



MEMORANDUM

Date: December 18, 2013

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

A handwritten signature in black ink, appearing to be "C.H. Huckelberry", is written over the typed name and title.

Re: **Green Valley Drainageway Basin Management Study**

As you know, Ms. Mary Murphy has spoken to the Board on several occasions at Call to the Audience regarding flooding from the tributary drainage system in Green Valley. This is not a new or substantially altered issue since the development of Green Valley. Its development on the sloping piedmont of the Santa Cruz River, a tributary cross drainage to the Santa Cruz, has been the issue.

The County's ability to extract and require certain drainage improvements during the development of Green Valley has evolved over time from no controls in the early development of Green Valley to much more sophisticated analysis today. Certain deficiencies in the tributary drainage system of Green Valley have been known for some time. It is a fact of life that there are substantial and significant drainage deficiencies in every urban developed section of Pima County, whether inside of an incorporated city or town or outside. For this reason, the County commissions drainage basin management studies, including the one referenced in Ms. Murphy's Call to the Audience on December 10, 2013.

I am enclosing a memorandum and supporting information with regard to the Green Valley drainageway basin management study. We certainly have the ability through these drainage basin management studies to identify serious deficiencies in our flood control and drainage systems. Correcting these deficiencies through capital improvements is another matter and requires an annual appropriation by the Board of Supervisors for such capital improvements once identified. There is a history of bond funding of the most critical capital improvements identified by basin management studies, and this will continue to be our practice.

It should be noted that the tax levy of the Regional Flood Control District (RFCD) has been consistently declining over the last six years. The table below shows the 10-year history of the tax rate and tax levy of the RFCD. It is likely time to begin increasing the tax rate of the RFCD this budget year to offset the revenue generating losses that have occurred through the substantial shrinkage of the tax base.

10-Year history of the tax rate and tax levy of the RFCD.

Fiscal Year	Net Assessed Value	% change	Tax Rate	% change	Tax Levy	% change
2004/05	4,907,357,254		0.3546		17,401,489	
2005/06	5,323,432,911	8.5%	0.3746	5.6%	19,941,580	14.6%
2006/07	6,113,952,541	14.8%	0.3746	0.0%	22,902,866	14.8%
2007/08	7,412,190,230	21.2%	0.3446	-8.0%	25,542,408	11.5%
2008/09	8,684,571,743	17.2%	0.2935	-14.8%	25,489,218	-0.2%
2009/10	8,885,189,956	2.3%	0.2635	-10.2%	23,412,476	-8.1%
2010/11	8,529,149,549	-4.0%	0.2635	0.0%	22,474,309	-4.0%
2011/12	7,634,237,253	-10.5%	0.2635	0.0%	20,116,215	-10.5%
2012/13	7,244,629,122	-5.1%	0.2635	0.0%	19,089,598	-5.1%
2013/14	6,768,456,641	-6.6%	0.2635	0.0%	17,834,883	-6.6%

Please note that the tax rate has declined from 0.3546 in FY 2004/05 to 0.2635 in FY 2013/14, a decline of 26 percent. In addition, the tax levy has declined from \$25.5 million in 2007/08 to \$17.8 million, a decline of 30 percent.

Given these fiscal facts and the desire to transfer most of the maintenance obligations on the river park system from the Natural Resources, Park and Recreation Department to the RFCD an approximate \$0.03 cent increase will be recommended to the Board in the FY 2014/15 budget of the RFCD. It should be noted that the river park system is a federal regulatory requirement imposed on the County as a result of our flood control bank stabilization work along the major river system. Hence, the operation and maintenance of a river park system being a Clean Water Act Section 404 mitigation requirement is a normal and customary expense of the RFCD.

CHH/anc

Attachments

- c: John Bernal, Deputy County Administrator for Public Works
- Suzanne Shields, Director, Regional Flood Control District
- Tom Burke, Director, Finance and Risk Management
- Robert Johnson, Budget Manager, Finance and Risk Management



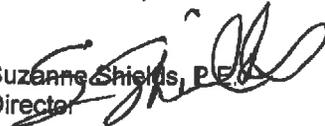
MEMORANDUM

Director's Office
Regional Flood Control District



DATE: December 12, 2013

TO: C. H. Huckelberry
County Administrator

FROM: Suzanne Shields, P.E.
Director 

SUBJECT: **Green Valley Drainageway Basin Management Study, Capital Improvement Projects and Maintenance**

I understand that Mary Murphy spoke during the Call to the Audience on December 10, 2013 at the Board of Supervisors' meeting about the current study being conducted by CMG Engineering, Inc. (CMG) for Green Valley as well as questions concerning flood control improvements and maintenance. The purpose of this memorandum is to provide you with follow-up information regarding those items.

Green Valley Drainageway Basin Management Study

In March 2013, we contracted with CMG to conduct a basin management study to provide updated hydrologic information and floodplain mapping along the 25 drainageways that the Regional Flood Control District (District) maintains in Green Valley. The Green Valley area topography, hydrologic calculations and previous floodplain mapping were developed in the 1980s, so the purpose of the study is to update the information to reflect current conditions using the District's current standards. The engineering services also include inspections, determining current conditions along the drainageways and identifying areas that need mitigation for potential flood and erosion damage. The study contract is for \$235,033.51 and is anticipated to be completed in March 2014 (see attached contract and scope of work).

