



Water Quality Improvement Grant Program  
Grant Agreement EV17-0001 (19-003)

EV17-0001

Project Title: Wetland Restoration on O'Donnell Creek, Santa Cruz Co  
Expiration Date: April 30, 2019  
Dollars Matched: \$45,300.00  
Dollars Awarded: \$67,430.00

602 242 - 0210

Between  
Arizona Department of Environmental Quality  
and  
Desert Botanical Garden

This Grant Agreement is established between the State of Arizona Department of Environmental Quality, located at 1110 West Washington Street, Phoenix, Arizona 85007 ("ADEQ" or "Department") pursuant to Arizona Revised Statutes (A.R.S.) § 41-2701 et. seq. and A.R.S. § 49-104 and ("Grantee"). This Grant Agreement includes the attachments listed below. Incorporated by reference, this Grant Agreement also includes the ADEQ Water Quality Improvement Grant Program Request for Grant Applications (EV16-0002).

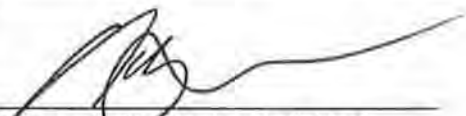

Attachment 1: Grant Applications

Attachment 2: Water Quality Improvement Grant Agreement Terms and Conditions

Special Conditions

- Attachment 1 includes the approved project scope of work and budget. Any adjustments shall be pre-approved by ADEQ.
- Grantee shall provide proof of adequate insurance prior to any grant activities being initiated. Minimum insurance requirements are located in Attachment 2: Water Quality Improvement Grant Agreement Terms and Conditions.
- Grantee shall work with ADEQ staff to develop a complete and approved monitoring plan prior to on-the-ground activities that reflects grantee and ADEQ responsibilities.
- Grantee agrees to coordinate with ADEQ for water quality sampling and best management practice effectiveness monitoring.
- Grantee shall provide the required information to ADEQ to obtain SHPO clearance for projects and update Work Plan Steps and Milestones to reflect activities and time needed to obtain SHPO clearance. No on-the-ground work shall be initiated on a project of concern until SHPO clearance has been secured for the specific project.
- Grantee shall work with the ADEQ Project Manager to update the Work Plan Steps & Milestones to be approved by the ADEQ Project Manager.
- Grantee shall work with the ADEQ Grant & Watershed Coordinator to develop a measurable component for outreach success.
- Grantee shall allow access to project area before and after implementation to complete BMP assessment monitoring.
- Grantee shall provide letters of support from landowners prior to any grant activities being initiated.
- Grantee will provide an amended final application form that reflects the revised budget amounts from the revised Budget Form.

In witness whereof the parties hereto agree to carry out the terms of this Grant Agreement.

<b>Arizona Department of Environmental Quality</b>	<b>Desert Botanical Garden</b>
Trevor Baggio, ADEQ Water Quality Division Director	Andrew Salywon, Authorizing Agent
 Signature of Authorized Individual	 Signature of Authorized Individual
Date: 3-20-17	Date: 4/26/2017



Reset Form

# Final Application

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

*Procurement  
 17-169013*

Additional instructions for this application can be found in the ADEQ WQIG Request for Grant Applications (RFGA) and the Water Quality Improvement Grant Manual located on the ADEQ website at [www.azdeq.gov/wqig](http://www.azdeq.gov/wqig). Please read the RFGA and Grant Manual in its entirety before completing your application.

**Project Title** Wetland Restoration on O'Donnell Creek, Santa Cruz Co

**Project Description**  
 Provide an abstract that briefly describes the project. Limit 350 Characters

This project seeks funding to restore the degraded wetlands and adjacent floodplain and uplands along O'Donnell Creek, a tributary to the Babocomari River, in order to improve the natural filtering capacity of wetlands for the pollutants *E. coli* and sediment originating from active pastures.

**Authorizing Agency-** Name of agency/company/person/tribal authority who is applying for the grant.

**Name** Desert Botanical Garden

**Address** 1201 N Galvin Parkway

**City** Phoenix **State** AZ **Zip Code** 85008

**Authorized Agency Contact-** Person who will accept responsibility for the terms and conditions of the Grant Agreement. This person must sign the signature page

**Last Name** Salywon **First Name** Andrew **Initial** M

**Title** Research Botanist **Phone Number** +1 (480) 481-8107 **Fax Number**

**E-mail** asalywon@dbg.org

**Project Manager-** Person who will have the day-to-day knowledge of the projects and should be contacted if clarification is required.

