2011 Groundwater and Surface Water Monitoring Project:
Baseline Monitoring to Address Oil and Gas Development in South Park

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Abbreviations

ADP Application to Drill Permit
CDOW Colorado Division of Wildlife
CDPHE Colorado Department of Public Health and Environment
CUSP Coalition for the Upper South Platte
CPW Colorado Parks and Wildlife
COGCC Colorado Oil and Gas Conservation Commission
DRO Diesel Range Organics
EPA Environmental Protection Agency
GRO Gasoline Range Organics
HEM n-hexane extractable material
JMJSWA James Mark Jones State Wildlife Area
BLM Bureau of Land Management
MCFD Million Cubic Feet per Day
MBO Million Barrels of Oil
SMCL Secondary Maximum Contaminant Level
SUA Surface Use Agreement
TDS Total Dissolved Solids
VOC Volatile Organic Compounds

1.0 Executive Summary

This report summarizes the 2011 Baseline Water Quality Monitoring Program conducted by the Coalition for the Upper South Platte (CUSP). CUSP is a nonprofit watershed group focused on the protection of water quality and ecological health of the Upper South Platte Watershed through cooperative efforts of watershed stakeholders, with an emphasis placed on community values and economic sustainability. Through financial support by the Park County Land and Water Trust Fund, CUSP was able to collect both ground and surface water samples with the intent to qualify the existing water quality in a portion of the South Park Basin of Park County Colorado.

This program was initiated due to increased natural gas exploration in the greater South Park Area. When CUSP began the baseline water quality program in 2011, El Paso E&P Company, LP. held three oil and gas permits issued by the Colorado Oil and Gas Conservation Commission (CDOW 3-25-10-76, CDOW 11-13-10-76, and CDOW 1-36-10-76). These permitted wells were located within the James Mark Jones State Wildlife Area (JMJSWA). Well 11-13-10-76 was drilled in September 2010 to a measured depth of 8,836 ft and was not hydraulically fractured. As of summer 2012, the well is listed as temporarily abandoned and the well pad has been partially reclaimed with plans for further reclamation during the 2012 summer season (personal communication with CPW representative).

The primary goal of the 2011 sampling program was to identify the baseline water quality conditions for both groundwater and surface water in the vicinity of potential natural gas exploration in the South Park area. CUSP collected fifty-one water samples from the South Park area. This includes five quality control samples, twenty-nine domestic water well samples, sixteen surface water samples, and one stock well sample.

Surface water samples were collected from the Middle Fork of the South Platte at the historic town site of Garo and the Badger Basin fishing access approximately two miles north of Hartsel. The South Platte was sampled approximately three miles upstream of Spinney Reservoir below the confluence of the Middle and South forks. Additionally, Fourmile Creek and a large spring were sampled near Garo. Four spring samples were also taken from the Bald Hill area near the Elkhorn

Rd. All surface water samples, both spring and river, were sampled seasonally; sampling was done once in the spring and again in the fall.

Water quality in South Park is variable and dependent on local geology, geography, and seasonal influences. The majority of the groundwater samples were collected from wells that were completed in sedimentary rock units that had a calcium-bicarbonate-sulfate dominated chemical signature. This water was often classified as hard water and had significant detections of sulfate. Manganese, sulfate, and uranium were the most common constituents found at concentrations above drinking water standards. Methane was detected above reporting limits in two well and two spring locations. The highest methane concentration was 0.68 mg/L from a well in the Hartsel area. With the exception of one well, there were no significant detections of organic contaminants such as benzene or toluene in any of the surface- or groundwater samples collected in 2011. The well with significant detections of organic contaminants has been attributed to original chlorine dosing during well construction. Significant detections refer to compounds that were detected above detection and reporting limits that has not been qualified.

2.0 Introduction

In the fall of 2010, CUSP was approached by many individuals to address the potential water quality impacts that could result from increased natural gas exploration in the South Park area. As a non-advocacy watershed group, we believed our best role was to provide a third party testing group to help build the background knowledge that will allow the county, its citizens, and other interested parties to have the information they need in the future to properly assess natural gas development and the potential impacts to surface and groundwater quality.

Data collected under this program is intended to further establish the baseline water quality condition of the surface and groundwater in the South Park Basin. Baseline data is the initial collection of data that serves as a basis for comparison with any data collected in the future. Therefore, the intent of this data is to aid in the understanding of the water quality condition prior to the development of major natural gas or other mineral extraction activities. This report also summarizes the work done by other agencies and organizations in relation to water quality.

3.0 Background

3.1 Purpose and Scope: Goals of the Baseline Water Quality Program

The purpose of this report is to provide relevant data and interpretations to better quantify the existing water quality conditions of the greater South Park area, Park County Colorado. Specifically, the report: (1) provides a general assessment of the quality of ground and surface water in proximity to lands subject to past and future natural gas exploration and development; (2) identifies spatial and temporal gaps in the existing data for future studies; and (3) compares current findings to historical water quality data when possible. In addition, this report summarizes past water quality and geologic studies of the area that add to the interpretation of baseline conditions.

The general scope of work completed under the baseline study included: (1) development of sampling and quality assurance documents; (2) creation of a cost-share program to encourage increased participation in domestic well sampling; (3) sampling of domestic wells and surface water locations; (4) data management of field observations, chain of custody documentation, sample results, and result analysis; (5) summary reporting for individual domestic well samples and final project reporting. Every well owner received a summary report outlining important findings or potentially harmful compounds, a table of the field and laboratory results, fact sheets and relevant information regarding compounds found in the sample, and the full laboratory reports (generally over 1000 pages and included on a CD).

3.2 Description of the Study Area

All samples were collected within Park County, Colorado with a focus area around the South Park Basin (Figure 1). South Park lies approximately 80 miles southwest of Denver in west-central Park County. South Park is a large grass-covered plateau situated in central Park County with high mountain peaks bordering the north and west. The South Park Basin is both a topographic and structural basin. This 50 mile long by 35 mile wide basin is one of the four north-trending intermountain basins located in the Southern Rocky Mountains (Stark, and others, 1949; Harmon, 1984, *in* Scarbrough, 2001). The South Park Basin encompasses approximately 1,000 square miles. This high elevation basin is bounded to the west by the Mosquito Range, the Kenosha Mountains and western extension of the Front Range to the north, the Tarryall Mountains to the east, and the Thirtynine Mile Mountain volcanic area to the south. Altitudes within the park range from above

10,000 ft in the north to 8,200 ft in the south; the majority of South Park consists of high-altitude, open-mountain meadows.

South Park experiences mild summers and cold winters with average temperatures ranging from 70°F to below 0°F. Average annual precipitation ranges from about 10 to 40 inches and varies with altitude (Miller and Ortiz, 2007). The lowest annual precipitation amounts occur in the vicinity of Hartsel, and the highest amounts occur along the Continental Divide in the western part of the basin. Much of the precipitation in the higher altitudes is in the form of snow, which can accumulate to more than 300 inches per year in the mountains (Miller and Ortiz, 2007). Park County and the South Park area host significant peatlands, or fens, which contain unique plant species that are globally rare, and numerous types of other wetlands.

The towns of Alma, Fairplay, Hartsel, Jefferson, and Como are all located within the South Park area. Of these towns, Alma and Fairplay are the incorporated population centers. There are also a number of subdivisions located in the South Park area. According to the 2010 Census the greater South Park area has 1.0 to 4.9 people per square mile, making it a dominantly rural area. Alma and Fairplay have public water-supply systems, but most residents in South Park depend on domestic wells for their water supply.

3.3 Past and Present Oil and Natural Gas Exploration in South Park

According to the Colorado Oil and Gas Conservation Commission (COGCC) database, twenty-five oil and gas exploration wells have been drilled in Park County from 1930 to 2010 with no significant commercial production. Wells are spread out throughout the Basin, as far north as Jefferson and south near Spinney Mountain Reservoir. These wells were drilled by various operators including Shell Oil Company, South Park Oil and Gas, McDannald Oil Company, Amoco Production Co. and Jonah Energy Company LLC to name a few primary operations.

As of February 2012, El Paso E&P Company, L.P. has drilled one natural gas exploratory well and originally anticipated drilling two or more additional wells. The current probability of future drilling by El Paso remains uncertain because the company has undergone significant reorganization. Natural gas development is expected to continue increasing over the next few years, with thousands

of acres of federal and state land being leased for development. According to the Colorado Wildlife Federation, as of November 2011 27,832 acres of federal mineral estate has been leased within their proposed Master Leasing Plan area which generally corresponds to the area of South Park. Additionally, the Colorado State Land Board has leased 36,693 acres of state mineral estate as of the same date for the same area within South Park.

El Paso currently holds two oil and gas permits issued by the COGCC (CDOW 11-13-10-76 and Bald Hill Federal 5-29-10-75). Well 11-13-10-76 is located within the James Mark Jones State Wildlife Area; see Figure 2 for well and permit locations. Additionally, the Bureau of Land Management (BLM) initiated an Environmental Assessment in response to an Application to Drill Permit (ADP) for wells Bald Hill Federal 5-29-10-75 and 6-6-11-75 on BLM land located just to the southeast of well 11. Well 11-13-10-76 was drilled in September 2010 to a Measured Depth of 8836 ft, and was not hydraulically fractured. In the summer of 2011, Well 11 was closed and pad reclamation was initiated. As of August 2012, the well is listed as temporally abandoned. The drilling pits and liners were buried in place. Although there has been some re-growth of vegetation, Colorado Parks and Wildlife (CPW) has asked the contracted consulting firm to do additional revegetation on the site and to continue monitoring water features in the JMJSWA. El Paso well permits (CDOW 3-25-10-76, CDOW 1-3-10-76, and Bald Hill Federal 6-6-11-75,) have been listed as abandoned locations as of October, 2012.

4.0 Hydrogeology of the Greater South Park Area

4.1 Geology

The geology of South Park is diverse and complex, and has a direct impact on water quality. Previous studies, the general geologic setting, and oil and gas target formations are discussed in the following subsections. These sections will highlight the important geologic formations and structures of the South Park area.

4.1.1 Previous Studies

The South Park region and the baseline study area have been the focus of many studies throughout the years. The geology and origin of South Park has been thoroughly examined by Stark and others (1949) and De Voto (1961; 1971; 1972; 1995). In the 1960s and 1970s, oil and gas exploration

resulted in many publications and theses regarding the evaluation of mineral and mineral fuel potential of the area. Some highlights include Clement and Dolton (1970); Maughan (1988; 1989), Spencer (1987), Wellborn (1977), and Gautier and Clayton (1984). New technology and the development of unconventional deposits around the country has led to further investigation into oil and gas plays in South Park, such as Popov and others (2001) and Higely and Cox (2007). Faculty and students from the University of Texas, El Paso, and Colorado School of Mines have carried out geophysical studies of the South Park Basin (Beggs, 1977; Durrani, 1980; Fatti, 1974; Shoffner, 1974; Sawatzky, 1967). Both Scarbrough (2001) and McGookey (2002) provide a good overview of the geology in South Park. In Raynolds (2003), the South Park Formation sediments were examined and correlated to the time equivalent deposits in the Denver Basin. The Colorado Geological Survey and the U.S. Geological Survey have completed several geologic maps of the area. The authors' notes associated with these geologic maps are detailed and provide valuable geologic information for specific sites. A summary of the following geologic setting is derived from these sources.

4.1.2 Geologic Setting

South Park is located in the Front Range section of the Southern Rocky Mountain Physiographic Province. The Front Range is a northerly trending linear band of complex Precambrian age rocks that were uplifted and faulted during the Laramide Orogeny in the Early Tertiary Period about 65 million years ago. The South Park study area is bounded by structural faulting and uplifted blocks. The geology is exceptionally diverse and ranges in age from Early Proterozoic to Tertiary. The various tectonostratigraphic and physiographic settings include highly faulted mountain ranges that are composed of Proterozoic schist and gneiss as well as Paleozoic marine carbonate, shale, and siltstone. The high open planes of South Park are underlain by gently folded Mesozoic and Cenozoic clastic sedimentary rocks of marine, continental-lacustrine, and volcanic origin. Intrusive rocks of Tertiary age are widely scattered but are most notable in the Mosquito Range and the central and southern South Park Basin (Epis and Chapin, 1968). Periglacial Quaternary gravel terraces are associated with the major streams in the watershed.

The west central portion of the Upper South Platte watershed coincides with the South Park Basin, which is a highly complex structural and depositional basin with a major synclinal axis that plunges southward. This high elevation basin is bounded by the Mosquito Range to the west, the Kenosha Mountains and western extension of the Front Range to the north, the Tarryall Mountains to the

east, and the Thirtynine Mile Mountain volcanic area to the south. The edge of the Front Range in South Park is marked by the Elkhorn Thrust, which brings Precambrian rocks east of the fault against Tertiary and older rocks on the west. A generalized geologic cross-section adapted from the Colorado Geologic Survey Groundwater Atlas illustrates the complex nature of this basin and shows the structural relationship of the sedimentary rock units; the cross-section is located about five miles north of Antero Reservoir (Figure 3). A generalized geologic map for the study area is shown in Figure 4.

4.1.3 South Park Stratigraphy

The following summary of the prominent formations in South Park and the corresponding geologic history was mainly derived from McGookey (2002). The oldest rocks in the South Park region include a middle Proterozoic period of volcanic activity and a long period of sedimentation in deep marine troughs. The western third of Park County and South Park contain sediments of Paleozoic age. In the Antero Reservoir area, there is a very thick section of Pennsylvanian and Permian sediments that were derived from the eroding Ancestral Front Range. These formations include the marine black shales of the Belding Formation, which grades upward into the fluvial red sandstones, shales, and conglomerates of the Maroon Formation.

The Garo Sandstone unconformably overlies the Maroon Formation. This Permian aged red to gray sandstone is exposed in the western ridge of Red Hill one of the north- to northwest- trending ridges that interrupts the flat and gently rolling plains of South Park. The Garo Sandstone is comprised of medium to fine-grained sandstone with a basal conglomeratic bed. Large-scale cross bedding suggests an eolian origin. Another period of erosion and/or non-deposition resulted in a disconformity between the Garo Sandstone and the overlying Upper Jurasic Morrison Formation, which outcrops along the west side of Red Hill. The Morrison Formation is predominantly shale with limestone beds.

The prominent east-dipping Cretaceous Dakota Group overlies the Morrison Formation and outcrops at the uppermost ridge of the Red Hill hogback. The Dakota is a white to light gray sandstone that was deposited in a near-shore and beach setting corresponding to the first submerging of the area by the Cretaceous Western Interior Sea in the Early Cretaceous. As the sea transgressed, a sequence of shallow and deepwater marine black shales and limestones were

deposited, including the Benton Group, Niobrara Formation, and Pierre Formation. These formations may be grouped together and mapped undivided in different locals throughout South Park. The Benton Group is comprised of the Graneros Shale, Greenhorn Limestone, and Carlisle Shale. The Niobrara Formation is comprised of the Fort Hays Limestone Member and the Smoky Hill Shale Member, totaling to an average thickness of 540 feet or less. The lower chalky limestone forms low ridges in the topography of South Park. The Pierre Shale conformably overlies the Niobrara and is estimated to be 2,300 to 2,700 feet thick or more. The black fissile shale transitions into sandy shale and into the beach and near-shore sandstone of the Fox Hills Formation. Ledges of sandstone in the Pierre may be equivalent to the Hygiene or Apache Creek Member. The Fox Hills Formation crops out along the north and west sides of Mexican Ridge (the Mexican Ridge syncline), which is prominent in the eastern part of the South Park Basin. This represents a regression of the Cretaceous epicontinental sea that was further enhanced by the uplift of the Sawatch Range and the Laramide Orogeny.

The Laramie Formation represents the last sediments deposited in the basin during the Cretaceous. These fluvial, swamp, and lake deposits have few outcrops near Jefferson and Como. The Laramie Formation consists of lenticular beds of shale ranging from olive gray to yellowish brown to dark gray in color. There are two locally developed coal beds in the Laramie Formation; the uppermost is less than 3 feet thick and the basal coal bed is 2-8 feet thick with a maximum localized thickness of 40 feet near Como. The King Coal Mine exploited this thicker section in the late 1800's.

The Tertiary South Park Formation and its four prominent members represent a significant shift in the depositional history of South Park. The sediments and volcanic rocks of the South Park Formation are separated from the underlying Cretaceous sediments by a low angle unconformity. The South Park Formation is comprised of the basal Reinecker Ridge Volcanic Member, the Reinecker Ridge Conglomeratic Member, the Link Spring Tuff Member, and the Arkosic Member. The volcanic member (500-1,000 feet thick) consists of a lower flow and breccia unit and an upper conglomerate and tuffaceous sandstone unit. The Conglomeratic Member (4,500 feet thick) consists of lenticular beds of conglomerate, sandstone, and tuffaceous mudstone. This member also contains cobbles and boulders of silicified wood. The Link Spring Tuff Member (maximum 700 feet thick) is composed of laminated water-laid tuff, volcanic breccia, flows of andesite, and a minor porphyry cobble conglomerate in a tuffaceous matrix. The Arkosic Member (50-3,500 feet thick) consists of

lenticular beds of arkosic sandstone, conglomerate and mudstone. The composition of the sandstone grains indicate the Arkosic Member sediment was derived from Proterozoic granitic and metamorphic rock associated with the uplift and faulting of the Front Range and the Laramide Orogeny. Through the mid-Tertiary there was continued intrusion of sills and stocks and the associated emplacement of base and precious metals, molybdenum, and other types of metallic minerals.

The Eocene was a time of uplift, volcanism, erosion, and non-deposition in South Park. During this time, the west side of the Front Range was thrust westward over the South Park Formation along the low angle Elkhorn Thrust. The Oligocene Wall Mountain Tuff is present primarily in southern Park County and overlies the Late Eocene surface. This extrusive volcanic deposit originated from a volcano overlying the southern part of the Mount Princeton batholith and is a moderately to densely welded rhyolitic ash-flow tuff. Additional Oligocene volcanic activity resulted in an extensive blanket of andesitic to basaltic flows, breccias, and tuffs that cover most of southern Park County; these are generally grouped as volcanic rocks of the Thirtynine Mile Volcanic complex and the volcanic rocks of the Guffey Complex.

The next period of deposition in South Park resulted in the Oligocene in age Antero Formation comprised of water laid ash, air fall tuff, siltstone, sandstone, and algal limestone. Volcanic activity dammed the southern portion of South Park, resulting in the development of a large lake that covered much of South Park. The sediments of this lake are grouped into the Antero Formation, which consists of three members. The lowest member consists of thin limestone beds, tuff, sandstone, conglomerate, and shale. The middle member is comprised of fine-grained tuff, shale beds, and limestone lenses. The topmost member is a poorly consolidated conglomerate with sandy interbeds. Miocene deposition is only represented by the Wagontounge Formation that occurs south of Antero Reservoir at the southern end of the park. The Wagontongue Formation is comprised of coarse sandstone, sandy clay, and fluvial conglomerate with volcanic fragments. This formation is generally the last sedimentary bedrock formation in South Park, although other Pliocene formations may exist locally.

Surficial deposits in South Park are dominated by Pleistocene glacial deposits including gold placer deposits. During the Holocene, post-glacial breaching of glacial moraines and dissection of terraces

altered the textbook glacial features. Glacial placers and surficial deposits were and continue to be modified by fluvial outwash systems, resulting in the alluvium and colluvium surficial deposits throughout South Park.

4.1.4 Target Formations

Hydrocarbon shows have been found in South Park by South Park Oil Company's State 1, which tested 5 Million Barrels of Oil (MBO) from a sandstone bed in the Upper Cretaceous Pierre Shale on Rieneker Ridge in the 1930's (Clement and Dolton, 1970 *in* Barker, 1996). In South Park, hydrocarbon traps most likely formed after generation and migration (Barker, 1996). Hydrocarbon shows were found in the Apache Creek Member of the Pierre Shale. In 1999 Savant Resources LLC evaluated the Basin and obtained gas data for the Hunt Tarryall Federall 1-17 well. Savant Resources re-entered this well and found a 24-ft section of the Apache Creek sandstone yielded 195 Million Cubic Feet per Day (MCFD) of pipeline-quality gas (Popvo, 2001).

The Apache Creek sandstone is stratigraphically located above the Niobrara Formation within the Upper Cretaceous Pierre Shale formation. Testing done by Savant Resources indicated the Apache Creek Sandstone had a 0.3 md matrix permeability, 8.3% average porosity, and 0.52 psi/ft pressure gradient, which according to Savant Resources indicated formation damage (Povpo, 2001). Analysis done by Savant Resources indicated this formation would produce 1,500 to 2,945 MCFD without hydraulic fracturing and 7,344 MCFD with fracturing. Information gleaned from the Tarryall Federal well allowed Savant Resources to calculate gas reserves of 1.4-2.3 Trillion Cubic Feet (TCF) in the Apache Creek sandstone. The depth of the Apache Creek sandstone is 11,150 in the Hunt Tarryall well and varies widely; never the less, shoreline sands of the Apache Creek do appear throughout the 24 wells in South Park.

Secondary targets in the basin include the Fox Hill Sandstone, the Upper Transition Member of the Pierre Shale, the Niobrara Formation, the Frontier Sandstone, the Dakota Group, and the Garo (Entrada) Sandstone (Povpo, 2001). The source rocks for these hydrocarbon resources are the organic-rich layers of the Niobrara and the Sharon Springs Member of the Pierre Shale (Gautier et al., 1984 *in* Povpo, 2001). Major structural traps and seals include the numerous thrust faults such as the Elkhorn and South Park. Pressure seals occur around a depth of 10,000 ft, the minimum depth of these units, and extend to depths of 20,000 ft (Povpo, 2001).