Capital Improvement Projects

In the 1980s and 1990s there were a number of large capital improvement projects in Green Valley including upgrading culverts and bridges along La Cañada and the new roadway and bridges at Continental Road at the Santa Cruz River including the west branch of the Santa Cruz River. I informed Ms. Murphy about these improvements in my letter dated May 10, 2013 (see attached). Since 1997, there have been seven bond projects completed using 1997 and 2004 bond funds that provide improvements along 17 of the drainageways and three non-bond funded projects (see attached project summaries).

Maintenance

The District performs routine maintenance activities as well as responding to public requests (see attached 2012/13 Maintenance Log). Our maintenance activities include publicly dedicated drainageways, rights-of-way and easements. We don't maintain private drainageway improvements, improvements to any ADOT rights-of-way, or alleys. We coordinate with the Traffic and Arroyos Committee monthly regarding these activities.

Please let me know if you would like additional information.

SS/tj

Attachments

c: John Bernal, Deputy County Administrator – Public Works
Nanette Slusser, Assistant County Administrator for Public Works Policy
Bill Zimmerman, Deputy Director – Regional Flood Control District
Tom Ward, Special Staff Assistant – Board of Supervisors, District 4 Office

ATTACHMENT 1

**CMG ENGINEERING, INC. CONTRACT AND
SCOPE OF WORK**



CONTRACT PIMA COUNTY, ARIZONA

PLEASE REFERENCE THIS CONTRACT NUMBER ON ALL INVOICES OR PAY APPLICATIONS

Contract No: 13000000000000000656

Contract Version: 1

Page: 1 of 2

S H I P	REGIONAL FLOOD CONTROL DISTRICT - 3RD FLOOR
	PW-PQ-RFCD-97
	97 E CONGRESS 3RD FL
	TUCSON AZ 85701
T O	Requested By: DEIRDRE BROSNIHAN
	Dept: FC Phone: 5202431886

B I L L	PIMA COUNTY FINANCE & RISK MANAGEMENT - ACCOUNTS PAYABLE
	PO BOX 791
	TUCSON AZ 85701
T O	

V E N D O R	CMG DRAINAGE ENGINEERING	Contact: CLINT GLASS
	PO BOX 64880	Phone: 520-862-4244
	TUCSON AZ 85728	Email: cglass@cmgdrainage.com
		Terms: 0.0000 %
		Days: 30

Issued By: TRACEY LINDSKOG	Total: \$235,033.51
Issued Phone: 5202431883	
Issued Email: tracey.lindskog@pima.gov	
Issued Date: 02-27-2013	
Initiation Date: 03-04-2013	Expiration Date: 03-03-2014
Short Description (See Contract for full details) 5GVWD6 GV DRAINAGE WAY 6 REPAIRS BASIN MGMT STUDY	
Modification Reason	

This Contract incorporates the attached documents, and by reference all instructions, Standard Terms and Conditions, Special Terms and Conditions, and requirements that are included in or referenced by the solicitation documents used to establish this agreement. All Transactions and conduct are required to conform to these documents.

Number of Attachments: 3

Attachment Names: Vendor Note.docx, CMG Green Valley Dmgways BMS Fee Est_02.26.13.pdf, 13-310_5gvdw6-SOW.pdf



CONTRACT DETAILS

Contract No: 13000000000000000656

Contract Version: 1

Page: 2 of 2

Line Description

1 5GVWD6 GV DRAINAGE WAY 6 REPAIRS BASIN MGMT STUDY

Service Contract Amt (Not-To-Exceed)
\$235033.61

Service From
03-04-2013

Service To
03-03-2014

Vendor Note

No. 86714 – Green Valley Drainageways Basin Management Study

This CT is subject to the terms of the QCL Master Agreement between Consultant and County. The Master Agreement has been assigned the No. 13000000000000000287 for Flood Control – Floodplain Management Services.

Acceptance of this PO affirms Consultant complies with the requirements of Executive Order 2009-09 "PROHIBITION OF DISCRIMINATION IN STATE CONTRACTS - NON DISCRIMINATION IN EMPLOYMENT BY GOVERNMENT CONTRACTORS AND SUBCONTRACTORS" approved by Janice K. Brewer, Governor of the State of Arizona, effective October 20, 2009.

**Scope of Work
Green Valley Drainageways Basin Management Study
February 6, 2013**

PROJECT SUMMARY

The Pima County Regional Flood Control District (RFCD) owns and maintains 25 urban drainageways within Green Valley. These drainageways function to convey stormwater that emanates from the urban areas and from undeveloped areas west of the community. Some of the drainageways are lined channels while others are fully earthen. The RFCD has spent significant funds during past decades to maintain these drainageways and repair periodic damages. Bank erosion has occurred threatening adjoining neighborhoods and channel degradation has, in some locations, undercut bank protection, underground utilities and roadway crossings. In addition, the RFCD does not have reliable hydrologic and hydraulic data to verify whether or not existing drainageways and structures (such as roadway culverts) have sufficient capacity to contain current regulatory discharges. Study area topography, hydrologic calculation methods and floodplain mapping, most of which date to studies conducted in the 1980s, need to be updated to current RFCD standards.

The RFCD is requesting funds to contract an As-Needed consultant to conduct various engineering analyses and investigation of the Pima County owned drainage facilities within this community. The purpose of the study is to develop updated hydrologic and hydraulic mapping for the watercourses, to inspect and determine the condition of the drainageways, to prioritize needed repairs and to develop preliminary design drawings for structural solutions to mitigate ongoing flood and erosion damages. The study area for this project will include Green Valley Drainageways #1 through #25. Study limits for each of these watercourses are summarized in the table below.

