



**CITY COUNCIL WORK SESSION
RICHFIELD MUNICIPAL CENTER, BARTHOLOMEW ROOM
AUGUST 13, 2019
6:00 PM**

Call to order

1. Richfield Ice Arena Refrigeration Project Information and Staff Recommendations

Adjournment

Auxiliary aids for individuals with disabilities are available upon request. Requests must be made at least 96 hours in advance to the City Clerk at 612-861-9738.



WORK SESSION

8/13/2019

REPORT PREPARED BY: Amy Markle, Recreation Services Director

DEPARTMENT DIRECTOR REVIEW: Amy Markle
8/6/2019

OTHER DEPARTMENT REVIEW: N/A

CITY MANAGER REVIEW: Katie Rodriguez, City Manager
8/7/2019

ITEM FOR WORK SESSION:

Richfield Ice Arena Refrigeration Project Information and Staff Recommendations

EXECUTIVE SUMMARY:

The City Council work session will focus on the Richfield Ice Arena Refrigeration Project including:

- The history of the facility and it's connection to the community.
- An understanding of the community groups that utilize the facility and the impacts this project may potentially have on them.
- Project need and associated costs.
- Project timeline and next steps.
- Staff recommendations to consider for an October 22 Council vote to decide what option to pursue with the project.

Staff's recommendations are:

- Complete the refrigeration project in 2020, signing quotes in November 2019 for the work to be done and to secure pricing.
- Plan community engagement efforts in August, September, and early October.
- Bring engagement responses back to the council for a final vote on the project on October 22.
- Fund both sheets of ice and building improvements that would allow for year-round ice and/or dry floor activities.
- Fund the project with a combination of sources including: golf course sale monies, budgeted capital monies, grants, and contributions from partner organizations.
- No longer use harmful R-22 refrigerant.
- See significant annual energy savings.

DIRECTION NEEDED:

Please review the attachments and either prepare comments/questions for discussion at the work session or send comments/questions to Amy Markle, Recreation Services Director, prior to the meeting by email at amarkle@richfieldmn.gov and they will be addressed at the work session.

BACKGROUND INFORMATION:

A. HISTORICAL CONTEXT

The Richfield Ice Arena was built in 1971. A second sheet of ice was added in 1999. The current equipment that both sheets of ice run-on are original. Both ice rinks have direct R-22 refrigeration system. R-22 is a chemical that is no longer being produced after the end of 2019. The price of existing R-22 is anticipated to increase sharply, and become obsolete over time. This problem is not unique to the Richfield Ice Arena, almost every arena in the state is facing the same issue.

B. POLICIES (resolutions, ordinances, regulations, statutes, etc):

The Environmental Protection Agency has mandated that all production of ozone-depleting HCFC-22 (R-22), stop December 31, 2019. Please see attachment.

C. CRITICAL TIMING ISSUES:

The following issues create a sense of urgency for the project:

- The cost of replacing one ice sheet vs. two: the second sheet adds approximately \$700,000 varying with annual construction labor wages.
- The cost of total project materials escalates every year by a minimum of 4%.
- The elimination of R-22 production will put the cost at the demand of the market.
- Every year we are losing/leaking R-22 and have to add roughly 500 lbs to keep our system operating efficiently.
- We are already seeing mechanical failures of pieces of equipment.
- Our prime location we continue to be in high demand for our ice time and facility.
- Timing of this project will be competitively bid by many arena contractors.

D. FINANCIAL IMPACT:

The current quote we have for the project costs are estimated at:

- 2020 construction- \$3.4M + \$400,000 building improvement costs (HVAC system, roof, and indoor turf)
- 2021 construction- \$3.5M + improvement costs
- 2022 construction- \$3.6M + improvement costs
- The project can be funded in a variety of ways including: capital funds that were already budgeted (\$430,000), golf course sale monies, grants, and organizational partnerships

E. LEGAL CONSIDERATION:

N/A

ALTERNATIVE(S):

The following are alternatives to staff's recommendations:

- Replace one refrigeration plant now and defer the second ice sheet to a future time.
- We run on the current system and incur financial, community, and environmental risks.

