

Public Works



City of Yuba City
2021 WaterSMART Small Efficiency
Grant Application: No. R21AS00257



2022 Booster Pump Station Upgrade and
Modernization Project

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Executive Summary

Date: March 18, 2021

To: Bureau of Reclamation

Financial Assistance Support Section

Attn: Mr. Matthew Reichert

P.O. Box 25007, MS 84-27133

Denver, CO 80225

From: City of Yuba City Public Works Department

1201 Civic Center Blvd

Yuba City, CA 95993

Subject: 2021 WaterSMART Grants: Small-Scale Water Efficiency Projects

The City of Yuba City has developed this Category A application for Bureau of Reclamation's Small-Scale Water Efficiency Grant.

The City of Yuba City Public Works department, located in northern California, will replace various mechanical systems within the City's Water Distribution Systems. Current challenges the City's Public Works Department faces are its aged mechanical systems and assets such as their booster pump stations that still utilize pumps with soft start systems as well as split-case pumps that have exceeded their lifetime. The modernization project would replace strategically chosen soft start systems and split-case pumps that would significantly increase the efficiency and flexibility of the City's water distribution system while reducing potential damage by preventing "shocks" to the water distribution system and frequent maintenance. The benefits also will ultimately result in the City to be able to manage and maintain an effective water distribution system that also supports the opportunity for the City to develop and expand westward. Public Works used the City's 2019 Water Master Plan and maintenance records to identify the oldest equipment that has had high maintenance costs in recent years.

The City's Public Works Department is prepared to order and install new equipment as feasibly possible. Upgrading soft start systems to VFD and replacing the booster pump stations can be completed within the 2022 Calendar year. Installing VFDs and replacing booster pumps can start once equipment is received with no shutdowns of any facilities needed since each facility has multiple pumps that can remain in operation as one is shutdown to be removed or replaced. All locations involve work at City owned properties and maintained facilities and all equipment can be installed by experienced City staff.

Background Data

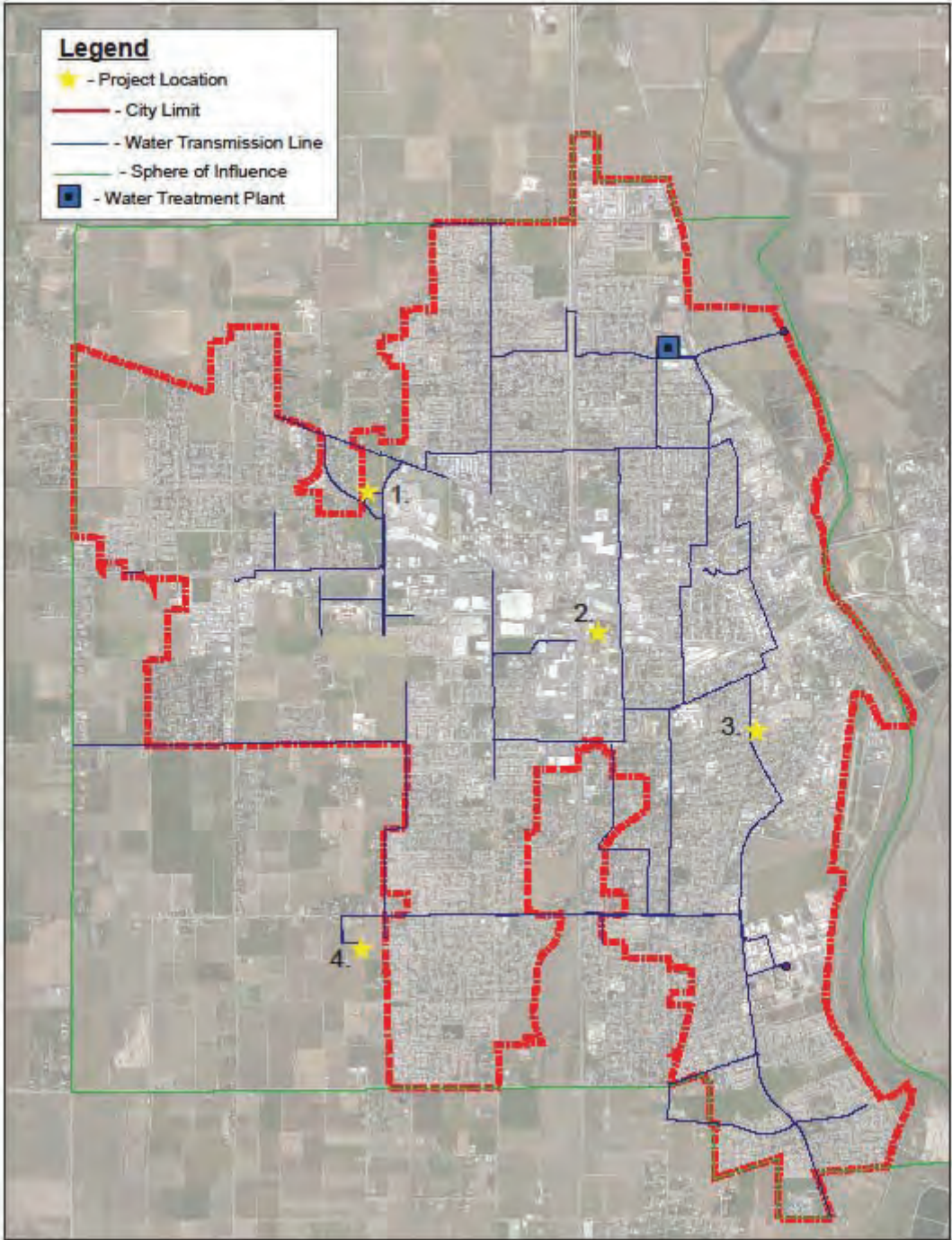
The City has identified all improvements through the City's 2018 Water Master Plan. Modernization improvements for a new transmission main water meter and split case pumps were decided due to the standard useful life being expired. Regarding the soft start conversions to VFDs, soft start devices are being phased out and replaced with VFDs throughout the entire water distribution system to avoid shocking water distribution infrastructure and causing damage throughout the City's system. Sections from the City's Water Master Plan are shown in Appendix A.

