

THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS  
BOARD ACTION SUMMARY

DEPT: Public Works

BOARD AGENDA:5.C.4  
AGENDA DATE: March 27, 2018

**SUBJECT:**

Approval of Amendment No. 2 to the E-PUR Professional Services Agreement to Prepare an Assessment of Historic Groundwater Supply and Monitoring Wells at and near Crows Landing Industrial Business Park

**BOARD ACTION AS FOLLOWS:**

**RESOLUTION NO. 2018-0142**

On motion of Supervisor Olsen Seconded by Supervisor Withrow  
and approved by the following vote,

Ayes: Supervisors: Olsen, Chiesa, Withrow, Monteith, and Chairman DeMartini

Noes: Supervisors: None


Excused or Absent: Supervisors: None

Abstaining: Supervisor: None

- 1)  Approved as recommended
- 2)  Denied
- 3)  Approved as amended
- 4)  Other:

**MOTION:**

ATTEST:

  
ELIZABETH A. KING, Clerk of the Board of Supervisors

File No.

**THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS  
AGENDA ITEM**

DEPT: Public Works

BOARD AGENDA:5.C.4  
AGENDA DATE: March 27, 2018

CONSENT:

CEO CONCURRENCE:

4/5 Vote Required: No

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**SUBJECT:**

Approval of Amendment No. 2 to the E-PUR Professional Services Agreement to Prepare an Assessment of Historic Groundwater Supply and Monitoring Wells at and near Crows Landing Industrial Business Park

**STAFF RECOMMENDATION:**

1. Approve amendment No. 2 to the E-PUR, LLC professional services agreement for the preparation and assessment of historic groundwater supply and monitoring wells at and near the Crows Landing Industrial Business Park, in the amount of \$30,650.
2. Authorize the Director of Public Works to execute the amendment with E-PUR, LLC in the amount of \$30,650, and to sign necessary documents.

**DISCUSSION:**

The former Crows Landing Naval Air Facility is located in the unincorporated portion of western Stanislaus County, approximately 1 mile east of Interstate 5. The 1,531 acre airfield is bound by Marshall Road to the north, Fink Road to the south, Bell Road to the east, and Davis Road to the west. A segment of the Delta Mendota Canal and Little Salado Creek cross the site. The site includes two decommissioned runways, associated pavement, and an air traffic control tower. Most of the structures that supported former military operations on the premises have been demolished.

In 2004, the Board of Supervisors accepted conveyance of the former Crows Landing Air Facility, and the National Aeronautics and Space Administration transferred ownership of 1,355 acres to the County. Of the remaining 176 acres associated with the former military facility, 6 parcels totaling 94.7 acres have undergone soil and groundwater remediation and were determined to be clean per industrial standards. Remediation of one 81.3-acre parcel is ongoing.

The primary goal associated with the County's acquisition of the Crows Landing project area has been to create an opportunity to produce a locally based job center that will allow County residents and those living nearby to earn sustainable wages without commuting to the Bay Area or other distant job centers. Specifically, the former Crows

Landing Air Facility is envisioned to be an industrial business park that combines the assets of a public use, general aviation airport, and proximity to Interstate 5.

The combination of available land, nearby transportation infrastructure, and regional connections to the San Francisco Bay Area presents an opportunity for investment and creativity that has the potential to provide a new and important regional employment center in central California.

On October 15, 2013, the Board of Supervisors approved an agreement for professional services with AECOM Technical Services, Inc. for land use, engineering, and environmental consultant services for the Crows Landing Development Project. The services included a review and analysis of needed infrastructure to ensure the viability of this business park and to meet the California Environmental Quality Act guidelines for required detailed analysis of potential water supply sources, as well as sewer and storm water.

On September 20, 2016, the Board of Supervisors approved the contract for professional services for the development of two water exploratory boreholes (test wells) to E-PUR, LLC for the Crows Landing Industrial Business Park (CLIBP) development. The purpose of the test well (TW) program, performed in early 2017, was to gain knowledge of the underlying groundwater system primarily below the Corcoran Clay. Test wells were drilled and water samples were taken from below the Corcoran Clay to determine quality and quantity of groundwater supplies in this area. The work completed included construction of two test wells that would allow evaluation of the suitability of the proposed site for the installation of future drinking water supply wells based on the results of the geophysical exploration and water quality sampling of the test hole.