4.2 Hydrology

4.2.1 Previous Studies

As part of the baseline study, CUSP completed an extensive review of water resource, hydrologic, and geologic studies done in the study area. In addition to the reconnaissance level water resource appraisal of Park County done by the USGS in the mid-1970's (Klein and others 1978), the primary water quality studies done in the basin include the early 2000 USGS report completed as a retrospective assessment of water resources. The following is an annotated list of important studies pertinent to this baseline study:

- Bruce, B.W., and Kimbrough, R.A., 1999, Hydrologic and water-quality data for surface water, ground water, and springs in north-central Park County, Colorado, April 1997-November 1998 U.S. Geological Survey Open-File Report 99-183. This report presents hydrologic data collected by the USGS during 1997-1998 in north-central Park County as part of a cooperation with the City of Aurora, Colorado, the Upper South Platte Water Conservancy District, and Park County government to monitor surface and ground-water resources in response to the proposed South Park Conjunctive Use Project (SPCUP) proposed by the City of Aurora. Specific sites were monitored as their location related to the recharge supply water for the SPCUP. This report provided the review and analysis of the available water resource data that was used in the subsequent USGS report by Kimbrough 2001.
- Kimbrough, R. A., 2001, Review and Analysis of Available Streamflow and Water-Quality Data for Park County, Colorado, 1962-98 USGS Water Resources Investigations Report 01-4034. This report summarizes the historical data on streamflow and surface- and groundwater quality. It analyzes this data in order to assess the broad-scale spatial and temporal variability in flow and quality, and where possible, the report identifies, describes, and explains the primary natural and human factors that affect the observed streamflow and water quality in Park County. In this report, water quality conditions are related to the general geology of the 'aquifer type' relating to the screened interval of the groundwater wells.
- Miller, L.D., and Ortiz, R.F., 2007, Ground-water quality and potential effects of individual sewage disposal systems effluent on ground-water quality in Park County, Colorado, 2001-2004: U.S. Geological Survey Scientific Investigations Report 2007-5220. This report

provides a general assessment of the quality of ground water by locale and aquifer type. It also uses historic data and subsequent sampling to determine if changes in constituent concentrations have occurred over time.

- Bruce and McMahon, 1998, Shallow groundwater quality of selected land-use/aquifer settings in the South Platte River Basin, Colorado and Nebraska 1993-95 USGS Water-Resources Investigations Report 97-4229.
- Goddard 1978, Availability and quality of groundwater in the Lake George area, southeastern Park County, Colorado: USGS Water-Resources Investigations Report 78-50.
- Klein, Goddard, and Livingston 1978, Appraisal of the water resources of Park and Teller Counties, Colorado: Colorado Water Resources Circular 36; McBride and Cooper 1991, Heavy metal analysis of stream waters in Park County, Colorado: Report prepared for the Park County Department of Environmental Health; McCarthy, Zackarakis, and Peral 1982.
- Geothermal resource assessment of Hartsel, Colorado: CGS Resource Series 18.

4.2.2 Hydrologic Setting

The South Park Basin is entirely located within the Upper South Platte Watershed. The major tributaries to the South Platte River include: the Tarryall Creek, which drains the northern part of the Park, and the South Fork and Middle Fork, which drain the remainder of the Park. The North Fork of the South Platte River does not flow through the South Park Basin. Prominent water bodies located in South Park include: Antero Reservoir, Elevenmile Reservoir, and Spinney Mountain Reservoir. Approximately 85% of Colorado's residents count wholly or in part on water that comes from the Upper South Platte Watershed (either native or transmountain diversion waters) for drinking, industrial, and agricultural use (CUSP, 2001).

The headwaters of the South Fork of the river originate on the eastern slopes of the Mosquito Range. Tributaries to the South Fork include Twelvemile Creek, Rich Creek, and Tumbling Creek. The South Fork eventually flows into Antero Reservoir. The South and Middle Forks converge near Hartsel, to form the main stem of the South Platte River. Principal tributaries of the Middle Fork of the South Platte River include Mosquito, Buckskin, Fourmile, Beaver, Sacramento, and Trout Creeks. The South Platte then flows through two major water supply reservoirs, Spinney Mountain and Elevenmile (CUSP, 1999). Downstream from Elevenmile Reservoir and Lake George, the South Platte picks up the Tarryall Creek tributary, which originates in the Continental Divide above Como.

Most of the sedimentary rock formations within South Park are potential aquifers (Topper, 2003). As described in Kimbrough (2001), water quality was analyzed with respect to aquifer types as determined by the general geology of the screened interval of the groundwater well or the source formation for spring waters. Using this classification, the four primary aquifer types are: alluvial aquifers of Quaternary age; sedimentary rock aquifers of Tertiary, Cretaceous, Jurassic, and Paleozoic age; and igneous-rock aquifers of Precambrian age. Within the sedimentary-rock aquifers the primary geologic units include the Antero, Florissant Lake Beds, South Park, and Wagontounge formations of Tertiary age; the Pierre Shale and Dakota Sandstone of Cretaceous age; the Jurassic Entrada Formation; and the Leadville and Maroon Formations of Paleozoic age. Tertiary age sedimentary rocks in South Park are more than 11,000 ft thick (Topper, 2003). Within the igneous-rock aquifer, the principal geologic unit is the Tertiary aged Thirtynine Mile Andesite. Of the crystalline-rock aquifers, the Boulder Creek, Silver Plume, and Pikes Peak Granite are the primary Precambrian age geologic units present in the study area (Kimbrough, 2001). Figure 5 shows a stratigraphic sequence of the hydrogeologic units and their hydrologic characteristics; this figure is from the Colorado Groundwater Atlas published by the Colorado Geologic Survey in 2003. The dominant aquifers in South Park are the several members of the South Park Formation, which is equivalent to the Denver Formation of the Denver Basin (Topper, 2003).

Water well records from the Division of Water Resources (February 2012) indicate there are approximately 3,800 permitted wells in the South Park Basin (Figure 6). According to the CGS, there were 2,100 permitted wells in 2001 and 90% of these wells were completed at depths equal to or less than 350 feet, with a mean depth of about 185 feet.

5.0 Data Collection

5.1 Methods

The general study approach was to identify appropriate ground and surface water sampling locations according to their proximity to current and reasonably projected natural gas exploration locale. Sampling was also intended to compliment, rather than duplicate, the water quality collection performed by El Paso as part of the sampling requirements issued by the COGCC and as part of the requirements under the Surface Use Agreement (SUA) with CPW, formally the Colorado

Department of Wildlife (CDOW). The data collected by Tetra Tech for El Paso is summarized in the following section.

Groundwater (well) sampling locations were based on participation in our cost-share program. Rather than selecting the budgeted 25 well locations, CUSP wanted to make baseline well testing available to all property owners within South Park that are dependent on domestic wells and therefore have the most interest in current and future water quality. Additionally, through the cost-share program, CUSP was able to sample more than 25 wells and increase the geographic distribution of the baseline data. CUSP sent a bulk mailing to over 2,500 property owners within the greater South Park area that depended on groundwater wells. Full-time residents were given a 50-50 cost-share option and part-time residents were asked to pay the majority of the sample analysis cost, $850.00; both full- and part-time owners were able pay monthly increments they could afford. The laboratory cost for sample analysis was $910 per sample. Approximately 40 individuals responded to the bulk mailing. Of the 27 wells CUSP tested, 22 participated in the cost-share program and 4 of those 22 qualified for the significantly discounted rate of $250 because of a legitimate disability or other low-income qualification. The other individuals that responded to the bulk mailing, but did not option for their well to be tested, did so for a number of reasons including cost.

Specific sampling protocols, quality control, and additional data management protocols are outlined in the Quality Assurance Project Plan (QAPP)/Sampling and Analysis Plan (SAP) prepared for this study (Appendix 1). Both field and laboratory analytical methods were required for the baseline monitoring program. Field parameters including pH, conductivity, water temperatures, and dissolved oxygen were measured using a Hanna multi-parameter GPS capable probe following manufacturer specifications and protocols outlined in the associated program SAP; this meter was maintained on a regular basis as outlined in the QAPP and calibrated at the beginning of each sampling event.

Water quality samples were collected following the protocols outlined in the QAPP/SAP as adapted from the USGS National Field Manual for the collection of water quality data (USGS accessed March 1, 2011). Discharge measurements were taken at all river sample locations and at domestic wells where applicable. Detailed analytical methods are required for laboratory analysis of water quality samples. Specific methods for analysis of each analyte are provided in Table 1; sample containers, holding times, and preservative for each test are provided in Table 2. Water samples

were analyzed by Test America for 172 different organic and inorganic parameters including: volatile and semi-volatile organic compounds, methane, ethane, ethylene, twenty-three metals (including uranium), Diesel and Gasoline Range Organics, chloride, fluoride, sulfate, nitrate, nitrite, orthophosphate, total coliform, alkalinity, total dissolved solids, oil and grease, and gross alpha/beta radiation.

Water samples were collected directly into pre-preserved and laboratory prepared bottles when possible. Occasionally, samples had to be collected using grab sampling equipment and transferred into laboratory prepared bottles. All sampling equipment was decontaminated prior to use and between sample locations following the protocol outlined in the QAPP/SAP. Samples were transported in a properly iced cooler provided by Test America to the laboratory in Denver and all Chain of Custody paperwork was maintained according to the protocol outlined in the QAPP/SAP.

5.1.1 Quality Control and Quality Assurance Project Plan/Sampling Analysis Plan

The overall objective of the Quality Assurance Project Plan/Sampling Analysis Plan (QAPP/SAP) is to establish quality assurance criteria for all sampling and project activities so data generated during the investigation is scientifically valid, legally defensible, and supportive of the goals laid out in the Sampling Analysis Plan. Generally, 10% of the analytical samples were devoted to quality control requirements. These samples include field blanks, sequential replicates and duplicates. Blank samples are designed to evaluate contamination potential from sampling equipment and atmospheric contamination, while sequential replicate and duplicate samples evaluate potential data variability relating to sampling and analytical techniques.

Specifically, five quality control samples were collected during the 2011 baseline study; of these, two were blank samples and three were duplicate samples from surface water locations and groundwater wells. All of the duplicate samples were within the acceptable criteria of <20% relative percent difference for non-qualified parameters as required by the QAPP. One of the two field blanks had detections of Gasoline Range Organics and 1,1-Dichloroethene above the MDL and MRL. 1,1-Dichloroethene is an industrial chemical not found naturally in the environment. It is used to make certain plastics, such as flexible films like food wrap, and flame retardant coatings for fiber and carpet backings. 1,1-Dichloroethene is also used in packaging materials, piping, coating for steel

pipes, and adhesive applications. De-ionized water was kept in HDPE Nalgene containers and transferred directly from the Nalgene containers into the laboratory prepared bottles, so it is unlikely this compound is the result of atmospheric contamination. Alternatively, there is a possibility the contamination may have occurred when de-ionized water was pumped into the Nalgene containers at Denver Water laboratories. No corrective action was deemed necessary, as this compound has not been found in associated water quality samples.

5.2 Sample Locations

Sample sites are located within the Upper South Platte watershed and specifically within the South Park area in Park County, Colorado. Surface water sites were chosen based on their proximity and relative hydrologic location to current and projected natural gas exploration or development areas. In general, groundwater flow within the study area follows the topography. Surface water generally flows southeast within the basin, and it was assumed the rivers have some amount of groundwater baseflow. Therefore, surface water (river) samples were collected upstream of projected and current natural gas exploration with the assumption that these samples capture both current surface water conditions and some amount of groundwater baseflow.

The general geographic distribution of the sample locations are shown on Figure 2. As described earlier in this section, groundwater domestic well locations were based on owner participation in the study. Although they do have a good distribution across the study area, their locations were not specifically chosen for any hydrogeologic condition or reason. Groundwater samples were collected from twenty-seven locations throughout the study area. Two of these wells were sampled in the spring and fall to evaluate seasonal variation.

A total of four river sample locations were chosen for this initial baseline sampling; these locations were sampled once in May 2011 and once in October 2011 with the intent of capturing high flow spring runoff conditions and low flow fall conditions. Surface water samples were collected from the Middle Fork of the South Platte River at Garo and the Badger Basin fishing access located just northwest of Hartsel. The main stem of the South Platte River was sampled just above Spinney Reservoir below the confluence of the Middle and South Forks. Additionally, Fourmile Creek was sampled at the DWR gauging station located near Garo. Spring samples were collected from five locations around the study area; these locations are also shown on Figure 2.

6.0 Results

Complete analytical result reports produced by Test America for the 2011 sampling events are provided upon request as Appendix A. These reports provide the laboratory minimum reporting limits (MRL) and method detection limits (MDL) for each analyte during each sampling event. They also contain the laboratory quality control results such as method blanks and duplicate sample runs. The following subsections highlight the field parameter observations and laboratory sample results for surface water samples, spring water samples, and groundwater samples.

6.1 Surface-Water Quality

Generally, surface water in South Park was of high quality. Sample results and field data are summarized in Tables 4 and 5. Total Dissolved Solids values ranged from 140 mg/L to 410 mg/L, and were below the Environmental Protection Agency (EPA) secondary maximum contaminant level (SMCL) of 500 mg/L. With the exception of the detection of Gasoline Range Organics (GRO) in Fourmile Creek (sampled November 11) at 26 μg/L, just above the reporting limit of 25 μg/L, there were no significant detections of organic compounds in any of the other river samples. There were no other organic compound detections in any of the volatile organic compounds (VOC), semi-VOC, Diesel Range Organics (DRO), or HEM Oil and Grease analysis for that sample. After discussion with the laboratory and representatives from the EPA, it appears that minor detections of GRO and DRO are common and may be a result of laboratory contamination.

There were minor exceedances of primary and secondary EPA and state standards for inorganic compounds in all of the spring season river samples. Iron was detected above the state MCL and EPA SMCL at all of the river locations sampled in the spring. By the fall, iron levels were below this aesthetic based SMCL standard. Manganese concentrations were higher than State MCL levels (50 μg/L) in three of the four river samples collected during the spring sampling event including: the Middle Fork of the South Platte at Badger Basin (MFBB-61111 68 μg/L); the South Platte above Spinney Reservoir (SPLATTE-6211 59 μg/L); and Fourmile Creek near Garo (FOURMILECR-61011 70 μg/L). At all river monitoring locations, manganese concentrations dropped below state and EPA drinking water standards during the fall sampling event.

Lead was detected in Fourmile Creek during the spring sampling event at a concentration of 39 μg/L, exceeding the EPA primary MCL of 15 μg/L and the hardness based aquatic life standard[1] by 1.95X. By the fall sampling event, the lead concentration dropped to 4.2 μg/L and no longer exceeded any drinking water standard or aquatic life standards. Lead was also detected in the South Platte above Spinney Reservoir (SPLATTE-6211) and the Middle Fork of the South Platte at Garo (MFGARO-6111) at concentrations of 4 μg/L and 4.3 μg/L respectively. These lead concentrations exceeded the lead aquatic live standard by 1.3X and 1.98 X. During the fall sampling event, lead concentrations had dropped below reporting limits. In the remaining spring and fall sample sets there were no other drinking water standard exceedances, although some metal concentrations were higher than aquatic life standards.

Aluminum was detected above hardness based aquatic life standards in the South Platte above Spinney Reservoir (SPLATTE-6211) and Fourmile Creek near Garo (FOURMILECR-61011) at concentrations of 810 μg/L and 1200 μg/L respectively. By fall, the aluminum concentration had dropped below reporting limits at both locations. The cadmium aquatic life standard was also exceeded by 2X at the South Platte location during the spring sampling event, but by the fall sampling event, cadmium concentrations dropped below reporting limits.

The quality control, blank sample collected during the spring did not show any of the above-mentioned metals. Therefore, the discrepancies between spring and fall sample concentrations can be attributed to seasonal differences rather than potential early season sampling protocol discrepancies. It is apparent that during spring runoff there are higher concentrations of metals in the South Park rivers and streams. The higher metal concentrations do not necessarily correspond to a higher total dissolved solids concentration, but conductivity readings were generally higher during spring season monitoring than fall monitoring. The higher metal concentrations may correspond to additional sediment being transported in the rivers as a result of spring snow melt runoff. Additional seasonal sampling is needed to better qualify the seasonal influence on cation and anion concentrations in the prominent South Park drainages.

[1]Hardness based aquatic life standards are calculated using the equations in Table III of: Colorado Department of Public Health and Environment (CDPHE). 2011. The Basic Standards and Methodologies for Surface Water (5 CCR 1002-31). Water Quality Control Commission. September 30 2012.

6.2 Spring-Water Quality

There are many springs throughout the South Park area. During the 2011 monitoring program, five spring locations were monitored. Of these five locations, three were sampled both in the spring and fall. The fall sampling event for Sevenmile Gulch Spring did not occur because the spring was frozen the entire depth and no sample was collected. There was no spring season sample collected from the spring adjacent to Fourmile Creek near Garo due to budgeting considerations and unknown participation in the well sampling cost-share program. Sample results and field data are summarized in Tables 5 and 6.

Manganese concentrations in the CDOW North Spring sample ID 129138-51011 were higher than the state and EPA secondary MCL of 50 μg/L at a concentration of 56 μg/L in. Manganese was also found in the laboratory blank associated with these sample results; therefore the result has been qualified. There were no other exceedances and no significant detections of organic compounds in either the spring or fall results for the CDOW North Spring.

The BLM Spring located just to the north of Bald Hill was tested in the spring and fall. Spring concentrations of chloride were equal to the EPA SMCL of 250 mg/L, and by the fall sampling event the chloride concentrations had dropped to 47 mg/L. Sulfate was also significantly higher during the spring than the fall, with concentrations in May at 6,200 mg/L and 950 mg/L in October. Both the spring and fall sulfate concentrations were higher than the EPA SMCL of 250 mg/L. There were qualified detections of methane in both the spring and fall samples at concentrations of 3.6 μg/L and 1.3 μg/L respectively. Both of these methane results were qualified as being higher than the instrument detection limit but lower than the laboratory reporting limit, indicating the concentration is only an estimate. Metal concentrations were generally higher in the fall at the BLM Spring. Aluminum was below reporting limits in the spring sample, but the fall concentrations were 260 μg/L. Iron concentrations were the same in the spring and the fall at a concentration of 500 μg/L, higher than the state MCL and the EPA SMCL of 300 μg/L. Manganese concentrations were below reporting limits during the spring but the fall concentration, 56 μg/L, was higher than the state MCL and EPA SMCL of 50 μg/L. Total dissolved solids concentrations decreased significantly from the spring concentration of 8,600 mg/L to the fall concentration of 1,700 mg/L. During the fall sampling event, there were a significant amount of salt deposits on the small mound bounding the north side of the pond. These salt deposits were not observed in the spring sampling event. The

decrease of total dissolved solids and the increase of salt deposits in the fall may be correlated. This also corresponds to the decrease in concentrations of common salt cations, such as calcium, magnesium, sodium, and potassium, from the spring season to the fall, and a corresponding decrease in anion compounds such as sulfate.

Buffalo Spring was tested on 6/2/11 and 10/18/11. This spring is located on the corner of Remington Rd. and CR 15 (Elkhorn Rd.), and is less than 200 yards from the Tarryall Federal natural gas well that was originally drilled by Hunt Oil Company in 1991, re-entered by McMurry Oil Company in 1999, changed ownership to Jonah Energy Company LLC in 2001, and completed on 11/8/2002. This natural gas well was drilled to a total depth of 11,376 ft. A number of violations were associated with the reclamation of this well pad site. It also appears they may have used a mud system that contained 5% diesel when originally drilling the well in 1992. Their production target was the Apache Creek Sandstone interval at a depth of approximately 11,000 ft below ground surface.

The Buffalo Spring had detections of methane at 57 μg/L in the spring season and 8.7 μg/L in the fall season sample. These methane concentrations warrant further investigation into the origin of the methane, particularly because of the proximity to a historic natural gas well. Both Diesel Range Organics and Gasoline Range Organics had qualified detections (above detection limits but below reporting limits) in both the spring and fall season samples. There were no other significant detections of organic compounds at concentrations higher than reporting limits, i.e. non-qualified results. Manganese concentrations were significantly higher than the State MCL and EPA SMCL of 50 μg/L in both the spring (260 μg/L) and fall (260 μg/L) samples. Iron concentrations were also higher than the state MCL and EPA SMCL of 300 μg/L in both the spring (2,300 μg/L) and fall (3,400 μg/L) samples. Cations such as magnesium, potassium, and sodium decreased in concentration from the spring to the fall. Similarly to the BLM Spring, metal concentrations increased from the spring to the fall season and total dissolved solids (TDS) concentrations decreased from the spring season to the fall.

Sevenmile Spring was tested only in the spring; by the fall sampling event, the spring was frozen the entire depth. This spring emerges in a number of locations throughout Sevenmile gulch and seems to be more of an intermittent stream than an isolated spring. Sulfate was detected at 340 mg/L,

higher than the EPA SMCL of 250 mg/L. Methane was also detected at a concentration of 8.3 µg/L. There are no historic oil or gas wells in the near vicinity of the Sevenmile Gulch sampling location. Cattle often use this spring and the methane may be attributed to this land use. Metal, cation, and anion concentrations were similar to the concentrations in the other springs. Manganese was detected at 140 µg/L, higher than the state MCL and EPA SMCL of 50 µg/L.

The spring located adjacent to Fourmile Creek near Garo was only tested in the fall. There were no exceedances of state or EPA drinking water standards nor were there any non-qualified detections of organic compounds.

6.3 Ground-Water Quality

Groundwater quality is generally affected by the local geology; groundwater quality in Park County is no exception. It is affected by natural factors resulting from the interaction of water with the soil and mineralogy of the various geologic formations in addition to human factors (USGS, 2007). Regulatory agencies such as the US EPA and Colorado Department of Public Health and Environment (CDPHE) have established numerical standards for dinking water supplies that are protective of human health; groundwater quality in South Park has been evaluated with respect to these standards. Including spring and fall samples, 29 groundwater samples were collected between May and November 2011 (Table 7). Samples were collected from 27 domestic and stock water well locations following the protocols outlined in the QAPP/SAP.

Using the Colorado State Engineer well permit database, well construction details and depths were used to determine the general geologic unit or units well water originated from. The majority, 20, of the sampled wells were completed in sedimentary rock units, primarily the South Park Formation. The South Park Formation consists of a lower and upper South Park Aquifer respectively located in the conglomeratic member and arkosic member of the South Park Formation. The Upper South Park Aquifer has higher transmissivity values than the Lower aquifer and therefore has higher well yields.

Field parameters for the well samples are provided in Table 8. Water temperature was measured in all of the wells and ranged from 6.90 °C to 19.32 °C with a median of 8.5 °C. Dissolved oxygen, measured in 18 of the wells, ranged from 0.29 to 8.77 mg/L; values for pH ranged from 6.62 to

9.77. Four of the wells had pH values higher than the EPA SMCL range for pH of 6.5 to 8.5. Values of pH greater than 8.5 can cause aesthetic problems such as taste and scaling on piles and fixtures.

One of the most common indicators of water quality is the total dissolved solids (TDS) content. Well water samples were tested for TDS both in the field and by laboratory analysis. TDS values measured in the field are actually calculated by the Hanna Multiparameter probe as related to the measured conductivity values. TDS concentrations provided by laboratory analysis were generally higher than the values calculated by the field probe. The Hanna Probe has a conductivity sensor that measures how much electricity is being conducted through a centimeter of water. A conversion factor is used to convert the electrical conductivity of a water sample in units of mS/cm into TDS. The Hanna Probe has a default setting conversion factor of 0.5 and also accounts for changes in temperature since conductivity varies with temperatures; conductivity values reported in the field data (Table 8) are adjusted for 25 °C.