Project Locations

The City of Yuba City is located in the state of California and is approximately forty miles north of Sacramento. The 2022 Water Treatment Plant Upgrade and Modernization Project involves five different locations where there is City owned and maintained water distribution infrastructure. The specific locations with latitude and longitude is shown below and in Exhibit 1.

- 1) *Harter Park Booster Pump Station – VFD Conversion*
Latitude, Longitude: 39° 8.8637' N, 121° 39.454' W
- 2) *Sam Brannon Park Booster Station – Split Case Pump Replacement*
Latitude, Longitude: 39° 8.1827' N, 121° 37.938' W
- 3) *Rowe Avenue Booster Pump Station – Split Case Pump Replacement*
Latitude, Longitude: 39° 7.66' N, 121° 36.932' W
- 4) *Sanborn Road Booster Pump Station – VFD Conversion*
Latitude, Longitude: 39° 6.5926' N, 121° 39.499' W

Exhibit 1. Project Locations Map



Project Description and Milestones

Soft Start Conversions to VFD's at Harter and Sanborn Road Facilities

The Harter Booster Station has five pumps that help provide adequate flow and water pressure for existing water distribution infrastructure in the northwest quadrant of Yuba City's Sphere of Influence. Of the five pumps, two still utilize a soft start system. One of the two soft start systems are to be replaced so a total of four pumps have VFD systems that help prevent sending "shocks" to a distributions system. Staff will begin the conversion by powering down the pump and proceed to remove the Eaton soft start device and wiring in existing cabinet, and will install an Allen-Bradley VFD that could require minor changes to existing cabinet and conduit.

The Sanborn Booster Station has five pumps that help provide adequate distribution and water pressure to the City's water distribution infrastructure in the southwest quadrant of the City's Sphere of Influence. Presently, two of the five pumps still utilize a soft start device. To convert the Eaton soft start device to an Allan-Bradley VFD, one pump at a time will be powered down in order for the existing soft start to be removed and then staff will make minor modifications to the cabinet and wiring to install the new VFD.