**Last Name** Salywon **First Name** Andrew **Initial** M

**Title** Research Botanist **Phone Number** +1 (480) 481-8107 **Fax Number**

**E-mail** asalywon@dbg.org

**Project Period**     0-1 year     2 years

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

**Project Costs**

Total Project Cost	<b>\$98,556.00</b>	Maximum possible values
Funds Requested (max 60% of total project cost)	\$58,200.00	\$59,133.60
Matching Funds (min. 40% of total project cost)	\$40,356.00	\$39,422.40

# Final Application Content

## I. Desired Outcomes

Describe how the project will assist in meeting the goals of the Water Quality Improvement Grant Program

This project will assist in meeting the goals of the Water Quality Improvement Grant Program by reducing non-point source of pollution, *E. coli*, generated from active pastures on O'Donnell Creek from reaching the Babocomari San Pedro Rivers. This will be accomplished by restoring the wetlands along the creek to a more nature and less degraded state. In essence, increasing the natural capacity of wetlands to improve water quality by trapping sediment and mitigating peak flows.

## II. Pollutant(s) of Concern

a. Select the pollutant(s) of concern that this project will address.

Primary Pollutant  Secondary Pollutant if any

Other

b. Will this project be able to provide load reduction data?

Yes  No

c. Provide estimated load reductions for projects.

I will consult with a collaborator of mine on other projects, Laura Norman, Ph.D. (USGS Tucson), about using the Soil and Water

## III. Location and Land Ownership

City/Town  County

Land Ownership

Provide Latitude and Longitude for the main location of the project

Latitude  Longitude

## IV. Background Information

Provide some background information about the project, including what is already known about the nonpoint source issues in the watershed, and what past work the project is building on. Reference previous projects (WQIG and other), data, monitoring, or planning that has been done to address the nonpoint source issue of concern.

This proposed work will expand on and be collaborative with Borderlands Restoration WQIG (ID# 18-004) which is limited to the very southern portion of O'Donnell Creek near Hwy 83. An assessment for restoration opportunities has been completed in April 2016 and a report generated (see attachment). The southern end of O'Donnell Creek, as it is delimited for this project is active pasture land (Fig. 1). Although we do not have *E. coli* data for this area, it can be inferred that restoring the sheet flow of water in this area will increase the capacity of the wetlands to reduce peak run-off, trap sediment and biofilter the water, thus greatly increasing the water quality entering the Babocomari River downstream.

## V. Scope and Scale of Watershed

a. Define the scope and scale of the watershed that your project will be addressing. Include a map that clearly shows the boundaries of the watershed of concern, and its location in relation to known water quality impairments as well as the greater watershed. Contact ADEQ for assistance in developing a map if necessary.

See attachment for Figures 2-4 for overall project location in relation to the San Pedro and Babocomari Rivers. The project boundaries can be roughly seen in in Fig. 4.

b. Provide the HUC associated with the project area. Projects should ideally focus on 12 digit HUCs, although slightly larger or smaller drainages may be feasible dependent upon the project. Contact ADEQ for assistance if necessary.

HUC-10 Babocomari River 1505020205 & HUC-12 Turkey Creek 150502020502

c. What water body is being impacted by this nonpoint source issue?

O'Donnell Creek which is a tributary to the Babocomari River and ultimately the San Pedro River.

d. Is this water body identified as impaired based on ADEQ's 2010 Status of Ambient Surface Water Quality in Arizona - Arizona's Integrated 305(b) Assessment and 303(d) Listing Report? Both reports can be found at [www.azdeq.gov/programs/water-quality-programs/surface-water-monitoring-and-assessments](http://www.azdeq.gov/programs/water-quality-programs/surface-water-monitoring-and-assessments) Contact ADEQ for assistance if necessary

**VI Scope of Work**

a. Briefly describe the overall approach that will be taken to complete this project.