Summary of Pima County Public Drainageways and Proposed Study Limits			
Drainageway	Upstream Study Limit	Downstream Study Limit	Length (ft)
1	Rio Altar	Santa Cruz River	11,600
2	Interstate 19	Santa Cruz River	3,400
3	Interstate 19	Santa Cruz River	3,700
4	Avenida del Abaco	Interstate 19	8,300
5	Avenida del Abaco	Interstate 19	15,500
6	Near Bell Tower Dr.	Santa Cruz River	8,500
7	Near Circulo Napa	Santa Cruz River	8,200
8	Interstate 19	Santa Cruz River	2,400
9	Freeport McMoren Property Line	Santa Cruz River	13,600
10	El Viento	Santa Cruz River	450
11	La Granadas	Santa Cruz River	1,600
12	La Huerta	Santa Cruz River	500
13	Camino del Portillo	Santa Cruz River	10,600
14	La Espina	Santa Cruz River	320
15	La Pera	Santa Cruz River	500
16	La Huerta	Santa Cruz River	400
17	Camino Del Sol	Santa Cruz River	8,400
18	Santa Bella	Santa Cruz River	450
19	Abrego Drive	Santa Cruz River	480
20	Interstate 19	Santa Cruz River	2,000
21	Interstate 19	Santa Cruz River	1,800
22	Interstate 19	Santa Cruz River	1,900
23	Interstate 19	Santa Cruz River	2,300
24	Desert Ridge	Santa Cruz River	4,700
25	Interstate 19	Santa Cruz River	1,700

**Scope of Work
Green Valley Drainageways Basin Management Study
February 6, 2013**

PROJECT SCOPE

1. Project Management

- a. Attend regular review meetings with RFCD staff (monthly, or as needed) during the design process to resolve issues, get direction at critical points in the design, and to ensure a quality product that reflects the RFCD's goals.
- b. Provide regular invoices accompanied by work progress updates for each billing period.

2. Data Collection, Initial Coordination and Surveying

- a. Collect all pertinent data including:
 - PAG digital elevation data. USGS data will be obtained for areas not covered by PAG mapping.
 - Available roadway plans for any streets or highways within the study area that have roadway drainage culverts or have an effect on drainage patterns. There are estimated to be over 80 roadway crossings within the project limits.
 - Available as-built plans on area drainage structures.
 - Previous study reports such as the studies by RS Engineering, Inc., CMG Drainage Engineering, Inc. and others.
- b. Review collected data and compile into summary format.
- c. Meet with RFCD to review/discuss the available data summary to determine additional survey needs.
- d. Perform field surveys on all area drainage structures to supplement as-built plans as needed.
- e. Acquire, sort and evaluate pertinent drainage complaints from RFCD records.
- f. Conduct site visits to examine drainage patterns and structures along the public drainageways, and to investigate significant drainage complaint locations.

3. Hydrologic Analysis

- a. Identify location of concentration points where peak discharge rates will be computed. Some of the drainageways will require several concentration points for accurate characterization of the hydrology within the study limits since several tributaries may be present.
- b. Delineate the boundaries of watersheds and determine watershed parameters such as area, soils types, basin factors, impervious cover.
- c. Develop hydrologic models for determining peak discharge rates per RFCD Technical Policies TECH-015 and TECH-016. For watersheds having drainage areas less than one square mile in size, peak discharge rates will be computed by RFCD hydrologic methods using the PC-Hydro computer program. The U.S. Army Corps of Engineers computer program HEC-1 will be used for developing peak flow rates and hydrographs for watersheds having drainage areas greater than one square mile. Only one or two watersheds are expected to have watersheds exceeding an area of one square mile. Storm event precipitation depths will be based on NOAA Atlas 14 per RFCD TECH-010.
- d. Prepare a watershed map showing watershed boundaries, concentration points, areas and results of the peak discharge rate computations in a format compatible with Pima County requirements.

**Scope of Work
Green Valley Drainageways Basin Management Study
February 8, 2013**

4. Existing Conditions Floodplain Analysis

- a. Meet with Pima County RFCD staff to review and discuss proposed floodplain mapping limits. Updated floodplain mapping will be developed using HEC-RAS Version 4.1.
- b. Map the existing 100-year floodplain limits for washes having a 100-year peak discharge rate greater than 100 cubic feet per second (cfs).
- c. Evaluate capacity of existing roadway crossing drainage structures.
- d. Prepare floodplain boundary maps in formats compatible with Pima County requirements. These maps will show areas that are under capacity and will have breakout areas identified and mapped.

5. Update 2004 Erosion Hazard Assessment

- a. Prepare report section that inventories and prioritizes locations requiring erosion or flood control measures to prevent future damages to adjoining property or to public improvements such as roads and underground utilities.
- b. Meet with RFCD to present results and discuss locations requiring immediate attention to prevent imminent damages.

6. Basin Management Study Report

- a. Prepare a comprehensive drainage report addressing the project background, the hydrologic and hydraulic methodologies used, results of the updated H & H analyses, and results of the erosion hazard assessment report updates for RFCD staff review.

PROJECT SCHEDULE

The project schedule for completion of the technical analyses and concept plan documents is within 12 months of the notice-to-proceed date.

