DISTRICT 6
Legistar # 150127

VILLAGE OF LOMBARD
REQUEST FOR BOARD OF TRUSTEES ACTION
For Inclusion on Board Agenda
Bids and Proposals

TO : President and Village Board of Trustees

FROM : Scott Neihaus, Village Manager

DATE : March 17, 2015 Agenda Date April 2, 2015

TITLE : Waiver of Bids – Layne Christenson Company

SUBMITTED BY: Brian M. Jack, Utilities Superintendent

RESULTS:
Date Bids Were Published _____ Bidding Closed _____
Total Number of Bids Received _____
Total Number of Bidders Meeting Specifications _____
Bid Security Required _____Yes _____No
Performance Bond Required _____Yes _____No
Were Any Bids Withdrawn _____Yes _____No
Explanation:
Waiver of Bids Requested? ___X___Yes _____No
If yes, explain: Purchase is directly from manufacturer.
Award Recommended to Lowest _____Yes _____No
Responsible Bidder?
If no, explain:

FISCAL IMPACT:
Engineer's estimate/budget estimate $35,000.00
Amount of Award $27,075.00 Water & Sewer Capital Reserve Fund RM PROG 32 520.790.715.75420

BACKGROUND/RECOMMENDATION:
Waive bids and award a contract to Layne Christenson Company for the Inpsection, Cleaning and Repair of Well #10 in an amount not to exceed $27,075.00.

Has Recommended Bidder Worked for Village Previously __X__Yes ___No
If yes, was quality of work acceptable __X__Yes ___No
Was item bid in accordance with Public Act 85-1295? ___Yes __X__No
Waiver of bids - Public Act 85-1295 does not apply __X__Yes

REVIEW (as needed):
Village Attorney XX_____ Date _____
Finance Director XX_____ Date _____
Village Manager XX_____ Date _____

NOTE: All materials must be submitted to and approved by the Village Manager's Office by 4:30 pm, Wednesday, prior to the Board Agenda distribution.

Legistar # 150127

MEMORANDUM

To: Scott Niehaus, Village Manager

From: Brian M. Jack, Utilities Superintendent

Through: Carl S. Goldsmith, Director of Public Works

Date: March 16, 2015

Subject: **Waiver of Bids – Layne Christenson Company**
Well #10 Emergency Inspection, Cleaning and Repair

Background

Since 1992, the Village has maintained four emergency backup drinking water wells that can provide an average day's water supply should the DuPage Water Commission not be able to provide the Village water. The wells are tested and operated monthly to ensure operational readiness. All water pumped from the wells is discharged into a storm water sewer and is not introduced into the actual distribution system. Well #10 is located at 1030 S. Stewart Ave (adjacent to Civic Center Reservoir Facility and Village Hall). The well is 245 feet deep and 12" in diameter. The pump and motor were last pulled in 2008 and the necessary maintenance and repairs were completed at that time.

Recently, the monthly water quality samples have shown indications that a biofilm growth is prevalent in the casing of the well. A special sample was drawn from the well and sent to Water Systems Engineering for further analysis. Two items were discovered as a possible cause. Biofilm was discovered and serves as a protective environment for many microorganisms and could be causing the inconsistent water samples. There is also a high level of anaerobic conditions in the well. These conditions arise when oxygen levels are depleted allowing anaerobic organisms to thrive creating a stagnant zone of water.

Accessing the biofilm and the anaerobic growth near the bottom of the well is difficult to do with the pump in place. Removing the pump is recommended. This will allow for a thorough cleaning, inspection and remediation of well #10 to determine the cause and identify any structural defects. The necessary repair work will be completed to remedy the problem and ensure the well is 100% operational.

Request for Proposals

To expedite construction and to minimize construction observation time, the Public Works Department requested authorization to directly solicit proposals from two (2) pre-selected deep well contractors who have successfully worked on previous Village projects/contracts. Documents and a scope were sent to two (2) area firms who were capable of performing such work. Both firms submitted a proposal.

