

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF GRAYSON)	
COUNTY WATER DISTRICT FOR A DEVIATION)	CASE NO.
FROM THE METER TESTING REQUIREMENTS)	2019-00115
OF 807 KAR 5:066, SECTION 16(1))	

ORDER

This matter is before the Commission on an application filed by Grayson County Water District (Grayson District) requesting an order granting a deviation from 807 KAR 5:066, Section 16(1).¹ No third party intervened or otherwise filed an objection to Grayson District's application. Grayson District responded to two data requests from Commission Staff. Having considered the Application and the materials at issue, the Commission now grants Grayson District a deviation from 807 KAR 5:066, Section 16(1), as discussed further below.

BACKGROUND

Grayson District requests a deviation to allow its 5/8-inch x 3/4-inch Badger Model 25 meters to remain in service for 15 years without individually testing the meters pursuant to 807 KAR 5:066, Section 16(1). Rather, Grayson District, which was previously permitted to keep meters in service for 13 years without testing, proposes to sample test meters after 13, 14, and 15 years of service pursuant to the *Sample Meter Testing Plan for Grayson County Water District: 5/8 x 3/4 Inch Badger Model 25 Meters* (Sample

¹ Application, Case No. 2019-00115 (filed Apr. 11, 2019) (Application).

Testing Plan).² Then, after 15 years of service, Grayson District currently proposes to remove its meters from service.

Grayson District's Sample Testing Plan is based, in part, on the sample-testing procedures set forth by the American National Standard Institute, *ANSI/ASQ Z1.9-2003* (2013) (ANSI/ASQ Standards).³ Grayson District indicated that it is only requesting a deviation from periodic testing for its Badger Model 25 meters, which make up the bulk of its 5/8-inch x 3/4-inch meters.⁴ Under the Sample Testing Plan, Grayson District would assign those meters to lots based on the year they were placed in service and would test samples from each lot in the meters 13th, 14th, and 15th year of service to assess the performance of the lots as a whole in each year.⁵ Grayson District will use "an Excel spreadsheet, its billing system, or another computerized process to randomly select meters for testing" from each lot.⁶ The sample size for each lot will be established pursuant to the ANSI/ASQ Standards based on the method of inspection used, the Acceptance Quality Limit (AQL), and the Inspection Level (as those terms are used in that standard).⁷

In its Sample Testing Plan, Grayson District proposes testing the maximum and intermediate flow rates of its meters using the Double Specification Limit Variability

² *Sample Meter Testing Plan for Grayson County Water District: 5/8 x 3/4 Inch Badger Model 25 Meters*, Case No. 2019-00115 (filed Dec. 29, 2016) (Sample Testing Plan) at 2 (attached as Exhibit 1 to the Application).

³ See Application.

⁴ Sample Testing Plan at 1.

⁵ Sample Testing Plan at 6.

⁶ *Id.* at 2.

⁷ *Id.* at 6.

Unknown-Standard Deviation Method (DSL Method) set forth in the ANSI/ASQ Standards with an AQL of 2.5 and Inspection Level II.⁸ It proposes testing the low flow rate of Grayson District's meters using the Single Specification Limit Variability Unknown-Standard Deviation Method (SSL Method) with an AQL of 10 and Inspection Level I.⁹

Grayson District indicated the method it proposes using to test the high and intermediate flow rate was not a good method to test the low flow rate. Grayson District asserted that a lower level of scrutiny was appropriate for testing the accuracy of meters at a low flow rate, because the low flow rate makes up a small percentage of total water usage.¹⁰ Moreover, Grayson District argued that there is little danger of it overcharging customers based on the proposed lower level of scrutiny for low flow rates, because inaccuracies at low flow rates generally result in under reporting of water usage as opposed to over reporting of usage.¹¹

DISCUSSION

Pursuant to 807 KAR 5:066, Section 16(1), a utility is required to periodically test all 5/8-inch x 3/4-inch meters such that no meter shall remain in service without a test for more than 10 years. The Commission may grant a deviation from the periodic testing requirements pursuant to 807 KAR 5:066, Section 18, which states that "for good cause shown, the commission may permit deviations from this administrative regulation." The

⁸ *Id.* at 2-4.

⁹ *Id.* at 5.

¹⁰ Sample Testing Plan at 3; *see also* Response to Staff's First Request, Item 7.