The wetlands on O'Donnell Creek, also known as Canelo Hills Cienega Preserve have been monitored by the Nature Conservancy for over 30 years. In April 2016 Van Clothier of Stream Dynamics, Inc. and I did a reconnaissance level assessment of resource damage points and opportunities for restoration (see attachment). We discovered ten opportunities for restoration ranging from legacy berm and gully issues, to headcuts, woody encroachment of the wetlands and compromised alluvial fans on CHCp and the adjacent private property owned by the Jelk family. If this project is funded, Stream Dynamics will perform a landform survey including longitudinal profile and cross-sections for the more technical sites and produce a construction-ready design prior to mobilizing the equipment. We will carefully assess each treatment site and make detailed plans for the restoration earthworks. Next we will mobilize equipment and complete the job.

b. What permits, if any, will need to be obtained in order to complete this project? Consider the need for Army Corps of Engineers 404 Permits and 401 Clearances for in-stream activities, Construction General Permit coverage for projects impacting an area greater than one acre, etc. All projects are subject to State Historical Preservation Office clearance.

The plan is to work with Denise Smith of 404 and More, Silver City, NM to do our permitting for the project. Denise will do a 401 consultation with the appropriate state agency to find out if we need an ACOE 404 permit. If this permit is need, she will apply for it. The overall project footprint will be less than one acre. We will also consult with the State Historical Preservation Office to determine if an archeological survey is necessary to obtain cultural clearance.

**VII. Methods**

a. Does this project propose activities that are specifically recommended by a WIP? If so, please identify the plan and recommendations. Be sure to include page numbers where applicable.

Yes, this project proposes activities that are recommended by the San Pedro River Targeted Watershed WIP. Specifically BMP Type 4: Range Improvement Practices (p. 41). The goal of this BMP is to reduce the sediment yield and runoff in order to reduce fecal material in stream channels (p. 50). By restoring the wetlands and adjacent compromised alluvial fans, our project will decrease the sediment load entering O'Donnell Creek and it will also increase the infiltration capacity and residence time of water in this system. Wetlands, with their thick vegetation and well developed root-soil binding capacity help to spread water out over a larger area which reduces the waters speed and depth, and as a result its power, which promotes the capture of sediment and pollutants, like *E. coli*. Several man made structures on O'Donnell Creek have been built in the distant past and several headcuts have channelizing the flow of O'Donnell Creek and significantly reduced the sheet flow of water through the wetland. Our work seeks to restore the natural sheet flow and thus increase the size and capacity of this wetland.

b. If your location is not directly identified in a watershed plan, describe the methods that will be used to survey the watershed to determine critical sites for implementation. Include methods for:

- Preliminary field modeling
- Actual physical surveys
- Social/educational needs surveys
- Pre- and post-implementation monitoring
- Data analysis

Please refer to the O'Donnell Creek restoration assessment attachment for details regarding preliminary field modeling and physical surveys. Pre- and post-monitoring will include analysis of aerial photography, permanent photo points, sub-meter GPS surveying and vegetation monitoring. Data analysis will include, but not be limited to SWAT modeling. I have installed six pressure transducers that will have two years of water-level data that can be compared to post-restoration data to determine if the peak flows are reduced with a longer retention time.

c. What BMPs are likely to be used in the implementation portion of the project, and what criteria will be used to determine their locations and design specifications? What evidence supports the use of these BMPs?

Successful application of watershed restoration techniques and water harvesting earthworks are intimately related to the specifics of each site. Stream Dynamics' policy is hands on through the entire process from assessment, through design, build, monitoring, and maintenance. This insures fidelity to the design concept, allows us to learn from the project results, and represents a commitment to both the watershed and the landowner to adjust and repair any work until it is functioning properly within the landscape. Please refer to the O'Donnell Creek restoration assessment attachment for greater detail.

d. Life Expectancy of BMPs: Identify the life expectancy of any BMPs implemented.

The life expectancy of the BMP in this case, the Range Improvement Practice of wetland restoration should be decades to centuries. The proposed project area will be monitored annually, and if needed any additional maintenance will be performed.

e. Grant Reporting BMPs: select the BMPs that describe your project

BMP 1 Wetland Restoration

BMP 2 Seeding (Re- Vegetation)

BMP 3 Water Quality Monitoring

Additional BMPs Outreach and Education

f. Long-term Maintenance: Identify the maintenance required for your project. Identify groups or individuals responsible for the long-term maintenance of projects. Provide letters of support if possible.