The following two (2) firms submitted the following proposals:

SUPPLIER	**WELL # 10 REPAIRS**
Layne Christenson Company, Aurora IL	**$27,075.00**
Municipal Well & Pump, Waupun WI	**$31,755.00**

Discussion
All proposals were checked to ensure that the supplier was meeting the proposed scope and providing the needed and necessary equipment to safely and properly complete the job. The lowest responsible proposal for the items requested is Layne Christenson Company of Aurora, IL. The firm has performed deep well pump and motor repairs over the past decade for numerous Villages' throughout the Chicagoland area and has performed work in Lombard in the past; that work has been satisfactory. Layne Christenson Company is considered a reliable, responsive vendor.

Recommendations:
Please request the Board of Trustees to waive the formal bidding process and accept the lowest, responsible proposal for the Well #10 Emergency Inspection, Cleaning and Repair to Layne Christenson Company of Aurora, IL and authorize an agreement in an amount not to exceed $27,075.00 at the April 2, 2015 meeting. Sufficient funds for this procurement exist in the current budget.

Please execute signature on the attached contract and return two copies to the Water Treatment and Wastewater Pumping Division for further processing.

Legistar # 150127

VILLAGE OF LOMBARD

Contract for Well #10 Emergency Inspection, Cleaning and Repair

This agreement is made this 2nd day of April, 2015, by and_between, and shall be binding upon, the Village of Lombard, an Illinois municipal Corporation hereinafter referred to as (the "Village") and (_____) hereinafter referred to as (the "Contractor").

Witnesseth That in consideration of the mutual promises of the parties delineated in the Contract Documents, the Contractor agrees to sell and the Village agrees to pay for the following described items as set forth in the Contract Documents:

Well #10 Emergency Inspection, Cleaning and Repair in an amount not to exceed $27,075.00

1. This Contract shall embrace and include all of the applicable Contract Documents listed below as if attached hereto or repeated herein:

   a. The Contractor's Proposal dated March 13, 2015

   b. Required Certificate of Insurance, Indemnification, Venue, Other Contractor Responsibilities

2. The Village agrees to pay, and the Contractor agrees to accept as full payment for the items which are the subject matter of this Contract the total sum of $27,075.00 paid in accordance with the provisions of the Local Government Prompt Payment Act and the provisions of the Contract Documents.

3. Risk of loss, destruction or damage of or to goods under this Contract shall be on contractor until delivery of the goods to the Village and acceptance of the goods by the Village.

4. The Contractor agrees to perform the terms of this Contract according to the following schedule set forth in their quotation after the Notice to Proceed has been delivered. Time is of the essence of this Contract.

IN WITNESS WHEREOF, the Village of Lombard, Illinois by Village President, and the Contractor have hereunto set their hands this 2nd day of April, 2015.

If an individual or partnership, all individual names of each partner shall be signed or if a corporation, an officer duly authorized shall sign here:

Accepted this __day of _____, 20__.

Individual or Partnership _____ Corporation _____

_____ _____
By Position/Title

_____ _____
By Position/Title

_____
Print Company Name

THE VILLAGE OF LOMBARD, ILLINOIS

Accepted this 2nd day of April, 2015.

_____
Keith T. Giagnorio
Village President

Attest: _____
Sharon Kuderna
Village Clerk

Legistar # 150127

VILLAGE OF LOMBARD
CONTRACTOR'S CERTIFICATION

_____, having been first duly sworn, depose and states as follows:

(Officer or Owner of Company)

I am the _____ for _____,

(Title) (Name of Company)

(the "Contractor"), which has submitted a proposal for Well #10 Emergency Inspection, Cleaning and Repair to the Village of Lombard and, having personal knowledge of the matters certified to herein, and being authorized by the Contractor to make the certifications set forth herein, hereby certifies that said Contractor:

1. has a written sexual harassment policy in place, in full compliance with 775 ILCS 5/2-105(A) (4);

2. is not delinquent in the payment of any tax administered by the Illinois Department of Revenue, or if it is:
   a. it is contesting its liability for the tax or the amount of tax in accordance with procedures established by the appropriate revenue Act; or
   b. it has entered into an agreement with the Department of Revenue for payment of all taxes due and is currently in compliance with that agreement;

3. is in full compliance with the Federal Highway Administration Rules on Controlled Substances and Alcohol Use and Testing, 49 CFR Parts 40 and 382, and that

_____

(Name of employee/driver or "all employee drivers")

is/are currently participating in a drug and alcohol testing program pursuant to the aforementioned rules; and

4. is not barred from contracting with any unit of state or local government as a result of a violation of either Section 33E-3 or 33E-4 of Article 33E of the Illinois Criminal Code of 1961.