Test America used method SM 2540C to determine the TDS values for each sample. In this method, a well-mixed sample is filtered through a standard glass fiber filter and the filtrate is evaporated to dryness in a weighted dish and dried to constant weight at 180 °C; the increase in dish weight represents the total dissolved solids. Laboratory measured TDS values ranged from as high as 1,400 mg/L to as low as 160 mg/L. Of the 27 wells, 19 had TDS values less than 500 mg/L, the EPA SMCL. Of the remaining 8 wells, 3 had concentrations greater than 2X the SMCL. Of the 8 wells that exceeded the SMCL of 500 mg/L, all but one were completed in sedimentary rock units; the lowest TDS value was found in a well completed in crystalline rock units.

As water flows through an aquifer it interacts with the different lithologies and assumes a diagnostic chemical composition as a result. Hydrochemical facies is a term used to describe the bodies of groundwater in an aquifer that differ in their chemical composition as a result of different lithologies. Hydrochemical facies can be classified on the basis of the dominant ions; the major ionic species in most natural waters are sodium, potassium, calcium, magnesium, chloride, carbonate, bicarbonate, and sulfate (Fetter, 2001). When the percentages of these ions are plotted on a trilinear diagram, the general groundwater hydrochemical facies can be determined.

Well samples were plotted on a trilinear diagram (Figure 8) according to their dominant aquifer type of sedimentary (n=18), crystalline (n=9), volcanic (n=1), or alluvial (n=1). Wells completed in sedimentary lighologies generally have calcium bicarbonate-sulfate type hydrochemical facies. A minority of the sedimentary wells had sodium dominated cation signatures. Wells drilled into crystalline lithologies have a much tighter signature when plotted on the trilinear diagram and calcium bicarbonate hydrochemical facies dominated.

When well sample results were compared to the state and EPA drinking water standards, as shown in Table 7, three constituents were detected at exceeding concentrations: sulfate, uranium, and manganese. Sulfate was detected at levels exceeding the EPA secondary MCL in five wells; uranium was detected above the EPA primary MCL in six wells, and manganese was detected at levels above the EPA primary MCL in seven wells. Other parameters were detected above state or EPA standards, but these three parameters were the most common exceedances.

6.4 Tetra Tech Sample Summary

The following is a summary of the sampling schedule and sampling plan conducted by Tetra Tech Consulting, who was hired by El Paso to conduct the required sampling in accordance with the schedule below.

CDOW water assets will be sampled at the following frequency:

- No more than three-month (90-day) intervals during drilling and drilling completion operations
- No more than 6-month (180-day) intervals for a minimum of two (2) years following drilling and completion of operations, whether or not production ensues
- No more than 6-month (180-day) intervals during production from any well on the Property
- Upon abandonment, immediately, and 12 months thereafter

Private domestic wells will be sampled at the following frequency:

- Baseline
- Post exploration drilling, sampling of water wells within a one mile radius of each proposed well site within three (3) months of plugging or completing the well

Samples collected by Tetra Tech were sent to Accutest Laboratories in Wheat Ridge for laboratory analysis; volatile compounds were analyzed using EPA method 8260 and method 8270 for semi-volatile compounds. This testing shall also included major anions and cations, total dissolved solids (TDS), field pH, metals (iron, manganese, selenium), BTEX (benzene, toluene, ethylbenzene, and xylenes)/GRO/DRO, specific conductance, dissolved methane, presence of bacteria (iron related, sulfate reducing, slime, and coliform), and hydrogen sulfide. Field observations such as odor, water color, sediment, bubbles, and effervesce shall also be included.

Tetra Tech's SAP included sampling plans for ten water resources identified by the CDOW, including Garcia Gulch drainage, playa lakes, groundwater springs, and livestock watering wells, as the primary water resources in the vicinity of the exploration wells. Additionally, three domestic water wells located within a 1-mile radius of Well 11 were sampled. The Tetra Tech sample locations and identified state water resources are shown in Figure 7.

The results from the quarterly testing was reviewed by CUSP staff and summarized as follows. CUSP reviewed the results from three quarterly sampling events for the North Well on the JMJSWA. There were no detections of organic contaminants in the North Well. Manganese concentrations were higher than the EPA primary drinking water standard of 50 μg/L in all sample events at concentrations of 90.8 μg/L, 90.2 μg/L, and 83.5 μg/L; sulfate was also above the EPA SMCL of 250 mg/L, at concentrations of 785 mg/L, 815 mg/L, and 809 mg/L above. Water chemistry appeared to remain constant from season to season with the exception of iron, which increased from the 2011 spring sample to the 2011 fall sample. Uranium concentrations were fairly consistent from quarter to quarter with a minimum concentration of 5.1 μg/L and maximum of 6.4 μg/L.

CUSP reviewed the results from six quarterly sampling events for the CDOW North Spring located in the JMJSWA. CUSP accompanied Tetra Tech during the May 10, 2011 sampling event and collected a sample alongside their sampling team. This sample acted as a laboratory split comparison between Test America and Accutest. The corresponding results from this sample event are in close agreement even for those results qualified due to presence of the compound in the laboratory blanks or the detection of the compound above detection limits but below reporting limits. All detected compounds reported by Test America and Accutest for the North Spring were below 10% Relative

Percent Difference RPD. There were no detections of organic contaminants in the North Spring quarterly samples with the exception of the February 16, 2012 sampling event. Bis(2-ethylhexyl) phthalate was detected at a concentration of 7.9 μg/L. This compound is a manufactured chemical commonly added to plastics to make them flexible. It is a common laboratory contaminant and was frequently found in the samples analyzed by Test America. Diesel Range Organics (C10-C28) were also detected in the February 16, 2012 North Spring sample, at a concentration of 1.09 mg/L. In the duplicate sample collected by Test America for the February 16, 2012 sampling event of the North Spring, there was no detection of Bis(2-ethylhexyl) phthalate and DRO was detected at 0.838 mg/L. Uranium concentrations remained very constant around a concentration of 3.3 μg/L for all sampling events.

The CDOW solar well, state permit ID – 26789, had detections of methane in all four quarterly sampling events that were reviewed. Methane concentrations were relatively consistent over the quarterly sampling events and ranged from 0.0539 mg/L to 0.0586 mg/L. Diesel Range Organics (C10-C28) were detected in the August 18, 2011 sampling event at a concentration of 1.06 mg/L. A duplicate sample was collected for this location and DRO results for this duplicate were just below reporting limits at a concentration of 0.336 mg/L. For all sampling events, sulfate concentrations exceeded the EPA SMCL of 250 mg/L. Sulfate concentrations ranged from 316 mg/L to 436 mg/L. Both sulfate reducing bacteria and iron reducing bacteria varied significantly between quarters with the highest concentrations occurring in the May 4, 2011 quarterly sample. Uranium was barely detected above the reporting limit of 1 μg/L in three of the four quarterly sampling events.

CUSP reviewed the results from six quarterly sampling events for the South Spring located within the JMJSWA. No organic contaminants were detected above reporting limits. Uranium was detected at low levels ranging from a minimum concentration of 3.1 μg/L to a maximum of 7.2 μg/L. Sulfate concentrations were relatively low in comparison to other springs within South Park. Concentrations remained fairly consistent throughout the quarterly monitoring, with a minimum concentration of 49.4 mg/L and a maximum of 56.5 mg/L; the exception was the February 15, 2012 result of 82.2 mg/L.

Three quarterly sampling events were reviewed for the CDOW south well located as a stock well within the JMJSWA. Methane was detected in two of the three sampling events at low

concentrations of 0.0033 mg/L on July 28, 2010 and 0.0013 mg/L on August 16, 2011. No other organic contaminants were detected during the Tetra Tech quarterly sampling at this location. Manganese concentrations were very consistent over the quarters and were just above the state drinking water standard and EPA SMCLof 50 μg/L at a concentration of 60.6 μg/L. Sulfate concentrations were also just above EPA SMCL with a maximum concentration of 304 mg/L and minimum of 289 mg/L. Sulfate reducing, iron reducing, and slime forming bacteria levels were lowest during the May quarterly sampling event. Uranium was detected in the first sampling event at this location at a concentration of 0.58 μg/L; it was not detected in the subsequent quarterly samples.

Five quarterly results were reviewed for the CDOW middle spring. There were no detections of any organic contaminants. Uranium concentrations were very low and consistent at a concentration of 3.0 μg/L. Sulfate concentrations were also consistent through the quarterly monitoring with concentrations around 80 mg/L. Both iron reducing and sulfate reducing bacteria were constant through the quarters, except for the significant spike in the February 2012 sampling event.

The west playa lake was tested in August 2011, and results indicate the playa water was very concentrated with dissolved solids and salts. Uranium was detected at a concentration of 47 μg/L; this is above the EPA primary drinking water standard of 30 μg/L. No methane or organic contaminants were detected for this monitoring location.

7.0 Summary

Water quality is variable both seasonally and geographically throughout South Park. Water quality is also heavily influenced by the local geology.

Sulfate was detected in all of the locations CUSP monitored in 2011, and concentrations ranged from 17 to 680 mg/L in groundwater samples and 0.98 to 6,200 mg/L in surface water samples; higher sulfate concentrations were found in the springs, and river samples had a maximum sulfate concentration of 830 mg/L. Similarly, sulfate was often found at many of the sample locations monitored by Tetra Tech. In the 2007 USGS Groundwater quality report, sulfate concentrations ranged from 2.4 to 1,760 mg/L with a median concentration of 18 mg/L out of 220 wells sampled. The USGS reported that the highest concentrations of sulfate were generally measured in samples

collected from wells in sedimentary-rock aquifers near the Park County line southwest of Hartsel and between Alma and Fairplay. The lowest sulfate concentrations were measured in samples collected from wells completed in crystalline-rock aquifers. Similarly, CUSP found that wells completed in sedimentary rock aquifers had a maximum sulfate concentration of 830 mg/L and minimum concentration of 27 mg/L, whereas wells completed in crystalline rock had a maximum sulfate concentration of 78 mg/L and a minimum of 17 mg/L.

Uranium was detected in 23 of the 29 groundwater samples collected in 2011. Of these, six locations had concentrations greater than drinking water limits (above 30 μg/L). Uranium was also detected in seven of the eight spring locations and all of the river samples. None of these surface water locations had uranium concentrations greater than drinking water standards.

It is apparent that wells completed in sedimentary formations have higher concentrations of dissolved solids and sulfate, whereas wells completed in crystalline rock units have higher concentrations of uranium. There are exceptions to these trends and future water quality assessment will aid in the interpretation of the hydrogeochemical facies of South Park.

Methane concentrations were highest in the vicinity of the Hartsel area. Future sampling will help determine the isotopic composition of the methane and may help identify its source. One groundwater sample had a significant detection of coliform, which has been attributed to chlorine dosing at the time the well was drilled. This same well also had a significant detection of Gasoline Range Organics and Benzoic Acid. There were no other significant detections of organic compounds in the remaining samples collected by CUSP or Tetra Tech, with the exception of very low concentrations of DRO and GRO. These screening level tests are often indicators of another organic compound, but after thorough review no specific organic compound was identified that would trigger the screening level DRO and GRO tests. Therefore, these minor detections have been attributed to laboratory equipment contamination or organic materials such as grass.

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Table 1 General Analyte List and Analytical Methods

Specific Method	CAS Number	Analyte
2320B	N/A	Alkalinity
2320B	N/A	Bicarbonate Alkalinity as CaCO3
2320B	N/A	Carbonate Alkalinity as CaCO3
2320B	N/A	Hydroxide Alkalinity
300_48HR	14797-55-8	Nitrate as N
300_48HR	14797-65-0	Nitrite as N
300_48HR	N/A	Orthophosphate as P
300.0_28D	24959-67-9	Bromide
300.0_28D	16887-00-6	Chloride
300.0_28D	16984-48-8	Fluoride
300.0_28D	14808-79-8	Sulfate
RSK_175	74-82-8	Methane
RSK_175	74-85-1	Ethylene
RSK_175	74-84-0	Ethane
1664A_Calc	N/A	HEM (n-hexane extractable material) Oil and Grease
6010B	7429-90-5	Aluminum
6010B	7440-70-2	Calcium
6010B	7439-89-6	Iron
6010B	7439-95-4	Magnesium
6010B	7440-09-7	Potassium
6010B	7440-23-5	Sodium
6020	7440-36-0	Antimony
6020	7440-38-2	Arsenic
6020	7440-39-3	Barium
6020	7440-41-7	Beryllium
6020	7440-43-9	Cadmium
6020	7440-47-3	Chromium
6020	7440-48-4	Cobalt
6020	7440-50-8	Copper
6020	7439-92-1	Lead
6020	7439-96-5	Manganese
6020	7440-02-0	Nickel
6020	7782-49-2	Selenium
6020	7440-22-4	Silver
6020	7440-28-0	Thallium
6020	7440-61-1	Uranium
6020	7440-62-2	Vanadium
6020	7440-66-6	Zinc
2540C_Calcd	N/A	Total Dissolved Solids
8015C_DRO	N/A	Diesel Range Organics [C10-C28]

Table 1 General Analyte List and Analytical Methods

Specific Method	CAS Number	Analyte
8015C_GRO	8006-61-9	Gasoline Range Organics (GRO)-C6-C10
8015B_DAI		Propanol
8015B_DAI	67-56-1	Methanol
8270C	92-52-4	1,1'-Biphenyl
8270C	95-94-3	1,2,4,5-Tetrachlorobenzene
8270C	120-82-1	1,2,4-Trichlorobenzene
8270C	95-50-1	1,2-Dichlorobenzene
8270C	541-73-1	1,3-Dichlorobenzene
8270C	106-46-7	1,4-Dichlorobenzene
8270C	123-91-1	1,4-Dioxane
8270C	58-90-2	2,3,4,6-Tetrachlorophenol
8270C	95-95-4	2,4,5-Trichlorophenol
8270C	88-06-2	2,4,6-Trichlorophenol
8270C	120-83-2	2,4-Dichlorophenol
8270C	105-67-9	2,4-Dimethylphenol
8270C	51-28-5	2,4-Dinitrophenol
8270C	121-14-2	2,4-Dinitrotoluene
8270C	606-20-2	2,6-Dinitrotoluene
8270C	91-58-7	2-Chloronaphthalene
8270C	95-57-8	2-Chlorophenol
8270C	91-57-6	2-Methylnaphthalene
8270C	95-48-7	2-Methylphenol
8270C	88-74-4	2-Nitroaniline
8270C	88-75-5	2-Nitrophenol
8270C	15831-10-4	3 & 4 Methylphenol
8270C	91-94-1	3,3'-Dichlorobenzidine
8270C	99-09-2	3-Nitroaniline
8270C	534-52-1	4,6-Dinitro-2-methylphenol
8270C	101-55-3	4-Bromophenyl phenyl ether
8270C	59-50-7	4-Chloro-3-methylphenol
8270C	106-47-8	4-Chloroaniline
8270C	7005-72-3	4-Chlorophenyl phenyl ether
8270C	100-01-6	4-Nitroaniline
8270C	100-02-7	4-Nitrophenol
8270C	83-32-9	Acenaphthene
8270C	208-96-8	Acenaphthylene
8270C	98-86-2	Acetophenone
8270C	120-12-7	Anthracene
8270C	1912-24-9	Atrazine
8270C	100-52-7	Benzaldehyde

Table 1 General Analyte List and Analytical Methods

Specific Method	CAS Number	Analyte
8270C	56-55-3	Benzo[a]anthracene
8270C	50-32-8	Benzo[a]pyrene
8270C	205-99-2	Benzo[b]fluoranthene
8270C	191-24-2	Benzo[g,h,i]perylene
8270C	207-08-9	Benzo[k]fluoranthene
8270C	65-85-0	Benzoic acid
8270C	100-51-6	Benzyl alcohol
8270C	111-91-1	Bis(2-chloroethoxy)methane
8270C	111-44-4	Bis(2-chloroethyl)ether
8270C	117-81-7	Bis(2-ethylhexyl) phthalate
8270C	85-68-7	Butyl benzyl phthalate
8270C	105-60-2	Caprolactam
8270C	86-74-8	Carbazole
8270C	218-01-9	Chrysene
8270C	53-70-3	Dibenz(a,h)anthracene
8270C	132-64-9	Dibenzofuran
8270C	84-66-2	Diethyl phthalate
8270C	131-11-3	Dimethyl phthalate
8270C	84-74-2	Di-n-butyl phthalate
8270C	117-84-0	Di-n-octyl phthalate
8270C	206-44-0	Fluoranthene
8270C	86-73-7	Fluorene
8270C	118-74-1	Hexachlorobenzene
8270C	87-68-3	Hexachlorobutadiene
8270C	77-47-4	Hexachlorocyclopentadiene
8270C	67-72-1	Hexachloroethane
8270C	193-39-5	Indeno[1,2,3-cd]pyrene
8270C	78-59-1	Isophorone
8270C	91-20-3	Naphthalene
8270C	98-95-3	Nitrobenzene
8270C	621-64-7	N-Nitrosodi-n-propylamine
8270C	86-30-6	N-Nitrosodiphenylamine
8270C	87-86-5	Pentachlorophenol
8270C	85-01-8	Phenanthrene
8270C	108-95-2	Phenol
8270C	129-00-0	Pyrene
8260B	71-55-6	1,1,1-Trichloroethane
8260B	79-34-5	1,1,2,2-Tetrachloroethane
8260B	79-00-5	1,1,2-Trichloroethane
8260B	76-13-1	1,1,2-Trichlorotrifluoroethane

Table 1 General Analyte List and Analytical Methods

Specific Method	CAS Number	Analyte
8260B	75-34-3	1,1-Dichloroethane
8260B	75-35-4	1,1-Dichloroethene
8260B	87-61-6	1,2,3-Trichlorobenzene
8260B	120-82-1	1,2,4-Trichlorobenzene
8260B	96-12-8	1,2-Dibromo-3-Chloropropane
8260B	106-93-4	1,2-Dibromoethane
8260B	95-50-1	1,2-Dichlorobenzene
8260B	107-06-2	1,2-Dichloroethane
8260B	78-87-5	1,2-Dichloropropane
8260B	541-73-1	1,3-Dichlorobenzene
8260B	106-46-7	1,4-Dichlorobenzene
8260B	123-91-1	1,4-Dioxane
8260B	591-78-6	2-Hexanone
8260B	108-10-1	4-Methyl-2-pentanone (MIBK)
8260B	67-64-1	Acetone
8260B	71-43-2	Benzene
8260B	75-27-4	Bromodichloromethane
8260B	75-25-2	Bromoform
8260B	75-15-0	Carbon disulfide
8260B	56-23-5	Carbon tetrachloride
8260B	108-90-7	Chlorobenzene
8260B	74-97-5	Chlorobromomethane
8260B	124-48-1	Chlorodibromomethane
8260B	75-00-3	Chloroethane
8260B	67-66-3	Chloroform
8260B	156-59-2	cis-1,2-Dichloroethene
8260B	10061-01-5	cis-1,3-Dichloropropene
8260B	110-82-7	Cyclohexane
8260B	75-71-8	Dichlorodifluoromethane
8260B	100-41-4	Ethylbenzene
8260B	67-63-0	Isopropanol
8260B	98-82-8	Isopropylbenzene
8260B	79-20-9	Methyl acetate
8260B	74-83-9	Methyl bromide
8260B	74-87-3	Methyl chloride
8260B	78-93-3	Methyl Ethyl Ketone (2-Butanone)
8260B	1634-04-4	Methyl tert-butyl ether
8260B	108-87-2	Methylcyclohexane
8260B	75-09-2	Methylene Chloride
8260B	179601-23-1	m-Xylene & p-Xylene

Table 1 General Analyte List and Analytical Methods

Specific Method	CAS Number	Analyte
8260B	95-47-6	o-Xylene
8260B	100-42-5	Styrene
8260B	127-18-4	Tetrachloroethylene
8260B	108-88-3	Toluene
8260B	156-60-5	trans-1,2-Dichloroethene
8260B	10061-02-6	trans-1,3-Dichloropropene
8260B	79-01-6	Trichloroethene
8260B	75-69-4	Trichlorofluoromethane
8260B	108-05-4	Vinyl acetate
8260B	75-01-4	Vinyl chloride
8260B	1330-20-7	Xylenes, Total

Table 2
Sampling Containers and Preservatives

Test Description	Holding Time	#of Containers per sample	Container Type	Preservative
Volatile Organic Compounds (GC/MS)	14 Days or per lab instructions	3	40 ml VOA	Hydrochloric Acid
Semivolatile Organic Compounds (GC/MS)	14 Days or per lab instructions	2	1 L Amber Glass	None
Dissolved Gases (GC) - Methane, Ethane, Ethylene	Per lab instructions	3	40 ml VOA	Hydrochloric Acid
Total Metals (ICP/MS) – 17 Elements (Includes Uranium), Total Metals (ICP-AES) – 6 Elements	6 months or per lab instructions	1	1 L Plastic	Nitric Acid
Gross Alpha and Beta	Per lab instructions	1	1 L Plastic	Nitric Acid
Diesel Range Organics (DRO) (GC) - C10-C28	14 days or per lab instructions	2	1 L Amber Glass	None
Gasoline Range Organics (GRO) (GC) - C6-C10	14 days or per lab instructions	3	40 ml VOA	Hydrochloric Acid
Chloride, Fluoride, Sulfate (IC) (Anions)	28 Days	2	1 L Plastic	None
Nitrate, Nitrite, Orthophosphate (IC)	48 Hours	Same bottle as Anions	1 L Plastic	None
Coliforms, Total (Membrane Filter)	24 Hours	1	125 ml Plastic	Sodium Thiosulfate
Alkalinity	Per lab instructions	Same bottle as Anions	1 L Plastic	None
Methanol and Propanol (Nonhalogenated Organic Compounds - Direct Injection (GC))	14 Days or per lab instructions	2	40 ml VOA	None
Solids, Total Dissolved (TDS)	Per lab instructions	Same bottle as Anions	1 L Plastic	None
HEM (Oil & Grease)	Per lab instructions	2	1 L Amber Glass	Sulfuric Acid
Gross Alpha / Beta	Per lab instructions	2	1 L or 500 ml Plastic	Nitric Acid