¹¹ See Response to Staff's First Request, Item 7 (in which Grayson District referred to responses to request for information in Case No. 2016-00432 making this point as its basis for applying a lower level of scrutiny at low flow).

party requesting the deviation bears the burden of proving that good cause exists for granting a deviation.¹²

In Case 1997-00434,¹³ the Commission granted Grayson District a deviation from 807 KAR 5:066, Section 16(1), that allow it to keep its 5/8-inch x 3/4-inch meters in service for up to 13 years without a periodic test. As indicated above, Grayson District now requests that it be permitted to keep its 5/8-inch x 3/4-inch Badger Model 25 meters in service for two additional years, up to a total of 15 years, without a periodic test in order to implement its Sample Testing Plan. Grayson District argues that it has demonstrated good cause for the deviation, because its Sample Testing Plan will provide significant cost savings and will not erode protections for customers.¹⁴

Based on the information currently in the record, the Commission does find that Grayson District's claims of cost saving are credible. Specifically, Grayson District will experience an average annual cost savings of about \$13,687.00 by deferring the purchase of meters because it will be able to spread the cost of new meter purchases over 15 years as opposed to 13 years for the same number of meters.¹⁵ Grayson District will also experience, on average, an annual cost savings based on labor costs associated

¹² *Energy Regulatory Comm'n v. Kentucky Power, Co.*, 605 S.W.2d 46, 50 (Ky. App. 1980) ("Applicants before an administrative agency have the burden of proof.").

¹³ *The Joint Application of Warren County Water District, Simpson County Water District, Grayson County Water District, and Butler County Water Systems, Inc. for a Deviation from 807 KAR 5:066, Section 16(1)*, Case No. 1997-00434, Order (Ky. PSC Apr. 28, 1999).

¹⁴ Application at 4-5; Grayson District's responses to Commission Staff's First Request for Information (Staff's First Request), Item 3(a).

¹⁵ See Application at 4-5 (indicating that the cost savings per year rising from spreading the purchase of its meters over 15 years as opposed to 13 years); see also Grayson District's response to Staff's First Request, Item 3(a) (indicating the current cost to Grayson District to purchase a single new meter); Grayson District's response to Staff's First Request, Item 4(a) (indicating the total number of 5/8 x 3/4-inch meters in Grayson Districts system).

with replacing fewer meters per year, which Grayson District estimated to be \$26.59 per meter.¹⁶ There would be some cost increases associated with sample-meter testing, which Grayson District estimated would be comparable to the labor costs for replacing a meter on a per meter basis, but those costs would be offset by just the labor cost savings resulting from the decrease in the average number of meters replaced per year.¹⁷ Thus, the Commission finds that Grayson District's plan is likely to result in cost savings.¹⁸

However, cost savings, while important, are not dispositive on whether Grayson District has shown good cause for the deviation requested because the inspection obligation in 807 KAR 5:066, Section 16(1), is intended, among other things, to protect customers from being overcharged by inaccurate meters and to ensure that customers are charged fairly.¹⁹ In response to those concerns, Grayson District argued that its

¹⁶ Grayson District's response to Staff's First Request, Item 3(b).

¹⁷ Grayson District's evidence indicated that the cost of sample testing would be about the same as the cost as the labor cost for replacing a meter. Grayson District's response to Staff's First Request, Item 3(c). Allowing meters to remain in service for 15 as opposed to 13 years would, on average, result in 70 fewer meters being replaced each year. Sample Testing Plan, Appendix B. Conversely, Grayson District has about 6,800 of the meters in question, so assuming they were distributed equally in each year, Grayson District would be required to test 35 meters each year pursuant to the sample testing plan.

¹⁸ In applying for its deviation, Grayson District did not address the potential effects on revenue of keeping the meters in place for 15 as opposed to 13 years without individual testing. Potential revenue losses from keeping older meters in service are important, particularly in matters involving a non-profit utility because a decrease in revenue from water loss through defective meters or otherwise is ultimately borne by the consumer in the form of higher rates.

However, Grayson District has a positive history of keeping water loss low. See Application at 5–6. Moreover, Grayson District's sample testing plan, as discussed in more detail herein, should allow it and the Commission to monitor meter accuracy and, therefore, any potential revenue loss as the meters age. Nevertheless, in the event Grayson District later seeks a deviation pursuant to KRS 278.210, it should be prepared to discuss any revenue loss.

