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## **Appendix B**

**SJBA Monitoring Plan**



## SAN JUAN BASIN AUTHORITY

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**TO:** Board of Directors **DATE:** January 8, 2013  
**FROM:** Dan Ferons  
**SUBJECT:** Authorization of 2013 San Juan Basin Management Monitoring and Reporting Program

### SUMMARY

**Issue:** The Authority authorized soliciting a proposal from Wildermuth Environmental at the December Board meetings for monitoring under its Permit for Diversion and Use of Water from the State Water Resources Control Board as well as under the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. The Authority is proposing additional monitoring during 2013 to identify the amount of water in storage and establish a baseline for seawater intrusion.

**Recommendation:** Authorize professional service contract in the amount of \$139,119 with Wildermuth Environmental for monitoring services in Calendar Year 2013.

**Fiscal Impact:** Monitoring costs are included in the annual budget; the proposed additional services can be accommodated in the current administration budget.

**Previously Related Action:** The Authority has an annual contract for monitoring services. The current contract was through December 2012 with Wildermuth Environmental in the amount of \$96,381.

### DISCUSSION

Attached is a detailed proposal from Wildermuth Environmental Inc. (WEI) to provide expanded monitoring services in 2013. WEI provides ongoing monitoring services for the Authority for 2012 at a reduced level in comparison to 2011 and 2010. The Authority selected WEI based on competitive proposals in 2010 and the Board extended the contract in 2011 and currently through December 2012. The Authority's monitoring requirements are based on the amount of water diverted through pumping. The current requirements are based on a projected pumping over 4,800 acre feet per year.

The recommendation to continue with WEI is based on the following:

- The annual reports prepared by WEI are detailed and well-received by the member agencies and the State Water Resources Control Board.
- WEI is developing an on-line database for the monitoring information that also incorporates other water quality data from the member agencies.
- WEI efforts have been cost-effective and under budget.

Funding:

The proposed contract is divided between two fiscal years as noted below:

<b>Account Description</b>	<b>Budget FY 12/13</b>	<b>Notes</b>
<b>Monitoring services budget</b>	\$ 100,000.00	
Current authorization	\$ 74,114.74	2012 monitoring
Proposed authorization	\$ 43,436.00	2013 monitoring in Fiscal 2012-13
<b>Shortfall reallocated from Administration</b>	\$ (17,550.74)	Contingency was included in the administration budget for development of a database and library that has started.
Proposed authorization for Fiscal 2013/14	\$ 95,683.00	Portion of the contract in next fiscal year



January 4, 2013

San Juan Basin Authority  
Attn: Dan Ferons and West Curry  
C/o Santa Margarita Water District  
P.O. Box 7005  
Mission Viejo, CA 92690-7005

**Subject: 2013 San Juan Basin Management Monitoring and Reporting Program**

Dear Messrs. Ferons and Curry:

Pursuant to our professional services agreement (PSA) with the San Juan Basin Authority (SJBA) dated February 14, 2012, Wildermuth Environmental Inc. (WEI) prepared this letter proposal to present the recommended San Juan Basin Management Monitoring and Reporting program for 2013 and the scope-of-work and cost estimate for WEI to implement the recommended program.

**Background**

Since early 2003, the SJBA has implemented a groundwater, surface water, and vegetation field monitoring program to comply with the conditions outlined in the SJBA's Permit for Diversion and Use of Water, No. 21074 (Permit 21074), issued by the State Water Resources Control Board (SWRCB) Division of Water Rights in October 2000. The monitoring program, which was developed in 2001, has focused primarily on collecting the data needed to satisfy the monitoring requirements enumerated in Permit 21074. WEI has implemented the SJBA's field monitoring and reporting program since calendar year 2010. In October 2011, the SWRCB amended Permit 21074 to reflect the results of monitoring performed by the SJBA to date. Program Task III of WEI's 2012 PSA, is to prepare an updated Basin Management Monitoring and Reporting Program, in part to comply with the amended conditions of Permit 21074.

In 2011, the SJBA hired WEI to prepare an updated Groundwater Management Plan for the long-term, sustainable management of the San Juan Basin's water resources. The final task of the Groundwater Management Plan is to recommend a monitoring program to collect the data needed to effectively manage the basin (e.g. assess the impact to groundwater levels and groundwater quality as a result of implementing the Groundwater Management Plan).