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111		MFBB-101911		MFGARO-6111		MFGARO-101911	
N/A	Alkalinity	mg/L				96		140		89		130	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				96		140		89		130	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		ND		ND		ND		ND	
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				ND		ND		ND		ND	
16887-00-6	Chloride	mg/L			250	4.8		5.1		4.1		4.4	
16984-48-8	Fluoride	mg/L		4	2	0.13	J	0.13	J	0.13	J	0.13	J
14808-79-8	Sulfate	mg/L			250	33		34		31		35	
N/A	Coliform, Total	MPN/100ml [1]		< 5%		-		102		-		110	
74-82-8	Methane	ug/L				0.26	J	0.4	J	ND		ND	
74-82-8	Methane	ug/L				0.26	J	0.4	J	ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND	
N/A	HEM	mg/L				2.5	J B	ND		2.4	J B	ND	
7429-90-5	Aluminum	ug/L	5000		0.05 to 2.0 mg/L	650		39	J	370		ND	
7440-70-2	Calcium	ug/L				31000		40000		29000		39000	
7439-89-6	Iron	ug/L	300		300	980		100		600		66	J
7439-95-4	Magnesium	ug/L				12000		15000		12000		15000	
7440-09-7	Potassium	ug/L				1200	J	1500	J	1000	J	1200	J
7440-23-5	Sodium	ug/L				3200		4700	B	2500		3400	B
7440-36-0	Antimony	ug/L	6	6		0.13	J	ND		0.13	J	ND	
7440-38-2	Arsenic	ug/L	50	10		0.29	J	ND		ND		ND	
7440-39-3	Barium	ug/L	2000	2000		57		54		51		50	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		ND	
7440-43-9	Cadmium	ug/L	5	5		0.2	J	0.044	J	0.2	J	ND	
7440-47-3	Chromium	ug/L		100		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111		MFBB-101911		MFGARO-6111		MFGARO-101911	
7440-48-4	Cobalt	ug/L	50			0.26	J	ND		0.13	J	ND	
7440-50-8	Copper	ug/L	200	1300	1000	2.8		ND		2.2		ND	
7439-92-1	Lead	ug/L	50	15		6.1		0.33	J	4.3		0.47	J
7439-96-5	Manganese	ug/L	50		50	68		24		47		16	
7440-02-0	Nickel	ug/L	100			0.81	J	ND		0.55	J	ND	
7782-49-2	Selenium	ug/L	20	50		ND		ND		ND		ND	
7440-22-4	Silver	ug/L	50		100	0.017	J	ND		0.021	J	ND	
7440-28-0	Thallium	ug/L	2	2		0.037	J B	ND		0.045	J B	ND	
7440-61-1	Uranium	ug/L		30		2.6		3.1		2.4		3.2	
7440-62-2	Vanadium	ug/L	100			0.78	J	0.16	J	0.38	J	ND	
7440-66-6	Zinc	ug/L	2000		5000	31		7.9	J	35		21	
N/A	Total Dissolved Solids	mg/L			500	170		190		140		170	
N/A	Gross Beta	pCi/L				3.59 ± 1.2	J	3.08 ± 1.6	J	2.14 ± 1.1	J	7.43 ± 2.0	
N/A	Gross Alpha	pCi/L		15		1.46 ± 1.1	J	2.52 ± 1.0	J	1.32 ± 1.3	U	2.53 ± 1.1	J
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				10	J	ND		10	J	ND	
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND	
111-91-1	Bis(2-chloroethoxy)methane	ug/L				ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND	
117-81-7	Bis(2-ethylhexyl) phthalate	ug/L	2.5	6		2.5	J B	2.6	J B	2.2	J B	2.7	J B

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111		MFBB-101911		MFGARO-6111		MFGARO-101911	
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND	
51-28-5	2,4-Dinitrophenol	ug/L	14			ND		ND		ND		ND	
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND		ND		ND		ND	
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND		ND		ND		ND	
117-84-0	Di-n-octyl phthalate	ug/L	280			ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
206-44-0	Fluoranthene	ug/L	280			ND		ND		ND		ND	
86-73-7	Fluorene	ug/L	280			ND		ND		ND		ND	
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND		ND		ND		ND	
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND		ND		ND		ND	
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND		ND		ND		ND	
67-72-1	Hexachloroethane	ug/L	0.7			ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111		MFBB-101911		MFGARO-6111		MFGARO-101911	
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND		ND		ND		ND	
78-59-1	Isophorone	ug/L	140			ND		ND		ND		ND	
91-57-6	2-Methylnaphthalene	ug/L	28			ND		ND		ND		ND	
95-48-7	2-Methylphenol	ug/L	350			ND		ND		ND		ND	
15831-10-4	3 & 4 Methylphenol	ug/L				ND		ND		ND		ND	
91-20-3	Naphthalene	ug/L	140			ND		ND		ND		ND	
88-74-4	2-Nitroaniline	ug/L				ND		ND		ND		ND	
99-09-2	3-Nitroaniline	ug/L				ND		ND		ND		ND	
100-01-6	4-Nitroaniline	ug/L				ND		ND		ND		ND	
98-95-3	Nitrobenzene	ug/L	3.5			ND		ND		ND		ND	
88-75-5	2-Nitrophenol	ug/L				ND		ND		ND		ND	
100-02-7	4-Nitrophenol	ug/L	56			ND		ND		ND		ND	
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND		ND		ND		ND	
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND		ND		ND		ND	
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND		ND		ND		ND	
85-01-8	Phenanthrene	ug/L				ND		ND		ND		ND	
108-95-2	Phenol	ug/L	2100			ND		ND		ND		ND	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		ND		ND		ND	
95-94-3	1,2,4,5-Tetrachlorobenzene	ug/L				ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111		MFBB-101911		MFGARO-6111		MFGARO-101911	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		ND		ND		ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	MFBB-6111	MFBB-101911	MFGARO-6111	MFGARO-101911
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND	ND	ND	ND
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND	ND	ND	ND
100-41-4	Ethylbenzene	ug/L	700	700		ND	ND	ND	ND
179601-23-1	m-Xylene & p-Xylene	ug/L				ND	ND	ND	ND
95-47-6	o-Xylene	ug/L				ND	ND	ND	ND
75-01-4	Vinyl chloride	ug/L	0.023	2		ND	ND	ND	ND
76-13-1	1,1,2-Trichlorotrifluoroethane	ug/L	210000			ND	ND	ND	ND
79-01-6	Trichloroethene	ug/L	5	5		ND	ND	ND	ND
75-69-4	Trichlorofluoromethane	ug/L	2100			ND	ND	ND	ND
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND	ND	ND	ND
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND	ND	ND	ND
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND	ND	ND	ND
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND	ND	ND	ND
108-88-3	Toluene	ug/L	1000	1000		ND	ND	ND	ND
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND	ND	ND	ND
100-42-5	Styrene	ug/L	100	100		ND	ND	ND	ND
127-18-4	Tetrachloroethylene	ug/L	5	5		ND	ND	ND	ND
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND	ND	ND	ND
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND	ND	ND	ND
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND	ND	ND	ND
123-91-1	1,4-Dioxane	ug/L	6.1			ND	ND	ND	ND
108-87-2	Methylcyclohexane	ug/L				ND	ND	ND	ND
108-05-4	Vinyl acetate	ug/L	7000			ND	ND	ND	ND
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND	ND	ND	ND

[1] (MPN) most probable number metod

[2] CDPHE Water Standards 2007
[3] USEPA - Primary Drinking Water Standards
[4] USEPA - Secondary Drinking Water Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

[J] Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
N/A	Alkalinity	mg/L				120		140		130		190	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				120		140		130		190	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		2	J	3.6	J
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		ND		ND		ND		0.076	J
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				ND		ND		ND		ND	
16887-00-6	Chloride	mg/L			250	100		30		0.31	J	0.68	J
16984-48-8	Fluoride	mg/L		4	2	0.17	J	0.15	J	ND		ND	
14808-79-8	Sulfate	mg/L			250	87		47		22		45	
N/A	Coliform, Total	MPN/100ml [1]		< 5%		-		65		551		58	
74-82-8	Methane	ug/L				0.52	J	0.43	J	ND		ND	
74-82-8	Methane	ug/L				0.52	J	0.43	J	ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND	
N/A	HEM	mg/L				2.5	J B	ND		1.8	J B	1.7	J B
7429-90-5	Aluminum	ug/L	5000		0.05 to 2.0 mg/L	810		54	J	1200		81	J
7440-70-2	Calcium	ug/L				46000		41000		34000		53000	
7439-89-6	Iron	ug/L	300		300	1200		110		1400		150	
7439-95-4	Magnesium	ug/L				20000		17000		15000		25000	
7440-09-7	Potassium	ug/L				2500	J	1600	J	1300	J	1900	J B
7440-23-5	Sodium	ug/L				73000		24000	B	1000	B	3300	B
7440-36-0	Antimony	ug/L	6	6		0.15	J	0.18	J	1.5	J	0.49	J
7440-38-2	Arsenic	ug/L	50	10		0.71	J	0.63	J	1.3	J	0.27	J
7440-39-3	Barium	ug/L	2000	2000		64		58		140	B	120	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		ND	
7440-43-9	Cadmium	ug/L	5	5		0.12	J	0.11	J	0.18	J	ND	
7440-47-3	Chromium	ug/L		100		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
7440-48-4	Cobalt	ug/L	50			0.27	J	ND		0.3	J	0.061	J
7440-50-8	Copper	ug/L	200	1300	1000	1.8	J	ND		3.7		ND	
7439-92-1	Lead	ug/L	50	15		4		0.19	J	39		4.2	
7439-96-5	Manganese	ug/L	50		50	59		13		70	B	14	B
7440-02-0	Nickel	ug/L	100			0.92	J	ND		1.1	J	ND	
7782-49-2	Selenium	ug/L	20	50		ND		ND		ND		ND	
7440-22-4	Silver	ug/L	50		100	ND		ND		0.037	J	0.027	J
7440-28-0	Thallium	ug/L	2	2		0.027	J B	ND		ND		ND	
7440-61-1	Uranium	ug/L		30		3.2		3.1		1.7		2.4	B
7440-62-2	Vanadium	ug/L	100			1.2	J	0.53	J B	0.8	J	0.25	J
7440-66-6	Zinc	ug/L	2000		5000	16		5	J	44		8.4	J B
N/A	Total Dissolved Solids	mg/L			500	410		240		160	B	240	
N/A	Gross Beta	pCi/L				5.06 ± 1.8		1.19 ± 1.9	U	3.86 ± 1.6	J	0.726 ± 1.5	U
N/A	Gross Alpha	pCi/L		15		3.66 ± 2.6		1.13 ± 2.0	U	1.72 ± 1.3	J	0.824 ± 1.2	U
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				15	J	ND		ND		26	
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND	
111-91-1	Bis(2-chloroethoxy)methane	ug/L				ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND	
117-81-7	Bis(2-ethylhexyl) phthalate	ug/L	2.5	6		2.2	J B	0.65	J	2.1	J B	ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND	
51-28-5	2,4-Dinitrophenol	ug/L	14			ND		ND		ND		ND	
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND		ND		ND		ND	
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND		ND		ND		ND	
117-84-0	Di-n-octyl phthalate	ug/L	280			ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
206-44-0	Fluoranthene	ug/L	280			ND		ND		ND		ND	
86-73-7	Fluorene	ug/L	280			ND		ND		ND		ND	
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND		ND		ND		ND	
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND		ND		ND		ND	
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND		ND		ND		ND	
67-72-1	Hexachloroethane	ug/L	0.7			ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND		ND		ND		ND	
78-59-1	Isophorone	ug/L	140			ND		ND		ND		ND	
91-57-6	2-Methylnaphthalene	ug/L	28			ND		ND		ND		ND	
95-48-7	2-Methylphenol	ug/L	350			ND		ND		ND		ND	
15831-10-4	3 & 4 Methylphenol	ug/L				ND		ND		ND		ND	
91-20-3	Naphthalene	ug/L	140			ND		ND		ND		ND	
88-74-4	2-Nitroaniline	ug/L				ND		ND		ND		ND	
99-09-2	3-Nitroaniline	ug/L				ND		ND		ND		ND	
100-01-6	4-Nitroaniline	ug/L				ND		ND		ND		ND	
98-95-3	Nitrobenzene	ug/L	3.5			ND		ND		ND		ND	
88-75-5	2-Nitrophenol	ug/L				ND		ND		ND		ND	
100-02-7	4-Nitrophenol	ug/L	56			ND		ND		ND		ND	
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND		ND		ND		ND	
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND		ND		ND		ND	
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND		ND	*	ND		ND	
85-01-8	Phenanthrene	ug/L				ND		ND		ND		ND	
108-95-2	Phenol	ug/L	2100			ND		ND		ND		ND	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		ND		ND		ND	
95-94-3	1,2,4,5-Tetrachlorobenzene	ug/L				ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		0.5	J B	0.4	J B	ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND	

Table 3
Laboratory Results for Surface Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	SPLATTE-6211		SPLATTE - 101811		FOURMILECR-61011		FOURMILECR-111511	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND	
76-13-1	1,1,2-Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		0.47	J B	ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND	*
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND	

[1] (MPN) most probable number metod

[2] CDPHE Water Standards 2007
USEPA - Primary Drinking Water
[3] Standards
USEPA - Secondary Drinking Water
[4] Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit
J Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted
Middle Fork of South Platte at Badger Basin Fishing Access just below confluence with Trout Creek	MFBB-6111	6/1/2011	2:30	JJ, CF	SW	GRO,DRO, VOC, SVOC, TDS, Anions, Alk., RSK-175, Total Metals, oil-grease
Middle Fork South Platte River at Badger Basin fishing access	MFBB-101911	10/19/2011	9:30	JJ	SW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta
Fourmile Creek at Mills Property	FourmileCreek-61011	6/10/2011	1:30	JJ, TZ	SW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta
Fourmile Creek at Mills Property	FOURMILECR-111511	11/15/2011	1:35	JJ	SW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted
South Platte River above Spinney Mt. Res	SPLATTE-6211	6/2/2011	9:30	JJ, CF	SW	GRO,DRO, VOC, SVOC, TDS, Anions, Alk., RSK-175, Total Metals, oil-grease
South Platte River above Spinney Mt. Res	SPLATTE-101811	10/18/2011	10:00	JJ	SW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta
Middle Fork of South Platte at Garo	MFGARO-6111	6/1/2011	11:15	JJ, CF	SW	GRO,DRO, VOC, SVOC, TDS, Anions, Alk., RSK-175, Total Metals, oil-grease
Middle Fork South Platte at Garo	MFGARO-101911	10/19/2011	11:30	JJ	SW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm	DO ppm	Odor	Color
Middle Fork of South Platte at Badger Basin Fishing Access just below confluence with Trout Creek	MFBB-6111	12.7	8.21	203	132	8.57	none	none
Middle Fork South Platte River at Badger Basin fishing access	MFBB-101911	1.94	7.82	187	166	10.1	none	none
Fourmile Creek at Mills Property	FourmileCreek-61011	16.16	7.89	232	138	7.14	none	none
Fourmile Creek at Mills Property	FOURMILECR-111511	-0.04	8.16	209	200	10.7	none	none

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm	DO ppm	Odor	Color
South Platte River above Spinney Mt. Res	SPLATTE-6211	10.14	8.55	473	329	7.31	none	none
South Platte River above Spinney Mt. Res	SPLATTE-101811	3.59	9.01	256	216	10.46	none	none
Middle Fork of South Platte at Garo	MFGARO-6111	8.69	8.48	163	118	10.09	none	none
Middle Fork South Platte at Garo	MFGARO-101911	2.95	7.97	190	163	9.67	none	none

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions	Notes/Comments	Easting	Northing
Middle Fork of South Platte at Badger Basin Fishing Access just below confluence with Trout Creek	MFBB-6111	none	none	sunny, windy	meandering river at high flow, many braided channels	collected water sample below confluence of all braids, cattle near sample location, cross section deep on East side	430333	4322872
Middle Fork South Platte River at Badger Basin fishing access	MFBB-101911	none	none	sunny	river, low flow	collected water sample below confluence of braided sections of river, water much lower than spring sample, no flow measurement because flow meter not in operation	430509	4322666
Fourmile Creek at Mills Property	FourmileCreek-61011	none	none	sunny	Fourmile Creek at Joanne Mills property	collected sample just downstream from gauging station, river is about 9 ft wide, also did flow measurement	422582	4326444
Fourmile Creek at Mills Property	FOURMILECR-111511	none	none	cold, windy	very cold water, ice on water, about 6-12 inches of snow on the ground	collected sample at bridge just down stream of gauging station, same location as spring sample location	422582	4326444

Table 4
Field Data for Surface Water Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions	Notes/Comments	Easting	Northing
South Platte River above Spinney Mt. Res	SPLATTE-6211	none	none	sunny, very windy	meandering river at very high flow	collected sample at last fishing access just above Spinney Mt. Res, sample collected from South Platte river below confluence of Middle and South Forks	437420	4317688
South Platte River above Spinney Mt. Res	SPLATTE-101811	none	none	sunny, windy, cold	river, low flow	collected sample at last fishing access just above Spinney Mt. Res, sample collected from South Platte river below confluence of Middle and South Forks	437427	4317691
Middle Fork of South Platte at Garo	MFGARO-6111	none	none	sunny, windy	meandering river at high flow	collected water sample upstream of gauging station	423116	4329367
Middle Fork South Platte at Garo	MFGARO-101911	none	none	sunny	river, low flow	collected water sample downstream of gauging station	423116	4329367

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
N/A	Alkalinity	mg/L				220		220		290		220	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				220		220		290		220	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		0.058	J	0.061	J	ND		ND	
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				0.14	J	0.12	J	1.7		0.31	
16887-00-6	Chloride	mg/L			250	5.2		5.2		250		47	
16984-48-8	Fluoride	mg/L		4	2	0.14	J	0.15	J	0.58	J	0.31	J
14808-79-8	Sulfate	mg/L			250	71		76		6200		950	
N/A	Coliform, Total	MPN/100ml [1]		< 5%		ND		2		-		429	
74-82-8	Methane	ug/L				ND		ND		3.6	J	1.3	J
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND	
N/A	HEM	mg/L				1.9	J B	2	J B	2.8	J B	1.4	J B
7429-90-5	Aluminum	ug/L	5000		0.05 to 2.0 mg/L	ND		ND		42	J	260	
7440-70-2	Calcium	ug/L				71000		77000		270000		130000	
7439-89-6	Iron	ug/L	300		300	ND		ND		500		500	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
7439-95-4	Magnesium	ug/L				12000		13000		330000		63000	
7440-09-7	Potassium	ug/L				1600	J B	1200	J	75000		21000	
7440-23-5	Sodium	ug/L				26000	B	30000		2100000		350000	B
7440-36-0	Antimony	ug/L	6	6		0.39	J	0.18	J	ND		0.34	J
7440-38-2	Arsenic	ug/L	50	10		0.52	J	ND		ND		4.9	J
7440-39-3	Barium	ug/L	2000	2000		35		58		ND		52	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		0.12	J
7440-43-9	Cadmium	ug/L	5	5		0.098	J	ND		ND		0.048	J
7440-47-3	Chromium	ug/L		100		ND		ND		ND		0.61	J
7440-48-4	Cobalt	ug/L	50			0.63	J	ND		ND		0.63	J
7440-50-8	Copper	ug/L	200	1300	1000	13		ND		ND		ND	
7439-92-1	Lead	ug/L	50	15		0.67	J	ND		ND		0.21	J
7439-96-5	Manganese	ug/L	50		50	56	B	0.55	J ^	0.49	J	56	
7440-02-0	Nickel	ug/L	100			5.7		ND		ND		1	J
7782-49-2	Selenium	ug/L	20	50		15		1.3	J	2.4	J	ND	
7440-22-4	Silver	ug/L	50		100	0.15	J	ND		0.018	J	0.63	J
7440-28-0	Thallium	ug/L	2	2		ND		ND		ND		0.028	J
7440-61-1	Uranium	ug/L		30		7.5		3.4		ND		3	
7440-62-2	Vanadium	ug/L	100			0.63	J	0.2	J	ND		4.6	J B
7440-66-6	Zinc	ug/L	2000		5000	24		ND		ND		2.6	J
N/A	Total Dissolved Solids	mg/L			500	340	B	320		8600	B	1700	
N/A	Gross Beta	pCi/L				NT		4.6 ± 1.8		72.4 ± 23		26.9 ± 6.1	
N/A	Gross Alpha	pCi/L		15		NT		2.98 ± 2.2	U	-0.924 ± 11	U	6.73 ± 8.5	U

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		0.38		0.042	J
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				11	J	ND		11	J	ND	
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND	
111-91-1	Bis(2-chloroethoxy)methane	ug/L				ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND	
117-81-7	Bis(2-ethylhexyl) phthalate	ug/L	2.5	6		2.3	J B	ND		2.7	J B	ND	
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			0.36	J B	ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND	
51-28-5	2,4-Dinitrophenol	ug/L	14			ND		ND		ND		ND	
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND		ND		ND		ND	
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND		ND		ND		ND	
117-84-0	Di-n-octyl phthalate	ug/L	280			ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
206-44-0	Fluoranthene	ug/L	280			ND		ND		ND		ND	
86-73-7	Fluorene	ug/L	280			ND		ND		ND		ND	
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND		ND		ND		ND	
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND		ND		ND		ND	
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND		ND		ND		ND	
67-72-1	Hexachloroethane	ug/L	0.7			ND		ND		ND		ND	
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND		ND		ND		ND	
78-59-1	Isophorone	ug/L	140			ND		ND		0.67	J	ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
91-57-6	2-Methylnaphthalene	ug/L	28			ND		ND		ND		ND	
95-48-7	2-Methylphenol	ug/L	350			ND		ND		ND		ND	
15831-10-4	3 & 4 Methylphenol	ug/L				ND		ND		ND		ND	
91-20-3	Naphthalene	ug/L	140			ND		ND		ND		ND	
88-74-4	2-Nitroaniline	ug/L				ND		ND		ND		ND	
99-09-2	3-Nitroaniline	ug/L				ND		ND		ND		ND	
100-01-6	4-Nitroaniline	ug/L				ND		ND		ND		ND	
98-95-3	Nitrobenzene	ug/L	3.5			ND		ND		ND		ND	
88-75-5	2-Nitrophenol	ug/L				ND		ND		ND		ND	
100-02-7	4-Nitrophenol	ug/L	56			ND		ND		ND		ND	
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND		ND		ND		ND	
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND		ND		ND		ND	
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND		ND		ND		ND	*
85-01-8	Phenanthrene	ug/L				ND		ND		ND		ND	
108-95-2	Phenol	ug/L	2100			ND		ND		ND		ND	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		ND		ND		ND	
95-94-3	1,2,4,5-Tetrachlorobenzene	ug/L				ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		14		2.2	J
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		0.68	J
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND	*	ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		0.4	J B	ND		0.45	J B
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND	
76-13-1	1,1,2-Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND	*	ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		ND		ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	129138-51011		129138-111111		BLMSP01-51911		BLMSP01 - 101811	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND	
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND	

