methods and reclamation techniques for project sites; and reclaiming and safeguarding abandoned mine hazards and environmental problems (Nickless, 2017). DRMS partners with several agencies on mine safety closure projects including the Bureau of Land Management (BLM), United States Forest Service (USFS), Colorado Division of Parks & Wildlife, CDPHE, UMUT and many others.

During the years 1991 through 1999, the Colorado Geologic Survey (CGS) completed an inventory of abandoned mine lands on National Forest System lands within Colorado to assess environmental degradation (Colorado Geologic Survey, n.d.). The inventory included mapping of features, environmental information, environmental safety ratings and water and wastewater samples from selected sites. Each mine inventory area was given an environmental degradation rating based on a 1-through- 5 scale with 1 being “extreme” and 5 being “none.” Approximately 32 mine inventory areas were identified within the City of Cortez’s SWPA and over 150 abandoned mine openings. Of the mine inventory areas identified, 11 had environmental hazard ratings of “none”, eight had environmental hazard ratings of “slight”, eight had environmental hazard ratings of “potentially significant”, four had environmental hazard ratings of “significant”, and one had an environmental hazard rating of “extreme” (see Figure 7 below). Cortez is not currently aware of any impairment to their drinking water sources and continues to work with other agencies to observe and monitor for any potential contamination.

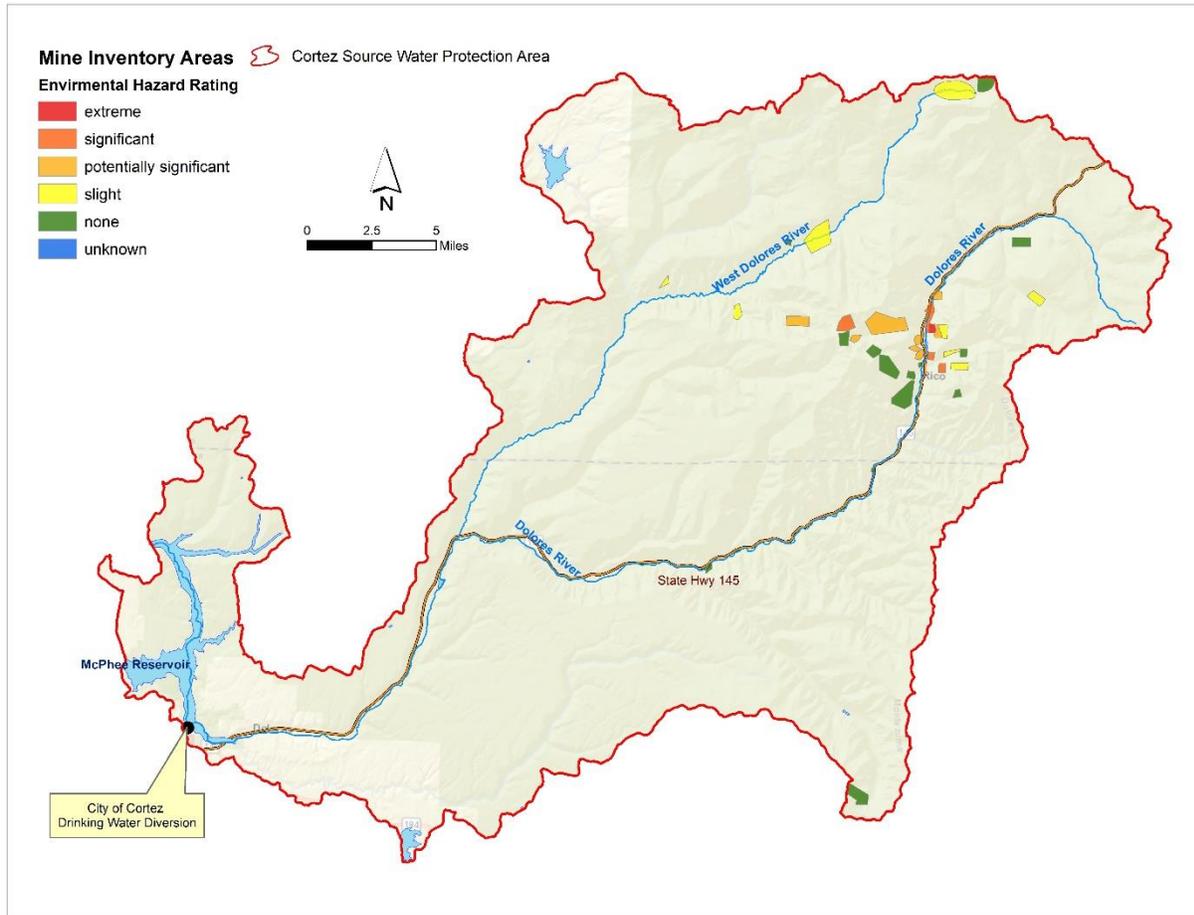


Figure 7: Historical mine inventory areas within City of Cortez SWPA

### Abandoned Mines Best Management Practices Recommendations

- Continue monitoring water quality of Dolores River. Check 303d list for prioritization
- Review data contained on the Mine Impacted Streams Task Force website (<https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force>) to determine priority mines in watershed, and partner with CDPHE, UMUT, Colorado Geological Society, and DRMS on abandoned mine reclamation.
- Coordinate with upstream water systems' SWPPs for data overlap

### **Leaking Fuel Storage Tanks**

*Priority Ranking: Moderate*

The Colorado Department of Labor and Employment (CDLE) Division of Oil & Public Safety regulates storage tanks in Colorado. Underground storage tanks (USTs) with a capacity greater than 110 gallons that contain petroleum products are regulated and aboveground storage tanks (ASTs) with a capacity between 660 and 39,999 gallons that contain fuel or lubricants are regulated. There are six facilities within Cortez's SWPA that have regulated storage tanks onsite. SWPA Zone 1 contains one regulated ASTs and seven USTs; within SWPA Zone 2, there is one regulated ASTs and no USTs. There are no regulated storage tanks within the Zone 3 SWPA.

Storage tanks are a concern to water systems because they may be old and subject to leakage due to corrosion, failure of the piping systems, spills and overfills, as well as equipment failure and human operational error. It only takes a small amount of petroleum to contaminate the ground or surface water. Even a small spill can have a serious impact. A single pint of oil released into the water can cover one acre of water surface area and can seriously damage an aquatic habitat. A spill of one gallon can contaminate a million gallons of water (US Environmental Protection Agency, 2001). Fuel tanks should be inspected visually on an annual basis and properly seated on a type of secondary containment structure to prevent spills from reaching the ground. The containment area should be able to hold 125% of the tank capacity.

According to the CDLE's Colorado Storage Tank Information System (COSTIS) website, there have been 11 spill events within Cortez's SWPA, but there are currently no known open spill events that have a corrective action plan (CAP) in place. A CAP is required when the results of a site characterization report identify that remediation is necessary to abate the concerns associated with a release; however, Cortez will track the events on the COSTIS website on an annual basis for any changes. For more information about storage tank releases visit <https://ops.colorado.gov/petroleum/petroleum-guidance/release-response/release-discovery-and-reporting>.

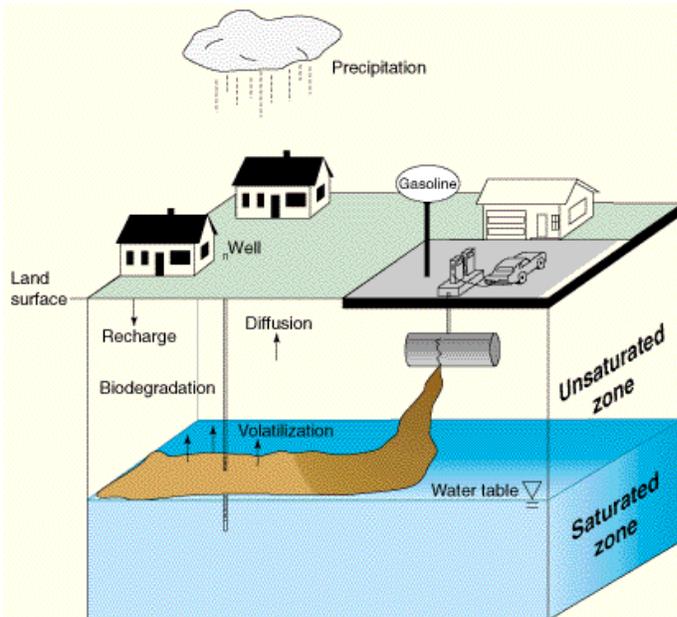


Figure 8: Schematic of a LUST spill site

#### Fuel Storage Tanks Best Management Practices Recommendations

- Install signage at gas pumps at McPhee Reservoir marinas that explain importance of source water protection
- Monitor known databases (such as COSTIS) on the status of storage tank spills or events within the SWPA
- Share copies of SWPP/maps of SWPA with CDLE OPS and request notifications of open events/corrective action plans

## **Stormwater runoff**

*Priority Ranking: Low*

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground. Stormwater can pick up debris, trash, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, or wetland. Within the Cortez's SWPA, no upstream towns or municipalities have stormwater systems in place to contain or treat stormwater runoff.

Polluted stormwater runoff can have adverse effects on plants, fish, animals, and people. Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Excess nutrients can cause algal blooms. Debris and trash can choke, suffocate, or disable aquatic life like ducks, fish, turtles and birds. Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil and other auto fluids can poison aquatic life. Polluted stormwater can also affect drinking water sources, affecting human health and increasing drinking water treatment costs (Colorado Department of Public Health and Environment).

Public education to homeowners and business owners within the SWPA is essential to the prevention of pollution via stormwater runoff. The City of Cortez recommends educating the public on proper use and storage of toxic materials, installing storm drain signage, and supporting upstream municipalities on their efforts to install stormwater systems.

### Stormwater Runoff Practices Best Management Practices Recommendations

- Educate homeowners and business owners within the SWPA on the proper use and storage of household toxic materials and responsible lawn care and landscaping
- Work with local entities and municipalities to install storm drain signage
- Encourage and support upstream municipalities' efforts to install and maintain stormwater containment and treatment

## **Chemical Storage**

*Priority Ranking: Moderate*

There are many businesses and industries within in Cortez's SWPA who use chemicals and produce chemical waste to carry out their business or operational functions. Improper storage and disposal of chemicals from these users can reach ground or surface water through a number of pathways. If substances from these businesses are accidentally or intentionally discharged into sewers, contamination of ground and surface waters can occur (US Environmental Protection Agency, 2001).

According to available data, there are approximately 12 facilities with direct discharge permits under the EPA National Pollutant Discharge Elimination System (NPDES) permitting program within Cortez's SWPA. Of those, 11 facilities are within SWPA Zone 1. These facilities discharge directly into stormwater drains or other waterbodies within the SWPA. There are two facilities that are regulated under the Resource Conservation and Recovery Act (RCRA), both of which are in SWPA Zone 1. A detailed list of EPA-regulated facilities within Cortez's SWPA are listed in EPA's Envirofacts website at <https://www3.epa.gov/enviro/>.

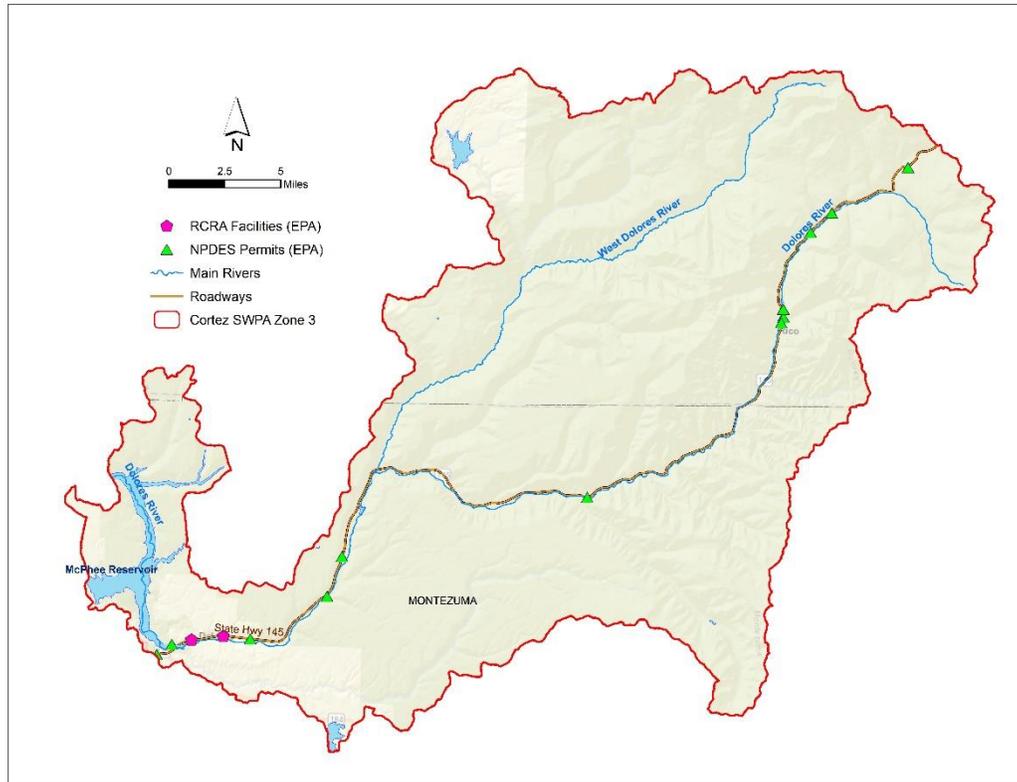


Figure 9: EPA-Regulated Facilities within City of Cortez SWPA

#### Resource Conservation and Recovery Act

RCRA, which was passed in 1976, was established to set up a framework for the proper management of hazardous waste. Hazardous waste is regulated under Subtitle C of RCRA. EPA has developed a comprehensive program to ensure that hazardous waste is managed safely from the moment it is generated to its final disposal (cradle-to-grave). Under Subtitle C, EPA may authorize states to implement key provisions of hazardous waste requirements in lieu of the federal government (US Environmental Protection Agency, 2017). In Colorado, the CDPHE is responsible for regulating and enforcing compliance with RCRA. Businesses that generate hazardous waste, as it is defined under RCRA, must comply with the Colorado Hazardous Waste Act for managing and disposing of hazardous wastes (CDPHE Hazardous Materials and Waste Management Division, 2008).

#### National Pollutant Discharge Elimination System Program

There are many facilities within the SWPA Zone of Influence such as chemical and metal manufacturing, mining and food processing that can contribute to nutrient and metal pollution in lakes, rivers and streams and can degrade water quality and threaten drinking water sources. Wastewater discharges from industrial and commercial sources may contain pollutants at levels that could affect the quality of receiving waters or interfere with publicly owned treatment works that receive those discharges. The EPA's NPDES permitting program establishes discharge limits and conditions for industrial and commercial sources with specific limitations based on the type of facility/activity generating the discharge. The EPA has identified 65 pollutants and classes of pollutants as "toxic pollutants", of which 126 specific substances have been designated "priority" toxic pollutants. All other pollutants are considered to be "non-conventional."

Effluent Guidelines are national wastewater discharge standards that are developed by the EPA on an industry-by-industry basis. These are technology-based regulations and are intended to represent the greatest pollutant reductions that are economically achievable for an industry. The standards for direct dischargers are incorporated into NPDES permits issued by States and EPA regional offices and permits or other control mechanisms for indirect dischargers (US Environmental Protection Agency, 2017).

**Chemical Storage Best Management Practices Recommendations**

- Accumulate contact information for regulatory agencies & chemical manufacturing facilities
- Create an inventory of facilities with onsite (regulated) chemical storage; develop chemical prioritization table and provide to Local Emergency Planning Committee (LEPC) and regulatory agencies
- Request notification for violations from LEPC
- Create emergency notification cards and outreach materials and distribute to chemical manufacturing facilities

**Gravel Pits along Dolores River**

*Priority Ranking: Moderate*

The Colorado Division of Reclamation, Mining and Safety (DRMS) regulates mining and prospecting operations in the state of Colorado under the auspices of the Colorado Mined Land Reclamation Act and the Hard Rock/Metal Mining Rules and Regulations of the Mined Land Reclamation Board. The Division is responsible for mineral and energy development, policy and regulation and planning. One of their primary objectives is to review mining permit applications and to inspect mining operations to make sure that regulations are being followed. According to the DRMS database, there are currently three active permitted mining operations within Cortez’s SWPA, all within Zone 2. The commodities mined include sand and gravel.

*Table 6. Active permitted mines within City of Cortez’s SWPA*

SWPA Zone	Site Name	Permittee	Permit ID	Commodities Mined
2	Wallace Pit	Stone Sand & Gravel, LLC	M1983028	Sand & Gravel
2	Hay Camp Pit	Montezuma County	M1990025	Gravel
2	New Hay Camp Pit	McStone Aggregates, LLC	M2013031	Sand & Gravel

(Colorado Division of Reclamation, Mining and Safety, 2017)

The DRMS Minerals Program conducts inspections of each permitted mine site at least once every four years to ensure compliance with the Act, Regulations and the provisions of an operator’s approved permit. High priority sites, such as hardrock and in-stream gravel extraction operations, may be inspected annually and operations that use toxic or hazardous materials may be inspected monthly. Inspections focus on a variety of topics including but not limited to: general compliance with their mining plan; erosion and sediment control; stormwater management; protection of the hydrologic balance; and protection of wildlife resources (Colorado Division of Reclamation Mining & Safety, 2017).