Conversions to VFDs will occur one pump at a time to avoid potential conflicts with having more than one pump offline at a time. General milestones for the conversion of soft starts to VFD's include: 1) ordering VFD systems; 2) receive VFD systems 3) install new VFD system by City staff.

Booster Station Split Case Pump Modernization

Staff will consider the present condition of six split case pumps at three different booster pump stations before deciding on which four split case pumps they would like to replace. Presently, the City has six split-case pumps that are the original pumps from when the facilities became operational in 1969. The two other referenced split-case pumps are in a facility that is roughly 10yrs older than the others. For installation, staff will power down existing split case pump and dismantle the case and remove the motor, impeller shaft and components, and finally the base. Next, staff will install the new base and once the base is in place, the casing, motor, and shaft components can be installed with bronze impeller components. Milestones include: 1) ordering split-case pumps and components; 2) receive split-case pumps and components; 3) install split-case pump and components.

Evaluation Criteria

Project Benefits

Soft Start Conversion to VFDs at Harter Booster Pump Station and Sanborn Booster Pump Station

The City's water distribution system consists of five booster pump stations. Harter and Sanborn Road Booster Pump Stations help provide adequate water pressure to approximately the western half of the City. Currently both Harter and Sanborn Road Booster Stations have five pumps. Two pumps at each station currently have soft start systems installed. Replacing one soft starts for the Harter Booster Pump Station and two for the Sanborn Road booster stations would help prevent damage to the water

distribution system from the “shock” that soft starts cause on a distribution system that supplies water to homes, schools, businesses, and some industrial for the western half of the City. The VFDs would provide more flexibility when running pumps and increase efficiency in distribution. The conversion to additional flexibility will also help support future development, while also maximizing the life of the existing distribution infrastructure by reducing the “shock” the water distribution system experiences when a soft start system starts.

Split Case Pump Replacement at Sanborn Road and Sam Brannan Booster Pump Stations

The City has three booster stations where split-case pumps that are 40+ years old are being utilized. The two subject booster stations include two split-case pumps at each facility that were installed in 1969. The split-case pumps have required costly maintenance and repairs due to the pumps being 20 years past their standard 30 year useful life. Issues such as bearings being repaired, water leaks due to weak seals, and hard to find parts have increased maintenance costs and staff time greatly at the two subject booster stations. A third booster station, Garden Highway Booster Pump Station, is to be considered as a potential site for new booster pumps, only if staff thinks the conditions of the split-case pumps at the Garden Highway Booster Pump Station are in immediate need for replacement.

Project Support and Planning Efforts

The City recently completed a Water Master Plan in 2019 where the City’s consultant prepared an extensive review of the City’s Water Treatment Plant, water distribution facilities and assets, and the distribution system. The staff have utilized the plan and prioritized the requested improvements based on what is feasible in the requirements for the grant, highest priority repairs, and work feasibility. The improvement for new split case pumps was directly identified in the Water Master Plan to have a 5 year maintenance program or replace with new equipment since existing equipment frequents repairs and replacement parts are hard to find. Staff identified the VFDs as being strategic improvements to protect the City’s water distribution infrastructure due to the soft starts at these locations sending “shocks” through our system. It would also help prevent further damage to a water distribution system in the area that is in the second half of its expected lifetime. Overall Staff came to the conclusion, by prioritizing improvements based on a balance of reducing costly and frequent maintenance while also modernizing the City’s water distribution infrastructure to allow for more pumping flexibility to help support development and growth westward. Asset information documents are attached in Appendix A.

Project Implementation

City staff has already begun asking qualified suppliers for quotes regarding the equipment. Acquiring and installing the equipment for the improvements at the subject booster stations can be done by the City’s Public Works Staff. Not only does our Water Department staff have experience in dismantling and reinstalling split case pumps on a regular basis, Public Works also has experienced electricians and instrument technicians that are capable of removing the soft start systems and install the VFD systems.

