	SUBJECT: APPENDIX J – SOLE SOURCE JUSTIFICATION FORM	Approval Date 1/1/2018
	DIVISION AND POLICY NUMBER PURCHASING	Revision Date N/A

COMMODITY OR SERVICE Drilling/Construction Services for Wells 27R and 231

VENDOR Hydro Resources Rocky Mountain Region

AMOUNT OF PURCHASE \$ 3,505,877.00

REQUESTORS NAME Heather Justus


DEPARTMENT Castle Rock Water

DEPARTMENT DIRECTOR's Approval Mark Marlowe ✓

Digitally signed by Mark Marlowe
DN: cn=Mark Marlowe, o=Castle Rock Water,
email=mmarlowe@crgov.com, c=US
Date: 2019.09.26 11:33:39 -0600

FINANCE DEPARTMENT's Approval Christie Guthrie ✓

Digitally signed by Christie Guthrie
DN: cn=Christie Guthrie, o=Town of Castle Rock, ou=Finance
Department, email=cguthrie@crgov.com, c=US
Date: 2019.10.01 17:24:17 -0600

TOWN MANAGER's (or Designee) Approval 

PURCHASING POLICY EXCEPTION ITEM	CHECK ONE
1. Item(s) or service has been formally awarded to a vendor by the State of Colorado, MAPO, or other cooperative purchasing group and the product meets the needs of the Town of Castle Rock.	<input type="checkbox"/>
2. The product or service is of a unique nature, or allows for standardization with existing equipment and will provide exceptional value to the Town of Castle Rock.	<input checked="" type="checkbox"/>
3. Emergency purchases where the well-being of the citizens, employees or Town property may be endangered if the purchase is delayed.	<input checked="" type="checkbox"/>
4. Town of Castle Rock currently has a contract in place with a vendor for like products or services and the compatibility and/or continuity of those products or services are paramount to the success of the department or Town function.	<input checked="" type="checkbox"/>

Per Municipal Code 3.02.060:

Purchases over \$1,000 and up to \$5,000 require three (3) verbal bids unless approved by the Town Manager on the basis of sole source, emergency or unresponsive bidder.

Purchases over \$5,000 and up to \$75,000 require three (3) informal written bids unless approved by the Town Manager on the basis of sole source, emergency or unresponsive bidders.

Purchases over \$75,000 require formal written sealed bids unless waived by the Town Council on the basis of sole source, emergency or unresponsive bidders.

The requesting department must provide written justification in addition to the one bid/quote to the Finance Department for review and forward it to the Accounting Manager. **Attach additional sheets as necessary.**

The last few years Castle Rock Water has worked diligently to replace and update aging well infrastructure. This year CRW recommends the redrill of well CR-27 and drill a new well that will replace well CR-49. In 2018, CRW requested proposals from qualified drillers for the construction of Wells 15R and 16R, Hydro Resources was awarded the bid based on their bid submittal. In addition, Hydro Resources successfully completed the Arapahoe Well CR-227 despite difficult conditions. Currently, Hydro Resources is completing the final items on the Lanterns Well Project. The wells were drilled and a temporary facility was in place in time to meet peak demands if needed. In addition, Hydro was awarded similar past projects through the RFP process. They have provided great value to the Town by completing the scope of work at or under budget.

CRW staff identified the need to replace two wells that serve the Meadows treatment plant. Staff requested Hydro to provide a proposal which is attached. A comparison of the Lantern's proposal to this proposal shows a 2% increase in costs for the base bid items and a 4% decrease in the mandatory alternate bid items which. The increases are due to increase in labor and fuel costs and in vendor product increases. Staff recommends that due to the past value that Hydro has provided and the time sensitivity +



September 23, 2019

**To: Town of Castle Rock
Castle Rock Water**

ATTN: Heather Justus – Water Resources Project Manager

Project: Arapahoe Well 27R and Well 231 Well Drilling and Pump Installation

Ms. Justus,

Hydro Resources (HR) is pleased to present the following proposal for well drilling and pump services for the Arapahoe Well 27R and Well 231 Project. Hydro Resources looks forward to another opportunity to team with Castle Rock and Leonard Rice Engineers on a successful drilling project. HR has reviewed the specifications and bid parameters provided by Leonard Rice and has reviewed both drilling sites with our operations group. HR wishes to outline our understanding of the scope of work.