[1] (MPN) most probable number metod

[2] CDPHE Water Standards 2011

[3] USEPA - Primary Drinking Water Standards

[4] USEPA - Secondary Drinking Water Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

[J] Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
N/A	Alkalinity	mg/L				160		100		250		180	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				160		100		250		180	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		ND		ND		ND		0.39	J
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				0.16	J	ND		0.14	J	ND	
16887-00-6	Chloride	mg/L			250	12		5.5		12		11	
16984-48-8	Fluoride	mg/L		4	2	0.49	J	0.15	J	0.42	J	0.14	J
14808-79-8	Sulfate	mg/L			250	1.8	J	0.98	J	340		32	
N/A	Coliform, Total	MPN/100ml[1]		< 5%		-		158		-		148	
74-82-8	Methane	ug/L				57		8.7		8.3		0.32	J p
74-85-1	Ethylene	ug/L				ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND	
N/A	HEM	mg/L				2.2	J B	1.5	J B	2.7	J B	1.8	J B
7429-90-5	Aluminum	ug/L	5000		0.05 to 2.0 mg/L	470		1300		360		ND	
7440-70-2	Calcium	ug/L				34000		24000		110000		47000	
7439-89-6	Iron	ug/L	300		300	2300		3400		340		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
7439-95-4	Magnesium	ug/L				9000		6400		15000		20000	
7440-09-7	Potassium	ug/L				11000		7100		2200	J	2400	J B
7440-23-5	Sodium	ug/L				21000		6100	B	130000		11000	B
7440-36-0	Antimony	ug/L	6	6		0.1	J	0.45	J	ND		0.18	J
7440-38-2	Arsenic	ug/L	50	10		1.9	J	2.2	J	0.44	J	0.44	J
7440-39-3	Barium	ug/L	2000	2000		40		47		26		71	
7440-41-7	Beryllium	ug/L	4	4		ND		0.14	J	ND		ND	
7440-43-9	Cadmium	ug/L	5	5		ND		ND		ND		ND	
7440-47-3	Chromium	ug/L		100		ND		1.3	J	ND		ND	
7440-48-4	Cobalt	ug/L	50			0.69	J	0.74	J	0.3	J	ND	
7440-50-8	Copper	ug/L	200	1300	1000	0.91	J	1.8	J	ND		ND	
7439-92-1	Lead	ug/L	50	15		0.99	J	2.1		0.23	J	ND	
7439-96-5	Manganese	ug/L	50		50	260		260		140		1.1	B
7440-02-0	Nickel	ug/L	100			2.2		1.9	J	1.1	J	ND	
7782-49-2	Selenium	ug/L	20	50		ND		ND		ND		ND	
7440-22-4	Silver	ug/L	50		100	ND		0.034	J	ND		ND	
7440-28-0	Thallium	ug/L	2	2		ND		0.031	J	0.031	J	ND	
7440-61-1	Uranium	ug/L		30		12		2.3		1.5		3.1	B
7440-62-2	Vanadium	ug/L	100			2.3	J	3.2	J B	1.2	J	0.81	J
7440-66-6	Zinc	ug/L	2000		5000	2.3	J	6.6	J	ND		ND	
N/A	Total Dissolved Solids	mg/L			500	230		150		770		230	
N/A	Gross Beta	pCi/L				13.4 ± 2.8		8.88 ± 2.1		5.51 ± 2.4		3.49 ± 1.7	J
N/A	Gross Alpha	pCi/L		15		9.91 ± 3.2		2.63 ± 1.7	U	2.55 ± 2.6	U	3.14 ± 1.7	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
	Diesel Range Organics [C10-												
N/A	C28]	mg/L				0.22	J	0.052	J	ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				19	J	15	J	17	J B	17	J
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND	
111-91-1	Bis(2-chloroethoxy)methane	ug/L				ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND	
117-81-7	Bis(2-ethylhexyl) phthalate	ug/L	2.5	6		2.4	J B	ND		2.2	J B	ND	
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND	
51-28-5	2,4-Dinitrophenol	ug/L	14			ND		ND		ND		ND	
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND		ND		ND		ND	
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND		ND		ND		ND	
117-84-0	Di-n-octyl phthalate	ug/L	280			ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
206-44-0	Fluoranthene	ug/L	280			ND		ND		ND		ND	
86-73-7	Fluorene	ug/L	280			ND		ND		ND		ND	
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND		ND		ND		ND	
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND		ND		ND		ND	
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND		ND		ND		ND	
67-72-1	Hexachloroethane	ug/L	0.7			ND		ND		ND		ND	
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND		ND		ND		ND	
78-59-1	Isophorone	ug/L	140			0.3	J	ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
91-57-6	2-Methylnaphthalene	ug/L	28			ND		ND		ND		ND	
95-48-7	2-Methylphenol	ug/L	350			ND		ND		ND		ND	
15831-10-4	3 & 4 Methylphenol	ug/L				ND		ND		ND		ND	
91-20-3	Naphthalene	ug/L	140			ND		ND		ND		ND	
88-74-4	2-Nitroaniline	ug/L				ND		ND		ND		ND	
99-09-2	3-Nitroaniline	ug/L				ND		ND		ND		ND	
100-01-6	4-Nitroaniline	ug/L				ND		ND		ND		ND	
98-95-3	Nitrobenzene	ug/L	3.5			ND		ND		ND		ND	
88-75-5	2-Nitrophenol	ug/L				ND		ND		ND		ND	
100-02-7	4-Nitrophenol	ug/L	56			ND		ND		ND		ND	
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND		ND		ND		ND	
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND		ND		ND		ND	
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND		ND	*	ND		ND	
85-01-8	Phenanthrene	ug/L				ND		ND		ND		ND	
108-95-2	Phenol	ug/L	2100			ND		ND		ND		ND	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		ND		ND		ND	
95-94-3	1,2,4,5-Tetrachlorobenzene	ug/L				ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			3	J	ND		ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		0.52	J B	ND		ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND	
76-13-1	1,1,2-Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		ND		ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND	

Table 5
Laboratory Results for Spring Water Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	BUFFSP-6211		BUFFSP - 101811		7-MILESPRING-51611		MILLSSP-111511	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND	*
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND	

[1] (MPN) most probable number metod

[2] CDPHE Water Standards 2011

[3] USEPA - Primary Drinking Water Standards

[4] USEPA - Secondary Drinking Water Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

[J] Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH
7-Mile Gulch Spring	7-mile Spring-51611	5/16/2011	1:35	JJ, MW	Spring/surface water	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	16.33	8.25
BLM Spring	BLM SP-01-51911	5/19/2011	10:15	JJ, MW	Spring	GRO,DRO, VOC, SVOC, TDS, Anions, Alk., RSK-175, Total Metals, oil-grease	8.39	8.22
BLM Spring	BLMSP-101811	10/18/2011	12:15	JJ	Spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.68	8.8
Spring located at the corner of Remington RD and CR 15, common name is Buffalo Spring	BuffSP-6211	6/2/2011	12:35	JJ, CF	spring	GRO,DRO, VOC, SVOC, TDS, Anions, Alk., RSK-175, Total Metals, oil-grease	12.71	8.24
Buffalo Spring located on the corner of Remington Rd and CR15	BUFFSP-101811	10/18/2011	1:30	JJ	Spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.53	7.43

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH
Spring located at Joanne Mills property adjacent to Fourmile Creek	MILLSSP-111511	11/15/2011	12:50	JJ	Spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.89	7.61
North Spring permit # 129138	129138-51011	5/10/2011	10:45	JJ, JK, AJ	Spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.52	7.45
North Spring permit # 129138	129138-111111	11/11/2011	11:00	JJ, BP	Spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.11	7.06

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Conductivity µS/cm at 25 °C	TDS ppm	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
7-Mile Gulch Spring	899	538	2.83	manure	cloudy/ yellow	none	none	clear, windy	spring seeping into a pond
BLM Spring	9494	4747	2.54	manure	yellow	none	none	light snow	spring seeping into a pond, pond was yellow to brown color and very impacted by stock watering
BLM Spring	1506	1155	4.85	manure/ urine	brown/ yellow	none	foam	sunny, windy, cold	spring seeping into a pond,
Spring located at the corner of Remington RD and CR 15, common name is Buffalo Spring	258	168	4.77	manure	yellow	none	samples foam when poured into container	sunny, very windy	spring flows into the bottom of the pond
Buffalo Spring located on the corner of Remington Rd and CR15	145	106	3.38	manure/ urine	brown/ yellow	none	foam	sunny, windy	spring seeping into a pond

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Conductivity µS/cm at 25 °C	TDS ppm	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
Spring located at Joanne Mills property adjacent to Fourmile Creek	261	200	4.78	slight fish	clear	none	none	cold, windy	spring not frozen
North Spring permit # 129138	338	260	2.86	none	clear	none	none	sunny, windy	augmented spring connected to stock trough
North Spring permit # 129138	356	268	2	none	clear	none	none	sunny, mild temp	augmented spring

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Notes/Comments	Easting	Northing
7-Mile Gulch Spring	Flow measurement not feasible at this site	431049	4330173
BLM Spring	Duplicate sample collected Sample ID: BLM SP-02-51911	427950	4334171
BLM Spring	pond was yellow to brown color and very impacted by stock watering, significant amount of salt deposits around edge of pond, slightly lower levels than spring sampling	427971	4334176
Spring located at the corner of Remington RD and CR 15, common name is Buffalo Spring	used grab sampler to get sample from about 10 feet from bank, manure from cattle all around banks, lots of reeds and plants growing in pond, in each grab sample there were many (>20) mega daphnia, decontaminated grab sampler prior to use and rinsed >5x with DI water wondering if foam in samples is from liquinox	431387	4337776
Buffalo Spring located on the corner of Remington Rd and CR15	used grab sampler to get sample from about 10 feet from bank, manure from cattle all around banks, lots of reeds and plants growing in pond, decontaminated grab sampler prior to use and rinsed >5x with DI water then rinsed with spring water, pond is much cloudier and lower water levels than spring sampling has more odor than past visits, large ditch on side of CR 15 has eroded and deposited a significant amount of sediment into pond, no daphnia as observed during spring sample	431386	4337778

Table 6
Field Data for Spring Locations
2011 South Park Baseline

Sample Location ID	Notes/Comments	Easting	Northing
Spring located at Joanne Mills property adjacent to Fourmile Creek	used grab sampler to collect water from near spring inlet marked by an old culvert under the water, observed fish greater than 12 inches in length, spring located approximately 100 ft to the south west of Fourmile creek, water slightly cloudy can see bubbles coming up through the metal culvert where the spring emerges into the large half acre pond	422482	4326422
North Spring permit # 129138	Collected from 1st stock tank	424004	4338913
North Spring permit # 129138	collected water from pipe in fenced area, water disconnected from stock tanks, spring had steady flow	424004	4338913

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611		B-52011		C-52011		D-6311		E-6311		F-61011		G-61011	
N/A	Alkalinity	mg/L				160		160		170		130		280		140		180	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				160		160		170		130		250		140		180	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND		25		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		0.082	J	ND		ND		0.11	J	0.097	J	ND		0.44	J
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				0.63		ND		0.27		ND		0.3		0.15	J	ND	
16887-00-6	Chloride	mg/L			250	43		4		18		4.4		340		7.6		2.5	J
16984-48-8	Fluoride	mg/L		4	2	0.25	J	0.44	J	1.1		0.1	J	0.17	J	0.16	J	0.23	J
14808-79-8	Sulfate	mg/L			250	830		34		78		41		17		35		32	
N/A	Coliform, Total	MPN/100ml [1]		< 5%		-		ND		ND		<1		<1		<1		<1	
74-82-8	Methane	ug/L				ND		ND		ND		ND		0.25	J	ND		ND	
74-82-8	Methane	ug/L				ND		ND		ND		ND		0.25	J	ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND		ND		ND		ND	
N/A	HEM	mg/L				2.5	J B	2.6	J B	1.9	J B	1.9	J B	2	J B	2.2	J B	2.9	J B
7429-90-5	Aluminum	ug/L	5000		mg/L	ND		ND		ND		770		71	J	ND		ND	
7440-70-2	Calcium	ug/L				130000		56000		70000		40000		63000		43000		40000	
7439-89-6	Iron	ug/L	300		300	290		ND		32	J	19000		610		24	J	ND	
7439-95-4	Magnesium	ug/L				50000		5900		15000		15000		2900		7300		17000	
7440-09-7	Potassium	ug/L				3100		2500	J	1900	J	1300	J	1800	J	1400	J	1800	J
7440-23-5	Sodium	ug/L				250000		15000		15000		3400		250000		17000	B	16000	B
7440-36-0	Antimony	ug/L	6	6		ND		ND		ND		ND		0.12	J	ND		ND	
7440-38-2	Arsenic	ug/L	50	10		0.37	J	ND		ND		0.44	J	0.29	J	ND		1.1	J
7440-39-3	Barium	ug/L	2000	2000		8.7		66		59		28		39		45	B	72	B
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611		B-52011		C-52011		D-6311		E-6311		F-61011		G-61011	
7440-43-9	Cadmium	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND	
7440-47-3	Chromium	ug/L		100		ND		ND		ND		0.52	J	73		ND		ND	
7440-48-4	Cobalt	ug/L	50			0.1	J	0.055	J	0.048	J	0.11	J	0.14	J	0.042	J	0.033	J
7440-50-8	Copper	ug/L	200	1300	1000	1.8	J	5.4		10		7.4		320		9.6		9.7	
7439-92-1	Lead	ug/L	50	15		ND		ND		0.27	J	6.1		2.9		0.24	J	ND	
7439-96-5	Manganese	ug/L	50		50	110		1.6		3.1		56		9.4		2.4	B	0.36	J B
7440-02-0	Nickel	ug/L	100			0.87	J	0.81	J	0.66	J	0.65	J	14		0.48	J	0.5	J
7782-49-2	Selenium	ug/L	20	50		ND		5.7		1.1	J	ND		4.9	J	1	J	ND	
7440-22-4	Silver	ug/L	50		100	ND		ND		ND		ND		0.016	J	ND		ND	
7440-28-0	Thallium	ug/L	2	2		ND		ND		ND		ND		ND		ND		ND	
7440-61-1	Uranium	ug/L		30		6.4		78		99		1.3		62		48		5	
7440-62-2	Vanadium	ug/L	100			ND		0.49	J	ND		7.2		2.3	J	0.51	J	2.9	J
7440-66-6	Zinc	ug/L	2000		5000	61		ND		3.2	J	1800		50		ND		3.5	J
N/A	Total Dissolved Solids	mg/L			500	1400		240		320		190		800		210	B	220	B
N/A	Gross Beta	pCi/L				7.87 ± 3.7		17.2 ± 3.3		23.6 ± 4.0	0	6.32 ± 1.8		26.8 ± 5.0		11.0 ± 2.5		1.82 ± 21.5	U
N/A	Gross Alpha	pCi/L		15		3.92 ± 3.2	U	52.8 ± 13		122 ± 26	0	2.80 ± 1.7	J	48.4 ± 12.0		23.5 ± 6.4		7.28 ± 2.4	
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND		0.098	J	ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				18	J B	11	J	ND		16	J	280		23	J	33	
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611		B-52011		C-52011		D-6311		E-6311		F-61011		G-61011	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND		ND		ND		ND	
111-91-1	chloroethoxy)methane	ug/L				ND		ND		ND		ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND		ND		ND		ND	
117-81-7	phthalate	ug/L	2.5	6		2.3	J B	2.4	J B	2.5	J B	2.3	J B	2.7	J B	2	J B	2.1	J B
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611	B-52011	C-52011	D-6311	E-6311	F-61011	G-61011
51-28-5	2,4-Dinitrophenol	ug/L	14			ND	ND	ND	ND	ND	ND	ND
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND	ND	ND	ND	ND	ND	ND
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND	ND	ND	ND	ND	ND	ND
117-84-0	Di-n-octyl phthalate	ug/L	280			ND	ND	ND	ND	ND	ND	1.9 J
123-91-1	1,4-Dioxane	ug/L	6.1			ND	ND	ND	ND	ND	ND	ND
206-44-0	Fluoranthene	ug/L	280			ND	ND	ND	ND	ND	ND	ND
86-73-7	Fluorene	ug/L	280			ND	ND	ND	ND	ND	ND	ND
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND	ND	ND	ND	ND	ND	ND
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND	ND	ND	ND	ND	ND	ND
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND	ND	ND	ND	ND	ND	ND
67-72-1	Hexachloroethane	ug/L	0.7			ND	ND	ND	ND	ND	ND	ND
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND	ND	ND	ND	ND	ND	ND
78-59-1	Isophorone	ug/L	140			ND	ND	ND	ND	ND	ND	ND
91-57-6	2-Methylnaphthalene	ug/L	28			ND	ND	ND	ND	ND	ND	ND
95-48-7	2-Methylphenol	ug/L	350			ND	ND	ND	ND	ND	ND	ND
15831-10-4	3 & 4 Methylphenol	ug/L				ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	ug/L	140			ND	ND	ND	ND	ND	ND	ND
88-74-4	2-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND
99-09-2	3-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND
100-01-6	4-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND
98-95-3	Nitrobenzene	ug/L	3.5			ND	ND	ND	ND	ND	ND	ND
88-75-5	2-Nitrophenol	ug/L				ND	ND	ND	ND	ND	ND	ND
100-02-7	4-Nitrophenol	ug/L	56			ND	ND	ND	ND	ND	ND	ND
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND	ND	ND	ND	ND	ND	ND
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND	ND	ND	ND	ND	ND	ND
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND	ND	ND	ND	ND	ND	ND
85-01-8	Phenanthrene	ug/L				ND	ND	ND	ND	ND	ND	ND
108-95-2	Phenol	ug/L	2100			ND	ND	ND	ND	ND	ND	ND

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611	B-52011	C-52011	D-6311	E-6311	F-61011	G-61011
129-00-0	Pyrene	ug/L	210			ND	ND	ND	ND	ND	ND	ND
100-51-6	Benzyl alcohol	ug/L				ND	ND	ND	ND	ND	ND	ND
95-94-3	Tetrachlorobenzene	ug/L				ND	ND	ND	ND	ND	ND	ND
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND	ND	ND	ND	ND	ND	ND
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND	ND	ND	ND	ND	ND	ND
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND	ND	ND	ND	ND	ND	ND
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND	ND	ND	ND	ND	ND	ND
65-85-0	Benzoic acid	ug/L	28000			ND	ND	ND	ND	110	ND	ND
67-64-1	Acetone	ug/L	6300			ND	ND	ND	ND	ND	ND	ND
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND	ND	ND	ND	170 B	ND	ND
71-43-2	Benzene	ug/L	5	5		ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	ug/L	100	100		ND	ND	ND	ND	ND	ND	ND
75-15-0	Carbon disulfide	ug/L	700			ND	ND	ND	ND	ND	ND	ND
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND	ND	ND	ND *	ND *	ND	ND
110-82-7	Cyclohexane	ug/L				ND	ND	ND	ND	ND	ND	ND
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND	ND	ND	ND	ND	ND	ND
74-83-9	Methyl bromide	ug/L	10			ND	ND	ND	ND	ND	ND	ND
75-25-2	Bromoform	ug/L	4			ND	ND	ND	ND	ND	ND	ND
75-00-3	Chloroethane	ug/L	120			ND	ND	ND	ND	ND	ND	ND
67-66-3	Chloroform	ug/L	3.5			ND	ND	ND	ND	910	ND	ND
74-97-5	Chlorobromomethane	ug/L				ND	ND	ND	ND	ND	ND	ND
75-27-4	Bromodichloromethane	ug/L	0.56			ND	ND	ND	ND	49	ND	ND
124-48-1	Chlorodibromomethane	ug/L	14			ND	ND	ND	ND	7 J	ND	ND
98-82-8	Isopropylbenzene	ug/L	700			ND	ND	ND	ND	ND	ND	ND
591-78-6	2-Hexanone	ug/L				ND	ND	ND	ND	ND	ND	ND
74-87-3	Methyl chloride	ug/L	18			ND	ND	ND	ND	ND	ND	ND
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND	ND	ND	ND	ND	ND	ND

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611		B-52011		C-52011		D-6311		E-6311		F-61011		G-61011	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		ND		ND		0.4	J B	13	J B	0.39	J B	0.39	J B
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND		ND		ND		ND	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND		ND		ND		ND	

Table 7
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	A-51611		B-52011		C-52011		D-6311		E-6311		F-61011		G-61011	
76-13-1	1,1,2-Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND	*	ND	*	ND		ND		ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		ND		ND		ND		0.5	J B	ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND		ND		ND		ND	
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND		ND		ND		ND	

(MPN) most probable number

[1] metod

[2] CDPHE Water Standards 2011
USEPA - Primary Drinking

[3] Water Standards
USEPA - Secondary Drinking

[4] Water Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

[J] Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

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Laboratory Results for Groundwater Locations
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
N/A	Alkalinity	mg/L				190		170		160		170		100		150		110	B	160	B
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				190		170		160		170		100		150		110	B	160	B
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		8.4		ND		ND		ND		ND		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		1.9		0.24	J	ND		ND		ND		ND		0.083	J	0.26	J
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				ND		ND		0.35		0.35		0.17	J	0.14	J	0.13	J	0.35	
16887-00-6	Chloride	mg/L			250	4		11		24		24		9.9		7.8		6.5		42	
16984-48-8	Fluoride	mg/L		4	2	0.22	J	2.4		0.41	J	0.42	J	0.17	J	0.48	J	0.58		0.17	J
14808-79-8	Sulfate	mg/L			250	33		350		680		680		24		130		130		480	
N/A	Coliform, Total	MPN/100ml[1]		< 5%		<1		<1		<1		<1		<1		<1		285		<1	
74-82-8	Methane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-82-8	Methane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
N/A	HEM	mg/L				2.3	J B	ND		2.5	J B	1.3	J B	2.7	J B	4.2	J B	3.1	J B	2.5	J B
7429-90-5	Aluminum	ug/L	5000		mg/L	ND		ND		ND		ND		ND		ND		ND		ND	
7440-70-2	Calcium	ug/L				44000		5600		220000		240000		25000		68000		63000		160000	
7439-89-6	Iron	ug/L	300		300	48	J	ND		4100		4200		22	J B	1000	B	ND		130	
7439-95-4	Magnesium	ug/L				18000		370		36000		39000		9400		8400		8900		30000	
7440-09-7	Potassium	ug/L				2100	J	910	J	1900	J	2200	J	940	J	990	J	5600		1100	J
7440-23-5	Sodium	ug/L				19000	B	260000	B	67000	B	68000	B	14000		30000		22000	B	72000	B
7440-36-0	Antimony	ug/L	6	6		0.073	J	ND		ND		ND		ND		ND		ND		0.084	J
7440-38-2	Arsenic	ug/L	50	10		1.2	J	ND		ND		ND		ND		ND		1.4	J	0.28	J
7440-39-3	Barium	ug/L	2000	2000		78	B	29		7.2		5.8		3.3		10		59		19	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		0.13	J	ND		ND		ND		ND	

