STATUS MEMORANDUM

785 Grand Ave, Suite 202, Carlsbad, California 92008
TEL: (760) 730-0701 FAX: (415) 457-1638 e-mail: stever@stetsonengineers.com

TO:	Indian Wells Valley TAC	DATE:	December 1, 2017
FROM:	Stetson Engineers Inc.	JOB NO:	2652-0004
RE:	Status of GeoDatabase Development to Support Indian Wells Valley GSP		

PROJECT OVERVIEW

The GeoDatabase project includes the development of a web-based geo-Database management system (DMS) consistent with the Department of Water Resources (DWR) requirements for a Groundwater Sustainability Plan (GSP). Generally, the DMS is used to store, access, and display data from the monitoring network. During future groundwater management activities, the DMS will be used to track sustainability goals and objectives for the Indian Wells Valley (IWV) groundwater basin as part of the GSP. Stetson Engineers has been tasked with developing the DMS and monitoring network that are fundamental to the success of the GSP.

Development of the DMS will occur under two phases based on available funding: Phase 1 - development of the DMS framework and structure; and Phase 2 - database population, implementation of equipment, and integration with GSP to assure its long-term success. Stetson Engineers was tasked to complete the first of these two phases under our approved existing 6-month budget, while the second phase will be implemented prior to the January 2020 deadline based on future funding availability. Phase 2 tasks were included in both the scope and budget in the Prop 1 grant application.

The purpose of this status memorandum is to describe the two phases, their relationship, and the progress that has been made through November 30, 2017. In addition, a schedule is provided to show how the second phase of the DMS development will integrate with other tasks required to complete the GSP.

PHASE 1 WORK PLAN

The Phase 1 work plan, which was previously approved by the TAC, includes the design, construction, and development of a SQL structured georeferenced database and library (DMS). In addition to development of the DMS, the project management task of Phase 1 includes presentation and consultation with the TAC to assure the DMS meets the goals and expectations of the community. Stetson Engineers has completed the development of the DMS and is seeking

consultation with the IWV TAC on December 6, 2017 to determine if all community goals are being met. The approved Phase 1 scope of work and budget are attached.

PHASE 2 WORK PLAN

The Phase 2 work plan, not yet authorized by the Board, includes: 1) establishing monitoring protocols; 2) populating the database with historical data; 3) installation of transducers and telemetry equipment; and, 4) integration with GSP goals and objectives. Although data from select wells have already been used to test the DMS functionality, data protocols will be developed prior to populating the remainder of the database. Following database population, the installation of telemetry equipment and integration of GSP goals and objectives in the DMS will assure sustainability goals in the future can be monitored and adaptively managed. Work has not yet commenced on any of the Phase 2 tasks.

UP-COMING TAC INVOLVEMENT IN DMS DEVELOPMENT

The TAC will need to be involved throughout the development of the DMS during both Phases 1 and 2. Specifically, the TAC will assess the functionality of the DMS and discuss the data that will be available to the various users. Secondly, the TAC will be asked to assess the extent of the data that will be stored in the DMS. Although Stetson Engineers is responsible for constructing a DMS that will meet or exceed the need for managing the basin through the GSP, the TAC may choose to recommend to the Board additional datasets be included in the DMS. Presently, the DMS is designed to include unlimited amounts of spatial and temporal data to meet the needs of the community. In summary, the TAC will consider the following questions regarding the final development of the DMS:

1) Who will have access to the DMS?

2) Will data be limited to different users?

3) What data will be stored on the DMS?

DMS USER ACCESS AND PRIVILEGES

The DMS has been developed with a security system that limits the data that can be accessed based on the user's login information. The DMS's security system may also limit the functionality of the system based on the user's login. For example, the TAC may choose to recommend that a specific type of user may only have access to data in a specific area; and that user can only view, but not download that data. Or, the TAC may choose to recommend unlimited access to all data, for all users, without restrictions to downloading or viewing the data. An example of tiered security system that

provides the user with different levels of data access and functionality is shown in Table 1. The table shows that the Administrator will have unlimited access to the DMS, while the public would have the least amount of access. Each user will have the privileges of the user below (lower security) them.

TABLE 1 – EXAMPLE OF DMS SECURITY STRUCTURE ALLOWING ACCESS TO DMS

User Level	Read/Write	Data Access	Description
Administrative	Unlimited	Unlimited	Administrator will have access to manage, upload, and edit all data.
Level 1/Purveyor	View/Limited Upload	Limited to Purveyor's Data and Reports	Level 1 user may upload their data and download location specific reports.
Level 2/Regulator	View Only	Limited to Regulator related data and reports	Level 2 user may only view data and download reports specific to them.
Public	View Only	GSP Data and Reports Only	Public user may only view GSP data and download GSP reports.

Note: Each user level has the rights of any user level lower than their own.
Only Administrator may edit data.

Although the number of user levels, with limited privileges, can range up to six different levels in the IWV DMS, the example shown in Table 1 recommends four levels of users. Stetson Engineers recommends the DMS not exceed the four user levels shown in Table 1, although the TAC will consider and make recommendations to the Board regarding the security structure, who will have access to the DMS and their privileges.

DATA STORED ON THE DMS

The TAC will discuss the amount and types of data that will be stored on the DMS. The minimum requirement is defined by DWR and includes only the amount of data required to implement the GSP and monitor the basin, specifically:

> *"Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin."* GSP, Section 352.6

The data required to implement the GSP and monitor the basin will be determined following analysis of the groundwater model, identification of gaps, and completion of other supporting studies. The data required to support the GSP is expected to include water-level monitoring wells, groundwater production wells, surface flow, climate, and water quality data. Although relevant to assessing the sustainable yield of the basin, older and/or redundant data are not required to be stored on the DMS. In addition to production, climatic, and water quality data, we believe that there will be between 30 and 40 groundwater level monitoring wells that will be required to manage the sustainability of the IWV groundwater basin.

Datasets not required to manage the groundwater sustainability in the IWV vary in character, but typically include wells with incomplete records, historical wells and data not currently monitored, wells that do not meet DMS monitoring protocols, and redundant wells. While the DMS is an excellent tool for storing historical, incomplete, and redundant data, the TAC should discuss which datasets will be stored on the DMS.

For example, a Level 1 water purveyor may choose to store all of its monitoring, pumping, and water quality data on the DMS in one comprehensive site. Based on the security protocol of the DMS, each purveyor would only be allowed access to their data. Inclusion of redundant data will not impact the DMS's ability to monitor basin sustainability, implement goals and objectives, or develop reports.

SCHEDULE

Stetson Engineers has completed the initial design and development of the DMS under Phase 1, including population of limited water level data. As shown in the attached schedule, the TAC will be asked to provide review and comment of the DMS during December 2017 and January 2018. Upon approval of Phase 2, the DMS will be expanded to include datasets and equipment required to implement the goals and the objectives of the GSP. During Phase 2, the TAC will discuss whether data not required to implement the GSP will be included in development of the DMS.

COST

Phase 1 costs are estimated to be approximately $48,600 and have been previously approved by the Board. Total costs incurred through November 30, 2017 have been approximately $40,000. Phase 2 costs, including transducer and telemetry installation, is estimated to be $308,500. No costs have been incurred on Phase 2 tasks.

SCHEDULE TO DESIGN, CONSTRUCT, AND IMPLEMENT DMS