Ivins City Staff Report
City Council Meeting 4/6/17

Agenda Item: Approval of expenditure for SCADA Improvements

Submitted by: Thomas Jorgensen, P.E., Assistant Public Works Director

Recommended City Council Action:
Approve expenditure of $49,417 for SCADA improvements plus an additional $5,000 for contingency for a total of $54,417.

BACKGROUND:
Staff has been working with SCI Automation for a comprehensive SCADA (supervisory control and data acquisition) plan for the City. SCADA systems allow staff to: control autonomously various public works facilities; monitor, gather, and process data associated with those facilities, and remotely interact with those facilities to control their operations. The facilities that staff is recommending SCADA improvements on include water tanks, water pump stations, and sewer lift stations. The SCADA system is crucial for our crews to maintain efficiency and to maintain the level of service at our public facilities. SCADA systems are mostly comprised of three different components: programmable controllers; communication devices; and measurement instruments. The communication devices can be transmitter radios, fiber connections, internet connections, etc. Measurement instruments can be things like flow meters, pressure transmitters, control valves, door sensors, depth sensors, etc. These components work together to form a SCADA system.

Staff has been working with SCI Automation on estimates for the SCADA improvements that staff is recommending. The first estimate is for SCADA improvements at the new Cliff Rose 2 MG tank. The scope of work associated with that estimate is to provide, install, and integrate the following components: software, RTU unit, flow meters, pressure transmitters, tank level transmitters, control valves, intrusions switches, and communication radios. See the attached scope of work for more details.

The second estimate is to integrate the SCADA system city wide and make necessary improvements at the following individual sites: Public Works Building, City Offices, Fitness Way Sewer Lift Station, 400 West Pump Station, Taviak Pump Station, and Taviak Tank. See the attached scope of work for more details.

FINDINGS AND ANALYSIS:
The estimates from SCI Automation are shown below.

Cliff Rose 2MG Tank SCADA (estimate 1)	$26,294
Ivins City SCADA Work and Communications (estimate 2)	$23,123
TOTAL	**$49,417**

Staff is recommending working with SCI Automation because we have had difficulty with other providers of this service. SCI has been the most responsive provider and has excellent expertise in SCADA equipment and SCADA integration. SCI was the low bidder for the work that needed

to be done on the Tuacahn Pump Station. Staff feels it's important to maintain consistency when it comes to SCADA system and maintenance. This consistency creates a familiarity on their part to help us maintain our system and provide necessary updates as they're required. Staff recommends awarding the contract to SCI Automation.

SUPPORT MATERIALS:

- SCI Automation Estimate 1 – Cliff Rose 2MG Tank SCADA
- SCI Automation Estimate 2 – Ivins City SCADA Work and Communications

FINANCIAL IMPACT:

Cliff Rose 2MG Tank SCADA
The following expense has been budgeted and is impact fee eligible.
GL 51-42-877: $26,294

Ivins City SCADA Work and Communications
The following expense has been budgeted.
GL 51-42-843: $28,123 this includes a contingency of $5,000.

For a total of: $54,417

Respectfully Submitted:

Thomas Jorgensen, P.E., Assistant Public Works Director

Content Review:

Dale Coulam, City Manager

SCI Automation

Ivins City, Utah

Cliff Rose 2MG Tank Project

J.W.
3-22-2017

Statement of Work

Date	3-22-2017
Client	Ivins City, Utah
Job Name	Cliff Rose 2MG Tank Project
Requested by	Tom J.
From	SCI Automation – Jared Whitmer

Summary

Install instrumentation, radios and develop program to monitor and operate tank valves.