PROJECT EXCLUSIONS

The following items are excluded from the scope of work:

- CWA Section 404, cultural, biological & environmental clearances and permitting
- FEMA map revisions
- Potholing or survey of underground utilities
- Preparation of construction plans and/or specifications
- Construction survey staking
- Construction management, site inspection and certification

**No. 86714 Green Valley Drainageways Basin Management Study
 Civil Engineering Fee Estimate - Hourly Breakdown Per Task
 Rates per CMG 5-27-08 Master Agreement as Modified April 2009
 Pima County Blanket Contract No. B504411**

To: Pima County Regional Flood Control District
 c/o Pima County Procurement
 130 West Congress St, 3rd Floor
 Tucson, AZ 85701
Attn: Sue Aegerter

Date: 2-26-13

From: CMG Drainage Engineering, Inc.
 3555 N Mountain Ave.
 Tucson, Arizona 85719
 Ph: 520-882-4244 Fax: 520-888-1421

Task 1: Project Mgt				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	30	\$	3,795.60
Project Eng	\$ 98.44	64	\$	6,300.16
Hydrologist	\$ 78.52	0	\$	-
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	0	\$	-
Clerical	\$ 38.12	12	\$	457.44
Sub-Total			\$	10,553.20
Task 2: Data Collection, Initial Coord. & Surveying				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	30	\$	3,795.60
Project Eng	\$ 98.44	73	\$	7,186.12
Hydrologist	\$ 78.52	32	\$	2,512.64
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	116	\$	5,469.40
Clerical	\$ 38.12	0	\$	-
Sub-Total			\$	18,963.76
OPW Surveying			\$	20,000.00
Task 3: Hydrologic Analysis				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	16	\$	2,024.32
Project Eng	\$ 98.44	81	\$	7,973.64
Hydrologist	\$ 78.52	99	\$	7,773.48
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	400	\$	18,860.00
Clerical	\$ 38.12	0	\$	-
Sub-Total			\$	36,631.44
Task 4: Existing Conditions Floodplain Analysis				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	36	\$	4,554.72
Project Eng	\$ 98.44	460	\$	45,282.40
Hydrologist	\$ 78.52	425	\$	33,371.00
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	571	\$	26,922.65
Clerical	\$ 38.12	0	\$	-
Sub-Total			\$	110,130.77

Task 5: Erosion Hazard Assessment Update				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	15	\$	1,897.80
Project Eng	\$ 98.44	41	\$	4,036.04
Hydrologist	\$ 78.52	22	\$	1,727.44
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	145	\$	6,836.75
Clerical	\$ 38.12	0	\$	-
Sub-Total			\$	14,498.03
Task 6: Basin Mgt Study Report				
Personnel	Rate	Hours		Fee
Principal	\$ 126.52	23	\$	2,909.96
Project Eng	\$ 98.44	41	\$	4,036.04
Hydrologist	\$ 78.52	109	\$	8,558.68
Technician	\$ 57.58	0	\$	-
Drafting	\$ 47.15	145	\$	6,836.75
Clerical	\$ 38.12	24	\$	914.88
Sub-Total			\$	23,256.31
Materials & Expenses			\$	1,000.00
Total Contract Amount			\$	235,033.51

Green Valley Completed Projects

December 11, 2013

Below is a list of completed CIP (Capitol Improvement) projects in the Green Valley area starting with the 1997 GO Bonds.

97 Bond Projects

FC-09, Green Valley Drainageway No. 9 (4FGVD9)

The bond for FC-09 Green Valley Drainageway Number 9 was \$1,000,000. Total construction and construction administration costs \$862,932. Total project costs \$1.217 million.

Project scope increased to include additional cells to the box culvert at Camino Holgado this supplemented the additional box culvert cells noted in the bond ordinance for the downstream Camino Portillo. The additional cells were required at both locations in order to assure channel flow capacity under each roadway for the entire project reach. The project scope was further modified by not constructing a portion of the bond proposed concrete channel that was installed by others, while older existing sections of bank protection were added into the project scope for repair and replacement.

Construction began May 2001 and was complete September 2001.

FC-10, Continental Vista (4FCVDI)

This project included \$250,000 in bond funds and \$500,000 in Flood Control District Tax Levy funds. The project provide drainage improvements to 6 different sites around and adjacent to the Continental Vista Subdivision, and construction of a pedestrian bridge across a wash to the Green Valley Recreational Center.

Construction began December 2003 and the project will be substantially completed in April 2004.

2004 Bond Projects

FC5.02 Urban Drainage

The following projects were completed in the Green Valley area under the general bond program FC5.02 Urban Drainage.

Green Valley Abrego (5GVABC)

Project provided funds to construct improvements on an existing drainage way and culvert crossing along Continental Road at Abrego Drive. Project was completed in May 2005

Total Project Cost: \$286,207

Green Valley Erosion (5GVERC) Phase 1

Overall Project Information:

- First Phase Construction Projects: Sites 5, 6, 7, 8, 9, and 11

- Construction Timeline: December 2006 – March 2007
- Estimated Project Cost: \$550,000

Site 1 Summary:

Drainageway #1, south of Duval Mine Road and west of La Canada. Rebuild and armor channel. Construction completed March 2007.

Site 5 Summary:

Drainageway #6, between La Canada Drive and I-19. Encase the exposed 8" DIP sewer crossing within the wash. Replace failing rock and rail bank protection with rock-filled gabion baskets. Add grade stabilization improvements around and downstream of the sewer crossing.

Site 6 Summary:

Drainageway #6 at Abrego Drive. Add second rock gabion drop structure within the channel to stabilize the channel. Additional gabions and wire-tied rock to be used to stabilize the channel banks and bed for approximately 70 feet downstream of this new drop structure. Additional landscaping improvements may be provided at this site.