Before reviewing the project details, HR would first like to stress our commitment to providing Castle Rock with a company committed to making Health & Safety our number one priority on this project. HR has broken down the proposal into the following units:

- I. Key Equipment to be supplied to the Project
- II. Technical Approach
- III. Unit Cost Breakdown

I. Key Equipment to be supplied to the Project

HR intends to mobilize the following equipment to the Castle Rock site:

- The primary drilling rig will be a Challenger 320 drilling rig or equivalent. The Challenger 320 rig has a 72' mast rated at 150,000 lbs. with an 18" Howard Turner rotary table.
- The rig will be equipped with 2000 ft of appropriate-sized drill pipe, a Sullair 900 CFM compressor and a Sullair 375 CFM compressor. HR has assumed a support truck for pipe and miscellaneous parts to complete the work.
- The drilling package includes a three-man drilling crew working 24 hours per day.
- HR will provide a pump rig for test pumping activities.
- HR has included sound walls and site development necessary at both drilling sites.



The equipment listed above will be dedicated to this project on a full-time basis and all the equipment is up to date with annual inspections and certifications.

II. Technical Approach

HR is providing the following summary of our technical approach regarding expected geology and drilling plan.

Well Drilling & Pump Installation

- HR will submit the GESC plans for each site.
- The Challenger 320 rig will be mobilized to the site and set up over the first well site (Well 27R).

Well 27R - Drilling

- 30' sound walls and a gate will be installed around the drill rig by the nearest residences.
- A 30" conductor casing will be installed to approximately 40'.
- The rig will drill a 20" hole from the surface to 1,685'.
- Perform geophysical log to determine screen interval.
- Install .035 slot screen and 12" casing to the surface. The casing will be a combination of stainless steel and carbon steel.
- Install filter pack (SiLi beads) with a 10' fine sand plug. Pressure grout casing with neat cement and bentonite grout in the annular seal to surface.
- Development of well to include circulation, airlift, and jetting.
- Install temporary test pump, perform development pumping, step testing, and 72-hour continuous pump test. Remove test pump equipment and perform final disinfection.
- Perform video survey of the well.
- Remove pump equipment and abandon existing Well 27.
- Demobilize rig and restore site.

Well 27R – Permanent Equipment

- HR will work with Castle Rock and Leonard Rice following the well test pumping and develop the design of the permanent pump equipment. For the initial bid, HR has included the following equipment:
 - 1ea SH13000-18 Stg Summit Subm. Pump (325GPM@1500ft)
(Final TDH, set depths, to be determined upon completion of drilling and Testing)
 - 1ea 180HP Summit Motor 2290V/43A
 - 1ea 513 BSBSL Monel Shaft Aflas Bag, SLUM, HD Water Well
 - 1ea Motor Lead w/factory splice

- 1ea 10" Baski Deep Well Pitless Adpt. 6.5ft bury 4.5" Column/6" Discharge w/4-
Restraints
- 1ea 4.5" Stainless DW Flowmatic Check Valve w/ko
- 1ea 8" 304SS Motor Cooling Shroud
- ±1800ft #4SOL w/6 grnd. Subm. Cable 5kv Galv. Armored (~100ft to stepup transformer)
- ±1700ft 4.5" 304SS Column Pipe (20ft) 8Round w/304SS Coupling
- ±1700ft 1 ¼" PVC Motor Tube
- ±1700ft ¼" Dbl Nylon Airline
- ±1730ft 500PSI Transducer w/SS Cable
- (Lot) Service Supplies - Tape, banding, HTH, etc.

#27R Electrical Gear

- 1ea VSD Summit, 6P 217Kva, 261A Nema 4 (Supply Only)
- 1ea HGP Input Harmonic Filter 302A (Supply Only) 5% THD
- 1ea 210Kva Southwest Electric Stepup Transformer (Supply Only)
- (Lot) Service Supplies - Tape, banding, HTH, etc.

