

## CITY OF KLAMATH FALLS GEOTHERMAL SYSTEM FACTS

1. The City of Klamath Falls Geothermal System supplies space heat to 24 commercial and government buildings totaling approximately 400,000 sq. ft. 4 greenhouses totaling 200,000 sq. ft. and approximately 125,000 sq. ft. of sidewalk and bridge snow melt systems.
2. The geothermal heating system is served by two production wells located on Old Fort Rd. 200-220 degree water is conveyed from the production wells through about 1 mile of 8" pipeline to the heat exchanger facility. A geothermal well at the heat exchanger facility is used as the re-injection well.
3. Heat transfer from production to the distribution district heating loop is through 2 heat exchangers located at the heat exchanger facility located on Wall St. and Spring St. near the Klamath County Museum.
4. The district heating system is a closed loop system consisting of approximately 1.75 miles of 8" and 12" supply and return pipeline. Make-up water is supplied from the City water system. Clean water is circulated through the heat exchangers and to distribution system by 3 circulating pumps located at the heat exchanger building. Heating service is provided for space heating and sidewalk snow melt throughout the downtown heating district.
5. Numerous upgrades have been completed including rehabilitating the #2 geothermal well, replacing expansion joints on the production pipeline, installing a third circulation pump on the distribution system, replacing leaking 8" and 10" steel mainlines and adding SCADA (supervisory control and data acquisition) system controls. These improvements are intended to improved reliability and operational control and monitoring.
6. Timbermill Shores development phase 1 will add an additional 60,000sf of sidewalk snowmelt and up to 333,000sf of floor area heat. And an additional 60,000sf of sidewalk snowmelt may be added with completion of phase 2.

- The most significant benefit of geothermal heating is the reduced energy cost compared to alternate heating sources. Natural gas rates have increased up to about 90% in the past 3 years, and are currently \$1.09736/therm. Geothermal rates are currently linked to 80% of gas rates however the City has limited geothermal rate increases to no more than 10% per year.
- Right now the standard geothermal rate is \$0.8779/therm. The comparable natural gas cost is \$1.09736/therm divided by about 75% combustion efficiency, or about \$1.37/therm of delivered heat. The cost of geothermal energy thus currently represents about a 60% savings compared to gas. Some additional rate incentives may be available for high performing buildings with interruptible geothermal service.
- The sidewalk and bridge snowmelt systems also provide safety and convenience that would not be obtainable without the low-cost geothermal energy.