To complete this work, four change orders were executed. Three change orders were completed under the 10% contingency of the original contract. The fourth change order exceeded the 10% contingency and was approved by the Board of Supervisors on May 2, 2017.

The geology found in the test wells concluded that there is a large water production zone immediately above the Corcoran Clay and below at the northern exploration location (TW-2). Depth to water was roughly 82 feet below ground surface (bgs) in the north and the Corcoran Clay begins at 260 feet bgs. At the southern location (TW-1) there was little water above the Corcoran Clay and below.

Water quality sample results demonstrated that groundwater quality in the southern location (TW-1) is generally poor. Groundwater quality in well TW-2 exceeds the short term limit for sulfate and would require either blending with another source lower in sulfate or treatment in order to meet all current codes and regulations.

Water production was very good at each of the three depth zones tested in location TW-2 and is estimated to be capable of producing 2,000 gallons per minute (gpm)/well with acceptable drawdown. The desirable operating range for each well completed in that zone is then likely to be 50% of that rate or 1,000 gpm/well as potential production. Two wells are capable of producing the stated potable supply need of 1,000 to 1,500 gpm for all 3 phases of CLIBP development.

An assessment of historic wells is a key element to developing a program for water supply protection for the CLIBP. Other elements to a water supply protection program include measuring and mapping saturated thicknesses of groundwater zones, measuring seasonal and annualized trends in groundwater levels, and measuring and mapping key water quality constituents.

The goals for this historic well-assessment project include:

- Documenting the locations and construction of historic wells at the CLIBP and within the lateral boundaries of a Study Area;
- Creating an inventory of existing production wells and monitoring wells to be used in subsequent studies and actions;
- Documenting historic wells that have been properly abandoned;
- Identifying wells that cross connect the two production zones and whether they still exist;
- Assessing the hydrogeology of shallow unconfined aquifer zones for water supply and re-assessing the hydrogeology of the confined aquifer zones for both water availability and water quality; and
- Developing a plan of actions to be taken during water supply development by phase of build out.

The information developed from this program will help with many aspects of the CLIBP water supply. It will aid in developing a monitoring program for protection of the water supply from both quality and quantity concerns. It will provide information on the historic groundwater wellheads that will likely be encountered during site development and it will provide a basis for project design plans to preserve and/or replace useful wells that exist.

This concept is a five task process:

- Task 1 – Catalogue Existing Wells at and around the Crows Landing Flight Airfield: This effort will produce a series of well location figures in a Geographic Information System (GIS) with corresponding data attributes. Figures will be prepared in draft and then updated following a first project meeting.
- Task 2 – Field Survey of Wells: Meeting documentation, photo documentation of well sites, field notes.

- Task 3 – Prepare Well Database and Compile Data: A web-hosted SQL Database of wells in and around the CLIBP for well construction data and chronologic water level measurements from the data sources listed for Task 1.
- Task 4 – Data Analysis: Figures (2 or 3) illustrating hydrogeology in section, (2) plan view figures of groundwater elevations and shallow zone aquifer thickness above the Corcoran Clay in the range of 2015 to 2017, and time-series graphs of groundwater levels for select wells.
- Task 5 – Prepare Technical Memorandum: A draft TM for review and comment from Stanislaus County, a project/TM review meeting, and a final TM incorporating comments.

E-PUR can perform these services under an Amendment to the contract between Stanislaus County and E-PUR for professional services. E-PUR's estimated fees and costs inclusive of subcontracted activities are \$30,650.

The full project is anticipated to take approximately 16 weeks to complete. Development of this information will synchronize well to the Feasibility Study of water supply alternatives for the CLIBP.

**POLICY ISSUE:**

The Board of Supervisors' must approve any amendments to existing professional services agreements.

**FISCAL IMPACT:**

The proposed amendment consists of five steps. Step 1 is to Catalog Existing wells in and around the Crows Landing Flight Facility Airfield and will cost \$6,250. Step 2 is the Field Survey of Wells and Preparations and will cost \$8,300. Step 3 is to Prepare Well Database and Compile Data and will cost \$5,000. Step 4 is the Data Analysis and will cost \$5,600. Step 5 is to Prepare TM of Findings and Action Plan and will cost \$5,500. It is recommended that all five steps be implemented for a total cost of \$30,650.