The secondary goal of Program Task III is to design the Basin Management Monitoring and Reporting Program such that it addresses the SJBA's regulatory compliance requirements, the recommended monitoring program from the Groundwater Management Plan, and that it identifies and eliminates any redundant data collection efforts of the SJBA and other local agencies collecting data in the San Juan Basin.

As of December 2012, the Groundwater Management Plan is still being developed, and thus the monitoring program to support the plan has not been identified. However, through the process of developing the Groundwater Management Plan, WEI has identified several basin management issues that should be addressed as part of the 2013 Basin Management Monitoring and Reporting

Program in addition to the requirements of Permit 21074: (1) groundwater storage, (2) seawater intrusion, and (3) point-source groundwater contamination from leaking underground storage tanks (LUSTs). Additional monitoring components can be added to the monitoring plan in subsequent years to address any additional management issues that arise as the Groundwater Management Plan is completed in 2013.

### **Recommended 2013 Basin Management Monitoring and Reporting Program**

The following is a description of each regulatory or basin management issue that should be addressed as part of the 2013 Basin Management Monitoring and Reporting Program.

#### **Permit 21074 Monitoring and Reporting**

Amended Permit 21074 describes, among other things, the groundwater, surface water, and vegetation monitoring requirements that must be satisfied to evaluate the impacts to groundwater-level elevation, groundwater quality, and riparian vegetation that result from groundwater extractions related to the operation of the SJBA desalter facility at two levels of production: groundwater extractions less than 4,800 acre-feet per year (acre-ft/yr) and groundwater extractions in excess of 4,800 acre-ft/yr. In 2013, the San Juan Basin Authority anticipates groundwater extractions will exceed 4,800 acre-ft/yr. Thus, the monitoring program for extractions in excess of 4,800 acre-ft/yr will be implemented in 2013. The explicit monitoring requirements include (1) quarterly groundwater level monitoring at eight monitoring wells to comply with the Department of Water Resources' (DWR) California Statewide Groundwater Elevation (CASGEM) program, (2) quarterly groundwater quality monitoring for Electrical Conductivity (EC) at eight monitoring wells, and (3) monthly monitoring of riparian vegetation health at five monitoring sites along the San Juan Creek. In addition to the explicit monitoring requirements listed in the permit, additional data is needed satisfy other permit conditions, such as reporting total groundwater extractions from the basin and computing water in storage. The additional data needed address the permit conditions includes groundwater production, total water use, precipitation, groundwater elevation data across the basin, and total dissolved solids (TDS) and chloride concentrations at wells. An annual progress report documenting permit compliance must be submitted to the SWRCB by June 2014.

#### **Groundwater Storage Management**

Through the work performed for the Groundwater Management Plan, WEI identified that the amount of groundwater storage in the San Juan Basin is far less than has long been reported by the DWR and others studying the basin. Furthermore, the water budget of the San Juan Basin is not well understood, particularly as it relates to net inflow to and outflow from the basin. While a groundwater model of the San Juan Basin has been developed to simulate changes in storage, inflow, and outflow based on the pumping plans of the agencies operating in the Basin, real-time data needs to be collected to validate the model results and to assist in the future update and calibration of the model.

We recommend that the SJBA conduct a regional, comprehensive groundwater-level survey and analysis of the San Juan Basin in the spring and the fall of each year to compute the volume of water in storage and the change in storage between each period (spring to fall and fall to spring). The spring levels and storage change calculations can be used by the SJBA to determine an appropriate level of pumping for the following summer. Additionally, the period change in storage and period

pumping can be used to estimate the net period inflow to the San Juan Basin. The net period inflow can then be correlated to precipitation and stream discharge measurements to characterize near-term and long-term recharge. After each groundwater-level survey (spring and fall), WEI will prepare a letter reports to the SJBA summarizing the analysis of storage change, the estimation of net inflow to the San Juan Basin, and recommending pumping plans for the subsequent period.

### **Seawater Intrusion**

Preliminary results of the groundwater modeling performed by Geoscience Support Services (GSS) in support of the Municipal Water District of Orange County's (MWDOC) seawater desalination project predicts that seawater intrusion is an imminent threat to the basin under the groundwater production plans of the SJBA member agencies.

To track seawater intrusion into the San Juan Basin, it is critical to begin collecting baseline data that will help the SJBA to understand the current extent of seawater intrusion. We recommend that this baseline dataset be collected in 2013. This effort would include sampling groundwater and surface water in the Basin, from the coast to the forebay areas, for intrinsic seawater tracers, including boron, bromide, iodide, and strontium. In addition, we recommend that the SJBA coordinate with the South Coast Water District (SCWD) and the City of San Juan Capistrano (CSJC) to request that they sample their production wells for the same intrinsic seawater tracers.

