

November 15, 2023
LSCE No. 23-2-152

Mark Adams
NorthStar
111 Mission Ranch Blvd, Ste. 100
Chico, CA 95926

SUBJECT: SCOPE AND BUDGET FOR CONDITION ASSESSMENT OF THREE WELL STATIONS FOR DURHAM IRRIGATION DISTRICT

Dear Mr. Adams:

Luhdorff and Scalmanini Consulting Engineers (LSCE) is pleased to present this defined scope, offering assistance in conducting a condition assessment for the three well stations owned and operated by Durham Irrigation District (DID).

BACKGROUND

DID's water system consists of three groundwater well stations. Well 3 the oldest well station was constructed in 1956, and more recently Well 4 in 1990 and Well 5 in 1995. The rated capacity of Well 3 and Well 4 is reported to be approximately 600 gpm, and Well 5 is approximately 1,100 gpm. The well stations maintain pressure within the transmission pipeline network. The water system does not have any storage tanks; a hydropneumatic tank is located near Well 3 but it is not used. Due to pressure constraints, mainly Well 4 operates alone in winter with support from Well 5 when demand increases. Well 3 is not used in the winter because it creates high pressures. During the summer, Well 3 is the primary well station with support from Well 4 and Well 5.

SCOPE OF WORK

The scope and budget include well and pump testing and analysis of the District's well stations. The proposed tasks are as follows:

Task 1 – Review Existing Information

LSCE will review the compiled information focusing on options for well rehabilitation, pumping equipment improvements, and how the system operation may be optimized.

- Well completion reports;
- Pump as-built information and performance testing reports;
- System Evaluation Technical Memorandum (West Yost Associates, 2008), or others.
- Other geophysical survey, drawdown tests, water quality, sand production, and level data, video logs, and other well related information
- Water System Hydraulic Grade Line

Task 2 – Field Test of Wells and Pumps

LSCE will conduct one site visit to DID's water system to evaluate and field test the well stations. The site visit will be scheduled to document the condition of well stations, confirm the stations equipment matches the available record drawings, and conduct a performance test of the well and pumping equipment by a third party pump tester. The test will document the static and pumping water levels, specific capacity, sand production, general water quality (EC, pH, turbidity), pumping flow rate, electrical consumption, overall pump efficiency, vibration and noise, pump operational parameters (pre-lubrication time, flow rate control, pressure settings), etc.

Task 3 – Evaluate Test Results and Prepare Technical Memorandum

LSCE will prepare a technical memorandum providing the field data, observations, and recommendations for repairs or additional testing. LSCE will evaluate the results in comparison to historic baseline tests (if available) and expected performance to assess the cause of the sand production, drop in well capacity, which can be the result of changes in the conditions of the well or the aquifer. The pump performance will be evaluated with the manufacturer's catalog pump curve. LSCE will make observations as to the possible causes for the drop in capacity and develop recommendations for repair and maintenance. The results will be evaluated and presented in a technical memorandum. LSCE will schedule a conference call with DID to review the findings presented in the technical memorandum.

Task 4 (Optional) – Water Quality Sampling

Under this optional task, LSCE will collect two water samples from each well. The water samples represent the well casing and the aquifer. These samples will be sent to Water System Engineering for analysis. The samples will be analyzed for water chemistry, microbiology, and geochemistry. LSCE will utilize the findings from this sampling to formulate a tailor-made chemical recipe for each well. This forms an integral part of a well rehabilitation initiative aimed at addressing specific microbial and geochemical scaling issues that might be causing blockages in the well. The presence of these blockages can adversely impact both the well's performance and overall efficiency, leading to increased energy costs for pumping.

Task 5 (Optional) – Well Video Survey

Under this optional task, the wells may be video surveyed to identify issues. These issues may be sand production or clogged well screens. LSCE will have an idea if these are a concern after completing Task 2, and LSCE may recommend to DID consider completing this optional Task 5. The success of well video surveys under Task 5 relies on accessing the well casing without the need to remove the permanent pumping equipment. The current proposed strategy would involve using the existing sounding ports as a means of entry to the well. The contractor will insert a small diameter camera to complete static (non pumping conditions) and dynamic (pumping conditions) well video surveys. LSCE will be onsite to provide instruction to the contract and to document the findings during the well video surveys.

FEE ESTIMATE AND INVOICING

LSCE will provide engineering and inspection services according to the attached *2024 Schedule of Fees – Engineering and Field Services*. The estimated cost to provide the engineering and field services are shown in the table below. This sum includes LSCE’s labor and direct expenses under each task.

In the event that LSCE is directed to deviate from the proposed scope, or as dictated by unforeseen field conditions, LSCE will provide notification of any potential changes in the estimated cost and time to complete the work. LSCE will not proceed with any work that deviates from the approved scope and budget until approval to proceed is granted.

Task	Description	Outside Services ^A	LSCE Services	Total
1	Review Existing Information	\$0	\$5,240	\$5,240
2	Field Test Well and Pump	\$3,000	\$5,190	\$8,190
3	Evaluate Test Results and Prepare TM	\$0	\$7,400	\$7,400
Proposed Tasks - Subtotal		\$3,000	\$17,830	\$20,830
4	Water Quality (Optional Task)	\$7,500	\$2,276	\$9,776
5	Well Video (Optional Task)	\$15,000	\$4,360	\$19,360
Optional Tasks - Subtotal		\$22,500	\$6,636	\$29,136
Total		\$25,500	\$24,466	\$49,966

A. *Outside services include testing company for well pump tests (Power Services, Inc., Water Systems Engineering, and Pacific Survey)*

SCHEDULE

LSCE is prepared to commence work once acceptance is given by DID. Once given the notice-to-proceed, we are confident that the well station assessment can be completed in a timely manner. We appreciate the opportunity to provide you with this scope and budget. If you have any questions or need additional information, we would be pleased to respond.