PRINCIPAL PARTIES EXPECTED AT MEETING:

ATTACHMENTS:

	Description	Type
□	Presentation	Backup Material
□	EPA Ice Rinks and R-22 Phaseout Information	Cover Memo

Richfield Ice Arena Refrigeration Renovation Plan



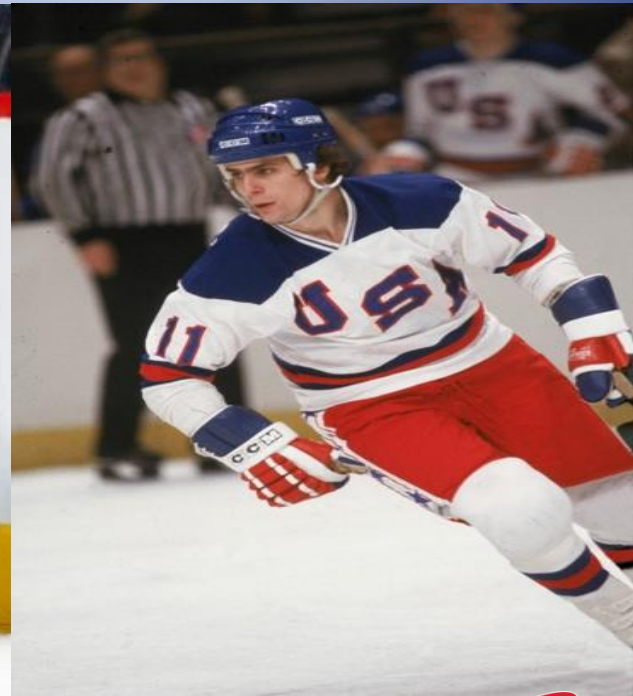
Work Session

Goals:

- Raise awareness of the Ice Arena project.
- Explain the history of the facility and it's connection to the community.
- Introduce groups that will be effected from the project.
- Explain the project including costs.
- Go through project timeline and next steps.

Richfield Ice Arena History and Rich Hockey Tradition

- Rink 1 was built in 1971 with a direct R-22 refrigeration system.
- Rink 2 was built in 1999 with a another direct R-22 refrigeration system.
- We have over 500,000 visitor's come through our doors every year.
- We are the home to many current and former NHL players.



We are the home to many organizations



MN Magicians and the NAHL

- The Minnesota Magicians starting playing here in 2013 and just finished their sixth season.
- We have an estimated 15-25 college and pro scouts attend each game.
- They gain us a national spotlight for our facility and give us other ice rental opportunities.
- Average attendance per game is around 800 and they typically have 28 home games from September thru April.
- Over 30 division 1 commitments and over 20 division 3 commitments.



Magicians Local Richfield Sponsorship

- Sheraton Four Points
- Local Roots
- My Burger
- Fireside
- Chipotle
- Domino's
- Giordano's
- Vinocopia



How does the Ice Arena benefit the city?

- Diversifying the use of the facility (i.e. Curling and Broomball) increases usage and exposure from youth to adults.
- Provide schools with field trip opportunities for ice skating or curling.
- Youth programs and tournaments from surrounding communities and outstate, all bring money into the community, restaurants, hotels and retail.
- Dry floor events or turf can add to the facility, creating a flexibility of usage.
- Expanding recreational opportunities and city wellness programs Richfield has to offer.
- One of the few facilities in our city that can generate high economic impact for the community.



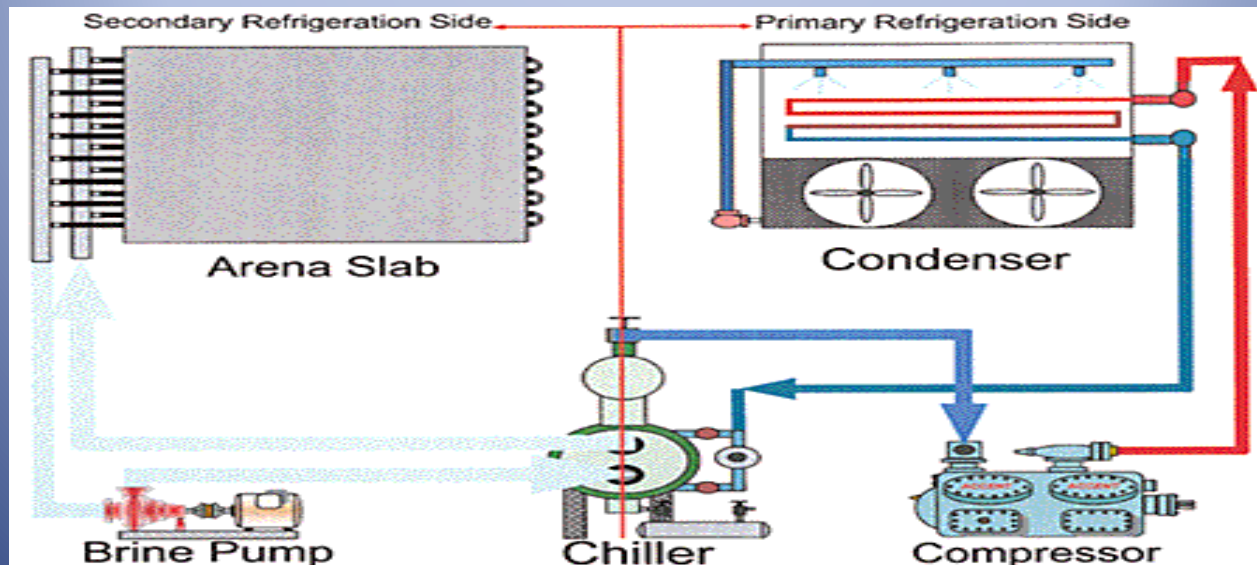
Why do we need to replace our refrigeration systems?