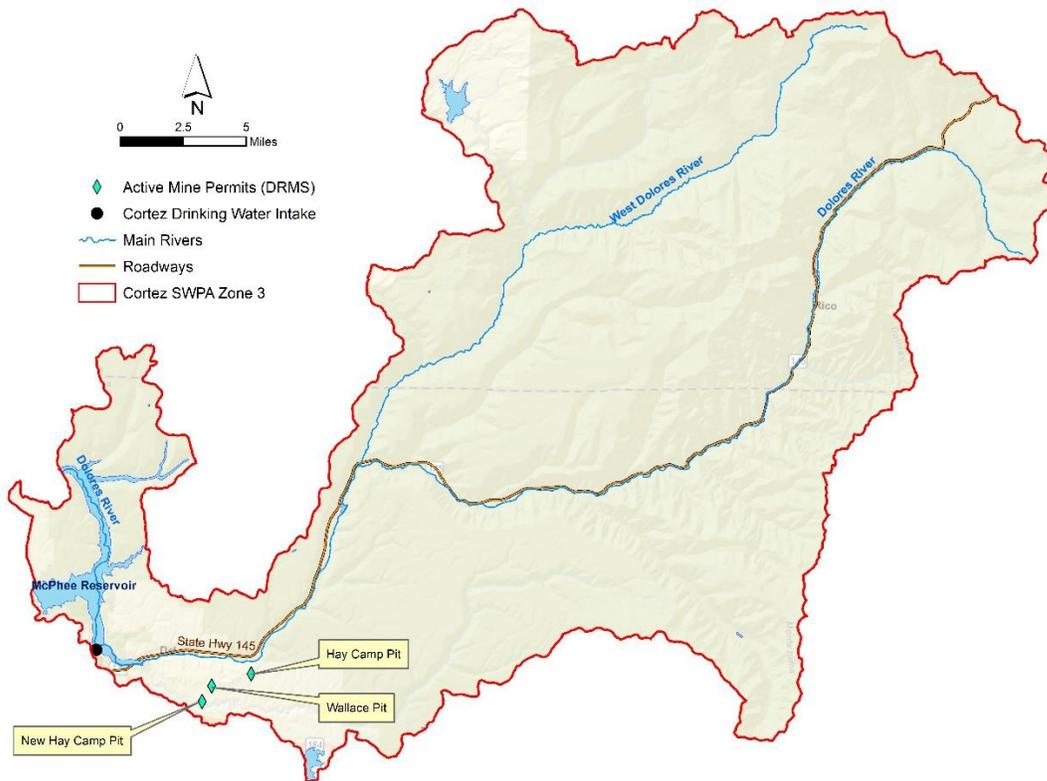


Figure 10: Active Mines within City of Cortez SWPA

**Gravel Pits Best Management Practices Recommendations**

- Monitor DRMS website for status of active mining facilities in SWPA
- Create emergency notification cards and provide them to active mining facilities in SWPAs
- Share copies of SWPP/maps of SWPA with the Colorado Division of Reclamation and Mining Safety (DRMS) and coordinate with them for notifications on permit changes within the SWPA

**Onsite Wastewater Treatment Systems**

*Priority Ranking: Low*

There are areas within Cortez’s SWPA that include properties that rely on onsite wastewater treatment systems (OWTS) to dispose of their sewage. An OWTS, commonly known of as a septic system, consists of a septic tank that collects all the wastewater and a soil treatment area that disperses the liquid effluent onto a leach field for final treatment by the soil.

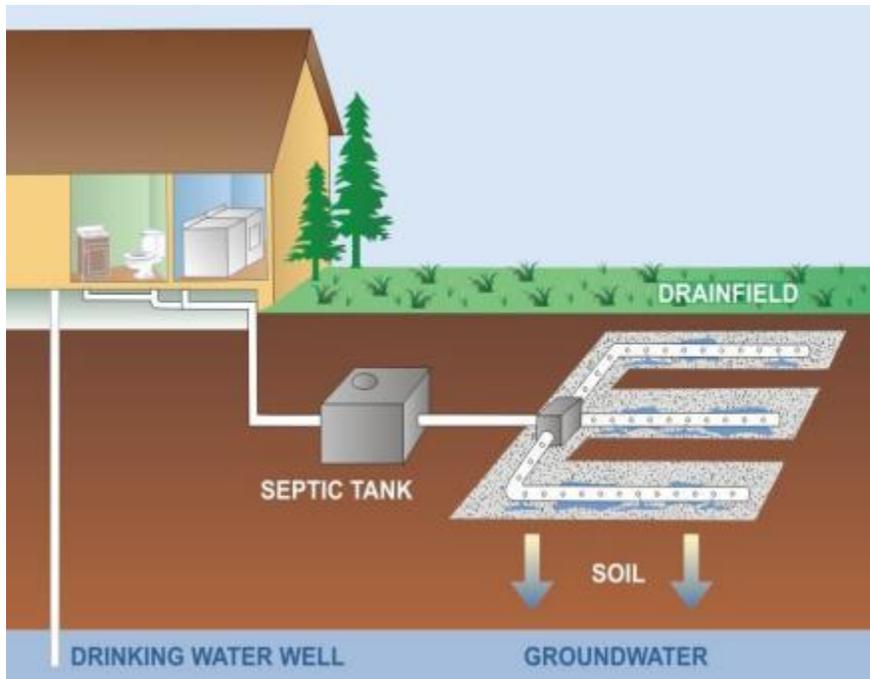


Figure 11: Schematic of a Conventional OWTS (Montezuma County Public Health Department)

Unapproved, aging, and failing septic systems have a large impact on the quality and safety of the water supply. The failure of property owners to pump solids that accumulate in the septic tank may lead to premature failure of the soil treatment area. This in turn can cause untreated wastewater to back up into the home or to surface on the ground. If managed improperly, these residential septic systems can contribute excessive nutrients, bacteria, pathogenic organisms, and chemicals to the groundwater. While OWTSs are the second most frequently cited source of groundwater contamination in our country, Cortez does not believe there are any impacts to their drinking water due to improper maintenance or failure of OWTSs and will work with the County to monitor these.

In Montezuma County, individual sewage disposal systems are permitted by their Public Health Department. The Health Department administers and enforces the minimum standards, rules, and regulations under the authority of the On-Site Wastewater Treatment Act under Colorado State Statute 25-10-101 as well as the Montezuma County Public Health Department the On-Site Wastewater Treatment System Regulation 43. It is unknown at this time the number of unapproved systems currently in use and the age of all septic systems in the SWPA. The absence of effective monitoring and education increases the risk of excessive contaminants from OTWS entering the groundwater.

Onsite Wastewater Treatment Systems Best Management Practices Recommendations:

- Work with Montezuma County Public Health Department to develop a list of all OWTS owners in the SWPA
- Work with Montezuma County Public Health Department to develop a public education campaign for property owners within the SWPA on the importance of proper septic maintenance as it relates to source water protection
- Work with the Montezuma County Public Health Department to develop and implement a voluntary septic system inspection program upon request of the property owner

- Work with Montezuma County Public Health Department to require property owners that sell land in the Source Water Protection Area to disclose issuance date of septic permit and condition of septic system including service records
- Work with realtors in SWPA to provide new buyers who have OWTS with information on proper OWTS maintenance as it pertains to source water protection
- Conduct nitrogen and phosphorous sampling at tributaries within close proximity to areas with high density of OWTS

## **Spills/Accidents on Roads**

*Priority Ranking: Moderate*

The City of Cortez's SWPA is served by a vast network of roads that lie within a variety of jurisdictions, including local municipalities, county, and state jurisdiction. In particular, Cortez is most concerned with hazardous spills and accidents occurring on Colorado State Highway 145, which runs parallel to the Dolores River. Highway 145 is maintained by the Colorado Department of Transportation (CDOT), and local response for spills and accidents on this roadway is from local/nearest fire departments, Colorado State Patrol, and the Montezuma County Sheriff's Office of Emergency Management. Spill cleanup on state highways is contracted through the Colorado State Patrol to an outside organization.

### Source Water Contaminant Pathways

Motor vehicles, roads, and parking facilities are a major source of water pollution to both surface and groundwater. An estimated 46% of US vehicles leak hazardous fluids, including crankcase oil, transmission, hydraulic, and brake fluid, and antifreeze, as indicated by oil spots on roads and parking lots, and rainbow sheens of oil in puddles and roadside drainage ditches. An estimated 30-40% of the 1.4 billion gallons of lubricating oils used in automobiles are either burned in the engine or lost in drips and leaks, and another 180 million gallons are disposed of improperly onto the ground or into sewers. Runoff from roads and parking lots has a high concentration of toxic metals, suspended solids, and hydrocarbons, which originate largely from automobiles (Gowler & Sage, 2006). Storm water runoff over these roads can deliver contaminants from the road surface into the nearby surface and groundwater.