By: _____
Authorized Agent of Contractor

Subscribed and sworn to
before me this _____
day of _____, 2015.

Notary Public

Water Systems Engineering, Inc.

Date: February 10, 2015

Lab Report No. 20071

Nathan Carpenter
Layne
721 W. Illinois Ave
Aurora, IL 60506

Project Description: Lombard, IL, Well No. 10; Samples dated 1/13/15
Complete Well Profile (1) PO# 217151

Test Description:

The Complete Well Profile analysis is designed for comparative analysis of two samples, typically one static and one pumping sample. The Complete Well Profile utilizes a series of inorganic chemical and microbiological tests to identify fouling and corrosion issues with potential impacts on the operation of the sampled well. The tests include a number of inorganic chemical parameters such as pH, total dissolved solids/conductivity, hardness, alkalinity, oxidation reduction potential (ORP), bicarbonate, carbonates, silica, sodium, potassium, chloride, iron, manganese, phosphate, nitrate, sulfate, and total organic carbon (TOC). Biological assessment is designed to quantify the total bacterial population, identify two dominant populations of bacteria, assess anaerobic conditions, and identify the presence of iron related bacteria and sulfate reducing organisms. Also included are tests for Adenosine triphosphate (ATP), heterotrophic plate count (HPC), total coliform and E. coli coliform, and a microscopic evaluation.

Testing Procedures:

All laboratory testing procedures are performed according to the guidelines set forth in *Standard Methods for the Examination of Water and Wastewater* as established by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). Corrosion analyses are performed in accordance with the guidelines as set forth by the National Association of Corrosion Engineers (NACE). In general, these methods are approved by both the Environmental Protection Agency (EPA) and AWWA for the reporting of water and/or wastewater data.

Sample collection and shipment is the responsibility of the customer, performed according to protocol and procedures defined by the laboratory in advance of the sampling event with regards to the specific project and nature of the problem.

Disclaimer:

The data and interpretations presented are based on an evaluation of the samples and submitted data. Conclusions reached in this report are based upon the data available at the time of submittal and the accuracy of the report depends upon the validity of information submitted. Any recommendations presented are based on laboratory and field evaluations of similar fouling occurrences within potable water systems. Further investigative efforts, such as efficiency testing, site inspection, video survey, or other evaluation methods may offer additional insight into the system's condition and the degree of fouling present.

Client: Layne
Date: February 10, 2015
Lab Report No. 20071

Re: Lombard, IL, Well No. 10; Samples dated 1/13/15
Complete Profile (1) PO# 217151

ND - Not Detected NA - Not Applicable	Well No.10 Casing mg/l	Well No. 10 Aquifer mg/l	Detection Limits
pH Value	7.42	7.40	NA
Phenolphthalein Alkalinity*	ND	ND	4 mg/l
Total Alkalinity*	396	396	4 mg/l
Hydroxide Alkalinity	ND	ND	4 mg/l
Carbonate Alkalinity	ND	ND	4 mg/l
Bicarbonate Alkalinity	396	396	4 mg/l
Total Dissolved Solids	703	693	1.0 mg/l
Conductivity (µm or µS/cm)	976	963	NA
ORP (mV)	183.6	198.9	NA
Langelier Saturation Index	+ 0.49	+ 0.45	NA
Total Hardness*	484	476	4 mg/l
Carbonate Hardness	396	396	4 mg/l
Non Carbonate Hardness	88	80	4 mg/l
Calcium*	308	300	4 mg/l
Magnesium*	176	176	4 mg/l
Sodium (as Na)	16.5	16.6	0.02 mg/l
Potassium (as K)	2.5	2.5	0.1 mg/l
Phosphate (as PO4)	0.85	0.22	0.06 mg/l
Chlorides (as Cl)	34	34	2 mg/l
Nitrate (Nitrogen)	ND	ND	0.3 mg/l
Chlorine (as Cl)	ND	ND	0.02 mg/l
Dissolved Iron (as Fe2+)	ND	ND	0.02 mg/l
Suspended Iron (as Fe3+)	1.15	0.94	0.02 mg/l
Iron Total (as Fe)	1.15	0.94	0.02 mg/l
Iron (resuspended)	1.31	0.11	0.02 mg/l
Copper (as Cu)	ND	ND	0.04 mg/l
Manganese (as Mn)	ND	ND	0.1 mg/l
Sulfate (as SO4)	100	104	2 mg/l
Silica (as SiO2)	27.5	26.2	1.0 mg/l
Tannin/Lignin	0.3	0.3	0.1 mg/l
Total Organic Carbon (C)	1.1	1.5	0.0 mg/l

