JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

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June 12th, 2017

Cochise County Highway and Floodplain
Attn: Karen Riggs, P.E., R.L.S., Director
1415 Melody Lane, Building F
Bisbee, AZ 85603

RE: Inspection, Monitoring and Maintenance: Year 4
Palominas Flood Control and Recharge Facility

Dear Karen,

Thank you for requesting a scope and fee proposal from JE Fuller Hydrology and Geomorphology, Inc. (JE Fuller) to provide continued inspection and monitoring services for the Palominas Flood Control and Recharge facility.

Background

Beginning in late 2011 with initial investigations into the feasibility of providing for dual benefits of flood control and aquifer recharge on the County-owned property (previously-named Mansker tract), JE Fuller has provided consulting services to the County through technical analyses, design plan preparation, construction-phase administration support, and system performance monitoring. With the successful July, 2014 construction completion of the Palominas Flood Control and Recharge Facility on the County-owned parcel and downstream channel, the pilot project entered the operations phase of its service life. Although the system was designed to minimize erosion, sediment transport and sediment deposition, periodic maintenance will be required. Program components that will be critical to the continued successful future operation of this facility are: inspection, maintenance, and continued monitoring and analysis of the system inflow/outflow data.

JE Fuller along with subconsultant GeoSystems Analysis, Inc. (GSA) who designed and installed the facility monitoring program, have provided monitoring data collection, retrieval, and analysis under contract to the County beginning with the July, 2014 completion of construction. The current contract (PSA 17-05-HFP-04) specifies a monitoring period of 1 year following the previous year; the current contract duration ends September 30, 2017. Note that this proposal departs from the previous timelines by extending the monitoring period to the end of the calendar year 2018.

Monitoring of the facility for a period of five years after construction was one stated expectation of the project outcomes, identified during application for grant funding from the Walton Family Foundation (WFF), which initiated the project work efforts undertaken to-date. Five years from the completion of facility construction will be mid-July, 2019.

Scope of Work

This Scope of Work represents the fourth year of data monitoring on the project, and the third year of scheduled periodic inspection and maintenance recommendations. JE Fuller will inspect the facility once in September and December, 2017, and once in March, June, September, and December 2018. Following the inspections, JE Fuller will prepare a memorandum detailing the observations made and recommendations for facility maintenance. Recommended maintenance actions will be ranked for priority using 3 categories: critical, high priority, low priority. It is assumed that County crews or a County contractor will perform all maintenance.

Specifically excluded are: land surveying, geotechnical testing or engineering, percolation testing, groundwater modeling, sediment/pollutant transport modeling, site planning, earthmoving activities, construction, environmental permitting, and governmental agency permitting.

Refer to the GSA Subconsultant proposal for the tasks proposed by GSA and the associated fees.

Fee Estimate and Billing Structure

JE Fuller labor will be billed on an hourly basis ($110/hour for P.E. II) plus mileage at the prevailing federal rate (currently $0.535/mile) and any direct expenses (e.g., reproductions, rental vehicles, etc.). Maximums of 100 hours of JE Fuller labor and $500.00 direct JE Fuller expenses are estimated for project administration, inspection visits and recommended maintenance memos.

Refer to the GSA Budget Worksheet for Subconsultant fees associated with the listed tasks. Note that the 5% markup on GSA subconsultant fees is retained for this proposal. Also note the incorporation of data download tasks being handled by Agricultural Research Service (ARS) Tombstone staff.

The fee estimate for completion of the SOW is not-to-exceed (NTE) **$53,380.30** without your prior written approval. If any additional work requires efforts beyond the attached scope and the NTE amount, that work will be charged per the standard T&M rates and conditions listed herein.

The use of a Time and Materials (T&M)-type contract allows for the potential to have County Staff perform some of the duties (data collection, inspection) listed in the SOW, as Staff availability allows. Potential cost savings will be achieved through using County Staff resources to perform some of the SOW tasks.

Invoicing will be monthly or at the discretion of JE Fuller, and will be based on work performed. This agreement is strictly between the County and JE Fuller and is not contingent upon payment by any third parties or on approval of the work by any third parties (including government agencies). A 1% charge per month will be added to all invoice amounts over 2 months old.

Thank you again for requesting this Scope of Work and fee estimate from JE Fuller. Should you have questions regarding this proposal, please give me a call.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Cyrus D. Miller, P.E., CFM
Vice President

Attachments: GSA Subconsultant Proposal
and Budget Worksheet

June 12, 2017

Cyrus D. Miller, PE, CFM
Project Manager
JE Fuller/Hydrology & Geomorphology, Inc.
40 E. Helen Street
Tucson, AZ 85705

RE: Palominas Facility Monitoring and Maintenance: Proposed Eighteen Month (2017-2018) Tasks and Budget

Dear Cy,

The following presents a proposed Scope of Work (SOW) and budget for GeoSystems Analysis, Inc. (GSA) to JE Fuller Hydrology & Geomorphology, Inc. (JEF) for continued monitoring and maintenance activities from July 1, 2017 through December 31, 2018 at the Palominas Stormwater Capture and Recharge facility. This eighteen month monitoring period is longer than previous annual monitoring periods with the intention of adjusting future monitoring years to align with the calendar year. The purpose of the recharge system monitoring is to evaluate the long-term stormwater capture and the amount of groundwater recharge that is occurring at the facility.

