

**Edl, Michele**

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**From:** Tim Cochran [tim.cochran@nli.coop]  
**Sent:** Tuesday, February 07, 2012 3:49 PM  
**To:** Edl, Michele  
**Subject:** Northern Lights

Michelle:

This the response I receive from our heating consultant after he read your memo:

*Tim,*

*Sorry to be so slow in this response.*

*Attached is the water use data I have - from startup and the next few days when I was trying to get Stan to slow down the valve control signal action for the new valve. At the bottom and to the right of the number columns, I have come up with water use per hour and minute based on these test data periods of April 14 (Average 5.6 GPM, 334.6 GPH), 16 (Average 9.1 GPM, 543.5 GPH) & 19 (Average 17.3 GPM, 1035 GPH) in 2004. I would be interesting to know what the hourly weather conditions were during those days in order to make some sense of the energy requirement water used. April 19 must have been a coldest day.*

*I doubt you would find the answer in GPM per year from any designer. It is not something normally considered in the design process because the maximum required flow is the primary consideration. The closest thing I can think of is running an annual energy use simulation and extract/calculate the flow information based on the typical observed temperature rise across the heat exchanger summer (cooling operation) and winter (heating operation). These calculation are used a comparisons between different systems and are not generally used as true operating cost models due to the many assumptions involved.*

*Back when you first considered correcting the water usage problem, I recall you had some yearly gallons used numbers. After the modifications I recall you commented that you saw a major reduction in the usage numbers. I do not have of these records?*

*Eric*

I am not sure which direction to go. I would like to suggest that you inquire of your boss that we provide you data for the 10 highest usage weeks we have on record. I believe we have weekly records of total usage for all of the weeks we have been here since 2000 and the you base the usage on those numbers. There would be no irrigation in those numbers only heating and domestic use. I would think that would set a high enough base line to use for the license.

Please let me know if that is feasible.

Tim Cochran  
Northern Lights