Site 7 Summary:

Drainageway #6 at confluence with Santa Cruz River, adjacent to Haven Golf Course. Repair of failed concrete grade control due to head cut migrating from the Santa Cruz River. Concrete structure will be replaced with new gabion grade control structure and large-diameter dumped riprap extending to the confluence with the Santa Cruz.

Site 8 Summary:

Drainageway #7 at Esperanza Blvd. Adding 6' concrete cut off wall to stabilize existing concrete apron downstream of 3-27" x 44" corrugated metal pipe arch culverts. Dumped riprap will be added to channel bed for approximately 50 feet downstream of new concrete cut off wall.

Site 9 Summary:

Drainageway #7, east of La Canada Drive. Extend existing concrete apron an additional 12 feet and construct a rock gabion grade control structure at the end of this extension. Gabion bank stabilization and wire-tied rock channel bed stabilization will be provided at this new drop and will extend approximately 50 feet downstream of the drop structure.

Site 11 Summary:

Drainageway #7, east of Abrego Drive. Stabilize existing concrete apron and add new gabion cut-off wall. Gabion bank protection and wire-tied rock mattress channel bed stabilization will extend 60' downstream of the new cut-off wall.

Green Valley Erosion Control (5GVERC) Phase 2

Utilizing the 2004 General Obligation Bonds FC5.02 Urban Infrastructure, Pima County Regional Flood Control District has developed a repair and improvement program for the community of Green Valley. Green Valley has been growing steadily since the 1960 when the

first subdivisions and drainage improvements were install. Phase 2 is the second year of small localized improvement to the aging Green Valley drainage way system, to prevent erosion of existing banks, culvert and other drainage structures. Projects completed this year include bank protection on Drainageway #3 at the Santa Cruz River, channel and bank improvements on Drainage way #4 at the Fire Station, downstream culvert and bank stabilization on Drainage ways #13 and #9 at Abrego Drive, and bank protection repairs at drainage ways #13 and #9 at Portillo. Cost of these improvement total \$442,000.

These projects were completed in March 2008.

Green Valley Erosion Control (5GVERC) Phase 3

Drainage Way # 7 (5GVDW7)

Install gabion rip rap rock bank protection and grade control structure to limit excessive bank and head cutting. Project constructed in May 2010, by Ashton under the District JOC contract for \$114,746.00.

Drainage Way #25

Channel re-grading and wire tied rip rap channeling completed by PCWMD with sewer improvements. RFCD provide funds for drainage improvements.

Drainage Way #13-east of Camino Del Portillo

Head cut migrating upstream towards roadway. Provided multiple grade control structures to stabilize approximately 600 feet of channel.

Green Valley Erosion Control (5GVERC) Phase 4

Drainage Way # 7 Phase II (5GVDW7)

Extended gabion rip rap rock baskets bank protection and provided an additional grade control structure to mitigate continued head cutting. Project was constructed in FY 10-11, by Ashton under the District JOC contract for \$129,998.00

Drainage Way #17- Safeway Plaza

Remove sediment and construct a new maintenance access ramp so that sediment can be removed regularly. Project constructed in March 2011, by Ashton under the District JOC contract for \$ 42,420.00

Non-bond Projects

Drainage Way #6 (5GVDW6)

Provide gabion bank protection and a series of grade control structure to mitigate continued bank and head cutting on the channel downstream of Abrego Drive. Project was constructed in FY 11-12, by Ashton under the District's JOC contract for \$269,316.00.

Drainageway #8 Improvements

Drainage improvements to increase channel slope and improve drainage flow through drainage easement on Haven Golf Course. Project was completed July 2013, by Granite Construction Company for \$30,500.

Drainageway #4 –

Repair to concrete lining of Drainageway #4. Project was completed by Ashton in November 2013 for \$24,600.

Studies

Green Valley Erosion Hazard Assessment Report
RS Engineering May 2004.

Green Valley 2010 Drainage Way Evaluation
Pima County RFCDD May 2010

Green Valley Drainageway Study 2013 (CMG)

ATTACHMENT 2

**LETTER TO MARY MURPHY REGARDING THE
BASIN MANAGEMENT STUDY**



**PIMA COUNTY
REGIONAL FLOOD CONTROL DISTRICT
97 EAST CONGRESS STREET, THIRD FLOOR
TUCSON, ARIZONA 85701-1797**

**SUZANNE SHIELDS, P.E.
DIRECTOR**

**(520) 243-1800
FAX (520) 243-1821**

May 10, 2013

Ms. Mary Murphy
147 E. Los Arcos
Green Valley, AZ 85614-2434

Subject: Drainageway Number 8 and Surrounding Drainageways in Green Valley

Dear Ms. Murphy:

This letter is a follow up to your telephone messages.

We are having our consultant, CMG Consultants Inc. study all of the watersheds and drainageways (1 through 25) in Green Valley. As I previously indicated to you, I have asked them to start with Drainageway #8 to address your concerns. They will also be looking at all of the other drainageways that flow across the golf course.

This study will entail a review from the top of the watersheds to the Santa Cruz River and development of flow volumes based on current conditions so that any manmade or natural changes can be evaluated to determine if there has been any changes to the volume or direction of flow. The study will also include a study of flow capacity in the drainageways, erosion and obstructions.

We have already gathered or are currently gathering information on public and private drainageway improvements, street storm drains and new topographic information.

