

Woodmoor Water & Sanitation District No. 1

Source Water Protection Plan

El Paso County, Colorado

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For the community water provider:
Woodmoor Water and Sanitation District No. 1ID # CO0121950

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EXECUTIVE SUMMARY

Woodmoor Water and Sanitation District No. 1 (WWSD or the District) values a clean, high quality drinking water supply and decided to work collaboratively with area stakeholders to develop a Source Water Protection Plan to protect their water sources, fourteen wells located within the Denver Basin aquifer system and three surface water intakes off Dirty Woman Creek, Monument Creek and Lake Woodmoor. During the months of April 2011 to June 2011, two stakeholder meetings were held at the District Office to encourage local public participation. The planning process attracted interest and participation from sixteen people including local citizens, water operators, and government representatives. This group comprised the Woodmoor Planning Team (the Planning Team or Team).

The Team initially reviewed the Source Water Assessment completed by the Colorado Department of Public Health and Environment (the State). The Assessment included the delineation of the source water protection area, potential sources of contaminants, and the susceptibility of these contaminants to degrade the water source. The delineated source water protection area defines the region where the Team has chosen to implement their source water protection measures to reduce source water susceptibility to contamination.

To develop the management approach, the Planning Team focused on the following issues of concern within the Source Water Protection Area: transportation on roads; golf courses, parks, and open spaces; residential practices; and commercial and industrial practices.

The Planning Team reviewed and discussed several possible management approaches that could be implemented within the protection area to help reduce the risks of potential contamination to the community's source water. Voluntary implementation of source water management approaches at the local level (i.e. county and municipal) applies an additional level of protection to the drinking water supply by taking preventive measures to protect the source water. The Planning Team established a "common sense" approach in identifying and selecting the most feasible source water management activities to implement locally. The management practices included in this Plan are recommended by the Team to reduce the risks of potential contaminants to the Source Water Protection Area and protect the drinking water sources for the community of Woodmoor.

At the completion of this plan, a Steering Committee was formed to oversee the implementation of the plan. Representatives from the District, neighboring water providers, community and government agencies who participated on the Planning Team volunteered to serve on the Steering Committee and meet quarterly throughout the year. The first meeting of the Steering Committee was held on June 7, 2011. At this meeting the Committee discussed which management approaches to implement during 2011 and 2012.

The Colorado Rural Water Association's Source Water Protection Specialist, Kimberly Mihelich, helped facilitate the source water protection planning process. The goal of the Association's Source Water Protection Program is to assist rural and small communities served by public water systems to reduce or eliminate the potential risks to drinking water supplies through the development of Source Water Protection Plans, and provide assistance for the implementation or prevention measures.

INTRODUCTION

Woodmoor Water and Sanitation District No. 1 values a clean, high quality drinking water supply and decided to work collaboratively with area stakeholders to develop a Source Water Protection Plan to protect their water sources. They recognize the possibility of potential threats to their water supply. Proactive planning and prevention are essential to both the long-term integrity of their water systems and limiting costs and liabilities. Source water protection planning to prevent possible contamination to source waters became a goal for the District.

Purpose of the Source Water Protection Plan

The Source Water Protection Plan (SWPP) is a tool for the District 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 water 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.

There are five basic steps a community water system takes when developing a Source Water Protection Plan:

- 1) Form a stakeholder committee
- 2) Delineate the Source Water Protection Area
- 3) Inventory Potential Sources of Contaminants
- 4) Identify Best Management Practices
- 5) Implement protection measures.

1. FORMATION OF A STAKEHOLDER COMMITTEE

Public Participation in the Planning Process

Public participation is vitally important to the overall success of Colorado's Source Water Assessment and Protection (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 plan is more likely where local stakeholders have actively participated in the development of their protection plan. During the months of April 2011 to July 2011, two stakeholder meetings were held at the District's office in Monument, Colorado to encourage local public participation in the planning process. Local stakeholders were sent letters of invitation to participate with follow-up by postcards and email reminders of meeting dates. The source water protection planning process attracted interest and participation from sixteen people including local citizens, water operators, and government representatives. Input from the following list of Planning Team participants was greatly appreciated.

Table 1: WWSD Source Water Protection Plan participants

Participant	Affiliation
Kimberly Mihelich*	Colorado Rural Water Association
Randy Gillette*	Woodmoor Water and Sanitation District #1
Barrie Town*	Woodmoor Water and Sanitation District #1
James W. Taylor*	Woodmoor Water and Sanitation District #1
Zach Collins	Woodmoor Water and Sanitation District #1
Jessie Shaffer*	Woodmoor Water and Sanitation District #1
Raimere Fitzpatrick	El Paso County Development Services
Amanda Rabenberg*	Monument Hill Country Club
Curtis Kauffman	Tri-Lakes Monument Fire Department
Duane Hanson	Palmer Lake Sanitation District
Elaine Kleckner	El Paso County
Rich Landreth*	Town of Monument
Bill Burks	Tri-Lakes Waste Water Treatment Facilities
Lisa Streisfeld*	Colorado Department of Transportation
Mike McCarthy*	El Paso County Health Department
Anne Stevens-Gountanis*	Woodmoor Water and Sanitation District #1

*Steering Committee members

After the first planning meeting, a Steering Committee was formed to finalize the Source Water Protection Plan and implement the management approaches of this Plan. Members of the Planning Team volunteered to serve on the Steering Committee and meet quarterly throughout the year. The first meeting of the Steering Committee was held on June 7, 2011. At this first meeting the Committee developed an Action Plan for management approaches to implement during 2011.

Protection Plan Development

The source water protection planning effort consisted of public planning team meetings and individual meetings with water operators, government, and agency representatives. Information discussed at the meetings helped the Team develop an understanding of the issues affecting source water protection for the Woodmoor community. The Team then made recommendations for management approaches to be incorporated into a protection plan. In addition to the planning team meetings, data and other information pertaining to source water protection areas was gathered via public documents, internet research, phone calls, emails, and field assessments of the protection area.

2. DELINEATION OF THE SOURCE WATER PROTECTION AREA

Drinking Water Supply Operations

WWSD is a Special District that provides sewer and water service to homes and businesses in the unincorporated area of northern El Paso County, Colorado. The District's service area is comprised of a range of elevations (7396' – 6949') in a land area of approximately 6.1 square miles.

The District is responsible for providing approximately 8350 customers with a reliable supply of water for domestic and irrigation use as well as sanitation services for the collection and treatment of the wastewater.

The sources of drinking water for WWSD include thirteen drilled wells located within the boundaries of the District as well as three surface water intakes that draw water from multiple surface water sources: Monument Creek, Dirty Woman Creek and Lake Woodmoor. All of the wells have depths ranging from 800 to 2500 feet and draw water from the Denver Basin Aquifer System. The water is treated with chlorine for disinfection and potassium permanganate is added to control iron and manganese. The treated water is stored in two 1,000,000 gallon aboveground storage tanks and delivered to Woodmoor residents via a network of underground pipelines to 3392 taps, of which 83 are commercial accounts.