- Our current system is 48 years old and most of the piping is original to our building.
- They will no longer manufacture R-22 as of January 1st 2020
- The cost of used R-22 will rise over \$40 per pound in the coming years.
- We currently have over 7,000 pounds of R-22 in our two direct systems.
- Certain compressor parts are no longer made and costly modifications will need to be made.



What would happen if we had a major R-22 leak?

- It would cost over \$160,000 per ice sheet to equalize the system again by purchasing reclaimed R-22.
- We would pollute the environment with hazardous ozone depleting gas.
- Lose existing ice sheet revenue for weeks and potentially customers.
- Locating the leak is difficult, time consuming and costly.



Why is it important for us to renovate both ice sheets?

- We host 12-13 hockey tournaments a year. The company's and associations would no longer use our location because it would affect their profits.
- We would no longer be able to host major figure skating events or support curling.
- We will be using an environment friendly refrigerant to replace R-22.
- We will be able to use rink 1 and rink 2 for dry floor events such as craft shows, bean bag tournaments, wine tastings, 4th of July events, indoor soccer and lacrosse.
- Allows for skating and dry floor events simultaneously



Examples of Dry floor events



How much will the renovation save us in energy and chemicals yearly?

- We will save roughly \$30,000 per year on utilities each year.
- We will save roughly \$5,000 on chemicals each year.
- The new ammonia ice plant will save \$10,000-\$15,000 on maintenance costs compared to the old R-22 system.
- The new desiccant HVAC system will keep our facility clear of mold and provide a better ice service.



Projected cost of project

- 2020 construction cost 3.4 million + \$400,000 in improvements (HVAC system, roof, and dry-floor turf)
- 2021 estimated cost 3.5 million + improvements
- 2022 estimated cost 3.6 million + improvements
- Variety of potential funding scenarios:
 - Fully funded in the 2020 budget with golf course sale monies and planned Ice Arena capital improvements.
 - Will seek additional funding sources including: Mighty Ducks grant and private partnerships.

Sense of urgency for the Project

- Cost of replacing one ice sheet vs two, the second sheet only adds about \$700,000 varying with construction labor wages yearly.
- Cost of total project for materials escalates every year by a minimum of 4%.
- The elimination of R-22 production will put the cost at the demand of the market.
- Every year we are losing/leaking R-22 and have to add roughly 500lbs to keep our system operating efficiently.
- We are already seeing mechanical failures of pieces of equipment.
- Our prime location we continue to be in high demand for our ice time and facility.
- Timing of this project will be competitively bid by many arena contractors.



The Next Step

- Plan public engagement opportunities in late August, September, and October at the facility (open-houses at the arena, presentations, tours, and opportunity for discussion).
- Bring community feedback to the Council in early October.
- Ask Council to vote on October 22 to secure the quote for the work to be completed in 2020.

What are our options going forward?

***Option #1-Staff Recommendation**

We replace both ice sheets and use one new ammonia refrigeration system.

- Less disruptive to our customer base and affects one summer of ice rental.
- We will see a significant energy savings on a yearly basis.
- We will no longer be using a refrigerant that's harmful to the environment.
- We will become a more versatile facility by being able to host dry floor events.

Option#2

We replace one refrigeration plant now and defer the second ice sheet to a future time

- We would have to find a safe location to store the used R-22 from the old system.
- We would not be able to save on energy costs.
- We would still have a hard time finding replacement parts for the older plant.
- Not able to do dry floor events.
- Cost to do one refrigeration plant and ice sheet is 2.6 million. You would save on initial construction costs of \$750-900,000.

Option #3

We keep current system

- Risk inflating costs of used R-22 replacement refrigerant.
- Continued higher energy costs.
- The replacement parts for the compressors and pumps are no longer being manufactured.
- We risk long periods of down time do to equipment failure.