¹⁹ See Case No. 2011-00220, *Joint Application of Warren County Water District, Simpson County Water District, and Butler County Water System, Inc. for a Deviation from Approved Meter Testing Program* (Ky. PSC Mar. 5, 2013), Order at 7 (Warren County Water Sample Testing Order, Case No. 2011-00220)(noting the various reasons for sample testing, including the need to accurately charge customers); see also KRS 278.210(4) (which allows a utility to obtain a deviation if sample testing reveals costs savings and that "no statistically significant number of its meters over-register").

proposed deviation provided adequate assurances as to the accuracy of meters because all of its 5/8-inch x 3/4-inch Badger Model 25 meters have a 15-year warranty as to their accuracy, the Commission has previously granted similar deviations; and the accuracy of the meters will be monitored, at least in part, pursuant to the Sample Testing Plan.²⁰

Grayson District did provide evidence that its 5/8-inch x 3/4-inch Badger Model 25 meters are warranted to meet AWWA meter accuracy standards for repaired meters for 15 years from the date of shipment or the registration of 2,500,000 gallons, whichever comes first.²¹ The AWWA meter accuracy standards for 5/8-inch x 3/4-inch meters are currently identical to the accuracy standards in Commission regulations.²² Both standards impose an accuracy limit of 98.5 to 101.5 percent for all 5/8-inch x 3/4-inch meters at the maximum and intermediate flow rates; an accuracy limit of 95 to 101 percent for new and rebuilt 5/8-inch x 3/4-inch meters at the minimum flow rate; and an accuracy limit of 90 percent for repaired 5/8-inch x 3/4-inch meters at the minimum flow rate.²³ Thus, Grayson District's 5/8-inch x 3/4-inch meters are warranted to meet the Commission's accuracy standards for all meters at maximum and intermediate flows and for repaired meters at low flow for approximately 15 years.

Grayson District's requested deviation is further supported, in part, by sample tests performed by Warren County Water District, Simpson County Water District, Butler

²⁰ Application at 3; Sample Meter Testing Plan at 1, 9; see also Response to Staff's First Request at Item 2 (providing meter warranties).

²¹ See Response to Staff's First Request, Item 2(b) (in which Grayson District provided the warranty indicating the same).

²² See 807 KAR 5:066, Section 15(2)(a), (incorporating a table that is identical to the AWWA standard in relevant part).

²³ See *id.*; see also Response to Staff's First Request, Item 2(b);

County Water System, Inc., and Kentucky-American Water Company. The Commission granted those utilities a deviation from 807 KAR 5:066, Section 16(1), allowing them to keep their 5/8-inch x 3/4-inch meters or 5/8-inch meters, depending on the utility, in place for 15 years without any testing based on sample tests showing that the meters remained accurate for that period.²⁴ While those tests are not conclusive as to the performance of Grayson District's meters, because they involved different systems and different brands of meters, they do provide some general evidence as to the accuracy of modern 5/8-inch x 3/4-inch meters after 15 years of service. Thus, those tests provide some support for the position that Grayson District's meters can be expected to perform within the accuracy standards established by 807 KAR 5:066, Section 15(2)(a), for 15 years, but they do not establish that Grayson District's specific meters will remain accurate on its system.

Grayson District proposed the Sample Testing Plan to provide further assurance that its 5/8-inch x 3/4-inch Badger Model 25 meters will perform within the accuracy standards. While there are some potential issues with Grayson District's sample-testing plan as discussed below, the Commission does find that it will provide some basis for monitoring the performance of the meters for which a deviation is being granted. Further, if an inspection lot fails a sample test, Grayson District proposes to remove the lot from service unless a subgroup can be identified within the lot in which case the subgroup will be removed from service.²⁵ Thus, the Commission finds that granting Grayson District a

²⁴ See *Joint Application of Warren County Water District, Simpson County Water District, and Butler County Water System, Inc. for a Deviation from Approved Meter Testing Program*, Case No. 2011-00220, Order (Ky. PSC Mar. 5, 2013) (allowing meters to remain in place without periodic testing for 15 years as opposed to the 21 years requested, in part, because sample testing showed "that a significant number of the meters sampled begin to fall below the repaired meter accuracy requirements after 15 years of service"); *Application Kentucky-American Water Company's Request for Permission to Deviate from 807 KAR 5:066, Section 16(1)*, Case No. 2009-00253, Order (Ky. PSC Oct. 5, 2011).

²⁵ Sample Testing Plan at 6.

deviation from 807 KAR 5:066, Section 16(1), to allow it to keep its Badger Model 25 meters in-service for 15 years with sample testing is not likely to result in significant accuracy issues arising from undetected meter failures and, therefore, finds that Grayson District's request for a deviation should be granted.

The Commission notes that its decision to grant the deviation requested is based on all of the facts and circumstances in this case. The Commission is making no determination regarding whether Grayson District's sample-testing plan is "based on established scientific, engineering, and economic methods" necessary to justify a deviation pursuant to KRS 278.210(4). In fact, there are some questions as to whether the Sample Testing Plan would satisfy the requirements for obtaining a deviation pursuant KRS 278.210(4).²⁶

The ANSI/ASQ Standards at section A7.2 require that all samples from a particular lot be selected "without regard to their quality."²⁷ Grayson District stated that it would satisfy this requirement by using a random, computerized process to select the meters to

²⁶ Grayson District relies on its use of the ANSI/ASQ Standard and the Commission's previous approval of plans using the standard to demonstrate the effectiveness of the Sample Testing Plan. However, the ANSI/ASQ Standard does not address every situation. For instance, the ANSI/ASQ Standard does not anticipate sample testing the same lot multiple times over several years and, as discussed in more detail below, doing so raises the possibility that meters would be selected from a lot based on performance. Further, the ANSI/ASQ Standard does not assign an AQL, which generally represents the average number of a lot that may fail to meet a particular specification, but rather indicates that the AQL should be specified by the parties, because the standard was designed to measure quality in a production setting and, therefore, anticipated that there would be a manufacturer and a purchaser to establish an AQL. Grayson District did not present testimony that the manner in which it handled or will handle issues not addressed by the ANSI/ASQ Standard would result in statistically accurate results, and because it does not know what might occur over the years, it left some questions—like how it would handle individual meters that are damaged—to be addressed as they arise.

²⁷ Pursuant to ANSI/ASQ Standard, A5.1, a "lot" is a collection of units of product from which samples are drawn to be tested.

be tested from a particular lot beginning when that lot reached 13 years in service.

Grayson District then stated that:

If a randomly selected meter has been vandalized or tampered with, that meter will be replaced by another random selection. Similarly, if a randomly selected meter has suffered a mechanical or other failure that is not equally likely to occur at the same or a similar rate in the lot as a whole, it will be removed and replaced by another random selection. In its annual meter testing reports to the Commission, [Grayson District] will report any vandalized, tampered, or failed meter that was replaced and explain why it was not used to determine the acceptability of the sample. . . .

If the sample is not accepted under the ANSI Standard and a poorly performing sub-group can be identified for separation from the original control group, the deviate sub-group will be removed from service within a 6-month period. If, by removal of a specific sub-group of meters, [Grayson District] can demonstrate that the original control group of meters now meets the applicability standard, the remaining meters in the original control group shall remain in service.²⁸

The Commission observes that the exclusion of meters from a sample group or from a lot simply because, upon testing, they were found to have suffered a failure or been damaged will result in the selection of meters based on quality. For instance, if Grayson District were to replace a meter in a sample group for testing in 2021 after sample testing in 2020 revealed that it was not measuring properly, then the results would be skewed in favor of finding that meters remain accurate because a meter that had tested as inaccurate would be replaced by a randomly selected meter that may or may not be accurate.²⁹ Similarly, although the effect would not be as great, if Grayson District

²⁸ Sample Meter Testing Plan at 7.

²⁹ As an example, if 33% of meters fail to register accurately after 10 years of service, then you would expect 10 out of 30 meters to test as inaccurate if you tested the meters after ten years of service. If those 10 meters were then removed from the sample group and replaced with 10 randomly selected meters from the lot, then about 3 (33%) of those replacement meters would test as inaccurate on average, which would change the tested rate of inaccuracy to about 10% despite an actual rate of inaccuracy of

randomly selected sample groups from a lot each year, but removed meters that failed to meet the accuracy standards upon testing, as it would be required to do, then the percentage of meters in the lot that would fail the test would be reduced such that when the sample group was selected the following year the chance that failing meters would be selected would be artificially reduced, unless Grayson District continued to account for the meter that was removed in a statistically appropriate manner. Thus, the Commission finds that a meter randomly selected for testing should not be excluded from a sample group or the inspection lot as proposed by Grayson District and should be accounted for in a statistically appropriate manner even if removed from service unless Grayson District can establish that the damage or failure was or would have been identified within a reasonable period in the ordinary course of business even if the meter had not been selected for sample testing.

The Commission also notes that based on the AQL and inspection level proposed by Grayson District for testing meters that the ANSI/ASQ Standard would require Grayson District to test substantially fewer meters at low flow than at high and intermediate flow. For instance, if Grayson District had 500 meters in a lot it would be required to test 35 meters at high and intermediate flow, but would only be required to test 7 meters at low flow. However, since it would be testing the same meters at high and intermediate flow and then testing only a portion of those meters at low flow, Grayson District acknowledged that it would not create any additional costs to test every meter pulled for high and

33%. If those 3 meters were then removed from the sample group and replaced with 3 randomly selected meters, then one of those meters (again 33%) on average would test as inaccurate, which would change the tested rate of inaccuracy to about 3% despite an actually rate of inaccuracy at 33%. While this is an example that does not account for numerous variables, it illustrates how replacing samples that fail to measure accurately from a lot will artificially inflate the tested accuracy of the meter's overtime, because it results in selection based on quality.

intermediate flow tests at low flow as well.³⁰ The Commission finds that obtaining the additional information regarding the performance of the meters at no additional cost would be cost beneficial for evaluating the performance of the meters. Thus, the Commission finds that Grayson District should test all meters pulled for high and intermediate testing at low flow.

The Commission expects Grayson District to submit an annual report to the Commission each year, as indicated in its plan, detailing the test results for each year, including details regarding each meter tested and the relevant data necessary for the Commission to perform the calculations detailed in ANSI/ASQ Standards, an explanation of whether each sample was accepted at each flow rate using the relevant ANSI/ASQ Standards, and an explanation of any abnormal meter results that were not used in determining the acceptability of the sample. If a particular meter is excluded from or replaced in a lot or sample group for any reason, the Commission expects Grayson District to provide a detailed explanation of the basis for removing or excluding the meter from the lot or sample group.³¹

IT IS THEREFORE ORDERED that:

1. Grayson District's application for a deviation from 807 KAR 5:066, Section 16(1), is granted.

³⁰ Response to Staff's First Request, Item 9(b).

³¹ The level of detail necessary would depend on the explanation for the exclusion from or replacement of the meter in the sample group. For instance, if a vandal were to cause significant and apparent damage to a meter that would have been identified regardless of whether it was individually tested, then Grayson District may easily explain why such failure is not representative of the lot as a whole.

2. Grayson District shall not be required to test its 5/8-inch x 3/4-inch Badger Model 25 meters pursuant to 807 KAR 5:066, Section 16(1), subject to the conditions set forth herein.

3. Grayson District shall sample test its 5/8-inch x 3/4-inch meters for which a deviation was granted herein, pursuant to its sample-testing plan, as modified by the Commission herein.

4. Grayson District shall submit annual reports of its sample testing detailing the results of the sample testing for that year, including:

a. The serial number, manufacturer, and model/form/type of each meter tested;

b. The date that each meter was tested;

c. The total water flow through the meter from the date it was placed in service through the date of sample testing as recorded at the time of testing;

d. An excel spreadsheet, with formulas intact, containing the raw data collected from each meter tested and showing the calculations detailed in the ANSI/ASQ Standards on which Grayson District relied on when conducting and analyzing its sample testing;

e. The results of Grayson District's calculations and an explanation of whether each sample was passed at each flow rate using the relevant ANSI/ASQ Standards;

f. An explanation of any abnormal meter results that were excluded or otherwise not used in determining whether a sample passed;

g. A detailed explanation, as discussed above, of the basis for excluding a meter or group of meters from a sample group or replacing them, including the test results at each flow level for the excluded meter;

h. The total number of meters in a particular lot in service at the time Grayson District performed the sample testing; and

i. Any other information Grayson District has deemed relevant and necessary to review the accuracy of the meters tested.

5. Documents filed pursuant to paragraph 4 of this Order shall contain a reference to this case number and shall be stored in the post-case correspondence of this case.

6. Grayson District shall replace every meter in a lot after 15 years of service, but not before sample testing is completed for the lot that year.

7. Grayson District may abandon its sample-testing plan and return to periodic testing of meters as prescribed by 807 KAR 5:066, Section 16(1), at its discretion, but if it does so, it must notify the Commission in writing.

8. Grayson District shall continue sample-testing meter lots pursuant to the Sample Testing Plan as approved herein for meters in their 13th through 15th year of service until the Commission orders otherwise, unless Grayson District chooses to abandon the sample-testing plan altogether, or for a particular lot, and returns to periodic testing of meters as prescribed by 807 KAR 5:066, Section 16(1). If Grayson District contends a change in the Sample Testing Plan or deviation granted herein is justified, it shall request and obtain the approval of the Commission before implementing that or any other change, unless it returns to periodic testing as described above.

9. Grayson District shall continue to comply with any other relevant regulations pertaining to its meters, including the quarterly reporting requirements in 807 KAR 5:006, subject to any deviation previously granted by the Commission.

10. This matter is closed and removed from the Commission's docket.

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By the Commission



ATTEST:

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Executive Director

Case No. 2019-00115

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