

Thompson Divide Baseline Water Quality Report

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Executive Summary

This report provides and describes an initial database of representative water quality and flow data for both surface and ground waters, collected prior to the onset of any significant oil and gas development in portions of Pitkin and Garfield counties. Sampling efforts focused on the Fourmile Creek and Thompson Creek Watersheds.

Water quality sampling and flow measurement were conducted at four surface water and four ground water sites selected to be representative of potential impacts from proposed oil and gas drilling and development activities. Samples were collected between late September 2009 and late August 2010, during all seasons to represent the range of normal hydrologic conditions.

This study demonstrates that surface waters at the monitored sites were cold, highly oxygenated, largely sediment-free, with low concentrations of dissolved chemical constituents. Most major chemical constituents were present at concentrations below reporting limits or at low concentrations. Chemical constituents that are often indicators of industrial, agricultural or human waste contamination were reported at very low concentrations [i.e. ammonia, nitrate, sulfate, sulfide, chloride, orthophosphate, dissolved organic carbon]. Most minor metals, metal-like elements and radiation were not detected in these surface waters [i.e. they were reported at concentrations below detection limits]. Low concentrations of aluminum, barium, iron, manganese and uranium were detected in some surface waters. Such low concentrations are normal given local geology and do not indicate contamination.

All organic compounds investigated were below reporting limits. The only exception is dissolved organic carbon (DOC), a general measure of the presence of both natural and introduced carbon compounds. DOC concentrations were within expected ranges for uncontaminated surface waters.

Ground water data show these waters to be generally cold, sediment-free, and well oxygenated. These ground waters contained low or non-detectable concentrations of most minor or trace constituents. Only barium had a *median* concentration that was above the detection limit. Several other metals and metal-like elements (boron, aluminum, iron, manganese, copper, antimony, selenium, uranium, and zinc) were detected at low concentrations, but their statistical median concentrations were below detection. The presence of these elements at low concentrations is common in such geologic formations and does not indicate any form of unusual contamination. No regulated water contaminants were detected at unacceptable concentrations in any samples.

These baseline water quality results are consistent with the conclusions presented in the studies of bottom-dwelling organisms and sediment by Miller (2010). Samples collected for the present study and the Miller (2010) study were collected at the same locations. This report together with Miller (2010) indicate that the baseline waters are healthy, uncontaminated and support significant populations of benthic aquatic organisms.