The average daily demand is 198,173 gallons. Peak usage during the summer is an average of 2.8 million gallons per day. The lowest usage months are in winter with an average of 500,000 gallons consumed per day. The system has a capacity for providing 3.72 million gallons per day. The District provides an Annual Drinking Water Quality Report to the public which provides information on the results of their water monitoring program. The 2011 report is available at the District's website: www.woodmoorwater.com.

Source Water Assessment Area Delineation

A source water protection area is the surface and subsurface areas from which contaminants are reasonably likely to reach a 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 delineated source water assessment area 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.

Ground Water Sources

WWSD's community source waters include wells that draw water out from the Denver Basin Aquifer system. The locations of potential contaminant sources to the drinking water intakes were evaluated using Geographic Information System technology to determine their proximity relative to three sensitivity zones defined as:

- 1) **Zone 1** is a 500-foot radius around each groundwater source intake. Due to the depth of WWSD's wells, most are only defined with a Zone 1 sensitivity zone.
- 2) **Zones 2 and 3** are defined by estimating the distance it takes a particle of water to travel to the groundwater source intake over a period of time by using a groundwater flow modeling program. **Zone 2** is defined as a two-year time of travel.
- 3) **Zone 3** is defined as a five-year time of travel.

Surface Water Sources

WWSD's drinking water sources also include surface water sources within three different geographic locations: Monument Creek, Dirty Woman Creek and Lake Woodmoor. The locations of potential contaminant sources to the surface water drainage network were evaluated using Geographic Information System technology to determine its proximity relative to three sensitivity zones defined as:

- 1) **Zone 1** is located one-quarter mile on either side of the surface water drainage network.
- 2) **Zone 2** extends outward a distance of one-quarter mile from the boundary of Zone 1.
- 3) **Zone 3** includes the rest of the source water assessment area that was not covered by either Zone 1 or Zone 2.

The Steering Committee decided to focus their protection efforts within Surface Water Zones 1 and 2 delineations. The Steering Committee will use Monument Lake as a buffer for their source water protection efforts. The thirteen groundwater wells are deep well and draw water from contained aquifers, which greatly reduces the potential for contamination.

Figure 1: WWSD Source Water Protection Areas

WWSD Source Water Protection Areas

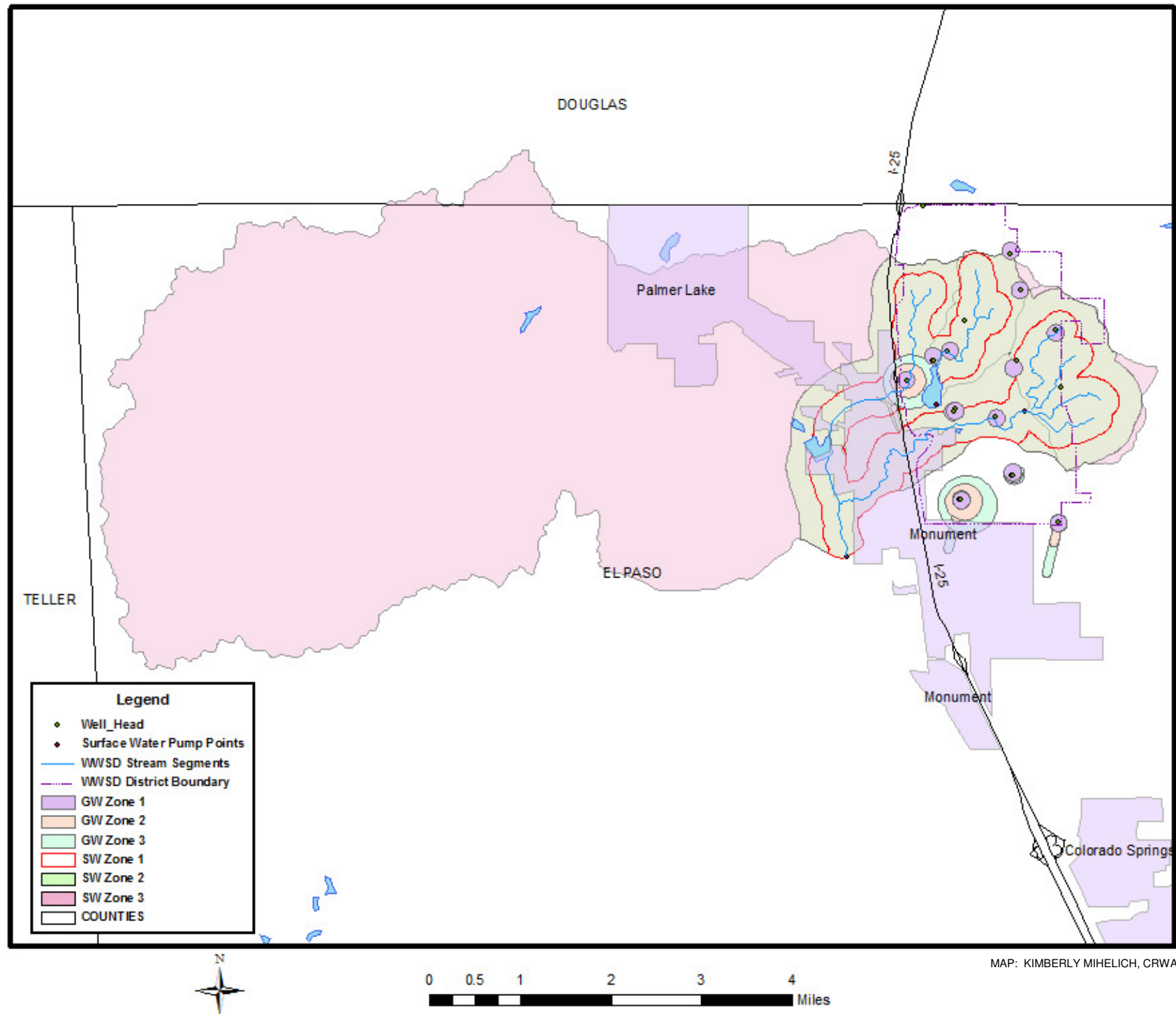
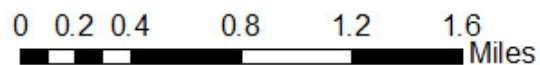
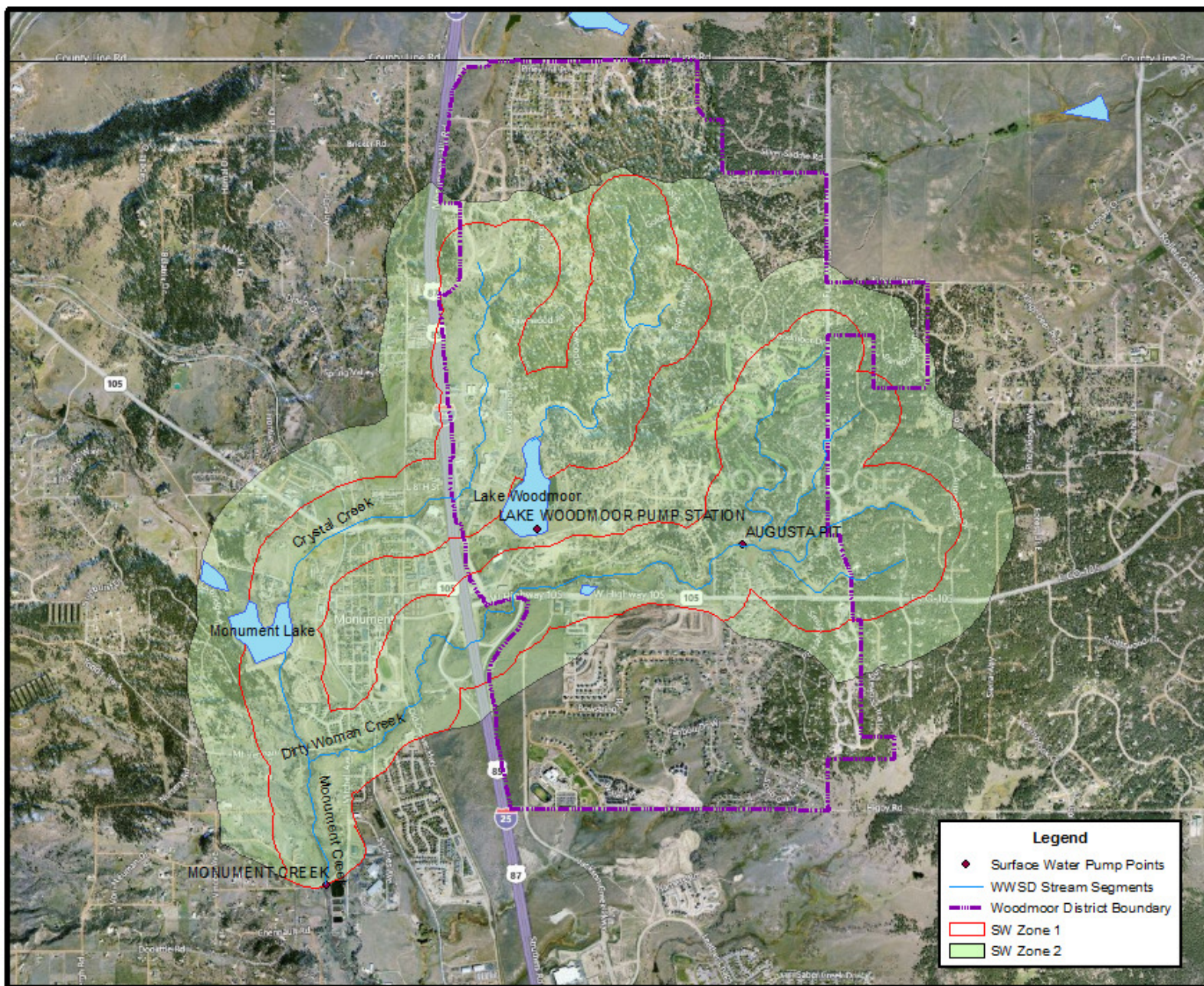


