

Education Grant Application

Grant Application Form and Signature Page

Arizona Department of Environmental Quality
Water Quality Improvement Grant Program
Grant Application Form

Project Title - Oak Creek Canyon Water Quality Improvement Program

Project Description - A stream monitoring project of Oak Creek chemical parameters, enumerating *Escherichia coli* (*E. coli*) concentrations and genotyping *E. coli* to identify problem areas within Oak Creek Canyon and thereby focus mitigation efforts. Field and lab work will be conducted by high school students, who will participate in a Trailhead Ambassador program and community outreach to educate recreational users and stakeholders towards reducing anthropogenic (human and pet) sources of fecal contamination in Oak Creek Canyon. This project is a collaboration with Oak Creek Canyon Task Force.

Authorizing Agency - Enter the name of the company, agency, or tribal authority who is applying for the grant.

Name: Pender Engineering
 Address: 1010 N Main St, PO Box 1245
 City: Cottonwood
 State: AZ
 Zip Code: 86326

Authorized Agency Contact - Enter the name of the person who will be accepting responsibility for the terms and conditions of the Grant Agreement. This person must sign the signature page.

Name: Tom Pender, PE
 Title: Owner
 Phone #: 928-639-0776
 Fax #: 928-639-3801
 E-mail: tomp@pender-engineering.com

Project Manager - Enter the name, title and contact information of the individual who will have the day-to-day knowledge of the project and should be contacted if clarification is required:

Name: Rex Bergamini
 Address: 1010 N Main St, PO Box 1245
 City: Cottonwood
 State: AZ
 Zip Code: 86326
 E-mail: rbergamini@pender-engineering.com

Title: Senior Environmental Scientist
 Phone #: 928-639-0776
 Fax #: 928-639-3801

Project Period

0 - 1 Year

Up to 2 years

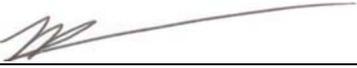
Project Costs

Funds Requested: \$53,490
 Matching Funds: \$96,076
 Total Project Cost: \$149,566

Are you or your organization currently debarred, suspended or otherwise lawfully prohibited from any public procurement activity? Yes No

Signature Page

The undersigned hereby offers and agrees to perform in compliance with all terms, conditions, specifications and scope in this grant application. Signature certifies understanding and compliance with the application attached hereto. ADEQ may approve the grant application with modifications to scope, methodology, schedule, final projects and/or budget.

Authorized Signature  _____

Date 04/18/2008

Print Name Thomas L Pender, PE

Title Owner

Company/Agency Pender Engineering

The Grant Application Form must be signed by the individual legally authorized to act on behalf of the applicant in conducting all official business relating to the project. Signing this form and submitting a grant application package, certifies that the applicant has authority to enter into the agreement, accept funding, and fulfill the terms of the proposed project if approved. Applicant is required to read the Water Quality Improvement Grant Agreement Terms & Conditions and be legally authorized to enter into an agreement with ADEQ.

Project Summary

Action Plan. Our action plan is twofold and involves establishing a Trailhead Ambassador Program and continued support to the Oak Creek Canyon Task Force efforts. Our approach targets educating three audiences: 1) High school and middle school students in the Sedona Oak Creek Unified School District (SOCUSD); recreational users of Oak Creek Canyon; and 3) Oak Creek Canyon homeowners with aging and/or substandard on-site septic waste disposal and treatment systems that are potential sources of fecal coliform and nutrient contamination. We expect that our target audiences, when educated, will promote stewardship in Oak Creek Canyon and its recreational areas, and that their behavioral changes will manifest themselves as long-term and broad-based; e.g., students will share their knowledge with family and friends, recreational users will dispose of waste and litter appropriately, and homeowners will voluntarily upgrade sub-standard septic systems.