In summary, GSA proposes to continue to collect and analyze data from the following monitoring systems:

1) Five (5) groundwater monitoring wells

2) Fourteen (14) stilling wells in detention and in-channel recharge basins

3) Stilling wells in six (6) drywells and three (3) infiltration trenches

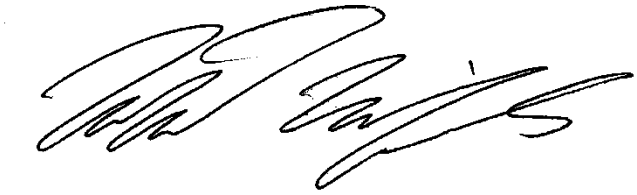
4) Soil moisture monitoring instruments in ten (10) vadose zone boreholes

5) Three (3) precipitation gauges

Two maintenance trips are scheduled for the monitoring period to replace and/or calibrate equipment as needed. Three monitoring reports will be provided, including a revised 2017 calendar year report (January 2017 – December 2017), a mid-year 2018 report (January 2018 – June 2018), and a 2018 calendar year annual report (January 2018 – December 2018).

Should you have any questions, please give me a call.

Sincerely,



Mike Milczarek
Program Director

PROPOSED SCOPE OF WORK FOR 2017-2018 MONITORING

Task 0 – Project Management

This task includes project management, planning, scheduling and coordination necessary to successfully conduct monitoring, maintenance, data processing, data analysis and interpretation, reporting, and related activities.

Task 1 – Monitoring System Data Collection and Management

Dataloggers at the Palominas recharge facility record sensor measurements of groundwater elevation (6-hour intervals); basin water level elevations (15-minute intervals); drywell and infiltration trench water level elevations (15-minute intervals); and soil matric potential and soil water content in vadose zone boreholes (4-hour intervals). Three rain gauges record total precipitation and average temperature precipitation on 15-minute intervals.

ARS staff will download data quarterly during the eighteen month monitoring period (7 events from July 2017 to December 2018). One data download site visit is budgeted for GSA staff to allow for concurrent maintenance and calibration of monitoring equipment, as needed (Task 2). Data will be checked and processed at least quarterly by GSA staff. Spreadsheet processing will include calibrations, corrections, and time-series plotting of sensor measurements, and modeled estimates of stormwater capture and groundwater recharge.

Task 2 – Monitoring System Maintenance

Monitoring station maintenance will consist of up to two site visits, as necessary, to troubleshoot and fix any problems. To the extent practicable, maintenance visits will be scheduled together with data downloading visits. For budgeting purposes we estimate $2,250 for instrument replacement during the 1.5 year monitoring period.

Task 3 – Data Analysis and Summary Reports

Data analysis will include estimates of precipitation, evaporation, basin-specific infiltration volumes using the mass balance and field-based approaches, duration of ponding, water flow between basins, recharge enhancement feature infiltration volumes, groundwater elevations and gradients, and soil moisture trends.

GSA will provide a revised 2017 calendar year annual report by March 31, 2018, a mid-year 2018 report by September 30, 2018, and a 2018 calendar year annual report by March 31, 2019.

Proposed Budget and Schedule

Table 1 shows the proposed schedule. Table 2 shows an estimated cost summary and Table 3 shows estimated detailed costs. Cost assumptions include:

- 1 field day per data download trip (1 GSA staff)
- 2 field days to troubleshoot and replace datalogger equipment as needed in 2017 – 2018 (1 GSA staff)
- USDA-ARS will download data from the Palominas facility on a quarterly basis

Table 1. Tasks with completion dates

Task	Task ID	Description	Completion Dates
1 – 2017-2018 Monitoring Data Management	1.1	Data Collection	December 31, 2018
	1.2	Data Processing	March 31, 2019
2 – 2017-2018 Maintenance	2.1	Monitoring System Maintenance	As Needed
3 - Data Analysis & Annual Reporting	3.1	Data Analysis	March 31, 2019
	3.2	Mid-Year 2018 Data Summary (January – June 2018)	September 30, 2018
	3.3	Revised 2017 Calendar Year Annual Report	March 31, 2018
	3.4	2018 Calendar Year Annual Report	March 31, 2019

Palominas Recharge & Flood Control Project - Eighteen Month (2017-2018) Monitoring

1720 - JE Fuller/Cochise County

June 12, 2017

Table 1 - Cost Summary By Task

	Total Costs
0 - Project Management	**$2,798**
No Subtask	$2,798
1 – Monitoring System Data Collection and Management	**$7,925**
1.1 - Data Collection (1 event July 2017 to December 2018)	$2,445
1.2 - Data Processing (7 events July 2017 to December 2018)	$5,480
2 – Monitoring System Maintenance	**$8,370**
2a - Station Maintenance and Sensor Calibration	$8,370
3 – Data Analysis and Summary Reports	**$20,793**
3.1 - Data Analysis and Interpretation	$6,980
3.2 - Mid-Year 2018 Data Summary (January - June 2018)	$3,111
3.3 - Revised 2017 Calendar Year Annual Report	$5,351
3.4 - 2018 Calendar Year Annual Report	$5,351
Proposal Grand Total	**$39,886**