All in all, since work is to be done by City staff and involve mechanical assets, the project is designed to be streamlined in three milestones: 1) order 2) receive 3) install. A more detailed tentative timeline is shown in Table 1. Project Milestones Timeline below:

Table 1. Project Milestones Timeline

Milestones	Start Date	Finish Date
Execute Funding Agreement and Allocate Funds	February 1, 2022	April 30, 2022
Order VFD and Split-Case Pump Equipment	May 1, 2022	May 30, 2022
Receive and Install VFD and Split-Case Pumps	July 1, 2022	December 31, 2022
Project Closeout and Reimbursement	January 1, 2023	March 30, 2023

Nexus to Reclamation

The City does not currently have any Reclamation projects nearby, but the City has been awarded various grant funds in the past. An example of Reclamation “activity”, the City currently has been awarded a Drought Resiliency grant where the City has recently finished environmental and cultural compliance for the Water Treatment Plant in preparation for construction of a second groundwater well.

Project Budget

Funding Plan and letters of commitment

The City has an experienced Finance Department that works closely with the Public Works Department with allocating the appropriate amount of funds for annual maintenance and capital improvements. In recent years, the maintenance account budgets have increased with the City’s aging infrastructure and there has been a lack of funds for improvements modernizing the City’s water distribution system, hence the City’s strategic pursuit of grant funds through the WaterSMART Small Efficiency Grant Program where the cost share amount is more manageable for the Public Works budget since the costs will not be as significant to Public Works over all water budget.

Budget Proposal

**ENGINEER'S ESTIMATE
CITY OF YUBA CITY PUBLIC WORKS DEPARTMENT**

Project Title: 2022 Booster Station Upgrade and Modernization Project
 Project Number: WaterSMART Small Efficiency Grant
 EA Number:
 Contract Number:
 Project Manager: William Jow



Item	Item Description	Estimated Quantity	Unit of Measure	Unit Price	Amount
1	Allan Bradley Powerflex 753 AC Packaged Drive (AB 20F1AND248JA0NNNNN) (Refer to quote in Appendix A)	3	EA	\$23,531.04	\$ 70,593.12
2	4" 5824 Split Case BARE dimensional, piping and hydraulic replacement, which includes: Cast Iron Casing Assembly; Cast Iron Casing Wear Ring; Steel Pump Shaft; SS Shaft Sleeve; Bronze Impellar and Wear Ring; Packing Box Assembly; Steel Base; Motor is 40HP Horizontal Motor; WP1; 1800 RMP; 3PH/60HZ/460V; Premium Efficiency; 324T	4	EA	\$24,929.00	\$ 99,716.00
Notes:	1. Installation to be completed by City staff. Estimated hours could not be determined. 2. All relevant quotes shown in Appendix A				
Contract Items					\$170,309.12
Contingency (10%)					\$ 17,030.91
Contract Total					\$187,340.03
Total Project Cost					\$187,340.03

Budget Narrative

Public Works staff has contacted various vendors regarding the cost of ordering new VFDs and split-case pumps. The itemized quotes that include the components required are shown in Appendix A. The project manager will be William Jow, Assistant Engineer for the Public Works Department will be working closely with Water Treatment Plant Supervisor, Terrance Piro with facilitating orders of equipment and scheduling of installation. Installation personnel will consist of Water Treatment Plant mechanics, electricians, and instrument technicians to install split-case pumps and VFDs. All salaries and wages are in compliance with wage rates rules and regulations, and is available to the public. Any heavy equipment used to assist with installation will comply with USACE equipment usage rates, however no heavy equipment will be required for installation, only to move new equipment. Unfortunately, staff could not provide an accurate estimate of man-hours required for installation, but the Project Manager can provide any staff or project reports regarding costs, staff wages, and hours worked as requested in a timely manner.

Environmental and Cultural Resources Compliance

The 2022 Booster Station Upgrade and Modernization project does not involve breaking any ground. All equipment will be installed in City owned facilities.

Required Permits or Approvals

No permits will be required for the work to replace existing equipment in City owned facilities since Public Works Staff will be performing the work. Approvals that would be required are any approvals Reclamation would like to establish under the funding agreement and Public Works Director's approval for executing the agreement and ordering/payment for the equipment.