At the conclusion of the baseline data collection effort, a report will be prepared that describes the 2013 monitoring program, analyzes historical and 2013 data to establish the baseline condition of the San Juan Basin as it relates to seawater intrusion, and describe the questions, analytical methods, and ongoing monitoring program to track the future rate of seawater intrusion.

### **Point-Source Groundwater Contamination**

Seven point-sources of groundwater contamination from LUST sites have been identified in the San Juan Basin. Contamination by methyl-tert-butyl-ether, or MTBE, has already required the CSJC to incorporate high-cost treatment systems into their municipal water system. As the pumpers in the San Juan Basin continue to increase production over time, there is a concern that the contaminants associated with the various LUST sites could be mobilized and further impact municipal water supplies. We recommend that the SJBA include an annual groundwater sampling event for volatile organic compounds (VOCs), including MTBE, as part of the monitoring program.

### **Scope of Work**

The following is the scope of work required to implement the recommended monitoring and reporting program described above. The scope of work is designed to rely on groundwater and surface water data collected by others in the basin to the extent possible, and supplements this data with a field monitoring program to fill in data gaps. The Basin Management Monitoring and Reporting Program is divided into three tasks: Field Monitoring Program, Data Acquisition and Management, and Reporting. The objectives, sub-tasks, schedule of implementation, and deliverables for each task are described below.

## Task 1 –Field Monitoring Program

The objective of the field monitoring program is to collect data in the field that is not available from other agencies that monitor the Basin. This task is broken down into four subtasks based on the data type and monitoring frequency. The duration of the field monitoring program is from January 2013 through December 2013.

***Subtask 1.1 Quarterly Groundwater Level Monitoring.*** Currently, the SJBA has pressure transducers and data loggers installed in eight monitoring wells across the San Juan Basin to continuously record groundwater-level elevations. The data loggers are also equipped to record electrical conductivity (EC). Groundwater elevation and EC data collected from these wells are used for water rights permit compliance reporting, CASGEM reporting, storage management, and seawater intrusion monitoring. Each quarter, WEI will download the groundwater elevation and EC data from the loggers, manually measure groundwater level elevation to calibrate the pressure transducers, calibrate the EC probes, and perform routine transducer maintenance. The field data will be processed, checked for quality assurance/quality control (QA/QC) and loaded into HydroDaVE.

***Subtask 1.2 – Quarterly Groundwater Quality Monitoring.*** To establish the baseline condition for monitoring seawater intrusion into the Basin, WEI will sample 14 monitoring wells in the San Juan Basin on a quarterly basis in 2013. The quarterly groundwater quality sampling events consist of purging each well, measuring field water quality parameters (e.g. temperature, pH, and EC), and collecting a groundwater quality sample for laboratory analysis. Groundwater samples will be delivered to Eurofins—Eaton Analytical Laboratory and analyzed for the constituents listed in Table 1. Note that groundwater samples will only be tested for VOCs during one of the four quarterly sampling events. Data collected for this task can also be used for the analysis and reporting required by Permit 21074. All field and laboratory data will be processed, checked for QA/QC and loaded into HydroDaVE.

***Subtask 1.3 – Surface Water Quality Monitoring.*** To establish the baseline condition for monitoring seawater intrusion into the Basin, WEI will sample up to 5 surface water sites in the Basin. The sites will be sampled twice in 2013 during dry-weather conditions for the constituents listed in Table 1 (excluding VOCs). The field and laboratory data will be processed, checked for QA/QC and loaded into HydroDaVE.

***Subtask 1.4 – Vegetation Monitoring.*** The SJBA’s water rights permit requires monthly vegetation monitoring at five sites along San Juan Creek. Monthly vegetation monitoring consists of a biologist visiting five monitoring stations to collect written and photographic records of vegetation health and current climate conditions. The field data will be checked for QA/QC and the photographs stored in a project file. Vegetation monitoring is performed by WEI’s sub-consultant, Glenn Lukos Associates.

## Task 2 – Data Acquisition and Management

The objective of this task is to coordinate with and collect data from all public and private entities that are collecting groundwater, surface water, or climate data in the San Juan Basin. This data will supplement the database of field data generated by the SJBA to satisfy the regulatory reporting requirements and basin management issues identified herein. At the end of this task, the SJBA will

have an updated database through December 2013. The duration of this task is from April 2013 through February 2014.