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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
7440-43-9	Cadmium	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
7440-47-3	Chromium	ug/L		100		ND		ND		ND		ND		ND		ND		ND		ND	
7440-48-4	Cobalt	ug/L	50			0.085	J	ND		2.8		2.6		ND		0.4	J	0.054	J	0.16	J
7440-50-8	Copper	ug/L	200	1300	1000	80		16		ND		ND		3.4		1.8	J	ND		7.3	
7439-92-1	Lead	ug/L	50	15		1.1		0.92	J	ND		ND		0.6	J	ND		ND		0.34	J
7439-96-5	Manganese	ug/L	50		50	1	B	1.5		670		660		1.9		280		ND		56	
7440-02-0	Nickel	ug/L	100			1	J	0.7	J	5.2		2.7		0.31	J	0.76	J	0.63	J	1.7	J
7782-49-2	Selenium	ug/L	20	50		0.76	J	ND		ND		ND		ND		ND		1.6	J	3.1	J
7440-22-4	Silver	ug/L	50		100	ND		ND		ND		ND		ND		ND		ND		ND	
7440-28-0	Thallium	ug/L	2	2		ND		ND		0.052	J	ND		ND		ND		0.055	J B	0.025	J B
7440-61-1	Uranium	ug/L		30		4.9		0.063	J	1		1		1.7		9.7		6.6		5.6	
7440-62-2	Vanadium	ug/L	100			3.2	J	0.17	J	ND		ND		ND		0.22	J	0.56	J	0.2	J
7440-66-6	Zinc	ug/L	2000		5000	7.4	J	31		2.6	J	2.4	J	3.4	J	ND		ND		ND	
N/A	Total Dissolved Solids	mg/L			500	250	B	720		1100		1100		160		350		350		920	
N/A	Gross Beta	pCi/L				3.06 ± 1.88	J	2.14 ± 2.3	U	4.16 ± 3.2	U	7.32 ± 3.2		2.83 ± 1.4	J	3.97 ± 1.8	J	9.21 ± 2.2		5.05 ± 3.1	U
N/A	Gross Alpha	pCi/L		15		9.62 ± 3.4		1.53 ± 1.8	U	6.76 ± 3.7		9.59 ± 6.7		4.95 ± 2.1		11.6 ± 3.0		4.58 ± 2.2		6.24 ± 2.8	
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				31		ND		ND		ND		ND		ND		13	J	21	J
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND		ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND		ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	

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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
111-91-1	chloroethoxy)methane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
117-81-7	phthalate	ug/L	2.5	6		2	J B	3.2	J B	2.2	J B	ND		ND		ND		2.4	J B	2.3	J B
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND		ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND		ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND		ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND		ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND		ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND		ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		1.6	J B	1.8	J B	ND		ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND		ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND		ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	

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Laboratory Results for Groundwater Locations
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011	I-61611	J-61611	J-111711	K-62411	L-62411	M-62711	N-62711
51-28-5	2,4-Dinitrophenol	ug/L	14			ND	ND	ND	ND	ND	ND	ND	ND
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND	ND	ND	ND	ND	ND	ND	ND
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND	ND	ND	ND	ND	ND	ND	ND
117-84-0	Di-n-octyl phthalate	ug/L	280			ND	ND	ND	ND	ND	ND	ND	ND
123-91-1	1,4-Dioxane	ug/L	6.1			ND	ND	ND	ND	ND	ND	ND	ND
206-44-0	Fluoranthene	ug/L	280			ND	ND	ND	ND	ND	ND	ND	ND
86-73-7	Fluorene	ug/L	280			ND	ND	ND	ND	ND	ND	ND	ND
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND	ND	ND	ND	ND	ND	ND	ND
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND	ND	ND	ND	ND	ND	ND	ND
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND	ND	ND	ND	ND	ND	ND	ND
67-72-1	Hexachloroethane	ug/L	0.7			ND	ND	ND	ND	ND	ND	ND	ND
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND	ND	ND	ND	ND	ND	ND	ND
78-59-1	Isophorone	ug/L	140			ND	ND	ND	ND	ND	ND	ND	ND
91-57-6	2-Methylnaphthalene	ug/L	28			ND	ND	ND	ND *	ND	ND	ND	ND
95-48-7	2-Methylphenol	ug/L	350			ND	ND	ND	ND	ND	ND	ND	ND
15831-10-4	3 & 4 Methylphenol	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	ug/L	140			ND	ND	ND	ND *	ND	ND	ND	ND
88-74-4	2-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
99-09-2	3-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
100-01-6	4-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
98-95-3	Nitrobenzene	ug/L	3.5			ND	ND	ND	ND	ND	ND	ND	ND
88-75-5	2-Nitrophenol	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
100-02-7	4-Nitrophenol	ug/L	56			ND	ND	ND	ND	ND	ND	ND	ND
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND	ND	ND	ND	ND	ND	ND	ND
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND	ND	ND	ND	ND	ND	ND	ND
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND	ND	ND	ND	ND	ND	ND	ND
85-01-8	Phenanthrene	ug/L				ND	ND	ND	ND	ND	ND	ND	ND
108-95-2	Phenol	ug/L	2100			ND	ND	ND	ND	ND	ND	ND	ND

Table 7
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2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND		ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		0.65	J	0.76	J	ND		ND		ND		ND		0.3	J
95-94-3	Tetrachlorobenzene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND		ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND		ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		ND		ND		ND		ND		ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND		ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND		ND		ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND		ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND		ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND		ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND		ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND		ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND		ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND		ND		ND	*	ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND		ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND		ND		ND		ND		ND	

Table 7
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2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND	*	ND	*
75-09-2	Methylene Chloride	ug/L	4.7	5		0.39	J B	0.33	J B	0.33	J B	0.52	J B	ND		ND		ND		ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND		ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND		ND		ND		ND		ND	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND		ND		ND		ND		ND	

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2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	H-61011		I-61611		J-61611		J-111711		K-62411		L-62411		M-62711		N-62711	
	1,1,2-																				
76-13-1	Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND		ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND		ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND		ND		ND		ND		ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		0.48	J B	ND		0.48	J	ND		ND		ND		ND		ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND		ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		2.6		ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND		ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND		ND		ND		ND		ND	
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND		ND		ND		ND		ND	

(MPN) most probable number

[1] metod

[2] CDPHE Water Standards 2011

[3] USEPA - Primary Drinking Water Standards

[4] USEPA - Secondary Drinking Water Standards

B Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

J Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	N-111711		E-62911		O-7611		P-7811		Q-72911		R-8211		S-82411		T-91211	
N/A	Alkalinity	mg/L				160		220		130		72		120		110		320		340	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				160		220		130		72		120		110		320		340	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		0.43	J	ND		ND		4.6		0.9		ND		ND		ND	
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				0.36		ND		0.2		ND		0.11	J	ND		ND		0.12	J
16887-00-6	Chloride	mg/L			250	42		2.8	J	12		3.7		4.3		3.1		1.4	J	6.7	
16984-48-8	Fluoride	mg/L		4	2	0.22	J	2.5		0.12	J	0.19	J	0.15	J	0.65		0.19	J	0.58	
14808-79-8	Sulfate	mg/L			250	500		61		75		23		20		74		27		520	
N/A	Coliform, Total	MPN/100ml[1]		< 5%		<1		<1		<1		<1		ND		<1		<1		<1	
74-82-8	Methane	ug/L				ND		ND		ND		0.41	J	ND		ND		ND		1.2	J
74-82-8	Methane	ug/L				ND		ND		ND		0.41	J	ND		ND		ND		1.2	J
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
N/A	HEM	mg/L				1.4	J B	2.2	J B	2.4	J B	1.6	J B	2.6	J B	2.2	J B	1.7	J	3.1	J B
7429-90-5	Aluminum	ug/L	5000		mg/L	44	J	ND		ND		ND		ND		21	J	ND		ND	
7440-70-2	Calcium	ug/L				170000		48000	B	50000		24000		35000		5000		47000		200000	
7439-89-6	Iron	ug/L	300		300	1000		85	J B	83	J B	ND		ND		36	J	25	J	1200	B
7439-95-4	Magnesium	ug/L				29000		23000	B	9000		6300		7100		46	J B	52000		62000	
7440-09-7	Potassium	ug/L				1200	J	7900		2600	J	940	J	3500		520	J B	2800	J	6600	
7440-23-5	Sodium	ug/L				66000	B	16000	B	24000	B ^	10000		10000	B	84000	B	5600	B	25000	B
7440-36-0	Antimony	ug/L	6	6		ND		ND		ND		ND		ND		0.082	J	0.11	J	ND	
7440-38-2	Arsenic	ug/L	50	10		0.8	J	0.44	J	ND		ND		ND		ND		ND		ND	
7440-39-3	Barium	ug/L	2000	2000		21		37		97		3		36		0.95	J	160		15	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		ND		ND		ND		ND		ND	

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7440-43-9	Cadmium	ug/L	5	5		0.073	J	ND		ND		ND		ND		ND		ND		ND	
7440-47-3	Chromium	ug/L		100		5.2		ND		0.54	J	ND		1.5	J	ND		ND		ND	
7440-48-4	Cobalt	ug/L	50			0.089	J	ND		0.066	J	ND		ND		ND		ND		ND	
7440-50-8	Copper	ug/L	200	1300	1000	20		8.4		58		130		66		3.2		2.4		0.84	J
7439-92-1	Lead	ug/L	50	15		1.4		0.32	J	1.1		3.9		2.5		0.85	J	0.27	J	0.28	J
7439-96-5	Manganese	ug/L	50		50	140		4.2		7.4		0.56	J	ND		2.2		4.2		210	B
7440-02-0	Nickel	ug/L	100			0.59	J	0.47	J	0.59	J	0.58	J	ND		ND		0.74	J	ND	
7782-49-2	Selenium	ug/L	20	50		2.1	J	ND		ND		1	J	0.96	J	ND		ND		ND	
7440-22-4	Silver	ug/L	50		100	ND		ND		ND		ND		ND		ND		ND		ND	
7440-28-0	Thallium	ug/L	2	2		ND		ND		0.048	J	ND		ND		0.025	J	0.046	J B	0.048	J
7440-61-1	Uranium	ug/L		30		5.8		0.25	J	72		1.8		32		0.12	J	3.1		15	
7440-62-2	Vanadium	ug/L	100			0.7	J	ND		0.5	J	0.17	J	2.1	J B	ND		ND		ND	
7440-66-6	Zinc	ug/L	2000		5000	2.2	J	6.6	J	2.4	J	34		12		3.2	J	2.2	J	2.6	J
N/A	Total Dissolved Solids	mg/L			500	880		320	B	300		180		180		230		330		1100	
N/A	Gross Beta	pCi/L				6.43 ± 5.4		9.59 ± 2.2		16 ± 3.9		8.39 ± 3.2		8.64 ± 2.5		1.82 ± 1.4	U	5.56 ± 2.3		46.3 ± 7.6	
N/A	Gross Alpha	pCi/L		15		4.25 ± 5.0	U	2.97 ± 2.0	J	59.1 ± 14		3.44 ± 1.6		21.3 ± 5.8		-0.572 ± 0.56	U	4.11 ± 2.2		305 ± 64	
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND		ND		ND		ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				ND		23	J	ND		26		17	J	16	J	11	J	17	J B
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND		ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND		ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	

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207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
111-91-1	chloroethoxy)methane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
117-81-7	phthalate	ug/L	2.5	6		ND		0.88	J	1.5	J	0.75	J	2.2	J B	1.8	J B	ND		0.69	J
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND		ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND		ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND		ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND		ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND		ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND		ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND		ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND		ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND		ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND		ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	N-111711		E-62911		O-7611		P-7811		Q-72911		R-8211		S-82411		T-91211	
51-28-5	2,4-Dinitrophenol	ug/L	14			ND		ND		ND		ND		ND		ND		ND		ND	
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND		ND		ND		ND		ND		ND		ND		ND	
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND		ND		ND		ND		ND		ND		ND		ND	
117-84-0	Di-n-octyl phthalate	ug/L	280			ND		2.2	J B	2	J	ND		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND		ND		ND		ND		ND	
206-44-0	Fluoranthene	ug/L	280			ND		ND		ND		ND		ND		ND		ND		ND	
86-73-7	Fluorene	ug/L	280			ND		ND		ND		ND		ND		ND		ND		ND	
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND		ND		ND		ND		ND		ND		ND		ND	
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND		ND		ND		ND		ND		ND		ND		ND	
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND		ND		ND		ND		ND		ND		ND		ND	
67-72-1	Hexachloroethane	ug/L	0.7			ND		ND		ND		ND		ND		ND		ND		ND	
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND		ND		ND		ND		ND		ND		ND		ND	
78-59-1	Isophorone	ug/L	140			ND		ND		ND		ND		ND		ND		ND		ND	
91-57-6	2-Methylnaphthalene	ug/L	28			ND	*	ND		ND		ND		ND		ND		ND		ND	
95-48-7	2-Methylphenol	ug/L	350			ND		ND		ND		ND		ND		ND		ND		ND	
15831-10-4	3 & 4 Methylphenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
91-20-3	Naphthalene	ug/L	140			ND	*	ND		ND		ND		ND		ND		ND		ND	
88-74-4	2-Nitroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
99-09-2	3-Nitroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
100-01-6	4-Nitroaniline	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
98-95-3	Nitrobenzene	ug/L	3.5			ND		ND		ND		ND		ND		ND		ND		ND	
88-75-5	2-Nitrophenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
100-02-7	4-Nitrophenol	ug/L	56			ND		ND		ND		ND		ND		ND		ND		ND	
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND		ND		ND		ND		ND		ND		ND		ND	
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND		ND		ND		ND		ND		ND		ND		ND	
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND		ND		ND		ND		ND		ND		ND		ND	
85-01-8	Phenanthrene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
108-95-2	Phenol	ug/L	2100			ND		ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	N-111711		E-62911		O-7611		P-7811		Q-72911		R-8211		S-82411		T-91211	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND		ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		0.33	J B	0.24	J	ND		0.36	J	1.1	J B	ND		ND	
95-94-3	Tetrachlorobenzene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND		ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND		ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		ND		ND		ND		2.9	J	ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND		ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND		ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND		ND	0	ND		ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND		ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND		ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND		ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND		0.84	J	ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND		ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND		ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND	*	ND		ND		ND		ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND		ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
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Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	N-111711		E-62911		O-7611		P-7811		Q-72911		R-8211		S-82411		T-91211	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		0.57	J B	0.41	J B	0.99	J B	ND		ND		ND		ND		ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND		ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND		ND		ND		ND		ND	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND	*	ND		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		ND		ND		ND		ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	N-111711		E-62911		O-7611		P-7811		Q-72911		R-8211		S-82411		T-91211	
	1,1,2-																				
76-13-1	Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND		ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND		ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND		ND		ND		ND		ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		ND		ND		ND		ND		ND		ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND		ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		ND		ND		ND		ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND		ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND		ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND		ND		ND		ND		ND	
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND		ND		ND		ND		ND	

(MPN) most probable number
[1] metod

[2] CDPHE Water Standards 2011
USEPA - Primary Drinking
[3] Water Standards
USEPA - Secondary Drinking
[4] Water Standards

[B] Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

[J] Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
N/A	Alkalinity	mg/L				170		54		160		440		250		170	
N/A	Bicarbonate Alkalinity as CaCO3	mg/L				170		54		160		440		240		170	
N/A	Carbonate Alkalinity as CaCO3	mg/L				ND		ND		ND		ND		6.4		ND	
N/A	Hydroxide Alkalinity	mg/L				ND		ND		ND		ND		ND		ND	
14797-55-8	Nitrate as N	mg/L	10	10		0.79		ND		0.38	J	ND		ND		ND	
14797-65-0	Nitrite as N	mg/L	1	1		ND		ND		ND		ND		ND		ND	
N/A	Orthophosphate as P	mg/L				ND		0.39	J	ND		ND		ND		ND	
24959-67-9	Bromide	mg/L				0.12	J	0.19	J	0.14	J	0.27		0.35		0.15	J
16887-00-6	Chloride	mg/L			250	4.8		12		96		220		32		8.1	
16984-48-8	Fluoride	mg/L		4	2	0.31	J	0.23	J	0.33	J	1.5		0.3	J	0.38	J
14808-79-8	Sulfate	mg/L			250	18		140		31		39		230		33	
N/A	Coliform, Total	MPN/100ml[1]		< 5%		<1		<1		<1		<1		<1		<1	
74-82-8	Methane	ug/L				ND		4	J	ND		680		5.8		ND	
74-82-8	Methane	ug/L				ND		4	J	ND		680		5.8		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND	
74-85-1	Ethylene	ug/L				ND		ND		ND		ND		ND		ND	
74-84-0	Ethane	ug/L				ND		ND		ND		0.59	J	ND		ND	
N/A	HEM	mg/L				2.6	J B	2.4	J B	1.9	J B	2.3	J B	1.6	J B	1.9	J B
7429-90-5	Aluminum	ug/L	5000		mg/L	33	J	1400		39	J	22	J	32	J	ND	
7440-70-2	Calcium	ug/L				47000		53000		33000		77000		32000		48000	
7439-89-6	Iron	ug/L	300		300	54	J B	10000	B	ND		8100		510		980	
7439-95-4	Magnesium	ug/L				9300		12000		8200		23000		12000		9700	
7440-09-7	Potassium	ug/L				2900	J	2100	J	2400	J	18000		1800	J	3700	B
7440-23-5	Sodium	ug/L				8100	B	6800	B	97000		220000		190000		24000	B
7440-36-0	Antimony	ug/L	6	6		0.12	J	ND		0.12	J	ND		0.18	J	0.17	J
7440-38-2	Arsenic	ug/L	50	10		0.93	J	14		8.2		ND		ND		0.38	J
7440-39-3	Barium	ug/L	2000	2000		21		22		27		410		33		30	
7440-41-7	Beryllium	ug/L	4	4		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
7440-43-9	Cadmium	ug/L	5	5		0.048	J	0.052	J	0.05	J	ND		ND		ND	
7440-47-3	Chromium	ug/L		100		ND		ND		ND		ND		ND		ND	
7440-48-4	Cobalt	ug/L	50			0.068	J	14		ND		0.085	J	0.065	J	0.17	J
7440-50-8	Copper	ug/L	200	1300	1000	9.3		2.2		3.6		7.4		6.7		15	
7439-92-1	Lead	ug/L	50	15		0.61	J	2.6		0.41	J	0.24	J	ND		0.96	J
7439-96-5	Manganese	ug/L	50		50	1.2	B	300	B	0.92	J	110		30		150	B
7440-02-0	Nickel	ug/L	100			ND		22		0.36	J	0.7	J	ND		0.93	J
7782-49-2	Selenium	ug/L	20	50		2.4	J	ND		2.8	J	ND		ND		ND	
7440-22-4	Silver	ug/L	50		100	0.48	J	0.58	J	ND		ND		0.015	J	0.022	J
7440-28-0	Thallium	ug/L	2	2		0.11	J	2.5		ND		ND		0.041	J	0.038	J B
7440-61-1	Uranium	ug/L		30		19		1.7		7.6		0.044	J	0.22	J	24	B
7440-62-2	Vanadium	ug/L	100			2.8	J	0.39	J	11		ND		ND		ND	
7440-66-6	Zinc	ug/L	2000		5000	2.9	J	540		18		29		2	J	890	B
N/A	Total Dissolved Solids	mg/L			500	200		270		380		800		610		260	
N/A	Gross Beta	pCi/L				8.02 ± 2.1		32.0 ± 5.1		5.53 ±2.4		26.1 ± 5.7		2.09 ± 1.7	U	15.2 ± 3.0	
N/A	Gross Alpha	pCi/L		15		30.9 ± 8.0		261.0 ± 54.0		6.02 ± 2.8		5.74 ± 3.0		1.36 ± 5.2	U	24.7 ± 5.3	
N/A	Diesel Range Organics [C10-C28]	mg/L				ND		ND		ND		ND		ND		ND	
8006-61-9	Gasoline Range Organics (GRO)-C6-C10	ug/L				11	J B	11	J B	ND		ND		ND		10	J
83-32-9	Acenaphthene	ug/L	420			ND		ND		ND		ND		ND		ND	
208-96-8	Acenaphthylene	ug/L				ND		ND		ND		ND		ND		ND	
98-86-2	Acetophenone	ug/L	700			ND		ND		ND		ND		ND		ND	
120-12-7	Anthracene	ug/L	2100			ND		ND		ND		ND		ND		ND	
1912-24-9	Atrazine	ug/L		3		ND		ND		ND		ND		ND		ND	
100-52-7	Benzaldehyde	ug/L				ND		ND		ND		ND		ND		ND	
56-55-3	Benzo[a]anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND	
50-32-8	Benzo[a]pyrene	ug/L	0.0048	0.2		ND		ND		ND		ND		ND		ND	
205-99-2	Benzo[b]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND	
191-24-2	Benzo[g,h,i]perylene	ug/L				ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
207-08-9	Benzo[k]fluoranthene	ug/L	0.0048			ND		ND		ND		ND		ND		ND	
92-52-4	1,1'-Biphenyl	ug/L				ND		ND		ND		ND		ND		ND	
111-91-1	chloroethoxy)methane	ug/L				ND		ND		ND		ND		ND		ND	
111-44-4	Bis(2-chloroethyl)ether	ug/L				ND		ND		ND		ND		ND		ND	
117-81-7	phthalate	ug/L	2.5	6		ND		ND		ND	J B	2.6	J B	0.62	J	0.6	J
101-55-3	4-Bromophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND	
85-68-7	Butyl benzyl phthalate	ug/L	1400			ND		ND		ND		ND		ND		ND	
105-60-2	Caprolactam	ug/L				ND		ND		ND		ND		ND		ND	
86-74-8	Carbazole	ug/L	18			ND		ND		ND		ND		ND		ND	
106-47-8	4-Chloroaniline	ug/L				ND		ND		ND		ND		ND		ND	
59-50-7	4-Chloro-3-methylphenol	ug/L				ND		ND		ND		ND		ND		ND	
91-58-7	2-Chloronaphthalene	ug/L	560			ND		ND		ND		ND		ND		ND	
95-57-8	2-Chlorophenol	ug/L	35			ND		ND		ND		ND		ND		ND	
7005-72-3	4-Chlorophenyl phenyl ether	ug/L				ND		ND		ND		ND		ND		ND	
218-01-9	Chrysene	ug/L	0.0048			ND		ND		ND		ND		ND		ND	
53-70-3	Dibenz(a,h)anthracene	ug/L	0.0048			ND		ND		ND		ND		ND		ND	
132-64-9	Dibenzofuran	ug/L	14			ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		0.37	J	ND	
91-94-1	3,3'-Dichlorobenzidine	ug/L	0.078			ND		ND		ND		ND		ND		ND	
120-83-2	2,4-Dichlorophenol	ug/L	21			ND		ND		ND		ND		ND		ND	
84-66-2	Diethyl phthalate	ug/L	5600			ND		ND		ND		ND		ND		ND	
105-67-9	2,4-Dimethylphenol	ug/L	140			ND		ND		ND		ND		ND		ND	
131-11-3	Dimethyl phthalate	ug/L	70000			ND		ND		ND		ND		ND		ND	
84-74-2	Di-n-butyl phthalate	ug/L	700			ND		ND		ND		ND		ND		ND	
534-52-1	4,6-Dinitro-2-methylphenol	ug/L				ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211	V-91211	W-93011	X-93011	Y-11911	Z-111511
51-28-5	2,4-Dinitrophenol	ug/L	14			ND	ND	ND	ND	ND	ND
121-14-2	2,4-Dinitrotoluene	ug/L	0.11			ND	ND	ND	ND	ND	ND
606-20-2	2,6-Dinitrotoluene	ug/L	7			ND	ND	ND	ND	ND	ND
117-84-0	Di-n-octyl phthalate	ug/L	280			ND	ND	ND	ND	ND	ND
123-91-1	1,4-Dioxane	ug/L	6.1			ND	ND	ND	ND	ND	ND
206-44-0	Fluoranthene	ug/L	280			ND	ND	ND	ND	ND	ND
86-73-7	Fluorene	ug/L	280			ND	ND	ND	ND	ND	ND
118-74-1	Hexachlorobenzene	ug/L	0.022	1		ND	ND	ND	ND	ND	ND
87-68-3	Hexachlorobutadiene	ug/L	0.45			ND	ND	ND	ND	ND	ND
77-47-4	Hexachlorocyclopentadiene	ug/L	42	50		ND	ND	ND	ND	ND	ND
67-72-1	Hexachloroethane	ug/L	0.7			ND	ND	ND	ND	ND	ND
193-39-5	Indeno[1,2,3-cd]pyrene	ug/L	0.0048			ND	ND	ND	ND	ND	ND
78-59-1	Isophorone	ug/L	140			ND	ND	ND	ND	ND	ND
91-57-6	2-Methylnaphthalene	ug/L	28			ND	ND	ND	ND	ND	ND
95-48-7	2-Methylphenol	ug/L	350			ND	ND	ND	ND	ND	ND
15831-10-4	3 & 4 Methylphenol	ug/L				ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	ug/L	140			ND	ND	ND	ND	ND	ND
88-74-4	2-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND
99-09-2	3-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND
100-01-6	4-Nitroaniline	ug/L				ND	ND	ND	ND	ND	ND
98-95-3	Nitrobenzene	ug/L	3.5			ND	ND	ND	ND	ND	ND
88-75-5	2-Nitrophenol	ug/L				ND	ND	ND	ND	ND	ND
100-02-7	4-Nitrophenol	ug/L	56			ND	ND	ND	ND	ND	ND
621-64-7	N-Nitrosodi-n-propylamine	ug/L	0.005			ND	ND	ND	ND	ND	ND
86-30-6	N-Nitrosodiphenylamine	ug/L	7.1			ND	ND	ND	ND	ND	ND
87-86-5	Pentachlorophenol	ug/L	0.29	1		ND	ND	ND	ND	ND	ND
85-01-8	Phenanthrene	ug/L				ND	ND	ND	ND	ND	ND
108-95-2	Phenol	ug/L	2100			ND	ND	ND	ND	ND	ND