Our hands-on, in-the-field, active-participation, experiential education is a Trailhead Ambassador Program staffed by volunteer high school students from SRRHS fluent in both English and Spanish. These students will:

- Work weekends and holiday weekends, 35 weekends from March to October, to greet visitors in Oak Creek Canyon day-use and overnight-use areas, explaining to visitors the risks associated with fecal contamination, reminding visitors of the stream of the importance of proper disposal of trash and human and pet wastes, and directing visitors attention to locations of toilettes, trash receptacles, recycling receptacles and dog waste stations. This program will provide up to one high school credit towards graduation upon completion of 120 hours of volunteer service.
- Educate middle school science students (all seventh and eighth grades) in preventing and mitigating for fecal coliform pollution to Oak Creek. The educational outreach by high school students will reach an audience of approximately 125 students at each middle school.
- Collaborate with Arizona EnviroZeum to conduct two workshops for stakeholders, homeowners and the public. We anticipate a Fall and Spring workshop held in the high school auditorium or cafeteria. Students will also present mitigation strategies that will promote voluntary upgrades of residential/commercial wastewater systems that may be contributing to pollution in Oak Creek with an approved alternative septic system. Oak Creek homeowners and businesses will receive, via mail, an invitation to attend the workshops. It is anticipated that ADEQ, Arizona NEMO, Coconino County and the OCCTF will participate in this seminar.

Additional educational tools that are proposed and budgeted for development continue support for the OCCTF and include:

- Maintain, upgrade, or add additional first-flush detention/retention ponds and sediment traps in day-use and camping areas to mitigate for turbidity. At this juncture, we've identified Manzanita Campground and Half Way day-use area as needing maintenance.
- Install and maintain at least 12 and up to 16 (depending on pricing) Barco[®] Dog Waste Disposal Stations at trailheads to educate recreational users about the importance of preventing the use of the streamside as a human and pet toilet. Each station will hold a dispenser with biodegradable and compostable BioBag Dog[®] waste bags, a receptacle and signage in both English and Spanish, depicting the ADEQ

and OCCTF logos. We anticipate locating the signage and dog waste stations on both sides of Oak Creek immediately above the Slide Rock swim area and at Half Way, Midgely Bridge and Grasshopper Point Picnic Areas.

- Collaborating with Arizona EnviroZeum and Canyon Services Inc to develop a homeowner's guidebook produced to identify the threats aging septic systems present to Oak Creek Water and illustrate the process of replacing a system. This document will include the several references available on the internet as well as a contact list from ADEQ, Coconino County, Arizona NEMO and Oak Creek Canyon Task Force. It will also include illustrations and explanation of different types of alternative septic systems and benefits of voluntarily replacing a non-conforming waste disposal system. It will be made available at both the Fall and Spring workshops and as a reference for those seeking to replace or upgrade their septic systems or simply to learn more about mitigating possible environmental stressers to unique waterways like Oak Creek.
- Revising, promoting and maintaining the Oak Creek Canyon Task Force (OCCTF) website and advertising in Sedona Biz, thereby promoting the ADEQ, the OCCTF and the Keep Oak Creek Canyon Beautiful Program. Sedona Biz conservatively estimates reaching via the web over 5,500 viewers each week, including those in the Sedona-Verde Valley, those who live part time in the area, and those who love Sedona or plan to visit the area.

Desired Outcomes

This project ultimately strives to achieve identification of major sources of *E. coli* pollution in the reach of Oak Creek within Oak Creek Canyon and mitigation of those sources of contamination assessed through:

- Increasing educational opportunities and public awareness of water quality issues in surface waters by integrating the project into a local high school science curricula and coordinating with a local environmental education nonprofit to conduct informational workshops targeting the public and private sectors.
- Developing opportunities for collaborative partners within public and private sectors.

The educational benefits that ADEQ is investing in is a hands-on, on-the-ground *pro bono* work force (we conservatively estimate the value of volunteer labor at approximately \$78,000, assuming a pay rate of \$10/hr) implemented at the high school level to act as Trailhead Ambassadors to promote and educate Best Management Practices (BMPs) to recreational users of Oak Creek for 35 weekends, and to promote BMPs to younger students, their friends, families, and stakeholders. In addition, the ADEQ is continuing its investment in a successful 319(h) program, the Oak Creek Canyon Task Force. Collectively, ADEQ will have potentially invested in the education of hundreds to thousands of people from the funding of this project.

We expect that promoting stewardship in the Oak Creek recreational areas will result in lasting behavioral changes in both students and visitors. Evidence of behavioral changes will be subjective (e.g., supervisors will observe attitudinal changes in students, as assessed through pretest/posttest measures of environmental values) and objective (e.g., measurable reductions in streamside litter, diapers, human and dog fecal waste, as assessed through physically measuring weekend trash collections. In addition, a homeowner or business voluntarily incurring the expense and hassle of a septic upgrade can be considered a behavioral change.