Official Resolution

The official resolution is scheduled to be presented to City Council for approval on April 6, 2021 and will be submitted to the appropriate staff within 30 days of the March 18, 2021 application deadline.

Appendix A


Attachment 1: 2019 Water Master Plan Relevant Pages

Attachment 2: VFD System Itemized Quote

Attachment 3: Split-Case Booster Pumps Itemized Quote

Mechanical Systems


Asset: EQU-000232, Pump_Harter Reservoir #4

Asset Class	Size/Material	Purchase Year
PUMP Vertical Turbine	200 hp	2005 (Original install est.)
Manufacturer	Volts/Amps/HP/Speed	
FLOWAY	200 hp, 1785 RPM	
Model	Duty (gpm) / Duty (TDH)	
	2800 gpm, 175 ft	
Serial Number	Condition Rating: 1	
56473-7-1	Performance Rating: 3	
Comments	Standard Useful Life: 25 years	
	Remaining Life: 13 years	
	Notes: -Constant speed pump. -Rarely run (only at 400 hours) due to causing pressure issues with distribution. -Missing anchor bolts, recommend adding.	



Asset: EQU-000430, Motor_Harter Reservoir #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
MOTR Motor (Over 20 HP)	200 hp	2005 (Original install est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
US, J0420002300-100R-02	460 V, 228 A, 200 hp, 1780 RPM	
Serial Number	Condition Rating: 1	
	Performance Rating: 1	
Comments	Standard Useful Life: 30 years	
Premium Efficiency/Inverter Duty	Remaining Life: 25 years	
	Notes: Record drawings shows incorrect 250 HP ratings.	

Mechanical Systems

Asset: WY-0081, (?) Pump Suction Piping_Harter #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
PIPE Suction Piping		
Manufacturer/Model	Volts/Amps/HP/Speed	
Serial Number	Condition Rating: Performance Rating: Standard Useful Life: 50 years Remaining Life: Notes:	
Comments		

Asset: WY-0086, Pump Discharge Piping_Harter #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
PIPE Discharge Piping	12 inch	2005 (Original install est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
Serial Number		
Comments		

Asset: WY-0091, Pump DS Isolation Valve_Harter #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
VALV Butterfly Valve	12 inch	2004 (Field Notes (CAH 7/17/2017))
Manufacturer/Model	Volts/Amps/HP/Speed	
DEZURIK, 9414713R004		
Serial Number	Condition Rating: 1 Performance Rating: 1 Standard Useful Life: 30 years Remaining Life: 17 years Notes:	
310538-1		
Comments		



Mechanical Systems

Asset: WY-0096, Pump Check Valve_Harter #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
VALV Check Valve	12 inch	2005 (Original install est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
VALMATIC, 8812WN		
Serial Number	Condition Rating: 1 Performance Rating: 1 Standard Useful Life: 25 years Remaining Life: 13 years Notes:	
Comments		



Asset: WY-0162, RV Soft Starter_Harter #4

Subcomponent to: EQU-000232

Asset Class	Size/Material	Purchase Year
ELEC Soft Starter	200 hp	2005 (Original install est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
Eaton/Cutler-Hammer	460 V	
Serial Number	Condition Rating: 1 Performance Rating: 1 Standard Useful Life: 25 years Remaining Life: 25 years Notes: Record drawings shows incorrect 250 HP ratings. Large Pumps not on generator power. Could not access internal to verify model and ratings. Update record drawings to reflect correct horsepower. Provide backup power for fire pumps.	
Comments		



Mechanical Systems

Asset: EQU-000221, Pump_Rowe Ave Reservoir #2

Asset Class	Size/Material	Purchase Year
PUMP Horizontal Split-Case	40 hp	1969 (Original Install - est.)
Manufacturer	Volts/Amps/HP/Speed	
FAIRBANKS MORSE	40 hp	
Model	Duty (gpm) / Duty (TDH)	
5824		
Serial Number	Condition Rating: 3	
	Performance Rating: 3	
	Standard Useful Life: 30 years	
	Remaining Life: 0 years	
Comments	Notes: Nameplate painted over.	