Well 231 - Drilling

- 30' sound walls and a gate will be installed around the drill rig by the nearest residences.
- A 30" conductor casing will be installed to approximately 40'.
- The rig will drill a 20" hole from the surface to 1,705'.
- Perform geophysical log to determine screen interval.
- Install .035 slot screen and 12" casing to the surface. The casing will be a combination of stainless steel and carbon steel.
- Install filter pack (SiLi beads) with a 10' fine sand plug. Pressure grout casing with neat cement and bentonite grout in the annular seal to surface.
- Development of well to include circulation, airlift, and jetting.
- Install temporary test pump, perform development pumping, step testing, and 72-hour continuous pump test. Remove test pump equipment and perform final disinfection.
- Perform video survey of the well.
- Demobilize rig and restore site.

Well 231 – Permanent Equipment

- HR will work with Castle Rock and Leonard Rice following the well test pumping and develop the design of the permanent pump equipment. For the initial bid, HR has included the following equipment:
 - 1ea SH13000-18 Stg Summit Subm. Pump (325GPM@1500ft)
(Final TDH, set depths, to be determined upon completion of drilling and Testing)
 - 1ea 180HP Summit Motor 2290V/43A
 - 1ea 513 BSBSL Monel Shaft Aflas Bag, SLUM, HD Water Well
 - 1ea Motor Lead w/factory splice
 - 1ea 10" Baski Deep Well Pitless Adpt. 6.5ft bury 4.5" Column/6" Discharge w/4-Restraints
 - 1ea 4.5" Stainless DW Flowmatic Check Valve w/ko
 - 1ea 8" 304SS Motor Cooling Shroud
 - ±1800ft #4SOL w/6 grnd. Subm. Cable 5kv Galv. Armored (~100ft to stepup transformer)
 - ±1700ft 4.5" 304SS Column Pipe (20ft) 8Round w/304SS Coupling
 - ±1700ft 1 ¼" PVC Motor Tube
 - ±1700ft ¼" Dbl Nylon Airline
 - ±1730ft 500PSI Transducer w/SS Cable
 - (Lot) Service Supplies - Tape, banding, HTH, etc.

Well #231 Electrical Gear

- 1ea VSD Summit, 6P 217Kva, 261A Nema 4 (Supply Only)
- 1ea HGP Input Harmonic Filter 302A (Supply Only) 5% THD
- 1ea 210Kva Southwest Electric Stepup Transformer (Supply Only)
- (Lot) Service Supplies - Tape, banding, HTH, etc.

III. Unit Cost Breakdown

HR has attached Bid Schedules for Well 27R and Well 231 for your review. We have also attached the preliminary pump curves for the permanent pumping equipment.

Clarifications:

- HR has assumed access for the drill rig (level site, approx. 150' x 200').
- HR has included all fuel costs.
- HR has included removal and disposal of drilling mud and drill cuttings for both sites.
- The Drilling Derived Waste assumed to be non-hazardous waste and has been assumed to be hauled from each site and disposed of.
- HR has included an allowance for water hauling. The engineer/city will provide a source of water.
- The bid is a complete package and cannot be modified without prior written authorization from HR. Also, this is an estimate and the final invoice will reflect actual quantities utilized in the field which are properly documented multiplied by the unit rates quoted.
- A mutually agreeable written contract will be negotiated prior to mobilization.
- HR has assumed working 24 hours a day

We are confident that the Town of Castle Rock will be impressed with our professional water supply services and look forward to the opportunity to team with the community on this exciting project. Please contact our office at your earliest convenience with any questions or concerns you may have.