Figure 2: WWSD Priority Source Water Protection Areas

WWSD Priority Source Water Protection Areas



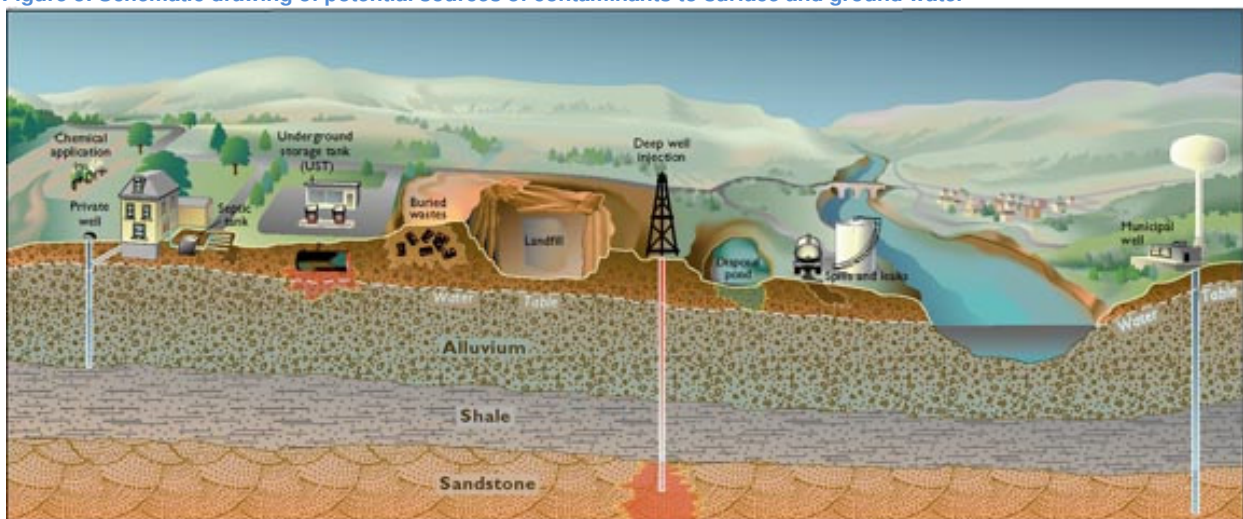
MAP: KIMBERLY MIHELICH, CRWA

3. INVENTORY OF POTENTIAL SOURCES OF CONTAMINATION

Surface and Ground Water Contaminants

Many types of land uses have the potential to contaminate source waters: spills from tanks, trucks, and railcars; leaks from buried containers; failed septic systems, buried or injection of wastes underground, use of fertilizers, pesticides, and herbicides, road salting, and polluted urban and agricultural runoff. While catastrophic contaminant spills or releases can wipe out a water resource, ground water degradation can result from a plethora of small releases of harmful substances. According to the USEPA, nonpoint-source pollution (when water runoff moves over or into the ground picking up pollutants and carrying them into surface and ground water) is the leading cause of water quality degradation (GWPC, 2008).

Figure 3: Schematic drawing of potential sources of contaminants to surface and ground water



SOURCE: GROUND WATER ATLAS OF COLORADO

The Planning Team reviewed the information presented in the State's assessment, discussed other potential sources of contaminants not included in the assessment, and identified areas of concern within the source water protection area in which to focus their management approaches.