Biological Analysis:

	Well No. 10 Casing	Well No. 10 Aquifer	Detection Limit
Plate Count (colonies/ml)	*No Growth*	*No Growth*	NA
Anaerobic Growth (%)	10	10	NA
Sulfate Reducing Bacteria	Negative	Negative	NA
Fe/Mn Oxidizing Bacteria	Negative	Negative	NA
ATP (cells per ml) Initial Filtered	11,000	4,000	NA
ATP (cells per ml) 24 Hour Filtered	8,000	3,000	NA
Total Coliform	Negative	Negative	NA
E. Coli	Negative	Negative	NA
Bacterial Identification	*No ID possible*	*No ID possible*	NA

Microscopic Evaluation:

Casing: Low visible bacterial activity, low number of crystals and plant particulate matter, low iron oxide, moderate to heavy iron oxide entrained biofilm, no sheathed or stalked bacteria noted.

Aquifer: Very low visible bacterial activity with minor amount of plant particulate matter, minor amount of iron oxide, low amount of iron oxide entrained biofilm, no sheathed or stalked bacteria noted.

Observations and Interpretations:

When received in the lab, both samples contained a small amount of reddish colored biofilm as sediment, with no visible turbidity. The chemical analysis performed during this complete well profile found no significant variations between the chemistry of the casing and of the aquifer samples. The chemical analysis found high alkalinity and hardness, and a high total dissolved solids content along with a high associated conductivity value. The higher than desired hardness and TDS are typical of this geologic region. The well displayed a slightly alkaline pH. Total dissolved solids (TDS) exceeded the secondary drinking water recommendation of 500 ppm. A notable portion of the total hardness, approximately 18%, consisted of non-carbonate hardness. This occurs generally in the form of calcium sulfate (gypsum) and is a harder deposit than calcium carbonate and therefore requires a greater effort to remove from the well. The oxidation-reduction potential (ORP) was positive indicating a moderately oxidative condition with a tendency for metal oxide deposition in the presence of metal ions

The Langelier Saturation Index, which is a calculation of the amount of dissolved calcium carbonate in the water and an indication of the potential for calcium carbonate mineral deposition, was positive implying a slightly over saturated condition with a possibility of carbonate scale deposition.

Overall there appears to be a fairly high level of dissolved mineral content in the groundwater at this site. Chemicals and compounds found to be present at concentrations above an ideal groundwater concentration included calcium, magnesium, sodium, potassium, and resuspended

iron. Resuspended iron is iron that has been concentrated by the metabolic activity of iron related bacteria. A high resuspended iron concentration can indicate the presence of iron related bacteria as well as the entrapment and accumulation of iron oxide in biomass present within the well system.

Total organic carbon (TOC), while not being excessively high, was at a level worth noting. Total organic carbon is the amount of carbon bound in organic compounds. It is typically derived from decaying organic matter as well as from synthetic sources such as pesticides, herbicides, fertilizers, and detergents. Organic carbon originates at or near the surface in the groundwater recharge area and infiltrates the aquifer over time. High TOC levels are a concern since the carbon provides an excellent food source and stimulates the growth of microorganisms.