Sincerely,

Hydro Resources

Jason Barnum

Jason Barnum
Business Development Manager
Rocky Mountain and West Regions
jbarnum@hydroresources.com

BID SCHEDULE
Arapahoe Well 27R

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENSION
1	Wellhead Completion	L.S.	1	\$ 1,000.00	\$ 1,000.00
2	Mobilization and Cleanup	L.S.	1	\$ 176,000.00	\$ 176,000.00
3	Drilling 20.0-inch Diameter	L.F.	1685	\$ 116.00	\$ 195,460.00
4	Casing				-
	a. 30-inch Diameter Conductor	L.F.	40	\$ 400.00	\$ 16,000.00
	b. 12-inch Diameter Carbon Steel	L.F.	900	\$ 76.00	\$ 68,400.00
	c. 12-inch Diameter Stainless Steel	L.F.	380	\$ 260.00	\$ 98,800.00
5	Well Screen Assembly	L.F.	390	\$ 215.00	\$ 83,850.00
6	Gravel Pack				-
	a. 8-12 Silica Sand	L.F.	10	\$ 32.00	\$ 320.00
	b. 4508R Glass Beads (10-8)	M.T.	34	\$ 2,750.00	\$ 93,500.00
7	Grout Seal	L.F.	1250	\$ 48.00	\$ 60,000.00
8	Well Development				-
	a. Circulation and airlift	HR.	52	\$ 613.00	\$ 31,876.00
	b. Jetting	HR.	30	\$ 600.00	\$ 18,000.00
9	Geophysical Logging				-
	a. resistivity, single point resistance, natural gamma, and caliper, at a minimum	L.S.	1	\$ 9,500.00	\$ 9,500.00
	b. Nuclear Magnetic Resonance Logging (24 inch minimum investigation radius)	L.S.	1	\$ 40,000.00	\$ 40,000.00
10	Well Pumping Test Tests Supply & Install Equipment	L.S.	1	\$ 34,500.00	\$ 34,500.00
	a. 8 - hour Step Test	L.S.	1	\$ 2,600.00	\$ 2,600.00
	b. 72- hour Pumping test	L.S.	1	\$ 21,600.00	\$ 21,600.00
11	Disinfection	L.S.	1	\$ 1,430.00	\$ 1,430.00
12	Video Survey	L.S.	1	\$ 1,450.00	\$ 1,450.00
13	Video Survey - Additional Pass	L.S.	1	\$ 1,450.00	\$ 1,450.00
15	Provide Submersible Pump & Equip (Include description)	L.S.	1	\$ 166,850.00	\$ 166,850.00
16	Nominal 4.5 inch Pump Column Drop Pipe	L.S.	1	\$ 187,000.00	\$ 187,000.00
17	Install Submersible Pump & Equipment	L.S.	1	\$ 15,110.00	\$ 15,110.00
18	Adjustable Frequency Drives (Include description)	L.S.	1	\$ 72,500.00	\$ 72,500.00
					\$ 1,397,196.00

DRILLING TOTAL (IN WORDS)

one million three hundred ninety-seven thousand one hundred ninety-six & 9/100 dollars.

BID SCHEDULE 27R
MANDATORY ALTERNATE ITEMS (Must be bid)

<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>EXTENSION</u>
Remove pumping equipment and Abandon Existing well	L.S.	1	\$ 44,200.00	\$ 44,200.00
GESC Permitting and Implementation	L.S.	1	\$ 10,000.00	\$ 10,000.00
Drilling Mud/Fluids Removal	L.S.	1	\$ 22,250.00	\$ 22,250.00
Drilling Cuttings Removal	L.S.	1	\$ 13,250.00	\$ 13,250.00
Drilling Hourly Rate (Lost Circulation)	HR	1	\$ 650.00	\$ 650.00
Drilling Hourly Rate (Slow Penetration Rate)	HR	1	\$ 650.00	\$ 650.00
Road Maintenance (Track pad, road sweeping, mud removal)	L.S.	1	\$ 8,500.00	\$ 8,500.00
Step up Transformer	L.S.	1	\$ 19,100.00	\$ 19,100.00
One hour coordination meetings	HR	2	\$ 250.00	\$ 500.00
Water Supply provide backflow meter Allowance (Reimbursed based on actual cost; provide copy of invoice)	Allowance	1	\$ 10,000.00	\$ 10,000.00
Startup at facility completion	L.S.	1	\$ 5,200.00	\$ 5,200.00
Sound Mitigation <i>Include description</i>	L.S.	1	\$ 96,000.00	\$ 96,000.00
<u>Arapahoe Well 27R Extended Conductor Casing Alternative</u>				
Drilling 26-inch Diameter	L.F.	485	\$ 200.00	\$ 97,000.00
Casing (24-inch)	L.F.	485	\$ 185.00	\$ 89,725.00
				\$ 417,025.00