Drainageway #8

CMG Consultants Inc. is conducting a drainage study of the watershed for Drainageway #8 as well as the flow across the golf course from Drainageway #8 and Placita Arcos drainage to determine what if any grading or improvements would be necessary. I have already been in contact with the golf course manager. If work is needed, then construction plans will be prepared and Pima County will work with the golf course to grade and improve flow.

Drainageway #9 – Former Bridge at La Cañada and Bridge Inspections

Since the 1983 flood, there have been many improvements. In 1989, La Cañada Drive was rebuilt and the former bridge over Drainageway #9 was replaced by a larger concrete box culvert. Drainageway #9 upstream of La Cañada Drive was also improved and rebuilt in 2001.

Bridges are inspected by a structural engineer annually and after major flood events. Most of

Ms. Mary Murphy - 147 E. Los Arcos

Drainageway Number 8 and Surrounding Drainageways in Green Valley

May 10, 2013

Page 2

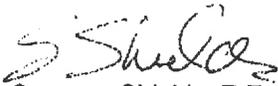
the small bridges like the former one for Drainageway #9 have been replaced by concrete box culverts. I will be sending the Traffic and Arroyos Committee information on any bridges in Green Valley including inspection information and results.

Traffic and Arroyos Committee Coordination

The District and the Pima County Department of Transportation staff meet with the Traffic and Arroyos Committee representatives prior to and after their meetings. The Traffic and Arroyos meetings are for the citizens of Green Valley. While we do not attend the meetings, we are informed about their discussions, citizen requests and/or questions, and maintenance issues for streets and drainageways.

In the meantime, please allow us time to complete the inspections/reviews/study outlined in this letter. We will keep you and the Traffic and Arroyos Committee informed of the results.

Sincerely,



Suzanne Shields, P.E.
Director and Chief Engineer

SS/tj

- c: Honorable Supervisor Ray Carroll – Board of Supervisors, District 4 Office
Tom Ward, Special Staff Assistant – Board of Supervisors, District 4 Office
Nanette Slusser, Assistant County Administrator for Public Works
Chris Cawein, Deputy Director, Regional Flood Control District

ATTACHMENT 3
GREEN VALLEY COMPLETED PROJECTS

Green Valley Completed Projects

December 11, 2013

Below is a list of completed CIP (Capitol Improvement) projects in the Green Valley area starting with the 1997 GO Bonds.

97 Bond Projects

FC-09, Green Valley Drainageway No. 9 (4FGVD9)

The bond for FC-09 Green Valley Drainageway Number 9 was \$1,000,000. Total construction and construction administration costs \$862,932. Total project costs \$1.217 million.

Project scope increased to include additional cells to the box culvert at Camino Holgado this supplemented the additional box culvert cells noted in the bond ordinance for the downstream Camino Portillo. The additional cells were required at both locations in order to assure channel flow capacity under each roadway for the entire project reach. The project scope was further modified by not constructing a portion of the bond proposed concrete channel that was installed by others, while older existing sections of bank protection were added into the project scope for repair and replacement.

Construction began May 2001 and was complete September 2001.

FC-10, Continental Vista (4FCVDD)

This project included \$250,000 in bond funds and \$500,000 in Flood Control District Tax Levy funds. The project provide drainage improvements to 6 different sites around and adjacent to the Continental Vista Subdivision, and construction of a pedestrian bridge across a wash to the Green Valley Recreational Center.

Construction began December 2003 and the project will be substantially completed in April 2004.

2004 Bond Projects

FC5.02 Urban Drainage

The following projects were completed in the Green Valley area under the general bond program FC5.02 Urban Drainage.

Green Valley Abrego (5GVABC)

Project provided funds to construct improvements on an existing drainage way and culvert crossing along Continental Road at Abrego Drive. Project was completed in May 2005

Total Project Cost: \$286,207

Green Valley Erosion (5GVERC) Phase 1

Overall Project Information:

- First Phase Construction Projects: Sites 1, 5, 6, 7, 8, 9, and 11

- Construction Timeline: December 2006 – March 2007
- Estimated Project Cost: \$550,000

Site 1 Summary:

Drainageway #1, south of Duval Mine Road and west of La Canada. Rebuild and armor channel. Construction completed March 2007.

Site 5 Summary:

Drainageway #6, between La Canada Drive and I-19. Encase the exposed 8" DIP sewer crossing within the wash. Replace failing rock and rail bank protection with rock-filled gabion baskets. Add grade stabilization improvements around and downstream of the sewer crossing.

Site 6 Summary:

Drainageway #6 at Abrego Drive. Add second rock gabion drop structure within the channel to stabilize the channel. Additional gabions and wire-tied rock to be used to stabilize the channel banks and bed for approximately 70 feet downstream of this new drop structure. Additional landscaping improvements may be provided at this site.

Site 7 Summary:

Drainageway #6 at confluence with Santa Cruz River, adjacent to Haven Golf Course. Repair of failed concrete grade control due to head cut migrating from the Santa Cruz River. Concrete structure will be replaced with new gabion grade control structure and large-diameter dumped riprap extending to the confluence with the Santa Cruz.

Site 8 Summary:

Drainageway #7 at Esperanza Blvd. Adding 6' concrete cut off wall to stabilize existing concrete apron downstream of 3-27" x 44" corrugated metal pipe arch culverts. Dumped riprap will be added to channel bed for approximately 50 feet downstream of new concrete cut off wall.

