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**EFFECT OF MOUNTAIN PINE BEETLE INFESTATION ON WATER SUPPLY –
INVESTIGATION INTO THE EFFECT OF BEETLE-KILLED TREES ON THE WATER SUPPLY**

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ABSTRACT: The ongoing mountain pine beetle epidemic has already dramatically impacted Colorado's forested high country and is increasingly impacting forests east of the continental divide along the Front Range. Over 3 million acres of lodgepole, ponderosa and limber pine stands have been infected by the mountain pine beetle infestation in Colorado. Although the pine beetles are indigenous to the area, the extent of this infestation has not previously been seen in the recorded history of Colorado's forests. Studies have shown that the majority of mature lodgepole pines have been infected during the current infestation, as well as ever-increasing areas of ponderosa pine. Various factors have played a role in the far-reaching infestation including forestry practices, drought, and increased temperatures. Natural cycles of insect and disease outbreaks are important components of functioning forest ecosystems, serving to diversify and rejuvenate the forest. Occasionally, forest and climatic conditions will collide in a way that causes these outbreaks to reach epidemic proportions, causing concern over increased wildfire risk, public safety and economic and aesthetic values. Severe drought during the past decade, accompanied by relatively warm temperatures in both summer and winter, has resulted in stressed trees and the perfect conditions for this kind of landscape-scale insect and disease activity. Research is now being done to determine the effects of the outbreak on water availability and supplies. The infestation has the potential to impact the local water supply in various ways. Studies have shown that runoff and infiltration from beetle killed areas can be affected and water quality can be impacted in various ways depending on the variation of stand maturity. These studies were reviewed, and additional data were analyzed to further study the effect of the beetle kill on a small mountainous watershed. Historic streamflow records and nearby snowpack records were analyzed for similar precipitation years in the high-elevation watershed in North Central Colorado. In addition, water quality monitoring has begun in many watersheds affected by the mountain pine beetle to determine the water quality concerns that will need to be addressed.