MANDATORY ALTERNATE ITEMS TOTAL (IN WORDS)

four hundred
seventeen thousand twenty five 1/4 % dollars

BID SCHEDULE
Araphoe Well 231

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENSION
1	Wellhead Completion	L.S.	1	\$ 1,000.00	\$ 1,000.00
2	Mobilization and Cleanup	L.S.	1	\$ 176,000.00	\$ 176,000.00
3	Drilling 20.0-inch Diameter	L.F.	1705	\$ 116.00	\$ 197,780.00
4	Casing				-
	a. 30-inch Diameter Conductor	L.F.	40	\$ 400.00	\$ 16,000.00
	b. 12-inch Diameter Carbon Steel	L.F.	900	\$ 76.00	\$ 68,400.00
	c. 12-inch Diameter Stainless Steel	L.F.	340	\$ 260.00	\$ 88,400.00
5	Well Screen Assembly	L.F.	450	\$ 215.00	\$ 96,750.00
6	Gravel Pack				-
	a. 8-12 Silica Sand	L.F.	10	\$ 32.00	\$ 320.00
	b. 4508R Glass Beads (10-8)	M.T.	34	\$ 2,750.00	\$ 93,500.00
7	Grout Seal	L.F.	1230	\$ 48.00	\$ 59,040.00
8	Well Development				-
	a. Circulation and airlift	HR.	52	\$ 613.00	\$ 31,876.00
	b. Jetting	HR.	30	\$ 600.00	\$ 18,000.00
9	Geophysical Logging				-
	a. resistivity, single point resistance, natural gamma, and caliper, at a minimum	L.S.	1	\$ 9,750.00	\$ 9,750.00
	b. Nuclear Magnetic Resonance Logging (24 inch minimum investigation radius)	L.S.	1	\$ 40,000.00	\$ 40,000.00
10	Well Pumping Test Tests Supply & Install Equipment	L.S.	1	\$ 34,500.00	\$ 34,500.00
	a. 8 - hour Step Test	L.S.	1	\$ 2,600.00	\$ 2,600.00
	b. 72- hour Pumping test	L.S.	1	\$ 21,600.00	\$ 21,600.00
11	Disinfection	L.S.	1	\$ 1,430.00	\$ 1,430.00
12	Video Survey	L.S.	1	\$ 1,450.00	\$ 1,450.00
13	Video Survey - Additional Pass	L.S.	1	\$ 1,450.00	\$ 1,450.00
15	Provide Submersible Pump & Equip (Include description)	L.S.	1	\$ 166,850.00	\$ 166,850.00
16	Nominal 4.5 inch Pump Column Drop Pipe	L.S.	1	\$ 187,000.00	\$ 187,000.00
17	Install Submersible Pump & Equipment	L.S.	1	\$ 15,110.00	\$ 15,110.00
18	Adjustable Frequency Drives Include description	L.S.	1	\$ 72,500.00	\$ 72,500.00
				\$	1,401,306.00

DRILLING TOTAL (IN WORDS)

one million four hundred one thousand three hundred six & 00/100 dollars

BID SCHEDULE 231
MANDATORY ALTERNATE ITEMS (Must be bid)

