APPENDIX J - ESTIMATED WATER SYSTEM LEAKAGE FOR MKL

As prepared by Ken Heiden, February 28, 2013

The Hurricane Sandy power outage was an excellent opportunity to evaluate the water-use characteristics of our Lake community. The outages, being in the late fall, eliminated most of the water-use variables that apply to other times of the year. These include lawn, garden, and tennis court watering, car and deck washing, and underground irrigation systems.

The quantity of water pumped during the two week, water-restricted outage, (10/29 - 11/12/2012), was compared with a two week period in early December. Corrections were made for the number of houses occupied, the water tank levels, and the time of day of the measurements. Estimates of per-house water use during and after the outage were made, so a total system water usage could be determined.

	Outage	Post-Outage
Water Pumped gallons/day	17,400	24,300
Number of Occupied Houses	75	90
Low Estimate		
Usage gallons/House	40	100
Total Usage gallons/day	3000	9000
Implied Leakage gallons/day	14,400	15,300
High Estimate		
Usage gallons/House	90	150
Total Usage gallons/day	6800	13,500
Implied Leakage gallons/day	10,600	10,800

Water leakage calculations were made for both low and high water-use houses. The low water use breakdown is as follows:

- Outage use: shower 10, sink 15, toilet 15, laundry & dishwasher 0 = 40 gal/day
- Post outage use: shower 25, sink 30, toilet 15, laundry & dishwasher 30 = 100 gal/day

This 100gal/day low estimate is in line with Aqua's customers in Warren County, who undoubtedly have expensive septic systems to protect, as we do.

In all cases the implied water leakage is over 10,000 gal/day and is consistent depending on the assumed house usage. Another indicator of significant leakage is that the pump goes on throughout the night to maintain tank water level.

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