Asset: EQU-000419, Motor_Rowe Ave Reservoir #2

Subcomponent to: EQU-000221

Asset Class	Size/Material	Purchase Year
MOTR Motor (Over 20 HP)	40 hp	1969 (Original Install - est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
US, R3578	440 V, 46 A, 40 hp, 1765 RPM	
Serial Number		
3893583		
Comments		
Premium Efficiency/Inverter Duty		



Mechanical Systems

Asset: EQU-000223, Pump_SamBrannon Reservoir #2

Asset Class	Size/Material	Purchase Year
PUMP Horizontal Split-Case	40 hp	1969 (Original Install - est.)
Manufacturer	Volts/Amps/HP/Speed	
FAIRBANKS MORSE	40 hp, 1750 RPM	
Model	Duty (gpm) / Duty (TDH)	
5824	760 gpm, 148 ft	
Serial Number	Condition Rating: 3	
K21022929	Performance Rating: 4	
Comments	Standard Useful Life: 30 years	
	Remaining Life: 0 years	
	Notes: Hard to find parts, bearings must be repaired often. Asset has reached end of useful life and should be replaced. Replace pumps with new horizontal split-case pumps unless replacing all mechanical and piping at station, operators would prefer higher efficiency vertical turbine pumps. Sprays water when running due to packing seals needing re-packing frequently.	



Asset: EQU-000421, Motor_SamBrannon Reservoir #2

Subcomponent to: EQU-000223

Asset Class	Size/Material	Purchase Year
MOTR Motor (Over 20 HP)	40 hp	1969 (Original Install - est.)
Manufacturer/Model	Volts/Amps/HP/Speed	
US	440 V, 40 hp, 1765 RPM	
Serial Number	Condition Rating: 4	
	Performance Rating: 3	
Comments	Standard Useful Life: 30 years	
	Remaining Life: 5 years	
	Notes: Nameplate illegible. Motor Assembly rusted & not in good shape. 40C rated motors; no cooling or ventilation - temperatures exceeding rating is likely. Replace in-kind.	





REXEL 3003 SCM SACRAMENTO
 1534 NORTH MARKET BLVD
 SACRAMENTO, CA 95834-1960
 916-928-9700
 Fax 916-928-6049

Attachment 2



Quotation

07/29/2020	S128446428	1 of 2

QUOTE TO:

CITY OF YUBA CITY
 1201 CIVIC CENTER BLVD
 YUBA CITY, CA 95993-3005

SHIP TO:

CITY OF YUBA CITY
 302 BURNS DR
 YUBA CITY, CA 95991-7205

CUSTOMER NUMBER	CUSTOMER PHONE#	ORDERED BY	SALESPERSON	
347107			Inga Kalnins Peterson 3003	
WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
William Gwinnup 3003	SH31	.5% 10, Net 30	07/29/2020	No
ORDER QTY	DESCRIPTION		UNIT PRICE	EXT PRICE
	<div style="border: 1px solid black; padding: 5px;"> <p>Many Rexel USA manufacturing partners have advised that until further notice they reserve the right to amend the delivery date, the price, the scope or quantity of supply and/or other terms and conditions set out in their offer or quotation to the extent affected by the COVID-19 pandemic. Be advised that Rexel USA considers any COVID-19 related changes imposed by manufacturers as outside its reasonable control and subject to Force Majeure provisions.</p> </div>			
1ea	AB 20F1AND248JA0NNNNN POWERFLEX 753 AC PACKAGED DRIVE Pn: 1152294 UPC: 88950855507		17897.772/EA	17897.77
1EA	AB 20-HIM-C6S PFLEX 20 IP66-UL NEMATYPER 4X-12 20HIM-C6 Pn: 44914 UPC: 82091995997		290.734/EA	290.73
1EA	AB 20-750-ENETR POWERFLEX 750 ETHERNET-IP ADAPTER Pn: 446929 UPC: 88495129093		524.203/EA	524.20

** Continued on Next Page *



Quotation

REXEL 3003 SCM SACRAMENTO
 1534 NORTH MARKET BLVD
 SACRAMENTO, CA 95834-1960
 916-928-9700
 Fax 916-928-6049

QUOTE DATE	QUOTE NUMBER	PAGE NO.
07/29/2020	S128446428	2 of 2
CUST PO#:		
JOB/REL#:		

