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Reduction of Energy Consumption through Pump Efficiency Analysis

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Reduction of Energy Consumption through Pump Efficiency Analysis

Prepared by Riley Dodds

Fall 2021

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Abstract

Water scarcity, global warming, lack of fossil fuels, and future Green Act goals and legislature are at the forefront of policy change and election discussion within the United States. As civil engineers these topics are heavily discussed and challenged within the field and new solutions along with innovations are in constant demand. Within the community of Akron, the Akron Water Supply Water Plant continues to actively innovate and solve numerous concerns ranging from the quality of water to the overall operating costs. Energy consumption cost Akron Water Supply over $952,914.32 and 14,411,960 of kilowatts per hour of electrical energy to perform all necessary functions in 2012. Present day, the costs per kilowatt per hour of electrical energy continues to increase. Decreasing overall energy costs while maintaining pump efficiency is vital for the community as well as Akron Water Supply. Since the addition of the variable frequency drives direct impacts in cost as well as kilowattage can be seen, however, pump degradation is still prominent and could reverse a decade of efforts to lower energy consumption. The objective of the report is to analyze the current operating conditions of Akron Water Supply and create predicted pump curves to depict degradation over the past 10 and 50 years. Degradation due to age affects pump curves and pump efficiency in a non-linear pattern and requires mathematical calculations to accurately produce realistic pump curves. Projections of pump curves based off present-day operations demonstrated immense degradation of 8% in impeller size for the 700-horsepower pump and 12% in impeller size for the 1250-horsepower pump. Consistent with pump affinity laws, the horsepower for both the 700 and 1250 HP pumps also demonstrated great jumps in performance. Analysis of two weeks of pump operations also demonstrated that the current pumping operations are below the projected system curves created in 2012. These visual displays of degradation of the pumps will aide in discussion of the final solutions for Akron Water Supply as forward progress to more energy efficient plants continues.

Goals and Objectives

One of the most expensive and crucial operating costs of the water plant includes the pump house. The pump house operates six (6) vertical-turbine high-service pumps installed in 1970 except for one installed in 2000. This past year marks the 50th year of service with the pumps which addresses

the first research question proposed. Is the current technology in place at Akron Water Supply sufficient? This question aims to answer the age and wear of the current pumps and if the supply demands are being met within an efficient manner.

In the year 2011, Akron Water Supply Water Plant discussed a new technology addition to improve the overall energy consumption and efficiency of the current pumps within the pump house. Variable Frequency Drives allow the motor of the pumps to speed up and slow down at a lower energy consumption. The next research question proposed analyzes this new technology within the plant. After a decade is the Variable Frequency Drive maintaining projected efficiency? The addition of the Variable Frequency Drive allowed Akron Water Supply to avoid the costs of replacing the pumps with new equipment.

Water demands vary within the City of Akron and direct consumers of the water plant. Several factors including time of day, seasons, and school and work schedules affect the demand of water. Therefore, an analysis of these changing conditions is important in understanding the energy consumption currently at the plant. Thus, the next question within the project is to be answered. Under varying operation procedures what is the impact on the equipment and overall energy consumption? Without an understanding of the varying operating loads of the water plant the overall analysis is ineffective in truly answering the efficiency of the plant and pumps.

Since the direct consumer of the water plant is the City of Akron, the operating costs of the plant are supported through taxes and water bills of the citizens within this community. In return the final two research questions provide insight on the overall impact of the research success. What cost savings would be achieved through implantation of new technology? How would implantation of new technology impact the community of Akron? All aspects of the water plant impact the community through operating costs, quality of water, and long-term operation efficiency. Inefficient and expensive pumps and equipment negatively impact the community and ultimately diminish the support for the water plant.

Methodology

To effectively understand and analyze the cost impact and equipment efficiency of the Akron Water Supply Water Plant meeting and discussion with plant operators is a crucial part of the project. Operators Perry Haggard and Kenneth Moats provided more insight on plant operations during the overall operation tour. The tour occurred on August 19th, 2021.

To provide more visual insight to the project, several photos of the existing conditions of the plant were taken during the tour. The main pumps of discussion throughout the report are pumps #2 and #6. As pictured below, the pump #2 (700 horsepower) is displayed.

Figure 1: Photograph of existing pumps #1 and #2 at the Akron Water Supply Plant from the tour.

Additional analysis of Pump #6 is also pertinent to the repot. The picture below displays pumps #5 and #6. Both are 1250 horsepower pumps, however, pump #5 has been out of service since May of 2020 according to plant operators.

Figure 2: Photograph of existing pumps #1 and #2 at the Akron Water Supply Plant from the tour.

The service line of the South clearwell of the pumps is displayed below. The water is pumped into the 48-foot discharge force mains. There are butterfly valves between the pump and the force main. In addition to the tour, areas of concerns that are dependent on overall plant operations were identified.

Figure 3: Visual of the 48-foot force main and butterfly valve connection of the pumps from the plant tour.

Once successfully identified, the next step in accomplishing the project goals includes an analysis of the existing CTI Engineers, Inc. "VFD Feasibility Study." This study provided insight on the implantation of the Variable Frequency Drives in operation at the water plant. Discussion of the effects and overall success of the Variable Frequency Drive will be elaborated on throughout the report. However, the installation of this equipment is nearly a decade into operations. The initial study referenced electrical consumption records from 2011 and can then be compared to the current usage present day. This should be consistent of the goals discussed within the initial study.

To determine if these goals are being met thorough analysis of existing and suggested pumping operations must be performed. These operations are provided within the 2011 "VFD Feasibility Study" and present-day Akron Water Supply High Lift Pump Station Reports.

Results

Consideration of pump age must be performed prior to investigation of current pump efficiencies and operations. Aging of pumps and other machines is a non-linear operation. This is due to the number of hours a pump may operate prior to showing aging and wear to the overall system. To determine the current performance of the pumps, calculations of Pump Affinity Laws are utilized. Pump Affinity Laws for specific centrifugal pumps may approximate the volume capacity, head or pressure, and power curves of different motor speeds and various impeller diameters. This range of applications is ideal for the evaluations necessary of the aging pumps. The initial Pump Affinity Law considered determines the volume capacity.

$$\frac{q_1}{q_2} = \left(\frac{n_1}{n_2}\right)\left(\frac{d_1}{d_2}\right) \qquad \text{(A)}$$

This calculation may be utilized to find *q* which is the volume flow capacity measured in million gallons per day (MGD) of the pumps presented in the CTI Engineers, Inc. (CTI) study. Variable *n* represents the speed at which the pump operates and can be measured in revolutions per minute. Lastly, variables d_1 and d_2 represent the initial and current diameters of the pumps measured in inches (in).

Initial pump curves provided within the CTI study demonstrated the original pump curves from 1970 at 100% speed and the pump curves from 2012 also performing at 100% speed. Since the speeds are equal, then the assumption that n_1 is equal to n_2 which becomes a value of 1 in equation A. These values are negligible in calculations at the same speed. Initial impeller diameters of the

pumps were 22.4375 inches for the 700 horsepower (HP) Pump #2 and 28.75 inches for the 1250 HP Pump #6.

With these initial values and conditions, present day test points may be selected to determine the degradation caused by age and operation of the impellers for pumps #2 and #6. The present-day conditions are selected from the Akron Water Supply High Lift Pump Station Reports provided by the plant. The station reports include hourly measurements of the North and South Clearwells. Measurements include the flowrates, motor speed, bearing temperatures, pressures, and dosages of chemical treatment. This report will focus only on the hourly reports of flowrate, motor speed, and pressure.

Selection of the present-day testing points occurred during the variable frequency drive bypass periods where both pumps operated at 100% motor speed. Since the CTI report data included the pump curves at 100% speed the periods of operation where the speeds are reduced would not provide an accurate pump curve of current plant conditions.

The two points selected were averaged values over a 24-hour period of the pumps operating at 100% speed. October 19th of 2021 was the date at which these averaged values were selected. Pump #2 had an average flowrate of 16.27 MGD and an average pressure of 72.8 pounds per square inch (psi). Pressure may then be multiplied by the conversion factor of 2.31 to find the total head measured in feet for Pump #2.

Therefore, Pump #2 had a total head of 168 feet at a discharge flowrate of 16.27 MGD. Pump #6 had a total head of 159 feet at a discharge flowrate of 24.57 MGD. Since both flowrate and total head are known then the head or pressure affinity law may also be utilized.

$$\frac{dp_1}{dp_2} = \left(\frac{n_1}{n_2}\right)^2 \left(\frac{d_1}{d_2}\right)^2 \quad \text{(B)}$$

The variables dp_1 and dp_2 are both known and represent the head measured in feet of the original pump and the present-day test point. Similar to equation A, the variable n is the speed of operation This variable equals 1 in the calculation for impeller diameter since the pumps are operating at the same speed. Lastly, variable d is the diameter of the impellers measured in inches and d_2 is unknown.

The only unknown value in equation B remains the diameter for the present-day pump. As discussed before, the aging of the pumps is non-linear and therefore a projected equal value or point on the original pump curve must be selected as the initial value. Selections of these points were determined by trial and error based on the collection of points provided in the CTI report.

Final calculations and selected of projected points produced a current impeller diameter of 20.843 inches for Pump #2 and 26.74 inches for Pump #6. This is a degradation of 8% and 12% respectively for each impeller. When the initial degradation of these impellers was investigated in 2012, each only showed about 1% and 7% decrease in size over an almost 40-year operation period. In less than a decade, the degradation increased by 7% and 5% for each impeller. This showcases the rapidly decreasing performance of both pumps.

Once the impeller diameter is determined for each pump, equations A and B may be utilized to determine several total head and discharge values. This creates the predicted pump curve of current operations within the plant.