Sincerely,
LUHDORFF & SCALMANINI
CONSULTING ENGINEERS



Eddy Teasdale, P.G., C.H.G
Principal Hydrogeologist

Mr. Mark Adams
NOVEMBER 15, 2023
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A handwritten signature in blue ink that reads "Philip L'Amoreaux". The signature is fluid and cursive, with the first name "Philip" and last name "L'Amoreaux" clearly legible.

Philip L'Amoreaux, P.E.
Project Engineer

Attachments: (1) Cost Estimate Worksheet, (2) 2024 Schedule of Fees

Client Northstar/DID
 Project 23-2-152
 Est. By PML
 Date 11/13/2023

Cost Estimate Worksheet for Condition Assessment of Three Well Stations for Durham Irrigation District

		Principal Professional	Supervising Professional	Senior Professional	Project Professional	Staff Professional	AutoCAD	Clerical	Power Hydrodynamics	Water Systems Engineering	Pacific Survey Well Video	Direct Expenses	Summary
Task	Description	\$240	\$230	\$220	\$180	\$160	\$145	\$94	Incurred	Incurred		Incurred	
Task 1 – Review Existing Information	Task Hours	0	4	8	0	16	0	0					28
	Task Cost	\$0	\$920	\$1,760	\$0	\$2,560	\$0	\$0					\$5,240
	Direct Expenses												\$0
	Sub Consultant												\$0
	SubTotal	\$0	\$920	\$1,760	\$0	\$2,560	\$0	\$0					\$5,240
Task 2 – Field Test Well Pump Stations	Task Hours	0	8	8	8	0							24
	Task Cost	\$0	\$1,840	\$1,760	\$1,440	\$0	\$0	\$0				\$150	\$5,040
	Direct Expenses											\$150	\$150
	Sub Consultant								\$3,000				\$3,000
	SubTotal	\$0	\$1,840	\$1,760	\$1,440	\$0	\$0	\$0	\$3,000				\$8,190
Task 3 – Evaluate Test Results and Prepare Technical Memorandum	Task Hours	0	4	8	12	16							40
	Task Cost	\$0	\$920	\$1,760	\$2,160	\$2,560	\$0	\$0					\$7,400
	Direct Expenses												\$0
	Sub Consultant												\$0
	SubTotal	\$0	\$920	\$1,760	\$2,160	\$2,560	\$0	\$0					\$7,400
Total Task Cost Estimate													\$20,830
Optional Task 4 Water Quality	Task Hours	0	2	0	8	0	0	4					14
	Task Cost	\$0	\$460	\$0	\$1,440	\$0	\$0	\$376					\$2,276
	Direct Expenses												\$0
	Sub Consultant									\$7,500			\$7,500
	SubTotal	\$0	\$460	\$0	\$1,440	\$0	\$0	\$376		\$7,500			\$9,776
Total Task Cost Estimate													\$29,136
Optional Task 5 Well Video	Task Hours	0	4	4	0	16	0	0					24
	Task Cost	\$0	\$920	\$880	\$0	\$2,560	\$0	\$0					\$4,360
	Direct Expenses												\$0
	Sub Consultant										\$15,000		\$15,000
	SubTotal	\$0	\$920	\$880	\$0	\$2,560	\$0	\$0			\$15,000		\$19,360
SUMMARY	Total LSCE Hours	0	16	24	20	32	0	0					92
	Total LSCE Cost	\$0	\$3,680	\$5,280	\$3,600	\$5,120	\$0	\$0					\$17,680
	Total Sub-consultant Cost								\$3,000				\$3,000
	Direct Expenses											\$150	\$150
	Optional Tasks	\$0	\$1,380	\$880	\$1,440	\$2,560	\$0	\$376		\$7,500	\$15,000		\$29,136
Proposed Tasks - Subtotal Cost Estimate													\$20,830
Optional Tasks - Subtotal Cost Estimate													\$29,136
Total Cost Estimate													\$49,966



500 FIRST STREET • WOODLAND, CA 95695

2024 SCHEDULE OF FEES

Professional (Engineer, Geologist, Hydrogeologist, Hydrologist)

Senior Principal	\$250/h
Principal Professional.....	\$240/h
Supervising Professional	\$230/h
Senior Professional	\$190 to 220/h
Project Professional	\$165 to 180/h
Staff Professional	\$145 to 160/h

Technical

Engineering Inspector	\$145/h
ACAD Drafting/GIS	\$145/h
Engineering Assistant.....	\$120 to 145/h
Scientist.....	\$120 to 145/h
Technician.....	\$120 to 145/h

Administration, Document Processing

Word Processing, Clerical.....	\$94/h
Digital Communications Specialist	\$105/h
Project Admin/Accounting Assistant	\$110/h

Vehicle Use	\$0.655/mile (or current IRS rate)
Subsistence	Cost Plus 15%
Groundwater Sampling Equipment (Includes Operator)	\$170.00/h
Copies	\$0.20 each
Professional or Technical Testimony	200% of Regular Rates
Technical Overtime (if required)	150% of Regular Rates
Outside Services/Rentals	Cost Plus 15%
Services by Associate Firms	Cost Plus 15%