Opinion of Probable Construction Costs - UPDATED
 Richfield Ice Arena
 Richfield, Minnesota

5/23/2019
 File No. 900-16-273



Item	Units	Qty	Unit Price	Total
DIVISION 01, GENERAL CONDITIONS				
1 Building Permit	LS	1		TBD
			Subtotal	\$0
DIVISION 02 - 12, BUILDING SYSTEMS				
2 Roofing	LS	1	\$7,500	\$7,500
3 Modifications to condenser remote sump tank	LS	1	\$5,000	\$5,000
4 Piping chase in lobby	LS	1	\$2,500	\$2,500
5 Structural penetrations for ME equipment and ice system mains	LS	1	\$10,000	\$10,000
6 Doors and Hardware	LS	1	\$10,000	\$10,000
7 Condenser Screen Wall	LS	1	\$50,000	\$50,000
			Subtotal	\$85,000
DIVISION 13, SPECIAL CONSTRUCTION				
8 Salvage and reinstall Rink 2 dasher boards	LS	1	\$35,000	\$35,000
9 Salvage and reinstall Rink 1 dasher boards	LS	1	\$40,000	\$40,000
10 Concrete demolition for underground mains trenches	LS	1	\$25,000	\$25,000
11 Demolish existing concrete ice rink floor (Rink 2)	LS	1	\$75,000	\$75,000
12 Demolish existing sand ice rink floor (Rink 1)	LS	1	\$35,000	\$35,000
13 Demolish existing refrigeration equipment (Rink 2)	LS	1	\$25,000	\$25,000
14 Demolish existing refrigeration equipment (Rink 1)	LS	1	\$25,000	\$25,000
15 New combined ammonia refrigeration system with screw compressors, computer controls and basic heat recovery (subfloor & snowmelt)	LS	1	\$1,200,000	\$1,200,000
16 8" transmission mains (rink 1 floor)	LS	1	\$50,000	\$50,000
17 3" transmission mains (rink 1 subfloor)	LS	1	\$30,000	\$30,000
18 New stainless steel snowmelt coil (Rink 2)	LS	1	\$20,000	\$20,000
19 New stainless steel snowmelt coil (Rink 1)	LS	1	\$20,000	\$20,000
20 Waste heat recovery to existing heat pump system in Rink 1 boiler room (incl. heat exchanger, pump, transmission mains)	LS	1	\$85,000	\$85,000
21 Concrete ice rink floor, poly rink piping and subfloor heat (Rink 2)	LS	1	\$550,000	\$550,000
22 Concrete ice rink floor, poly rink piping and subfloor heat (Rink 1)	LS	1	\$570,000	\$570,000
23 New concrete for underground mains trenches	LS	1	\$25,000	\$25,000
24 New resilient flooring for Rink 1 mains trench	LS	1	\$10,000	\$10,000
			Subtotal	\$2,820,000
DIVISION 20 - 23, MECHANICAL SYSTEMS				
25 Demolition	LS	1	\$2,500	\$2,500
26 New occupancy & emergency ventilation system for ice equipment room	LS	1	\$45,000	\$45,000
27 New 1" water line to remote sump	LS	1	\$2,500	\$2,500
28 Relocate floor drain in ice equipment room	each	1	\$4,000	\$4,000
29 New floor drains in ice equipment room	each	1	\$4,000	\$4,000
30 Combination eyewash / shower	each	2	\$5,000	\$10,000
31 Controls for ME equipment	LS	1	\$12,000	\$12,000
32 1" gas line to existing gas meter	LS	1	\$7,500	\$7,500
33 Fire Protection	LS	1	\$500	\$500
			Subtotal	\$88,000
DIVISION 26, ELECTRICAL				
34 Demolition	LS	1	\$4,000	\$4,000
35 New electrical feeder for ice equipment MCC	LS	1	\$85,000	\$85,000
36 Lighting and receptacle modifications in ice equipment room	LS	1	\$2,000	\$2,000
37 Electrical and controls for ME equipment	LS	1	\$2,500	\$2,500
			Subtotal	\$93,500
DIVISION 32 - EXTERIOR IMPROVEMENTS				
38 Remove existing chain link fence	LS	1	\$500	\$500
39 Erosion control, site work and restoration for condenser screen wall	LS	1	\$5,000	\$5,000
			Subtotal	\$5,500
Subtotal				\$3,092,000
10% Contingency				\$309,200
Total Estimated 2019 Construction Cost (excluding design and construction administration)				\$3,401,000
Total Estimated 2020 Construction Cost (excluding design and construction administration) (4% escalation applied)				\$3,538,000
Total Estimated 2021 Construction Cost (excluding design and construction administration) (4% escalation applied)				\$3,680,000

Questions?