This education project will support and expand upon existing mitigation and education efforts; specifically, to support and expand upon previous scientific studies and the efforts of the Oak Creek Canyon Task Force and will partially fulfill requirements of Section 319 of the Clean Water Act:

1. Arizona's 2004 303(d) List and Other Impaired Waters Report classifies Oak Creek at Slide Rock State Park as impaired by *E. coli*, citing a numeric target to "be focused on reduction of fecal coliform loading to sediments and water, with corresponding reduction of *E. coli* for the entire watershed above Slide Rock".
2. The Keep Oak Creek Beautiful Program is a BMP developed by OCCTF to address educating the public to reduce streamside activities (trash and waste) that may attract wildlife populations and their waste streamside, and is fully supported by ADEQ, Arizona NEMO and the Oak Creek Canyon Task Force.
3. The most recent TMDL completed by the ADEQ presented monitoring and testing results identifying contaminants, their possible or probable sources and recommended actions. This document makes several references to *E. coli* exceedences and cites septic systems as a probable contributor.
4. Best management practices (BMPs) recognized by ADEQ and EPA for Onsite/Septic Disposal Systems state that aging and substandard onsite/septic waste disposal and treatment systems are potential sources of fecal coliform and nutrients to both surface and ground water resources.
5. Replacement of septic systems that currently discharge into unsuitable soils, and that are hydrologically connected to surface and/or ground water has been successfully implemented on many properties along Oak Creek from previously awarded 319(h) Grant programs and their stimulus to neighboring properties to upgrade their systems.
6. The OCCTF has been and continues to be involved in projects to replace non-conforming septic systems with approved alternative septic systems to mitigate immediate contamination threats, prevent future expansion of contamination caused by increased wastewater volumes and protect the Oak Creek waters from any possible future contamination from properties.

Work Plan, Steps and Milestones

The associated costs for completion of the Work Plan milestones are inclusive of both match and grant expenditures. For instance, the \$104,300 costs for Trailhead Ambassadors includes \$16,800 for student supervisor salaries (grant expenditure), \$9,100 for transportation (match expenditure) and \$78,400 for volunteer salaries (match expenditure). The Work Plan, Steps, Milestones and Associated Costs are summarized in the table below:

Work Plan/Product Step	Milestone	Date Completed	Associated Costs
Procure Sedona Biz Advertising	Advertisement for OCCTF runs monthly	Jul 18, 2008	\$510
Procure website development, promotion & maintenance	Website on internet; receives 20 hits/day	Aug 08, 2008	\$4,500
Procure plastic litter bags & Trailhead Ambassador t-shirts	Plastic litter bags t-shirts imprinted	Aug 15, 2008	\$4000
Initiate Trailhead Ambassador Program	Educate 20 Student Volunteers	Aug 15, 2008	\$0
Deliver 40-yard roll off dumpsters at Indian Gardens for Memorial, July 4 th & Labor Day	Dumpsters delivered for each Holiday	May 29, Jul 03, & Aug 29, 2009	\$2000
Procure Dog Waste Stations, Bags & Signage	Install 10 Stations	Sep 30, 2008	\$11,380
Procure two Anti-litter signs depicting OCCTF, ADOT & ADEQ logos for Hwy 89A	Install signs at the top & bottom of Oak Creek Canyon	Sep 30, 2008	\$1,000
Trailhead Ambassadors educate middle school science classes; solicit new membership	90% of District 7 th and 8 th Graders attend presentations	Apr 24, 2009	\$0
Trailhead Ambassadors monitor trailheads	7 Participants per day for 35 weekends per year	Oct 15, 2009	\$104,300
Develop Homeowner Guidebook/Brochure based on survey results	Design & print 100 brochures	Nov 07, 2009	\$2,500
Conduct Stakeholder/Homeowner Public Meetings	30 Stakeholders or Homeowners attend each meeting	Nov 17, 2009 Nov 24, 2009	\$500
Voluntary Septic System Upgrades	One homeowner or business voluntarily upgrades septic	Dec 17, 2009	\$0
Administration of project, including completion of Quarterly & Final budget reports & narrative reports	Final reports submitted to the ADEQ	Dec 31, 2009	\$18,876
		Total	\$149,566