***Subtask 2.1 – Data Acquisition from Collecting Agencies.*** WEI staff will coordinate with each public and private entity on a quarterly basis to collect the relevant data sets (April 2013, July 2013, October 2013, and January 2014). Additionally, in early 2013, WEI staff will coordinate with the SCWD, the CSJC, and the MWDOC, to request that these agencies sample their wells for the intrinsic seawater tracers that are not included as part of their standard analytical testing programs.

***Subtask 2.2 – Data QA/QC, Processing, and Upload to HydroDaVE.*** After each quarterly data collection event, all groundwater, surface water, and climate data will be processed, checked for QA/QC, and loaded in to HydroDaVE.

### **Task 3 – Reporting**

The objective of this task is to prepare reports and presentations summarizing the data collected in the San Juan Basin during 2013.

***Subtask 3.1 – Water Rights Permit Reporting.*** WEI will prepare a letter report to the SWRCB summarizing the status of compliance with the requirements of Permit No. 21074. This report will be formatted as a letter report that directly answers the questions posed in the permit. A draft letter report will be submitted to the SJBA for review and comment by March 31, 2014. A final letter report, which incorporates the comments on the draft, will be submitted to the SWRCB by May 31, 2014.

***Subtask 3.2 – CASGEM Reporting.*** WEI will upload the quarterly groundwater sampling data collected in Task 1.1 to the DWR through the CASGEM online reporting system. Data will be uploaded in April 2013, July 2013, October 2013, and January 2014.

***Subtask 3.3 – Biannual Storage Change Reports.*** WEI will prepare two letter reports to the SJBA summarizing the analysis of storage change, the estimation of net inflow to the San Juan Basin, and recommending pumping plans for the subsequent six month period. The first letter report will document the change in storage in the San Juan Basin from fall 2012 to spring 2013 and will be submitted to the SJBA by May 31, 2013. The second letter report will document the change in storage in the San Juan Basin from spring 2013 to fall 2013 and will be submitted to the SJBA by November 30, 2013.

***Subtask 3.4 – Seawater Intrusion Monitoring Report.*** WEI will prepare a seawater intrusion monitoring report at the conclusion of the four quarterly groundwater quality sampling events in 2013. The report will describe the 2013 monitoring program, analyze historical and 2013 data to establish the baseline condition of the basin as it relates to seawater intrusion, and describe the questions, analytical methods, and ongoing monitoring needed to track seawater intrusion in subsequent years. A draft monitoring report will be submitted to the SJBA for review and comment by December 31, 2013. A final report incorporating comments on the draft will be submitted by February 28, 2014.

***Subtask 3.5 – Presentations to the SJBA Board of Directors.*** WEI staff will attend four SJBA Board meetings during 2013 to update the Board on the progress and deliverables produced for the various monitoring and reporting tasks.



***Subtask 3.6 – Miscellaneous Data Requests and Meetings.*** Typically during the year, WEI staff are asked to prepare data deliverables or attend meetings relevant to the work of the SJBA. This subtask assumes WEI will be asked to prepare one data deliverable and attend one meeting per quarter in 2013.

### **Professional Services Fee**

The total cost to complete the scope of work for the 2013 San Juan Basin Monitoring and Reporting Program presented herein is \$139,119. A line-item work breakdown structure is provided in Table 2. We recommend the SJBA budget \$153,031, which includes a contingency budget equal to ten percent of the professional services fee (\$13,912) to cover unanticipated costs that may arise throughout the year. WEI will not utilize the contingency budget without prior consent from the SJBA.

We look forward to continuing to work with the SJBA on this important and timely work. Should you have any questions about the recommendations and scope of work presented herein, please contact us at (949) 420-3030.

Very truly yours,

### **Wildermuth Environmental, Inc.**



Samantha S. Adams  
Supervising Scientist



Mark J. Wildermuth, PE  
President, Principal Engineer

### **Enclosures:**

Table 1 – Groundwater Quality Sampling Program – List of Chemical Analyses

Table 2 – Work Breakdown Structure and Fee Estimate for Professional Services

**Table 1**  
**2013 Quarterly Groundwater Quality Sampling Program**  
**List of Chemical Analyses**

Analytes
Alkalinity (Including Bicarbonate, Carbonate, and Hydroxide)
Boron
Bromide
Calcium
Chloride
Fluoride
Hardness
Iodide
Iron
Magnesium
Manganese
Nitrate-nitrogen
pH
Potassium
Sodium
Specific Conductance at 25C
Strontium
Sulfate
Total Dissolved Solids
VOCs (groundwater only, annual sample only)