QUOTE TO:

CITY OF YUBA CITY
 1201 CIVIC CENTER BLVD
 YUBA CITY, CA 95993-3005

SHIP TO:

CITY OF YUBA CITY
 302 BURNS DR
 YUBA CITY, CA 95991-7205

CUSTOMER NUMBER	CUSTOMER PHONE#	ORDERED BY	SALESPERSON	
347107			Inga Kalnins Peterson 3003	
WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
William Gwinnup 3003	SH31	.5% 10, Net 30	07/29/2020	No
ORDER QTY	DESCRIPTION		UNIT PRICE	EXT PRICE
1EA	AB 20-750-2262D-2R POWERFLEX 750 115V AC IO OPTION MODULE Pn: 58589 UPC: 88495106254		281.924/EA	281.92
1ea	TSI KLR250ACB KLR 480V 250A 200HP 3 PHASE OPEN INPUT LINE REACTOR UL RECOGNIZED 6-8 day lead / plus frt Pn: 1687011 UPC:		1420.574/EA	1420.57
1ea	TSI V1K250A00 V1K 480V 250A 3 PHASE OPEN DV/DT OUTPUT FILTER UL LISTED 6 day lead / plus frt Pn: 1213616 UPC:		1525.169/EA	1525.17

All sales transactions are subject to credit approval. Any quotation and all transactions with Rexel are conditioned upon Rexel's Terms and Conditions of Sale located at <http://www.rexelusa.com/terms>. Quotation is valid for 30 days after the date of issue unless otherwise specified. Items subject to governmental tariffs effective on or after quotation will be price in effect at time of shipment unless otherwise specified. Quotation for commodity items is valid for the day of the quote only unless otherwise specified. All applicable taxes will be itemized and charged at the time of sale. Returns may be subject to a restocking fee particularly if returned beyond 90 days from original purchase date. Returns for special orders are subject to vendor authorization before return can be processed.

Subtotal	21940.36
S&H Charges	0.00
Sales Tax	1590.68
Total	23531.04

Attachment 1

William Jow

From: Rene Garcia
Sent: Friday, February 19, 2021 10:29 AM
To: William Jow
Cc: Terrance Pioro; Lance Andes
Subject: FW: OEM Replacement Fairbanks Morse (Pentair) 4" Figure 5824 Horizontal Splitcase Pump

Here is the pump and motor information.



Rene Garcia | WTP Maintenance Supervisor
City of Yuba City | Water Treatment Plant
701 Northgate Dr | Yuba City, CA 95991
Phone (530) 822-4826 Ext.3405 | Fax 530) 822-4739 | rgarcia@yubacity.net

From: James MacNichols <jmsquaredassociates@gmail.com>
Sent: Friday, February 19, 2021 10:15 AM
To: Rene Garcia <rgarcia@yubacity.net>
Subject: OEM Replacement Fairbanks Morse (Pentair) 4" Figure 5824 Horizontal Splitcase Pump

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

1. **4" 5824 Split Case BARE dimensional, piping and hydraulic replacement is a total OF \$16,129.00 distributor net; Lead time is 16 weeks after the order is approved; this includes:**

- **Cast Iron Casing Assembly**
- **Cast Iron Casing Wear Ring**
- **Steel Pump Shaft**
- **SS Shaft Sleeve (Bronze Shaft Sleeve was provided on original quote)**
- **Bronze Impeller**
- **Bronze Impeller Wear Ring**
- **Packing Box Assembly**
- **Steel Base (Cast Iron Base was provided on original quote)**
- **Motor is 40 HP Horizontal Motor; WP1; 1800 RPM;3PH/60HZ/460V ; Premium Efficiency; 324T**

Total Lot: \$24929.00

Notes/Clarifications:



JM SQUARED ASSOCIATES, Inc.
Manufacturer Representatives Since 1963

James "Jimmy" MacNichols

P.O. Box 317

Concord, CA 94522

Office: (925)798-2500

Direct: (415)666-6151

jm@jmsquared.com

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