<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>EXTENSION</u>
GESC Permitting and Implementation	L.S.	1	\$ 10,000.00	\$ 10,000.00
Drilling Mud/Fluids Removal	L.S.	1	\$ 22,250.00	\$ 22,250.00
Drilling Cuttings Removal	L.S.	1	\$ 13,250.00	\$ 13,250.00
Drilling Hourly Rate (Lost Circulation)	HR	1	\$ 650.00	\$ 650.00
Drilling Hourly Rate (Slow Penetration Rate)	HR	1	\$ 650.00	\$ 650.00
Road Maintenance (Track pad, road sweeping, mud removal)	L.S.	1	\$ 8,500.00	\$ 8,500.00
Step up Transformer	L.S.	1	\$ 19,100.00	\$ 19,100.00
One hour coordination meetings	HR	2	\$ 250.00	\$ 500.00
Water Supply provide backflow meter Allowance (Reimbursed based on actual cost; provide copy of invoice)	Allowance	1	\$ 10,000.00	\$ 10,000.00
Startup at facility completion	L.S.	1	\$ 5,200.00	\$ 5,200.00
Sound Mitigation <i>Include description</i>	L.S.	1	\$ 76,750.00	\$ 76,750.00
<u>Arapahoe Well 231 Extended Conductor Casing</u>				
<u>Alternative</u>				
Drilling 26-inch Diameter	L.F.	325	\$ 200.00	\$ 65,000.00
Casing (24-inch)	L.F.	325	\$ 180.00	\$ 58,500.00
				\$ 290,350.00

MANDATORY ALTERNATE ITEMS TOTAL (IN WORDS)

two hundred ninety thousand three hundred fifty & 00/100 dollars

Water Well



Client:	Town of Castle Rock	Client Name:	
Address 1:		E-Mail:	
Address 2:		Office Phone:	
City:		Cell Phone:	
State:		Job Number:	Wells 27R & 231
Zip:		Date:	September 20, 2019

Tubing Size:	4 1/2" x 10.5 (lb/ft)		Target Freq:	60.0	Hz
Casing Size:	10 3/4" x 40.5 (lb/ft)		Pump:	SH13000 AR	
Temp:	70	Degree F	# Of Stages:	18	
Pump Depth:	1650	Feet	Stage Required	18	
TDH:	1500	Feet	Motor Seal:	513-BsBsL-HL	
Min Flow:	150	GPM	Motor:	562 - 180 HP, 2290 V, 43 A	
Target Flow:	325	GPM	Mtr Required	176 HP at 60 Hz. Rating	
Max Flow:	350	GPM	Cable Size:	2 AWG	
VFD Increments	5	Hertz	VFD	217 KVA, 480 V, 261A	
Max Surface KVA				164	

Results

	Min Flow 150 GPM	Target Flow 325 GPM	Max Flow 350 GPM
Frequency	55.2	60.0	60

Pump

Pump Power	105 HP (79 kW)	165 HP (123 kW)	171 HP (127 kW)
HSG Burst	Std 21.3% (HS 17.8%)	Std 25.2% (HS 21%)	Std 25.2% (HS 21%)
Shaft Load	Std 15.9% (HS 9.7%)	Std 22.9% (HS 13.9%)	Std 23.7% (HS 14.5%)
Max Thrust	709 Lbs	837 Lbs	837 Lbs

Motor Seal

Shaft Load	Std 18.2% (HS 10.9%)	Std 26.2% (HS 15.7%)	Std 27.2% (HS 16.3%)
Thrust Load	19.5 %	19.5 %	19.5 %
Fluid Expansion	122.8 %	159.8 %	164.5 %

Motor

Op Load	63.7%	91.4%	94.9%
Skin Temp	72.9 F (22.7 C)	72.8 F (22.7 C)	72.9 F (22.7 C)