Self-evaluation of the Project

We will verify achievement at each level of our desired outcomes for evaluation and implementation of the BMP (e.g., action plan) and acute and chronic efficacy of our educational success; specifically, metrics for measuring behavioral changes, retention of educational messages and active involvement by participants may overlap but will include, at a minimum:

1. **Behavioral Changes.** Evidence of behavioral changes will be subjective (e.g., supervisors will observe behavioral and attitudinal changes in students, as assessed through pretest/posttest measures of environmental values) and objective (e.g., measurable reductions in streamside litter, diapers, human and dog fecal waste, as assessed through physically measuring weekend trash collections). In addition, the number of homeowners or businesses that voluntarily incur the expense of a septic upgrade after a workshop will be considered and tracked as behavioral changes.
2. **Retention of Educational Messages.** Retention of educational messages will be assessed for high school students at the end of the semester/school year with a post-test; for incoming ninth graders to the high school, retention of educational messages will be assessed through a pre-test.
3. **Active Involvement.** Active involvement by participants will be measured subjectively (a willingness and eagerness to learn and work) and objectively (a volunteer is in attendance; a volunteer participates in educational outreach; a minimum of 30 stakeholders, homeowners and business owners attend workshops will be considered 10% achievement). In addition, a homeowner or business voluntarily incurring the expense of a septic upgrade after a workshop can be considered active involvement. Completion of construction and installation of trailhead signage, Highway SR 89A signage and dog waste disposal stations will be considered 20% achievement.

Budget

ADEQ Grant Award #

Project Title: Oak Creek Canyon Water Quality Improvement

Time Period From: June 1, 2008

To: December 31, 2009

Grant Expenditures	Original Budget	Prior Expenditures	Current Expenditures	Cumulative Expenditures	Budget Remaining
Admin. Costs (10% Max)					
Project Admin	\$10,800.00			\$0.00	\$10,800.00
	\$0.00			\$0.00	\$0.00
Direct Costs					
	\$0.00			\$0.00	\$0.00
Equipment	\$0.00			\$0.00	\$0.00
	\$0.00			\$0.00	\$0.00
Supplies - Studies	\$0.00			\$0.00	\$0.00
Supplies - OCCTF	\$17,380.00			\$0.00	\$17,380.00
	\$0.00			\$0.00	\$0.00
Other - OCCTF Promotion	\$8,510.00			\$0.00	\$8,510.00
	\$0.00			\$0.00	\$0.00
Personnel					
Salaries	\$16,800.00			\$0.00	\$16,800.00
	\$0.00			\$0.00	\$0.00
Sub-Total Grants	\$53,490.00	\$0.00	\$0.00	\$0.00	\$53,490.00
Verify Totals (This number should be the same as the Sub-Total Budget Remaining cell above)					\$53,490.00
Match Expenditures	Original Budget	Prior Expenditures	Current Expenditures	Cumulative Expenditures	Budget Remaining
Admin. Costs (10% Max)					
Project Admin	\$6,780.00			\$0.00	\$6,780.00
	\$0.00			\$0.00	\$0.00
Direct Costs					
	\$0.00			\$0.00	\$0.00
Equipment - Studies	\$0.00			\$0.00	\$0.00
	\$0.00			\$0.00	\$0.00
Supplies - Studies	\$0.00			\$0.00	\$0.00
	\$0.00			\$0.00	\$0.00
Other - Office/Space	\$1,796.00			\$0.00	\$1,796.00
Other - Transportation	\$9,100.00			\$0.00	\$9,100.00
	\$0.00			\$0.00	\$0.00
Personnel					
Salaries	\$78,400.00			\$0.00	\$78,400.00
	\$0.00			\$0.00	\$0.00
Sub-Total Match	\$96,076.00	\$0.00	\$0.00	\$0.00	\$96,076.00
Verify Totals (This number should be the same as the Sub-Total Budget Remaining cell above)					\$96,076.00
Totals	Original Budget	Prior Expenditures	Current Expenditures	Cumulative Expenditures	Budget Remaining
Grand Total	\$149,566.00	\$0.00	\$0.00	\$0.00	\$149,566.00