Site 9 Summary:

Drainageway #7, east of La Canada Drive. Extend existing concrete apron an additional 12 feet and construct a rock gabion grade control structure at the end of this extension. Gabion bank stabilization and wire-tied rock channel bed stabilization will be provided at this new drop and will extend approximately 50 feet downstream of the drop structure.

Site 11 Summary:

Drainageway #7, east of Abrego Drive. Stabilize existing concrete apron and add new gabion cut-off wall. Gabion bank protection and wire-tied rock mattress channel bed stabilization will extend 60' downstream of the new cut-off wall.

Green Valley Erosion Control (5GVERC) Phase 2

Utilizing the 2004 General Obligation Bonds FC5.02 Urban Infrastructure, Pima County Regional Flood Control District has developed a repair and improvement program for the community of Green Valley. Green Valley has been growing steadily since the 1960 when the

first subdivisions and drainage improvements were install. Phase 2 is the second year of small localized improvement to the aging Green Valley drainage way system, to prevent erosion of existing banks, culvert and other drainage structures. Projects completed this year include bank protection on Drainageway #3 at the Santa Cruz River, channel and bank improvements on Drainage way #4 at the Fire Station, downstream culvert and bank stabilization on Drainage ways #13 and #9 at Abrego Drive, and bank protection repairs at drainage ways #13 and #9 at Portillo. Cost of these improvement total \$442,000.

These projects were completed in March 2008.

Green Valley Erosion Control (SGVERC) Phase 3

Drainage Way # 7 (5GVDW7)

Install gabion rip rap rock bank protection and grade control structure to limit excessive bank and head cutting. Project constructed in May 2010, by Ashton under the District JOC contract for \$114,746.00.

Drainage Way #25

Channel re-grading and wire tied rip rap channeling completed by PCWMD with sewer improvements. RFCD provide funds for drainage improvements.

Drainage Way #13-east of Camino Del Portillo

Head cut migrating upstream towards roadway. Provided multiple grade control structures to stabilize approximately 600 feet of channel.

Green Valley Erosion Control (SGVERC) Phase 4

Drainage Way # 7 Phase II (5GVDW7)

Extended gabion rip rap rock baskets bank protection and provided an additional grade control structure to mitigate continued head cutting. Project was constructed in FY 10-11, by Ashton under the District JOC contract for \$129,998.00

Drainage Way #17- Safeway Plaza

Remove sediment and construct a new maintenance access ramp so that sediment can be removed regularly. Project constructed in March 2011, by Ashton under the District JOC contract for \$ 42,420.00

Non-bond Projects

Drainage Way #6 (5GVDW6)

Provide gabion bank protection and a series of grade control structure to mitigate continued bank and head cutting on the channel downstream of Abrego Drive. Project was constructed in FY 11-12, by Ashton under the District's JOC contract for \$269,316.00.

Drainageway #8 Improvements

Drainage improvements to increase channel slope and improve drainage flow through drainage easement on Haven Golf Course. Project was completed July 2013, by Granite Construction Company for \$30,500.

Drainageway #4 –

Repair to concrete lining of Drainageway #4. Project was completed by Ashton in November 2013 for \$24,600.

Studies

Green Valley Erosion Hazard Assessment Report
RS Engineering May 2004.

Green Valley 2010 Drainage Way Evaluation
Pima County RFCDD May 2010

Green Valley Drainageway Study 2013 (CMG)

