

**Date:** December 4, 2020

### Overview

On November 8, 2018, Arthur Binder from A.D. Binder Plumbing and Heating, LLC met with University Housing Facilities staff to demonstrate a device called the Aqua Mizer. The Aqua Mizer is a complete toilet valve system designed to retrofit any existing toilet and reduce water consumption to one gallon per flush. The device is also designed to prevent run-ons caused by leaky flappers and stuck valves, minimize excess water flowing through the trap when filling the bowl after a flush, and minimize potential water damage in the event of a tank failure.

Arthur provided several analyses from locations where the Aqua Mizer is installed. The location most like the Orchard Downs or Ashton Woods, where this device could be utilized within University Housing, is located at Kenzington Apartments in Normal Illinois. Kenzington Apartments installed the Aqua Mizer in 228 toilets in March 2018. From March through September of the same year, they documented a savings of 236,400 gallons. That is approximately \$3,800 in savings using a rate of .016 cents per gallon.

The cost to retrofit a single toilet with the Aqua Mizer device is approximately \$75 in material costs, and \$70 in installation costs if installed by A.D. Binder Plumbing and Heating, LLC. Installation takes approximately 15-20 minutes.

Based on the potential savings demonstrated by this device, University Housing conducted a small-scale test at three apartment buildings in the Ashton Woods apartment complex. Unlike Orchard Downs, the apartments at Ashton Woods are individually metered making them ideal for hosting the test. During the summer and early fall of 2019, the applicable apartments were retrofitted with Aqua Mizer devices. Below are the findings of this test.

### Dates

- Baseline Period: October 1, 2018 – June 30, 2019.
- Test Period: October 1, 2019 – June 30, 2020

### Location

Ashton Woods Apartments  
2221 S. First Street

- Buildings 2215, 2217 and 2219
- Each building contains 12 apartments for a total of 36 apartments.

### Occupancy Data

- 16 apartments had 100% occupancy during both the baseline and testing periods.
- 13 apartments had a combined baseline and testing period occupancy between 80% and 99%.
- 7 apartments had a combined baseline and testing period occupancy of less than 76%.

### Unusable Data

There are four apartments with data that is unusable. These apartments were excluded from all data calculations.

- 2215-304 (100% Occupancy), There is unusually high water consumption in March 2020.
- 2217-202 (100% Occupancy), There is zero water consumption from December 2019 through June 2020, but the apartment was leased to a student. It could be possible that someone leased the space but went home because of COVID.
- 2215-102 (85.92% Occupancy), There is unusually high water consumption in February 2019.
- 2217-301 (57.04% Occupancy), This apartment was unoccupied for almost the entire baseline period.

### Water Costs

Cost per 1,000 gallons of water used = \$5.851

(per the 10/16/2020 - 11/16/2020 F&S invoice for building 2219 at Ashton Woods)

### Totals

All encompassing

Baseline: 582.8 Kilo Gallons

Test: 456.1 Kilo Gallons

Delta: 126.7 Kilo Gallons

% Delta: 21.74% reduction

**Savings: \$741.32**

Apartments with 100% Occupancy

Baseline: 287.4 Kilo Gallons

Test: 256.5 Kilo Gallons

Delta: 30.9 Kilo Gallons

% Delta: 10.75% reduction

**Savings: \$175.53**

Apartments with 80-99% Occupancy

Baseline: 196.9 Kilo Gallons

Test: 170.1 Kilo Gallons

Delta: 26.8 Kilo Gallons

% Delta: 13.61% reduction

**Savings: \$156.81**

Apartments with 80-99% Occupancy (Pro-Rated the usage amounts based on 100% occupancy)

Baseline: 221.8 Kilo Gallons

Test: 183.4 Kilo Gallons

Delta: 38.47 Kilo Gallons

% Delta: 17.34% reduction

**Savings: \$225.09**

Apartments with 100% Occupancy and Pro-rated Apartments of 80-99% Occupancy

Baseline: 509.2 Kilo Gallons

Test: 439.9 Kilo Gallons

Delta: 70 Kilo Gallons

% Delta: 13.74% reduction

**Savings: \$409.57**