Vehicular spills may occur along the transportation route within SWPA from trucks that transport fuels, waste, and other chemicals that have a potential for contaminating the source waters. Chemicals from accidental spills are often diluted with water, potentially washing the chemicals into the soil and infiltrating into the groundwater. Roadways are also frequently used for illegal dumping of hazardous or other potentially harmful wastes.

### Spills/Accidents on Roads Best Management Practices Recommendations

- Continue supporting and implementing the "Montezuma County: Dolores River Emergency Alert and Notification Plan"
- Develop emergency response cards that includes water system contact info and intake locations; distribute to appropriate emergency responders (Montezuma County Sheriff's Department/Office of Emergency Management, Dispatch, Montezuma County Road & Bridge, Colorado State Patrol, CDOT, Local Fire Departments)
- Share copies of SWPP and maps/GIS shapefiles of SWPA with CDOT, Montezuma County Road & Bridge Department, and first responders (County OEM, dispatchers, sheriff department, fire depts.)

- Provide emergency responders with plant and intake (source water) tours
- Work with Colorado State Patrol to assess catch points within SWPA
- Inventory local fire departments and other emergency responders within SWPA and provide them with spill kits and training if needed

## **Wildfire**

*Priority Ranking: High*

Cortez's SWPA includes forested lands and lands that contain pasture grass, crops and areas of undisturbed natural grasslands. Wildfires including forest fires and small brush and grass fires are a concern for these areas. During 2007-2011, local fire departments across the country responded to an estimated average of 334,200 brush, grass and forest fires per year. This translates to 915 such fires per day. Only 10% of those fires were coded as forest, woods, or wildland fires. The remainder were brush and grass fires (Ahrens, 2013).

Cortez has not seen any major effects to their drinking water sources due to wildfires, however if a major wildfire were to occur in the SWPA, it could have a major impact on its source waters by altering land cover and watershed hydrology. The aftermath of a wildfire can result in soil erosion, sediment and ash pollution in source water supplies, which present challenges to water treatment operations. Large rain events can produce mudslides and debris flows capable of destroying water infrastructure and impacting water quality. These effects can increase during drought years when water levels are lower than normal.

Chemicals used in fire retardants may also have a negative impact on drinking water sources. On December 31, 2011, the US Forest Service signed a new direction to approve the use of aerially applied fire retardant and implement an adaptive management approach that protects resources and improves the documentation of retardant effects through reporting, monitoring and application coordination on US Forest Service lands. Aerial retardant drops are not allowed in mapped avoidance areas for certain threatened, endangered, proposed, candidate, or sensitive (TEPCS) species or waterways. All waterways were given at least a 300-foot buffer avoidance area. A waterway is defined as a body of water including lakes, rivers, streams and ponds whether or not they contain aquatic life (U.S. Department of Agriculture Forest Service, June 2015).

Fire regimes were determined within the San Juan National Forest using local data. Fire regimes describe the historical ecological role of fire in creating and maintaining vegetation communities for a period before Euro-American settlement activities and active fire suppression began. Fire regimes, or more generally, disturbance regimes, are a key component of historical range of variability (HRV) characterizations for forest and vegetation types. HRV reference conditions are also the basis for developing desired future conditions, which can be used as guidelines in developing program strategy and designing fuels restoration projects (USFS San Juan National Forest, 2013). Table 7 and Figure 12 below describe the historic fire regimes within Cortez's SWPA. Additionally, the Dolores Watershed and Resilient Forest Collaborative (DWRF) has completed a "Highly Valued Resources and Assets (HVRA)" analysis in the watershed (Appendix I). This analysis would provide valuable information of current conditions that will help in the development of projects.

Table 7: Fire Regime Class Descriptions

Fire Regime Class	Frequency (fire return interval)	Severity	Existing Vegetation Types
I	0–35+ years, frequent	Predominantly Low	<ul style="list-style-type: none"> <li>• Ponderosa pine</li> <li>• Warm-dry mixed conifer</li> </ul>
II	0–35+ years, frequent	Replacement	<ul style="list-style-type: none"> <li>• Mountain grasslands</li> <li>• Semi-desert shrubland</li> <li>• Sagebrush shrublands</li> </ul>
III	35–100+ years, less infrequent	Mixed and Low	<ul style="list-style-type: none"> <li>• Cool-moist mixed conifer</li> </ul>
IV	35–100+ years, less infrequent	Replacement	<ul style="list-style-type: none"> <li>• Aspen</li> <li>• Mountain shrubland</li> <li>• Semi-desert grassland</li> <li>• Semi-desert shrubland</li> <li>• Riparian and wetland</li> </ul>
V	200+ years	Replacement	<ul style="list-style-type: none"> <li>• Spruce-fir</li> <li>• Pinyon-juniper woodland</li> <li>• Alpine</li> </ul>

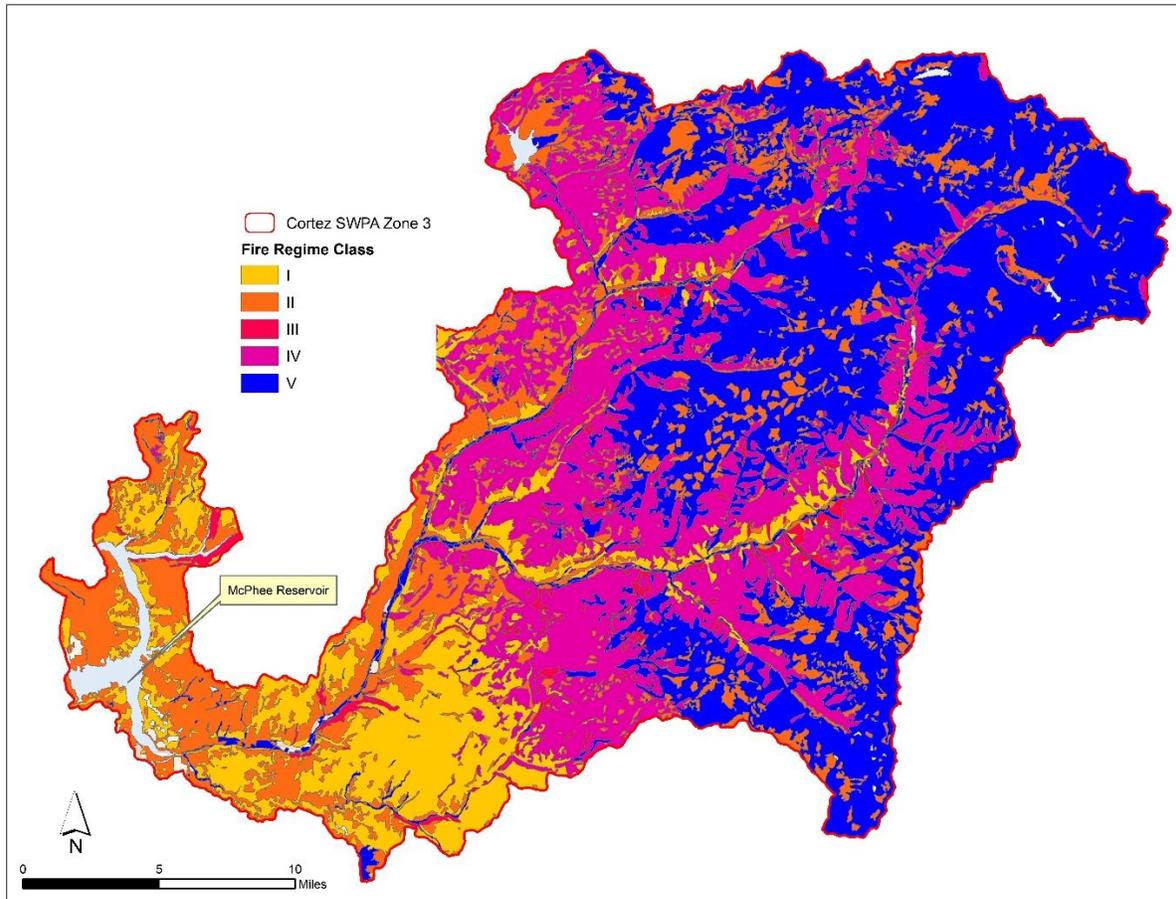


Figure 12: Historic Fire Regimes within the Cortez SWPA

The City of Cortez is an active participant in the Dolores Watershed Resilient Forest Collaborative (DWRf), which is a stakeholder group made of up federal, state, and local government, industry representatives, and local conservation groups who work together to improve the Dolores Watershed. One of their main goals is to “foster a network of professionals and residents in order to better prepare for, respond to, and recover from catastrophic wildfires and resulting post-fire effects.” (Dolores Watershed Resilient Forest Collaborative, n.d.) DWRf holds regular monthly meetings and is currently working to develop a Watershed Wildfire Plan, of which Cortez will reference when making decisions regarding wildfire impact to their drinking water source.