No microbial growth was noted on the culture plates for either sample although this may not be an accurate determination of the level of bacterial population present since over 95% of the all microorganisms do not grow on culture media under laboratory conditions. Adenosine triphosphate (ATP), a component of cellular material and a means of evaluating the total bacterial population present, both aerobic and anaerobic, was well within acceptable levels in both samples. The casing sample contained 11,000 cells per milliliter with 4,000 present in the aquifer sample. ATP levels for a properly functioning well system not experiencing biofouling typically fall within the range of 20,000 to 60,000 cells per milliliter. In general, any concentration in excess of 100,000 cells is of concern for bacterial congestion and biofouling.

Anaerobic growth represented 10% of the total microbial growth in each sample. Ten percent is a level where taste and odor issues may begin to manifest themselves. No sulfate reducing bacteria were detected.

Testing for total coliform bacteria including E. coli specific coliforms was negative in both the casing and aquifer samples.

The microscopic evaluation found a low level of visible bacterial activity present in the casing sample with only a trace noted in the aquifer sample. There were also low amounts of crystalline debris and plant particulate matter in the casing sample. The aquifer sample was free of crystalline material and contained only a trace of plant matter. The casing sample contained a small amount of iron oxide with a moderate to heavy concentration of iron oxide entrained biofilm. The aquifer sample contained a very low amount of iron oxide with a low concentration of biofilm.

Recommendations:

The laboratory analysis found a generally high level of dissolved mineralization at this location. The high mineral content and positive saturation index indicate a potential for mineral scale deposition within the well over time.

The bacterial analysis found an environment lightly impacted by bacterial growth although the analysis found anaerobic growth and biofilm to be at a level of concern in the casing sample.

The stated problem with the well is the inability to pass the Illinois EPA's bacterial analysis requirements. While the overall bacterial load in the well is not excessive, two issues identified in this analysis may be contributing to the problem. The first is the amount of biofilm present. Biofilm serves as a protective environment for the microorganisms present preventing them from being readily flushed from the well. During pumping, the microorganisms are gradually shed by the biofilm leading to ongoing positive hits during bacterial testing. The second concern

is the level of anaerobic growth detected. Anaerobic conditions arise when the environment becomes depleted of oxygen leading to anoxic conditions. In a well environment this is usually a zone of low or no flow where aerobic organisms die off after consuming the available oxygen allowing anaerobic organisms to take over. In an open-hole well completion in rock, such as the Village of Lombard well no. 10, this condition is often associated with a stagnant zone at the bottom of the well as well as in fractures, fissures, and pores in the rock which do not undergo adequate flushing and thereby become anoxic. In addition to taste and odor problems, anaerobic organisms are prolific producers of polysacride biofilm (slime) which can harbor other anaerobic organisms such as coliforms.

Construction information provided for Lombard well no. 10 states that the well is 245 feet in total depth with the pump set at 202 feet. It is possible that the bulk of the water production is coming from producing zones closer to the pump with little flow from deeper in the well contributing to anaerobic growth at or near the bottom of the well.

Unfortunately, accessing biofilm and anaerobic growth near the bottom of a well is difficult to do with the pump in place. To apply the mechanical swabbing or brushing required to disrupt the biofilm, removing the pump would be necessary. Since the well has not undergone a complete rehabilitation in 12 years and considering the level of dissolved mineralization present and the positive saturation index, it may be advisable to conduct a multi-phase well cleaning to remove any mineral buildup as well as reduce the bacterial load.

The process should begin with pulling the pump and mechanically scrubbing the interior of the well using a surge block or brush. This will help remove loose scale, rust deposits, and biofilm which can provide a protective environment for microorganisms. Once the entire column has been scoured, bail or pump the disrupted material and any fill from the well, starting at the bottom. Once clear, a combined chemical and mechanical treatment can continue.

