

Energy/Sustainability Considerations

- ◆ Pool Heating Alternatives
 - ◆ Pool water heating can be the most significant operational cost depending on selection of system and fuel source
- ◆ OPTION 1 – Natural Gas Pool Heaters
- ◆ OPTION 2 - All-Electric Pool Heaters
- ◆ OPTION 3 – Electric Heat Pump Chiller System
 - ◆ Option 3a – Natural Gas Boiler Back-up
 - ◆ Option 3b – Electric Pool Heater Back-up
- ◆ Solar Energy Contribution
 - ◆ Optimizing the size, cost and type of solar thermal heating or power generation system will require more detailed study as the project progresses.

Energy/Sustainability Considerations

POOL WATER HEATING SYSTEM COMPARISON CHART				
All systems are to are assumed to have a peak capacity of 3,000,000 BTU per hour, and will meet pool water heating load requirements of 8,640,000,000 BTU over the course of one year				
OPTION 1		OPTION 2		OPTION 3A
OPTION 3B				
Description				
New natural-gas fired 3MBH pool heater with 97% efficiency proposed by the pool contractor to replace the older heater.		Four (4) new 300kW all-electric pool heaters at 97% efficiency, with new 1400amp 480v electrical service upgrade.		New 268kW Heat Pump Chiller unit requiring a new 600amp 480v Electrical service upgrade, with new back-up natural-gas fired 3MBH boiler.
New 268kW Heat Pump Chiller unit with back-up from (4) new 300kW all-electric pool heaters at 97% efficiency, with new 1400amp 480v electrical				
Annual Power/Fuel Requirements				
Power		2,610,556 kWh	738,182 kWh	738,182 kWh
Nat. Gas	89,072 Therms		13,732 Therms	402,417 kWh
Power/Fuel Rates				
Power		Use & Demand Charges	Use & Demand Charges	Use & Demand Charges
Nat. Gas	\$0.90184/Therm		\$0.90184/Therm	
Annual Power/Fuel Costs				
Power		\$274,188	\$88,056	\$88,056
Nat. Gas	\$80,329		\$12,384	\$50,149
TOTAL Annual Power/Fuel Costs				
	\$80,329	\$274,188	\$100,440	\$138,205

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OPTION 1	OPTION 2	OPTION 3A	OPTION 3B
TOTAL Annual Power/Fuel Costs			
\$80,329	\$274,188	\$100,440	\$138,205
Added Capital Costs and Project Costs			
\$0.00	\$101,844	\$534,441	\$599,748
Equipment priced in Base Estimate and Project Budget	Equipment cost differential and electrical service	Equipment cost differential and electrical service	Equipment cost differential and electrical service
Simple Payback			
Lowest Cost	240% Energy Cost Increase	25% Energy Cost Increase	74% Energy Cost Increase
No Payback	No Payback	2.7yr Payback over Option 2	4.4yr Payback over Option 2
Gas Only Heating	All-Electric Heating	Elec./Gas Back-up Heating	Elec./Elec. Back-up Heating