The City of Cortez will continue to be involved in additional wildfire planning and mitigation projects in conjunction with other water systems, state and federal agencies and other collaborative groups (including Dolores Watershed Resilient Forest Collaborative (DWRf), Dolores Water Conservancy District, USFS, BOR, etc.). Cortez intends to share their critical infrastructure at risk with the USFS and working with them to incorporate those values into the Wildland Fire Decision Support System (WFDSS). WFDSS assists fire managers and analysts in making strategic and tactical decisions for fire incidents. Having local water infrastructure data in the WFDSS database will help with protecting these valuable assets during and post wildfire events.

Wildfire Best Management Practices Recommendations

- Continue involvement in planning and wildfire mitigation projects in conjunction with other water systems, state and federal agencies, and other collaborative groups (including USFS, Dolores Watershed Resilient Forest Collaborative (DWRF), Bureau of Reclamation, Wildfire Adapted Partnership, etc.)
- Continue supporting and implementing the Montezuma County Emergency Operations Plan (2017) that includes an attachment titled: “Dolores River Emergency Alert and Notification Plan.” If a wildfire were to occur, construct berms, diversion structures, or revegetation practices for flood mitigation, debris flow, and erosion control. The Montezuma County Debris Management Plan (currently being written) contains actions the county would take to deal with debris from a flooding situation.
- Inventory water sources and critical infrastructure
- Share values/assets at risk with the USFS and work with them to incorporate values into their Wildland Fire Decision Support System (WFDSS). Work with CRWA’s Critical Water Infrastructure Data Collection & WFDSS Integration Program to accomplish this.

**Agricultural Practices**

*Priority Ranking: Moderate*

Agricultural land use has been a historical mainstay in Colorado for over a century. Even though land use changes have occurred over this time period with development of homes and businesses, agriculture will continue to be a presence in local communities and a key part of local heritage. “Right to Farm” laws and the preservation of private property rights are important to the landowners and will be respected when developing and implementing SWPPs.

Approximately 88% of the land within Montezuma County, including most of the private land within Cortez’s SWPA is zoned for agriculture. Cumulative impacts improper agricultural practices can be a threat to water supplies. The City of Cortez believes these impacts to be a low risk and considers it to be a moderate priority. The Natural Resource Conservation Service (NRCS) and CSU Extension work extensively with agricultural producers to educate them on best management practices they can implement to help reduce their environmental impacts to surrounding lands.

*Table 8: Agricultural-Zoned Land in Montezuma County*

Zone	Code	# of Parcels	% Parcels	# of Acres	% Acres
Agricultural Use	AGZ	338	4%	9,294	3%
Large Scale Agricultural	A-80+	674	7%	125,004	39%
Large Scale Agricultural & Residential	A/R 35+	1,521	17%	116,723	36%
Medium Scale Agricultural & Residential	A/R 10-34	1,108	12%	28,500	9%
Small Scale Agricultural & Residential	A/R 3-9	2,116	23.6%	4,410	1.1%

(Montezuma County, Colorado, 2018)

Fertilizer & Pesticide Use

Excess fertilizer use and poor application methods at farming operations can cause fertilizer movement into surface and groundwater. If land is over-irrigated, this can lead to excess runoff of fertilizers as well.

Fertilizers usually consist of nitrogen and phosphorus, the two compounds which are of greatest concern to drinking water supplies.

Nitrogen fertilizer, whether organic or inorganic, is biologically transformed to nitrate that is highly soluble in water. 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 10 parts per million (ppm) for nitrate measured as nitrogen (US Environmental Protection Agency, 2001). The City of Cortez routinely monitors for nitrate and nitrite in their drinking water. Neither were detected at measurable limits during calendar year 2018 (City of Cortez, 2019).

Phosphorus is the other element of concern in fertilizer. Under certain conditions phosphorus can be readily transported with the soil. In fact, 60 to 90 percent of phosphorus moves with the soil. Phosphorus is the major source of water quality impairments in lakes nationwide. Even though regulations that affect the taste and odor of water are not federally enforceable under the Safe Drinking Water Act, municipalities often must treat their drinking water supplies for these aesthetic reasons (US Environmental Protection Agency, July 2001).

Pesticide application to crops, another potential source of contamination, can seep into surface and groundwater supplies if mismanaged. Synthetic organic chemicals in pesticides have been linked to serious health problems, including cancer, liver and kidney damage, reproductive difficulties and nervous system effects.

#### Livestock Grazing

Livestock grazing occurs within private and federal lands within the SWPA. Livestock grazing can impact riparian health, stream-channel conditions and water quality. The most common water quality impacts include pathogen contamination, sedimentation and increased water temperatures from loss of vegetative stream coverage. Livestock grazing activities with the highest potential for direct and indirect impacts to water resources include long-term concentrated grazing in riparian areas and trampling/trailing near water sources. Direct bank damage may add large amounts of sediment directly into streams, especially in wet meadow streams or erosive topography that is prone to gully formation.

In addition, animal waste contains many pollutants that can contaminate surface and ground waters used as drinking water sources. Pathogens found in animal waste can infect humans if ingested. Organisms like *Cryptosporidium*, *Giardia lamblia* and *Salmonella* can induce symptoms ranging from skin sores to chest pain. *E. coli*, which causes diarrhea and abdominal gas, can cause serious illness and even death. *Cryptosporidium* is of particular concern, as it is highly resistant to disinfection with chlorine. This protozoan causes gastrointestinal illness that lasts 2 to 10 days in healthy individuals but can be fatal in people with weakened immune systems.

Animal wastes can also contribute to nitrates in drinking water. Impacts from nitrates were previously discussed in the subsection above.

#### Agricultural Practices Best Management Practice Recommendations

- Share electronic and hard copies of the SWPP and GIS shapefiles of the SWPA with NRCS, CSU Extension, and local conservation districts

- Work with NRCS, CSU Extension, and local conservation districts to educate ag producers on funding sources that incorporate source water protection
- Encourage NRCS, CSU Extension, and local conservation districts to incorporate source water protection into workshops or presentations

## **Public Education**

*Priority Ranking: High*

While public education is not a potential source of contamination, the City of Cortez believes that educating community members about source water protection efforts is essential to the prevention of surface and groundwater contamination. Public education can help community members understand the potential threats to their drinking water sources and motivate them to participate as responsible citizens to protect their valued resources.

### Public Education Best Management Practices Recommendations

- Develop public education campaigns for community members to explain the importance of source water protection
  - Work w/ CRWA and other agencies to find/create material
- Post articles or educational materials on website, at Town Hall, or in local newspaper that explains the importance of source water protection
- Hold public meetings to introduce citizens to the SWPP
- Install CPDHE SWPA road signs at various locations within the SWPA

## **Residential Practices**

*Priority Ranking: Low*

Cortez's SWPAs include rural, urban and sub-urban residential land use areas. Common household practices including washing vehicles, lawn fertilization and pet wastes can allow chemicals and biologic pollutants to enter the water supply. Material stockpiling also represents a threat to water supplies when residents allow toxic materials to accumulate, such as paints, fuels and cleaning products. The garbage collection process at all types of properties is a potential source of contamination if garbage cans are blown or knocked over and release trash into the environment.

In addition, urban runoff due to a rise in population and land development can alter the local hydrologic cycle by replacing surface materials like plants and soils that absorb water with impervious surfaces like concrete. When water hits impervious surfaces and is not absorbed, it can flow over streets and other urban sites and can pick up fertilizers, dirt, pesticides, oil and grease and other pollutants and transport them into drinking water supplies. Runoff from urban areas can affect stream hydrology, morphology, water quality and aquatic ecology. Water quality problems can include turbid water, nutrient enrichment, bacterial contamination, organic matter loads, metals, salts, temperature increases in surface water and deposition of trash and debris.



Figure 13: Residential Potential Contaminant Sources (Colorado State University Extension, 2018)

### Residential Practices Best Management Practices Recommendations

- Develop public education campaigns for community members to explain the importance of source water protection as it related to a variety of residential practices (pet waste, turf grass/small scale fertilizer & pesticide application, household chemical storage, etc.)
  - Work w/ CRWA and other agencies to find/create material
- Work with agencies and land managers within SWPA to install and maintain dog waste stations throughout SWPA. Encourage donors to sponsor dog waste stations
- Host or support local agencies' (such as the Montezuma County Public Health Department or Montezuma County Sheriff's Department) hazardous materials collection events

### **Future Land Use**

*Priority Ranking: Low*

The majority of Cortez's SWPA lies within undeveloped US Forest System lands and unincorporated areas of Montezuma County. Land use patterns in Montezuma County were developed under Landowner Initiated Zoning. Currently, parcels can be rezoned based on the request of the landowner at the time of their development proposal. Therefore, it is uncertain where commercial or industrial development could occur.