Ice Rinks and the Phaseout of HCFC-22

What You Need to Know



What Is the HCFC Phaseout?

Under the U.S. Clean Air Act and the *Montreal Protocol on Substances that Deplete the Ozone Layer*, the United States is phasing out the production and import of hydrochlorofluorocarbons (HCFCs) in order to protect the stratospheric ozone layer. By phasing out the production of ozone-depleting substances (ODS) like HCFCs, we are reducing the risk of skin cancer caused by exposure to UV radiation. In addition, many of these ozone-depleting substances, as well as their substitutes, are greenhouse gases that contribute to climate change.

No Immediate Change Is Required

HCFC-22 is used as a refrigerant in many applications, including ice rinks. Starting on January 1, 2020, U.S. production and import of HCFC-22 will end. This does not mean that use of HCFC-22 must stop at that time. Since a significant inventory of virgin HCFC-22 exists, and recovered and reclaimed material will be available, the U.S. Environmental Protection Agency (EPA) expects use of HCFC-22 to continue well into the future.

Planning for the Future Is Important

Even though there is no immediate need for change, supply of HCFC-22 will decline over the next few years, and prices may rise. For existing HCFC-22 systems, this makes tightening leaks and performing preventive maintenance even more important to keep refrigerant emissions down and reduce the need to purchase additional HCFC-22. When the time does come to replace or retrofit an existing system, there are many alternatives available that are safer for the environment. EPA has listed several examples of alternatives in the table on the next page.

What Alternatives Can Be Used Instead of HCFC-22?

Many alternatives that are safer for the environment than HCFC-22 are available for use both in new rinks and in existing systems that require retrofit. See the table on the next page for a list of some acceptable non-ozone-depleting alternatives under EPA's Significant New Alternatives Policy (SNAP) Program. Some of these alternatives are listed for use in retrofitted HCFC-22 systems, and others are only listed for new ice rink refrigeration systems. A full list of acceptable alternatives under SNAP is available at www.epa.gov/ozone/snap/refrigerants/lists/icerinks.html.



Acceptable Non-Ozone-Depleting Alternatives to HCFC-22 Under EPA's SNAP Program

Chemical	GWP	Ozone Depleting?	Retrofit	New
Ammonia	0	No		X
THR-03	918	No		X
R-134a	1,430	No	X	X
RS-24 (2002 formulation)	1,505	No	X	X
R-426A	1,508	No	X	X
R-407C	1,774	No	X	X
R-407F	1,825	No	X	X
R-442A	1,888	No	X	
R-410A	2,088	No		X
R-407A	2,107	No	X	X

GWP = Global Warming Potential. GWP is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming relative to the same mass of carbon dioxide.

When considering an alternative for retrofitting a system, be sure to follow the manufacturer's suggested handling and installation guidelines and to consider possible effects on the system's energy consumption.

Are There Other Refrigerant Regulations Affecting Ice Rinks?

Ice rinks are subject to refrigerant management regulations under section 608 of the Clean Air Act, specifically the requirement to keep leak rates below 15% for comfort cooling appliances and below 35% for refrigeration equipment. In addition, it is illegal to knowingly vent refrigerant—both ozone-depleting refrigerants and the alternatives¹—during servicing, maintaining or disposing of a refrigeration or air conditioning system.

For Further Information

- Phaseout of Ozone-Depleting Substances: www.epa.gov/ozone/title6/phaseout
- Leak Repair Requirements for HCFC-22 Systems: www.epa.gov/ozone/title6/608/leak.html
- Leak Prevention and Retrofit Guidelines: www2.epa.gov/greencill/reports-guidelines-and-tools

Other EPA Resources for Ice Rink Managers

- Indoor Air Quality and Ice Rinks: www.epa.gov/iaq/icearenas.html
- ENERGY STAR for Buildings and Plants: www.energystar.gov/buildings



FOR MORE INFORMATION Visit www.epa.gov/ozone/title6/phaseout/classtwo.html or contact David Donaldson at (202) 343-9086 or donaldson.david@epa.gov.

¹Several alternatives have been exempted from the venting prohibition. Examples include ammonia in commercial or industrial process refrigeration or in absorption units, and carbon dioxide, nitrogen or water in any application. A complete list is available in the U.S. Code of Federal Regulations at <http://go.usa.gov/kAhQ>.