Cable

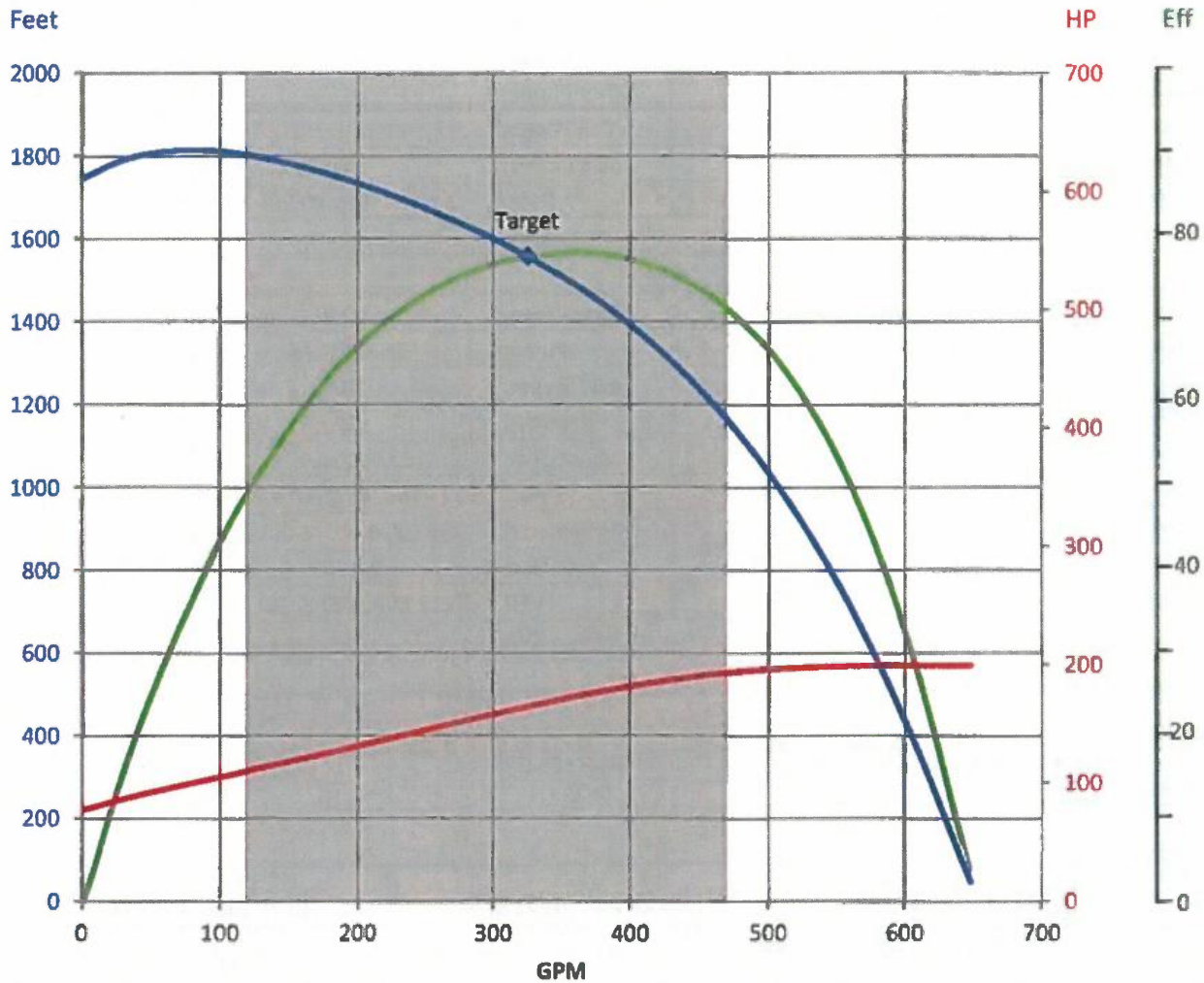
Volt Loss	13.2	19	19.8
Power Cost	0.6 kW (0.8 HP)	1.3 kW (1.7 HP)	1.3 kW (1.8 HP)