The Montezuma County Land Use Code is a resolution first adopted by the Board of County Commissioners in 1998 and last amended on March 2, 2015. The Land Use Code provides the regulatory standards for all development(s) in the unincorporated areas of Montezuma County. The Land Use Code states that "because the Dolores River Valley is the primary water source for the people in the Town of Dolores, the City of Cortez, and much of the unincorporated areas of Montezuma County, it is essential that the quality of the water in the Dolores River be preserved." (Montezuma County Board of County Commissioners, 2015)

The City of Cortez believes that advanced communication and collaboration between the City and the Montezuma County Planning and Zoning Department along with developers and construction companies is imperative to protecting drinking water sources. Cortez will provide Montezuma County with maps of their SWPA and request notifications for proposed development within the area.

Future Land Use Best Management Practices Recommendations

- Provide county land use departments/county planners with shapefiles of SWPA and request notifications for proposed developments within SWPA.
- Provide comment to county land use departments if any new site may impact source waters.
- Advocate for Land Use policies that limit or prohibit industrial and commercial land uses in the Dolores River Valley and require commercial or industrial land use adjacent to drainages into McPhee to be mitigated against accidental spills or contaminated runoff through appropriate setbacks and storm water containment.
- Advocate for monitoring and regulation of septic tanks located on parcels within the river corridor.

**Public Land Management**

*Priority Ranking: Moderate*

The majority of Cortez’s SWPA lies within public lands. These include unincorporated areas of Montezuma County in the lower reaches of the SWPA, but the majority of Cortez’s drinking water originates in the Dolores Ranger District of the San Juan National Forest.

A principal purpose for which the Forest Reserves, which was a predecessor to the National Forest Service, were established was to “secure favorable conditions of water flows”. Throughout its history, the National Forest Service has had a very diverse and broad mission of multiple use management outlined by the Federal Land Policy and Management Act. This means that they balance outdoor recreation and preservation of wildlife habitat, air and water, and other scenic and historical values with environmentally responsible commercial development of the land and its resources.

One of the long-term management goals of the Rocky Mountain Region is to manage the forest for water resources and works cooperatively and collaboratively with stakeholders and suppliers to meet those goals (USFS Rocky Mountain Region, 2010).

At the district level, the Dolores Ranger District adheres to the management directives established in the San Juan National Forest Land and Resource Management Plan which was updated in 2013. Each National Forest and Grassland is governed by a management plan in accordance with the National Forest Management Act (NFMA). These plans set management, protection, and use goals and guidelines. Monitoring conditions on a Forest or Grassland ensures projects follow plan direction and determines effects that might require management change (USDA Forest Service, 2019).

In October 2009, the US Forest Service Rocky Mountain Region and the Colorado Department of Public Health and Environment signed a Memorandum of Understanding (MOU) to establish a framework to work together on issues regarding the management and protection of water quality on state-defined Source Water Assessment Areas on National Forest System lands in Colorado. Under this agreement, the Forest Service recognizes a CDPHE-delineated Source Water Area as a “Municipal Supply Watershed” per definition in FSM 2542 (Appendix H). The SWPA for the City of Cortez that lies within these National Forest System lands, will be included in future Revised Forest Plans as a municipal supply watershed.

Public Land Management Best Management Practices Recommendations

- Provide county land use departments/county planners with electronic and hard copies of the SWPP and GIS shapefiles of the SWPA and request notifications for proposed developments within SWPA.
- Provide comment to public land managers if any new site or development may impact source waters.
- Support public land managers on efforts to increase watershed health within SWPA

## **Sanitary Sewer**

*Priority Ranking: Moderate*

Within Cortez's SWPA, there are two wastewater treatment facilities (WWTF), both of which are in SWPA Zone 1. WWTFs are permitted under the CDPHE National Pollutant Discharge Elimination System (NPDES) regulation. The CDPHE Water Quality Control Commission is authorized by section 25-8-205 C.R.S., under Regulation 85 (Nutrient Management Control Regulation), to promulgate control regulations to describe prohibitions, standards, concentrations and effluent limitations on the extent of specifically identified pollutants that any person may discharge into any specific class of state waters (CDPHE Water Quality Control Commission, 2012). Reg. 85 contains nutrient effluent limits and nutrient monitoring requirements for WWTFs.

According to EPA's Enforcement and Compliance History Online (ECHO) website, one WWTF within the SWPA currently has a violation (see Table 9 below). ECHO is a web tool designed to provide environmental regulatory compliance and enforcement information for regulated facilities nationwide and at the state level (United States Environmental Protection Agency, 2018). For more information, visit <https://echo.epa.gov/>.

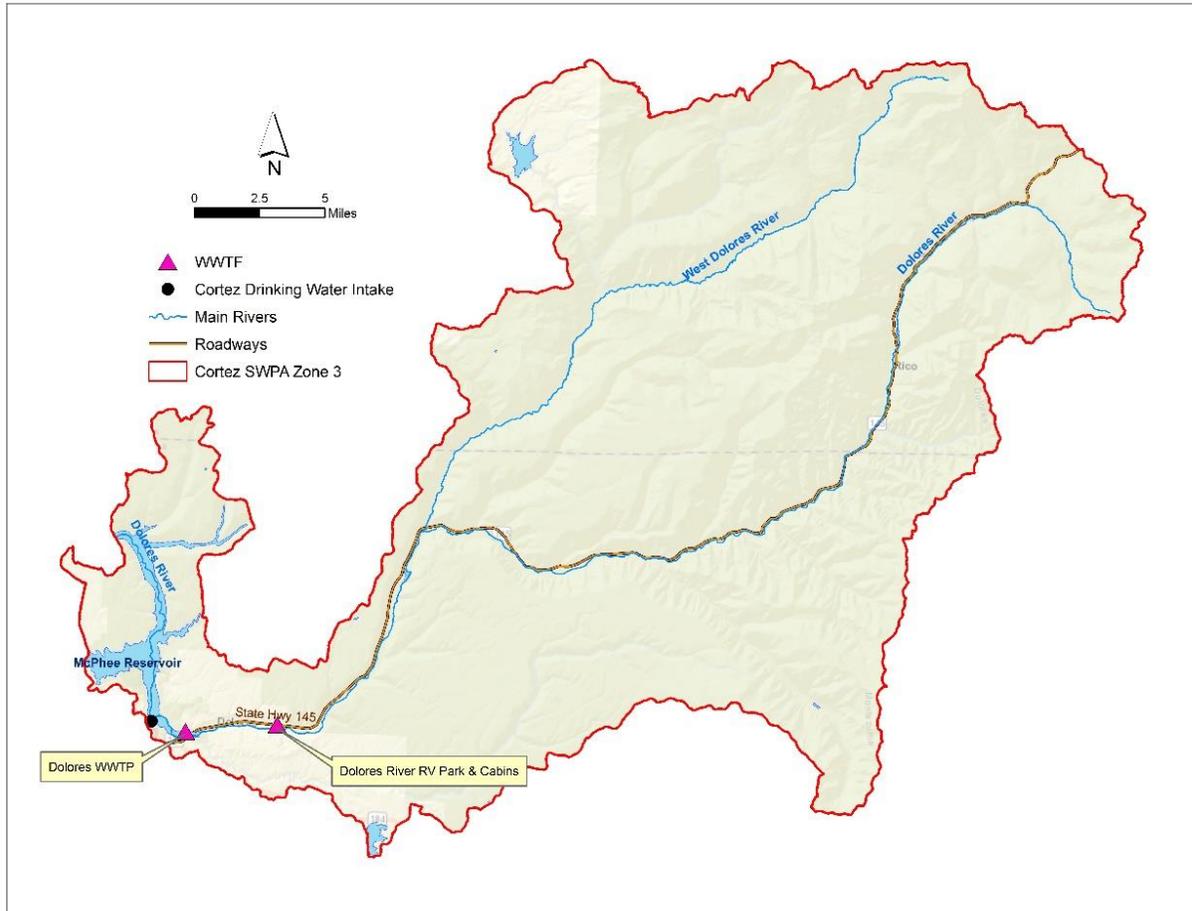


Figure 14: WWTFs in City of Cortez SWPA

Table 9: WWTFs within City of Cortez’s SWPA

Name	Regulatory ID	Address	SWPA Zone	Compliance Status	Date of Last Inspection
Dolores River RV Park and Cabins	110010053299	18680 Hwy. 145 Montezuma, CO 81323	1	No Violations	5/16/2016
Dolores WWTP	110055974655	30 Central Ave. Dolores, CO 81323	1	Violation Identified	11/15/2016

Upstream WWTF Best Management Practices Recommendations

- Share electronic and hard copies of the SWPP and GIS shapefiles of the SWPA with upstream WWTP operators
- Maintain awareness of status of upstream WWTPs
- Create emergency notification cards and outreach materials and distribute to upstream WWTP operators

## Recreation

*Priority Ranking: Low*

There are many types of recreation that occurs in Cortez’s SWPA including camping and hiking on public lands, motorized boating on McPhee Reservoir, and local festivals that occur at the Reservoir and within upstream towns, hiking, mountain biking and boating.



