

Improvement Plan for the Oak Creek Watershed, Arizona

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Oak Creek Watershed Council

Plan development oversight was provided by Oak Creek Watershed Council in conjunction with the Oak Creek Watershed Improvement Commission (WIC). Oak Creek Watershed Council is a 501(c)(3) nonprofit organization that exists to protect the Oak Creek Watershed environment as well as the integrity of Oak Creek and its tributaries.

Oak Creek Watershed Improvement Commission

The WIC is a voluntary group of watershed stakeholders including local and state government and land management agencies, as well as local residents and community groups. Individuals and organizations represented on the WIC include:

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Abstract

Previous research and monitoring in Oak Creek have found *Escherichia coli* (*E. coli*) bacteria concentrations exceeding Arizona Water Quality Standard for full body contact of 235 colony forming units per 100 ml water. Efforts have been made to try to reduce human-caused sources of *E. coli*, yet *E. coli* exceedances remain a problem especially where there is concentrated recreation in the creek, such as at Slide Rock State Park, and during storm events that deliver additional *E. coli* to the creek. The Oak Creek Watershed Council conducted a field investigation during summer 2011 to try to identify *E. coli* source areas. Water samples were collected repeatedly before and during summer monsoon at several locations along the entire stream length, from tributary flow, and from springs that discharge to Oak Creek. All samples were tested for *E. coli* bacteria. Some of these samples were also tested for turbidity and nutrient concentrations. A limited number of samples were tested to determine the presence of human, bovine and dog DNA. Results showed that *E. coli* exceedances were greatest in and below the City of Sedona with very few exceedances in Oak Creek Canyon. Exceedances often corresponded with storm flow events, were strongly related to turbidity, and may sometimes be associated with septic leakage, especially from larger commercial systems, that may be intercepted by groundwater and transported through spring discharge to the creek. The findings of the 2011 investigation support earlier studies some of which call for investigation of sediment *E. coli* reservoirs because they appear to be a primary means by which *E. coli* causes exceedances when reservoirs are disturbed either by recreation activity or turbulence caused by storm events. A series of best management practices projects regarding recreational, agricultural, residential and commercial activities in the watershed is recommended, as are continued investigations into potential contaminant pathways including septic system leakage, dog feces concentrations, and sediment reservoir development and disturbance with emphasis on tracking and reducing sediment sources as a means of reducing the *E. coli* bacteria that are harbored in sediment.

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Abbreviations

303(d)	Arizona’s Impaired Waters List
319(h)	Clean Water Act Section 319(h), a source of funding for nonpoint source pollution prevention
A&W	Aquatic and wildlife – a designated use for water quality standards
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game and Fish Department
AIS	Anthropogenicly Influenced Site
AUW	Arizona Unique Waters
AZPDES	Arizona Pollution Discharge Elimination System
BMP	Best Management Practices
cfu/100ml	colony forming units per 100 milliliters, a measure of <i>E. coli</i> concentration
CNF	Coconino National Forest
<i>E. coli</i>	<i>Escherichia coli</i>
EPA	United States Environmental Protection Agency
FBC	Full body contact – a designated use for water quality standards
HUC	Hydrologic Unit Code
NAU	Northern Arizona University
NEMO	Nonpoint Education for Municipal Officials
NPDES	National Pollution Discharge Elimination System
OAW	Outstanding Arizona Waters
OCCTF	Oak Creek Canyon Task Force
OCWC	Oak Creek Watershed Council
OCWIC	Oak Creek Watershed Improvement Commission
PBC	Partial body contact – a designated use for water quality standards

SAP	Sampling and Analysis Plan
SRSP	Slide Rock State Park
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
TMDL	Total Maximum Daily Load
WIP	Watershed Improvement Plan
YCFCD	Yavapai County Flood Control District