Table 2  
Work Breakdown Structure and Fee Estimate for Professional Services  
2013 San Juan Basin Monitoring and Reporting

Description	Notes	Labor										Other Direct Charges										Total Program Costs	
		Person Hours		Cost		Travel		Equipment		Subs		Lab		Repro-duction		Total ODCs		Sub-Task		Task			
		Sub-task	Task	Sub-task	Task	Sub-task	Task	New	Rental	Sub-task	Task	Sub-task	Task	Sub-task	Task	Sub-task	Task	Sub-task	Task	Sub-task	Task		
																						Sub-task	Task
<b>Task 1 - Field Monitoring Program</b>	a		\$23,935																		\$53,442		
1.1 Quarterly Groundwater-Level Monitoring		88	\$9,800		\$456	\$520	\$128														\$10,904		
1.2 Quarterly Groundwater Quality Monitoring	b	128	\$10,960		\$456	\$500	\$500														\$26,716		
1.3 Bi-annual Dry-weather Surface Water Monitoring	c	15	\$1,420		\$228	\$100	\$100														\$3,818		
1.4 Monthly Vegetation Monitoring	d	12	\$1,755																		\$12,005		
<b>Task 2 - Data Acquisition and Management</b>	e		\$21,560																		\$21,560		
2.1 Data Acquisition from Collecting Agencies		32	\$4,680																		\$4,680		
2.2 Data QA/QC, Processing, and Upload to HydroDAVE		120	\$16,880																		\$16,880		
<b>Task 3 - Reporting</b>	f		\$61,005																		\$64,117		
3.1 Water Rights Permit Reporting to the State Board		86	\$12,300																		\$15,050		
3.2 Quarterly CASGEM Reporting to DWR		12	\$1,620																		\$1,620		
3.3 Biannual Storage Change Reports to the SJBA Board	g	77	\$11,870																		\$11,870		
3.3.1 Spring 2013 Storage Change Letter Report		46	\$6,845																		\$6,845		
3.3.2 Fall 2013 Storage Change Letter Report		114	\$19,010																		\$19,260		
3.4 Seawater Intrusion Monitoring Plan		24	\$4,320		\$56																\$4,376		
3.5 Presentations to SJBA Board of Directors	i	32	\$5,040		\$56																\$5,096		
3.6 Miscellaneous Meetings and Data Requests	j																						
<b>Sub-total Contingency @ 10%</b>		786	\$106,500		\$1,251	\$520	\$728		\$13,550	\$15,570	\$1,000										\$139,119		
<b>Total</b>	k																				\$13,912		
																					\$153,031		

**Notes:**

- a Field data collection tasks include review, post-processing, QA/QC, and upload of data to HydroDAVE.
- b Assumes 14 wells will be sampled by WEI staff (7 SCWD monitoring wells and 6 SJBA monitoring wells), and assumes that municipal production wells that need to be tested for seawater intrinsic tracers will be sampled by the well owners (CSJIC and SCWD).
- c Assumes 5 surface water sites will be sampled during dry-weather flow.
- d Field work performed by our sub-consultant Glenn Lukos Associates. Labor hours includes coordination with sub-consultant and review of results
- e Includes collection of groundwater production, groundwater level, groundwater quality, surface water quality, surface water flow, and precipitation data collected in the field by cooperating agencies (e.g. SCWD, City of San Juan Capistrano, County of Orange, etc.).
- f A portion of the report is produced by our sub-consultant Glenn Lukos Associates.
- g The initial storage change letter report will require more staff hours than subsequent reports because it is the first time the report is being produced. Also, the initial reporting effort will require water level elevation contouring for multiple time periods (Fall 2012 and Spring 2013). Subsequent reports will only require water level elevation contouring for one time period (Fall 2013) and will rely on figure and text templates developed during the initial reporting effort.
- h After analysis of the water quality data collected in 2013, an ongoing seawater intrusion monitoring program will be recommended. The analysis and recommended monitoring program will be documented in a letter report
- i Assumes a total of four quarterly presentations to the SJBA Board of Directors.
- j Assumes a total of one meeting and one data request per quarter.
- k WEI recommends a contingency budget of \$10,000 to cover unanticipated work. The contingency will not be spent without prior approval from the San Juan Basin Authority



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