It is our hope that once the habitat is restored no major maintenance will be needed. However, the properties will continued to be

### VIII. Education and Outreach

a. Describe the education and outreach component of this project. How will the public be educated about nonpoint source pollution? What are the desired outcomes and behavioral changes associated with education and outreach? How will this component of the project be measured for effectiveness?

Several public and scientific presentations will be given including presentations at the annual Science on the Sonoita Plain at the Audubon Research Ranch in Elgin, the Arizona Native Plant Society chapters in Tucson and Sierra Vista, and the southwestern chapter of the Society for Ecological Restoration. Additionally, a webpage/blog about the work will be created and posted on the Desert Botanical Garden's website. The desired outcomes and behavioral changes associated with this educational outreach are for citizens to recognize the importance of wetlands in providing clean water by filtering pollutants. It is also hoped that people will have a greater understanding of the threat and persistence of *E. coli* in watercourses. It is very difficult to measure the effectiveness of this component, but at a minimum the number of hits to the website where the blog on this project will be posted will give a numerical value of views.

b. How will the community be involved in each of the major aspects of the project? Who makes up the community (who are the landowners/managers and other stakeholders)? Explain how they will be brought into the process and how they will participate in each of the methods identified in Part IV above.

We will involve many members of the community in all aspects of the project. The Nature Conservancy, Appleton-Whittell Research Ranch of the National Audubon Society in Elgin, U.S. Fish and Wildlife Service, the U. S. Forest Service, and Joe Quiroga (the land manager for the Jelk's property) among others are aware of the proposed work and support it. They are well positioned to reach-out to local ranchers, land managers and citizens about all aspects of this project. Additionally, our work is complementing and existing WQIG project by Borderlands Restoration so we can potentially collaborate on community outreach.

### IX. Key Personnel & Partnerships

Describe the organization that is requesting funds as well as the key personnel and their expertise. Identify all partners including watershed groups, agencies, tribes, etc. and the duties they will be performing. Be sure to include personnel handling the following project aspects at a minimum:

a. Project manager (Responsible for making sure that the project is progressing in accordance with the approved scope of work and milestones, submitting quarterly and final reporting as well as budget and reimbursement request documents to ADEQ, providing additional load reduction and project information upon request, and serving as the day-to-day contact person regarding the project)

Andrew Salywon, Ph.D., Research Botanist, Desert Botanical Garden with expertise in southern Arizona wetlands including their conservation, plant community, GIS analysis, water chemistry and age and source analysis, and wildlife ecology. Responsibilities will include report writing, coordination of work schedule, budget management and reimbursement requests, volunteer coordination, and educational outreach. The Vision Statement for the Desert Botanical Garden (dbg.org) is to be "the premier center in the world for the display, study and understanding of desert plants and their environments." With seven Ph.D. research staff scientists, a business office that includes a grants administrator and over 700 volunteers, DBG is well positioned to see this project through to completion.

b. Technical expertise (Responsibilities may include BMP design and site evaluation, BMP implementation, volunteer coordination, monitoring, ...)

Van Clothier, Stream Dynamics, Inc. (<http://streamdynamics.us>) will conduct the pre-restoration surveys and project construction.

c. Qualifications

If individuals have not yet been identified to fill these positions, what qualifications will be used to determine who will fulfill these duties?

All individuals have been identified to fill these positions.

### X. Conflict of Interest

What steps will be taken to ensure that hiring/personnel selection practices are carried out without the existence or appearance of bias? Provide a statement of policy for hiring if possible.

Desert Botanical Garden has a Director of Human Resources who can review any hires to make sure they are carried out without the existence of apparent bias. However, for this project Stream Dynamics, Inc. has extensive experience in this watershed and has worked with both Desert Botanical Garden and Trevor Hare of Borderlands Restoration, so it is believed that Stream Dynamics is ideally qualified for this project.

**XI. Work Plan Steps and Milestones**

Develop a work plan with a series of steps and associated dates that are necessary to complete the plans. Each step must have a milestone that provides a description of what will be accomplished. **Work plan must developed as part of the budget form.** The budget form can be downloaded at: [www.azdeq.gov/environ/water/watershed/download/budget.xls](http://www.azdeq.gov/environ/water/watershed/download/budget.xls).