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
129-00-0	Pyrene	ug/L	210			ND		ND		ND		ND		ND		ND	
100-51-6	Benzyl alcohol	ug/L				ND		ND		ND		ND		ND		ND	
95-94-3	Tetrachlorobenzene	ug/L				ND		ND		ND		ND		ND		ND	
58-90-2	2,3,4,6-Tetrachlorophenol	ug/L				ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND	
95-95-4	2,4,5-Trichlorophenol	ug/L	700			ND		ND		ND		ND		ND		ND	
88-06-2	2,4,6-Trichlorophenol	ug/L	3.2			ND		ND		ND		ND		ND		ND	
65-85-0	Benzoic acid	ug/L	28000			ND		ND		ND		ND		ND		ND	
67-64-1	Acetone	ug/L	6300			ND		ND		ND		3.5	J B	ND		ND	
78-93-3	Methyl Ethyl Ketone (2-Butanone)	ug/L	4200			ND		ND		ND		ND		ND		ND	
71-43-2	Benzene	ug/L	5	5		ND		ND		ND		ND		ND		ND	
108-90-7	Chlorobenzene	ug/L	100	100		ND		ND		ND		ND		ND		ND	
75-15-0	Carbon disulfide	ug/L	700			ND		ND		ND		ND		ND		ND	
56-23-5	Carbon tetrachloride	ug/L	0.27	5		ND		ND		ND		ND	*	ND		ND	
110-82-7	Cyclohexane	ug/L				ND		ND		ND		ND		ND		ND	
96-12-8	1,2-Dibromo-3-Chloropropane	ug/L	0.2	0.2		ND		ND		ND		ND		ND		ND	
74-83-9	Methyl bromide	ug/L	10			ND		ND		ND		ND		ND		ND	
75-25-2	Bromoform	ug/L	4			ND		ND		ND		ND		ND		ND	
75-00-3	Chloroethane	ug/L	120			ND		ND		ND		ND		ND		ND	
67-66-3	Chloroform	ug/L	3.5			ND		ND		ND		ND		ND		ND	
74-97-5	Chlorobromomethane	ug/L				ND		ND		ND		ND		ND		ND	
75-27-4	Bromodichloromethane	ug/L	0.56			ND		ND		ND		ND		ND		ND	
124-48-1	Chlorodibromomethane	ug/L	14			ND		ND		ND		ND		ND		ND	
98-82-8	Isopropylbenzene	ug/L	700			ND		ND		ND		ND		ND		ND	
591-78-6	2-Hexanone	ug/L				ND		ND		ND		ND		ND		ND	
74-87-3	Methyl chloride	ug/L	18			ND		ND		ND		ND		ND		ND	
75-71-8	Dichlorodifluoromethane	ug/L	1400			ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
10061-02-6	trans-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	ug/L	100	100		ND		ND		ND		ND		ND		ND	
75-09-2	Methylene Chloride	ug/L	4.7	5		ND		ND		ND		0.45	J B	0.67	J B	ND	
79-20-9	Methyl acetate	ug/L				ND		ND		ND		ND		ND		ND	
1634-04-4	Methyl tert-butyl ether	ug/L				ND		ND		ND		ND		ND		ND	
108-10-1	4-Methyl-2-pentanone (MIBK)	ug/L	560			ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	ug/L	70	70		ND		ND		ND		ND		ND		ND	
10061-01-5	cis-1,3-Dichloropropene	ug/L				ND		ND		ND		ND		ND		ND	
75-34-3	1,1-Dichloroethane	ug/L	140			ND		ND		ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	ug/L	7	7		ND		ND		ND		ND		ND		ND	
107-06-2	1,2-Dichloroethane	ug/L	0.38	5		ND		ND		ND		ND		ND		ND	
78-87-5	1,2-Dichloropropane	ug/L	0.52	5		ND		ND		ND		ND		ND		ND	
100-41-4	Ethylbenzene	ug/L	700	700		ND		ND		ND		0.83	J	ND		ND	
179601-23-1	m-Xylene & p-Xylene	ug/L				ND		ND		ND		ND		ND		ND	
95-47-6	o-Xylene	ug/L				ND		ND		ND		ND		ND		ND	
75-01-4	Vinyl chloride	ug/L	0.023	2		ND		ND		ND		ND		ND		ND	

Table 7
Laboratory Results for Groundwater Locations
2011 South Park Baseline

Analyte CAS Number	Analyte	Units	Colorado MCL [2]	EPA Primary MCL [3]	EPA Secondary MCL [4]	U-91211		V-91211		W-93011		X-93011		Y-11911		Z-111511	
	1,1,2-																
76-13-1	Trichlorotrifluoroethane	ug/L	210000			ND		ND		ND		ND		ND		ND	
79-01-6	Trichloroethene	ug/L	5	5		ND		ND		ND		ND		ND		ND	
75-69-4	Trichlorofluoromethane	ug/L	2100			ND		ND		ND		ND		ND		ND	
71-55-6	1,1,1-Trichloroethane	ug/L	200	200		ND		ND		ND		ND	*	ND		ND	
79-00-5	1,1,2-Trichloroethane	ug/L	2.8	5		ND		ND		ND		ND		ND		ND	
87-61-6	1,2,3-Trichlorobenzene	ug/L				ND		ND		ND		ND		ND		ND	
120-82-1	1,2,4-Trichlorobenzene	ug/L	70	70		ND		ND		ND		ND		ND		ND	
108-88-3	Toluene	ug/L	1000	1000		ND		ND		ND		ND		ND		ND	
79-34-5	1,1,2,2-Tetrachloroethane	ug/L	0.18			ND		ND		ND		ND		ND		ND	
100-42-5	Styrene	ug/L	100	100		ND		ND		ND		ND		ND		ND	
127-18-4	Tetrachloroethylene	ug/L	5	5		ND		ND		ND		ND		ND		ND	
95-50-1	1,2-Dichlorobenzene	ug/L	600	600		ND		ND		ND		ND		ND		ND	
541-73-1	1,3-Dichlorobenzene	ug/L	94			ND		ND		ND		ND		ND		ND	
106-46-7	1,4-Dichlorobenzene	ug/L	75	75		ND		ND		ND		ND		0.37	J	ND	
106-93-4	1,2-Dibromoethane	ug/L	0.00041	0.05		ND		ND		ND		ND		ND		ND	
123-91-1	1,4-Dioxane	ug/L	6.1			ND		ND		ND		ND		ND		ND	
108-87-2	Methylcyclohexane	ug/L				ND		ND		ND		ND		ND		ND	
108-05-4	Vinyl acetate	ug/L	7000			ND		ND		ND		ND		ND		ND	*
1330-20-7	Xylenes, Total	ug/L	1400	10000		ND		ND		ND		ND		ND		ND	

(MPN) most probable number
[1] metod

[2] CDPHE Water Standards 2011
USEPA - Primary Drinking
[3] Water Standards
USEPA - Secondary Drinking
[4] Water Standards

B Compound was found in the blank and sample.

* LCS or LCSD exceeds the control limit

J Result is less than the Reporting Limit (RL) but greater than or equal to the Method Detection Level (MDL) and the concentration is an approximate value.

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
A-51611	5/16/2011	11:00	JJ, MW	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.66	7.97	1186	911
B-52011	5/20/2011	9:20	JJ, MW	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.52	7.53	242	181
C-52011	5/20/2011	12:45	JJ, MW	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.5	7.28	335	244
D-6311	6/3/2011	12:00	JJ, AB	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.42	7.55	208	160
E-6311	6/3/2011	2:10	JJ, AB	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	9.23	9.58	1022	730

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
F-61011	6/10/2011	9:15	JJ, TZ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.28	6.62	241	177
H-61011	6/10/2011	12:20	JJ, TZ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.28	7.08	295	216
G-61011	6/10/2011	12:50	JJ, TZ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	9.68	7.13	277	195
J-61611	6/16/2011	8:45	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.62	7.26	912	701
I-61611	6/16/2011	2:30	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	12.03	9.77	829	550

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
K-62411	6/24/2011	9:45	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.33	8.07	176	131
L-62411	6/24/2011	11:45	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.92	7.43	362	267
N-62711	6/27/2011	1:30	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.66	7.54	819	610
E-62911	6/29/2011	10:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	12.21	7.63	384	254
O-7611	7/6/2011	10:00	JJ, AM	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.73	7.78	294	212

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
P-7811	7/8/2011	1:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	7.81	6.9	166	123
Q-72911	7/29/2011	1:30	JJ, AM	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	10.19	7.43	200	139
R-8211	8/2/2011	12:30	JJ, AM	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	13.99	8.58	311	196
S-82411	8/24/2011	9:30	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	13.38	7.59	438	281

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
T-91211	9/12/2011	8:40	JJ, BP	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	9.53	7.59	857	607
U-91211	9/12/2011	10:00	JJ, BP	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	10.09	8.24	234	163
Y-11911	11/9/2011	10:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.22	7.96	684	487
Z-111511	11/15/2011	10:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	9.31	6.77	258	184
J-111711	11/17/2011	10:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.19	6.89	904	703
N-111711	11/17/2011	11:30	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	8.01	7.99	802	592
W-93011	9/30/2011	9:21	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	9.39	7.46	451	321

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	Date	Time	Field Personnel	SW, GW, or Spring?	Laboratory Analysis to be Conducted	Temperature °C	pH	Conductivity µS/cm at 25 °C	TDS ppm
X-93011	9/30/2011	10:00	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	19.32	7.58	1386	775
M-62711	6/27/2011	11:50	JJ	augmented spring	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	6.43	7.19	330	249
V-91211	9/12/2011	1:30	JJ	GW	GRO, DRO, VOC, SVOC, Coliform, TDS, Anions, Alk., Dissolved Gasses (RSK-175), Total Metals, HEM oil-grease, Gross Alpha/Beta	-	7.2	-	-

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
A-51611	0.29	none	clear	none	none	sunny, windy	Windmill-powered well
B-52011	NA	none	clear	none	none	sunny	domestic water well
C-52011	NA	none	clear	none	none	partly cloudy	domestic water well
D-6311	1.01	none	red/rust	none	none	sunny, windy	domestic water well with old hand pump
E-6311	3.1	chlorine	clear	none	none	sunny	domestic water well prior to pressure tank entry

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
F-61011	8.77	none	clear	none	none	sunny	domestic water well
H-61011	3.72	none	clear	none	none	sunny	domestic water well
G-61011	3.3	none	clear	none	none	sunny	domestic water well
J-61611	NA	none	clear	none	none	sunny	domestic water well, solar powered
I-61611	4.16	none	clear	none	none	sunny	domestic water well, solar powered

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
K-62411		none	clear	none	cloudy with bubbles but becomes clear over time as bubbles dissipate	sunny	domestic water well, solar powered
L-62411		none	clear	none	none	sunny	domestic water well, usually solar powered but for purging and sampling a gas generator was used
N-62711	0.41	none	clear	none	none	sunny, windy	domestic water well, wind and solar powered
E-62911	2.15	none	clear	none	none	sunny	domestic water well, not sure power source
O-7611	0.93	none	clear	none	none	sunny	domestic water well

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
P-7811	1	none	clear	none	none	partly cloudy	domestic water well
Q-72911	2.45	none	clear	none	none	partly cloudy	domestic water well
R-8211	2.91	none	clear	none	bubbles present	cloudy, overcast	domestic water well, solar powered, generator powered for test
S-82411	NA	slight sulfur	clear	none	none	sunny	domestic water well

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
T-91211	NA	none	clear	none	none	partly cloudy	domestic water well
U-91211	4.98	none	clear	none	none	partly cloudy	domestic water well
Y-11911	5.83	none	clear	none	none	sunny, cold	domestic water well
Z-111511	4.61	none	cloudy, clears up as air escapes	little air bubbles	none	cold, windy	domestic water well
J-111711	NA	slight sulfur	clear	none	none	sunny	domestic water well, solar powered
N-111711	NA	none	clear	none	none	sunny	domestic water well, wind and solar powered
W-93011	0.87	none	clear	none	none	partly cloudy	domestic water well

Table 8
Field Data for Groundwater Locations
2011 South Park Baseline

Sample ID	DO ppm	Odor	Color	Effervesce	Bubbles/Gas	Weather Cond.	Stream Conditions
X-93011		slight sulfur	slight yellow	none	very small minimal, could be from high pressure flow	partly cloudy	domestic water well
M-62711	2.95	none	clear	none	none	sunny, windy	augmented spring
V-91211	-	none	clear	none	none	partly cloudy	subdivision supply water well