Surface

Volts	2120	2309	2310
KVA	101	158	164
kW/H	154	163	162



Summit SH13000 AR, 18 Stage, 3410 RPM



SH13000 AR - 60 Hertz Best Efficiency Point (BEP) Data

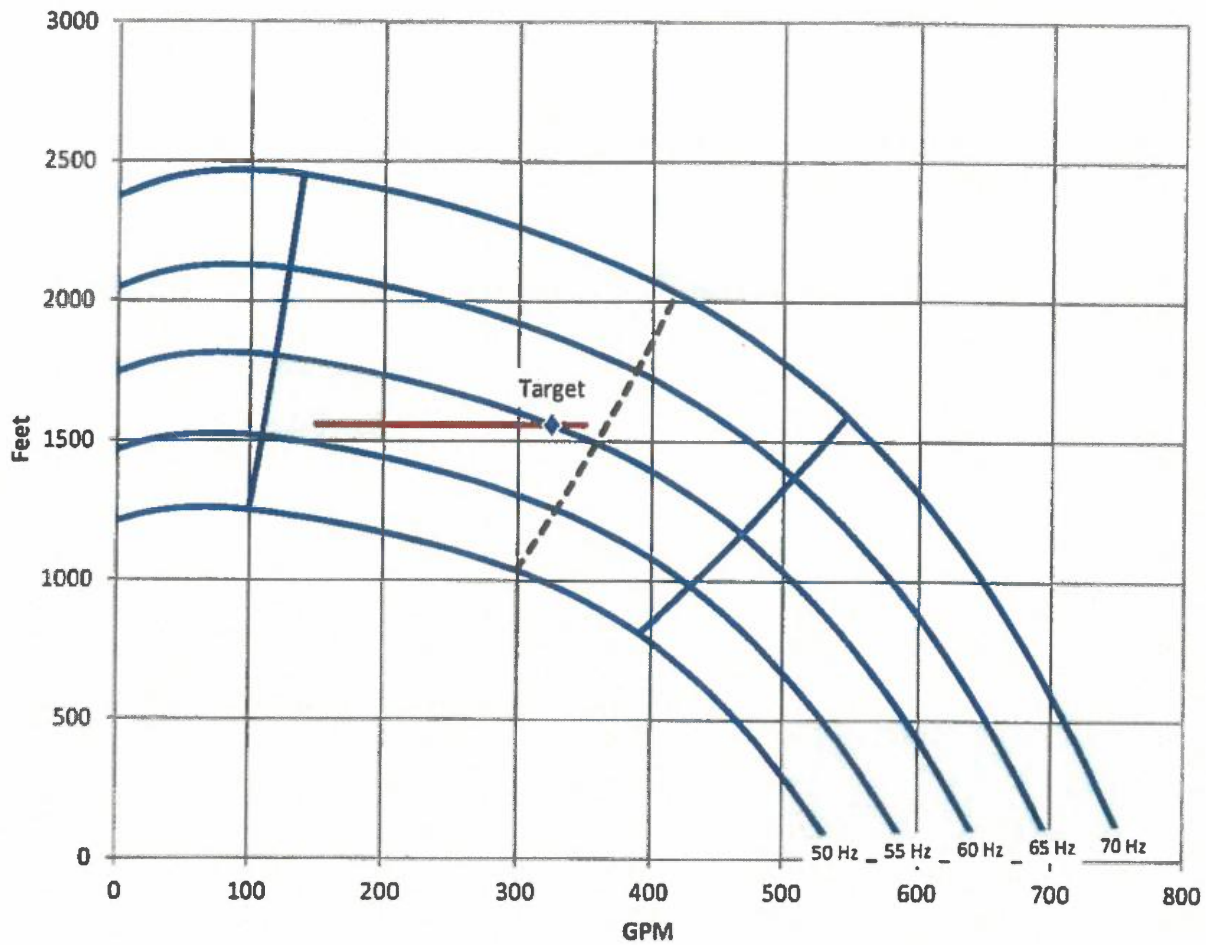
Optimum Flow Rate (GPM)	367.8	Power per Stage (HP)	10.40
Operating Range (GPM)	122.5 - 481.1	Efficiency (%)	78.3
Head per Stage (Feet)	87.4		

SH13000 AR - Engineering Data

Nominal Casing Size (Inch)	8 5/8	Rotational Direction	CCW
Housing Diameter (Inch)	6.75	Shaft Diameter (Inch)	1.187
Housing Pressure Limit (PSI)		Shaft Power Limit (HP)	
Standard	3000	Monel	720
High Pressure	3600	Inconel	1180
		Stage Type	Mixed



Summit SH13000 AR, 18 Stage, Multi Frequency Head



Summit SH13000 AR, 18 Stage, Multi Frequency Power