*Figure 15: McPhee Reservoir (Tanner, 2017)*

Some undesirable impacts of recreation can include eroded soils, user-created unplanned roads, disrupted wetland ecosystems, as well as general habitat destruction and degraded water quality. Fuel spills from boats on McPhee Reservoir can also impact drinking waters in the same manner as discussed on page 27 “Leaking Fuel Storage Tanks”. However, there has been no evidence of degradation to Cortez’s drinking water and the City of Cortez considers impacts from recreation to be a very low risk.

### Recreation Best Management Practices Recommendations

- Develop/distribute public outreach materials to visitors of McPhee Reservoir & public land within SWPA (as it pertains to camping, hiking, mountain biking, boating)
- Install signage at strategic locations within the SWPA that explains the importance of source water protection to visitors
- Share copies of SWPP and maps/GIS shapefiles of SWPAs with Dolores Water Conservancy District, USFS, Colorado Parks & Wildlife, and Bureau of Reclamation

## Aquatic Nuisance Species

Priority Ranking: High



Figure 16: Quagga Mussels on ABS Pipe from Lake Mead, NV showing proliferation over a six-month period. (Perko, 2018)

The possible introduction and spread of the aquatic nuisance species (ANS), zebra mussel (*Dreissena polymorpha*) and quagga mussel (*Dreissena rostriformis bugensis*), into the waters of Colorado is a concern for drinking water suppliers. Zebra and quagga mussels are invasive non-native freshwater bivalve mollusks. They can be differentiated by morphological differences of their shell. The zebra mussel is more triangular in shape, usually have a striped pattern on their shells and average one inch in length. The quagga has a rounded carina, slightly larger than the zebra mussel and paler toward the hinge.

### Impacts to Water Bodies

Both species of mussels are prolific breeders thus contributing to their spread and abundance. A fully mature female mussel is capable of producing up to one million eggs per season. Their larvae are microscopic. These invasive mussels smother other aquatic organisms and compete with native species for food and habitat. Their massive colonies can clog water intake structure, such as pipes and screens, reducing pumping capabilities for power and water treatment plants, costing industries, companies and communities. Recreation-based industries and activities can also be impacted; docks, break-walls, buoys, boats and beaches can all be heavily colonized in a mussel infestation. The mussels attach themselves to hard surfaces and are difficult to remove. They can withstand short periods (several days) out of the water if conditions are moist and humid.

### Mussels in Colorado

Both species of mussels were originally native to the lakes of southeast Russia and were accidentally introduced into other countries from ocean-going ships. The mussels were first discovered in the United States in the Great Lakes in 1988 and spread to a large number of waterways throughout the country.

In 2006, the United States Bureau of Reclamation (USBR) began a study that included testing for the presence of both species of dreissenid mussels in 425 water bodies in 15 states that included Colorado. Direct microscopic examination and DNA testing for zebra and quagga mussel larvae, known as “veligers”, was conducted in the selected water bodies until 2012. The DNA testing indicated the positive presence of dreissenid larvae in several Colorado Reservoirs including: Lake Pueblo (2007, 2008, 2009, 2011), Granby Reservoir (2008), Grand Lake (2008), Shadow Mountain Reservoir (2008), Willow

Creek Reservoir (2008), Tarryall Reservoir (2008) and Jumbo Reservoir (2008). It is important to note however that the DNA test methods and the microscopic procedures used in the study at that time frequently produced conflicting data making absolute confirmation of the presence of veligers difficult.

While no adult mussels have been confirmed living in any of the Colorado reservoirs, in 2007 one adult zebra mussel was found in Pueblo Reservoir by a Division of Wildlife (DOW) contractor while performing an aquatic life study at one of the reservoir's marinas. An investigation into the circumstances of this finding eventually concluded that the lone mussel was most probably brought in by a visiting boat and was not a resident of the reservoir itself. As of 2017, all reservoirs in Colorado have been delisted, and Colorado is the only state in the US to have gone from a positive mussel state to a negative state.

#### Prevention Efforts

Colorado was one of the first states to deploy an early-detection monitoring program for invasive species (Belvins, 2017). Education, monitoring and early detection are important parts of a prevention program, as infestations can become extremely difficult and costly to eradicate. A January 2018 Colorado Parks and Wildlife (CPW) factsheet notes that "the Metropolitan Water District of Southern California will spend \$10–15 million annually in operations and maintenance costs to address quagga mussel infestation in its Colorado River Aqueduct and terminal reservoirs." (Colorado Parks & Wildlife, 2018)

The Colorado Aquatic Nuisance Species Program was authorized in 2008 with the mission to "protect wildlife, recreation, natural resources, infrastructure and the economy by preventing the introduction of zebra and quagga mussels and other invasive species by containing current infestations and stopping the spread into new waters." (Colorado WRRC, 2017) All boats entering and leaving Colorado waterbodies are required to undergo an inspection process and a decontamination process if mussels are detected. Boaters are asked to clean, drain and dry their boats after each use. Since the ANS Program began, Colorado has intercepted a total of 144 boats infested with adult mussels. In 2017 alone, 26 boats were intercepted.

The ANS Program has historically been supported by utilizing severance tax funds. In April 2018, the Mussel-Free Colorado Act was signed into law and took effect in January 2019. The Mussel-Free Colorado Act will provide a stable funding source for the ANS Program by requiring boats to purchase an ANS stamp (\$25 for Colorado resident boats and \$50 for non-resident boats). It also continues the Tier 2 Severance Tax appropriations, increases fines for ANS related violations, allows CPW to charge labor/costs incurred to store and decontaminate intercepted vessels and encourages federal partners to take responsibility for ANS inspection funding at their reservoirs (Colorado Parks & Wildlife, 2018).

#### Aquatic Nuisance Species Best Management Practices Recommendations:

- Support the boat inspection and outreach efforts by the Dolores Water Conservancy District, Colorado Parks & Wildlife, and Bureau of Reclamation
- Continue monitoring program for presence of Zebra and Quagga mussel larvae and other aquatic nuisance species
- Support additional regulations of aquatic nuisance species in Colorado
- Conduct public outreach with message that ties drinking water quality to recreation. Examples may include an article about water quality in location newspapers, postings on social media, water system website, CCRs, and water bill inserts.

## SOURCE WATER BEST MANAGEMENT PRACTICES

The City of Cortez recommends the best management practices listed in the following table be considered for implementation.

Table 10: Source Water Protection Best Management Practices

Issues	Priority Ranking	Risk Level	Best Management Practices
<b>Abandoned mines</b>	High	High	<ul style="list-style-type: none"> <li>• Continue monitoring water quality of Dolores River. Check 303d list for prioritization</li> <li>• Review data contained on the Mine Impacted Streams Task Force website (<a href="https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force">https://www.colorado.gov/pacific/cdphe/WQ-Mine-Impacted-Streams-Task-Force</a>) to determine priority mines in watershed, and partner with CDPHE, Colorado Geological Society, and DRMS on abandoned mine reclamation.</li> <li>• Coordinate with upstream water systems' SWPPs for data overlap</li> </ul>
<b>Fuel Storage Tanks</b>	Moderate	Moderate	<ul style="list-style-type: none"> <li>• Install signage at gas pumps at McPhee Reservoir marinas that explain importance of source water protection</li> <li>• Monitor known databases (such as COSTIS) on the status of storage tank spills or events within the SWPA</li> <li>• Share copies of SWPP/maps of SWPA with CDLE OPS and request notifications of open events/corrective action plans</li> </ul>
<b>Stormwater Runoff</b>	Low	Moderate	<ul style="list-style-type: none"> <li>• Educate homeowners and business owners within the SWPA on the proper use and storage of household toxic materials and responsible lawn care and landscaping</li> <li>• Work with local entities and municipalities to install storm drain signage</li> <li>• Encourage and support upstream municipalities' efforts to install and maintain stormwater containment and treatment</li> </ul>
<b>Chemical Storage</b>	Moderate	TBD	<ul style="list-style-type: none"> <li>• Accumulate contact information for regulatory agencies &amp; chemical manufacturing facilities</li> <li>• Create an inventory of facilities with onsite (regulated) chemical storage; develop chemical prioritization table and provide to Local Emergency Planning Committee (LEPC) and regulatory agencies</li> <li>• Request notification for violations from LEPC</li> <li>• Create emergency notification cards and outreach materials and distribute to chemical manufacturing facilities</li> </ul>
<b>Gravel Pits Along Dolores River</b>	Moderate	Low	<ul style="list-style-type: none"> <li>• Monitor DRMS website for status of active mining facilities in SWPA</li> <li>• Create emergency notification cards and provide them to active mining facilities in SWPAs</li> </ul>

