



**SCV**  
**WATER**



# Chiller Replacement Rio Vista Treatment Plant

# Background

A chiller is a cooling system that removes heat by circulating heat-absorbing refrigerant through a series of mechanisms through which the heat is released. The essential components of a chiller are a compressor, condenser, expansion valve, and evaporator.

- Chiller has reached 20 + years life cycle
- Chiller has no capacity to sustain full or partial-loads
- Cost of maintenance has increased in the last five years roughly 15% or more

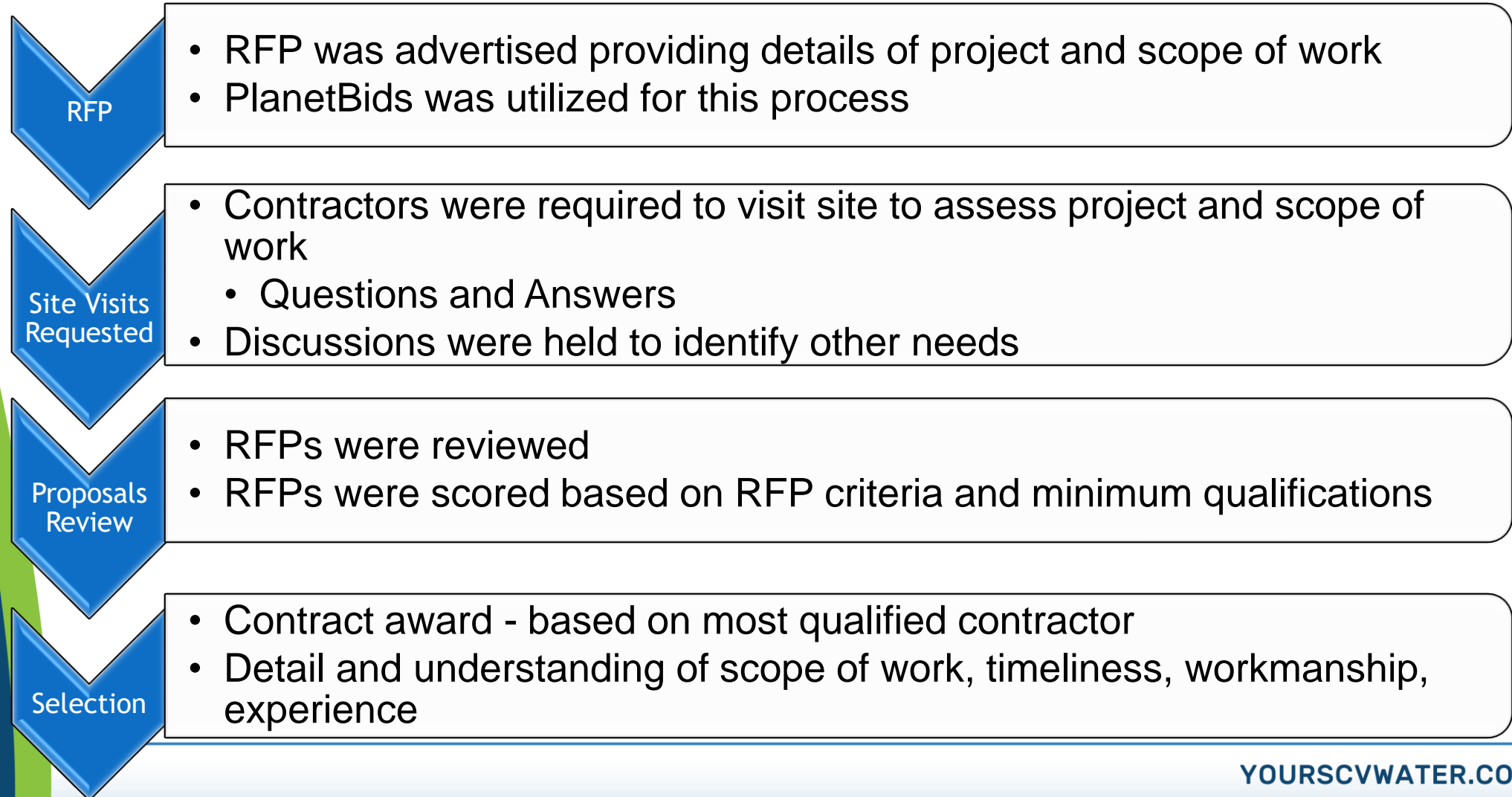




- Currently, the chiller is working with one circuit (i.e., 1 out of 2 compressors)
  - Working compressor operating at 50%
- Exposure to loud operation (i.e., noise decibels 95 (+) dB)
- No energy efficiency EER = 13.2 or 0.95 kw/T
- Refrigerant phase-out R22



# RFP Process





# Proposed Work

- Replace Existing Chiller with a high energy efficient and oil-free unit
- New Chiller to have Redundancy
- Reaching efficiencies up to **37.41** ERR at full load and **25** ERR partial-load
- Expandability
- Quiet Operation
- Compatibility with BAS (Building Automation System)
- Use Environmentally Friendly Refrigerant



**Energy Cost Savings.** Achieve energy efficiency with truly tailored turndown to your exact load requirements – no more, no less. Achieve energy efficiency up to 25% or 0.63 Kw/T

# Refrigerants

- EPA has banned the manufacture of new equipment that contains R-22 refrigerant
  - R-22 remains available for servicing equipment made before 2010. Supplies of R-22 will become more limited which is causing prices to rise steeply.
- **Starting in 2023, new HVAC systems will no longer use R-410A**
  - Similar to R-22, for existing equipment, R410-A will be available, but as R410-A production gets gradually reduced and phased out, the refrigerant will likely become harder to find and get more expensive.
- The EPA has recommended installing and replacing new AC or HVAC units with newer refrigerants or non-depleting ozone refrigerants, such as R-513A (XP10)

# Specifications

CONTRACTOR	CURRENT	EMCOR	ALLISON MECHANICAL	DIVERSIFIED THERMAL SERVICES
CHILLER MODEL/TYPE	YORK CHILLER	TURBOCOR CHILLER	MULTISTACK CHILLER	YORK LIKE-TO-LIKE
ENERGY EFFICIENCY RATIO (EER)*	12	37.41	29.4	16.9
INTEGRATED PART LOAD VALUE (IPLV) **	0.9	0.32	0.4	0.6
DECIBEL LEVEL	105dB	70dB	70dB	100dB
REFRIGERANT TYPE	R-22	R-513A	R-410A	R-410A

\*Higher EER better

\*\*IPLV Lower better





# EMCOR Cost and Installation

- Proposed cost \$ 541,100
- Installation of new equipment approximately 5-7days
  - Goal to install new unit from Th-Mon during the dark Friday week
- Install Exhaust System prior to chiller change out
- Quick project turn around
- Goal is to minimize chiller downtime





# Other Considerations

- Added contingencies to proposed cost of project
- Consider adjusting staff schedule for the duration of project to minimize cooling discomfort
- Add cost of SCV Buildings and Grounds support (Overtime)
  - Goal to is to have this work done during normal operation and off hours (including weekend and dark Friday)
- Quick project turn around



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# Other Units Proposed

- Allison Mechanical Inc.  
Multistack Modular Chiller



- Diversified Thermal Services  
York Chiller



# Recommendation

That the Finance and Administration Committee recommend the Board of Directors authorize the General Manager to enter into a Construction Contract with EMCOR in a not-to-exceed amount of \$541,100 for the chiller replacement at Rio Vista main administration building, for a total project cost of \$600,000.