ATTACHMENT 4

**GREEN VALLEY ROUTINE MAINTENANCE
SPREADSHEET**

ActivityNu	DateRecvl	ChannelNam	ChannelTyp	DateJobCom	Comments	Name	DATEINSP
IMD-MW-12-0024	9/4/2012		Drainageway-constructed		Mowing Green Valley Drainages Abrego Drive:	RFCD Mowing	8/15/2013
IMD-MW-12-0024	9/4/2012		Drainageway-constructed		Mowing Green Valley Drainages Abrego Drive:	RFCD Mowing	
IMD-MW-12-0024	9/4/2012		Drainageway-constructed		Mowing Green Valley Drainages Abrego Drive:	RFCD Mowing	8/15/2013
IMD-MW-12-0025	9/10/2012		Drainageway-constructed	9/11/2012	Green Valley DRWY mowing off of Abrego Drive:	RFCD Mowing	8/5/2013
IMD-MW-12-0025	9/10/2012		Drainageway-constructed	9/11/2012	Green Valley DRWY mowing off of Abrego Drive:	RFCD Mowing	
IMD-MW-12-0025	9/10/2012		Drainageway-constructed	9/11/2012	Green Valley DRWY mowing off of Abrego Drive:	RFCD Mowing	8/5/2013
IMD-MW-12-0025	9/10/2012		Drainageway-constructed	9/11/2012	Green Valley DRWY mowing off of Abrego Drive:	RFCD Mowing	8/5/2013
IMD-MW-12-0035	9/17/2012		Drainageway-constructed		Routine Mowing Green Valley DRWY:	RFCD Mowing	8/5/2013
IMD-MW-12-0035	9/17/2012		Drainageway-constructed		Routine Mowing Green Valley DRWY:	RFCD Mowing	
IMD-MW-12-0035	9/17/2012		Drainageway-constructed		Routine Mowing Green Valley DRWY:	RFCD Mowing	8/7/2013
IMD-DC-12-0196	10/31/2012		Drainageway-constructed	12/3/2012	Green Valley DRWY # 23: This drainage way was mowed in September but has Mowing District # 5 Green Valley:	RFCD Mowing	8/14/2013
IMD-MW-12-0040	11/5/2012		Drainageway-constructed	12/3/2012	Mowing District # 5 Green Valley:	RFCD Mowing	8/26/2013
IMD-MW-12-0040	11/5/2012		Drainageway-constructed	12/3/2012	Mowing District # 5 Green Valley:	RFCD Mowing	8/15/2013
IMD-MW-12-0041	11/5/2012		Drainageway-constructed	12/12/2012	Mowing District # 5 Green Valley:	RFCD Mowing	
IMD-MW-12-0041	11/5/2012		Drainageway-constructed	12/12/2012	Mowing District # 5 Green Valley:	RFCD Mowing	8/7/2013
IMD-MW-12-0041	11/5/2012		Drainageway-constructed	12/12/2012	Mowing District # 5 Green Valley:	RFCD Mowing	7/11/2013
IMD-DC-12-0198	10/31/2012		Drainageway-natural	11/12/2012	Drainage way 9 in Green Valley:	RFCD Vegetation	
IMD-DM-13-0003	12/31/2012	Green Valley Drwy # 3	Drainageway-constructed	2/5/2013	Green Valley Drwy # 3 erosion repair:	DOT Maintenance Support	8/14/2013
IMD-IV-13-0001	1/1/2013	Green Valley Drainages			Green Valley Vegetation maintenance:	RFCD Vegetation	8/15/2013
IMD-IV-13-0001	1/1/2013	Green Valley Drainages			Green Valley Vegetation maintenance:	RFCD Vegetation	8/15/2013
IMD-IV-13-0001	1/1/2013	Green Valley Drainages			Green Valley Vegetation maintenance:	RFCD Vegetation	8/15/2013
IMD-IV-13-0002	1/1/2013	Green Valley DRWY # 23	Drainageway-constructed	1/7/2013	Green Valley veg. maintenance:	RFCD Vegetation	8/15/2013
IMD-IV-13-0004	1/16/2013	Green Valley DRWY # 4	Drainageway-constructed		Green Valley Drainage way # 4	RFCD Vegetation	
IMD-DC-13-0022	3/15/2013	Green Valley DRWY 13	Drainageway-natural		Green Valley drainage way # 13 off of S. La Canada Drive and W. Passo Del Prado:	IMD Maintenance	
IMD-DM-13-0008	3/11/2013	Green Valley DRWY # 3	Drainageway-natural	4/15/2013	Green Valley DRWY # 3	DOT Maintenance Support	8/14/2013
IMD-DM-13-0009	3/18/2013	Green Valley DRWY # 6	Drainageway-constructed	4/15/2013	Green Valley Drwy # 6	DOT Maintenance Support	8/26/2013

IMD-DC-13-0033	4/9/2013	Green Valley DRWY # 13	Drainageway-constructed	4/23/2013	This drainage way is Green Valley DRWY # 13 from La Canada to Paseo del Prado a short section with some Green Valley Drainages vegetation maintenance is completed.	RFCD Vegetation	8/7/2013
IMD-IV-13-0023	4/1/2013	Green Valley Drainages	Drainageway-constructed	4/15/2013	Green Valley Drainages vegetation maintenance is completed.	RFCD Vegetation	8/5/2013
IMD-IV-13-0023	4/1/2013	Green Valley Drainages	Drainageway-constructed	4/15/2013	Green Valley Drainages vegetation maintenance is completed.	RFCD Vegetation	8/5/2013
IMD-IV-13-0026	4/15/2013	GV Drainage way # 9 La Cana	Drainageway-constructed	4/25/2013	Green Valley DRWY # 9 La Canada: Completed 1. Vegetation maintenance starting at Portillo east to Green Valley Drainage maintenance:	RFCD Vegetation	8/5/2013
IMD-IV-13-0027	4/15/2013	Green Valley DRWY 17 & 19	Drainageway-constructed	4/25/2013	Green Valley Drainage maintenance:	RFCD Vegetation	8/5/2013
IMD-DC-13-0065	6/5/2013	Green Valley DRWY # 7 & 9	Drainageway-constructed	6/26/2013	Green Valley DRWY 7 & 9 west of La Canada: I did find some dead and down that can be removed	RFCD Vegetation	8/15/2013
IMD-DC-13-0065	6/5/2013	Green Valley DRWY # 7 & 9	Drainageway-constructed	6/26/2013	Green Valley DRWY 7 & 9 west of La Canada: I did find some dead and down that can be removed	RFCD Vegetation	8/15/2013
IMD-DC-13-0067	6/13/2013	Green Valley DRWY # 13	Drainageway-constructed	6/26/2013	Green Valley DRWY # 13 starting at Abrego Drive along the south bank alleyway: Routine Mowing Green Valley:	RFCD Vegetation	8/15/2013
IMD-MW-13-0013	6/21/2013		Drainageway-constructed		Routine Mowing Green Valley:	RFCD Mowing	8/15/2013
IMD-MW-13-0013	6/21/2013		Drainageway-constructed		Routine Mowing Green Valley:	RFCD Mowing	8/5/2013
IMD-MW-13-0013	6/21/2013		Drainageway-constructed		Routine Mowing Green Valley:	RFCD Mowing	8/5/2013
IMD-IV-13-0038	6/24/2013	Green valley DRWY # 7 Abre	Drainageway-constructed		Green Valley DRWY # 7 Abrego Dr: Green Valley Drainage way #8:	RFCD Vegetation	8/26/2013
IMD-DC-13-0087	6/11/2013					IMD Maintenance	8/15/2013