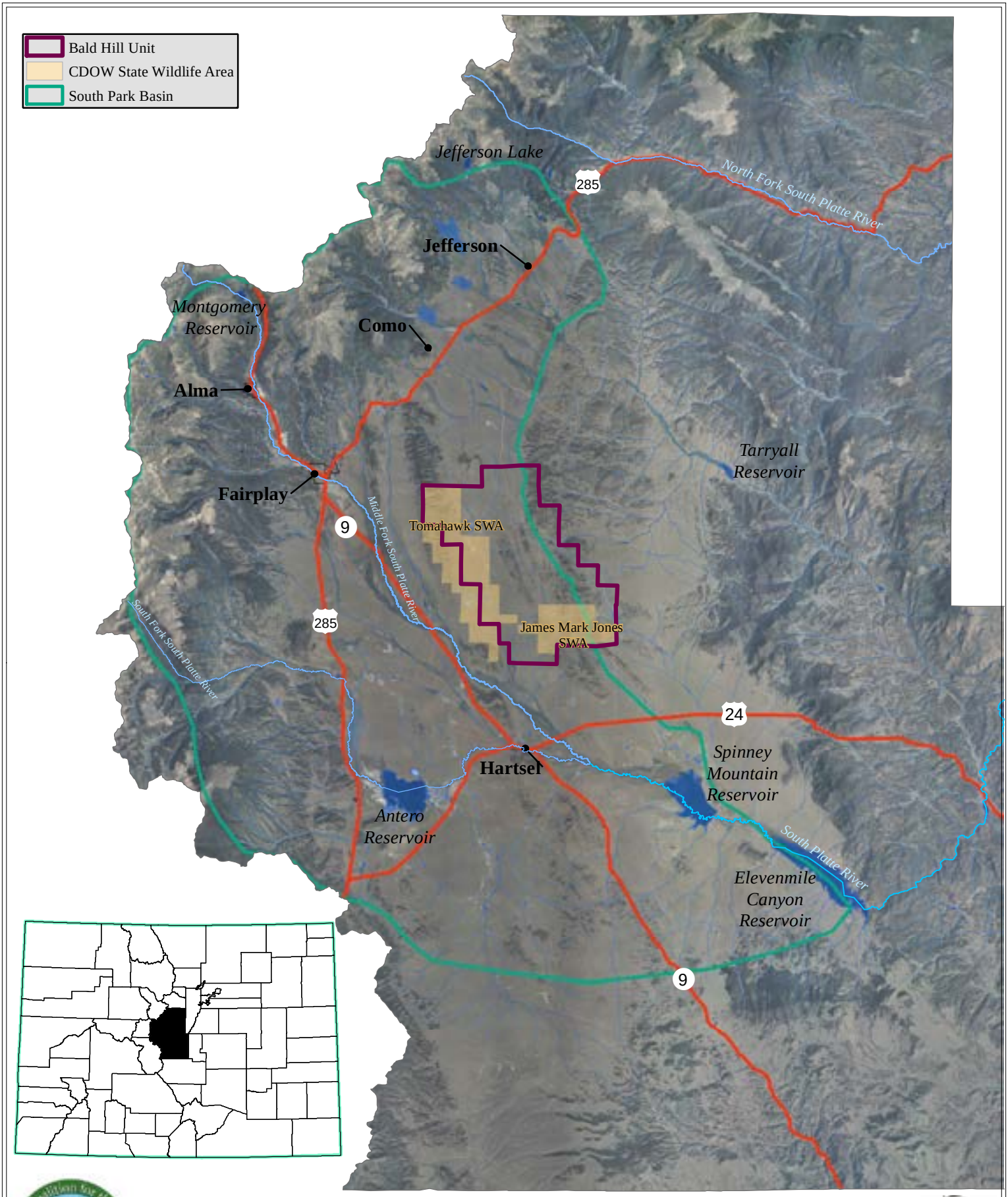

Figure 1. Location of Park County and the South Park Basin

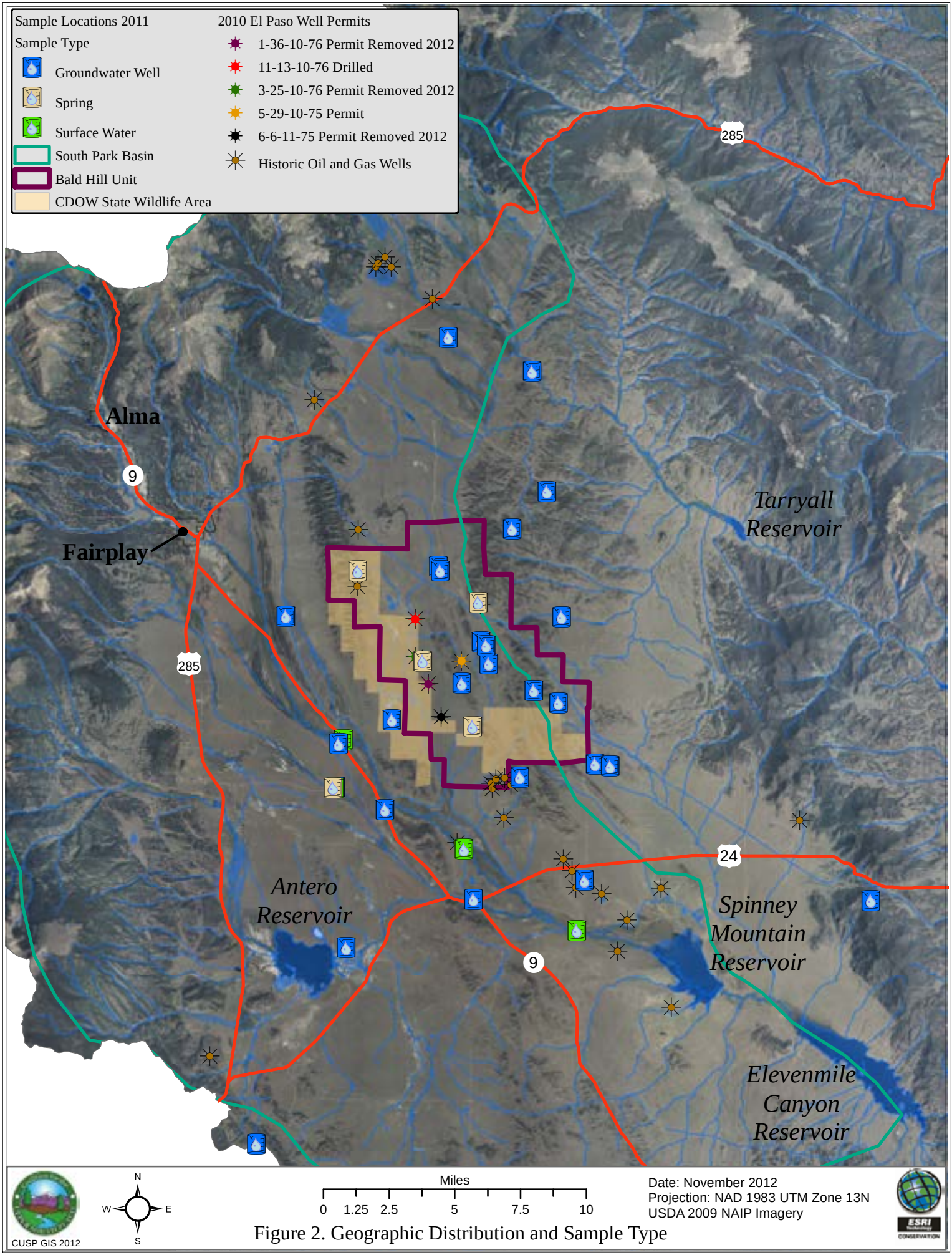

Figure 2. Geographic Distribution and Sample Type

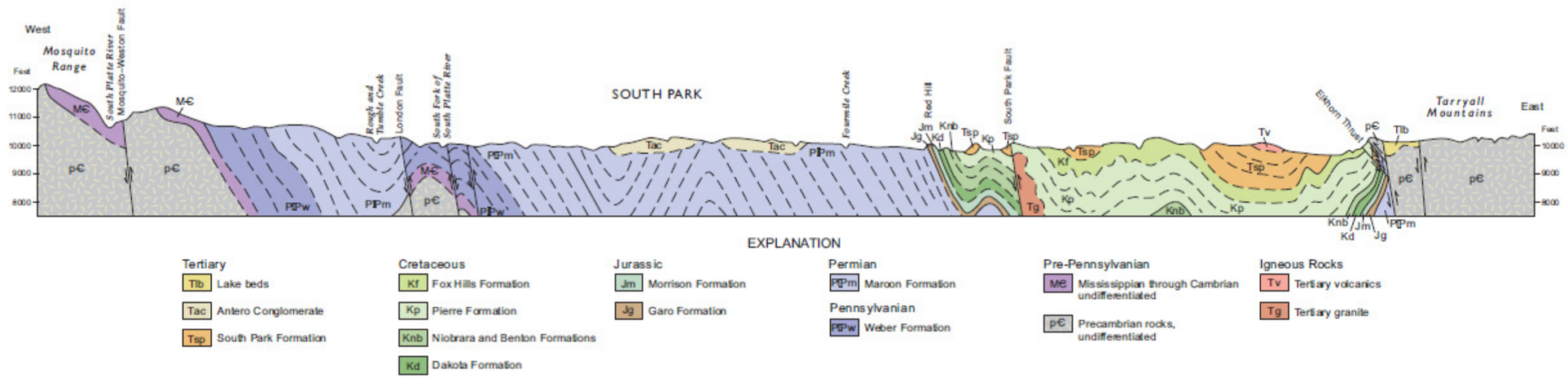

Figure 3. A generalized geologic cross-section located about 5 miles north of Antero Reservoir. From: Topper, K.L., Spray, W.H., Bellis, J.L., Hamilton, and Barkmann, P.E., 2003, Ground Water Atlas of Colorado, Colorado Geological Survey, 210 p.

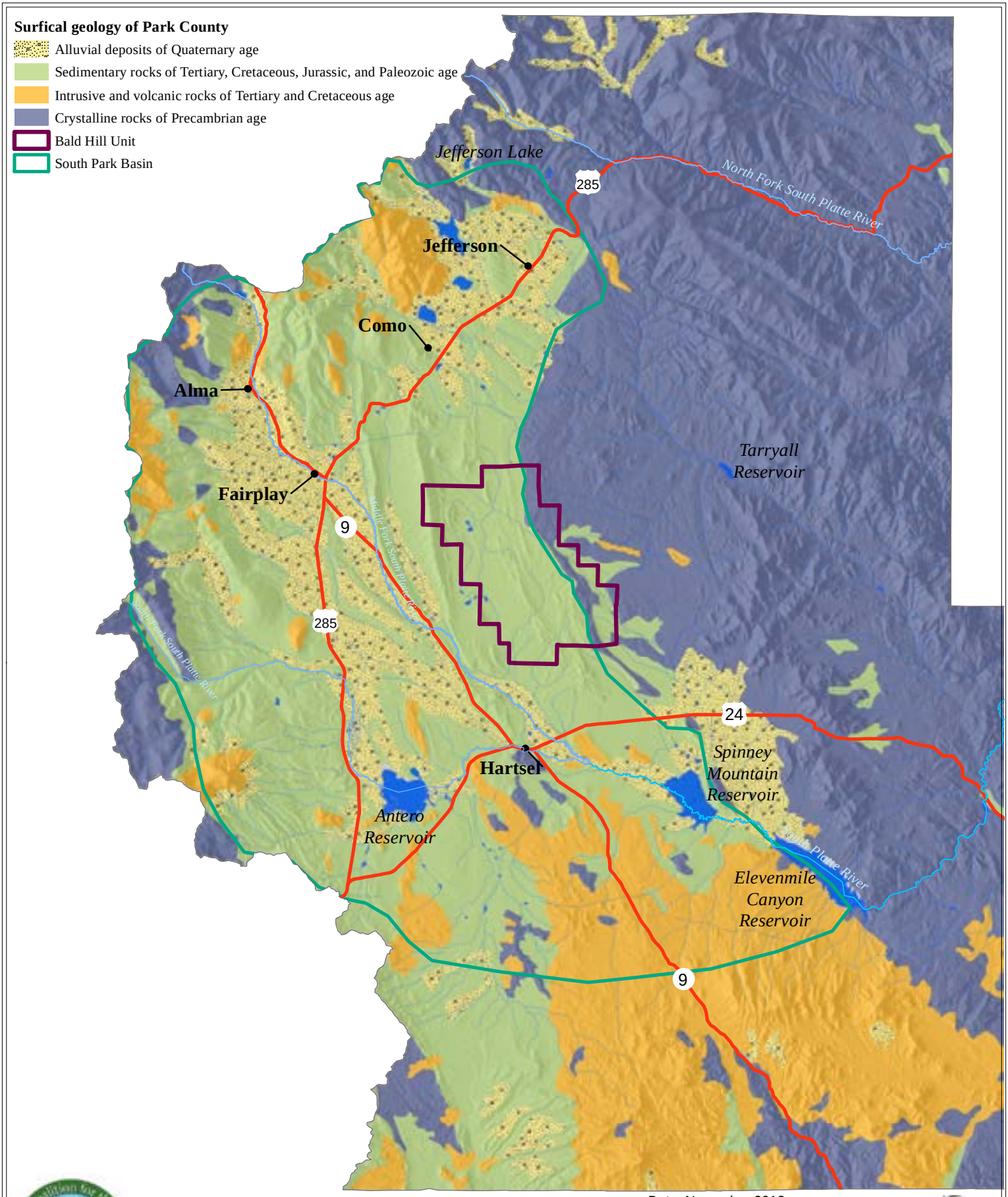

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Figure 4. Generalized Geologic Map of Park County

Era	System	Series	Stratigraphic Unit	Unit Thickness (feet)	Physical Characteristics	Hydrogeologic Unit	Saturated thickness (feet)	Hydrologic Characteristics
Cenozoic	Tertiary	Pliocene	Trump Formation	0–500	Sand, gravel, and poorly consolidated conglomerate	Trump aquifer	No data	No data
		Miocene	Wagontongue Formation	100–500	Coarse sandstone, sandy clay, and conglomerate; volcanic fragments	Wagontongue aquifer	No data	No data
		Oligocene	Antero Formation	>2,000	*Upper member*—gravel and conglomerate with sandy interbeds *Middle member*—fine-grained tuff, shale, and lacustrine limestone *Lower member*—thin limestones, tuff, shale, sandstone, and conglomerate	Antero aquifer	No data	No data
		Paleocene	South Park Formation	50–3,500 700 4,500 500–1,000	*Arkosic member*—arkosic sandstone, conglomerate and mudstone *Link Spring Tuff Member* *Conglomeratic member*—conglomerate, sandstone and tuffaceous mudstone *Reinecker Ridge Volcanic Member*—andesite flows, breccias, tuffs, and tuffaceous sandstone and mudstone	Upper South Park aquifer Middle part a confining unit Lower South Park aquifer Lower part a confining unit	50–2,000 50–3,000	Monitoring well data, average transmissivity = 475 ft^2/day Water wells yield 5–10 gpm; transmissivity range 44–88 ft^2/day, hydraulic conductivity range = 1–3 ft/day Monitoring well data, transmissivity averages 260 ft^2/day
Mesozoic	Cretaceous	Upper Cretaceous	Laramie Formation	0–375	Shale, sandstone, and coal	Upper part a confining unit		No data
			Fox Hills Sandstone	0–350	Sandstone and sandy shale at base	Laramie–Fox Hills aquifer		
			Pierre Shale Niobrara Fm Benton Group *Carlile Shale* *Greenhorn Limestone* *Graneros Shale*	~6,000 500–540 ~600	Predominantly shale, siltstone and sandstone at top Calcareous shale and limestone Predominantly shale with minor limestone	Considered a confining unit		Pierre can yield water from sandstone zones
		Lower Cretaceous	Dakota Sandstone	~400	Sandstone and conglomerate with shale and sandy shale	Dakota aquifer		No data
	Jurassic		Morrison Formation	200–400	Predominantly shale with limestone	Confining unit, can yield water in porous zones		No data
			Garo Sandstone	0–400	Sandstone with shaly lenses and basal conglomerate	Garo aquifer		No data
Paleozoic	Permian		Maroon Formation	~8,500	Predominantly redbeds including siltstone, sandstone with thin limestone beds and conglomerate lenses	Can be confining unit or aquifer		No data
	Pennsylvanian		Weber Formation	~3,000	Arkosic conglomerate with sandstone and shale	Aquifer unit		Well yields 3 to 30 gpm

Modified from Stark and others, 1949; Chronic, 1964; Leroy, 1964; Barker and Wyant, 1976; Jehn Water Consultants, 1997

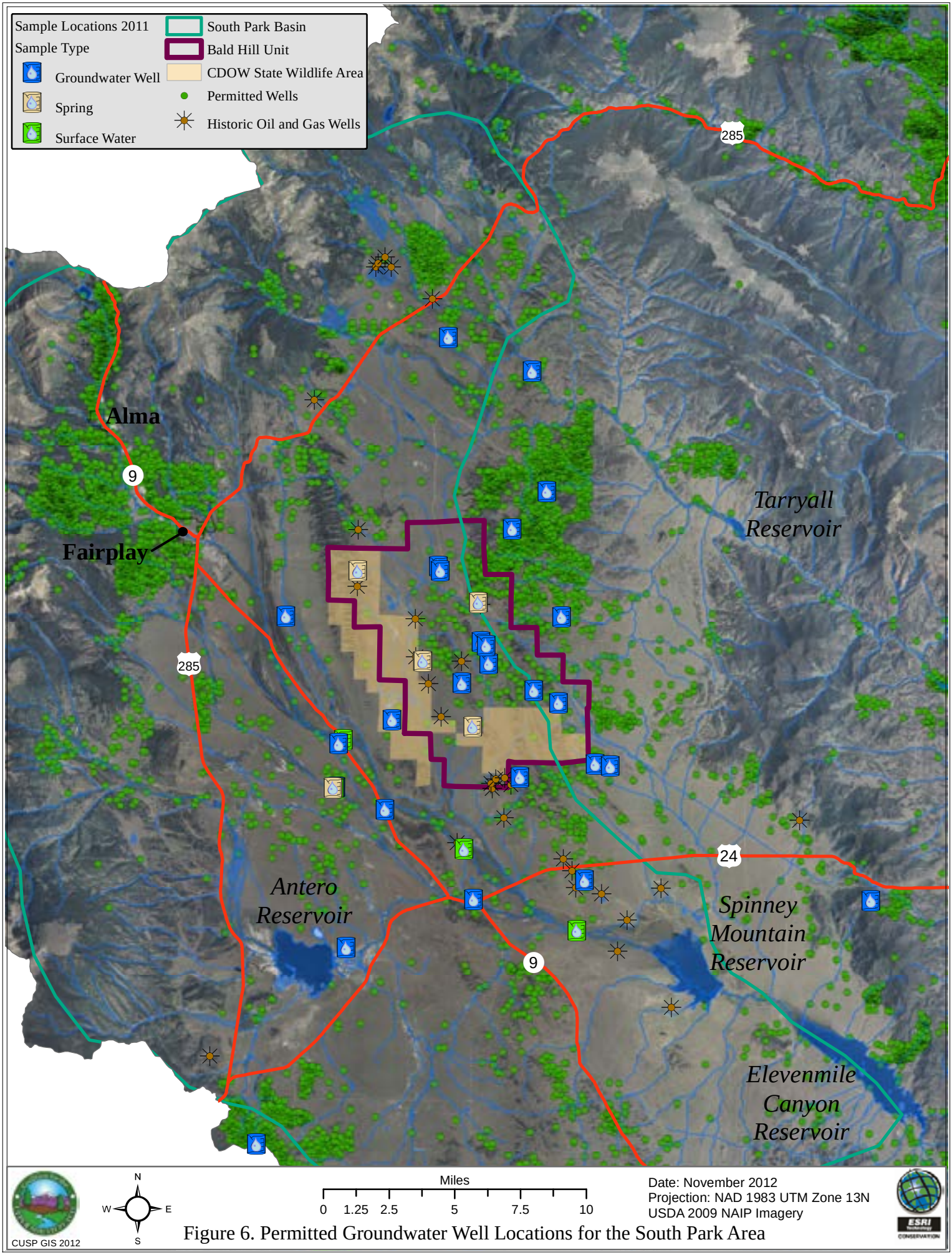


Figure 6. Permitted Groundwater Well Locations for the South Park Area

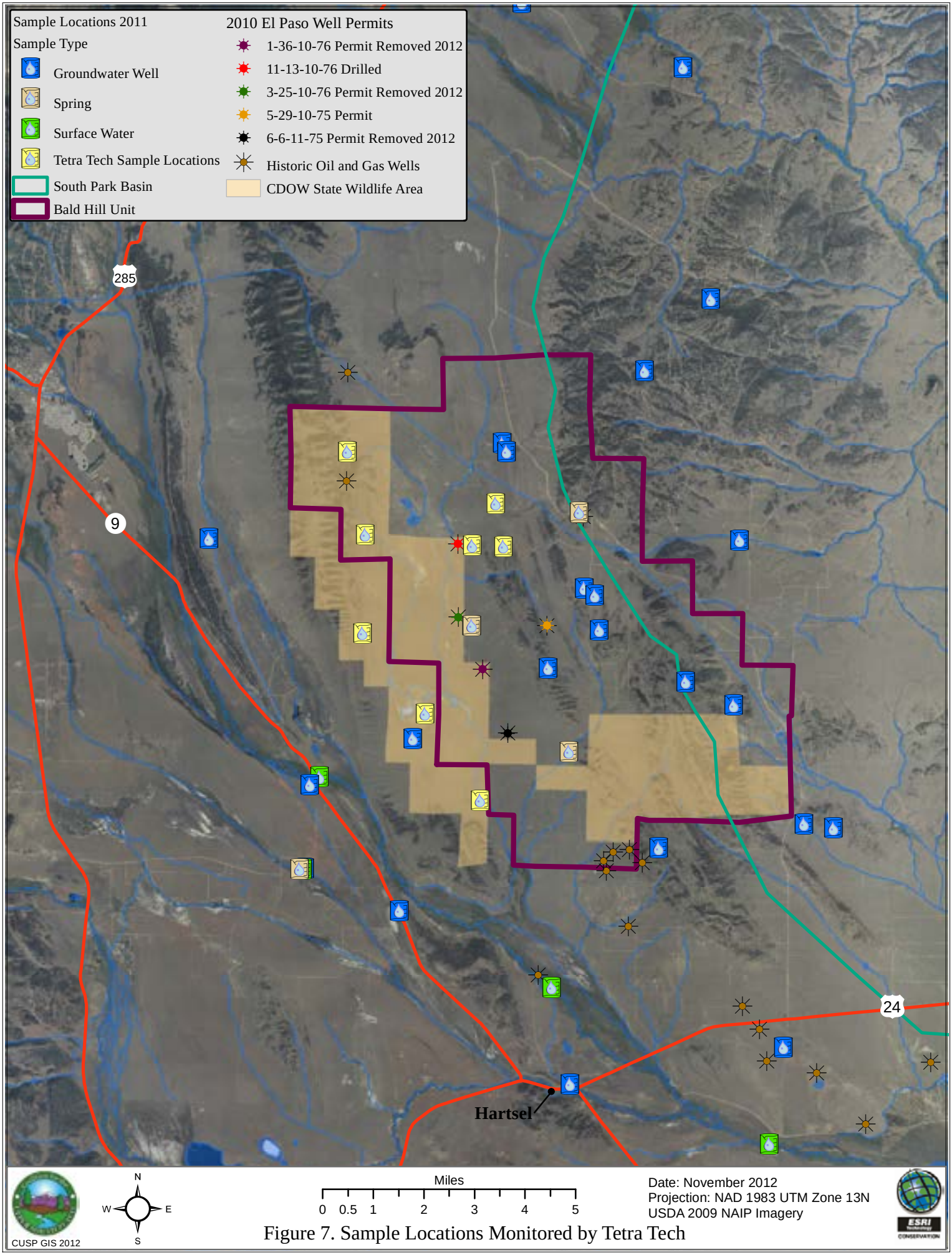
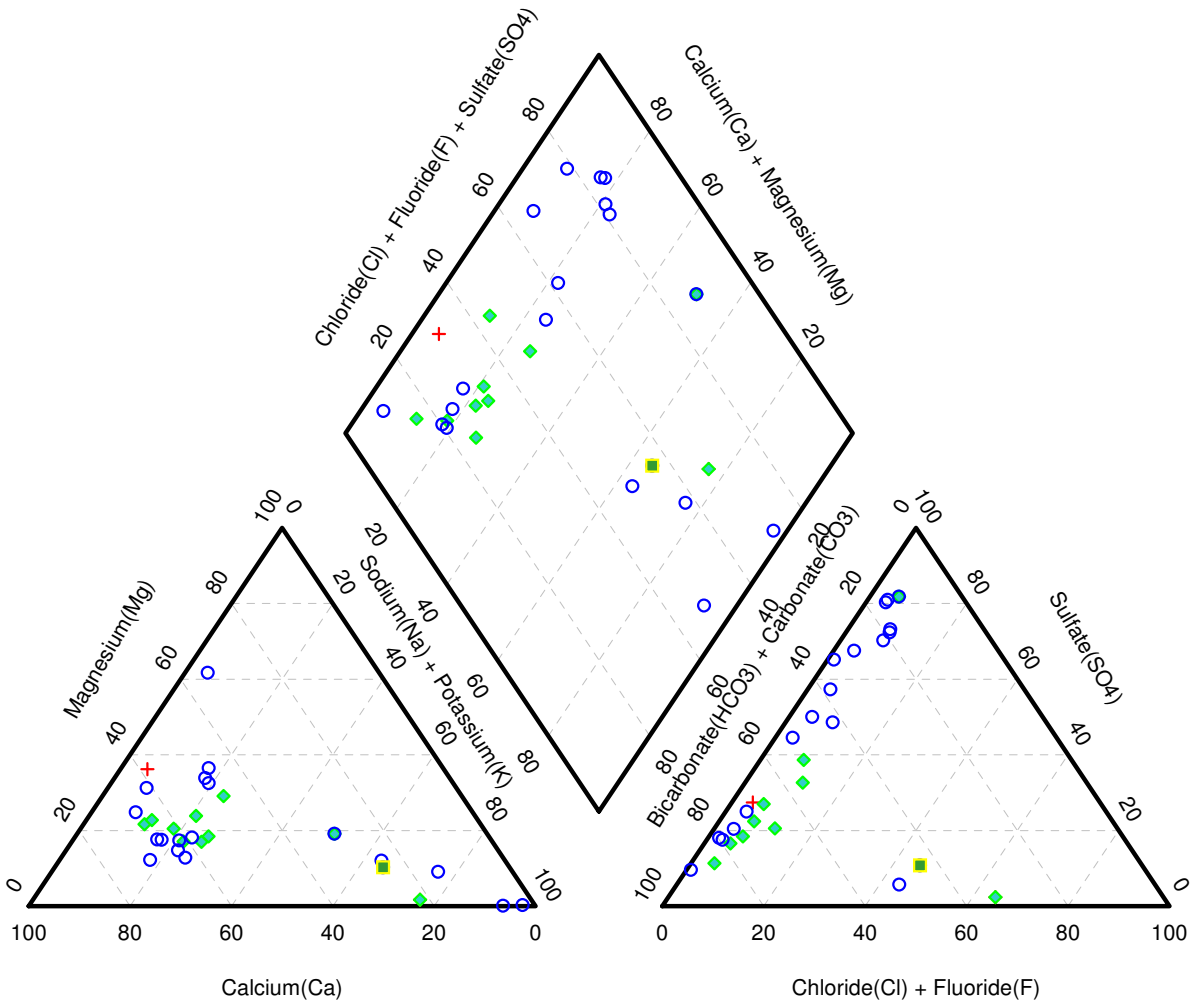


Figure 7. Sample Locations Monitored by Tetra Tech

Figure 8
Trilinear Diagram of Groundwater Chemistry



*symbol color corresponds to rock type of the screened interval of the well

* n=29

Alluvial | Crystalline | Sedimentary | Volcanic