Chemical treatment should begin by placing a solution of 7 phosphoric acid combined with 2% dispersion polymer such as Layne's QC-21 biodispersant below the static water level and aggressively swabbing or surging it into the producing zones for approximately four minutes per foot of producing zone. The recommended biodispersant is NSF approved for use in potable wells and is recommended to enhance the activity of the acid in cleaning biomass and extending the efficiency of the acid in attacking mineral scale. The use of phosphoric acid is recommended over hydrochloric acid since phosphoric acid is less aggressive than hydrochloric acid but will achieve the same level of reaction. This produces less reaction with the steel casing resulting in fewer iron ions being released which can provide a food source for iron oxidizing organisms. Also, phosphoric acid will have a less violent reaction than hydrochloric acid with any carbonates that may be present in the well. The acid and biodispersant solution will aid in breaking down the biofilm that surrounds and protects the organisms, allowing for better penetration of the disinfection solution as well as removing any mineral scale present. If possible, leave the acid solution in the well overnight while maintaining a pH of 3 or less.

Once the well has been effectively purged of all acid residue and is pumping clear of visible turbidity, disinfection should be carried out utilizing a pH adjusted chlorination at a 300 ppm chlorine level with a targeted pH range of 6.5 to 7.0. The treatment volume of the disinfection solution should be equivalent to 3 times the well volume and evenly distributed throughout the screened zones. This larger volume is utilized to flood the borehole with the disinfection solution in order to increase the effectiveness of treatment as well as the effective treatment zone. Utilization of a chlorine enhancing chemistry such as Layne's Oximate for pH control is strongly advised to improve disinfection as well as to increase the treatment zone.

The disinfection solution should be surged into the well for approximately two minutes for each foot of producing zone. Monitor the chlorine level during disinfection and add additional chlorine to maintain at least a 100 ppm chlorine level during disinfection.

Based on information provided, the following volumes are necessary for each step of the recommended treatment process:

Rehabilitation		
	Phosphoric Acid (85% strength)	85 gallons
	QC-21 Biodispersant	27 gallons
	Potable water for blending	1,500 gallons
Disinfection		
	Sodium Hypochlorite (12% strength)	8 gallons
	Oximate Chlorine Enhancer	19 gallons
	Potable Water for blending	3,200 gallons

For acid treatments, mix the chemicals in this order: water, acid, biodispersant. Mix lightly. If during acid treatment, the pH rises to a level above 3.0, add additional acid and water at the rate of 2 gallons acid and 1 gallon water. No additional dispersant should be needed.

For the chlorine treatment, mix the chemicals in this order: water, chlorine enhancer, check the pH (above 5), add chlorine. Mix lightly. During disinfection, if the chlorine residual has dropped to below 100 ppm, add additional sodium hypochlorite in increments of 0.12 gallon to raise it to that level.

Before reinstalling the pumps, conduct a thorough inspection of all pump bowls, column pipe, and shafts to check for wear, cracks, and corrosion. Leave a slight chlorine residual in the well (25 to 30 ppm) to disinfect the pump and use the production pump to remove the residual.

As an alternative to the above described full rehabilitation, provided that the well is still producing at an acceptable level and the specific capacity has not dropped below 20% of the original value, disinfection involving tank surging with the pump in place may be tried. This process would eliminate the acid treatment phase and the need to pull the pump. In tank surging, the full disinfection solution described above would be placed in the well between the column pipe or drop pipe and allowed to flow to the bottom of the well. The pump would then be started and the solution pumped into a tank at the surface where the process is repeated. Continue this process for two to three hours while monitoring and maintaining a chlorine level of 100 ppm or greater. While this process does not involve the mechanical action recommended to break up the biofilm and won't do anything for mineral scale buildup, it may be enough to reduce the bacterial load to where the samples will pass the IEPA requirements.

It is recommended that the well be put into operation as soon as possible and pumped on a regular schedule to inhibit the regrowth of microorganisms. Additionally, frequent and regular pumping helps control the growth of anaerobic organisms.

Also, it would be advisable to conduct a periodic monitoring analysis to monitor bacterial regrowth since the presence of organic carbon can contribute to ongoing bacterial problems.

If you have any questions regarding the analyses or the information presented, please contact our office.

Paul D. Buozis
Professional Geologist
Water Systems Engineering, Inc.