Issues of concern identified by the Steering Committee include:

- Road Miles
- Golf Courses, Parks and Open Spaces
- Residential Practices
- Industrial and Commercial Practices
- Forest Lands

All other potential issues of concern that were identified by the State's source water assessment for WWSD were determined to be of very low or no risk to the source water protection area.

DISCUSSION OF ISSUES OF CONCERN

Transportation on Roads

WWSD's source water protection area is served by a network of paved roads on both private and public lands. These roadways present a significant threat to the District's drinking water sources. Many of these roads lie in close proximity to, or cross over, water bodies within the protection area. The Colorado Department of Transportation (CDOT) maintains state highways and El Paso County maintains the local road system. Roads can change natural run-off patterns by increasing the amount of impervious surface in a watershed, intercepting overland flow, and routing this water directly into streams. Storm water runoff over these roads can deliver contaminants from the road surface into nearby surface waters including: sediment, chemical de-icers such as road salts, which could cause elevated levels of sodium and chlorides; dust-abatement, vehicular spills, and maintenance activity of the roadways which may include herbicide and pesticide applications.

The Planning Team recommends educating the public on how to respond to a hazardous spill as well as working with local emergency response teams to ensure that any spills within the protection areas be effectively contained and remediated.

Sediment

Sediment is a major pollutant associated with roads on public lands. Both the density of these routes and their location within the riparian corridor can result in impacts to the ecological health of the stream system as well as higher water treatment costs for public water suppliers.

Chemical Applications

The Town of Monument as well as the Colorado Department of Transportation (CDOT) uses a small amount of magnesium chloride (which is not listed as hazardous material), a salt/sand mixture, and pure salt for winter roadway maintenance (Stresfield, CDOT). In addition, CDOT applies herbicides once a year to the highway median and at light posts near guard rails. The herbicide is known as a sterilant. The majority of weed maintenance is conducted through mowing. These materials may accumulate along routes within the source water protection areas and have a potential to enter Dirty Woman Creek and Monument Creek. Sand has negative impacts on water quality by increasing suspended solid levels and turbidity, and increasing sediment loading into streams. A recent study conducted by the U.S. Geological Survey demonstrates a detrimental impact from road-salt runoff to surface water affecting the stream water quality and aquatic life (Corsi, et al, 2010). In high concentrations for extended periods of time, chloride in streams is toxic to aquatic life. Chloride may also negatively impact vegetation near the roadside; watershed roadside vegetation is an important part of the riparian corridor. However in a recent study conducted by the National Cooperative Highway Research Program found that when considering drinking water obtained from groundwater, magnesium, calcium, chloride are not associated with impairment of human health (NCHRP, 2007).

Spills

Within this area, spills may occur from vehicles that transport fuels, waste, and other materials potentially contaminating the source waters. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

Golf Courses, Parks and Open Spaces

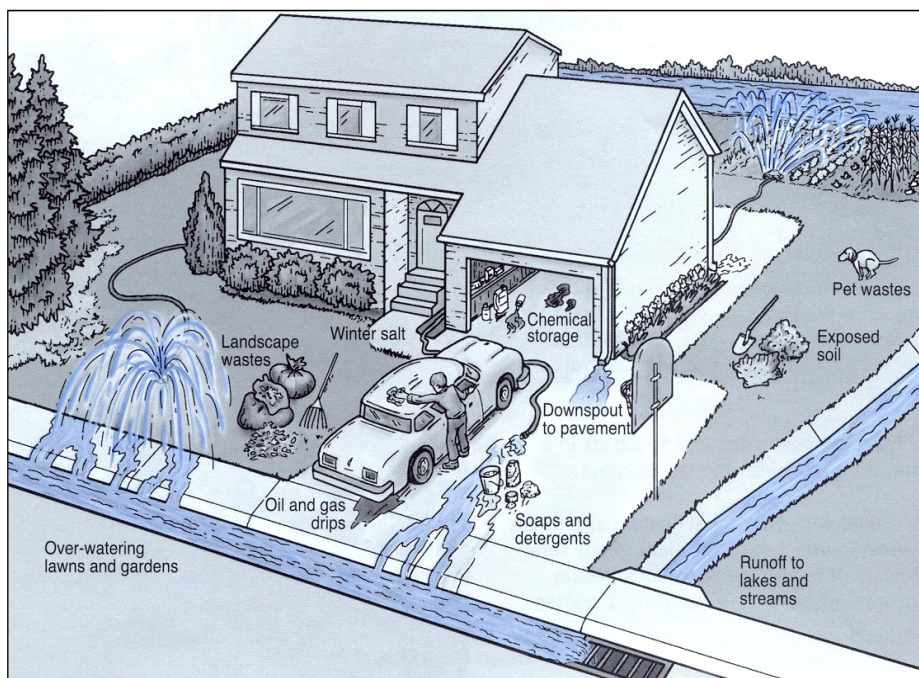
The major recreational facilities within the source water protection area are local parks, open space common areas and the Monument Hill Country Club. Local parks are maintained by the Town of Monument and lie within Zone 3 of the Source Water Protection Area. The Woodmoor Improvement Association (WIA) maintains common areas that lie within WWSD's boundaries, and the Monument Hill Country Club is responsible for maintenance of its golf course. The golf course and Woodmoor's common areas both lie within Zones 1 and 2 of its Source Water Protection Area.

Surface and groundwater quality can be affected by different practices used within recreational areas. Improper applications of pesticides and fertilizers can lead to the contamination of surface and groundwater. Other common recreational uses such as improper disposal of pet waste can contribute to source water contamination. Studies performed on watersheds in the Seattle, Washington, area found that nearly 20 percent of the bacteria found in water samples were matched with dogs as the host animals. (EPA Source Water Practices Bulletin, 2001).

The Steering Committee recommends that the managers of the Monument Hill Country Club, the Woodmoor Improvement Association and the Town of Monument use Best Management Practices to prevent pollutants from entering WWSD's source waters.

Residential Practices

The Source Water Protection Area includes many residential dwellings; however there are no individual sanitary sewer systems (septic tanks/leach fields) within the District boundaries. Common household practices may cause pollutants to runoff residential property and enter the surface or ground water as indicated in Figure 4 below. Prevention of source water contamination requires education, public involvement, and people motivated to help in the effort. Educating the community and decision makers is one of the challenges and cornerstone of this



protection plan. Public education will help people understand the potential threats to their drinking water source and motivate them to participate as responsible citizens to protect their valued resources.

Figure 4: Common household practices that may cause pollutants to runoff residential property and enter the surface or ground water

Commercial and Industrial Practices

There are several commercial and industrial businesses that lay within the source water protection area including carwashes, gas stations, laundromats, and automotive repair businesses. These industries can contribute to source water contamination. They may have storage tanks and sand/oil interceptors onsite and may use harmful chemicals that can runoff into source waters.

Storage Tanks

There are 20 permitted storage tank sites (7 active and 13 inactive) within the source water protection area (Table 2). Information of the current status of Aboveground Storage Tanks (AST) and Underground Storage Tanks (UST) within the source water protection area was obtained from the Colorado Department of Labor and Employment Division of Oil and Public Safety's database via their Colorado Storage Tank Information (COSTIS) website at <http://costis.cdle.state.co.us>. Over 23% of the above and underground storage tanks in the source water protection area have had leaking tanks, recorded as Confirmed Releases. There have been twelve Confirmed Release spills of which seven have been cleaned up and five underground tank spill in the process of cleanup and monitoring (Table 2). A release means any spilling, leaking, emitting, discharging, escaping, leaching, or disposing of a regulated substance from a storage tank into groundwater, surface water or soils. The owner/operator must report a suspected release within 24 hours and investigate suspected releases within seven days. After confirming a release and conducting the initial response and abatement, the owner/operators must continue further source investigation, site assessment, characterization and corrective actions.

The majority of the underground storage tanks contain petroleum products (gasoline, diesel). The leaky tank releases gasoline or "liquid phase hydrocarbon." The gasoline descends through the unsaturated soil zone to float on the water table (gasoline is less dense than water). In the "smear zone", the gasoline releases compounds like benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) to the groundwater and they are carried in the direction of groundwater flow. The extent of contamination is defined by the concentration of benzene (from 10 to 10,000 parts per billion) in the ground water.

Spills from leaking underground storage tanks (LUST) sites can contaminate the groundwater and also presents other hazards. Because gasoline is less dense than water, gasoline floats on the water table and remains relatively close to the land surface. The most hazardous compounds in groundwater, the BTEX compounds, are quite volatile (Ryan, 2006).

Table 2: Storage tanks within the Source Water Protection Area

Tank Site	ID No.	Status	Event	Information
7-Eleven #20308	8930	Active	2	3 UST* Inactive, 3 UST Active; Confirmed Release in 1993 with LUST** cleanup completed in 1995; Confirmed Release in 2002 with CAP*** in progress
Amoco #70529	12253	Inactive	1	No records found
CDOT Monument	7755	Inactive	1	1 UST Inactive, 1 AST**** Inactive; Confirmed Release in 1992 with LUST cleanup initiated in 1992
Colorado Heights Camping Resort	17950	Active	0	1 LPG***** Active
Conoco Phillips Site 6507	307	Active	2	6 UST Inactive, 1 LPG Inactive, 6 UST Active; Confirmed Release in 1990 with LUST cleanup initiated in 1995 and CAP in progress; Confirmed Release in 2006 and permanently closed in 2007
Ferrell Gas	16413	Active	0	1 LPG Active
K & G Store #541	10540	Active	1	5 UST Inactive, 3 UST Active, 1 LPG Active; Confirmed Release in 1989 with LUST cleanup initiated in 1992 and CAP in progress
Lewis Palmer School District #38	14489	Active	1	2 UST Active; Confirmed Release in 2005 and closure letter sent 2006
Lewis Palmer School District #38	5036	Inactive	1	4 UST Inactive; Confirmed Release in 1995 with REV clean up completed in 1996
Monument Texaco Inc.	942	Inactive	1	5 UST Inactive, 1 LPG Inactive; Confirmed Release in 1996 and 2002 and permanently closed in 2002
Phillips 66 SS	8809	Inactive	0	3 UST Inactive
Price Truck Sales	4502	Inactive	0	2 UST Inactive
Qwest Monument Co. 220525	7256	Active	0	2 UST Inactive, 1 AST Active
Rampart Car Care	4698	Inactive	1	4 UST Inactive; Confirmed Release in 1995 with LUST cleanup initiated in 1995 and CAP in progress
Texaco Station	17109	Inactive	0	1 LPG Inactive
US West Monument Central Office	13516	Inactive	1	Confirmed Release in 2005 with no further action required
Wilmar Cornerstone Real Estate	2528	Inactive	1	2 UST Inactive; Confirmed Release in 1991 with CAP initiated in 1992, cleanup completed in 1993
Woodmoor Automotive Inc.	17491	Inactive	0	1 LPG Inactive
Woodmoor Country Club	4159	Inactive	1	2 UST Inactive; Confirmed Released in 1991 with LUST cleanup initiated in 1991 and CAP initiated in 1998, Closure letter sent in 2006
Woodmoor/ Monument Fire District	3969	Inactive	0	No records found

*UST – Underground Storage Tank

****AST – Aboveground Storage Tanks

**LUST – Leaking Underground Storage Tank

*****LPG – Liquefied Petroleum Gas

***CAP – Corrective Action Plan

Sand/Oil Interceptor

Many businesses have sand/oil interceptors on location including car washes and gas stations. Sand/oil interceptors are in ground tanks designed to capture dirt, sand, sweepings, minor petroleum spills, etc. from these facilities to keep these substances out of the wastewater system. The interceptor treats these wastes by allowing substances lighter than water (such as oil) to float and substances heavier than water (such as sand) to sink. Only the grey water between these two zones should flow to the wastewater system.

If the sand/oil interceptor is not pumped frequently enough, the heavier dirt, sand, sweepings (sludge) and/or the lighter oil and grease will occupy too much space in the interceptor and be siphoned through the outlet pipe to the wastewater system. Wastes can also backup into the

wastewater service line and cause a blockage and/or odor problems. Additionally, sand/oil interceptors can overflow into the environment causing damage and bring about public health issues (Colorado Springs Utilities).

Runoff

Chemical, soap, and petroleum spills at gas stations, car washes, automotive repair businesses and other industries can gather on impervious surfaces and can migrate into the stormwater system or drain into the surface waters within the SWPA and contaminate source waters.

The Steering Committee recommends industries use best management practices such as dry clean-up methods for spills on impervious surfaces.

Forest Lands

The majority of forested lands within WWSD's Source Water Protection Area lie within Surface Water Zone 3, and are outside the area of responsibility. These lands are considered a low priority for the scope of this Plan. Studies show that the percentage of forested land in a source water area is one of the most important factors in determining water quality. The more forested land in a source area, the better the water quality and lower the treatment costs (Source Protection Handbook, 2005). Public lands within the Source Water Protection Area are managed by the Pikes Peak Ranger District, within the USFS Rocky Mountain Region.

Protecting Water Resources

A principal purpose for which the Forest Reserves (predecessor to the National Forest System) were established was to "secure favorable conditions of water flows". Throughout its history, the 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:

"Protect the resource. Maintain, and where opportunities exist, restore watershed and forest health to ensure full watershed function exhibiting high geomorphic, hydrologic, and biotic integrity. Ensure that forest management activities occur in a manner that adequately protects the integrity of watersheds (USFS, 2010)."

In October 2009, the Forest Service Rocky Mountain Region and the State of 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 (MOU, 2009).

4. IDENTIFYING BEST MANAGEMENT PRACTICES

The Steering Committee reviewed and discussed several possible management practices that could be implemented within the Source Water Protection Area to help reduce the potential risks of contamination to the community's source water. The Steering Committee established a "common sense" approach in identifying and selecting the most feasible source water management activities to implement locally. The focus was on selecting those protection measures that are most likely to work for this project.

The Planning Team recommends the management practices listed in Table 3, "Source Water Protection Best Management Practices" be considered for implementation by:

- Woodmoor Water and Sanitation District No. 1
- Woodmoor Improvement Association
- Private Landowners within the Source Water Protection Area
- Town of Monument
- El Paso County (Government, Land Use, and Health Department)
- Colorado Department of Transportation
- United States Forest Service
- Colorado Department of Public Health and Environment
- Colorado Rural Water Association

Table 3: Source Water Protection Best Management Practices

Priority Issue	Management Approach	Implementer
Transportation: Road Systems		
<p>Road Maintenance</p> <p>*CDOT – Colorado Department of Transportation</p>	<p>1. Keep informed on the road maintenance practices and schedules within the Source Water Protection Area (SWPA) including: grading, de-icing, dust abatement and Best Management Practices used.</p> <p>2. Provide *CDOT, County transportation department, and local road maintenance departments with the Source Water Protection Plan (SWPP) and map. Encourage them to use road Best Management Practices to prevent road materials from entering the source waters.</p>	<p>Steering Committee</p> <p>Steering Committee Transportation Departments</p>
<p>Vehicular spills</p>	<p>1. Establish emergency response plans to address spills that result in the release of contaminants with the SWPA. Find out what the County response is to a “911” report of a spill on a roadway.</p> <p>2. Provide the local highway departments with a map of the SWPA and education about source water protection in the area.</p> <p>3. Meet with the local Fire Department to discuss their emergency response plans for responding to hazardous and non-hazardous vehicular within the SWPA. Include this information in the emergency plans for each water system.</p> <p>4. Provide training to emergency responders. The following material will be covered during the training session:</p> <ul style="list-style-type: none"> • Importance of Source Water Protection and Plan • Location of the Wellhead and Source Water Protection Areas • Overview of the Emergency Contingency Plan • Personnel to be notified in event of an emergency • Distribution and discussion of emergency responder materials to be posted at their respective agencies’ location. <p>On-site tour of the Water Works plant, elevated tanks, and well field</p>	<p>Steering Committee</p> <p>Fire Departments Water operators</p> <p>Steering Committee</p> <p>Steering Committee Water Utility and Steering Committee</p>
<p>Public Education</p>	<p>1. Post boundaries of the protection areas with signs to alert travelers about the presence of the protection area.</p> <p>2. Educate the public on how to call “911” to report any spills within the SWP area Zone 3 both on public and private lands.</p> <p>4. Educate the public about the proper disposal of vehicular motor oil during oil changes</p>	<p>Water Utility</p> <p>Steering Committee</p> <p>Steering committee</p>

Priority Issue	Management Approach	Implementer
Golf Courses/ Parks/ Open Spaces		
Best Management Practices	<p>1. The managers of Monument Hill Country Club, local parks, and Woodmoor’s common areas will be encouraged to use Best Management Practices to minimize the effects of practices on the water quality of the source waters. These include BMP’s applied to:</p> <ul style="list-style-type: none"> • Fertilizer and pesticides usage and management • Irrigation practices • Storage, handling, and disposal of pesticides and fertilizers, and washing of application equipment 	1. Golf Course manager, Town of Monument, Woodmoor Improvement Association
Fertilizers/Pesticides	<p>1. Tests soils to determine nutrient requirements and fertilize during periods of maximum plant uptake.</p> <p>2. Use Low Spray techniques for herbicide and fertilizer applications.</p> <p>3. Obtain a list of fertilizers and pesticides used on golf courses, parks and open spaces.</p>	<p>1. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>2. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>3. Steering Committee</p>
<p>Source Controls/ Spills Prevention</p> <p>* Proper handling of fertilizers, pesticides, fuels and other maintenance chemicals should be employed to prevent spills.</p>	<p>1. Equipment wash-down techniques to prevent contamination of source waters.</p> <p>2. Storage buildings for pesticides, fertilizers and other chemicals should be constructed on concrete pads surrounded by curbs to contain accidental spills.</p> <p>3. Above ground fuel tanks should be installed with conservatively sized secondary containment capacity.</p> <p>4. Material safety data sheets (MSDSs) should be kept for chemicals used at the course.</p> <p>5. Properly handle fertilizers during equipment loading and mixing.</p> <p>6. Avoid spills and immediately clean up any that may occur.</p>	<p>1. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>2. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>3. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>4. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>5. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p> <p>6. Golf Course manager, Town of Monument, Woodmoor Improvement Association</p>

Priority Issue	Management Approach	Implementer
Residential Practices		
Public education	<p>1. Conduct public education and outreach programs to SWPA resident to encourage practices that will protect their drinking water source. Topics may include: household hazardous waste storage and disposal, fertilizer usage, pet waste cleanup, water conservation, car washing, and ideas on how to use secondary containment for above ground fuel storage tanks.</p> <p>2. Opportunities for public education include: newspaper articles, poster displays at local utility offices and public buildings, water bill inserts, flyers, water utility website, public forums, and community events.</p> <p>3. Host a Water Conservation and Protection Workshop where water professionals, local citizens, non-profit organizations focused on watershed protection, local governing bodies, and a variety of private consultants and specialists from related fields all assembled to share knowledge and insight about equipment, supplies, management practices, and technologies related to the practice of conserving and protecting drinking water sources</p>	<p>1. Steering Committee, Water Utility, Local Government</p> <p>2. Steering Committee, Water Utility, Local Government</p> <p>3. Steering Committee, Water Utility, Local Government</p>
Hazardous materials	<p>1. Educate the community about proper disposal of any hazardous materials including: local waste oil, solvents, lubricants, and degreasers, etc., and encourage collection and recycling of used oil, batteries, tires, pesticide containers and other agricultural chemical containers.</p> <p>2. Organize local hazardous waste collection program for residents within the SWPA.</p> <p>3. Notify all facilities that store, manufacture, or use hazardous materials of their vicinity to the public water systems. Provide information on the proper handling of hazardous materials and contact information of emergency responders in case of a release.</p>	<p>1. Steering Committee, Woodmoor Improvement Association</p> <p>2. Steering Committee</p> <p>3. Steering Committee</p>
Owners and Operators of identified potential sources of contamination	<p>1. Develop a mailing list of the owners and operators of identified potential sources of contamination.</p> <p>2. Notify the owners and operators of identified potential sources of contamination of: Source Water Protection plan, their site being identified as a potential source of contamination to the water source, and the importance of preventing contamination of the source water (wells, springs, surface water).</p>	<p>1. Steering Committee</p> <p>2. Steering Committee</p>

Priority Issue	Management Approach	Implementer
Industrial/Commercial Practices		
Storage Tanks	<p>1. Maintain a current inventory and information on the status of above and underground storage tanks in the source water protection area using the Colorado Storage Tank Information (COSTIS) website at http://costis.cdle.state.co.us. Storage tank information from this site includes: facility, tank, owner, and events.</p> <p>2. Identify Leaking Underground Storage Tank (LUST) events that have occurred within the SWPA using the State's database COSTIS. Contact the Colorado Department of Labor and Employment Division of Oil and Public Safety (303-318-8000) for information regarding LUST events within the SWPA. Contact the Public Records Center for a file review at (303) 318-8521 or (303) 318-8522. Monitor progress on any remedial action conducted for the known contamination sites.</p> <p>3. Provide information to large tank owners on how they can help with source water protection efforts.</p> <p>4. Provide information to small residential tank owners on how they can guard against leaks and spills that may potentially contaminate the water supply (i.e. Well-A-Syst[®] program).</p>	<p>1. Steering Committee</p> <p>2. Steering Committee</p> <p>3. Steering Committee</p> <p>4. Steering Committee</p>
Sand/Oil Separators	<p>1. Identify facilities with sand/oil separators.</p> <p>2. Ensure sand/oil separators are pumped frequently enough to keep waste from overflowing or out of the wastewater system.</p> <p>2. Encourage facilities with sand/oil separators to use Best Management Practices to minimize the effects of practices on the water quality of the source waters. These BMP's include: frequent pumping, testing sludge frequently to ensure it is not hazardous, and avoid using chemicals that are considered hazardous.</p>	<p>1. Steering Committee</p> <p>2. Facilities</p> <p>3. Steering Committee, Facilities</p>
Runoff	<p>1. Use best management practices such as dry clean-up methods for hazardous spills on impervious ground</p>	<p>1. Facilities,</p>
Priority Issue	Management Approach	Implementer
Forest Service land management		
Communication	<p>1. The Steering Committee will maintain communication with the USFS, providing comment when needed on source water protection concerns.</p>	<p>1. U.S. Forest Service, Steering Committee</p>

5. IMPLEMENTATION OF BEST MANAGEMENT PRACTICES

A plan is only a prologue. Its usefulness lies in its implementation. What is essential therefore, is the willingness of the community to concern itself with its own future. Building on that concern, this Plan can be a catalyst for responsible and productive measures to guide the changes that inevitably will come (Delta County Master Plan, 1996).

WWSD is voluntarily committed to applying source water assessment and protection principles to finding and protecting new water sources in the future. This is part of the larger ongoing commitment to providing the highest quality drinking water to their consumers.

Also, the District is voluntarily committed to assisting 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

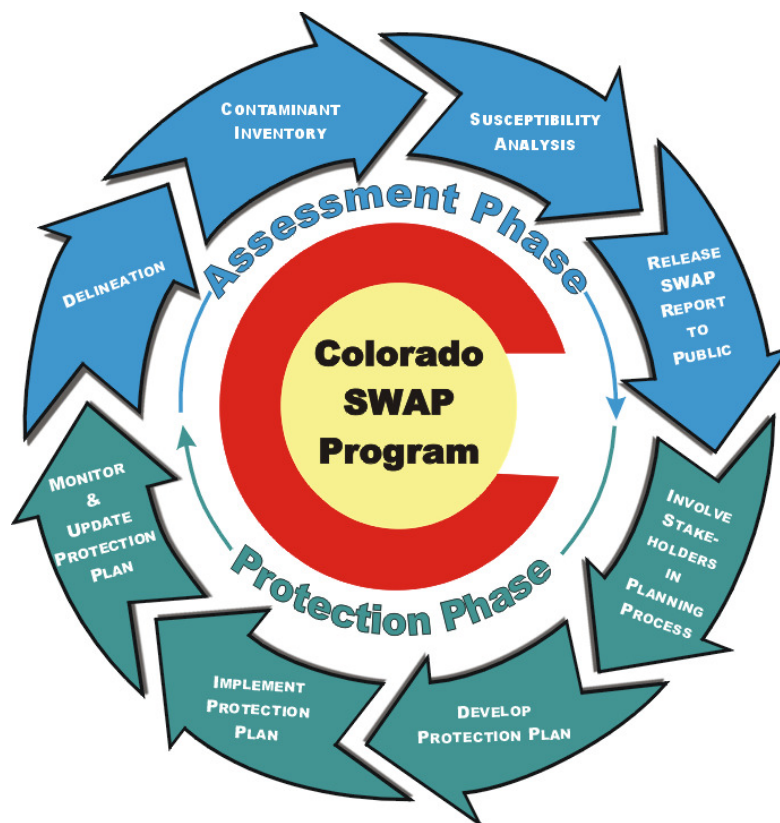
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APPENDIX A: OVERVIEW OF COLORADO'S SWAP PROGRAM

Source water assessment and protection came into existence in 1996 as a result of Congressional reauthorization and amendment of the Safe Drinking Water Act. The 1996 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. The SWAP program protection plans will be integrated with the existing Colorado Wellhead Protection Program that was established in amendments made to the federal Safe Drinking Water Act (SDWA, Section 1428) in 1986. Wellhead protection is a preventative concept that aims to protect public groundwater wells from contamination. The Wellhead Protection Program and the SWAP program have similar goals and will combine protection efforts in one merged program plan.

Colorado's SWAP program is a 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 1, respectively.

Figure 1: Source Water Assessment and Protection Process



SOURCE: COLORADO DEPT. OF PUBLIC HEALTH AND ENVIRONMENT-WQCD

Source Water Assessment Phase

As depicted in the upper portion of Figure 1, the Assessment Phase for all public water systems consists of four primary elements:

1. Delineating the source water assessment area for each drinking water source;
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 and;
4. Reporting the results of the source water assessment to the public water systems and the general public.

The Assessment Phase involves understanding where the WWSD's source water comes from, what contaminant sources potentially threaten our water sources, and how susceptible each water source is to potential contamination. The susceptibility of an individual water source is analyzed by examining the properties of its physical setting and potential contaminant source threats. The resulting analysis calculations are used to report an estimate of how susceptible each water source is to potential contamination.

Source Water Protection Phase

The Protection Phase is a voluntary, ongoing process in which WWSD has been encouraged to voluntarily employ preventive 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 1, 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 1. 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.

APPENDIX B: SOURCE WATER ASSESSMENT RESULTS

The Colorado Department of Public Health and Environment assumed the lead role in conducting the source water assessments for public water systems in Colorado. WWSD drinking water providers received their source water assessment report in November 2004 and have reviewed the report along with the Source Water Protection Planning Team. These assessment results were used as a starting point to guide the development of appropriate management approaches to protect their source water from potential contamination. A copy of the source water assessment summary report can be obtained by contacting the water system or by downloading a copy from the Colorado Department of Public Health and Environment's SWAP program web site located at: www.cdphe.state.co.us/wq/sw/swaphom.html. The following sections provide a brief summary of the main findings from the three component phases of the assessment.

Contaminant Source Inventory

Notice

The information contained in this "Plan" is limited to that available from public records and the water supplier. Other "potential contaminant sites" or threats to the water supply may exist in the source water assessment area that are not identified in this "Plan." Identification of a site as a "potential contaminant site" should not be interpreted as one that will necessarily cause contamination of the water supply.

In 2001-2002 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 contaminant sources were inventoried using selected state and federal regulatory databases. Dispersed contaminant sources were inventoried using a recent land use/land cover and transportation maps of Colorado, along with selected state regulatory databases. The contaminant inventory was completed by mapping the potential contaminant sources with the aid of a Geographic Information System (GIS).

The results were provided to the water systems as part of the source water assessment process. As a town, we were asked to review the inventory information, field-verify selected information about existing and new discrete contaminant sources, and provide feedback on the accuracy of the inventory.

The WQCD's assessment process used the terms "discrete" and "dispersed" potential sources of contamination. A discrete source is a facility that can be mapped as a point, while a dispersed source covers a broader area such as a type of land use (crop land, forest, residential, etc.). Contaminant health concerns for the discrete and dispersed sources of contaminants are included in the Appendices of this report.

Discrete Potential Sources of Contamination

As identified by CDPHE, the contaminant source inventory indicates the following types of discrete contaminant sources within the source water assessment areas analyzed:

- EPA Hazardous Waste Generators
- EPA Chemical Inventory/Storage Sites
- EPA Toxic Release Inventory Sites

- Permitted Wastewater Discharge Sites
- Aboveground, Underground and Leaking Storage Tank Sites
- Existing/Abandoned Mine Sites
- Other Facilities

Dispersed Potential Sources of Contamination

As identified by CDPHE, the contaminant source inventory indicates the following types of dispersed contaminant sources within the source water assessment areas analyzed:

- Commercial/Industrial/Transportation
- Low Intensity Residential
- Urban Recreational Grasses
- Row Crops
- Fallow
- Pasture/Hay
- Deciduous Forest
- Evergreen Forest
- Septic Systems
- Road Miles

Susceptibility Analysis

Notice

The susceptibility analysis provides a screening-level evaluation of the likelihood that a potential contamination problem could occur rather than an indication that a potential contamination problem has or will occur. The analysis is NOT a reflection of the current quality of the untreated source water, nor is it a reflection of the quality of the treated drinking water that is supplied to the public.

The susceptibility analysis was conducted by the Colorado Department of Public Health and Environment to identify how susceptible an untreated water source could be to contamination from potential sources of contamination inventoried within its source water assessment area. The analysis looked at the susceptibility posed by individual potential contaminant sources and the collective or total susceptibility posed by all of the potential contaminant sources in the source water assessment area. The Colorado Department of Public Health and Environment developed a susceptibility analysis model for surface water sources and ground water sources under the influence of surface water, and another model for ground water sources. Both models provided an objective analysis based on the best available information at the time of the analysis. The Colorado Department of Public Health and Environment provided the WWSD with a final source water assessment report and supporting analysis information.

Table 6 summarizes the total susceptibility and physical setting vulnerability results, and the individual susceptibility results for the discrete and dispersed contaminant sources associated with each of the water sources identified in the assessment reports.

An explanation of the rating system used in Table 1 includes:

- 1) **Overall Susceptibility Rating** - This rating is based on two components: the physical setting vulnerability of the water source and the contaminant threat.
- 2) **Physical Setting Vulnerability Rating** – This rating is based on the ability of the ground water flow to provide a sufficient buffering capacity to mitigate potential contaminant concentrations in the water source.
- 3) **Land Uses (Dispersed Potential Sources of Contaminants) Susceptibility Ratings** - This summarizes those land uses that the WQCD’s assessment considered to represent the highest threats to the water source.

Table 1: Susceptibility Results and Contaminant Source Inventory as identified by CDPHE

Public Water System	Woodmoor Water and Sanitation District No. 1
Public Water System Identification #	CO0121950
Drinking Water Sources	13 Wells
Source Type	Ground Water
OVERALL SUSCEPTIBILITY RATING	
	12 – Moderately Low; 1 – Moderately High
PHYSICAL SETTING VULNERABILITY RATING	
	1 – Low; 12 – Moderately High
DISCRETE CONTAMINANT SOURCES	
EPA Hazardous Waste Generators	3
EPA Chemical Inventory/Storage Sites	2
EPA Toxic Release Inventory Sites	1
Permitted Wastewater Discharge Sites	1
Aboveground, Underground and Leaking Storage Tanks Sites	30
Existing/Abandoned Mine Sites	1
Other Facilities	48
DISPERSED CONTAMINANT SOURCES	
Commercial/Industrial/Transportation	2
Low Intensity Residential	13
Urban Recreational Grasses	8
Row Crops	3
Fallow	1
Pasture/Hay	5

Deciduous Forest	5
Evergreen Forest	7
Septic Systems	1
Road Miles	12

Contaminants Health Concerns

The discrete and dispersed sources of contaminants can cause acute and chronic health concerns as indicated below. These categories of contaminants are most likely associated with the most prevalent sources identified in Table 1.

Acute Health Concerns

Acute health concern contaminants include individual contaminants and categories of constituents that pose the most serious immediate health concerns resulting from short-term exposure to the constituent. Many of these acute health concern contaminants are classified as potential cancer-causing (i.e., carcinogenic) constituents or have a Maximum Contaminant Level Goal (MCLG) set at zero (0).

Table 2: Acute Health Concerns

Acute Health Concern	Discrete Contaminants	Dispersed Contaminants
Microorganisms	X	x
Nitrate/Nitrite	x	x
Pesticides	x	x
Semi-volatile organic compounds (SVOCs)	x	
Volatile organic compounds (VOCs)	x	
Lead	x	
Ammonia or nitric acid	x	x

SOURCE: COLORADO WATER QUALITY CONTROL DIVISION

Chronic Health Concerns

Chronic health concern contaminants include categories of constituents that pose potentially serious health concerns due to long-term exposure to the constituent. Most of these chronic health concern contaminants include the remaining primary drinking water contaminants.

Table 3: Chronic Health Concerns

Chronic Health Concern	Discrete Contaminants	Dispersed Contaminants
Herbicides	x	x
Pesticides		x
Volatile organic compounds (VOCs)	x	
Non-metal inorganic compounds		
Metals – Primary Drinking Water (other than lead)	x	
Turbidity	x	x
Other inorganic compounds	x	x
Other organic compounds	x	

SOURCE: COLORADO WATER QUALITY CONTROL DIVISION