AS  Initials

**XV. Budget Form**

Develop a budget based on the anticipated costs for completing the project within the proposed time schedule. The budget form can be downloaded at: [www.azdeq.gov/environ/water/watershed/download/budget.xls](http://www.azdeq.gov/environ/water/watershed/download/budget.xls). **Be sure to attach your budget form to your final application submission.**

AS  Initials

**XII. Budget Narrative**

Identify how costs were determined, including comparative quotes used to determine costs or worth where applicable as well as sources of all project match (funding and in-kind). Adequate justification should be provided to show that the cost of implementing the project is reasonable for the benefits anticipated toward improving water quality.

**XVI. SHPO Form**

Any ADEQ action, including grant projects paid in-part with ADEQ funds, on state, federal, or private lands that may impact historic properties (i.e., any prehistoric or historic-period district, site, building, structure, or object included in, or eligible for inclusion in the State Register of Historic Places) require consultation with the State Historic Preservation Office (SHPO) pursuant to the State Historic Preservation Act (ARS 41-861 to 864).

In order to make informed decisions and facilitate consultation with SHPO, ADEQ requires applicants to provide the project related information requested in the SHPO form. Please complete the information requested in the SHPO form and submit with your final application. The SHPO form can be downloaded from the ADEQ website at: [www.azdeq.gov/environ/water/watershed/improvement.html](http://www.azdeq.gov/environ/water/watershed/improvement.html)

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**XVII. Abbreviated Monitoring Plan**

If water quality data are to be collected and interpreted to determine effectiveness, a "sample analysis and quality assurance plan" (SAP/QAP) must be developed in accordance with state guidelines. Additional information for developing the abbreviated monitoring plan can be found at [www.azdeq.gov/wqig](http://www.azdeq.gov/wqig)

AS  Initials

Print Form

## Authority 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 and modifications to scope, methodology, and schedule, final projects, and/or budget.

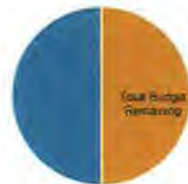
Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_

**Authority Signature Page must be submitted in hard copy and must be received prior to the Final Application deadline.**

# Grant Project Cost- Project Name

PROJECT TASKS	Rate/ Unit/ # of Unit	Total Grant Budget	Prior Cost	Current Cost	Cumulative Cost	Remaining Budget
<b>PROJECT ADMINISTRATION</b> 404 consultation and living		\$1,000.00	\$0.00	\$0.00	\$0.00	\$1,000.00
Cultural survey and SHPO		\$6,000.00	\$0.00	\$0.00	\$0.00	\$6,000.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Subtotal</b>		<b>\$7,000.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$7,000.00</b>
<b>PROJECT DEVELOPMENT</b> Assessment and design		\$6,000.00	\$0.00	\$0.00	\$0.00	\$6,000.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Subtotal</b>		<b>\$6,000.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$6,000.00</b>
<b>PROJECT DELIVERY (Direct Costs)</b> Transportation	Equip freight, veh m	\$3,850.00	\$0.00	\$0.00	\$0.00	\$3,850.00
Equipment Rental	Cat 306, Cat299d	\$13,645.00	\$0.00	\$0.00	\$0.00	\$13,645.00
Equipment Expenses	fuel, insurance, profit	\$10,395.00	\$0.00	\$0.00	\$0.00	\$10,395.00
Labor	Equip Oper, Helpers	\$24,440.00	\$0.00	\$0.00	\$0.00	\$24,440.00
Materials	(All locally sourced)	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Per diem	20 person days @ \$80/d	\$1,600.00	\$0.00	\$0.00	\$0.00	\$1,600.00
<b>Subtotal</b>		<b>\$53,930.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$53,930.00</b>
<b>PROJECT MANAGEMENT</b>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Subtotal</b>		<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>
<b>OTHER COST</b> Educational Signage		\$500.00	\$0.00	\$0.00	\$0.00	\$500.00
Other cost		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Other cost		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Subtotal</b>		<b>\$500.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$500.00</b>
<b>Grant Subtotals</b>		<b>\$67,430.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$67,430.00</b>
<b>Match Subtotals</b>		<b>\$45,300.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$45,300.00</b>
<b>Matching/All Funding %</b>		<b>40.18%</b>	<b>#DIV/0!</b>	<b>#DIV/0!</b>	<b>#DIV/0!</b>	<b>40.18%</b>
<b>Total Grant</b>		<b>\$112,730.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$112,730.00</b>



Total Budget: \$67,430.00  
Remaining Budget: \$45,300.00