Funding for this project is available in the Fiscal Year 2017-2018 Crows Landing Air Facility Adopted Final Budget. An existing agricultural lease provides a revenue source to fund studies necessary for the Crows Landing Air Facility development project.

**BOARD OF SUPERVISORS' PRIORITY:**

The recommended actions are consistent with the Boards' priority of *Delivering Efficient Public Services and Community Infrastructure* by developing a reliable and sustainable water supply for the Crows Landing Industrial Business Park.

**STAFFING IMPACT:**

Existing Public Works staff is overseeing this project.

**CONTACT PERSON:**

Matt Machado, Public Works Director  
Keith Boggs, Assistant Executive Officer

Telephone: (209) 525-4153  
Telephone: (209) 652-1514

**ATTACHMENT(S):**

1. E-PUR, LLC Contract Amendment #2

**STANISLAUS COUNTY**  
Second Amendment to Professional Design Services Agreement  
between County of Stanislaus and E-PUR, LLC

Crows Landing Industrial Business Park

This Second Amendment is made and entered into this 27th day of March, 2018, in the City of Modesto, State of California, by and between the County of Stanislaus ("County") and E-PUR, LLC of Stockton, California ("Consultant"), for and in consideration of the promises, and the mutual promises, covenants, terms, and conditions, hereinafter contained.

WHEREAS, on September 20, 2016, the Stanislaus County Board of Supervisors awarded a Professional Design Services Agreement ("Agreement") to Consultant for the Crows Landing Industrial Business Park Project in the amount of \$312,879;

WHEREAS, on September 20, 2016, the Stanislaus County Board of Supervisors authorized the Director of Public Works to execute the agreement with the Consultant and to sign necessary documents, including any amendments to the Agreement not to exceed 10%;

WHEREAS, Section 3.3 of the Agreement states that additional services must be approved in writing by the County;

WHEREAS, the Director of Public Works has exercised his authority to make change orders totaling \$31,287.50;

WHEREAS, on May 2, 2017 the Stanislaus County Board of Supervisors approved an additional change order for \$30,852;

WHEREAS, on September 19, 2017, the Stanislaus County Board of Supervisors authorized the Director of Public Works to execute Amendment No. 1 in the amount for \$173,750;

WHEREAS, the Director of Public Works has determined that additional services are necessary for Consultant to complete the project;

WHEREAS, an increase of Thirty Thousand Six Hundred Fifty Dollars (\$30,650) to the Agreement is necessary to cover the additional services;

|                    |                  |
|--------------------|------------------|
| \$548,768.50       | Agreement        |
| <u>+ 30,650.00</u> | Second Amendment |
| \$579,418.50       | Total            |

WHEREAS, Consultant has continued to diligently perform the services requested to support this project in good faith; and,

NOW THEREFORE, the parties agree as follows:


1. Section 1.1 - Scope of Services is amended to include additional services as shown in "Exhibit 1-A" attached hereto and made a part of this Amendment.
2. Section 3.1 - Compensation is amended to include additional fees of Thirty Thousand Six Hundred Fifty Dollars (\$30,650) as shown in "Exhibit 1-A" attached hereto and made a part of this Amendment. Consultant's compensation shall in no case exceed Five Hundred Seventy-Nine Thousand Four Hundred Eighteen and 50/100 Dollars (\$579,418.50).
3. All other terms and conditions of the Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Second Amendment effective on the date written above.


COUNTY OF STANISLAUS

E-PUR, LLC

By: \_\_\_\_\_

  
Matt Machado, Director  
Department of Public Works

By: \_\_\_\_\_

  
John M. Lambie, PE, PG, CEG  
Principal Hydrogeologist

APPROVED AS TO FORM  
John P. Doering, County Counsel

By: \_\_\_\_\_

  
Amanda DeHart  
Deputy County Counsel





March 8, 2018

Mr. Matt Machado, P.E., L.S.  
Director, Stanislaus County Department of Public Works  
1716 Morgan Road  
Modesto, CA 95358

**SUBJECT: PROPOSED AMENDMENT NO. 2 TO STANISLAUS COUNTY CONTRACT 2016-479 TO PREPARE AN ASSESSMENT OF HISTORIC GROUNDWATER SUPPLY AND MONITORING WELLS AT AND NEAR CROWS LANDING INDUSTRIAL BUSINESS PARK**

Dear Matt:

The following proposal describes a program for assessing the lateral and vertical locations of historic water wells. This program is intended to address existing water supply wells and existing monitoring wells. Its goal is to protect a water supply system for the CLIBP and design it as a resilient system against issues such as water quality and drought along with other potential disruptors.