Issues	Priority Ranking	Risk Level	Best Management Practices
			<ul style="list-style-type: none"> <li>• Share copies of SWPP/maps of SWPA with the Colorado Division of Reclamation and Mining Safety (DRMS) and coordinate with them for notifications on permit changes within the SWPA</li> </ul>
<b>Onsite Wastewater Treatment Systems</b>	Low	Moderate	<ul style="list-style-type: none"> <li>• Work with Montezuma County Public Health Department to develop a list of all OWTS owners in the SWPA</li> <li>• Work with Montezuma County Public Health Department to develop a public education campaign for property owners within the SWPA on the importance of proper septic maintenance as it relates to source water protection</li> <li>• Work with the Montezuma County Public Health Department to develop and implement a voluntary septic system inspection program upon request of the property owner</li> <li>• Work with Montezuma County Public Health Department to require property owners that sell land in the Source Water Protection Area to disclose issuance date of septic permit and condition of septic system including service records</li> <li>• Work with realtors in SWPA to provide new buyers who have OWTS with information on proper OWTS maintenance as it pertains to source water protection</li> <li>• Conduct nitrogen and phosphorous sampling at tributaries within close proximity to areas with high density of OWTS</li> </ul>
<b>Spills/Accidents on Roads</b>	Moderate	Moderate	<ul style="list-style-type: none"> <li>• Continue supporting and implementing the “Montezuma County: Dolores River Emergency Alert and Notification Plan”</li> <li>• Develop emergency response cards that includes water system contact info and intake locations; distribute to appropriate emergency responders (Montezuma County Sheriff’s Department/Office of Emergency Management, Dispatch, Montezuma County Road &amp; Bridge, Colorado State Patrol, CDOT, Local Fire Departments)</li> <li>• Share copies of SWPP and maps/GIS shapefiles of SWPA with CDOT, Montezuma County Road &amp; Bridge Department, and first responders (County OEM, dispatchers, sheriff department, fire depts.)</li> <li>• Provide emergency responders with plant and intake (source water) tours</li> <li>• Work with Colorado State Patrol to assess catch points within SWPA</li> <li>• Inventory local fire departments and other emergency responders within SWPA and provide them with spill kits and training if needed</li> </ul>
<b>Wildfire</b>	High	High	<ul style="list-style-type: none"> <li>• Continue involvement in planning and wildfire mitigation projects in conjunction with other water systems, state and federal agencies, and other collaborative groups</li> </ul>

Issues	Priority Ranking	Risk Level	Best Management Practices
			<p>(including USFS, Dolores Watershed Resilient Forest Collaborative (DWRF), Bureau of Reclamation, etc.)</p> <ul style="list-style-type: none"> <li>• Continue supporting and implementing the “Montezuma County: Dolores River Emergency Alert and Notification Plan”</li> <li>• If a wildfire were to occur, construct berms, diversion structures, or revegetation practices for flood mitigation, debris flow, and erosion control.</li> <li>• Inventory water sources and critical infrastructure</li> <li>• Share values/assets at risk with the USFS and work with them to incorporate values into their Wildland Fire Decision Support System (WFDSS). Work with CRWA’s Critical Water Infrastructure Data Collection &amp; WFDSS Integration Program to accomplish this.</li> </ul>
<b>Agricultural practices</b>	Moderate	Low	<ul style="list-style-type: none"> <li>• Share electronic and hard copies of the SWPP and GIS shapefiles of the SWPA with NRCS, CSU Extension, and local conservation districts</li> <li>• Work with NRCS, CSU Extension, and local conservation districts to educate ag producers on funding sources that incorporate source water protection</li> <li>• Encourage NRCS, CSU Extension, and local conservation districts to incorporate source water protection into workshops or presentations</li> </ul>
<b>Public Education</b>	High	n/a	<ul style="list-style-type: none"> <li>• Develop public education campaigns for community members to explain the importance of source water protection               <ul style="list-style-type: none"> <li>○ Work w/ CRWA and other agencies to find/create material</li> </ul> </li> <li>• Post articles or educational materials on website, at Town Hall, or in local newspaper that explains the importance of source water protection</li> <li>• Hold public meetings to introduce citizens to the SWPP</li> <li>• Install CPDHE SWPA road signs at various locations within the SWPA</li> </ul>
<b>Residential Practices</b>	Low	Low	<ul style="list-style-type: none"> <li>• Develop public education campaigns for community members to explain the importance of source water protection as it related to a variety of residential practices (pet waste, turf grass/small scale fertilizer &amp; pesticide application, household chemical storage, etc.)               <ul style="list-style-type: none"> <li>○ Work w/ CRWA and other agencies to find/create material</li> </ul> </li> <li>• Work with agencies and land managers within SWPA to install and maintain dog waste stations throughout SWPA. Encourage donors to sponsor dog waste stations</li> <li>• Host or support local agencies’ (such as the Montezuma County Public Health Department or Montezuma County Sheriff’s Department) hazardous materials collection events</li> </ul>

Issues	Priority Ranking	Risk Level	Best Management Practices
<b>Future land use</b>	Low	n/a	<ul style="list-style-type: none"> <li>• Provide county land use departments/county planners with shapefiles of SWPA and request notifications for proposed developments within SWPA.</li> <li>• Provide comment to county land use departments if any new site may impact source waters.</li> <li>• Advocate for Land Use policies that limit or prohibit industrial and commercial land uses in the Dolores River Valley and require commercial or industrial land use adjacent to drainages into McPhee to be mitigated against accidental spills or contaminated runoff through appropriate setbacks and storm water containment.</li> <li>• Advocate for monitoring and regulation of septic tanks located on parcels within the river corridor.</li> </ul>
<b>Public Land Management</b>	Moderate	n/a	<ul style="list-style-type: none"> <li>• Provide county land use departments/county planners with electronic and hard copies of the SWPP and GIS shapefiles of the SWPA and request notifications for proposed developments within SWPA.</li> <li>• Provide comment to public land managers if any new site or development may impact source waters.</li> <li>• Support public land managers on efforts to increase watershed health within SWPA</li> </ul>
<b>Sanitary Sewer/Combined Sewer Overflows</b>	Moderate	Moderate	<ul style="list-style-type: none"> <li>• Share electronic and hard copies of the SWPP and GIS shapefiles of the SWPA with upstream WWTP operators</li> <li>• Maintain awareness of status of upstream WWTPs</li> <li>• Create emergency notification cards and outreach materials and distribute to upstream WWTP operators</li> </ul>
<b>Recreation</b>	Low	Very Low	<ul style="list-style-type: none"> <li>• Develop/distribute public outreach materials to visitors of McPhee Reservoir &amp; public land within SWPA (as it pertains to camping, hiking, mountain biking, boating)</li> <li>• Install signage at strategic locations within the SWPA that explains the importance of source water protection to visitors</li> <li>• Share copies of SWPP and maps/GIS shapefiles of SWPAs with Dolores Water Conservancy District, USFS, Colorado Parks &amp; Wildlife, and Bureau of Reclamation</li> </ul>
<b>Aquatic Nuisance Species</b>	High	High	<ul style="list-style-type: none"> <li>• Support the boat inspection and outreach efforts by the Dolores Water Conservancy District, Colorado Parks &amp; Wildlife, and Bureau of Reclamation</li> <li>• Continue monitoring program for presence of Zebra and Quagga mussel larvae and other aquatic nuisance species</li> <li>• Support additional regulations of aquatic nuisance species in Colorado</li> <li>• Conduct public outreach with message that ties drinking water quality to recreation. Examples may include an article about water quality in location newspapers, postings on social media, water system website, CCRs, and water bill inserts.</li> </ul>

## **EVALUATING EFFECTIVENESS OF SOURCE WATER PROTECTION PLAN**

The City of Cortez is committed to evaluating the effectiveness of the various source water best management practices that have been implemented. The purpose of evaluating the effectiveness is to determine if the various source water best management practices are being achieved, and if not, what adjustments to the Source Water Protection Plan will be taken in order to achieve the intended outcomes. It is further recommended that this Plan be reviewed at a frequency of once every three years or if circumstances change resulting in the development of new water sources and source water protection areas, or if new risks are identified.

The City of Cortez is committed to a mutually beneficial partnership with the Colorado Department of Public Health and Environment in making future refinements to their source water assessment and to revise the Source Water Protection Plan accordingly based on any major refinements.

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## **APPENDICES<sup>2</sup>**

- A. Source Water Assessment Report
- B. Source Water Assessment Report Appendices
- C. CRWA's SWAP Risk Assessment Matrix
- D. Table A-1 Discrete Contaminant Types
- E. Table A-2 Discrete Contaminant Types (SIC Related)
- F. Table B-1 Dispersed Contaminant Types
- G. Table C-1 Contaminants Associated with Common PSOC's
- H. FSM 2542
- I. DWRP - HVRA

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<sup>2</sup> All appendices are located on the CD version of this SWPP.