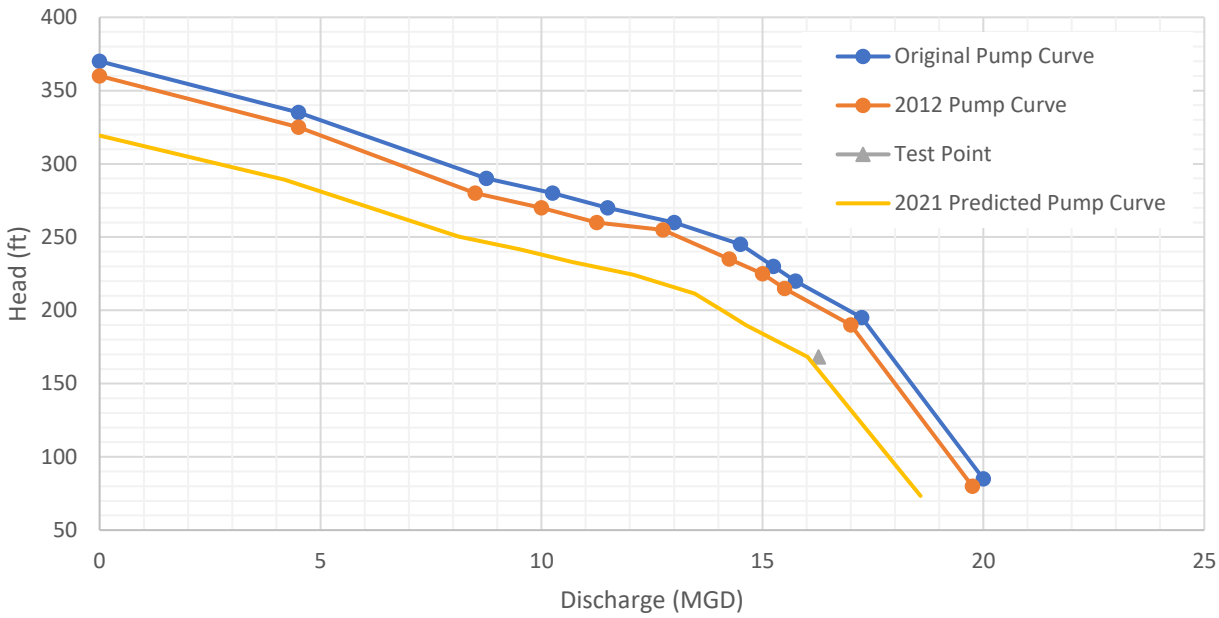

Figure 4: Pump #2 (700 HP) adjusted for age utilizing impeller diameter and Pump Affinity Laws (CTI Engineers, Inc., 2012).

Within Figure 1, Pump #2 displays the predicted pump curve determined from the test point and Pump Affinity Laws. The predicted curve passes through the test point and operates at significantly lower curve than the originally installed pump. The performance differences from 2012 to 2021 is even more clearly represented as you can see the relative closeness of the original pump curve and the 2012 pump curve versus the distances between the 2021 predicted curve and the 2012 curve.

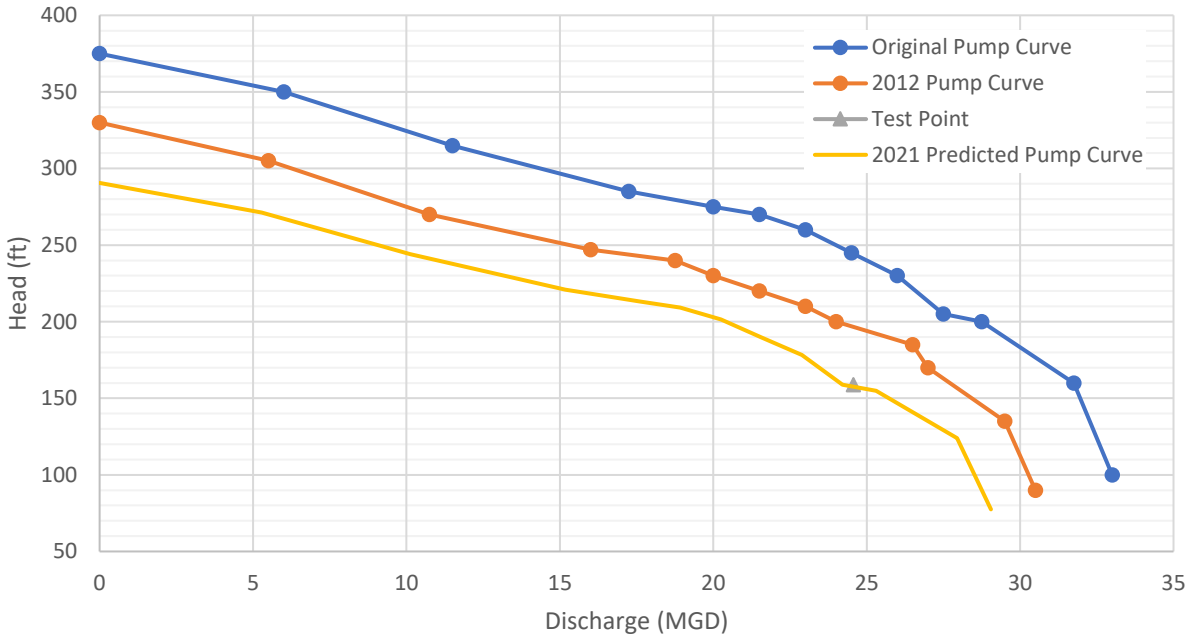

Figure 5: Pump #6 (1250 HP) adjusted for age utilizing impeller diameter and Pump Affinity Laws (CTI Engineers, Inc., 2012).

Similarly, the age adjustments for Pump #6 displayed rapid degradation of the overall pump performance in just less than decade. Although Pump #6 had a larger difference in performance between the original pump curve from 1970 and the pump curve from 2012. That overall difference in nine years versus almost 40 years is jarring to overall pump performance curves. Operations of water and supply demand remain consistent from 2012 to 2021 and therefore shows increasing problems with the overall pump performance.

Provided through the CTI report and Akron Water Supply Plant operators, discussion of active operations within in the plant is necessary to understand the impacts of the variable frequency drives (VFD) installed at the plant. In the initial report the plant would operate in two modes. Mode 1 consisted of a discharge of 33 MGD between two 700 HP pumps running at 100% speed in parallel operation. The second operating mode, Mode 2, consisted of one 700 HP pump and one 1250 HP pump operating at 100% speed to produce 39 MGD of discharge. At the time, Mode 1 and Mode 2 would be switched every two and half days manually.

Installation of the VFD was to solve the problems that arise with frequent shut-off and switching of pumps. Issues often associated with shut-off and start-up periods are added stresses to the piping, turbidity spikes, and particulate breakthrough within the filters as well. Additionally, power and electrical consumption of continuous shut-off and start-up periods caused higher utility costs and increased maintenance to the electrical housing in and around the pumps.

Variable Frequency Drives allow for the variable speed control, which controls the speeds at which the pumps may operate. Instead of a switch of on to off, a VFD converts the alternating current (AC) into direct current (DC) and allows for reduced operations of pump speed. Typically, if the speed of the pump is reduced the overall efficiency of the pumps also decreases. With a VFD the efficiency of the pump only decreases slightly depending on the reductions of speed it is subjected to.

The scenarios at which the Akron Water Supply Plant are operating at are nearly the suggested speeds "Scenario 4: Constant Rate Pumping" (CTI Engineers, Inc., 2012). The specific scenario is "4b," where the 700 HP pump and the 1250 HP pump operate at speeds of 70% and 100% respectively. What has been found that the pumps currently operate at two conditions.

The first condition follows "Scenario 4b" however, has both pumps operating at a reduced speed through utilization of the VFD. The North clearwell contains Pump #6 (1250 HP) and operates at a speed of 83% and discharges 16.3 MGD on average. The South clearwell contains Pump #2 (700 HP) and operates at a speed of 93% and discharges 14.1 MGD on average. The combined flowrate of these pumps is nearly 29.5 MGD on average or 30 MGD.

The second condition follows the pre-existing conditions of the plant prior to the VFD installation. The North clearwell utilizes Pump #6 however, it operates at 100% and discharges an average 24

MGD. The South clearwell utilizes Pump #2 and operates as well at 100% and discharges an average of 16 MGD.

The following graph displays a two-week window of daily discharge within the plant. This graph was utilized to determine the operating schedule of the plant. Graph presented on next page.