Project Scope

The work provided by SCI Automation (hereinafter called the **CONTRACTOR**) shall include full and complete execution of the items listed below, and as described further through any/all appendices or amendments. Work involved under the terms of contract with Ivins City, Utah (hereinafter called the **COMPANY**) shall include:

I. **CONTRACTOR PROVIDED:**

A. *SCADA SYSTEM:*

1. Software development to graphically/digitally represent the Cliff Rose 2MG tank site.
    a) Flow and pressure monitoring.
    b) Tank Level monitoring.
    c) Valve management.
    d) Intrusion alarming.
    e) Create alarming notifications and alarm management.

B. *CLIFF ROSE 2MG TANK AND VAULT:*

1. RTU Cabinet:
    a) One (1) rugged and weather resistant enclosure.
    b) Power and I/O marshalling terminal blocks.
    c) One (1) Scadapack 334 PLC.
    d) One (1) Ethernet radio.
    e) One (1) unmanaged Ethernet switch.
    f) One (1) 120 VAC to 24VDC control power transformer.
    g) Two (2) 110 amp hour back up batteries.
    h) Labor to construct enclosure, install hardware, develop software and commission into the SCADA system.
2. Interface two (2) flow meters (provided by others).
3. Provide and install eight (8) pressure transmitters.
4. Provide and install two (2) submersible tank level transmitters.
5. Provide and install eight (8) solenoids for valve control.
6. Provide and install three intrusion switches for the tanks and vault.

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C. *COMMUNICATION:*

1. Install one (1) radio on the tank at the Cliff Rose site. Install one (1) radio at the Public Works building.

Pricing

All costs listed below are based on the scope and appendices included in this Statement of Work.

Item	Price	Cost Structure
Hardware and Material	$16,558.00	Fixed fee basis
Labor	*$9,736.00*	Fixed fee basis
Grand Total	**$26,294.00**	Fixed fee basis

Acceptance

The client named below verifies that the terms of this Statement of Work is acceptable. The parties hereto are each acting with proper authority by their respective companies.

Company name	Company name
Full name	Full name
Title	Title
Signature	Signature
Date	Date

Statement of Work

SCI Automation, INC.

650 W Highway 40
Roosevelt, UT 84066

Revision 1

SCOPE OF WORK – SCADA WORK & COMMUNICATION

Date	Services Performed By:	Services Performed For:
March 15, 2017	SCI Automation, INC. 650 W Highway 40 Roosevelt, UT 84066 Revision 1	City of Ivins 55 North Main Ivins, UT 84738

This Statement of Work (SOW) is issued between City of Ivins ("Client") and SCI Automation, INC. ("Contractor"), effective March 15, 2017 (the "Agreement"). This SOW is subject to the terms and conditions contained in the Agreement between the parties and is made a part thereof. Any term not otherwise defined herein shall have the meaning specified in the Agreement. In the event of any conflict or inconsistency between the terms of this SOW and the terms of this Agreement, the terms of this SOW shall govern and prevail.

This SOW # 031517IV (hereinafter called the "SOW"), effective as of March 15, 2017, is entered into by and between Contractor and Client, and is subject to the terms and conditions specified below. The Exhibit(s) to this SOW, if any, shall be deemed to be a part hereof. In the event of any inconsistencies between the terms of the body of this SOW and the terms of the Exhibit(s) hereto, the terms of the body of this SOW shall prevail.

Period of Performance

The Services shall commence on March 20, 2017, and shall continue through July 31, 2017.

Engagement Resources

Steve Secrest, Owner SCI Automation. Phone (435) 725-2600 Cell (801) 554-4742 steve@sciautomation.net

Jared Whitmer, Automation Eng. Phone (435) 725-2600 Cell (435) 565-0148 jwhitmer@sciautomation.net

Steve Gingell, MCSE, Network Eng. Phone (435) 725-2600 Cell (435) 300-0194 sgingell@sciautomation.net

Chris Bigelow, Automation Engineer Phone (435) 725-2600 Cell (435) 300-0193 cbigelow@sciautomation.net

Tige Murray, Automation Technician Phone (435) 725-2600 Cell (435) 300-0195 tmurray@sciautomation.net

Jeramy Jeppsen, Automation Technician Phone (435) 725-2600 Cell (325)650-3188
jjeppsen@sciautomation.net

Additional Network/Automation Technicians as needed.