#### **BACKGROUND**

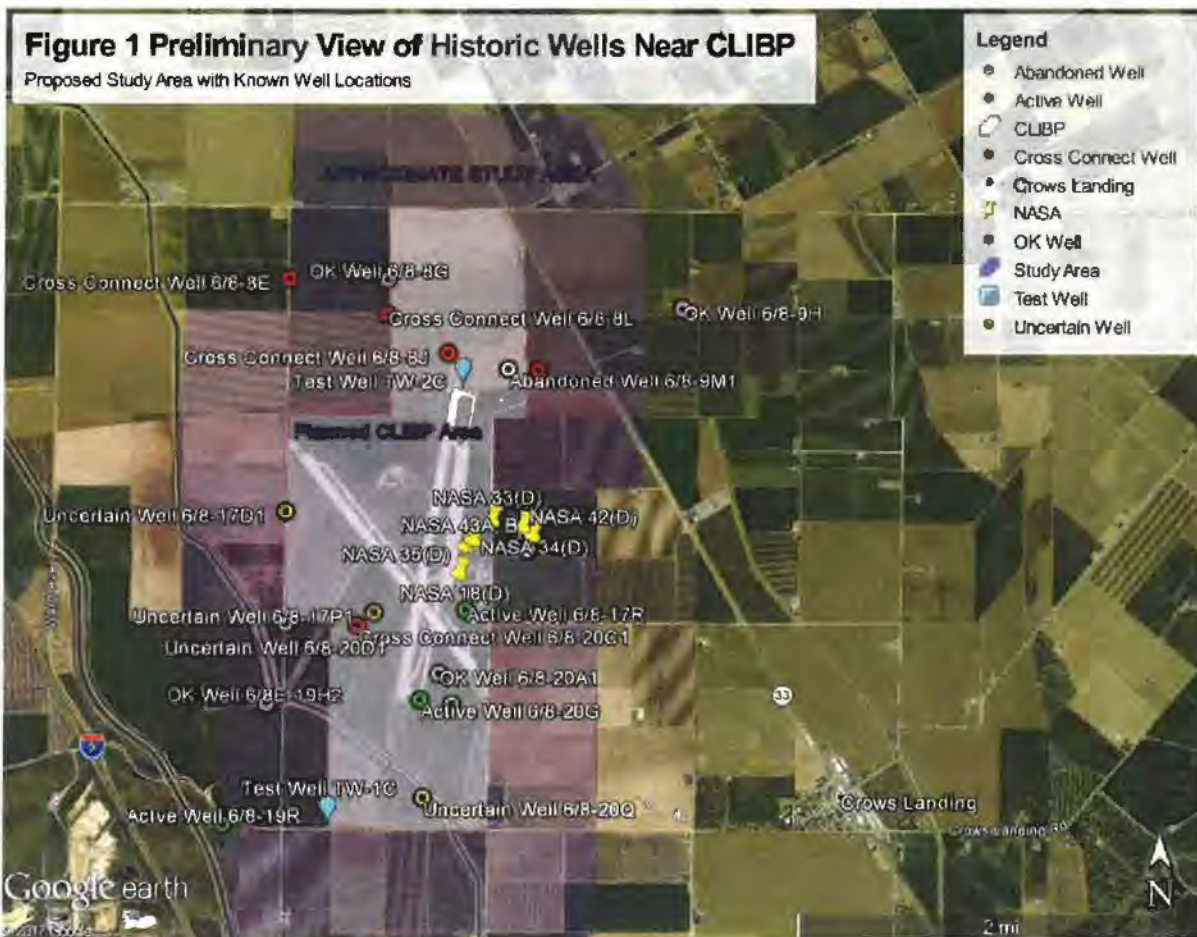
The water supplies for the Crows Landing Industrial Business Park (CLIBP) are vital to the project's very existence. They will need to come from a reliable groundwater supply that is sourced locally at the site; E-PUR and Stanislaus County have learned together that there is no capacity from nearby groundwater systems based on work to date. There is no likely reliable drought-resilient surface-water supply according to AECOM's work.

Fortunately E-PUR's work to date indicates that a reliable drought-resilient potable groundwater-supply may be achievable on and near the CLIBP site itself. This could be done utilizing a groundwater production zone located just above the regional Corcoran Clay which is low in total dissolved solids and sulfate and by utilizing a groundwater production zone just below that same regional aquitard which is higher in sulfate; thus a blending of water from the two zones is likely to produce good quality water. Water quality is one of the primary considerations for each groundwater supply scenario for the CLIBP under consideration (along with legal considerations of developing a new potable supply permit under Senate Bill 1263 as it pushes merging new with existing systems). A dialogue with the Crows Landing Community Services District (CSD) is progressing in a very positive direction but they do not have capacity as mentioned above, and they have chromate concentrations that will benefit from blending with water from the CLIBP. So again a quality and quantity of water reliable supply from groundwater at the CLIBP may produce the highest-quality and most cost-effective water supply for both CLIBP and Crows Landing CSD. There is a feasibility study in progress with a project team led by E-PUR but with strong support from Provost & Pritchard Consulting Group. That feasibility study will benefit from information to be collected under the historic well assessment proposed herein.



The water quality risk to a CLIBP groundwater supply is primarily from elevated nitrate concentrations in shallow groundwater from agricultural fertilizer application. Designing a resilient water supply system for nitrate and other water quality constituents of concern in shallow groundwater requires both a good understanding of where shallow groundwater is connected to deeper groundwater below the Corcoran Clay and the ability to mitigate and/or control this intermingling of groundwater.

E-PUR has found that there are a relatively large number of historic water supply wells at and near CLIBP. Figure 1 demonstrates E-PUR's preliminary catalogue and locations of the known wells within ½ mile of the CLIBP boundary, the proposed Study Area. Some of these wells are screened only above the Corcoran Clay; some are screened only below it, and some are screened above and below the Corcoran Clay creating a short circuit between these two hydraulically-distinct production zones. All of these wells may be useful in further developing concepts for the CLIBP's water supply system especially to enable controlled blending of water quality but also to assess water availability in the shallow zone in the area of planned extraction and to address drought periods of five years or more.





The Sustainable Groundwater Management Act of 2014 (the SGMA) is slowly coming into full effect over in the area of the CLIBP. This should be a benefit to gaining information on groundwater conditions at and around the CLIBP and may help with well access for existing off-site wells. The CLIBP and surrounding area are in the Delta Mendota Groundwater Subbasin under the Department of Water Resources (DWR) designations. There are a myriad of Groundwater Sustainability Agencies (GSAs) in the Delta Mendota who will be developing Groundwater Sustainability Plans (GSPs) by January 31, 2020. These GSPs are required for compliance with the SGMA. Of some utility is that prior to that date and those GSPs being put into effect, the GSAs will also be developing groundwater monitoring networks and other measurement requirements they see as necessary for compliance under the SGMA. Helpfully Mr. Walt Ward of Stanislaus County Department of Environmental Resources Groundwater Division (SCDER Groundwater) is overseeing much of the activity by GSAs in the Northern Delta Mendota. However the CLIBP resides within a GSA, DM-II, managed by Del Puerto Water District; coordination with DM-II will be required to support a data collection program of value to the CLIBP's groundwater reliability assessment. Stanislaus County is a member of the Northwestern Delta Mendota GSA which adjoins much of the DM-II. Stanislaus County may be in a position to influence the development of a monitoring program that aids the CLIBP.

Groundwater above the Corcoran Clay in the area of the CLIBP is at some risk of desaturation from agricultural extractions and from water quality degradation. This needs to be assessed and monitored for seasonal supply risks by measuring water levels in existing wells above the Corcoran exclusively and below the Corcoran exclusively. This seasonal data coupled with analysis of agricultural water demand vs. supply taken from the Water Budget for the Delta Mendota Subbasin and this DM-II area can ultimately aid in an overall assessment of water supply resiliency for the CLIBP. SCDER Groundwater prepared a hydrogeologic assessment report of potential groundwater resource impacts to comply with the County Well Ordinance<sup>1</sup>; that study demonstrated a sustainable water balance for the CLIBP is likely.

### PROPOSED SCOPE OF WORK

An assessment of historic wells is a key element to developing a program for water supply protection for the CLIBP. Other elements to a water supply protection program include measuring and mapping saturated thicknesses of groundwater zones, measuring seasonal and annualized trends in groundwater levels, and measuring and mapping key water quality constituents.

The goals for this historic well-assessment project include:

- Documenting the locations and construction of historic wells at the CLIBP and within the lateral boundaries of a Study Area
- Creating an inventory of existing production wells and monitoring wells to be used in subsequent studies and actions
- Documenting historic wells that have been properly abandoned,

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<sup>1</sup> Jacobsen Jones & Associates, 2016, "Groundwater Resources Impact Assessment, Crows Landing Industrial Park, Stanislaus County, California", Draft August 19



- Identifying wells that cross connect the two production zones and whether they still exist,
- Assessing the hydrogeology of shallow unconfined aquifer zones for water supply and re-assessing the hydrogeology of the confined aquifer zones for both water availability and water quality;
- Developing a plan of actions to be taken during water supply development by phase of build out.

The information developed from this program will help with many aspects of the CLIBP water supply. It will aid in developing a monitoring program for protection of the water supply from both quality and quantity concerns. It will provide information on the historic groundwater wellheads that will likely be encountered during site development and it will provide a basis for project design plans to preserve and/or replace useful wells that exist.

#### **TASK 1 CATALOGUE EXISTING WELLS AT AND AROUND THE CROWS LANDING FLIGHT FACILITY AIRFIELD**

E-PUR will create a comprehensive list and maps of historic wells in the Study Area. The well completion reports from DWR that E-PUR obtained in our Phase 1 work for water supply development will be used as a primary data source for a well inventory at and around the CLIBP within the approximately ½ mile buffer of the Study Area. Additional data sources to be reviewed for a well inventory include:

- the local well inventory developed by Walt Ward in the Stanislaus County Department of Environmental Resources (SCDER);
- the Crows Landing Airfield well evaluation report from 2004 created by SCDER;
- the hydrogeologic assessment report of potential water resource impacts developed for SCDER<sup>2</sup>;
- the California Water Data Library; and ,
- the USGS National Water Information System (NWIS) data library for groundwater.

E-PUR already has each of these sources and in some cases has the data associated with them. Each will be reviewed and the useful information incorporated to a database in Task 3. Data on each well's static attributes will be inventoried during the mapping and cataloguing in this Task 1 for step wise assemblage of an existing well database. The depth of well and well screen depths will be incorporated to the data attributes for each well. In addition well status as to its history and current condition will be annotated to the data.

Draft areal figures will be prepared and then reviewed with Stanislaus County prior to field work in Task 2 to field inventory unknown well conditions.

**Deliverables:** This effort will produce a series of well location figures in a Geographic Information System (GIS) with corresponding data attributes. Figures will be prepared in draft and then updated following a first project meeting.

**Schedule:** Work is estimated to take 1 week for the preliminary mapping. An additional 2 weeks will be required to meet and confer with County personnel on well information ahead of any field survey work.

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<sup>2</sup> JJA, 2016



## TASK 2 FIELD SURVEY OF WELLS

After the number and location of wells with uncertain construction is developed in Task 1 then a field survey will be conducted by E-PUR staff to attempt to locate these subject wells as well as to gather well information for known wells, principally water levels. The field survey would include photo documenting well locations explored and found wells. In the case of found wells we will collect field data from the wells such as diameter, depth to water and open well depth. Two full days in the field are budgeted, if needed, to provide time for reconnaissance and data collection water system facilities). Field data collected will be compiled to a database containing an inventory of known information regarding the wells.

Site access for on and off-site well reconnaissance will require support from Stanislaus County. CLIBP on-site wells owned by the Navy Facilities Air Command (NAVFAC) can readily be accessed with a written request by E-PUR; the same is thought to be true of the irrigation wells on-site with support from the County regarding the request. For off-site wells access is likely to be a bit more complicated. Access information will be derived from a Google Earth reconnaissance and a review of property ownership from the Stanislaus County GIS of Tax Lots. E-PUR staff will contact GSA leadership from DM-II to review findings of potential wells and to meet over current and prospective groundwater monitoring programs with support from SCDER Groundwater. Groundwater well access to known or suspected historic wells will be requested of the property owners after dialogue with the DM-II GSA about their existing and evolving monitoring programs. Emphasis is likely to be on the key issue of well cross-connection above and below the Corcoran Clay in regard to water quality concerns. The initial request will be to access the property to develop photo documentation, and if a well is located then to tag well depth, and measure resting water level. No water quality sampling is envisioned and none is planned for an access request.

**Deliverables:** Meeting documentation, photo documentation of well sites, field notes.

**Schedule:** Work is estimated to take 4 weeks.

## TASK 3 – PREPARE WELL DATABASE AND COMPILE DATA

A database for the wells of interest in the Study Area will be assembled to hold both chronologic and stationary data using structured query language tools such as Microsoft Access.



Proposal for a Historic Well Assessment  
and Action Plan, CLIBP Water Supply  
Stanislaus County Public Works



Figure 2 - Screen Capture of Water Data Library Wells with Chronologic Data (E-PUR has this database)

The name, location, and other static attributes of wells within the Study Area will be assembled to the stationary or static portion of the database. This portion of the database will include well characteristics that are not expected to change over time such as land surface elevation, well depth, screen intervals, well type (e.g. irrigation well), pump capacity, well diameter, and other meaningful characteristics. The database will develop unique State Well IDs for each well along with local reference names. The data to be catalogued include lateral locations for each well in Latitude and Longitude in decimal degrees, consistent with California data collection and reporting standards. Another key attribute to be catalogued is the depth to the top and the depth to the bottom of the Corcoran Clay. This can be used subsequently to assess the saturated thickness of the aquifer zones above the Corcoran Clay over time.

A chronologic database will be assembled of known depth to water measurements. This data exists within a variety of sources listed in Task 1. No water quality data compilation is intended at this time. The focus will be on depth to water, calculated groundwater elevation head, and estimates of saturated thickness for unconfined zones.

**Deliverables:** A web-hosted SQL Database of wells in and around the CLIBP for well construction data a chronologic water level measurements from the data sources listed for Task 1.

**Schedule:** Work is estimated to take 3 weeks from completion of the Field Survey.

#### TASK 4 – DATA ANALYSIS

To better understand the hydrogeology for the CLIBP's water supply and to properly assess the type of and degree of risks from historic wells to that water supply, a number of technical analyses will be performed on the data.

Two to three cross sections of the geology and hydrogeology within the Study Area will be made to reflect the depth of the Corcoran Clay, the saturated thickness above it, and the nitrate water quality. E-PUR's existing hydrogeologic cross-section of the geology in the subsurface beneath the CLIBP from Phase 1 will be increased in scale to address more local features in the Study Area and will be updated to include both groundwater elevations from 2017 and nitrate concentrations. A second hydrogeologic cross-section traversing the north of the airfield and CLIBP area with a parallel orientation will be developed to pass thru the area of likely wellfield development. If needed a third cross-section will be developed roughly



perpendicular to these to illustrate the changes in saturated thickness from south to north, tie the two parallel sections together, and display additional data that may lie between the two sections.

The groundwater elevations from shallow wells above the Corcoran Clay will be evaluated. If sufficient data exist to generate one or more areal maps from 2015 to present then they will be made. These will depict iso-contours of hydraulic heads and a graphical depiction of probable groundwater flow direction(s) and magnitude. Earlier assessments (JJ&A 2016) of groundwater elevations focused on the confined aquifer beneath the Corcoran Clay from 2011 to 2016. Those maps below the Corcoran Clay may be sufficient but will be analyzed in light of new data locations installed in 2017 and data collected from those and other wells in 2017. If the data support generation of an updated map of the confined aquifer(s) in 2017 or 2018, then one will be made. The concentrations of nitrate in shallow and deep wells will be analyzed on the cross-sections. An analysis of the spatial distribution of nitrated in relation to agricultural operations and in relation to planned water supply well locations will be done.

**Deliverables:** Figures (2 or 3) illustrating hydrogeology in section, (2) plan view figures of groundwater elevations and shallow zone aquifer thickness above the Corcoran Clay in the range of 2015 to 2017, and time-series graphs of groundwater levels for select wells

**Schedule:** Work is estimated to take 5 weeks from completion of the Field Survey in Task 2.

#### **TASK 5 – PREPARE TECHNICAL MEMORANDUM**

A technical memorandum will be prepared to document the findings, the analysis, and an Action Plan for historic wells at and around the wellfield in relation to the water supply and the development.