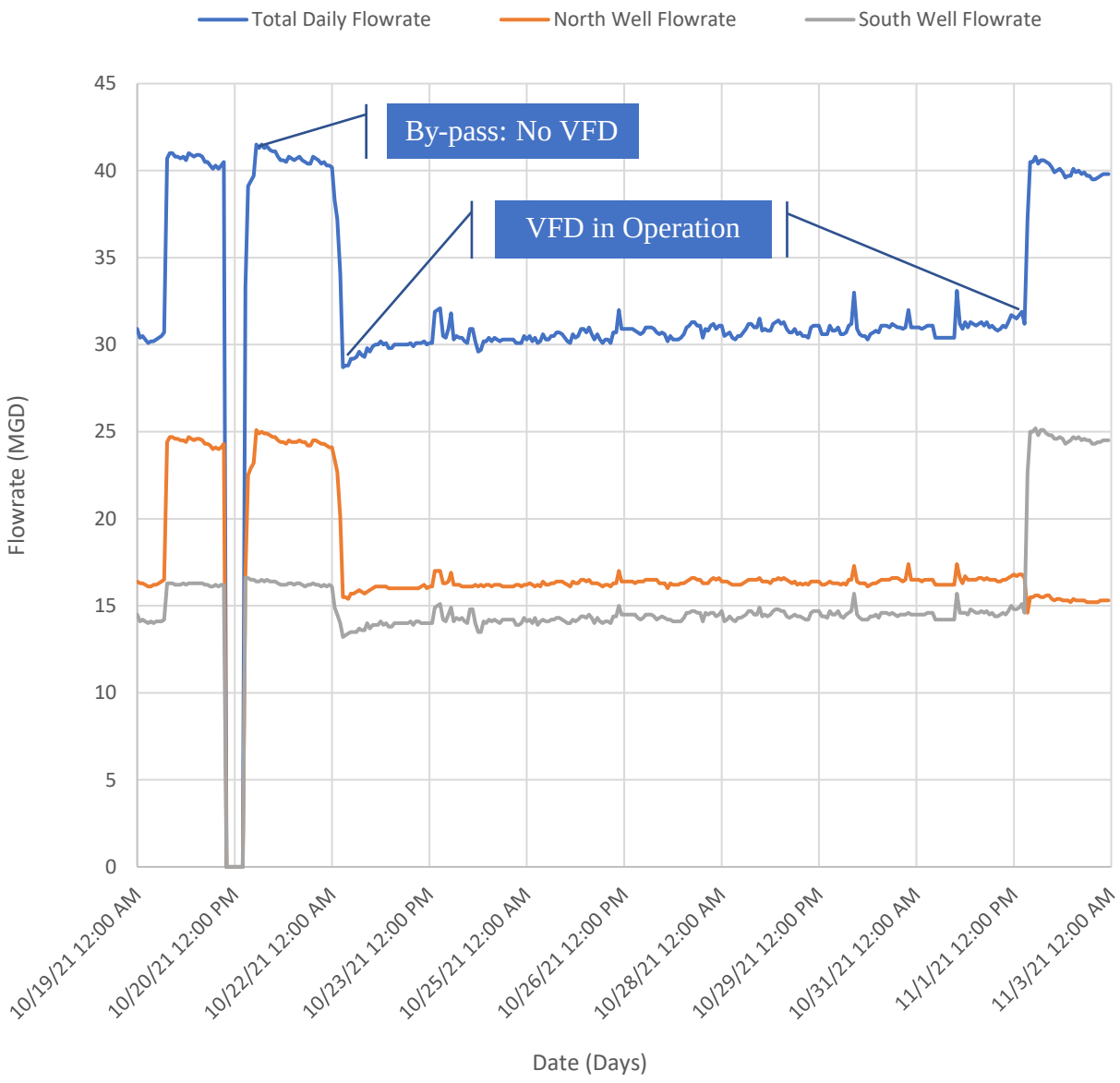

Figure 6: Daily average flowrates of plant operations provided by the "AWS High Lift Pump Station Reports."

The blue line represents the combined daily flow, the orange represents the North clearwell flowrates, and the grey represents the South clearwell. Occurring at nine in the morning October 20th, a shut off to the entire pumping system occurred for nearly seven hours. This is the only

outlier within the calculations as the remainder of operations is nearly identical to their average flowrate operations.

Over the two-week span, the plant operated at a continuous average speed of 93% for Pump #2 (700 HP) and 83% for Pump #6 (1250 HP). This type of operation maintains an average daily flow of nearly 30.7 MGD. According to the CTI report, this daily average flow demand is significantly less than the 34.5 MGD once being met in 2012.

Occurring on November 1st, nearly the end of the two-week analysis, the pumps operating in the North and South clearwells appear to switch. Since both lines contain a 700 HP and a 1250 HP service pump, the North line switched from 1250 HP Pump #6 to the 700 HP Pump #3. Additionally, the 700 HP Pump #2 on the South line switched to the 1250 HP Pump #4. This aides in extending the service life of the pumps so that they may not continuously operating all year long. Additionally, these pumps are operating at 100% speed during this switch here they begin the original pumping conditions from 2012.

Age adjustments and general operations of the pumps has been extensively covered. To combine these two areas of interest it is first important to note the general system curves for operation. These system curves were created utilizing the Hazen-Williams equation as follows:

$$V = kCR^{0.63}S^{0.54} \qquad \text{(C)}$$

The variable "*V*" stands for velocity, "*k*" is the conversion factor for the unit system, "*C*" is the roughness coefficient, "*R*" is the hydraulic radius, and "*S*" is the slope of the energy line or the head loss per length of the pipe.

System curves represent the extremes points of pressure variance as the tanks are filled by the discharging amounts. The maximum and minimum values of the system curves are unchanging as the same distance to the tanks remains between 2012 and 2021. These are the ideal operating conditions necessary to have the best efficiency of both discharge and total head of the pumps. The values and system curves were calculated in the CTI report. The same values and curves will be utilized for further examination of the pumps.

Pump #2 has already been age adjusted utilizing the affinity laws and prior known impeller size. Continuation of the affinity laws allows for adjustments made to the pump speed, where the value of "*n*" in equations A and B are no longer ignored. Projections of the age adjusted pumps with varying speeds helps to demonstrate the effects the VFD has on the pump curves and system efficiency.

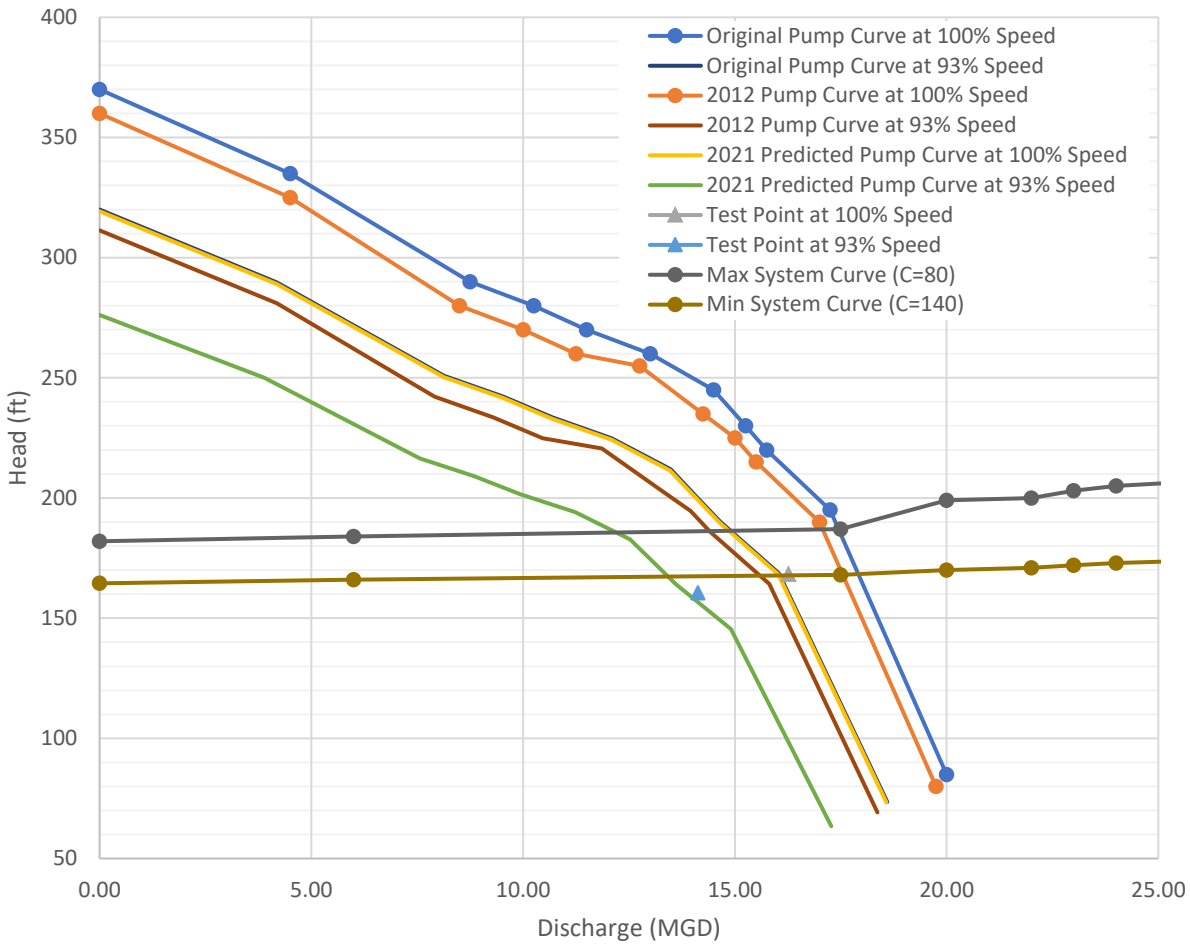

Figure 7: Pump #2 (700 HP) adjusted operating speeds utilizing Pump Affinity Laws in relation to the maximum and minimum system curves of existing conditions (CTI Engineers, Inc., 2012).

Once adjusted for age and speed, Pump #2 displays both the points of operation as well as the system curves. As projected, the 2021 predicted pump curve operating at 100% has a test point on the efficiency line and several portions of the curve operating within that window. However, the test point for the 2021 predicted pump curve at a 93% speed is operating below the system curve. Interestingly, pump curves for the 93% of the original pump mirrors that of the 100% speed 2021 pump curve. The degradation for age is evident throughout the figure.

To quantify the degradation for age examination of the horsepower for the 2012 and 2021 pump curves at varying operating speeds may be investigated. Use of the following equation is essential to determine the degradation:

$$P_{hp} = \frac{\gamma Q H_p}{33000} \quad \text{(D)}$$

Where "P_{hp}" is the horsepower at a specified "Q" (discharge in cubic feet per minute) and "H_p" (head in feet). The "γ" is the density of water which is 62.4 pounds per cubic foot. Analysis of the test points at 93% and 100% operating speeds for the 2021 pump curve are provided by the test points (Figure 7). Those points can be directly compared to the points of intersection of the upper system curve line of the 93% and 100% operating speeds for the 2012 pump curve.

Once calculated, the horsepower at the 2021 test points was found to be 478 HP for the 93% operating speed and 577 HP for the 100% operating speed. Similarly, the horsepower at the 2012 intersections of the maximum system curve were 557 HP for the 93% operating speed and 677 HP for the 100% speed. This clearly shows the numerical value of degradation since the facility should ideally be operating within the same system curves of 2012 in 2021. The difference between the 93% operating speed was nearly 80 HP and 100 HP for the 100% operating speed. These are drastic numerical differences of horsepower as that has a direct affect on the power that is required to operate the pumps.

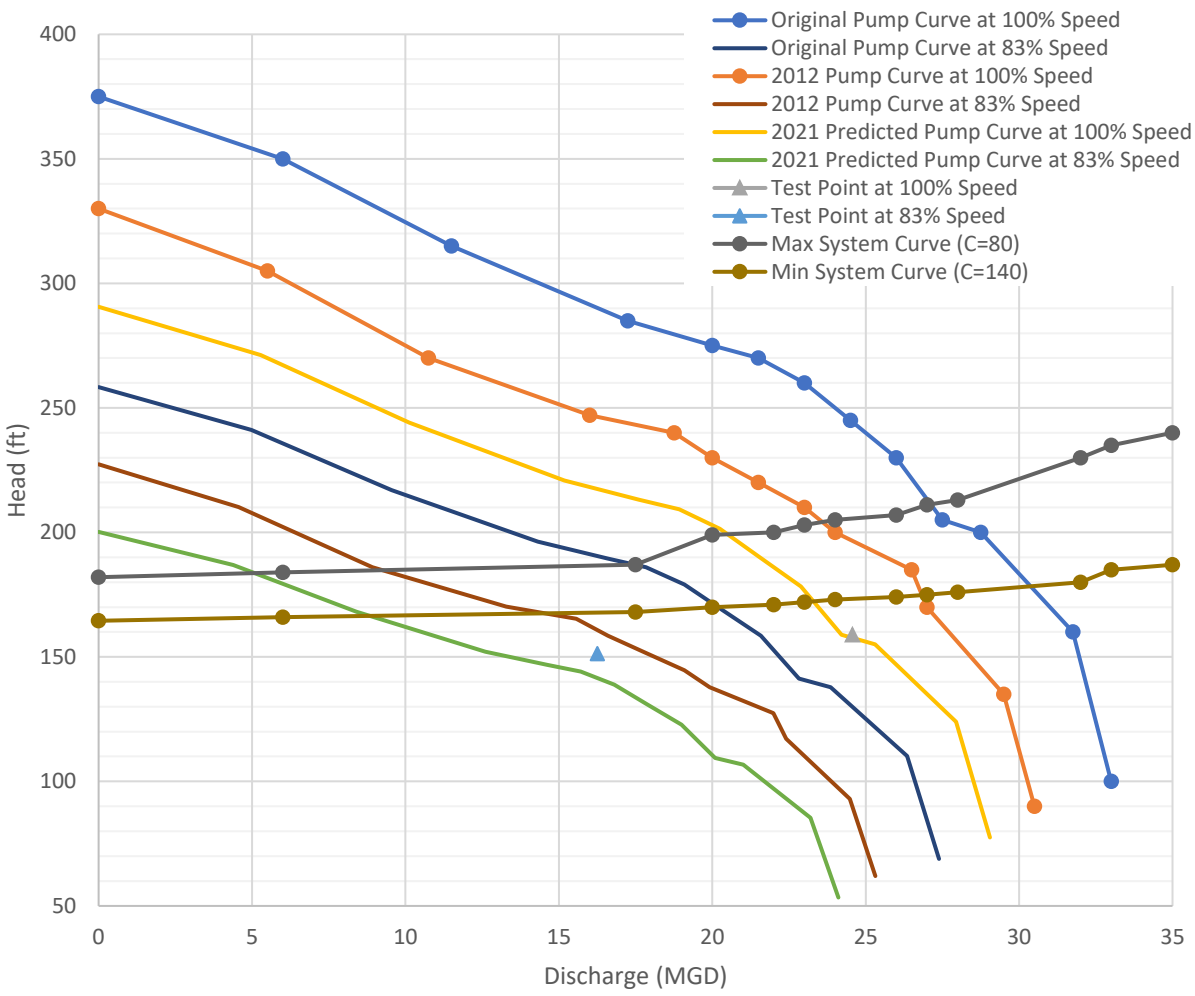

Figure 8: Pump #6 (1250 HP) adjusted operating speeds utilizing Pump Affinity Laws in relation to the maximum and minimum system curves of existing conditions (CTI Engineers, Inc., 2012).

Unlike Pump #2, the system curve for Pump #6 has neither test point within the curve. The degradation of the pumps due to age is extremely evident. The projections of the 1970 (original) pump curve and the 2012 pump curve at 83% are below the predicted pump curve of 2021.

Those points can be directly compared to the points of intersection of the upper system curve line of the 83% and 100% operating speeds for the 2012 pump curve. Equation D may also be utilized to calculate the difference in horsepower of the pumps over the nine-year span.

Once calculated, the horsepower at the 2021 test points was found to be 518 HP for the 83% operating speed and 823 HP for the 100% operating speed. Similarly, the horsepower at the 2012 intersections of the maximum system curve were 371 HP for the 83% operating speed and 1016 HP for the 100% speed. This clearly shows the numerical value of degradation since the facility should ideally be operating within the same system curves of 2012 in 2021.

The difference between the 83% operating speed produced an interesting result. The result of horsepower required in 2012 was significantly less than that in 2021. This is due to where the intersection of the system curve and 83% 2012 pump curve occurs. Since the majority of the pump curves fall within the smaller section of the system curve, the slope of the curve is much more significant.

Larger than the previous pump, the difference of the 2012 and 2021 horsepower requirement was nearly 200 HP for the 100% operating speed. These are drastic numerical differences of horsepower as that has a direct effect on the power that is required to operate the pumps.

With a visual examination of the pump curve and system curves, the final area of discussion is the power usage of the pumps. The initial installation of VFDs was to reduce the amount of power being consumed by the pumps to aide in spending costs for Akron Water Supply. The less that is spent to produce the same water demand is crucial for both the city and the constituents.

After installation and utilization of the variable frequency drives, the total annual power used by the pump decreased drastically by over one million kilowatts per hour. However, the areas of importance are within the horsepower calculations and points of intersection in Figures 7 and 8. However, it is important to note that the initial CTI report only examined one additional variable frequency drive. Therefore, the tables provided throughout the CTI report only accounted for one pump at a variable speed versus both sides of the line at a variable speed.

Conclusion

Analyzing the initial project concerns, the first goal was to determine if the installation of the variable frequency drive was worth it to Akron Water Supply. Considering the annual power consumption and current operating procedures, Akron Water Supply is meeting the demands of the constituents. Initially, the scenarios or plans that CTI had for Akron Water Supply were to run a continuous rate of pumping using a VFD for only one pump. The initial cost savings for the one individual pump were nearly $26,000 and 489,550 kilowatts per hour (kWh) over the non VFD pumping operations (CTI Engineers, Inc., 2012). However, since two VFDs were able to be installed for the North and South clearwells the city adjusted the plant operations. The cost savings is not nearly the same as the price for one kilowatt per hour continues to rise. As cited in their yearly electrical bill the average cost is about 6.8 cents per kilowatts per hour compared to 5.2 cents per kilowatts per hour in 2012.

Cost of energy consumption and usage of kilowatts of power will continue to rise as the market does as well. Therefore, with the installation of VFDs the city did save money over the past decade since general demands did not increase. The concern that does affect the VFDs that were installed is the rapid degradation of the pumps over the nine-year span of the study (Figure 7 and Figure 8). The analysis of the drop in horsepower over the varying operating speeds from Equation D demonstrates the amount of power the pumps once were utilizing versus what they are now. The operating conditions of the pumps did not change over the last nine-years. This is to say that the job of the pumps remained constant, but the efficiency did not. The tanks did not change in location or size but horsepower demands have.

As stated before, pump aging is non-linear and with the current discharge and flow demands, the operating points tested and used to predict the new pump curves for 2021 no longer lie within the system curves (Figure 7 and Figure 8). The system curves like the pump horsepower calculations, demonstrate an unchanging demand that is no longer being met. The system curves are affected by both pressure and the changing of water elevation within the tanks. As previously stated, none

of the operating equipment utilized by AWS has been adjusted except for the speed at which the pumps operate (due to the VFDs).

Replacing just the motors or impellers of the pumps may save some energy costs. This was suggested initially in the CTI report but sited that it would only have an improvement of 1.5% efficiency. Additionally, In Figure 4 and Figure 5 the severity of age degradation is displayed through the pump affinity laws. Final calculations showed the current impeller diameters of 20.843 inches for Pump #2 (700 HP) and 26.74 inches for Pump #6 (1250 HP). This is a degradation of 8% and 12% respectively for each impeller. When the initial degradation of these pumps was investigated in 2012, each only showed about 1% and 7% decrease in size over an almost 40-year operation period. In less than a decade, the degradation increased by 7% for Pump #2 (700 HP) and 5% for Pump #6 (1250 HP). Considering that the city operates both the 700 HP and 1250 HP pumps on a rotational basis the shift in pump curves is too severe to ignore.

The city may benefit from adding new pumps in rotation and begin a pricing plan of slowly upgrading each pump that is actively used within the general operating procedures. Since the CTI report, Pump #5, one of the two 1250 HP pumps on the North clearwell line has been decommissioned. This can cause intense strain on the single 1250 HP pump on the North clearwell line since the city switches every two weeks which side of the line will be operating the 1250 HP pump. Meanwhile, the south line has two 1250 HP pumps to select from.

No more than two pumps were observed running at a time over the two-week observation period (Figure 6). Therefore, if pumps were replaced one at a time starting with the decommissioned Pump #5, the strain on the pumps in constant pumping scenarios would be lessened. Additionally, if new pumps were installed to match the original pump curves from 1970, the operating windows within the system curve would be adequately met with less demand of horsepower (Equation D).

The constituents and end users of the Akron Water Supply Plant deserve the best quality of water at an affordable price. To ensure prices are maintained, the continuation of energy savings from the VFDs and potential upgrades to the pumps will drive energy consumption down as the pumps operate more efficiently within the system curve envelope. This is especially important since the pumps are operating outside the system curve. The continued degradation due to age will eventually force the city to reevaluate the modes and operating levels at which the pumps are currently performing. To provide the best service, it is within the best interest of Akron Water Supply to levy the potential impacts and proposals as discussed above.

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Akron Water Supply Treatment Plant Operators: Kenneth Moats and Perry Haggard

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"Pump Affinity Laws." Engineering ToolBox, https://www.engineeringtoolbox.com/affinity-laws-d_408.html.

Appendix

Item A: "Akron Water Supply High Lift Station Reports"

Item B: "OhioEdison City of Akron Public Utilities"

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DRS 2 RDW 3 JW DATE 11/21/21

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 3 SSP	N-HSP# 3 AMP/PRS	N-HSP# 3 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 4 SSP	S-HSP# 4 AMP/PRS	S-HSP# 4 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	65	15.6	24.4	BP	92 69					BP	148 75	124 104				4.40	4.40	4.80	4.80	17.25	18.50
1am	65	15.6	24.8	|	92 69					|	148 76	124 104									
2am	64	15.4	24.8	|	92 69					|	149 76	124 104									
3am	63	15.3	24.6	|	93 70					|	149 77	124 104									
4am	63	15.4	24.6	|	92 70						148 77	124 104									
5am	62	15.4	24.7	|	92 71						148 77	124 104									19.50
6am	61	15.3	24.6	BP	92 71					BP	148 77	124 104				4.40	4.40	4.80	4.80	17.25	19.50
7am	60	15.3	24.3	BP	93 71					BP	146 77	124 104				4.40	4.20	4.80	4.80	17.25	19.50
8am	60	15.3	24.4	|	94 71					|	147 77	124 104									
9am	60	15.2	24.5	|	93 71					|	146 77	124 104									
10am	60	15.4	24.7	|	94 71					|	146 77	124 104									
11am	60	15.3	24.6	|	94 71					|	146 77	124 104									
12nn	61	15.3	24.7	|	93 71					|	146 77	124 104									
1pm	61	15.3	24.5	|	93 71					|	146 77	124 104									
2pm	61	15.3	24.6	BP	94 71					BP	146 77	124 104				4.40	4.20	4.80	4.80	17.25	19.50
3pm	61	15.2	24.5	BP	93 71					BP	146 77	126 102									
4pm	61	15.2	24.5	|	93 71					|	146 77	126 102									
5pm	61	15.2	24.3	|	93 72					|	146 78	126 102									
6pm	61	15.2	24.3	|	93 72					|	146 78	126 102									
7pm	61	15.2	24.4	|	93 72					|	146 78	126 102					5.00			
8pm	60	15.3	24.4	|	93 71					|	146 78	126 102						5.00		
9pm	60	15.3	24.5	|	93 71					|	146 78	126 102								
10pm	60	15.3	24.5	BP	92 71					BP	146 78	126 102									
11pm	60	15.3	24.5		71						146 78	126 102									
12Md	60	15.3	24.5	BP	92 71					BP	146 78	126 102				4.40	4.40	5.00	5.00	17.25	19.50

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	132554	149398
Prev Midnight	131027	146948
Difference	1527	2450
Total Flow	3977	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DRG 2 KN 3 JW DATE 11/1/21 monday

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# (1) SSP	N-HSP# (1) AMP/PRS	N-HSP# (1) UP/LO	N-HSP# (3) SSP	N-HSP# (3) AMP/PRS	N-HSP# (3) UP/LO	S-HSP# (2) SSP	S-HSP# (2) AMP/PRS	S-HSP# (2) UP/LO	S-HSP# (4) SSP	S-HSP# (4) AMP/PRS	S-HSP# (4) UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	72	16.6	14.7	83	118 65	58 43				93	80 68	58 39				4.20	4.20	4.60	4.60	17.00	18.00
1am	72	16.5	14.6		118 65	58 43					80 68	58 39									
2am	72	16.6	14.7		118 65	58 43					81 60	58 39									
3am	72	16.5	14.5		118 65	58 43					80 68	58 39									
4am	72	16.5	14.6		118 65	58 41					80 69	58 39									
5am	72	16.5	14.4		118 65	58 43					80 69	58 39									
6am	72	16.4	14.4	83	118 65	58 43				93	80 69	58 39				4.20	4.20	4.60	4.60	17.00	18.00
7am	72	16.4	14.5	83	118 65	58 43				93	82 68	58 38				4.20	4.20	4.60	4.60	17.00	18.00
8am	72	16.5	14.6		118 65	58 43					82 68	58 38									
9am	72	16.5	14.5		118 66	58 43					82 68	58 38									
10am	72	16.6	14.7		118 66	58 43					82 68	58 38									
11am	72	16.7	15.0		118 65	58 43					82 68	58 38									
12nn	72	16.8	14.8		118 64	58 43					82 68	58 38									
1pm	72	16.7	14.8		118 64	58 43					82 67	58 38									
2pm	72	16.8	14.9		118 64	58 43					82 67	58 38				4.20	4.20	4.60	4.60	17.00	18.00
3pm	72	16.8	15.1	83	118 64	58 42				93	82 67	58 38									
4pm	72	16.6	14.6	1	118 64	58 42				1	82 67	58 38									
5pm	72	14.6	22.6	OFF			95	91 67		—	OFF		94	140 73	70 88	4.40		5.00	4.80	17.75	18.50
6pm	70	15.5	25.0				BP	92 69					BP	145 75	100 99						
7pm	69	15.5	25.0					93 69						146 75	112 102						
8pm	68	15.6	25.2					93 69						146 74	120 102						
9pm	66	15.6	24.9					93 69						145 74	122 102			4.80		17.25	
10pm	66	15.5	25.1				BP	92 69					BP	145 75	124 102						
11pm	65	15.5	25.1					69						75	124 104						
12Md	65	15.6	24.9				BP	92 69					BP	145 75	124 104	4.40	4.20	4.80	4.80	17.25	18.50

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	131045	146948
Prev Midnight	124404	145150
Difference	1641	1798
Total Flow	3414	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DT 2 DJ 3 MP DATE 10-31-21

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# 2 SSP	N-HSP# 2 AMP/PRS	N-HSP# 2 UP/LO	S-HSP# 1 SSP	S-HSP# 1 AMP/PRS	S-HSP# 1 UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO
12Md	72	16.5	14.5	83	118 65	58 43				83	82 61	58 38			
1am	72	16.5	14.5		118 65	58 43					82 65	58 38			
2am	72	16.5	14.5		118 65	58 43					82 69	58 39			
3am	72	16.5	14.5		118 65	58 43					82 65	58 39			
4am	72	16.5	14.6		118 65	58 43					82 69	58 39			
5am	72	16.5	14.6		118 65	58 43					82 69	58 39			
6am	72	16.5	14.6		118 66	58 43					82 69	58 39			
7am	72	16.2	14.2		118 66	58 42					82 69	58 39			
8am	72	16.2	14.2		118 66	58 42					82 69	58 39			
9am	72	16.2	14.2		118 66	58 42					82 69	58 39			
10am	72	16.2	14.2		118 66	58 42					82 69	58 39			
11am	72	16.2	14.2		118 66	58 42					82 69	58 39			
12nn	72	16.2	14.2		118 66	58 42					82 69	58 39			
1pm	72	16.2	14.2		118 66	58 42					82 69	58 39			
2pm	72	16.2	14.2		118 66	58 42					82 69	58 39			
3pm	72	17.4	15.7		118 66	58 42					81 69	58 39			
4pm	72	16.6	14.6		118 65	58 41					81 68	58 39			
5pm	72	16.3	146		118 65	58 41					81 68	58 39			
6pm	72	16.7	146		118 65	58 42					81 68	58 39			
7pm	72	16.5	14.5		118 65	58 43					82 68	58 38			
8pm	72	16.5	14.8		118 65	58 43					82 68	58 38			
9pm	72	16.5	14.7		118 65	58 43					82 68	58 38			
10pm	72	16.5	14.6		118 65	58 43					82 68	58 38			
11pm	72	16.6	14.6	83	118 65	58 43				93	80 68	58 38			
12Md	78	16.6	14.7	83	118 65	58 43				93	80 68	58 39			

DOSAGE SETPOINTS

POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
4.40	4.50	4.80	4.80	17.00	18.00
4.20		4.60			
	4.20		4.60		
4.20	4.20	4.60	4.60	17.00	18.00

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	129404	145150
Prev Midnight	128341	144212
Difference	1063	938
Total Flow	2001	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 MP 2 NB 3 NB DATE 10/29/21 10-30-21

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO
12Md	72°	16.5	14.7	83	118 65	58 43				93	82 68	58 38			
1am	72°	17.3	15.7		118 65	58 43					81 68	58 38			
2am	72°	16.4	14.5		118 65	58 42					82 68	58 38			
3am	72°	16.3	14.3		118 65	58 43					82 68	58 38			
4am	72°	16.3	14.2		118 65	58 42					82 68	58 38			
5am	72°	16.3	14.2		118 65	58 43					82 68	58 38			
6am	72°	16.1	14.2	83	118 66	58 43				93	82 69	58 38			
7am	71°	16.2	14.4	83	118 67	58 43				93	82 69	58 39			
8am	72°	16.3	14.4	83	118 66	58 43				93	82 69	58 39			
9am	72°	16.3	14.5	83	118 66	58 43				93	82 69	58 39			
10am	72°	16.4	14.3	83	118 65	58 43				93	82 69	58 39			
11am	72°	16.5	14.6	83	118 65	58 43				93	82 69	58 39			
12nn	72°	16.5	14.6	83	118 65	58 43				93	82 69	58 39			
1pm	72°	16.5	14.6	83	118 65	58 43				93	82 69	58 39			
2pm	72°	16.5	14.5	83	118 65	58 43				93	82 69	58 39			
3pm	72°	16.6	14.6	83	118 65	58 43				93	82 69	58 39			
4pm	72°	16.6	14.5	83	118 65	58 43				93	82 69	58 39			
5pm	72°	16.6	14.4	83	118 65	58 43				93	82 69	58 39			
6pm	72°	16.5	14.5	83	118 65	58 43				93	82 70	58 39			
7pm	72°	16.4	14.5	83	118 65	58 43				93	82 70	58 39			
8pm	72°	16.5	14.5	83	118 65	58 43				93	82 69	58 39			
9pm	72°	16.4	14.6	83	118 65	58 43				93	82 69	58 39			
10pm	72°	16.5	14.5	83	118 65	58 43				93	82 69	58 39			
11pm	72	16.5	14.5		118 65	58 43				93	82 69	58 39			
12Md	72	16.5	14.5		118 65	58 43				93	82 69	58 38			

DOSAGE SETPOINTS

POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
4.40	4.50	4.80	4.80	17.00	18.00
4.40	4.50	4.80	4.80	17.00	18.00
4.40	4.50	4.80	4.80	17.00	18.00
4.40	4.50	4.80	4.80	17.00	18.00

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight		
Prev Midnight	126104	142240
Difference		
Total Flow		

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 AU 2 JB 3 SB DATE 10/29/21 FRIDAY

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	73	16.5	14.4	83	118 65	58 43				93	82 69	58 39				4.20	4.20	4.50	4.60	17.00	18.00
1am	73	16.4	14.3		118 66	58 43					82 70	58 39									
2am	73	16.3	14.4		118 66	58 43					82 70	58 39									
3am	73	16.4	14.5		118 66	58 43					82 70	58 39									
4am	73	16.2	14.4		117 66	58 43					82 70	58 39									
5am	73	16.3	14.4		117 66	58 43					82 70	58 39									
6am	73	16.2	14.3	83	117 66	58 43				93	82 70	58 39				4.20	4.20	4.50	4.60	17.00	18.00
7am	72	16.3	14.2	83	117 66	58 43				93	82 70	58 39				4.20	4.20	4.50	4.60	17.00	18.00
8am	72	16.2	14.2	83	117 66	58 42				93	82 70	58 39				1	1	1	1		
9am	72	16.4	14.6	83	118 66	58 42				93	82 70	58 39				4.40	4.40	4.70	4.70		
10am	72	16.4	14.7	83	118 66	58 42				93	82 70	58 39					4.50	4.80	4.80		
11am	72	16.4	14.7	83	118 66	58 42				93	82 70	58 39									
12nn	72	16.4	14.7	83	118 66	58 42				93	82 70	58 39									
1pm	72	16.2	14.4	83	118 66	58 42				93	82 70	58 39									
2pm	72	16.2	14.4	83	118 66	58 42				93	82 70	58 39				4.40	4.50	4.80	4.80	17.00	18.00
3pm	72	16.3	14.3	83	118 66	58 42				93	82 70	58 39				4.40	4.50	4.80	4.80	17.00	18.00
4pm	72	16.4	14.7		118 66	58 42					82 70	58 39									
5pm	72	16.3	14.5		118 66	59 42					82 70	58 39									
6pm	72	16.3	14.5		118 66	59 42					82 69	59 38									
7pm	72	16.3	14.7		118 66	59 42					81 69	59 38									
8pm	72	16.2	14.4		118 66	59 42					81 69	59 38									
9pm	72	16.3	14.3		118 66	59 42					82 69	59 38									
10pm	72	16.2	14.5	83	117 66	59 42				93	82 69	59 38				4.40	4.50	4.80	4.80	17.00	18.00
11pm	72	16.5	14.6		118 66	58 42					82 69	59 38									
12Md	72	16.5	14.7		118 65	58 43					82 68	58 38									

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	126 164	142 240
Prev Midnight	124457	140788
Difference	16.47	14.52
Total Flow	30.99	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 AH 2 JB 3 AH DATE 10/28/21 THURSDAY

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	SP21	NP22	NP22A	CAUSTIC NORTH	SOUTH
12Md	73	16.4	14.7	83	118 65	58 43				93	82 68	58 39				4.20	4.20	4.50	4.60	17.00	18.00
1am	72	16.4	14.1		118 66	59 43					82 70	58 39									
2am	72	16.4	14.2		117 66	59 43					82 70	58 39									
3am	72	16.3	14.4		117 66	59 43					82 70	58 39									
4am	72	16.2	14.2		117 66	59 43					82 70	58 39									
5am	72	16.2	14.1		117 66	59 43					82 70	58 39									
6am	72	16.2	14.3	83	117 66	59 43				93	82 70	58 39				4.20	4.20	4.50	4.50	17.00	18.00
7am	72	16.2	14.3	83	117 66	58 42				93	82 69	58 38				4.20	4.20	4.50	4.60	17.00	18.00
8am	72	16.3	14.4	83	117 66	58 42				93	82 69	58 38									
9am	72	16.4	14.5	83	117 66	58 42				93	82 69	58 38									
10am	72	16.5	14.7	83	118 66	58 42				93	82 69	58 38									
11am	72	16.5	14.7	83	118 66	58 42				93	82 69	58 38									
12nn	72	16.5	14.5	83	117 66	58 42				93	82 69	58 38									
1pm	72	16.5	14.5	83	117 66	58 42				93	82 69	58 38									
2pm	72	16.6	14.9	83	118 66	58 42				93	82 69	58 38				4.20	4.20	4.50	4.60	17.00	18.00
3pm	73	16.4	14.4	83	117 65	58 43				93	82 69	58 39				4.20	4.20	4.50	4.60	17.00	18.00
4pm	73	16.4	14.5		117 65	58 43					82 69	58 39									
5pm	73	16.4	14.4		117 65	58 43					82 69	58 39									
6pm	73	16.3	14.5		117 65	58 43					82 69	58 39									
7pm	73	16.5	14.7		118 65	58 43					82 69	58 39									
8pm	73	16.5	14.8		117 65	58 43					82 69	58 39									
9pm	73	16.6	14.8		118 65	58 43					82 69	58 39									
10pm	73	16.5	14.7	83	118 65	58 43				93	82 68	58 39				4.20	4.20	4.50	4.60	17.00	18.00
11pm	73	16.6	14.7	83	118 65	58 43				93	82 69	58 39									
12Md	73	16.5	14.4	83	118 65	58 43				93	82 69	58 39				4.20	4.20	4.50	4.60	17.00	18.00

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	124457	140788
Prev Midnight	122821	139348
Difference	1636	1440
Total Flow	3076	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 [illegible] 2 JB 3 [illegible] DATE 10/27/21 WEDNESDAY

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	SP21	NP22	NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	73	16.5	14.2	83	118 69	59 43				93	82 69	58 39				4.20	4.20	4.50	4.50	17.00	19.00
1am	72	16.3	14.3		117 66	58 43					82 70	58 39								16.00	18.00
2am	72	16.3	14.4		118 66	58 43					82 70	58 39									
3am	72	16.3	14.3		118 66	58 43					82 70	58 39									
4am	72	16.0	14.2		118 66	58 43					82 70	58 39									
5am	72	16.3	14.2		117 66	58 43					82 70	58 39									
6am	72	16.2	14.1	83	117 66	58 43				93	82 70	58 39				4.20	4.20	4.50	4.50	16.00	18.00
7am	72	16.2	14.1	83	117 66	58 42				93	82 70	58 39				4.20	4.20	4.50	4.50	17.00	19.00
8am	72	16.2	14.1	83	117 66	58 42				93	82 70	58 39									
9am	72	16.3	14.1	83	118 66	58 42				93	82 70	58 39									
10am	72	16.3	14.3	83	118 66	58 42				93	82 70	58 39							4.60		
11am	72	16.4	14.6	83	118 66	58 42				93	82 70	58 39									
12nn	72	16.5	14.6	83	118 66	58 42				93	82 70	58 39									
1pm	72	16.6	14.7	83	118 66	58 42				93	82 70	58 39									
2pm	72	16.6	14.7	83	118 66	58 42				93	82 70	58 39				4.20	4.20	4.50	4.60	17.00	19.00
3pm	72	16.5	14.6	83	118 66	58 42				93	82 70	58 39				4.20	4.20	4.50	4.60	17.00	19.00
4pm	72	16.5	14.6		118 66	58 42					82 69	58 39									
5pm	72	16.3	14.1		118 66	59 42					82 69	59 39									
6pm	72	16.3	14.6		118 66	59 42					82 69	59 39									
7pm	72	16.3	14.5		118 66	59 42					82 69	59 39									
8pm	72	16.5	14.6		118 66	59 42					82 69	59 39									
9pm	72	16.6	14.6		118 65	59 41					82 69	59 38									
10pm	72	16.5	14.4	83	118 64	59 40				93	82 68	59 38				4.20	4.20	4.50	4.60	17.00	19.00
11pm	73	16.6	14.5	83	118 65	58 43				93	82 68	58 39									18.00
12Md	73	16.4	14.7	83	118 65	58 43				93	82 68	58 39				4.20	4.20	4.50	4.60	17.00	18.00

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	122821	139348
Prev Midnight	121179	137905
Difference	1642	1443
Total Flow	3085	

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 [illegible] 2 JB 3 [illegible] DATE 10/26/21 TUESDAY

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP#			N-HSP#			S-HSP#			S-HSP#			DOSAGE SETPOINTS					
																POST BLEACH				CAUSTIC	
				SSP	AMP/PRS	UP/LO	SSP	AMP/PRS	UP/LO	SSP	AMP/PRS	UP/LO	SSP	AMP/PRS	UP/LO	SP20	SP21	NP22	NP22A	NORTH	SOUTH
12Md	73	16.3	14.3	83	117 66	58 43				93	82 70	58 39				4.20	4.20	4.50	4.50	19.00	21.00
1am	73	16.3	14.0		118 67	58 43					82 71	58 39									
2am	73	16.3	14.3		118 67	58 43					82 71	58 39									
3am	73	16.2	14.1		117 67	58 43					82 71	58 39									
4am	73	16.1	14.0		117 67	58 43					82 71	58 39									
5am	73	16.2	14.1		117 67	58 43					82 71	58 39									
6am	73	16.2	14.1	83	117 67	58 43				93	82 71	58 39				4.20	4.20	4.50	4.50	19.00	21.00
7am	72	16.1	14.0	83	117 67	58 42				93	82 70	58 38				4.20	4.20	4.50	4.50	18.00	20.00
8am	72	16.3	14.4	83	117 67	58 42				93	82 70	58 38									
9am	72	16.3	14.4	83	117 67	58 42				93	82 70	58 38									
10am	72	17.0	15.0	83	118 67	58 42				93	81 70	58 36									
11am	72	16.4	14.5	83	118 67	58 42				93	82 70	58 38									
12nn	72	16.4	14.5	83	117 67	58 42				93	82 70	58 38									
1pm	72	16.4	14.5	83	117 67	58 42				93	82 70	58 38									
2pm	72	16.4	14.5	83	117 67	58 42				93	82 70	58 38				4.20	4.20	4.50	4.50	18.00	20.00
3pm	72	16.4	14.5	83	117 67	58 42				93	82 70	58 38				4.20	4.20	4.50	4.50	18.00	20.00
4pm	72	16.3	14.5		117 64	59 42					82 70	58 38									
5pm	72	16.4	14.3		117 64	59 42					82 70	58 38									
6pm	72	16.4	14.2		117 64	59 42					82 70	58 38									
7pm	72	16.5	14.3		117 64	59 42					82 70	58 38									
8pm	72	16.5	14.5		117 64	59 42					82 70	58 38									
9pm	72	16.5	14.5		118 64	59 42					82 70	58 38									
10pm				83	118 64	59 41				93	82 70	58 39				4.20	4.20	4.50	4.50	18.00	20.00
11pm	73	16.5	14.4	83	118 65	59 43				93	82 69	58 39								17.00	19.00
12Md	73	16.5	14.2	83	118 65	59 43				93	82 69	58 39				4.20	4.20	4.50	4.50	17.00	19.00

COMMENTS

VENTURI FLOW TOTALIZERS		
Midnight	121179	137905
Prev Midnight	119544	136472
Difference	1635	1433
Total Flow	3068	

CHEMICAL DOSAGES				
ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 MH 2 JB 3 SK DATE 10/25/21 MONDAY

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	72	16.2	14.1	83	117 66	58 43				93	82 71	58 39				4.20	4.30	4.50	4.50	19.00	21.00
1am	72	16.3	14.2		117 67	58 43					82 71	58 39									
2am	72	16.2	14.0		117 67	58 43					82 71	58 39					4.25				
3am	72	16.1	14.3		117 67	58 43					82 71	58 39									
4am	72	16.2	13.9		117 67	58 43					82 71	58 39					4.20				
5am	72	16.1	14.1		117 67	58 43					82 71	58 39									
6am	72	16.4	14.2	83	117 67	58 43				93	82 71	58 39				4.20	4.20	4.50	4.50	19.00	21.00
7am	72	16.2	14.1	83	117 66	58 42				93	82 69	58 39				4.20	4.20	4.50	4.50	19.00	21.00
8am	72	16.2	14.1	83	117 66	58 42				93	82 69	58 39									
9am	72	16.3	14.2	83	117 66	58 42				93	82 69	58 39									
10am	72	16.3	14.2	83	117 66	58 42				93	82 69	58 39									
11am	72	16.4	14.3	83	117 66	58 42				93	82 69	58 39									
12nn	72	16.4	14.3	83	117 66	58 42				93	82 69	58 39									
1pm	72	16.4	14.2	83	117 66	58 42				93	82 69	58 39									
2pm	72	16.3	14.1	83	117 66	58 42				93	82 69	58 39				4.20	4.20	4.50	4.50	19.00	21.00
3pm	72	16.2	14.0	83	117 66	59 42				93	82 70	59 38				4.20	4.20	4.50	4.50	19.00	21.06
4pm	72	16.1	14.0		117 66	59 42					82 70	59 38									
5pm	72	16.4	14.2		117 66	59 42					82 70	59 38									
6pm	72	16.3	14.1		117 66	59 42					82 70	59 38									
7pm	72	16.3	14.2		117 65	59 42					82 70	59 38									
8pm	72	16.5	14.4		118 64	59 42					83 69	59 38									
9pm	72	16.5	14.4		118 64	59 42					82 69	59 38									
10pm	72	16.4	14.3	83	118 64	59 42				93	82 69	59 38				4.20	4.20	4.50	4.50	19.00	21.00
11pm	73	16.5	14.5	83	118 66	58 43				93	82 70	58 39									
12Md	73	16.3	14.3	83	117 66	58 43				93	82 70	58 39				4.20	4.20	4.50	4.50	19.00	21.00

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	119544	136472
Prev Midnight	117913	135050
Difference	1631	1422
Total Flow	3053	

CHEMICAL DOSAGES

ZINC	N	1.00	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 LTP 2 LTP 3 DT DATE 10/24/21 Sunday

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# (1) SSP	N-HSP# (1) AMP/PRS	N-HSP# (1) UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# (2) SSP	S-HSP# (2) AMP/PRS	S-HSP# (2) UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	72	16.1	14.3	83	117 67	58 43				93	82 71	58 38				4.10	4.40	4.50	4.40	19.00	21.00
1am	72	16.1	14.1	83	117 67	58 43				93	82 71	58 38									
2am	72	16.1	14.0	83	117 67	58 43				93	82 71	58 38									
3am	72	16.1	13.8	83	117 67	58 43				93	82 71	58 38									
4am	72	16.1	13.8	83	117 67	58 43				93	82 71	58 38									
5am	72	16.2	14.0	83	117 67	58 43				93	82 71	58 38									
6am	72	16.1	13.9	83	117 67	58 43				93	82 71	58 38									
7am	72	16.2	13.9	83	117 67	58 43				93	82 71	58 38									
8am	72	16.1	14.1	83	117 67	58 43				93	82 71	58 38									
9am	72	16.2	14.0	83	117 67	58 43				93	82 71	58 38									
10am	72	16.2	14.2	83	117 67	58 43				93	82 71	58 38									
11am	72	16.1	14.1	83	117 67	58 43				93	82 71	58 38									
12nn	72	16.2	14.2	83	117 67	58 43				93	82 71	58 38									
1pm	72	16.2	14.1	83	117 67	58 43				93	82 71	58 38									
2pm	72	16.2	14.0	83	117 67	58 43				93	82 71	58 38									
3pm	72	16.1	14.2		117 67	59 42					82 70	58 38									
4pm	72	16.1	14.2		117 67	59 42					82 70	58 38									
5pm	72	16.1	14.2		117 67	59 42					82 70	58 38									
6pm	72	16.1	14.7		117 67	59 42					82 70	58 38									
7pm	72	16.1	14.2		117 67	59 42					82 70	58 38									
8pm	72	16.2	13.9		117 67	59 42					82 70	58 38									
9pm	72	16.2	13.9		117 67	59 42					82 70	58 38									
10pm	72	16.1	14.0		117 67	59 42					82 70	58 38									
11pm	72	16.2	14.3	83	117 66	58 43				93	82 71	58 39				4.20	4.30		4.50		
12Md	72	16.2	14.1	83	117 66	58 43				93	82 71	58 39				4.20	4.30	4.50	4.50	19.00	21.00

COMMENTS

VENTURI FLOW TOTALIZERS		
Midnight	117913	135050
Prev Midnight	116784	133637
Difference	1624	1413
Total Flow	3037	

CHEMICAL DOSAGES				
ZINC	N		S	
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1		2	
	3		4	

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DT 2 NB 3 NB DATE 10-23-21

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# (1) SSP	N-HSP# (1) AMP/PRS	N-HSP# (1) UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# (2) SSP	S-HSP# (2) AMP/PRS	S-HSP# (2) UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	72	16.0	14.0	83	117 66	58 42				93	82 71	58 38				4.10	4.40	4.30	4.40	19.50	21.75
1am	72	16.0	14.0		117 66	58 42					82 71	58 38									
2am	72	16.0	14.0		117 66	58 42					82 71	58 38									
3am	71	16.0	14.0		117 66	58 42					82 70	58 39									
4am	71	16.0	14.0		117 66	58 42					82 70	58 39									
5am	71	16.0	14.2		117 66	58 42					82 70	58 39									
6am	71	16.0	13.9	83	117 66	58 42				93	82 70	58 39				4.10	4.40	4.30	4.40	19.50	21.75
7am	71°	16.0	14.1	83	117 67	58 43				93	82 71	58 39									
8am	71°	16.0	14.1	83	117 67	58 43				93	82 71	58 39								19.00	21.00
9am	71°	16.1	14.0	83	117 67	58 43				93	82 71	58 39									
10am	71°	16.2	14.0	83	117 67	58 43				93	82 71	58 39						4.50			
11am	71°	16.0	14.0	83	117 67	58 43				93	82 72	58 39									
12nn	71°	16.1	14.0	83	117 67	58 43				93	82 71	58 39									
1pm	71°	16.1	14.0	83	117 67	58 43				93	82 71	58 39									
2pm	71°	17.0	14.9	83	117 67	58 43				93	82 72	58 39									
3pm	71°	17.0	15.0	83	117 67	59 43				93	82 72	58 39									
4pm	71°	17.0	15.1	83	117 67	59 43				93	82 72	58 39									
5pm	71°	16.3	14.2	83	117 67	58 43				93	82 71	58 39									
6pm	71°	16.3	14.1	83	117 66	58 43				93	82 70	58 39									
7pm	71°	16.4	14.5	83	117 67	58 43				93	82 70	58 39									
8pm	71°	16.9	14.9	83	117 67	58 43				93	82 70	58 39									
9pm	71°	16.2	14.1	83	117 67	58 43				93	82 71	58 39									
10pm	71°	16.2	14.3	83	117 67	58 43				93	82 71	58 39				4.10	4.40	4.50	4.40	19.00	21.00
11pm	72°	16.2	14.2	83	117 67	58 43				93	82 71	58 38									
12Md	72°	16.1	14.3	83	117 67	58 43				93	82 71	58 39									

COMMENTS

VENTURI FLOW TOTALIZERS		
Midnight	116289	132357
Prev Midnight	114679	132239
Difference	1610	118
Total Flow	3008	

CHEMICAL DOSAGES				
ZINC	N 1.10	S 1.10		
FLUORIDE	N 1.00	S 1.00		
PRE-BLEACH	1 4.00	2 —	3 2.00	4 2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DZ 2 KM 3 JW

DATE 10/22/21 Friday

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	66	24.1	16.1	BP	147 72	60 49				BP	83 76	59 40				3.90	4.10	4.10	4.30	21.50	22.75
1am	68	23.4	14.9	95	141 71	60 49				95	83 75	59 40									
2am	70	22.7	14.5	89	132 70	61 48				94	83 75	59 40				4.10	4.20	4.20			23.75
3am	70	20.1	14.0	85	121 70	61 46				94	83 74	58 40					4.40			20.50	
4am	70	15.5	13.8	83	116 70	61 45				93	82 74	58 40				4.40		4.50			
5am	70	15.5	13.3	83	116 69	60 43				93	82 73	58 39								20.00	22.50
6am	71	15.4	13.4	83	116 69	60 43				93	82 73	58 39				4.40	4.40	4.50	4.30	20.00	22.50
7am	71	15.7	13.5	83	117 69	60 43				93	82 73	58 39				4.40	4.40	4.50	4.30	20.00	22.50
8am	71	15.7	13.5	83	117 69	59 43				93	82 71	58 39								19.00	
9am	71	15.8	13.5	83	117 69	59 43				93	82 70	58 39									
10am	71	15.9	13.7	83	117 69	59 43				93	82 70	58 39							4.30		
11am	71	15.8	13.6	83	117 69	59 43				93	82 68	58 39							4.40		
12nn	71	15.7	13.6	83	117 69	59 43				93	82 70	58 39									
1pm	71	15.8	14.0	83	117 69	59 43				93	82 72	58 39									
2pm	71	15.9	13.7	83	117 69	59 43				93	82 72	58 39				4.40	4.40	4.50	4.40	19.00	22.50
3pm	71	16.0	13.9	83	117 67	58 42				93	82 71	58 38								20.25	
4pm	71	16.1	13.9		117 67	58 42					82 71	58 38									
5pm	71	16.1	13.9		117 67	58 42					82 71	58 38				4.10					
6pm	71	16.1	14.1		117 67	58 42					82 72	58 38									
7pm	71	16.1	13.9		117 67	58 42					82 72	58 38								19.50	
8pm	71	16.1	14.0		117 67	58 42					82 70	58 38									21.75
9pm	71	16.0	13.8		117 67	58 42					82 70	58 38									
10pm	71	16.0	13.8	83	117 67	58 42				93	82 71	58 38									
11pm	72	16.0	14.0	83	117 66	58 42				93	82 72	58 38									
12Md	72	16.0	14.0	83	117 66	58 42				93	82 71	58 38				4.10	4.40	4.30	4.40	19.50	21.75

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	114679	132239
Prev Midnight	113009	130843
Difference		
Total Flow		

CHEMICAL DOSAGES

ZINC	N	1.10	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS

REV 10/15

OPERATOR 1 [illegible] 2 [illegible] 3 [illegible] DATE 10/21/21 Thursday

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	68	24.9	16.5	BP	147 68	60 49				BP	80 71	59 40				3.90	3.90	4.10	4.30	22.25	24.50
1am	68	24.8	16.4		147 68	60 49					80 71	59 40									
2am	68	24.7	16.4		147 69	60 49					80 72	59 40									23.50
3am	68	24.7	16.4		147 69	60 49					80 72	58 40								21.50	
4am	67	24.5	16.3		147 69	60 49					80 72	58 40									22.75
5am	67	24.4	16.0		147 70	60 49					80 72	58 40									
6am	67	24.4	16.0	BP	147 70	60 49				BP	80 73	58 40				3.90	3.90	4.10	4.30	21.50	22.75
7am	67	24.3	16.2	BP	149 70	62 49				BP	84 73	59 40				3.90	3.90	4.10	4.30	21.50	22.75
8am	67	24.5	16.3		149 70	62 49					84 73	59 40									
9am	67	24.5	16.3		149 70	62 49					84 73	59 40									
10am	68	24.4	16.2		149 70	62 49					84 73	59 40									
11am	68	24.4	16.3		149 70	62 49					84 73	59 40									
12nn	68	24.5	16.3		149 70	62 49					84 73	59 40									
1pm	68	24.4	16.2		149 71	62 49					84 75	59 40									
2pm	68	24.4	16.1	BP	149 71	62 49				BP	84 75	59 40				3.90	3.90	4.10	4.30	21.50	22.75
3pm	68	24.2	16.2	BP	149 71	62 49				BP	84 75	58 40									
4pm	68	24.2	16.2		149 71	62 49					84 75	58 40									
5pm	68	24.5	16.3		149 71	62 49					84 73	59 40				4.10	4.10				
6pm	68	24.5	16.2		148 70	62 49					84 73	59 40									
7pm	68	24.4	16.2		149 70	62 49					83 73	59 40									
8pm	67	24.4	16.1		149 71	62 49					83 73	59 40									
9pm	67	24.3	16.2		148 71	62 49					83 73	59 40				3.90					
10pm	67	24.2	16.1	BP	148 71	62 49				BP	83 76	59 40									
11pm	66	24.1	16.0		148 71	60 49					83 76	59 40									
12Md	66	24.1	16.1	BP	147 70	60 49				BP	83 76	59 40				3.90	4.10	4.10	4.30	21.50	22.75

COMMENTS

VENTURI FLOW TOTALIZERS

Midnight	113009	130843
Prev Midnight	110598	129238
Difference	0411	1605
Total Flow	4016	

CHEMICAL DOSAGES

ZINC	N 1.10	S 1.10
FLUORIDE	N 1.00	S 1.00
PRE-BLEACH	1 4.00	2 —
	3 2.00	4 2.00

Item A

AKRON WATER SUPPLY - HIGH LIFT PUMP STATION REPORT

PS
REV 10/15

OPERATOR 1 DCB 2 KN 3 JW DATE 10/20/21 wednesday

TIME	VFD Room	NORTH VEN	SOUTH VEN	N-HSP# 1 SSP	N-HSP# 1 AMP/PRS	N-HSP# 1 UP/LO	N-HSP# SSP	N-HSP# AMP/PRS	N-HSP# UP/LO	S-HSP# 2 SSP	S-HSP# 2 AMP/PRS	S-HSP# 2 UP/LO	S-HSP# SSP	S-HSP# AMP/PRS	S-HSP# UP/LO	DOSAGE SETPOINTS POST BLEACH SP20	POST BLEACH SP21	POST BLEACH NP22	POST BLEACH NP22A	CAUSTIC NORTH	CAUSTIC SOUTH
12Md	70	24.5	16.3	BP	149 69	61 49				BP	83 73	58 40				4.10	4.10	4.30	4.00	21.75	22.25
1am	69	24.3	16.2		149 69	61 49					83 73	58 40									
2am	68	24.3	16.2		149 70	62 49					83 74	59 40									
3am	68	24.2	16.1		150 70	62 49					83 74	57 40									
4am	68	24.0	16.1		149 70	62 49					83 74	59 40									22.00
5am	67	24.1	16.2		149 71	61 49					83 75	59 40							4.10		
6am	65	24.0	16.1	BP	149 71	60 49				BP	82 75	59 40				4.10	4.10	4.30	4.10	21.75	22.00
7am	67	24.1	16.2	BP	150 71	62 49				BP	84 75	59 40				4.10	4.10	4.30	4.10	21.75	22.00
8am	67	24.3	16.2	BP	150 71	62 49	83			BP	84 75	59 40	93								
9am	67	0	0	OFF	0 0	60 48				OFF	0 0	58 40									
10am	67	0	0		0 0	60 48					0 0	54 38									
11am	67	0	0		0 0	58 46					0 0	54 38									
12nn	68	0	0		0 0	54 44					0 0	50 36									
1pm	68	0	0		0 0	52 41					0 0	48 35									
2pm	69	0	0	OFF	0 0	52 41				OFF	0 0	46 35				4.10	4.10	4.30	4.10	21.75	22.00
3pm	69	0	0	OF						OF											
4pm	70	16.7	16.6	83	120 65	42 30				BP	83 70	47 35									
5pm	70	22.5	16.6	94																	
6pm	70	22.9	16.5	95	142 67						83 70	56 40									22.50
7pm	70	23.2	16.5		142 67	56 44					83 70	56 40				3.90					
8pm	70	25.1	16.5	BP	147 67	59 44					83 71	58 40					3.90				
9pm	70	24.9	16.4		147 67	60 47					83 71	58 40								22.75	24.50
10pm	69	25.0	16.5	BP	147 67	60 48				BP	82 70	58 40									
11pm	69	24.9	16.4	BP	147 67	60 48					84 71	58 40									
12Md	68	24.9	16.5	BP	147 68	60 49				BP	84 71	59 46				3.90	3.90	4.10	4.30	22.75	24.50

COMMENTS
8:45 AM PLANT Shutdown

VENTURI FLOW TOTALIZERS

Midnight	110598	109238
Prev Midnight	108937	128085
Difference	1661	1153
Total Flow	2814	

CHEMICAL DOSAGES

ZINC	N	1.00	S	1.10
FLUORIDE	N	1.00	S	1.00
PRE-BLEACH	1	4.00	2	—
	3	2.00	4	2.00

Item A

Item B

OhioEdison
A FirstEnergy Company

CITY OF AKRON PUBLIC UTILITIES
Billed Account Summary

Account Nbr	110009294346 (210000000831)	**Meter Read Unit**	E111600
Customer Nbr	08007642060000434386	**Meter Constant**	800
Customer Acct Id	WATER DEPT	**Voltage Level**	69000 Delta Volt 3 phase
Move in/out Date	02/17/1984 - Active Account	**Capacity Peak Load**	2,001.6202
Service Address		**Load Profile**	CH
	1570 RAVENNA RD	**Supplier Name**	Energy Harbor LLC - 07/14/2009
	KENT OH 44240	**Supplier Dual Bill**	No
Meter Nbr(s)	G064049286, G064049287		

		Trans Peak Load	1,864.7028
		Rate	OE-GTD
		EDI Billing	No

CURRENT 12 MONTHS						PREVIOUS 12 MONTHS					
DATE	**KVAR**	**DEMAND**	**KWH**	**$**	**¢/KWH**	**DATE**	**KVAR**	**DEMAND**	**KWH**	**$**	**¢/KWH**
Oct-21		2,096.2	1,068,774	72,801.91	6.81	**Oct-20**		2,231.0	1,122,838	76,612.25	6.82
Sep-21		2,175.1	1,120,960	74,718.41	6.67	**Sep-20**		2,285.3	1,267,823	84,200.23	6.64
Aug-21		2,224.7	1,102,819	73,459.78	6.66	**Aug-20**		2,549.0	1,178,853	80,500.02	6.83
Jul-21		2,146.9	1,166,397	77,161.51	6.62	**Jul-20**		2,148.1	1,173,596	77,960.77	6.64
Jun-21		2,479.4	1,111,631	76,714.87	6.90	**Jun-20**		2,103.9	1,127,048	75,087.70	6.66
May-21		2,156.7	1,131,077	75,803.91	6.70	**May-20**		2,184.9	1,080,097	72,923.15	6.75
Apr-21		2,135.3	1,053,005	71,792.92	6.82	**Apr-20**		2,226.6	1,019,671	69,729.10	6.84
Mar-21		2,290.6	1,232,299	81,114.39	6.58	**Mar-20**		2,191.2	1,110,215	74,453.89	6.71
Feb-21		2,233.7	1,172,260	76,659.46	6.54	**Feb-20**		2,243.5	1,085,084	73,338.93	6.76
Jan-21		2,207.6	1,345,380	87,269.96	6.49	**Jan-20**		2,250.5	1,289,257	97,003.75	7.52
Dec-20		2,271.6	1,153,355	79,372.28	6.88	**Dec-19**		2,349.2	1,205,489	91,183.45	7.56
Nov-20		2,160.1	1,197,913	81,326.79	6.79	**Nov-19**		2,175.9	1,136,255	81,766.02	7.20
TOTAL		2,479.4	13,855,870	928,196.19	6.70	**TOTAL**		2,549.0	13,796,226	954,759.26	6.92