Scope of Work

Contractor shall provide the Services and Deliverable(s) as follows:

- Install/Configure Radio/Communication infrastructure to SCADA locations.
- Establish Direct Link between City Office and Public Works Office for network extension.
- Install/Setup New ClearSCADA Server and Upgrade ClearSCADA software
- Installation of ViewX on Chuck's workstation and establish connection to ClearSCADA server.
- Replacement of GE Controller at Taviak pump station with Scadapack.
- Automation of Lift Station
- ClearSCADA Support update/verification
- Point to Point Radio connection between the Taviak Pump station and Taviak Tank.

SOW NOTES:

- It is the intention of the Contractor to perform the SOW in a way that will maintain the uptime of the current communication network to the best of our abilities to do so. The Contractor and the Client both acknowledge the potential for unknown factors that could, as they are discovered, affect the direction of the work and plans. It is the policy of the Contractor to schedule meetings with the Client, at consistent intervals, to update Client on progress of each project and make specific plans and timing that may affect the Client's ability to communicate with any equipment.
- The Contractor also commits to perform pre-rollout tests when possible on any firmware or equipment upgrades to limit the inherent risks of applying firmware or software updates.

Deliverable Materials

- Cambium ePMP 2000 AP radios
- Cambium Force 200 Radios
- IBM Server – Windows 2012 Standard Server, 5Cals, Redundant Harddrives
- ViewX Client License for viewing ClearSCADA on PC
- Outdoor rated Cat5e cable

- Materials for termination of Cat5 Cable
- Mounting material for mounting of AP and Subscriber radios

There are no other formal deliveries of product or materials established at this time. Both parties are aware that as the network is assessed and, monitoring is established, it may be determined that equipment may need to be replaced, or additional (new) equipment may need to be installed. A Project Change Request (PCR), as defined in this SOW, will be followed to approve/reject the changes in equipment.

Contractor Responsibilities

- **Install/Configure radio/communication network for SCADA locations.**
    - Installation of 2 Access Points (APs) on Public Works building. Connect them to the existing SCADA network. Installation method and location on the public works building needs to be determined, as well as cable entry into the building.
    - Installation of Radios on the Cliff Rose Tanks, 400 W Pump station & Fitness Sewer Lift locations connecting to the APs on the Public Works building.
    - Assignment of IPs to Scadapacks at each location and verification of communication through radio network to them.
    - **Estimated Budget: $6,055.00**

The Taviak Pump station already has an internet connection. The Taviak Tank does not have line of site to any good point, but has current 900 communication link to Taviak pump station. There may be line of site from some point from the Taviak Pump station to the Taviak Tank but that would need to be verified.

The Tuacahn Pump station will have a fiber connection into it providing communication. A direct Radio connection from the Pump station to the Tuacahn tank will be established with the current work on that pump station.

This leaves the Cliff Rose Tanks, the 400W Pump Station, the Fitness Way Sewer Lift Station, the Public Works building and the City Office locations. In planning and plotting using Cambium link planning software it is determined that line of site from the Public Works office to the other remaining locations exists. The software considers the geography of the area but not physical man-made structures or vegetation, so line of site verification may be needed in some cases.

I would recommend that a direct 3rd party internet connection (DSL, Cable, Wireless, etc) be considered for the Taviak Tank location.