From the cross sections and areal maps of groundwater elevations an evaluation will be prepared of the potential risks from historic wells.

Recommendations will be developed for a monitoring network and program for water supply protection and resilience. This review will incorporate considerations from the project Environmental Impact Report in regard to groundwater prospective impacts.

Development of this information and a TM will provide further support for the Feasibility Study of water supply alternatives for the CLIBP.

**Deliverables:** A draft TM for review and comment from Stanislaus County, a project/TM review meeting, and a final TM incorporating comments.

**Schedule:** Work on the TM is estimated to take 4 weeks from completion of Task 4.

#### **SCHEDULE OF COST AND FEES**

E-PUR can perform these services under an Amendment to the contract between Stanislaus County and E-PUR for professional services, Stanislaus County Contract 2016-479. The work would be performed and invoice monthly on a time and materials basis in accordance with our Standard Fee Schedule in effect for this Stanislaus County Contract 2016-479. E-PUR's estimated fees and costs inclusive of subcontracted activities are approximately \$30,650 as shown in the following table.



Proposal for a Historic Well Assessment  
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Stanislaus County Public Works

| <b>PROPOSED FEE BY TASK</b>   |                        |                            |                                   |                              |
|---|------------------------|----------------------------|-----------------------------------|------------------------------|
| <b>Tasks</b>  | <i>E-PUR<br/>Labor</i> | <i>Direct<br/>Expenses</i> | <i>Subcontracted<br/>Expenses</i> | <i>Subtotals by<br/>Task</i> |
| 1 - Catalogue Existing wells in and around the Crows Landing Flight Facility Airfield | \$6,200                | \$50                       | \$0                               | \$6,250                      |
| 2 - Field Survey of Wells and Preparations  | \$6,500                | \$500                      | \$1,300                           | \$8,300                      |
| 3 - Prepare Well Database and Compile Data  | \$2,500                | \$0                        | \$2,500                           | \$5,000                      |
| 4 -Data Analysis  | \$5,600                | \$0                        | \$0                               | \$5,600                      |
| 5 -Prepare TM of Findings and Action Plan   | \$5,340                | \$60                       | \$100                             | \$5,500                      |
| <b>TOTAL ESTIMATED FEE</b>  | <b>\$26,140</b>        | <b>\$610</b>               | <b>\$3,900</b>                    | <b>\$30,650</b>              |

Fees will be invoiced monthly as they are accrued. Reimbursable expenses will be invoiced in addition to professional fees and are included in the estimate above. If it appears we will need to exceed the estimate above, we will notify you in writing before we do so, and will provide a revised estimate. We will not continue work beyond the initial budget without additional authorization.

### PROJECT SCHEDULE

The full project is anticipated to take approximately 16 weeks to complete. Development of this information will synchronize well to the Feasibility Study of water supply alternatives for the CLIBP if initiated in the spring of 2018.

### ASSUMPTIONS

Groundwater elevation data will be made available from Stanislaus County's existing database.

Site access for on and off-site well reconnaissance will require support from Stanislaus County.

Groundwater quality information will be compiled only for nitrate for groundwater wells along cross-sections and areal mapping will not be developed (unless authorized separately)

### CLOSING

E-PUR can efficiently provide Stanislaus County an important hydrogeologic evaluation of historic wells that may affect the CLIBP water supply while at the same time developing crucial information for the water supply development in progress via inter-agency coordination and water-supply engineering evaluations.



March 8, 2018



Proposal for a Historic Well Assessment  
and Action Plan, CLIBP Water Supply  
Stanislaus County Public Works

E-PUR will continue to demonstrate for Stanislaus County Public Works the enthusiasm and the rigor with which we perform projects. If there are questions or comments regarding the proposed scope of work and fees for this integral project to meeting the water supply needs of the CLIBP development please reach out to us.

Sincerely,

E-PUR, LLC

A handwritten signature in black ink that reads 'John M. Lambie'. The signature is fluid and cursive.

John M. Lambie, PE, PG, CEG  
Principal Hydrogeologist

cc: Walt Ward, SCDER Groundwater  
Jon Turner, E-PUR  
Mike Milczarek, Geosystems Analysis