- **Establish Direct Link between Public Works Building and City Office Building**
  - Connect a Radio that points to the Established APs at the Public Works Building. Connecting the SCADA and/or Public Works building to the City Office Network or a Specific Workstation at the City Office.
  - Install ViewX client on Workstation and Establish connection to ClearScada Server.
  - **Estimated budget: $1,265.00**

- **Install/setup New ClearSCADA server.**
  - Purchase IBM x3100 Server with Windows 2012 Standard and 5 Cal license.
  - Install hardware and configuration of RAID of the hard drives.
  - Installation/configuration of Operating System and CALs.
  - Installation of ClearSCADA server and backup and restore current ClearSCADA program from old system.
  - **Estimated Budget: $2,745.00**

- **Installation of ViewX on Chuck's workstation at City Office.**
  - Obtain License for additional ViewX installation.
  - Install on Workstation and configure connection to ClearSCADA server.
    *Requires connection between offices to be established
  - **Estimated Budget: $2,600.00**

- **Replacement of GE Controller at Taviak pump station with Scadapack.**
  - Removing GE Controller
  - Wiring I/O to ScadaPack Controller (Pulled from Kayenta tank)
  - Scadapack programming to match GE controls
  - ClearScada Programming change of controllers, addresses etc.
  - **Estimated budget: $2,960.00**

- **Automation of the Fitness Way Sewer Lift Station.**
  - Wiring I/O to existing Scadapack
  - Scadapack Programming for new instruments and function
  - ClearScada programming for controls and displays
  - **Estimated Budget: $2,920.00**

- **ClearSCADA support update/verification:**
  - ClearSCADA support expired as of Feb 28th, 2015.
  - Renewal of Support allowing for Updated Versions of ClearSCADA and ViewX to be used.
  - **Estimated Budget: $2,388.00**

- **Point to Point (PTP) radio connection between Taviak Pump station and Taviak Tank:**
  - Verify Line of Site path between locations.
  - Install a Force 200 Radio on each location and configure for PTP
  - Verify communications between locations.
  - **Estimated Budget: $2,190.00**

Client Responsibilities

- Provide contacts & network configuration
- Provide information on installation points for Radio hardware on any building and installation restrictions or specifications.

Fee Schedule

Contractor will provide resources based on need with the following functional/rate structure. Additional work or changes will be quoted and agreed upon by both parties.

Bill To Address	Client Project Manager
55 North Main Ivins, UT 84738	Shiloh

Out-of-Pocket Expenses / Invoice Procedures

Client will be invoiced when quoted job, or specific section of the job is completed. Standard Contractor invoicing is assumed to be acceptable. Invoices are due upon receipt.

Completion Criteria

Contractor shall have fulfilled its obligations when any one of the following first occurs:

- Contractor accomplishes the Contractor activities described within this SOW, including delivery to Client of the materials listed in the Section entitled "Deliverable Materials," and Client accepts such activities and materials without unreasonable objections.
- Contractor and/or Client has the right to cancel services or deliverables not yet provided with 20 business days advance written notice to the other party.

Assumptions

Project Change Control Procedure

The following process will be followed if a change to this SOW is required:

- A Project Change Request (PCR) will be the vehicle for communicating change. The PCR must describe the change, the rationale for the change, and the effect the change will have on the project.
- The designated Project Manager of the requesting party (Contractor or Client) will review the proposed change and determine whether to submit the request to the other party.
- Both Project Managers will review the proposed change and approve it for further investigation or reject it. Contractor and Client will mutually agree upon any charges for such investigation, if any. If the investigation is authorized, the Client Project Managers will sign the PCR, which will constitute approval for the investigation charges. Contractor will invoice Client for any such charges. The investigation will determine the effect that the implementation of the PCR will have on SOW price, schedule and other terms and conditions of the Agreement.
- Upon completion of the investigation, both parties will review the impact of the proposed change and, if mutually agreed, a Change Authorization will be executed.
- A written Change Authorization and/or PCR must be signed by both parties to authorize implementation of the investigated changes.

IN WITNESS WHEREOF, the parties hereto have caused this SOW to be effective as of the day, month and year first written above.

City of Ivins	SCI Automation, INC.
By: _____	By: _____
Name:	Name:
Title:	Title: