**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

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|---|---|---|
| **In the Matter of:** | ) | |
| | ) | |
| **SIERRA CLUB, ENVIRONMENTAL LAW AND POLICY CENTER, PRAIRIE RIVERS NETWORK, and CITIZENS AGAINST RUINING THE ENVIRONMENT** | ) | |
| | ) | **PCB 2013-015** |
| **Complainants,** | ) | **(Enforcement – Water)** |
| | ) | |
| **v.** | ) | |
| | ) | |
| **MIDWEST GENERATION, LLC,** | ) | |
| | ) | |
| **Respondent.** | ) | |

**NOTICE OF FILING**

TO: Don Brown, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

Attached Service List

PLEASE TAKE NOTICE that I have filed today with the Illinois Pollution Control Board, Midwest Generation, LLC's Motion to Stay Proceedings and Memorandum in Support of Its Motion to Stay Proceedings with Exhibits, a copy of which is hereby served upon you.

MIDWEST GENERATION, LLC

By: /s/ Jennifer T. Nijman

Dated: January 21, 2022

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**CERTIFICATE OF SERVICE**

The undersigned, an attorney, certifies that a true copy of the foregoing Notice of Filing, Certificate of Service for Midwest Generation, LLC's Motion to Stay Proceedings and Memorandum in Support of Its Motion to Stay Proceedings with Exhibits, a copy of which is hereby served upon you was filed on January 21, 2022 with the following:

Don Brown, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

and that true copies of the Notice of Filing, Certificate of Service for Midwest Generation, LLC's Motion to Stay Proceedings and Memorandum in Support of Its Motion to Stay Proceedings with Exhibits were emailed on January 21, 2022 to the parties listed on the foregoing Service List.

/s/ Jennifer T. Nijman

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**<u>MIDWEST GENERATION, LLC'S MOTION TO STAY PROCEEDINGS</u>**

Pursuant to 35 Ill. Adm. Code 101.514, Midwest Generation, LLC ("MWG") respectfully requests that the Illinois Pollution Control Board ("Board") enter an order staying this proceeding in deference to the Illinois Environmental Protection Agency ("Illinois EPA") delegated authority over the coal combustion residual ("CCR") surface impoundments under the Illinois Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments ("Illinois CCR Rule"), 35 Ill. Adm. Code Part 845. A stay is also required to avoid multiplicity of remedies and conflicts with the remedies permitted by the Illinois EPA and the evolving regulatory landscape for CCR.

In support of its Motion, MWG submits its Memorandum in Support of Motion to Stay Proceedings and states as follows:

1. In October 2017 and continuing to January 2018, the parties participated in a lengthy and extensive hearing regarding Complainants' allegations that MWG violated the Illinois Environmental Protection Act ("Act").

2. On June 20, 2019, the Board entered an Interim Order and Opinion, which it reconsidered and revised on February 6, 2020. The Board directed the parties to proceed to hearing on remedy.

3. Shortly after the Board's first Interim Order and Opinion, on July 30, 2019, Illinois enacted the Coal Ash Pollution Prevention Act, which amended the Illinois Environmental Protection Act ("Act") and added new sections regarding the regulation, management, and permitting of CCR and CCR surface impoundments. 2019 ILL. ALS 171, 2019 Ill. Laws 171, 2019 ILL. P.A. 171, 2019 Ill. SB 9. The General Assembly delegated to the Illinois EPA the oversight and regulation of CCR surface impoundments, and ordered the Board to adopt rules proposed by the Illinois EPA. 415 ILCS 5/22.59(b)(2), (d), (g).

4. On April 15, 2021, the Board adopted the Illinois CCR Rule, with an effective date of April 21, 2021, initiating the many deadlines established in the rule. The Board also opened a sub docket in the Illinois CCR Rulemaking in part to evaluate whether historic fill areas of CCR should be subject to additional regulation. *In the Matter of: Coal Combustion Waste (CCW) Surface Impoundments at Power Generating Facilities: Proposed New 35 Ill. Adm. Code 841*, PCB 14-10 (April 15, 2021).

5. The Illinois CCR Rule delegates to the Illinois EPA the authority to review and approve the permit applications for operating the CCR surface impoundments, and permit applications for retrofitting or closing the CCR surface impoundments via either closure by removing the CCR or closure in place. 35 Ill. Adm. Code 845, Part G. Owners/operators must prepare and submit operating permit applications and construction permit applications to the Illinois EPA for its review and approval. 35 Ill. Adm. Code 845, Parts B and G.

6. The decision to grant or deny a motion for stay is "vested in the sound discretion of the Board." *Sierra Club, et. al v. Midwest Generation, LLC*, PCB 13-15, *slip op* at 4 (April 16, 2020) *citing People v. State Oil Co.,* PCB 97-103 (May 15, 2004). In determining whether a stay is justified, the Board may consider these factors: (1) comity; (2) prevention of multiplicity, vexation, and harassment; (3) likelihood of obtaining complete relief in the foreign jurisdiction; and (4) the *res judicata* effect of a foreign judgment in the local forum, *i.e.*, in the Board proceeding. *Sierra Club, et. al v. Midwest Generation, LLC*, PCB 13-15, *slip op* at 4 (April 16, 2020). "The Board may also weigh the prejudice a stay would cause the nonmovant against the policy of avoiding duplicative litigation," and "must also consider any ongoing environmental harm should the stay be granted." *Id*.

7. While the Board previously denied MWG's Motion to Stay, the situation now is exceedingly different. Now that the Illinois CCR Rule is final, there is an issue of comity due to the significant potential for conflict between any remedy that may be ordered here and the Illinois EPA delegated oversight and decision-making authority for closure and corrective actions of the CCR surface impoundments. MWG's CCR surface impoundments are subject to the Illinois CCR Rule, and MWG is conducting the work to comply. MWG has submitted the voluminous operating permit applications, which include preliminary closure plans. As allowed by the Illinois CCR Rule, MWG has proposed to close the ponds either via closure-in-place or closure by removal. In contrast, the only remedy proposed by Complainants is complete removal. If the Board were to accept the Complainants' removal remedy, and Illinois EPA later determines that an alternate closure method is more protective, than MWG is in the impossible situation of attempting to comply with two conflicting orders by two independent State agencies.

8. The Board should also stay this matter to prevent multiplicity of corrective actions ordered by the Board and approvable by the Illinois EPA. Because MWG is subject to the Illinois CCR Rule, MWG could be subject to a remedy here that conflicts with the remedy approved by Illinois EPA. Even if the Board orders a different remedy than proposed by either Party with deadlines, MWG cannot do any work on the CCR surface impoundments without a construction permit from Illinois EPA, resulting in the real potential of violations of the deadlines because of the lack of permit. It would be a waste of the Board's and Parties' resources to move forward now when the remedy may conflict with the Illinois EPA remedy.

9. Even though the Illinois CCR Rule does not address historic areas of CCR, the Board has opened a rulemaking to establish Illinois rules for those areas. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, PCB20-19(A). The same issues of conflict and comity with the Illinois EPA decision making apply, and the potential for multiplicity and vexation in conflicting orders. Continuing the litigation even just for the historic areas would not solve these issues, because many of the ash areas outside the ponds are adjacent to and between the CCR surface impoundments.

10. A stay in this proceeding will not result in environmental harm or threats to public health. There are no potable wells downgradient of the MWG Stations, and Environmental Land Use Controls are established at three of the Stations preventing any access to the groundwater. Additionally, the established groundwater management zones ("GMZs") eliminate exceedances of the Part 620 groundwater standards and are under the oversight of the Illinois EPA.[1]

11. MWG also investigated and evaluated other areas the Board addressed in its April 16, 2020 opinion, and MWG's expert concluded that the areas would not result in a threat to public

[1] The Board held that the violations of Part 620 of the Board regulations are stayed following establishment of the GMZs. *Sierra Club v. Midwest Generation, LLC*, PCB 13-15, Order, Feb. 6, 2020.

health or the environment. MWG investigated the soil surrounding the MW-09 at the Joliet 29 Station, and found no CCR or other source for the constituents in the groundwater. MWG's expert concluded that the constituents in the groundwater are naturally occurring. Ex. 1, Weaver Rpt., pp. 36-37. MWG also investigated an area at the Waukegan Station (the "Grassy Field") to the west of the West Pond. *Id.*, p. 41-42. Based on findings, MWG's expert recommended installing an engineered cap over the Grassy Field. *Id.*, p. 52-53. However, because of the Board's proposed rules for historic ash areas and because there is no environmental harm, the expert recommended that MWG wait to design the cap.

12. Without a stay, MWG will be highly prejudiced. MWG could be compelled to conduct a corrective action inconsistent with a subsequent Illinois EPA permit. In contrast, Complainants would suffer no prejudice because there is no environmental harm. Also, any objection based upon the duration of this matter are flawed. This litigation is lengthy because it concerns four large stations, each at least sixty years old, with multiple CCR surface impoundments that have operated for long periods and each of which have four different groundwater units.

WHEREFORE, Respondent, Midwest Generation, LLC, respectfully requests that the Board stay these proceedings to defer to Illinois EPA's decision making process pursuant to the Illinois CCR Rule, avoid conflicts with the Illinois EPA permits, and avoid conflicts related to the historic ash areas. A stay is also necessary to avoid multiplicity of decisions for the CCR surface impoundments and the areas outside the impoundments, and to prevent a waste of resources to the Board and the Parties. There is no threat to the environment or public health in granting the stay. MWG will be highly prejudiced without a stay because of the significant potential of conflicting orders and permits, whereas, Complainants would suffer no prejudice. Accordingly, MWG respectfully requests that the Board grant MWG's Motion to Stay, and order MWG to submit an update the Board on the status one year from the date the stay is granted. 35 Ill. Adm. Code 101.514(b).

Respectfully submitted,

Midwest Generation, LLC

By: /s/ Jennifer T. Nijman
One of Its Attorneys

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| **MIDWEST GENERATION, LLC,** | ) | |
| | ) | |
| **Respondent.** | ) | |

**MIDWEST GENERATION, LLC'S MEMORANDUM IN SUPPORT OF ITS MOTION TO STAY PROCEEDINGS**

The Illinois Pollution Control Board ("Board") should stay this proceeding in deference to the Illinois Environmental Protection Agency's ("Illinois EPA" or "Agency") delegated oversight and decision-making authority over coal combustion residual ("CCR") surface impoundments pursuant to the Illinois Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments ("Illinois CCR Rule"), 35 Ill. Adm. Code Part 845. A stay is also necessary to avoid multiplicity of remedies and conflicts with any remedy permitted by the Illinois EPA.

Although this Board denied Midwest Generation, LLC's ("MWG") request for a stay in early 2020, circumstances are now vastly different and no longer uncertain. Now that the Illinois CCR Rule is final, there is an issue of comity due to the significant potential for conflict between any remedy that may be ordered here and the retrofit or closure permits to be issued by Illinois EPA pursuant to the Illinois CCR Rule. Because the Illinois EPA is the delegated authority for review and approval of corrective actions, closures of CCR surface impoundments, as well as for the issuance of permits (see 415 ILCS 5/22.59(b)(2),(d)), the Board should defer to the Agency's decisions and decision-making process.

MWG has expended significant time and effort to comply with the Illinois CCR Rule requirements. MWG has already submitted operating permit applications and is preparing construction permit applications for submittal to Illinois EPA for the very same CCR surface impoundments that are the subject of this matter. A stay would avoid multiplicity and vexation, as well as unnecessarily wasting the Board's and Parties' time, and allow MWG to continue its regulatory requirements, potentially making all or part of a Board hearing on remedy moot. In fact, MWG *cannot* take any action at the CCR surface impoundments until Illinois EPA issues construction permits for each unit, and a Board order to act without a permit or contrary to permit terms would directly conflict with the Illinois CCR Rule.

There is no risk of environmental harm if a stay is granted because the undisputed expert opinion is there is no threat to public health or the environment and there is no risk to downgradient receptors. MWG's expert opinion demonstrates there is no risk from the either the surface impoundments (which also will be addressed by the CCR Rule) or unconsolidated fill areas at the MWG Stations. While the Board determined that there was potential harm in its April 2020 decision denying a stay, the Board did not account for the groundwater management zones ("GMZs") in its decision (per the Board's revised Interim Order on reconsideration) which GMZs eliminate exceedances of the Part 620 groundwater standards and are under the oversight of the Illinois EPA.[1] Further, MWG has since investigated and assessed areas the Board identified as potentially causing harm.

[1] The Board held that the alleged violations of Part 620 of the Board regulations are stayed following establishment of the GMZs. *Sierra Club v. Midwest Generation, LLC*, PCB 13-15, Order, Feb. 6, 2020.

MWG acknowledges that the Illinois CCR Rule addresses surface impoundments, and not historic ash areas. However, proceedings are already underway to establish Illinois rules for such historic ash areas *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845,* PCB20-19(A). Similar to the Illinois CCR Rule, the pending rule to regulate the historic ash areas delegates regulation to the Illinois EPA (the same agency that regulates the CCR surface impoundments). Thus, the same principles of conflict and comity apply. Moving forward when the rules are pending will not resolve the issue of conflict and will only further divide this case into a series of potential remedies. Adding to the complications is the fact that many of the ash areas outside of the surface impoundments at the Stations are adjacent to or between the CCR surface impoundments, making implementation of separate remedies unworkable.

Without a stay MWG will be severely prejudiced because the only remedy proposed by Complainants (CCR removal) is at odds with the remedies and corrective actions allowed under the Illinois CCR Rule. In contrast, Complainants will suffer no prejudice because of the lack of harm and the implementation of the Illinois CCR Rule. Any claims of prejudice because of the length of time since the complaint was filed are misplaced given the complexity and breadth of this matter and the status of the Stations.

## I. APPLICABLE STANDARD FOR A STAY

The decision to grant or deny a motion for stay is "vested in the sound discretion of the Board." *Sierra Club, et. al v. Midwest Generation, LLC,* PCB 13-15, *slip op* at 4 (April 16, 2014), *citing People v. State Oil Co.,* PCB 97-103 (May 15, 2004). In determining whether a stay is justified, the Board may consider these factors: (1) comity; (2) prevention of multiplicity, vexation, and harassment; (3) likelihood of obtaining complete relief in the foreign jurisdiction; and (4) the *res* *judicata* effect of a foreign judgment in the local forum, *i.e.*, in the Board proceeding. *Sierra Club, et. al v. Midwest Generation, LLC,* PCB 13-15, *slip op* at 4 (April 16, 2014). "The Board may also weigh the prejudice a stay would cause the nonmovant against the policy of avoiding duplicative litigation." *Id.* Additionally, the Board must consider any ongoing environmental harm should the stay be granted. *Id.* The Board does not have to consider all of these cited factors in granting a stay, but may rely upon one factor to conclude a stay is necessary. For example, in *U.S. Steel v. Illinois EPA*, PCB 10-23, U.S. Steel requested that the Board stay a permit appeal because of the uncertainty created by a third-party objection to the permit issued to the U.S.EPA. *U.S. Steel v. Illinois EPA*, PCB 10-23 (Feb. 2, 2012) at *3. In granting the stay, the Board only considered the effect of the U.S.EPA proceeding on the appeal, and none of the other factors, finding that the uncertainty over the impact of the U.S.EPA proceeding on the appeal merited a stay. *Id* at 12. *See also North Shore Sanitary District v. Illinois EPA,* PCB 03-146 (March 20, 2003), *3 (In granting the stay, Board only considered whether the movant would suffer irreparable harm without the stay).

## II. BACKGROUND

On October 3, 2012, Complainants filed a seven-count complaint against MWG, alleging groundwater contamination due to CCR surface impoundments at four individual MWG Stations in Illinois. Three years later, on February 19, 2015, Complainants amended the complaint to add alleged areas of historic "coal ash repositories", thus expanding and further complicating the issues involved. *Sierra Club v. Midwest Generation, LLC*, PCB 13-15, Order, Feb. 19, 2015. Since both complaints were filed, the Parties have conducted extensive discovery, exchanged multiple expert reports, and taken numerous depositions. The matter was bifurcated by the Hearing Officer and went to hearing on liability in October 2017. Due to the number of Stations and the multiple issues, the hearing was lengthy and extensive. The first part of the hearing was conducted over five days in October 2017 and extended for an additional five days in January 2018. Seven witnesses and two expert witnesses testified and approximately 250 exhibits were admitted in the record. On June 20, 2019, the Board entered an Interim Order and Opinion. On MWG's motion, the Board issued a revised Interim Order on February 6, 2020 reconsidering the Board's opinion regarding GMZs established at three of the Stations. The Board ordered additional hearings to determine the need for appropriate relief or remedy.

On February 21, 2020, MWG moved to stay the proceedings because Illinois EPA expected to propose draft CCR rules to the Board a month later. MWG argued that because of the uncertainty posed by the draft CCR rules and the unknown requirements, the matter should be stayed one year to allow the Illinois CCR Rule to provide clarity. On April 15, 2020, the Board denied MWG's request, finding no issue of comity no concern of multiple actions, vexation, or harassment because both the draft CCR rules and this case were before the Board. *Sierra Club v. MWG*, PCB 13-15, *slip-op* at 4-5 (April 15, 2020). The Board supported its denial by stating that the Complainants would be prejudiced due to ongoing environmental harm, citing as support groundwater exceedances reported in MWG's groundwater monitoring reports, but not citing to the GMZs in place at three of the Stations.

Following the Board's order, the Parties continued discovery to prepare for a hearing on remedy. Over 60,000 pages of documents have been exchanged, and Complainants have taken the deposition of five lay witnesses. Complainants requested that the Hearing Officer allow it to name new experts, which the Hearing Officer granted, further extending the proceedings. *Sierra Club v. Midwest Generation,* Sept. 14, 2020 Hearing Officer Order. The Parties have also exchanged five expert reports, and each expert has been deposed.

Over the past two years, the facts related to MWG's CCR surface impoundments have evolved significantly. Following the finalization of the Illinois CCR Rule, MWG filed two petitions for brief variances from deadlines in the rule, and three petitions for an adjusted standard and finding of inapplicability for certain impoundments. The variance petitions were decided in September 2021, and the petitions for adjusted standard are currently before the Board. MWG is also working diligently to comply with the Illinois CCR Rule. MWG has submitted operating permit applications for each of the Illinois CCR surface impoundments, and is preparing and submitting construction permit applications pursuant to the schedule in Part 845 of the Board Rules.

The current status of the groundwater impacts at the Stations reflects the presence of ongoing protective measures. The Environmental Land Use Controls ("ELUC") remain in effect at the Powerton, Waukegan and Will County Stations, preventing any potable use of the groundwater. The GMZs continue to apply at the Joliet 29, Powerton, and Will County Stations. As determined by this Board, the GMZs at those facilities establish that there are no violations of the Part 620 Groundwater Standards. *Sierra Club v. Midwest Generation, LLC,* PCB13-15, Feb. 6, 2020, p. 13; *See also* 35 Ill. Adm. Code 620.250(e). MWG also conducted investigations of specific source areas identified by the Board (in the Board's decision denying a stay) at the Joliet 29 and Waukegan Stations. The Joliet 29 investigation showed that there is no CCR in the soil in the area identified by the Board as a source (MW-9). MWG's expert concluded that the constituents in the groundwater in MW-9 were naturally occurring. Ex. 1, Weaver Rpt. p. 36. MWG also conducted an investigation at the Waukegan Station to assess causes of groundwater impact from the area west of the West Pond ("the Grassy Field" aka Former Slag and Fly Ash Storage area). *Id.* at 41-42. While MWG concluded that the area contains CCR, and constituents from the area appear to combine with the groundwater contamination already migrating on to the Waukegan Station from off-site sources, MWG's investigation further confirmed that groundwater constituents do not reach the nearest surface water body, Lake Michigan, above the water quality standard. In any case, to reduce infiltration from the area, MWG's expert recommends that MWG install a low permeability cap. Because of the pending sub docket relating to such historic ash areas (*In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845* PCB20-19(A)), MWG's expert recommends MWG wait to initiate the design of the cap to avoid installing a cap that would conflict with an Illinois EPA decision. MWG's expert concluded that there was no harm to public health or the environment to stay initiation of design and construction because they confirmed that there "is no risk to Lake Michigan or other potential off-site receptors and groundwater use on-site is controlled by the ELUC." Ex. 1, p. 53.

## III. THE BOARD SHOULD STAY THIS PROCEEDING

Because of the work being conducted at each of the Stations pursuant to the Illinois CCR Rule as implemented by Illinois EPA, the Board should stay this proceeding under principles of comity. The CCR surface impoundments will be closed or retrofitted pursuant to detailed permits issued by the Illinois EPA and there is no basis to move forward on a remedial scheme that will conflict with the remedies and deadlines established in those permits. The Board should also grant a stay to prevent multiplicity and vexation. It is clear that the Illinois CCR Rule encompasses many of the issues in the second phase of this litigation (i.e., remediation/damages). It would be a waste of the Board's and Parties' resources to proceed when the issues will be rendered moot by the Illinois EPA permitting decisions. Similarly, it would be impractical to attempt to move forward with a partial remedy for the areas of CCR outside of the CCR surface impoundments. There are pending regulations that will address those areas (with the Illinois EPA as the administrator) creating identical conflicts as those between this matter and the Illinois EPA permitting process pursuant to the Illinois CCR Rule. In addition, to the extent CCR lies adjacent to or between the CCR surface impoundments, it is wasteful and vexatious to attempt to design a remedy for those ash areas that is distinct from the final remedy for the CCR surface impoundments. There is no risk of harm to the public health or the environment if a stay is granted. It is undisputed that there are no potable wells downgradient of the Stations, and there is no risk to the surface waters adjacent to the Stations. Because of the absence of harm, Complainants will not be prejudiced by a stay. In comparison, without a stay, MWG will be highly prejudiced by the likelihood of conflicting orders from the Illinois EPA and the Board.

### A. Under Principles of Comity, the Board Must Defer to the Illinois EPA for a Remedy for the CCR Surface Impoundments

Fundamentally, the Illinois EPA's administration of the Illinois CCR Rule places the Board's potential actions here at odds with the Illinois EPA's decision making process. Under the principle of comity, pursuant to Section 22.59 of the Act and the Illinois CCR Rule, the Board must give effect to the decisions of Illinois EPA as it implements the Act and the underlying rules. The General Assembly delegated to the Illinois EPA the oversight and regulation of CCR surface impoundments. Specifically, the Generally Assembly stated that "no person shall…close any CCR surface impoundment without a permit granted by the Agency…" 415 ILCS 5/22.59(b)(2) and stated that before commencing closure of a CCR surface impoundment, the owner of a CCR surface impoundment must submit to the Illinois EPA for its approval a closure alternatives analysis to analyze all the closure methods. 415 ILCS 5/22.59(d). The Illinois CCR Rule specifically requires groundwater monitoring and corrective actions if a CCR surface impoundment causes groundwater contamination, all under the oversight and approval of the

Illinois EPA. 35 Ill. Adm. Code Subpart F. Because the Illinois EPA is the delegated authority to implement the Illinois CCR Rule, the Board must defer to its decision-making process under the doctrine of comity. Comity is the principle under which a decision-making body gives effect to the decisions of a body in another jurisdiction as a matter of deference and respect. *Commonwealth Edison Co. v. Illinois EPA*, 2006 Ill. ENV LEXIS 200, *15, PCB04-215, April 6, 2006). Comity is not limited to deference to courts and applies equally to agencies.[2] In *Commonwealth Edison Co. v. Illinois EPA*, the Board granted Commonwealth Edison's motion to stay a trade secret appeal due to potentially conflicting decisions between Illinois EPA and the U.S.EPA. *Id*, at *15-16. The Board stated that a "stay diminishes the opportunity for potentially conflicting determinations." *Id.* at *16. *See also Midwest Generation EME, LLC v. IEPA*, PCB 04-216 (Apr. 6, 2006), at 7-8 (Board granted stay in part to diminish the opportunity for potentially conflicting determinations by U.S.EPA); *Midwest Generation, LLC v. Illinois EPA*, PCB 04-185, April 6, 2006, *7. The Board will generally grant a stay to avoid inconsistent relief. In *Weglarz Hotel III, LLC, et al. v. The Belt Railway Company of Chicago*, 2019 Ill. ENV LEXIS 7, PCB 19-64 (Jan. 17, 2019) the Board granted a motion to stay pending resolution of a federal court action filed in federal court. *Id*. at *5. The Board weighed the comity factor in the movant's favor, because "if both actions proceed independently of one another, the Board and the federal court could conceivably grant inconsistent relief," and "administrative efficiency weighs in favor of granting the stay". *Id*.

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[2] The Act established the Illinois EPA and the Board as separate and independent Agencies. 415 ILCS 5/4, 5. David Currie, one of the drafters of the Act, stated that "In order to separate prosecutor from judge, the Environmental Protection Agency was to file complaints and the independent Pollution Control Board to decide them, …" Currie, D. "Rulemaking under the Illinois Pollution Law," 42 U. Chi. L. Rev. 457 1974-1975; *See also* "Illinois Pollution Control Board, 50th Anniversary, 1970-2020," July 1, 2020, p. 16 ("The Board is an independent body"), p. 28 ("The Board and Agency were independent of each other and defined along functional lines.")

Here, MWG has been complying with the regulatory process prescribed in the Illinois CCR Rule, including preparing voluminous operating permit applications and even longer construction permit applications. MWG timely submitted to Illinois EPA operating permits for eight of the CCR surface impoundments that are the subject of this matter.[3] The operating permit applications include plans for closure or retrofitting each of the CCR surface impoundments, pursuant to the closure methods allowed in the Illinois CCR Rule. For each pond, the current closure plan is:

| | **Closure Plan** | **Date Construction Permit App. Due** |
|---|---|---|
| **Joliet 29** | | |
| Pond 2 | Closure by Removal, assuming reuse of the HDPE liner.[4] | Feb. 1, 2022 |
| **Powerton**[5] | | |
| Ash Surge Basin | Retrofit the Pond pursuant to 845.770. | Aug. 1, 2023 |
| Ash Bypass Basin | Retrofit the Pond pursuant to 845.770. | Aug. 1, 2023 |
| Former Ash Basin | Closure in Place | Aug. 1, 2023 |
| Metal Cleaning Basin | Will be proposed in operating permit application to be submitted by March 31, 2022, including a Category Designation | The date depends upon the Category Designation |
| **Waukegan** | | |
| East Pond | Closure in Place | Feb. 1, 2022 |
| West Pond | Closure by Removal, assuming reuse of the HDPE liner.[6] | Feb. 1, 2022 |

[3] The Board granted a five month extension to submit the operating permit applications for the Metal Cleaning Basin at Powerton and Ponds 1N and 1S at Will County. *Midwest Generation LLC (Powerton Station) v. Illinois Environmental Protection Agency*, PCB 21-109; *Midwest Generation LLC v. Illinois EPA*, PCB21-108, Sept. 9, 2021.

[4] MWG filed a Petition for Adjusted Standard requesting that the Board allow MWG to reuse the HDPE liner in Pond 2 and find Part 845 inapplicable to Ponds 1 and 3. *Midwest Generation, LLC's Petition for Adjusted Standard and Finding of Inapplicability for the Joliet 29 Station*, PCB 21-01, May 11, 2021.

[5] MWG filed a Petition for Adjusted Standard requesting that the Board find Part 845 inapplicable to Service Water Basin. *Midwest Generation, LLC's Petition for Adjusted Standard and Finding of Inapplicability for the Joliet 29 Station*, PCB 21-02, May 11, 2021.

[6] MWG filed a Petition for Adjusted Standard requesting that the Board allow MWG to reuse the HDPE liner in the West Pond and find Part 845 inapplicable to the Grassy Field. *Midwest Generation, LLC's Petition for Adjusted Standard and Finding of Inapplicability for the Waukegan Station*, PCB 21-03, May 11, 2021.

| | **Closure Plan** | **Date Construction Permit App. Due** |
|---|---|---|
| **Will County** | | |
| Pond 1N | Will be proposed in operating permit application to be submitted by March 31, 2022, including a Category Designation | The date depends upon the Category Designation |
| Pond 1S | Will be proposed in operating permit application to be submitted by March 31, 2022, including a Category Designation | The date depends upon the Category Designation |
| Pond 2S | Closure in Place | Aug. 1, 2022 |
| Pond 3S | Closure in Place | Aug. 1, 2022 |

Assuming the construction permit applications comply with the Illinois Environmental Protection Act ("Act") and Illinois CCR Rule, Illinois EPA will issue permits to close the ponds per the closure plans in the applications. 415 ILCS 5/39(a).

The only remedy proposed by Complainants for these surface impoundments is a complete removal – which is only one of the options allowed by the Illinois CCR Rule.[7] In fact, Complainants continue to assert that a remedy of complete removal of the ash ponds (and identified historic areas) is appropriate because their economic expert recently relied upon the estimated costs of removal to calculate a purported economic benefit for this next phase of the case. *See* Table 3 of Shefftz Report attached as Ex. 2. In comparison, MWG's expert proposes a remedy that takes into account the work conducted pursuant to the Federal CCR Rule and proposed to be conducted under the Illinois CCR rules. Ex. 1, p. 49. If the Board were to accept the removal remedy proposed by Complainants, and the Illinois EPA later determines, based on detailed permit applications, that an alternate closure method is appropriate and protective, MWG is in an impossible situation.

[7] *See* Kunkel Supplemental Report, December 2015 report, Hearing Ex. 412, pp 11-12 (recommending removal of the ash ponds in addition to historic ash areas). Pursuant to the Hearing Officer's Sept. 14, 2020 Order, the Parties' expert opinions from 2015 stand and parties may build on the information. H.O. Order, p. 3. Complainants' additional expert (M. Quarles) solely opines that a nature and extent investigation is necessary for each MWG Station. *See* Excerpt of Quarles Jan. 25, 2021 Rpt, p. 24-25, attached as Ex. 3.

There is a real possibility that the Board could force a remedy inconsistent with the remedy approved by the Illinois EPA. Illinois EPA has the technical knowledge to review MWG's permit applications and grant or deny permits for each impoundment. This is the exact reason for a stay based on comity – to allow the Agency with the appropriate knowledge and delegated authority to control the remedial decision.

Even if the Board fashions a different remedy than proposed by either party, MWG cannot conduct any work on the CCR surface impoundments until Illinois EPA issues construction permits. Illinois EPA has testified that it will review each application thoroughly and that issuing the permits is expected to take significant time due to their complexity. Ex. 4, *Midwest Generation LLC v. Illinois EPA*, PCB21-108, Tr. p. 82:16-21; 118:24-119:15. Again, it is this recognized complexity that requires the Board to grant a stay based on comity and the expertise of the Illinois EPA. If the Board attempts to create a remedy for the MWG CCR surface impoundments, there is a high probability MWG will be ordered to conduct a corrective action that ultimately is not approved by the Illinois EPA or in a deadline inconsistent with the Illinois EPA's permitting process.

MWG is duly following the Illinois CCR Rule, including conducting corrective actions required and as permitted by Illinois EPA. But this permitting process will take time and the Board should defer to the Illinois EPA's decision making in the permit applications. It is unreasonable to push forward while the Illinois EPA is proceeding with its regulatory review. Similarly, because Illinois EPA is proposed to be the delegated agency for decisions concerning historic ash areas, the same conflict and comity issues apply. The only way to avoid inconsistent relief is to stay this matter so regulatory requirements under the Illinois CCR Rule are resolved.

**B. A Stay will Avoid Multiplicity in Remedy Decisions and will Prevent Vexation**

Continuing this matter likely will generate multiplicity and vexatious decisions because the Board could order a corrective action contrary to the Illinois EPA's permit requirements, wasting the Board's and Parties time and resources. The Board has previously granted a stay to avoid "multiplicity and the potential for unnecessarily expending the resources of the Board and those before it." *Commonwealth Edison*, 2006 Ill. ENV LEXIS 200, at *18; *Midwest Generation, LLC v. Illinois EPA*, PCB 04-185, April 6, 2006, *7 (Board granted stay in part to avoid wasteful multiplicity of litigation, even though there was no finding of likelihood of obtaining complete relief in foreign jurisdiction nor a *res judicata* effect.); *Weglarz Hotel III, LLC*, 2019 Ill. ENV LEXIS 7, *5 (Board granted stay in part to avoid wasting resources of the Board and the parties); *Herrin Security Bank v. Shell Oil Company*, PCB 94-178, May 18, 1995 *1-2 (Board granted stay where relevant regulatory actions could resolve the issues, thus avoiding wasting the Board's and Parties time and resources.)

MWG has already suffered a multiplicity of decisions and waste of resources related to its surface impoundments. In 2012, MWG received violation notices from the Illinois EPA asserting that MWG's surface impoundments caused groundwater contamination. The Illinois EPA demanded that MWG conduct corrective actions by relining the surface impoundments, even though the Federal CCR rules were pending and expected to be issued at any time. Despite MWG's expressed concern that the proposed liners demanded by Illinois EPA could be inconsistent with Federal CCR rule due to be issued, Illinois EPA insisted that MWG proceed and MWG spent millions to reline many of its ash ponds with new HDPE liners. The liners were specifically approved by Illinois EPA and detailed plans for the liners were properly applied for and permitted. Only two years later, due to the specific requirements of the final Federal CCR Rule, the costly new liners had no regulatory use to demonstrate compliance and MWG was required to close or retrofit the impoundments at significant cost.

Now, MWG is subject to the requirements under the Coal Ash Pollution Prevention Act and the Illinois CCR Rule, both specifically drafted to address potential groundwater contamination caused by CCR. 415 ILCS 5/22.59(b)(2), (d). The Illinois CCR Rule requires groundwater monitoring and corrective actions if a CCR surface impoundment causes groundwater contamination, all under the decision-making and oversight of the Illinois EPA. 35 Ill. Adm. Code Subpart F. Because MWG is fully complying with the Illinois CCR Rule pursuant to the schedules in the Rule, the Board should stay this matter to prevent a multiplicity of actions and vexation to MWG in facing a remedy that could conflict with the remedy approved in the future. The Illinois EPA-approved corrective actions and closure methods pursuant to Agency issued permits will address any potential groundwater contamination from the Illinois CCR surface impoundments, and the Board will avoid wasting resources to move forward with a remedy that may conflict with the Illinois EPA's.

The potential for multiplicity and vexation, and ultimately a waste of resources, is also true for the areas of CCR outside the CCR surface impoundments, particularly the Grassy Field at the Waukegan Station. As noted, the Board is in the process of adopting rules for historic ash areas in its sub docket in the Illinois CCR Rulemaking. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, PCB20-19(A). Those rules, like the Illinois CCR Rule, are also proposed to be under the purview of the appropriate and knowledgeable agency - Illinois EPA. The new rules will subject the CCR areas outside of the CCR surface impoundments to alternate requirements. As a result, MWG could be forced to conduct a corrective action in this matter for the Grassy Field and other historic areas that will have no regulatory value under the regulations passed in PCB20-19(A). Regarding the Grassy Field, MWG is in a dispute with Illinois EPA over whether the Grassy Field at the Waukegan station is in fact a surface impoundment. If Illinois EPA prevails in the dispute, then the area will be subject to the Illinois CCR Rule, requiring it to be permitted and requiring MWG to conduct corrective actions under the oversight of the Illinois EPA. Even if MWG prevails, the Sub docket (A) rules will subject the Grassy Field to alternate requirements. As a result, any remedy recommended by the Board – including MWG's expert's remedy to install a cap over the area – could subject MWG to a multiplicity of corrective actions resulting in unnecessary costs and waste of materials.

It would also be vexatious and a waste of resources to attempt to further divide the remedy stage of this this matter between CCR surface impoundments and other areas. This case has already been bifurcated between liability and remedy. A second bifurcation will only create confusion and complications. Many of the CCR areas outside of the CCR surface impoundments at the Stations are adjacent to or between the CCR surface impoundments. Attempting to design a remedy for CCR areas that are not CCR surface impoundments but are around and between the CCR surface impoundments, while waiting for the construction permits from Illinois EPA for the CCR surface impoundments, is unnecessarily complicated. It would result in a waste of time and resources by the Board and the Parties.

### C. A Stay is Appropriate Because There is No Risk of Environmental Harm

A stay in this manner is further justified because these proceedings do not involve a risk of ongoing environmental harm. *See North Shore Sanitary District v. Illinois EPA*, PCB 03-146, March 20, 2003, slip op. at 3, (Board granted stay of permit appeal in part because "no environmental harm will come from granting a stay"). The four Stations at issue here have each operated for over 60 years. It is undisputed that there are no potable wells downgradient of the

MWG Stations, and there are ELUCs established at the Waukegan Station, Powerton Station, and Will County Station preventing any potable use of the groundwater.[8]

In its April 2020 Order denying a stay, the Board stated that groundwater monitoring reports at the Stations revealed exceedances that supported a finding of harm. However, the Board did not consider the GMZs at the Stations in its discussion. 4/16/2020 Order at p 5. MWG established GMZs at the Joliet 29, Powerton, and Will County Stations, with the review and approval of the Illinois EPA. Because the GMZs are established, "the otherwise applicable standards as specified in Subpart D of this Part *shall not be applicable to the "contaminants of concern,…*" 35 Ill. Adm. Code 620.250(e) (*emphasis added*). The Board similarly revised its Interim Order in this case to note that because the GMZs were in effect, there were no ongoing exceedances of the Part 620 groundwater standards. *Sierra Club v. Midwest Generation, LLC*, PCB13-15, Feb. 6, 2020, p. 13. Accordingly, pursuant to the Board's Feb. 6, 2020 Order and Section 620.250(e) of the Board Rules there are no exceedances of the Part 620 standards at the Joliet 29, Powerton, and Will County Stations. The GMZs are under the oversight of the Illinois EPA to confirm that the controls and management of the groundwater at the Stations are sufficient. 35 Ill. Adm. Code 620.250(c).

It is also undisputed that there is no risk to the surface waters near the Stations because the concentrations of the constituents are below the water quality standards and water quality criteria considered protective of human health and the environment. *See* Hearing Ex. 903, App. B (2015 Surface Water Risk Characterization), and Hearing Ex. 907 (2017 Updated Surface Water Risk Characterization). MWG's expert (Weaver) updated this analysis and similarly concluded that the downgradient groundwater conditions at each of the Stations do not pose risk to surface water

[8] There is also an ELUC on the western side of the Joliet 29 Station. Hearing Ex. 612

receptors. Ex. 1, pp. 45-47. While Complainants' expert (M. Quarles) speculated there could be risks for accumulation in the sediments, wetlands, or macro-invertebrate organisms in the surface water, he provided no data supporting his speculations, and no studies to suggest that the sediment in the surface waters near the MWG Stations may be affected. In fact, available sediment data shows the opposite. As part of the *Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River Rulemaking*, PCB R08-09, MWG surveyed the sediment in the Des Plaines River. The sediment survey showed that the concentrations of constituents in sediment sampled in the Des Plaines River next to the Joliet 29 Station were lower than the concentrations directly upgradient to the Station. *See Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River*, PCB R08-09, Sediment Chemistry Study, Upper Illinois Waterway, Dresden and Lower Brandon Pools, Prepared by EA Engineering, Science, and Technology, Sept. 2008, Fig. 2, (Sept. 8, 2008). Fig. 2 is attached as Ex. 5. There is no basis to support a harm to surface waters.

MWG's expert, Weaver, also conducted a groundwater trend analysis of the constituents in the groundwater at the four Stations since sampling began in 2010, and concluded that the concentrations of the constituents in the groundwater at Joliet 29, Powerton and Will County Stations are decreasing. Ex. 1, p. 42-43. Most of the trend analysis tests showed there was no trend in the groundwater concentrations, meaning that the groundwater concentrations neither increased nor decreased. Weaver explained that "no trend actually indicates that the constituent wasn't detected." Ex. 1, p. 44, Ex. 6, and Weaver Dep., p. 176:18-22. In other words, there cannot be a further decreasing trend when there is nothing there to detect. Weaver concluded that monitored natural attenuation was occurring at the Stations, and recommended that application of the GMZs approved by the Illinois EPA continue as the appropriate remedy, because monitored natural attenuation "can conceivably last for many years." Board Order, Feb. 6, 2020, p. 13.

At Waukegan, the Board's April 2020 decision denying a stay pointed to the Grassy Field (aka "Former Slag and Fly Ash Storage area") as a likely source to support the Board's finding of potential harm. Since that time, MWG's expert Weaver concluded that despite potential impact from the Grassy Field, no ash constituents were reaching the nearest water body (Lake Michigan). Ex. 1, p. 44. In addition, Illinois EPA has stated that the active CCR surface impoundments at Waukegan are not a source.[9] Following the Board's Interim Order, MWG investigated the Grassy Field by installing 40 probes over a 1,000 ft by 400 ft area and collecting 100 samples of the soil for evaluation of metals and general chemistry parameters. *Id.* at 41-42. Based on the results of that investigation, Weaver recommended that MWG install an engineered cap over the Grassy Field to reduce infiltration and mitigate the potential leaching from the ash to the groundwater. *Id.* p. 53. However, Weaver also cautioned against initiating any action until the Board finalized its rulemaking in the sub docket A of R20-19 to explore "historic, unconsolidated coal ash fill in the State", located outside of surface impoundments. *Id.* Weaver concluded there was no harm to the environment nor public health staying the corrective actions, because it confirmed "that there is

[9] See statement of Darin LeCrone, Illinois EPA Manager of the Permit Section in Division of Water, "Continued groundwater monitoring indicated a source other than East or West Ponds." Illinois EPA Bureau of Water Waukegan Power Station: Part 845 CCR Surface Impoundments, attached as Ex. 7, p. 5, and filed with the Board in PCB 21-03. Illinois EPA has consistently held this opinion since at least 2013. *See* Hearing Exhibit 648 ("Currently we don't believe the active ash ponds are the source of contamination."), Hearing Exhibit 649 ("the CCA indicated that the active ponds (for which the VN was issued) are not the likely source of contaminants in the groundwater."). Even counsel for Complainants stated that because the CCR surface impoundments were lined, "…Midwest Generation's active coal ash ponds subject to the state and federal rules were probably less likely to be contaminating groundwater than at many other coal ash sites." Lydersen, Kari, *Historic coal ash raises concerns at iconic Illinois coal plant site*, Energy News Network, (Dec. 21, 2021), https://energynews.us/2021/12/21/historic-coal-ash-raises-concerns-at-iconic-illinois-coal-plant-site/.

no risk to Lake Michigan or other potential offsite receptors and groundwater use on-site is controlled by the ELUC." *Id.*[10]

At Joliet 29, the Board's April 2020 Order denying a stay identified elevated concentrations in one well (MW-9) to support a finding of harm. Not only is MW-9 within the GMZ at Joliet 29, meaning there are no exceedances of the groundwater standards, the constituents in the groundwater at MW-9 are unrelated to Station operations. MWG conducted an investigation in the soil around MW-9 by drilling and sampling 18 soil borings. Ex. 1, p. 36. The boring logs showed there is no CCR in the soil around the well, and no other potential source of the constituents in the monitoring well related to Station operations. *Id.* Based upon the soil and sample results, MWG's Expert (Weaver) concluded that the constituents found in MW-9 are naturally occurring and not due to CCR in the soil or the impoundments. *Id.*, p. 37. Complainants' expert provided no data in dispute. *Id.*, p. 37

Complainants' claims that other areas at the Stations may pose a threat are baseless because there is no evidence the areas are causing immediate harm that cannot be addressed through the regulatory scheme being established by Illinois. While Complainants point to a historic fill area titled "the Northeast Area" at the Joliet 29 Station as an alleged threat to the Des Plaines River, there is no basis for this claim.[11] The Northeast Area is part of the Station's NPDES stormwater permit. *Sierra Club v. Midwest Generation, LLC*, PCB 13-15, 1/29/18 Tr. 183:17-21. Annually, Richard Gnat, KPRG, walks the Northeast Area to confirm there are no seeps or releases to the

[10] The absence of risk is supported by Section 21 of the Illinois Environmental Protection Act ("Act") which specifically allows for coal combustion waste "generated by such person's own activities which are stored, treated or disposed within the site to remain with no permit. 415 ILCS 21(d)(1), (r)(1). Because the CCR historic ash areas (such as the Grassy Field) was generated by the Station's own activities, disposal was not required to have a permit and was allowed under the Act.

[11] Complainants have the burden of establishing such alleged harm, including whether an area is causing contamination. *Northern Illinois Anglers' Assoc. v. Kankakee Water Co., Inc.*, PCB 81-127, 1981 WL 21931 (September 24, 1981), *1.

River. In October 2021, Mr. Gnat walked the entire length of the Northeast Area and observed no seeps or releases to the Des Plaines River. He took numerous photos to demonstrate there are no ash seeps along the waters' edge. *See* Ex. 8. He has confirmed these results every year since 2013. As noted above, a sediment study performed on the Des Plaines River further supports the lack of harm. *See supra* Sec. III.C, and Ex. 5. There is no basis to claim that a stay -- to allow Illinois EPA to implement the Illinois CCR Rule (and sub docket) -- will result in harm. [12]

### D. MWG will be Prejudiced without a Stay

The potential prejudice to MWG without a stay is considerable because MWG will otherwise be forced to act without regulatory certainty. MWG faces the specter of implementing remedies imposed by the Board that are inconsistent with future permits issued by Illinois EPA. MWG could also be once again compelled to conduct a corrective action inconsistent with later regulations, like it did with installing new pond liners in 2013, ultimately making the work worthless in effect and cost. Requiring MWG to continue to defend this lawsuit and attempt to fabricate a remedy that complies with the Illinois CCR Rule and is capable of being permitted by Illinois EPA, is a waste of the Board's and each Party's time and resources. In fact, a stay now to await the Illinois EPA's permitting process will likely reduce the facts and issues for the Parties and Board to review.

As a matter of policy, state-wide voluntary compliance with the Illinois EPA will also be prejudiced and incentives to work with the Agency will be adversely impacted if the Board does not issue a stay. The Illinois CCR Rule imposes detailed requirements for all coal ash impoundments in the State, under the review, oversight and decision-making of Illinois EPA. To impose a potentially inconsistent remedy against MWG alone, resulting from a third-party

[12] In any case and as noted in FN 10 above, the Act supports the lack of harm as it allows such CCR waste to remain in place. 415 ILCS 5/21(d), (r).

enforcement action, removes all incentives to resolve matters with Illinois EPA. In other words, a third-party enforcement action should not be allowed to take precedent over state-wide law and regulation. Here, there is no dispute that MWG voluntarily investigated the groundwater around its CCR surface impoundments in 2010, which is the data Complainants rely upon in support of their claims. There is also no dispute that MWG voluntarily entered into Compliance Commitment Agreements ("CCAs") with Illinois EPA to remedy the alleged groundwater contamination and spent millions to reline the ponds in compliance with the CCAs. And yet, despite all those efforts, MWG is potentially subject to corrective actions far beyond what may be required by Illinois EPA under the Illinois CCR Rule and/or sub docket. MWG is also potentially subject to substantial penalties based upon the dates of MWG's initial voluntary groundwater investigation because Complainants' expert has calculated the economic benefit from one month after groundwater sampling began. Ex. 2. What person would agree to work with an agency to develop data for potential future regulation if that same data is used in a later enforcement action by a third party? What person would enter into a CCA to remedy potential violations and environmental contamination if the CCA provides no protection against third-party enforcement? The answer is no one, when the consequence is an enforcement action demanding corrective actions beyond the regulatory requirements and demanding substantial penalties. In retrospect, MWG would have been better served refusing Illinois EPA's request to install groundwater monitoring wells in 2010 (as did other coal ash facilities), refusing to collect the groundwater data that supports Complainants' claims, refusing to reline its ponds in 2013 due to the pending CCR rules, and instead forcing the Illinois EPA to expend resources and effort to compel MWG to conduct work later. This cannot be the Board's goal.

Granting a stay will allow MWG to conduct the significant work required by the Illinois CCR Rule, conduct any regulatory proscribed remedy established in the sub docket for historic fill areas, and will allow Illinois EPA to perform its statutorily directed role of regulating the environment. A stay will preserve cooperation between the Illinois EPA and the regulated community.

**E. <u>Complainants Are Not Prejudiced</u>**

Complainants are not prejudiced by a stay because, as discussed above, there is no ongoing environmental harm and MWG's compliance with the Illinois CCR Rule provides a remedy that comports with applicable rules as applied by the Illinois EPA. *See supra* Sec. III.A., B. and C. Any claims of prejudice due to the length of time for this lawsuit are misleading because the duration is unrelated to the Parties' efforts in moving it forward. First, even before the matter could begin, MWG's bankruptcy filing stayed the litigation for over one year. *See Notice of Bankruptcy Stay for Edison Mission Energy, et al,* Dec. 28, 2012 and *Notice of Lift of Stay by Bankruptcy Court*, Jan. 4, 2013. Second, this litigation matter is complex and wide-ranging. At first, this litigation was about the CCR surface impoundments. About two years later, Complainants expanded it to include areas of coal ash beyond the CCR surface impoundments. Further, because the litigation concerns CCR impoundments and other ash areas at four stations with four different operations and groundwater units, it is actually four complex and separate proceedings combined into one. For that very reason, discovery was extensive and time consuming. To prepare for the first hearing, discovery lasted over 18 months, over 100,000 pages of documents were exchanged, and ten witnesses were deposed, including two expert witnesses. Complainants then elected to name all new expert witnesses for the remedy stage of the hearings, which the Board allowed. As a result, second round of discovery has also taken over a year. An additional approximately 60,000 pages of documents have been exchanged, and eleven witnesses were deposed - including six new expert witnesses. To ensure sufficient time to collect all the discovery, the discovery deadlines have been extended multiple times, most recently at Complainants' request. *See Complainants' Unopposed Motion for Extension of Time to File Expert Rebuttal Reports and to Adjust Remaining Schedule*, May 5, 2021.

Similarly, the briefing for dispositive motions and preparation for the first phase of this matter have taken time simply due to the extent and breadth issues. For example, it took over eight months from the date of Complainants' Motion for Partial Summary Judgment to the Board's decision denying the motion in January 2017. Preparation for the first hearing took approximately ten months, and the first hearing occurred over 10 days between October 2017 and February 2018. The post-hearing briefs were not fully briefed for the Board's consideration until August 30, 2018, almost one year after the first hearing began. The Board issued its Order almost one year later on June 20, 2019, and issued a second order reconsidering its initial order in part on February 6, 2020.

No party in this matter can be accused of causing any inappropriate delay to resolve this matter. Rather, because the litigation involves four Stations with complex and differing issues and facts, it is not surprising that an extensive amount of time was necessary. As stated above, a stay to await the Illinois EPA permitting process will likely benefit the Board, the Hearing Officer, and the Parties because it will reduce the facts and issues to be presented at the next hearing.

## IV. CONCLUSION

A stay of this proceeding is appropriate given the need for comity to Illinois EPA based on MWG's compliance with the Illinois CCR Rule and the conflict with the Illinois EPA's review and permitting of the CCR surface impoundments. A stay is also necessary to avoid multiplicity of decisions for both the CCR surface impoundments and areas outside the CCR surface impoundments, and to prevent waste of resources by the Board and the Parties. There is no environmental harm in granting the stay, but without one MWG will be highly prejudiced because of the potential to be subject to conflicting orders and permits. Based on the above, MWG respectfully requests that the Board grant Respondent's Motion to Stay, and order MWG to submit to the Board a status one year from the date the stay is granted, pursuant to 101.514(b).

Respectfully submitted,

MIDWEST GENERATION, LLC.

By ____/s/ Jennifer T. Nijman_________
One of Its Attorneys

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# EXHIBIT 1

**April 22, 2021**

# EXPERT REPORT ON RELIEF AND REMEDY

## SIERRA CLUB, ET AL (COMPLAINANTS) V. MIDWEST GENERATION, LLC (RESPONDENT)

PREPARED BY

Weaver Consultants Group

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## APPENDICES

# 1 INTRODUCTION

Weaver Consultants Group (WCG) has been retained by "Respondent", Midwest Generation, LLC (MWG), to provide its opinions on recommended relief, if any, in the case of Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment v. Midwest Generation, LLC., and to respond to opinions expressed by Mr. Mark A. Quarles in his expert report (the "Quarles Report"). WCG's opinions in this Report are made to a reasonable degree of scientific certainty. WCG reserves the right to supplement this report, if additional relevant information becomes available.

## 1.1 Qualifications

### 1.1.1 Douglas G Dorgan, Jr., LPG

Mr. Dorgan's resume and list of publications is presented in **Appendix A**.

I have over 30 years of experience working as an environmental consultant. I have a Bachelor of Science (BS) in Earth Science, with a Minor in Geology, and a Master of Science (MS) in Geography with a Concentration in Environmental Science. I am a Licensed Professional Geologist (PG) in the states of Illinois, Indiana, and Kansas.

Since 1986, my practice has focused on providing consulting services and performing remedial investigation, planning, design, and construction for a wide range of industrial, commercial, and institutional properties. I have been qualified as an expert witness and supported litigation associated with projects involving environmental assessment, design, permitting, and engineering design and construction-related issues. I have also implemented various projects involving compliance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and under various Illinois regulatory programs (e.g., Leaking Underground Storage Tank (LUST), Site Remediation Program (SRP), Tiered Approach to Corrective Action Objectives (TACO)). I have regularly interfaced with both the United States Environmental Protection Agency (USEPA) and the Illinois Environmental Protection Agency (EPA) in many contexts.

I have worked on numerous commercial and industrial properties exhibiting legacy environmental impacts. I have experience assessing and remediating soils and fill material impacted by a wide range of contaminants of concern (COCs). I also have experience supporting environmental investigation and restoration associated with Brownfields redevelopment.

During my career, I have extensive experience:

1. Investigating contaminated properties;
2. Evaluating appropriate environmental risk mitigation options;
3. Designing environmental remediation programs and preparing cost models to support same;
4. Managing all aspects of environmental remediation implementation including, but not limited to, developing bid specifications (general and technical), coordinating the bid process and contractor selection, managing implementation of remediation work, and review and approval of contractor pay requests.
5. Managing technical consulting services associated with remedial program implementation to assess conformity with project plans and technical criteria.
6. Managing documentation of remedial program implementation via project completion reports.

Finally, I have worked on projects involving a range of anthropogenically produced fill materials including coal ash, dredge spoils, slag, and construction/demolition debris. I have supervised closure of Federal CCR regulated ash ponds. I also served as the Principal in Charge for implementation of various elements of the CERCLA Remedial Investigation/Feasibility Study (RI/FS) activities for a northern Indiana Restricted Waste Site (RWS) containing exclusively locally-generated Coal Combustion By-products (CCB).

### 1.1.2 Michael B. Maxwell, LPG

Mr. Maxwell's resume is presented in **Appendix A**.

I have attained nearly 25 years of experience working in the local Chicagoland area as an environmental consultant with WCG. I have a Bachelor of Arts (BA) in Geological Sciences from the State University of New York, College at Geneseo in 1994 and earned a MS in Geology from the University of Iowa in 1996. My Masters' Thesis involved investigation and characterization of various solid waste products produced in southcentral Iowa, including coal ash, as a means for strip mine remediation. I have been licensed for nearly 20 years as a PG in the states of Illinois and Indiana and am also certified as a Certified Hazardous Materials Manager (CHMM).

I have been practicing environmental consulting in the Chicagoland market since 1996, providing services related to site investigation, remedial investigation, planning, design, and construction for a wide range of industrial, commercial, and institutional properties. I have implemented various projects involving compliance with the Resource Conservation Recovery Act (RCRA) Subtitle D (solid waste disposal facilities) and Subtitle C (hazardous waste disposal facilities), as well as the 40 CFR 257 Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (Federal CCR Rules). Additionally, I have implemented various technical projects involving compliance with CERCLA. Since the beginning of my professional practice in 1996, I have regularly applied the SRP regulations and related TACO regulations to a variety of different Illinois sites. I have regularly interfaced with both the USEPA and Illinois EPA on behalf of various industrial clients involving RCRA and alleged violations of the Illinois Environmental Protection Act, including negotiations and compliance with various Compliance Commitment Agreements (CCAs).

I have provided previous testimony before the Illinois Pollution Control Board (Board or IPCB) in connection with an Adjusted Standard Hazardous Waste Delisting Petition that was approved by the Board in 2008. I provided technical assistance and support in a case involving CERCLA liability, cost allocation, appropriateness, and costs associated with the selected remedy related to a former zinc smelter located in downstate Illinois. I have also played the key supporting role in toxic tort and property damage claims related to the historical use of chlorinated solvents at an industrial facility in St. Louis, MO.

I have worked on various different projects involving regulatory compliance/permitting, investigation, and remediation of coal ash surface impoundments, and coal ash fill disposal sites. At one such site in northwest Indiana, I manage the permitting, closure, groundwater monitoring, and corrective action at a restricted waste site (RWS). I have overseen the design and installation of the initial groundwater monitoring system required under the Federal CCR Rules and managed the collection of background groundwater quality data, as well as the statistical evaluation of the groundwater monitoring data at two former coal ash surface impoundment sites in Indiana. I also managed the review of Groundwater Monitoring Reports prepared under the Federal CCR Rules for two former coal ash impoundment sites in northern New Jersey.

## 1.2 Information Considered

For purposes of this Report, WCG has reviewed the documents presented within the Quarles Report, select publicly available information obtained from the administrative record on the IPCB website (available at https://pcb.illinois.gov/), select publicly available information available concerning MWG on the CCR Rule Compliance Data and Information website (available at:

https://www.nrg.com/legal/coal-combustion-residuals.html) and other information provided by MWG. These sources are listed in **Appendix B**.

## 1.3 Background

MWG owns/operates the following electric generating stations:

1. Joliet #29 Generating Station, located in Joliet, IL (Joliet 29);
2. Powerton Generating Station, located in Pekin, IL (Powerton);
3. Will County Generating Station, located Romeoville, IL (Will County); and
4. Waukegan Generating Station, located in Waukegan, IL (Waukegan).

Each of the above facilities have been operated by MWG since 1999, when MWG acquired the Stations from a prior owner. On October 3, 2012, Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment (collectively, "Complainants") filed a complaint against MWG, alleging that MWG allowed groundwater contamination and open dumping at the above facilities in violation of the Environmental Protection Act (Act) and Board regulations.

The Interim Opinion and Order of the Board dated June 20, 2019, (2019 Board Order) concluded that "it is more probable than not" that MWG violated certain portions of the Act and Board Regulations[1], identifying areas at each facility. Specifically, the Board found that MWG violated Sections 12(a) and 21(a) of the Act at each of the four Stations. The Section 12(a) violation identified by the Board relates to causing or allowing discharge of coal ash constituents into groundwater causing water pollution. Section 21(a) relates to allowing coal ash to consolidate in fill areas around ash ponds and historical ash storage areas. In addition, the Board found that MWG violated Section 12(d) of the Act (open dumping of coal ash onto the ground) at the Powerton Station (only) by temporarily storing coal ash outside of the surface impoundments on a single occasion.

The 2019 Board Order was reconsidered and modified by a February 6, 2020 Order of the Board (2020 Board Order). Importantly, the subsequent 2020 Board Order found that the Groundwater Management Zones (GMZs) previously established at the Joliet 29, Powerton, and Will County Stations in 2013 had not been terminated and are still in place. With the continued applicability

[1] 2019 Board Order, pg. 79.

of the GMZs at the Joliet 29, Powerton and Will County Stations, there are presently no ongoing violations of Part 620 of the Board Regulations[2].

The 2019 Board Order concluded by indicating that the record up to that point lacks sufficient information to determine the appropriate remedy (in response to the above violations identified by the Board). The Board further indicated that additional hearings were to be held to determine the appropriate relief and any remedy, which will be enacted based upon Sections 33(c) and 42(h) of the Act[3]. Accordingly, WCG's opinions expressed in this Report were developed in consideration of the factors presented in these referenced sections of the Act. These relevant criteria are cited below in Sections 3-4.

## 1.4 Regulatory Background/Applicable Definitions

### 1.4.1 Federal CCR Rules

The materials managed at the above Stations that are the subject of this litigation are considered coal combustion wastes (CCW) or coal combustion residuals (CCR). CCW is defined in the 2019 Board Order as:

> *"any fly ash, bottom ash, slag, or flue gas or fluid bed boiler desulfurization by-products generated as a result of the combustion of…coal, or…coal in combination with [other material]."*[4]

CCR is not specifically defined in the 2019 Board Order, but is defined in 40 CFR 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (Federal CCR Rules). According to 40 CFR 257.53:

> *"Coal combustion residuals (CCR) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers."*

CCR has been found at various locations at the four Stations, however, based on MWG's assessment, all of the CCR does not necessarily fall under the same regulations. MWG has concluded that certain areas at the Stations fall under the definition of "existing CCR surface

[2] 2020 Board Order, pg. 13.
[3] 2019 Board Order, pg. 92-93.
[4] 2019 Board Order, pg. 14.

impoundment" pursuant to the Federal CCR Rules. The terms "CCR surface impoundment or impoundment" and "existing CCR surface impoundment", are defined as:

CCR surface impoundment:

*"a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR".*

Existing CCR surface impoundment:

*"a CCR surface impoundment that receives CCR both before and after October 19, 2015, or for which construction commenced prior to October 19, 2015 and receives CCR on or after October 19, 2015".*

The Federal CCR Rules also define the term "inactive surface impoundments", as:

*"a CCR surface impoundment that no longer receives CCR on or after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015"*.

MWG has determined that none of the areas at the MWG Stations are Federal inactive surface impoundments., with the exception of the Former Ash Basin at the Powerton Station.

While some of the CCR at the above facilities is managed in CCR surface impoundments (i.e., ponds), other CCR is not. The Federal CCR Rules also identify another CCR unit, known as a landfill. A "CCR landfill" or "landfill" means:

*"an area of land or an excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, and underground or surface coal mine, or a cave".*

The Federal CCR Rules state that they do not apply to CCR landfills that have ceased receiving CCR prior to October 19, 2015[5]. MWG has concluded that there are no areas at these Stations that fall within the definition of CCR landfill.

### 1.4.2 State CCR Rules

Illinois has promulged rules related to CCR Surface Impoundments (Illinois Pollution Control Board Case #R20-19). The rulemaking authority is related to Section 22.59 of the Act. In Section 22.59, the General Assembly found that "environmental laws should be supplemented to ensure

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[5] Preamble to 40 CFR 257, Disposal of Coal Combustion Residuals From Electric Utilities, Final Rule, April 2015.

consistent, responsible regulation of all existing CCR surface impoundments". Section 22.59 of the Act further required that Illinois EPA propose, and the Board adopt, new rules on CCR surface impoundments. Illinois EPA timely filed a rulemaking proposal in March 2020.

The Second Notice of Proposed Rule R20-19, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments, Proposed New 35 Ill. Adm. Code 845 was published by the Board on February 4, 2021 (IL CCR Rules). The IL CCR Rules were adopted by the Board on April 15, 2021. These rules are based largely on the Federal CCR Rules, with some modifications, and will also apply to certain CCR surface impoundments at the four Stations. One key difference between the IL CCR Rules and Federal CCR Rules is that the IL CCR Rules include a broader definition of "inactive surface impoundment". The definition of "inactive CCR surface impoundment" under the IL CCR Rules is as follows:

> *"CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015."*

The Federal definition states that an inactive surface impoundment must contain BOTH CCR and liquids, while the IL definition encompasses units that contain just CCR after the specified date.

The IL CCR Rules do not include CCR Landfills, because CCR disposed in Illinois landfills is already regulated as a solid waste under different regulations. The 35 Ill. Adm. Code 811 landfill regulations (and predecessor 35 Ill. Adm. Code 807 regulations) require solid waste landfill facilities operating (i.e., receiving and disposing of solid waste) after the effective date of the regulations to attain a permit from the Illinois EPA Bureau of Land.

CCR outside regulated surface impoundments has also been included within the scope of this case. The subject of historical unconsolidated coal ash fill areas was raised during the above IL CCR Rules rulemaking. The Board found that regulation of "unconsolidated coal ash fills" was beyond the scope of Section 22.59(g) of the Act, and directed the Clerk to open a sub-docket to R20-19 to explore "historic, unconsolidated coal ash fill in the State", located outside of surface impoundments.

The opinions expressed herein are subject to change, based upon future Illinois regulations pertaining to the above sub-docket to R20-19[6].

[6] The deadline for filing this report did not allow for incorporation of the final Illinois CCR rules, adopted on April 15, 2021, and WCG reserves the right to supplement this report in consideration of the final rules, if necessary.

### 1.4.3 Beneficial Use of Coal Ash

The Federal CCR rules do not regulate practices that meet the definition of a beneficial use of CCR and the Federal CCR rules do not affect past beneficial uses (i.e., uses completed before the effective date of the rule)[7]. The Act states that CCW is excluded from the definition of "waste" under the Act. "Waste" does not include "coal combustion by-products as defined in Section 3.135." "Coal combustion by-product" or CCB is defined as "coal combustion waste when used beneficially in any of the following ways…". Specific beneficial uses are included in Section 3.135(a), including use as structural fill, foundation backfill, antiskid material, soil stabilization, pavement, or mine subsidence.

As discussed below in support of WCG's opinions, historical Neutral Leaching Extraction Test (NLET) testing was performed by MWG on samples of coal ash removed from the Federal CCR surface impoundments to support beneficial use demonstrations. The comparison of the NLET results to the Illinois Class 1 Groundwater Quality Standards was also utilized to characterize the potential for the coal ash to result in impacts to groundwater. In addition to the NLET testing on the coal ash from the surface impoundments, a substantial amount of NLET testing was performed by MWG at Joliet 29, Powerton, and Will County Stations to characterize the potential for the historical coal ash fill areas to impact groundwater. The data collected from these prior site investigations and related comparisons to the Class 1 Groundwater Quality Standards is also used to support WCG's opinions presented in this Report.

## 1.5 Station Background

### 1.5.1 Joliet 29 Station

The Joliet 29 Station is located in a primarily industrial area, bordered on the west by a former Caterpillar, Inc. manufacturing facility. The north side of the Joliet 29 Station is bordered by Channahon Road (East James St.), beyond which are the Illinois and Michigan Canal Trail and industrial facilities. Brandon Rd. borders the east side and the Des Plaines River borders the south side of the facility. A site layout map is included as **Figure 1**.

The Station has produced electricity since the mid-1960s. The power plant has been operated by MWG since its acquisition in 1999. On March 18, 2016, the Plant ceased burning coal. On May 26, 2016, Joliet 29 began generating electricity with natural gas. The source of coal utilized by

[7] Preamble to 40 CFR 257, Disposal of Coal Combustion Residuals From Electric Utilities, Final Rule, April 2015.

MWG to produce electricity was subbituminous coal sourced from Wyoming's Powder River Basin[8].

#### 1.5.1.1 Surface Impoundments

Two coal ash surface impoundments (Pond 1 and Pond 2) and one service water basin (Pond 3) were constructed in 1978 with 12-inch thick Poz-o-Pac™ dense aggregate liners, which is similar to concrete[9]. Each pond is permitted under the Station's National Pollutant Discharge Elimination System (NPDES) Permit. During historical operations, most of the bottom ash produced at the Joliet 29 Station was conveyed across the Des Plaines River to an off-site permitted landfill[10]. On rare occasions when the enclosed pipe system was offline, bottom ash was pumped to either Pond 1 or Pond 2, where it was temporarily staged, until it could be removed for disposal at the off-site permitted landfill. Water from Pond 1/Pond 2 flowed to Pond 3, which was used exclusively as a finishing pond and received a *de minimis* quantity of coal ash[11].

Ponds 1 and 2 were relined in 2008. The new liners consisted of the following, from the bottom up: a bottom geotextile cushion layer placed on top of the Poz-o-Pac™, 60-mil high-density polyethylene (HDPE) geomembrane liner, a top geotextile cushion, a 12 inch thick sand cushion layer, and 6 inch thick limestone warning layer. The bottom elevation of Pond 2 is approximately 516 feet (ft.) above mean sea level (MSL). The highest recorded groundwater elevations since June 2011 in the vicinity of Pond 2 (i.e., in MW-03, MW-04, MW-05 and MW-10) ranged from approximately 511.5 ft. MSL at MW-05 and 511.8 ft. MSL at MW-10 (both data points observed in May 2020). The average groundwater elevation in the vicinity of Pond 2 between June 2011 and October 2020 was approximately 506.0 ft. MSL.

Coal ash was removed from Pond 1 and MWG cleaned Pond 1 prior to October 12, 2015[12]. Coal ash from Pond 2 was removed by November 22, 2019 and is in the process of being closed as soon as a permit is received[13]. The Pond 3 Finishing Pond was relined in 2013, and never received CCR[14].

[8] Joint Agreed Stipulations (JAS), Oct. 2, 2017, 51.
[9] JAS, Oct. 2, 2017, 5.
[10] 1/29/18, Tr. pg. 192-194 (Test. of Race).
[11] JAS, Oct 2, 2017, 10; 1/29/18 Tr. pg. 188-191 (Test. of Race).
[12] JAS, Oct 2, 2017, 12.
[13] Annual CCR Fugitive Dust Control Report, Joliet #29 Generating Station, December 10, 2020, pg. 2.
[14] 1/29/18 Tr. at 188-191 (Test. of Race).

Based on the Federal CCR Rules, MWG has determined that Pond 1 at Joliet 29 is not a Federal CCR Surface Impoundment, because it did not contain CCR after October 19, 2015. Pond 3 never received an accumulation of CCR, so MWG determined Pond 3 is not a Federal CCR surface impoundment. In 2020, MWG conducted a multi-layered analysis of the contents of Pond 1 and Pond 3, including a bathymetric survey of the base of the ponds and an analysis of the material found at the base of the ponds. The analysis demonstrated that the material in the ponds was not CCR. Instead, it was a mixture of biologic material, as well as sand and silt, air deposits, and stormwater runoff.[15] MWG has determined that Pond 2 is considered a Federal CCR Surface Impoundment because CCR and water was present in this surface impoundment after October 19, 2015. MWG removed the CCR from Pond 2 in 2019, and, under the IL CCR Rules, closure will be completed when a permit is issued by Illinois EPA, pursuant to the IL CCR Rules.

#### 1.5.1.2 Historical Fill Areas

In addition to coal ash surface impoundments, according to the case record, three other areas at Joliet 29 Station are suspected to contain historical coal ash. One is in the northeastern portion of the facility, one is on the southwest side, and one is northwest of the former coal pile[16]. As presented in further detail in the sections below presenting WCG's opinions, some of these areas have been historically investigated. Based on the results from prior site investigation activities, in some areas, coal ash was excavated and hauled to an appropriately permitted landfill, as a remedial measure. These areas did not receive coal ash after October 19, 2015 and were not operated as units meeting the definition of a Federal CCR surface impoundment and therefore MWG has not included them within the scope of the Federal CCR Rules.

### 1.5.2 Powerton Station

The Powerton Station is a 1,710-acre property located at 13082 East Manito Road in Pekin, Tazewell County, Illinois. The plant is bordered on the north by the Illinois River, Powerton Lake and Wildlife Area to the west, industrial and residential areas to the east, and agricultural land to the south. A site layout map is included as **Figure 2**.

Powerton has been operating as a generating station since the 1920s. Historically, operations were conducted with four coal-fired units; however, these units were replaced in the early 1970s

[15] MWG13-15_79325-79340.
[16] 2019 Board Order, pg. 26.

by the currently operating Units 5 and 6. The source of coal to produce electricity at Powerton is subbituminous coal sourced from Wyoming's Powder River Basin[17].

#### 1.5.2.1 Surface Impoundments

Various basins either historically or currently used to treat/manage materials are present at the Powerton Station, including:

- Ash Surge Basin;
- Bypass Basin;
- Metal Cleaning Basin;
- Secondary Settling Basin/Service Water Basin;
- Former Ash Basin;
- Limestone Runoff Basin; and
- East Yard Runoff Basin.

The Ash Surge Basin is the primary basin used for the collection of ash at the Powerton Station. The Ash Surge Basin was constructed in 1978 with at least a 12-inch Poz-o-Pac™ liner on the bottom topped with a bituminous seal coat and a Hypalon® liner on the sides of the basin[18]. The Ash Surge Basin was relined in 2013 with a bottom geotextile cushion layer placed on top of the Poz-o-Pac™ , 60-mil HDPE geomembrane liner, a top geotextile cushion, a 12-inch-thick sand cushion layer, and 6-inch-thick limestone warning layer[19]. The bottom elevation of the Ash Surge Basin is 452 ft. MSL[20]. The highest recorded groundwater elevations since September 2011 in the vicinity of the Ash Surge Basin ranged between approximately 446.8 ft. MSL at MW-18 in May 2017 and 449.4 ft. MSL at MW-15 in May 2013. The average groundwater elevation in the vicinity of the Ash Surge Basin between September 2011 and December 2020 was approximately 445.2 ft. MSL.

The Bypass Basin is used only when the Ash Surge Basin is being emptied[21]. The Bypass Basin was constructed in 1978 with a Poz-o-Pac™ liner on the bottom and a Hypalon® liner on the

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[17] JAS, Oct. 2, 2017, 51.
[18] JAS, Oct. 2, 2017, 20; MWG Exhibit 901, pg. 28.
[19] Id.
[20] Id at 30.
[21] 1/31/18 Tr. p. 75:20-23 and 75:16-19; Exh. 667, p. 12; MWG Ex. 901, p. 27-28; 1/30/18 Tr. p. 58:13-18 and p. 59:17-21; JAS, Oct. 2, 2017, 30.

sides. The Bypass Basin was relined in 2010 with 12 inches of Poz-o-Pac™ on the bottom, a bottom geotextile cushion, a 60 mil HDPE liner, a top geotextile cushion, a sand cushion, and a limestone warning layer[22]. The pond's bottom elevation is at 459 ft MSL[23]. The highest recorded groundwater elevation since September 2011 in the vicinity of the Bypass Basin was 452.8 ft. MSL at MW-12 in February 2020, and the average groundwater elevation in the vicinity of the Bypass Basin between September 2011 and December 2020 was approximately 450.4 ft. MSL.

The Metal Cleaning Basin is not a part of the ash sluice system and instead is used during outages in at the Station as a temporary lay-down area for dry ash cleaned out of the boiler tubes[24]. The Metal Cleaning Basin was constructed in 1978 with a 12-inch Poz-o-Pac™ liner on the bottom and a Hypalon® liner on the sides[25]. The Metal Cleaning Basin was relined in 2010 with 12 inches of Poz-o-Pac™ on the bottom, a bottom geotextile cushion, a 60 mil HDPE liner, a top geotextile cushion, a sand cushion, and a limestone warning layer[26]. The bottom elevation of the pond is 457.5 ft. MSL. In addition to use for the temporary lay-down of ash, the Metal Cleaning Basin occasionally holds process water. The Metal Cleaning Basin does not receive commingled ash and process water[27].

The highest recorded groundwater elevation since April 2011 in the vicinity of the Metal Cleaning Basin (i.e., from MW-13, MW-14, MW-15, and MW-17) ranged from approximately 449.0 ft. MSL at MW-17 in April 2019 and 450.1 ft. MSL at MW-14 in March 2018. The average groundwater elevation in the vicinity of the Metal Cleaning Basin between April 2011 and December 2020 was approximately 445.6 ft. MSL.

The Secondary Settling Basin/Service Water Basin is used as a finishing pond and receives *de minimis* ash from the Surge Basin[28]. Since before 1999, the Service Water Basin had a Hypalon® liner. The pond was relined in 2013 with a geotextile separator fabric, gravel underdrain system 18-24 inches thick, another geotextile separator fabric, a sand cushion layer, a bottom geotextile cushion, and a 60 mil HDPE liner[29]. Because the Service Water Basin would not be cleaned out,

[22] MWG Exhibit 901, pg. 28.
[23] Id at 31.
[24] Id at 28.
[25] Id.
[26] MWG Exhibit 901, p. 28.
[27] Interview with Sharene Shealey, MWG Director, Environment, April 19, 2021.
[28] 2019 Board Order at 3(A)(ii).
[29] MWG Exhibit 901, pg. 28.

no cushion or warning layer above the HDPE was necessary[30]. The pond's bottom elevation is at 440 ft. MSL. Average groundwater elevation is at 441.5 feet (about 1.5 ft above the pond's bottom)[31]. To address higher groundwater levels in the area, MWG installed an underdrain system beneath the Service Water Basin[32]. The purpose of the underdrain system, composed of stone, drain tiles, and riprap on the sides, is to divert water that may seep into the ground near the pond, away from the pond liner[33]. In 2020, MWG conducted a multi-layered analysis of the contents of the Service Water Basin, including a bathymetric survey of the base of the basin and an analysis of the material found within the basin. The analysis demonstrated that there was little to no material that had accumulated in the basin and that the material in the basin was not CCR. Instead, it was sand and silt from air deposition and stormwater runoff.[34]

Located to the northeast of the existing Ash Surge Basin, the Former Ash Basin is an inactive CCR surface impoundment which was historically used for bottom ash management prior to MWG's operations at the Station[35]. The Former Ash Basin is part of the Station's NPDES permit solely as an emergency overflow for the Ash Surge Basin[36]. Originally a single pond, in 2010 the Former Ash Basin was bisected into two areas by construction of a railroad embankment[37]. The two bisected ponds are now designated as the North Pond and South Pond[38] and are shown on **Figure 2**.

The Limestone Runoff Basin, located directly east of the Ash Surge Basin, is lined on the bottom with a Poz-o-Pac™ liner and also had a Hypalon® liner on the sides[39]. The Limestone Runoff Basin has been used on two occasions to temporarily store coal ash when equipment changes occurred at the Station and there was an immediate need for a lined storage space[40]. The last time was in 2013, when the Station was relining the Ash Surge Basin and the Secondary Ash Basin, and since that time the basin has been empty and not used[41].

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[30] 1/31/18 Tr. p. 135:10-18.
[31] MWG Exhibit 901, pg. 28.
[32] [32] MWG Exh. 710; MWG13-15_34265; 1/31/18 Tr. p. 132:11-12 (Test. of Kelly).
[33] 1/31/18 Tr. p. 133:2-10; MWG Ex. 710; MWG13-15_34265.
[34] MWG13-15_79325-79340.
[35] 1/31/18 Tr. p. 141:19-23 (Test. of Kelly); MWG Exh. 667, p. 15; MWG Ex. 901, p. 38.
[36] MWG Exh. 901 at 38; 1/30/18 Tr. at 2:14-18 (Test. of Race).
[37] Geosyntec Consultants, History of Construction Former Ash Basin, dated April 2018.
[38] Id.
[39] MWG Exh. 667, p. 15; JAS 31; 1/31/18 Tr. p. 144:12-145:1 (Test. of Kelly).
[40] 1/31/18 Tr. p. 144:2-6 (Test. of Kelly); 1/30/18 Tr. p. 70:2-7 (Test. of Race).
[41] 1/31/18 Tr. p. 144:7-145:1. (Test. of Kelly).

The East Yard Runoff Basin is located southwest of the Ash Surge Basin and west of the Bypass Basin and is not part of the ash sluicing system, nor used by MWG to store or receive ash[42] (see **Figure 2**). The East Yard Runoff Basin is used for stormwater runoff from the east half of the property at the Station[43].

Based on the Federal CCR Rules, MWG considers the Ash Surge Basin and the Bypass Basin to be Federal CCR Surface Impoundments because they have been used to temporarily accumulate CCR and liquid after October 19, 2015. In addition, MWG considers the Former Ash Basin to be a Federal CCR Surface Impoundment because, although it is inactive and CCR ceased being sent to the Former Ash Basin prior to MWG's operations at the Station, CCR and water were present in this surface impoundment after October 19, 2015. In addition, MWG considers the Metal Cleaning Basin to be an Illinois Surface Impoundment, because it contained CCR materials after October 19, 2015. The Limestone Runoff Basin, Service Water Basin, and East Yard Runoff Basins are not considered Federal or Illinois Surface Impoundments, because none of the basins accumulated coal ash materials and liquid[44].

The most recent technical document pertaining to the Federal CCR surface impoundments at the Powerton Station was submitted to USEPA in late 2020. On November 30, 2020, MWG submitted a Demonstration for a Site Specific Alternative Deadline to Initiate Closure (a/k/a Alternative Closure Demonstration (ACD)) under the Federal CCR Rule for the Ash Surge Basin and Bypass Basin due to the infeasibility for the development of alternative capacity for CCR at Powerton [45]. In accordance with the Federal CCR rules, Powerton must cease placing the CCR and non-CCR waste streams sent to the Ash Surge Basin and Bypass Basins as soon as technically feasible but no later than April 11, 2021, unless an alternate schedule is approved by the EPA, as the Basins do not meet the liner design requirements of the Federal CCR Rules.

This ACD proposes to cease sending CCR and non-CCR waste streams to the Bypass Basin after April 11, 2021. The ACD also proposes a workplan for the development of alternate disposal capacity to replace the Ash Surge Basin. This workplan calls for implementation of a multiple technology system (MTS) to address CCR and non-CCR waste streams being managed within the Ash Surge Basin. The system is proposed to consist of refurbished dewatering bins, a new

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[42] MWG Exh. 254 at 4; 1/31/18 Tr. at 138:5-22 (Test. of Kelly); MWG Exh. 667 at 12.
[43] MWG Exh. 710, MWG13-15_34265 (Construction Documentation of the Secondary Ash Basin Liner Replacement); 1/31/18 Tr. p. 132:11-12 (Test. of Kelly).
[44]1/31/18 Tr. at 138:5-22 (Test. of Kelly); MWG13-15_48645; MWG13-15_48742; MWG Exh. 711.
[45] Sargent & Lundy, Demonstration for a Site-Specific Alternative Deadline to Initiate Closure, November 30, 2020.

concrete ash-settling tank, a new Recycle Cooling Water Basin, and a new Low-Volume Waste Basin. The MTS will be developed in two phases. The first phase will bring Powerton into compliance with the Federal CCR Rule and will set up the second phase which will bring the Station into compliance with the EPA's recently-revised effluent limitation guidelines for steam electric power generating stations (ELG Rule). To allow for sufficient time for the design and installation of the modified treatment system, the ACD requests USEPA allow the Ash Surge Basin to continue receiving CCR and non-CCR waste streams until August 11, 2023. WCG understands that the ACD is under review by USEPA.

#### 1.5.2.2 <u>Historical Fill Areas</u>

In addition to the CCR surface impoundments, there are other areas of the Powerton Station that are known or suspected to have had or currently contain coal ash and have been referred to in the record as the historical coal ash fill areas.

As described in Section 1.3 above, the 2019 Board Order found that MWG was in violation of Section 12(d) of the Act due to the temporary storage of cinders stored on the ground in an open area directly south of the Bypass Basin for "two to three months" during the "winter before 2012"[46]. MWG subsequently removed the cinders within two to three months[47].

The Quarles Report also identified two "suspected" disposal areas between the intake and discharge channels (noting that this area was not previously recognized by the Board) and underlying the area to the southeast of the power plant. The Quarles Report fails to present the basis for the conclusion that there are additional, unrecognized historical ash management areas. Based on a review of historical aerials and topographic maps, WCG's was unable to independently substantiate Quarles' characterization of these two suspected disposal areas.

### 1.5.3 Will County Station

The Will County Station began producing power in 1955, with four coal-fired electric generating units. Units 1-3 were deactivated between 2010 and 2015, which leaves only one active unit (Unit 4) as of the date of this report. As was the case with the other Stations, the Powder River Basin in Wyoming is also the source of coal burned by MWG at the Will County Station[48].

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[46] 2019 Board Order, pg. 42.
[47] 1/31/18 Tr. at 185:14-16 (Test. of Kelly).
[48] 2019 Board Order, pg. 20.

The Will County Station is bordered on two sides by surface water features. The Chicago Sanitary and Ship Canal (CSSC) is located to the east of the plant and the Des Plaines River borders the plant on the west. The Station is bordered on the north by Romeo Road and on the south by Hanson Materials (f/k/a Materials Services Corp.). A site layout map is included as **Figure 3**.

#### 1.5.3.1 CCR Surface Impoundments

Four CCR surface impoundments are located at the Will County Station. Ponds 1N, 1S, 2S, and 3S are each permitted under the Station's NPDES Permit[49]. The above four ponds were constructed in 1977, with 24-36 inches of Poz-o-Pac™ liner. Only Ponds 2S and 3S are presently used as part of Station operations. They are used interchangeably. While one of the ponds is in service, the other is designated for cleaning, which generally occurs approximately on an annual basis[50].

When they were part of the facility coal ash treatment system, Ponds 1N and 1S collected bottom ash fines from Units 1 and 2 at the Will County Station[51]. Units 1 and 2 were shut down in 2010 and Ponds 1N and 1S were removed from service at that time[52]. A dewatering system has been installed at Ponds 1N and 1S that is designed to maintain no more than 1 ft. of water in the ponds[53].

The liner for Pond 3S was installed in 2009. The new liner consisted of the following, from the bottom up: a bottom geotextile cushion layer placed on top of the Poz-o-Pac™, 60-mil HDPE geomembrane liner, a top geotextile cushion, a 12" thick sand cushion layer, and 6" thick limestone warning layer. Pond 2S was upgraded with a similar liner system in 2013. Due to the smaller size of the pond, MWG also installed a geocell on the sideslopes of Pond 2S[54]. The purpose of the geocell was for additional protection of the liner during operation and cleanup in the pond.

The bottom elevation of Pond 2S and Pond 3S is 582.5 ft. MSL[55]. The highest recorded groundwater elevations since June 2011 in the vicinity of Ponds 2S and 3S (i.e., from MW-05, MW-06, MW-09, MW-10, MW-11, and MW-12) ranged between approximately 581.6 ft. MSL at

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[49] NPDES Permit No. IL0002208.
[50] JAS, Oct 2, 2017, 47.
[51] JAS, Oct 2, 2017, 48 and 1/31/18 Tr. p. 253 (Test. of Veenbaas).
[52] JAS, Oct 2, 2017, 50; 10/24/18 Tr. p. 276 (Test. of Maddox); 1/30/18 Tr. p. 254 (Test. of Race).
[53] Compliance Commitment Agreement, Will County, Oct 24, 2012.
[54] MWG Exhibit 901, p. 61.
[55] Id.

MW-12 in May 2019 and 584.1 ft. MSL at MW-05 in May 2019. The average groundwater elevation in the vicinity of Ponds 2S and 3S between June 2011 and November 2020 was approximately 581.4 ft. MSL.

Based on the Federal CCR Rules, MWG considers Ponds 2S and 3S at Will County to be Federal CCR Surface Impoundments, as they meet the definition of surface impoundment and contained CCR and liquids after October 19, 2015. Because of the dewatering system previously installed at Ponds 1S and 1N prior to 2015, they do not contain both CCR and liquids after 2015 and MWG determined they are not covered under the Federal CCR Rules. Based on the Illinois definition, Ponds 1S and 1N are considered Illinois CCR Surface Impoundments, because they meet the definition of an inactive CCR surface impoundment and contained CCR materials after October 19, 2015.

The most recent technical document pertaining to the Federal CCR surface impoundments at the Will County Station was submitted to USEPA in late 2020. MWG submitted an ACD under the Federal CCR Rules (40 CFR 257.103) to USEPA on November 30, 2020 addressing Ponds 2S and 3S[56]. The ACD was submitted because Pond 2S and Pond 3S do not meet the liner design criteria or uppermost aquifer location criteria under the Federal CCR Rule, but the Will County Station does not have an alternative capacity for CCR.

The ACD for the Will County Station proposes to cease sending CCR and non-CCR waste streams to Pond 3S after April 11, 2021 and subsequently clean close Pond 3S. The ACD also proposes a workplan for the development of alternate disposal capacity to replace Pond 2S. This workplan calls for implementation of a multiple technology system (MTS) to address CCR and non-CCR waste streams being managed within Pond 2S. The system is proposed to consist of a remote submerged scraper conveyor (SSC) for the CCR waste streams and a new Low Volume Waste Basin for the Station's non-CCR waste streams managed at Pond 2S. The MTS will be developed in two phases. The first phase will separate the CCR and non-CCR waste streams that are currently commingled and then the second phase will convert the Station's bottom ash-handling system into a closed-loop system. To allow for sufficient time for the design and installation of the modified treatment system, the ACD requests USEPA allow Pond 2S to continue receiving CCR waste streams until July 23, 2023 and non-CCR waste streams until April 28, 2023. WCG understands that the ACD is under review by USEPA.

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[56] Sargent & Lundy, Demonstration for a Site-Specific Alternative Deadline to Initiate Closure, Will County Generating Station, November 30, 2020.

#### 1.5.3.2 Historical Fill Areas

In addition to the above coal ash surface impoundments, other areas at the Will County Station are suspected or known to contain historic coal ash and have been included in the case record. These areas include: 1) fill areas around coal ash surface impoundments and 2) an alleged former coal ash placement area in the southeastern portion of the Station. These areas have been investigated and the data collected during these historical environmental investigations has assisted with development of WCG's opinions expressed within this Report.

### 1.5.4 Waukegan Station

The Waukegan Station is a 194-acre property located at 401 East Greenwood Avenue, Waukegan, Lake County, Illinois. The station has been operating since 1923 with five coal-fired units, later expanded to eight units. The Station currently has two active units that have been in operation since 1958 and 1962. MWG has owned and operated that Station since 1999. As was the case with the other Stations, the Powder River Basin in Wyoming is also the source of coal burned by MWG at the Waukegan Station[57]. A Site Layout Map is included as **Figure 4.**

The surrounding area has been utilized for industrial purposes since the 1930s. Bordered to the north by Johns Manville Company Superfund site; North Shore Sanitary District to the south with Johnson Marine Plant Superfund site beyond; to the east by Lake Michigan; and to the west by the former General Boiler Company and former Greiss-Pfleger Leather Tanning Facility. Both the former General Boiler Company and the former Greiss-Pfleger Leather Tanning Facility area are located upgradient of the Waukegan Station.

#### 1.5.4.1 CCR Surface Impoundments

The Waukegan Station has two ash ponds, East Pond and West Pond, located on the southern side of the Station, and operated as part of the Station's NPDES permitted system[58]. The East Pond and West Pond are "U-shaped" and were constructed in 1977 with a Hypalon® liner[59]. The East Pond and West Pond alternate receiving bottom ash, thus only one pond (East Pond or West Pond) is in service at a time[60]. Additionally, typically the bottom ash settles out on the influent

[57] 2019 Board Order, pg. 20.
[58] MWG Ex. 901, p. 45, 46; MWG Ex. 667, p. 20; MWG Ex. 642 ;1/30/18 Tr. p. 120:4-18 (Test. of Race).
[59] JAS 34; MWG Ex. 901, p. 45, 46; 1/31/18 Tr. p. 225:22-226:4 (Test. of Veenbaas); MWG Ex. 901, p. 45.
[60] JAS 37; 10/24/17 Tr. p. 162:3-6 (Test. of Lux); 1/30/18 Tr. p. 118:13-18 (Test. of Race); 1/31/18 Tr. p. 230 (Test. of Veenbaas).

side of the "U" of the pond, and the opposite side of the "U" typically only contains water and a small quantity of bottom ash[61].

MWG replaced the liner at the East Ash Pond in 2003 with a 60 mil HDPE liner and replaced the West Ash Pond a year later in 2004[62]. The East and West Ponds liner system includes a prepared subgrade, HDPE liner, a sand cushion and limestone warning layer[63]. The bottom elevation of the CCR surface impoundments is 585 ft. MSL[64]. The highest recorded groundwater elevation since June 2011 in the vicinity of the Waukegan ash ponds (i.e., from MW-01, MW-02, MW-03, MW-04, MW-05, MW-07, and MW-16) ranged from approximately 584.2 ft. MSL at MW-01 in May 2019 and MW-16 in November 2019 to 584.6 ft. MSL at MW-05 in May 2018. The average groundwater elevation in the vicinity of the ash ponds between June 2011 and November 2020 was approximately 582.0 ft. MSL.

Based on the Federal CCR Rules, MWG considers the East and West Ash Ponds at Waukegan to be Federal CCR Surface Impoundments, as they meet the definition of surface impoundment and contained CCR after October 19, 2015.

MWG has prepared an ACD for the Waukegan Station, as neither the East Ash Pond nor the West Ash Pond meet the liner design criteria required by the Federal CCR Rules[65]. Under the Federal CCR Rules, Waukegan must cease placing CCR and non-CCR waste streams into the East and West Ash Ponds as soon as technically feasible, but no later than April 11, 2021, unless an alternative deadline is granted by the EPA in accordance with 40 CFR 257.103. Because the Station does not need to have both of its CCR surface impoundments in service to operate – and pursuant to the revised Federal CCR Rule – Waukegan will not send CCR or non-CCR waste streams to the West Ash Pond after April 11, 2021 and does not plan on sending any waste streams to that basin in the interim. After evaluating several on- and off-site alternative disposal solutions for the waste streams currently managed within the East Ash Pond (both permanent and temporary), MWG has concluded that no alternative disposal capacity is available for these waste streams. Further, it is technically infeasible to obtain alternative disposal capacity for these waste streams on- or off-site by April 11, 2021.

[61] 10/24/17 Tr. p. 163:15-24 (Test. of Lux); 1/31/18 Tr. p.235:4-10 (Test. of Veenbaas); 2/2/18 Tr. p. 82:15-83:4 (Test. of Seymour).
[62] JAS 35, 36; MWG Ex. 901, p. 46.
[63] MWG Exh. 901, pg. 46.
[64] MWG Exh. 901, pg. 47.
[65] Sargent & Lundy, Demonstration for a Site-Specific Alternative Deadline to Initiate Closure, November 30, 2020

As described in the ACD, MWG is proposing to install a multiple technology system, consisting of a remote SSC for Waukegan's CCR waste streams and construct a new Low Volume Waste Pond for the Station's non-CCR waste streams that are currently being managed by the East Ash Pond. This multiple technology system will be developed in two phases. The first phase will bring Waukegan into compliance with the Federal CCR Rule and will separate the CCR and non-CCR waste streams that are currently being commingled in the East Ash Pond. This will set up the second phase in which MWG will bring the Station into compliance with the EPA's recently revised effluent limitation guidelines for steam electric power generating stations (ELG Rule) by converting Waukegan's bottom ash-handling system into a closed-loop system.

This proposed multiple technology solution to replace the East Ash Pond will be installed in accordance with the Federal CCR Rule and with the Illinois EPA's forthcoming regulations and permit program for CCR surface impoundments. Pursuant to the Illinois Public Act authorizing the Illinois EPA to prepare and the Illinois Pollution Control Board to adopt the Final Illinois CCR Rule, MWG cannot "close any CCR surface impoundment without a permit granted by the [Illinois EPA]." To allow for sufficient time for the design and installation of the modified treatment system, the ACD requests USEPA allow the East Ash Pond to continue receiving the noted CCR waste streams until October 11, 2023 and the noted non-CCR waste streams until June 16, 2023. WCG understands the ACD is under review by USEPA.

#### 1.5.4.2 <u>Historical Fill Area</u>

In addition to the above coal ash surface impoundments, the Former Slag Area (FS Area), located to the west of the West Pond, is reported to contain historical coal ash that was placed before 1998[66]. This area has been investigated as part of work performed by MWG[67]. The presence of coal ash has also been noted at certain areas outside of the surface impoundments during geotechnical investigations. The data collected during these environmental investigations has assisted with development of WCG's opinions expressed within this Report.

[66] 2019 Illinois Pollution Control Board Order at 66-67.
[67] MWG 13-15 79493-79771; MWG 13-15_81195-81293.

# 2 ISSUES WITH QUARLES OPINIONS

## 2.1 Quarles incorrectly applies the Federal CCR Rules to each Station.

The conclusions of the Quarles report are presented in three primary sections, containing Mr. Quarles' opinions with respect to contaminant sources, nature and extent of potential contamination, and potential remedies for the Stations. Mr. Quarles draws heavily from the 2019 Interim Opinion and Order of the Board, resulting in a Report that presents little independent analysis of the extensive Station-specific information developed to date through historical investigation prior to MWG's operation of the Stations, voluntary implementation of the CCAs entered with Illinois EPA, compliance with the 2015 Federal CCR Rules, and on-going investigative activities. He also ignores the Board's February 2020 Opinion and Order that significantly modifies the 2019 Opinion and Order. There should be a distinction made between areas of the Stations that are subject to the Federal CCR Rules (40 CFR 257) and/or the IL CCR Surface Impoundment regulations (35 Ill. Adm. Code 845) and those areas of the Stations which are not subject to those regulations. Quarles attempts to apply the regulatory requirements of the Federal CCR Rules to the entirety of the Stations, including both the Federal CCR regulated units and the historical fill areas. Quarles did not mention the IL CCR Rules, which were under review by the Board as of the date of the Quarles Report. Certain surface impoundments fall under the Federal CCR Rules, while others fall under the IL CCR Rules. The specific areas at each Station covered under the Federal and IL CCR Rules was discussed above in Section 1.5.

## 2.2 Quarles incorrectly concludes that the Federal CCR Surface Impoundments are used for permanent disposal of coal ash.

Quarles indicates that the CCR surface impoundments at the Stations are intended for permanent disposal of coal ash. However, each of the CCAs signed by MWG with Illinois EPA clearly state that the active surface impoundments are temporary units for dewatering CCR and use of the surface impoundments will be discontinued. Also, the MWG employees testified that the active CCR impoundments are routinely emptied.

## 2.3 Quarles fails to consider the extensive data record available at each Station.

Quarles does not adequately consider the entire record. In particular, the record contains an extensive amount of environmental data (i.e., soil, ash, and groundwater) collected from the MWG Stations. These data have been collected from 1998 up until late 2020, in the case of recent investigations performed at both the Joliet 29 and Waukegan Stations. Quarles fails to consider the extensive environmental data collected by MWG that is relevant to deciding the appropriate remedy at each of the Stations.

Although Quarles does not identify a specific remedy for each of the Stations, he broadly concludes that "Even though MWG plans to close ash ponds at Joliet 29, Powerton, Waukegan, and Will County by excavation and removal, those closure efforts will be incomplete to remove contaminant sources if historical coal ash remains in adjacent areas or beneath the former active ash ponds. Closure by excavation is expected to improve groundwater quality over time because the source of the contaminants is removed"[68]. However, there is no independent analysis performed in the Quarles Report to demonstrate that there are or will be source areas at the Stations. As described in greater detail in subsequent sections, an evaluation of the leaching data collected from CCR surface impoundments and soil obtained from historical fill areas indicates that not all coal ash is necessarily a source that will contribute to groundwater contamination.

Not only does the Quarles Report fail to reference data already available, it fails to mention the February 2020 Board Order reaffirming the continued application of the GMZs at three of the Stations, which cease the applicability and the violations of Part 620 of the Board regulations that were previously found by the Board in the 2019 Board Order.

## 2.4 Quarles fails to adequately consider the specific factors used by the Board as the basis for a remedy at each Station.

The Quarles Report does not adequately evaluate the factors listed in the Act Section 33(c) and 42(h) that the Board directed be utilized as the basis for any remedy. Rather than concluding that a specific remedy was or was not required at the various Stations, Quarles more broadly stated that other actions are required to meet Illinois EPA groundwater standards, but he fails to address the technical practicability or economic reasonableness of a remedy, the suitability of the Stations to the area at which they are located, and any due diligence to comply, including entry into and compliance with the CCAs.

[68] Quarles Report at 25.

# 3 REGULATORY FRAMEWORK

The following opinions set the applicable regulatory background relevant to determining the appropriate action and/or remedy, which is discussed in more detail below in Section 4.

## 3.1 The Federal and State CCR Rules apply to specific units at each Station, not to all coal ash present at the Station.

As first mentioned above in Section 1.4, the Federal and IL CCR Rules apply to each of the four Stations. Specifically, these rules apply to both existing and inactive surface impoundments under the definitions in the Federal CCR Rules and Illinois CCR Rules. However, these rules only apply to specific areas of each Station, based upon those areas meeting the regulatory definitions of existing or inactive surface impoundment, discussed above in Section 1.4.1. Other areas outside the federal/state surface impoundments do not meet the regulatory definition of a surface impoundment.

The specific CCR units subject to either the Federal and/or State CCR requirements at each of the four Stations is discussed above in the Station Background Section 1.5.

The record associated with Illinois rulemaking R20-19 indicates that certain parties (including some of the Complainants) formally requested that the Board develop Illinois regulations for “historic, unconsolidated coal ash fill”. If these areas were already regulated under the IL CCR Rules, there would be no need for additional regulations. However, the areas of unconsolidated fill are not unregulated. Instead, the Act and the Board regulations generally apply to all areas in all parts of the State of Illinois.

## 3.2 The 2012 CCAs at each of the Stations are key compliance mechanisms that have also resulted in collection of a substantial quantity of data useful for characterization of environmental conditions and implementation of measures to control potential contaminant sources at each Station.

In response to the issuance of notices from Illinois EPA related to alleged violations of the Act and 35 Ill. Adm. Code 620 Groundwater Quality Standards, MWG entered into CCAs with Illinois EPA at all four Stations. Each of the CCAs was accepted by Illinois EPA in separate letters to MWG dated October 24, 2012. The CCAs placed various obligations on MWG for each of the Stations.

At Joliet 29, MWG agreed to undertake the following to attain compliance with the alleged violations:

a) The ash ponds at Joliet 29 shall not be used as permanent disposal sites and shall continue to function as treatment ponds to precipitate ash. Ash shall continue to be removed from the ponds on a periodic basis.

b) The ash treatment ponds shall be maintained and operated in a manner which protects the integrity of the existing liners. During the removal of ash from the ponds, appropriate procedures shall be followed to protect the integrity of the existing liners, including operating the ash removal equipment in a manner which minimizes the risk of any damage to the liner.

c) During the ash removal process, visual inspections of the ponds shall be conducted to identify any signs of a breach in the integrity of the pond liners. If a breach of the pond liners is detected, MWG shall promptly notify the Illinois EPA and shall implement a corrective action plan for repair or replacement as necessary. Upon Illinois EPA approval, and issuance of any necessary construction permit, MWG will implement the corrective action plan.

d) Continue quarterly groundwater monitoring and submit the results to Illinois EPA, including groundwater elevation data/potentiometric surface map.

e) Submit an application for a construction permit to reline Pond #3 with a HDPE liner.

f) Submit an application to establish a GMZ within 90 days.

g) Establish a GMZ within one year.

h) Once Pond #3 was relined and the GMZ established, submit a certification/statement of compliance.

The CCA for Powerton included the same basic provisions as items (a) through (d), (g), and (h) above for Joliet 29. In addition, the Powerton CCA included the following requirements:

a) Submit an application for a construction permit to reline the Ash Surge Basin and Secondary Ash Settling Basin with a HDPE liner or approved equivalent.

b) Install an additional groundwater monitoring well south of well 9.

c) Enter/record an Environmental Land Use Control (ELUC) to cover the area of the Powerton Station property contained within the GMZ.

d) Do not allow the East Yard Run-off Basin to be part of the ash sluicing flow system. Also, submit monitoring results from water contained in the East Yard Run-off Basin proximate to outfall monitoring point 003 within 60 days. Quarterly monitoring of the East Yard Run-off Basin shall also be performed.

e) No unlined areas may be used for permanent or temporary ash storage or ash handling.

The CCA for Will Co. contained the same basic provisions as items (a) through (d), (g), and (h) above for Joliet 29. The following items were also included:

a) Remove Ponds 1N and 1S from service and divert process water to Ponds 2S and 3S. Also, a dewatering system shall be developed and implemented, which will not allow water to exceed a depth of one foot above the bottom of Ponds 1N and 1S.

b) Submit an application for a construction permit to reline Pond 2S with HDPE liner (or approved equivalent material).

c) Enter an ELUC to cover the area of the Will County Station property covered under the GMZ, except for the portion owned by ComEd.

The Waukegan CCA included the same requirements as those listed for the other Stations above related to operations at the ash ponds and regular groundwater monitoring. The Waukegan CCA also required:

a) Installation of two additional groundwater monitoring wells at locations approved by Illinois EPA;

b) Enter an ELUC to cover the remaining Station property to the east not already included in the existing ComEd Former Tannery Site ELUC.

As required by the CCAs, MWG filed a certificate with the Illinois EPA that the measures outlined in the CCA were implemented (with groundwater monitoring continuing at all stations and GMZs in place at three), as follows:

- Joliet 29, on October 9, 2013;
- Powerton, on October 17, 2013;
- Will County, on October 17, 2013; and
- Waukegan, on October 22, 2013.

Illinois EPA has not pursued any additional enforcement action against MWG at any of the four Stations since the CCAs were signed.

The CCAs resulted in a database of groundwater quality data since the CCAs were established in 2012. Groundwater data has also been collected at the four Stations under the Federal CCR Rules. A total of 57 monitoring wells have been monitored at the four Stations for thirty-four (34) constituents four times per year, which has resulted in the collection of over 62,000 individual data points since establishment of the CCAs in 2012 (8 years of monitoring). As will be discussed further below, WCG has statistically evaluated the data collected near the downgradient property boundaries at each Station. This statistical analysis indicates that the majority of statistical trends in the data are downward, as discussed in Section 4.3.

WCG has assisted clients in the development of many different CCAs in the past. We have CCA experience related to various environmental regulations, primarily issues with the Illinois EPA Bureau of Land involving solid and/or hazardous waste management/disposal, related to the RCRA, as well as issues with the Illinois EPA Bureau of Water primarily involving the Clean Water Act (CWA). A common attribute associated with clients that enter CCAs is a desire to voluntarily comply with environmental regulations, not avoid compliance. The alleged violations of the 35 Ill. Adm. Code 620 standards addressed by the CCAs are the same violations of the Act cited in the 2019 Board Order. The CCAs were entered on a voluntary basis to responsibly address the alleged violations identified by Illinois EPA and comply with the applicable regulations.

Whether the Respondent has successfully completed a CCA is one of the factors the Board must consider under Section 42(h) of the Act in mitigation or aggravation of any penalty, if a penalty is to be imposed. MWG having successfully entered CCAs for each Station and subsequent compliance with the terms and conditions included in the CCAs, is a mitigating factor in this case.

# 4 APPROPRIATE ACTIONS/REMEDY

As discussed in the 2019 Board Order, the current phase of this litigation is intended to determine the appropriate relief and any remedy that may be required. WCG's opinions concerning relief and remedy presented in this section are subdivided into two categories addressing the potential need for:

1. Additional site investigation; and
2. A remedy to address the environmental conditions, based on both Board Orders.

The above items are presented separately because the need for additional investigation was discussed by Quarles and additional investigation to characterize a site (such as additional soil/groundwater sampling/analysis) is viewed as fundamentally different than a remedy, which under certain circumstances, may be required to address contaminated groundwater previously documented at the Stations.

## 4.1 The Federal/State CCR Surface Impoundments at each Station do not need to be investigated further to determine appropriate actions.

The Federal/State CCR surface impoundments do not need to be investigated further because the existing Federal/State CCR Rules already sufficiently address any required investigation. Moreover, the record indicates that the Federal CCR surface impoundments are operated pursuant to the Federal CCR Rules, which are deemed sufficiently protective of human health and the environment.

A rigorous groundwater monitoring program is being implemented at each of the Stations. The groundwater monitoring program is largely based upon the RCRA Subtitle D groundwater monitoring program implemented at solid waste landfills since the 1990s. Pursuant to the Federal CCR Rules, MWG is implementing a detection or assessment groundwater monitoring program at each of the Stations. The groundwater concentrations are compared to statistically derived background concentrations to evaluate whether the regulated units are adversely impacting groundwater.

Quarles incorrectly opines that the existing background groundwater data are not sufficient for evaluating whether the regulated CCR units have impacted groundwater quality. The existing background groundwater data utilized to evaluate whether the Federal CCR Surface Impoundments are adversely impacting groundwater are appropriate for satisfying the regulatory requirements in the Federal CCR Rules and determining background concentrations at the Stations. The Federal CCR Rules require that the detection and assessment monitoring (if needed) programs focus on potential contributions of the regulated units to groundwater. The upgradient wells identified by KPRG[69] in the monitoring programs for the Stations are not affected by the regulated units because the wells are upgradient based on groundwater elevation contour maps, there is no evidence of mounding from the units, the units are lined, and those liners are functioning as designed to control infiltration from the surface impoundments. Groundwater elevation contour maps produced annually, most recently for data collected in 2020 and 2021[70], in accordance with the CCR monitoring at each Station do not indicate groundwater mounding in proximity of the regulated units. WCG agrees with the direction of groundwater flow depicted in the 2020 CCR Compliance Annual Groundwater Monitoring and Corrective Action Reports for all the Stations prepared by KPRG.

Based on the lack of groundwater mounding observed at the Stations, the upgradient wells represent the character of groundwater flowing from areas upgradient of the CCR surface impoundments and that the identified upgradient groundwater quality is the correct basis for comparison to the groundwater quality after it has passed beneath the CCR Surface Impoundments.

#### 4.1.1 Groundwater Conditions at Powerton

WCG disagrees with Quarles' attempt to identify mounded groundwater and radial groundwater flow conditions emanating from the Ash Surge Basin and the Bypass Basin at the Powerton Station[71].

The Quarles Report fails to differentiate that at the Powerton Station, there are two saturated vertical units. Quarles instead inappropriately combines groundwater elevation data for monitoring wells screened in two different saturated zones into one contour map. Using groundwater elevation data from two separate units to create one potentiometric surface

[69] KPRG is the environmental consultant performing groundwater monitoring at each of the Stations.
[70] CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for the Joliet #29 Station at 11 – 12; CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for the Ash Surge Basin and Bypass Basin at the Powerton Station at 13 – 14; CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for the Former Ash Basin at the Powerton Station at 16 – 17; CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for the Will County Station at 11 – 12; and CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for East and West Ash Ponds at the Waukegan Station at 13 – 14.
[71] Expert Report of Mark A. Quarles at pg. 16.

diagram is inconsistent with industry standard practice and results in his inaccurate conclusion that there is mounding under the Ash Surge Basin and the Bypass Basin. WCG's evaluation of the April 2020 groundwater elevation data along with the monitoring well boring logs and well construction logs identified the following:

- Six wells (MW-6, MW-8, MW-12, MW-14, MW-15, and MW-17) screened within a confining clay/silt unit and the overlying gravel, sand, and cinders unit;
- Twelve (12) wells screened within the deeper unit consisting mostly of gravel and sand; and one well (MW-18) screened within both the deep and shallow sand units separated by a confining clay unit. Given MW-18 is screened across two water bearing units, MW-18 groundwater elevation data is not an accurate representation of either water bearing units. Therefore, MW-18 groundwater elevation data should not be used in the creation of potentiometric surface maps.

The two different units demonstrate that there are two distinct but hydraulically connected groundwater units, a conclusion that was identified by KPRG and that has been consistently demonstrated in each of MWG's groundwater reports for the CCR surface impoundments. In fact, that there are two distinct but hydraulically connected units was never in dispute. Rather, Complainants' first expert agreed with KPRG's analysis, testifying that there are two aquifers at Powerton, that one was a sand-and-gravel unit, and the other was a silty clay aquifer.[72] Once the two saturated vertical units are identified, it is clear that there is no mounding in the groundwater under the Ash Surge Basin and the Bypass Basin.

#### 4.1.2 Alternate Source Demonstrations (ASDs)

The Federal CCR Rules allow for a demonstration that the regulated units are not the source of the confirmed statistically significant increases above the background concentrations. MWG has pursued this Alternate Source Demonstration (ASD) path at three of the Stations: Powerton, Will County, and Waukegan. No ASD was needed for Joliet 29 because no statistically significant increases have been confirmed at monitoring wells monitoring Pond 2, which is the only unit covered under the Federal CCR Rules at the Joliet 29 Station. Each of the ASDs has been certified by an Illinois Licensed Professional Engineer (PE) and made available to the on-line MWG CCR platform. Further discussion concerning the ASDs is presented below:

[72] Oct. 26, 2017 Afternoon Transcript, pg. 93:15-20.

#### 4.1.2.1 Powerton ASD

The initial detection monitoring results for the Powerton Station were discussed by KPRG in the 2017 CCR Groundwater Monitoring Report dated January 24, 2018[73]. KPRG recommended completing an ASD because the detection monitoring statistical evaluations indicated statistically significant increases (SSIs) in downgradient monitoring wells relative to established background for various 40 CFR 257 Appendix III parameters.

The recommended ASD for SSIs of Appendix III detection monitoring parameters was performed April 12, 2018[74]. Ash and water samples were collected from the Ash Surge Basin and the Bypass Basin and analyzed using the Leaching Environmental Assessment Framework (LEAF) method to determine whether the noted SSIs may be associated with a release from the regulated unit(s) or if another potential source in the vicinity of the ash ponds may be affecting the local groundwater quality. Each of the samples underwent leaching over a range of 8 pH values and under "Natural pH" conditions, which is the actual pH of the sample itself. The natural pH results are believed to be the most applicable to field conditions because the natural pH represents the best approximation of field conditions. A summary of the LEAF data is located in **Table 2**. KPRG concluded that the Ash Surge Basin is not the source of downgradient monitoring well SSIs and that there is an alternate source(s) of impacts.

KPRG concluded that the data relative to the Bypass Basin was not definitive and potential contribution of leachate from the Bypass Basin to the local downgradient groundwater impacts could not be ruled out. KPRG recommended that the Ash Surge Basin and Bypass Basin be shifted from detection monitoring into assessment monitoring[75]. In accordance with the Federal CCR rules, KPRG performed a round of assessment monitoring for all Appendix III and Appendix IV parameters and determined that there were detections of Appendix IV parameters at concentrations exceeding Groundwater Protection Standards (GWPS), including arsenic at three well locations MW-11, MW-12 and MW-17, barium at well location MW-11 (August sampling only), selenium at well location MW-15, and molybdenum (May sampling only) and thallium at

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[73] KPRG, CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2017 Powerton Station, dated January 24, 2018.
[74] KPRG, Alternate Source Demonstration CCR Groundwater Monitoring Powerton Generating Station, dated April 12, 2018.
[75] Both Basins were shifted into assessment monitoring even though KPRG determined that the Ash Surge Basin was not the source of the SSIs. As described in the CCR Annual Groundwater Monitoring and Corrective Action Report – 2018, dated January 31, 2019, KPRG concluded that Ash Surge Basin should be included in the assessment monitoring as the well network for the Ash Surge Basin and Bypass Basins are "somewhat integrated".

well location MW-17. KPRG recommended that an ASD for the Appendix IV parameters be completed[76].

An ASD for detected Appendix IV parameters above established groundwater protection standards (GWPSs) was performed on March 25, 2019[77]. Ash and water samples were again collected from the Ash Surge Basin and Bypass Basin and analyzed using the LEAF method. A summary of the LEAF data is located in **Table 2**. KPRG performed a statistical evaluation of the LEAF data relative to groundwater and concluded that the Ash Surge Basin and Bypass Basin are not the source of downgradient monitoring well detections of arsenic, barium, molybdenum, selenium, and thallium concentrations detected above the GWPSs.

#### 4.1.2.2 Will County ASD

The ASD for Will County was prepared by KPRG and dated April 12, 2018. The 2017 CCR Groundwater Monitoring Report dated January 12, 2018 included the following recommendation:

> *"The completed detection monitoring statistical evaluations have determined that there are SSIs in downgradient monitoring wells relative to established background for chloride, fluoride and TDS. At this time, KPRG recommends completing an alternate source demonstration to determine whether these exceedances may be associated with an actual release from the regulated unit(s) or if another potential historical source in the vicinity of the ash ponds may be affecting the local groundwater quality. If the alternate source demonstration is successful, then detection monitoring will resume. If the alternate source demonstration is not successful, then a transition to an assessment monitoring program complying with Section 257.95 will be required."*

To support the ASD, composite ash samples were collected from Pond 2S and Pond 3S. The composite samples consisted of a series of equivalent grab samples from across the length of the ponds, from the inlet area to the outfall. The samples were analyzed using the LEAF method. Each of the samples underwent leaching over a range of 8 pH values and under "Natural pH" conditions, which is the actual pH of the sample itself. The natural pH results are believed to be the most applicable to field conditions because the natural pH represents the best approximation

[76] Id.
[77] KPRG, CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2018 Ash By-Pass Basin and Ash Surge Basin, dated January 31, 2019.

of field conditions. The leachate was analyzed for the CCR Appendix III detection parameters. The results from the LEAF Natural pH testing are summarized in **Table 3**.

The Will County ASD concluded that the SSIs for chloride, fluoride, and total dissolved solids (TDS) identified in the groundwater are not the result of leakage of leachate from the regulated units (Ponds 2S and 3S), but rather from "other potential sources". This was based on the following:

- Upgradient monitoring well concentrations of fluoride and TDS are higher than those measured for ash leachate at Natural pH conditions.
- The ash leachate at Natural pH conditions does not contain a sufficient concentration of each of these constituents to result in the measured downgradient well concentrations.

#### 4.1.2.3 Waukegan ASD

The initial detection monitoring results for the Waukegan monitoring were presented by KPRG in the CCR Compliance Annual Groundwater Monitoring and Corrective Action Report dated January 31, 2019[78].

According to an ASD prepared by KPRG on April 12, 2018 for the Waukegan Station[79], detection monitoring statistical evaluations determined that there were SSIs in downgradient monitoring wells relative to established background for boron, pH and sulfate. Therefore, the ASD evaluated boron, pH, and sulfate. Ash and water samples were collected from each of the two CCR Ponds (East and West) and analyzed using the LEAF method (as described above). A summary of the LEAF data is located in **Table 4**. KPRG concluded that the SSIs for boron, pH, and sulfate are not the result of a release of leachate from the regulated units (East and West Ash Ponds) but rather from other potential source(s). KPRG based the recommendation on evaluation of the boron and sulfate ratio for ash samples and groundwater, the downgradient sulfate concentrations relative to the LEAF data, elevated sulfate outside the regulated units, and the concentration of sulfate and boron in groundwater upgradient of the CCR Ponds relative to the downgradient groundwater and LEAF results. The recommendation was to continue with routine detection monitoring.

[78] KPRG, CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2018 for the Waukegan Generating Station, dated January 31, 2019.
[79] KPRG, Alternate Source Demonstration CCR Groundwater Monitoring at the Waukegan Generating Station, dated April 12, 2018.

#### 4.1.3 Testing of Coal Ash Under Beneficial Use Requirements

The coal ash that is removed from the Federal CCR surface impoundments at the Stations for offsite use has been sampled and analyzed to support the beneficial reuse of this product. Specifically, as discussed above in Section 1.4.3 and pursuant to Section 3.135(a) of the Act, NLET test results are obtained and compared to the Illinois Class I Groundwater Quality Standards located in 35 Ill. Adm. Code 620.410. A summary of this historical analytical data included in the record reviewed by WCG is presented in **Tables 1 - 4**. These data indicate:

- Powerton: a composite sample of bottom ash collected in February 2007 did not exhibit any metals concentrations above the Class I Groundwater Quality Standards;
- Will County: a composite sample of bottom ash collected in December 2010 did not exhibit any metals concentrations above the Class I Groundwater Quality Standards;
- Waukegan: two composite samples of bottom ash collected in July 2004 did not exhibit any metals concentrations above the Class I Groundwater Quality Standards.

Overall, the above NLET data indicates that the coal ash sampled from the Federal CCR surface impoundments exhibits concentrations of metals less than the Class I Groundwater Quality Standards. In addition, the upgraded liners installed above the historical Poz-o-Pac$^{TM}$ liners are consistent with industry-accepted standards, USEPA's Guide for Industrial Waste Management (2012), and industry acceptance of and reliance on HDPE liners under RCRA.

## 4.2 Historical fill areas at each Station do not need to be investigated further to determine appropriate actions.

When the vast quantity of available data collected at the Stations and available in the regulatory record associated with the Federal CCR Rules is considered, the data and information indicate that sufficient investigation of historical fill areas identified at the Stations has already occurred. These historical fill areas do not meet the regulatory definition of "CCR surface impoundment" because they were not designed to hold an accumulation of CCR and liquids. Because the record indicates that these historical fill areas received CCR before October 19, 2015, these areas are excluded from the Federal CCR Rules.

One reason for excluding these units from the Federal CCR rules is discussed in the preamble to the CCR Rulemaking, wherein USEPA specifically states that the Agency is not aware of any damage cases associated with inactive CCR landfills. Further, the risks of releases to the environment from such units are significantly lower than CCR surface impoundments or active

CCR landfills[80]. The primary reason for the reduced risk associated with inactive landfills is that these areas do not exhibit a constant head of water on top of the CCR materials, as is the case with surface impoundments and active landfills. The weight and pressure of water in surface impoundments is more likely to result in releases to the environment.

The above opinion is further supported by a substantial amount of data historically collected at each of the four Stations. Some of these data were collected before MWG's acquisition of the Stations, additional data was collected during MWG's ownership, and data collection has occurred until recently, as the most recent data was obtained at the Joliet 29 and Waukegan Stations during the 4th quarter of 2020. The following provides a discussion of the historical data collected related to the historical fill areas at each of the Stations.

#### 4.2.1 Joliet 29

The 1998 Phase II Environmental Site Assessment (ESA) performed by ENSR[81], included the results from 17 soil borings, installation of five monitoring wells, 23 surface soil samples, and 6 sediment samples. The locations of the various samples collected is shown on **Figure 5**.

As related to the historical fill areas relevant to the case, groundwater monitoring wells MW-3 and MW-4 installed as part of the 1998 Phase II ESA are located downgradient of the Northwest and Southwest Fill Areas, while MW-5 is also located near the Northwest Fill Area. While an insufficient volume of groundwater was present in MW-4, the results from the groundwater samples analyzed at MW-3 and MW-5 did not identify concentrations of RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) above the Class I Groundwater Quality Standards.[82]

The 1998 Phase II ESA Report indicated: "Based on the current land use (industrial) and site conditions (analytical results and soil types), it is judged that the potential for human exposure to the constituents of concern from this facility is low." The Phase II ESA Report concluded: "There is not a requirement under Illinois environmental law to further investigate or remediate this property."[83]

MWG collected additional information at the Northwest Fill Area in 2004. An initial investigation performed by Andrews Environmental Engineering (AEE) is referenced in KPRG's August 18, 2005

[80] 40 FR 21342.
[81] ENSR, December 1998.
[82] Arsenic, barium, cadmium, chromium, lead, mercury, and selenium are listed as constituents to evaluate the presence of contamination of coal ash in groundwater. 35 Ill. Adm. Code 845.600.
[83] ENSR, December 1998.

Letter Report to MWG[84]. AEE performed an initial site assessment of an area at Joliet 29 to determine whether a CCB classification was feasible. The area investigated by AEE is now referred to as the Northwest Fill Area. AEE found that the subsurface materials were generally homogenous, consisting of interlayered fly ash and bottom ash/slag. A total of 20 samples were collected from 20 borings across a 13.2-acre area. The 20 samples were composited into one representative sample and analyzed for NLET metals and for "Code R" disposal parameters, which included Toxicity Characteristic Leaching Procedure (TCLP) metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), ignitability, reactive cyanide, and reactive sulfide.

According to the above 2005 KPRG report, the results indicated that none of the leachable metals analyzed using the NLET method exceeded the Class I Groundwater Quality Standards and the material would be classified as non-hazardous for disposal purposes.

Intending to build off the information collected in 2004 by AEE, MWG contracted with KPRG to perform additional investigation of the Northwest Fill Area in June 2005. A total of 15 Geoprobes (GP-1 through GP-15) were advanced over the 13.2-acre study area. Three of the original locations (GP-12, GP-14, and GP-15) did not exhibit CCR and therefore these locations were off-set to locations GP-12A, GP-14A, and GP-15A. The coal ash deposits encountered within these Geoprobes were consistent and homogeneous, consisting of interlayered fly ash and bottom ash/slag from the coal combustion process.

A composite soil sample of the entire vertical profile of each of the Geoprobes was submitted for laboratory analysis using the NLET method for metals. A total of 17 composite samples from the Northwest area were analyzed for NLET metals and the results are summarized in **Table 1**. The results from 16/17 samples exhibited NLET metals below the Class I Groundwater Quality Standards. Concentrations of copper and lead from GP-14A were higher than the Class I Groundwater Quality Standards. A statistical analysis was performed on the remaining 16 samples. The results indicated "with a high degree of statistical certainty that the criteria established in 415 ILSC 5/3.135…are met and that the material may be considered CCB relative to this criterion" and the "data set is sufficiently large to support the statistical evaluations based on the variance and specific regulatory threshold relationships"[85].

[84] KPRG, August 18, 2005.
[85] KPRG, August 18, 2005.

In response to the identification of the above concentrations of copper and lead in the NLET result from GP-14A, additional delineation within this area was undertaken in the Northwest area in November 2005. The results were presented in a report to MWG by KPRG dated December 6, 2005[86]. Eight additional Geoprobes and one test pit was installed to collect ash/slag samples from around boring GP-14A. One composite sample was collected from the entire vertical profile at each Geoprobe and the test pit and submitted for NLET for copper and lead. The additional samples collected in November each exhibited concentrations of NLET copper and lead below the Class I Groundwater Quality Standards, which adequately delineated the (limited) extent of the soils exhibiting concentrations of NLET copper and lead above the Class I Groundwater Quality Standard.

As documented in KPRG's 12/6/2005 Report, waste profiling data consisting of TCLP metals, TCLP VOCs, TCLP SVOCs, pH, paint filter, reactive cyanide/sulfate, flashpoint, phenols, and chlorinated solvents scan, was used to classify the materials as non-hazardous special waste for disposal purposes. A total of 52 loads of soil/CCR weighing 1,062.88 tons were excavated and hauled to the Environtech Landfill facility in Morris, Illinois for disposal, as a remedial action[87].

The most recent site investigation work at the Joliet 29 Station was performed in November 2020 and focused on the area in proximity to monitoring well MW-09, which has historically exhibited fluctuating concentrations of TDS and sulfate in the groundwater exceeding the 35 Ill. Adm. Code 620 Class 1 Groundwater Quality Standards. This area was the only area at the Joliet 29 Station identified by the Board as evidence of a violation of 12(a) of the Act[88]. A total of 18 soil borings were advanced in the vicinity of MW-09 and various soil samples obtained from these borings were analyzed for sulfate, iron, and manganese[89].

The soils in the investigation area consisted of a mixture of brown to gray sand, gravel, silty sand, and some clay. No coal ash materials were identified in the above boring logs. The analytical results from this investigation indicated concentrations of iron and manganese in the soil in this area generally at consistent concentrations, some which exceed the Soil Background Concentration in Metropolitan Statistical Areas included in the 35 Ill. Adm. Code TACO Regulations. However, the sulfate concentrations reported in the soil samples varied widely.

[86] KPRG, December 6, 2005.
[87] 2019 Board Order mistakenly states on pg. 28 that "the record does not include information as to whether MWG separated or removed this part of the material from the sampled area."
[88] 2019 Board Order, pg. 31-33 and pg. 78.
[89] MWG 13-15_ 79341-79442.

Most of the sulfate concentrations were reported below 100 mg/kg. However, certain samples exhibited sulfate concentrations of an order of magnitude (or more) higher. For example, SB-11 (11-13') reported sulfate at 2,000 mg/kg, SB-14 (3-4') reported sulfate at 4,000 mg/kg, SB-15 (6-8') reported sulfate at 16,000 mg/kg. There are no apparent distribution trends either horizontally or vertically in the soil.

The pH in the groundwater at MW-09 is more acidic, compared to the other locations, which is believed to be related to oxidation of a localized pocket of residual sulfide minerals near the MW-9. Sulfide minerals are common within the underlying Silurian dolomite bedrock[90], which comprises the parent material for the soil. Oxidation reactions of sulfide minerals results in the formation of sulfuric acid and mobilization of metals such as iron, manganese, and other metals, depending on the specific mineral and associated impurities. These oxidation reactions are believed to be associated with the groundwater quality conditions observed in the groundwater at MW-09. Thus, the sporadic sulfate and TDS groundwater concentrations are naturally occurring in the soil and not due to Station operations, including the presence of CCR in the soil or leaking from a pond.

The Northeast area is regularly inspected under the Station's NPDES stormwater permit. The inspections are performed on an annual basis by a third party contractor (KPRG). If erosional features are identified during the inspections, the appropriate repairs have been implemented in a timely manner[91].

The historical data as described above are sufficient to adequately characterize the historical coal ash fill areas at the Joliet 29 Station for the purposes of assessing a remedial approach. The Board did not identify the northwest, northeast or the southwest areas as causes for the elevated concentrations in the groundwater, based on the lack of monitoring well data.[92] It appears that the Board did not consider the 1998 groundwater data when making this conclusion.[93] Additionally, the Board has created a sub-docket in the Illinois CCR Rulemaking, R20-19(A) to explore "historic, unconsolidated coal ash fill in the State", located outside of surface impoundments, *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845 (Sub Docket A)*, PCB R20-19(A). Any

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[90] MWG Ex. 621 (MWG13-15_297); https://www.mdpi.com/2076-3263/6/2/29/htm.
[91] MWG Exhibits 800-805.
[92] Board 2019 Order, pp. 27-28.
[93] Id.

additional assessment of these historical fill areas that is deemed necessary will be addressed by the Board's rulemaking in Sub-docket 20-19(A).

#### 4.2.2 Powerton

A Phase II ESA was also prepared by ENSR for the Powerton Station in 1998[94]. The investigation included the results from 28 soil borings, six monitoring wells, 17 surface soil samples, and 12 sediment samples. A summary of the locations of the various samples collected is shown on **Figure 6**.

During the groundwater investigation, monitoring wells were installed to assess groundwater quality in proximity of the Yard and Roof Runoff Basin (also referred to as the East Yard Runoff Basin) and the Former Ash Basin. The results from the groundwater samples analyzed at MW-1 and MW-2 did not identify concentrations of RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) above the Class I Groundwater Quality Standards.[95]

The 1998 Phase II ESA Report indicated: "Based on the current land use (industrial) and site conditions (analytical results and soil types), it is judged that the potential for human exposure to the constituents of concern from this facility is low." The Report concluded: "There is no requirement under Illinois environmental law to further investigate or remediate this property."

After the 1998 Phase II, Patrick Engineering, on behalf of MWG, conducted a hydrogeologic investigation at the Powerton Station in 2010. This evaluation included the installation of monitoring wells downgradient of the Former Ash Basin, including MW-3, MW-4 and MW-5. Monitoring well locations are shown on **Figure 6**.

Based on the data available at the time of the proceedings, the Board determined in its 2019 opinion that the groundwater samples taken downgradient of the Former Ash Basin showed no coal ash constituents. The Board concluded that the Complainants did not prove that it was more likely than not to be a source of contamination at the Station[96]. After the ENSR 1998 Phase II ESA and Patrick 2010 Hydrogeologic Investigation, additional evaluation of the Former Ash Basin has been on-going since October 2016 in accordance with 40 CFR 257.100(b) through (d) of the

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[94] ENSR, December 1998.
[95] Arsenic, barium, cadmium, chromium, lead, mercury and selenium are listed as constituents to evaluate the presence of contamination of coal ash in groundwater. 35 Ill. Adm. Code 845.600.
[96] 2019 IPCB Order, pg. 41.

Federal CCR Rules[97]. For the purpose of the Federal CCR groundwater monitoring requirements, monitoring wells MW-01 and MW-10 (upgradient) and monitoring wells MW-02 through MW-05 (downgradient) are sampled annually[98]. MWG is required to implement the detection and assessment monitoring program for the Former Ash Basin, and, if necessary, to conduct corrective action.

The historical data as described above are sufficient to adequately characterize the historical coal ash fill areas at the Powerton Station.

#### 4.2.3 Will County

Like the other Stations discussed above, a Phase II ESA Report was generated in 1998 prior to MWG's acquisition of the Will County Station. The 1998 Phase II Environmental Site Assessment (ESA) was also performed by ENSR[99]. This investigation included the results from 18 soil borings, installation of five monitoring wells, 23 surface soil samples, and 14 sediment samples. The locations of the various samples collected is shown on **Figure 7**.

Pertaining to the historical fill areas relevant to the case, borings B-1 and B-2 were advanced within the southeast portion of the Station and MW-1 was installed near B-2 (see **Figure 7**). While coal ash was noted as mixed with soils obtained from B-1 and B-2, concentrations of total RCRA metals in the soils from 0-3 ft. below ground surface (bgs) did not exceed the TACO Tier 1 soil remediation objectives (SRO). Of note is arsenic, as it has been noted in the record as present in the groundwater at certain wells monitored under the Federal CCR Rules and the CCA above the Class I Groundwater Quality Standard. The arsenic concentrations at B-1 and B-2 were reported as 4.6 mg/kg and 4.9 mg/kg respectively, which are below the TACO Tier 1 SRO, which is currently 13 mg/kg (i.e., the background concentration for sites within Metropolitan Statistical Areas). The groundwater sample collected from MW-1 did not exhibit concentrations of RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag) above the Class I Groundwater Quality Standards[100].

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[97] KPRG, CCR Compliance Annual Groundwater Monitoring and Corrective Action Report – 2020 for the Former Ash Basin. January 31,2021.
[98] Id.
[99] ENSR, December 1998.
[100] Arsenic, barium, cadmium, chromium, lead, mercury, and selenium are listed as constituents to evaluate the presence of contamination of coal ash in groundwater. 35 Ill. Adm. Code 845.600.

Given these historical analytical results, although coal ash was noted within the southeast portion of the Station, sufficient investigation has been performed to evaluate whether this area presents an unacceptable risk to human health and the environment.

Although coal ash was identified in certain borings advanced as part of the 1998 Phase II ESA performed at the Will County Station, no concentrations of RCRA metals were reported above the TACO Tier 1 SRO, including arsenic. As mentioned above, arsenic is of particular relevance because arsenic is a more common heavy metal constituent that may be related to CCR and it has been identified in the groundwater at concentrations exceeding the Class I Groundwater Quality Standard. This historical analytical data supports the conclusion that the mere presence of CCR within historical boring logs does not necessarily mean that these areas serve as sources and represent a threat to human health and the environment.

Another investigation of the historical fill areas was performed by MWG in 2015[101]. As part of this investigation, KPRG advanced 20 borings in a grid pattern east of Pond 1N. The Geoprobes were advanced to the top of the dolomite bedrock and composite soil samples of the entire vertical profile were submitted for laboratory analysis using the NLET method for metals. The subsurface materials encountered during this investigation were consistent and homogeneous and consisted of bottom ash/slag from the coal combustion process. The analytical results from this site investigation are presented in **Table 3**.

There were no detections for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, thallium, or zinc in the leachate from any of the samples analyzed and the method detection limits were below the Class I Groundwater Quality Standards. While boron, iron, and sodium were detected, the statistical analysis of the NLET data described in KPRG's report indicated "with a high degree of statistical certainty that the criteria established in 415 ILSC 5/3.135…are met and that the material may be considered CCB relative to this criterion for engineering/beneficial reuse".

The historical data as described above are sufficient to adequately characterize the historical coal ash fill areas at the Will County Station.

[101] KPRG, September 8, 2015.

### 4.2.4 Waukegan

The Waukegan Station was also investigated in 1998, along with the other Stations[102]. The Phase II ESA included the results from 22 soil borings, 5 monitoring wells, 13 surface soil samples, and 6 sediment samples. A summary of the locations of the various samples collected is shown on **Figure 8**. One soil boring (B-22) was installed in the far northern portion of the FS Area to the west of the West Ash pond. This boring was installed to a depth of approximately two feet bgs. The boring log indicated the presence of coal and gray coal ash. A sample was collected from the boring for analysis of several constituents, including RCRA metals. Concentrations of RCRA metals were below laboratory reporting limits or Tier 1 SROs, except for arsenic which was detected at a concentration of 14 mg/kg, slightly above the TACO soil background concentration of 13 mg/kg (which is the applicable SRO under TACO).

As part of the hydrogeologic investigation conducted at the Waukegan Station in 2010, Patrick Engineering installed five wells (MW-1 through MW-5) with wells MW- 6 and 7 added as upgradient wells at the request of Illinois EPA. Monitoring wells MW-8 and MW-9 were installed in 2014[103]. Five additional wells (MW-10, 11, 12, 14 and MW-15) located west of the ash ponds have been monitored since August 2014 to assess the groundwater impacted by the adjoining former Greiss-Pfleger Tannery and General Boiler properties[104]. In its 2019 Interim Order, the Board recognized that groundwater contamination is migrating from the upgradient Greiss-Pfleger Leather Tanning Facility property[105]. In 2003, at the neighboring property owner's request, MWG established an ELUC on the western side of its property as an institutional control to prevent exposure to historically contaminated soil and groundwater that has migrated onto MWG's Waukegan site as the result of past industrial activities on the former Greiss-Pfleger Tannery Site. It is suspected that contamination may also be migrating from the General Boiler Site, also located upgradient of the Waukegan Station[106].

To evaluate if the FS Area to the west of the West Pond could be contributing to observed groundwater concentrations in MW-5, located downgradient of the former Greiss-Pfleger Tannery and General Boiler properties, KPRG investigated the FS Area in November 2020. KPRG installed 40 probes over a 1,000 ft by 400 ft area and collected 100 samples for the evaluation of

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[102] ENSR, December 1998.
[103] 2019 IPCB Order at 68.
[104] Id.
[105] 2019 IPCB Order at 74.
[106] 1/30/18 Tr. p. 124:22-125:3; MWG Ex. 623, p. MWG13-15_472.

metals including arsenic, boron, calcium, iron, lithium, manganese, molybdenum and thallium and general chemistry parameters including pH, chloride, and sulfate. In addition, four samples were collected for the analysis of leachable sulfate via the Synthetic Precipitation Leaching Procedure (SPLP) (A8-5-7, B10-5-9, C7-5-10, D5-5-10)[107] and three additional samples were collected for LEAF analysis (A1-0-5, A9-0-5 and C7-0-5)[108]. Sample locations are shown on **Figure 8** and a summary of the analytical results from the leaching analysis performed during this investigation is included in **Table 4**.

Boring logs indicate the presence of coal ash at depths ranging from near ground surface to approximately 7 to 17 ft. SPLP data indicate one sulfate concentration of 460 milligrams per liter (mg/L) at sample locations B10-5-9, which exceeds the Class I Groundwater Quality Standard of 400 mg/L. All LEAF results for samples at the natural pH are below the applicable Class I Groundwater Quality Standard, with the exception of boron which was detected at a concentration of 5 mg/L, 8.2 mg/L and 13 mg/L at A1-0-5, A9-0-5, and C7-0-5, respectively, each of which exceed the Class I Groundwater Quality Standard of 2 mg/L. In addition, arsenic was detected at a concentration of 0.058 mg/L at A9-0-5 which slightly exceeds the Class I Groundwater Quality Standard of 0.05 mg/L. Based on the results from the November 2020 evaluation, sufficient information is available to determine if a remedy is appropriate to address potential leaching of CCR-related constituents from ash in the FS Area to groundwater at concentrations exceeding Class 1 Groundwater Quality Standards.

The historical data as described above are sufficient to adequately characterize the historical coal ash fill area at the Waukegan Station.

## 4.3 Analysis of the historical groundwater quality data indicates that groundwater concentrations are decreasing at the Joliet 29, Powerton, and Will County Stations.

An extensive database of groundwater quality data has been attained at each Station by MWG over approximately the last decade. Groundwater data have been collected in compliance with both the CCAs and the Federal CCR Rules. WCG conducted statistical testing of these analytical data to evaluate changes in groundwater constituent concentrations over time at each of the Stations. Our analysis included the detection groundwater monitoring constituents under 40 CFR 257 Appendix III. These are the constituents recognized by USEPA as representing the most

[107] MWG13-15 79493-79771.
[108] MWG13-15 81195-81293.

reliable indications of CCR impacts within groundwater. For completeness, WCG also evaluated trends for the 40 CFR 257 Appendix IV assessment groundwater monitoring constituents.

The monitoring wells evaluated at each Station included the wells that were at the farthest downgradient locations. These wells are most relevant because they best represent groundwater quality after the natural groundwater mechanisms of advective dispersion and attenuation have impacted groundwater concentrations. In most cases, these wells are not necessarily located at the downgradient property boundary, and therefore use of these wells presents a conservative assessment of groundwater quality conditions because further advective dispersion, and attenuation will occur before the groundwater migrates further downgradient, toward the property boundary. The following monitoring wells were included in the trend testing:

- Joliet 29: MW-1, MW-2, MW-3, MW-4, MW-6, and MW-7;
- Powerton: MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-13, MW-14, and MW-15;
- Will Co.: MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12;
- Waukegan: MW-1, MW-2, MW-3, and MW-4.

WCG has performed groundwater monitoring at many solid and hazardous waste disposal facilities since inception of the RCRA Subtitle D regulations in the 1990s. Temporal trends in groundwater quality data are often used to evaluate whether a corrective action is needed or if prior corrective action is having the intended beneficial impact on groundwater quality. In WCG's experience, the most common statistical method for evaluating temporal trends in groundwater quality data is the Mann-Kendall Test for Trend. The Mann-Kendall Test is included in the USEPA Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance dated March 2009.

The Mann-Kendall test can be utilized to evaluate both upward and downward trends. The statistical software program Sanitas Version 9.6 was utilized to conduct Mann-Kendall trend analyses on the groundwater monitoring data. WCG has found that the Sanitas software is commonly utilized by regulators overseeing groundwater monitoring programs at solid waste landfills regulated under RCRA Subtitle D. Results from the Mann-Kendall Testing are included in **Appendix C**.

The results from the Mann-Kendall Trend testing are summarized in the tables at the front of **Appendix C**. The supporting output from the statistical software is also presented in **Appendix D**, following the summary tables. In summary, the results indicate:

- Joliet 29: Of the 132 trend tests performed, 64% exhibited no trend, 26% exhibited a downward trend (11/34 statistically significant downward), and 10% exhibited an upward trend. Of the data where a trend was observed, 72% of the trends are downward and 28% upward.
- Powerton: Of the 233 trend tests performed, 64% exhibited no trend, 30% exhibited a downward trend (25/70 statistically significant downward), and 6% exhibited an upward trend. Of the data where a trend was observed, 82% of the trends are downward and 18% upward.
- Will Co.: Of the 140 trend tests performed, 57% exhibited no trend, 27% exhibited a downward trend (13/38 statistically significant downward), and 16% exhibited an upward trend. Of the data where a trend was observed, 63% of the trends are downward and 37% are upward.
- Waukegan: Of the 135 trend tests performed, 60% exhibited no trend, 19% exhibit a downward trend (9/26 statistically significant downward), and 21% exhibited an upward trend. Of the data where a trend was observed, 48% of the trends are downward and 52% are upward.

Many of the trend tests returned “no trend” results because the majority of the constituents evaluated were reported as not detected by the laboratory. Generally, the laboratory reporting limits are consistent from event to event and thus, results in no trend.

In cases where there were enough results reported above the laboratory detection limit so that meaningful trend testing could be performed, the majority of the trend test results from Joliet 29, Powerton, and Will Co. indicate that groundwater concentrations are decreasing over the approximately 10 years of data available. These results validate the continued applicability of monitored natural attenuation, and the application of the GMZ, as an appropriate remedy.

The trend testing results for Waukegan are not necessarily skewed towards more downward than upward trends. Consequently, WCG’s opinions regarding the appropriate remedy for Waukegan are discussed separately below, in Section 4.8.

The groundwater monitoring wells installed by MWG beginning in 2010 and results obtained from the CCA and CCR monitoring programs are sufficient to monitor the natural attenuation occurring at the Stations, as applicable.

## 4.4 There is no unacceptable risk to offsite receptors at the four Stations.

Each of the Stations are bordered by surface water and the shallow groundwater unit at each of the Stations discharges into either the adjacent river or Lake Michigan (in the case of Waukegan). To support the above opinion, WCG conducted an updated evaluation to assess whether the groundwater conditions will result in discharge to surface water at concentrations that meet the applicable surface water quality standards. A similar statistical risk evaluation was presented in the expert opinion of John Seymour[109]. While the concentrations in groundwater will be reduced as the groundwater discharges to surface water and mixes with the surface water, the following evaluation takes the very conservative approach of first excluding the (beneficial) effects of groundwater/surface water mixing. Mixing is only considered in those rare instances where a groundwater concentration slightly exceeded an applicable surface water standard.

Downgradient groundwater sample concentrations were compared to Illinois Water Quality Standards (WQS) included in 35 Ill. Adm. Code Part 302 and Illinois Water Quality Criteria (WQC) for surface water. Downgradient groundwater concentrations were compared to Illinois chronic WQS, or if a WQS was not available, the Illinois chronic WQC. The surface water standards and their sources are provided in **Table 1** in **Appendix D**. No unacceptable risk is deemed present if groundwater concentrations are less than the applicable WQS or WQC for surface water, which are set at levels that are protective of human health and the environment in accordance with the surface water's designated uses.

The surface water comparisons were conducted for CCR constituents listed in Appendices III and IV to 40 CFR Part 257. Appendix III constituents are Constituents for Detection Monitoring and Appendix IV constituents are Constituents for Assessment Monitoring.

For each Station, the extensive dataset from downgradient monitoring wells was averaged using the Sanitas™ groundwater statistical software. The mean concentration was calculated by Sanitas™ at each sites' respective downgradient monitoring wells is presented in each table included in **Appendix D**. The average groundwater concentration was compared to the surface water standards presented in Table 1 in **Appendix D**. While both chronic and acute surface water standards are presented in Table 1 for completeness, the groundwater data has been compared to the chronic standards, as they are the lower standard. This approach is therefore deemed conservative. If a constituent was reported as non-detect in seventy-five percent (75%) or more

[109] MWG Exh. 903. pgs. 44-45 and Appendix B.

in the historical data, then the laboratory reporting limit was presented as the average concentration for that constituent.

**Joliet 29**

Shallow groundwater in the vicinity of the Joliet 29 Station ash ponds discharges to the south of the Station to the Des Plaines River. Groundwater data collected between December 2010 and October 2020 from downgradient monitoring wells (i.e., wells south of the ponds) MW-01 through MW-04, and MW-06 and MW-07 was averaged using the Sanitas™ groundwater statistical software and compared to applicable surface water standards. For Joliet 29, average groundwater concentrations at downgradient monitoring wells did not exceed surface water standards.

**Powerton**

Shallow groundwater in the vicinity of the Powerton Station ash ponds discharges to the north and west. Groundwater data collected between December 2010 and December 2020 from downgradient monitoring wells MW-03 through MW-08 and MW-13 through MW-15 was averaged using the Sanitas™ groundwater statistical software and compared to applicable surface water standards. For Powerton, average groundwater concentrations at downgradient monitoring wells did not exceed surface water standards.

**Will County**

Shallow groundwater in the vicinity of the Will County Station ash ponds discharges west to the adjacent Des Plaines River. Groundwater data collected between December 2010 and November 2020 from downgradient monitoring wells MW-07 through MW-12 was averaged using the Sanitas™ groundwater statistical software and compared to applicable surface water standards. Apart from pH at monitoring well MW-09, the Will County average groundwater concentrations at downgradient monitoring wells did not exceed the applicable surface water standards. At MW-09, the average pH concentration of 9.22 slightly exceeded the applicable pH range of 6.5-9.0 for surface water. However, MW-9 is located approximately 120 feet upgradient of the downgradient property boundary, which approximately coincides with the Des Plaines River. Groundwater flowing from MW-09 to the west towards the Des Plaines River will undergo further advection dispersion and attenuation. Additionally, the mixing that occurs as groundwater discharges into surface water will further moderate the pH. Therefore, the average pH concentration of 9.22 at MW-09 does not pose an unacceptable risk to surface water receptors in the Des Plaines River.

**Waukegan**

Shallow groundwater in the vicinity of the Waukegan Station ash ponds discharges to the east to adjacent Lake Michigan. Groundwater data collected between December 2010 and November 2020 from downgradient monitoring wells MW-01 through MW-4 was averaged using the Sanitas™ groundwater statistical software. Except for pH at monitoring well MW-01, the Waukegan average groundwater concentrations at downgradient monitoring wells did not exceed the applicable surface water standards for the Lake Michigan Basin. At MW-01, the average pH concentration of 9.74 slightly exceeded the applicable pH range of 6.5-9.0 for surface water. However, MW-1 is located over 700 feet upgradient from the existing shore of Lake Michigan. Groundwater flowing from MW-01 to the east towards Lake Michigan will undergo further advection dispersion and attenuation. Additionally, the mixing that occurs as groundwater discharges into surface water will further moderate the pH. Therefore, the average pH concentration of 9.74 at MW-01 does not pose an unacceptable risk to potential surface water receptors in Lake Michigan.

The results of the surface water risk evaluation indicate that downgradient groundwater conditions at each of the four Stations do not pose unacceptable risks to surface water receptors. WCG's opinion is consistent with the export report of John Seymour, who concluded that it was his opinion that "groundwater conditions do not pose risks to surface water receptors[110]."

## 4.5 MWG has already committed to following the Federal/State CCR Rules for applicable Existing and Inactive Surface Impoundments at each Station, until closure is complete. Therefore, no additional action beyond continued compliance with these Rules is warranted.

MWG has been operating the active surface impoundments in a manner that minimizes potential impacts to groundwater. Regarding the liners previously installed at the Federal CCR Surface Impoundments, it is WCG's opinion that the prior and current liners are consistent with industry practice for this type of application and are effective at containing the materials managed in the surface impoundments. However, the existing HDPE liners – even though many were required by the CCAs and approved by Illinois EPA when installed -- do not meet the Federal CCR Rules which require a dual liner. MWG has opted to close the surface impoundments.

[110] MWG Exh. 903. pg. 44.

Regular inspections occur at each Station to ensure that design, construction, operation, and maintenance of the CCR units are consistent with recognized generally accepted good engineering standards[111][112][113].

In addition, MWG implemented a detection monitoring program at Joliet 29, Will County, and Waukegan Stations to identify potential impacts to groundwater from the regulated impoundments. An assessment program is being implemented at the Powerton Station. Further assessment monitoring will be implemented at the other Stations if statistically significant increases attributable to the regulated units are confirmed. Corrective action will be conducted if assessment monitoring data indicates that the groundwater protection standards are exceeded. MWG continues to upload reports associated with these activities as well as other technical reports to the website for CCR Rule Compliance Data and Information[114]. Also, the recently adopted Illinois CCR Rule does not distinguish between detection monitoring and assessment monitoring. Instead, pursuant to the Illinois EPA Rule, beginning in the second quarter of 2021, MWG will be sampling the groundwater for all of the constituents identified in the federal CCR rule pursuant to 35 Ill. Adm. Code 845.600.

Pursuant to the Federal CCR Rules, MWG prepared Closure Plans for the regulated surface impoundments at each of the Stations, including Pond 2 at Joliet 29[115], the Ash Surge Basin, Bypass Basin[116], and the Former Ash Basin[117] at Powerton, the South Ash Ponds 2S and 3S at Will County[118], and the East and West Ash Basins at Waukegan[119].

As discussed in Section 1.5, in compliance with the Federal CCR Rules, MWG has prepared and submitted to the USEPA Alternative Closure Demonstrations (ACD) related to the infeasibility of

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[111] Annual Inspection Reports for Ash Pond 2 at Joliet 29 Station, October 2020, Ash Surge Basin and Bypass Basin at Powerton Station, January 2016, October 2018, October 2019, October 2020; Annual Inspection Reports for Former Ash Basin at Powerton Station, July 2017, July 2018, July 2019, July 2020; and Annual Inspection Reports for East Ash Pond and West Ash Pond at Waukegan Station, January 2016, October 2018, October 2019, October 2020.
[112] MWG Ex. 903, p. 38; 1/31/18 Tr. p. 145:2-23 and p. 145:18-146:3 (Test. of Kelly); 10/24/17 Tr. p. 126:20-127:6 (Test. of Lux); 1/31/18 Tr. p. 237:20-23 and p. 257:15-258:4 (Test. of Veenbaas); 10/24/18 Tr. p. 222:18-223:8 (Test. of Maddox).
[113] Op. cit. footnote 47.
[114] NRG website for CCR Rule Compliance Data and Information available at: https://www.nrg.com/legal/coal-combustion-residuals.html.
[115] Closure Plan for Ash Pond 2 at the Joliet 29 Station, October 2016.
[116] Closure Plan for the Ash Surge Basin and Bypass Basin at the Powerton Station, October 2016.
[117] Closure Plan for the Former Ash Basin at the Powerton Station, April 2018 as amended in May 2019.
[118] Closure Plan for the South Ash Ponds 2S and 3 S at the Will County Station, October 2016.
[119] Closure Plan for the East and West Ash Basins at the Waukegan Station, October 2016.

the development of alternative capacity for the Ash Surge Basin at Powerton, Ash Pond 2S at Will County and the East Ash Pond at Waukegan. Continued operation of the CCR Ponds until the alternate closure deadlines identified for each Station will be monitored to mitigate any potential impacts to groundwater. The detection and assessment groundwater monitoring programs implemented by MWG are designed to identify potential issues with the regulated impoundments until such time that the ponds are taken out of service and formally closed in accordance with the applicable permits. According to IL Public Act 101-171, signed into law July 30, 2019, closure activities related to Federal/State Ponds cannot be completed until a permit is attained from Illinois EPA.

Contrary to Quarles's opinion, the scope of the ASDs associated with the Powerton, Will Co., and Waukegan Stations is appropriate and complies with the Federal CCR Rules and likely also the Illinois CCR Rules. Quarles's suggestion that MWG should have used the ASD process to specifically identify the source of statistically significant increases in groundwater concentrations is incorrect. It is not appropriate nor required by the Federal CCR Rules or the Illinois CCR Rules to pursue additional investigation of non-regulated units as part of this process. The Federal CCR Rules and the Illinois CCR Rules require the owner/operator to evaluate whether the *regulated unit(s)* are adversely impacting groundwater, but neither require an exhaustive site-wide study to identify a specific alternate source.

Moreover, additional investigation is not needed for purposes of identifying the appropriate relief/remedy related to groundwater conditions attributed by the Board to MWG. The appropriate action recommended by WCG is based on the existing applicable regulatory framework and data historically collected at the Stations.

In closing, no additional relief is warranted at the Stations with respect to Section 33(c), criteria (i), the character and degree of injury to, or interference with the protection of the health, general welfare, and physical property of the people. MWG is actively complying with the detection and assessment groundwater monitoring requirements of the Federal CCR Rules at these Stations and has created a long-term plan for closure of the regulated active and inactive CCR surface impoundments, as appropriate. The plans comply with the existing Federal CCR Rules and MWG is aware of, and further intends to comply with the IL CCR Rules, once promulgated.

## 4.6 MWG should continue to maintain the GMZs at each Station until the corrective action is complete.

GMZs have been established at Joliet 29, Powerton, and Will County Stations. The GMZs are a component of corrective action included in the CCAs implemented for the Joliet, Powerton and Will County Stations. A GMZ would not have been approved by the Illinois EPA if a specific means for managing the groundwater was not implemented. The means for managing the groundwater for the three Stations is deemed to be the various corrective measures specified in the CCAs, including:

- Upgrades to various CCR surface impoundment liners;
- Installation of the dewatering system at Will County Ponds 1N and 1S; and
- At Powerton, the East Yard Run-off Basin was not to be used as part of the ash sluicing flow system and no unlined areas may be used for temporary or permanent management of CCR.

The GMZ also includes conducting long-term groundwater monitoring to confirm the effectiveness of the corrective measures included in the CCAs, and the maintenance of institutional controls to prevent potential exposures to groundwater containing CCR-related constituents at concentrations above Class I Groundwater Quality Standards. The 2020 Board Order specifically clarifies that *"(t)he Board is aware that the process of monitored natural attenuation (MNA) can be, by its nature, a long one. Monitored natural attenuation, depending upon its efficacy and subject to the Agency's review, can conceivably last for many years."*[120]

WCG agrees that MNA is a long-term process, which may require multiple decades to complete. WCG recommends that MWG maintain the GMZs and continue the groundwater monitoring until the corrective actions through MNA are complete. Because there are no off-site complete or potentially complete exposure pathways, that the MNA may take time would not result in unacceptable impact to human health or the environment at the Stations. Additionally, as discussed further below in Section 4.8, WCG recommends implementation of a remedy at the Waukegan Station, which includes the establishment of a GMZ.

[120] Board Opinion, February 6, 2020, pg. 13.

## 4.7 No further remedy is warranted at the Joliet 29, Powerton, and Will County Stations.

As discussed in Section 4.5, MWG has already committed to following the Federal/State CCR Rules for applicable Existing and Inactive Surface Impoundments at each Station, until closure is complete. Therefore, no additional action beyond continued compliance with these Rules is warranted for these regulated areas of the Stations. In addition, Section 4.3 demonstrates that detections of CCR-related constituents in groundwater at the Joliet 29, Powerton, and Will County Stations are decreasing through natural attenuation. The institutional controls in place at each of the Stations are sufficient to control potential on-site exposures to impacted groundwater while corrective action activities previously implemented under the prior CCAs continue to take effect. Illinois regulatory programs rely on institutional controls when a risk-based evaluation indicates that potential exposures to impacted media may be managed by the implementation of these corrective actions. GMZs and ELUCs are proven as effective, industry-accepted remedial approaches approved by the State of Illinois to adequately control exposure to impacted groundwater. These types of controls can be implemented in lieu of active remediation, when exposures can be controlled. Risk-based remediation is particularly beneficial at sites like the MWG Stations, where both the properties and surrounding areas are industrial in nature and site access can be controlled. Further, as discussed in Section 4.4, there are no off-site complete or potentially complete exposure pathways that would result in unacceptable impact to human health or the environment at the Stations. The administrative record is clear that there are no off-site downgradient potable use wells at any of the Stations, and a review of the Annual CCR Fugitive Dust Reports indicate that there are no significant issues with fugitive dust at the Stations or citizen complaints related to dust originating from the Stations.

Additional support for continuing to utilize monitored natural attenuation at these three Stations includes:

- Groundwater monitoring will continue to be performed while the GMZs are in place, to confirm monitored natural attenuation continues to be effective;
- As discussed above, the existing regulatory framework does not require additional action at the historical fill areas; and
- Illinois EPA has not identified any noncompliance with the CCAs or pursued any enforcement action against MWG, since the CCAs were signed in 2012.

Because the statistical evaluation indicates that natural attenuation is occurring and that there is no unacceptable risk to human health or the environment, no further remedy is required at Joliet 29, Powerton, or Will County Stations to address the regulated CCR units or the historical fill areas.

## 4.8 Despite the absence of risk, an appropriate remedy is warranted at the Waukegan FS Area to attain compliance with applicable regulations.

The 2020 KRPG investigation[121] indicates that impacts to groundwater at MW-5, MW-7 and MW-16 (downgradient of the FS Area) are potentially caused by leaching of materials at the FS Area. Additionally, migration of impacted groundwater from the upgradient General Boiler and Tannery properties is occurring[122]. The evaluation of groundwater data in Section 4.4 demonstrates that concentrations of CCR-related analytes are attenuating below applicable surface water quality criteria before groundwater leaves the property. However, the statistical evaluation of the groundwater concentration trends in samples collected from downgradient wells at Waukegan indicates that supplemental activities may be implemented to enhance natural attenuation of groundwater underlying the Station.

Therefore, it is WCG's opinion that a presumptive remedy in the form of a low permeability cap be installed in the FS Area in order to enhance the natural attenuation remedy. A presumptive remedy is a technology that regulators believe, based upon prior experience, will be the most appropriate remedy for a specified type of site. Use of presumptive remedies accelerates the remedial alternatives analysis. Capping is a proven remedial technology that has been used for decades and is particularly prevalent as a means of closing solid and hazardous waste landfills, and surface impoundments (usually after removal of liquids) under RCRA.

Capping of the FS Area would reduce infiltration, leading to a decrease in water percolation through the coal ash materials. It is anticipated that this reduction in percolation will significantly decrease leaching from coal ash materials within the FS area. The installation of the cap is expected to reduce the time required for natural attenuation to restore groundwater concentrations to Class I Groundwater Quality Standards.

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[121] MWG-13-15_79493-79771; MWG13-15_81195-81293.
[122] MWG Ex. 644; MWG13-15_46627 -46630; 1/30/18 Tr. pp. 135:23-136:18, 138:3-139:3,155:10-21 (Test. of Race); MWG Ex. 644, p.; 1/30/18 Tr. p. 136:19-138:1 (Test. of Race).; Ex. 19D, p MWG13-15_45800.

An evaluation of the potential to reduce infiltration via the installation of a low permeability cap at the FS Area was modeled with the Hydrologic Evaluation of Landfill Performance (HELP) Model, Version 3.07. The results from the HELP Model are presented in **Appendix E**. According to the model results, a cap would significantly reduce infiltration and thereby would be expected to mitigate potential leaching from ash materials to groundwater.

WCG recommends that, if implemented, the cap should be designed specifically for the Waukegan Station by a Professional Engineer licensed in Illinois in consideration of site-specific performance-based infiltration reduction goals. In addition, WCG recommends that initiation of the design of the cap wait until the Board has finalized its rulemaking in the sub-docket A of R20-19 to explore "historic, unconsolidated coal ash fill in the State", located outside of surface impoundments. Because WCG has confirmed that there is no risk to Lake Michigan or other potential offsite receptors and groundwater use on-site is controlled by the ELUC, staying initiation of the corrective actions will not harm the environment nor public health and will also ensure that the corrective actions taken for the FS Area are in compliance with the Board's final rule in R20-19(A).

WCG believes that it is both technically practicable and economically reasonable to implement a low permeability cap for the FS Area. The estimated cost of a low permeability cap is variable and could range from approximately \$1.9 million to \$3.3 million, depending upon the performance objectives of the cap. The ultimate performance objectives are expected to be informed by regulatory standards, remedial goals, technical practicability and implementability, among other considerations.

A GMZ should be established in conjunction with the implementation of the cap corrective action. When the GMZ is established, the Class I Groundwater Quality Standards are inapplicable, while monitored natural attenuation is occurring in the groundwater at the Station.

## 4.9 Relevant Section 33(c) and 42(h) Criteria

The record reviewed by WCG and discussed in this Report indicates that all the Stations are located in industrial areas. This is a factor the Board considers under 33(c) of the Act when making its orders and determinations.

The Stations are each surrounded by other industries and commercial properties. Each of the Stations have been at their current location for at least 50 years and nearly 100 years in the case of Powerton and Waukegan Stations. Joliet 29 and Will County were established later, built in 1964 and 1955, respectively. Powerton and Waukegan were both built in the 1920s and are also surrounded by industrial properties and in many cases, the industrial development surrounding the Stations occurred after original construction of the Stations. For example, Waukegan is surrounded by properties that have historic contamination from prior uses, including the Superfund sites such as the Johns Manville Site to the north, and the General Boiler and Greiss-Pfleger Tannery sites to the west. A SRP site that previously attained a NFR Letter also adjoins the Joliet 29 Station, on the west side. Based upon the age of the Stations and that they are all in industrial areas, the existing environmental conditions are suitable for the areas in which they are located.

It is common in most Federal and State environmental remediation programs to utilize risk-based remedial goals as the basis of a remedial approach. Illinois EPA's method for developing remediation objectives for contaminated soil and groundwater is known as TACO. Remediation objectives developed under TACO protect human health and the environment, take into account site conditions and land use, and are risk-based and site-specific. Therefore, even those adjacent properties that have been, or are currently enrolled within a regulatory program have some level of residual impact corresponding to compliance with risk-based goals. These risk-based goals may consider engineering and institutional controls to preclude exposures to impacted material (such as the ELUCs already established for the Greiss-Pfleger Tannery west of the Waukegan Station and the former Caterpillar facility west of the Joliet 29 Station) which allow impacted materials to remain in-place, if there are no unacceptable hazards posed to human health or the environment. The Stations are located within areas that are known or suspected to be similarly impacted by long-term industrial land use.

Another factor included in Section 33(c) of the Act is technical practicability and economic reasonableness. MWG has already implemented multiple measures at the CCR surface impoundments and historical fill areas, including implementing corrective actions (relining the ponds and establishing institutional controls that prevent access to the groundwater). In addition, MWG has implemented GMZs to address violations of Class I Groundwater Quality Standards, while the monitored natural attenuation corrective action at the Joliet 29, Powerton and Will County Stations continues to be implemented. The GMZs were established in accordance with 35 Ill. Adm. Code Section 620.250, which indicates that a GMZ may be established to mitigate impairment caused by the release of contaminants from a site: ***that is subject to a correction action process approved by the Agency*** (emphasis added) or for which the owner or operator undertakes an adequate corrective action in a timely and appropriate manner and provides a written confirmation to the Agency. Therefore, in the case of Joliet 29, Powerton and Will County, the GMZs were established as part of a corrective action process that has been approved by a regulatory agency. Illinois EPA has not required or requested MWG conduct additional corrective action after establishment of the CCAs.

Duration and gravity of the violation is also listed in Section 33(c) of the Act as a factor utilized by the Board to determine an appropriate remedy. The 2020 Board Order indicates that the violations of Part 620 of the Board regulations do not apply, given the ongoing nature of the previously established GMZs at Joliet 29, Powerton, and Will County. Thus, the duration of the Part 620 violations was limited to the first identification of an exceedance of the Class 1 Groundwater Quality Standards in late 2010, until the GMZs were formally established in 2013.

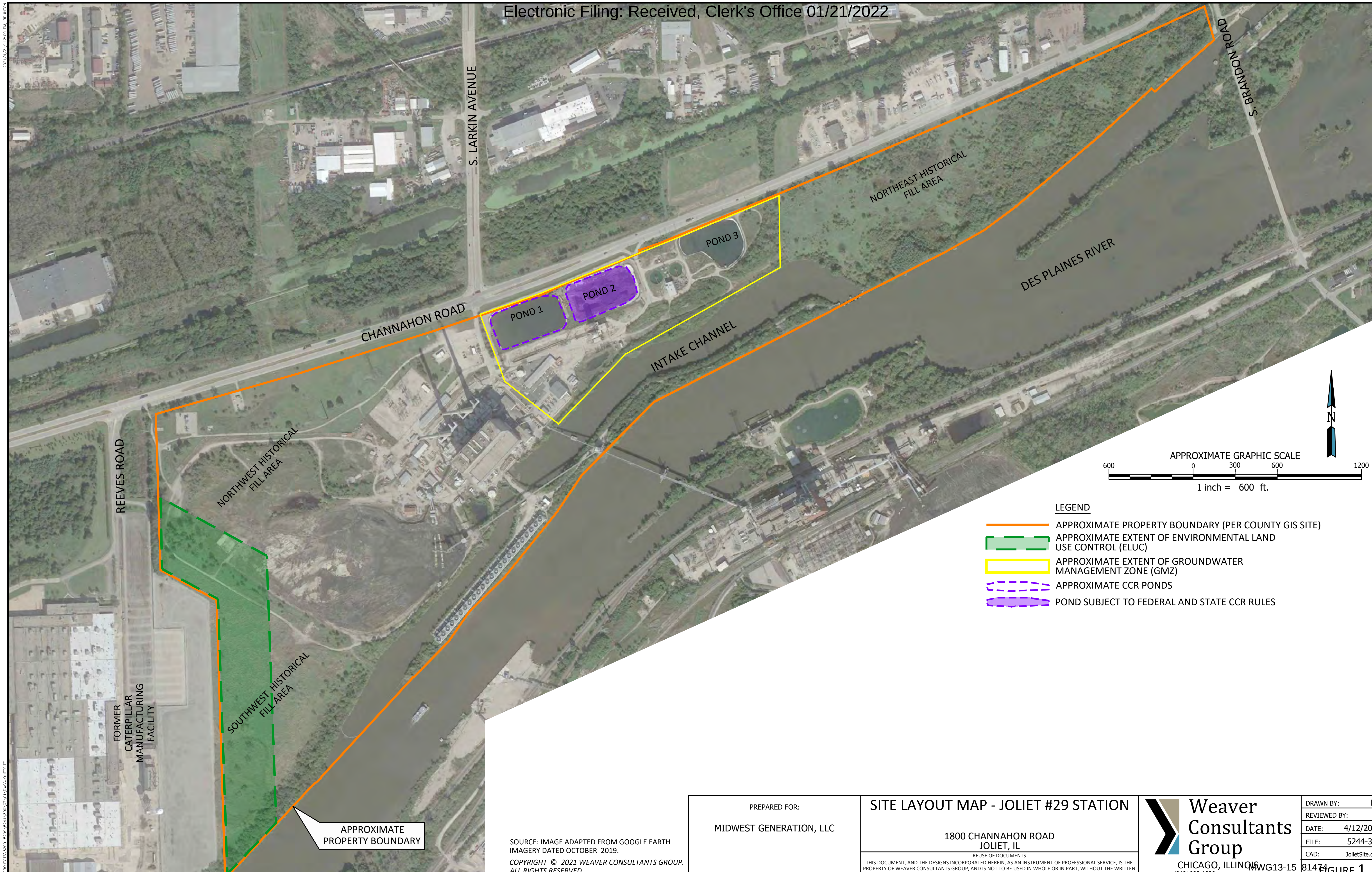
The comparison of groundwater data to surface water quality standards presented above in Section 4.4 provides further evidence for the lack of gravity of the violations. This evaluation indicates that surface water, including related receptors, will not be adversely impacted by the groundwater concentrations at the Stations. Minimal gravity of the noted violations is also exhibited based on the incomplete exposure pathway for groundwater. Human consumption of groundwater at each of the Stations is controlled using various ELUCs, which prohibit the installation and use of groundwater for potable purposes. In any case, there are no downgradient potable receptors at any of the Stations.

The record indicates that the violation of Section 12(d) of the Act at the Powerton Station was based on temporarily storing coal ash outside of the surface impoundments during a single occasion lasting approximately two to three months during the winter before 2012[123]. The condition was corrected and the materials were removed. Moreover, storage during the winter, when the ground would have been frozen further decreasing the likelihood that runoff from the coal ash could have infiltrated the ground and subsequently impacted groundwater, thus further decreasing the gravity of what was already an event of very limited duration.

Due diligence in attempting to comply is another 33(c) factor supporting WCG's opinion. MWG proactively undertook appropriate investigation of the Stations prior to any agency request beginning in 2002, voluntarily agreed to perform a hydrogeologic assessment and later sampling (where other utilities did not) in 2008-2010 and implemented the CCAs under oversight by the Illinois EPA. MWG consistently attempted to act diligently, based on: early site investigations, sampling for CCB, relining ponds, CCAs (and related GMZs/ELUCs) and other investigations discussed above.

[123] 2019 Board Order, pg. 42.

# Figures




LEGEND

- APPROXIMATE PROPERTY BOUNDARY (PER COUNTY GIS SITE)
- APPROXIMATE EXTENT OF ENVIRONMENTAL LAND USE CONTROL (ELUC)
- APPROXIMATE EXTENT OF GROUNDWATER MANAGEMENT ZONE (GMZ)
- APPROXIMATE CCR PONDS
- POND SUBJECT TO FEDERAL AND STATE CCR RULES

SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED OCTOBER 2019.



PREPARED FOR:

MIDWEST GENERATION, LLC

SITE LAYOUT MAP - JOLIET #29 STATION

1800 CHANNAHON ROAD
JOLIET, IL



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| DRAWN BY: | RD |
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| DATE: | 4/12/2021 |
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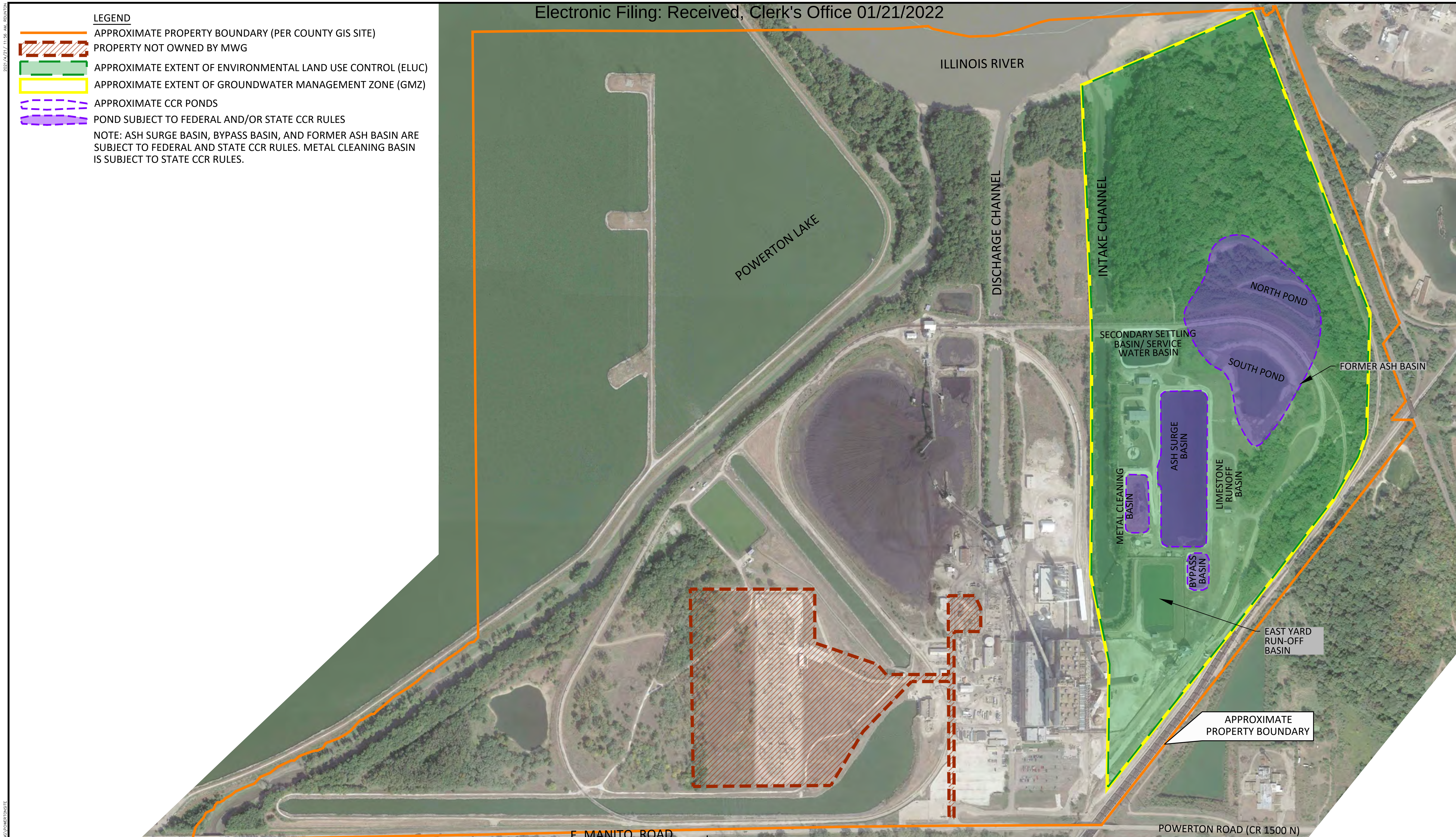
| CAD: | JolietSite.dwg |

MWG13-15_81474

FIGURE 1




SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED SEPTEMBER 2017.



APPROXIMATE GRAPHIC SCALE

600 0 300 600 1200

1 inch = 600 ft.

N

PREPARED FOR:

MIDWEST GENERATION, LLC

SITE LAYOUT MAP - POWERTON STATION

13082 E. MANITO ROAD
PEKIN, IL



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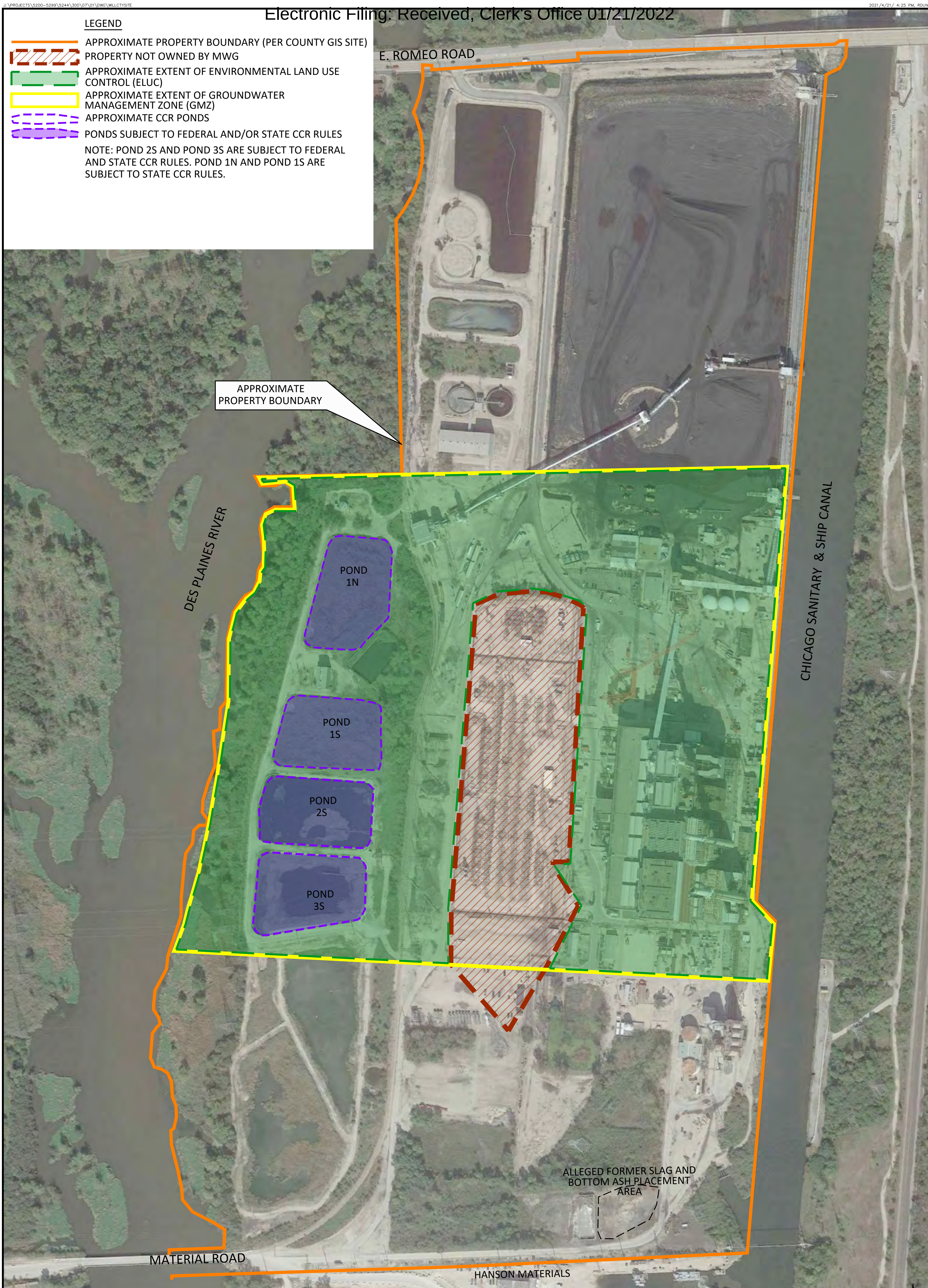
| CAD: | PowertonSite.dwg |

MWG13-15_81475

FIGURE 2




APPROXIMATE GRAPHIC SCALE
300 0 150 300 600
1 inch = 300 ft.
N

SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED OCTOBER 2019.



PREPARED FOR:

MIDWEST GENERATION, LLC

SITE LAYOUT MAP - WILL COUNTY STATION

529 E. ROMEO ROAD
ROMEOVILLE, IL



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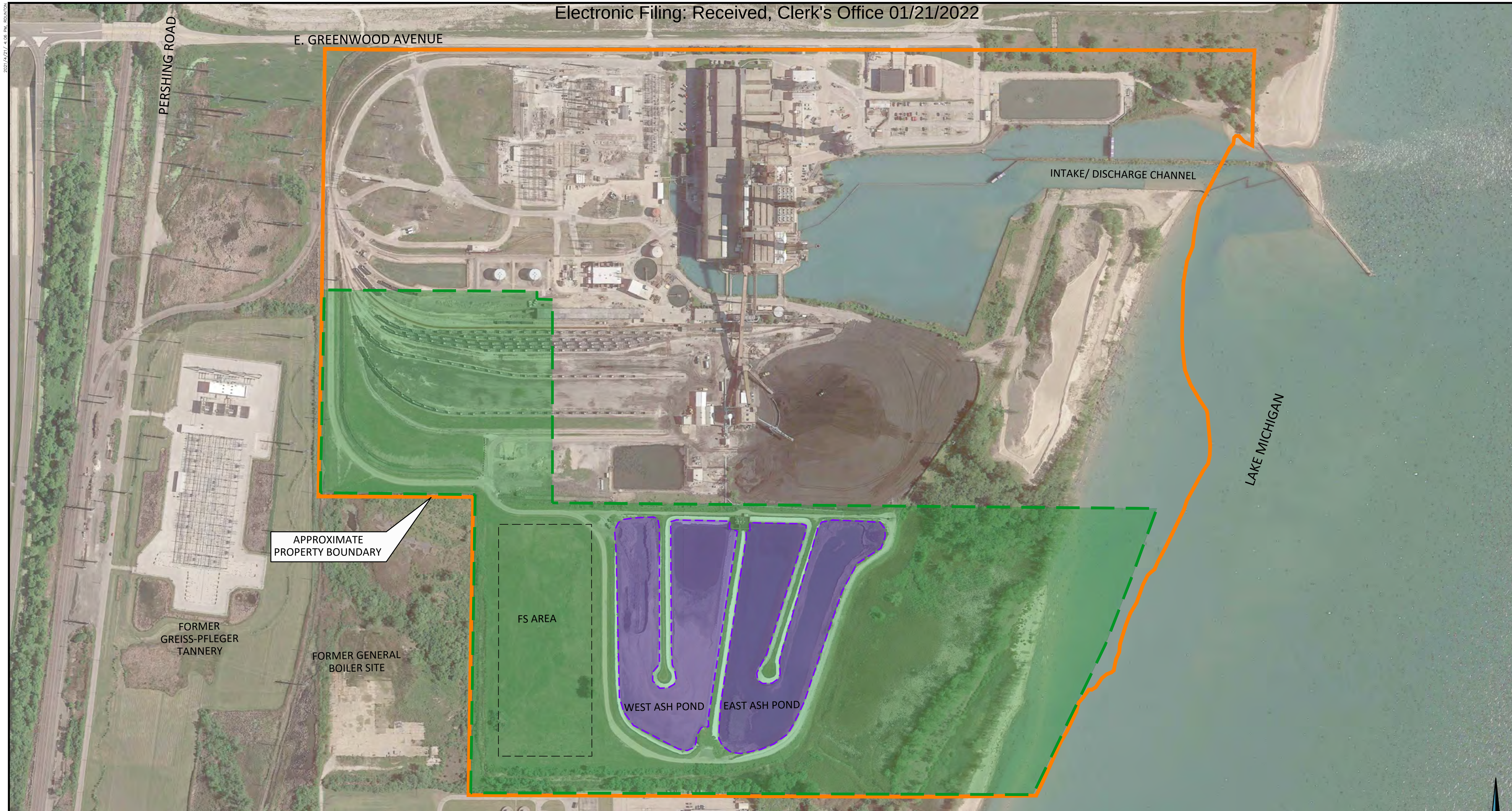
| CAD: | WillCtySite.dwg |

MWG13-15_81476

FIGURE 3




LEGEND

- APPROXIMATE PROPERTY BOUNDARY (PER COUNTY GIS SITE)
- APPROXIMATE EXTENT OF ENVIRONMENTAL LAND USE CONTROL (ELUC)
- APPROXIMATE CCR PONDS
- POND SUBJECT TO FEDERAL AND STATE CCR RULES

APPROXIMATE GRAPHIC SCALE

400 0 200 400 800

1 inch = 400 ft.

N

SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED JUNE 2020.



PREPARED FOR:

MIDWEST GENERATION, LLC

# SITE LAYOUT MAP - WAUKEGAN STATION

401 E. GREENWOOD AVENUE
WAUKEGAN, IL



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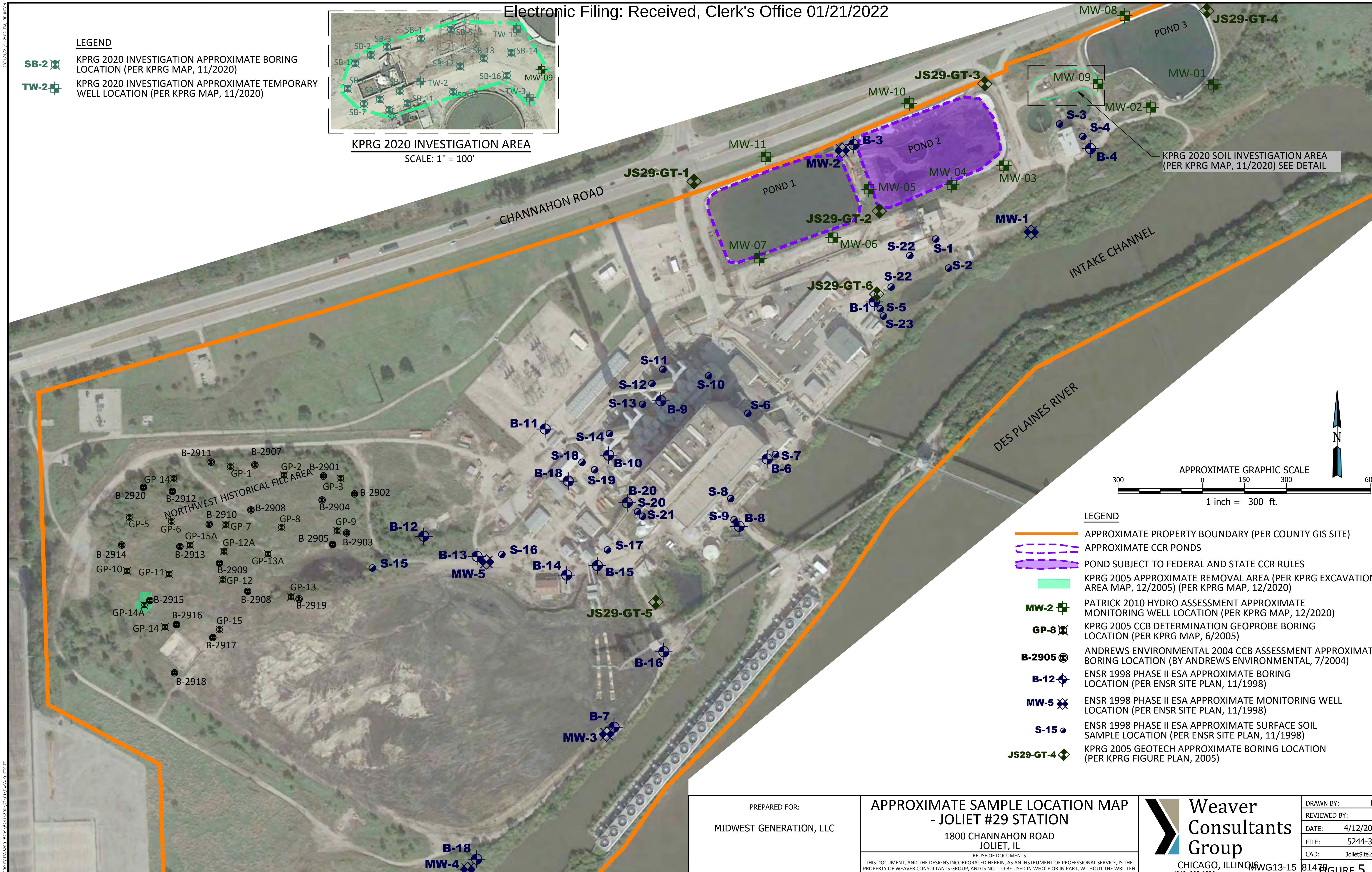
| CAD: | WaukeganSite.dwg |

FIGURE 4

MWG13-15_81477




PREPARED FOR:

MIDWEST GENERATION, LLC

APPROXIMATE SAMPLE LOCATION MAP - JOLIET #29 STATION

1800 CHANNAHON ROAD
JOLIET, IL

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| CAD: | JolietSite.dwg |

FIGURE 5

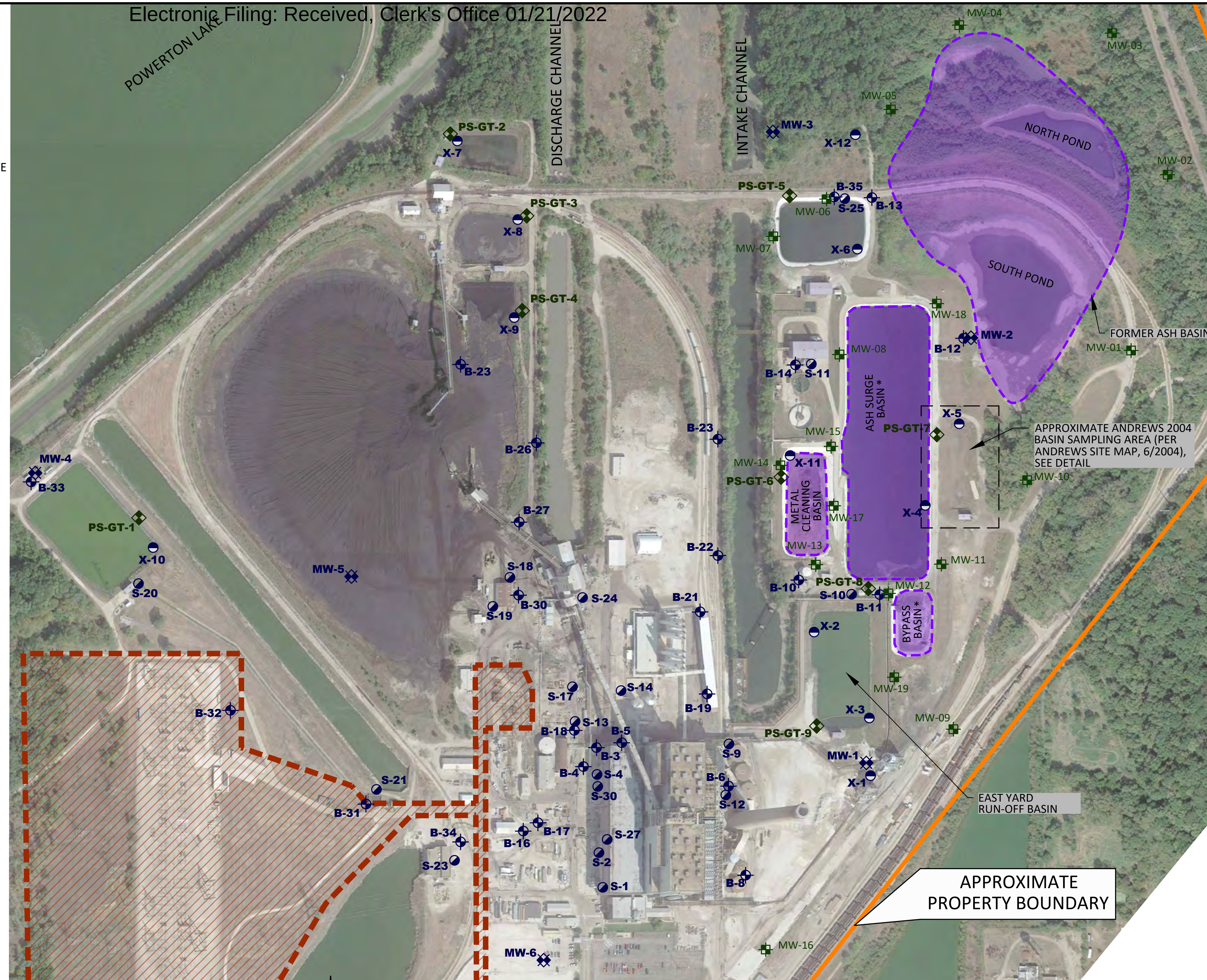
MWG13-15_81478

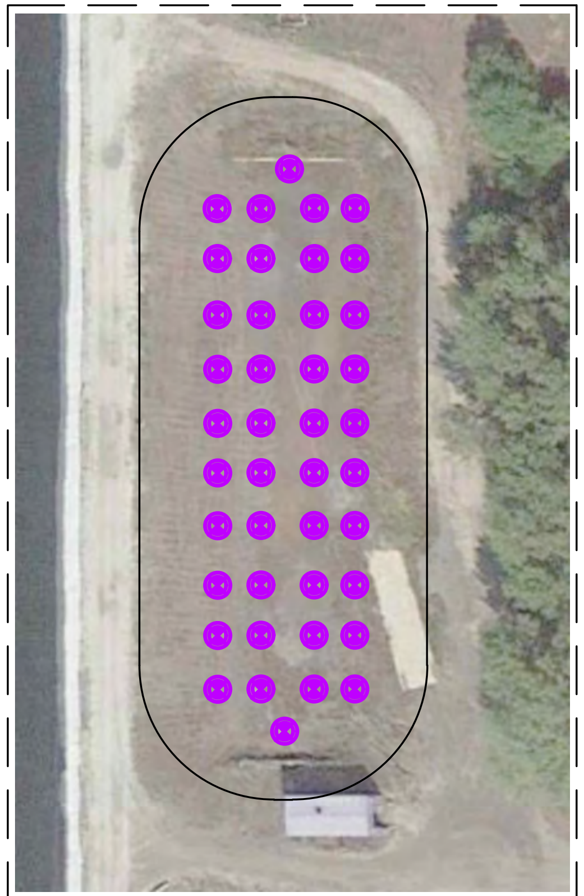
SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED OCTOBER 2019.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY (PER COUNTY GIS SITE)
- PROPERTY NOT OWNED BY MWG
- APPROXIMATE CCR PONDS
- POND SUBJECT TO FEDERAL AND/OR STATE CCR RULES
- NOTE: ASH SURGE BASIN, BYPASS BASIN, AND FORMER ASH BASIN ARE SUBJECT TO FEDERAL AND STATE CCR RULES. METAL CLEANING BASIN IS SUBJECT TO STATE CCR RULES.
- MW-2 — PATRICK 2010 HYDRO ASSESSMENT/KPRG 2012-2019 CCR APPROXIMATE MONITORING WELL LOCATION (PER KPRG MAP, 12/2020)
- B-12 — ENSR 1998 PHASE II ESA APPROXIMATE BORING LOCATION (PER ENSR SITE PLAN, 11/1998)
- MW-5 — ENSR 1998 PHASE II ESA APPROXIMATE MONITORING WELL LOCATION (PER ENSR SITE PLAN, 11/1998)
- S-15 — ENSR 1998 PHASE II ESA APPROXIMATE SURFACE SOIL SAMPLE LOCATION (PER ENSR SITE PLAN, 11/1998)
- X-8 — ENSR 1998 PHASE II ESA APPROXIMATE SEDIMENT SAMPLE LOCATION (PER ENSR SITE PLAN, 11/1998)
- ANDREWS 2004 BASIN SAMPLING APPROXIMATE TEST PIT LOCATION (PER ANDREWS SITE MAP, 6/2004)
- PS-GT-4 — KPRG 2005 GEOTECH APPROXIMATE BORING LOCATION (PER KPRG FIGURE PLAN, 2005)

NOTE:
* ASH AND WATER SAMPLES COLLECTED FROM THE BYPASS BASIN AND ASH SURGE BASIN IN 2018 AND 2019 AS PART OF 2019 AND 2020 KPRG ASDs.



ANDREWS 2004 BASIN SAMPLING AREA

SCALE: 1" = 100'

NOTE: SAMPLE LOCATIONS PER ANDREWS SITE MAP, 6/2004. UNABLE TO DISCERN TEST PIT NUMBERING DUE TO IMAGE QUALITY, REFER TO ANDREWS REPORT FOR CLARITY.

SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED SEPTEMBER 2017.



APPROXIMATE GRAPHIC SCALE

400 0 200 400 800

1 inch = 400 ft.

N

PREPARED FOR:

MIDWEST GENERATION, LLC

## APPROXIMATE SAMPLE LOCATION MAP - POWERTON STATION

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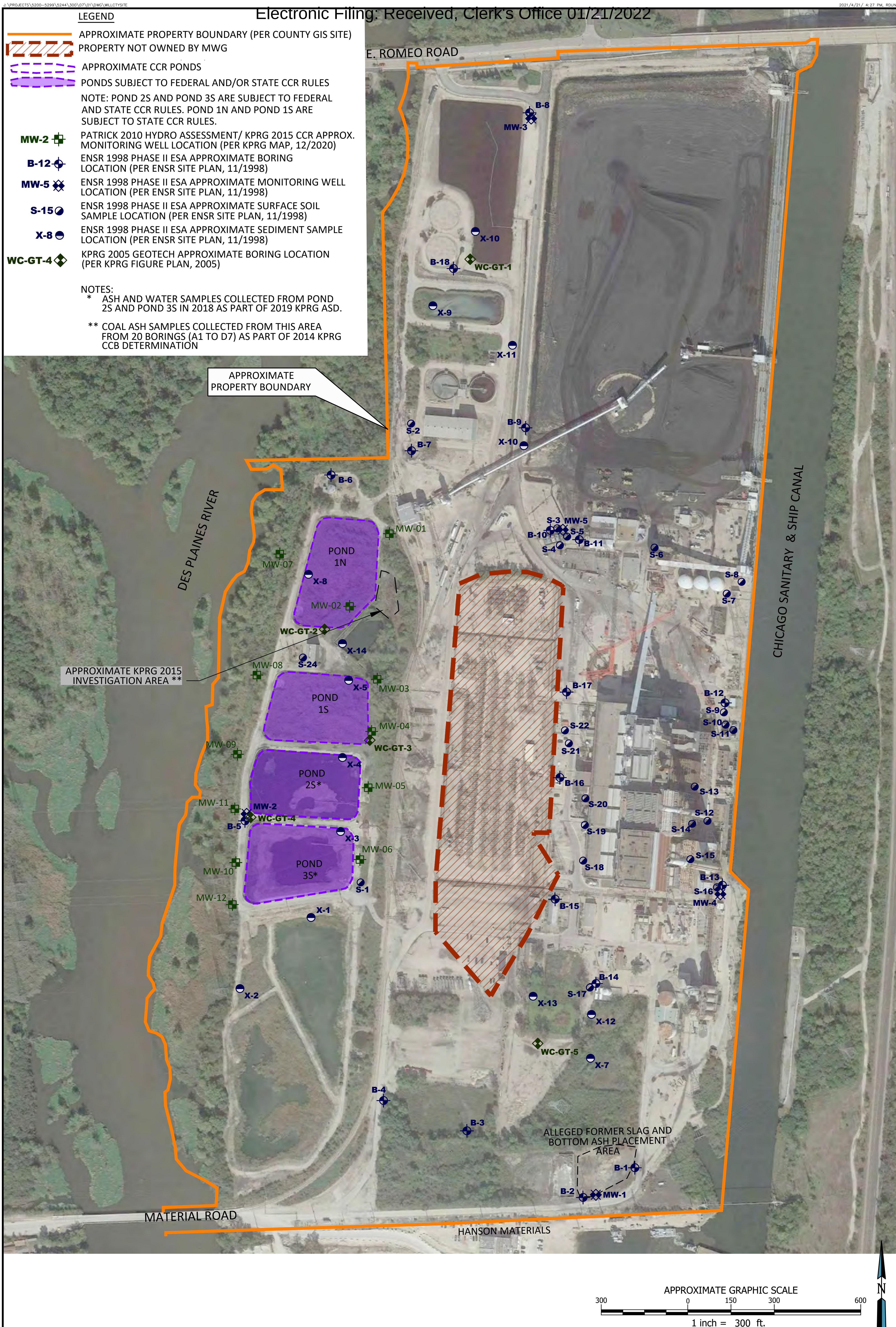
| DATE: | 4/16/2021 |
| FILE: | 5244-300 |
| CAD: | PowertonSite.dwg |

MWG13-15_81479

FIGURE 6




SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED OCTOBER 2019.



PREPARED FOR:

MIDWEST GENERATION, LLC

APPROXIMATE SAMPLE LOCATION MAP - WILL COUNTY STATION

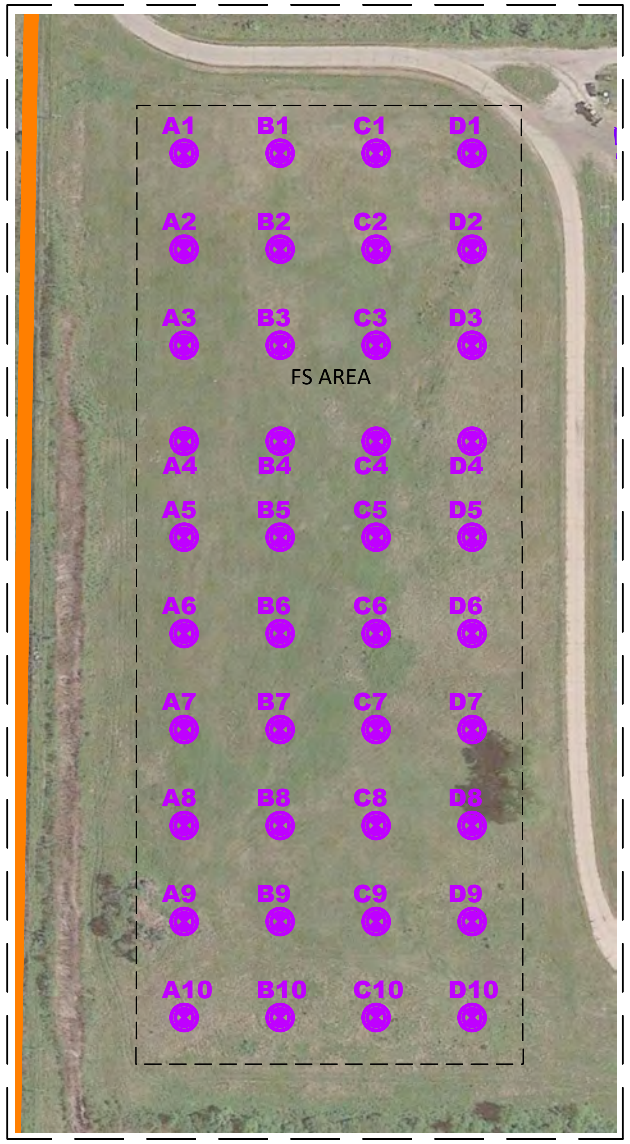
529 E. ROMEO ROAD
ROMEOVILLE, IL



Weaver Consultants Group
CHICAGO, ILLINOIS
(312) 922-1030 www.wcgrp.com

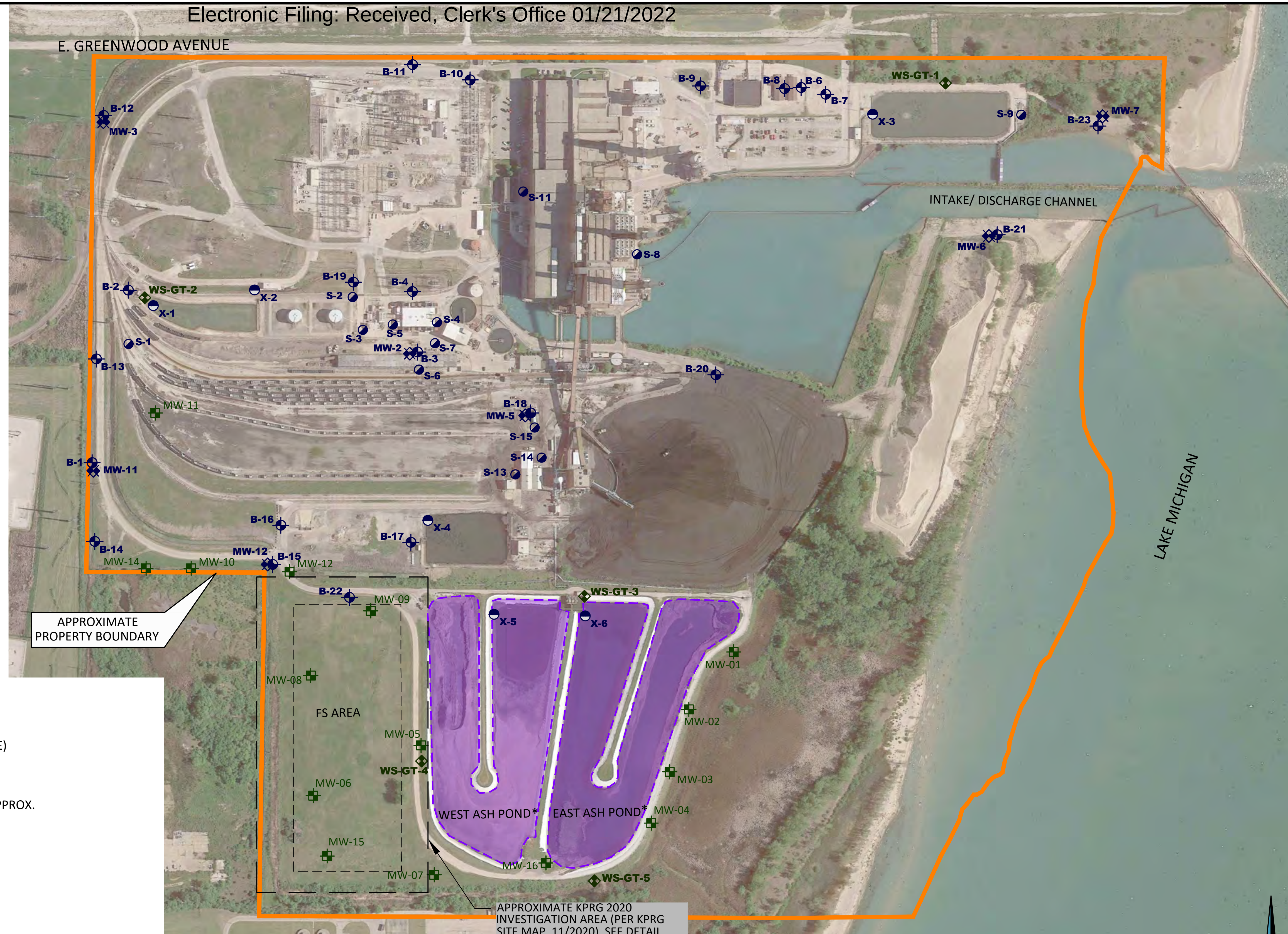
| | |
|---|---|
| DRAWN BY: | RD |
| REVIEWED BY: | RS |
| DATE: | 4/12/2021 |
| FILE: | 5244-300 |
| CAD: | WillCtySite.dwg |

FIGURE 7




KPRG 2020 INVESTIGATION AREA

SCALE: 1" = 200'




LEGEND

| | |
|---|---|
| (orange line) | APPROXIMATE PROPERTY BOUNDARY (PER COUNTY GIS SITE) |
| (dashed purple outline) | APPROXIMATE CCR PONDS |
| (purple fill) | POND SUBJECT TO FEDERAL AND STATE CCR RULES |
| MW-2 | PATRICK 2010 HYDRO ASSESSMENT/KPRG 2010-2014 CCR APPROX. MONITORING WELL LOCATION (PER KPRG MAP, 11/2020) |
| B-12 | ENSR 1998 PHASE II ESA APPROXIMATE BORING LOCATION (PER ENSR SITE PLAN, 11/1998) |
| MW-5 | ENSR 1998 PHASE II ESA APPROXIMATE MONITORING WELL LOCATION (PER ENSR SITE PLAN, 11/1998) |
| S-15 | ENSR 1998 PHASE II ESA APPROXIMATE SURFACE SOIL SAMPLE LOCATION (PER ENSR SITE PLAN, 11/1998) |
| X-8 | ENSR 1998 PHASE II ESA APPROXIMATE SEDIMENT SAMPLE LOCATION (PER ENSR SITE PLAN, 11/1998) |
| A4 | KPRG 2020 INVESTIGATION APPROXIMATE SAMPLING LOCATION (PER RUETTIGER, TONELLI & ASSOC. INC. PLAN, 11/2020) |
| WS-GT-4 | KPRG 2005 GEOTECH APPROXIMATE BORING LOCATION (PER KPRG FIGURE PLAN, 2005) |

NOTES:

* ASH AND WATER SAMPLES COLLECTED FROM THE EAST AND WEST ASH PONDS IN 2018 AS PART OF 2019 KPRG ASD. BOTTOM ASH SAMPLES (BOTTOM ASH-1, BOTTOM ASH-2, AND BOTTOM ASH1/2) COLLECTED FROM EAST AND WEST ASH PONDS AS PART OF KPRG 2004 SAMPLING.

SOURCE: IMAGE ADAPTED FROM GOOGLE EARTH IMAGERY DATED JUNE 2020.



PREPARED FOR:

MIDWEST GENERATION, LLC

# APPROXIMATE SAMPLE LOCATION MAP - WAUKEGAN STATION

401 E. GREENWOOD AVENUE
WAUKEGAN, IL



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(312) 922-1030 www.wcgrp.com

| | |
|---|---|
| DRAWN BY: | RD |
| REVIEWED BY: | AF |
| DATE: | 4/16/2021 |
| FILE: | 5244-300 |
| CAD: | WaukeganSite.dwg |

MWG13-15_81481

FIGURE 8

Electronic Filing: Received, Clerk's Office 01/21/2022

# Tables

# Table 1
## Historical Leaching Data
## Joliet 29 Station

| Parameter | Units | Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater [a] | KPRG CCB Determination June 8, 2005 — Soil Borings - Composite | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GP-1/0-8' | GP-2/0-11' | GP-3/0-8' | GP-4/0-4' | GP-5/0-4' | GP-6/0-7' | GP-7/0-2' | GP-8/0-13' | GP-9/0-18' | GP-10/0-9' | GP-11/0-17' | GP-12/0-7' | GP-13/0-3' | GP-14/0-9' | GP-15/0-6' |
| **Toxicity Characteristic Leaching Procedure** | | | | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Neutral Leaching Extraction Test** | | | | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0 .01 | <0.01 | <0.01 | <0.01 | <0 .01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Barium | mg/L | 2.0 | 0.11 | 0.088 | 0.13 | 0.042 | 0 .091 | 0.11 | 0.16 | 0.15 | 0.14 | 0.11 | 0.0878 | 0.12 | 0.26 | 0 .15 | 0 .17 |
| Beryllium | mg/L | 0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0 .004 | <0 .004 | <0.004 | <0.004 | <0.004 |
| Boron | mg/L | 2.0 | 0.37 | 1.1 | 0.66 | 0.47 | 0.33 | 0.73 | 0.87 | 1.2 | **2.2** | 0.77 | 1.3 | 0.86 | 0.43 | 1.9 | 1.2 |
| Cadmium | mg/L | 0.005 | 0.005 | <0.002 | <0.002 | <0.002 | <0.002 | <0 .002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0 .002 | <0.002 | <0.002 | <0.002 |
| Chromium | mg/L | 0.1 | <0.01 | 0.012 | <0.01 | <0.01 | <0 .01 | <0.01 | <0.01 | 0.011 | 0.010 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cobalt | mg/L | 1.0 | <0.005 | <0.005 | <0.005 | <0.005 | <0 .006 | <0.006 | <0.005 | <0.005 | <0.005 | <0 .005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Copper | mg/L | 0.65 | <0.01 | <0.01 | <0.01 | <0:01 | <0.01 | 0.048 | 0.0158 | <0.01 | <0.01 | 0.021 | <0.01 | 0.43 | <0.01 | **1.6** | <0.01 |
| Iron | mg/L | 5.0 | <0.05 | <0.05 | <0 .05 | <0.06 | <0.05 | <0 .05 | <0.05 | <0.05 | <0.05 | <0 .06 | <0.05 | <0.05 | <0.06 | <0.05 | <0.06 |
| Lead | mg/L | 0.0075 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.006 | **0.016** | <0.005 | **0.043** | <0.005 |
| Manganese | mg/L | 0.15 | <0 .01 | <0.01 | <0 .01 | <0.01 | <0.01 | <0 .01 | <0 .01 | <0.01 | <0.01 | <0.01 | 0.036 | <0.01 | <0.01 | <0.01 | <0.01 |
| Mercury | mg/L | 0.002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0 .0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0 .0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| *Molybdenum* | mg/L | 0.035 | 0.017 | 0.022 | 0.013 | <0.01 | <0.01 | 0.011 | 0.026 | 0.012 | **0.088** | <0 .01 | 0.015 | 0.0188 | <0.01 | 0.026 | <0.01 |
| Nickel | mg/L | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Potassium | mg/L | --- | 0.96 | 1.3 | 1.2 | 0.52 | <6 | 1.8 | 3.68 | 2.4 8 | 3.3 | 1.3 8 | 3.8 | 1.88 | 1.28 | 2.48 | 1.88 |
| Selenium | mg/L | 0.05 | <0 .002 | <0.002 | <0.002 | <0 .002 | <0.002 | <0.002 | 0.0027 | 0.0039 | 0.0046 | <0.002 | <0 .002 | <0.002 | 0.0027 | <0.002 | <0.002 |
| Sodium | mg/L | --- | 3.9 | 6.1 | 4.4 | 6.4 | 3.1 | 14 | 36 | 24 | 43 | 5.6 | 9.2 | 36 | 9 .1 | 9.2 | 7.2 |
| Zinc | mg/L | 5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0 .02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.068 | <0 .02 | 0.21 | <0.02 |
| **General Chemistry** | | | | | | | | | | | | | | | | | |
| pH | S.U. | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| | |
|---|---|
| **5** | Concentration exceeds the Tier 1 SRO |

Notes:

[a] Tier 1 SRO obtained from TACO 35 IAC 742, Appendix B, Table A.

*Italics* indicates a non-TACO objective. Objective obtained from the IEPA non-TACO Table revised 10/24/2018.

NA - Not Analyzed

"<" - Indicates the parameter was not detected above the laboratory reporting limit.

--- Not listed in 35 IAC 742, Appendix B, Table A or IEPA non-TACO Table.

# Table 1
## Historical Leaching Data
## Joliet 29 Station

| Parameter | Units | Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater [a] | KPRG Ash/Slag Removal November 4, 2005 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Soil Probes - Composite | | Test Pit - Composite | Soil Probes - Composite | | | | | | |
| | | | GP14A-25N/0-9' | GP14A-40N/0-9' | GP14A-45N/0-9' | GP14A-25W/0-9' | GP14A-40W/0-9' | GP14A-25S/0-9' | GP14A-40S/0-9' | GP14A-25E/0-9' | GP14A-40E/0-9' | GP14A-Profile/0-9' |
| **Toxicity Characteristic Leaching Procedure** | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 |
| Barium | mg/L | 2.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1 |
| Cadmium | mg/L | 0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 |
| Chromium | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 |
| Lead | mg/L | 0.0075 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 |
| Mercury | mg/L | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.002 |
| Selenium | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 |
| Silver | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 |
| **Neutral Leaching Extraction Test** | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | mg/L | 0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | mg/L | 2.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | mg/L | 1.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | mg/L | 0.65 | <0.05 | <0.05 | NA | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA |
| Iron | mg/L | 5.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | **0.018** | <0.0075 | 0.0072 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | NA |
| Manganese | mg/L | 0.15 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| *Molybdenum* | mg/L | 0.035 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Potassium | mg/L | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sodium | mg/L | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | mg/L | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **General Chemistry** | | | | | | | | | | | | |
| pH | S.U. | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | 7.4 |

**5** Concentration exceeds the Tier 1 SRO

Notes:
[a] Tier 1 SRO obtained from TACO 35 IAC 742, Appendix B, Table A.
*Italics* indicates a non-TACO objective. Objective obtained from the IEPA non-TACO Table revised 1(
NA - Not Analyzed
"<" - Indicates the parameter was not detected above the laboratory reporting limit.
--- Not listed in 35 IAC 742, Appendix B, Table A or IEPA non-TACO Table.

**Table 2**
**Historical Leaching Data**
**Powerton Station**

| Parameter | Units | Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater [a] | Andrews Environmental Engineering, Inc. Test Pit Activities May 6, 2004 | | | | | | | | | | | | MWG Bottom Ash Sampling February 27, 2007 | KPRG Alternate Source Demonstration January 11, 2018 | | KPRG Alternate Source Demonstration January 4, 2019 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Test Pit Samples | | | | | | | | | | | | Composite | Composite | Composite | Composite | Composite |
| | | | TP-03/2.9' | TP-12/3.0' | TP-15/5.4' | SFA-1 | TP-16/6.6' | TP-19/2.7 | TP-23/4.8 | TP-27/7.2 | TP-29/8.0' | FS-01 | FS-02 | BA-01 | Powerton Bottom Ash | Ash Bypass Basin | Ash Surge Basin | Ash Bypass Basin | Ash Surge Basin |
| **Toxicity Characteristic Leaching Procedure** | | | | | | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | 0.18 | 0.43 | 0.21 | 0.22 | 0.095 | 1.5 | 0.17 | 0.17 | 0.17 | 0.16 | 0.18 | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | **0.008** | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | NA | NA | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | <0.05 | 0.027 | **0.16** | **0.13** | 0.024 | <0.05 | <0.05 | 0.026 | 0.053 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | NA | NA | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | NA | NA | NA | NA | NA | NA |
| Selenium | mg/L | 0.05 | **0.14** | **0.059** | **0.19** | **0.095** | **0.052** | 0.016 | 0.021 | 0.046 | **0.077** | **0.056** | **0.069** | NA | NA | NA | NA | NA | NA |
| Silver | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA |
| **Neutral Leaching Extraction Test** | | | | | | | | | | | | | | | | | | | |
| Antimony | mg/L | 0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | <0.006 | NA | NA | NA | NA |
| Arsenic | mg/L | 0.05 | <0.05 | <0.05 | 0.013 | <0.05 | <0.05 | 0.011 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | 0.22 | 0.27 | 0.21 | 0.15 | 0.24 | 0.33 | 0.37 | 0.21 | 0.2 | 0.28 | 0.21 | 0.39 | 0.27 | NA | NA | NA | NA |
| Beryllium | mg/L | 0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | NA | NA | NA | NA |
| Boron | mg/L | 2 | 1.5 | 1.1 | 1.2 | 1 | 0.32 | 0.1 | 1.4 | 0.84 | 0.65 | **4** | **3** | 0.087 | <0.1 | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | 0.027 | <0.05 | **0.16** | **0.16** | 0.032 | <0.05 | <0.05 | 0.036 | 0.092 | 0.015 | 0.021 | <0.05 | <0.025 | NA | NA | NA | NA |
| Cobalt | mg/L | 1.0 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.025 | NA | NA | NA | NA |
| Copper | mg/L | 0.65 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.025 | NA | NA | NA | NA |
| Iron | mg/L | 5.0 | <0.1 | 0.15 | <0.1 | <0.1 | <0.1 | 0.31 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | <0.0075 | NA | NA | NA | NA |
| Manganese | mg/L | 0.15 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.025 | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 0.0004 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | NA | NA | NA | NA |
| Nickel | mg/L | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.025 | NA | NA | NA | NA |
| Selenium | mg/L | 0.05 | **0.08** | 0.035 | **0.15** | **0.099** | 0.04 | <0.05 | <0.05 | 0.035 | 0.04 | 0.044 | 0.038 | <0.05 | <0.05 | NA | NA | NA | NA |
| Silver | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.025 | NA | NA | NA | NA |
| Thallium | mg/L | 0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | NA | NA | NA | NA |
| Zinc | mg/L | 5 | 0.07 | 0.17 | 0.098 | 0.037 | 0.041 | 0.067 | 0.053 | 0.054 | 0.056 | 0.053 | 0.053 | 0.044 | <0.1 | NA | NA | NA | NA |
| **Leaching Environmental Assessment Framework Analyses [b]** | | | | | | | | | | | | | | | | | | | |
| Antimony | mg/L | 0.006 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0011 | 0.0013 |
| Arsenic | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0048 | 0.0033 |
| Barium | mg/L | 2.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.35 | 0.15 |
| Beryllium | mg/L | 0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.00011 | <0.000057 |
| Boron | mg/L | 2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **3.7** | 0.36 | NA | NA |
| Cadmium | mg/L | 0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.00018 | <0.00013 |
| Calcium | mg/L | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 130 | 35 | NA | NA |
| Chromium | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0085 | 0.002 |
| Chloride | mg/L | 200 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 27 | 6.5 | NA | NA |
| Cobalt | mg/L | 1.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0014 | <0.000075 |
| Fluoride | mg/L | 4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.8 | 0.21 | 1.4 | 0.45 |
| Lead | mg/L | 0.0075 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0033 | <0.000094 |
| Lithium | mg/L | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0034 | 0.0097 |
| Mercury | mg/L | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.000065 | <0.000065 |
| *Molybdenum* | mg/L | *0.035* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.0039 | 0.0029 |
| Selenium | mg/L | 0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.00081 | <0.00081 |
| Sulfate | mg/L | 400 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **910** | 87 | NA | NA |
| Thallium | mg/L | 0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.000063 | <0.000063 |
| TDS | mg/L | 1200 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **1500** | 200 | NA | NA |
| pH | S.U. | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.8 | 8.5 | 9 | 8.6 |
| **General Chemistry** | | | | | | | | | | | | | | | | | | | |
| pH | S.U. | --- | 11.5 | 11.8 | 12.2 | 11.4 | 10.4 | 8.6 | 10.3 | 10.7 | 10.8 | 8.7 | 9.9 | NA | NA | NA | NA | NA | NA |

| | |
|---|---|
| **0.14** | Concentration exceeds the Tier 1 SRO |

Notes:
[a] Tier 1 SROs obtained from TACO 35 IAC 742, Appendix B, Table A.
[b] LEAF results from natural pH analysis shown.
*Italics* indicates a non-TACO objective. Objective obtained from the IEPA non-TACO Table revised 10/24/2018.
NA - Not Analyzed
"<" - Indicates the parameter was not detected above the laboratory reporting limit.
--- Not listed in 35 IAC 742, Appendix B, Table A or IEPA non-TACO Table.

**Table C**
**Historical Leaching Data**
**Will County Station**

| Parameter | Units | Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater [a] | MWG Bottom Ash Sampling December 2, 2010 | KPRG CCB Determination June-August 2015 | | | | | | | | | | | | | | | | | | | | | KPRG Alternate Source Demonstration | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Composite | Soil Borings - Composite | | | | | | | | | | | | | | | | | | | | | Composite | |
| | | | 3 South Bottom Ash | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C2 | C3 | C4 | C5 | C6 | C7 | D5 | D6 | D7 | Protocol 1 | AP 2S Ash | AP 3S Ash |
| **Toxicity Characteristic Leaching Procedure** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 | NA | NA |
| Barium | mg/L | 2.0 | 0.96 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.83 | NA | NA |
| Boron | mg/L | 2.0 | <0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.005 | NA | NA |
| Chromium | mg/L | 0.1 | 0.029 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.025 | NA | NA |
| Copper | mg/L | 0.65 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.025 | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 | NA | NA |
| Nickel | mg/L | 0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.025 | NA | NA |
| Selenium | mg/L | 0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 | NA | NA |
| Silver | mg/L | 0.05 | <0.025 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.025 | NA | NA |
| Zinc | mg/L | 5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 | NA | NA |
| **Neutral Leaching Extraction Test** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antimony | mg/L | 0.006 | <0.006 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA |
| Arsenic | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA |
| Barium | mg/L | 2.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | NA | NA |
| Beryllium | mg/L | 0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | NA | NA | NA |
| Boron | mg/L | 2.0 | 1.3 | 0.2 | 0.16 | 0.16 | 0.16 | 0.24 | <0.1 | <0.1 | <0.1 | <0.1 | 0.12 | 0.16 | 0.15 | <0.1 | 0.15 | <0.1 | <0.1 | <0.1 | <0.1 | 0.12 | 0.13 | NA | NA | NA |
| Cadmium | mg/L | 0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | NA | NA | NA |
| Chromium | mg/L | 0.1 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| Cobalt | mg/L | 1.0 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| Copper | mg/L | 0.65 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| Iron | mg/L | 5.0 | <0.1 | <0.2 | <0.2 | 0.3 | 0.21 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | 0.24 | 0.42 | <0.2 | 0.22 | 0.47 | <0.2 | NA | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA |
| Manganese | mg/L | 0.15 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| *Molybdenum* | mg/L | *0.035* | NA | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA |
| Mercury | mg/L | 0.002 | <0.002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | NA | NA | NA |
| Nickel | mg/L | 0.1 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| Potassium | mg/L | --- | NA | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | NA | NA | NA |
| Selenium | mg/L | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA | NA | NA |
| Silver | mg/L | 0.05 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | NA | NA | NA |
| Sodium | mg/L | --- | NA | 14 | 7.6 | 6.4 | 6.4 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | NA | NA | NA |
| Thallium | mg/L | 0.002 | <0.002 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | NA | NA | NA |
| Zinc | mg/L | 5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | NA | NA | NA |
| Cyanide, Total | mg/L | 0.2 | <0.01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloride | mg/L | 200 | 0.97 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | mg/L | 4 | 0.25 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrate as N | mg/L | 10 | <0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfate | mg/L | 400 | 49 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| TDS | mg/L | 1200 | 200 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Leaching Environmental Assessment Framework Analyses [b]** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boron | mg/L | 2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **4.6** | **3.3** |
| Calcium | mg/L | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 59 | 95 |
| Chloride | mg/L | 200 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 69 | 15 |
| Fluoride | mg/L | 4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 | 0.31 |
| Sulfate | mg/L | 400 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 310 | 390 |
| TDS | mg/L | 1200 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 590 | 610 |
| pH | SU | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.8 | 9.3 |
| **General Chemistry** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | S.U. | --- | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 6.99 | NA | NA |

**4.6** Concentration exceeds the Tier 1 SRO

Notes:
[a] Tier 1 SROs obtained from TACO 35 IAC 742, Appendix B, Table A.
[b] LEAF results from natural pH analysis shown.
*Italics* indicates a non-TACO objective. Objective obtained from the IEPA non-TACO Table revised 10/24/2018.
NA - Not Analyzed
"<" - Indicates the parameter was not detected above the laboratory reporting limit.
--- Not listed in 35 IAC 742, Appendix B, Table A or IEPA non-TACO Table.

**Table 4**
**Historical Leaching Data**
**Waukegan Station**

| Parameter | Units | Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater [a] | MWG Bottom Ash Sampling July 22, 2004 | | | KPRG Alternate Source Demonstration January 17, 2018 | | KPRG Bates Soil Investigation November 2020 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Composite | | | Composite | | Soil Probes | | | | | | |
| | | | Bottom Ash-1 | Bottom Ash-2 | Bottom Ash 1/2 | East Pond Ash | West Pond Ash | A1-0-5 | A8-5-7 | A9-0-5 | B10-5-9 | C7-0-5 | C7-5-10 | D5-5-10 |
| **Toxicity Characteristic Leaching Procedure** | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | NA | NA | <0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | NA | NA | 0.51 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | NA | NA | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | NA | NA | 0.011 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | mg/L | 0.15 | NA | NA | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | NA | NA | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | NA | NA | <0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | mg/L | 0.05 | NA | NA | 0.025 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | mg/L | 0.05 | NA | NA | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | mg/L | 5 | NA | NA | <0.2 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Synthetic Precipitation Leaching Procedure** | | | | | | | | | | | | | | |
| Sulfate | mg/L | 400 | NA | NA | NA | NA | NA | NA | 97 | NA | **460** | NA | 49 | 150 |
| **Neutral Leaching Extraction Test** | | | | | | | | | | | | | | |
| Antimony | mg/L | 0.006 | <0.006 | <0.006 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | mg/L | 0.05 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Barium | mg/L | 2.0 | 0.19 | 0.12 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | mg/L | 0.004 | <0.004 | <0.004 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | mg/L | 2 | 1.1 | 2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | mg/L | 0.005 | <0.005 | <0.005 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium | mg/L | 0.1 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | mg/L | 1.0 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | mg/L | 0.65 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Iron | mg/L | 5.0 | <0.1 | <0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | mg/L | 0.0075 | <0.0075 | <0.0075 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | mg/L | 0.15 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | mg/L | 0.002 | <0.002 | <0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | mg/L | 0.1 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | mg/L | 0.05 | <0.05 | <0.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | mg/L | 0.002 | <0.002 | <0.002 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | mg/L | 5 | <0.1 | <0.1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Leaching Environmental Assessment Framework Analyses [b]** | | | | | | | | | | | | | | |
| Arsenic | mg/L | 0.05 | NA | NA | NA | NA | NA | 0.011 | NA | **0.058** | NA | 0.022 | NA | NA |
| Boron | mg/L | 2 | NA | NA | NA | 2 | 1.9 | **5** | NA | **8.2** | NA | **13** | NA | NA |
| Calcium | mg/L | --- | NA | NA | NA | 43 | 42 | 55 | NA | 85 | NA | 150 | NA | NA |
| Chloride | mg/L | 200 | NA | NA | NA | 2.9 | 17 | 2.5 | NA | 1.2 | NA | 1.2 | NA | NA |
| Fluoride | mg/L | 4 | NA | NA | NA | 0.32 | 0.53 | NA | NA | NA | NA | NA | NA | NA |
| Iron | mg/L | 5 | NA | NA | NA | NA | NA | <0.05 | NA | <0.05 | NA | <0.05 | NA | NA |
| Lithium | mg/L | --- | NA | NA | NA | NA | NA | 0.014 | NA | 0.0048 | NA | 0.0042 | NA | NA |
| Manganese | mg/L | 0.15 | NA | NA | NA | NA | NA | 0.00093 | NA | 0.0013 | NA | 0.00098 | NA | NA |
| *Molybdenum* | mg/L | 0.035 | NA | NA | NA | NA | NA | **0.094** | NA | **0.072** | NA | **0.17** | NA | NA |
| Sulfate | mg/L | 400 | NA | NA | NA | 130 | 38 | 93 | NA | 140 | NA | 290 | NA | NA |
| Thallium | mg/L | 0.002 | NA | NA | NA | NA | NA | 0.00026 | NA | 0.00017 | NA | <0.001 | NA | NA |
| TDS | mg/L | 1,200 | NA | NA | NA | 270 | 240 | 220 | NA | 310 | NA | 580 | NA | NA |
| pH | SU | --- | NA | NA | NA | 9.7 | 9.7 | 9.4 | NA | 10.1 | NA | 9.6 | NA | NA |
| **General Chemistry** | | | | | | | | | | | | | | |
| pH | S.U. | --- | NA | NA | 10.5 | NA | NA | 9.0 | 9.1 | 9.2 | 7.5 | 8.5 | 8.8 | 7.3 |

**5** Concentration exceeds the Tier 1 SRO

Notes:
[a] Tier 1 SROs obtained from TACO 35 IAC 742, Appendix B, Table A.
[b] LEAF results from natural pH analysis shown.
*Italics* indicates a non-TACO objective. Objective obtained from the IEPA non-TACO Table revised 10/24/2018.
NA - Not Analyzed
"<" - Indicates the parameter was not detected above the laboratory reporting limit.
--- Not listed in 35 IAC 742, Appendix B, Table A or IEPA non-TACO Table.

# Appendix A

# Resumes

# Douglas G. Dorgan, Jr., LPG

Co-President, Principal

**EDUCATION**

B.S. Earth Science, Eastern Illinois University, 1986

Graduate Course Work in Environmental Studies, Sangamon State University, 1986

M.S. Geography/Environmental Science, Northern Illinois University, 1993

**CERTIFICATIONS**

Licensed Professional Geologist: Illinois, Indiana, and Kansas

OSHA Supervisor's Health & Safety Training Chemical-terrorism Vulnerability Information (CVI) Authorized User

**FIELDS OF EXPERTISE**

Environmental Due Diligence, Environmental Permitting, Brownfield's Redevelopment, Remediation Design and Cost Modeling, Groundwater Impact Assessment, Risk Based Corrective Action, Expert Witness and Litigation Support

## Professional Summary

Mr. Dorgan serves as Co-President and Principal of Weaver Consultants Group. He has over thirty-five years of environmental and solid waste control project experience. He has supervised completion of numerous projects including multi-phase environmental site assessments, risk based corrective action, Brownfield's redevelopment, hydrogeological investigations, groundwater impact assessments, remediation planning and implementation, multi media compliance audits, UST closures, and solid waste management facility permitting. He has also served as an Expert Witness.

Prior to joining Weaver Consultants Group, Mr. Dorgan was an Office Director for a national environmental consulting firm.

## Select Project Experience

He has been involved in over 100 state voluntary remediation program projects at sites located across the country. These projects have utilized a range of closure strategies involving site-specific fate and transport modeling, risk assessment, remediation, land use controls, and engineered barriers. Many of these projects were completed in support of property acquisition and consequently completed in accordance with aggressive schedule and risk mitigation requirements.

Mr. Dorgan has provided services to both private and public sector clients redeveloping Brownfield's. Plans have included residential, retail, commercial, industrial, institutional, and mixed use developments. He also consults on the unique construction related aspects of developing distressed properties.

He has been the Principal in Charge for the Environmental Due Diligence associated with acquisition of the 3100 acre former Bethlehem/RG Steel facility in Sparrows Point, Maryland. Since completion of the property acquisition, Mr. Dorgan has been serving as the Project Coordinator on behalf of the owner, Tradepoint Atlantic, LLC. His responsibilities include coordination of environmental obligations being performed pursuant to regulatory agreements executed with both the Maryland Department of Environment and the United States Environmental Protection Agency.

In his role as lead consultant, Mr. Dorgan is supporting due diligence undertaken by a national industrial redevelopment company that specializes in acquisition of distressed assets across the United States. Mr. Dorgan's role includes leading a team of environmental professionals supporting due diligence including completion of Environmental Site Assessments, remedial options evaluation and cost modeling, support to environmental insurance underwriting review, and support in communications with capital partners and investment advisors. Properties include closed steel mills, power plants, petrochemical facilities, shipyards, ports, and oil and gas operations.



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## Select Project Experience - Continued

Mr. Dorgan has been the Principal in Charge for environmental investigation and cleanup activities conducted by a Class I Railroad Operator at sites located in five states across the Midwest. Activities have included investigations and risk based cleanups conducted pursuant to various state voluntary cleanup programs.

He managed activities performed in compliance with a RCRA Hazardous Waste Management Permit for a major steel company located in Northwest Indiana. Responsibilities include supervision of preparation of permit renewal and amendment applications, permit negotiations with IDEM and USEPA, and ongoing groundwater sampling and reporting for a hazardous waste landfill network comprised of 64 monitoring points. Mr. Dorgan also managed RCRA Corrective Action activities for the site, including preparation of required plans and deliverables and investigation and corrective measures implementation pursuant to approved workplans.

Mr. Dorgan managed acquisition of a comprehensive "No Further Remediation" letter pursuant to the Illinois Site Remediation Program for a 14-acre parcel located in the northern suburbs of Chicago. A soil and groundwater investigation was performed to assess site impacts. Tier 2 modeling and development of site specific background following the Illinois Tiered Approach to Corrective Action Objectives (TACO) methods were used to support appropriate soil and groundwater remediation objectives. Remediation activities included removal of 45,000 tons of debris and fill material, and excavation and disposal of LUST contaminated soils.

As Principal in Charge, Mr. Dorgan was previously responsible for overseeing design, permitting and compliance activities for a Type II and III Solid Waste Disposal facility in Pines, Indiana. He was also responsible for oversight of ongoing RI/FS activities for the Town of Pines Superfund Site in Pines, Indiana. On behalf of a major PRP, Mr. Dorgan collaborated with other technical consultants on the implementation of the RI/FS and ongoing remedial measures development and construction.

He managed the site investigation and Indiana Voluntary Remediation Program activities for a large glass manufacturing facility in Central Indiana. Site investigation activities resulted in remediation of select facility areas to control for impacts attributable to semi-volatile organic compounds, polychlorinated biphenyl's (PCB's), and inorganic constituents. Additional site measures included removal of contaminated creek sediments and implementation of a comprehensive groundwater investigation.

Mr. Dorgan managed an Illinois SRP application for a former die casting facility with PCB impacts to facility structures, soils, and shallow groundwater. Extensive site investigation was undertaken and TACO Tier 2 and 3 modeling performed. Certain remedial objectives for the project were approved through a Risk Based Disposal Approval Request submitted to USEPA Region 5.

He was Project Manager for a comprehensive Phase I Environmental Site Assessment of the General Motors Danville, IL gray iron foundry whose operations date to the early 1940s. Project required a detailed records review and site inspection to identify potential areas of concern. Subsequent responsibilities included developing a scope of work for site investigation.

Mr. Dorgan managed implementation of a facility-wide investigation for PCB-related impacts at a die casting facility in Chicago, Illinois. The investigation scope included sampling of soil, concrete, structural surfaces, and process equipment. Based on investigation results, alternative risk-based opinions were evaluated for site remediation. In support of on-going litigation, an engineering remediation cost estimate was generated.

Mr. Dorgan managed RCRA Corrective Action activities for a specialty steel manufacturing facility in Niles, Michigan. Activities included operation and monitoring of an Interim Measures groundwater remediation system, implementation of preliminary subsurface investigations, development of RCRA RFI Workplans, and negotiations with Michigan Department of Environmental Quality personnel.

He conducted comprehensive and media-specific environmental compliance audits of facilities located in four states for a major medical diagnostic imaging equipment manufacturer. Comprehensive audits were performed for select waste and scrap material management facilities. Audits included recommendations for corrective measures in addition to development of a division-wide program for management of recoverable waste streams.

## Select Project Experience - Continued

Mr. Dorgan was the Project Manager for a Phase I and II Environmental Site Assessment of a 1.1 million square foot former can manufacturing facility in Chicago. Assessment activities were designed to evaluate long term liabilities and environmental considerations associated with facility reuse and/or demolition planning.

## Publications and Presentations

**"Environmental Audits for Selection of Solid Waste Disposal Sites",** presented at Waubonsee Community College, Sugar Grove, IL, November, 1992

**"Conducting Effective Environmental Site Assessments",** presented to the Institute of Business Law Conference 'Environmental Regulation in Illinois', September, 1993

**"Minimizing Liability in Real Estate Transactions by Conducting Effective Environmental Site Assessments",** New Mexico Conference on the Environment, Journal of Conference Proceedings, April, 1994

**"General Geologic/Hydrogeologic and Contaminant Transport Principles",** presented to ITT/Hartford Insurance Co., January, 1996

**"Environmental Site Assessments and the Due Diligence Process",** presented to the AIG Environmental seminar 'Legal Actions Against Facilities', March, 1998

**"Brownfields Development, TACO and the SRP Process",** presented to the Calumet Area Industrial Commission Executive Council, May, 1998

**"Property Acquisition and the Due Diligence Process",** presented to Cushman and Wakefield Corporate Services Department, August, 1998

**"Brownfields Development, TACO and the SRP Process",** presented to the Calumet Area Industrial Commission, March, 1999

**"Risk Management Tools for Contaminated Site Development",** presented to a construction industry seminar 'A View From the Top', February, 2000

**"Voluntary Remediation of Brownfields/Risk Based Remediation",** presented to Illinois Association of Realtors, October, 2002

**"Blue Skies for Brownfields",** Illinois Association of Realtors Magazine, May, 2003

**"Environmental Considerations Associated with Site Development",** presented to Power Construction Operations Meeting, March, 2006

**"Weaver Consultants Group Environmental Manager AAI Roundtable",** facilitator and presenter, June, 2006

**"Overview of AAI and ASTM E1527-05: The Changing Due Diligence Landscape",** presented to Grand Rapids Chamber of Commerce Environmental Committee, January, 2007

**"Weaver Consultants Group Environmental Manager Vapor Intrusion Roundtable",** facilitator and presenter, July/November, 2007

**"Brownfields Redevelopment: A Catalyst for Change",** presented to Indiana University Northwest, July, 2011

# Michael B. Maxwell, LPG

EPG Chicago Operations Manager

**EDUCATION**

M.S. Geology, University of Iowa, 1996

B.A. Geological Science, State University of New York, College at Geneseo, 1994

**CERTIFICATIONS**

Licensed Professional Geologist (LPG), Illinois and Indiana

Certified Hazardous Materials Manager (CHMM)
OSHA 40 Hour Hazardous Waste Site Worker and OSHA 8 Hour Refresher Course

## Professional Summary

Mr. Maxwell serves as the Environmental Practice Group Chicago Operations Manager for Weaver Consultants Group. He has over twenty four years of professional consulting experience in conducting and managing a wide variety of environmental and solid/hazardous waste facility projects. These projects have included detailed environmental studies and closures of solid and hazardous waste disposal facilities, as well as industrial manufacturing operations. He has successfully completed numerous environmental projects including: multi-phase environmental site assessments, risk-based corrective action and closure, UST closures, hazardous and solid waste permitting, and corrective action, routine groundwater monitoring, groundwater assessment reports, and hydrogeological investigations. He has also played the key supporting/management role in preparation of Expert Reports and testimony as an Expert Witness related to various legal cases involving investigations/remediation under CERCLA (Superfund) and various state voluntary cleanup program regulations.

## Select Project Experience

Mr. Maxwell is project director for permitting, design, and compliance activities at an industrial waste (coal ash) disposal facility in northwest Indiana. The facility is regulated under two different permits and is also part of a larger RI/FS investigation conducted within the local municipality under an Agreed Order with USEPA based on the CERCLA regulations. Activities managed include detection, assessment, and corrective action groundwater/surface water planning/monitoring, and supplemental closure, including wetlands investigations and permitting.

Mr. Maxwell assisted with the preparation of an Expert Witness Report and subsequent deposition testimony associated with CERCLA liability, cost allocation, appropriateness, and costs associated with the selected remedy related to a former zinc smelter located in the Metro East Area in Illinois.

He has also played the key supporting role in the preparation of Expert Opinions and deposition testimony in support of defendants involved in toxic tort and property damage litigation claims related to historic use of chlorinated solvents at an industrial facility in St. Louis, MO. The facility and surrounding residential neighborhood has been extensively investigated over the last 25 plus years under a prior Consent Degree with the State of Missouri and ongoing investigation/remediation under a separate Consent Decree with USEPA, which requires extensive investigation/remediation activities modeled after CERCLA.

Mr. Maxwell has been involved in over 100 state voluntary remediation program projects at sites in the Midwest and Mid-Atlantic. These projects have utilized a range of closure strategies, often involving site-specific fate and transport modeling, risk assessment, remediation, land use controls, and engineered barriers. Many of these projects were completed to support property transactions with aggressive schedules and risk mitigation requirements.

He has provided environmental consulting services related to compliance with the closure and groundwater monitoring requirements under 40 CFR 257 Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals From Electric Utilities rules (Federal CCR Regulations). Mr. Maxwell assisted in the design and installation of the initial groundwater monitoring system, including preparation of the Groundwater Sampling and Analysis Plan, oversaw the collection of the initial eight rounds of background data, as well as the statistical evaluation of the groundwater monitoring data. The groundwater monitoring data was intended to support the preparation and regulatory approval of Closure Plans for the facilities. He was also involved in addressing various technical comments provided by the state regulators concerning the Closure Plans for both facilities. Services provided to local Indiana utility and general contractor that prepared the Closure Plans.

Mr. Maxwell managed the review of Groundwater Monitoring Reports prepared under the Federal CCR Regulations for two former Coal Ash Impoundment sites in northern New Jersey. The former surface impoundments were closed by removal as part of the facilities being redeveloped into commercial/industrial mixed use properties. Liability protections were attained for the site owner under the New Jersey Voluntary Cleanup Program.

He prepared a Technical Impracticability (TI) Waiver related to the remedial approach selected in the Record of Decision (ROD) to address a complex chlorinated solvents groundwater plume at a rail yard Superfund site located in northern Indiana. Supporting information for the TI waiver was obtained from a number of other chlorinated solvent groundwater remediation projects in vicinity of the railyard. The TI Waiver was utilized as the basis for the issuance of an Amended ROD by USEPA. The Amended ROD waived the prior requirement to restore the aquifer to drinking water standards throughout the plumes and required various other source control measures, aquifer flushing, groundwater monitoring, and further investigation/remediation within certain parts of the Superfund site.

Mr. Maxwell has managed Phase II ESA activities and developed a Response Action Plan (RAP) compliant with the Maryland Voluntary Cleanup Program for a 48-acre parcel of prime real estate not far from the I-95 corridor that is part of a larger 3,300 acre redevelopment of a former steel mill located in Baltimore, MD. The environmental due diligence and risk management activities are being performed to support attainment of a NFA Letter that will be acceptable to the current landowner, developer, and future lessee.

He has performed site investigation and Indiana Voluntary Remediation Program (VRP) closure activities for a large glass manufacturing facility in Central Indiana. Site Investigation activities resulted in remediation of select facility areas to control for impacts attributable to semi-volatile organic compounds, PCB’s and inorganic constituents. Additional site measures included removal of contaminated creek sediments and implementation of a comprehensive groundwater investigation. The Remediation Completion Report was approved by IDEM and a Comprehensive Certificate of Completion has been issued under the Indiana VRP.

Mr. Maxwell supervised a team of over five technical staff involved in the due diligence review of the environmental conditions associated with a portfolio of nearly 300 commercial/industrial properties owned by a Real Estate Investment Trust in support of a proposed asset transfer totaling approximately $3.4 billion. The results of the due diligence review were presented in a master spreadsheet that highlighted key environmental issues associated with each property. The review was completed within a compressed timeline of 3 weeks in order to meet the client specified closing schedule.

He was project manager for a LUST remediation project for a 2 acre parcel in the west suburbs of Chicago formerly containing a gasoline station and various other commercial buildings. Remedial and site development activities completed at the site included the demolition of the previous gas station and other commercial buildings, UST removal, along with the excavation and disposal of greater than 2,000 tons of petroleum impacted soils. The costs incurred for the remedial activities were eligible for reimbursement under the Illinois LUST Fund and over $200,000 were approved for payment from the LUST Fund. The remediation activities allowed for the timely redevelopment of the property as a drug store for a nationwide chain.

Mr. Maxwell has managed remedial and report writing activities for the remediation and redevelopment of a high profile 7.5 acre Brownfield redevelopment property on Goose Island within the City of Chicago. The undeveloped site was entered into the Illinois SRP for purposes of securing a Comprehensive NFR Letter. A Draft NFR Letter was attained in a timely manner, allowing for the closing of the real estate transaction. Implementation of risk-based remediation strategies, including soil management zone, engineered barriers, and institutional controls instead of active remediation saved the property owner millions of dollars. The final NFR Letter from the state agency has been issued.

He has prepared two petitions to delist multi-source leachates that were considered listed hazardous wastes under RCRA. The documents include a risk assessment of the petitioned waste using the Delisting Risk Assessment Software (DRAS) developed by USEPA. Also, Mr. Maxwell provided testimony relating to the technical content of the Delisting Petition at a hearing before the Illinois Pollution Control Board. One Delisting Petition has been approved by the Illinois Pollution Control Board and the other is under review by USEPA Region VII.

Mr. Maxwell has supervised technical support staff involved in hydrogeologic site investigations designed to comply with detailed solid and hazardous waste permitting requirements in Indiana. The specific activities included the field drilling program, data evaluation, and preparation of the hydrogeologic site investigation for inclusion in the permit applications. The reports were subsequently approved by the state agency and assisted the client in attaining expansion and/or renewal permits.

He has both performed and supervised numerous projects relating to permitting and regulatory compliance at a Hazardous Waste Disposal Facility in northwest Indiana. Tasks completed included: RCRA permit compliance, RCRA permit modifications, permit renewals, preparation of assessment monitoring reports and preparation of Alternate Source Demonstration Reports. The Alternate Source Demonstration Reports documented that the hazardous waste landfill was not the cause of statistically significant concentrations of barium and cyanide in groundwater. The reports were subsequently approved by state regulators, which avoided implementation of costly compliance groundwater monitoring at the facility.

Mr. Maxwell has prepared various report documents supporting RCRA Corrective Action activities at two steel finishing facility properties located in Portage, IN. The RCRA Facility Investigation (RFI) Workplan detailed proposed investigation and corrective action activities at numerous solid waste management units (SWMUs) identified on the property containing the active steel finishing mill, as well as the property that formerly contained various waste disposal lagoons associated with the mill.

The reports prepared by Mr. Maxwell have resulted in the regulatory closure under RCRA in the form of the attainment of No Further Action (NFA) Letters for two individual SWMUs and three interim status RCRA Units located on the property that formerly contained various waste disposal lagoons. The closure of these SWMUs allowed for 50 acres of land along Lake Michigan to ultimately become part of the Indiana Dunes National Lakeshore.

The various reports and evaluations prepared by Mr. Maxwell have resulted in the regulatory closure under RCRA in the form of the issuance of NFA Letters for 12 SWMUs located on property containing an active steel finishing mill. The technical evaluation which demonstrates that site conditions were eligible for closure included application of Indiana's Risk-Integrated System of Closure (RISC), as well as the more recently implemented Indiana Remediation Closure Guidance.

He is responsible for all aspects of groundwater monitoring projects at over two dozen solid and hazardous waste disposal facilities, including: groundwater sampling, interpretation of analytical results, statistical evaluation, and report writing.

Mr. Maxwell is presently managing implementation of a comprehensive groundwater monitoring and free product recovery program at various RCRA land disposal units located at a 4,000 acre steelmaking/finishing facility in northwest Indiana. Quarterly groundwater monitoring is being performed at over 100 monitoring points by a team of environmental professionals. Closure has also been approved under the Indiana State Cleanup Program for a historical LUST Incident on an adjacent railyard.

He has prepared an Alternate Concentration Limit (ACL) Demonstration for a closed RCRA Solid Waste Disposal facility in southern Indiana. The ACLs were shown to be protective of human health and the environment using various risk-based methodologies, including: Risk-Based Corrective Action (RBCA), and the state of Indiana Risk Integrated System of Closure. The ACL Demonstration was subsequently approved by IDEM.

## Publications/Presentations

"Synthetic Soils From Industrial and Municipal Wastes, For the Reclamation of Strip Mines in Southern Iowa", presented at the Geological Society of America North-Central Meeting, Ames, IA, May 1996.

"Side-by-Side Comparison of Two Groundwater Sampling Methodologies: A Quantitative Review of Analytical Data from Groundwater Samples Collected Simultaneously Using Micropurge 'Low-Flow' and Traditional Standard Groundwater Sampling Techniques", presented at the National Groundwater Association National Conference, Denver, CO, April 2010.

## References

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Address: 4100 Edison Lakes Parkway, Mishawaka, IN 46545
Phone Number: (574) 855-1522

Name: **Mr. Kevin Stetter,** Manager, Corrective Action - United States Steel Corporation
Address: Penn Liberty Plaza 1, 1350 Penn Ave – Suite 200, Pittsburgh, PA 1522-4211
Phone Number: (412) 433-4070

Name: **Mr. Jim Hitzeroth,** Environmental Manager**,** Republic Services
Address: 26W580 Schick Rd., Hanover Park, IL 60133
Phone Number: (224) 970-1129

# Appendix B

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Code of Federal Regulations (CFR), Title 40. Protection of Environment, Chapter I. Environmental Protection Agency, Subchapter I. Solid Wastes, Part 258. Criteria for Municipal Solid Waste Landfills.

Code of Federal Regulations (CFR), Title 40. Protection of Environment, Chapter I. Environmental Protection Agency, Subchapter I. Solid Wastes, Part 261. Identification and Listing of Hazardous Waste.

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# Appendix C

# Statistical Evaluation of Groundwater Data

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Joliet 29 Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Antimony, Dissolved | MW-01 | none | | |
| Antimony, Dissolved | MW-02 | none | | |
| Antimony, Dissolved | MW-03 | none | | |
| Antimony, Dissolved | MW-04 | none | | |
| Antimony, Dissolved | MW-06 | none | | |
| Antimony, Dissolved | MW-07 | none | | |
| Antimony, Total | MW-03 | none | | |
| Antimony, Total | MW-04 | none | | |
| Arsenic, Dissolved | MW-01 | none | | |
| Arsenic, Dissolved | MW-02 | none | | |
| Arsenic, Dissolved | MW-03 | Down ↓ | No | |
| Arsenic, Dissolved | MW-04 | none | | |
| Arsenic, Dissolved | MW-06 | Down ↓ | No | |
| Arsenic, Dissolved | MW-07 | none | | |
| Arsenic, Total | MW-03 | Up ↑ | No | |
| Arsenic, Total | MW-04 | none | | |
| Barium, Dissolved | MW-01 | Down ↓ | No | |
| Barium, Dissolved | MW-02 | Down ↓ | Yes | |
| Barium, Dissolved | MW-03 | Up ↑ | No | |
| Barium, Dissolved | MW-04 | Up ↑ | Yes | No |
| Barium, Dissolved | MW-06 | Up ↑ | No | |
| Barium, Dissolved | MW-07 | none | | |
| Barium, Total | MW-03 | Down ↓ | No | |
| Barium, Total | MW-04 | Down ↓ | No | |
| Beryllium, Dissolved | MW-01 | none | | |
| Beryllium, Dissolved | MW-02 | none | | |
| Beryllium, Dissolved | MW-03 | none | | |
| Beryllium, Dissolved | MW-04 | none | | |
| Beryllium, Dissolved | MW-06 | none | | |
| Beryllium, Dissolved | MW-07 | none | | |
| Beryllium, Total | MW-03 | none | | |
| Beryllium, Total | MW-04 | none | | |
| Boron, Dissolved | MW-01 | Down ↓ | No | |
| Boron, Dissolved | MW-02 | Down ↓ | Yes | |
| Boron, Dissolved | MW-03 | Up ↑ | No | |
| Boron, Dissolved | MW-04 | Down ↓ | No | |
| Boron, Dissolved | MW-06 | Down ↓ | Yes | |
| Boron, Dissolved | MW-07 | Down ↓ | No | |
| Boron, Total | MW-03 | Down ↓ | No | |
| Boron, Total | MW-04 | none | | |
| Cadmium, Dissolved | MW-01 | none | | |
| Cadmium, Dissolved | MW-02 | none | | |
| Cadmium, Dissolved | MW-03 | none | | |
| Cadmium, Dissolved | MW-04 | none | | |
| Cadmium, Dissolved | MW-06 | none | | |
| Cadmium, Dissolved | MW-07 | none | | |
| Cadmium, Total | MW-03 | none | | |
| Cadmium, Total | MW-04 | none | | |
| Calcium, Total | MW-03 | none | | |

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Joliet 29 Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Calcium, Total | MW-04 | Up ↑ | No | |
| Chloride | MW-01 | Down ↓ | No | |
| Chloride | MW-02 | none | | |
| Chloride | MW-03 | Down ↓ | Yes | |
| Chloride | MW-04 | Down ↓ | No | |
| Chloride | MW-06 | none | | |
| Chloride | MW-07 | Down ↓ | No | |
| Chromium, Dissolved | MW-01 | none | | |
| Chromium, Dissolved | MW-02 | none | | |
| Chromium, Dissolved | MW-03 | none | | |
| Chromium, Dissolved | MW-04 | none | | |
| Chromium, Dissolved | MW-06 | none | | |
| Chromium, Dissolved | MW-07 | none | | |
| Chromium, Total | MW-03 | none | | |
| Chromium, Total | MW-04 | none | | |
| Cobalt, Dissolved | MW-01 | none | | |
| Cobalt, Dissolved | MW-02 | none | | |
| Cobalt, Dissolved | MW-03 | none | | |
| Cobalt, Dissolved | MW-04 | Up ↑ | No | |
| Cobalt, Dissolved | MW-06 | none | | |
| Cobalt, Dissolved | MW-07 | none | | |
| Cobalt, Total | MW-03 | none | | |
| Cobalt, Total | MW-04 | none | | |
| Fluoride | MW-01 | Down ↓ | No | |
| Fluoride | MW-02 | Down ↓ | Yes | |
| Fluoride | MW-03 | none | | |
| Fluoride | MW-04 | none | | |
| Fluoride | MW-06 | Down ↓ | Yes | |
| Fluoride | MW-07 | Down ↓ | Yes | |
| Lead, Dissolved | MW-01 | none | | |
| Lead, Dissolved | MW-02 | none | | |
| Lead, Dissolved | MW-03 | none | | |
| Lead, Dissolved | MW-04 | none | | |
| Lead, Dissolved | MW-06 | none | | |
| Lead, Dissolved | MW-07 | none | | |
| Lead, Total | MW-03 | none | | |
| Lead, Total | MW-04 | none | | |
| Lithium, Total | MW-03 | none | | |
| Lithium, Total | MW-04 | Up ↑ | No | |
| Mercury, Dissolved | MW-01 | none | | |
| Mercury, Dissolved | MW-02 | none | | |
| Mercury, Dissolved | MW-03 | none | | |
| Mercury, Dissolved | MW-04 | none | | |
| Mercury, Dissolved | MW-06 | none | | |
| Mercury, Dissolved | MW-07 | none | | |
| Mercury, Total | MW-03 | none | | |
| Mercury, Total | MW-04 | none | | |
| Molybdenum, Total | MW-03 | Up ↑ | No | |
| Molybdenum, Total | MW-04 | Up ↑ | No | |

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Joliet 29 Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| pH, Field | MW-03 | Down ↓ | No | |
| pH, Field | MW-04 | Down ↓ | No | |
| pH, Field | MW-06 | Down ↓ | No | |
| pH, Field | MW-07 | Down ↓ | Yes | |
| Radium 226 + 228, Comb | MW-03 | none | | |
| Radium 226 + 228, Comb | MW-04 | none | | |
| Selenium, Dissolved | MW-01 | Up ↑ | No | |
| Selenium, Dissolved | MW-02 | none | | |
| Selenium, Dissolved | MW-03 | none | | |
| Selenium, Dissolved | MW-04 | none | | |
| Selenium, Dissolved | MW-06 | Down ↓ | No | |
| Selenium, Dissolved | MW-07 | none | | |
| Selenium, Total | MW-03 | none | | |
| Selenium, Total | MW-04 | none | | |
| Sulfate | MW-01 | Down ↓ | No | |
| Sulfate | MW-02 | Down ↓ | No | |
| Sulfate | MW-03 | Down ↓ | Yes | |
| Sulfate | MW-04 | Down ↓ | No | |
| Sulfate | MW-06 | Down ↓ | No | |
| Sulfate | MW-07 | Down ↓ | No | |
| Thallium, Dissolved | MW-01 | none | | |
| Thallium, Dissolved | MW-02 | none | | |
| Thallium, Dissolved | MW-03 | none | | |
| Thallium, Dissolved | MW-04 | none | | |
| Thallium, Dissolved | MW-06 | none | | |
| Thallium, Dissolved | MW-07 | none | | |
| Thallium, Total | MW-03 | none | | |
| Thallium, Total | MW-04 | none | | |
| Total Dissolved Solids | MW-01 | Up ↑ | No | |
| Total Dissolved Solids | MW-02 | Up ↑ | No | |
| Total Dissolved Solids | MW-03 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-04 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-06 | none | | |
| Total Dissolved Solids | MW-07 | Down ↓ | No | |

Joliet Stats Summary:

| | | |
|---|---|---|
| 34 | 26% | Downward trends (11 significant) |
| 13 | 10% | Upward trends (1 significant) |
| 85 | 64% | No trend |
| **132** | | **Total Tests Performed** |

47 Total Tests where a trend is present
72% of tests where a trend is present are downward
28% of tests where a trend is present are upward

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Antimony, Dissolved | MW-03 | none | | |
| Antimony, Dissolved | MW-04 | none | | |
| Antimony, Dissolved | MW-05 | none | | |
| Antimony, Dissolved | MW-06 | none | | |
| Antimony, Dissolved | MW-07 | none | | |
| Antimony, Dissolved | MW-08 | none | | |
| Antimony, Dissolved | MW-13 | none | | |
| Antimony, Dissolved | MW-14 | none | | |
| Antimony, Dissolved | MW-15 | none | | |
| Antimony, Total | MW-03 | none | | |
| Antimony, Total | MW-04 | none | | |
| Antimony, Total | MW-05 | none | | |
| Antimony, Total | MW-08 | none | | |
| Antimony, Total | MW-15 | none | | |
| Arsenic, Dissolved | MW-03 | none | | |
| Arsenic, Dissolved | MW-04 | none | | |
| Arsenic, Dissolved | MW-05 | none | | |
| Arsenic, Dissolved | MW-06 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-07 | Down ↓ | No | |
| Arsenic, Dissolved | MW-08 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-13 | Down ↓ | No | |
| Arsenic, Dissolved | MW-14 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-15 | Down ↓ | Yes | |
| Arsenic, Total | MW-03 | none | | |
| Arsenic, Total | MW-04 | none | | |
| Arsenic, Total | MW-05 | none | | |
| Arsenic, Total | MW-08 | Down ↓ | No | |
| Arsenic, Total | MW-15 | Down ↓ | No | |
| Barium, Dissolved | MW-03 | none | | |
| Barium, Dissolved | MW-04 | Down ↓ | Yes | |
| Barium, Dissolved | MW-05 | Down ↓ | No | |
| Barium, Dissolved | MW-06 | Down ↓ | Yes | |
| Barium, Dissolved | MW-07 | Down ↓ | No | |
| Barium, Dissolved | MW-08 | Down ↓ | Yes | |
| Barium, Dissolved | MW-13 | none | | |
| Barium, Dissolved | MW-14 | Up ↑ | No | |
| Barium, Dissolved | MW-15 | Down ↓ | No | |
| Barium, Total | MW-03 | none | | |
| Barium, Total | MW-04 | Down ↓ | No | |
| Barium, Total | MW-05 | Down ↓ | No | |
| Barium, Total | MW-08 | Down ↓ | No | |
| Barium, Total | MW-15 | Down ↓ | No | |
| Beryllium, Dissolved | MW-03 | none | | |
| Beryllium, Dissolved | MW-04 | none | | |
| Beryllium, Dissolved | MW-05 | none | | |
| Beryllium, Dissolved | MW-06 | none | | |
| Beryllium, Dissolved | MW-07 | none | | |
| Beryllium, Dissolved | MW-08 | none | | |
| Beryllium, Dissolved | MW-13 | none | | |
| Beryllium, Dissolved | MW-14 | none | | |
| Beryllium, Dissolved | MW-15 | none | | |
| Beryllium, Total | MW-03 | none | | |
| Beryllium, Total | MW-04 | none | | |
| Beryllium, Total | MW-05 | none | | |
| Beryllium, Total | MW-08 | none | | |
| Beryllium, Total | MW-15 | none | | |
| Boron, Dissolved | MW-03 | Down ↓ | No | |
| Boron, Dissolved | MW-04 | Down ↓ | Yes | |
| Boron, Dissolved | MW-05 | Down ↓ | Yes | |
| Boron, Dissolved | MW-06 | Down ↓ | Yes | |
| Boron, Dissolved | MW-07 | none | | |
| Boron, Dissolved | MW-08 | none | | |
| Boron, Dissolved | MW-13 | Down ↓ | No | |
| Boron, Dissolved | MW-14 | none | | |
| Boron, Dissolved | MW-15 | Up ↑ | No | |
| Boron, Total | MW-03 | Down ↓ | No | |
| Boron, Total | MW-04 | Down ↓ | No | |
| Boron, Total | MW-05 | Down ↓ | Yes | |
| Boron, Total | MW-08 | Down ↓ | Yes | |
| Boron, Total | MW-15 | Down ↓ | No | |
| Cadmium, Dissolved | MW-03 | none | | |
| Cadmium, Dissolved | MW-04 | none | | |
| Cadmium, Dissolved | MW-05 | none | | |
| Cadmium, Dissolved | MW-06 | none | | |
| Cadmium, Dissolved | MW-07 | none | | |
| Cadmium, Dissolved | MW-08 | none | | |
| Cadmium, Dissolved | MW-13 | none | | |
| Cadmium, Dissolved | MW-14 | none | | |
| Cadmium, Dissolved | MW-15 | none | | |
| Cadmium, Total | MW-03 | none | | |
| Cadmium, Total | MW-04 | none | | |
| Cadmium, Total | MW-05 | none | | |
| Cadmium, Total | MW-08 | none | | |

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Cadmium, Total | MW-15 | none | | |
| Calcium, Total | MW-03 | none | | |
| Calcium, Total | MW-04 | Down ↓ | No | |
| Calcium, Total | MW-05 | none | | |
| Calcium, Total | MW-08 | Down ↓ | Yes | |
| Calcium, Total | MW-15 | Down ↓ | No | |
| Chloride | MW-03 | Down ↓ | No | |
| Chloride | MW-04 | Down ↓ | No | |
| Chloride | MW-05 | Down ↓ | Yes | |
| Chloride | MW-06 | Down ↓ | Yes | |
| Chloride | MW-07 | Up ↑ | Yes | No |
| Chloride | MW-08 | Down ↓ | No | |
| Chloride | MW-13 | Down ↓ | No | |
| Chloride | MW-14 | Down ↓ | Yes | |
| Chloride | MW-15 | Down ↓ | No | |
| Chromium, Dissolved | MW-03 | none | | |
| Chromium, Dissolved | MW-04 | none | | |
| Chromium, Dissolved | MW-05 | none | | |
| Chromium, Dissolved | MW-06 | none | | |
| Chromium, Dissolved | MW-07 | none | | |
| Chromium, Dissolved | MW-08 | none | | |
| Chromium, Dissolved | MW-13 | none | | |
| Chromium, Dissolved | MW-14 | none | | |
| Chromium, Dissolved | MW-15 | none | | |
| Chromium, Total | MW-03 | none | | |
| Chromium, Total | MW-04 | none | | |
| Chromium, Total | MW-05 | none | | |
| Chromium, Total | MW-08 | none | | |
| Chromium, Total | MW-15 | none | | |
| Cobalt, Dissolved | MW-03 | none | | |
| Cobalt, Dissolved | MW-04 | none | | |
| Cobalt, Dissolved | MW-05 | none | | |
| Cobalt, Dissolved | MW-06 | none | | |
| Cobalt, Dissolved | MW-07 | Down ↓ | No | |
| Cobalt, Dissolved | MW-08 | none | | |
| Cobalt, Dissolved | MW-13 | none | | |
| Cobalt, Dissolved | MW-14 | none | | |
| Cobalt, Dissolved | MW-15 | none | | |
| Cobalt, Total | MW-03 | none | | |
| Cobalt, Total | MW-04 | none | | |
| Cobalt, Total | MW-05 | none | | |
| Cobalt, Total | MW-08 | none | | |
| Cobalt, Total | MW-15 | none | | |
| Fluoride | MW-03 | Down ↓ | No | |
| Fluoride | MW-04 | Down ↓ | No | |
| Fluoride | MW-05 | Up ↑ | No | |
| Fluoride | MW-06 | Down ↓ | No | |
| Fluoride | MW-07 | Down ↓ | No | |
| Fluoride | MW-08 | Down ↓ | Yes | |
| Fluoride | MW-13 | Down ↓ | No | |
| Fluoride | MW-14 | Down ↓ | No | |
| Fluoride | MW-15 | Down ↓ | Yes | |
| Lead, Dissolved | MW-03 | none | | |
| Lead, Dissolved | MW-04 | none | | |
| Lead, Dissolved | MW-05 | none | | |
| Lead, Dissolved | MW-06 | none | | |
| Lead, Dissolved | MW-07 | none | | |
| Lead, Dissolved | MW-08 | none | | |
| Lead, Dissolved | MW-13 | none | | |
| Lead, Dissolved | MW-14 | none | | |
| Lead, Dissolved | MW-15 | none | | |
| Lead, Total | MW-03 | none | | |
| Lead, Total | MW-04 | none | | |
| Lead, Total | MW-05 | none | | |
| Lead, Total | MW-08 | none | | |
| Lead, Total | MW-15 | none | | |
| Lithium, Total | MW-03 | none | | |
| Lithium, Total | MW-04 | none | | |
| Lithium, Total | MW-05 | none | | |
| Lithium, Total | MW-08 | none | | |
| Lithium, Total | MW-15 | Down ↓ | No | |
| Mercury, Dissolved | MW-03 | none | | |
| Mercury, Dissolved | MW-04 | none | | |
| Mercury, Dissolved | MW-05 | none | | |
| Mercury, Dissolved | MW-06 | none | | |
| Mercury, Dissolved | MW-07 | none | | |
| Mercury, Dissolved | MW-08 | none | | |
| Mercury, Dissolved | MW-13 | none | | |
| Mercury, Dissolved | MW-14 | none | | |
| Mercury, Dissolved | MW-15 | none | | |
| Mercury, Total | MW-03 | none | | |
| Mercury, Total | MW-04 | none | | |
| Mercury, Total | MW-05 | none | | |

MWG13-15_81509

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Mercury, Total | MW-08 | none | | |
| Mercury, Total | MW-15 | none | | |
| Molybdenum, Total | MW-03 | none | | |
| Molybdenum, Total | MW-04 | none | | |
| Molybdenum, Total | MW-05 | Up ↑ | No | |
| Molybdenum, Total | MW-08 | Down ↓ | No | |
| Molybdenum, Total | MW-15 | Down ↓ | No | |
| pH, Field | MW-03 | Down ↓ | No | |
| pH, Field | MW-04 | Down ↓ | No | |
| pH, Field | MW-05 | Down ↓ | No | |
| pH, Field | MW-06 | Down ↓ | No | |
| pH, Field | MW-07 | Down ↓ | No | |
| pH, Field | MW-08 | Down ↓ | Yes | |
| pH, Field | MW-13 | Up ↑ | No | |
| pH, Field | MW-14 | Down ↓ | Yes | |
| pH, Field | MW-15 | Down ↓ | No | |
| Radium 226 + 228, Combined | MW-03 | none | | |
| Radium 226 + 228, Combined | MW-04 | none | | |
| Radium 226 + 228, Combined | MW-05 | Up ↑ | No | |
| Radium 226 + 228, Combined | MW-08 | none | | |
| Radium 226 + 228, Combined | MW-15 | none | | |
| Selenium, Dissolved | MW-03 | none | | |
| Selenium, Dissolved | MW-04 | none | | |
| Selenium, Dissolved | MW-05 | none | | |
| Selenium, Dissolved | MW-06 | none | | |
| Selenium, Dissolved | MW-07 | none | | |
| Selenium, Dissolved | MW-08 | none | | |
| Selenium, Dissolved | MW-13 | Up ↑ | No | |
| Selenium, Dissolved | MW-14 | none | | |
| Selenium, Dissolved | MW-15 | none | | |
| Selenium, Total | MW-03 | none | | |
| Selenium, Total | MW-04 | none | | |
| Selenium, Total | MW-05 | none | | |
| Selenium, Total | MW-08 | none | | |
| Selenium, Total | MW-15 | Down ↓ | No | |
| Sulfate | MW-03 | Down ↓ | No | |
| Sulfate | MW-04 | Down ↓ | No | |
| Sulfate | MW-05 | Down ↓ | Yes | |
| Sulfate | MW-06 | none | | |
| Sulfate | MW-07 | Up ↑ | No | |
| Sulfate | MW-08 | Down ↓ | Yes | |
| Sulfate | MW-13 | Up ↑ | Yes | Yes |
| Sulfate | MW-14 | none | | |
| Sulfate | MW-15 | Up ↑ | No | |
| Thallium, Dissolved | MW-03 | none | | |
| Thallium, Dissolved | MW-04 | none | | |
| Thallium, Dissolved | MW-05 | none | | |
| Thallium, Dissolved | MW-06 | none | | |
| Thallium, Dissolved | MW-07 | none | | |
| Thallium, Dissolved | MW-08 | none | | |
| Thallium, Dissolved | MW-13 | none | | |
| Thallium, Dissolved | MW-14 | Up ↑ | No | |
| Thallium, Dissolved | MW-15 | none | | |
| Thallium, Total | MW-03 | none | | |
| Thallium, Total | MW-04 | none | | |
| Thallium, Total | MW-05 | none | | |
| Thallium, Total | MW-08 | none | | |
| Thallium, Total | MW-15 | none | | |
| Total Dissolved Solids | MW-03 | Down ↓ | No | |
| Total Dissolved Solids | MW-04 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-05 | Down ↓ | No | |
| Total Dissolved Solids | MW-06 | Down ↓ | No | |
| Total Dissolved Solids | MW-07 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-08 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-13 | Up ↑ | Yes | Yes |
| Total Dissolved Solids | MW-14 | Up ↑ | No | |
| Total Dissolved Solids | MW-15 | Up ↑ | No | |

Powerton Stats Summary:

| | | |
|---|---|---|
| 70 | 30% | Downward trends (25 significant) |
| 15 | 6% | Upward trends (3 significant) |
| 148 | 64% | No trend |
| **233** | **Total Tests Performed** | |

85 Total Tests where a trend is present
82% of tests where a trend is present are downward
18% of tests where a trend is present are upward

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Will County Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Antimony, Dissolved | MW-07 | none | | |
| Antimony, Dissolved | MW-08 | none | | |
| Antimony, Dissolved | MW-09 | none | | |
| Antimony, Dissolved | MW-10 | none | | |
| Antimony, Total | MW-09 | none | | |
| Antimony, Total | MW-10 | none | | |
| Antimony, Total | MW-11 | none | | |
| Antimony, Total | MW-12 | none | | |
| Arsenic, Dissolved | MW-07 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-08 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-09 | Down ↓ | Yes | |
| Arsenic, Dissolved | MW-10 | Up ↑ | No | |
| Arsenic, Total | MW-09 | Down ↓ | No | |
| Arsenic, Total | MW-10 | Down ↓ | No | |
| Arsenic, Total | MW-11 | Up ↑ | No | |
| Arsenic, Total | MW-12 | Up ↑ | No | |
| Barium, Dissolved | MW-07 | Down ↓ | No | |
| Barium, Dissolved | MW-08 | Down ↓ | No | |
| Barium, Dissolved | MW-09 | Up ↑ | Yes | No |
| Barium, Dissolved | MW-10 | Down ↓ | No | |
| Barium, Total | MW-09 | Up ↑ | No | |
| Barium, Total | MW-10 | none | | |
| Barium, Total | MW-11 | Up ↑ | No | |
| Barium, Total | MW-12 | Up ↑ | No | |
| Beryllium, Dissolved | MW-07 | none | | |
| Beryllium, Dissolved | MW-08 | none | | |
| Beryllium, Dissolved | MW-09 | none | | |
| Beryllium, Dissolved | MW-10 | none | | |
| Beryllium, Total | MW-09 | none | | |
| Beryllium, Total | MW-10 | none | | |
| Beryllium, Total | MW-11 | none | | |
| Beryllium, Total | MW-12 | none | | |
| Boron, Dissolved | MW-07 | Down ↓ | No | |
| Boron, Dissolved | MW-08 | Up ↑ | No | |
| Boron, Dissolved | MW-09 | none | | |
| Boron, Dissolved | MW-10 | Up ↑ | No | |
| Boron, Total | MW-09 | none | | |
| Boron, Total | MW-10 | Down ↓ | No | |
| Boron, Total | MW-11 | none | | |
| Boron, Total | MW-12 | Down ↓ | No | |
| Cadmium, Dissolved | MW-07 | none | | |
| Cadmium, Dissolved | MW-08 | none | | |
| Cadmium, Dissolved | MW-09 | none | | |
| Cadmium, Dissolved | MW-10 | none | | |
| Cadmium, Total | MW-09 | none | | |
| Cadmium, Total | MW-10 | none | | |
| Cadmium, Total | MW-11 | none | | |
| Cadmium, Total | MW-12 | none | | |
| Calcium, Total | MW-09 | Down ↓ | No | |
| Calcium, Total | MW-10 | Down ↓ | No | |
| Calcium, Total | MW-11 | Down ↓ | No | |
| Calcium, Total | MW-12 | Up ↑ | No | |
| Chloride | MW-07 | Down ↓ | No | |

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Will County Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| Chloride | MW-08 | Down ↓ | No | |
| Chloride | MW-09 | Up ↑ | Yes | Yes* |
| Chloride | MW-10 | none | | |
| Chloride | MW-11 | Up ↑ | No | |
| Chloride | MW-12 | Down ↓ | No | |
| Chromium, Dissolved | MW-07 | none | | |
| Chromium, Dissolved | MW-08 | none | | |
| Chromium, Dissolved | MW-09 | none | | |
| Chromium, Dissolved | MW-10 | none | | |
| Chromium, Total | MW-09 | none | | |
| Chromium, Total | MW-10 | none | | |
| Chromium, Total | MW-11 | none | | |
| Chromium, Total | MW-12 | none | | |
| Cobalt, Dissolved | MW-07 | none | | |
| Cobalt, Dissolved | MW-08 | Up ↑ | Yes | No |
| Cobalt, Dissolved | MW-09 | none | | |
| Cobalt, Dissolved | MW-10 | none | | |
| Cobalt, Total | MW-09 | none | | |
| Cobalt, Total | MW-10 | none | | |
| Cobalt, Total | MW-11 | none | | |
| Cobalt, Total | MW-12 | none | | |
| Fluoride | MW-07 | Down ↓ | Yes | |
| Fluoride | MW-08 | Down ↓ | No | |
| Fluoride | MW-09 | Up ↑ | No | |
| Fluoride | MW-10 | Up ↑ | Yes | No |
| Fluoride | MW-11 | Down ↓ | No | |
| Fluoride | MW-12 | Down ↓ | No | |
| Lead, Dissolved | MW-07 | none | | |
| Lead, Dissolved | MW-08 | none | | |
| Lead, Dissolved | MW-09 | none | | |
| Lead, Dissolved | MW-10 | none | | |
| Lead, Total | MW-09 | none | | |
| Lead, Total | MW-10 | none | | |
| Lead, Total | MW-11 | none | | |
| Lead, Total | MW-12 | none | | |
| Lithium, Total | MW-09 | none | | |
| Lithium, Total | MW-10 | Down ↓ | No | |
| Lithium, Total | MW-11 | none | | |
| Lithium, Total | MW-12 | Down ↓ | No | |
| Mercury, Dissolved | MW-07 | none | | |
| Mercury, Dissolved | MW-08 | none | | |
| Mercury, Dissolved | MW-09 | none | | |
| Mercury, Dissolved | MW-10 | none | | |
| Mercury, Total | MW-09 | none | | |
| Mercury, Total | MW-10 | none | | |
| Mercury, Total | MW-11 | none | | |
| Mercury, Total | MW-12 | none | | |
| Molybdenum, Total | MW-09 | Down ↓ | No | |
| Molybdenum, Total | MW-10 | Up ↑ | No | |
| Molybdenum, Total | MW-11 | Down ↓ | No | |
| Molybdenum, Total | MW-12 | Up ↑ | No | |
| pH, Field | MW-07 | Down ↓ | Yes | |
| pH, Field | MW-08 | Down ↓ | Yes | |

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Will County Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with stat. sig upward trend ever exceeded a GW standard? |
|---|---|---|---|---|
| pH, Field | MW-09 | Down ↓ | Yes | |
| pH, Field | MW-10 | Down ↓ | Yes | |
| Radium 226 + 228, Combined | MW-09 | none | | |
| Radium 226 + 228, Combined | MW-10 | Down ↓ | No | |
| Radium 226 + 228, Combined | MW-11 | Up ↑ | No | |
| Radium 226 + 228, Combined | MW-12 | none | | |
| Selenium, Dissolved | MW-07 | Up ↑ | Yes | No |
| Selenium, Dissolved | MW-08 | none | | |
| Selenium, Dissolved | MW-09 | Down ↓ | Yes | |
| Selenium, Dissolved | MW-10 | none | | |
| Selenium, Total | MW-09 | none | | |
| Selenium, Total | MW-10 | none | | |
| Selenium, Total | MW-11 | none | | |
| Selenium, Total | MW-12 | none | | |
| Sulfate | MW-07 | Down ↓ | No | |
| Sulfate | MW-08 | Up ↑ | No | |
| Sulfate | MW-09 | Down ↓ | Yes | |
| Sulfate | MW-10 | Down ↓ | Yes | |
| Sulfate | MW-11 | Down ↓ | Yes | |
| Sulfate | MW-12 | Down ↓ | No | |
| Thallium, Dissolved | MW-07 | none | | |
| Thallium, Dissolved | MW-08 | none | | |
| Thallium, Dissolved | MW-09 | none | | |
| Thallium, Dissolved | MW-10 | none | | |
| Thallium, Total | MW-09 | none | | |
| Thallium, Total | MW-10 | none | | |
| Thallium, Total | MW-11 | none | | |
| Thallium, Total | MW-12 | none | | |
| Total Dissolved Solids | MW-07 | none | | |
| Total Dissolved Solids | MW-08 | Up ↑ | No | |
| Total Dissolved Solids | MW-09 | Down ↓ | No | |
| Total Dissolved Solids | MW-10 | Down ↓ | Yes | |
| Total Dissolved Solids | MW-11 | none | | |
| Total Dissolved Solids | MW-12 | Up ↑ | No | |

*Choride covered under 2018 ASD.

Will County Summary Stats:

| | | |
|---|---|---|
| 38 | 27% | Downward trends (13 significant) |
| 22 | 16% | Upward trends (5 significant) |
| 80 | 57% | No trend |
| **140** | | **Total Tests Performed** |

60 Total Tests where a trend is present
63% of tests where a trend is present are downward
37% of tests where a trend is present are upward

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Waukegan Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with SSI ever exceeded a GW standard? |
|---|---|---|---|---|
| Antimony, Dissolved | MW-01 | none | | |
| Antimony, Dissolved | MW-02 | none | | |
| Antimony, Dissolved | MW-03 | none | | |
| Antimony, Dissolved | MW-04 | none | | |
| Antimony, Total | MW-01 | none | | |
| Antimony, Total | MW-02 | none | | |
| Antimony, Total | MW-03 | none | | |
| Antimony, Total | MW-04 | none | | |
| Arsenic, Dissolved | MW-01 | Up ↑ | No | |
| Arsenic, Dissolved | MW-02 | Down ↓ | No | |
| Arsenic, Dissolved | MW-03 | Up ↑ | No | |
| Arsenic, Dissolved | MW-04 | Up ↑ | No | |
| Arsenic, Total | MW-01 | Down ↓ | Yes | |
| Arsenic, Total | MW-02 | Down ↓ | Yes | |
| Arsenic, Total | MW-03 | Down ↓ | No | |
| Arsenic, Total | MW-04 | Down ↓ | No | |
| Barium, Dissolved | MW-01 | Down ↓ | No | |
| Barium, Dissolved | MW-02 | Up ↑ | No | |
| Barium, Dissolved | MW-03 | Up ↑ | No | |
| Barium, Dissolved | MW-04 | Up ↑ | No | |
| Barium, Total | MW-01 | Up ↑ | Yes | No |
| Barium, Total | MW-02 | Up ↑ | No | |
| Barium, Total | MW-03 | Up ↑ | No | |
| Barium, Total | MW-04 | Down ↓ | No | |
| Beryllium, Dissolved | MW-01 | none | | |
| Beryllium, Dissolved | MW-02 | none | | |
| Beryllium, Dissolved | MW-03 | none | | |
| Beryllium, Dissolved | MW-04 | none | | |
| Beryllium, Total | MW-01 | none | | |
| Beryllium, Total | MW-02 | none | | |
| Beryllium, Total | MW-03 | none | | |
| Beryllium, Total | MW-04 | none | | |
| Boron, Dissolved | MW-01 | Down ↓ | Yes | |
| Boron, Dissolved | MW-02 | Up ↑ | Yes | Yes |
| Boron, Dissolved | MW-03 | Up ↑ | No | |
| Boron, Dissolved | MW-04 | none | | |
| Boron, Total | MW-01 | Up ↑ | No | |
| Boron, Total | MW-02 | Down ↓ | No | |
| Boron, Total | MW-03 | Up ↑ | No | |
| Boron, Total | MW-04 | Up ↑ | No | |
| Cadmium, Dissolved | MW-01 | none | | |
| Cadmium, Dissolved | MW-02 | none | | |
| Cadmium, Dissolved | MW-03 | none | | |
| Cadmium, Dissolved | MW-04 | none | | |
| Cadmium, Total | MW-01 | none | | |
| Cadmium, Total | MW-02 | none | | |
| Cadmium, Total | MW-03 | none | | |
| Cadmium, Total | MW-04 | none | | |
| Calcium, Total | MW-01 | Up ↑ | No | |
| Calcium, Total | MW-02 | Up ↑ | No | |
| Calcium, Total | MW-03 | Up ↑ | No | |

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with SSI ever exceeded a GW standard? |
|---|---|---|---|---|
| Calcium, Total | MW-04 | none | | |
| Chloride | MW-01 | Up ↑ | No | |
| Chloride | MW-02 | none | | |
| Chloride | MW-03 | Down ↓ | No | |
| Chloride | MW-04 | Down ↓ | No | |
| Chromium, Dissolved | MW-01 | none | | |
| Chromium, Dissolved | MW-02 | none | | |
| Chromium, Dissolved | MW-03 | none | | |
| Chromium, Dissolved | MW-04 | none | | |
| Chromium, Total | MW-01 | none | | |
| Chromium, Total | MW-02 | none | | |
| Chromium, Total | MW-03 | none | | |
| Chromium, Total | MW-04 | none | | |
| Cobalt, Dissolved | MW-01 | none | | |
| Cobalt, Dissolved | MW-02 | none | | |
| Cobalt, Dissolved | MW-03 | none | | |
| Cobalt, Dissolved | MW-04 | none | | |
| Cobalt, Total | MW-01 | none | | |
| Cobalt, Total | MW-02 | none | | |
| Cobalt, Total | MW-03 | none | | |
| Cobalt, Total | MW-04 | none | | |
| Fluoride | MW-01 | Down ↓ | Yes | |
| Fluoride | MW-02 | none | | |
| Fluoride | MW-03 | Down ↓ | Yes | |
| Fluoride | MW-04 | Down ↓ | No | |
| Lead, Dissolved | MW-01 | none | | |
| Lead, Dissolved | MW-02 | none | | |
| Lead, Dissolved | MW-03 | none | | |
| Lead, Dissolved | MW-04 | none | | |
| Lead, Total | MW-01 | none | | |
| Lead, Total | MW-02 | none | | |
| Lead, Total | MW-03 | none | | |
| Lead, Total | MW-04 | none | | |
| Lithium, Total | MW-01 | none | | |
| Lithium, Total | MW-02 | none | | |
| Lithium, Total | MW-03 | none | | |
| Lithium, Total | MW-04 | none | | |
| Mercury, Dissolved | MW-01 | none | | |
| Mercury, Dissolved | MW-02 | none | | |
| Mercury, Dissolved | MW-03 | none | | |
| Mercury, Dissolved | MW-04 | none | | |
| Mercury, Total | MW-01 | none | | |
| Mercury, Total | MW-02 | none | | |
| Mercury, Total | MW-03 | none | | |
| Mercury, Total | MW-04 | none | | |
| Molybdenum, Total | MW-01 | Down ↓ | No | |
| Molybdenum, Total | MW-02 | Down ↓ | No | |
| Molybdenum, Total | MW-03 | Up ↑ | No | |
| Molybdenum, Total | MW-04 | Up ↑ | No | |
| pH, Field | MW-01 | Down ↓ | No | |
| pH, Field | MW-02 | Down ↓ | No | |

**Downgradient Groundwater Statistical Analysis**
**Mann-Kendall Trend Tests**
**Waukegan Station**

| Constituent | Well | Trend | Statistically Significant Trend? (99% Confidence Level) | Has well with SSI ever exceeded a GW standard? |
|---|---|---|---|---|
| pH, Field | MW-03 | Down ↓ | Yes | |
| pH, Field | MW-04 | Down ↓ | Yes | |
| Radium-226 | MW-01 | none | | |
| Radium-226 | MW-02 | none | | |
| Radium-226 | MW-03 | none | | |
| Radium-228 | MW-01 | none | | |
| Radium-228 | MW-02 | none | | |
| Radium-228 | MW-03 | none | | |
| Radium-228 | MW-04 | Down ↓ | No | |
| Selenium, Dissolved | MW-01 | Down ↓ | No | |
| Selenium, Dissolved | MW-02 | Down ↓ | Yes | |
| Selenium, Dissolved | MW-03 | Down ↓ | Yes | |
| Selenium, Dissolved | MW-04 | Down ↓ | No | |
| Selenium, Total | MW-01 | Down ↓ | No | |
| Selenium, Total | MW-02 | none | | |
| Selenium, Total | MW-03 | none | | |
| Selenium, Total | MW-04 | none | | |
| Sulfate | MW-01 | Up ↑ | No | |
| Sulfate | MW-02 | Up ↑ | No | |
| Sulfate | MW-03 | Up ↑ | Yes | No |
| Sulfate | MW-04 | Up ↑ | No | |
| Thallium, Dissolved | MW-01 | none | | |
| Thallium, Dissolved | MW-02 | none | | |
| Thallium, Dissolved | MW-03 | none | | |
| Thallium, Dissolved | MW-04 | none | | |
| Thallium, Total | MW-01 | none | | |
| Thallium, Total | MW-02 | none | | |
| Thallium, Total | MW-03 | none | | |
| Thallium, Total | MW-04 | none | | |
| Total Dissolved Solids | MW-01 | Up ↑ | No | |
| Total Dissolved Solids | MW-02 | Up ↑ | Yes | No |
| Total Dissolved Solids | MW-03 | Up ↑ | Yes | No |
| Total Dissolved Solids | MW-04 | Up ↑ | Yes | No |

Waukegan Stats Summary:

| | | |
|---|---|---|
| 26 | 19% | Downward trends (9 significant) |
| 28 | 21% | Upward trends (6 significant) |
| 81 | 60% | No trend |
| **135** | **Total Tests Performed** | |

54 Total Tests where a trend is present
48% of tests where a trend is present are downward
52% of tests where a trend is present are upward

# Trend Test

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database    Printed 4/2/2021, 11:05 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony, Dissolved (mg/L) | MW-01 | 0 | -6 | -58 | No | 16 | 81.25 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-02 | 0 | -96 | -176 | No | 34 | 91.18 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-03 | 0 | -128 | -223 | No | 40 | 90 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-04 | 0 | -80 | -223 | No | 40 | 92.5 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-06 | 0 | -21 | -223 | No | 40 | 97.5 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-07 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-04 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-01 | 0 | -33 | -58 | No | 16 | 68.75 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-02 | 0 | -23 | -176 | No | 34 | 97.06 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-03 | -6.3e-12 | -100 | -223 | No | 40 | 27.5 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-04 | 0 | 36 | 223 | No | 40 | 45 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-06 | -0.00... | -196 | -223 | No | 40 | 22.5 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-07 | 0 | -104 | -223 | No | 40 | 60 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-03 | 0.000... | 10 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-04 | 0 | 3 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-01 | -0.01058 | -56 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-02** | **-0.00...** | **-178** | **-176** | **Yes** | **34** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-03 | 0.000... | 177 | 223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-04** | **0.002242** | **336** | **223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-06 | 0.002711 | 206 | 223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-07 | 0 | 50 | 223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-03 | -0.00... | -13 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-04 | -0.00... | -11 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-02 | 0 | 0 | 176 | No | 34 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-03 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-04 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-07 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-04 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-01 | -0.00... | -25 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| **Boron, Dissolved (mg/L)** | **MW-02** | **-0.02673** | **-356** | **-176** | **Yes** | **34** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Boron, Dissolved (mg/L) | MW-03 | 0.000... | 19 | 223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-04 | -0.00... | -128 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| **Boron, Dissolved (mg/L)** | **MW-06** | **-0.00...** | **-229** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Boron, Dissolved (mg/L) | MW-07 | -0.00... | -191 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-03 | -0.02859 | -6 | -38 | No | 12 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-04 | 0 | 0 | 38 | No | 12 | 0 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-02 | 0 | -13 | -176 | No | 34 | 94.12 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-03 | 0 | -29 | -223 | No | 40 | 97.5 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-04 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-07 | 0 | -7 | -223 | No | 40 | 97.5 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-04 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |

# Trend Test



Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database Printed 4/2/2021, 11:05 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride (mg/L) | MW-01 | -3.938 | -11 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-02 | 0 | -4 | -176 | No | 34 | 0 | n/a | n/a | 0.01 | NP |
| **Chloride (mg/L)** | **MW-03** | **-8.834** | **-3.043** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Chloride (mg/L) | MW-04 | -4.891 | -2.294 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-06 | 0 | -13 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-07 | -1.487 | -40 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-02 | 0 | 0 | 176 | No | 34 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-03 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-04 | 0 | 13 | 223 | No | 40 | 97.5 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-07 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-03 | 0 | -1 | -30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-04 | 0 | 7 | 30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-01 | 0 | 15 | 58 | No | 16 | 87.5 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-02 | 0 | -10 | -176 | No | 34 | 85.29 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-03 | 0 | -76 | -223 | No | 40 | 95 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-04 | 0.000... | 74 | 223 | No | 40 | 15 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-06 | 0 | -62 | -223 | No | 40 | 87.5 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-07 | 0 | -41 | -223 | No | 40 | 95 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-04 | 0.000... | 1 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-01 | -0.01075 | -52 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-02** | **-0.02597** | **-321** | **-176** | **Yes** | **34** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-03 | 0 | 0.2372 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-04 | 0 | -0.486 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-06** | **-0.0074** | **-315** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Fluoride (mg/L)** | **MW-07** | **-0.00...** | **-320** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Lead, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-02 | 0 | 0 | 176 | No | 34 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-03 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-04 | 0 | -23 | -223 | No | 40 | 97.5 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-07 | 0 | -7 | -223 | No | 40 | 92.5 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-04 | 0 | 4 | 30 | No | 10 | 60 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-03 | 0 | -7 | -30 | No | 10 | 10 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-04 | 0.000... | 15 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-02 | 0 | 0 | 176 | No | 34 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-03 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-04 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-07 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-04 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-03 | 0.000... | 9 | 30 | No | 10 | 10 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-04 | 0.000... | 14 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |

# Trend Test



Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database Printed 4/2/2021, 11:05 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH, Field (Standard Units) | MW-03 | -0.0136 | -113 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-04 | -0.01699 | -116 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-06 | -0.03421 | -202 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **pH, Field (Standard Units)** | **MW-07** | **-0.03777** | **-246** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Radium 226 + Radium 228, Combin... | MW-03 | 0 | -2 | -30 | No | 10 | 70 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-04 | 0 | -6 | -30 | No | 10 | 70 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-01 | 0.000... | 44 | 58 | No | 16 | 37.5 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-02 | 0 | -102 | -176 | No | 34 | 79.41 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-03 | 0 | 26 | 223 | No | 40 | 32.5 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-04 | 0 | 39 | 223 | No | 40 | 82.5 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-06 | -0.00... | -155 | -223 | No | 40 | 27.5 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-07 | 0 | 26 | 223 | No | 40 | 82.5 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-03 | 0.000... | 5 | 30 | No | 10 | 10 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-04 | 0 | 17 | 30 | No | 10 | 80 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-01 | -4.6 | -30 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-02 | -7.826 | -175 | -176 | No | 34 | 0 | n/a | n/a | 0.01 | NP |
| **Sulfate (mg/L)** | **MW-03** | **-6.868** | **-3.501** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Sulfate (mg/L) | MW-04 | -5.06 | -2.356 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-06 | -0.4307 | -49 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-07 | -5.456 | -215 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-01 | 0 | 0 | 58 | No | 16 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-02 | 0 | 0 | 176 | No | 34 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-03 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-04 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-06 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-07 | 0 | 0 | 223 | No | 40 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-03 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-04 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-01 | 12.34 | 24 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-02 | 3.834 | 21 | 176 | No | 34 | 0 | n/a | n/a | 0.01 | NP |
| **Total Dissolved Solids (mg/L)** | **MW-03** | **-27.74** | **-4.189** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Total Dissolved Solids (mg/L)** | **MW-04** | **-17.39** | **-2.826** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Total Dissolved Solids (mg/L) | MW-06 | 0 | -4 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-07 | -9.923 | -96 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |

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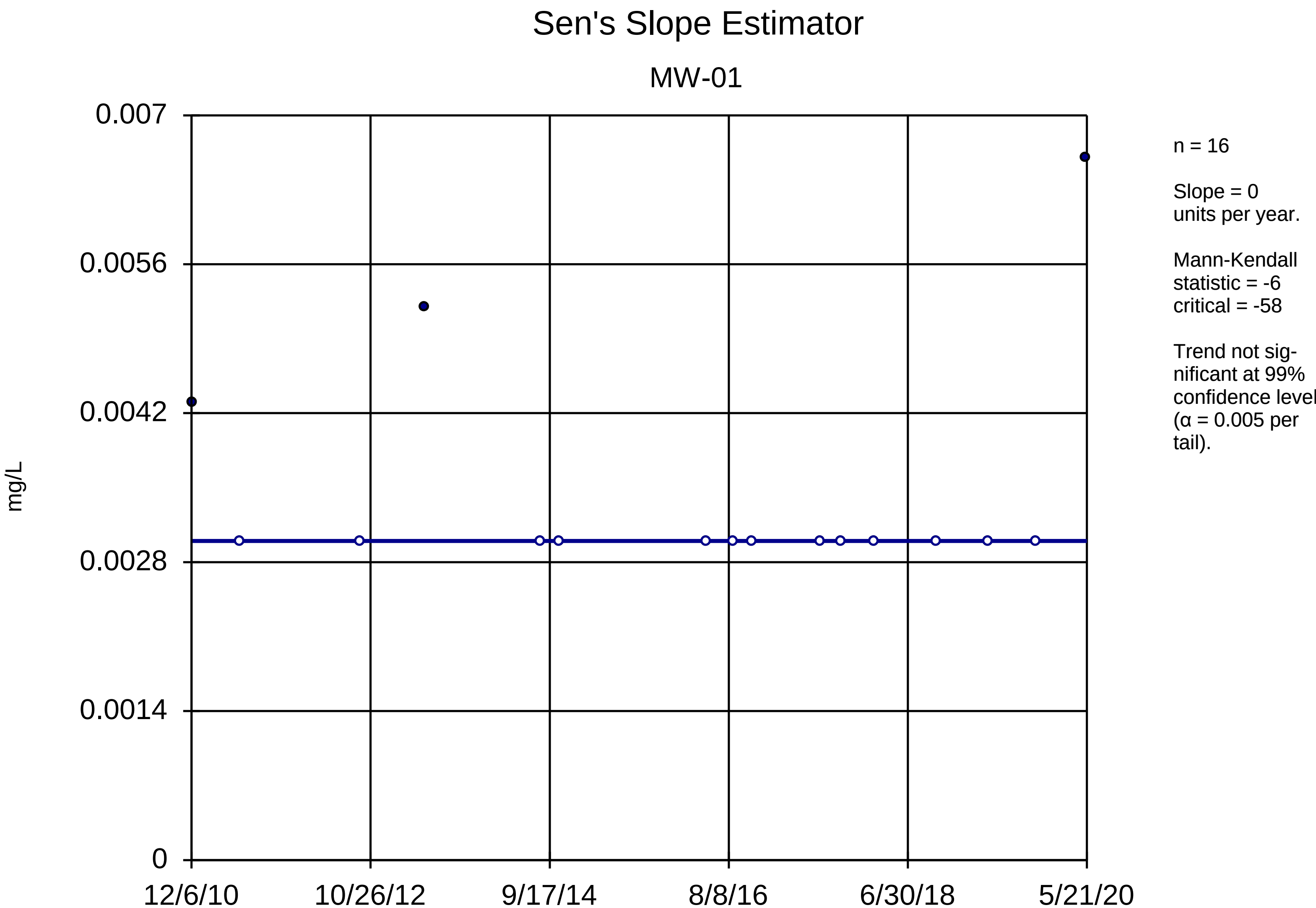
Hollow symbols indicate censored values.

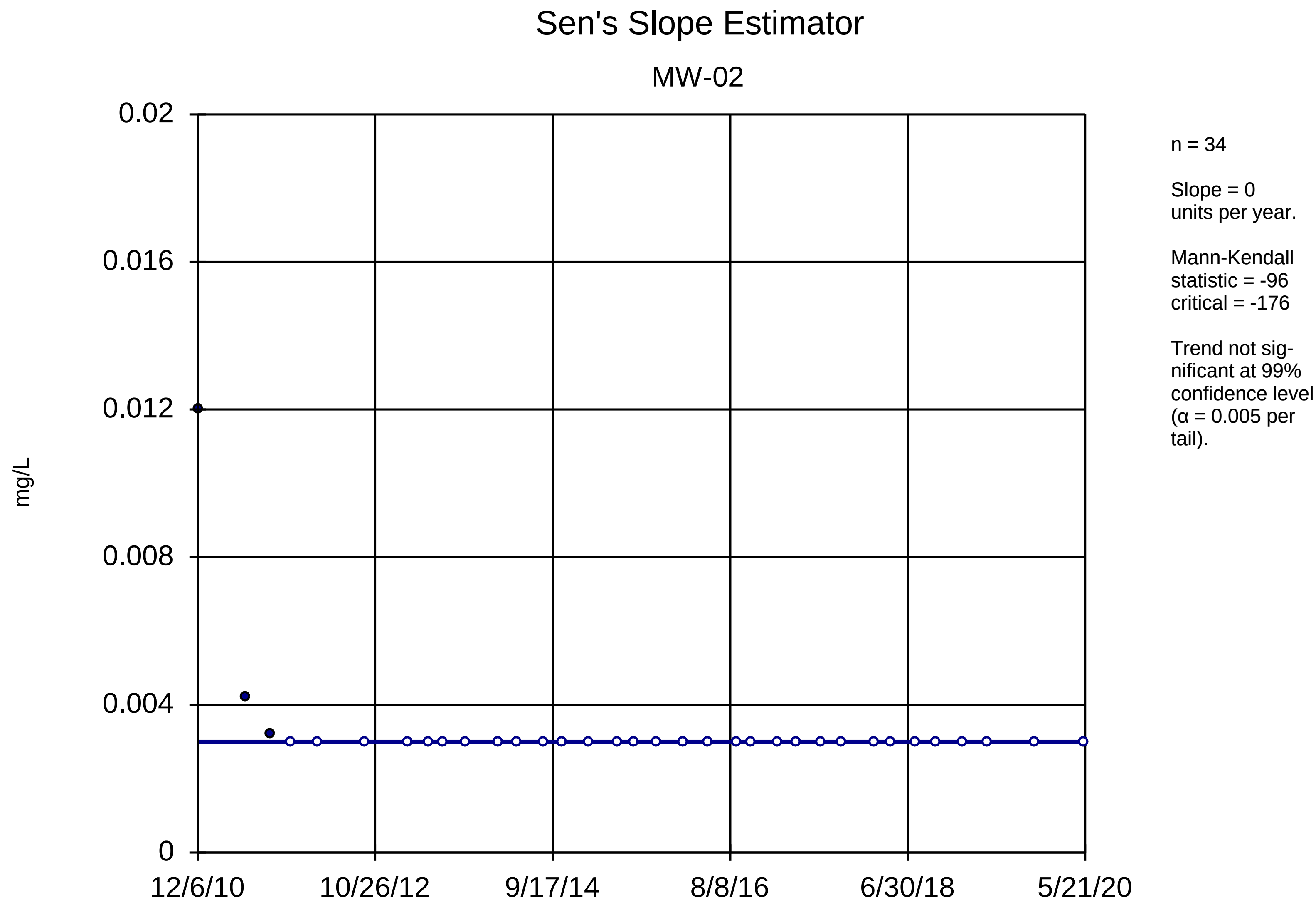



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81520

Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:00 AM

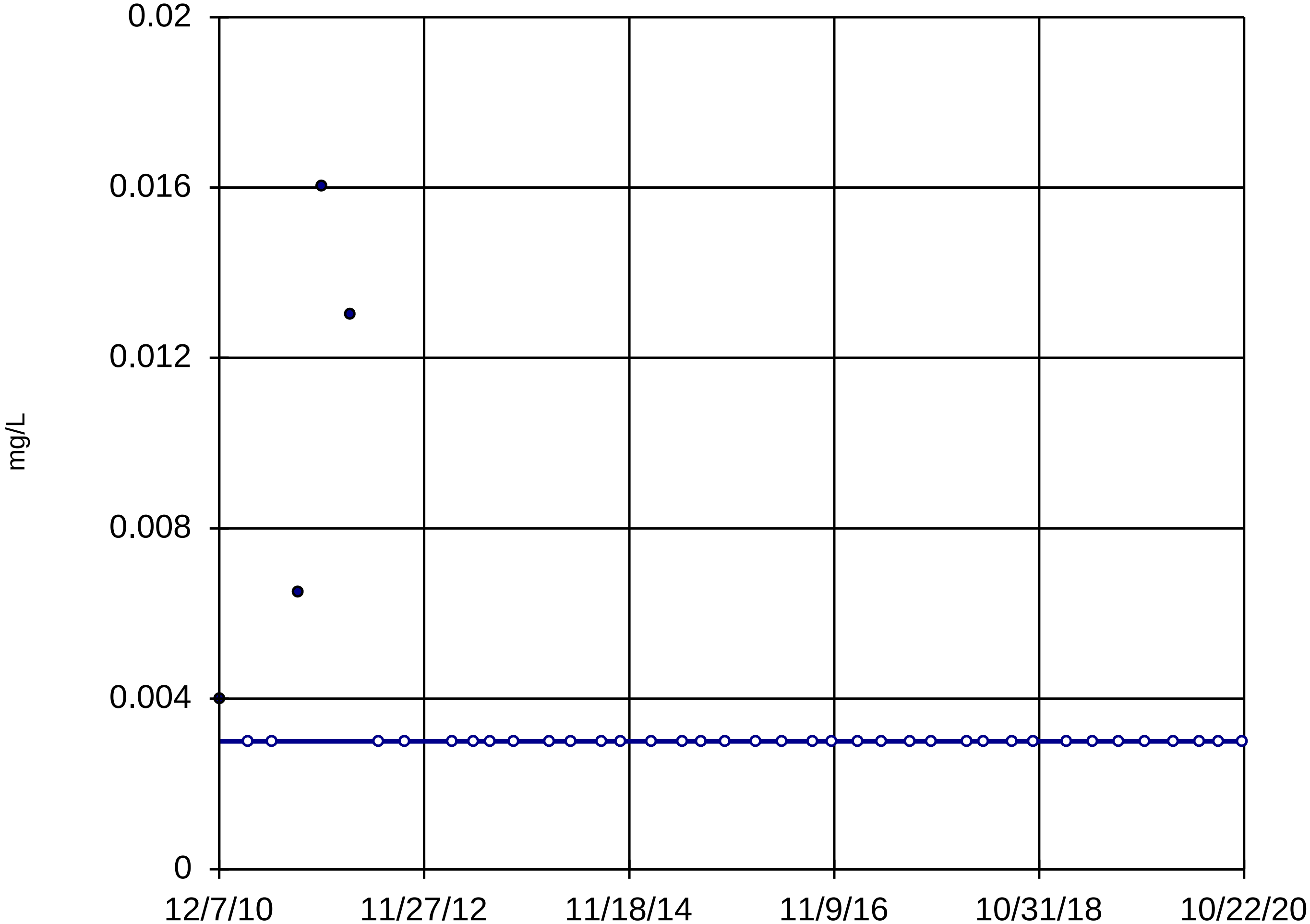
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81521

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -128
critical = -223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:00 AM

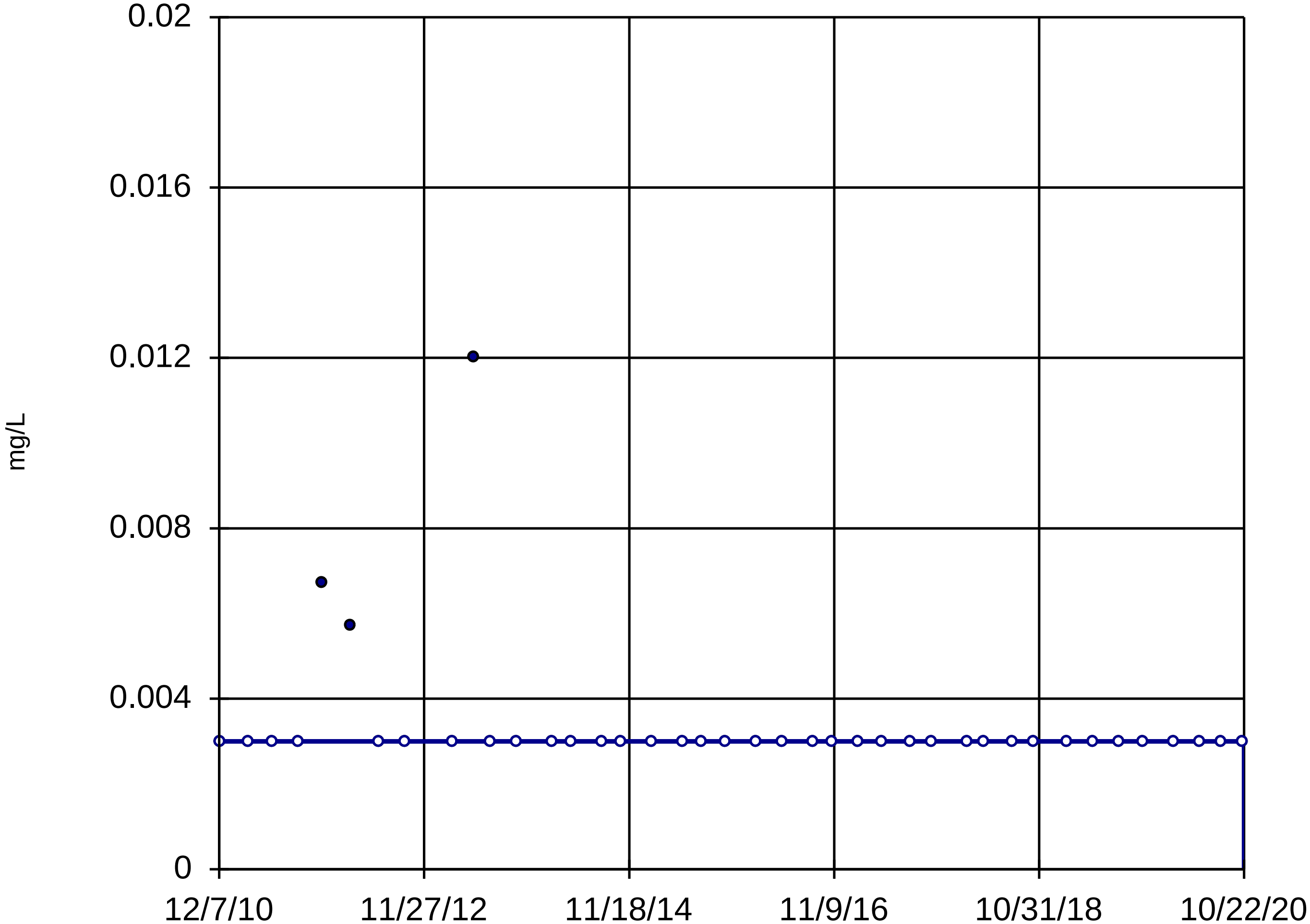
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81522

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -80
critical = -223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Dissolved  Analysis Run 4/2/2021 11:00 AM

Utility Site J  Client: Weaver Consultants Group  Data: Joliet 29 Sanitas Database

MWG13-15_81523

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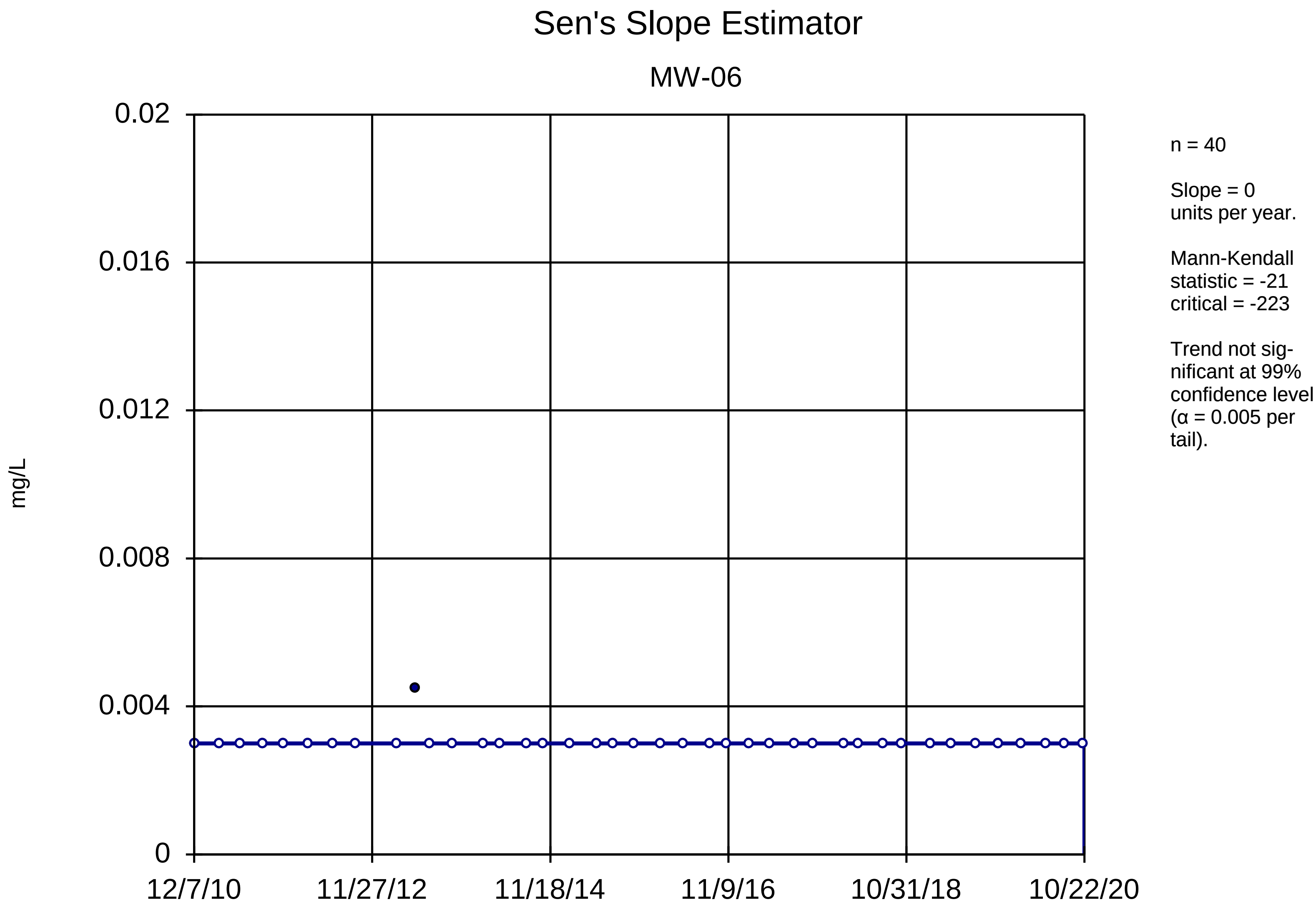



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:00 AM

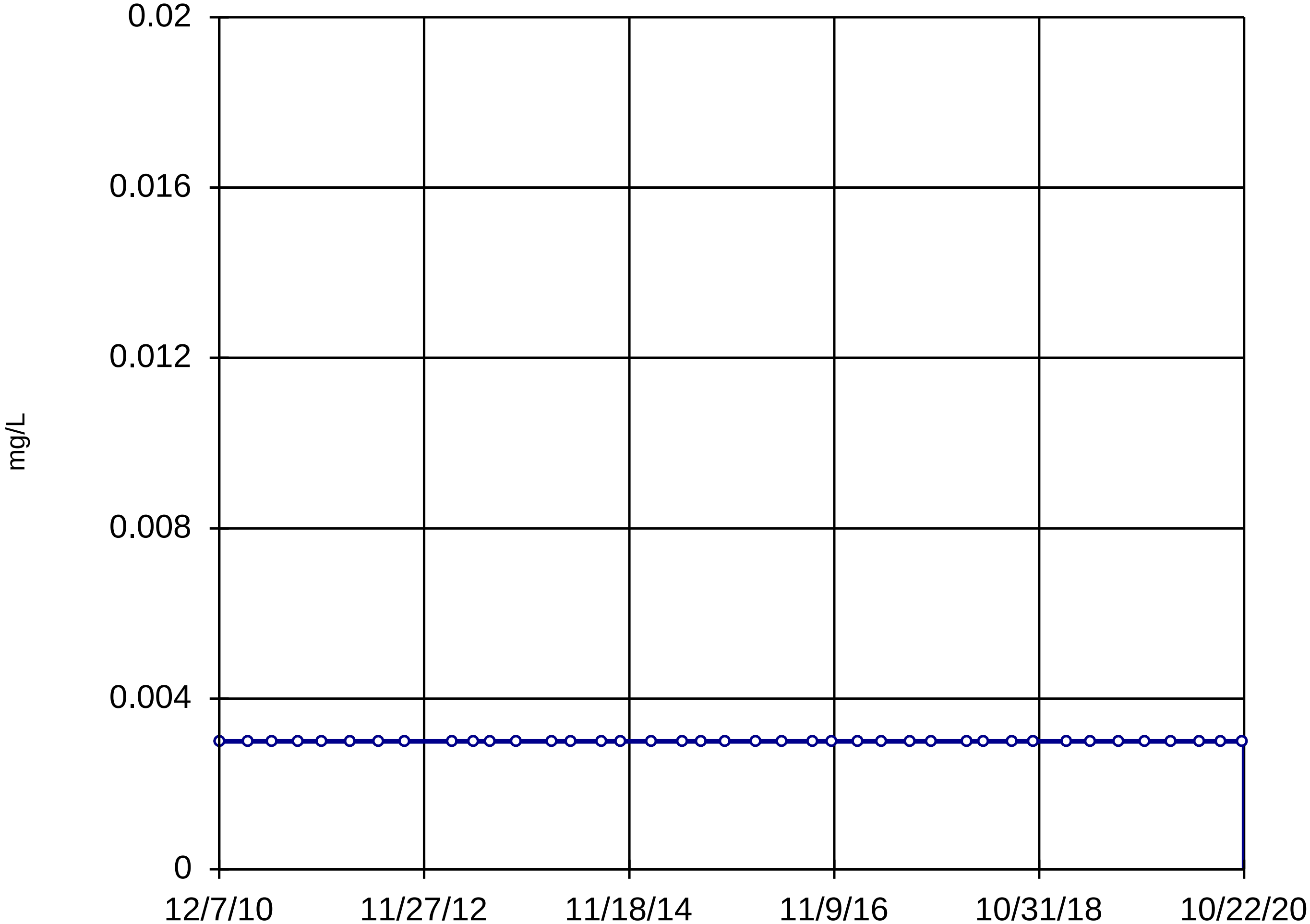
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81524

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-07




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:00 AM

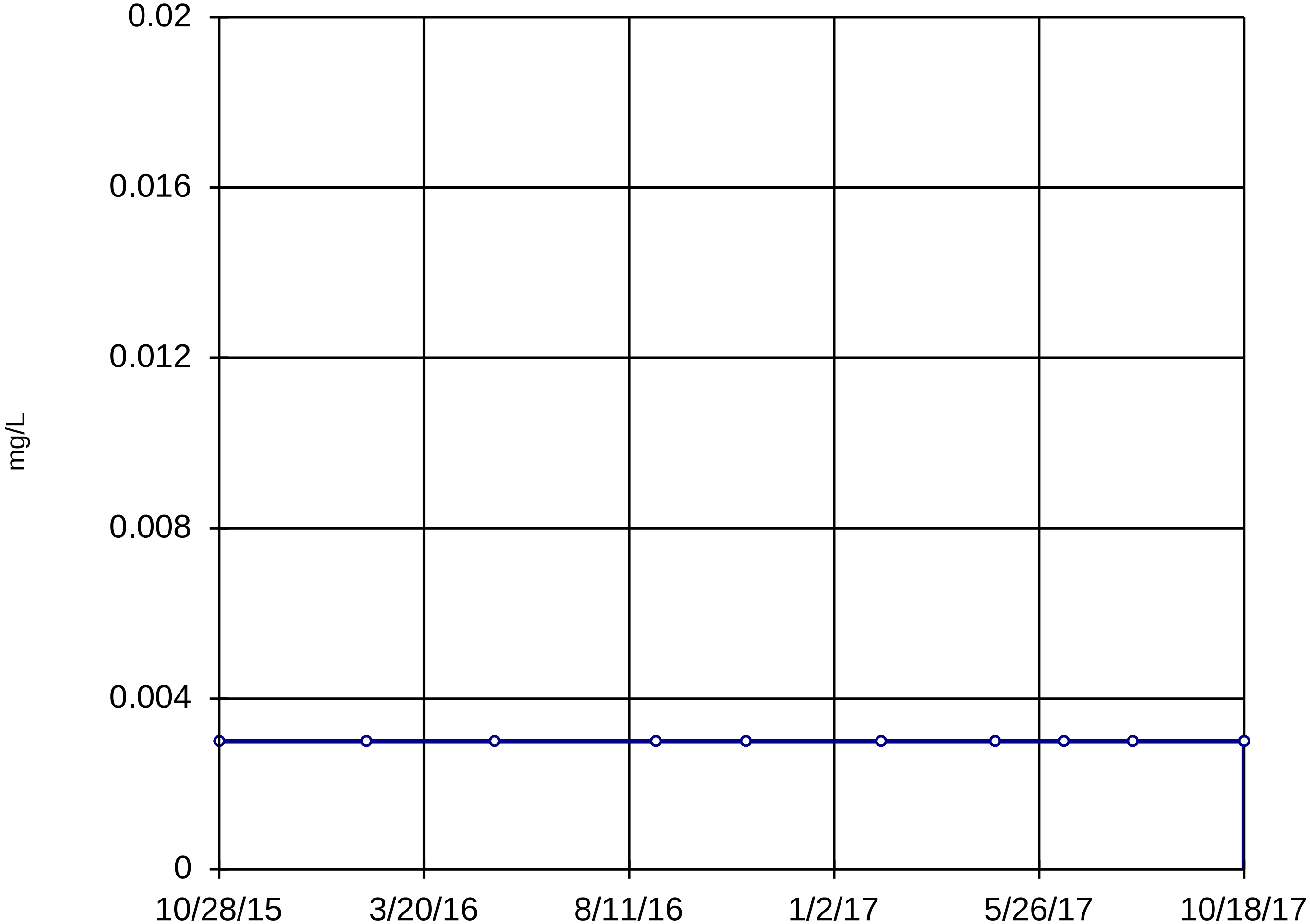
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81525

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Antimony, Total    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81526

Hollow symbols indicate censored values.


Constituent: Antimony, Total    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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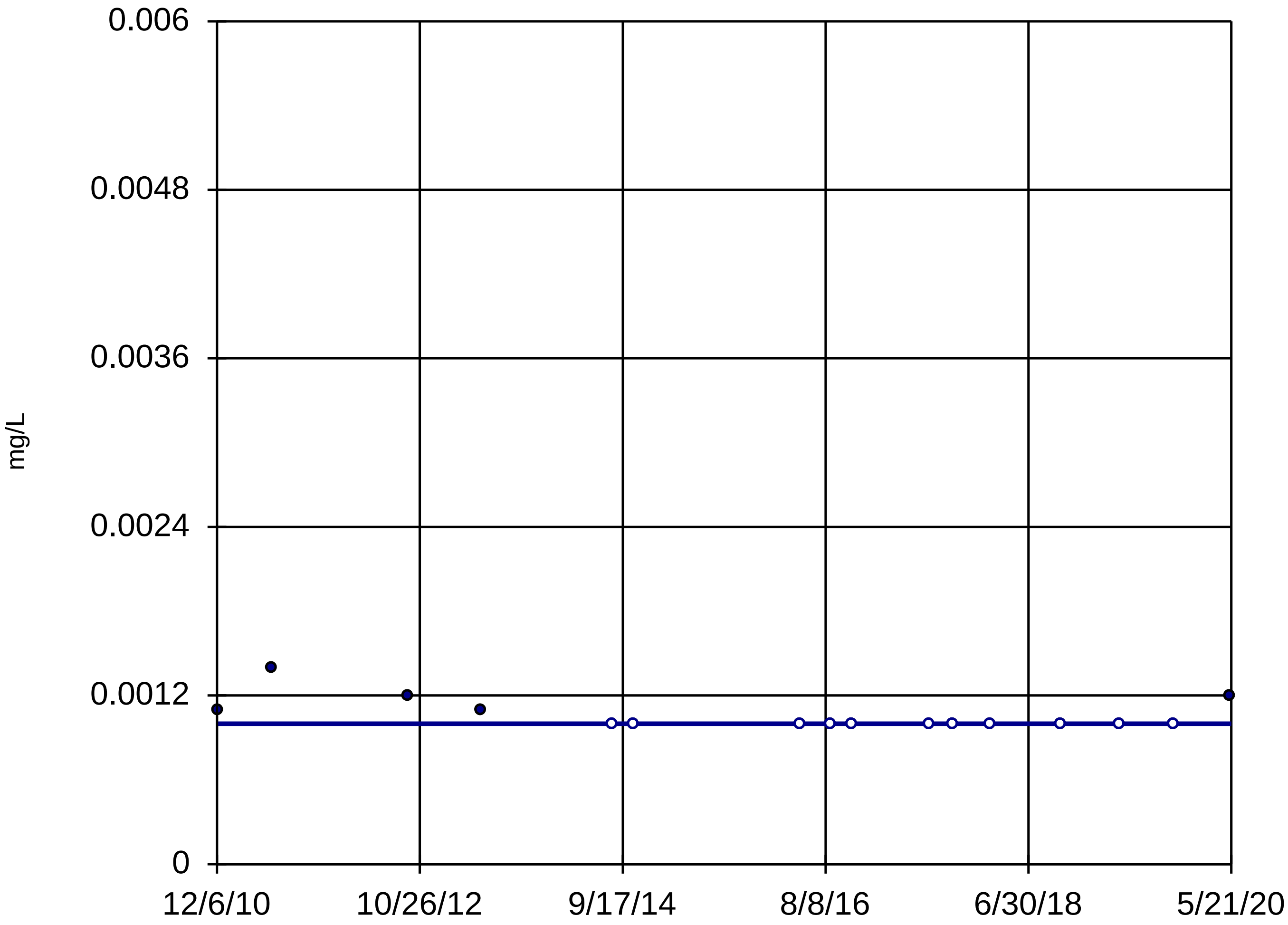
## Sen's Slope Estimator

MW-01




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = -33
critical = -58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

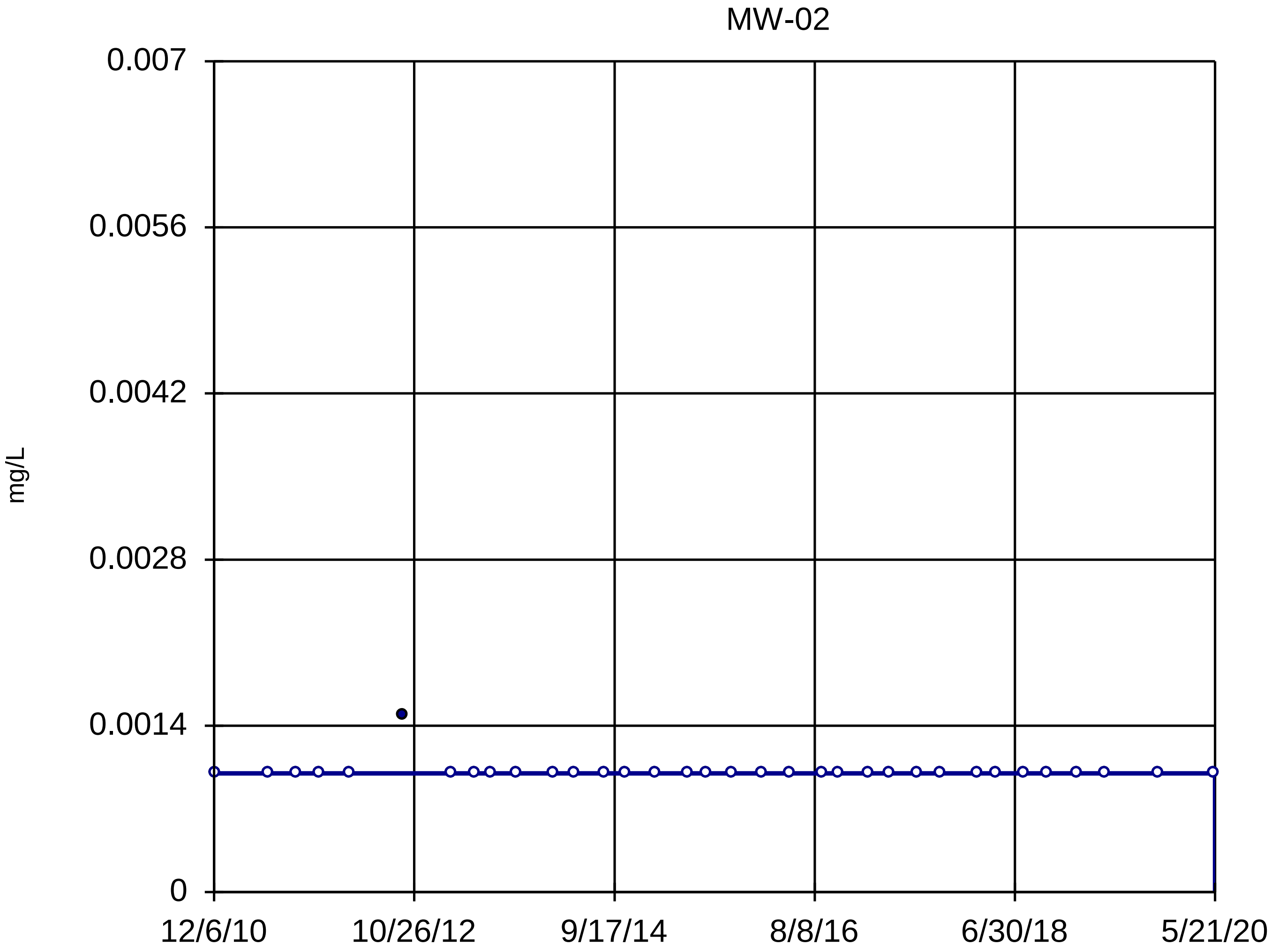
Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81528

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 34

Slope = 0
units per year.

Mann-Kendall
statistic = -23
critical = -176

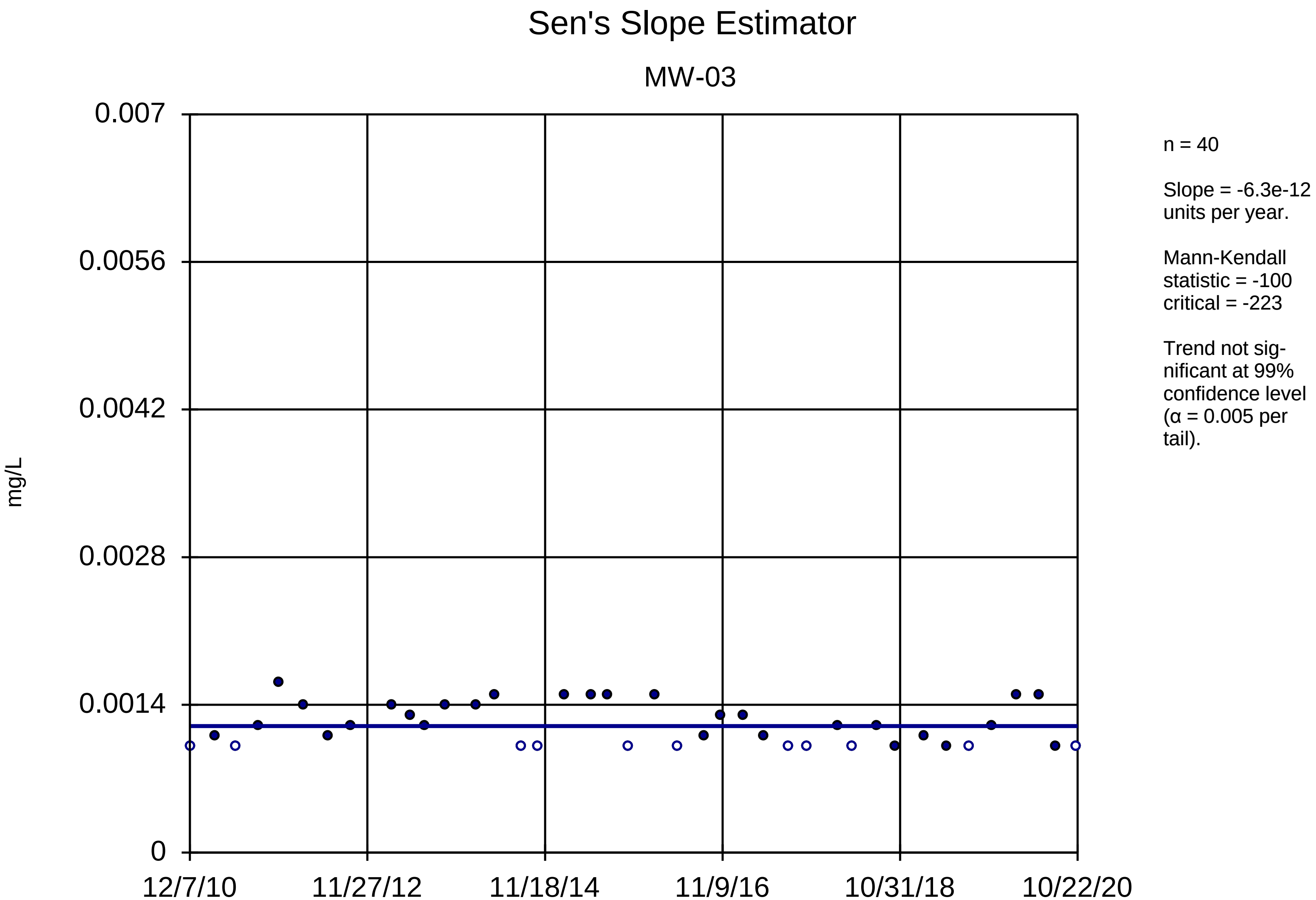
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81529

Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81530

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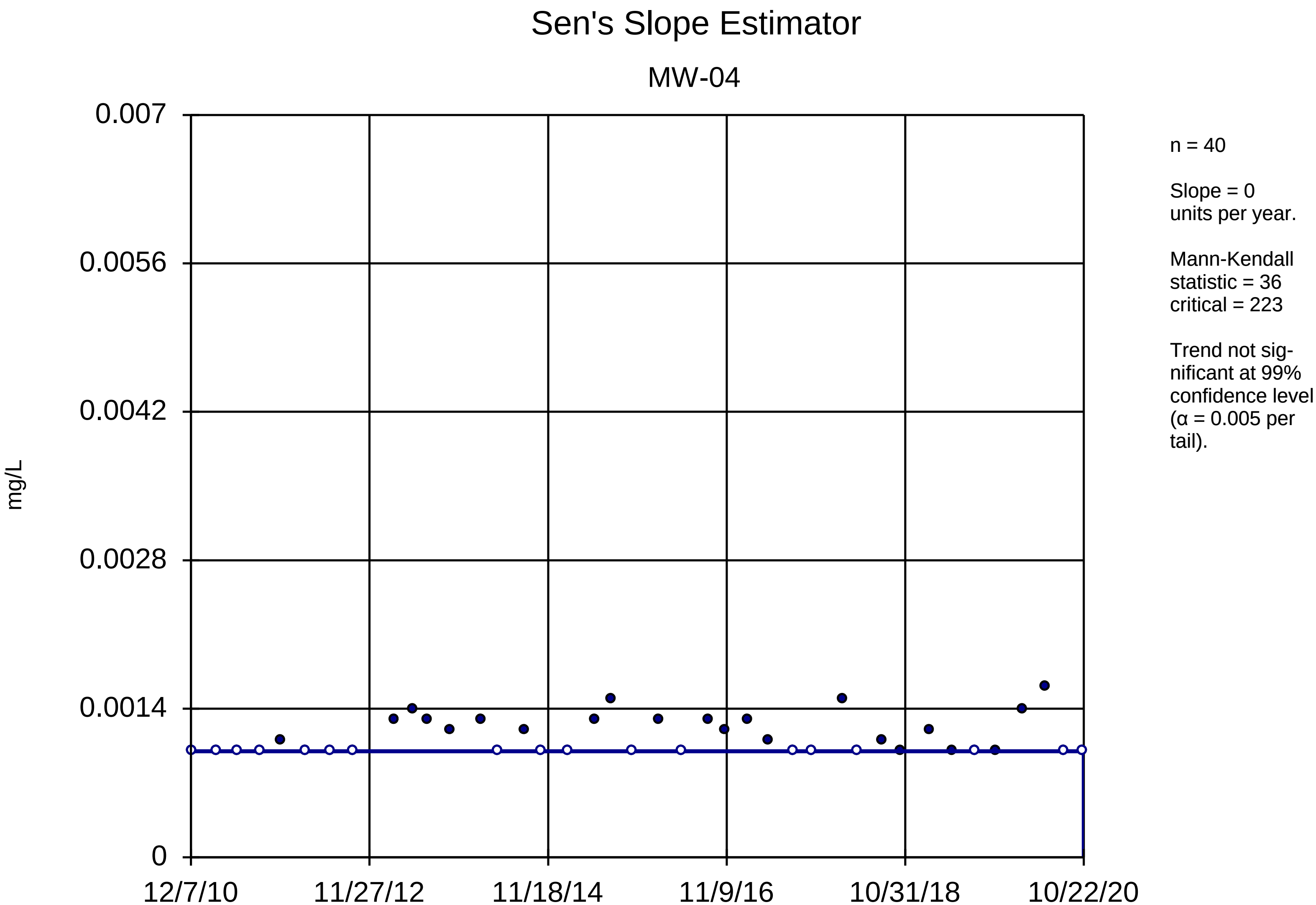
Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

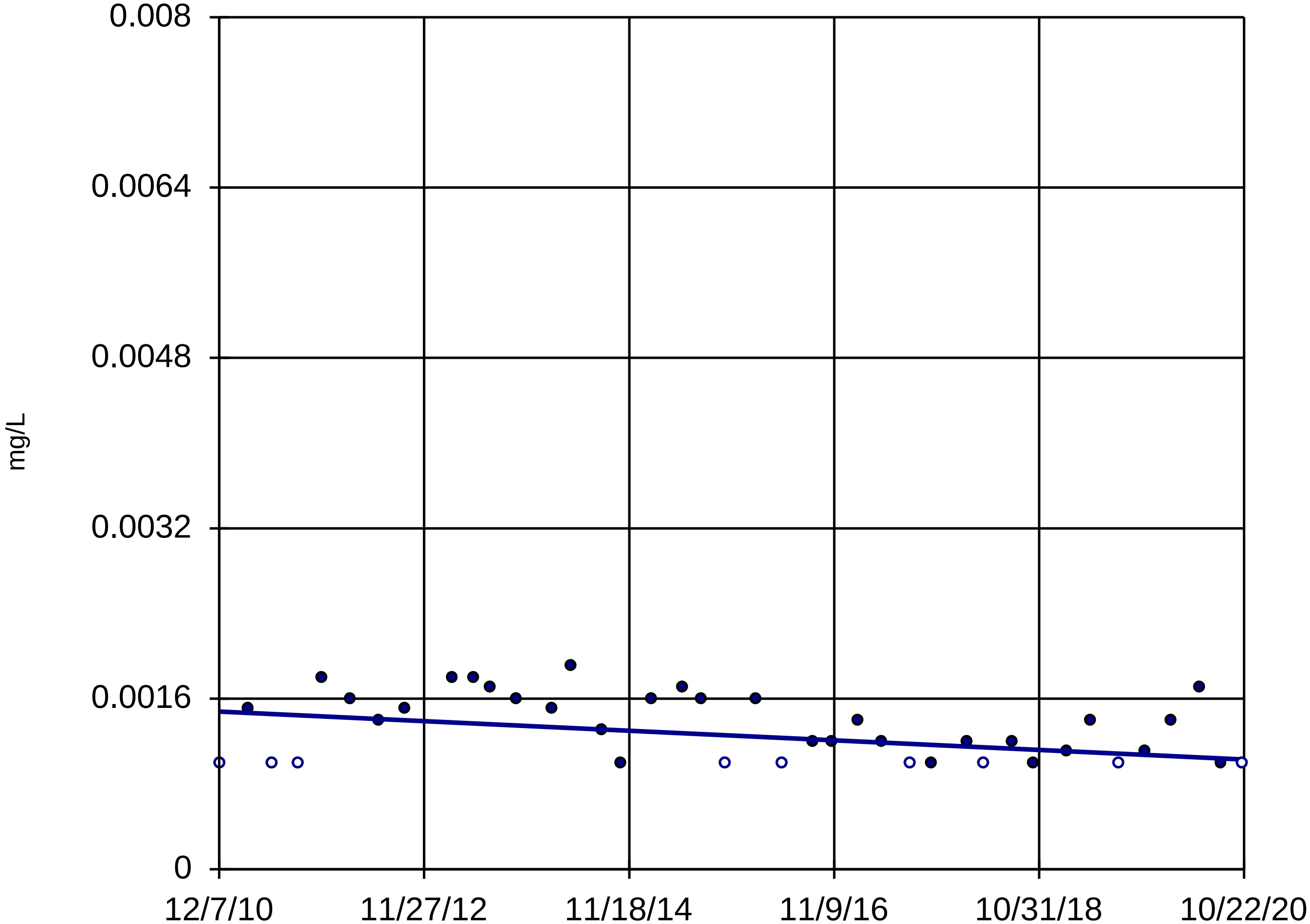
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81531

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-06




n = 40

Slope = -0.00004546 units per year.

Mann-Kendall statistic = -196 critical = -223

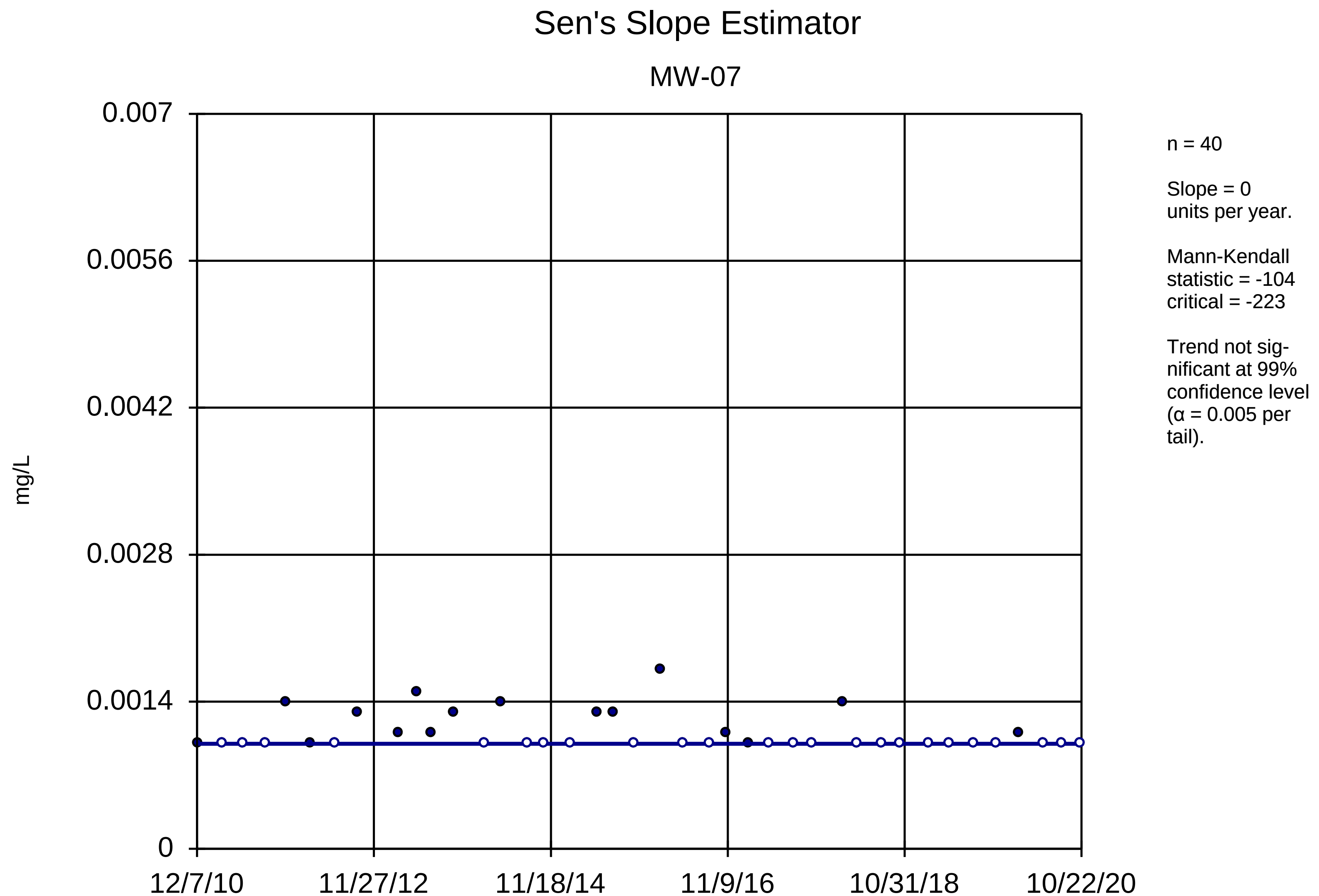
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81532

Hollow symbols indicate censored values.

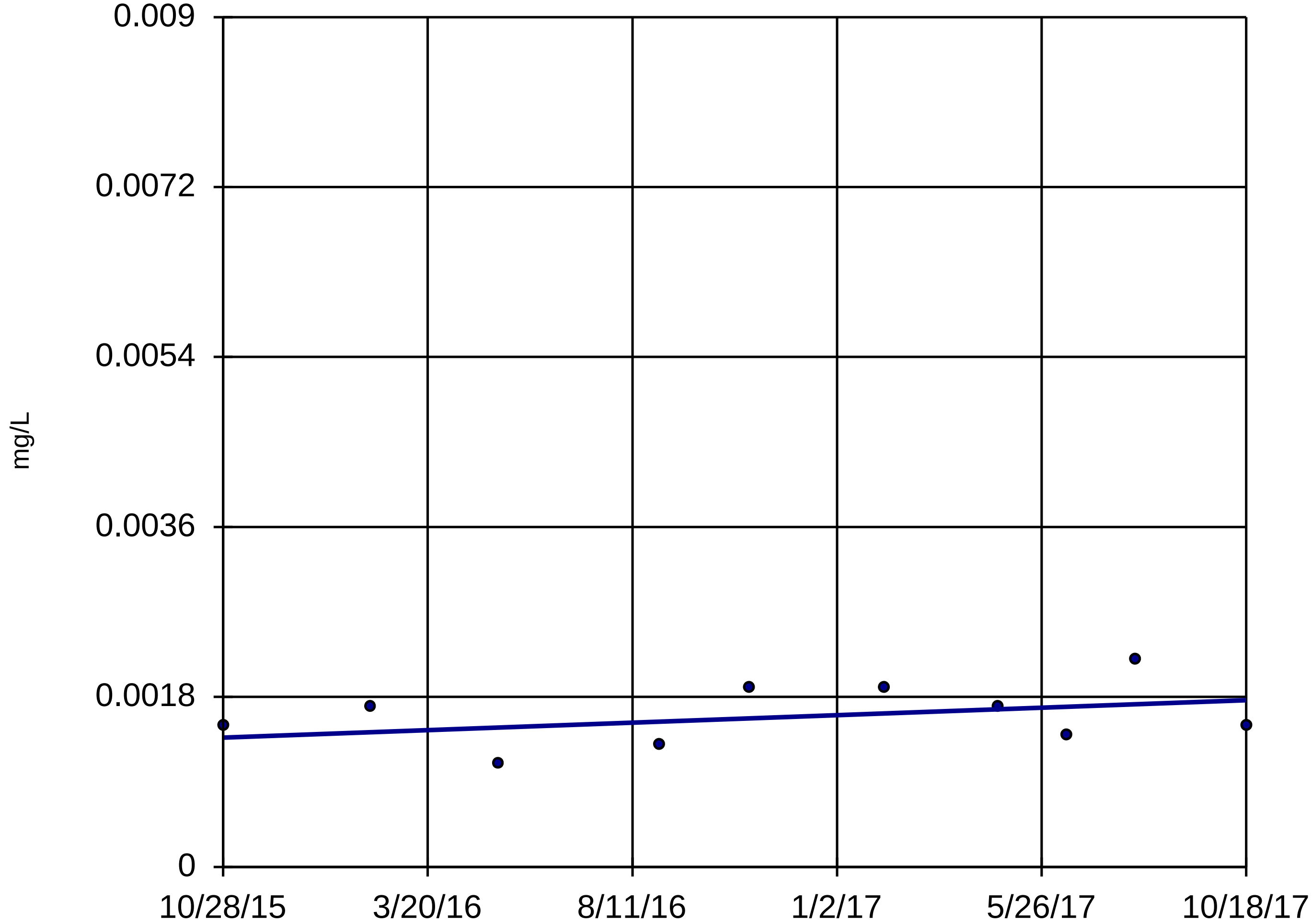



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Sen's Slope Estimator

MW-03




n = 10

Slope = 0.0002017 units per year.

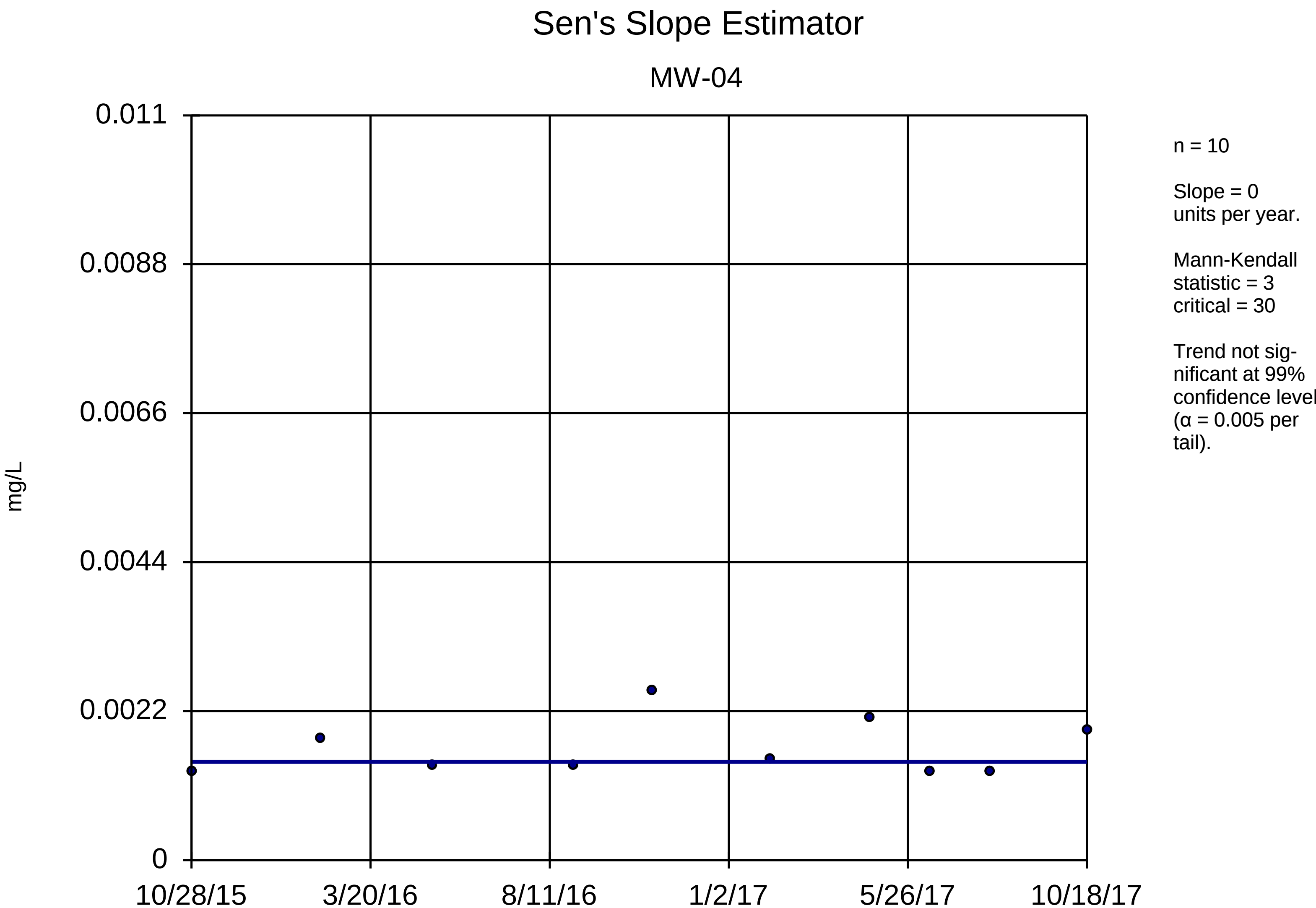
Mann-Kendall statistic = 10 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

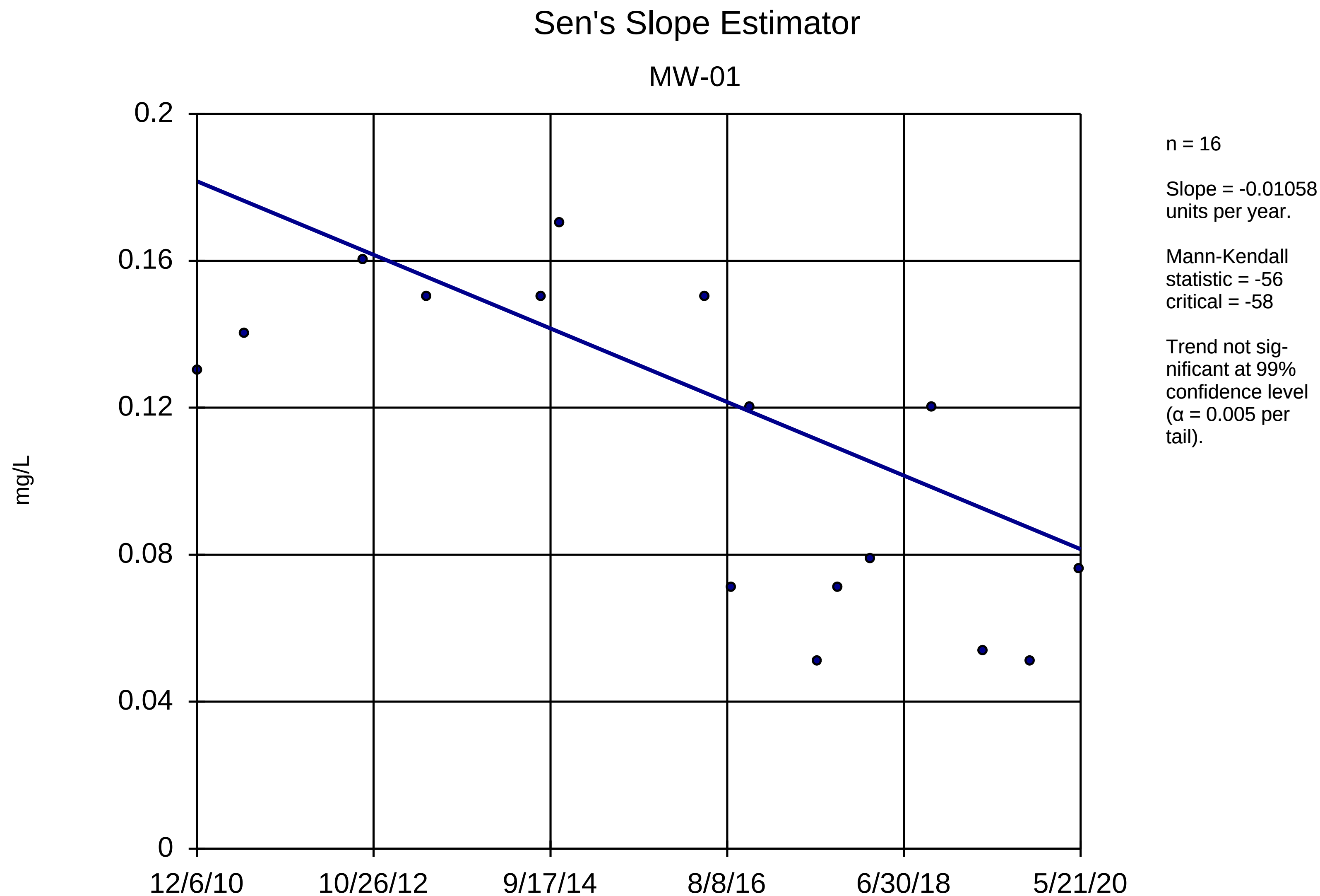
MWG13-15_81534




Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:00 AM

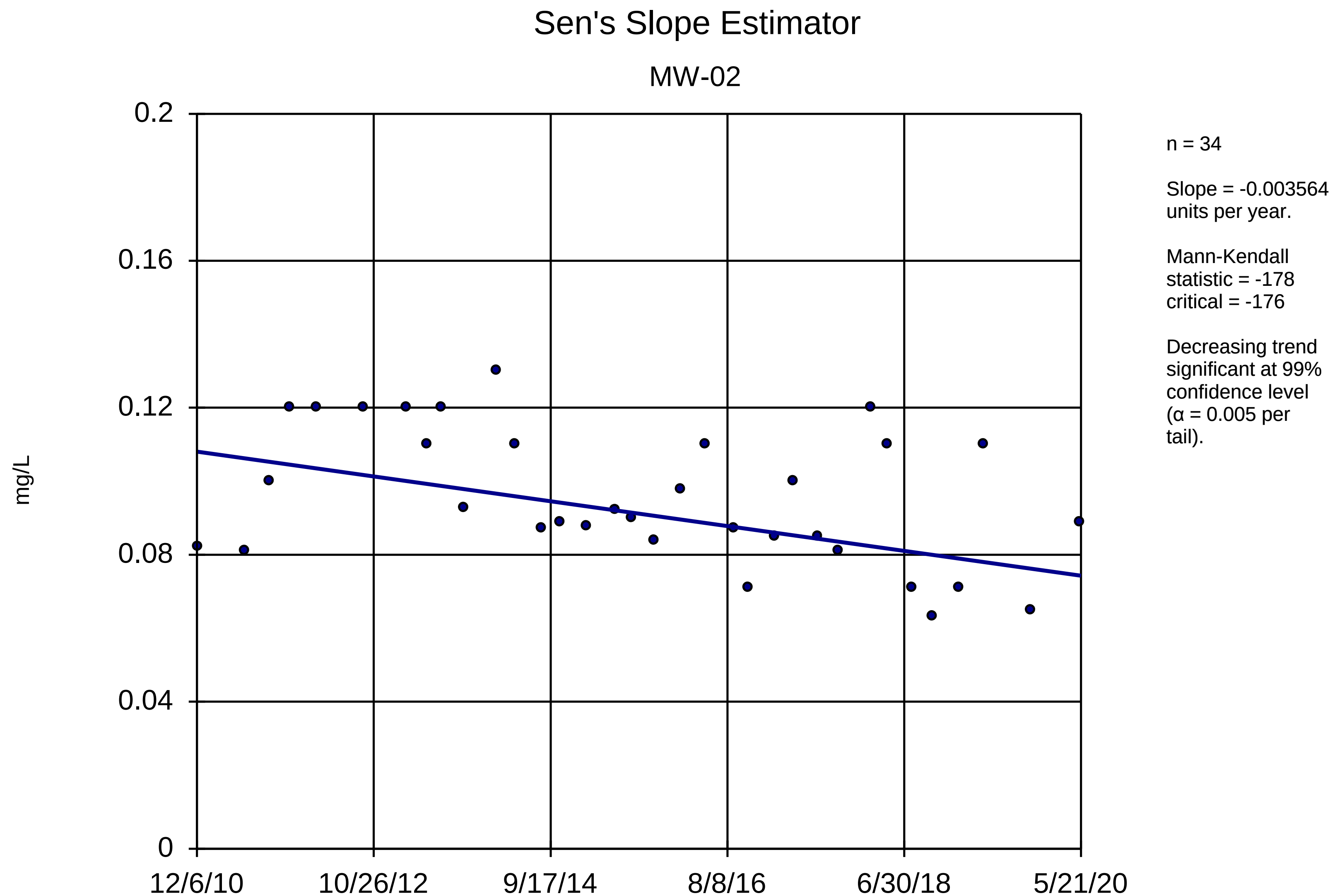
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81535




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:00 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81537

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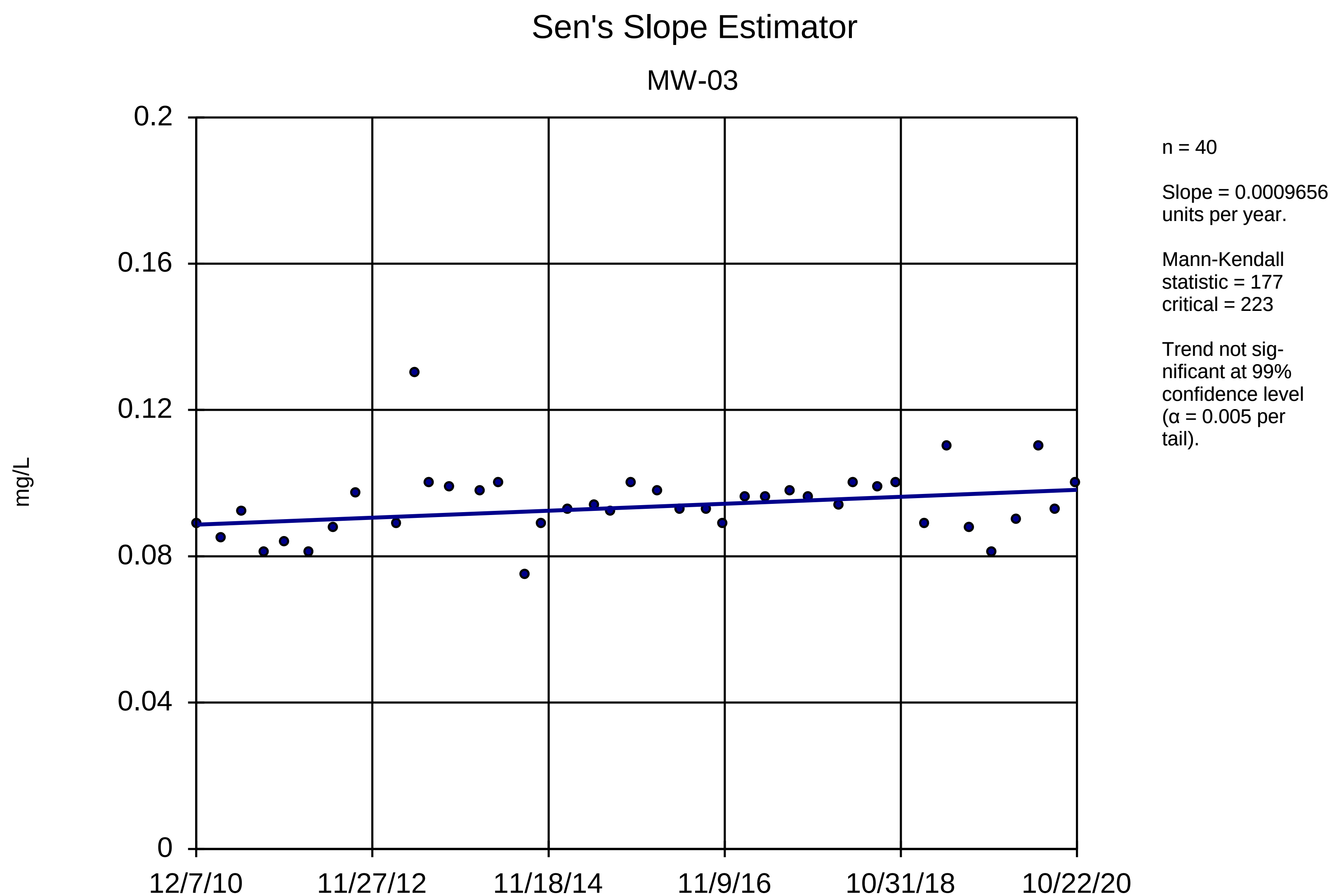
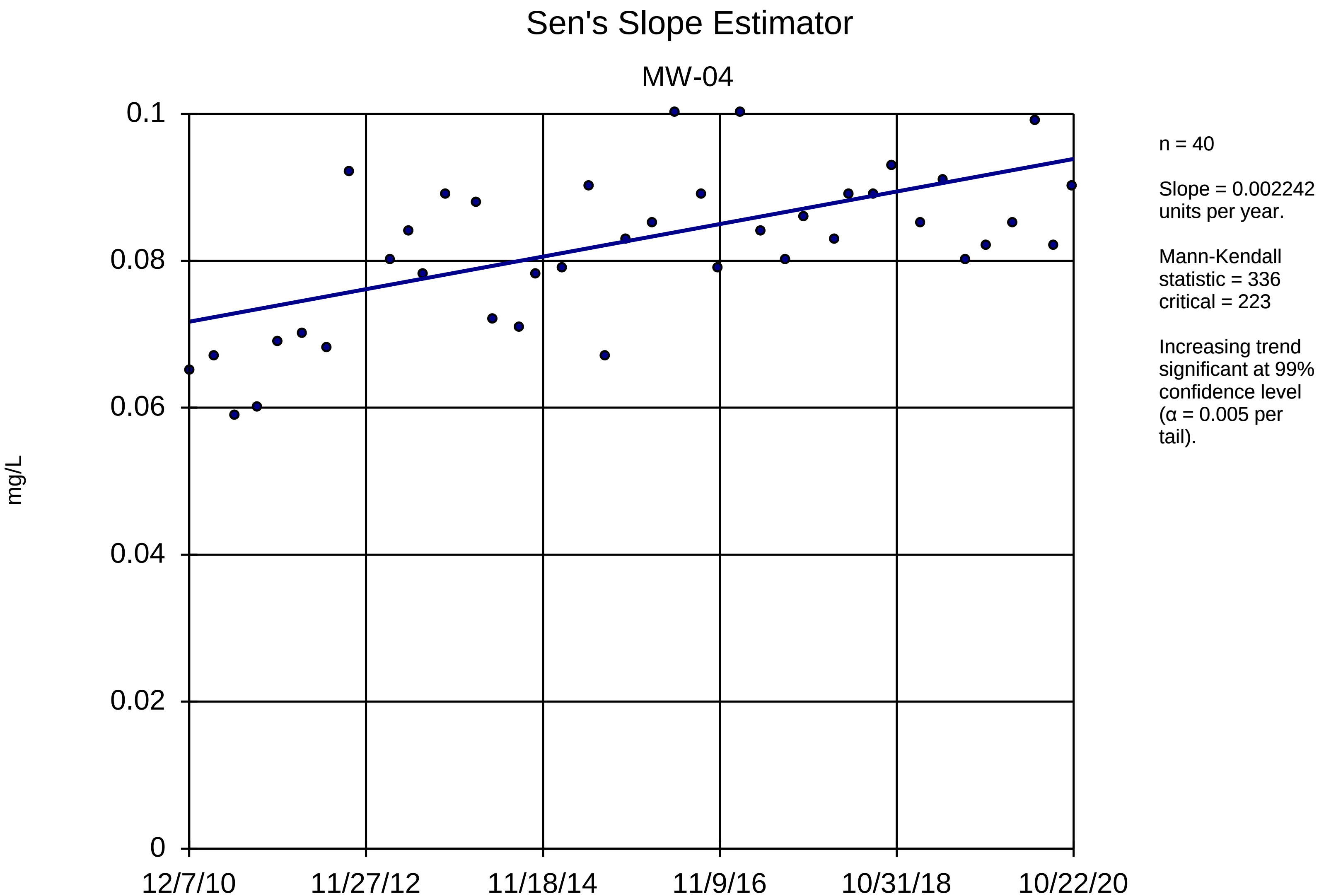



Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:00 AM

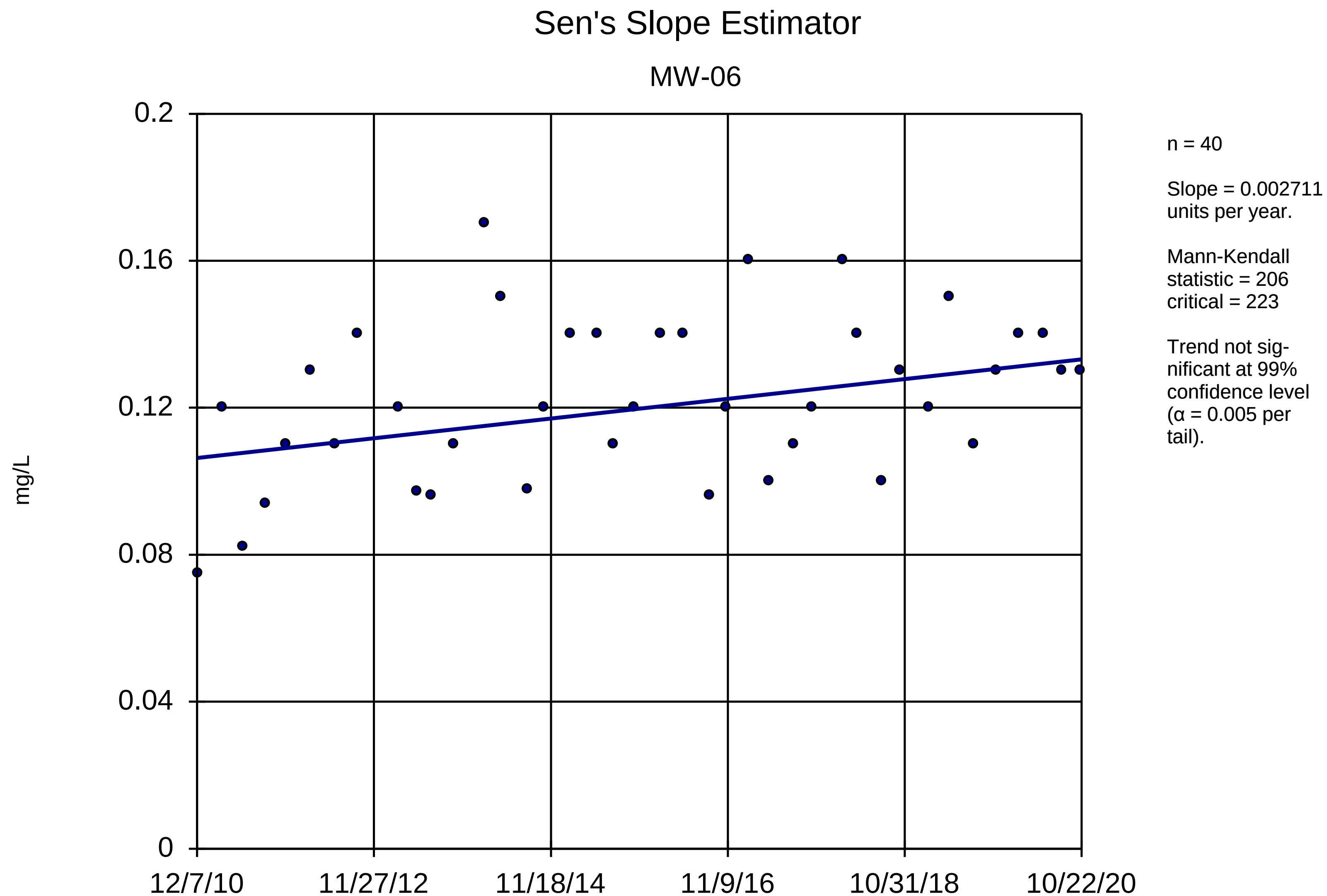
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81538



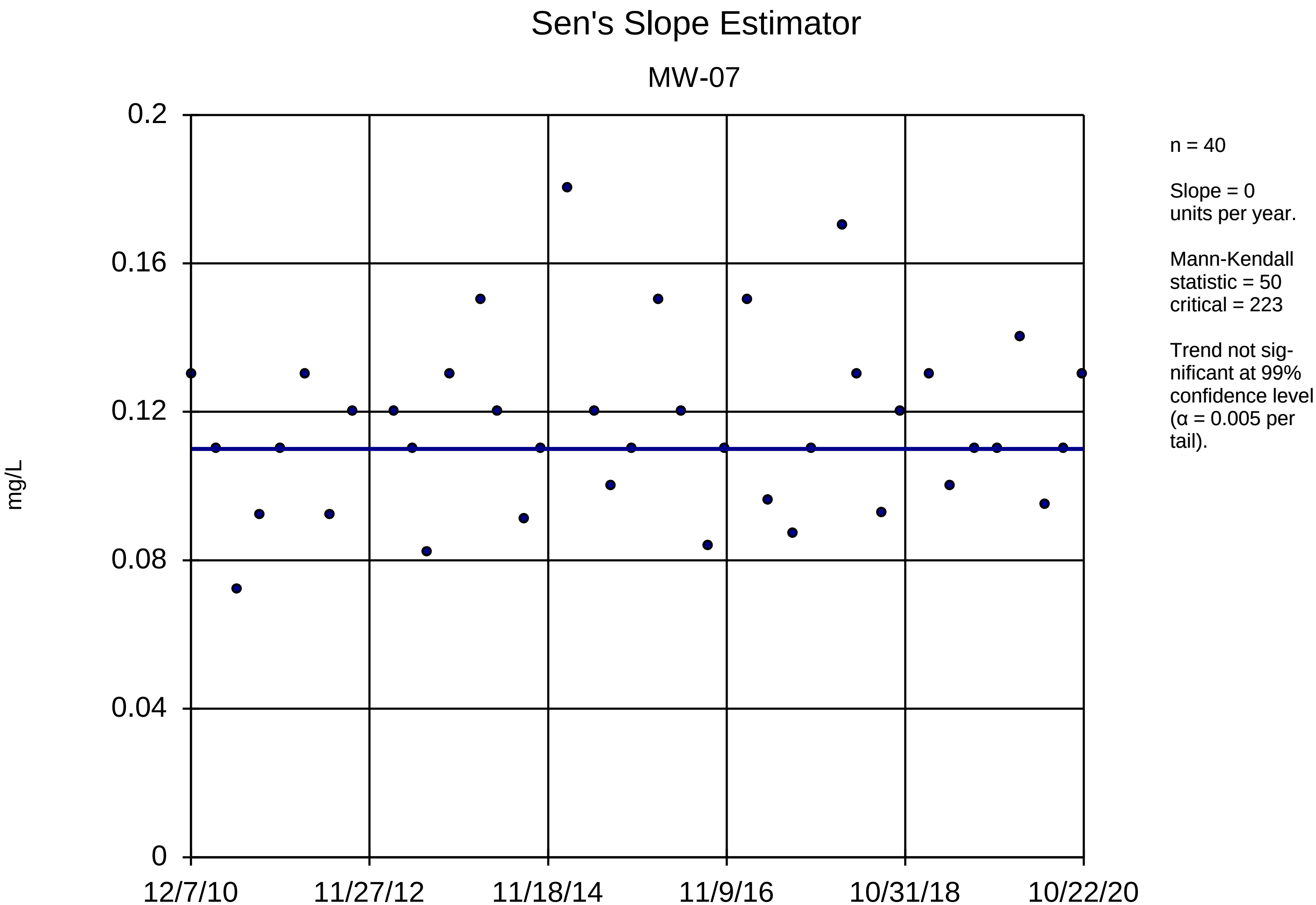

Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:01 AM

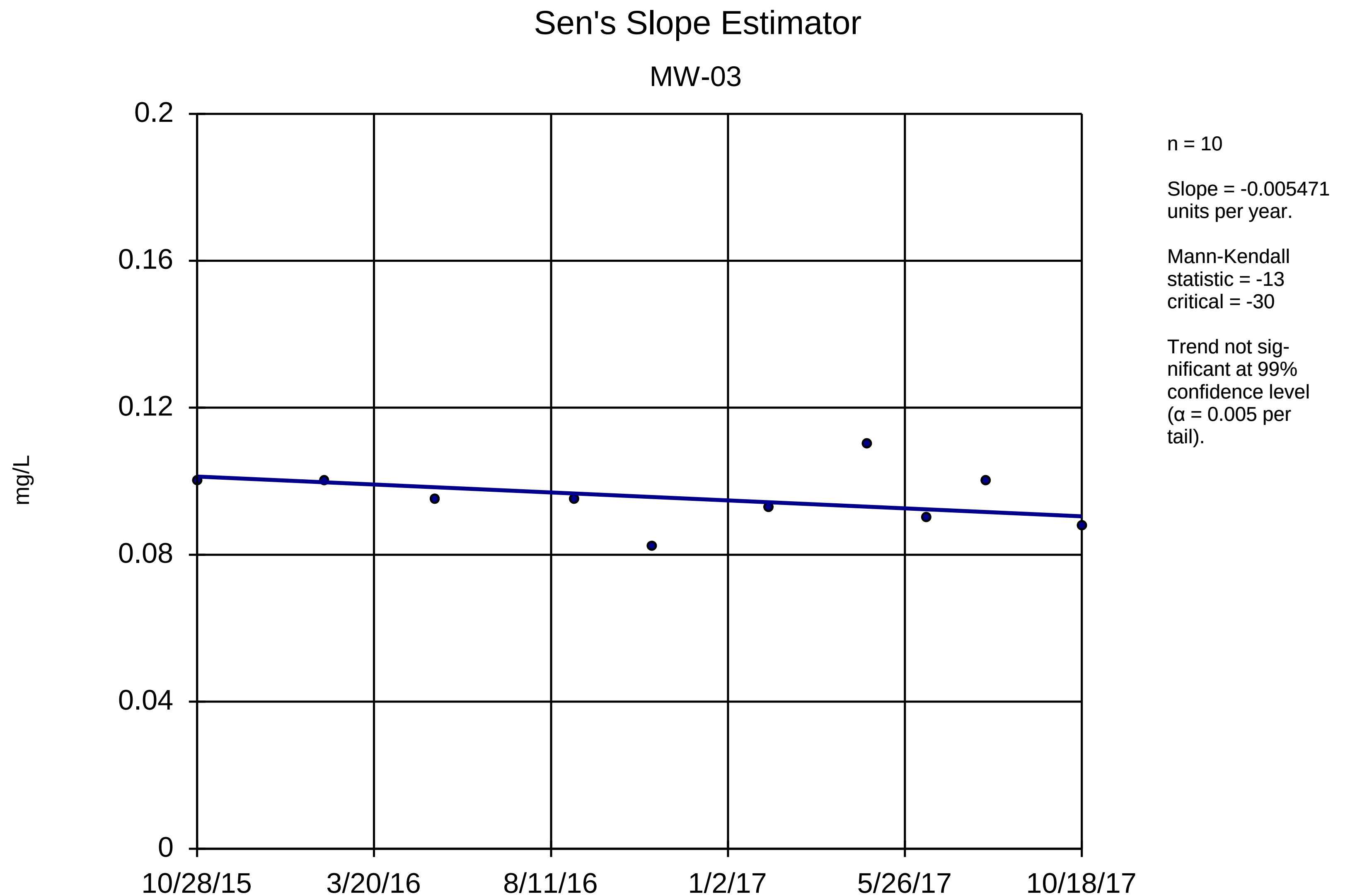
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:01 AM

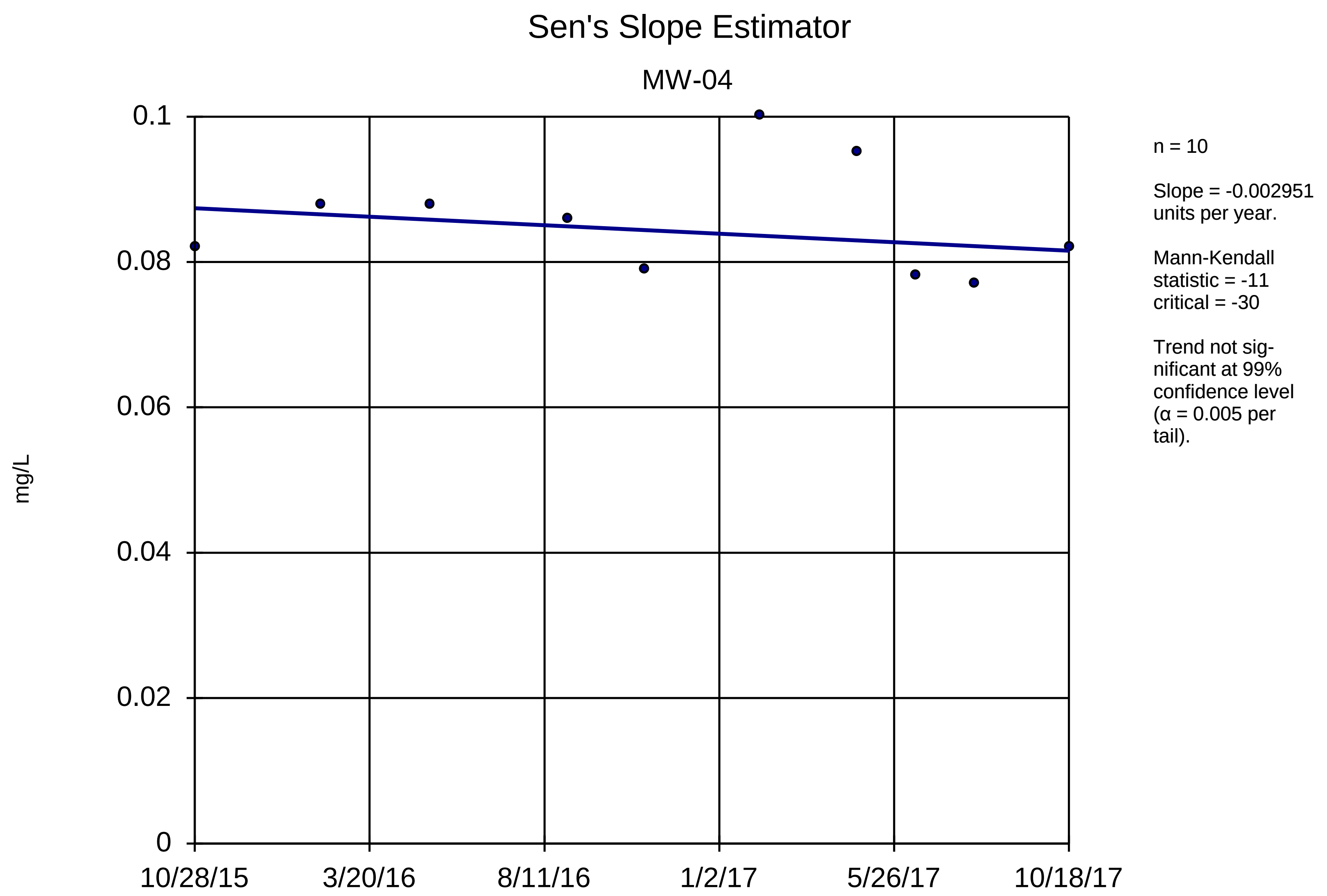
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81541




Constituent: Barium, Total Analysis Run 4/2/2021 11:01 AM

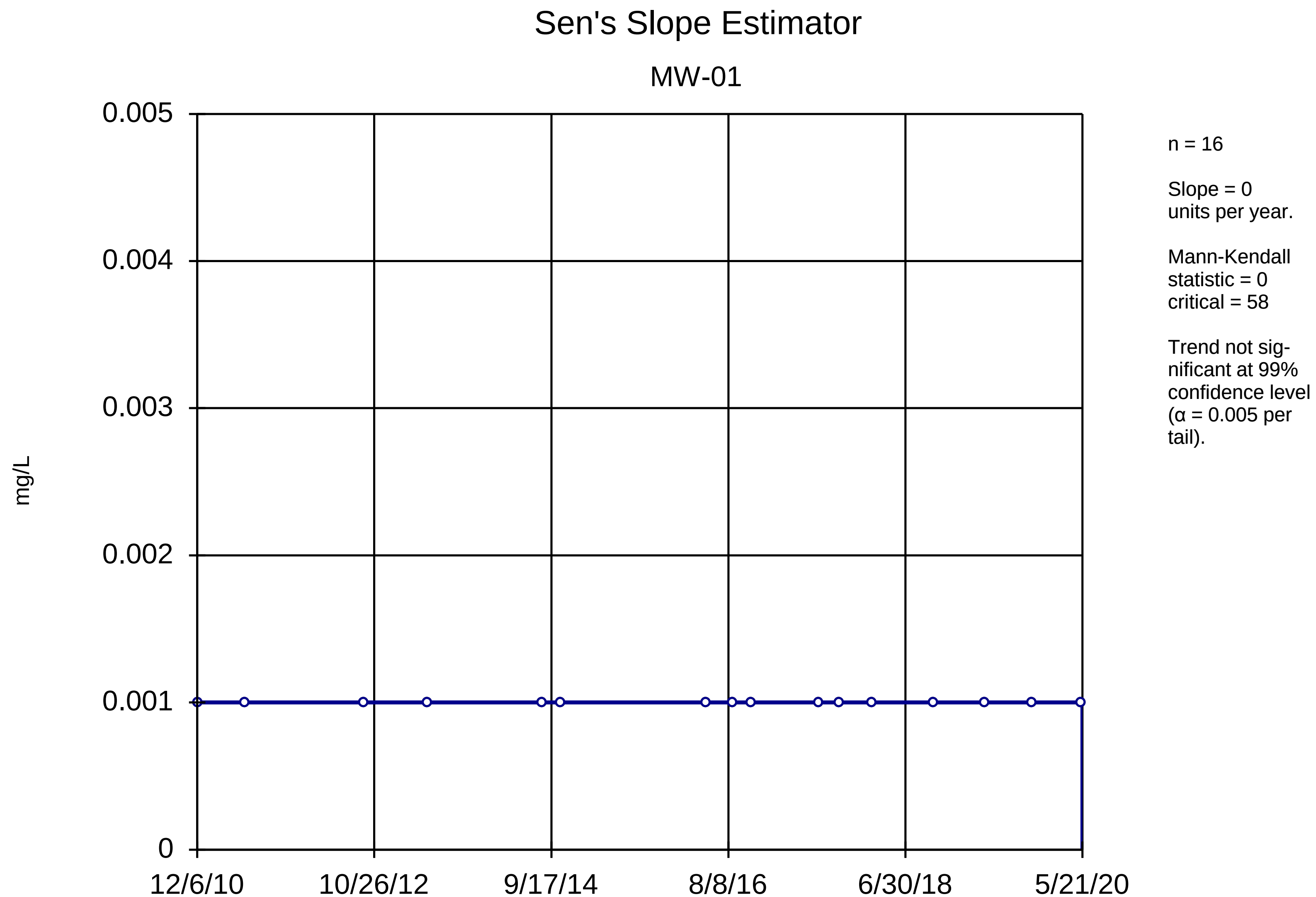
Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database




Constituent: Barium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

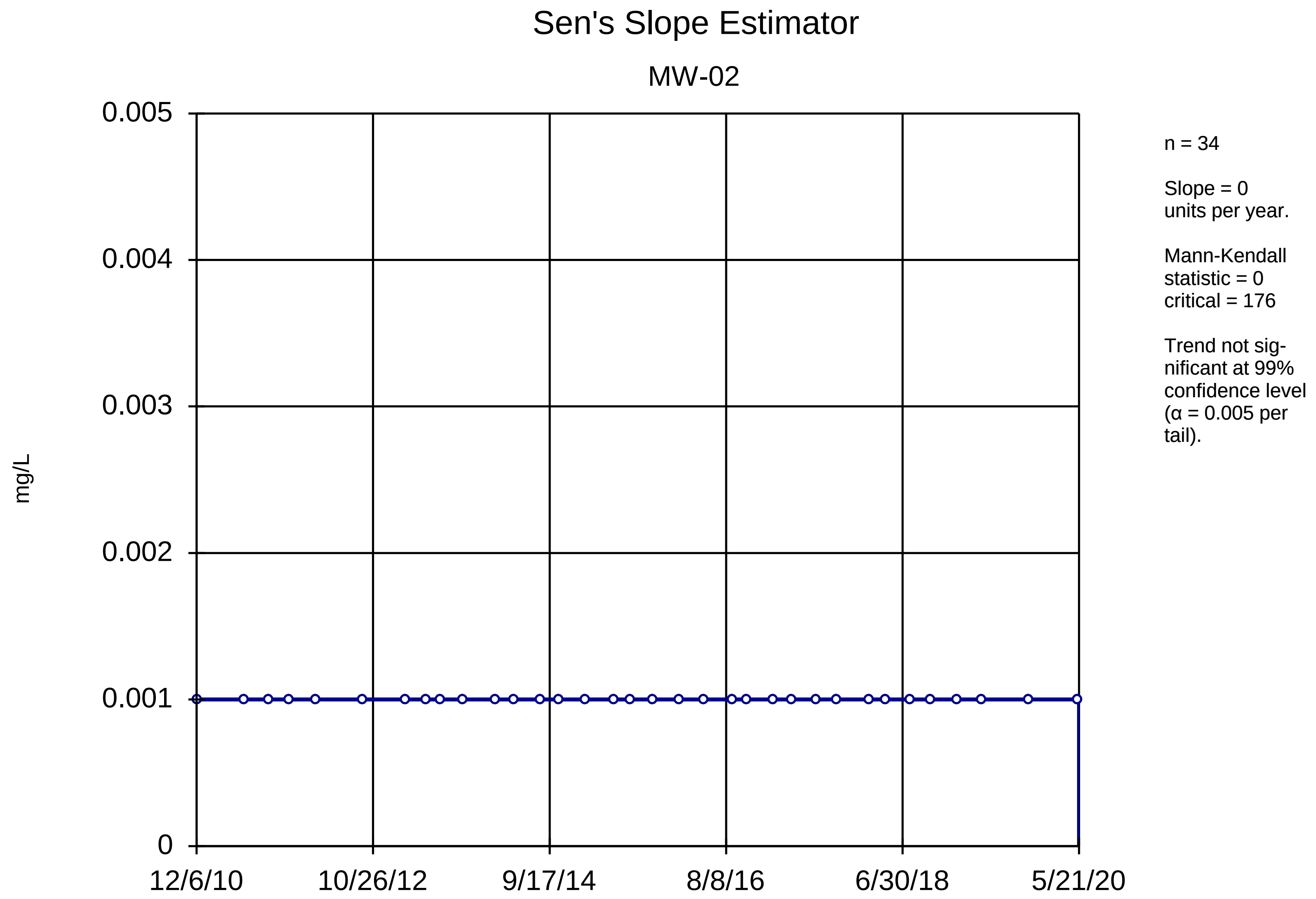



Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81544

Hollow symbols indicate censored values.

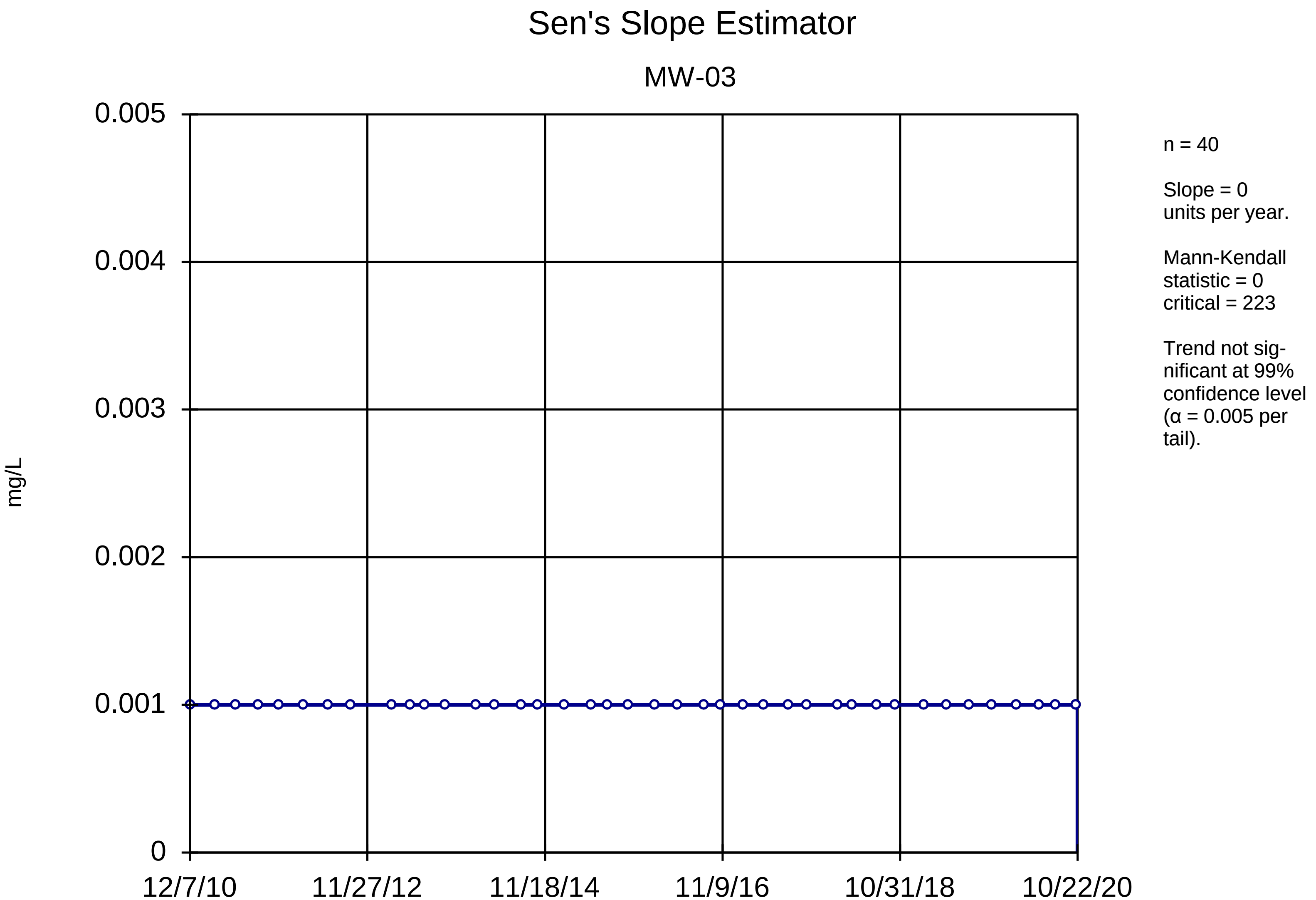



Constituent: Beryllium, Dissolved Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81545

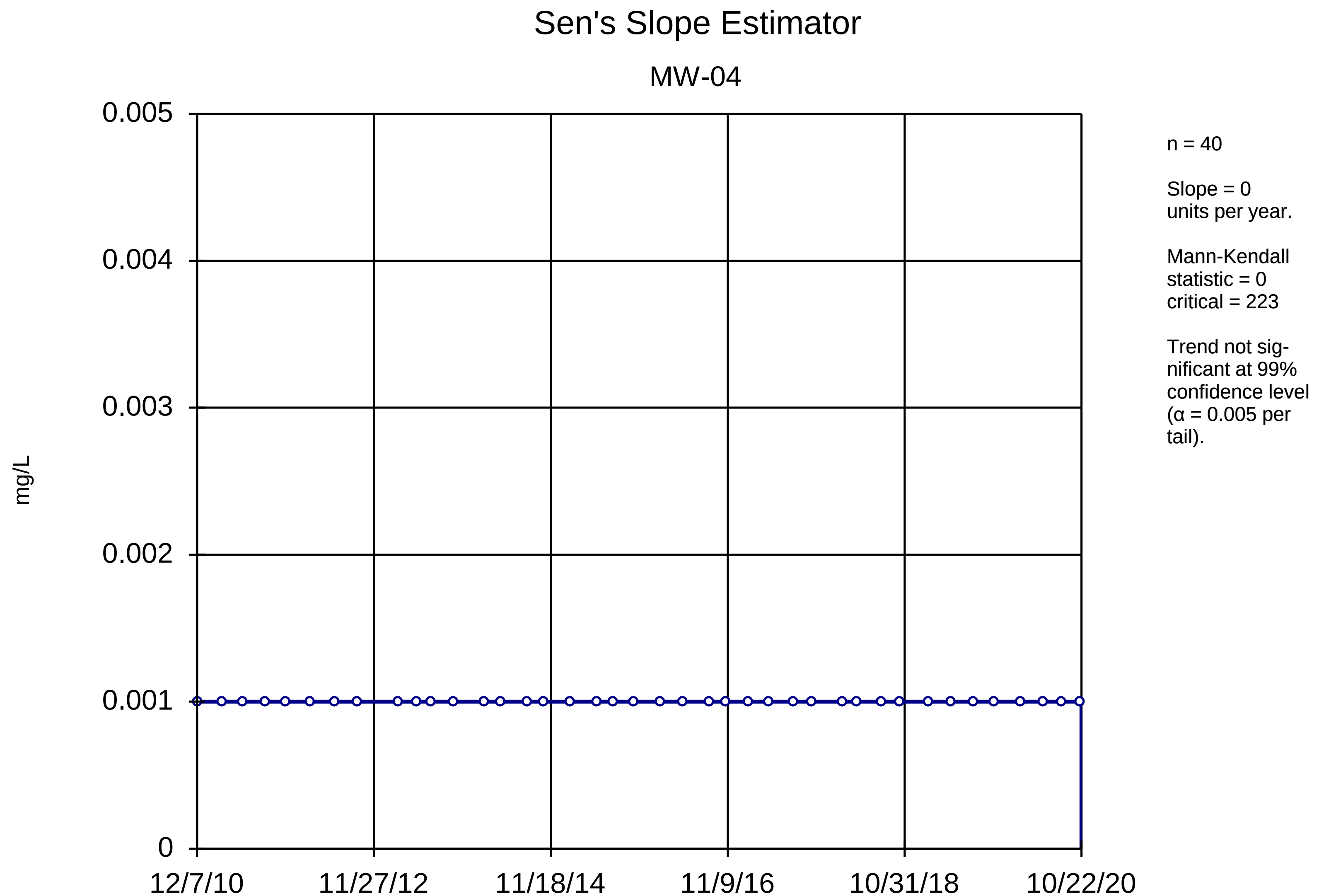
Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

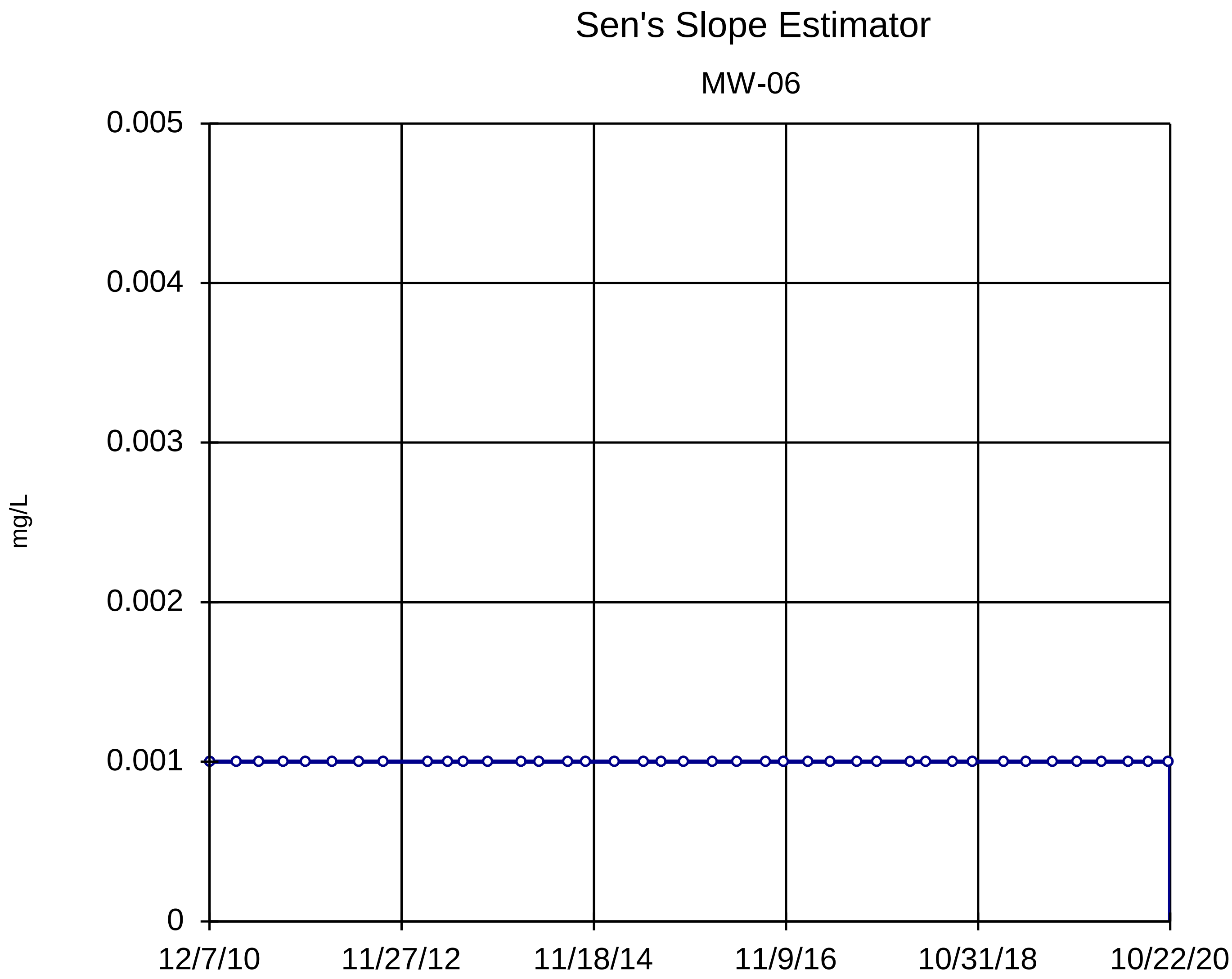



Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81547

Hollow symbols indicate censored values.




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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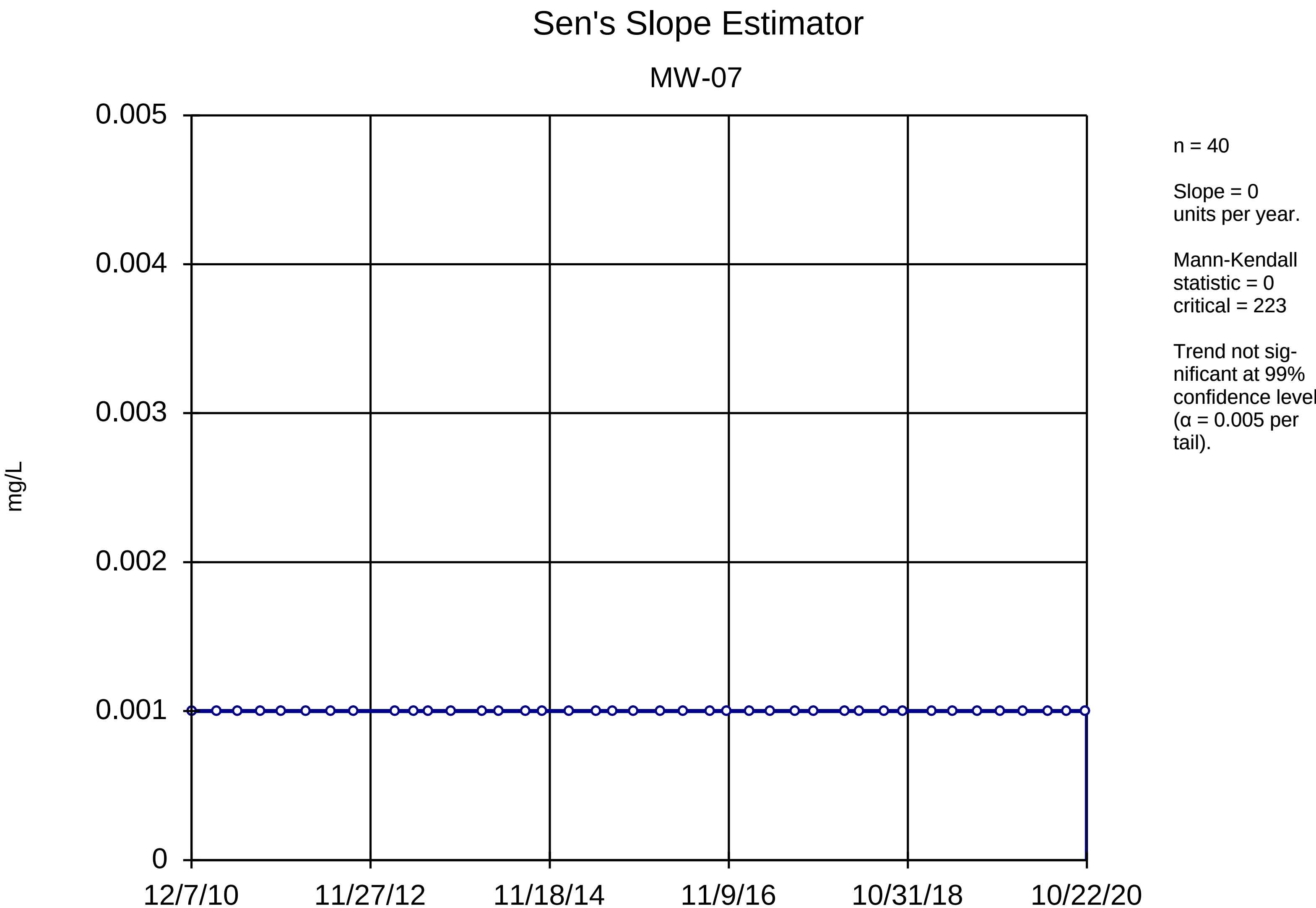
Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81549

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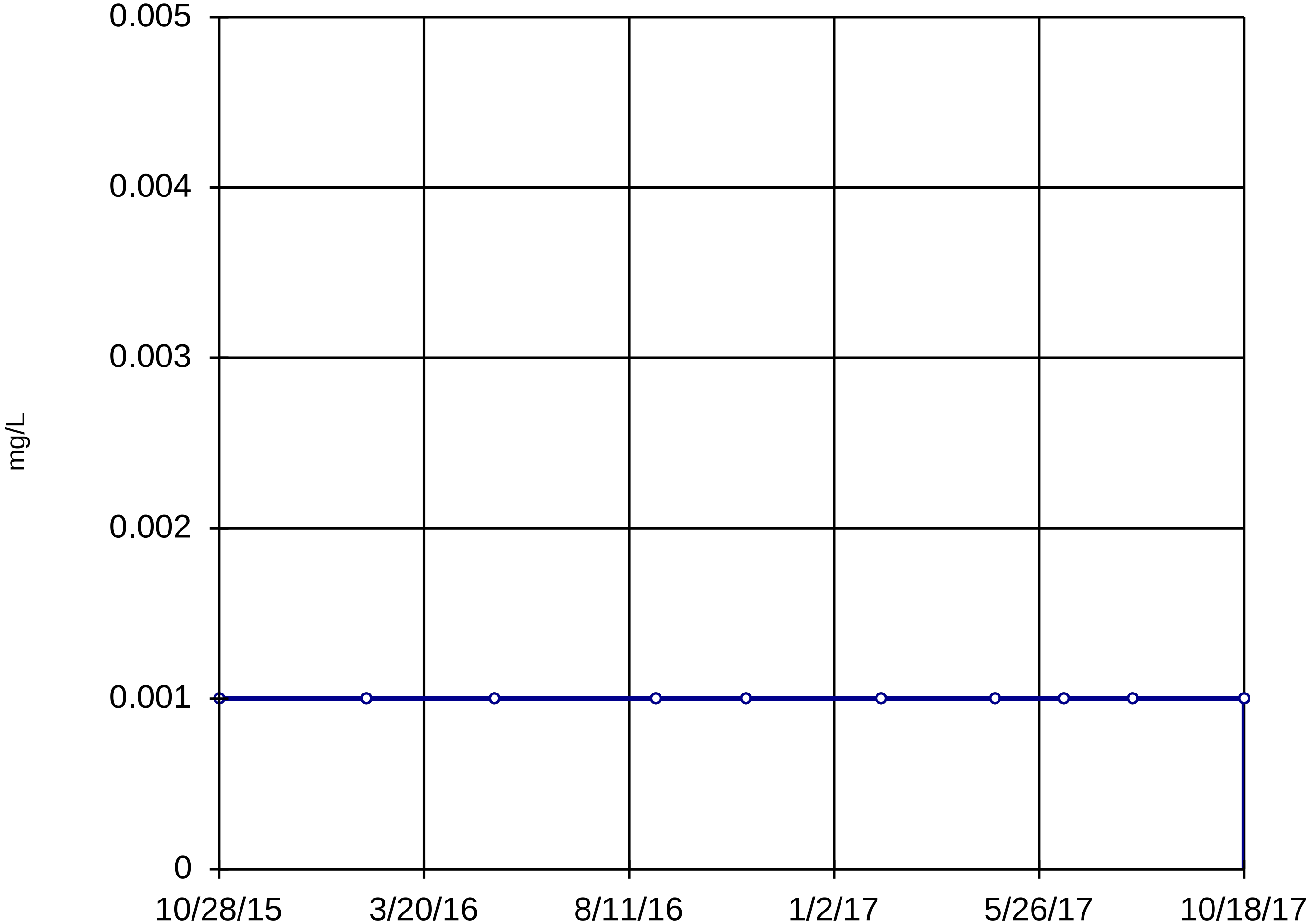
Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-03




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

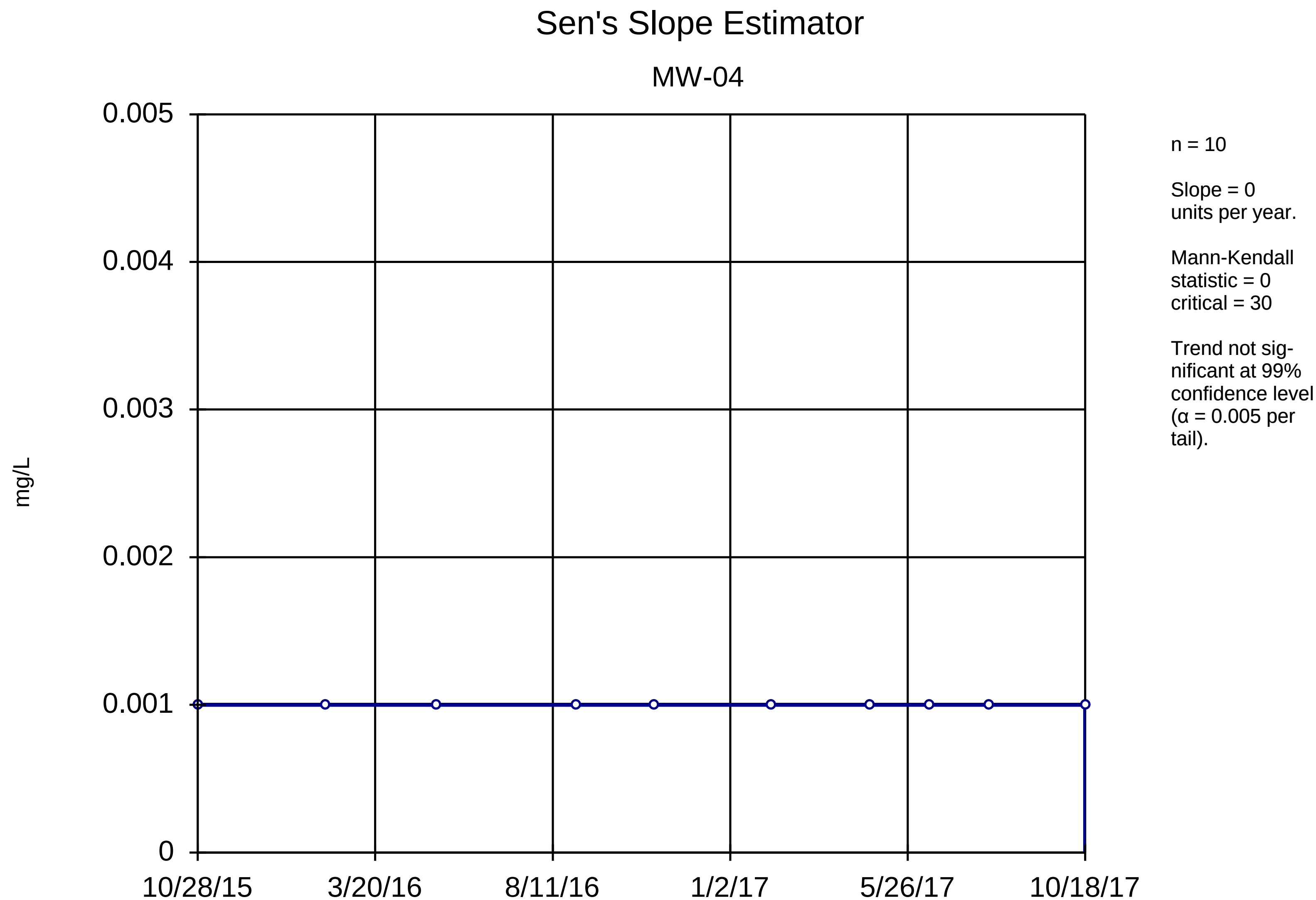
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81550

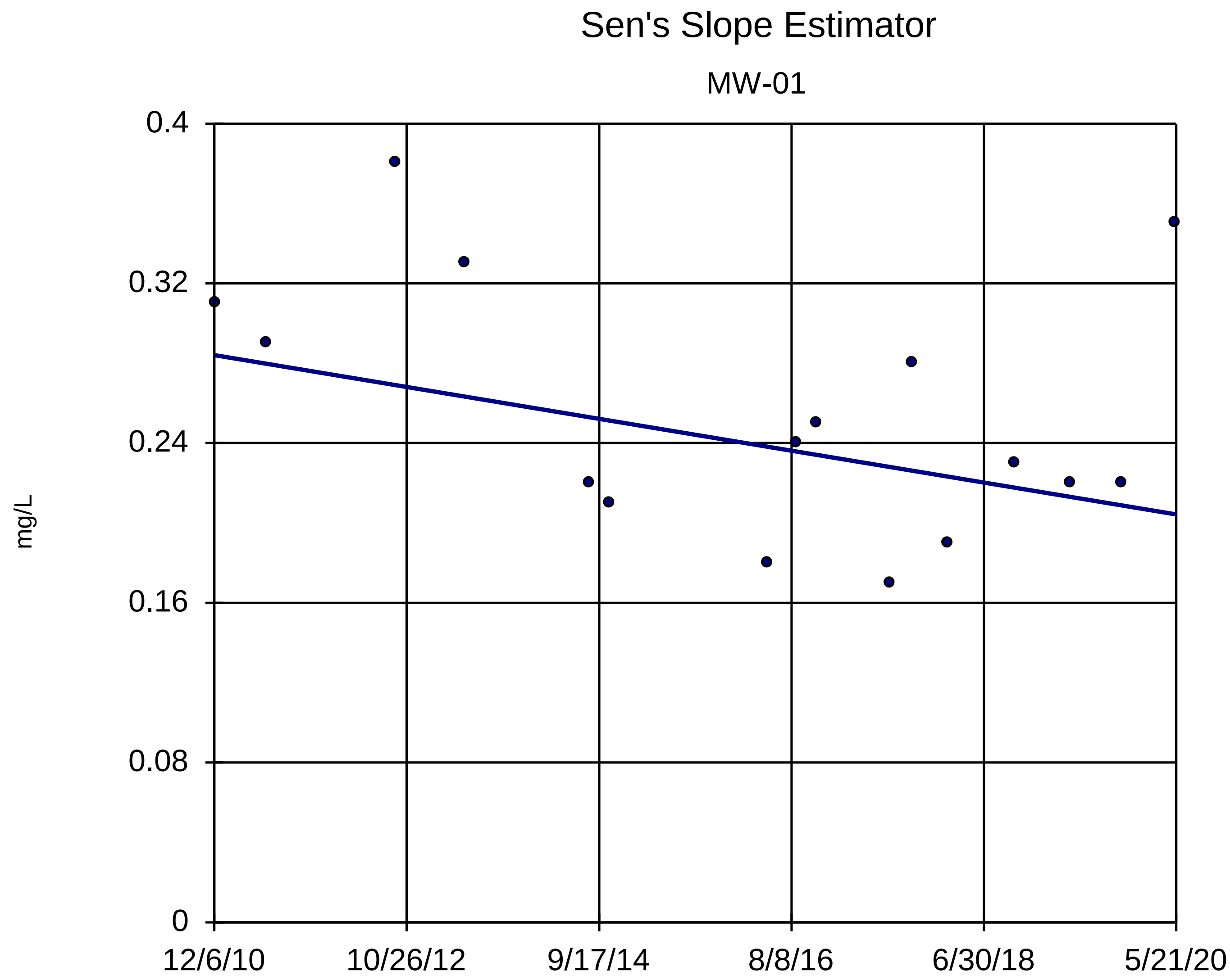
Hollow symbols indicate censored values.




Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81551




n = 16

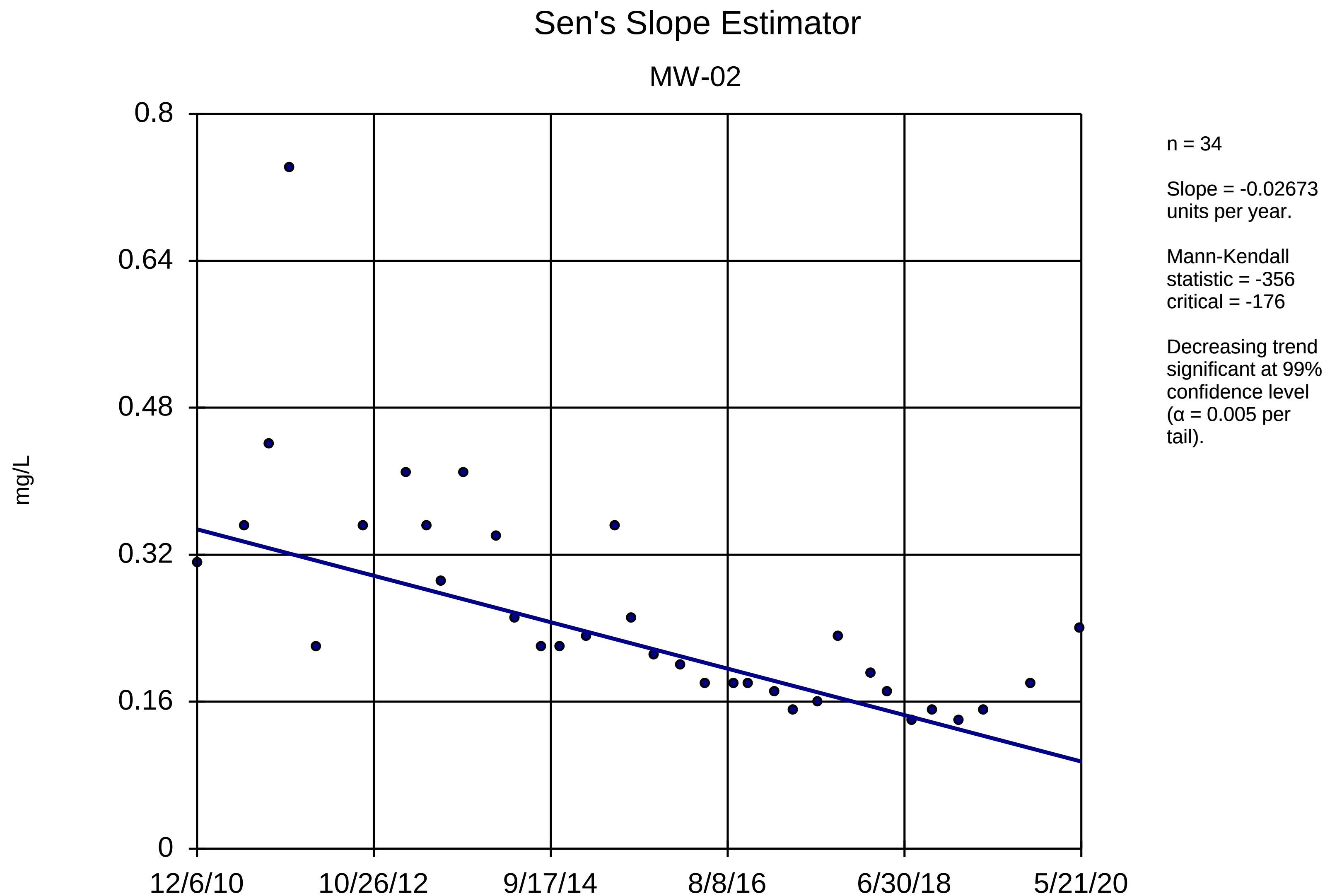
Slope = -0.008431 units per year.

Mann-Kendall statistic = -25 critical = -58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:01 AM

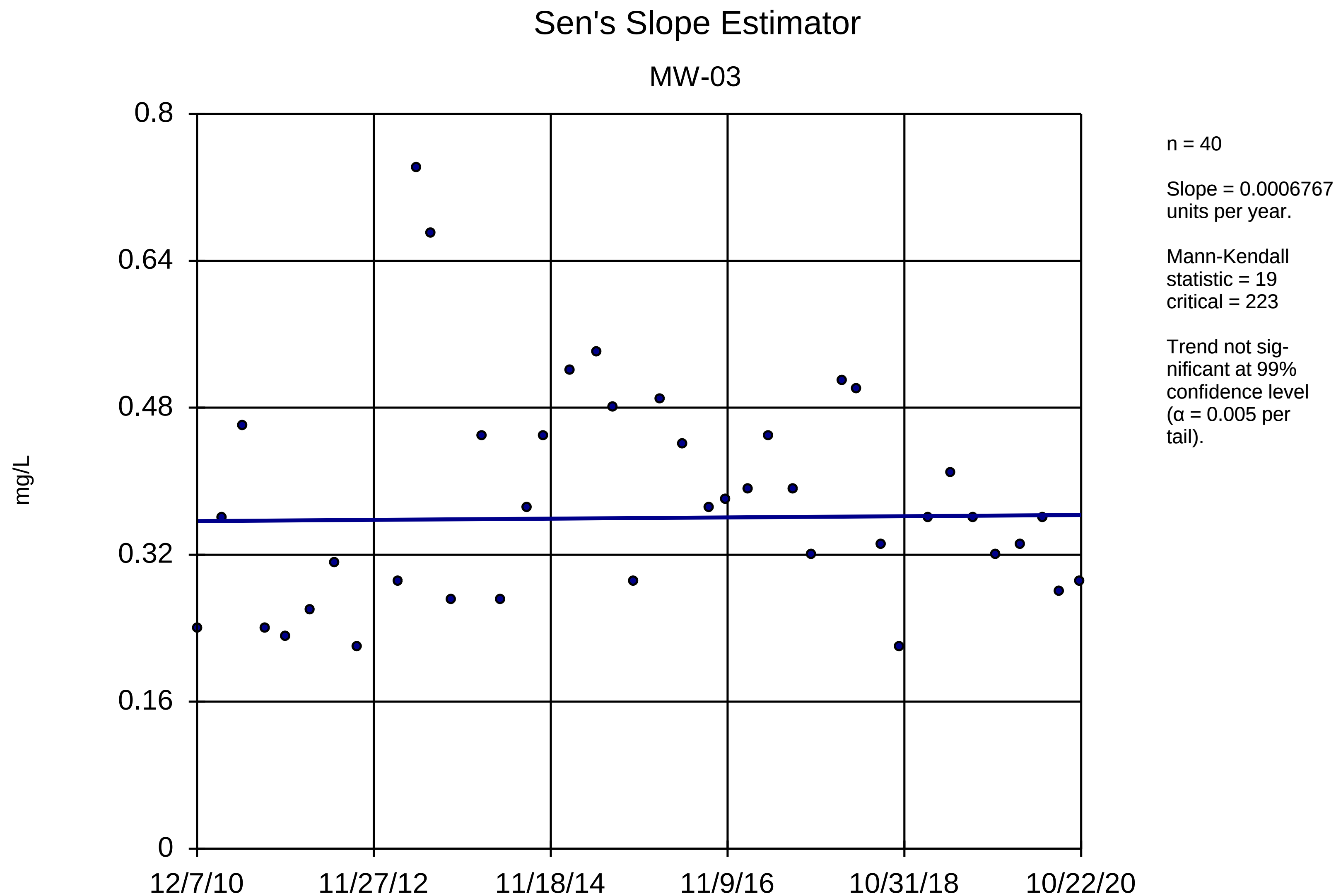
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

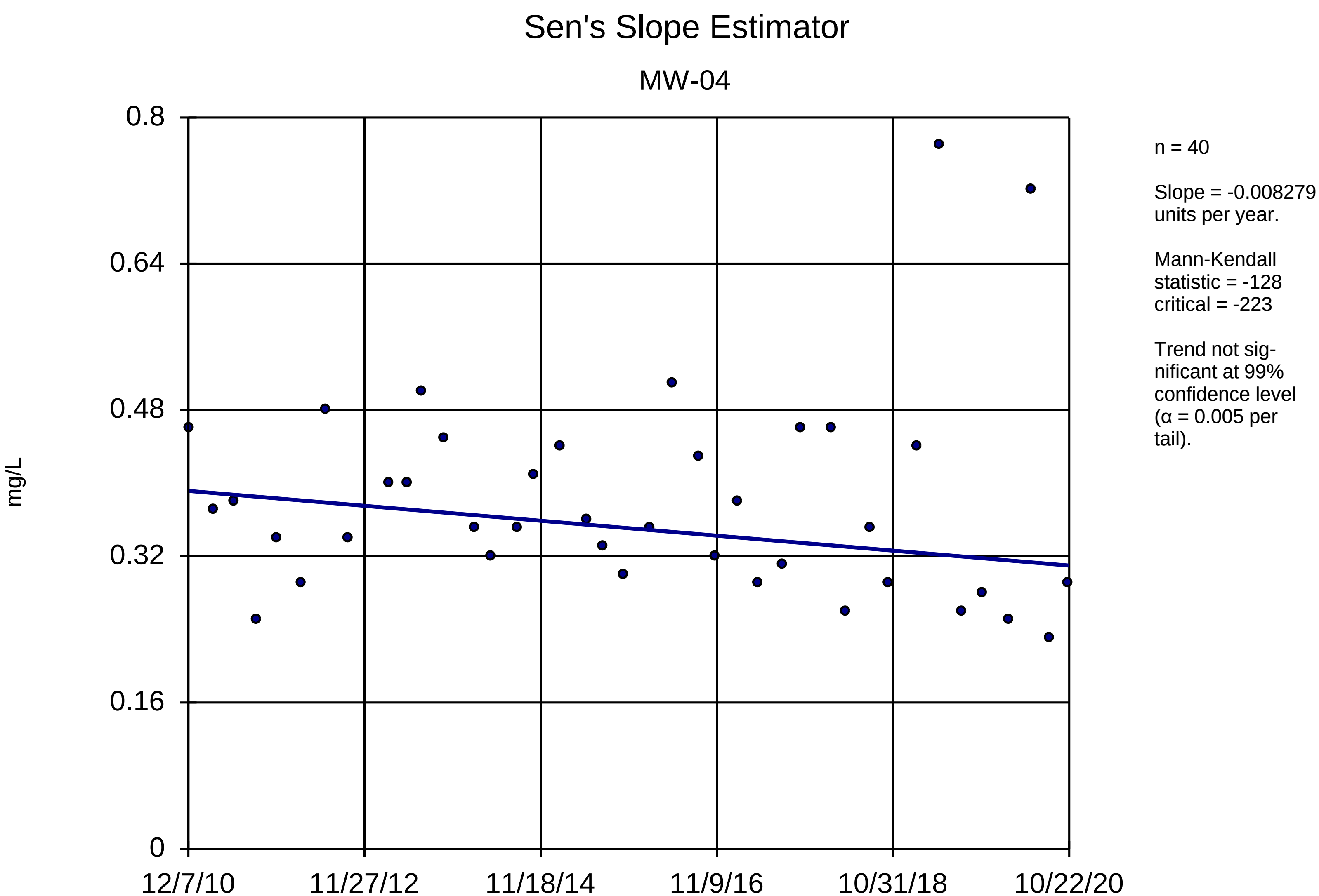
MWG13-15_81553




Constituent: Boron, Dissolved Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

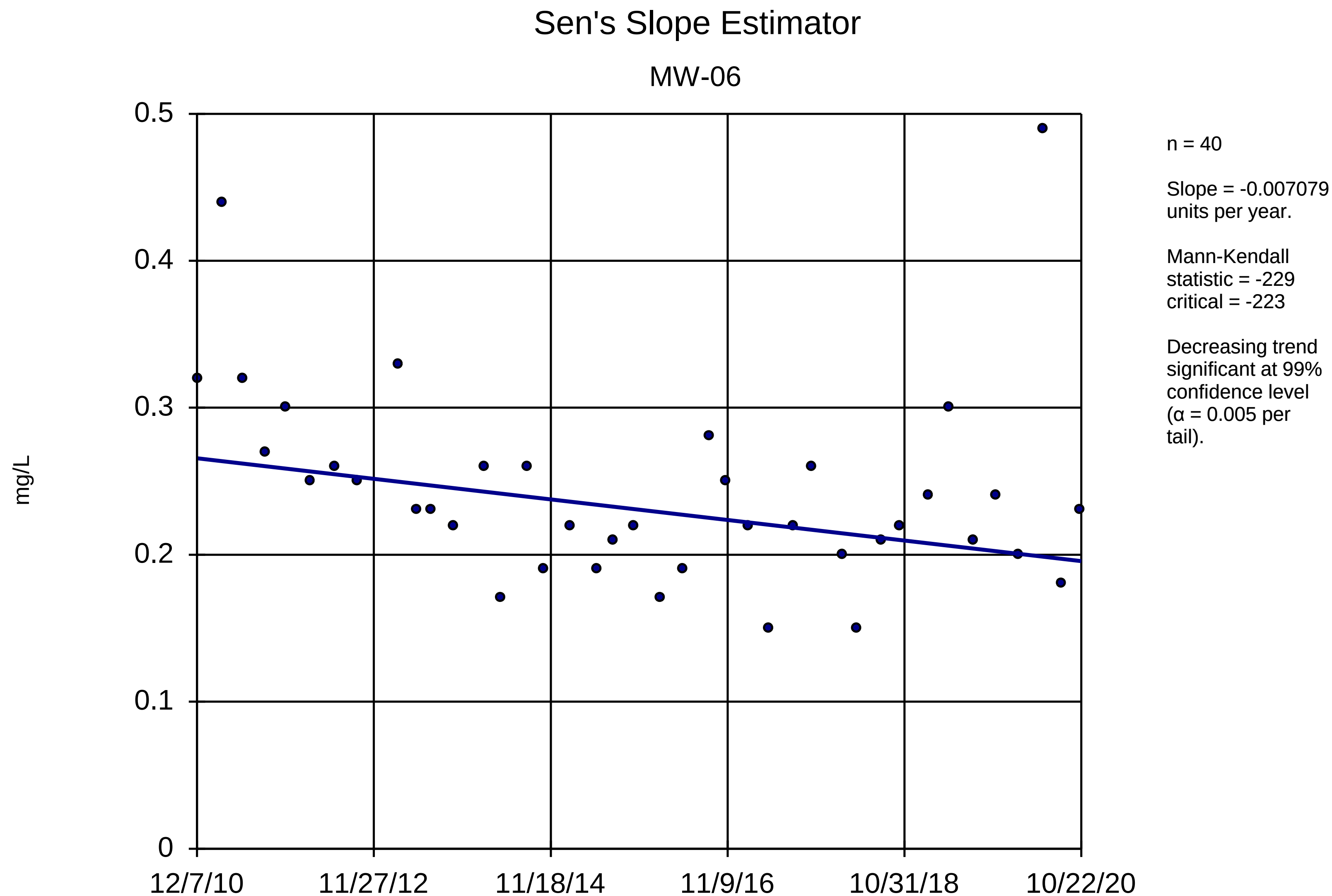
MWG13-15_81554




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81555




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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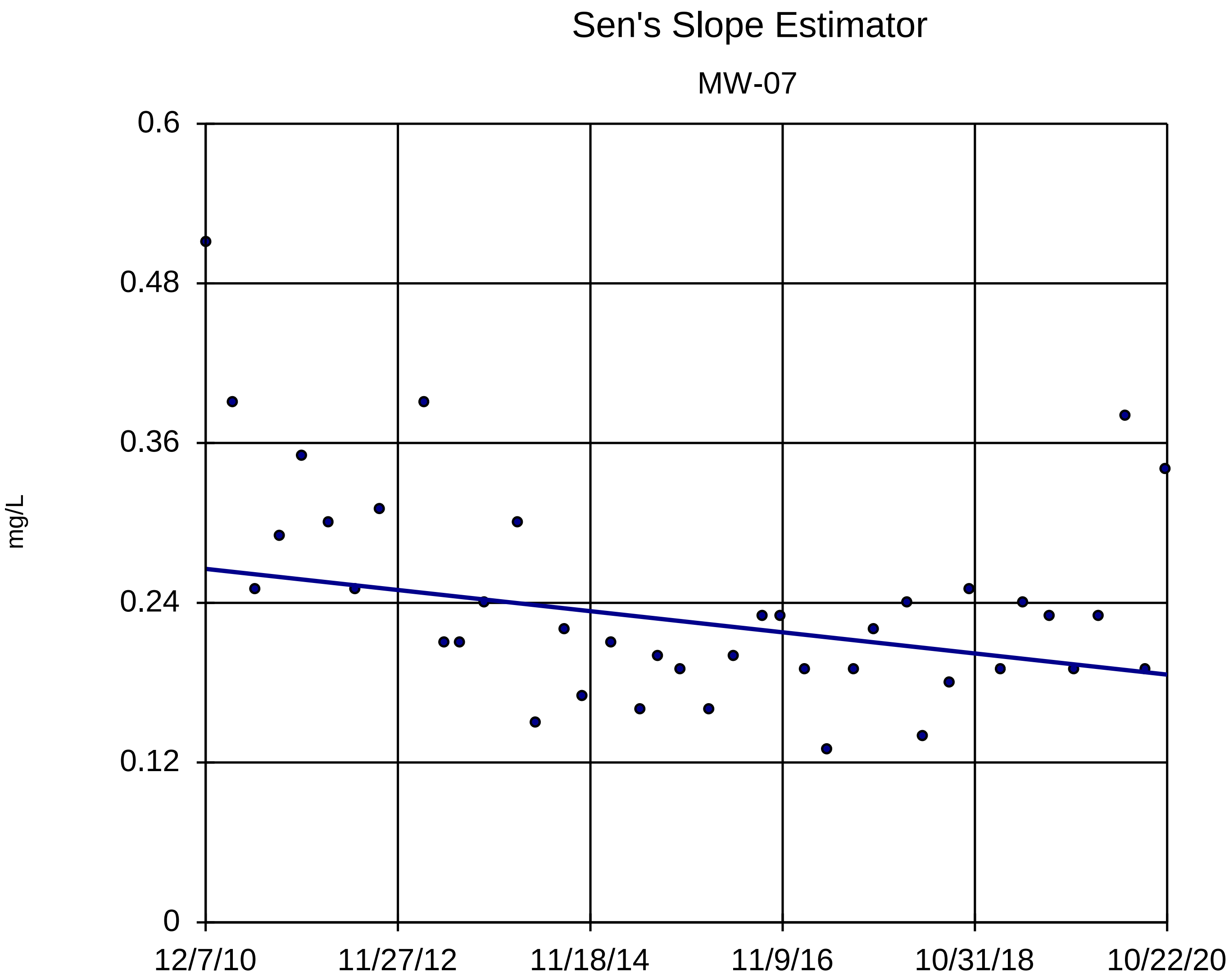



n = 40

Slope = -0.008027 units per year.

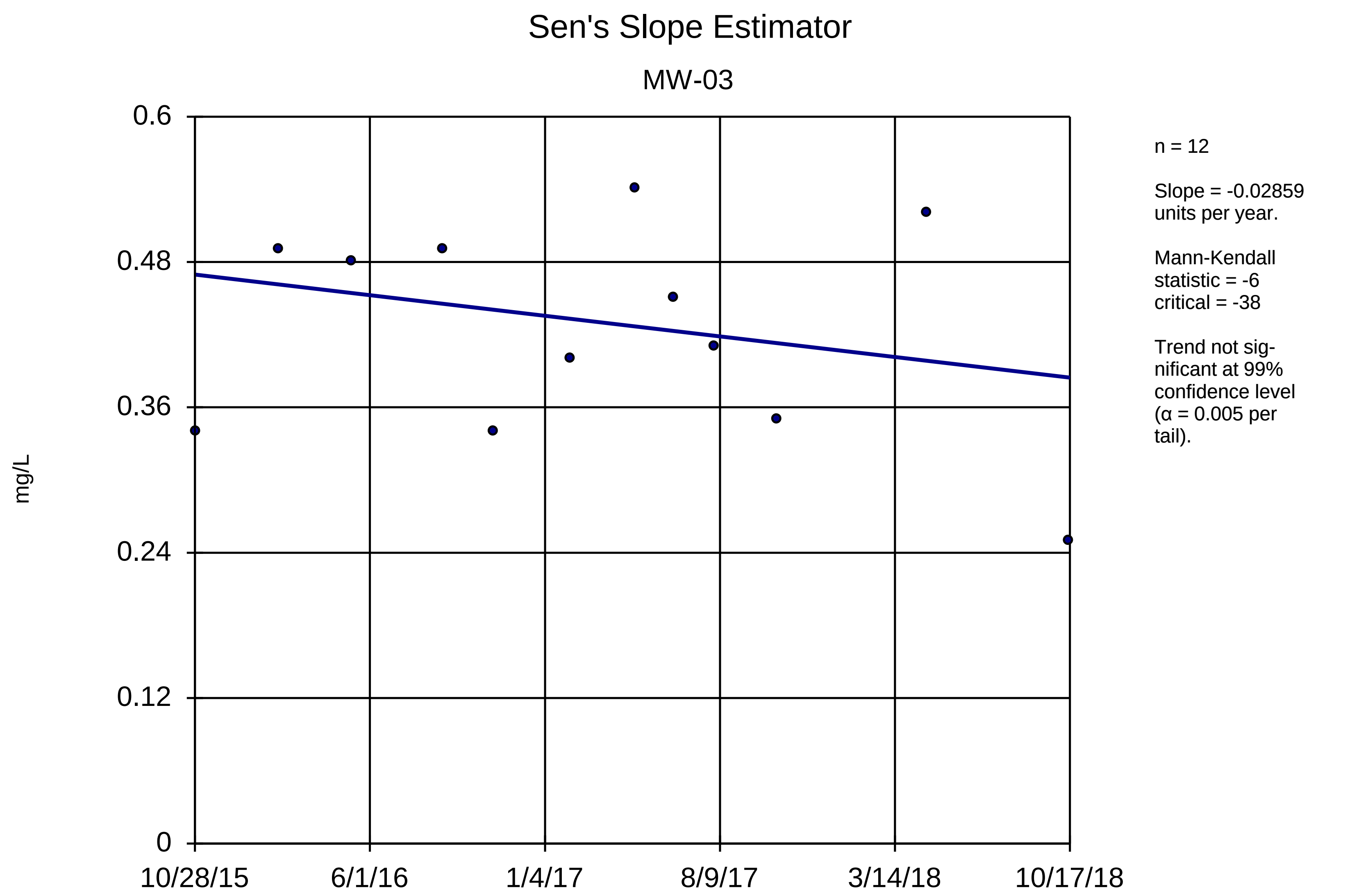
Mann-Kendall statistic = -191 critical = -223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:01 AM

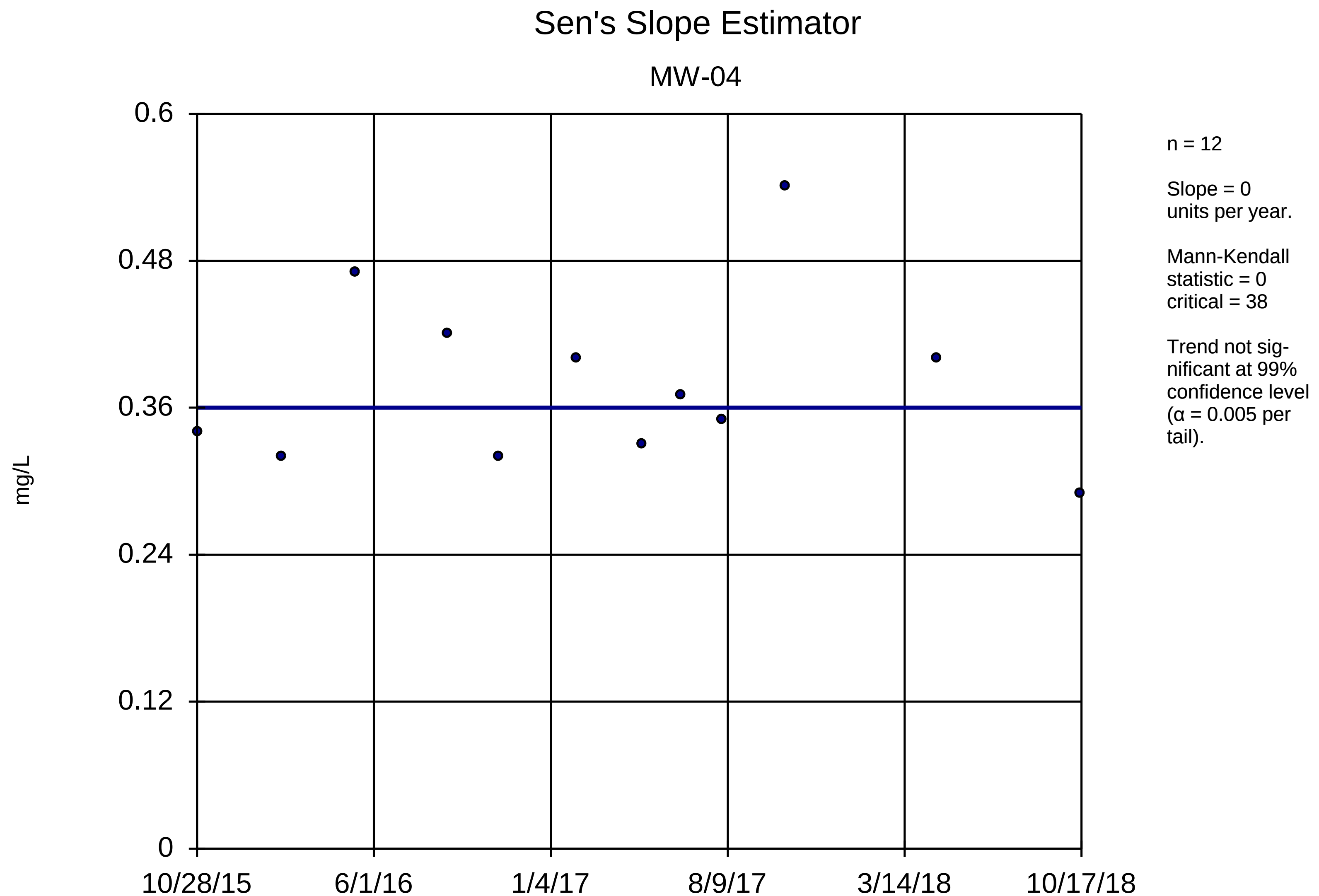
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81557




Constituent: Boron, Total Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database




Constituent: Boron, Total Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

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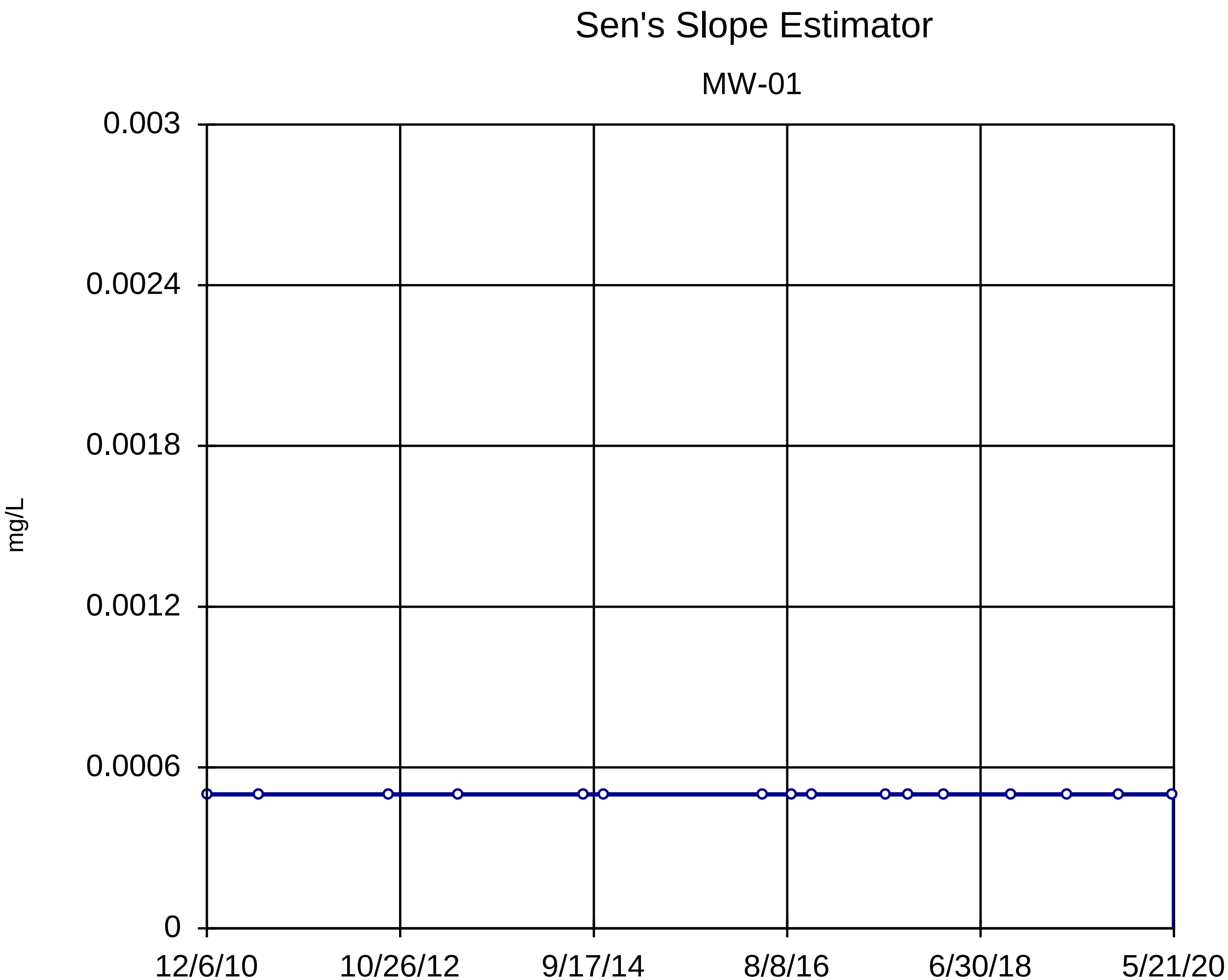
Hollow symbols indicate censored values.




n = 16

Slope = 0
units per year.

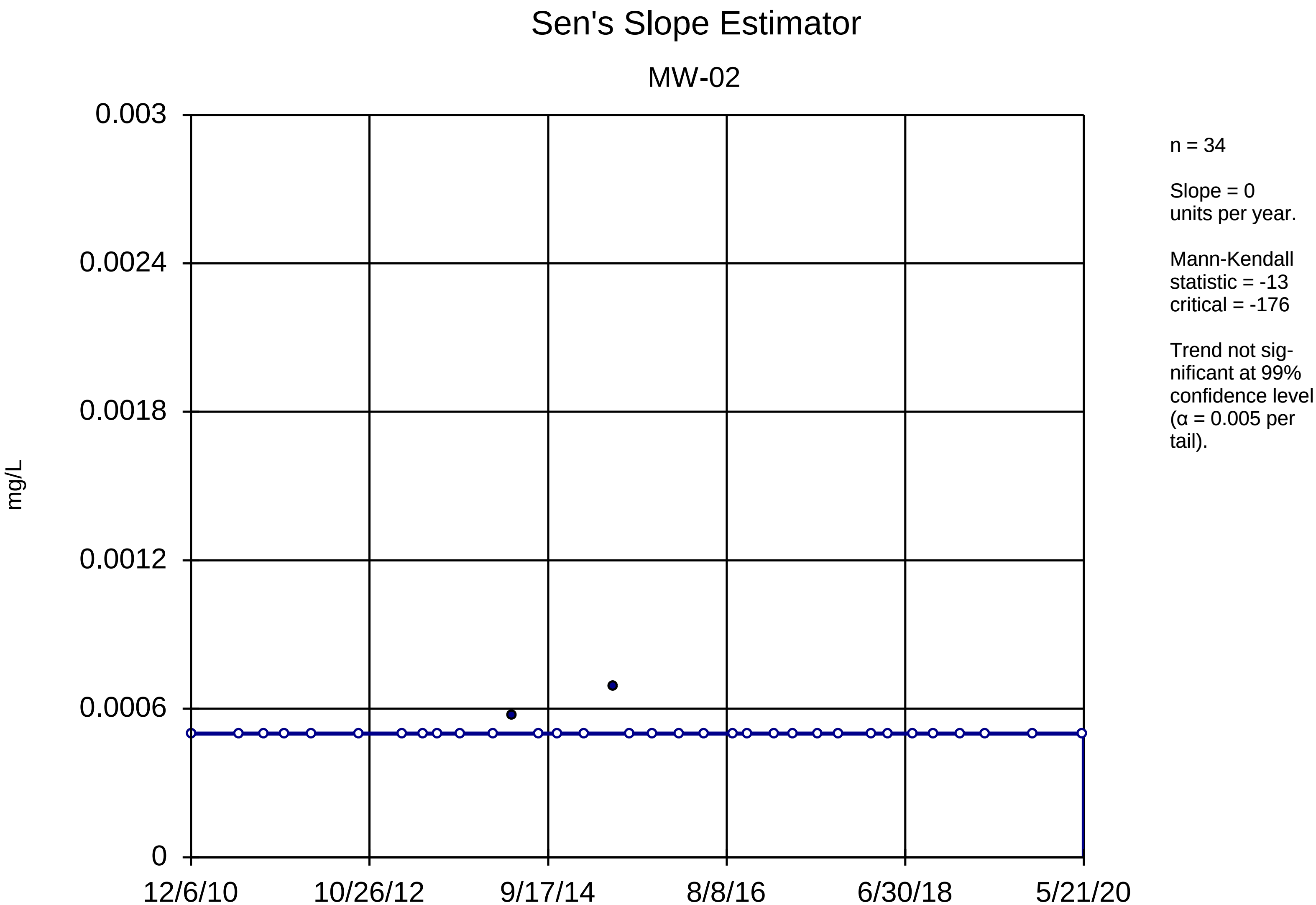
Mann-Kendall
statistic = 0
critical = 58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.




Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

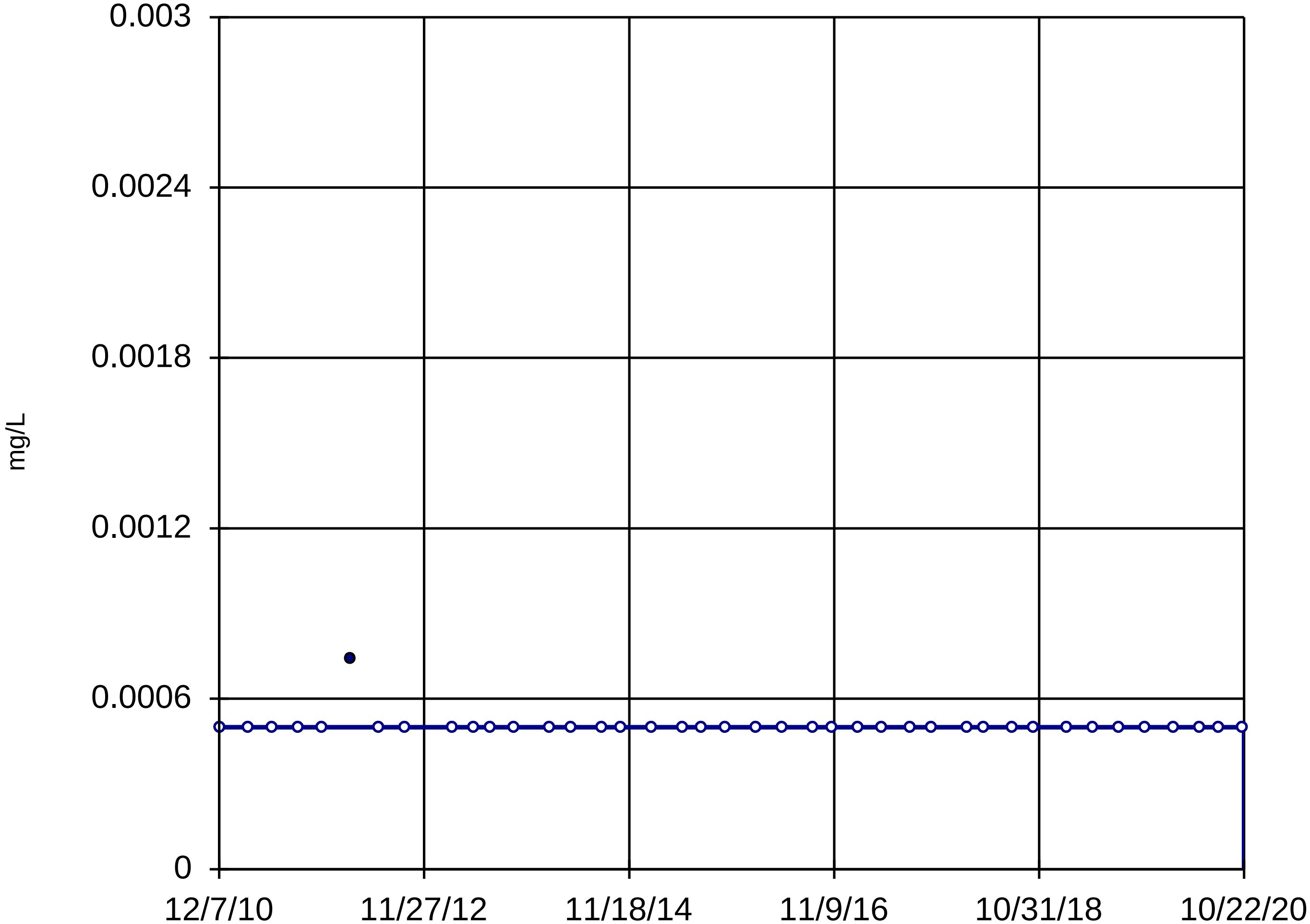
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81561

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -29
critical = -223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81562

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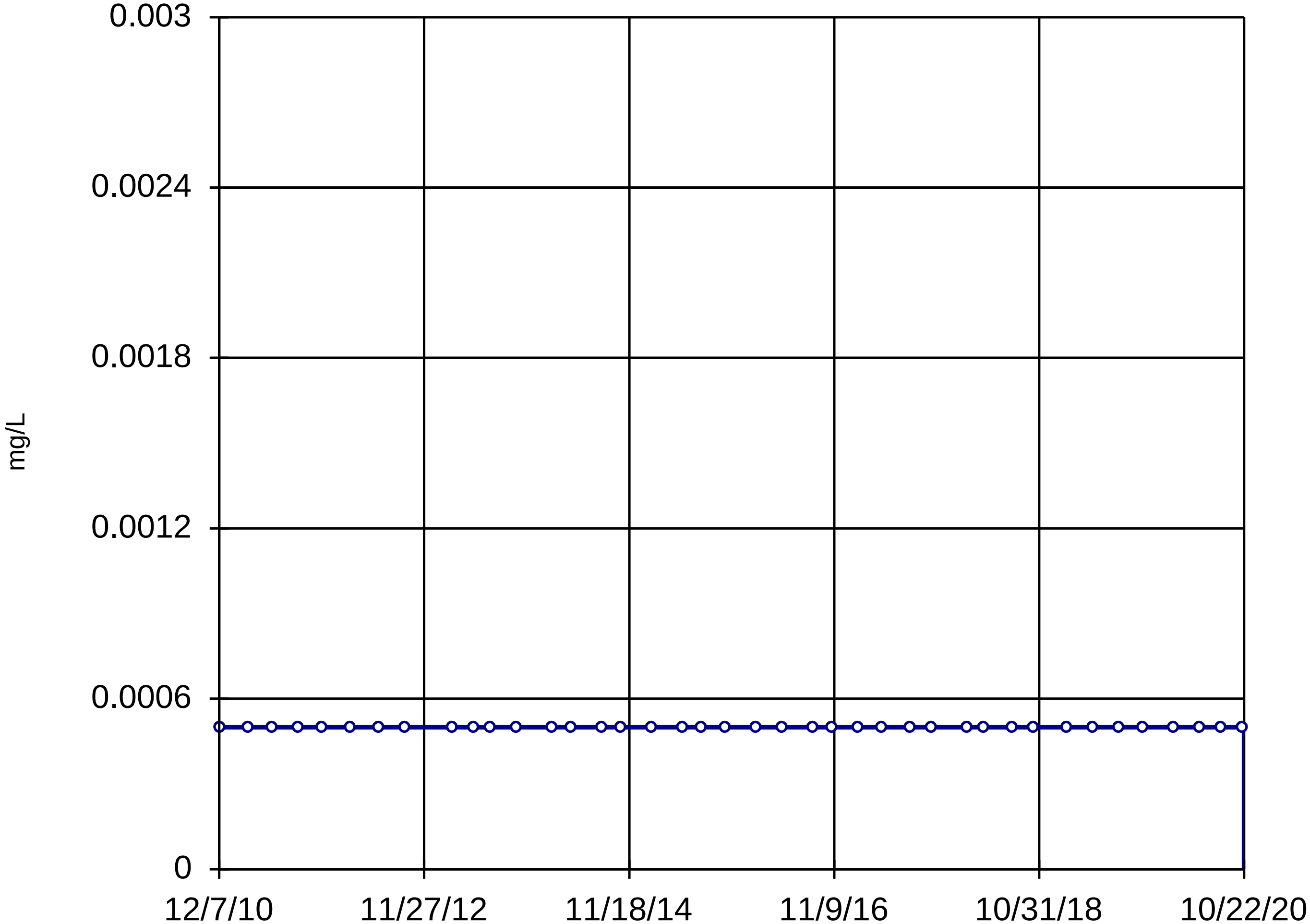
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81563

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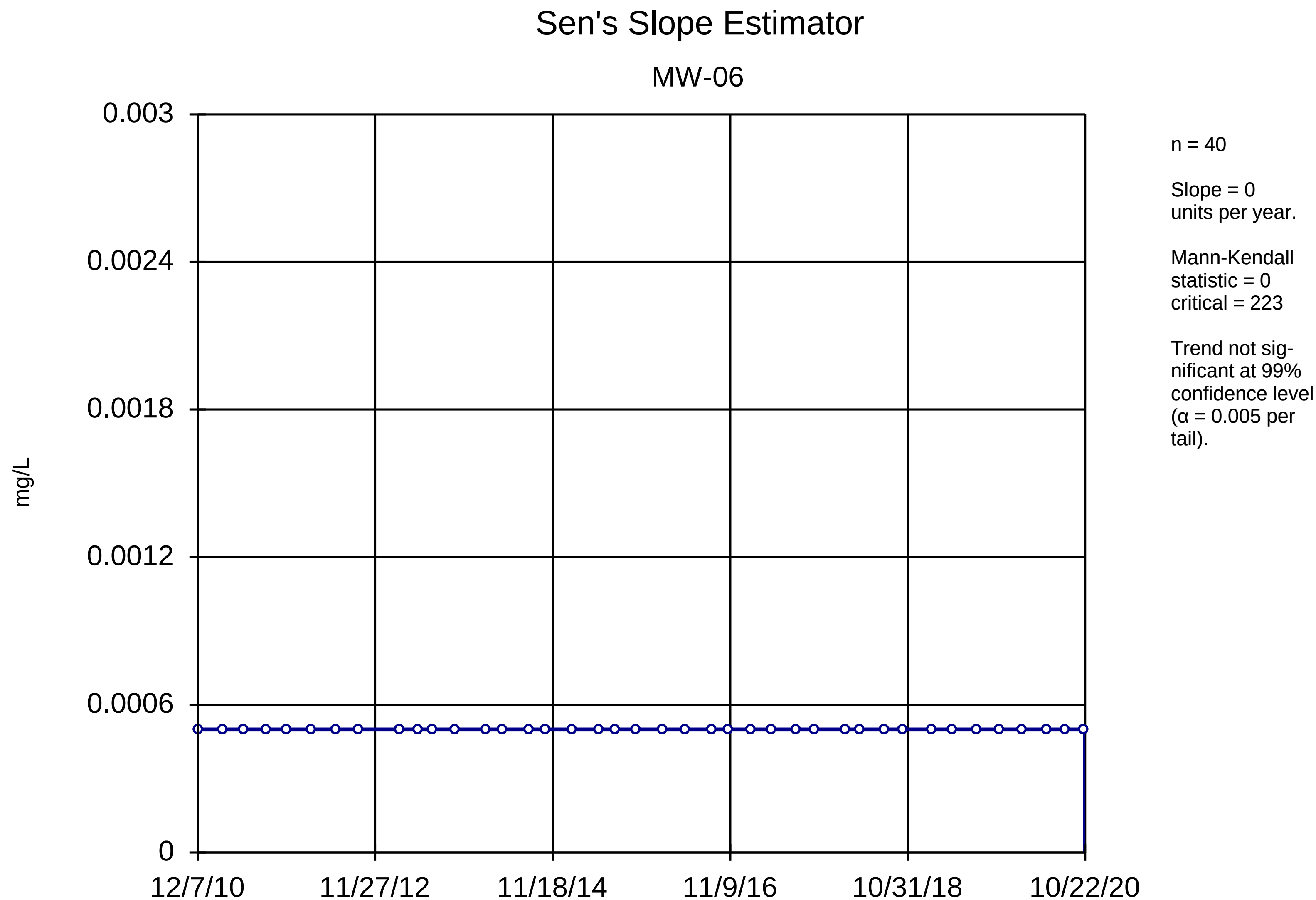
Hollow symbols indicate censored values.

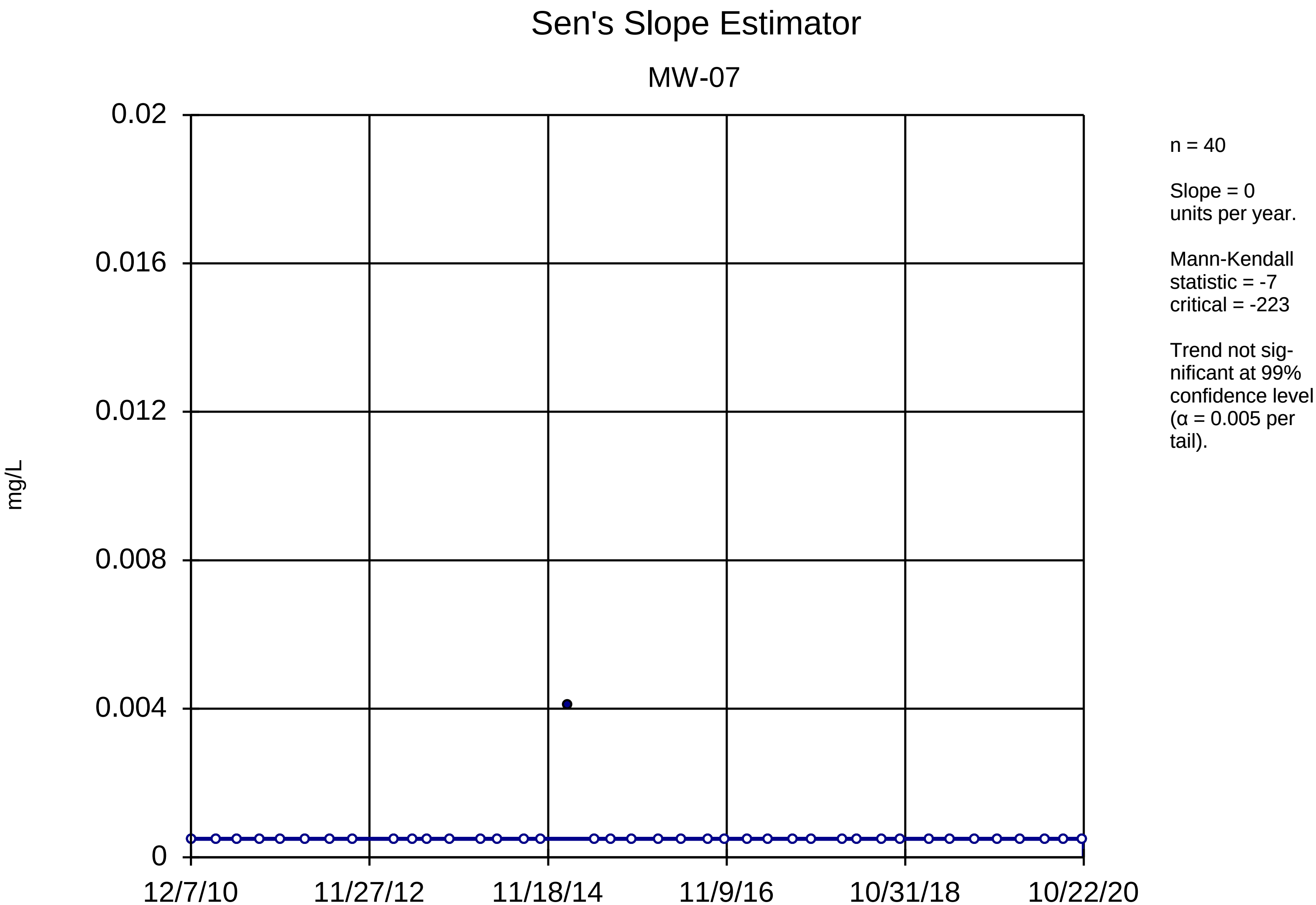



Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81564

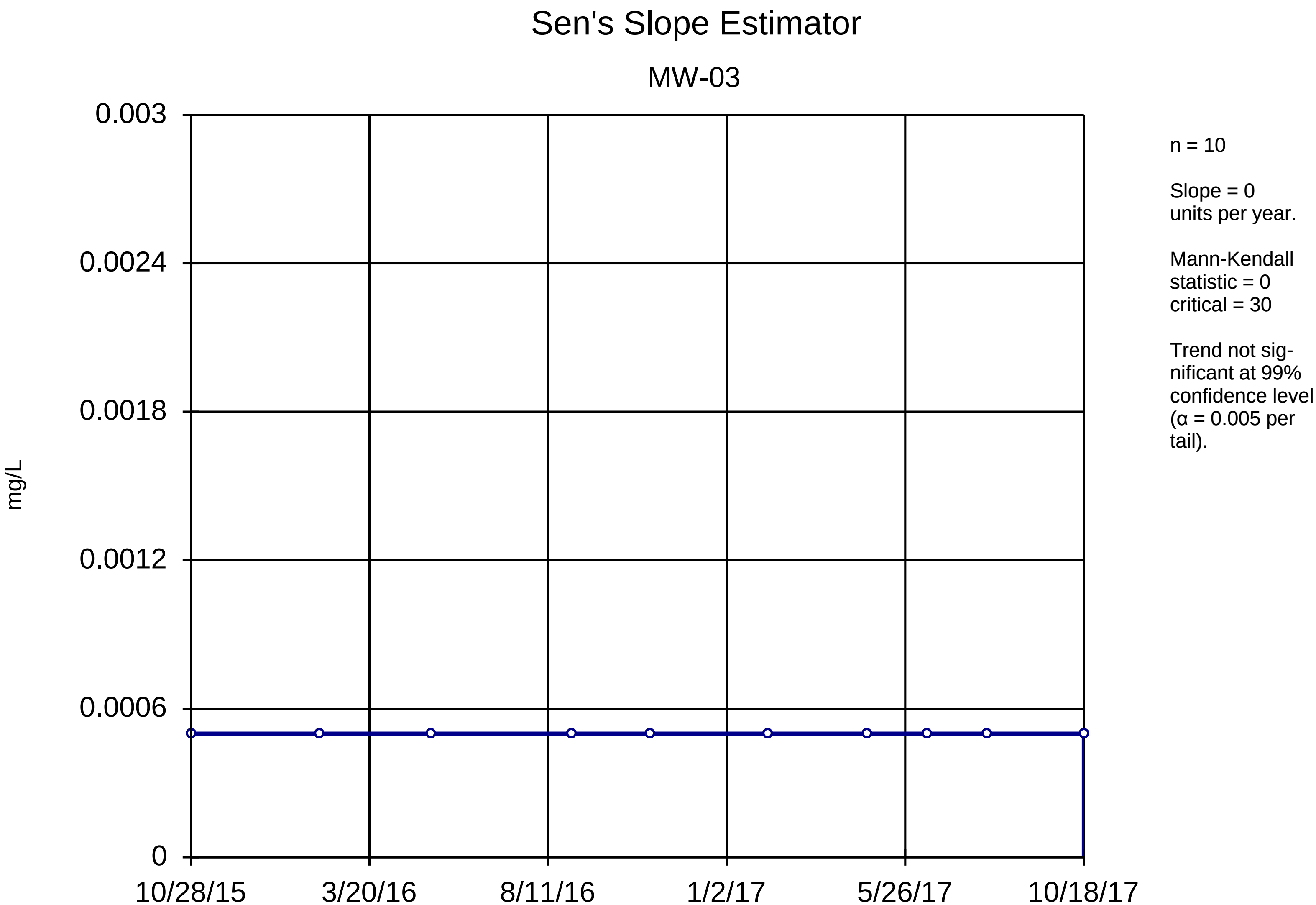
Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

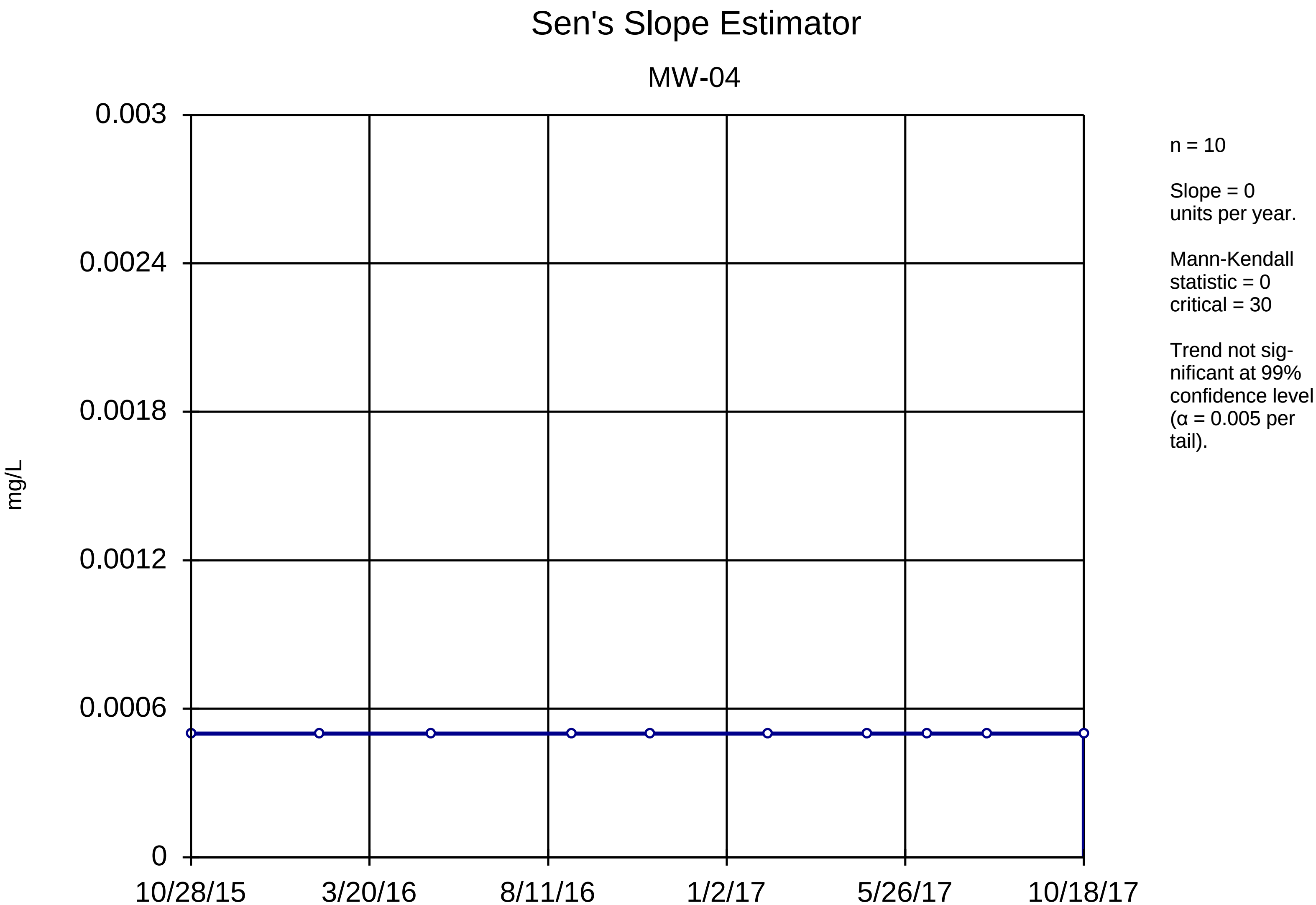



Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81566

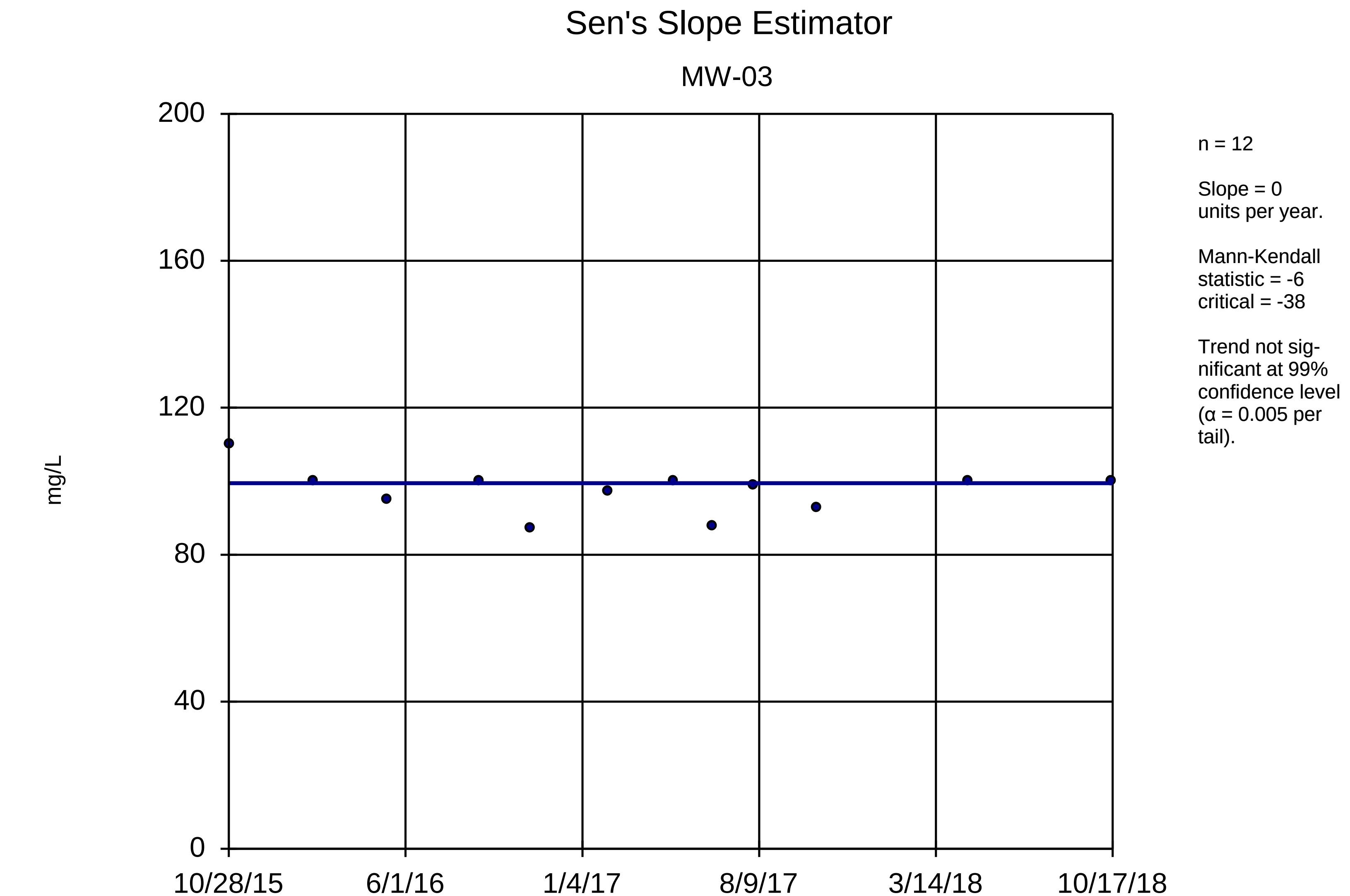
Hollow symbols indicate censored values.




Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:01 AM

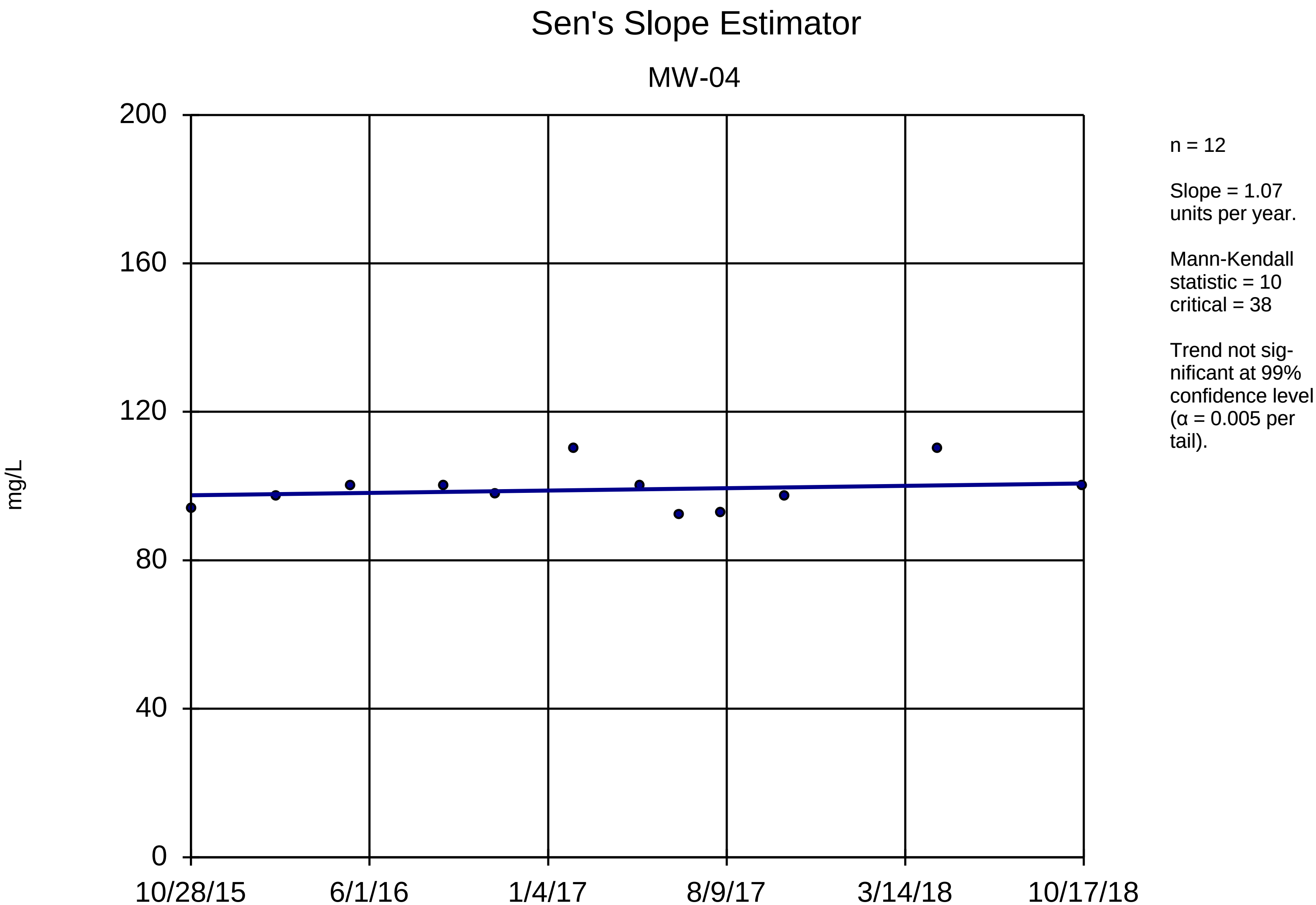
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81567




Constituent: Calcium, Total    Analysis Run 4/2/2021 11:01 AM

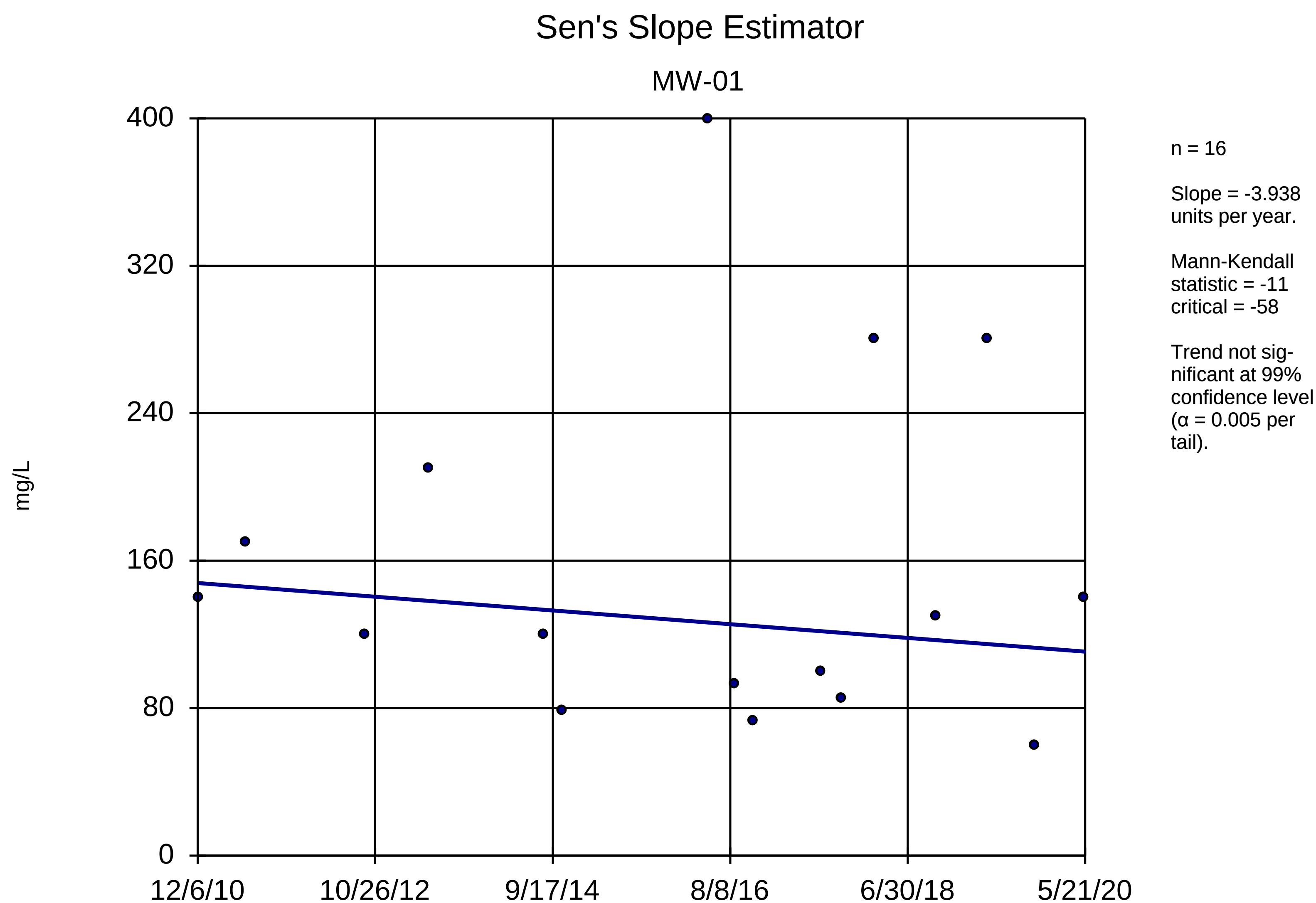
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Calcium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81569

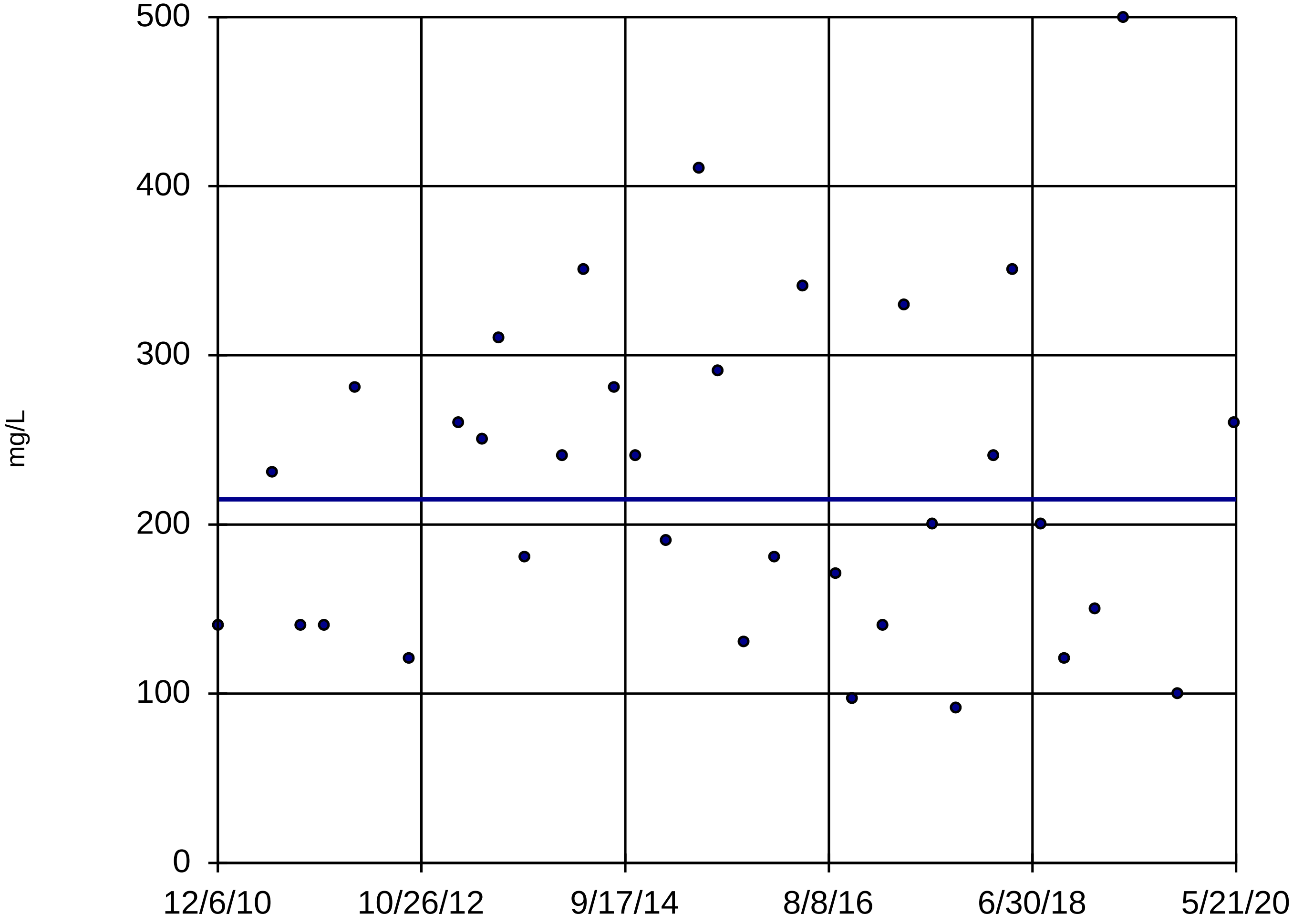



Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

# Sen's Slope Estimator

MW-02




n = 34

Slope = 0
units per year.

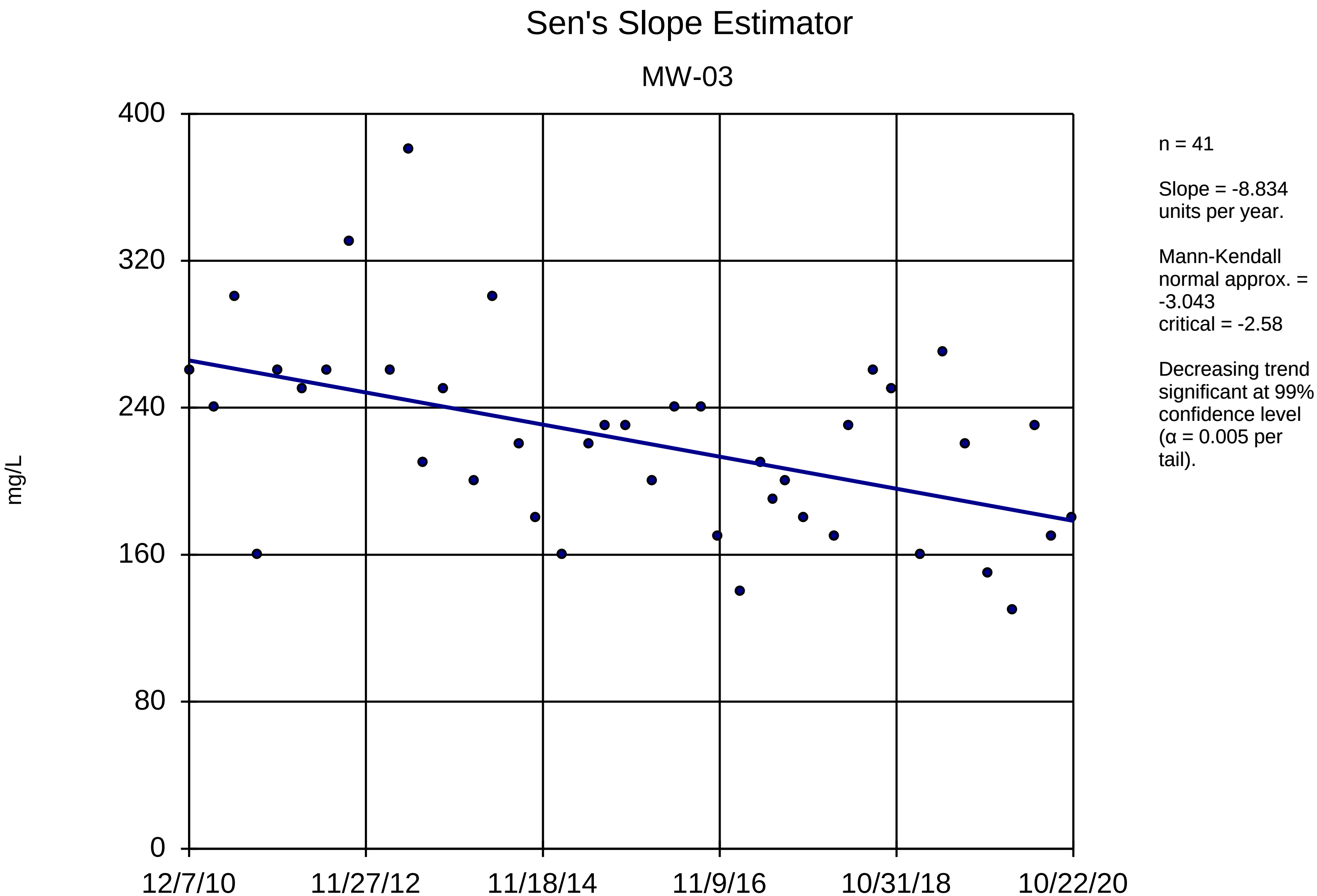
Mann-Kendall
statistic = -4
critical = -176

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81571




Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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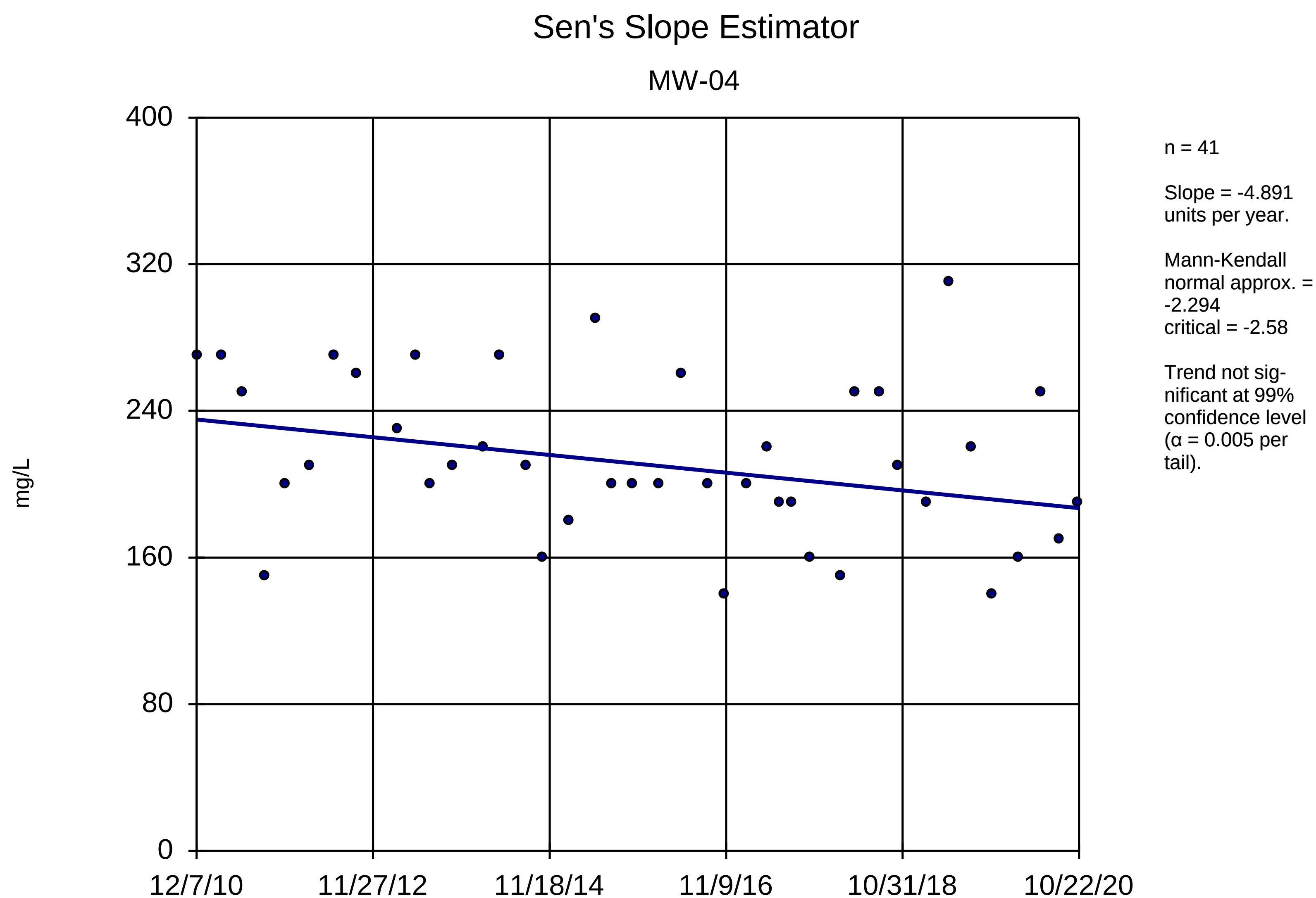


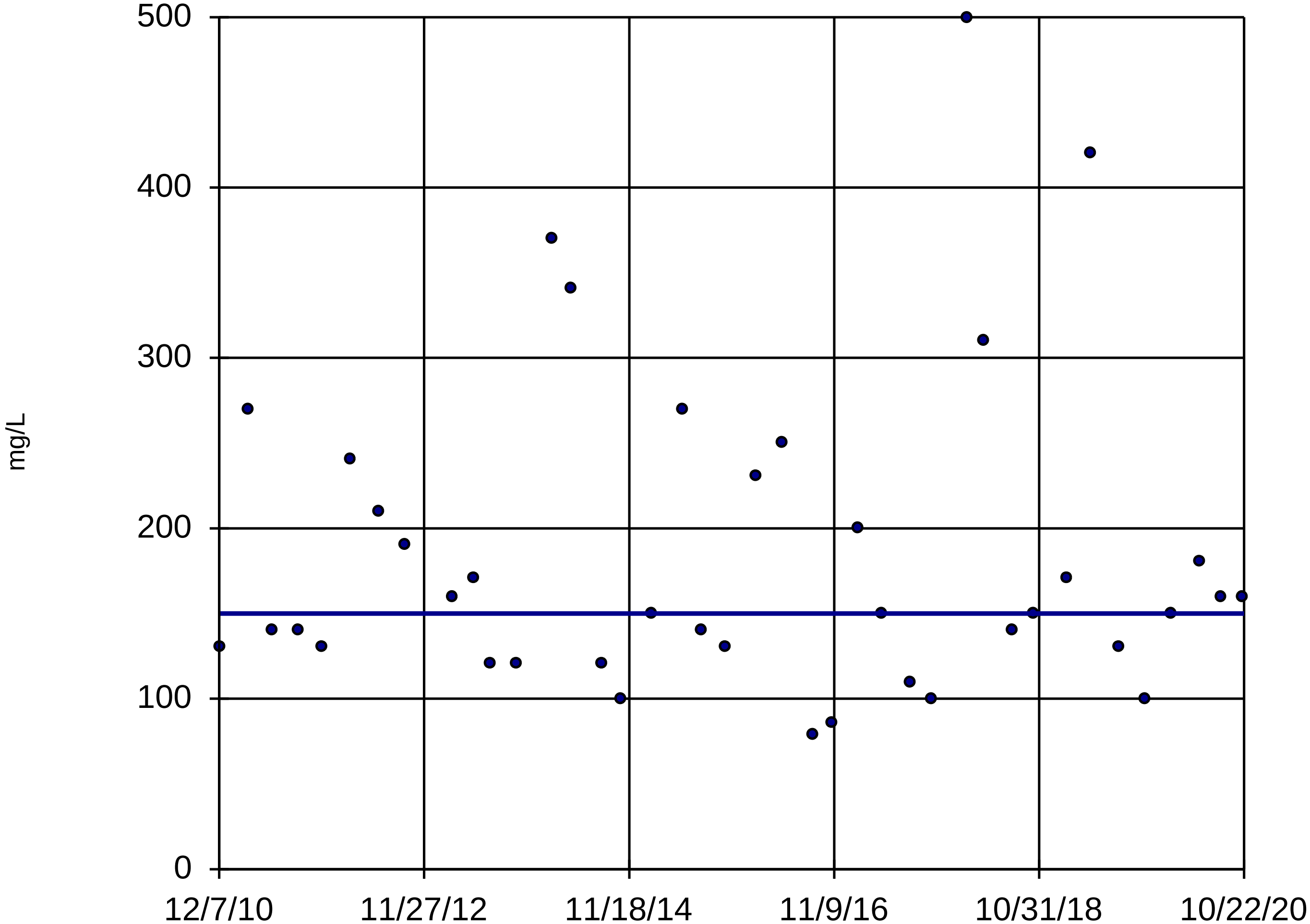

Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81573

## Sen's Slope Estimator

MW-06




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -13
critical = -223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

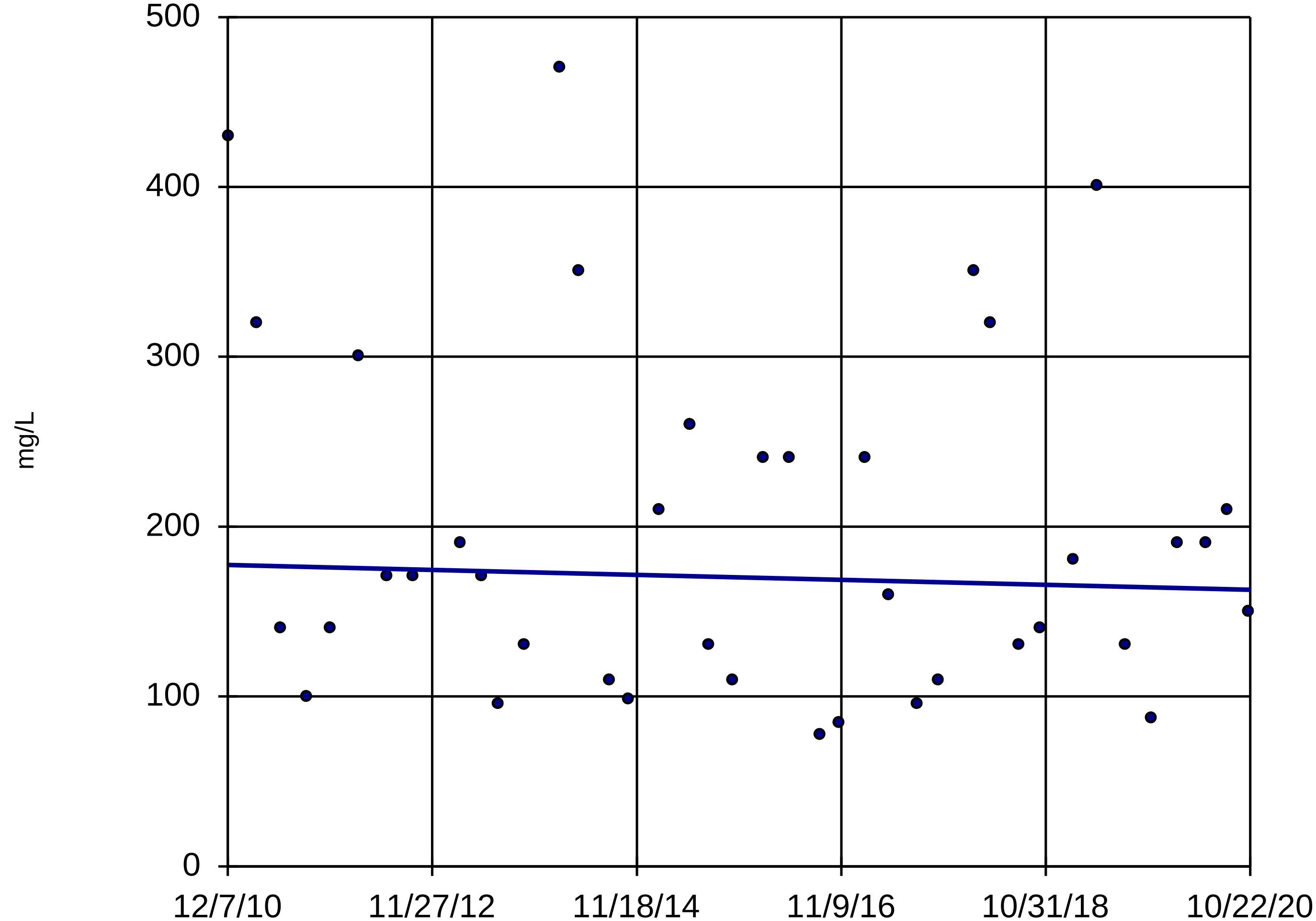
MWG13-15_81574

Electronic Filing: Received, Clerk's Office 01/21/2022



## Sen's Slope Estimator

MW-07




n = 40

Slope = -1.487
units per year.

Mann-Kendall
statistic = -40
critical = -223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/2/2021 11:01 AM

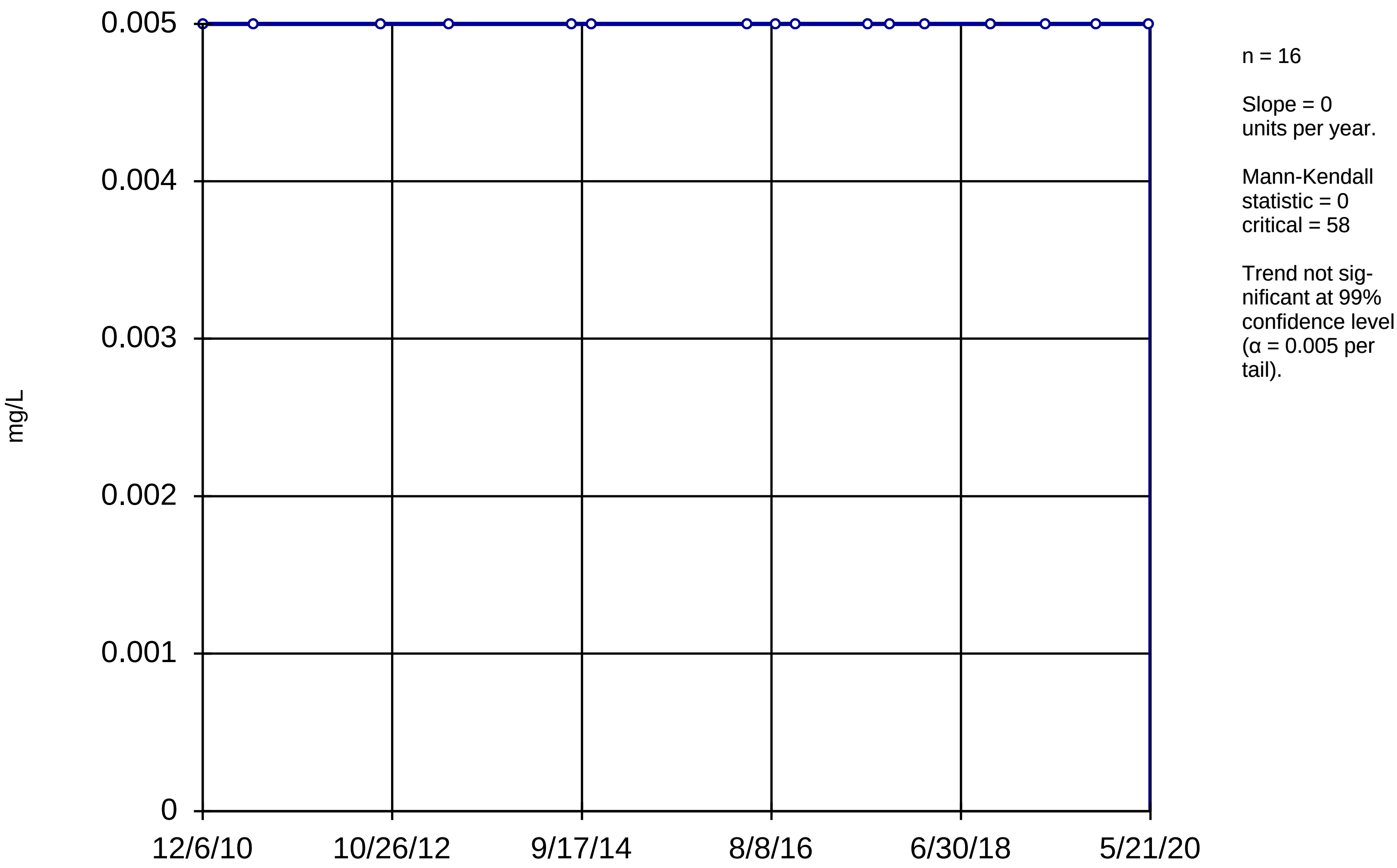
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81575

Hollow symbols indicate censored values.

## Sen's Slope Estimator

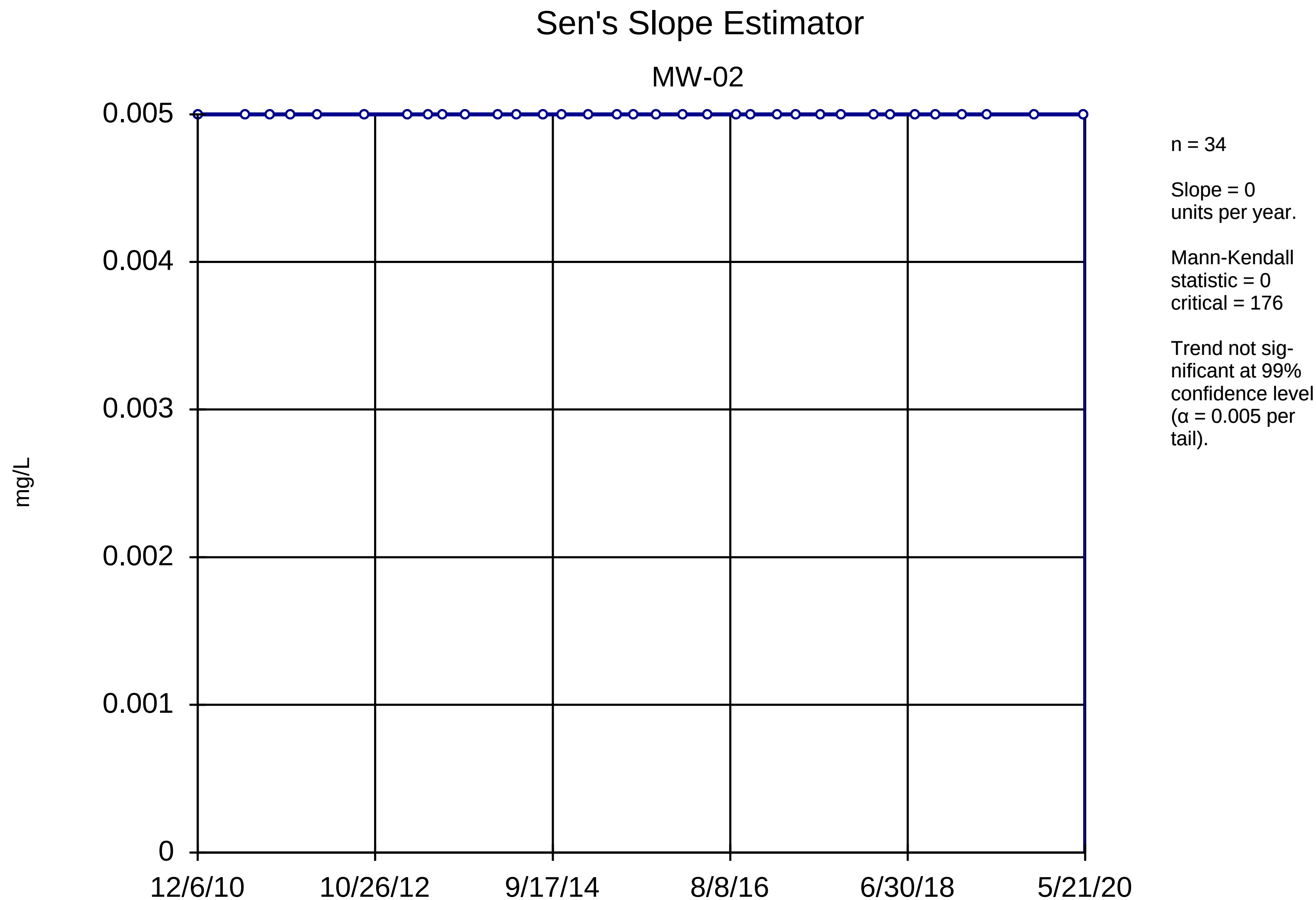
MW-01




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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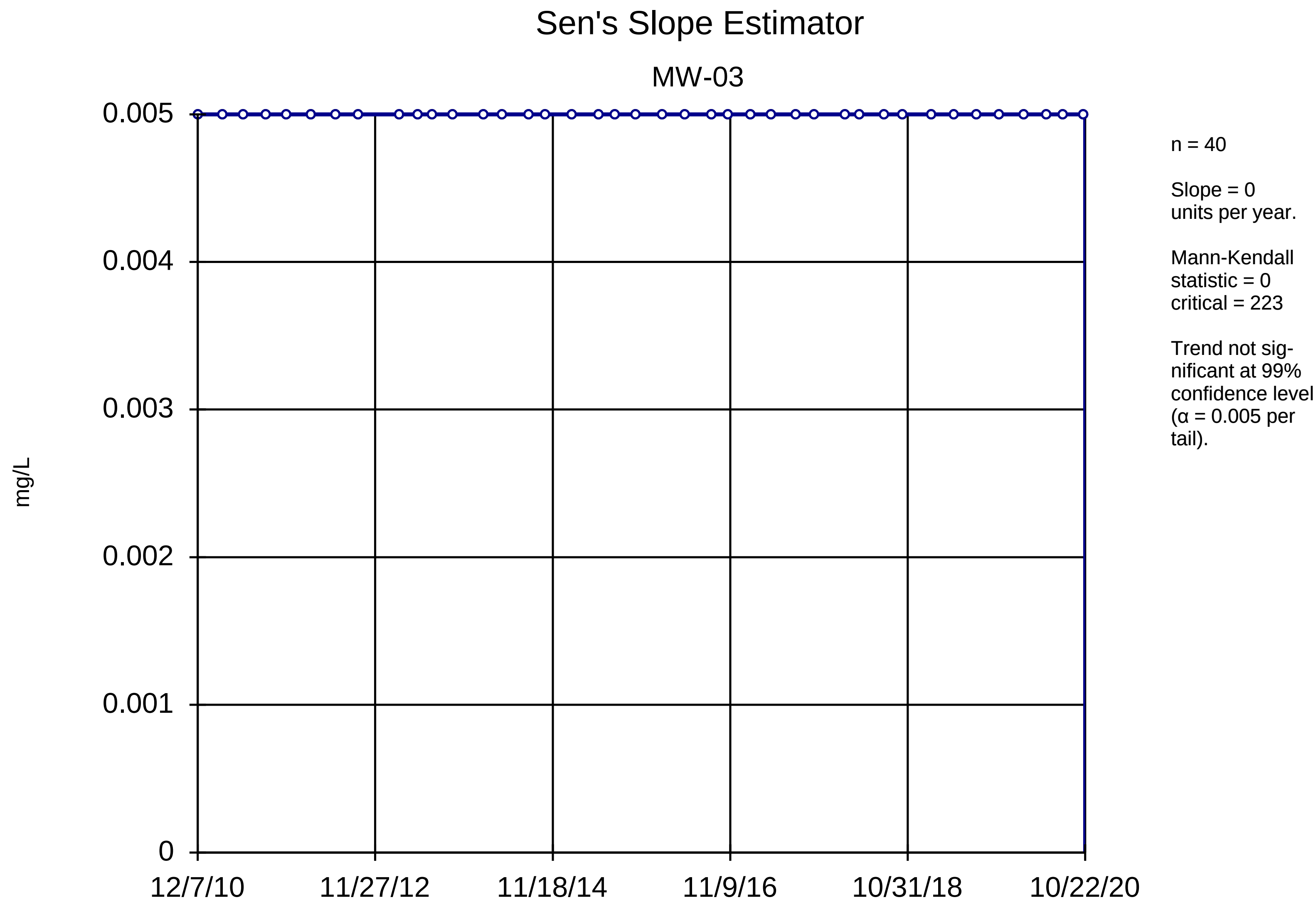
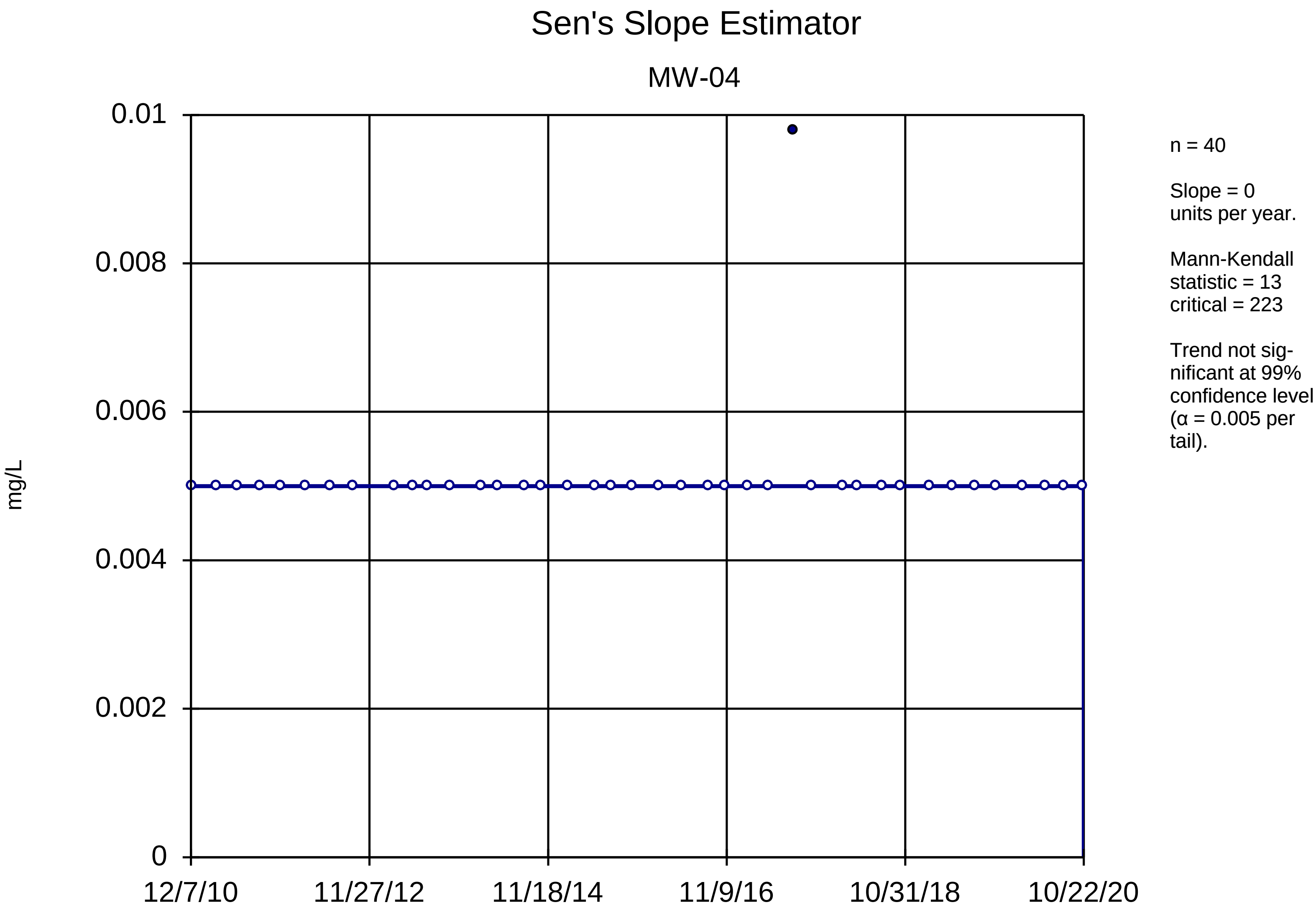
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81579

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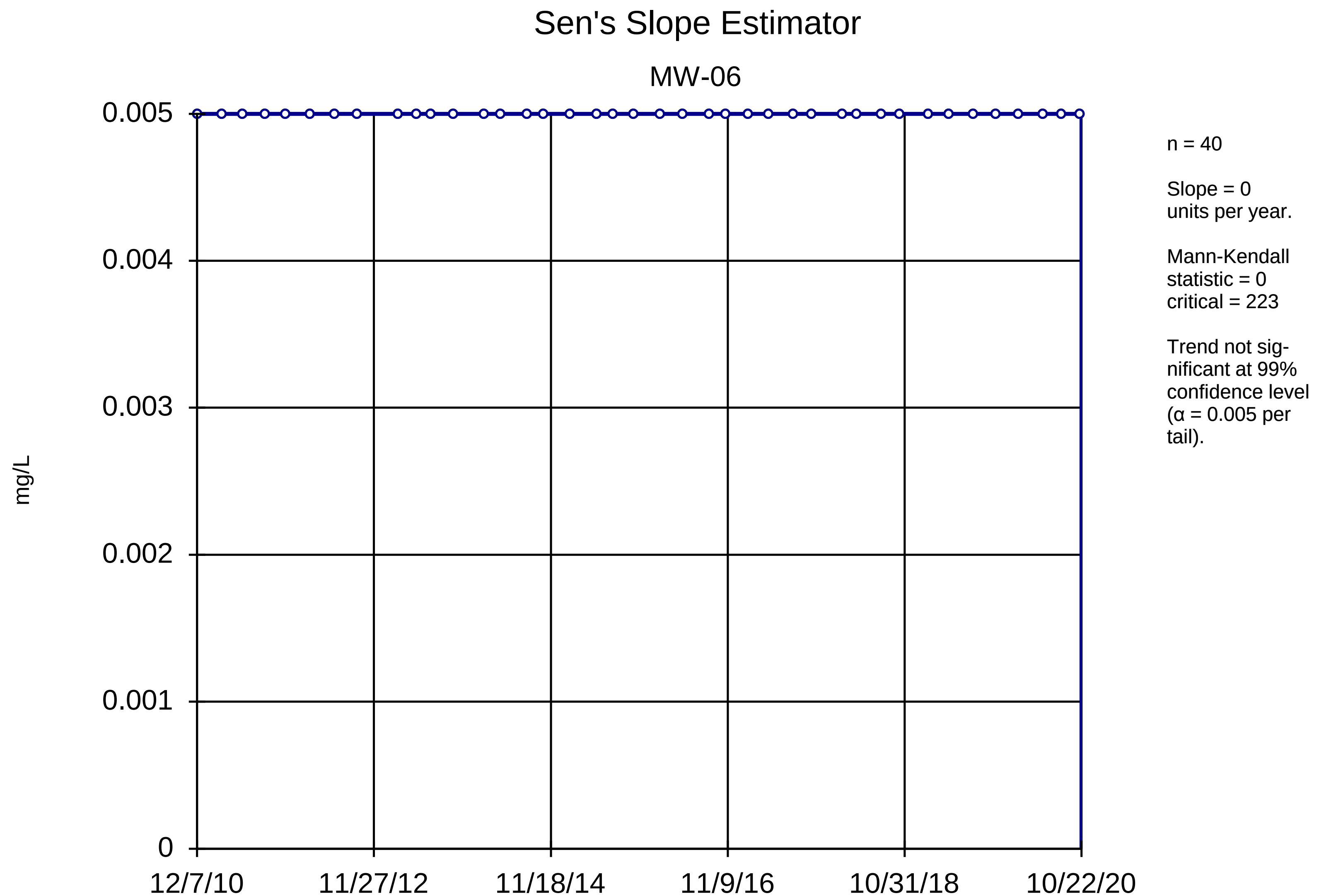
Hollow symbols indicate censored values.

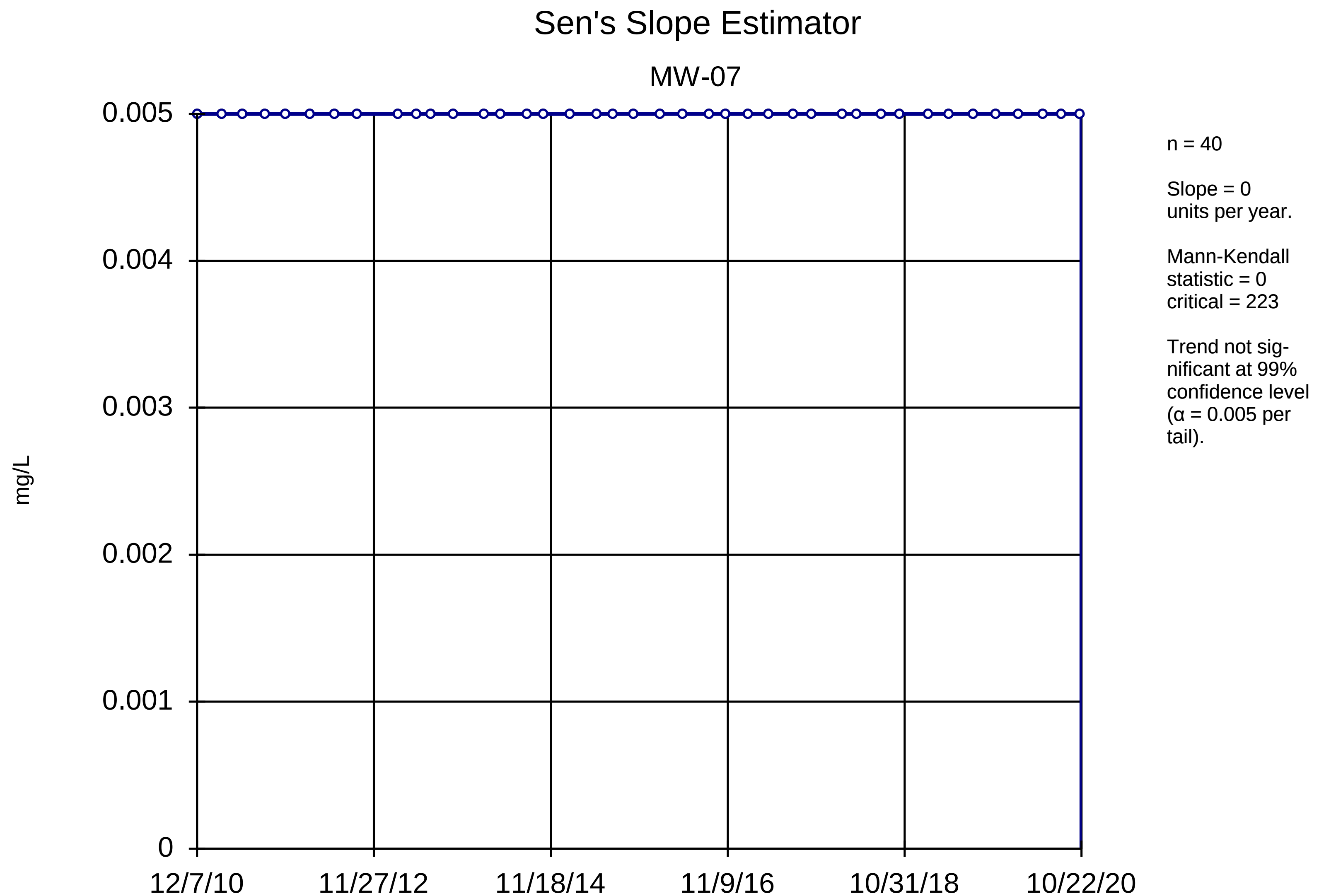



Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81580

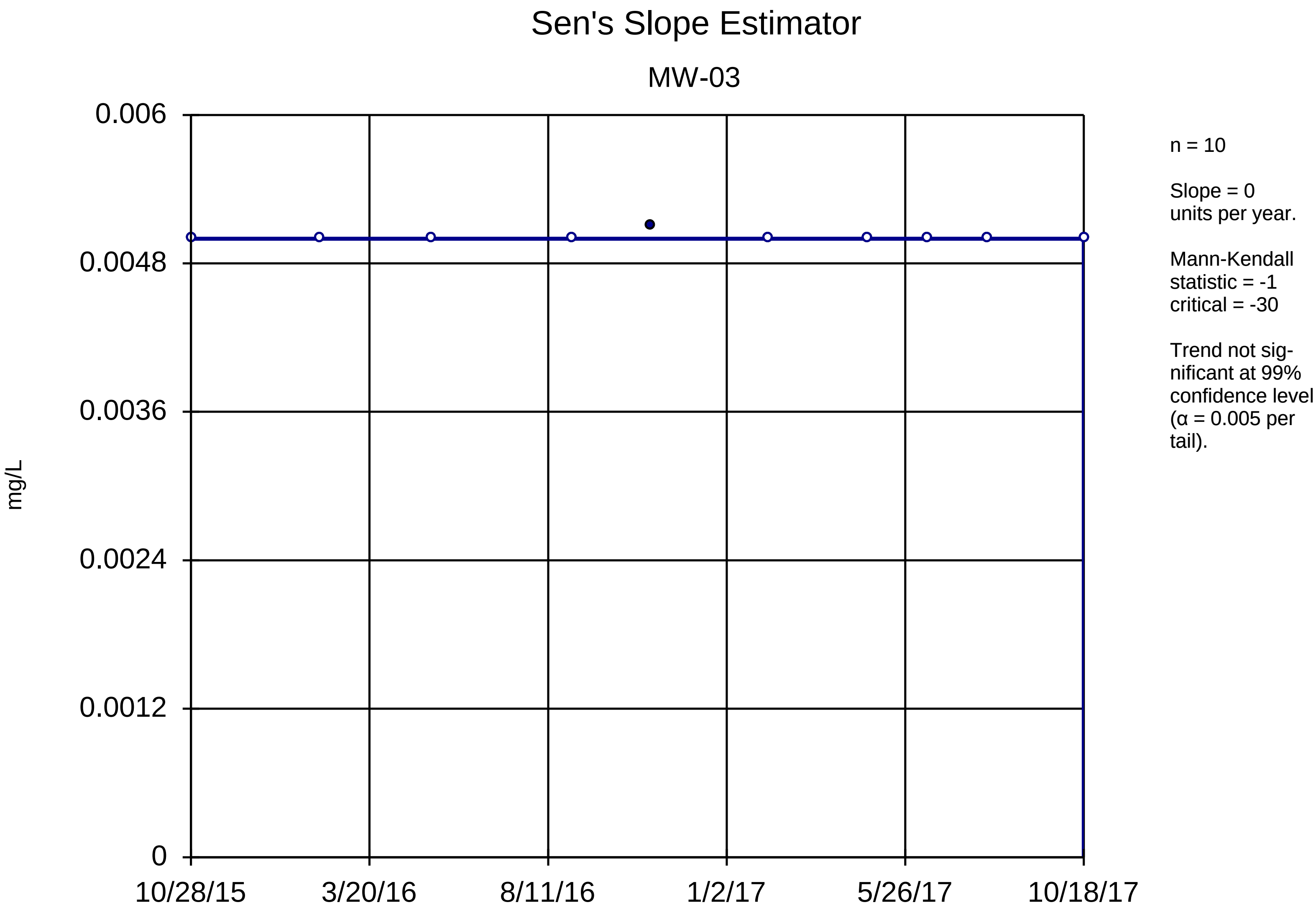
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

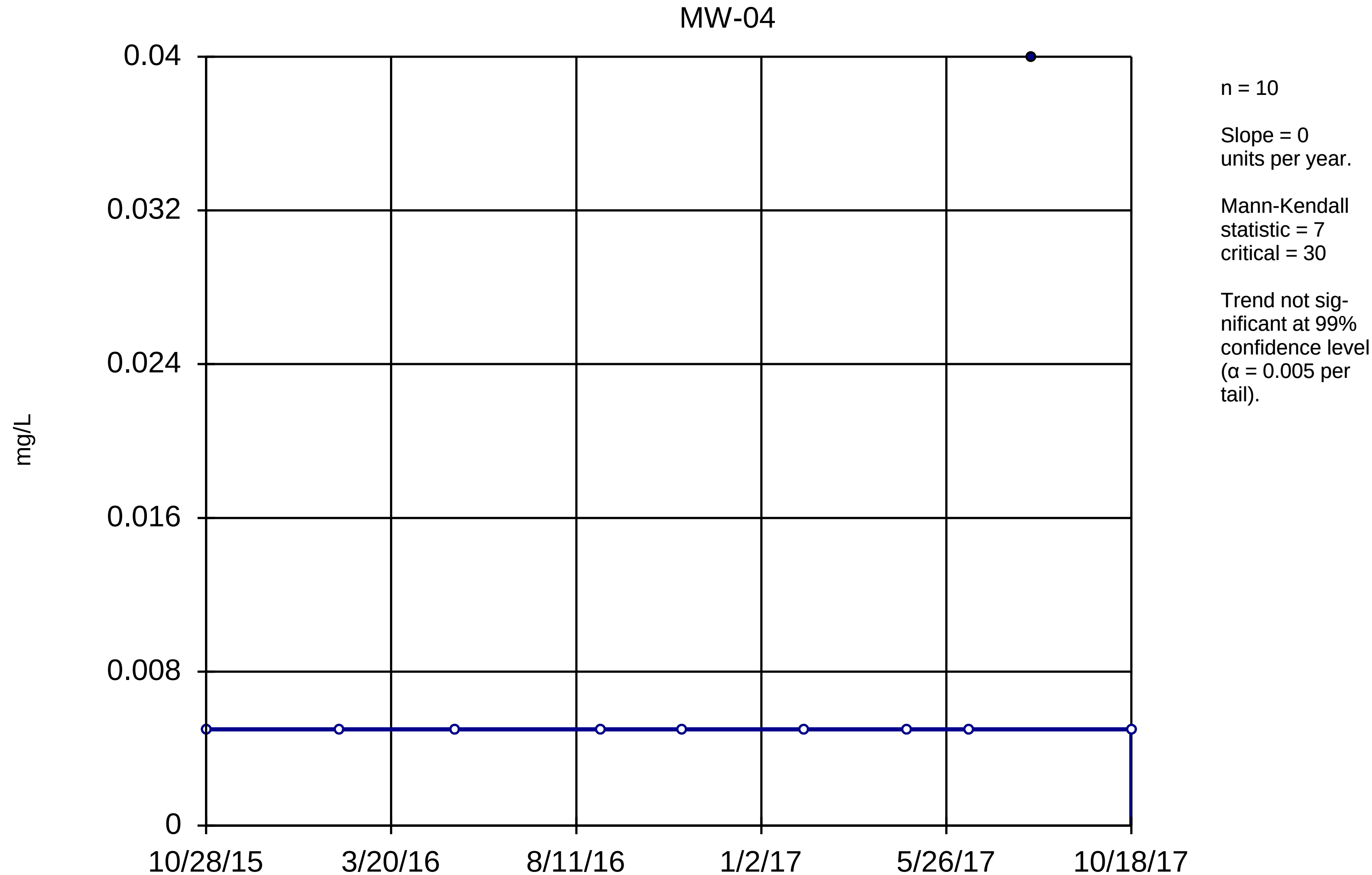



Constituent: Chromium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator



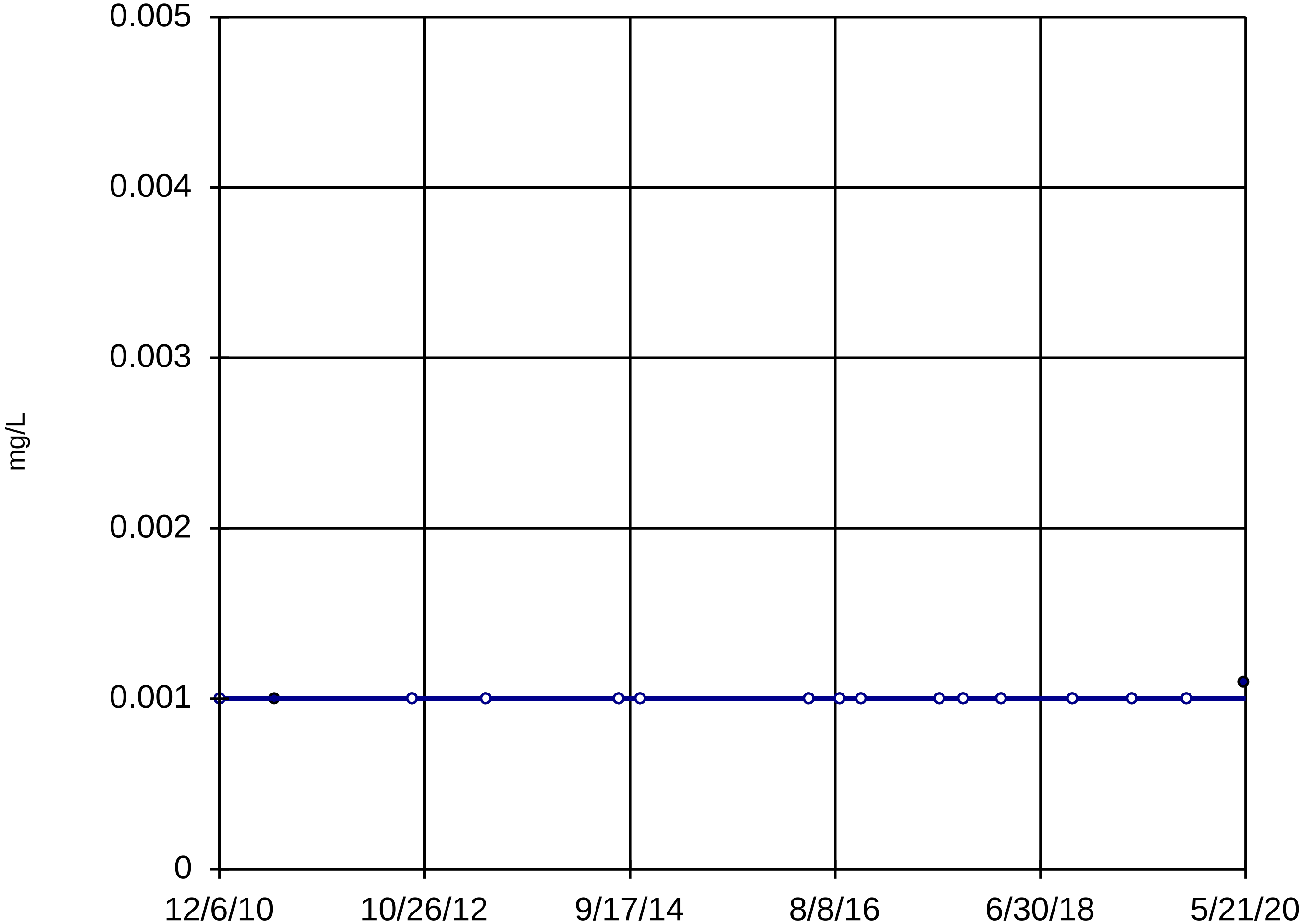

Constituent: Chromium, Total    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-01




n = 16

Slope = 0
units per year.

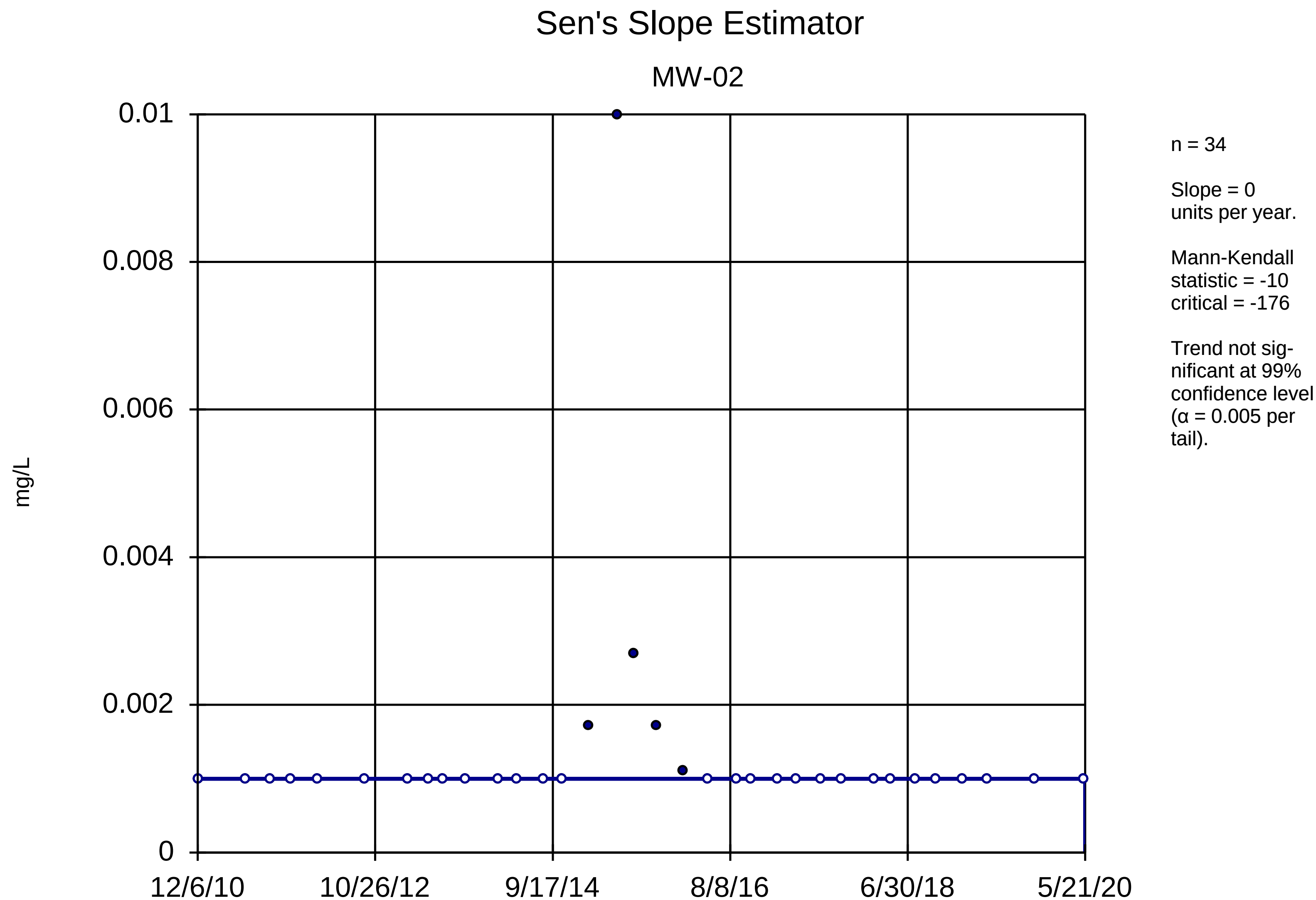
Mann-Kendall
statistic = 15
critical = 58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81585

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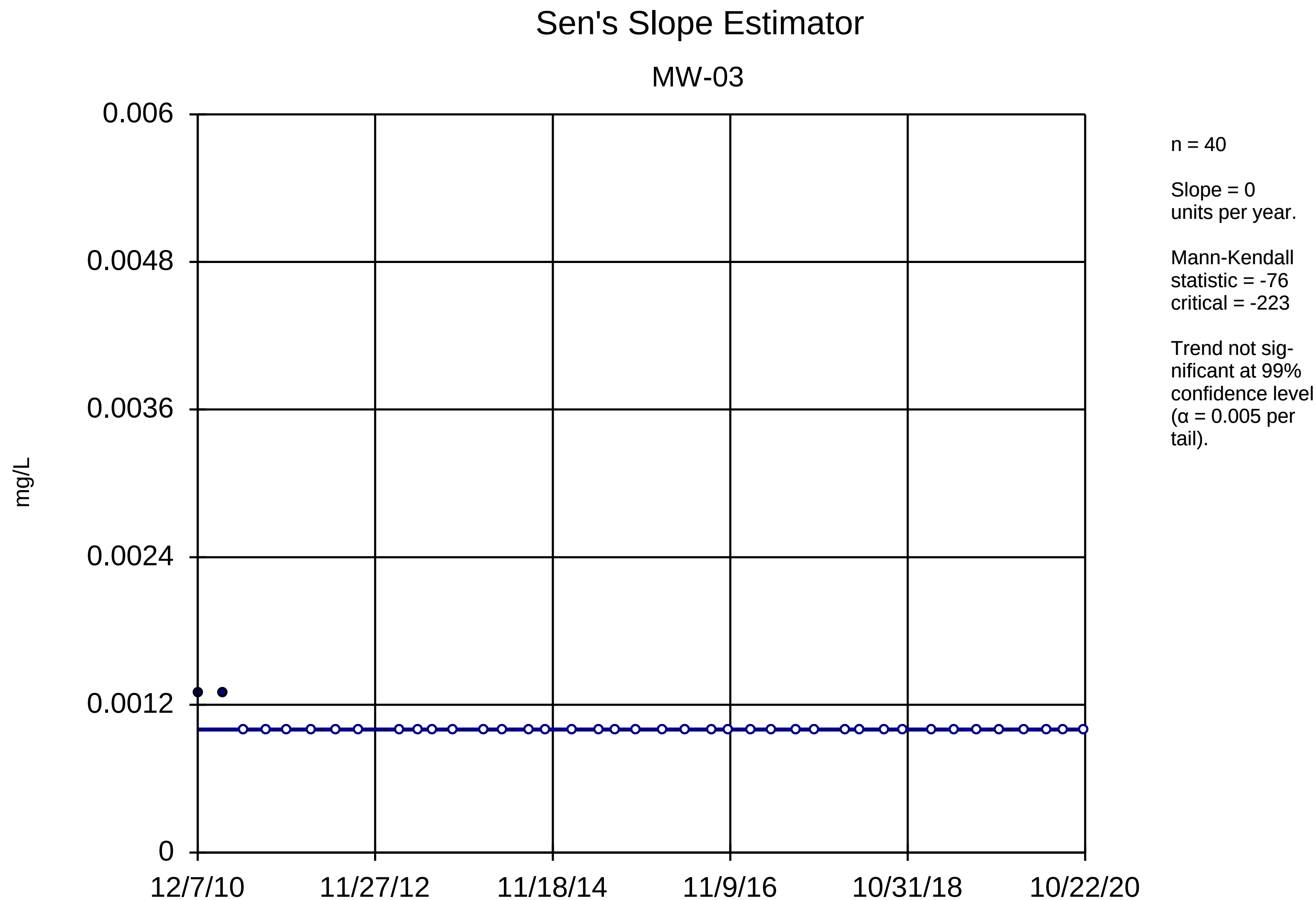
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81586

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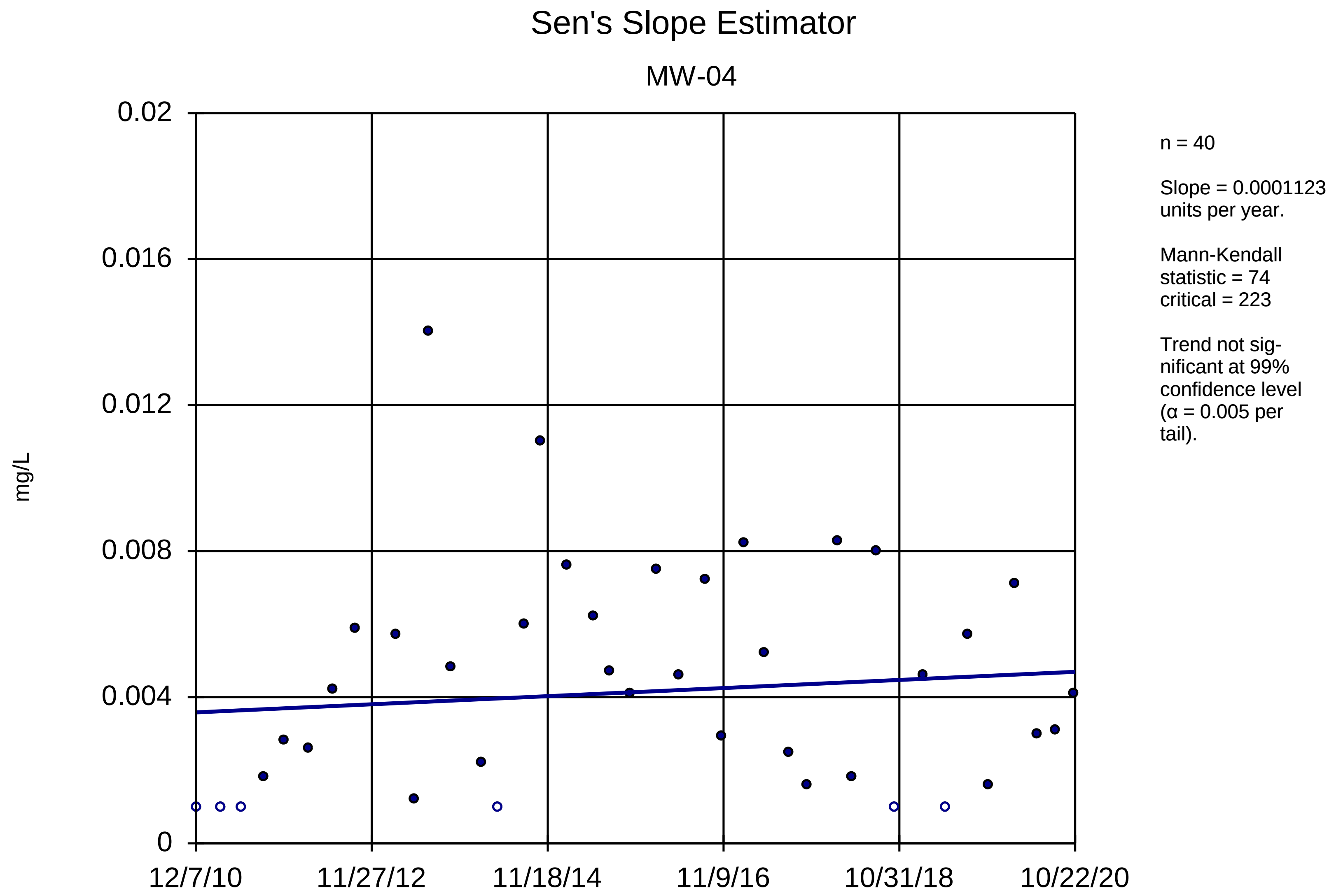
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved  Analysis Run 4/2/2021 11:01 AM

Utility Site J  Client: Weaver Consultants Group  Data: Joliet 29 Sanitas Database

MWG13-15_81587

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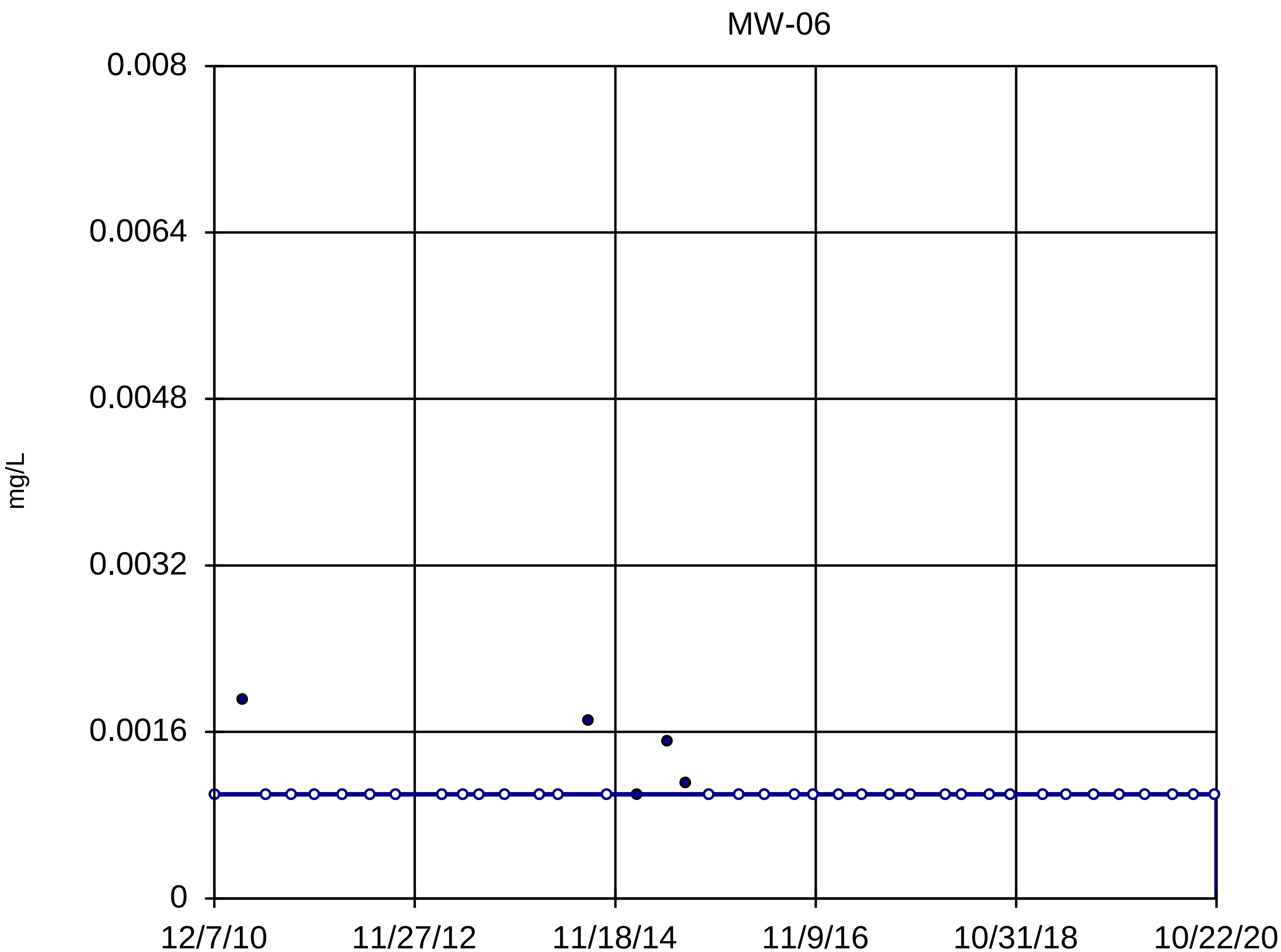
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -62
critical = -223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Dissolved Analysis Run 4/2/2021 11:01 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

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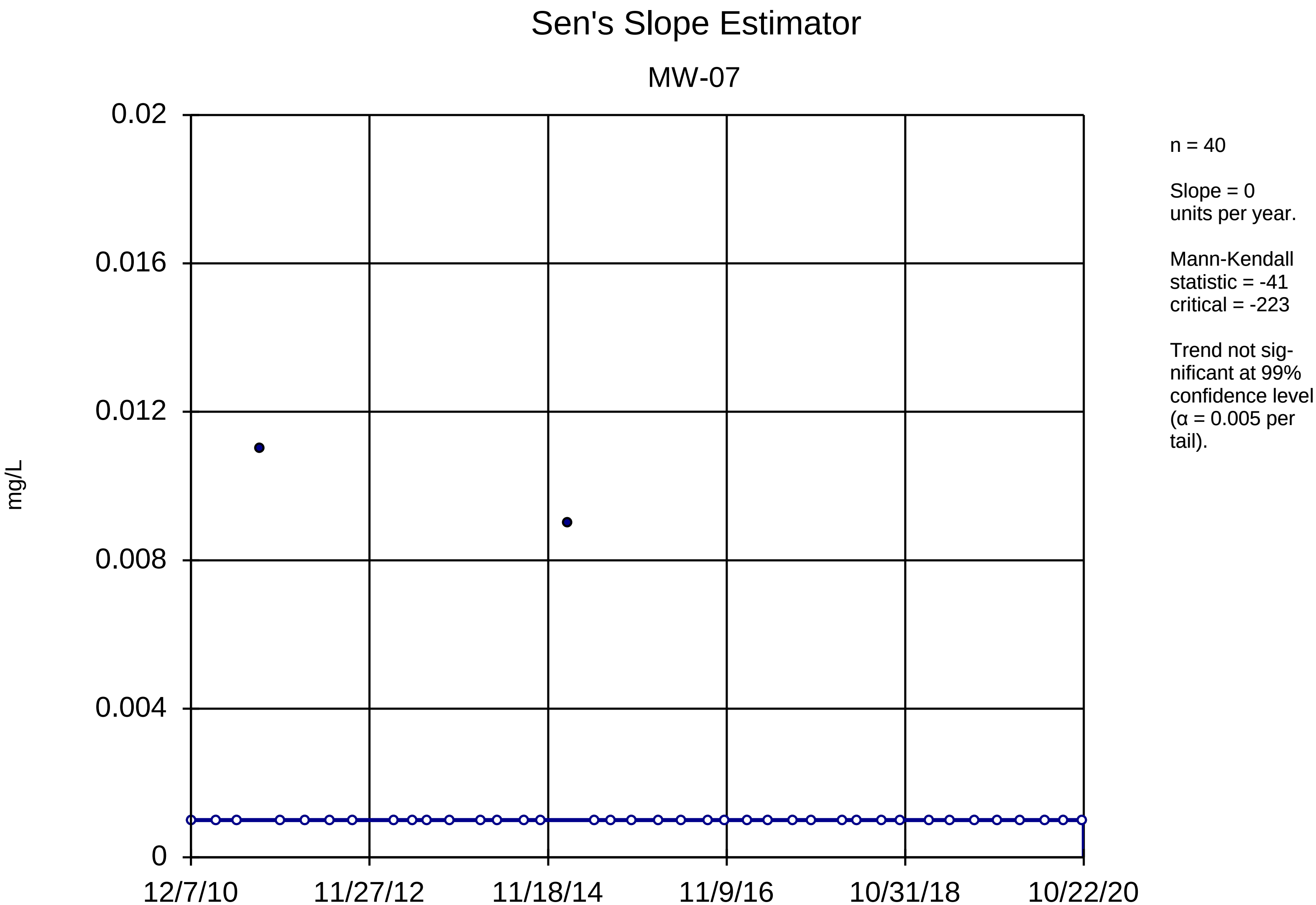
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:01 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81589

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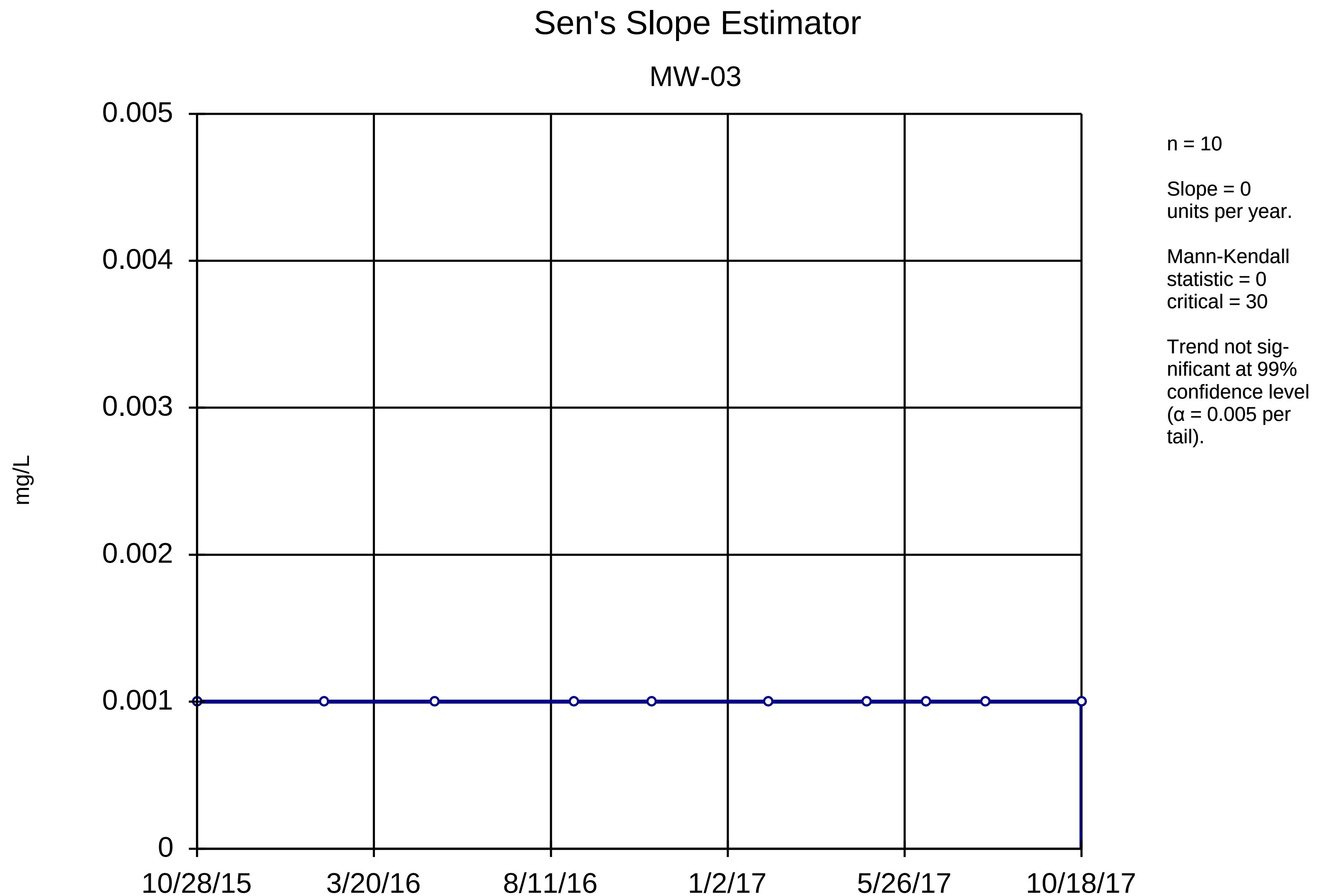


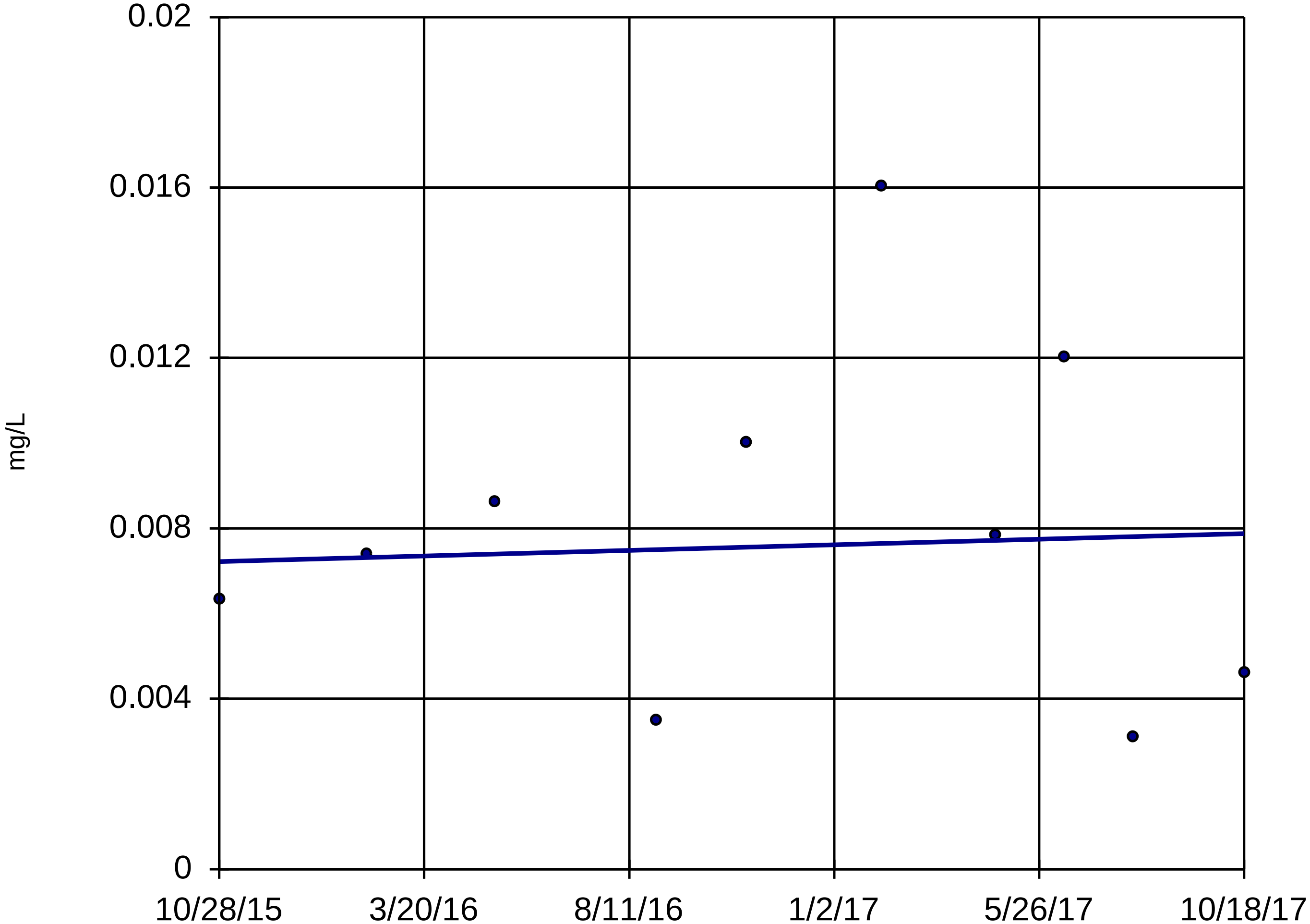

Constituent: Cobalt, Total Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81590

## Sen's Slope Estimator

MW-04




n = 10

Slope = 0.0003311 units per year.

Mann-Kendall statistic = 1 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

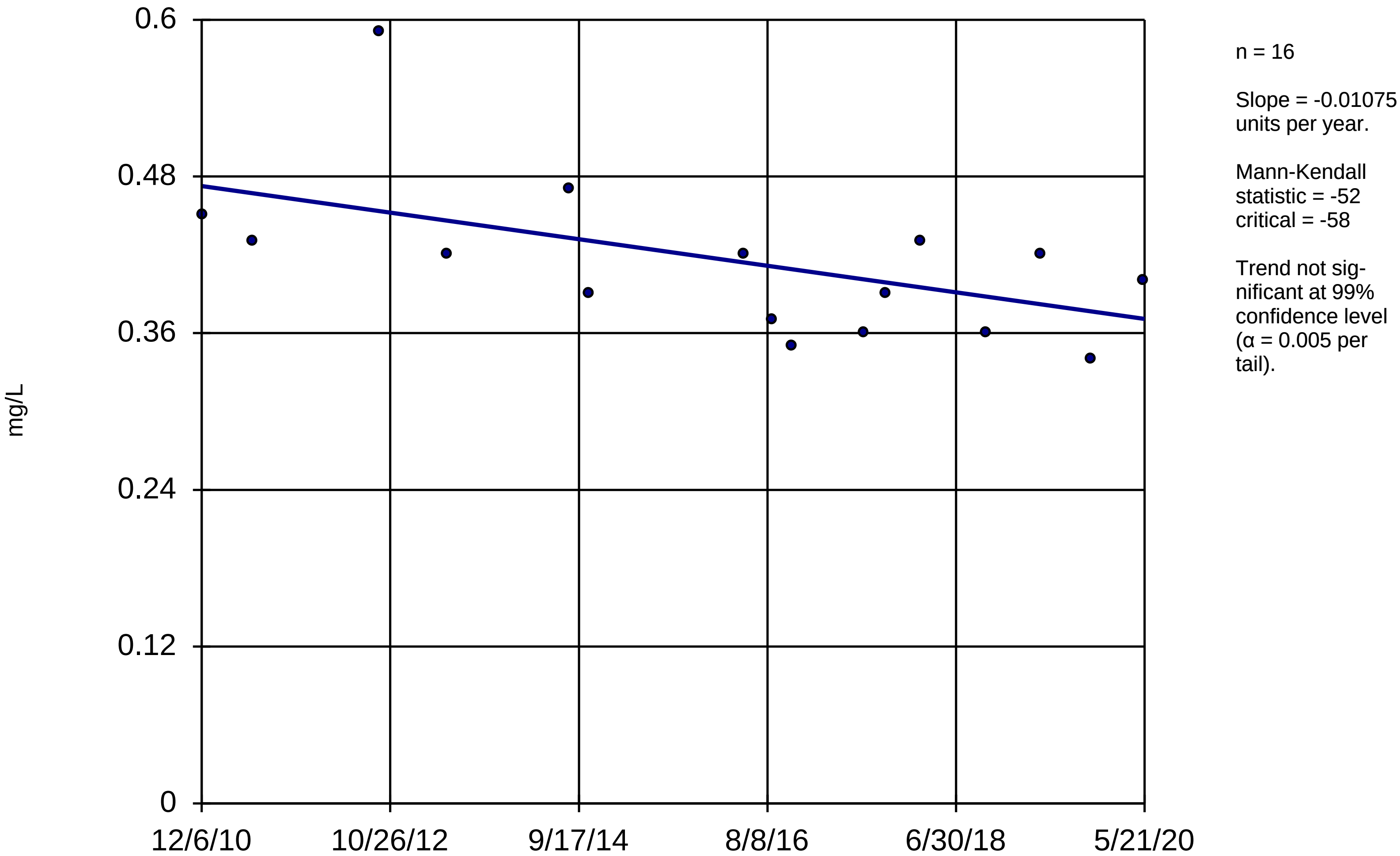
Constituent: Cobalt, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81591

## Sen's Slope Estimator

MW-01




Constituent: Fluoride Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81592

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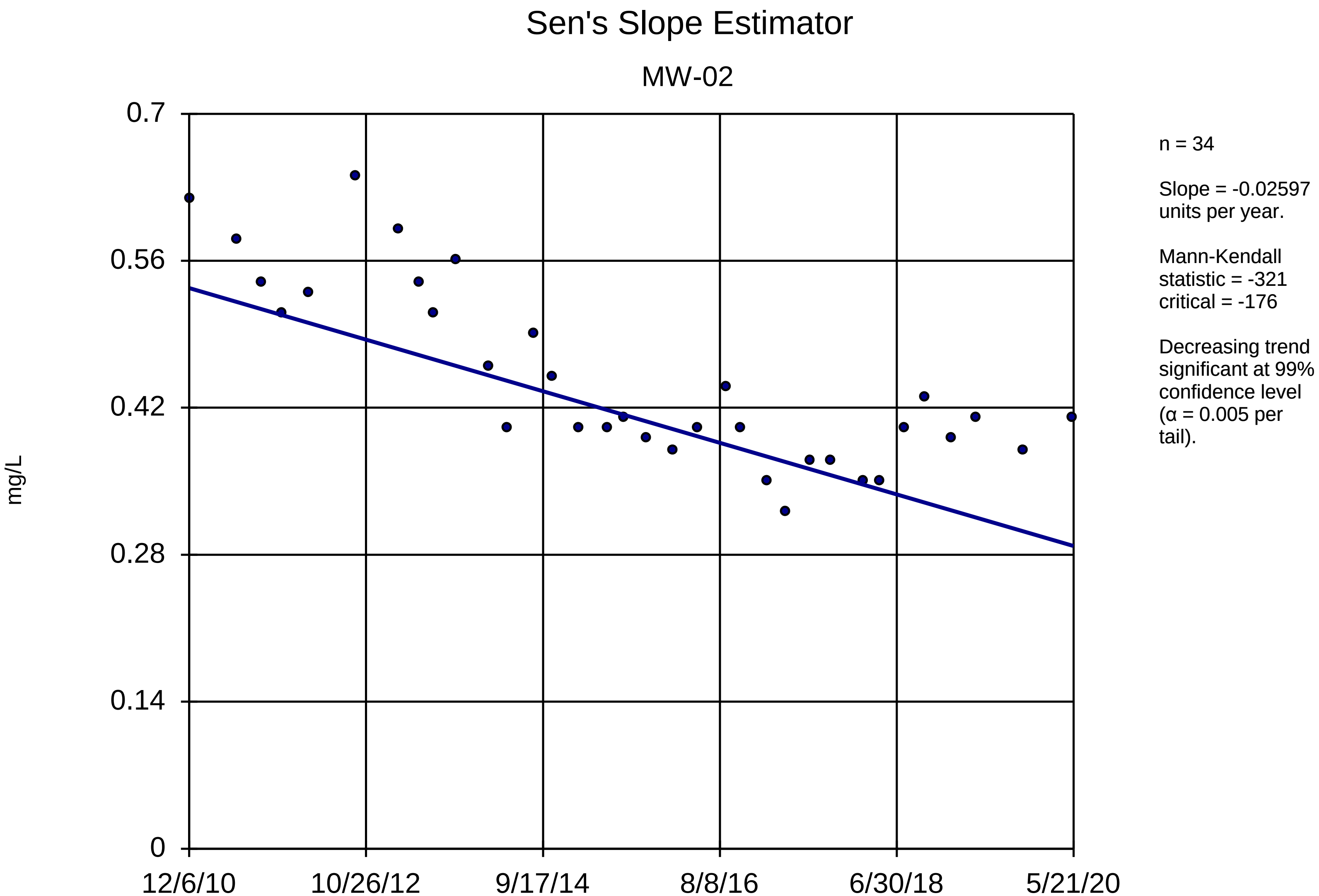
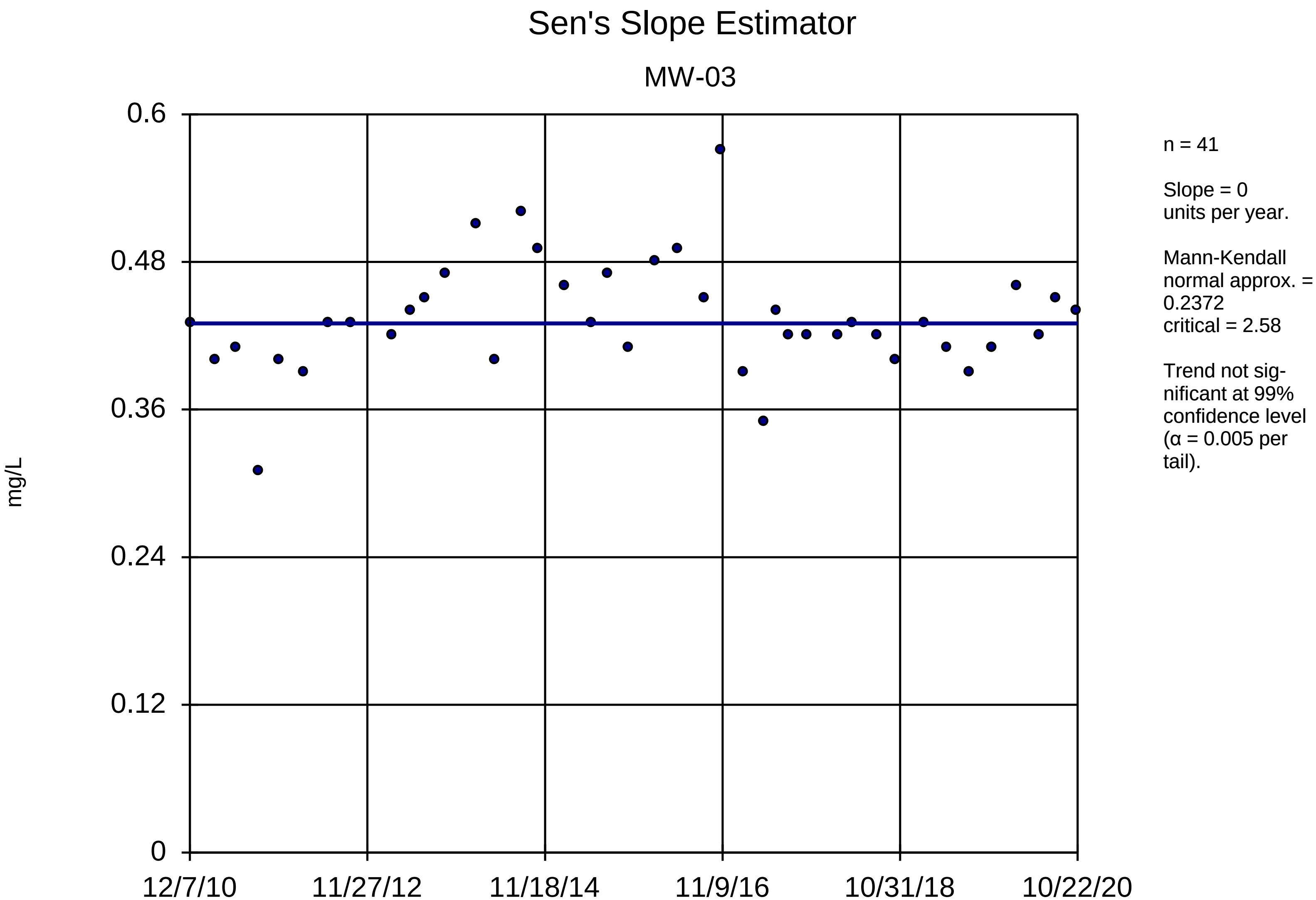



Constituent: Fluoride    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

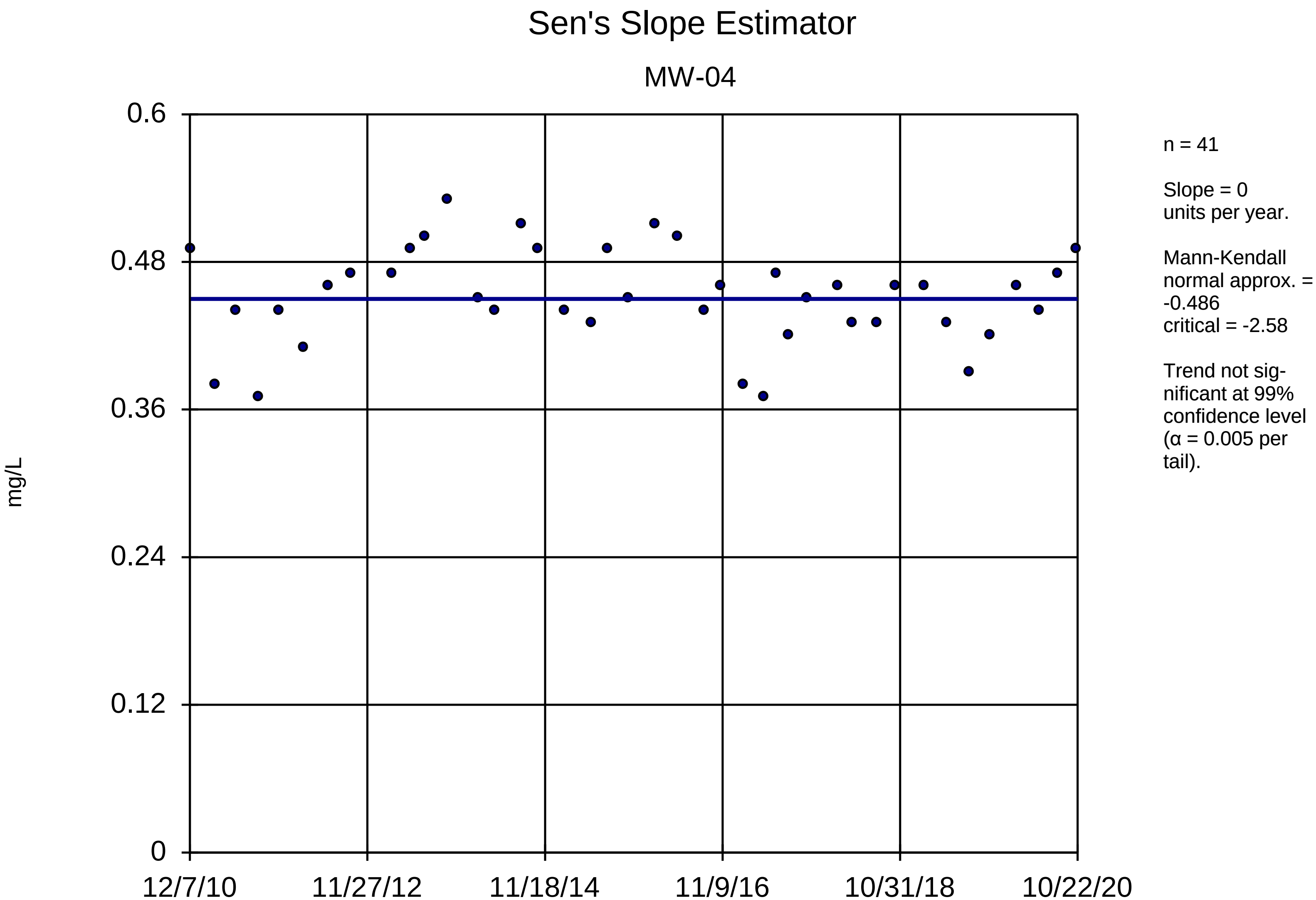
MWG13-15_81593




Constituent: Fluoride    Analysis Run 4/2/2021 11:02 AM

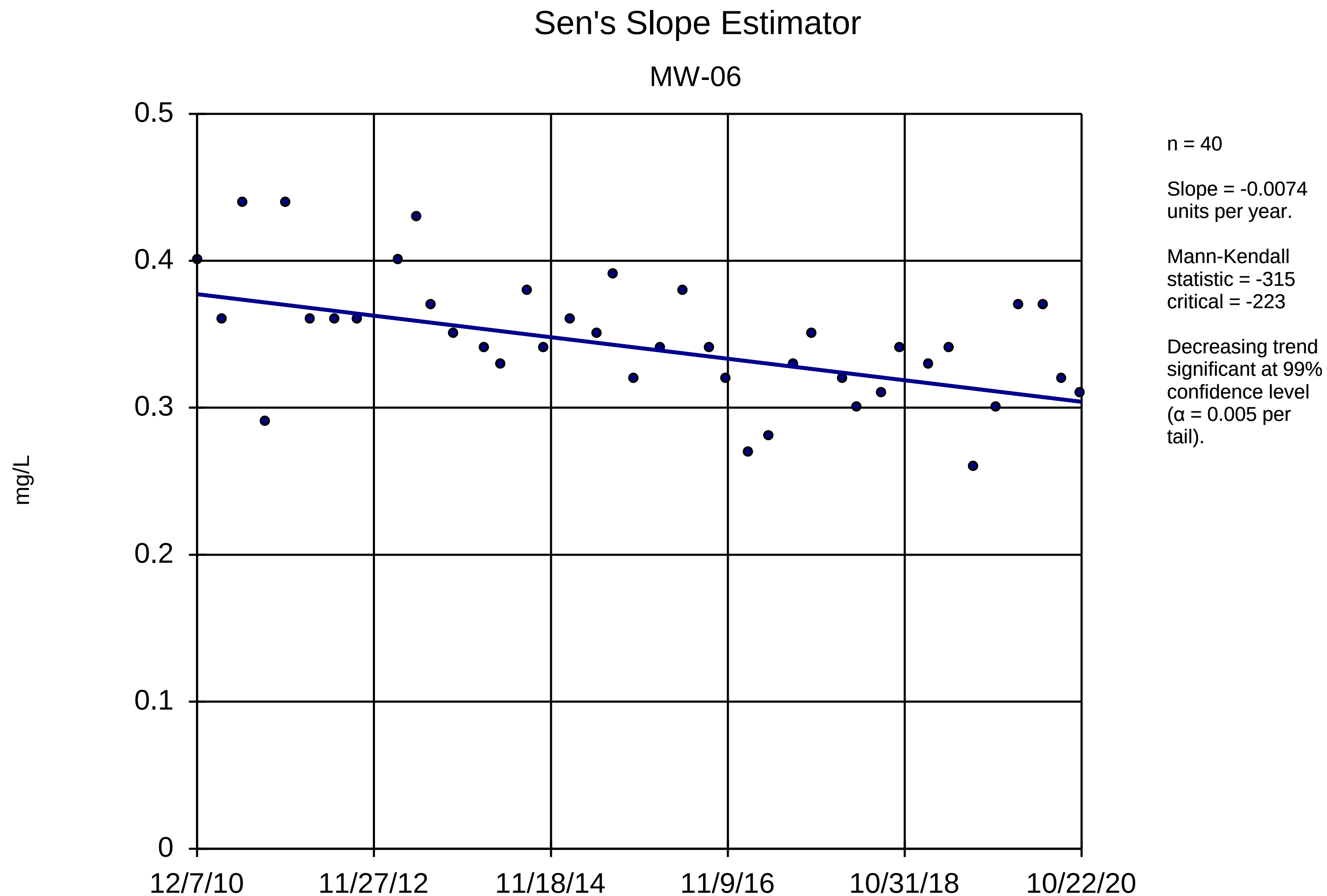
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81594




Constituent: Fluoride    Analysis Run 4/2/2021 11:02 AM

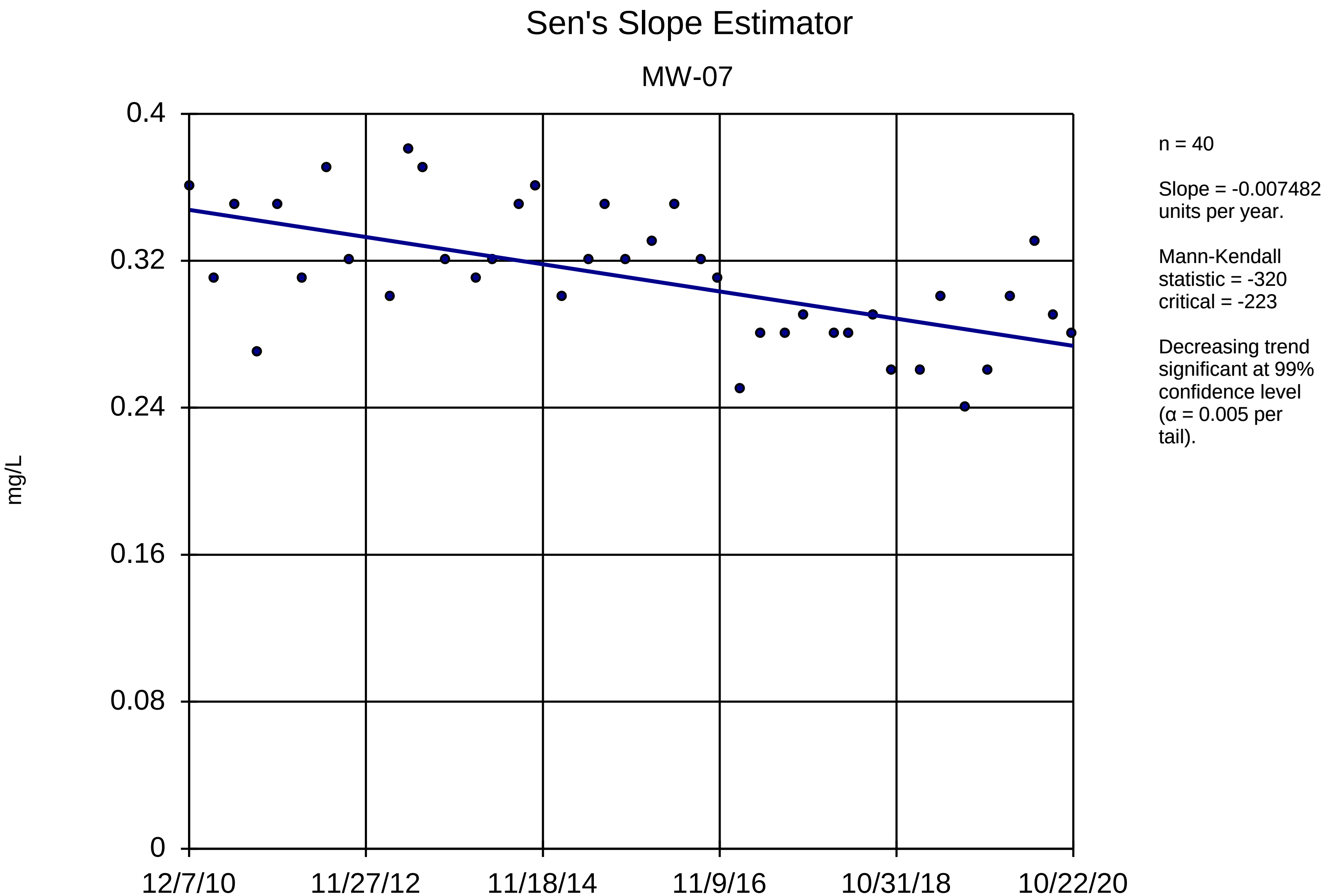
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Fluoride    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81596



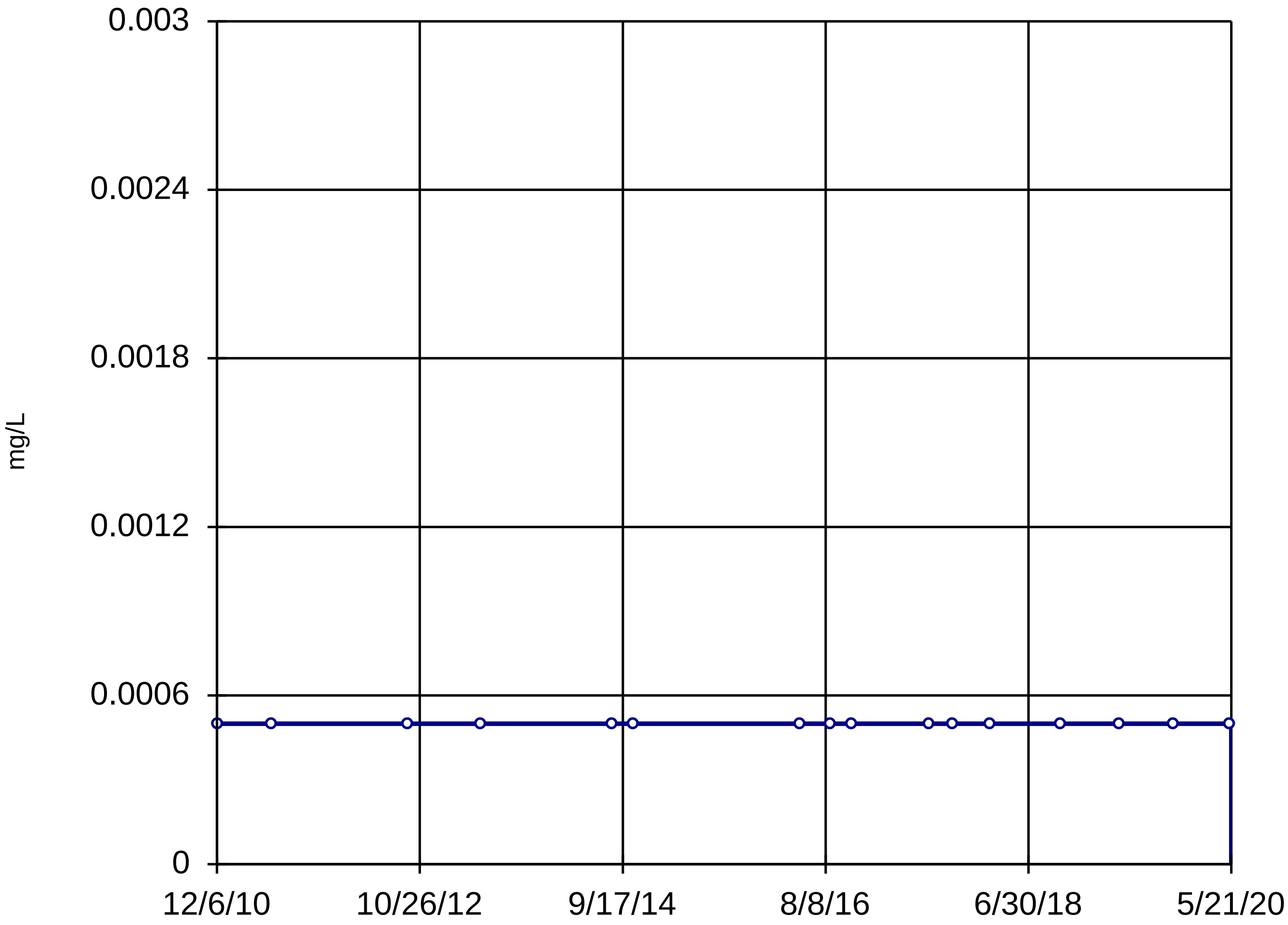

Constituent: Fluoride Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-01




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81598

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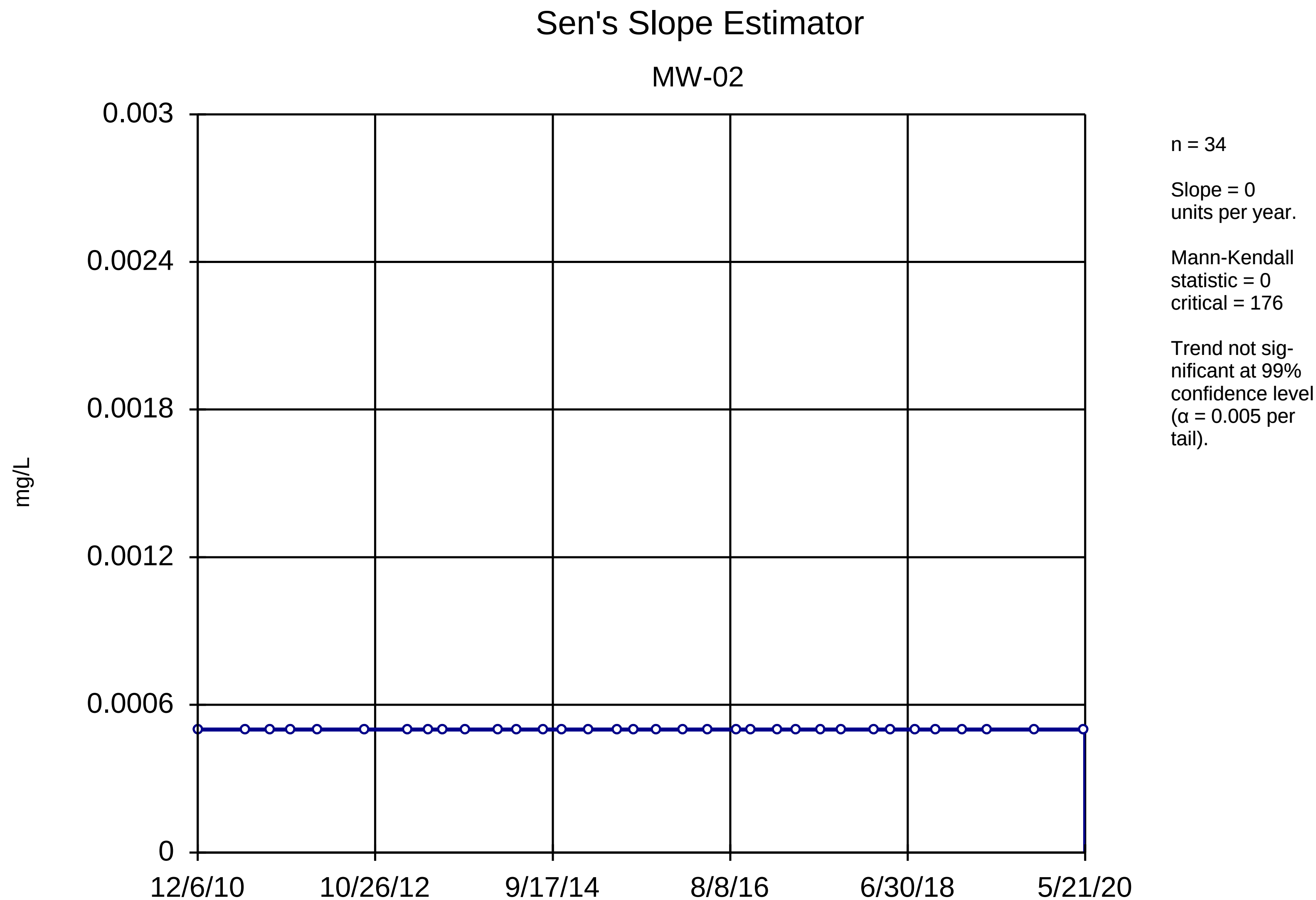
Hollow symbols indicate censored values.




Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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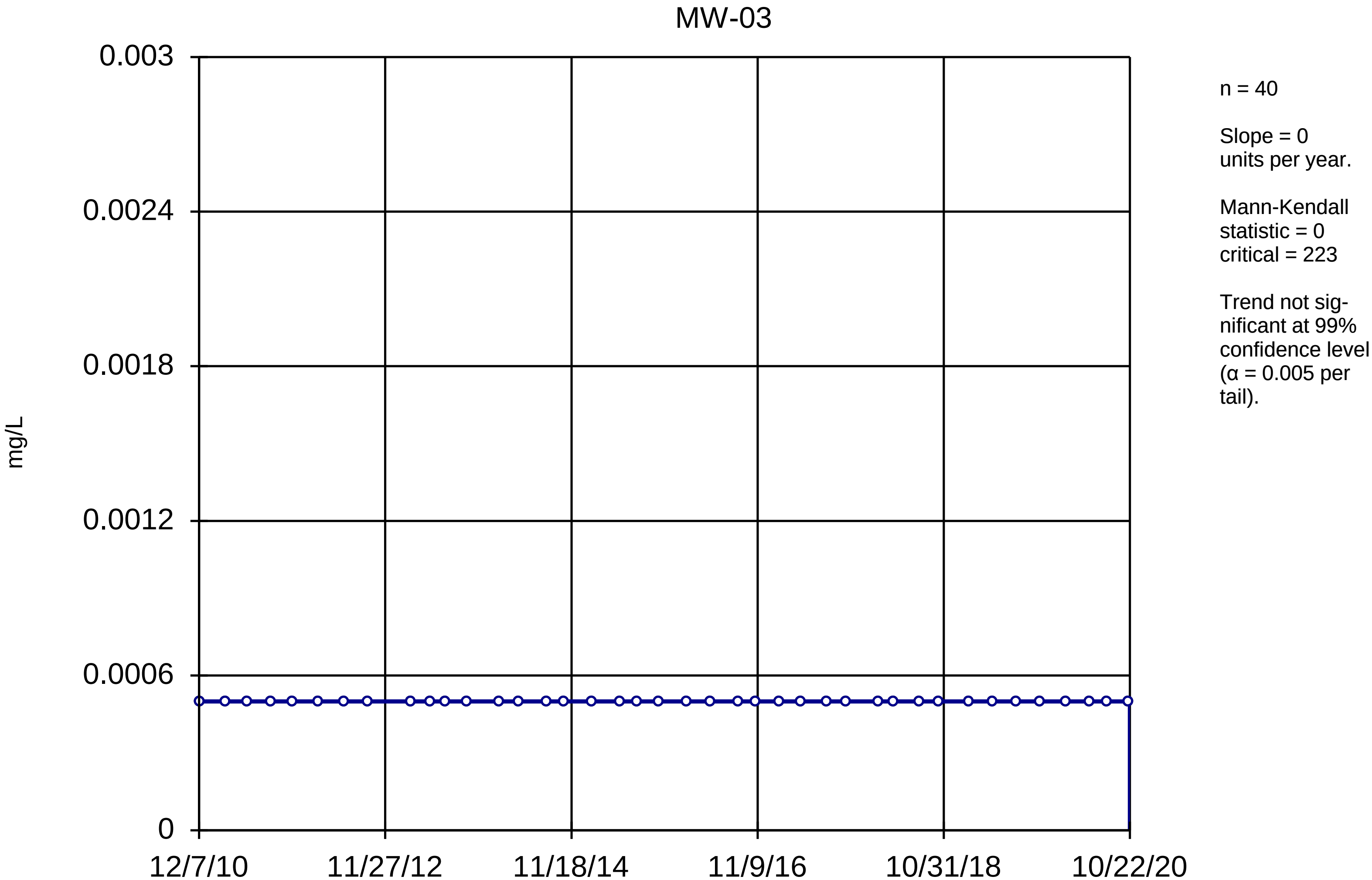
Hollow symbols indicate censored values.

## Sen's Slope Estimator



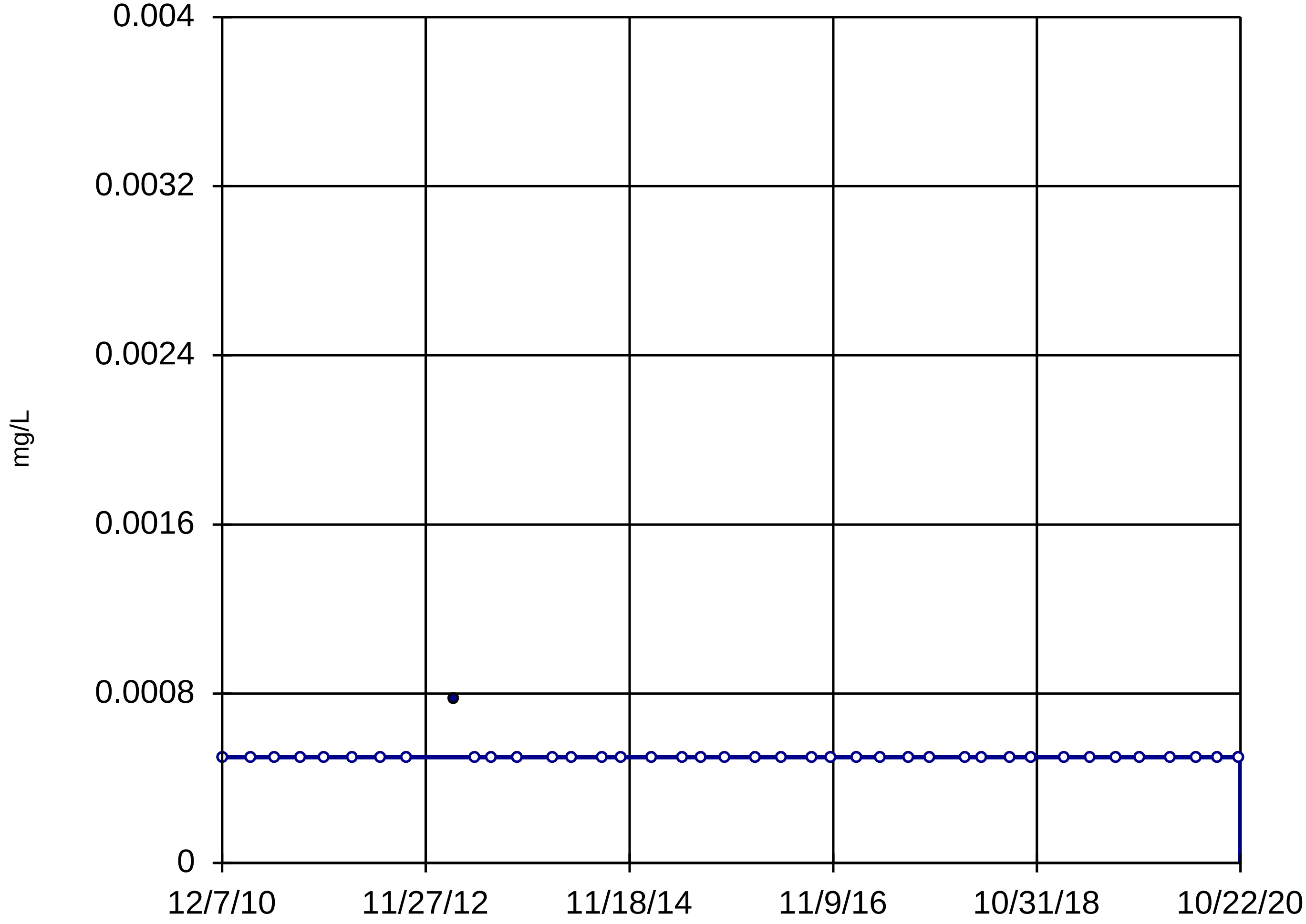

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = -23
critical = -223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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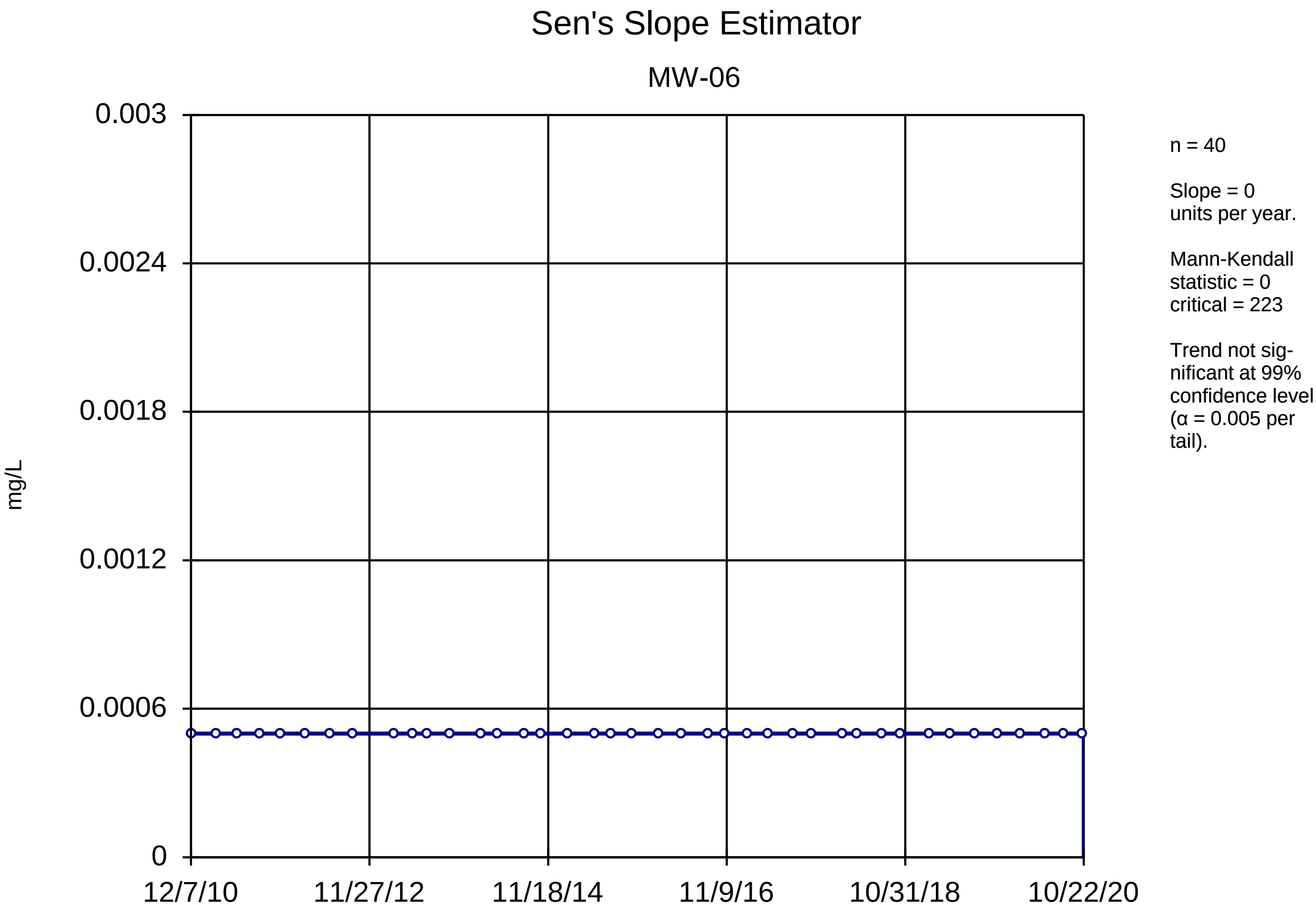
Hollow symbols indicate censored values.




Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81602

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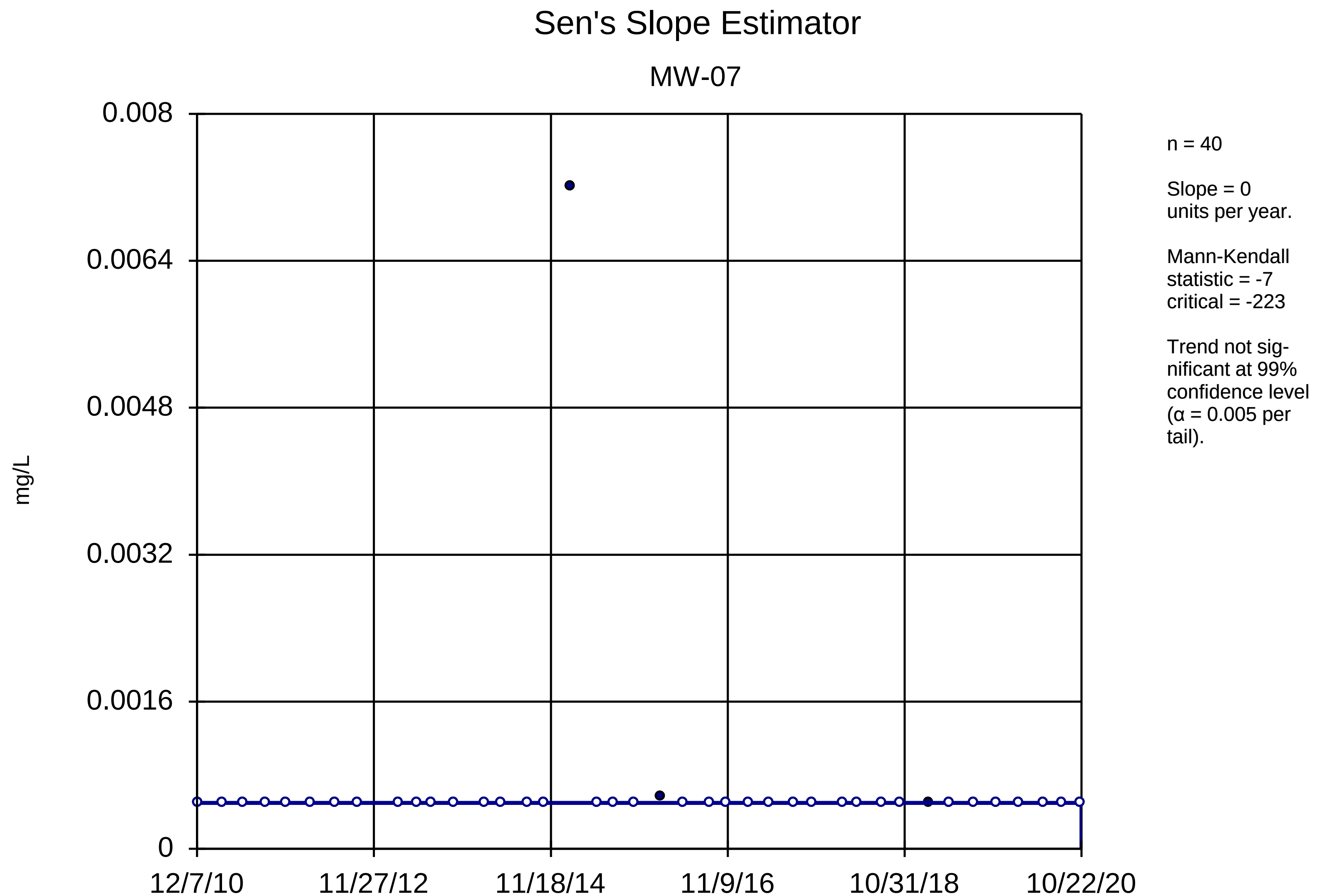
Hollow symbols indicate censored values.

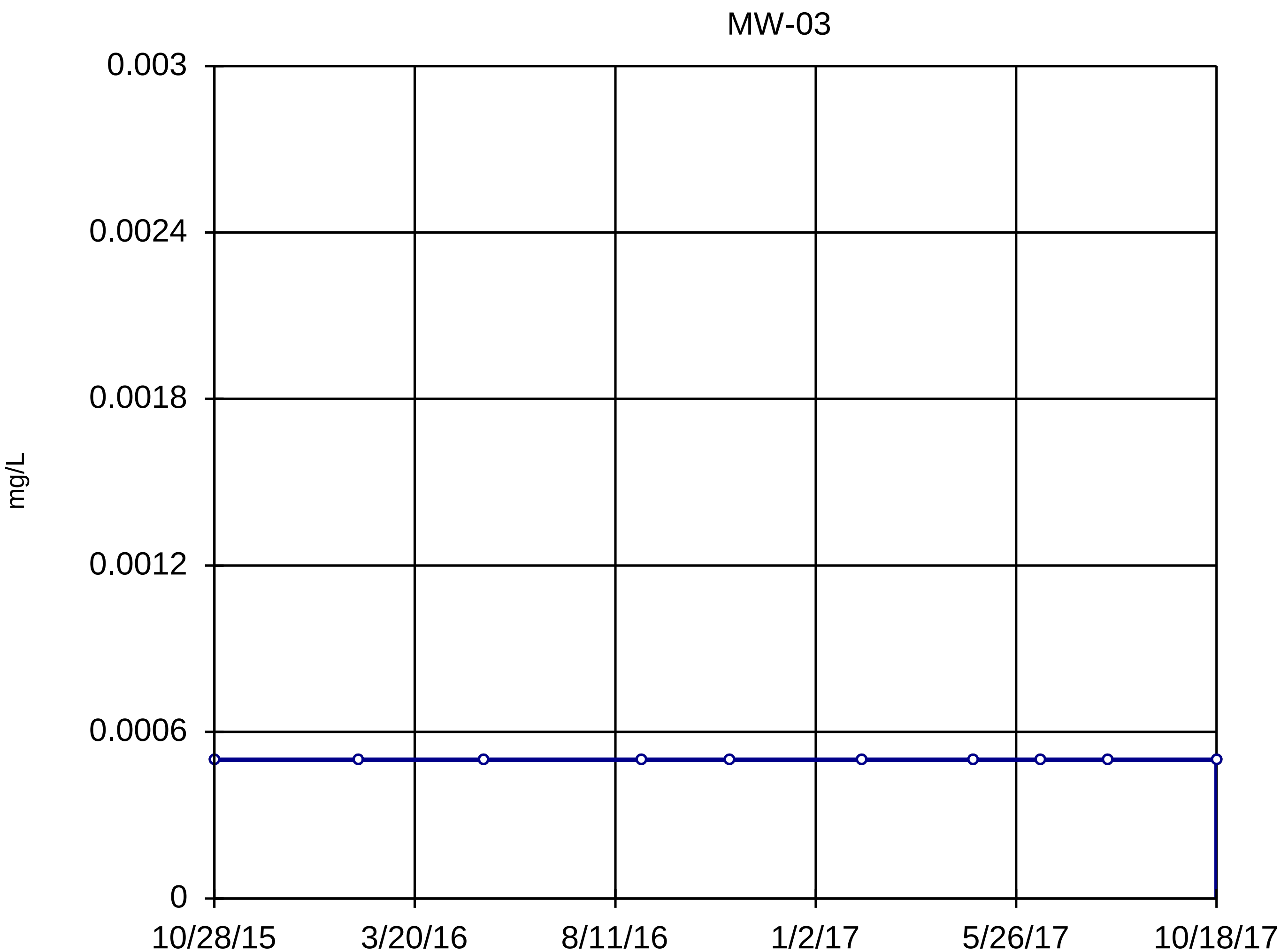



Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81604

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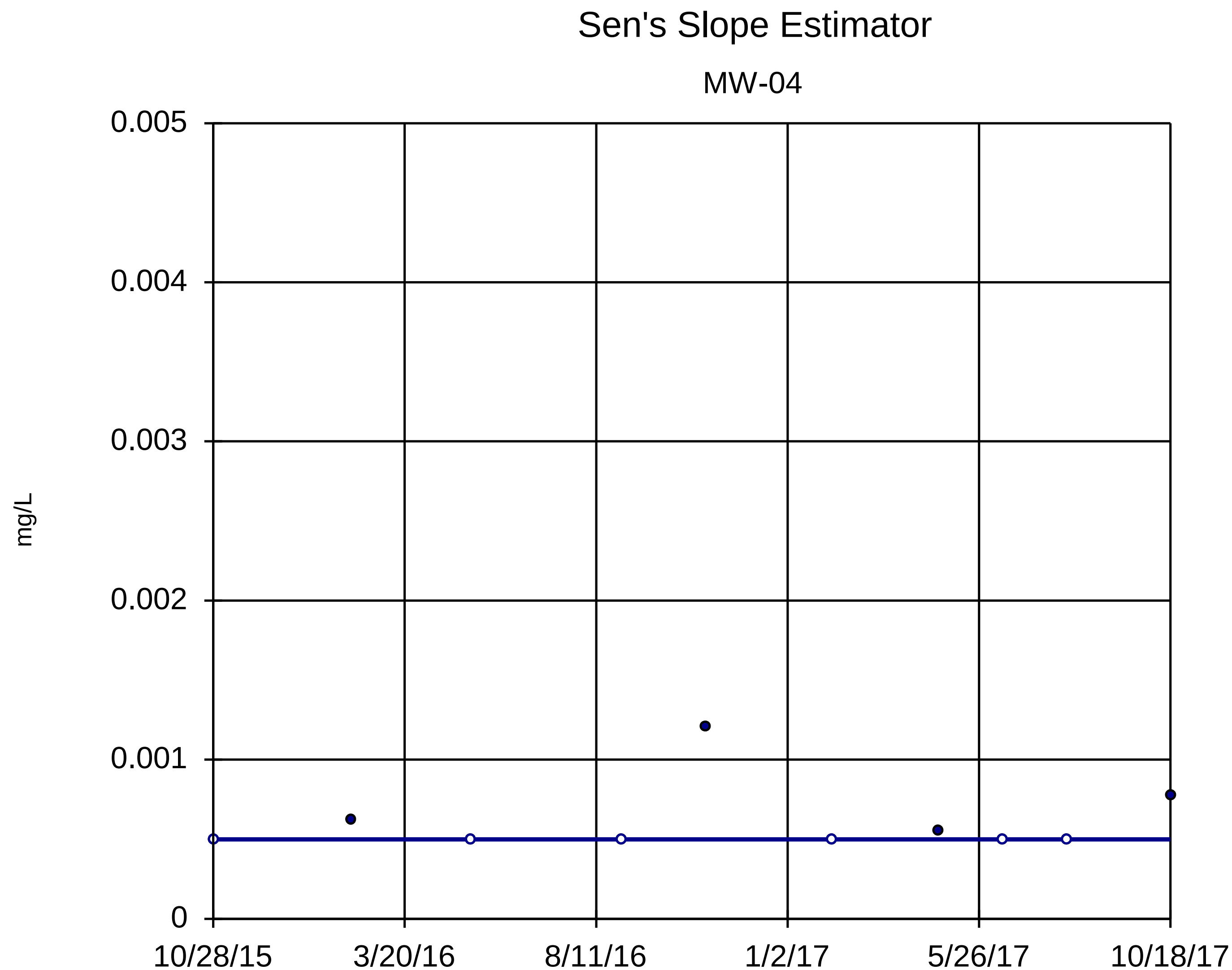
Hollow symbols indicate censored values.




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 4
critical = 30

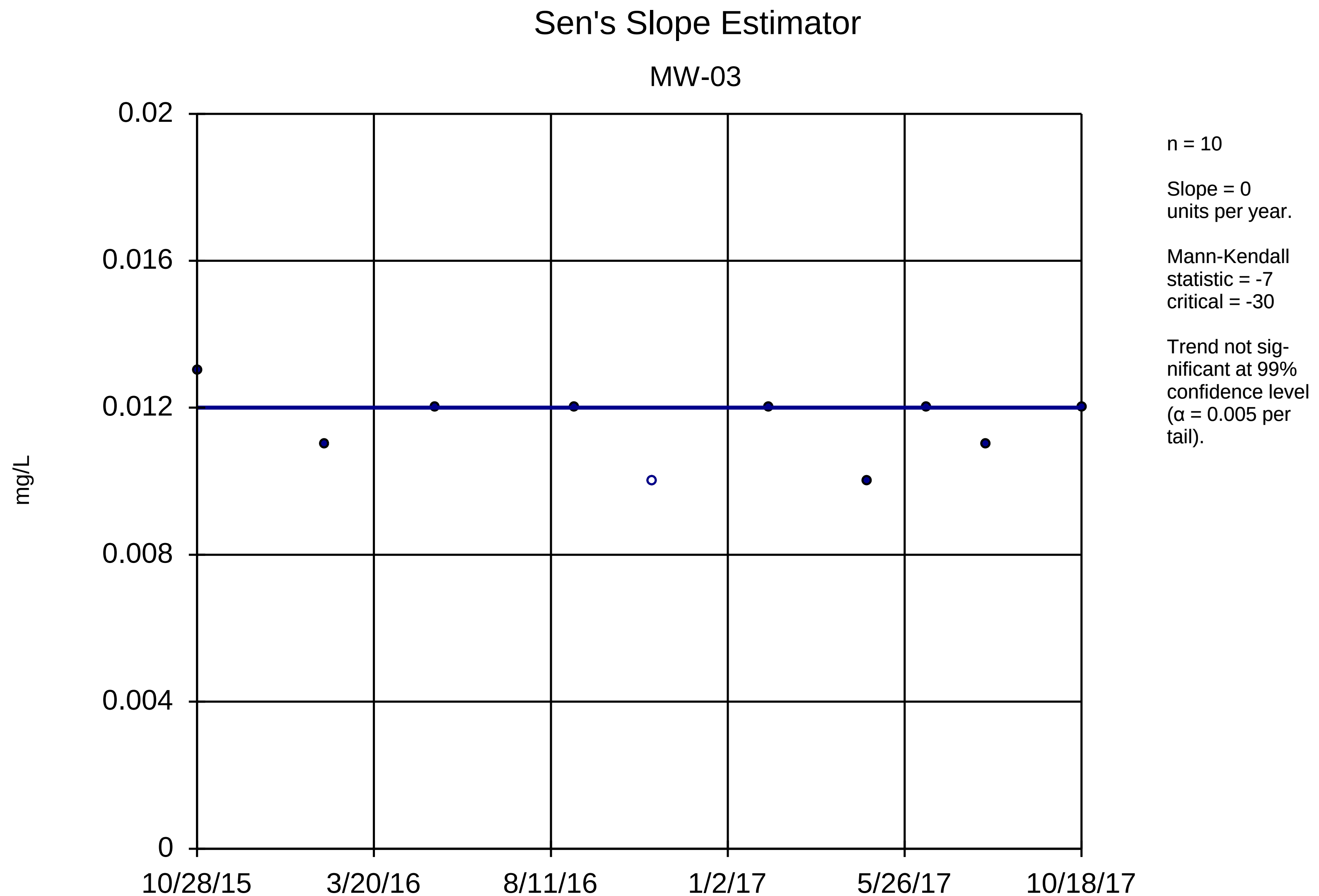
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

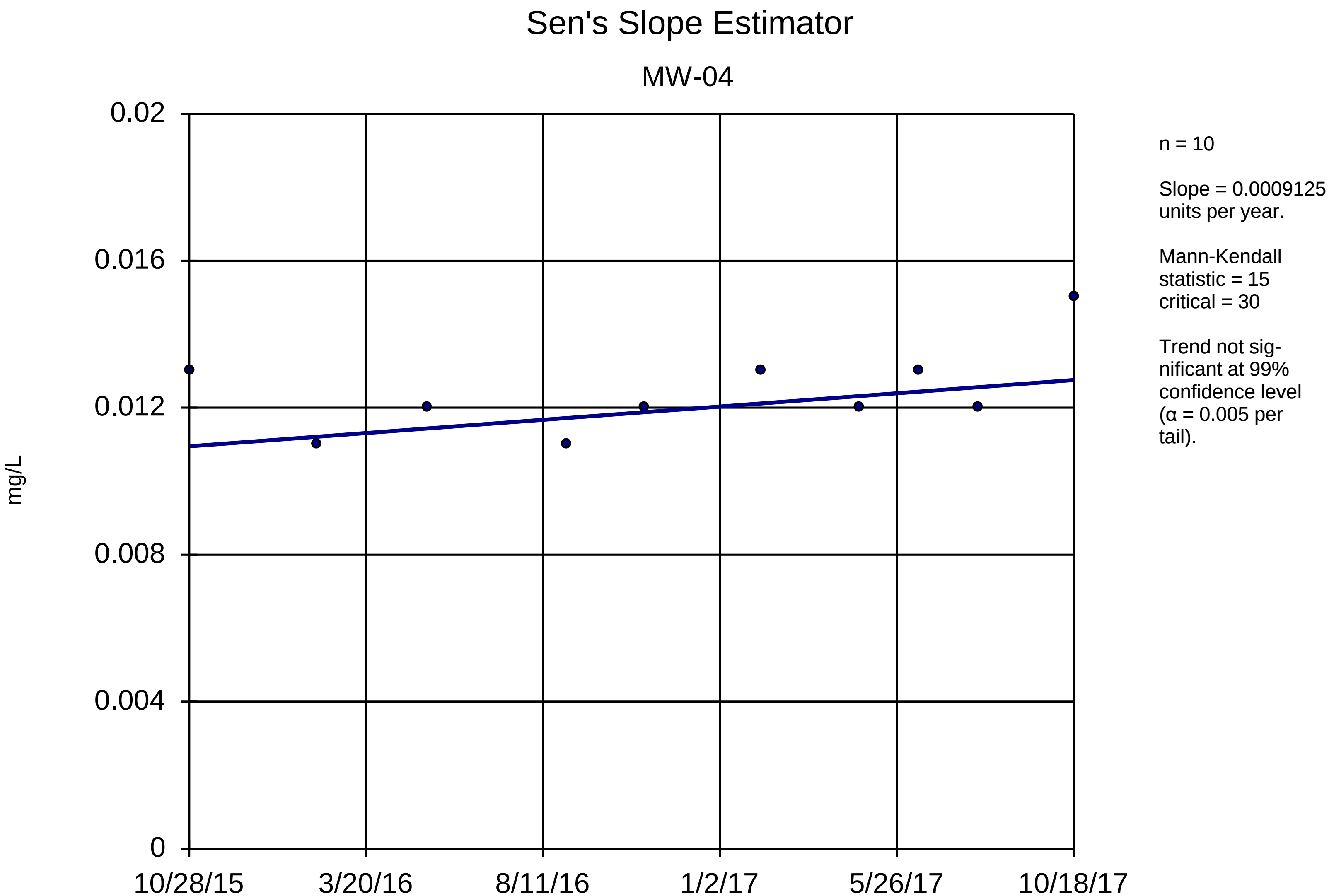
MWG13-15_81605

Hollow symbols indicate censored values.




Constituent: Lithium, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Lithium, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81607

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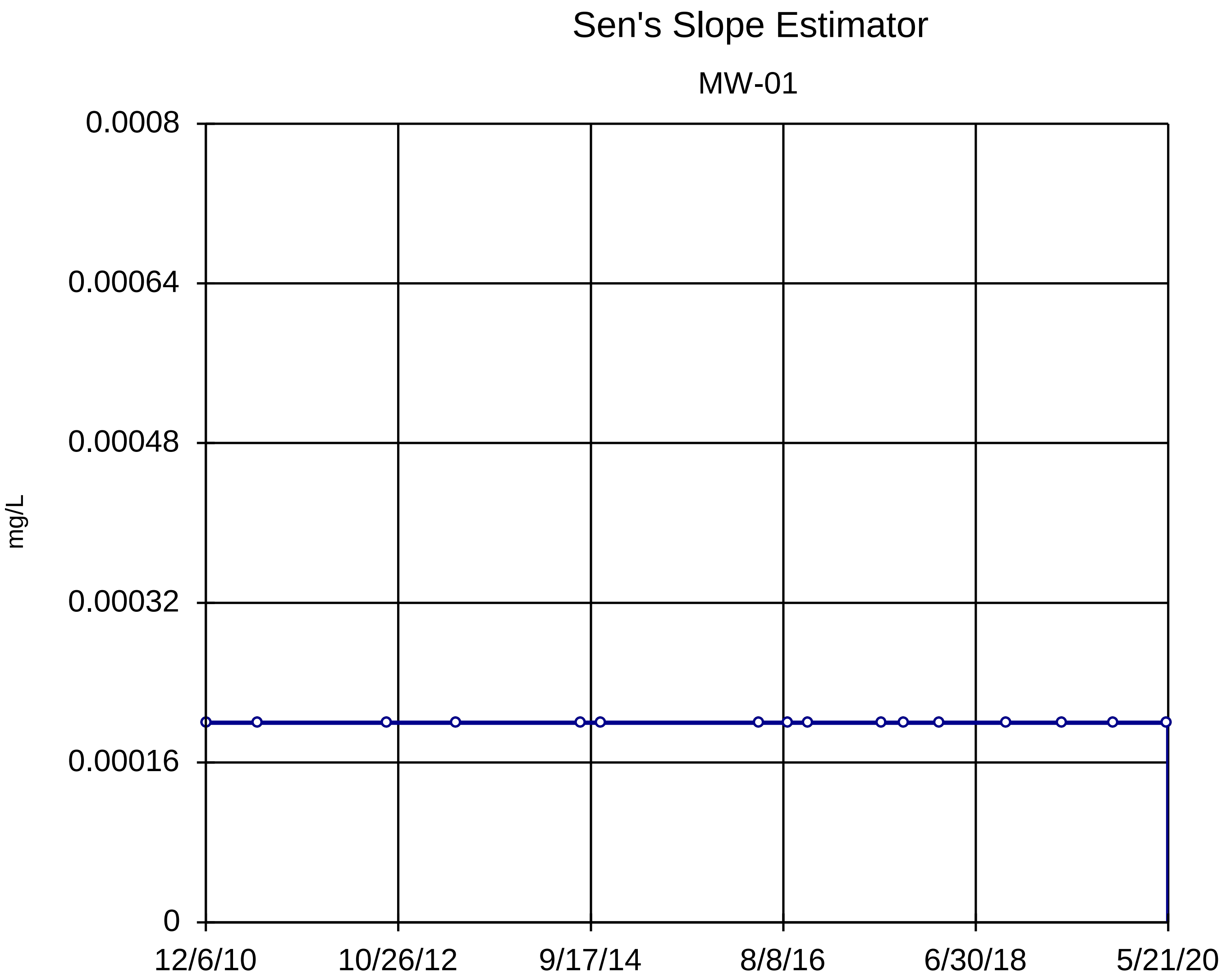
Hollow symbols indicate censored values.




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

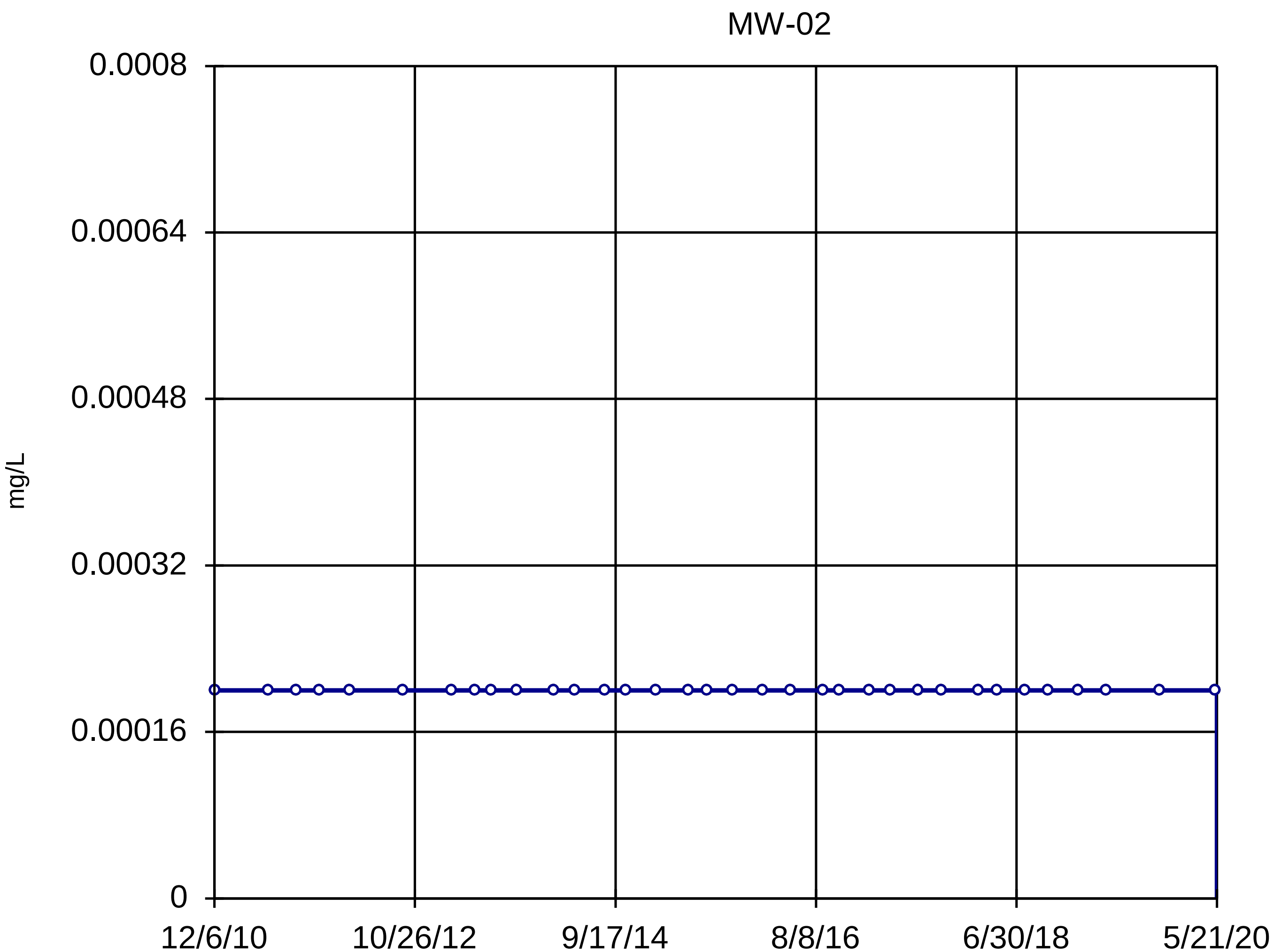
Constituent: Mercury, Dissolved Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81608

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 34

Slope = 0
units per year.

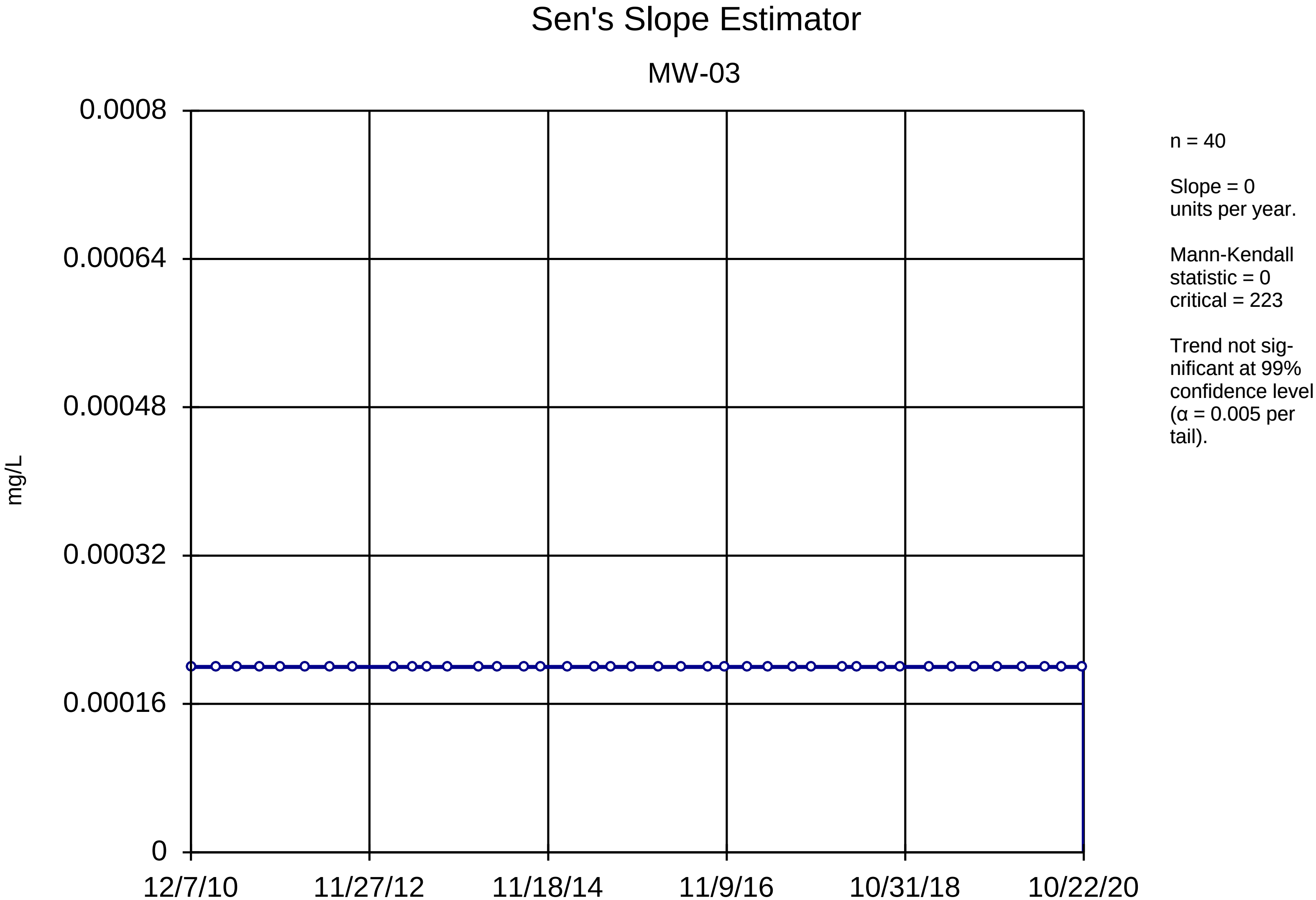
Mann-Kendall
statistic = 0
critical = 176

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

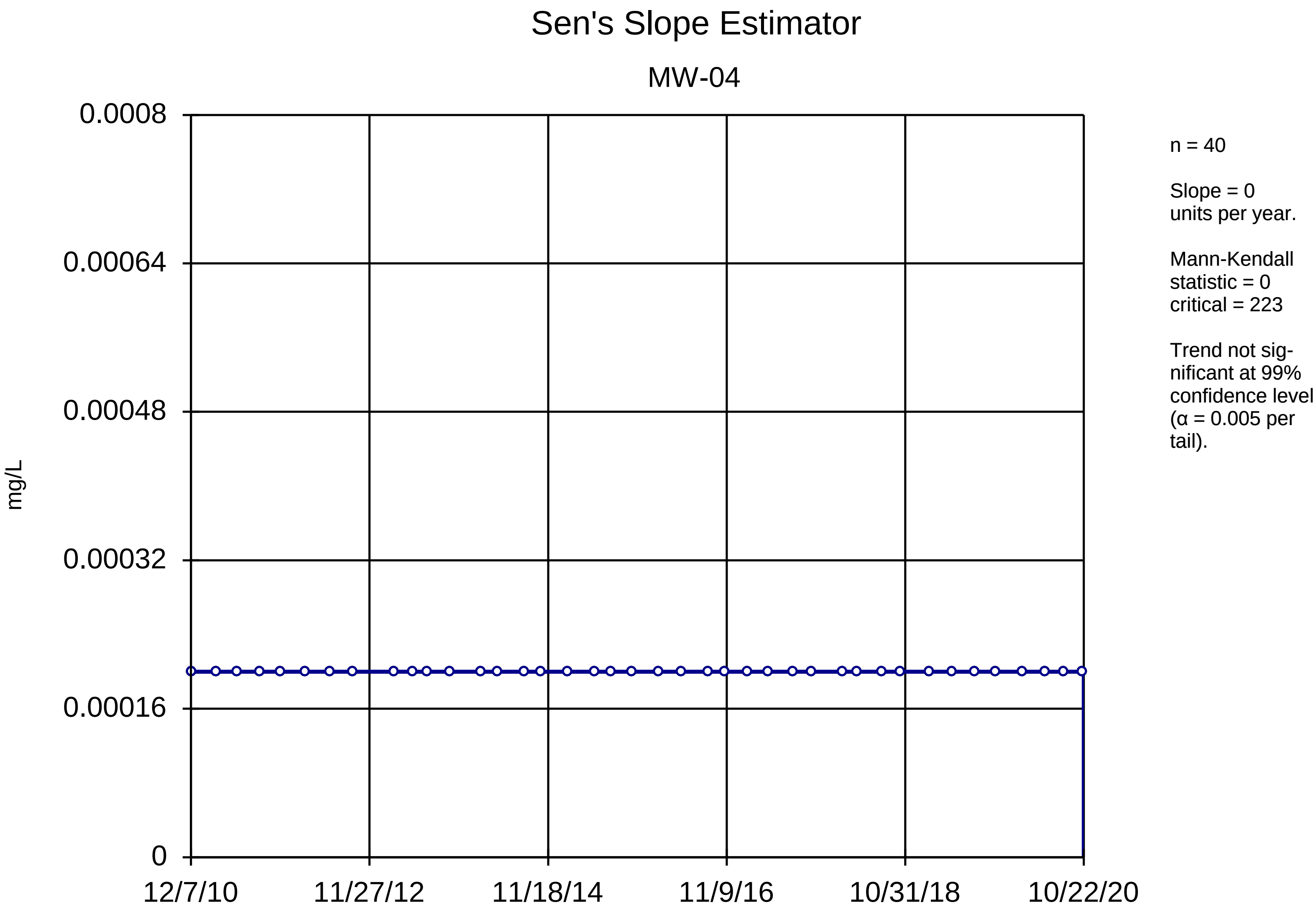
Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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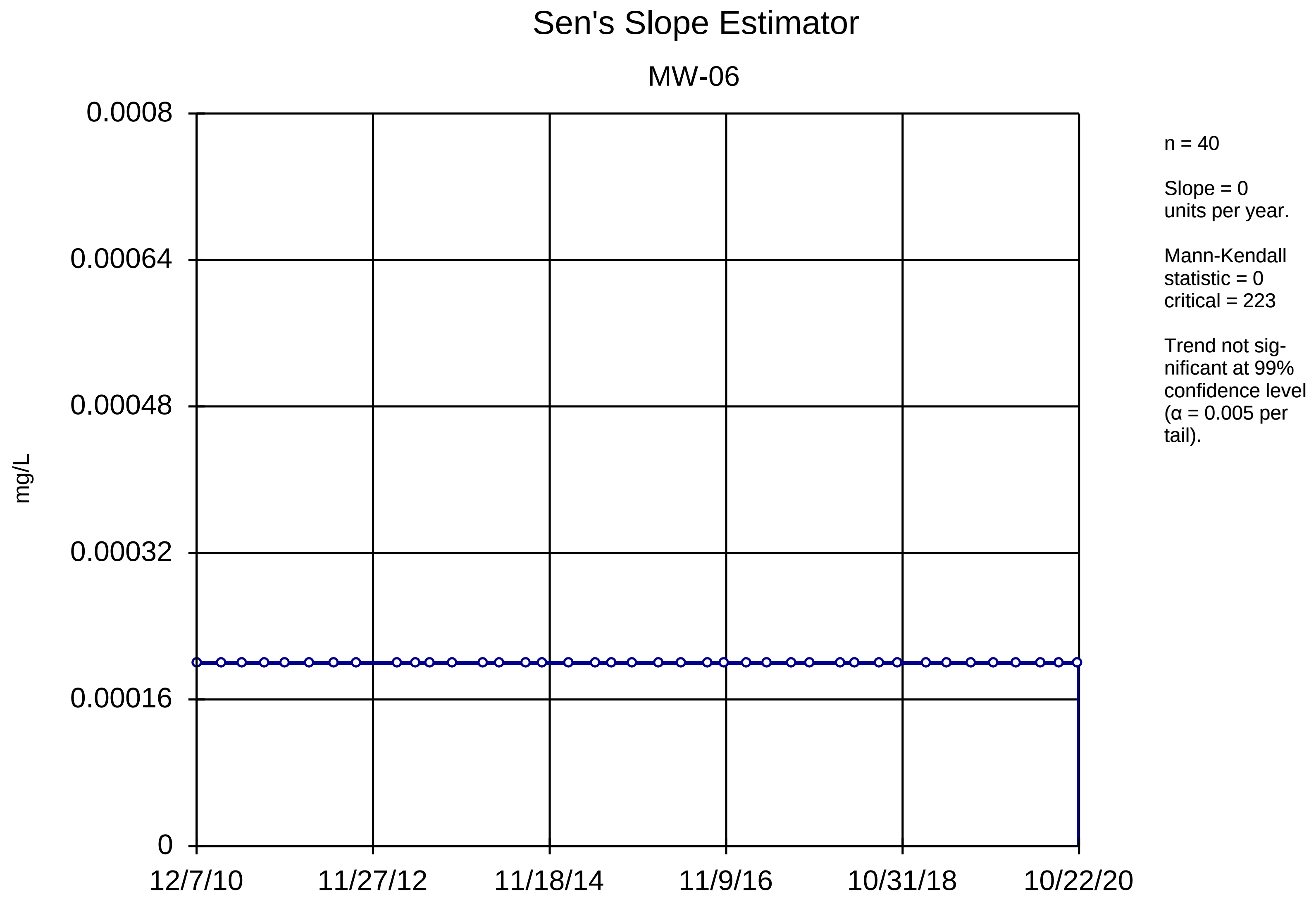
Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:02 AM

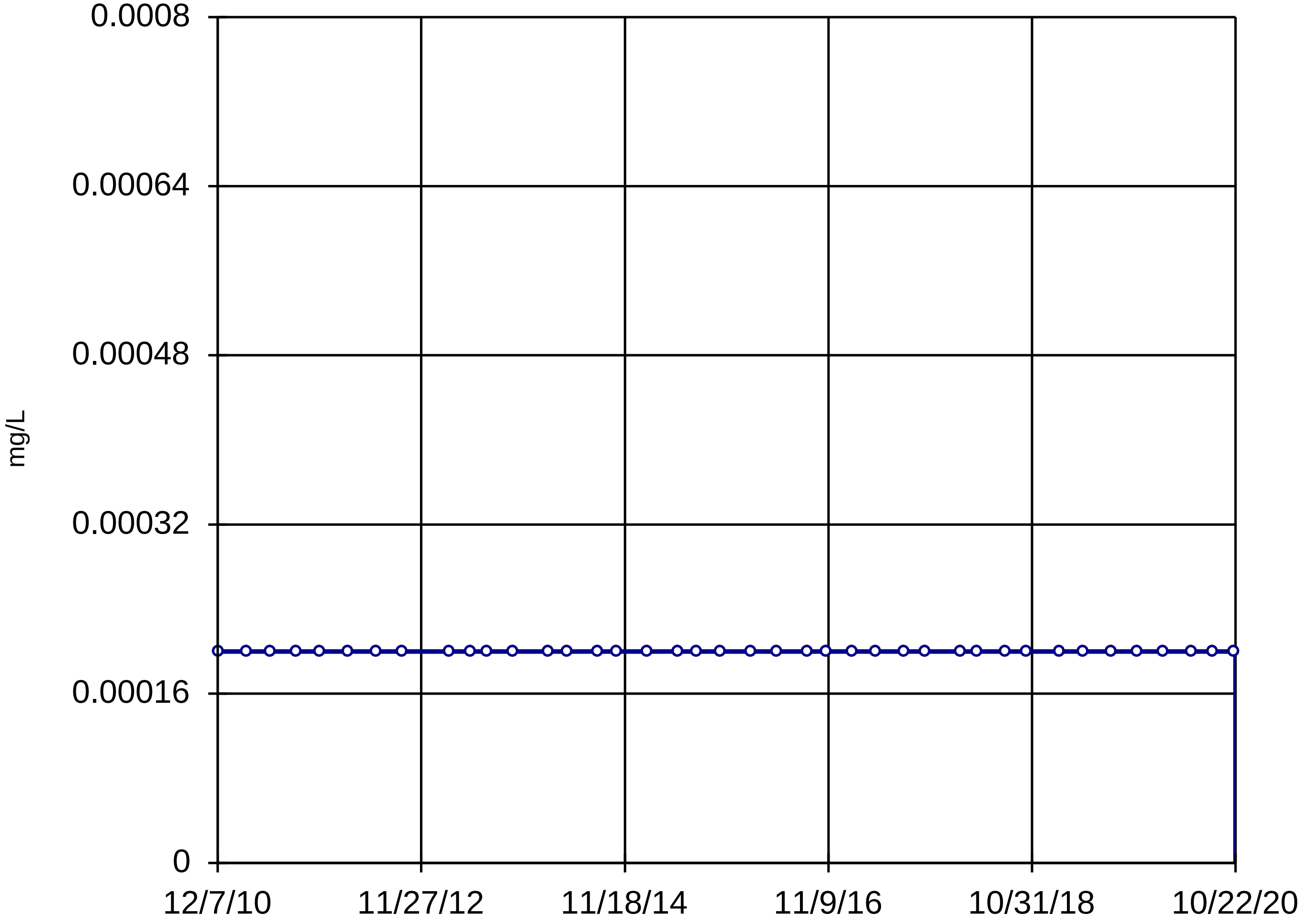
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81612

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-07




n = 40

Slope = 0
units per year.

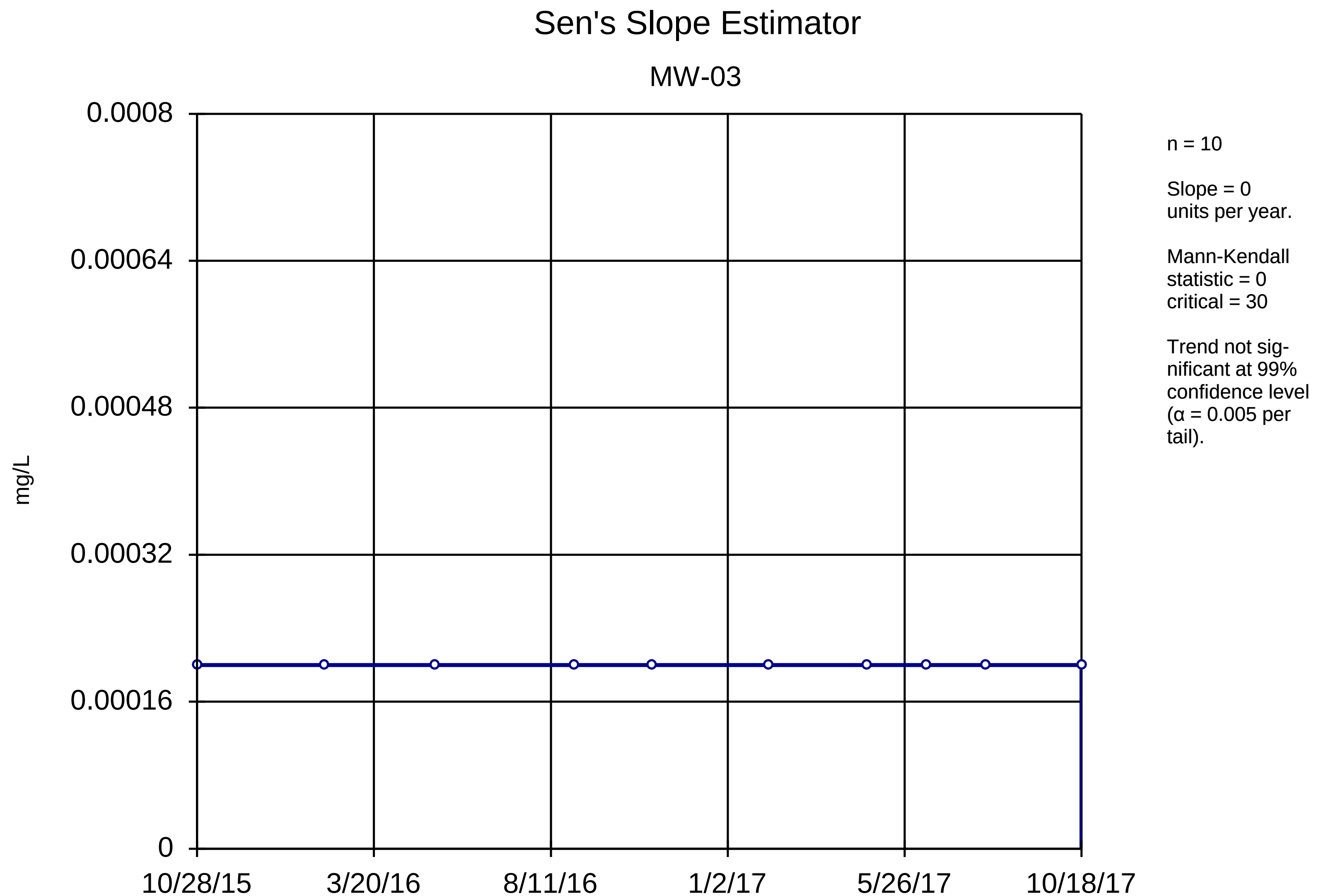
Mann-Kendall
statistic = 0
critical = 223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

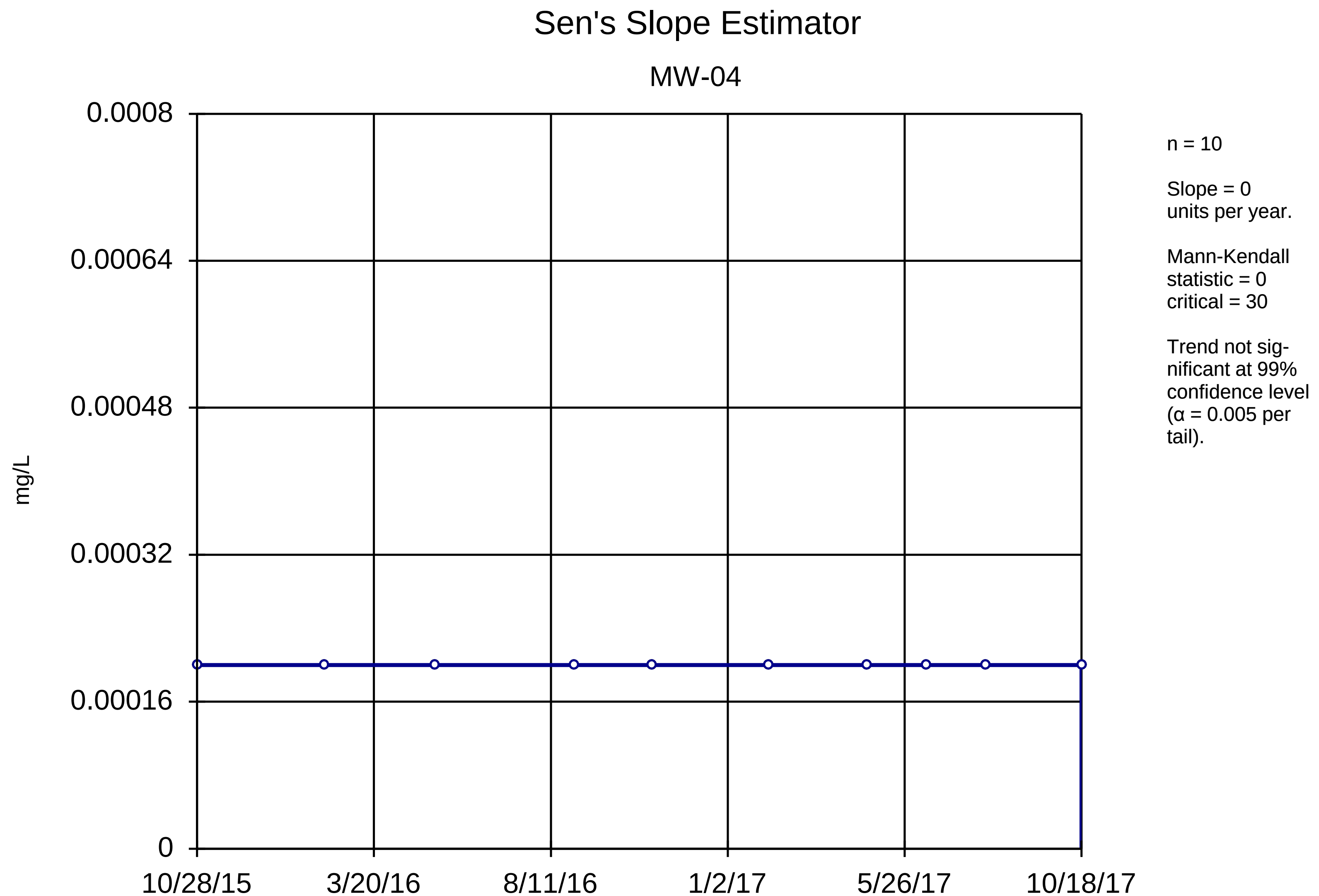



Constituent: Mercury, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81614

Hollow symbols indicate censored values.




Constituent: Mercury, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81615

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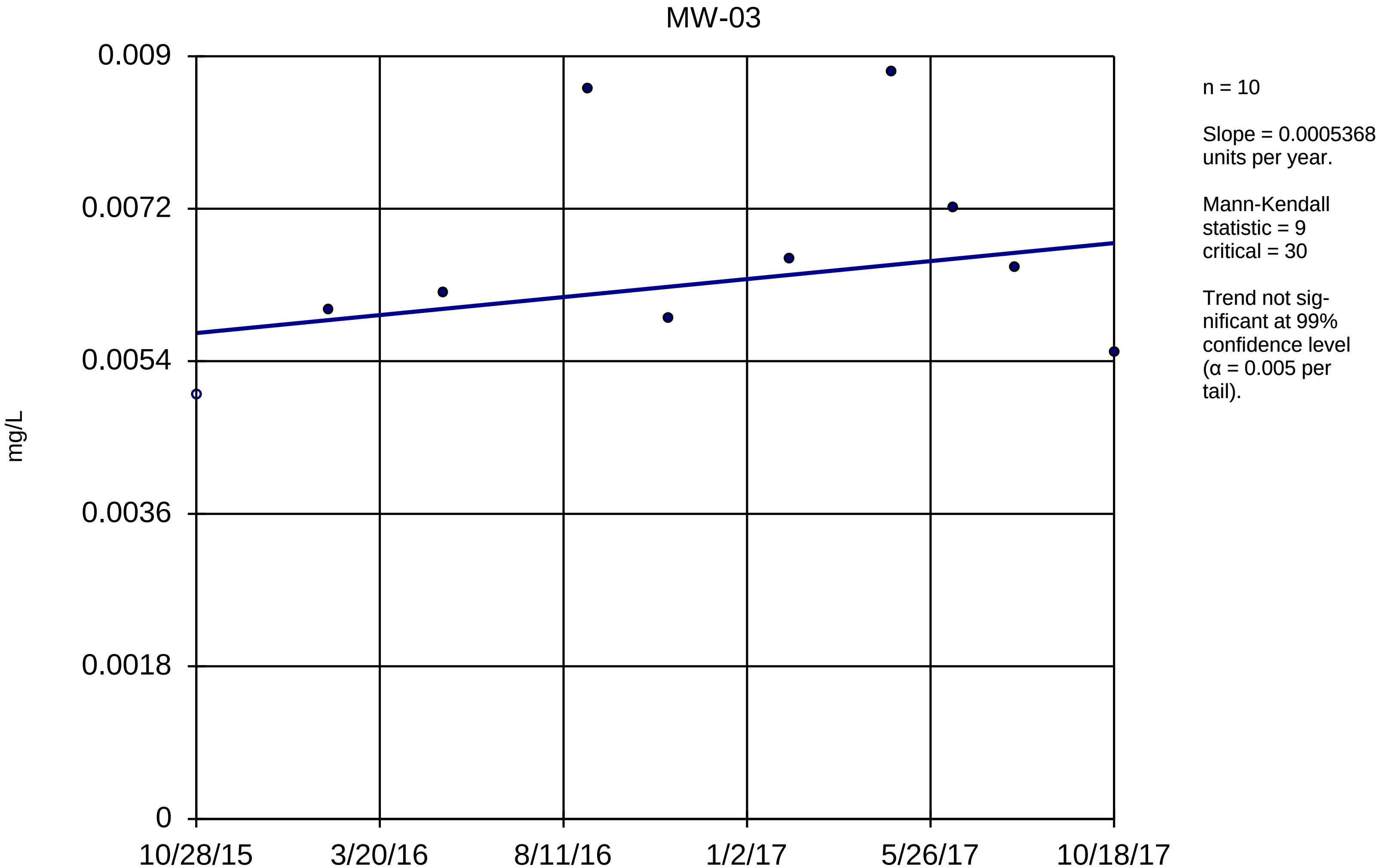
Hollow symbols indicate censored values.

## Sen's Slope Estimator

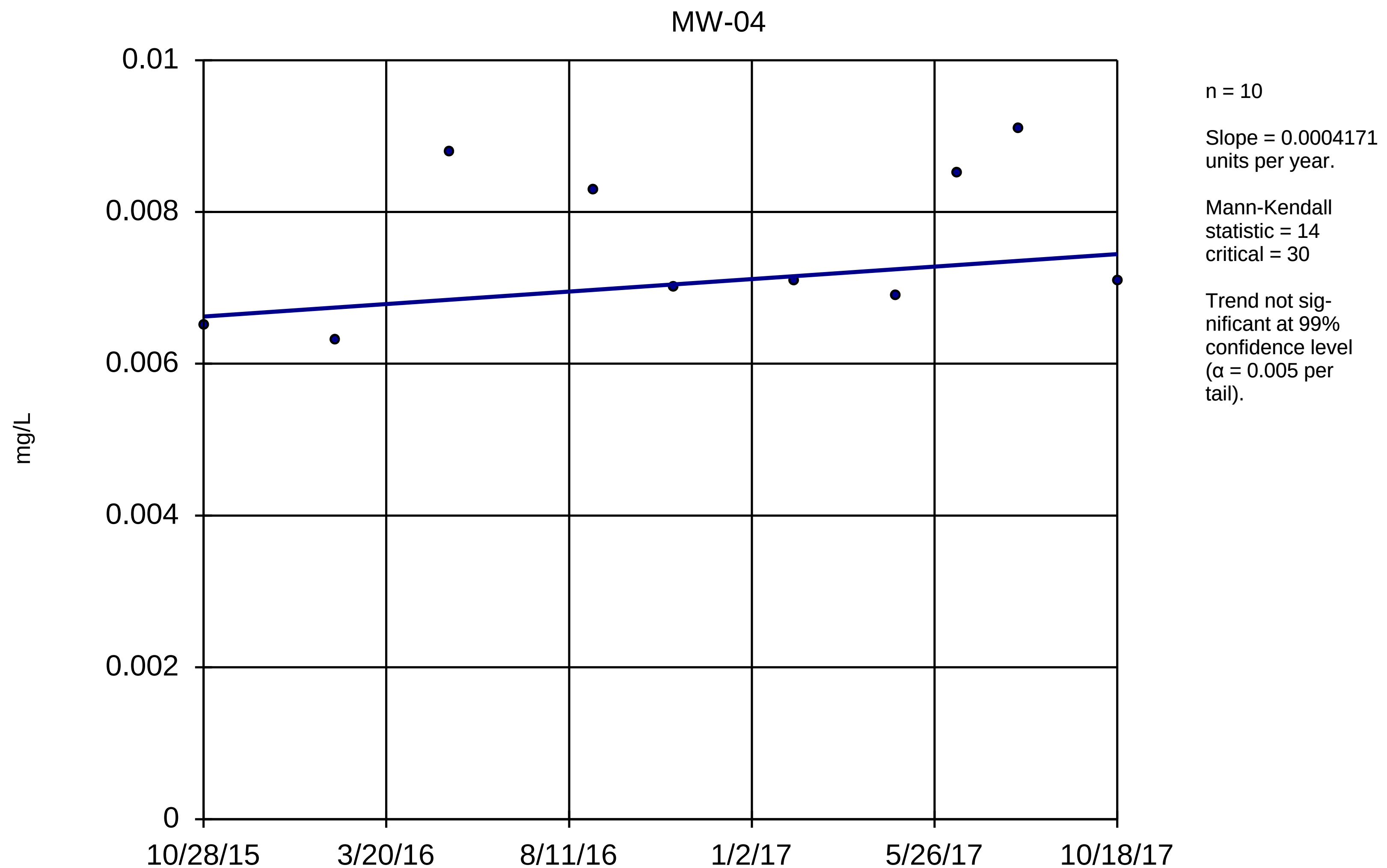



Constituent: Molybdenum, Total Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81616

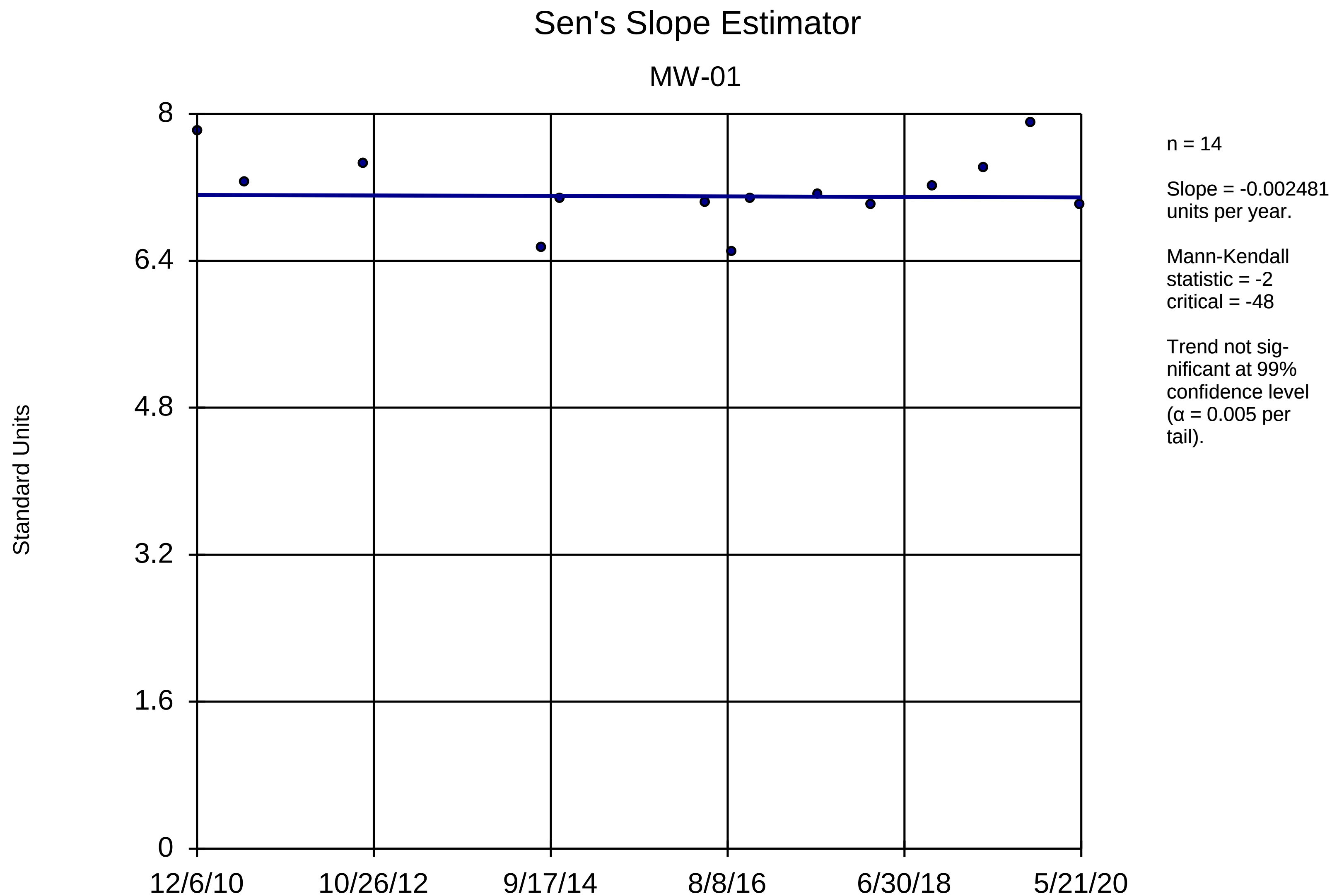
# Sen's Slope Estimator




Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

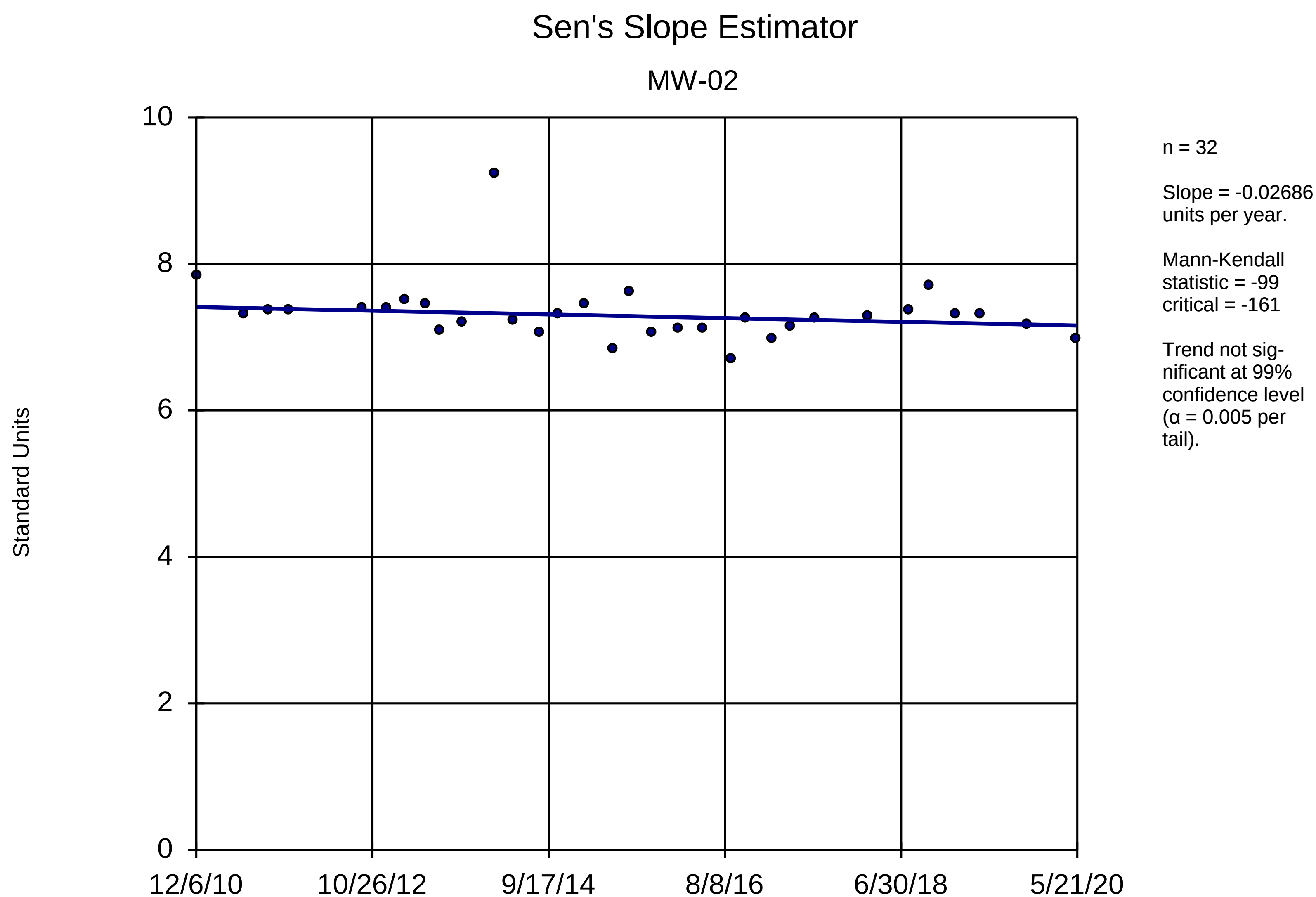
MWG13-15_81617




Constituent: pH, Field Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

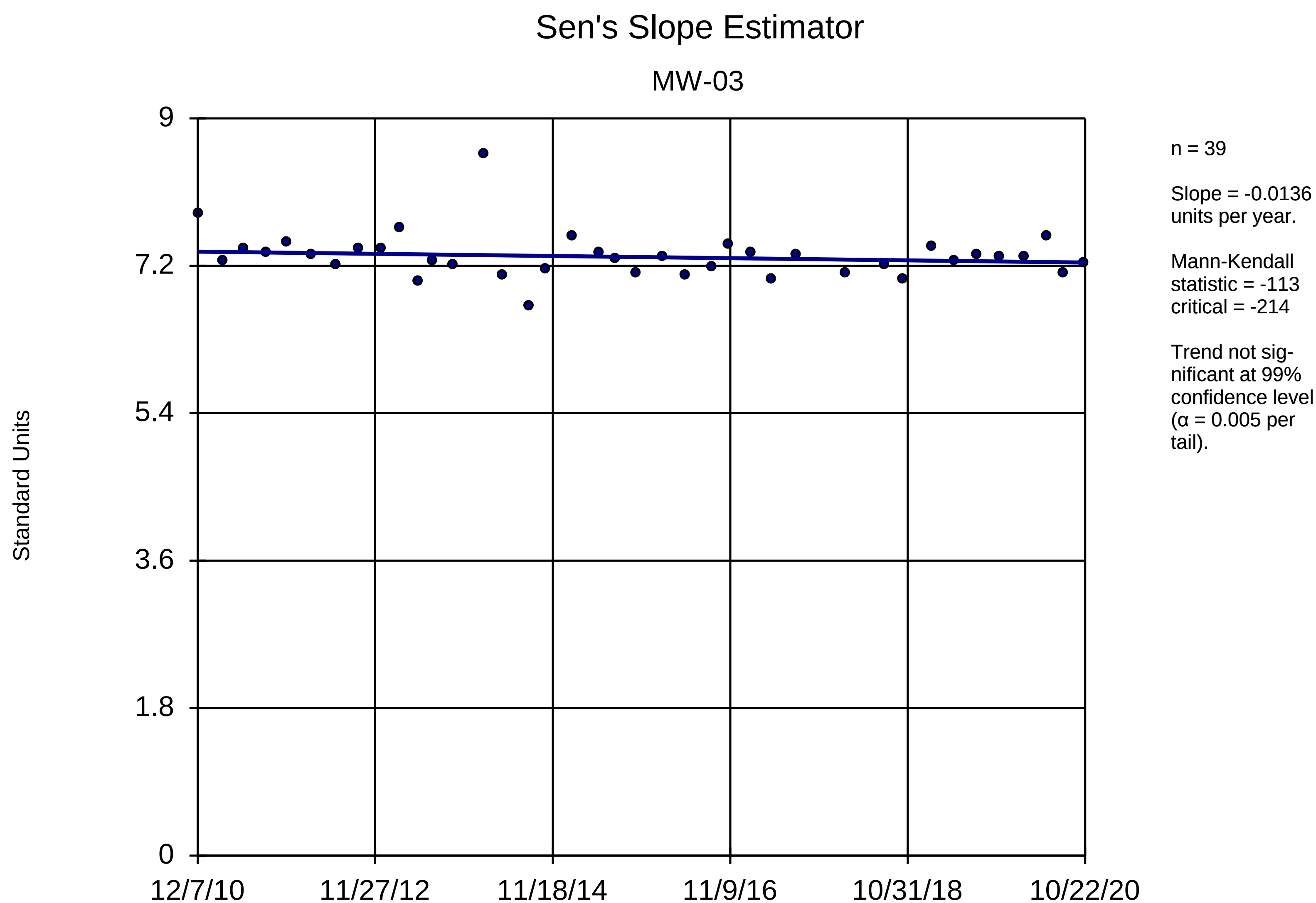
MWG13-15_81618




Constituent: pH, Field    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

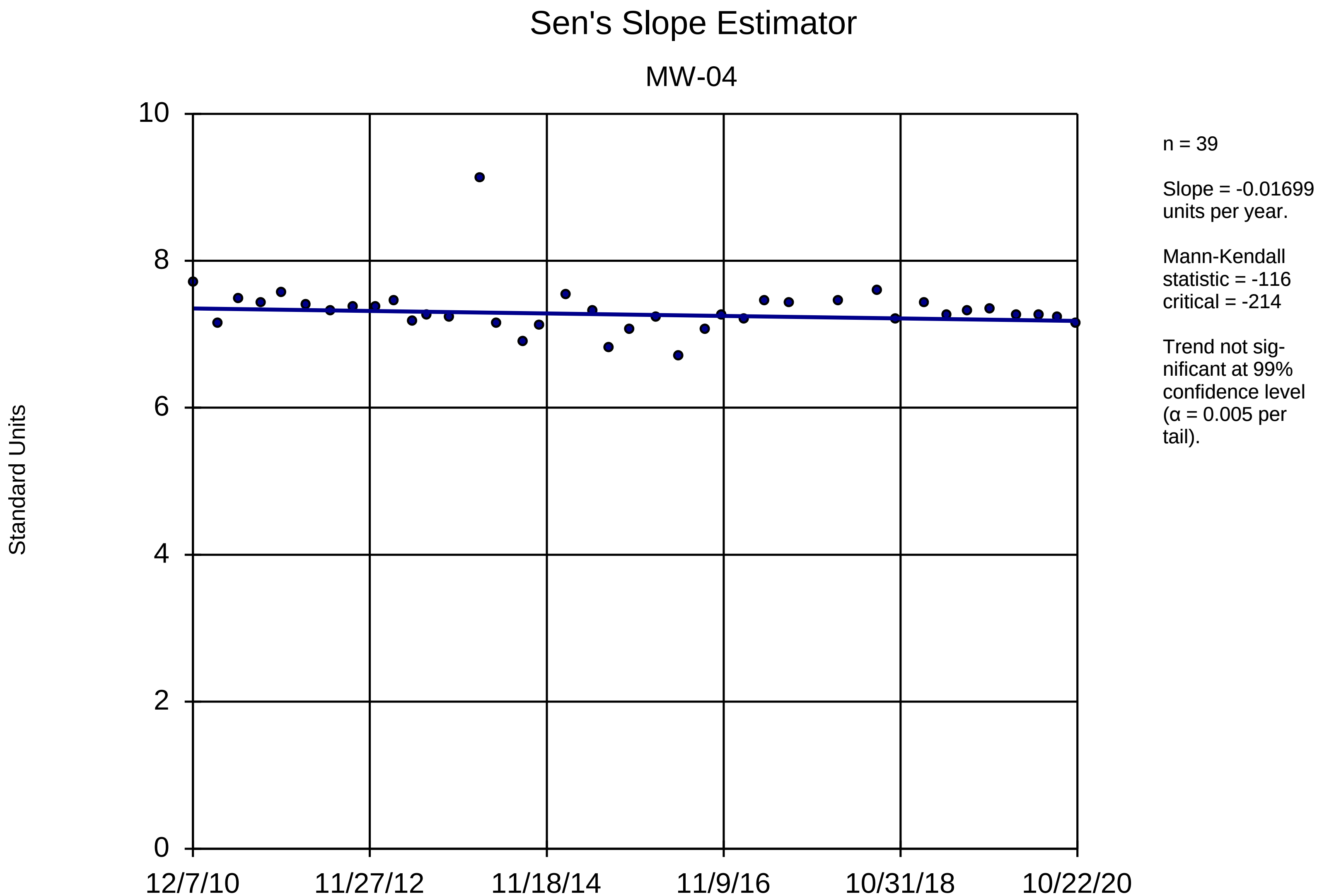
MWG13-15_81619




Constituent: pH, Field    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

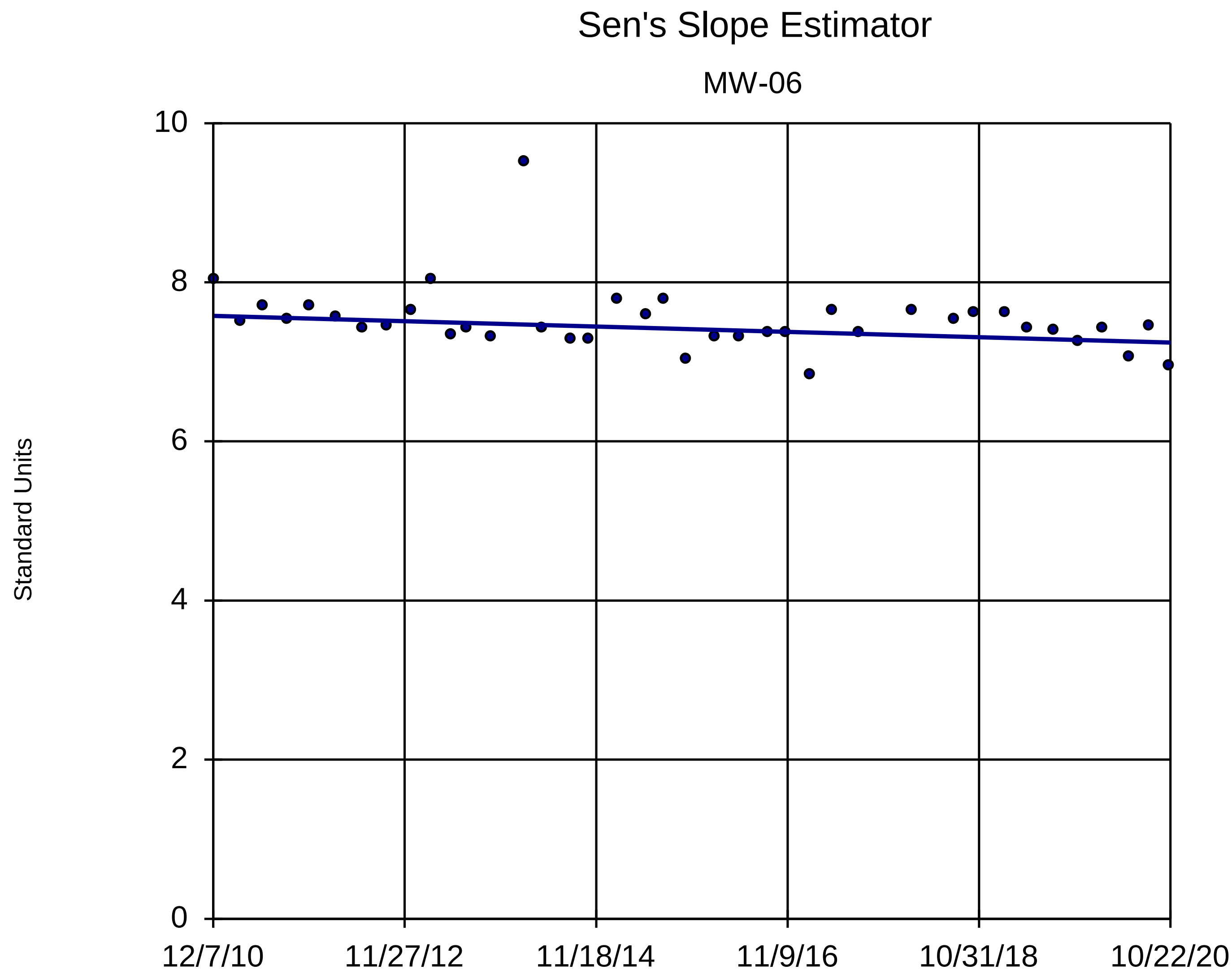
MWG13-15_81620




Constituent: pH, Field    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81621




n = 39

Slope = -0.03421 units per year.

Mann-Kendall statistic = -202 critical = -214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: pH, Field Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81622

Electronic Filing: Received, Clerk's Office 01/21/2022

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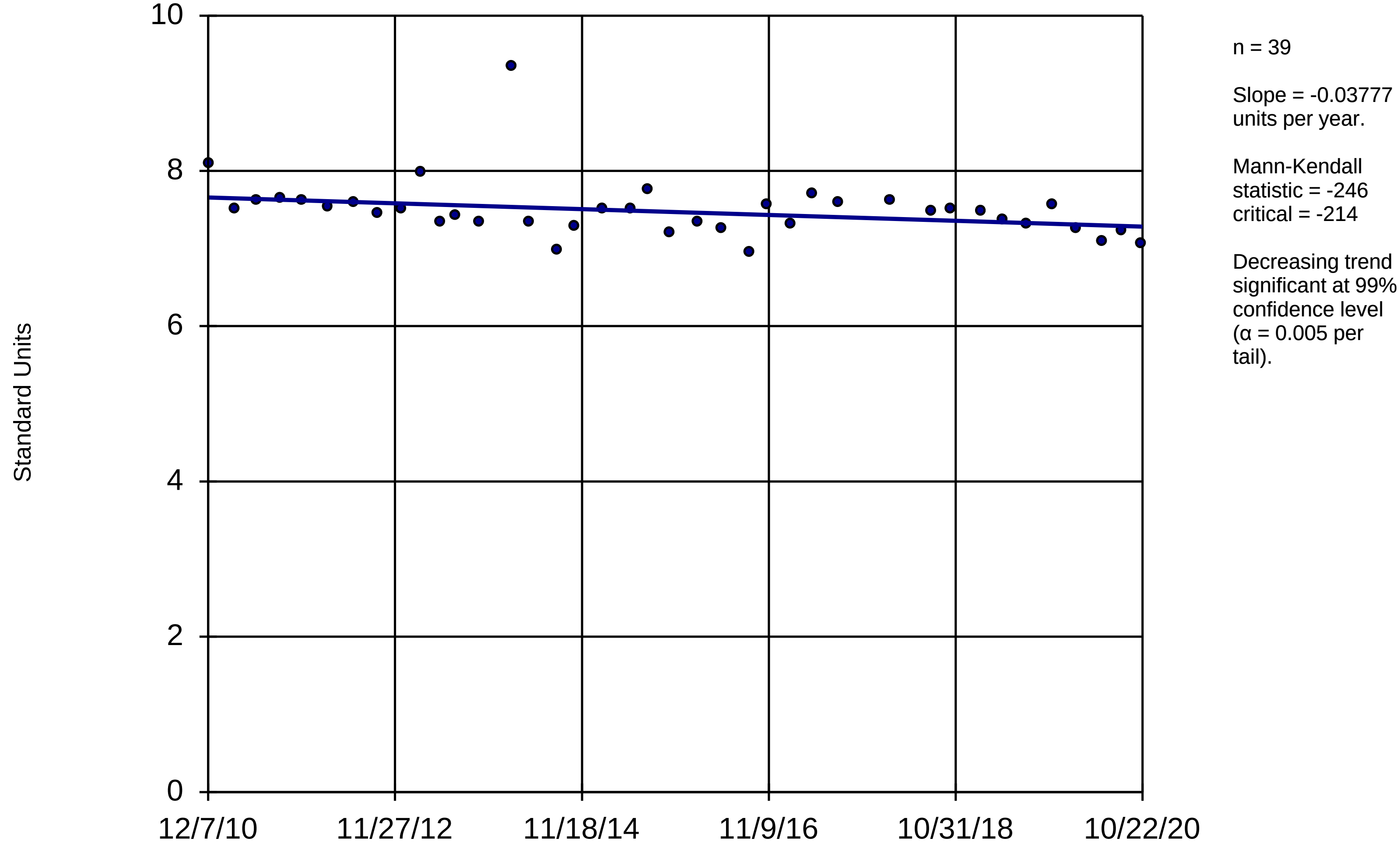
## Sen's Slope Estimator

MW-07




Constituent: pH, Field    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81623

Electronic Filing: Received, Clerk's Office 01/21/2022

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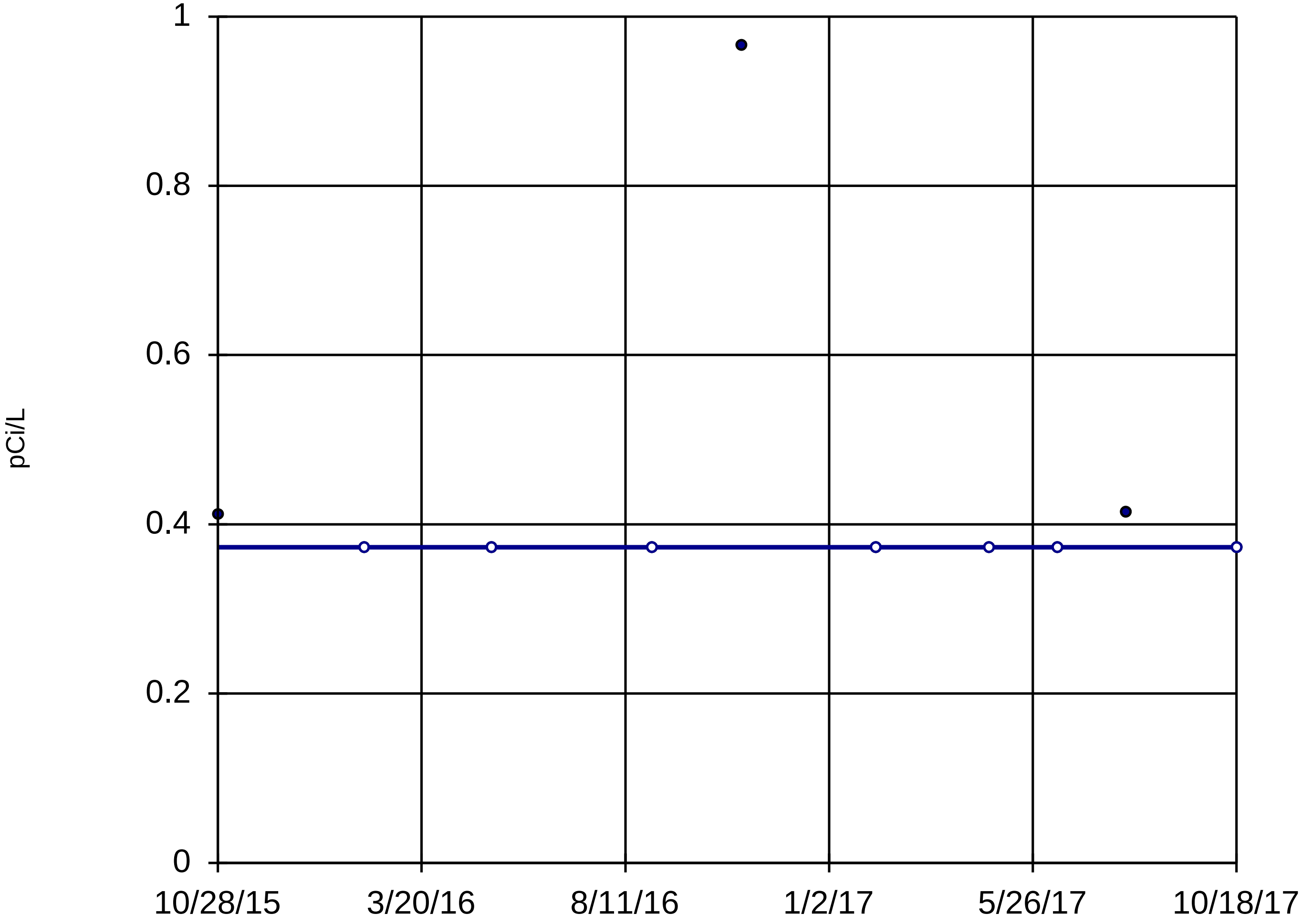
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = -2
critical = -30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Radium 226 + Radium 228, Combined     Analysis Run 4/2/2021 11:02 AM

Utility Site J     Client: Weaver Consultants Group     Data: Joliet 29 Sanitas Database

MWG13-15_81624

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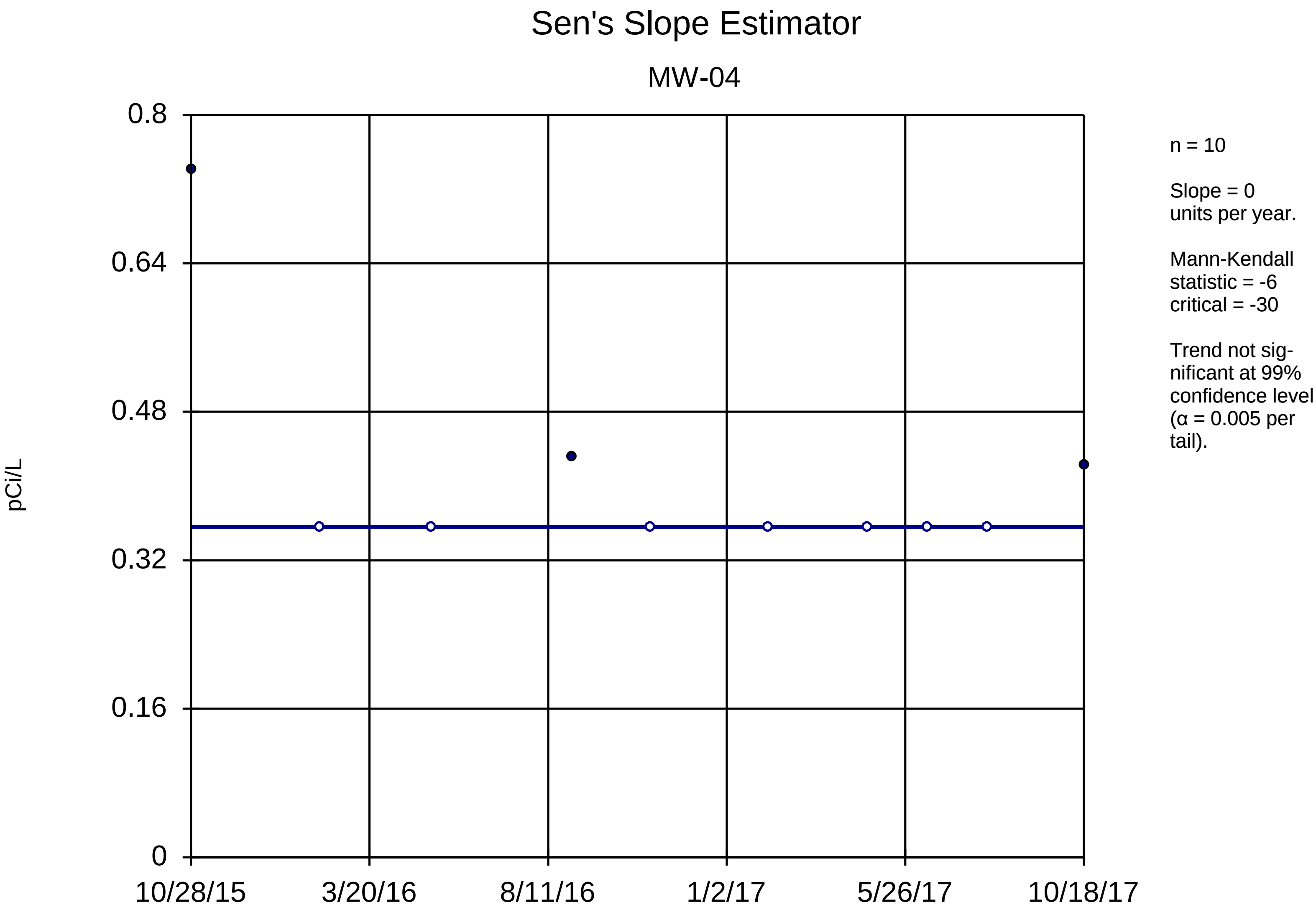
Hollow symbols indicate censored values.

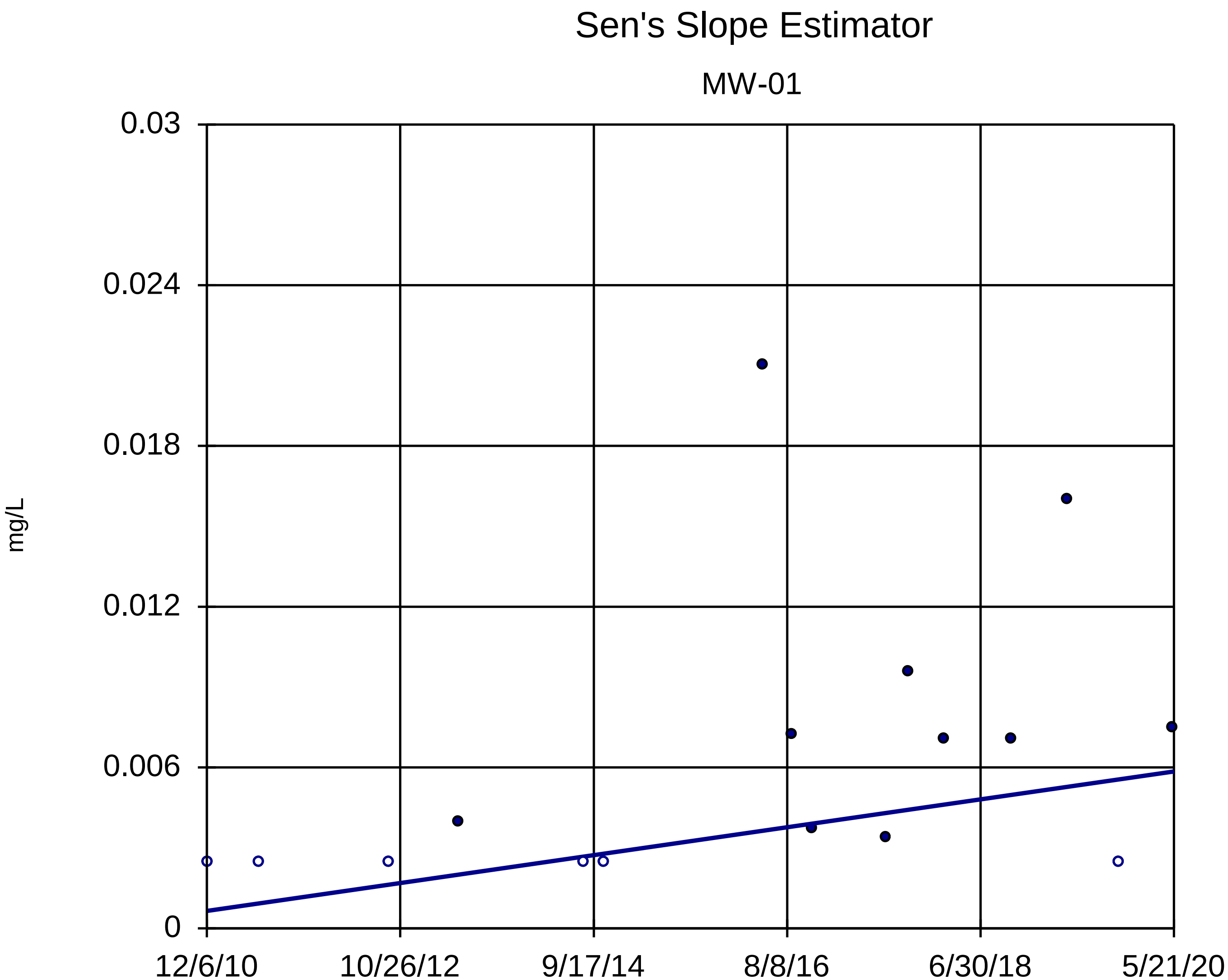



Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81625

Hollow symbols indicate censored values.




n = 16

Slope = 0.0005506 units per year.

Mann-Kendall statistic = 44 critical = 58

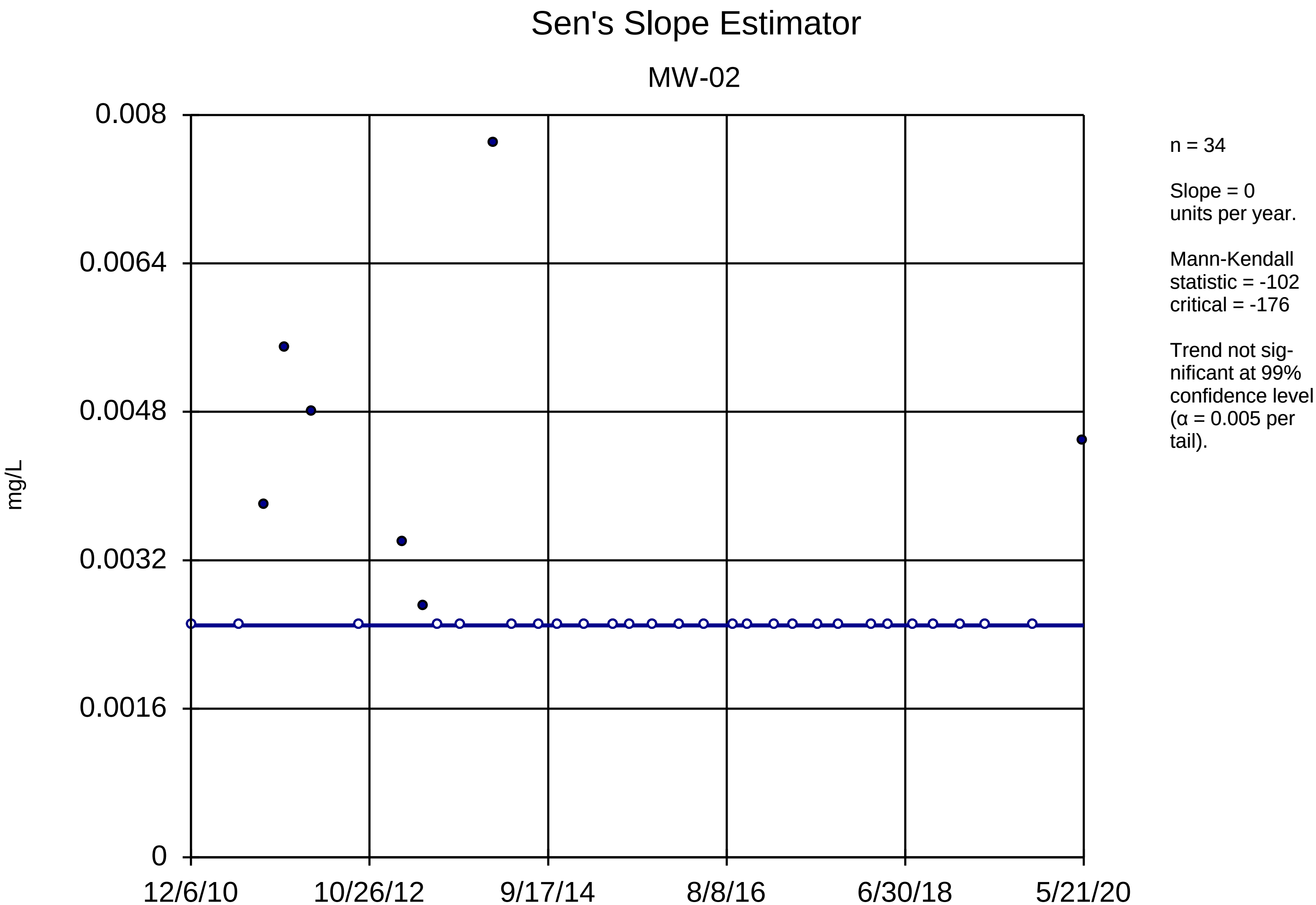
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81626

Hollow symbols indicate censored values.

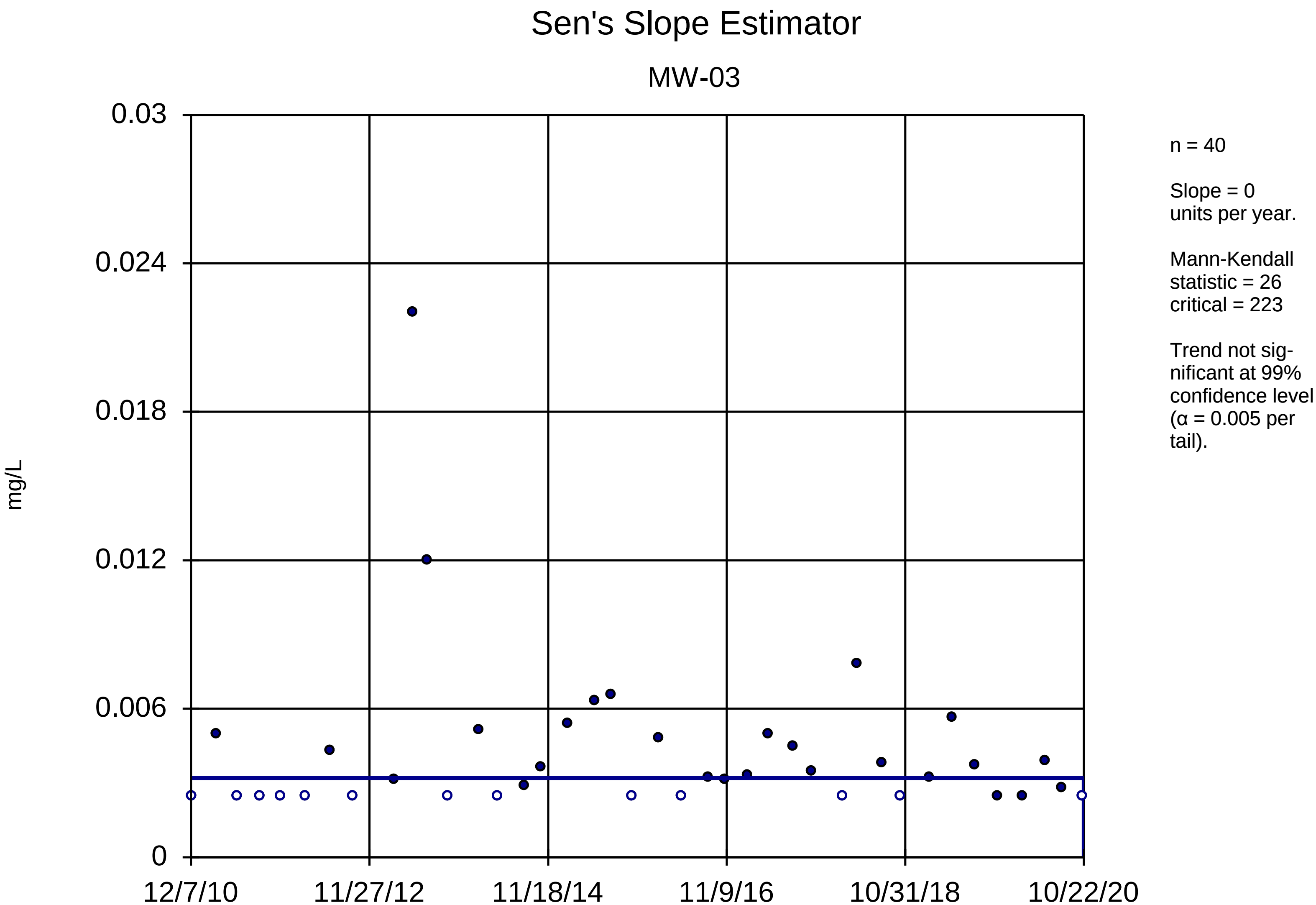



Constituent: Selenium, Dissolved  Analysis Run 4/2/2021 11:02 AM

Utility Site J  Client: Weaver Consultants Group  Data: Joliet 29 Sanitas Database

MWG13-15_81627

Hollow symbols indicate censored values.




Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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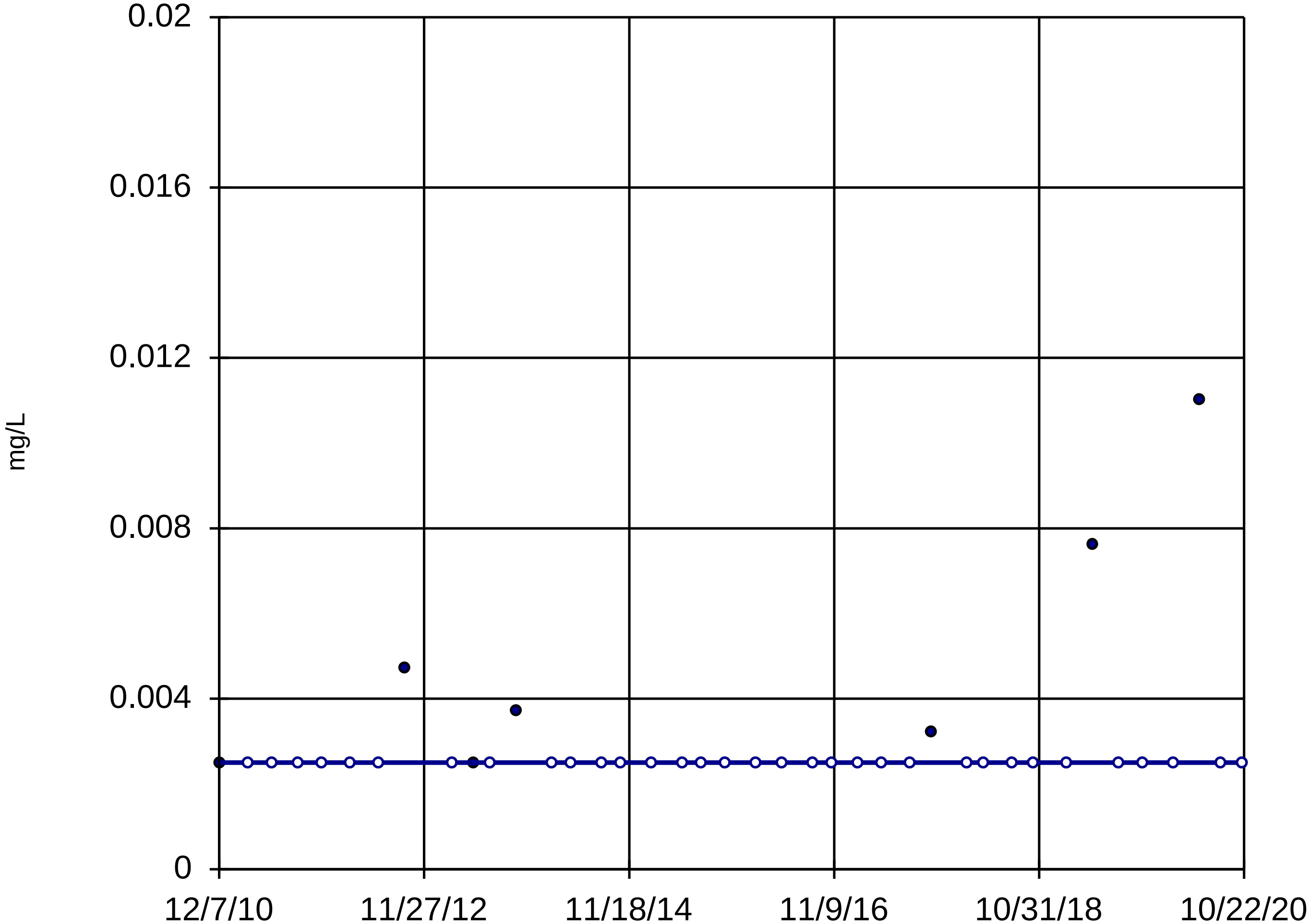
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 39
critical = 223

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81629

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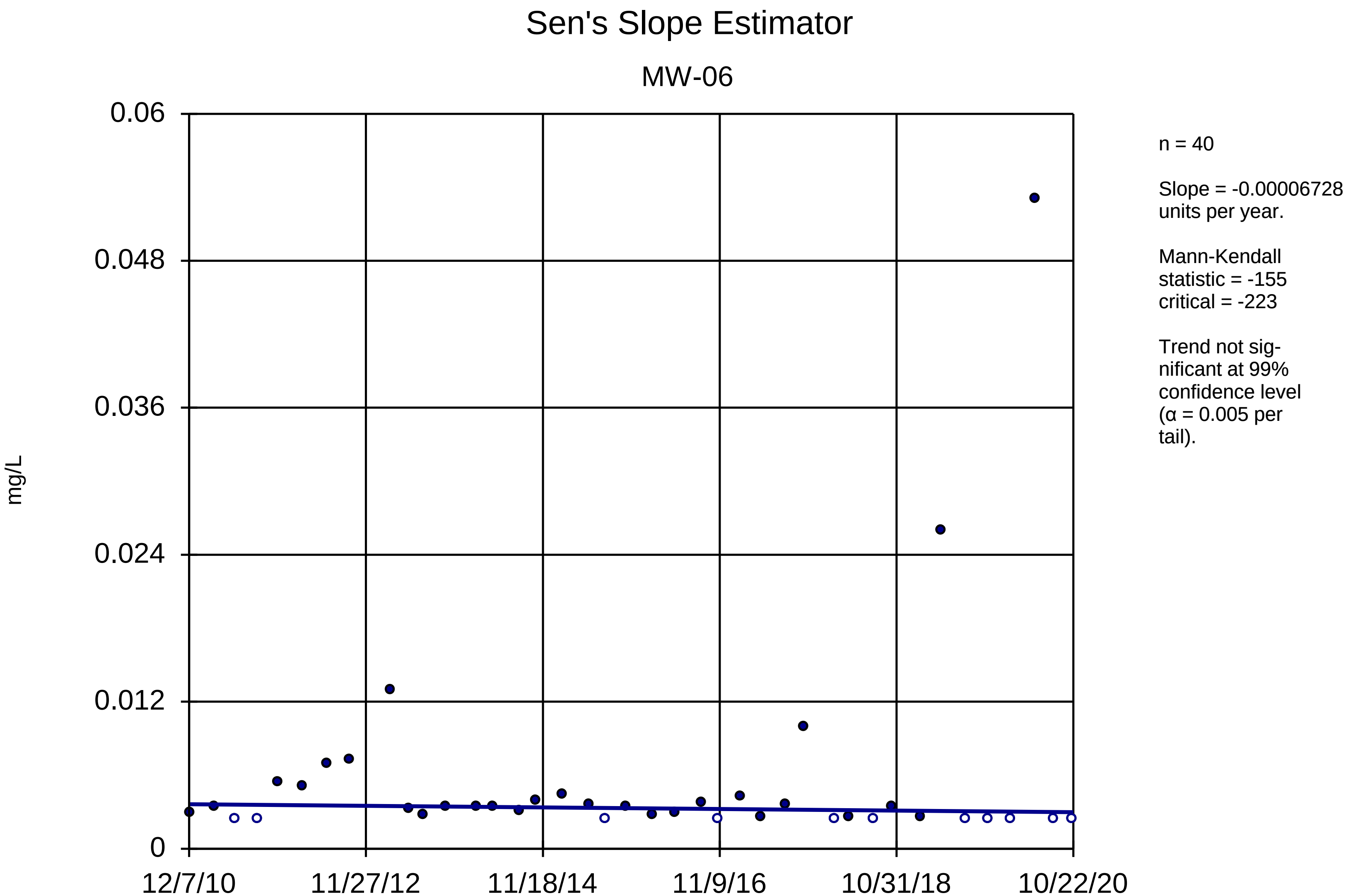
Hollow symbols indicate censored values.

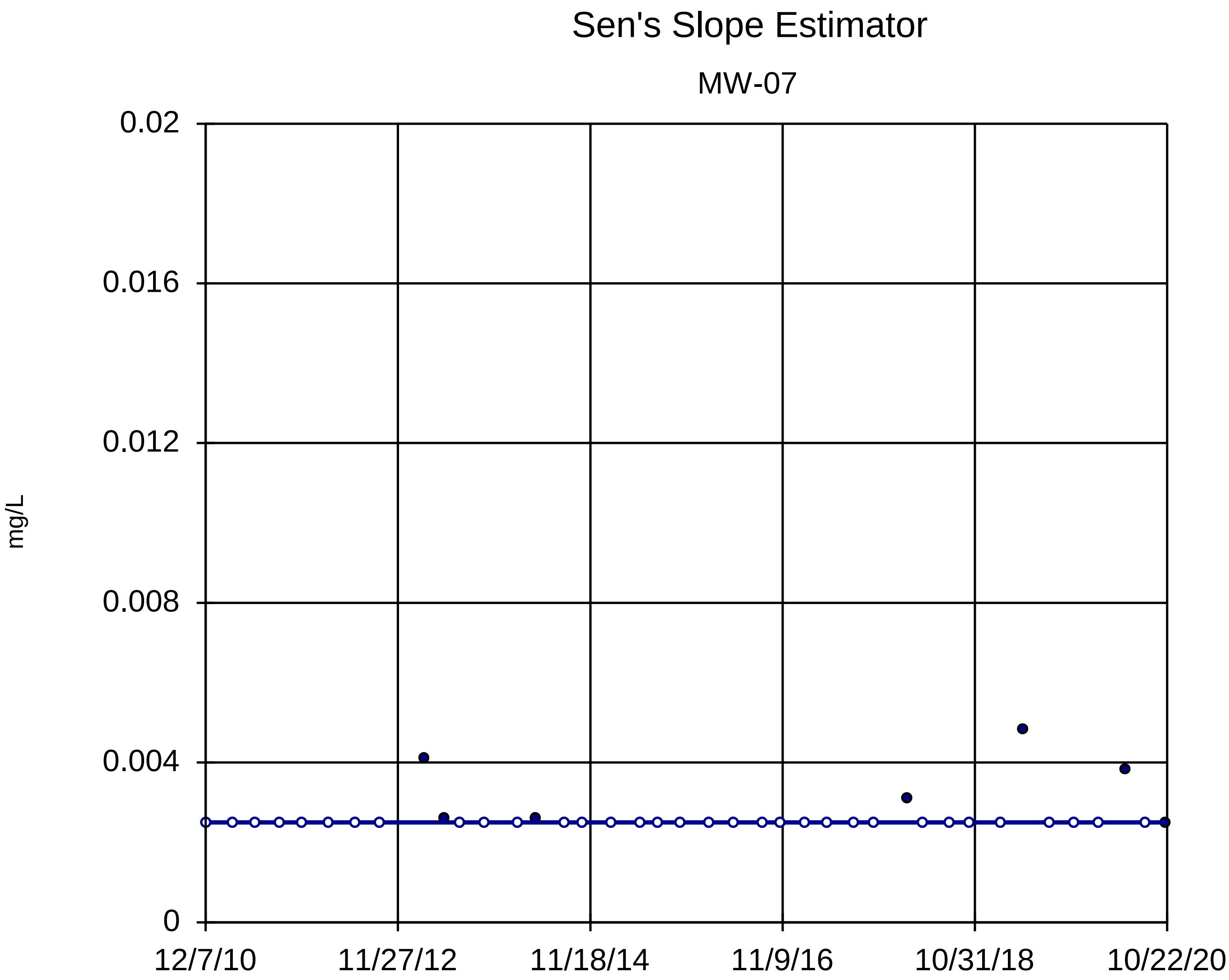



Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81630

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 26
critical = 223

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81631

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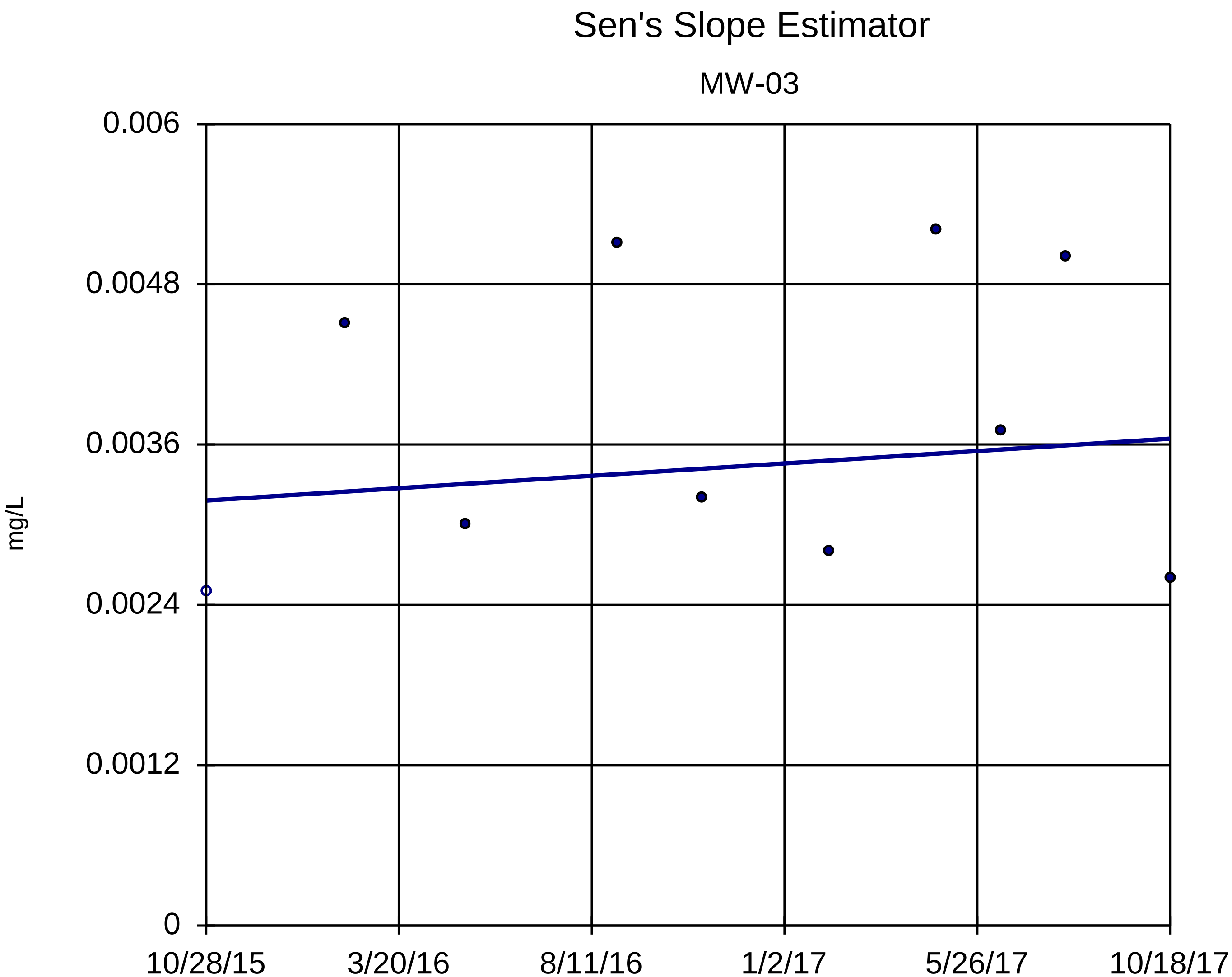
Hollow symbols indicate censored values.




n = 10

Slope = 0.0002345 units per year.

Mann-Kendall statistic = 5 critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Total    Analysis Run 4/2/2021 11:02 AM

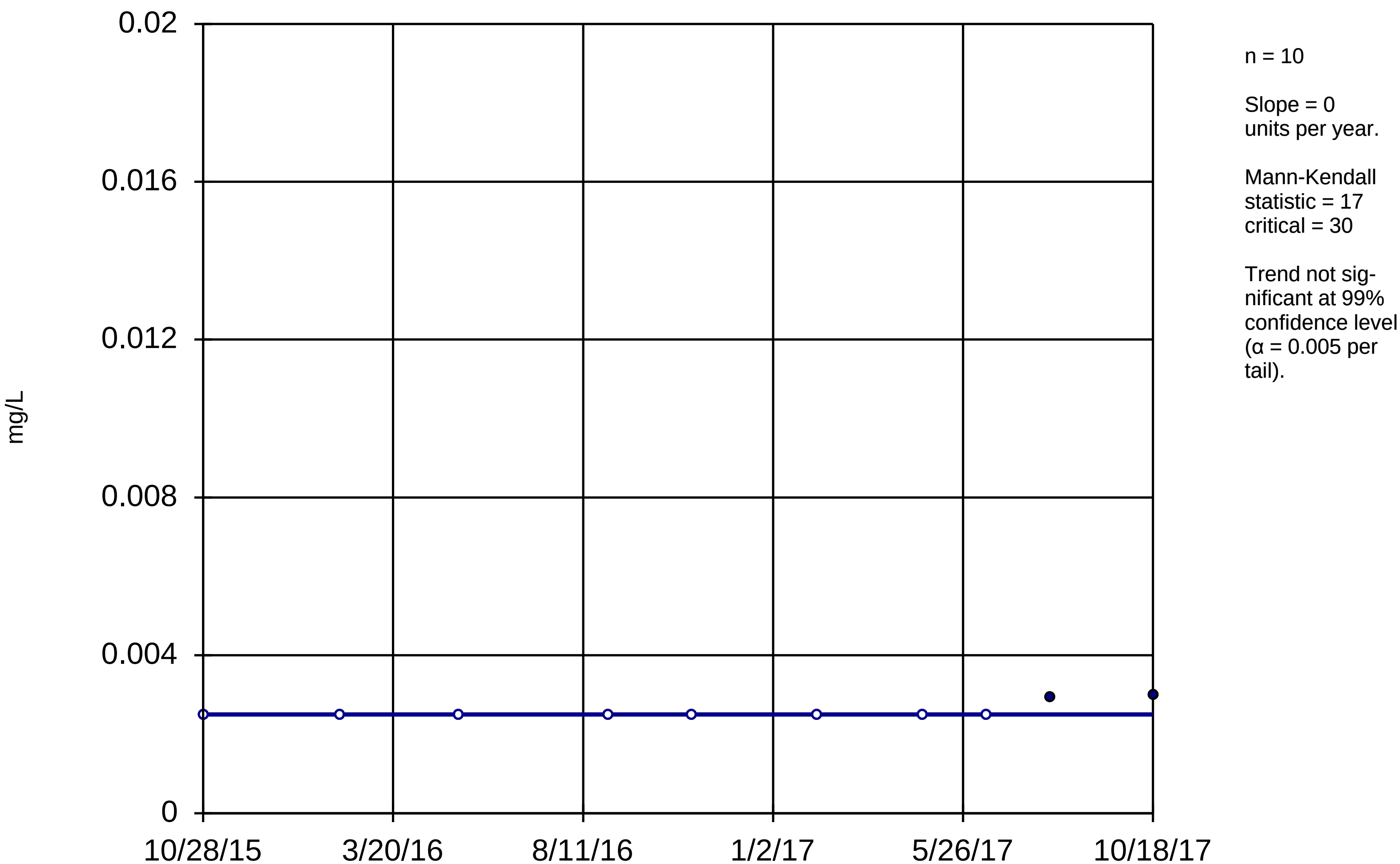
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81632

Hollow symbols indicate censored values.

## Sen's Slope Estimator

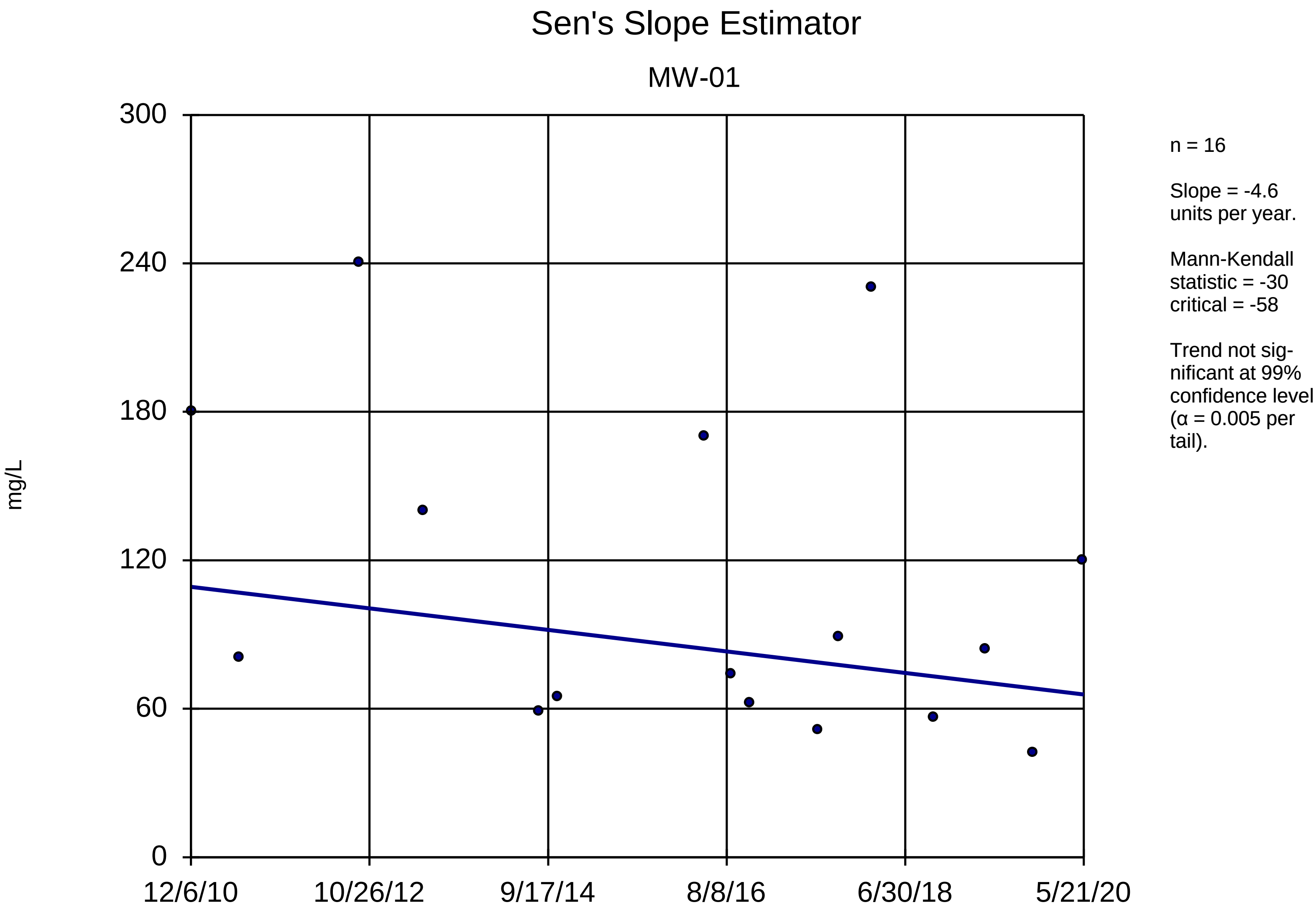
MW-04




Constituent: Selenium, Total    Analysis Run 4/2/2021 11:02 AM

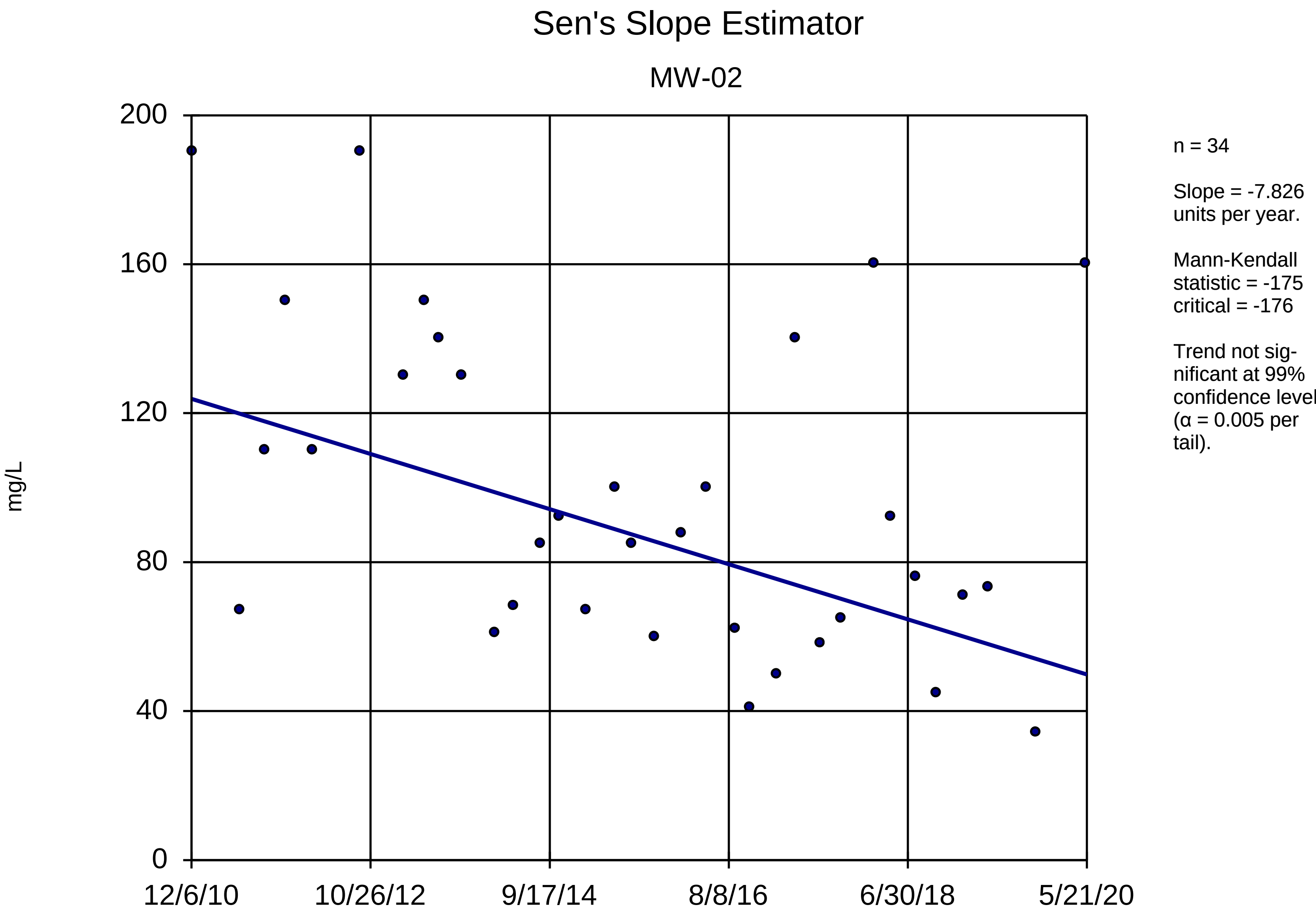
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81633




Constituent: Sulfate    Analysis Run 4/2/2021 11:02 AM

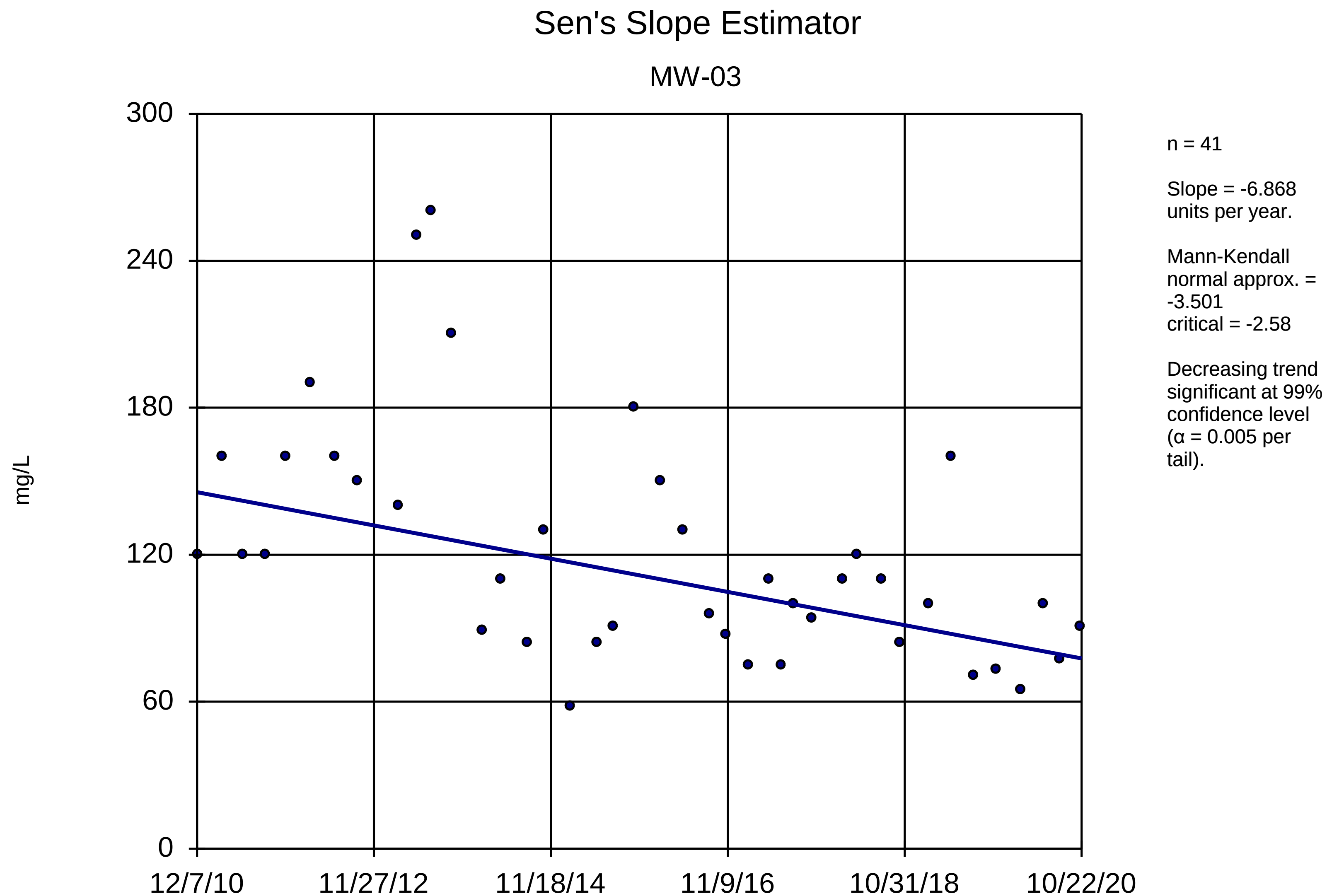
Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




Constituent: Sulfate    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

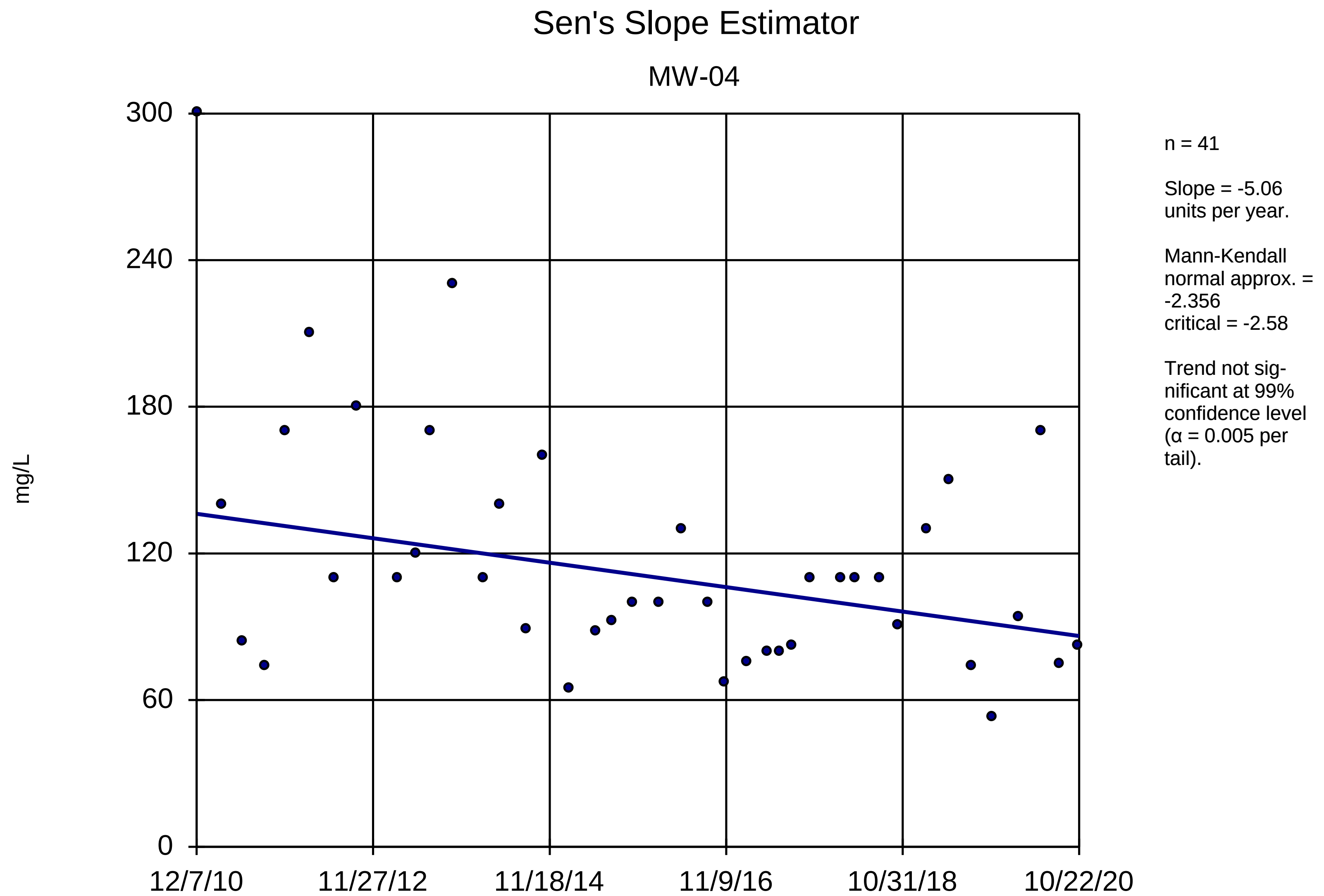
MWG13-15_81635




Constituent: Sulfate Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

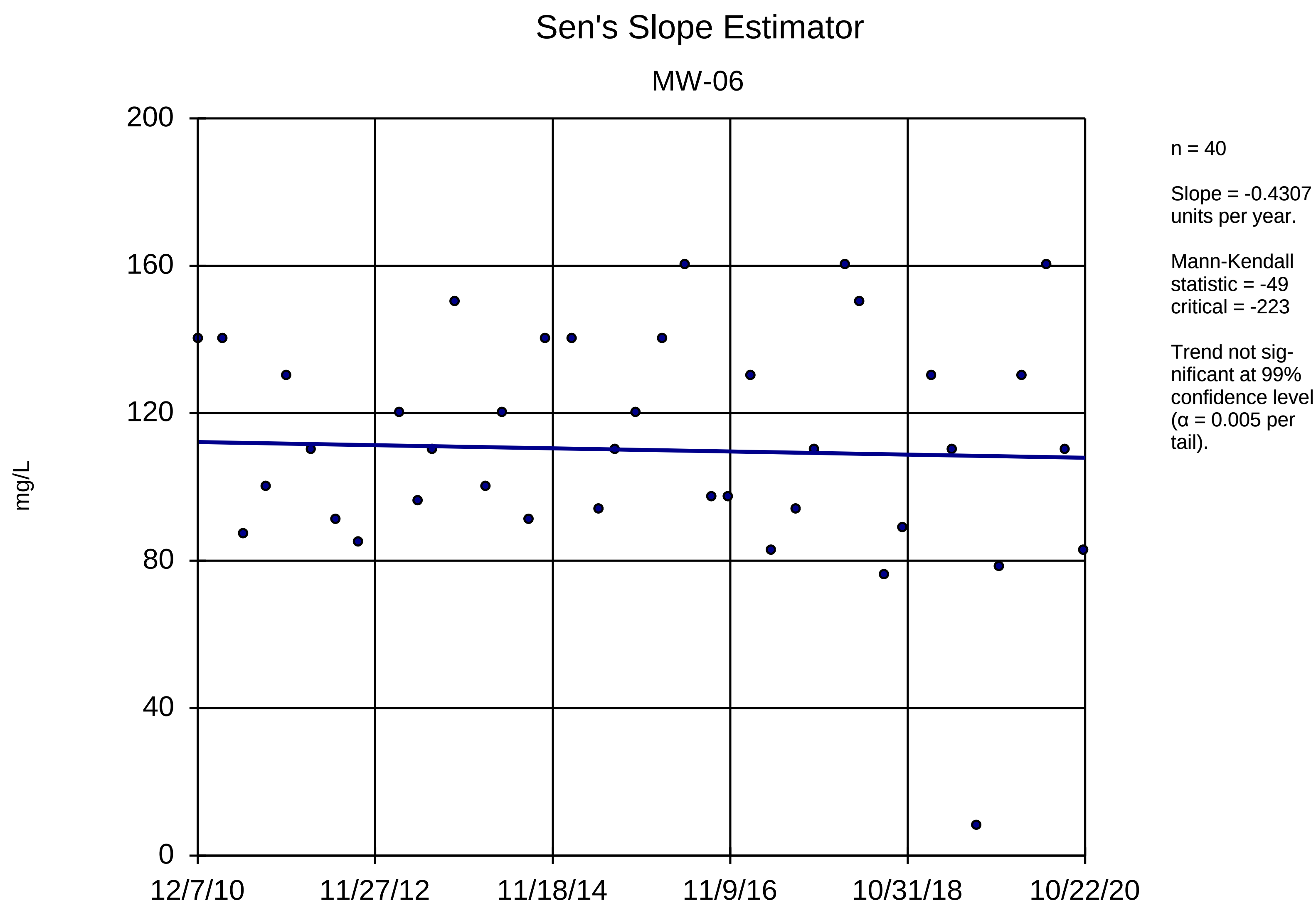
MWG13-15_81636




Constituent: Sulfate    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

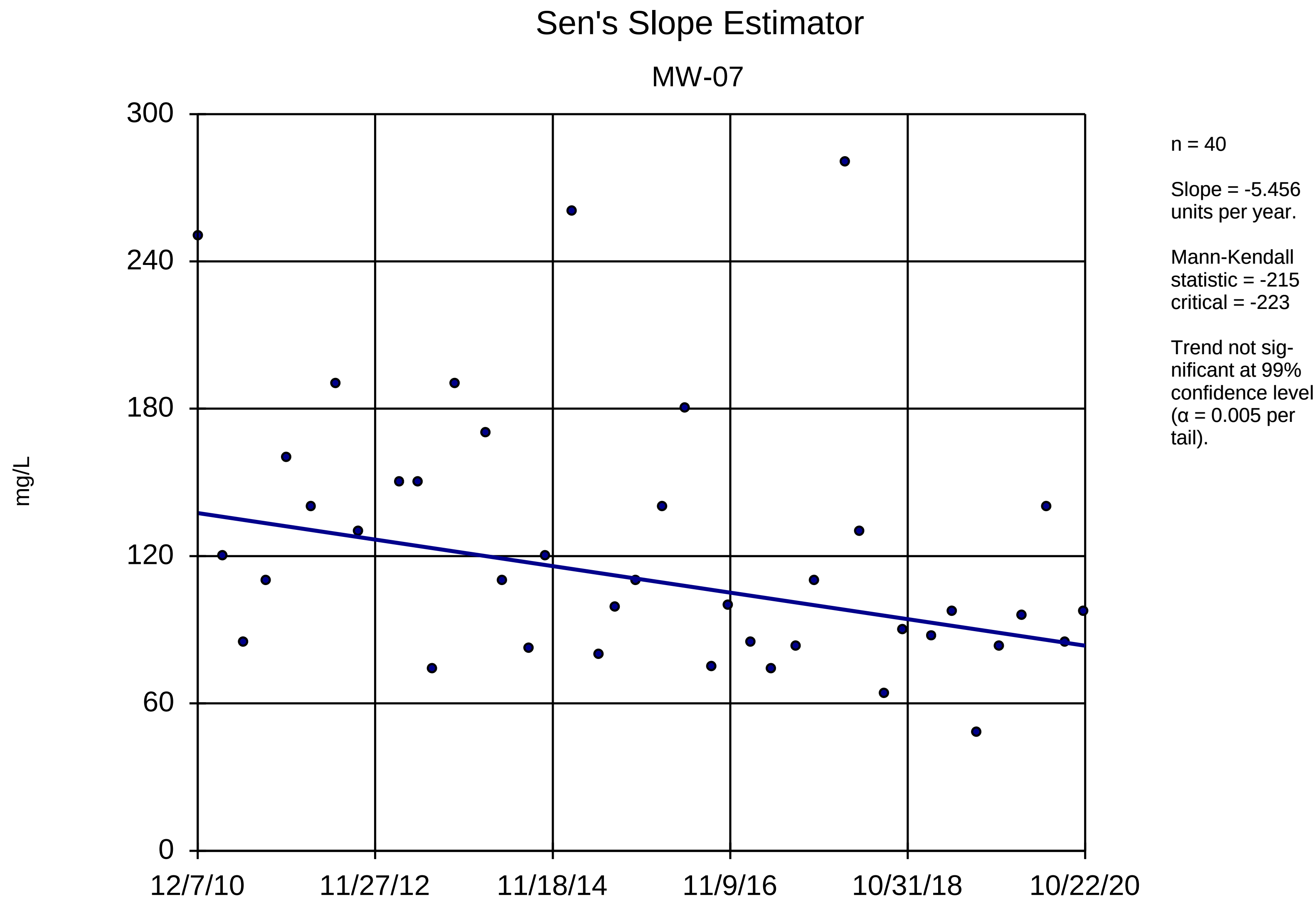
MWG13-15_81637




Constituent: Sulfate    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

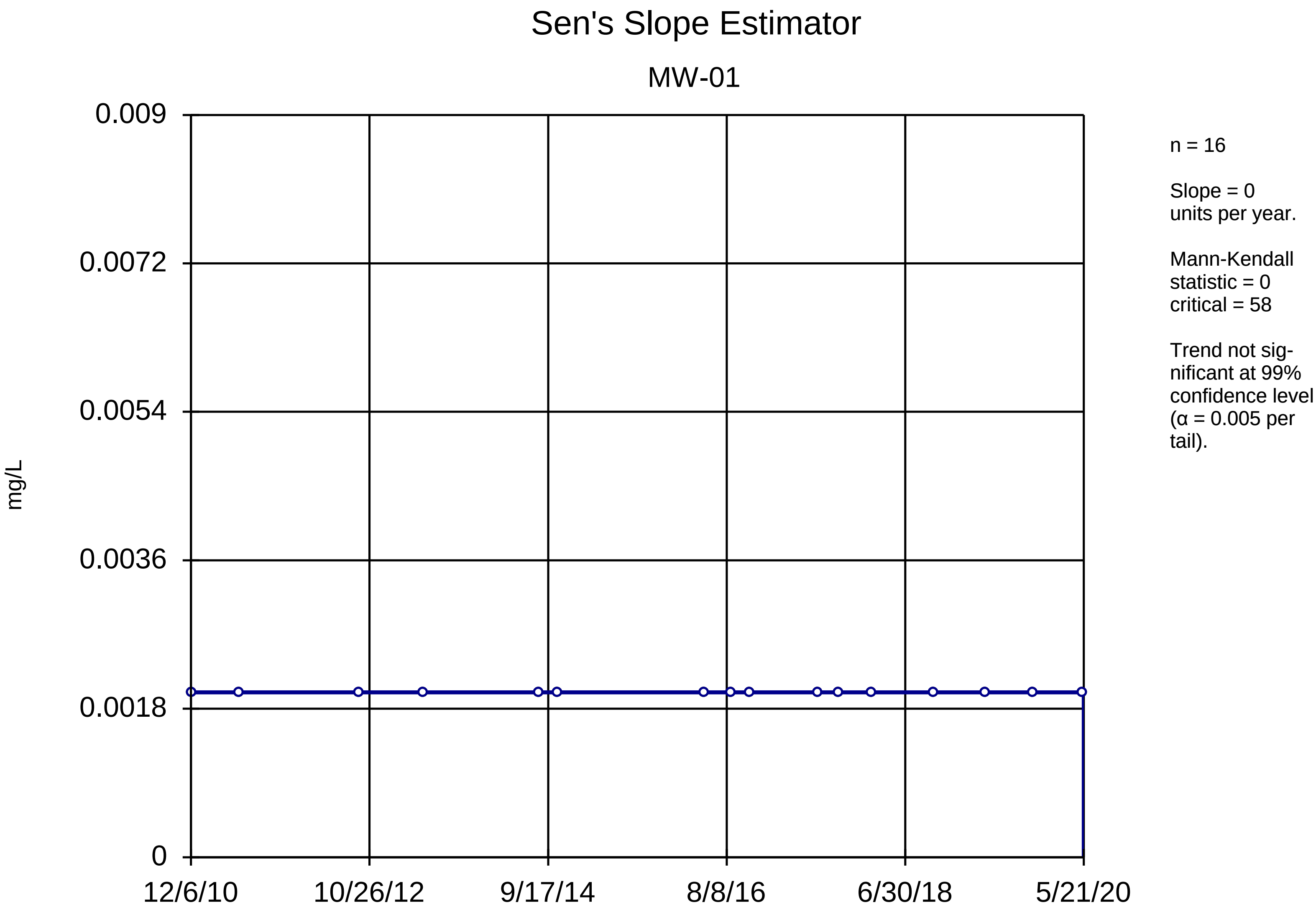
MWG13-15_81638




Constituent: Sulfate Analysis Run 4/2/2021 11:02 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

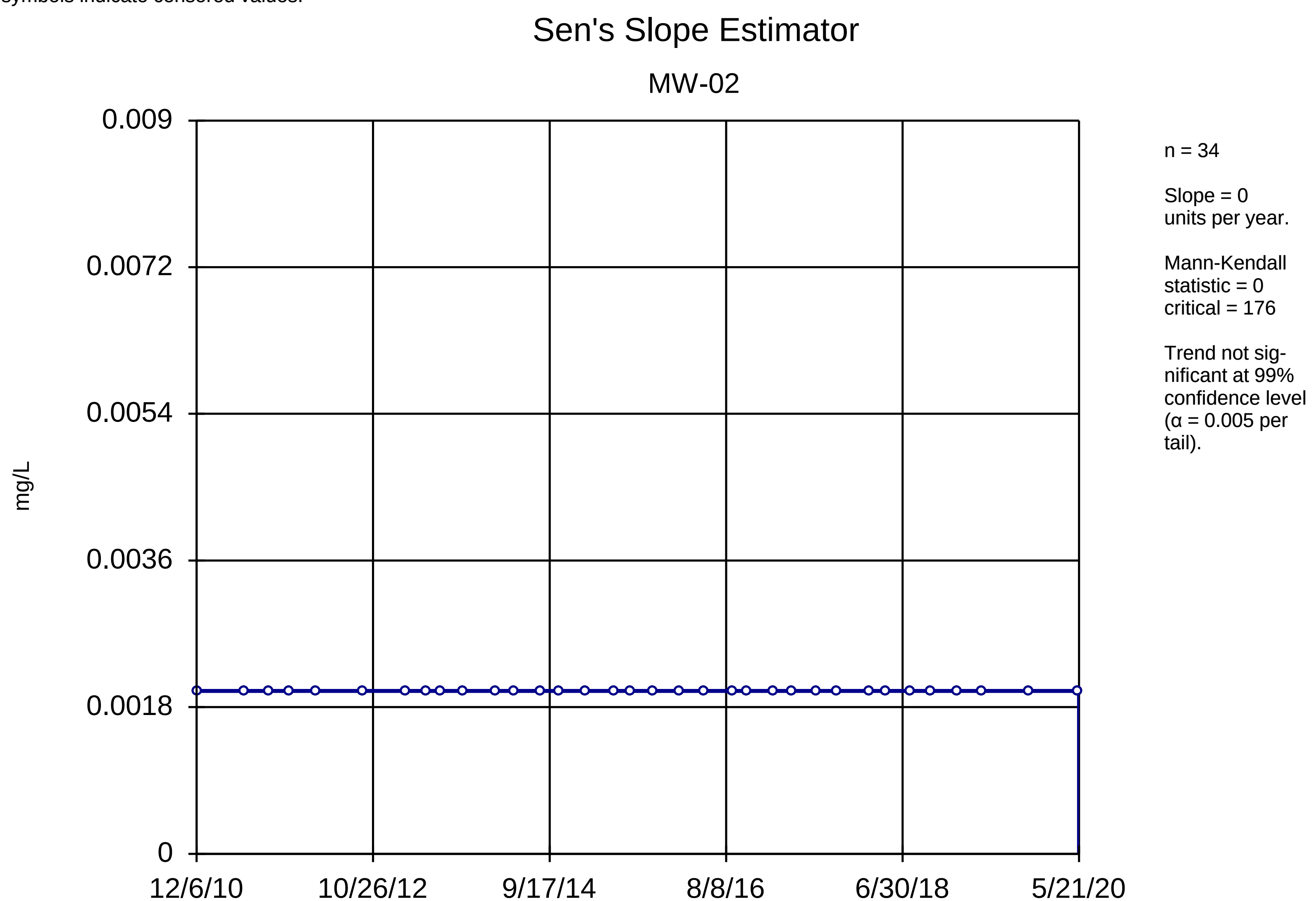
Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

Hollow symbols indicate censored values.

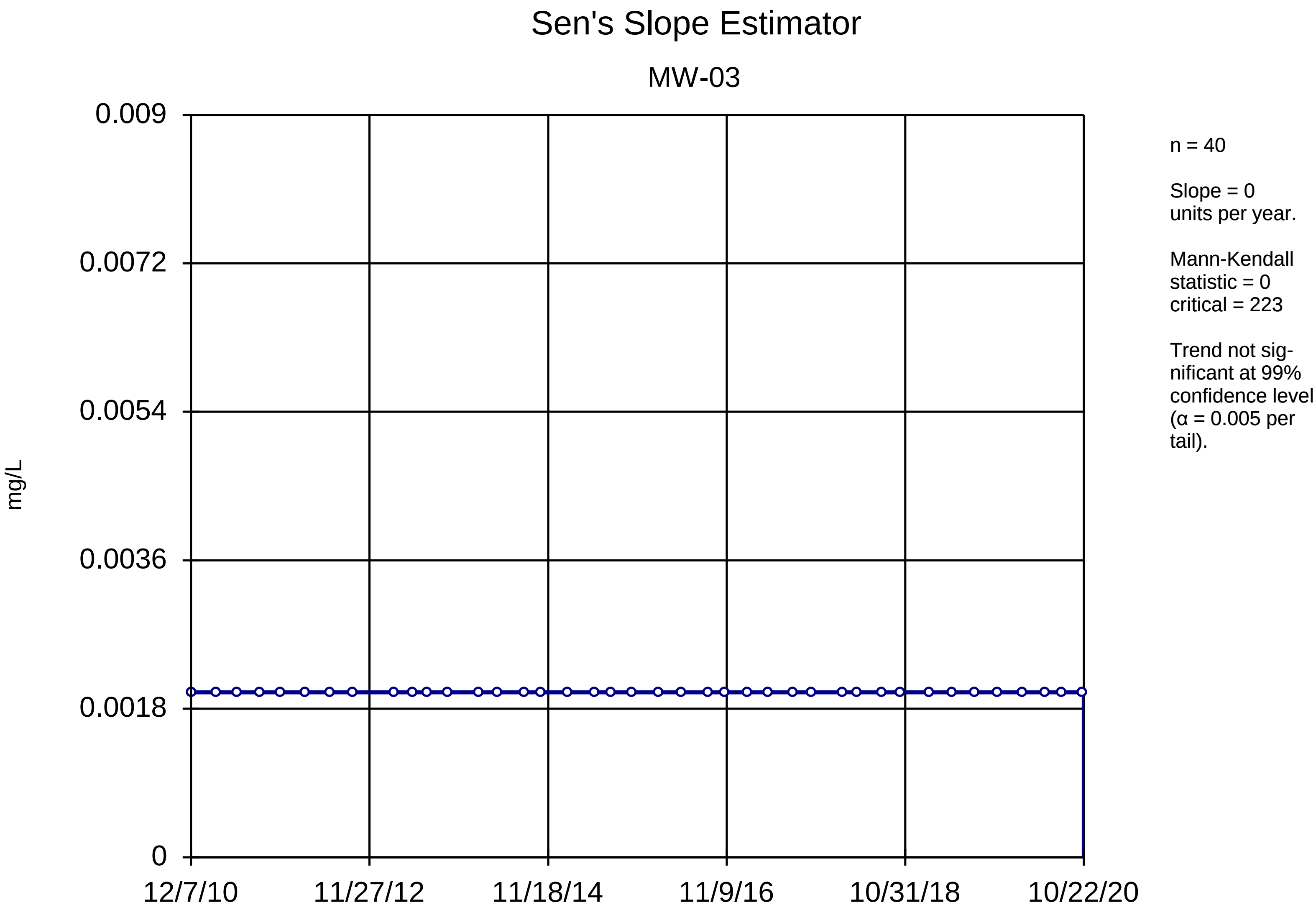



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:02 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81641

Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

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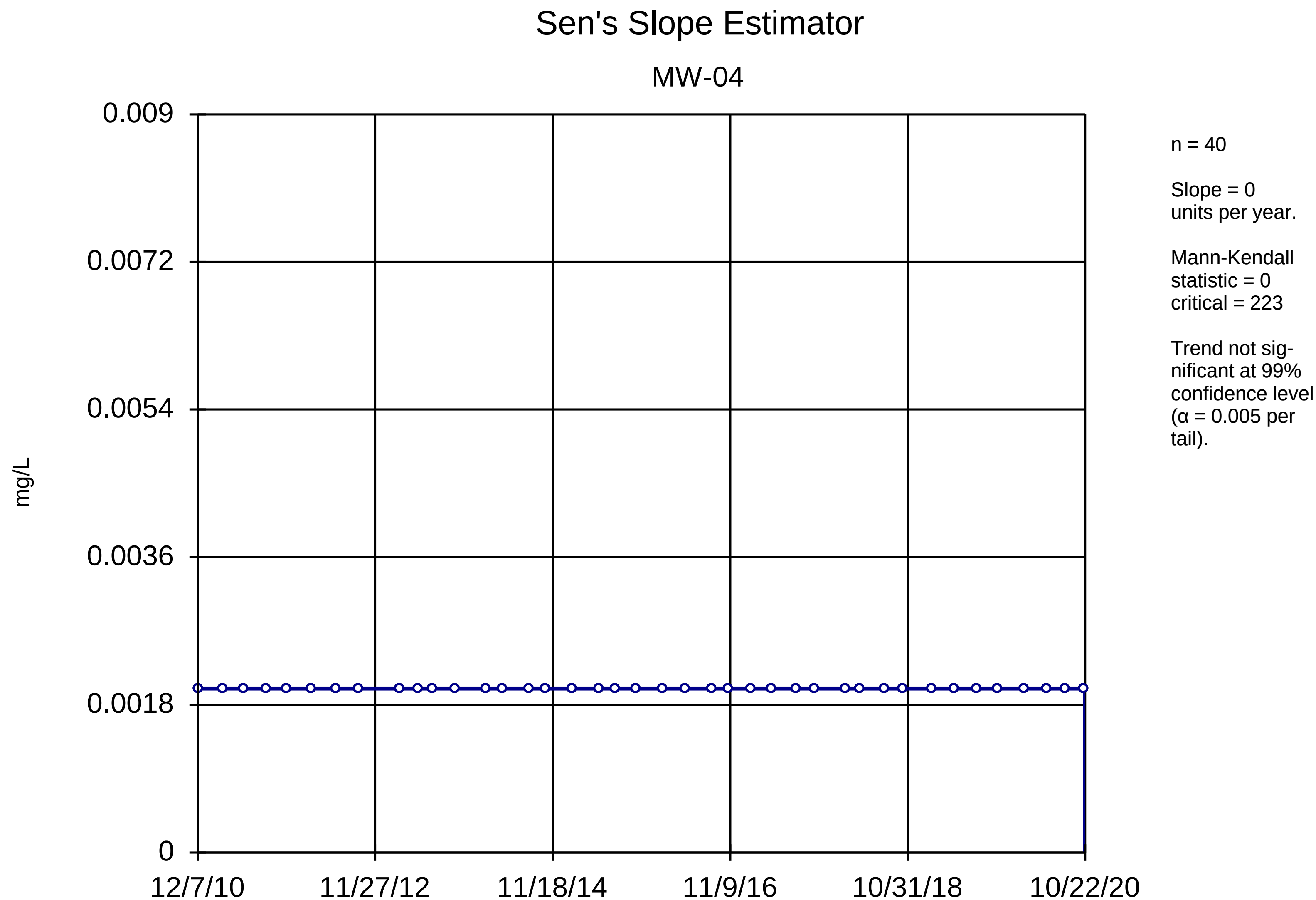
Hollow symbols indicate censored values.

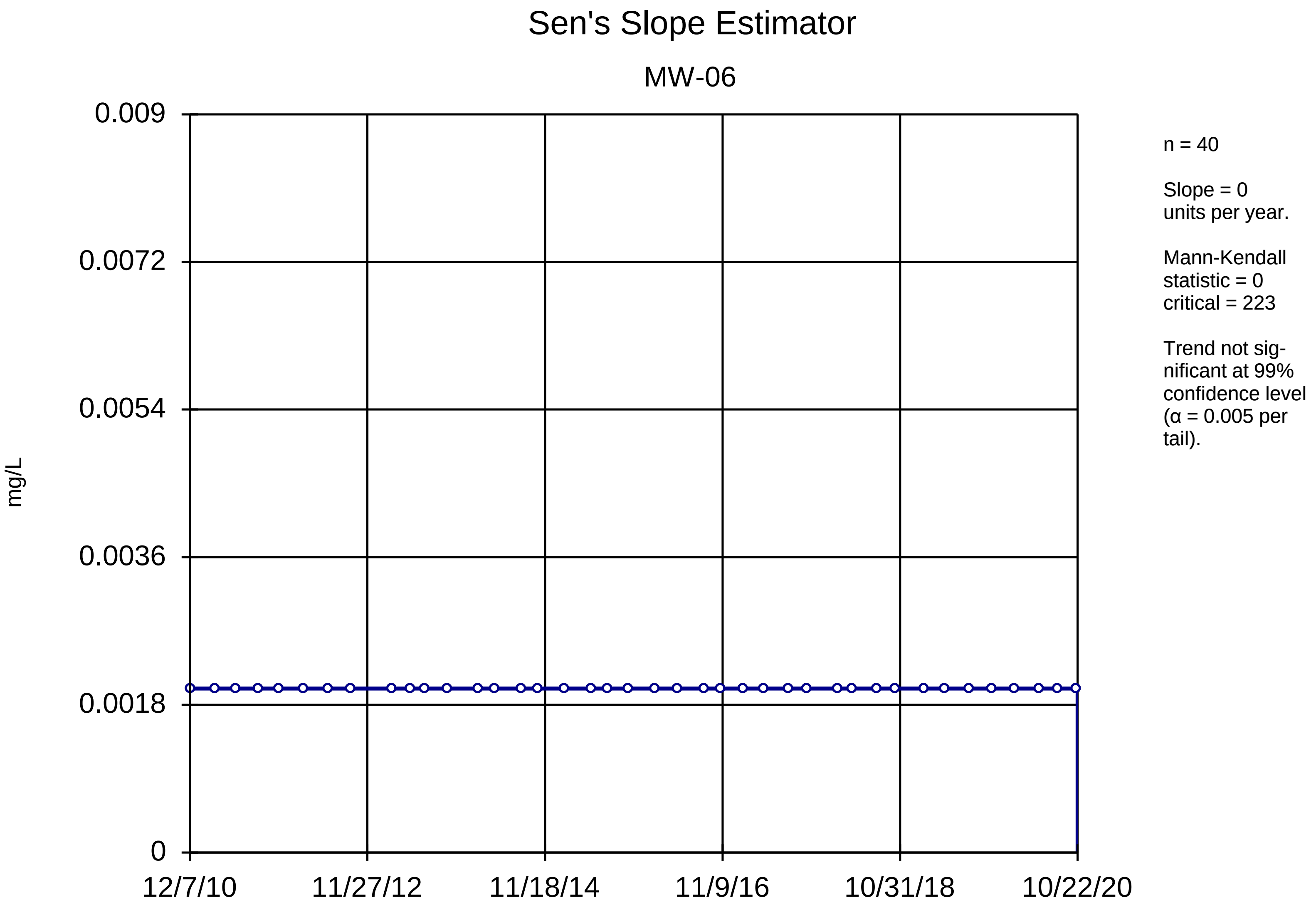



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81643

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

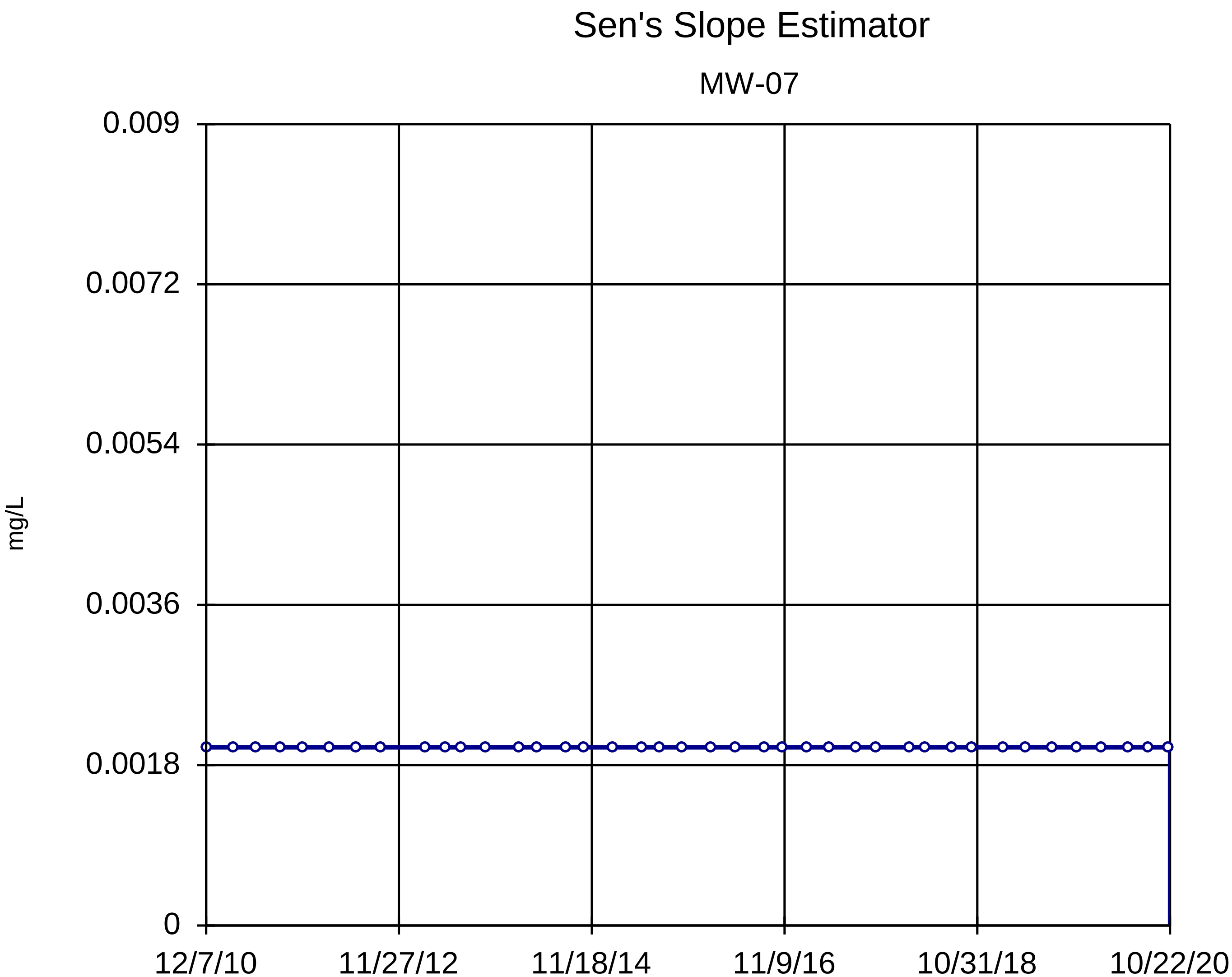



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81644

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 40

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 223

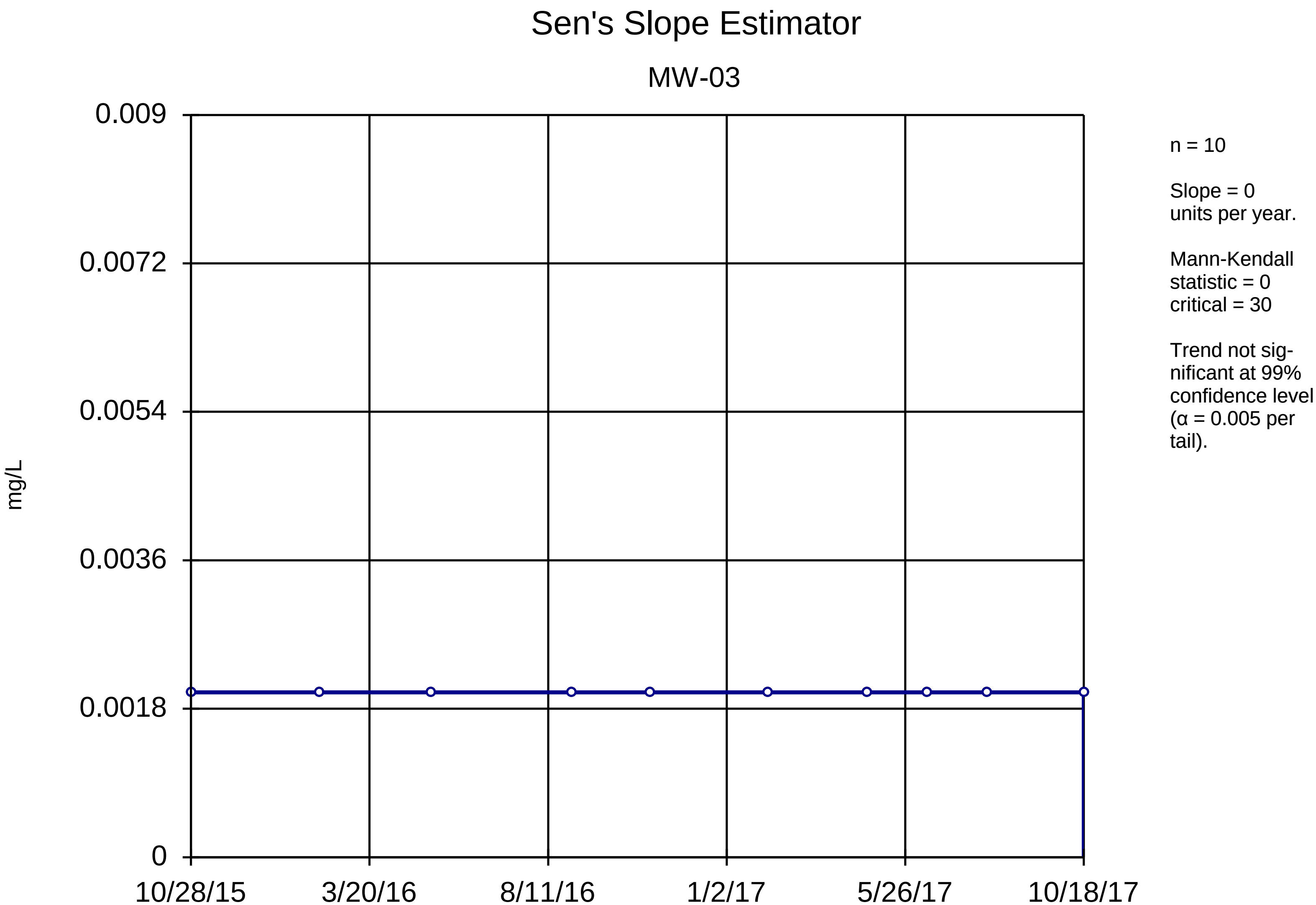
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81645

Hollow symbols indicate censored values.

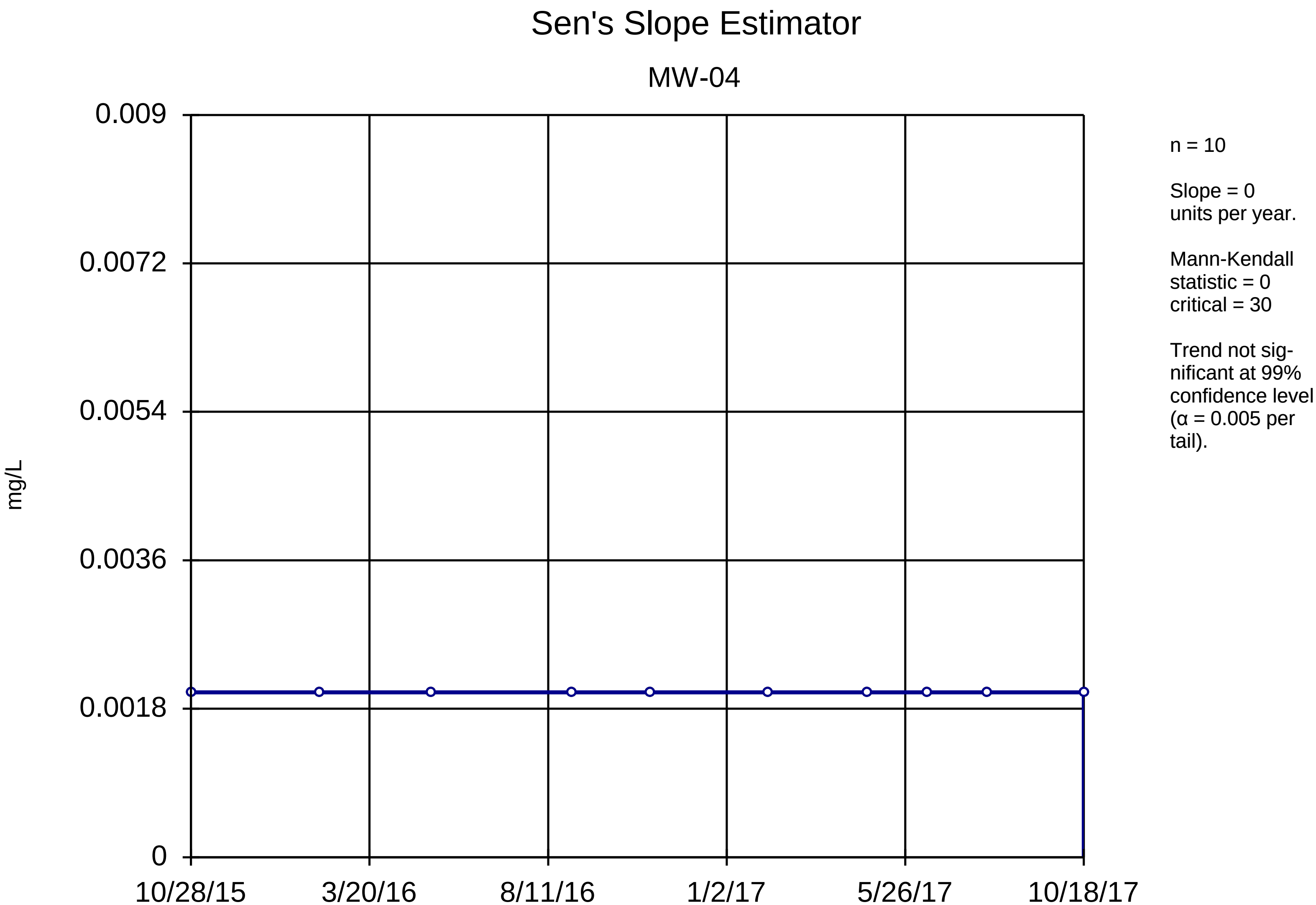



Constituent: Thallium, Total    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

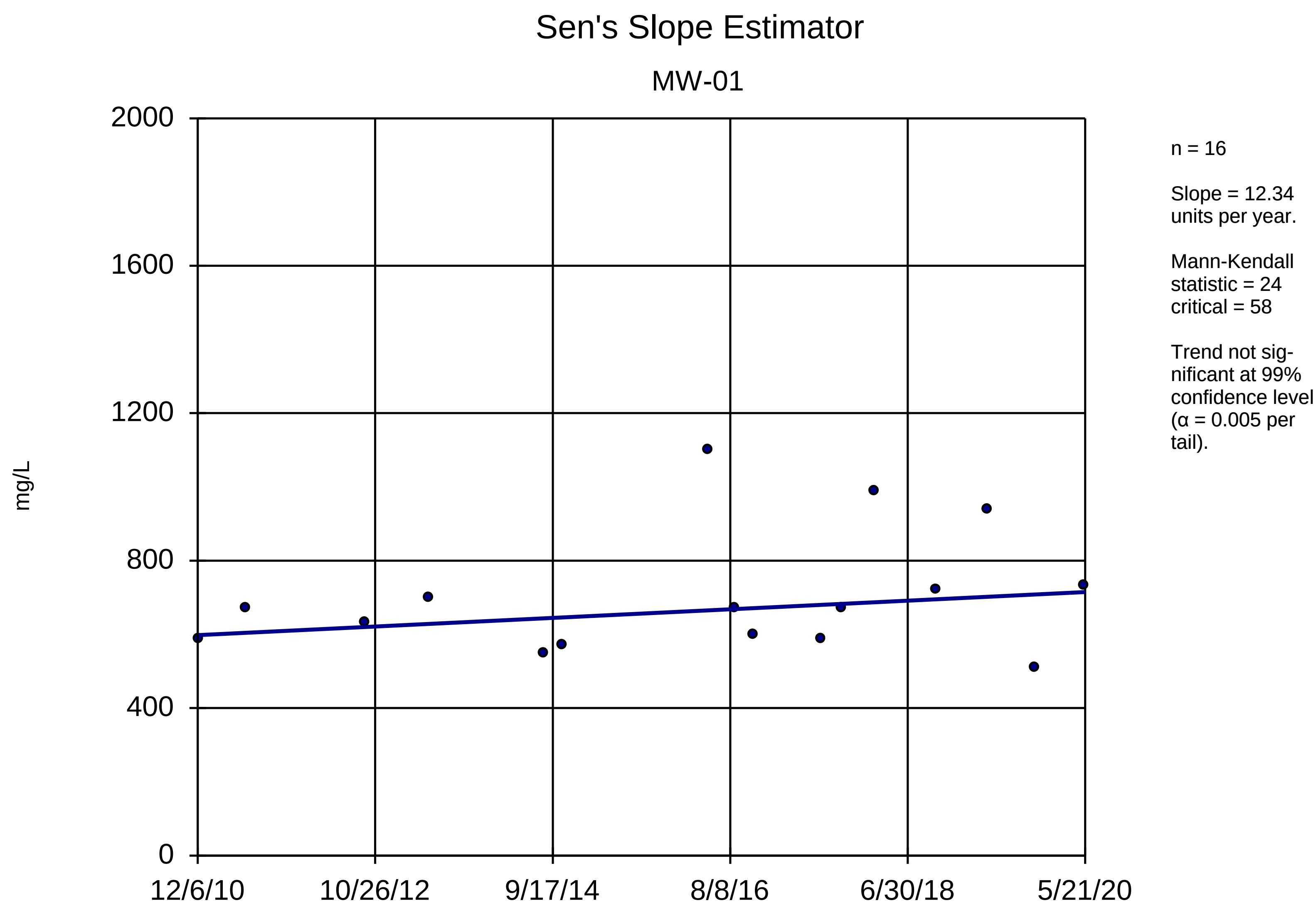
MWG13-15_81646

Hollow symbols indicate censored values.



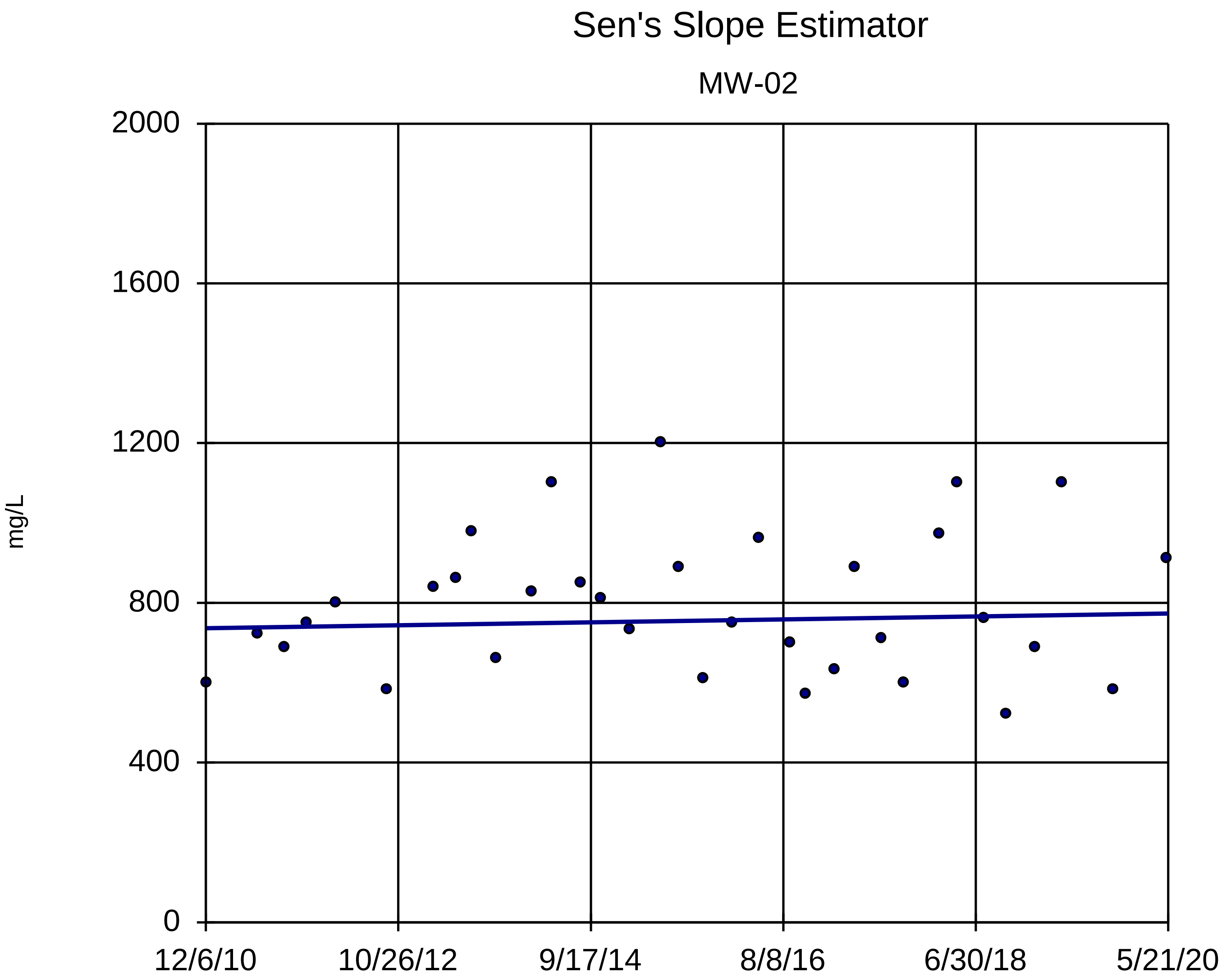

Constituent: Thallium, Total Analysis Run 4/2/2021 11:03 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database




n = 34

Slope = 3.834
units per year.

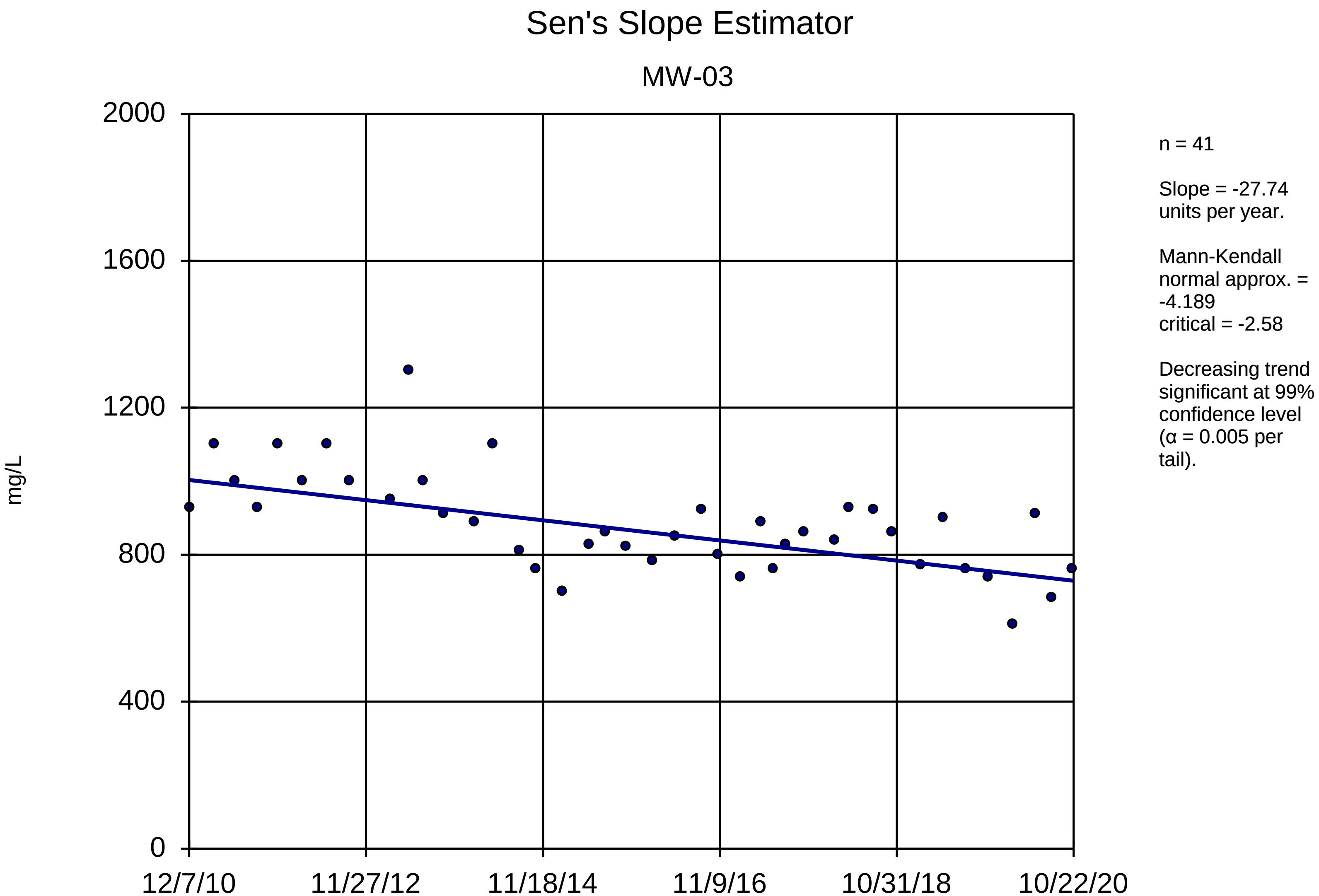
Mann-Kendall
statistic = 21
critical = 176

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:03 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

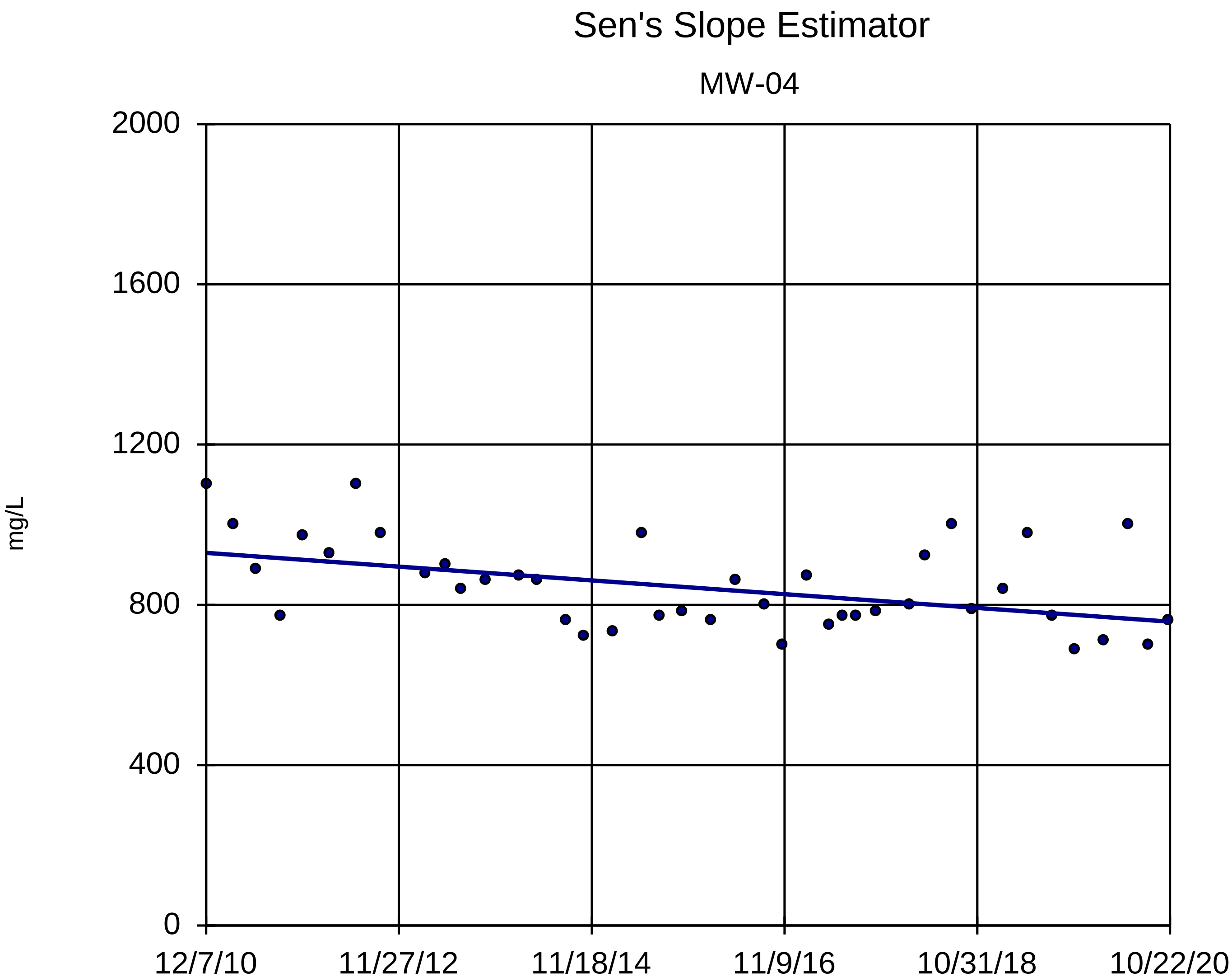
MWG13-15_81649




Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:03 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81650




n = 41

Slope = -17.39 units per year.

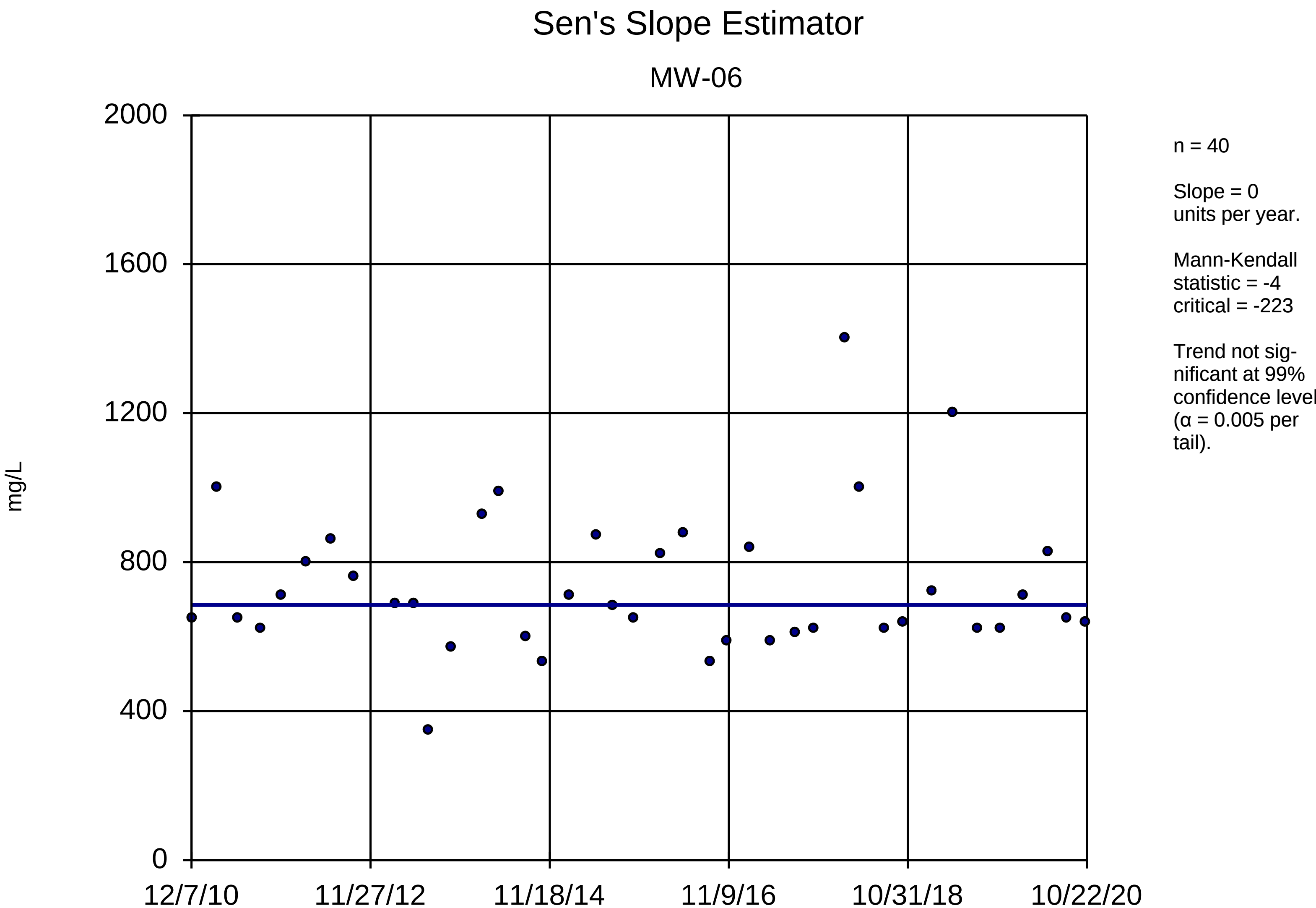
Mann-Kendall normal approx. = -2.826
critical = -2.58

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:03 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

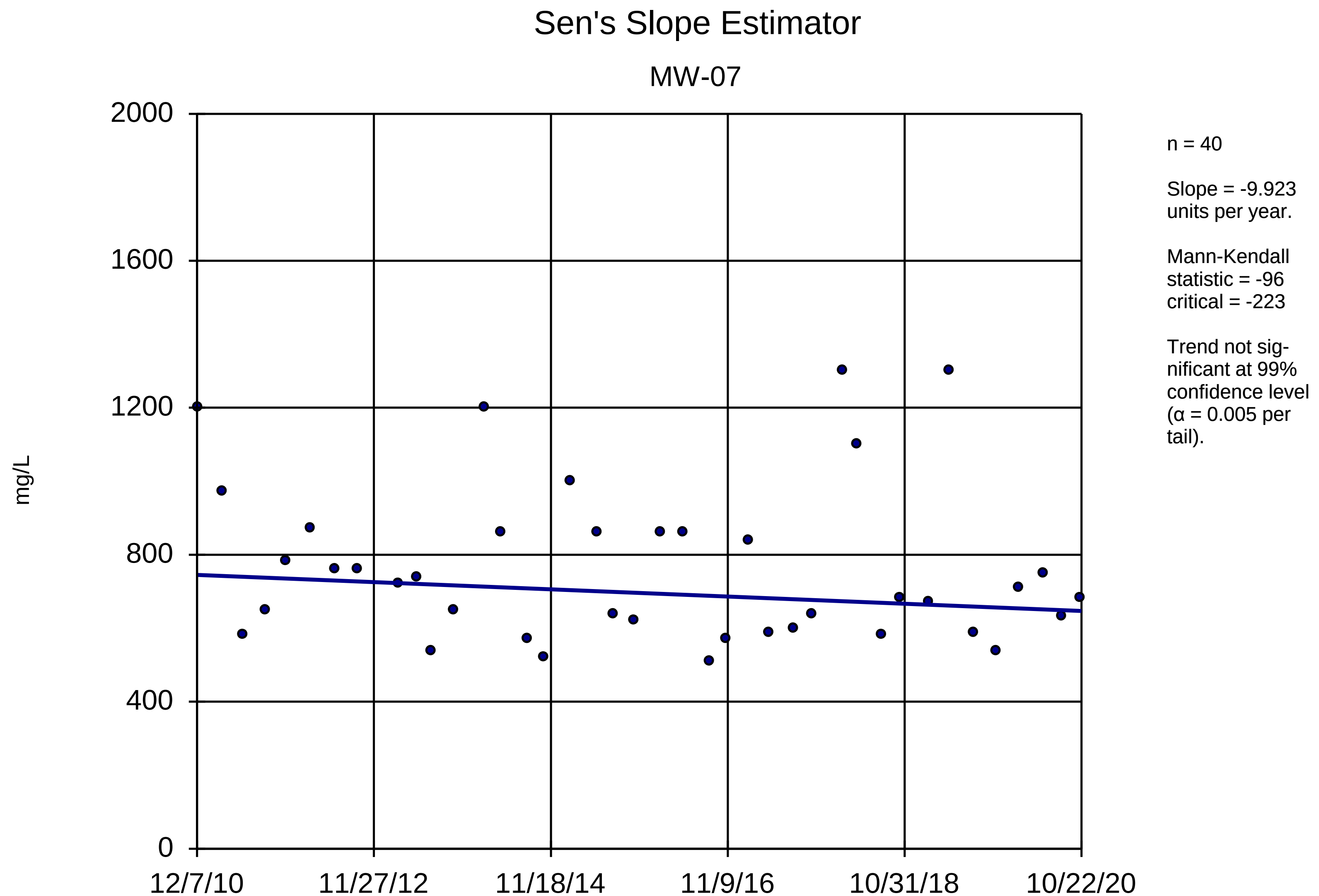
MWG13-15_81651




Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:03 AM

Utility Site J Client: Weaver Consultants Group Data: Joliet 29 Sanitas Database

MWG13-15_81652




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:03 AM

Utility Site J    Client: Weaver Consultants Group    Data: Joliet 29 Sanitas Database

MWG13-15_81653

# Trend Test

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database    Printed 4/2/2021, 11:48 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony, Dissolved (mg/L) | MW-03 | 0 | -22 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-05 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-06 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-07 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-13 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-14 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-03 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-08 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-15 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-03 | 0 | -183 | -214 | No | 39 | 64.1 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-04 | 0 | -49 | -214 | No | 39 | 94.87 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-05 | 0 | -24 | -214 | No | 39 | 94.87 | n/a | n/a | 0.01 | NP |
| **Arsenic, Dissolved (mg/L)** | **MW-06** | **-0.00...** | **-267** | **-214** | **Yes** | **39** | **28.21** | **n/a** | **n/a** | **0.01** | **NP** |
| Arsenic, Dissolved (mg/L) | MW-07 | -0.00145 | -42 | -214 | No | 39 | 2.564 | n/a | n/a | 0.01 | NP |
| **Arsenic, Dissolved (mg/L)** | **MW-08** | **-0.00...** | **-365** | **-206** | **Yes** | **38** | **23.68** | **n/a** | **n/a** | **0.01** | **NP** |
| Arsenic, Dissolved (mg/L) | MW-13 | -0.00... | -89 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| **Arsenic, Dissolved (mg/L)** | **MW-14** | **-0.00...** | **-282** | **-199** | **Yes** | **37** | **24.32** | **n/a** | **n/a** | **0.01** | **NP** |
| **Arsenic, Dissolved (mg/L)** | **MW-15** | **-0.00...** | **-353** | **-199** | **Yes** | **37** | **16.22** | **n/a** | **n/a** | **0.01** | **NP** |
| Arsenic, Total (mg/L) | MW-03 | 3.9e-11 | 5 | 25 | No | 9 | 11.11 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-04 | 0 | 0 | 25 | No | 9 | 88.89 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-05 | 0 | 0 | 38 | No | 12 | 91.67 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-08 | -0.00... | -6 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-15 | -0.00... | -42 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-03 | 0 | 11 | 214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-04** | **-0.00...** | **-268** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-05 | -0.00... | -129 | -214 | No | 39 | 2.564 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-06** | **-0.00...** | **-431** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-07 | -0.00... | -102 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-08** | **-0.00...** | **-282** | **-206** | **Yes** | **38** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-13 | 0 | -7 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-14 | 0.000... | 79 | 199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-15 | -0.00... | -171 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-03 | 0 | 1 | 25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-04 | -0.00... | -11 | -25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-05 | -0.00... | -10 | -38 | No | 12 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-08 | -0.00... | -33 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-15 | -0.00... | -7 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-03 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-05 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-06 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-07 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database    Printed 4/2/2021, 11:48 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-03 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-08 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-15 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-03 | -0.01931 | -132 | -214 | No | 39 | 2.564 | n/a | n/a | 0.01 | NP |
| **Boron, Dissolved (mg/L)** | **MW-04** | **-0.04286** | **-267** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Boron, Dissolved (mg/L)** | **MW-05** | **-0.03687** | **-377** | **-214** | **Yes** | **39** | **2.564** | **n/a** | **n/a** | **0.01** | **NP** |
| **Boron, Dissolved (mg/L)** | **MW-06** | **-0.0247** | **-339** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Boron, Dissolved (mg/L) | MW-07 | 0 | 11 | 214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-08 | 0 | 12 | 206 | No | 38 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-13 | -0.0693 | -146 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-14 | 0 | 37 | 199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-15 | 0.04385 | 150 | 199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-03 | -0.04515 | -16 | -25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-04 | -0.03816 | -4 | -25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| **Boron, Total (mg/L)** | **MW-05** | **-0.05707** | **-45** | **-38** | **Yes** | **12** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Boron, Total (mg/L)** | **MW-08** | **-0.1821** | **-61** | **-53** | **Yes** | **15** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Boron, Total (mg/L) | MW-15 | -0.02899 | -11 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-03 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-05 | 0 | 16 | 214 | No | 39 | 94.87 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-06 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-07 | 0 | -36 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-13 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-14 | 0 | 109 | 199 | No | 37 | 56.76 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-03 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-08 | 0 | -12 | -53 | No | 15 | 93.33 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-15 | 0 | -18 | -53 | No | 15 | 73.33 | n/a | n/a | 0.01 | NP |
| Calcium, Total (mg/L) | MW-03 | 0 | 0 | 25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| Calcium, Total (mg/L) | MW-04 | -4.423 | -6 | -25 | No | 9 | 0 | n/a | n/a | 0.01 | NP |
| Calcium, Total (mg/L) | MW-05 | 0 | 9 | 38 | No | 12 | 0 | n/a | n/a | 0.01 | NP |
| **Calcium, Total (mg/L)** | **MW-08** | **-10.81** | **-69** | **-53** | **Yes** | **15** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Calcium, Total (mg/L) | MW-15 | -16.29 | -53 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-03 | -0.6472 | -1.283 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-04 | -1.503 | -105 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| **Chloride (mg/L)** | **MW-05** | **-5.086** | **-249** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Chloride (mg/L)** | **MW-06** | **-5.6** | **-215** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Chloride (mg/L)** | **MW-07** | **3.37** | **265** | **214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Chloride (mg/L) | MW-08 | -6.84 | -1.249 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-13 | -2.917 | -169 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| **Chloride (mg/L)** | **MW-14** | **-6.008** | **-305** | **-199** | **Yes** | **37** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Chloride (mg/L) | MW-15 | -2.471 | -133 | -206 | No | 38 | 0 | n/a | n/a | 0.01 | NP |

# Trend Test

Utility Site P  Client: Weaver Consultants Group  Data: Powerton Sanitas Database  Printed 4/2/2021, 11:48 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Dissolved (mg/L) | MW-05 | 0 | -25 | -214 | No | 39 | 92.31 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-06 | 0 | -129 | -214 | No | 39 | 84.62 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-07 | 0 | -106 | -214 | No | 39 | 87.18 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-08 | 0 | -191 | -206 | No | 38 | 84.21 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-13 | 0 | -53 | -199 | No | 37 | 89.19 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-14 | 0 | -127 | -199 | No | 37 | 83.78 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-15 | 0 | -188 | -199 | No | 37 | 83.78 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-03 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-04 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-05 | 0 | 0 | 38 | No | 12 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-08 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-15 | 0 | 0 | 43 | No | 13 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-03 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-04 | 0 | -38 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-05 | 0 | -205 | -214 | No | 39 | 82.05 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-06 | 0 | -23 | -214 | No | 39 | 94.87 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-07 | -0.00... | -189 | -214 | No | 39 | 5.128 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-13 | 0 | -101 | -199 | No | 37 | 91.89 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-14 | 0 | 19 | 199 | No | 37 | 94.59 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-03 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-04 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-05 | 0 | 0 | 38 | No | 12 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-08 | 0 | 0 | 53 | No | 15 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-15 | 0 | 14 | 53 | No | 15 | 93.33 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-03 | -0.00... | -1.688 | -2.58 | No | 41 | 7.317 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-04 | -0.00... | -138 | -223 | No | 40 | 7.5 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-05 | 0.004669 | 134 | 223 | No | 40 | 7.5 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-06 | -0.00... | -90 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-07 | -0.00... | -154 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-08** | **-0.04977** | **-4.892** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-13 | -0.00... | -75 | -199 | No | 37 | 2.703 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-14 | -0.01334 | -154 | -199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-15** | **-0.02897** | **-382** | **-206** | **Yes** | **38** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Lead, Dissolved (mg/L) | MW-03 | 0 | -14 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-05 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-06 | 0 | -10 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-07 | 0 | -66 | -214 | No | 39 | 87.18 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-13 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-14 | 0 | -39 | -199 | No | 37 | 94.59 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-15 | 0 | -36 | -199 | No | 37 | 97.3 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-03 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-04 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-05 | 0 | -5 | -38 | No | 12 | 91.67 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-08 | 0 | 12 | 53 | No | 15 | 73.33 | n/a | n/a | 0.01 | NP |

# Trend Test

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database    Printed 4/2/2021, 11:48 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lithium, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-08 | 0 | 6 | 53 | No | 15 | 26.67 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-15 | -0.00... | -6 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-03 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-05 | 0 | 30 | 214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-06 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-07 | 0 | -36 | -214 | No | 39 | 97.44 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-13 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-14 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-03 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-08 | 0 | 0 | 53 | No | 15 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-15 | 0 | 0 | 53 | No | 15 | 100 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-03 | 0 | 0 | 25 | No | 9 | 100 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-04 | 0 | -1 | -25 | No | 9 | 66.67 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-05 | 0.000... | 30 | 38 | No | 12 | 50 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-08 | -0.00... | -7 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-15 | -0.00... | -23 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-03 | -0.01712 | -1.063 | -2.58 | No | 50 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-04 | -0.01479 | -1.398 | -2.58 | No | 50 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-05 | -0.01654 | -1.217 | -2.58 | No | 52 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-06 | -0.01961 | -1.472 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| pH, Field (Standard Units) | MW-07 | -0.02391 | -184 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| **pH, Field (Standard Units)** | **MW-08** | **-0.0944** | **-4.543** | **-2.58** | **Yes** | **51** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| pH, Field (Standard Units) | MW-13 | 0.01192 | 0.6966 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **pH, Field (Standard Units)** | **MW-14** | **-0.04916** | **-3.382** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| pH, Field (Standard Units) | MW-15 | -0.01994 | -1.456 | -2.58 | No | 54 | 0 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-03 | 0 | -13 | -30 | No | 10 | 80 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-04 | 0 | 4 | 30 | No | 10 | 60 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-05 | 0.00312 | 21 | 38 | No | 12 | 58.33 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-08 | 0 | 18 | 48 | No | 14 | 50 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-15 | 0 | -10 | -48 | No | 14 | 71.43 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-03 | 0 | -60 | -214 | No | 39 | 69.23 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-04 | 0 | -96 | -214 | No | 39 | 69.23 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-05 | 0 | -102 | -214 | No | 39 | 76.92 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-06 | 0 | 72 | 214 | No | 39 | 74.36 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-07 | 0 | 36 | 214 | No | 39 | 58.97 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-08 | 0 | 21 | 206 | No | 38 | 78.95 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-13 | 0.000... | 65 | 199 | No | 37 | 27.03 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-14 | 0 | 34 | 199 | No | 37 | 37.84 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-15 | 0 | 20 | 199 | No | 37 | 27.03 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-03 | 0 | 8 | 25 | No | 9 | 88.89 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-04 | 0 | -4 | -25 | No | 9 | 88.89 | n/a | n/a | 0.01 | NP |

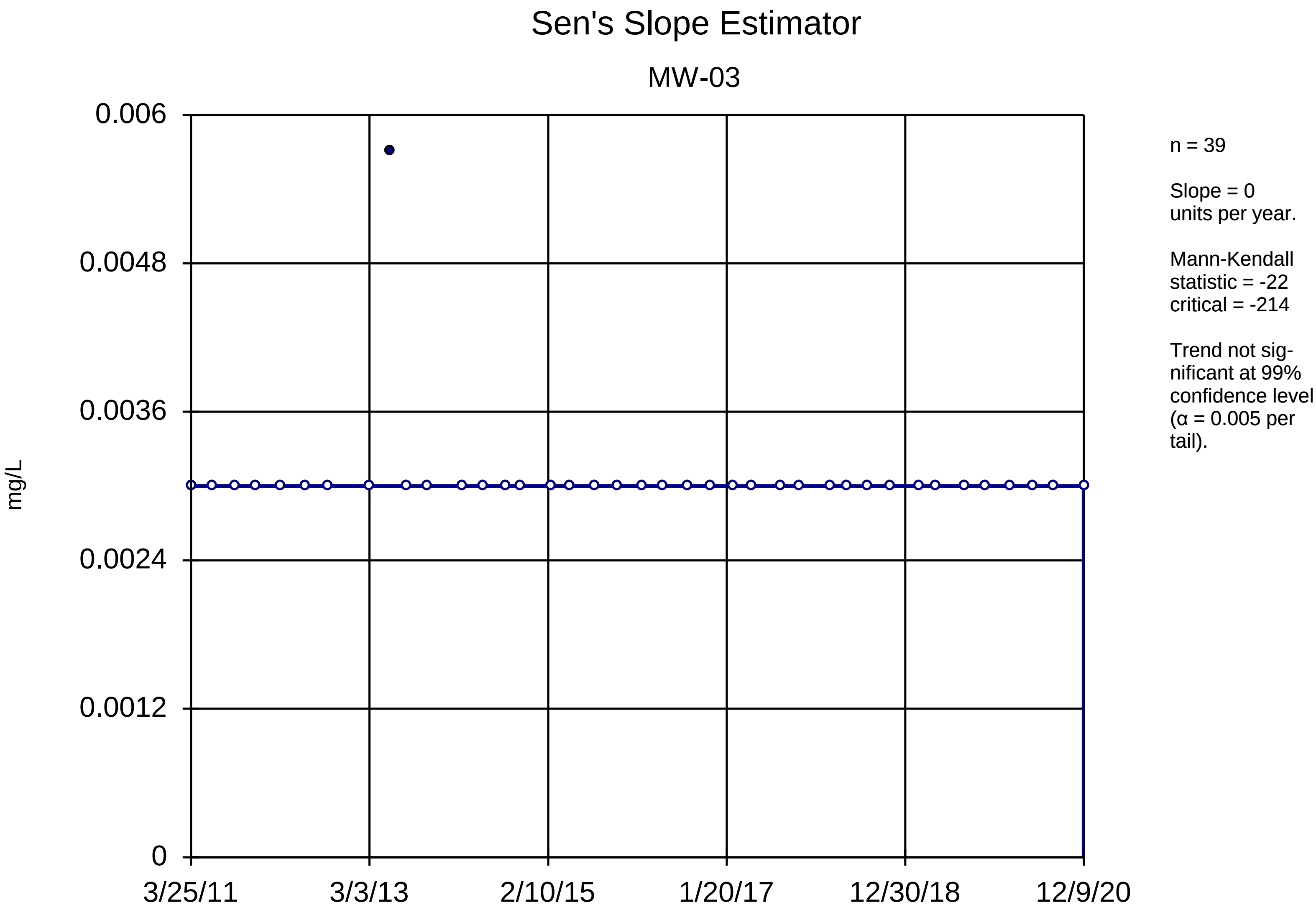
# Trend Test



Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database    Printed 4/2/2021, 11:48 AM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Selenium, Total (mg/L) | MW-15 | -0.00... | -6 | -53 | No | 15 | 20 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-03 | -2.97 | -2.348 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-04 | -9.213 | -219 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| **Sulfate (mg/L)** | **MW-05** | **-9.096** | **-249** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Sulfate (mg/L) | MW-06 | 0 | 3 | 214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-07 | 1.361 | 73 | 214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **Sulfate (mg/L)** | **MW-08** | **-23.74** | **-3.881** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Sulfate (mg/L)** | **MW-13** | **97.09** | **293** | **199** | **Yes** | **37** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Sulfate (mg/L) | MW-14 | 0 | 8 | 199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-15 | 5.709 | 28 | 206 | No | 38 | 0 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-03 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-04 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-05 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-06 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-07 | 0 | 0 | 214 | No | 39 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-08 | 0 | 0 | 206 | No | 38 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-13 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-14 | 0.000... | 140 | 199 | No | 37 | 10.81 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-15 | 0 | 0 | 199 | No | 37 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-03 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-04 | 0 | 0 | 21 | No | 8 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-05 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-08 | 0 | 0 | 53 | No | 15 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-15 | 0 | 0 | 53 | No | 15 | 100 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-03 | -5.995 | -2.198 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Total Dissolved Solids (mg/L)** | **MW-04** | **-19.65** | **-224** | **-223** | **Yes** | **40** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Total Dissolved Solids (mg/L) | MW-05 | -21.31 | -217 | -223 | No | 40 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-06 | -16.96 | -167 | -214 | No | 39 | 0 | n/a | n/a | 0.01 | NP |
| **Total Dissolved Solids (mg/L)** | **MW-07** | **-19.4** | **-257** | **-214** | **Yes** | **39** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Total Dissolved Solids (mg/L)** | **MW-08** | **-41.7** | **-2.844** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Total Dissolved Solids (mg/L)** | **MW-13** | **157.7** | **310** | **199** | **Yes** | **37** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Total Dissolved Solids (mg/L) | MW-14 | 23.16 | 93 | 199 | No | 37 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-15 | 11.68 | 53 | 206 | No | 38 | 0 | n/a | n/a | 0.01 | NP |

Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81659

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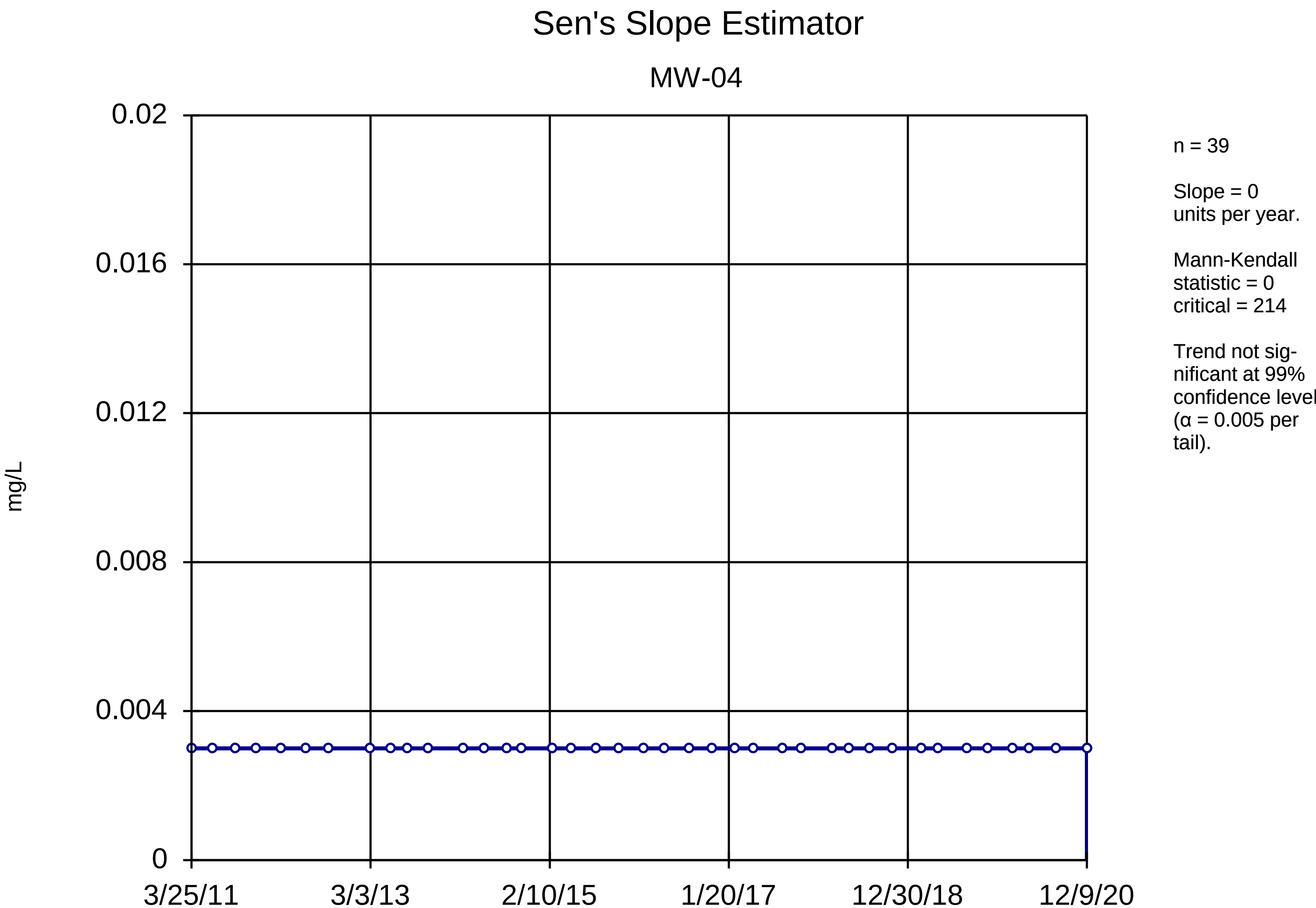
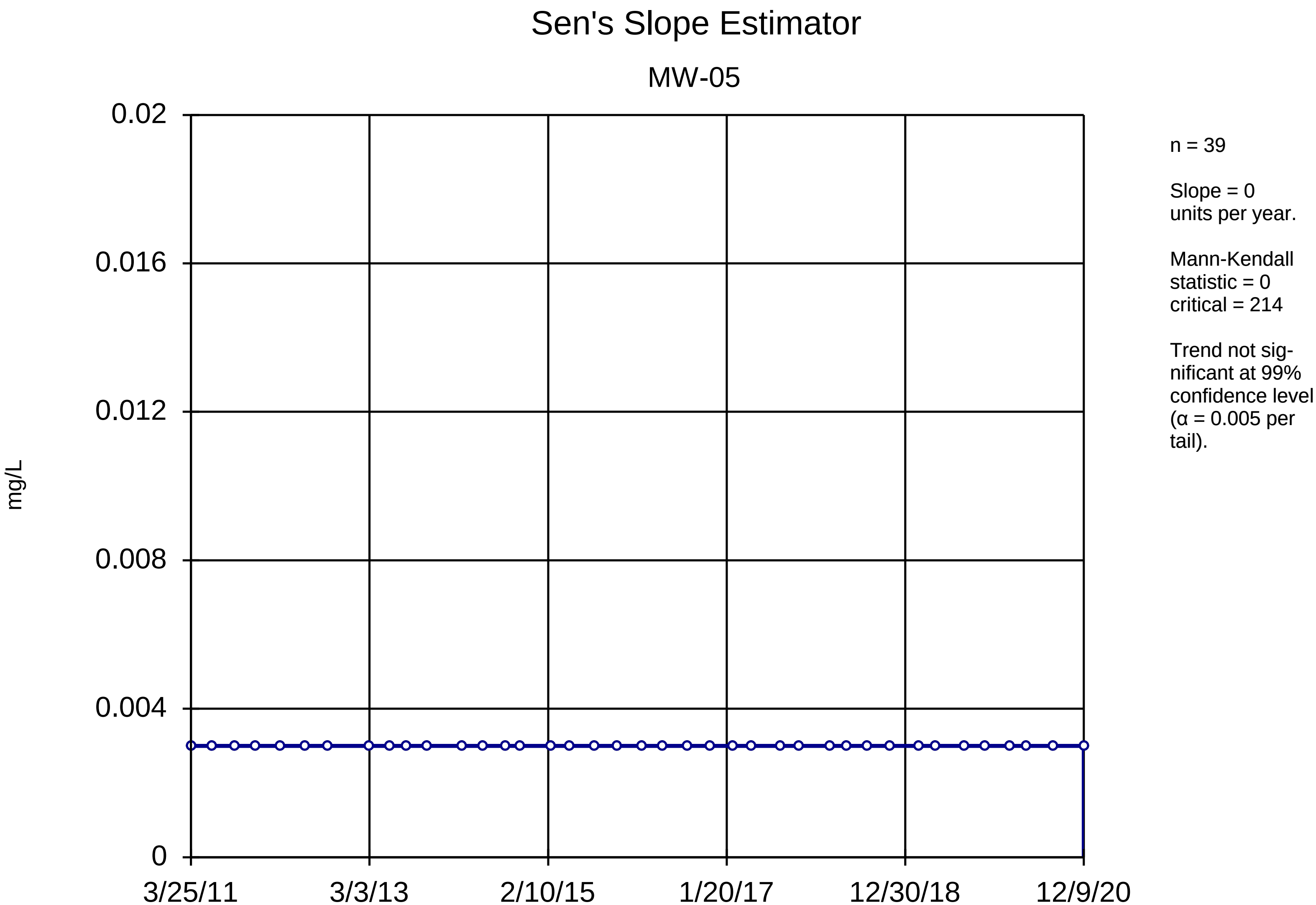



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81660

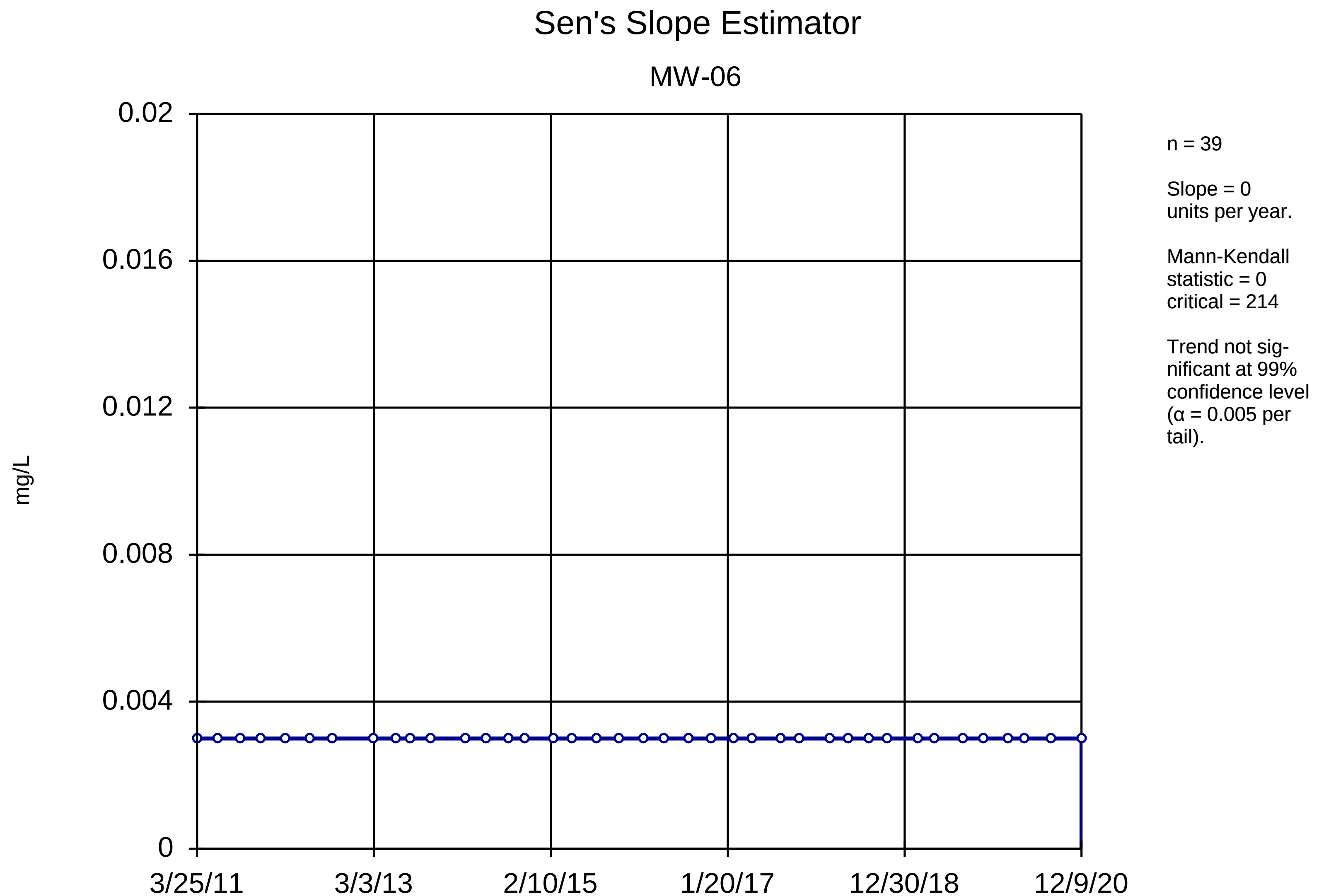
Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

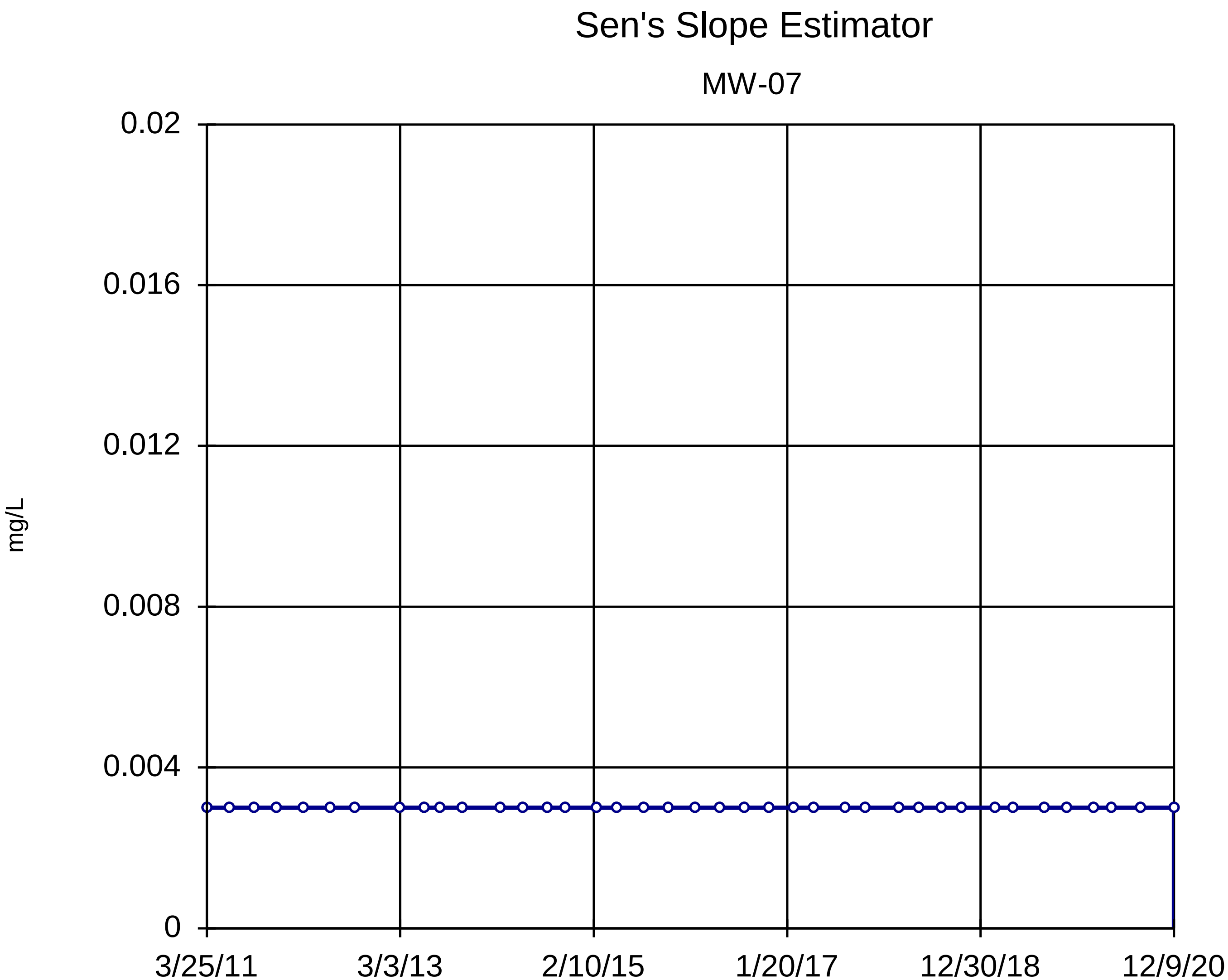



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81662

Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

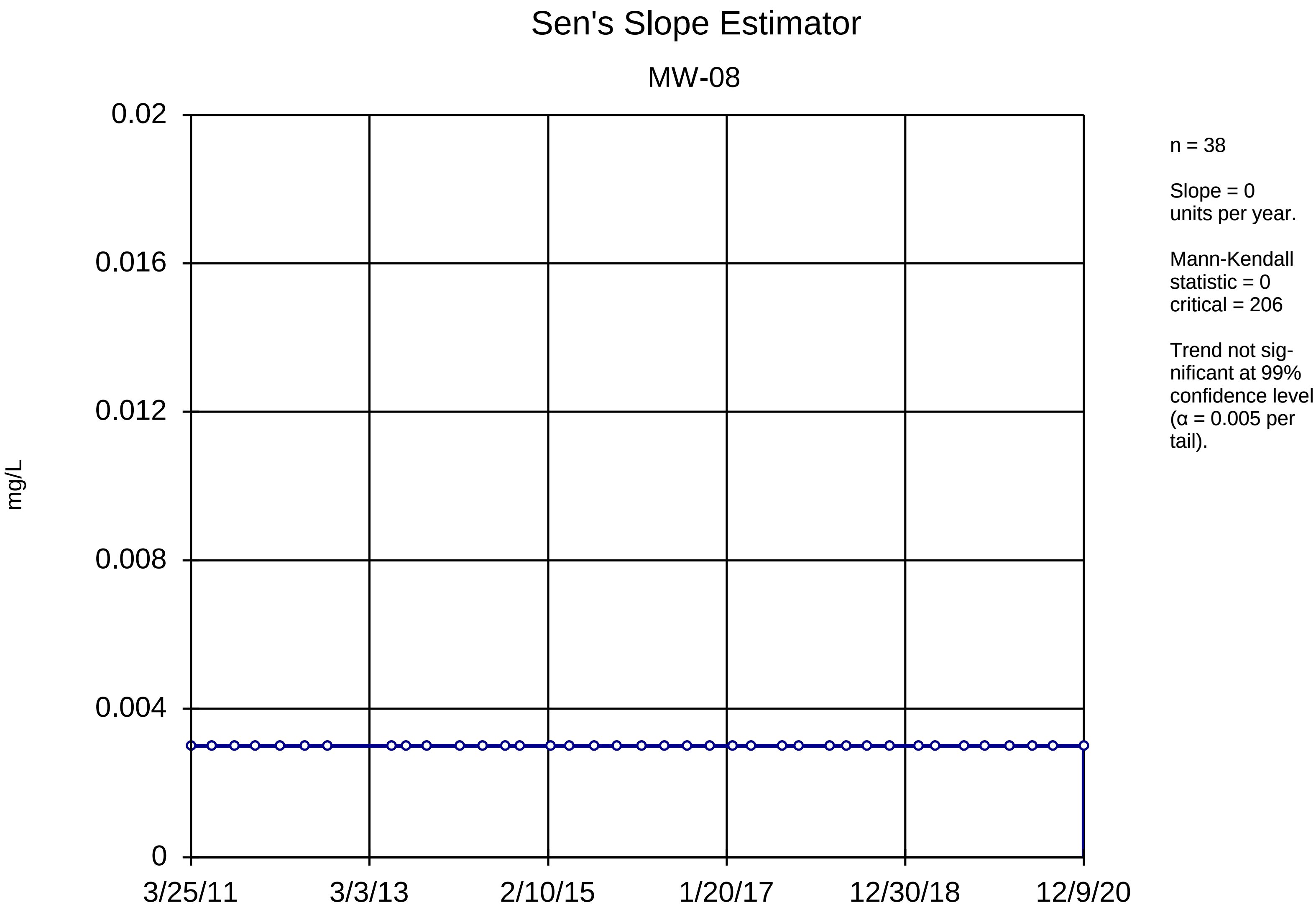
Mann-Kendall
statistic = 0
critical = 214

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

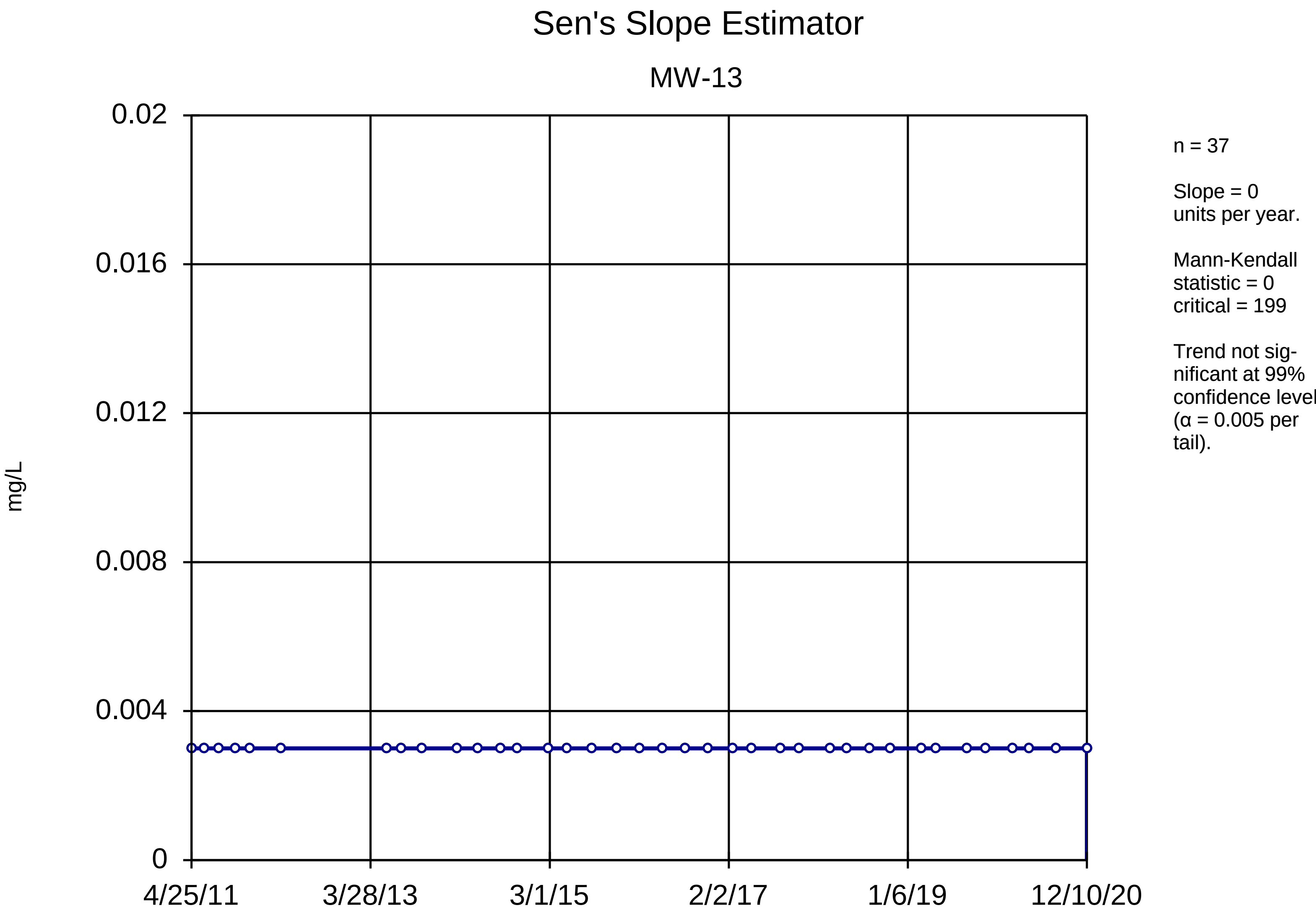
Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

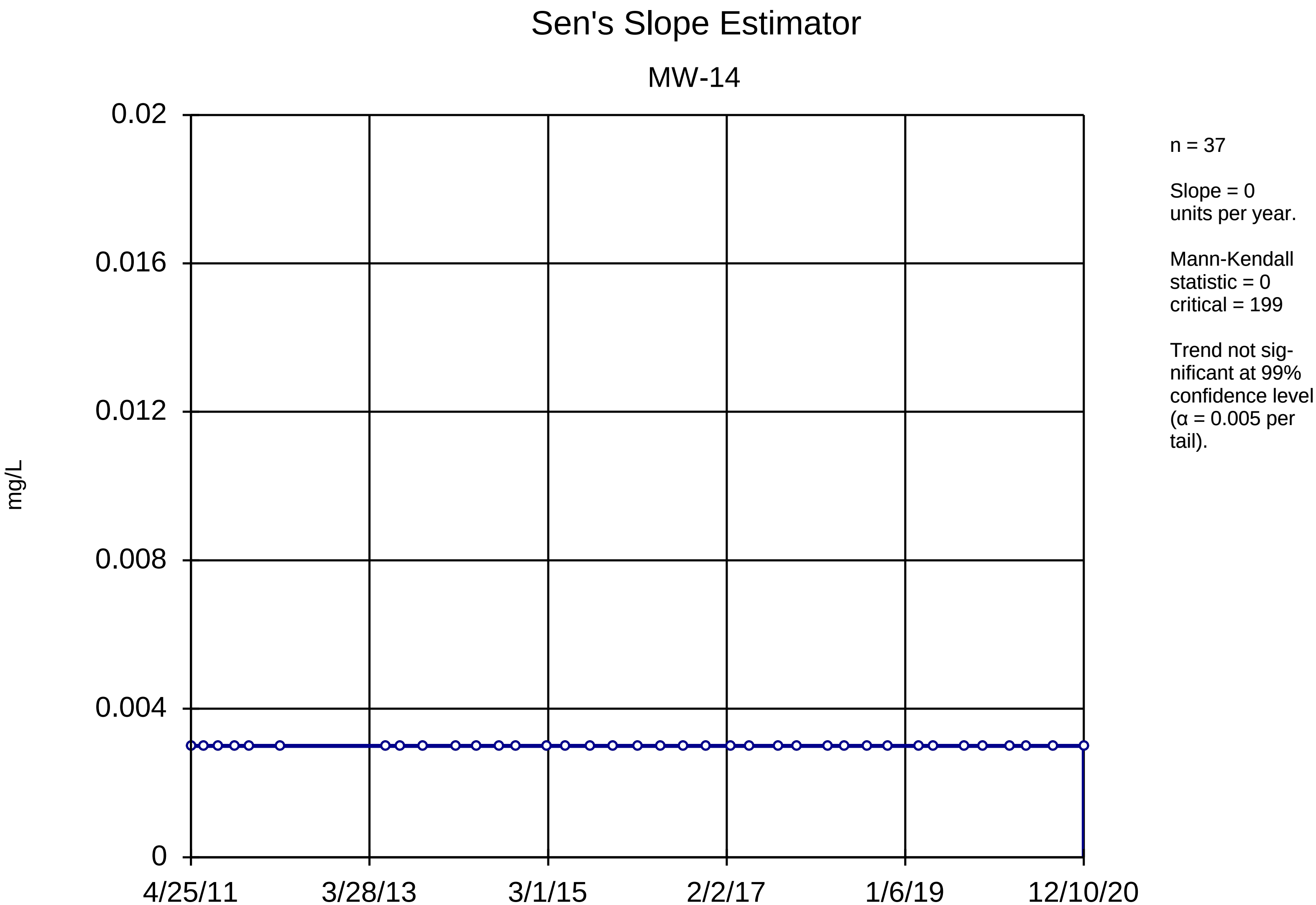



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81665

Hollow symbols indicate censored values.

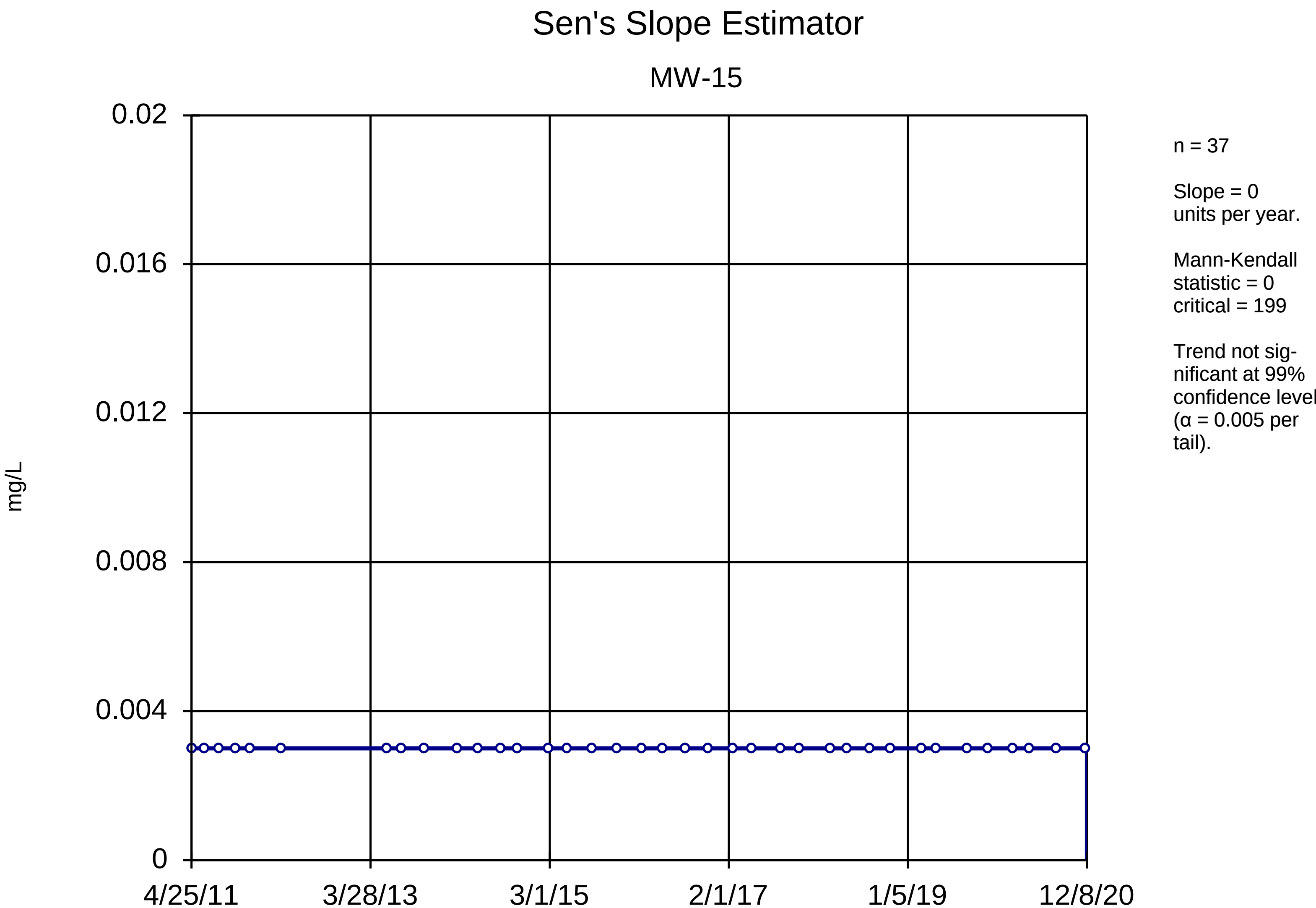



Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81666

Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81667

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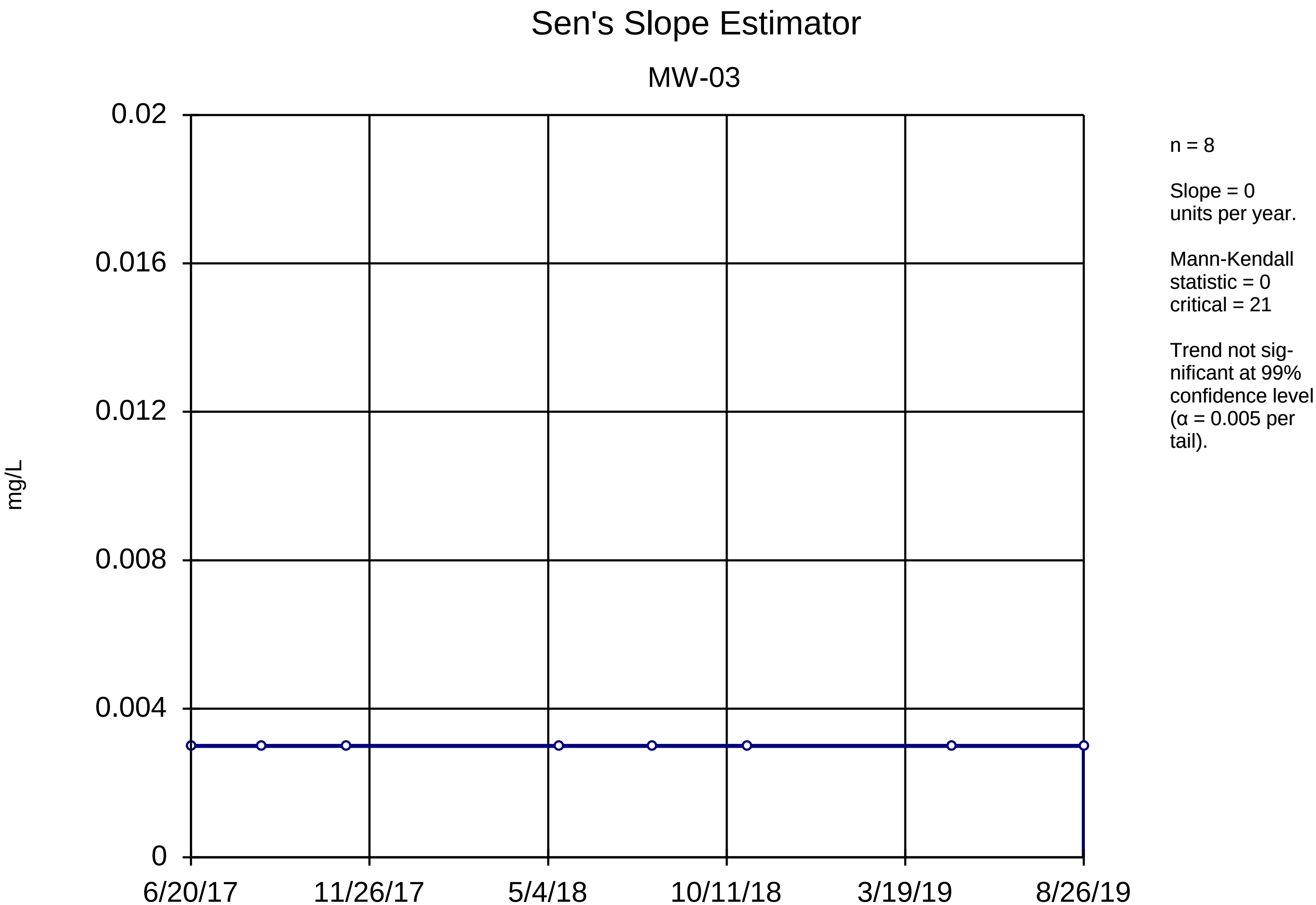
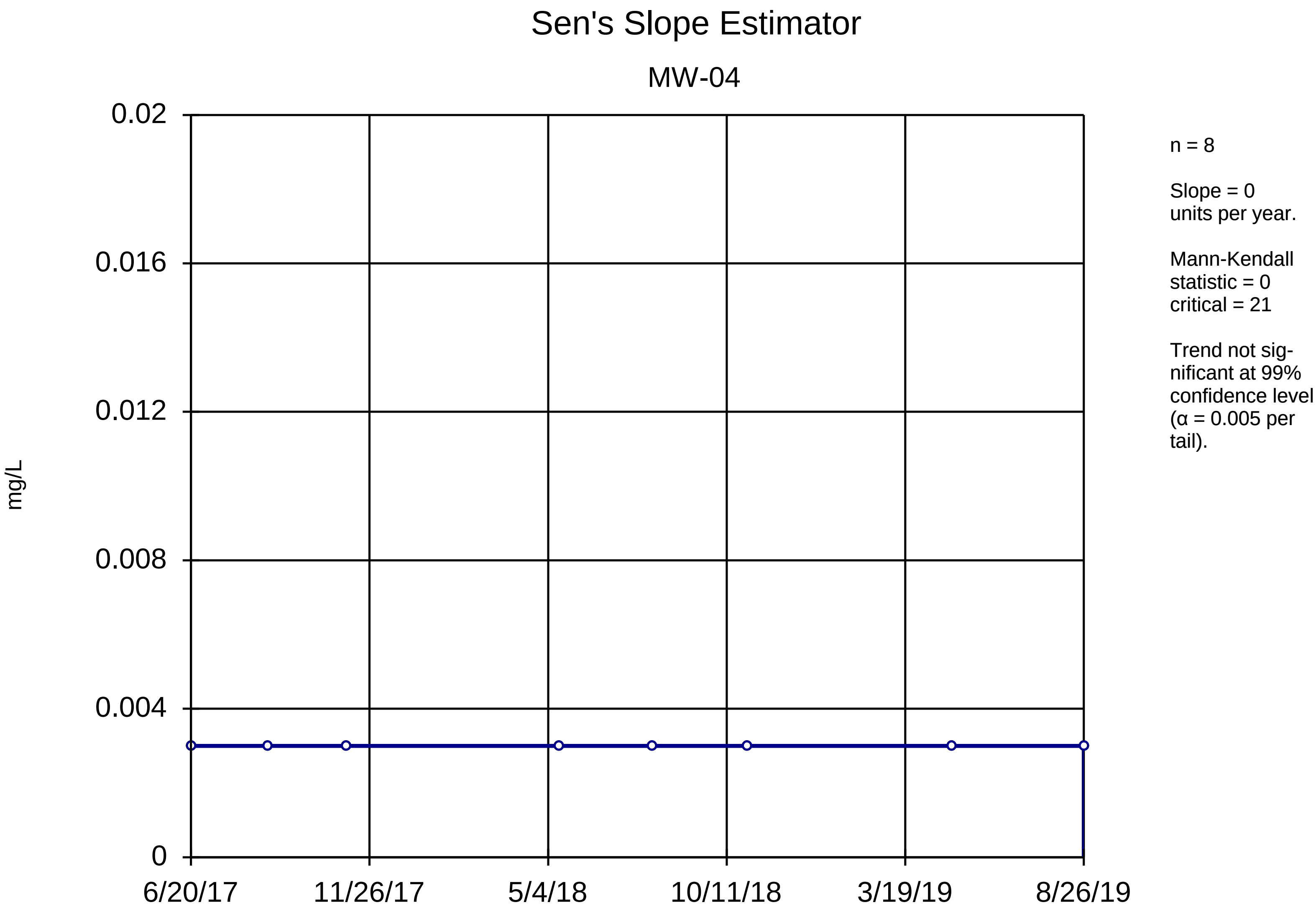
Hollow symbols indicate censored values.




Constituent: Antimony, Total    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

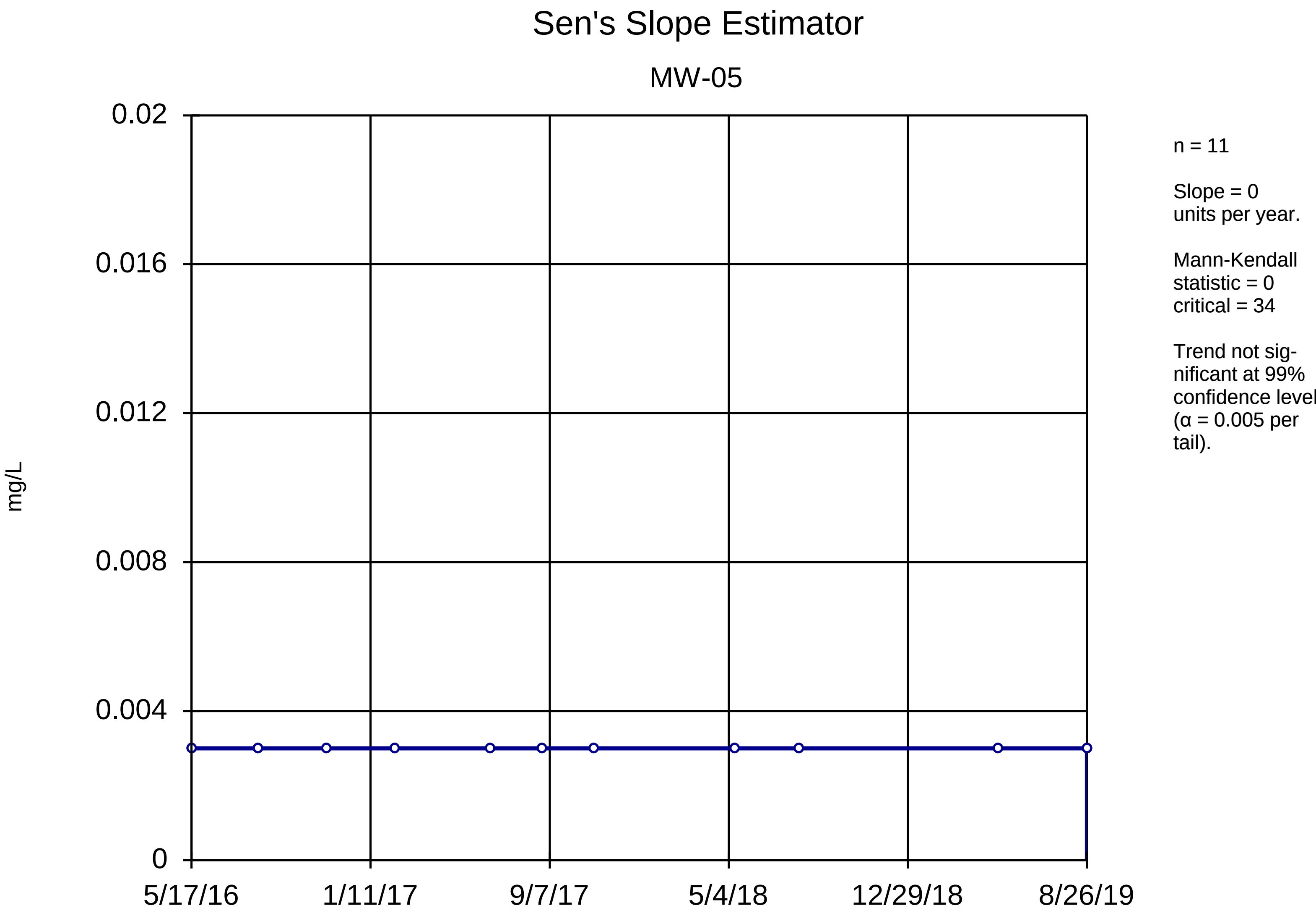



Constituent: Antimony, Total    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81669

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

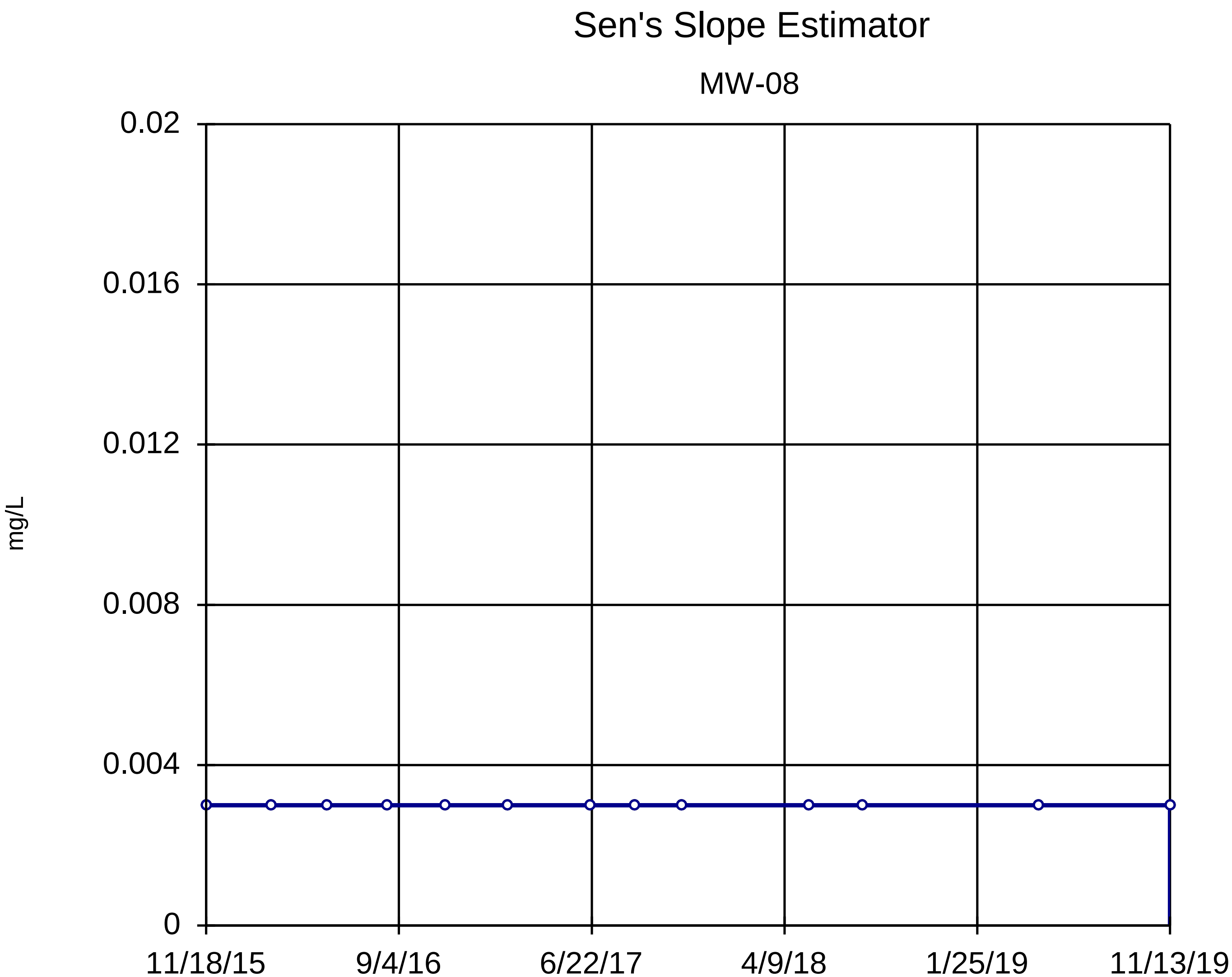



Constituent: Antimony, Total Analysis Run 4/2/2021 11:43 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81670

Hollow symbols indicate censored values.




n = 13

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 43

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Antimony, Total Analysis Run 4/2/2021 11:43 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

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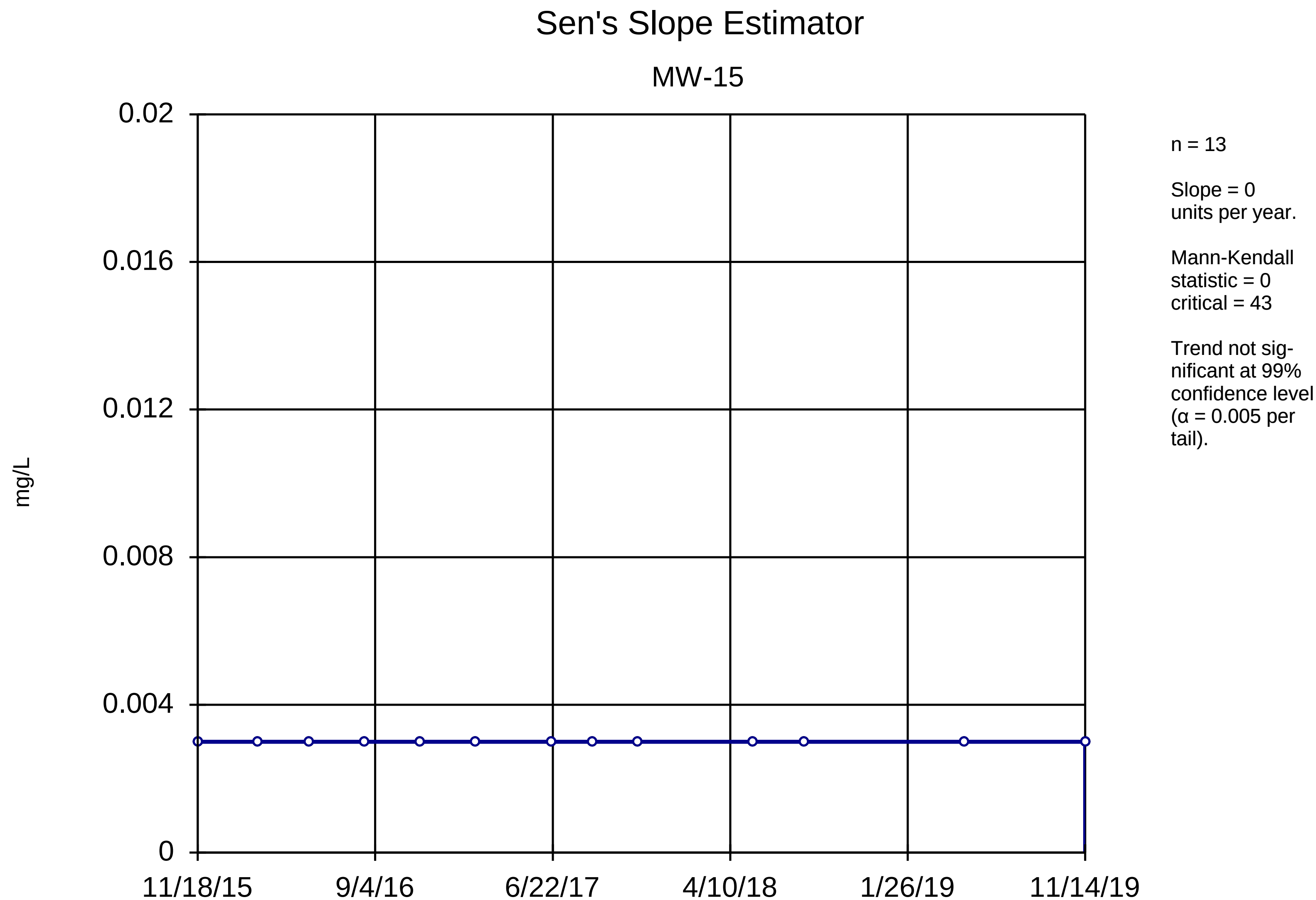
Hollow symbols indicate censored values.

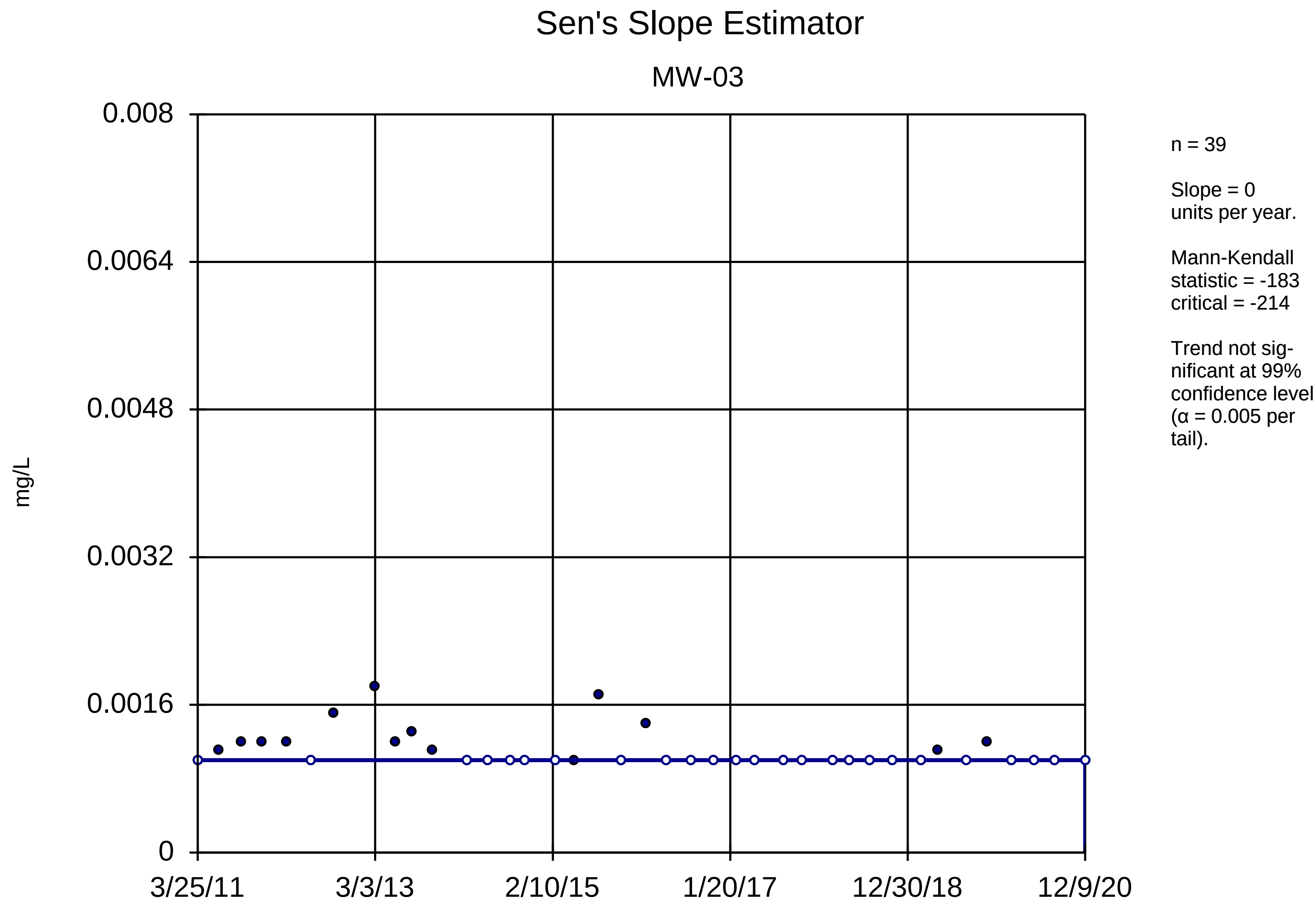



Constituent: Antimony, Total    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81672

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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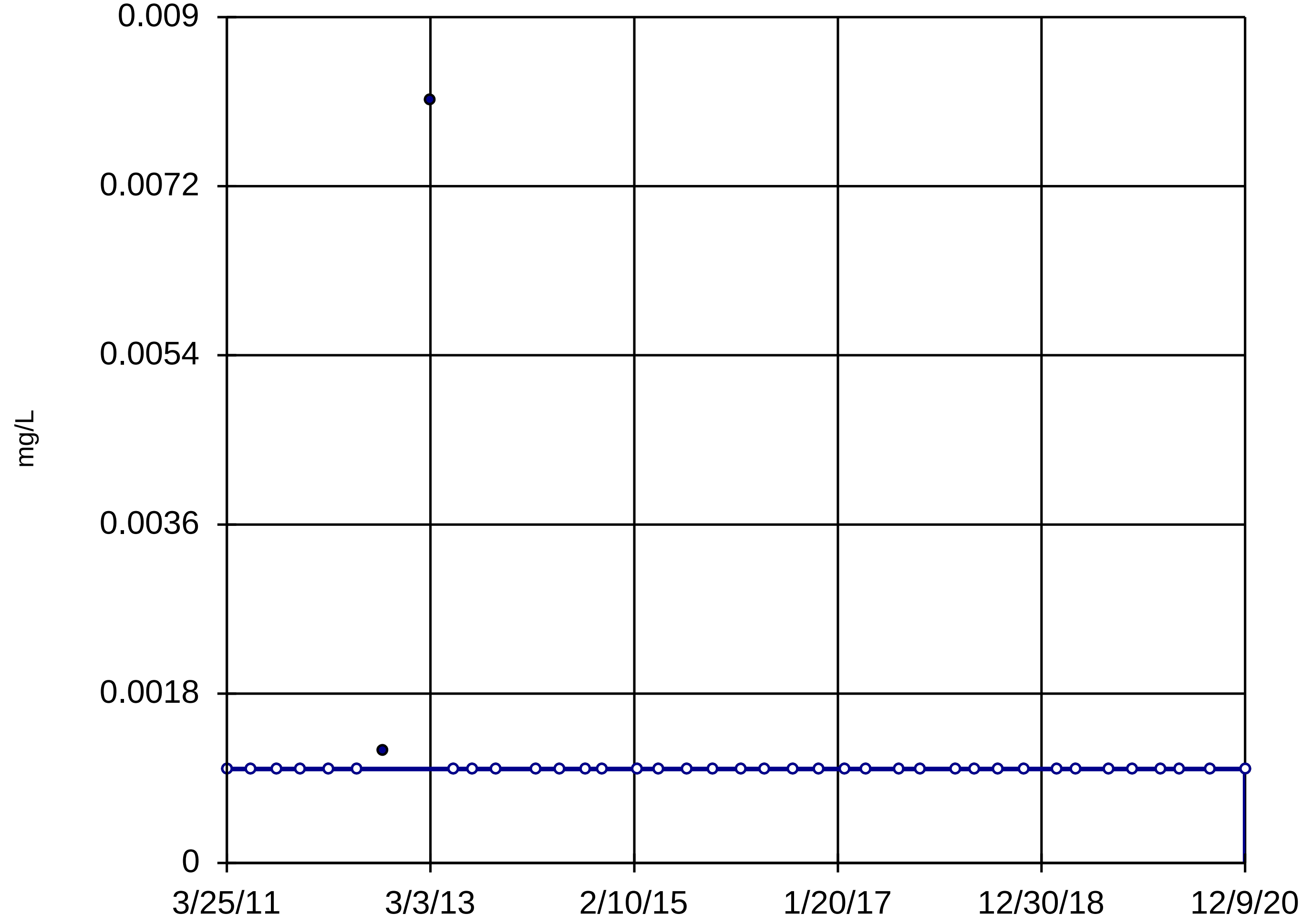
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = -49
critical = -214

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81674

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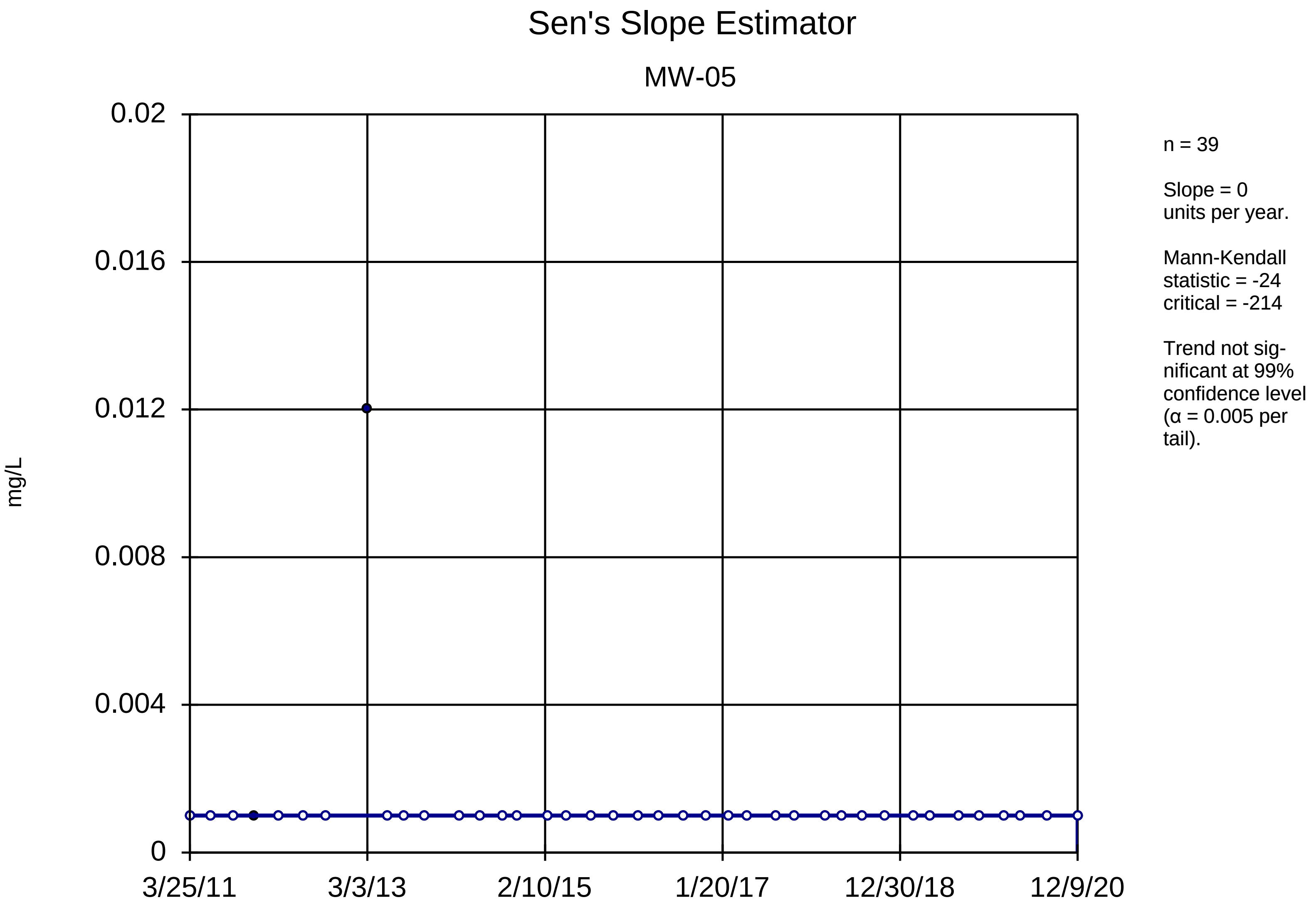
Hollow symbols indicate censored values.

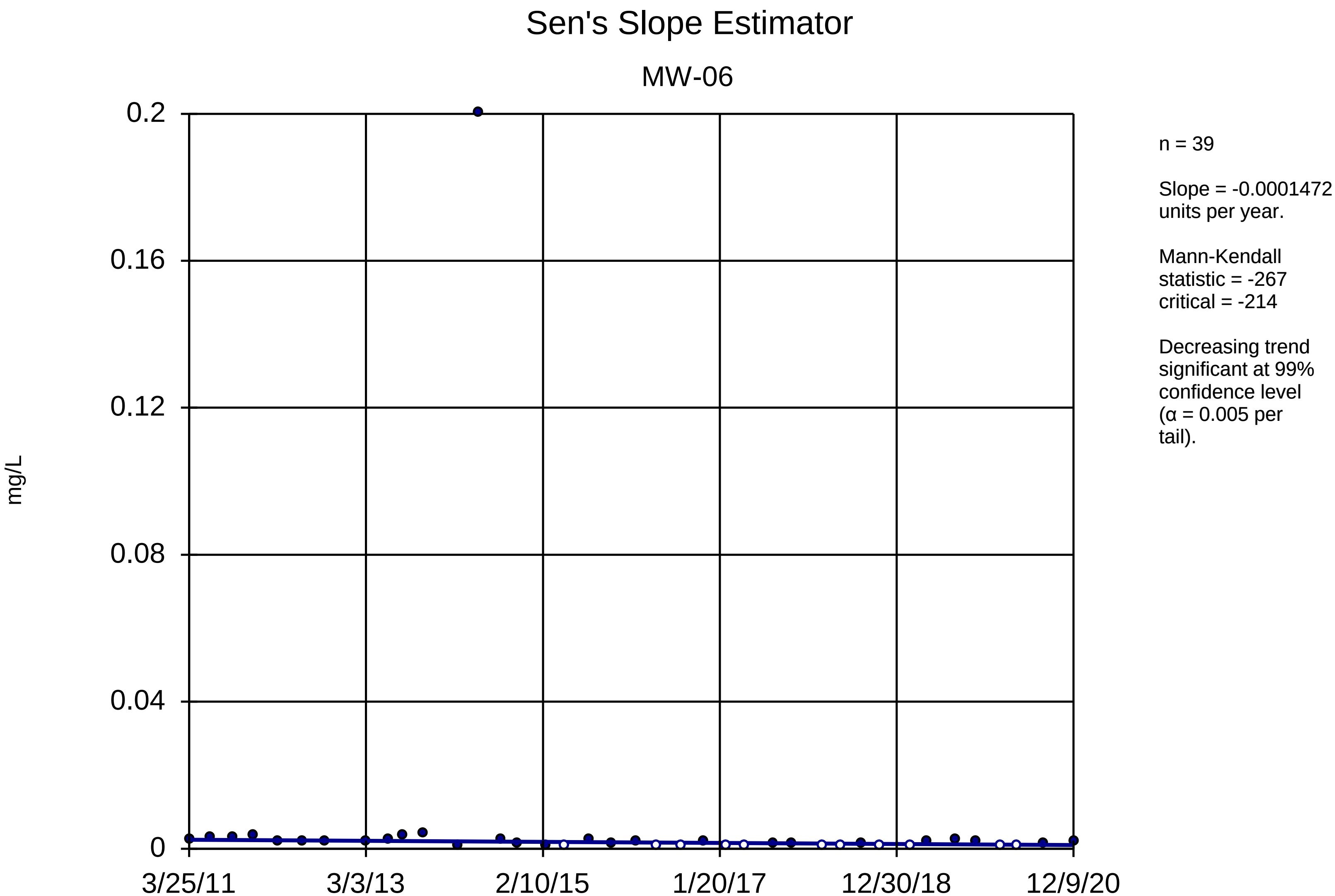



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81675

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

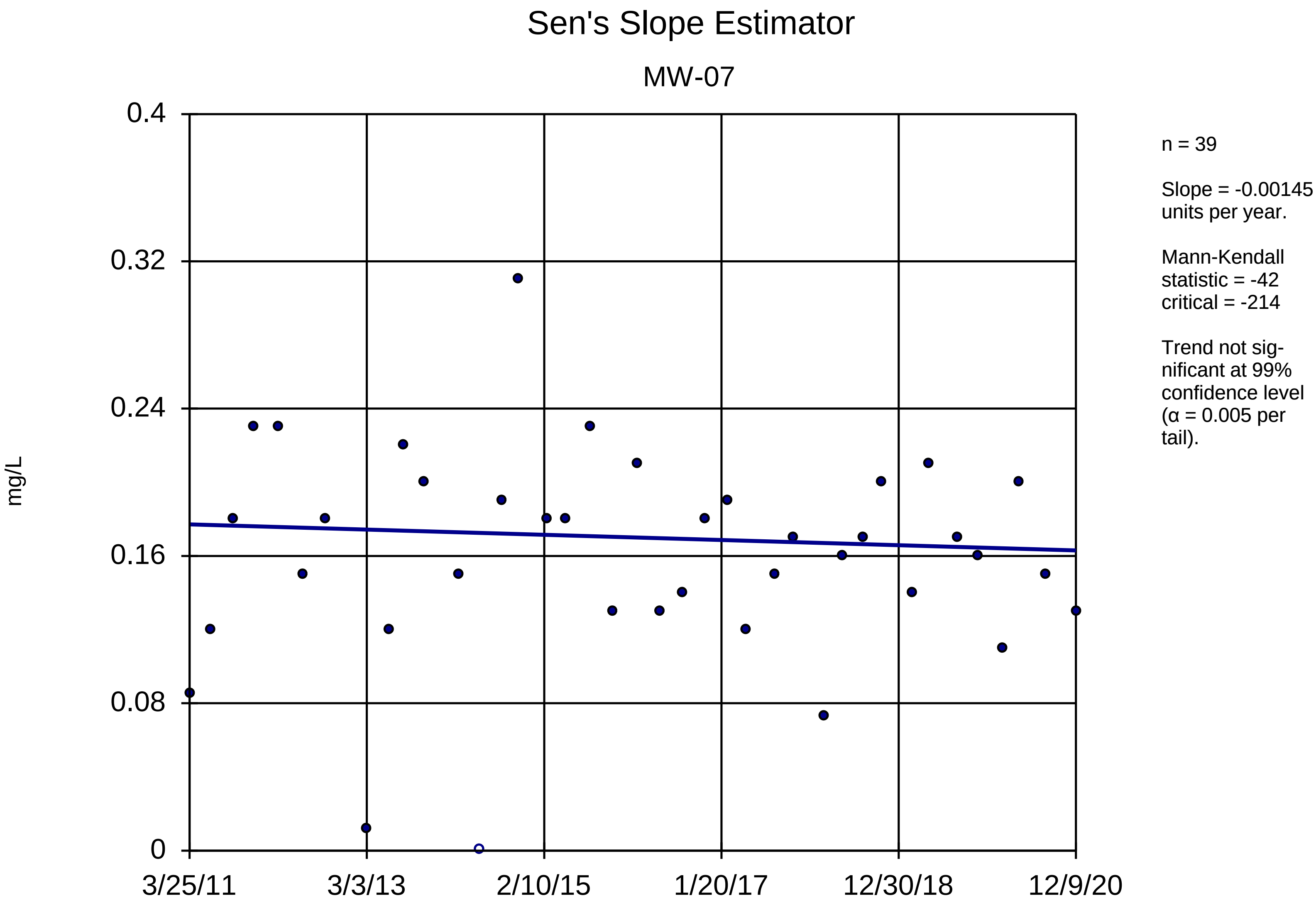



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81676

Hollow symbols indicate censored values.

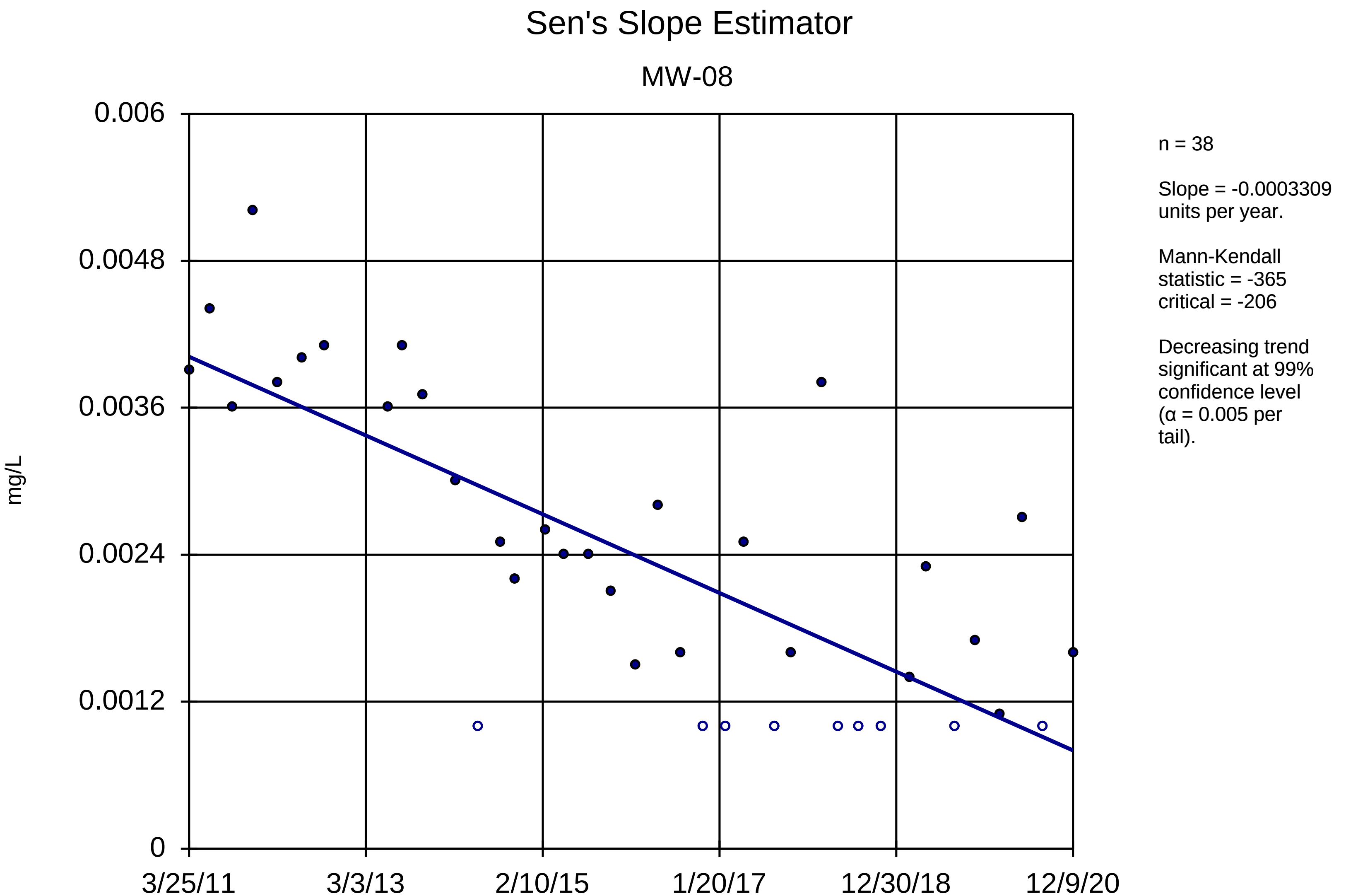



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:43 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81677

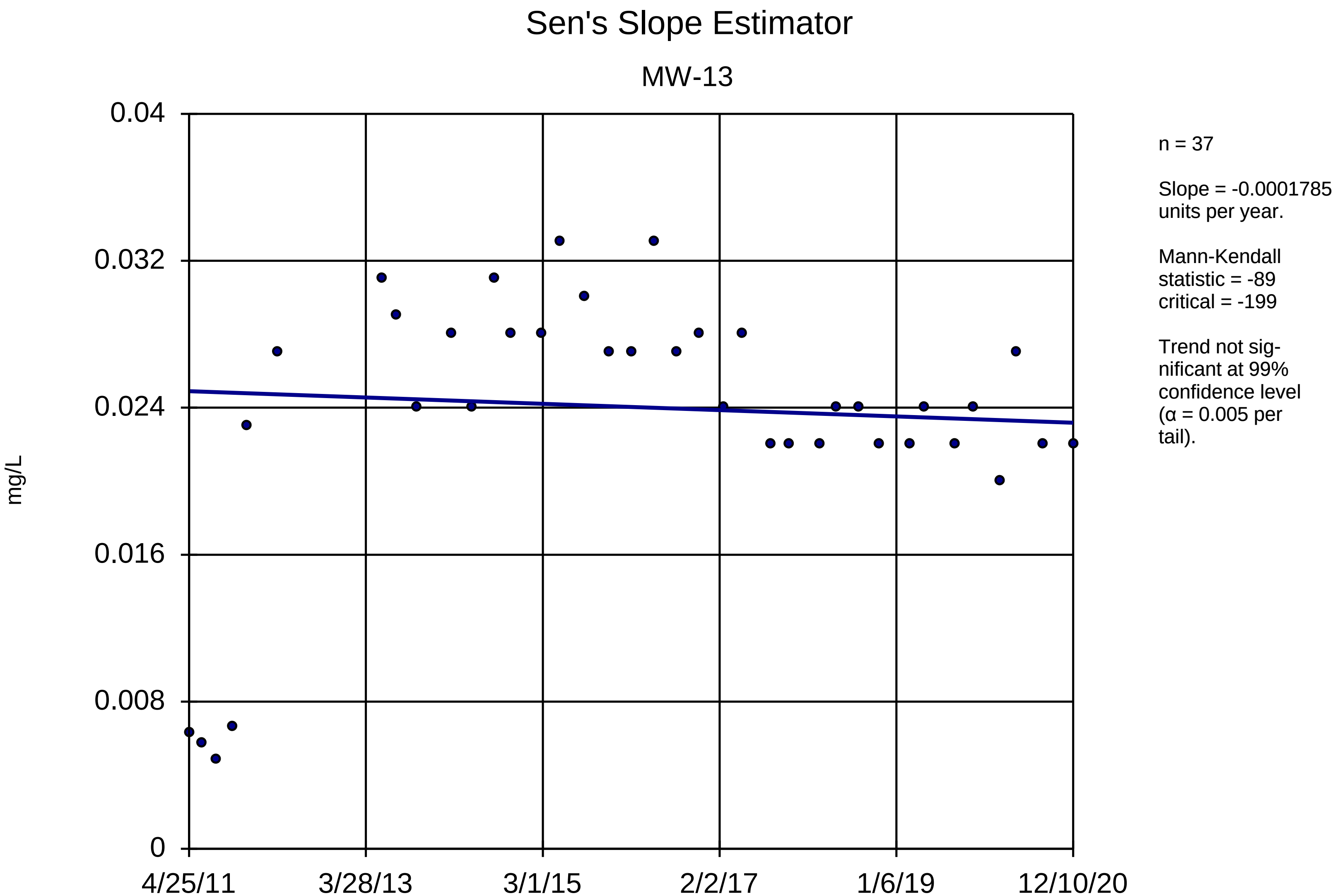
Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved   Analysis Run 4/2/2021 11:43 AM

Utility Site P   Client: Weaver Consultants Group   Data: Powerton Sanitas Database

MWG13-15_81678

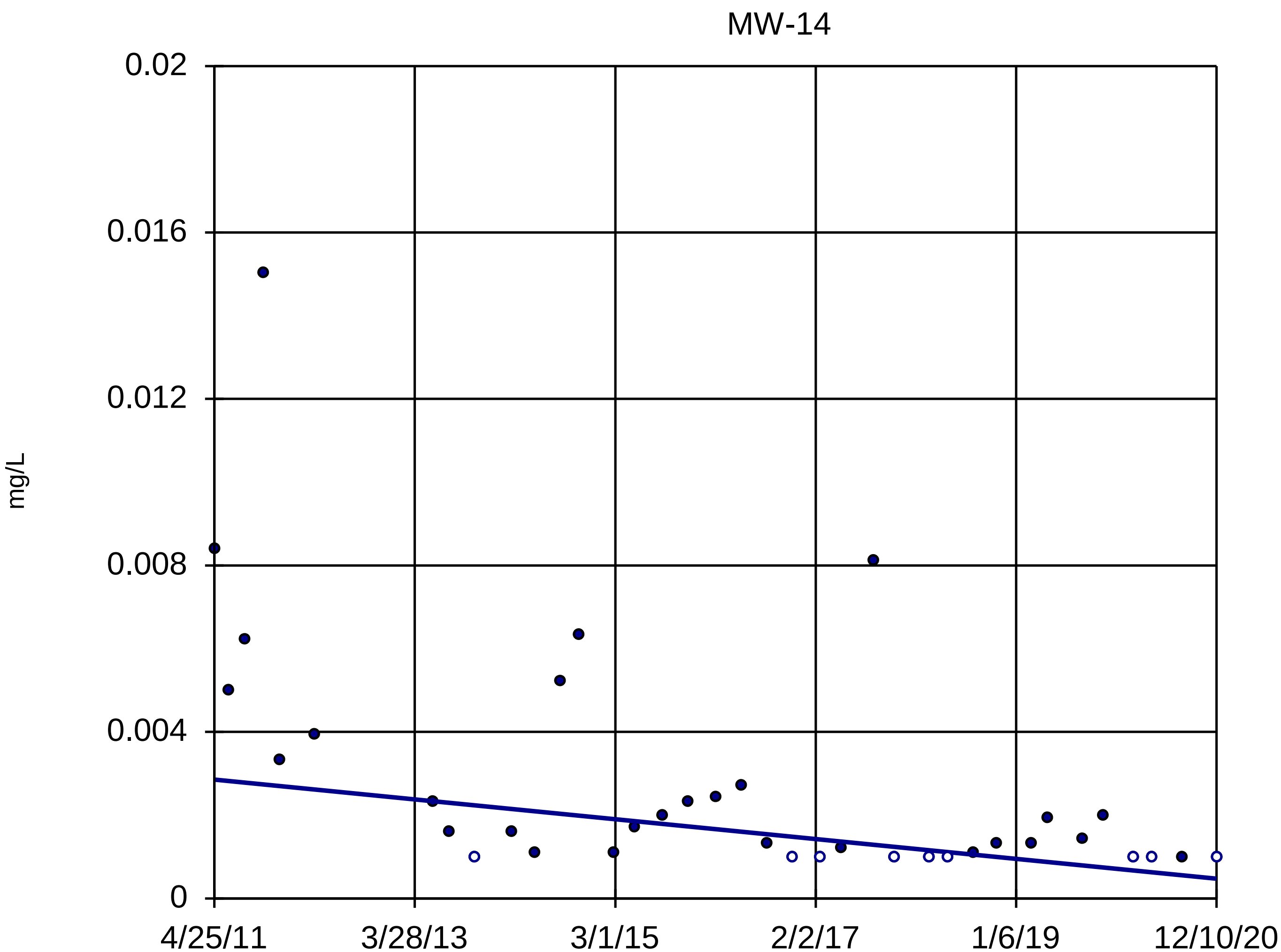



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 37

Slope = -0.0002473 units per year.

Mann-Kendall statistic = -282 critical = -199

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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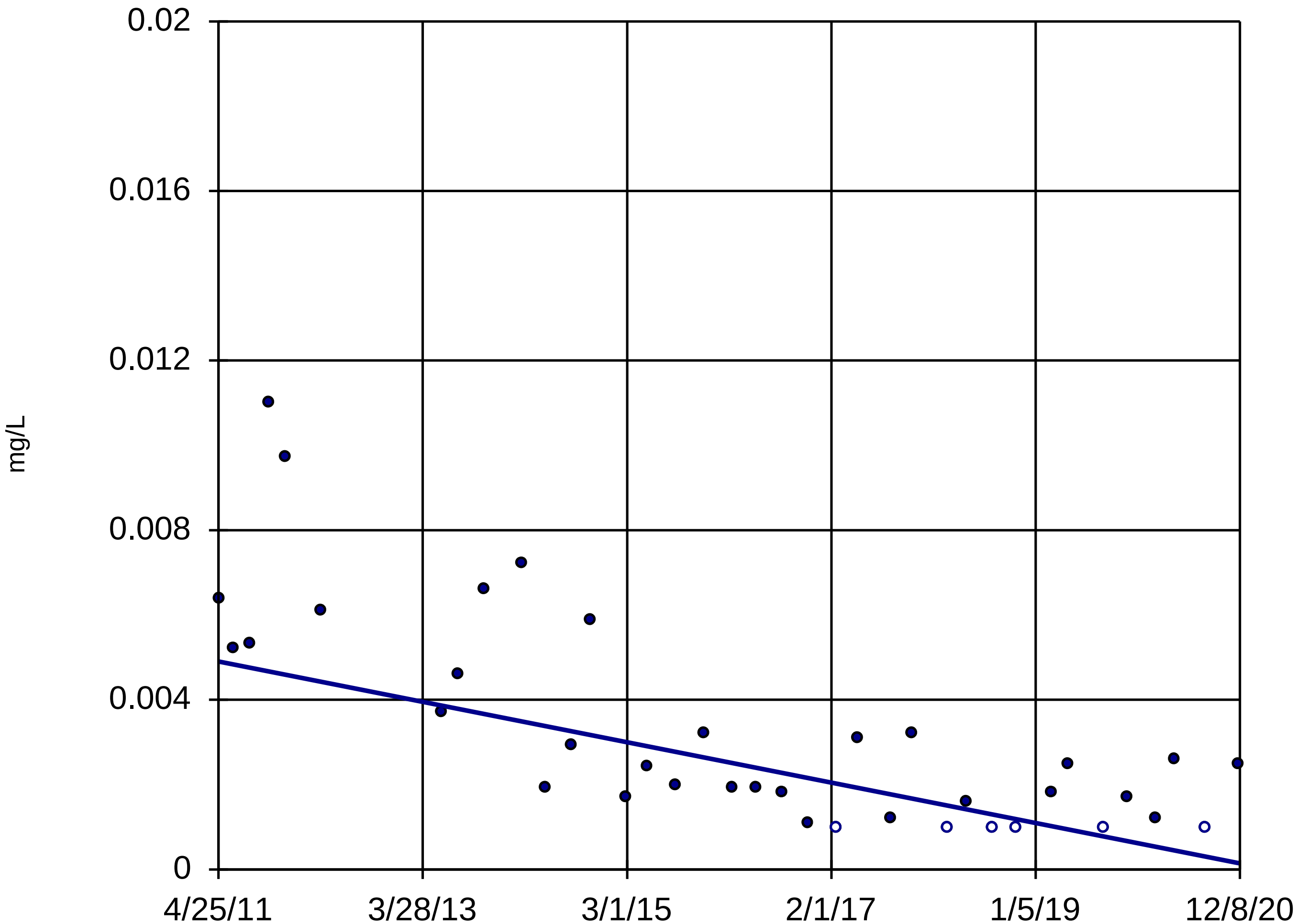
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-15




n = 37

Slope = -0.0004945
units per year.

Mann-Kendall
statistic = -353
critical = -199

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Arsenic, Dissolved Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81681

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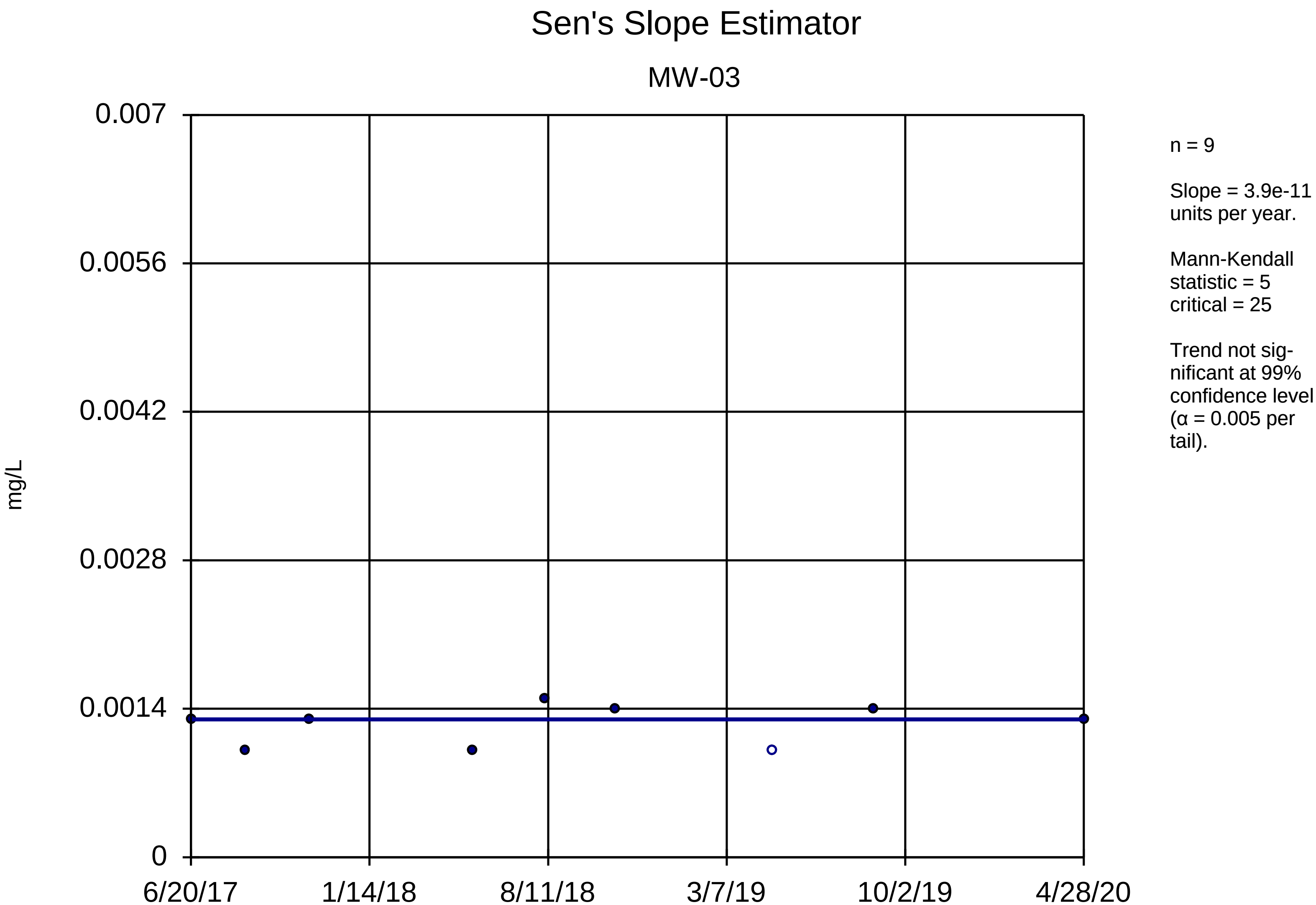
Hollow symbols indicate censored values.



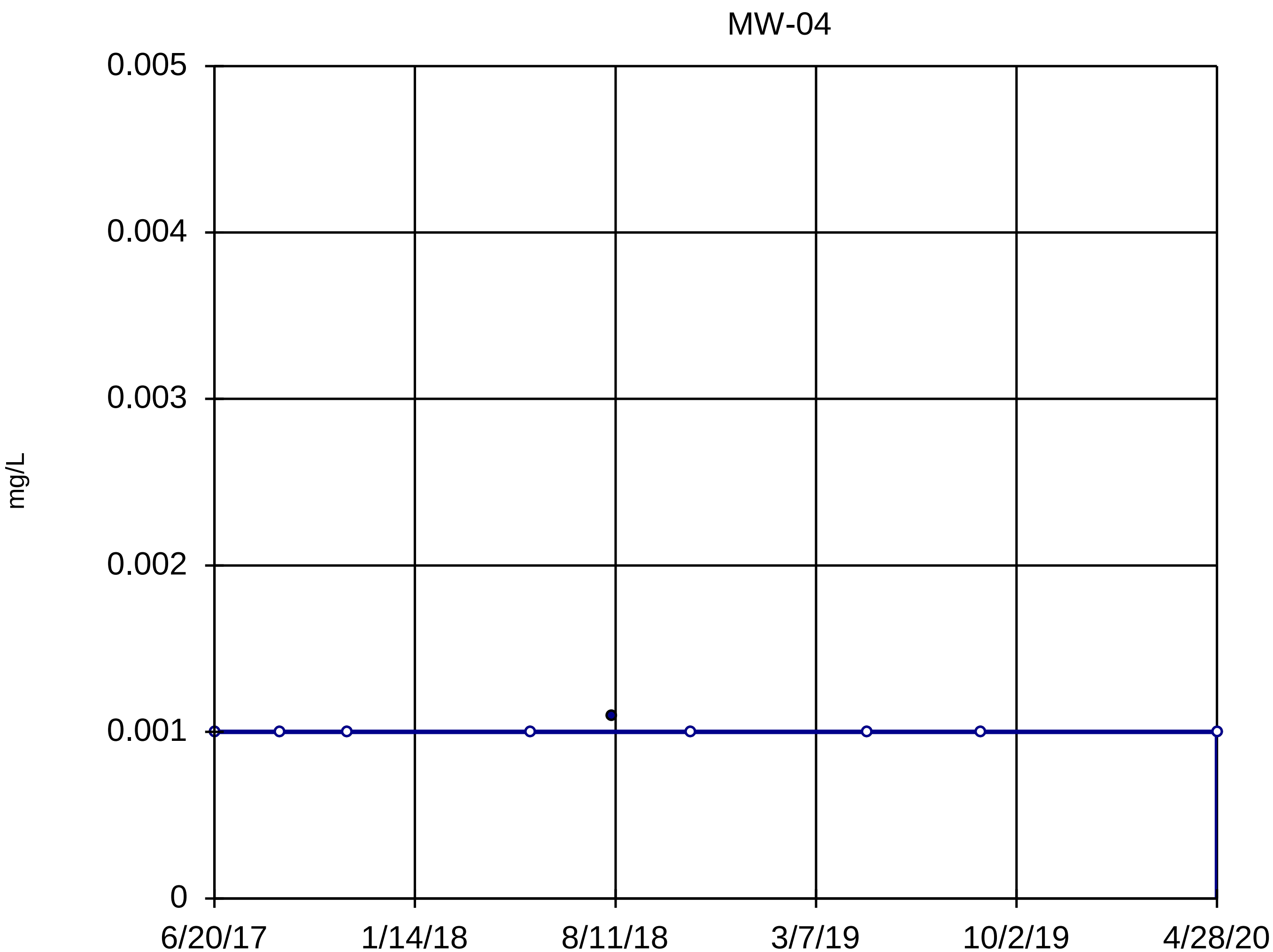

Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81682

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 9

Slope = 0
units per year.

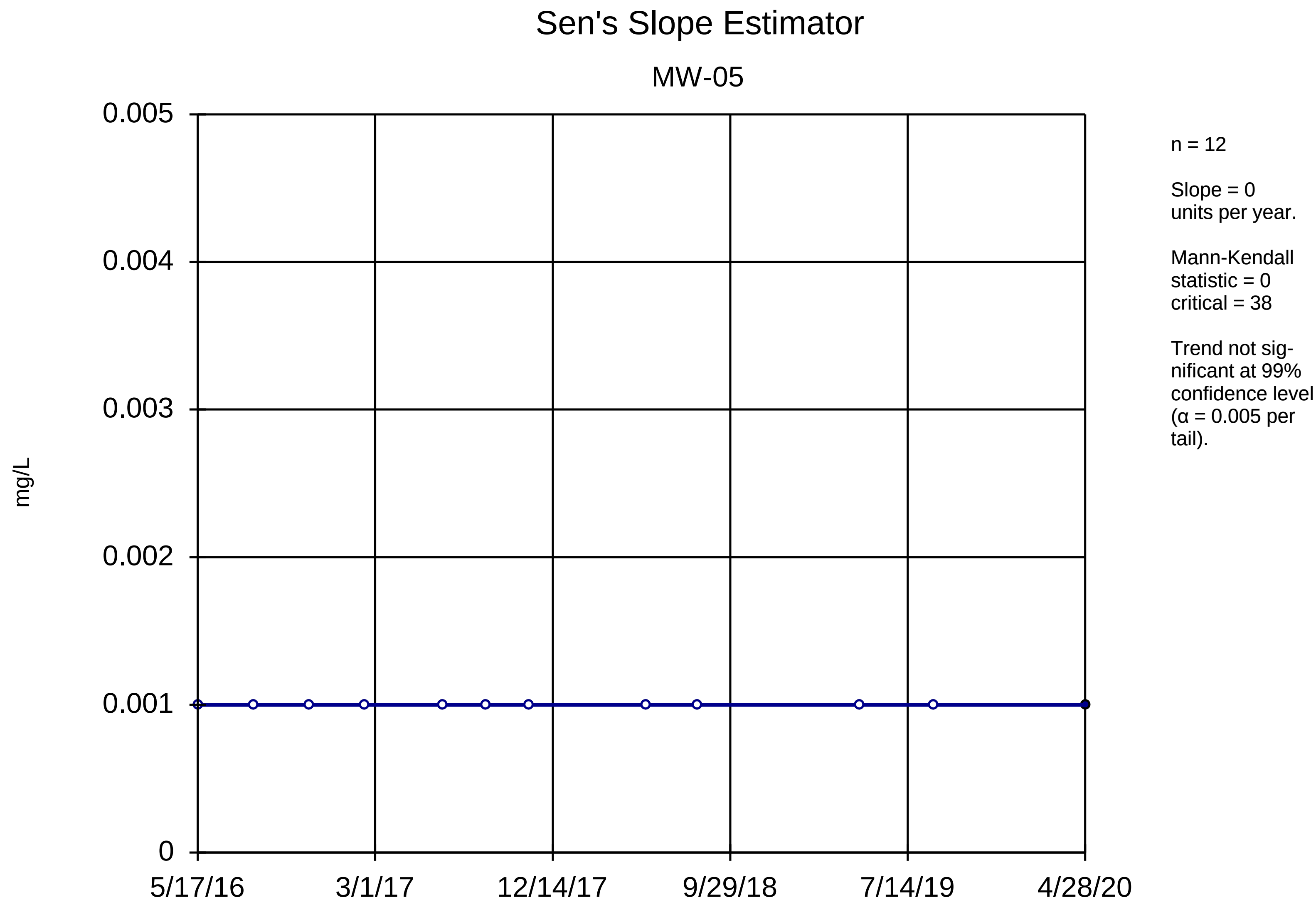
Mann-Kendall
statistic = 0
critical = 25

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.



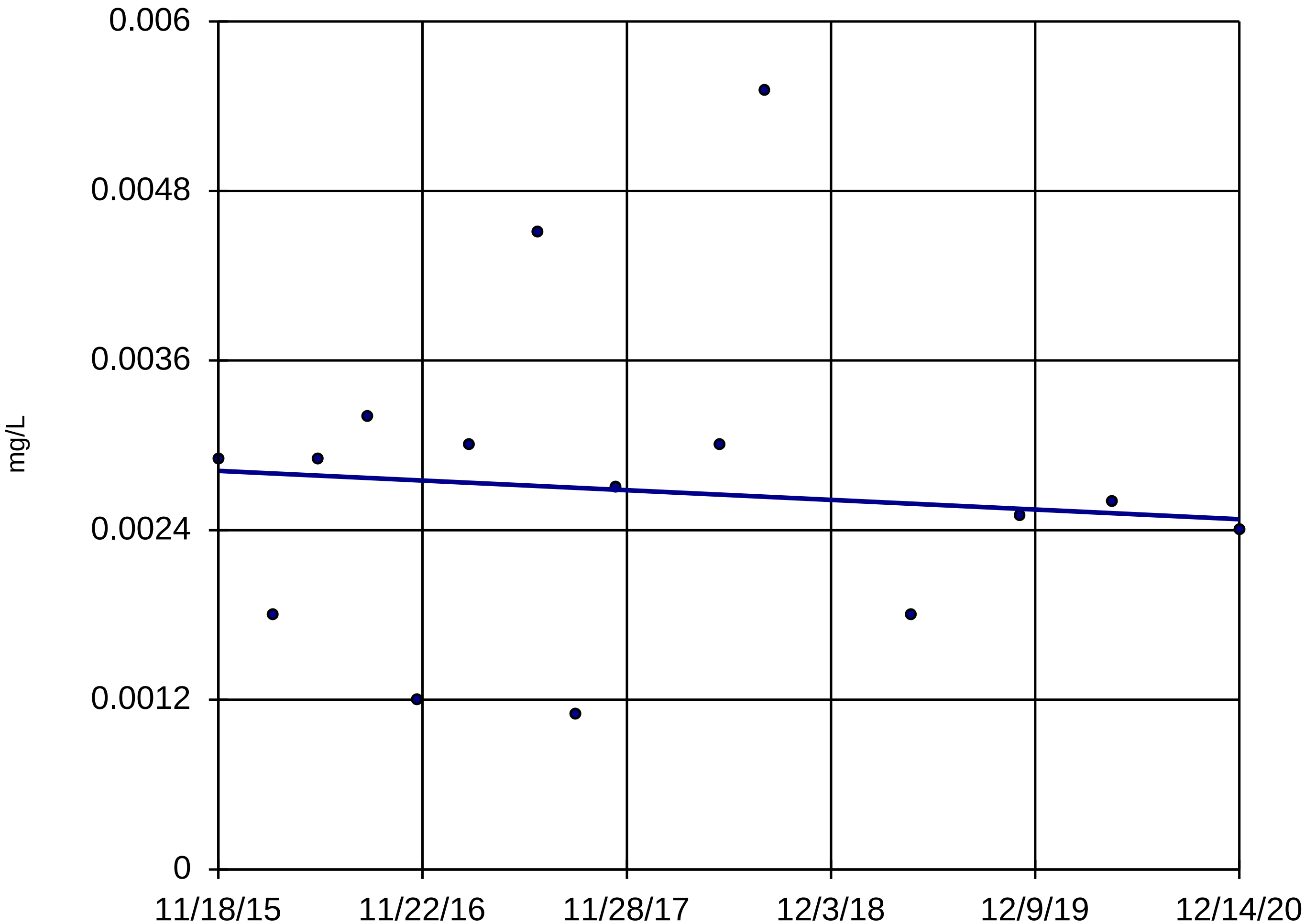

Constituent: Arsenic, Total Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81684

## Sen's Slope Estimator

MW-08




n = 15

Slope = -0.00006747
units per year.

Mann-Kendall
statistic = -6
critical = -53

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

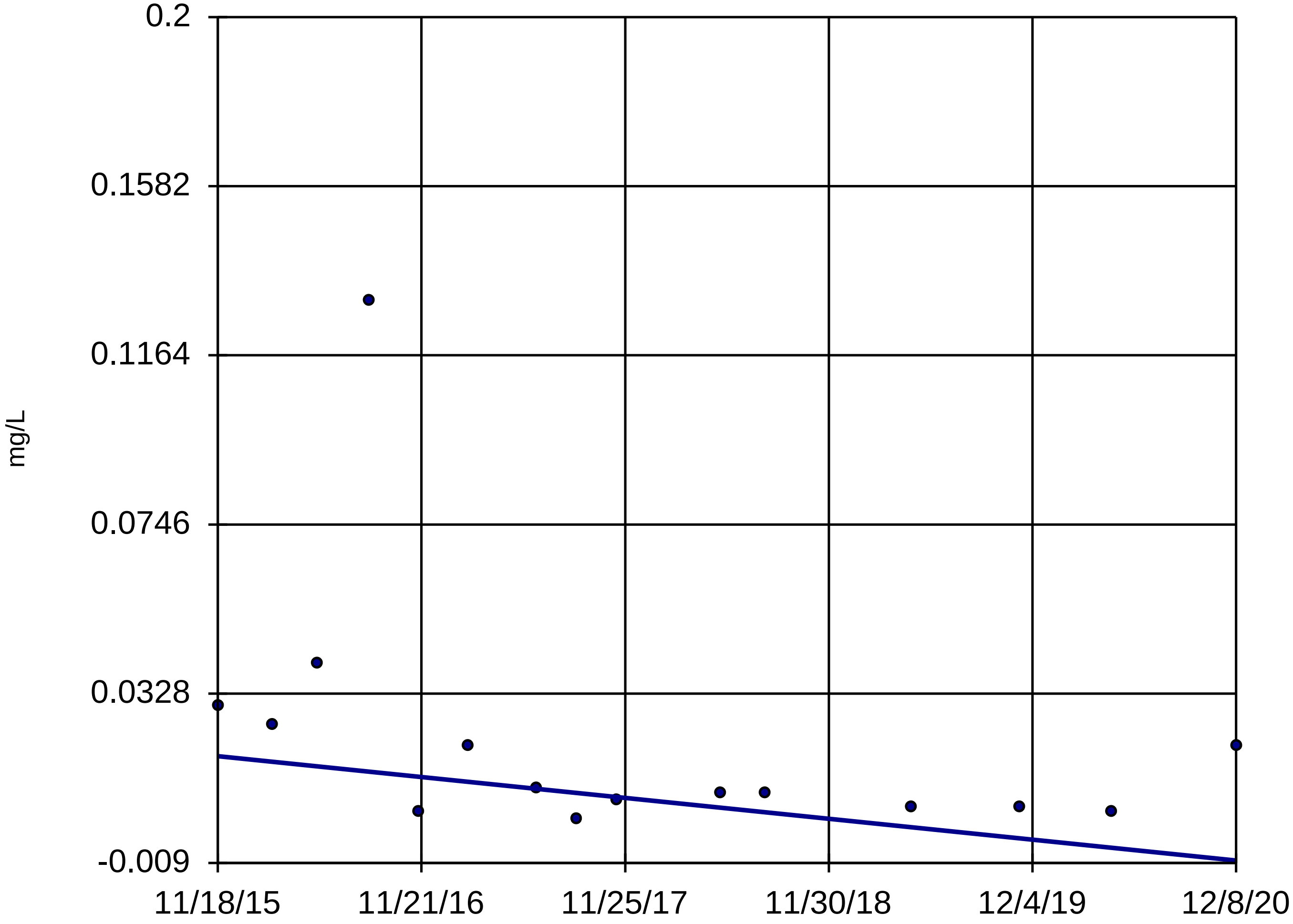
Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81685

## Sen's Slope Estimator

MW-15




n = 15

Slope = -0.005098
units per year.

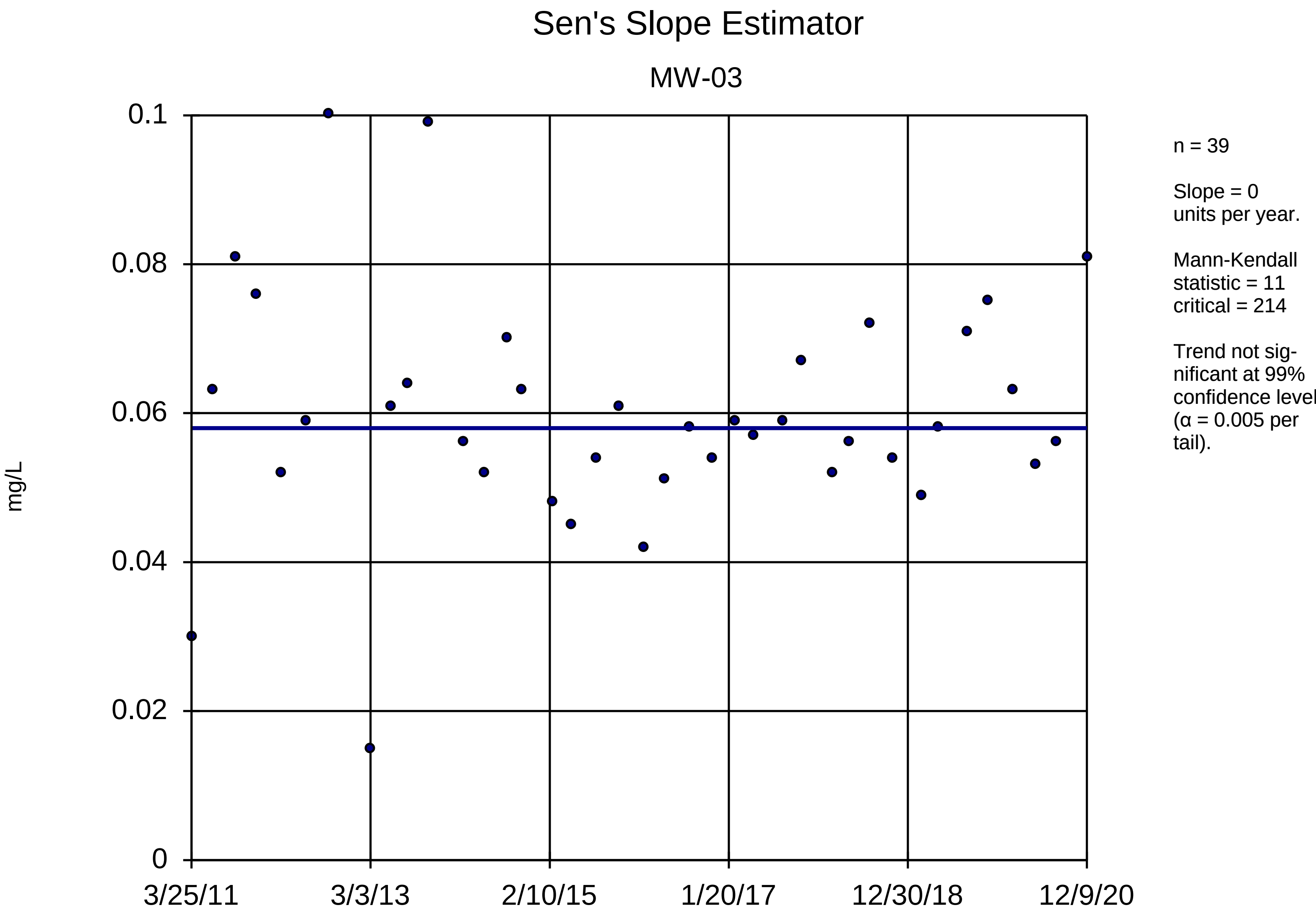
Mann-Kendall
statistic = -42
critical = -53

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Arsenic, Total    Analysis Run 4/2/2021 11:44 AM

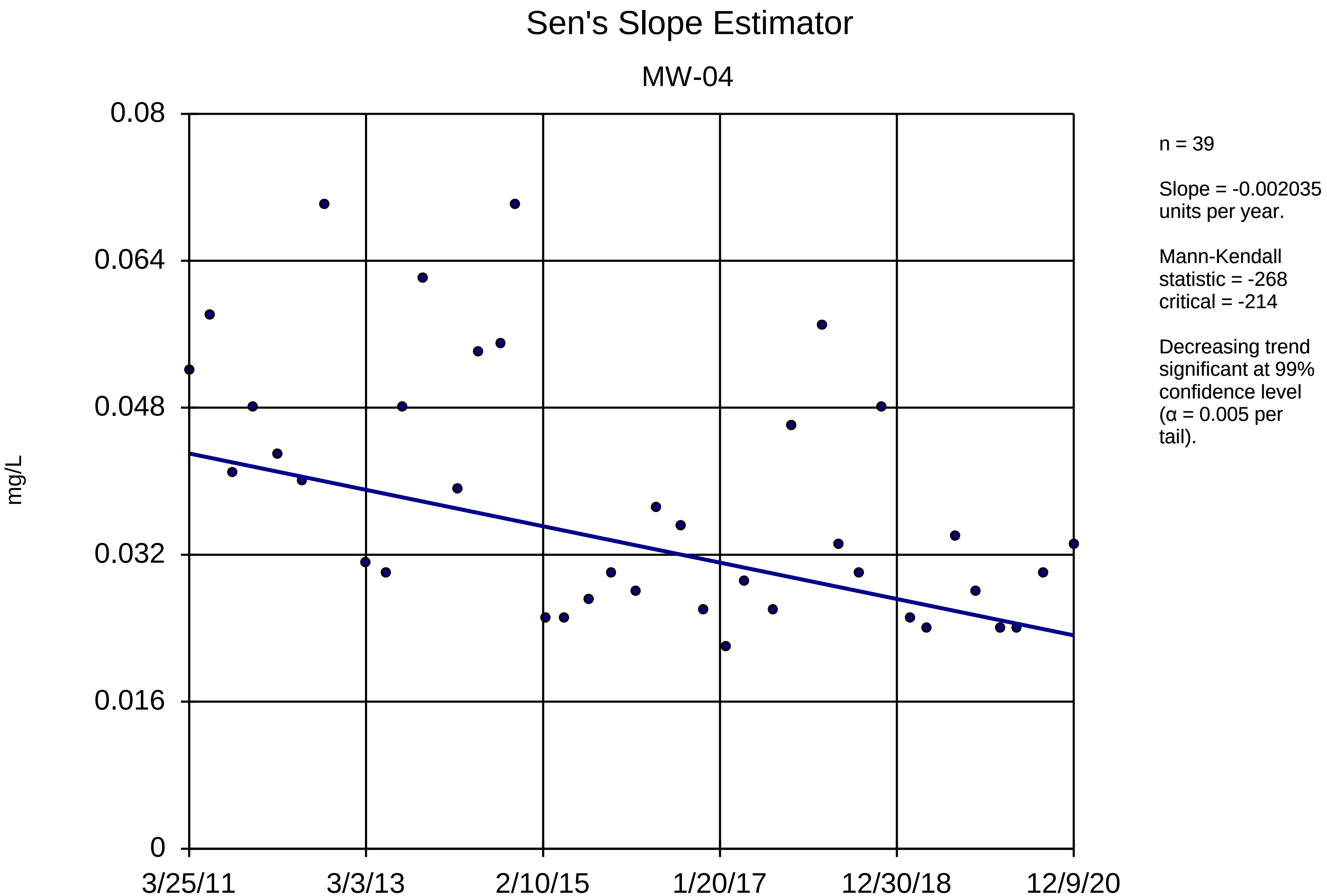
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81686




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

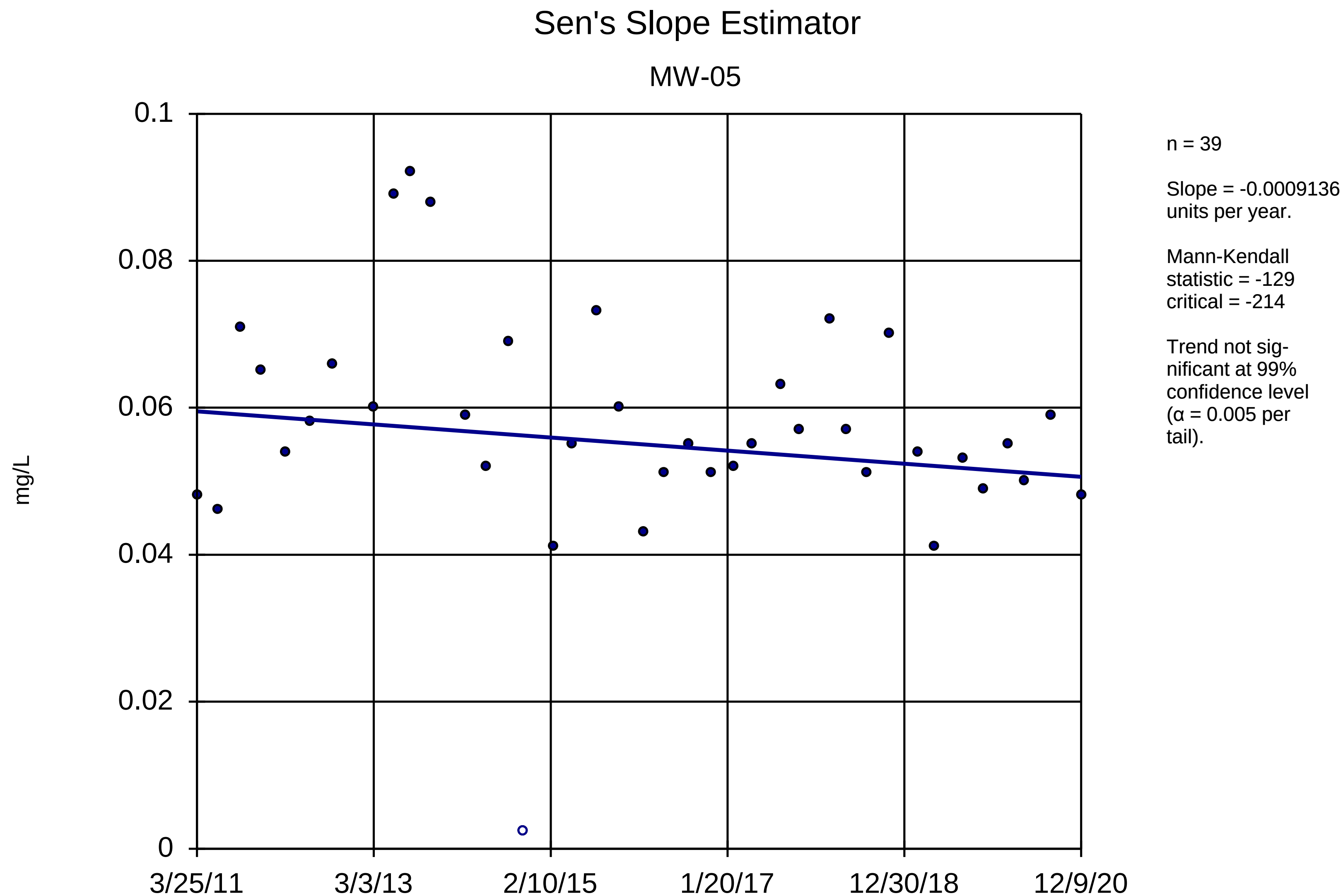
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

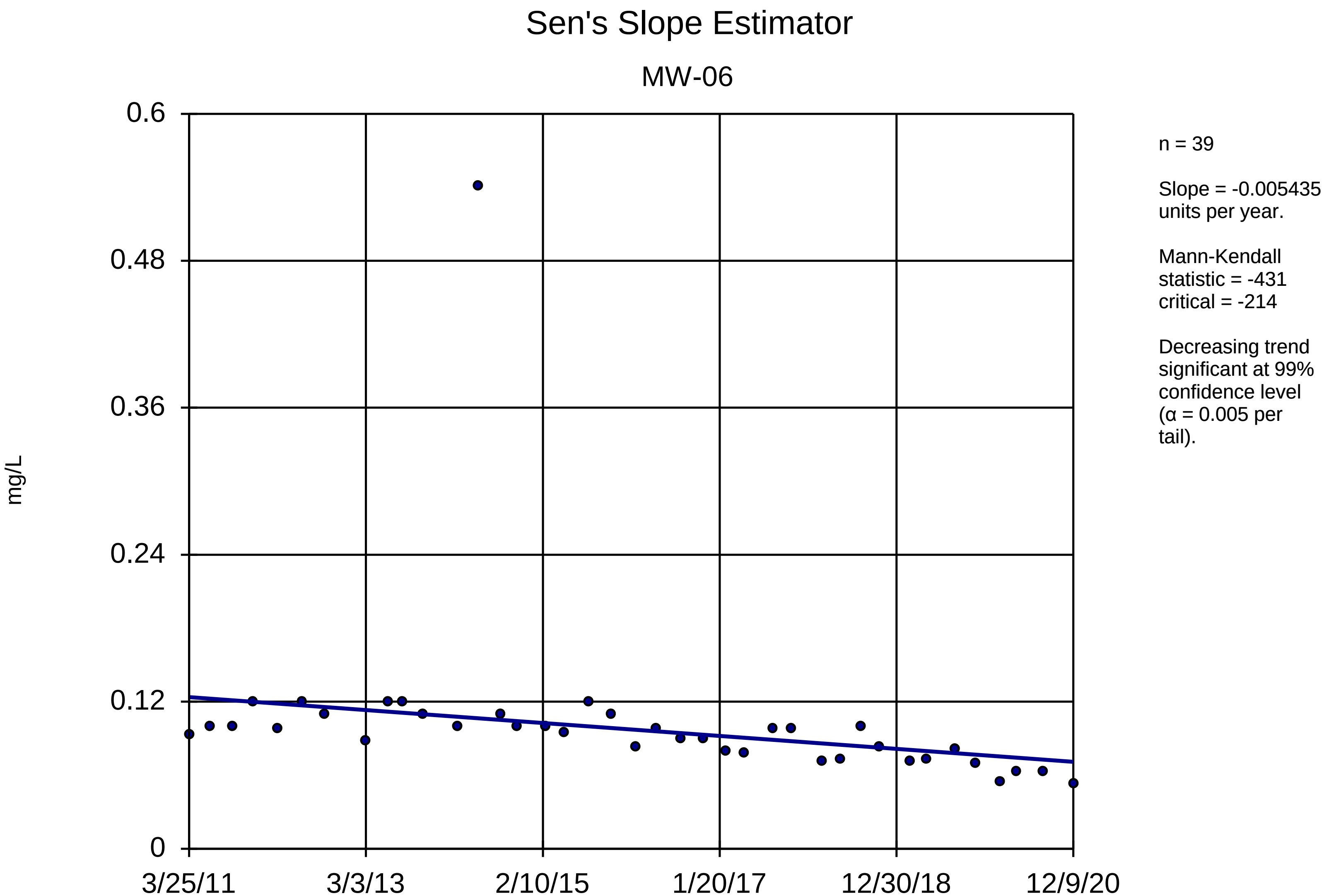
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

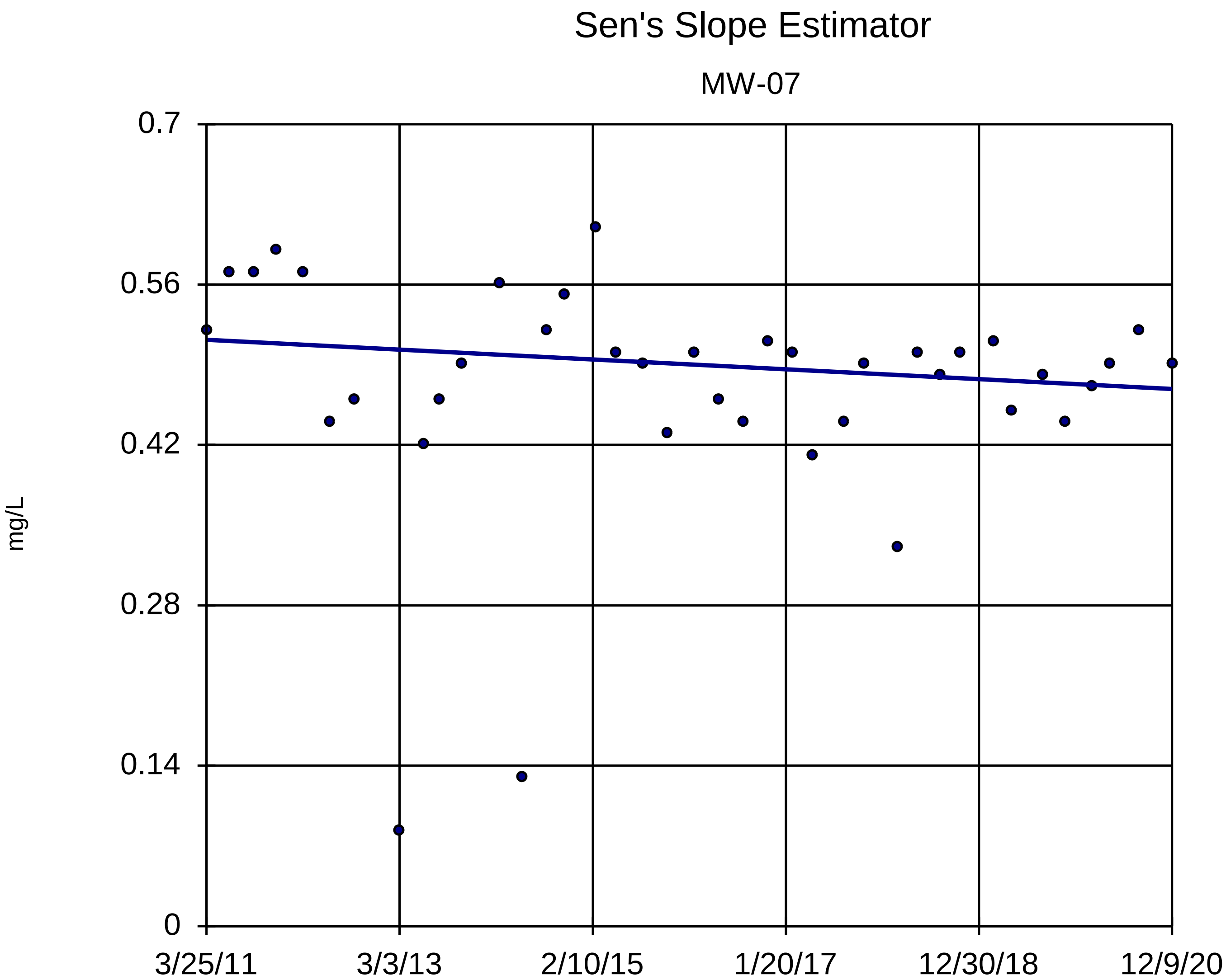
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81690




n = 39

Slope = -0.004419 units per year.

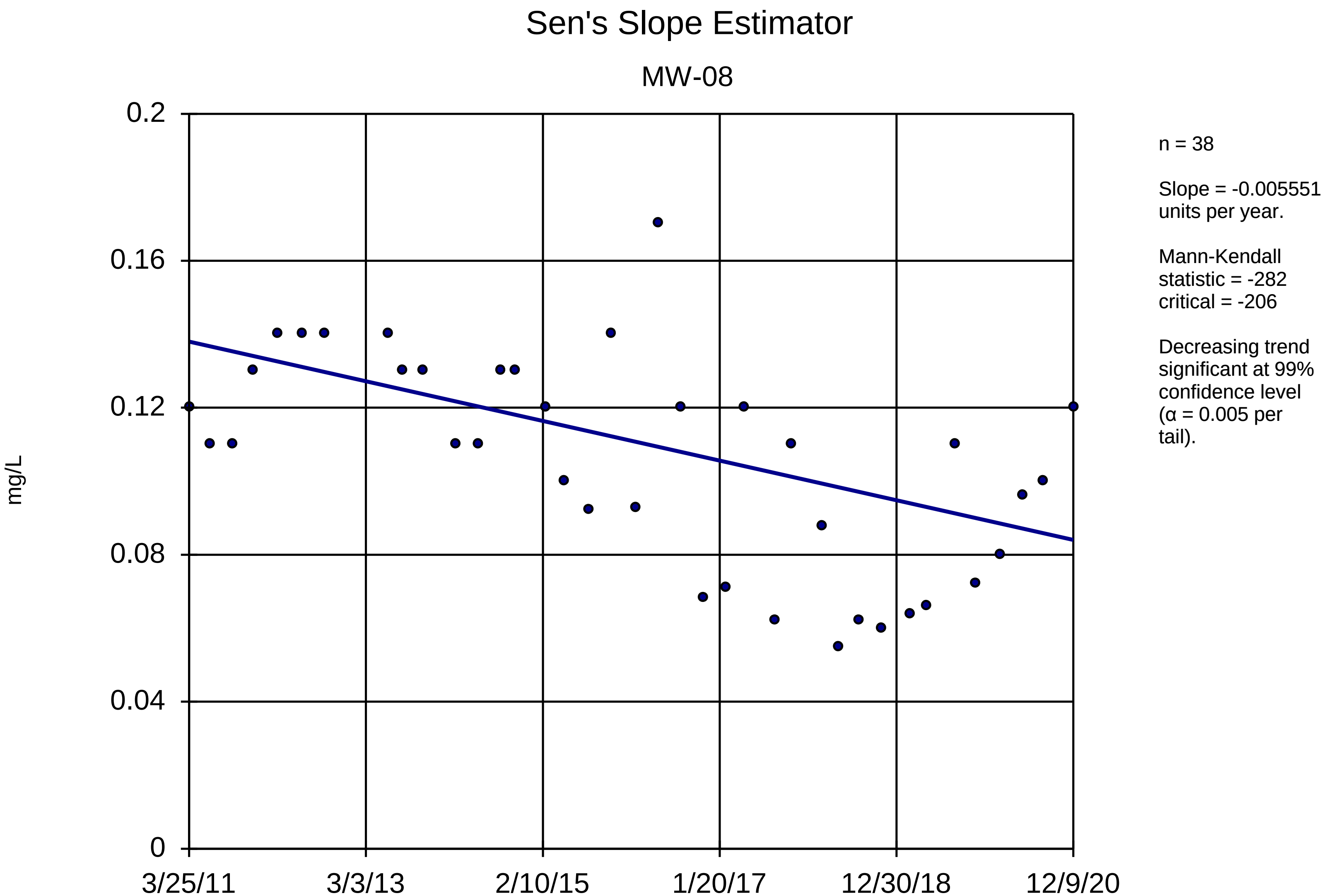
Mann-Kendall statistic = -102 critical = -214

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

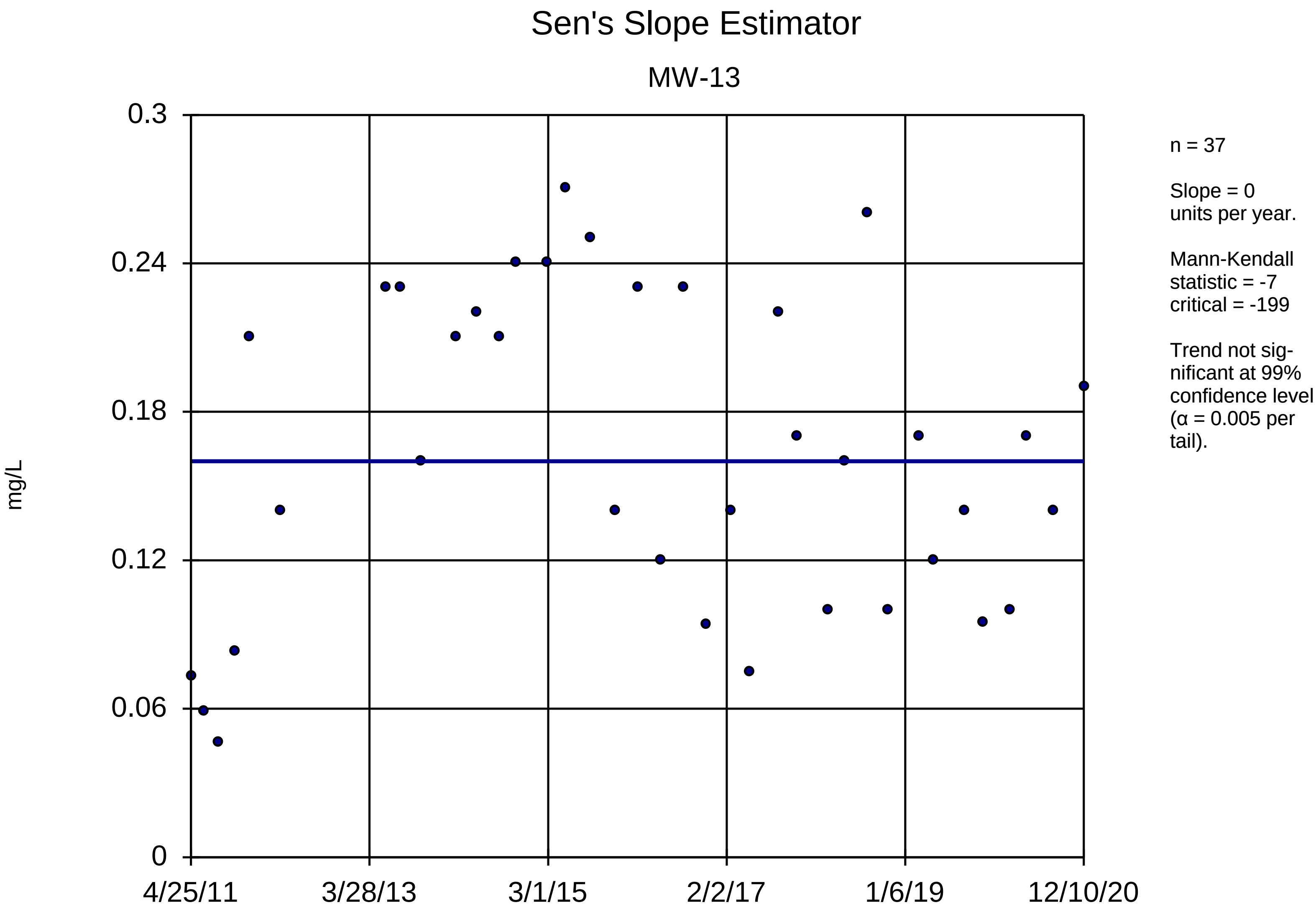
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81691




Constituent: Barium, Dissolved  Analysis Run 4/2/2021 11:44 AM

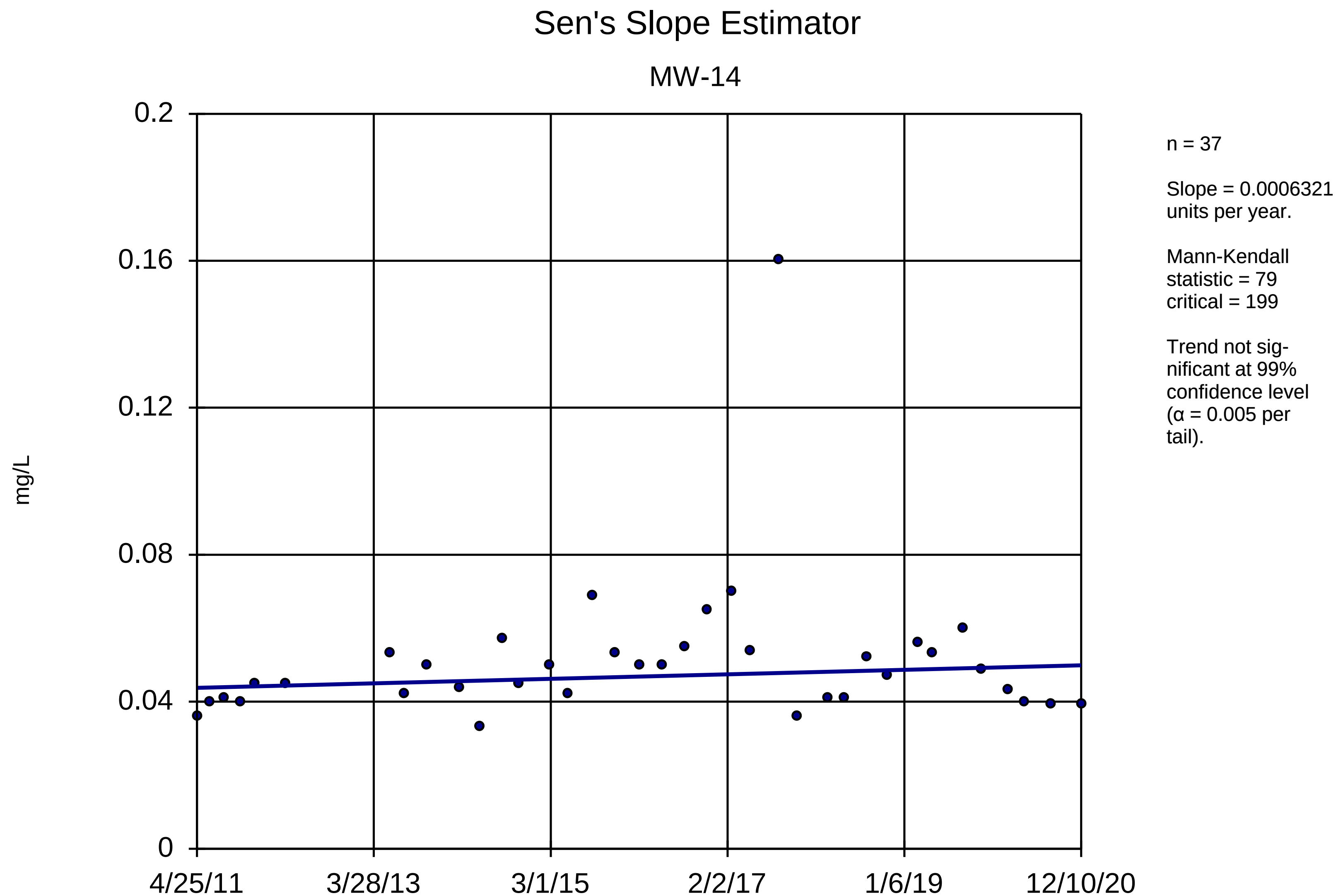
Utility Site P  Client: Weaver Consultants Group  Data: Powerton Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

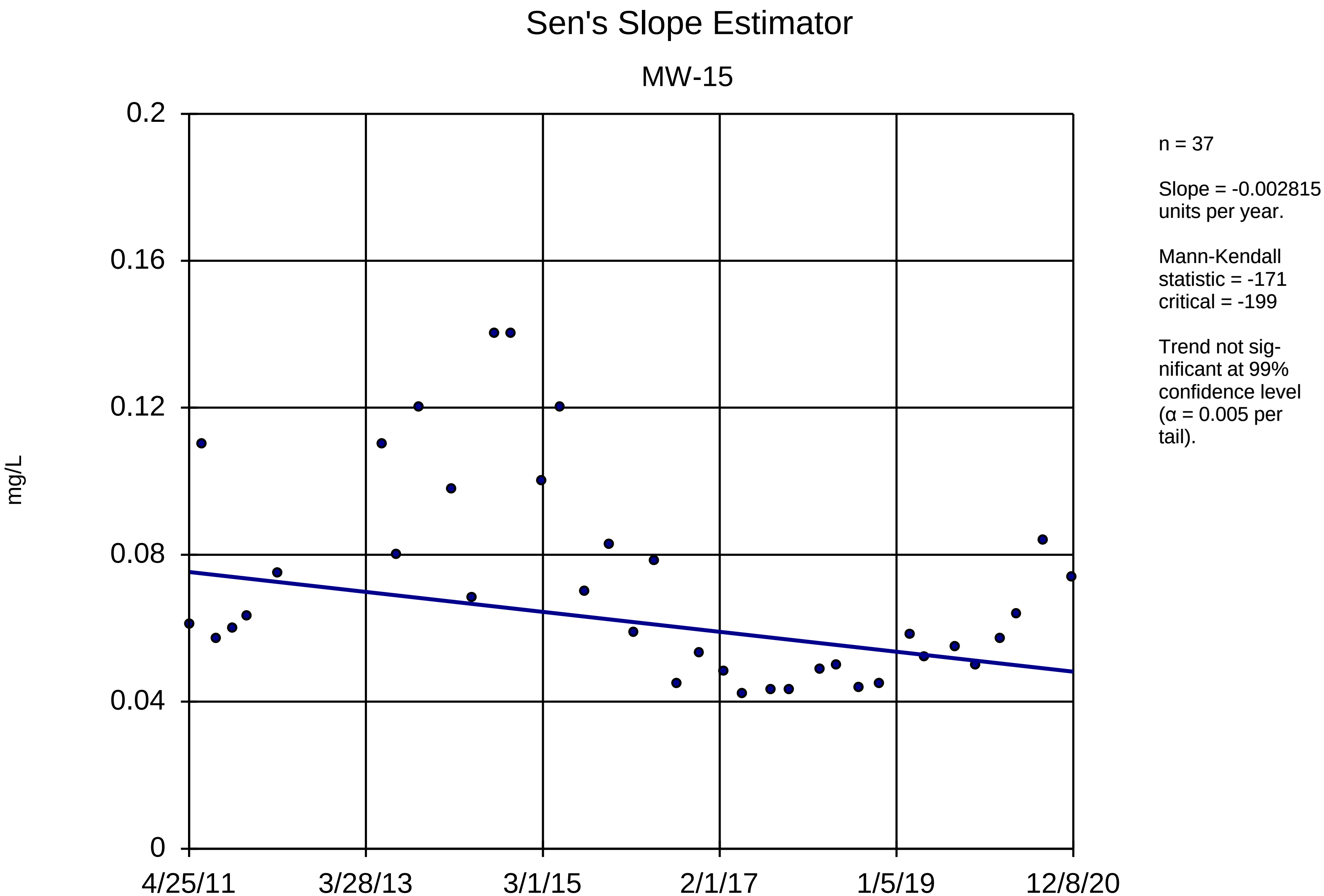
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81693




Constituent: Barium, Dissolved Analysis Run 4/2/2021 11:44 AM

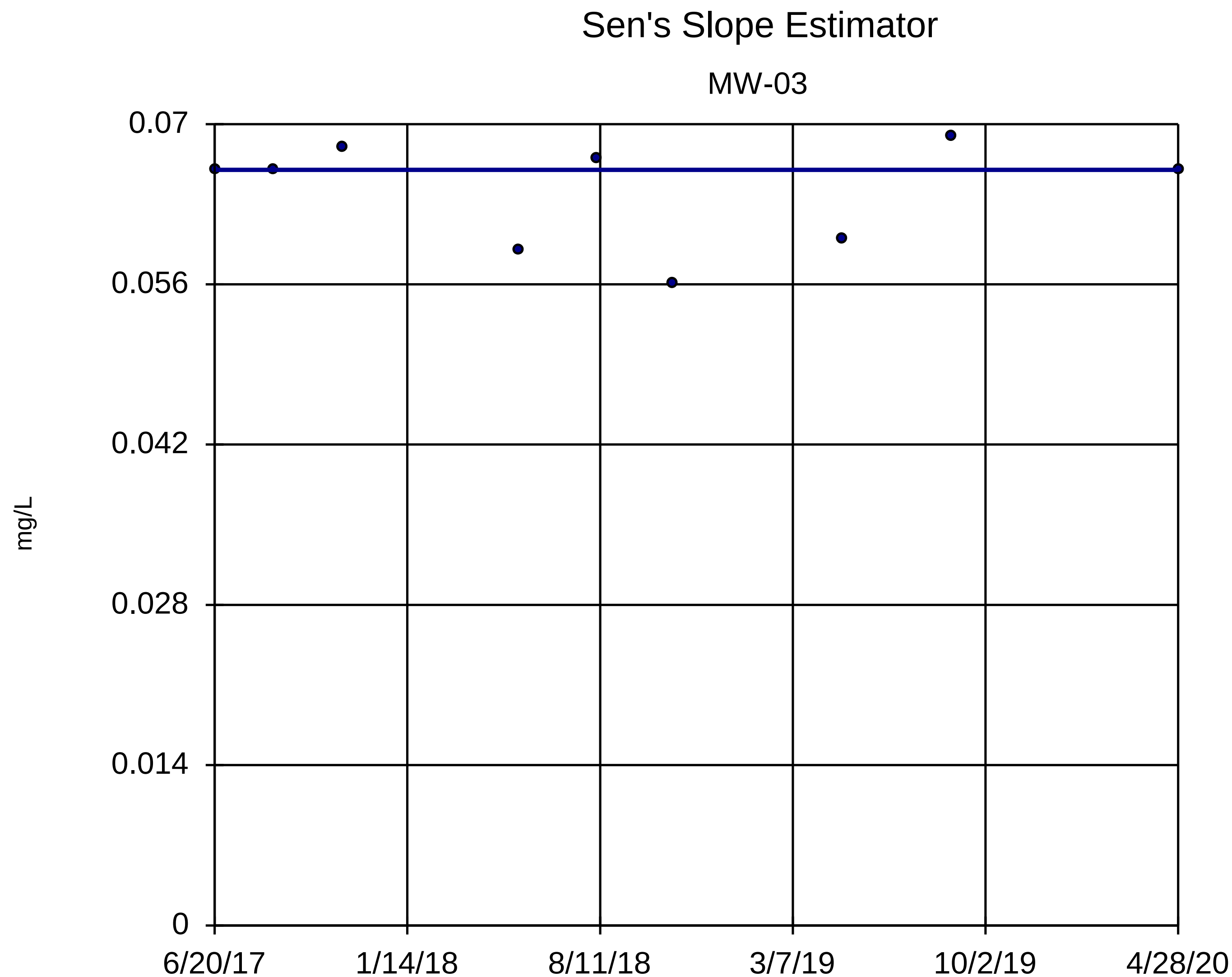
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81695




n = 9

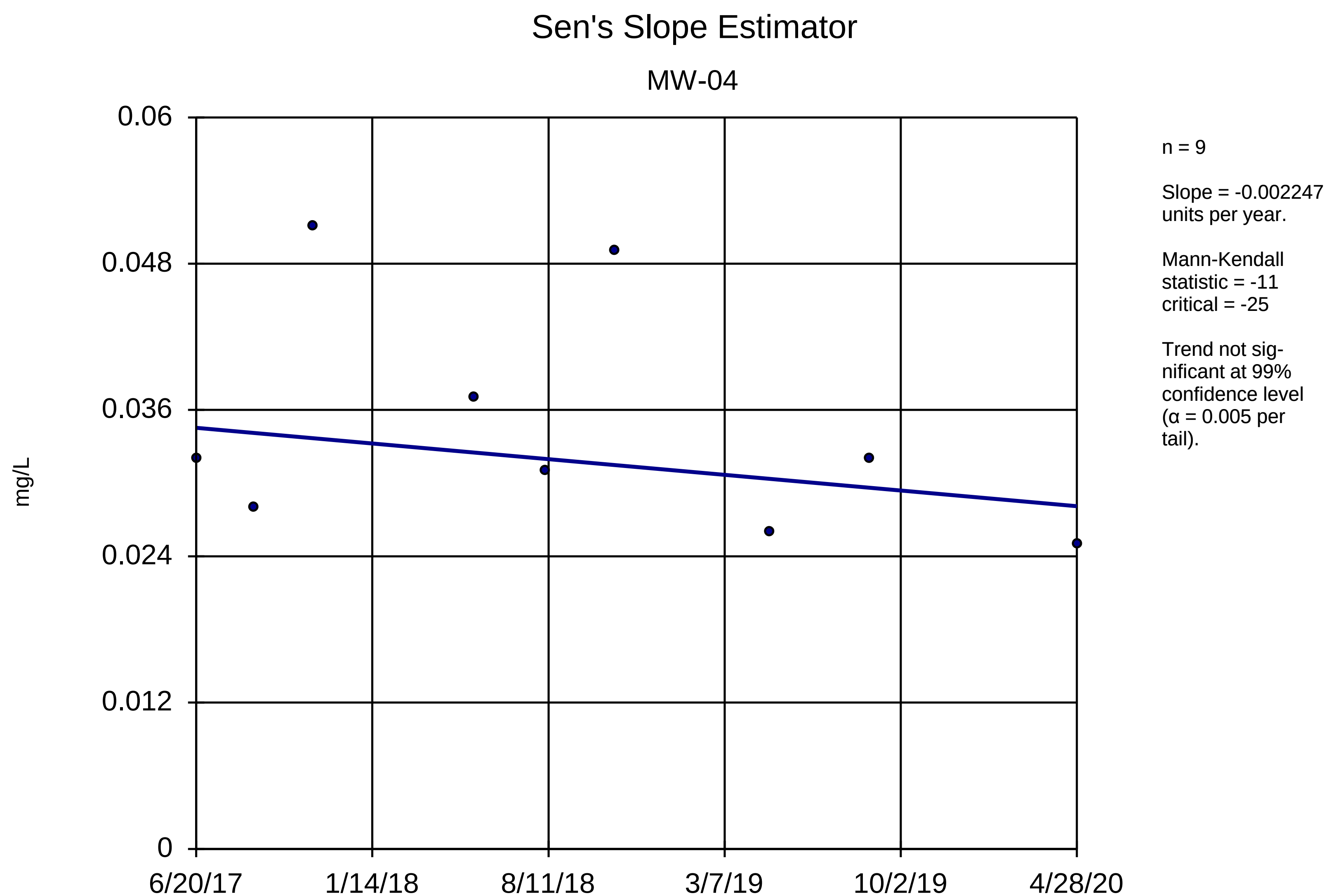
Slope = 0
units per year.

Mann-Kendall
statistic = 1
critical = 25

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

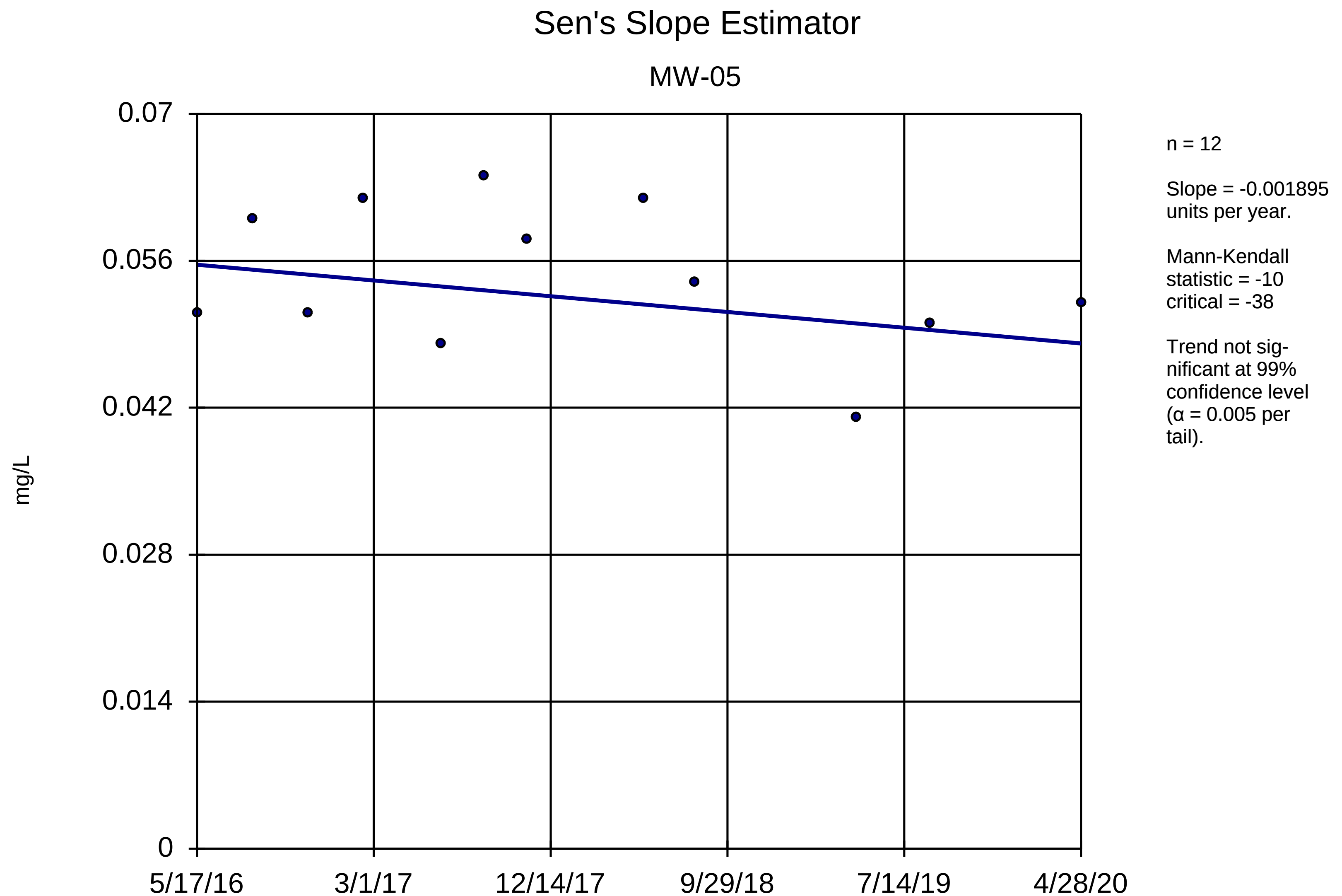
Constituent: Barium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Barium, Total    Analysis Run 4/2/2021 11:44 AM

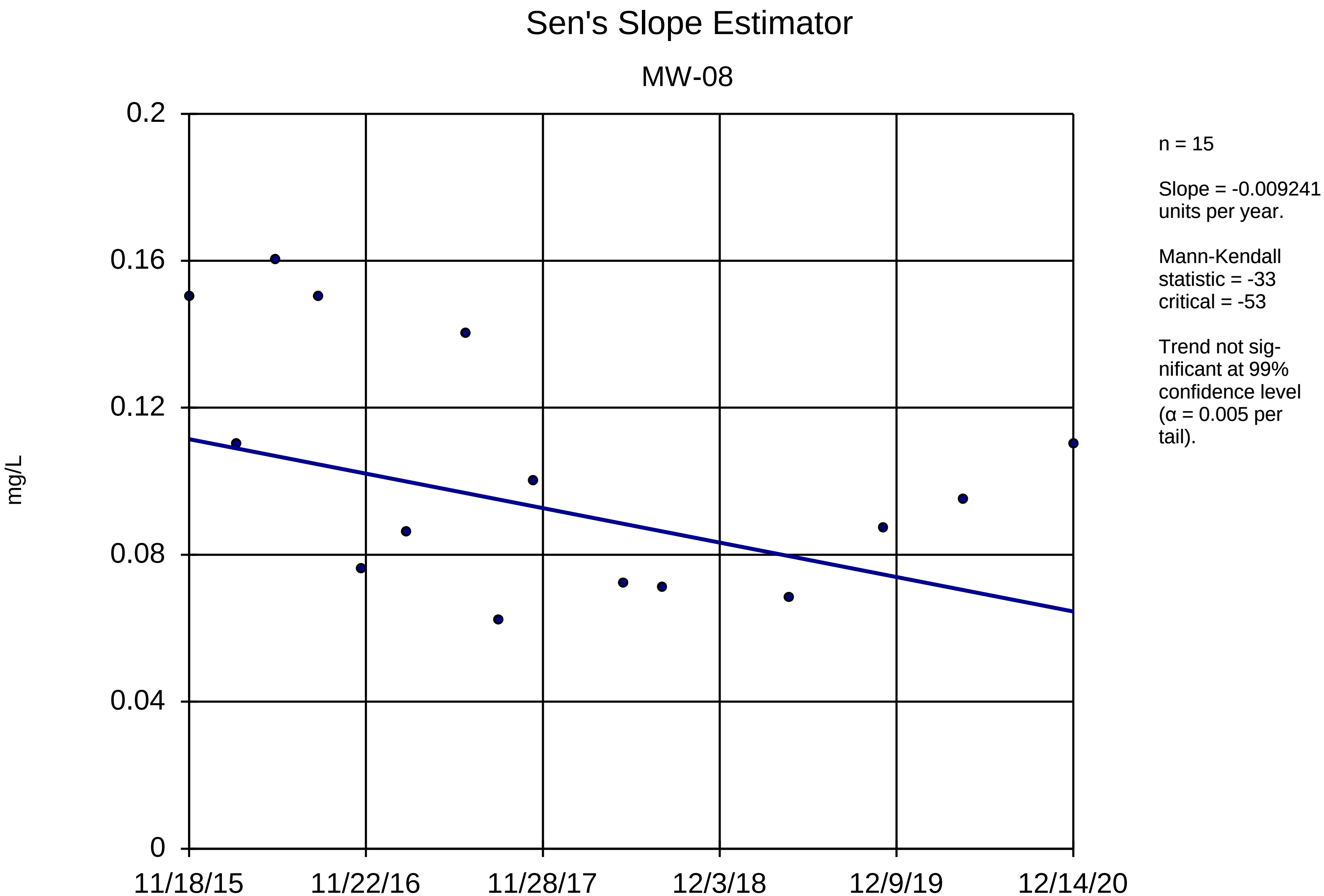
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Barium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

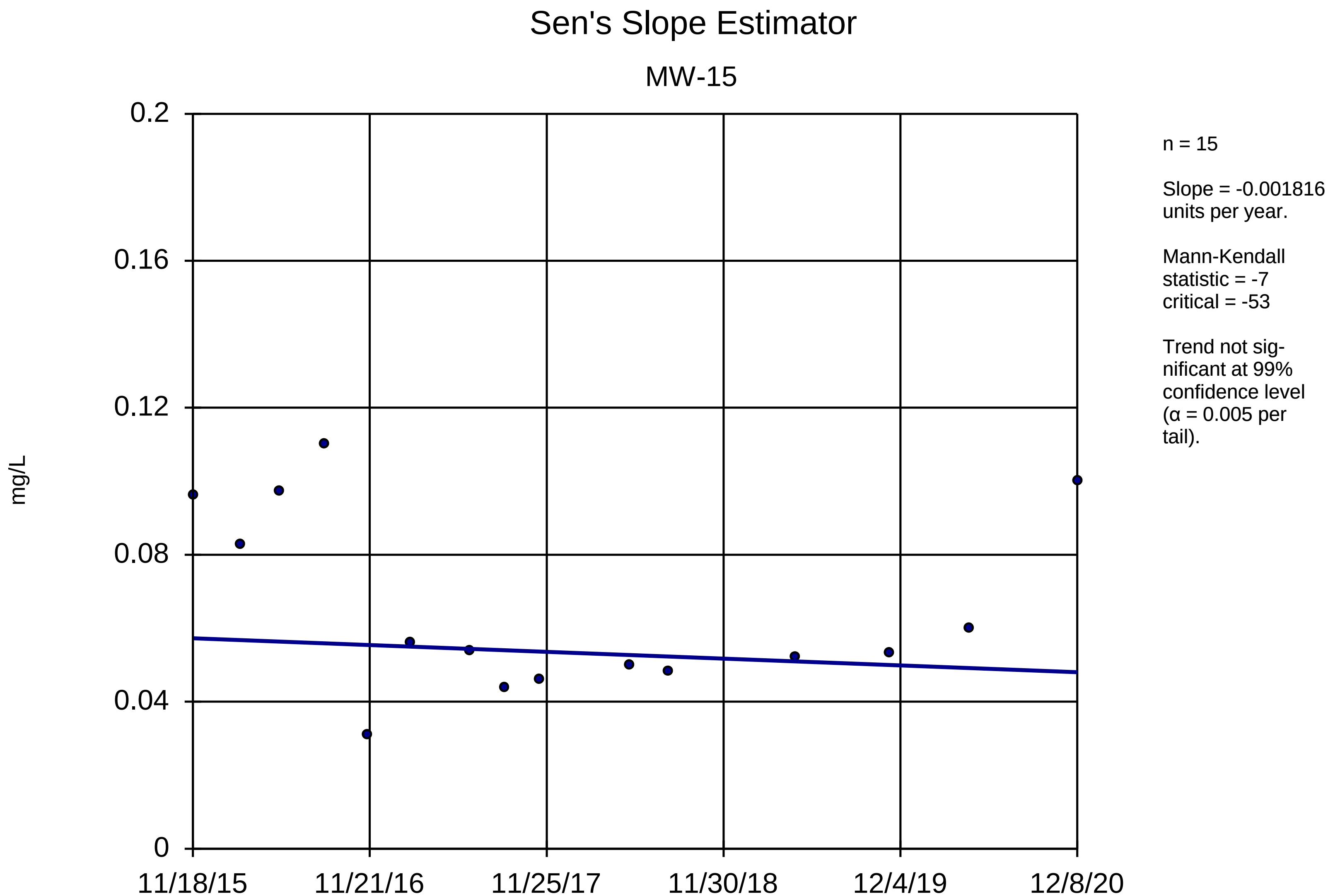
MWG13-15_81698




Constituent: Barium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81699

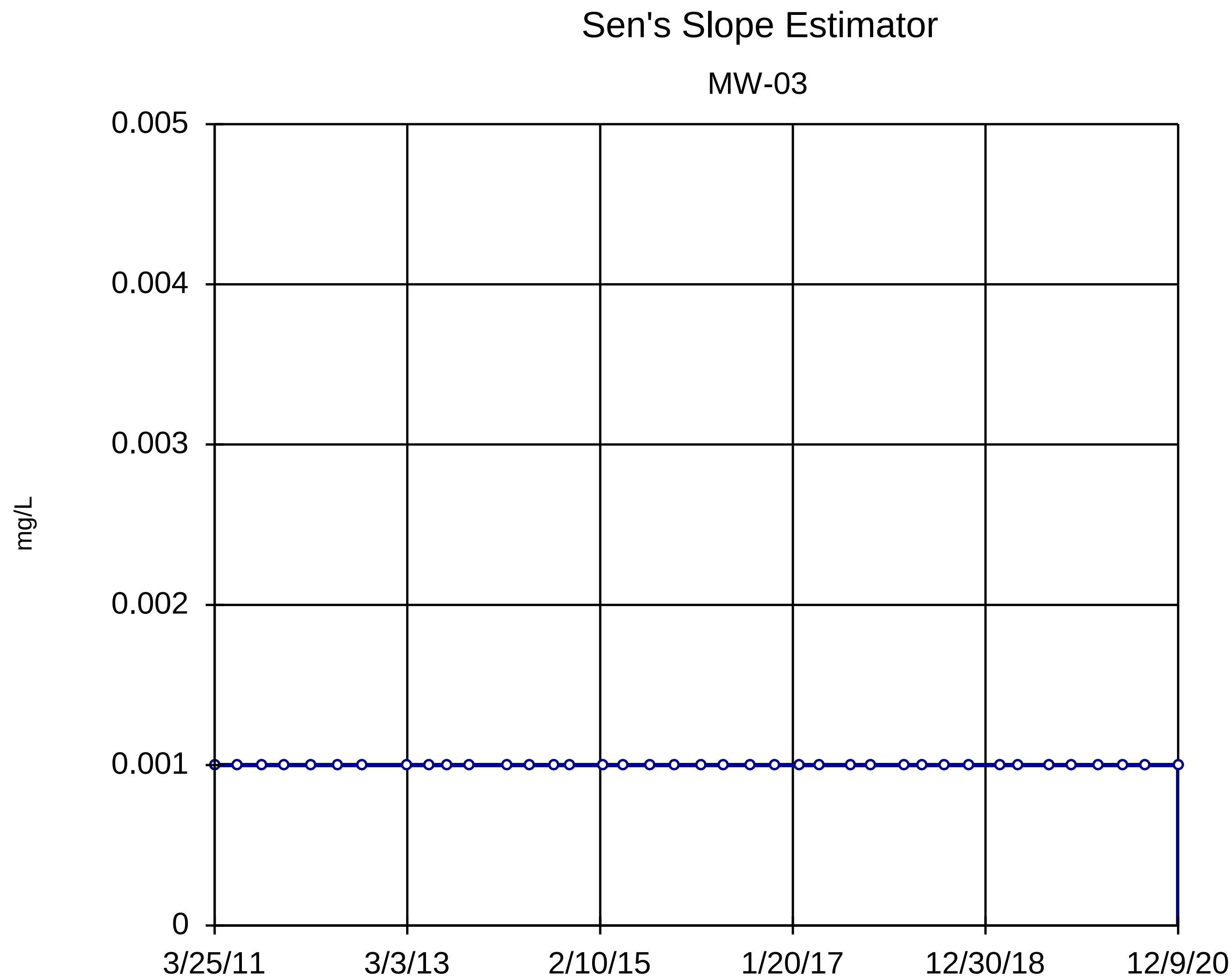



Constituent: Barium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81700

Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81701

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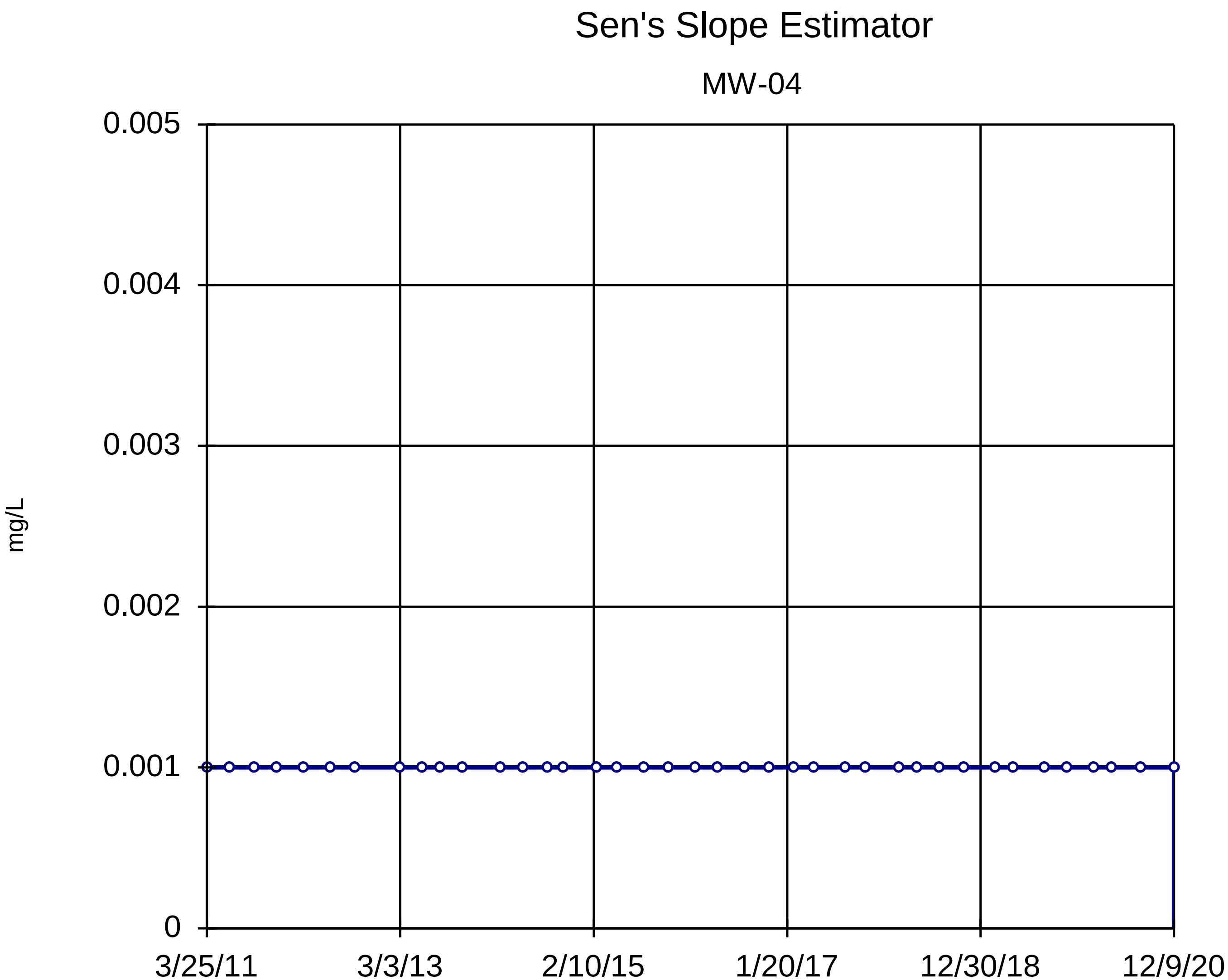
Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

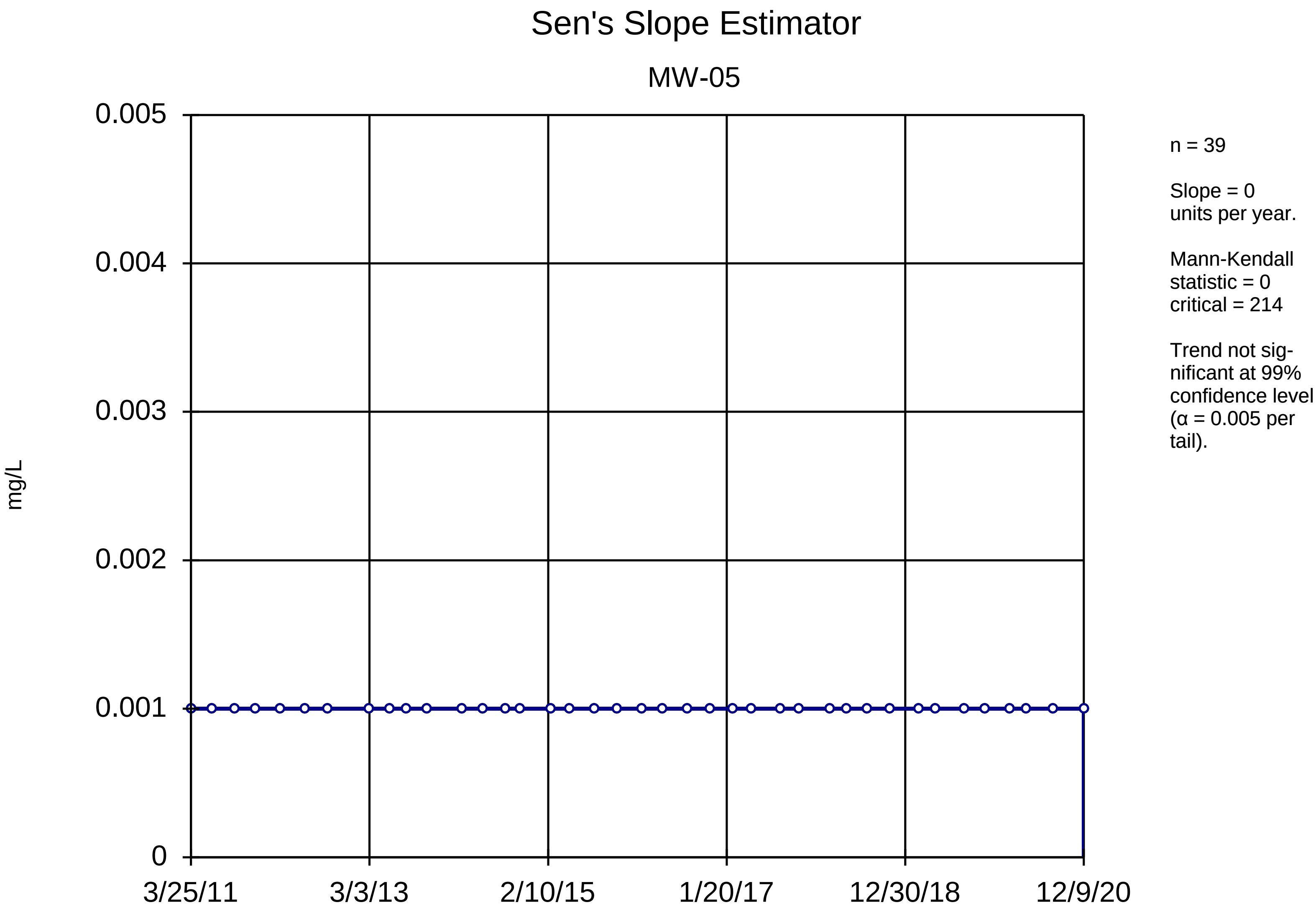
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Beryllium, Dissolved  Analysis Run 4/2/2021 11:44 AM

Utility Site P  Client: Weaver Consultants Group  Data: Powerton Sanitas Database

MWG13-15_81702

Hollow symbols indicate censored values.

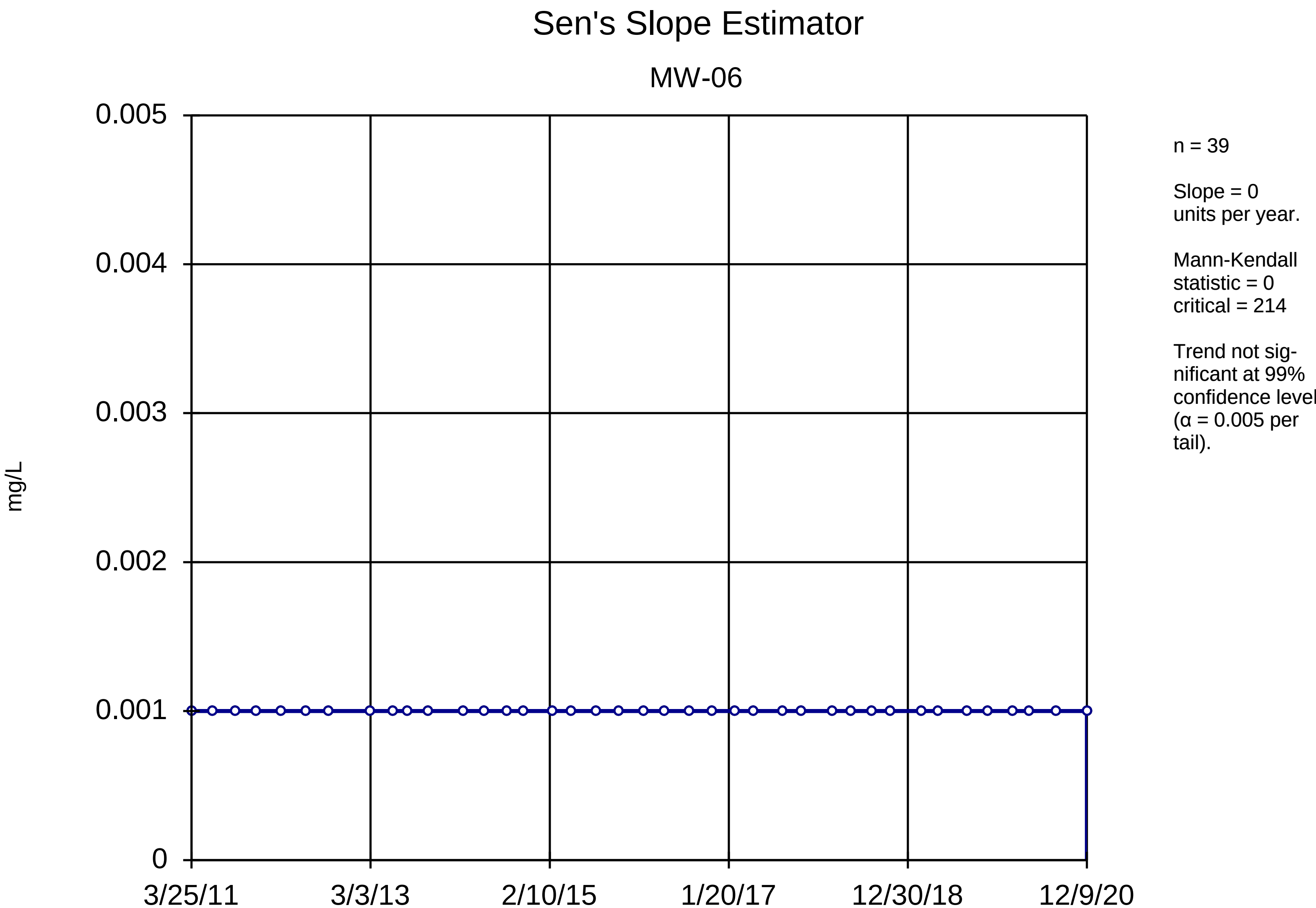



Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81703

Hollow symbols indicate censored values.



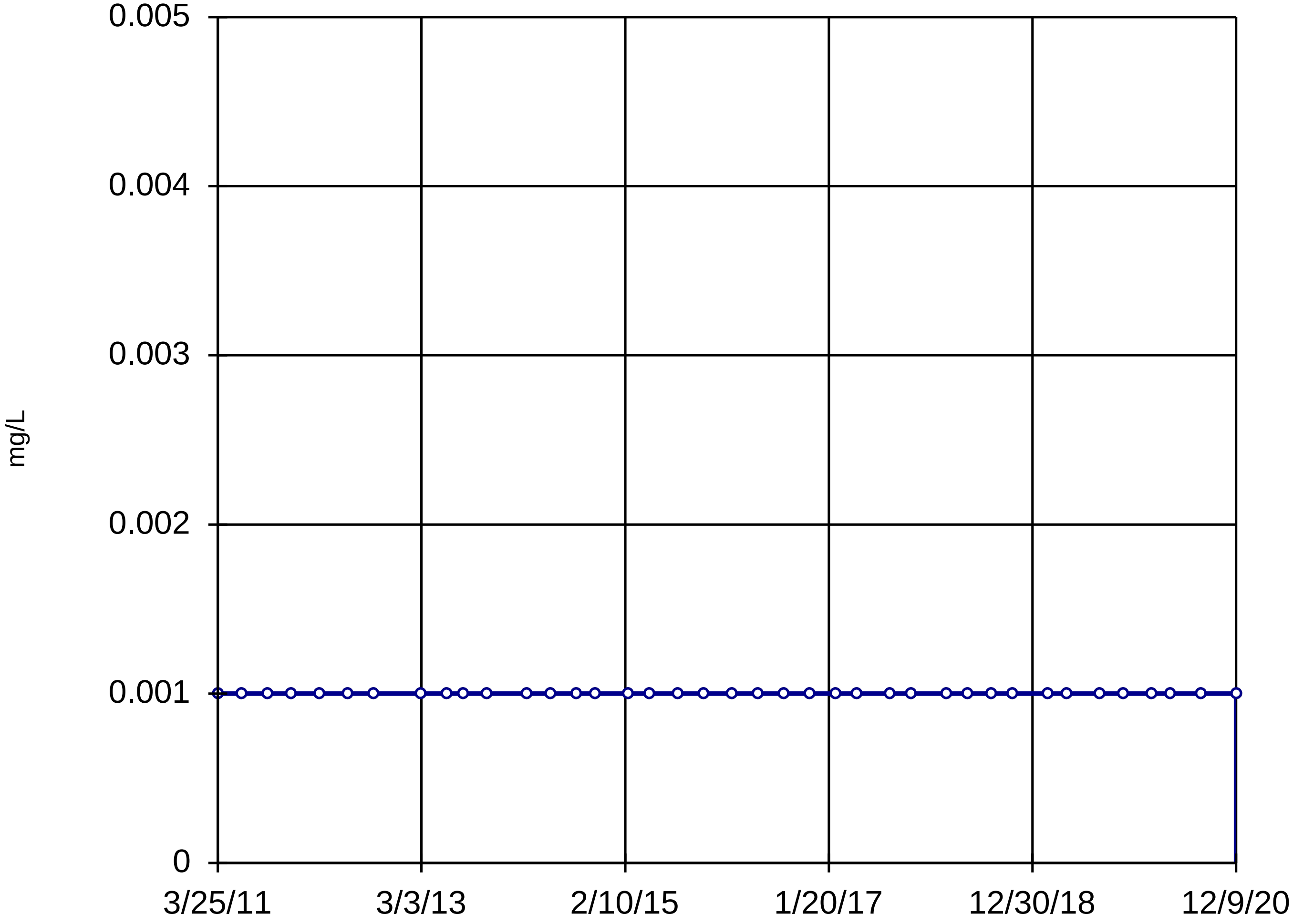

Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-07




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

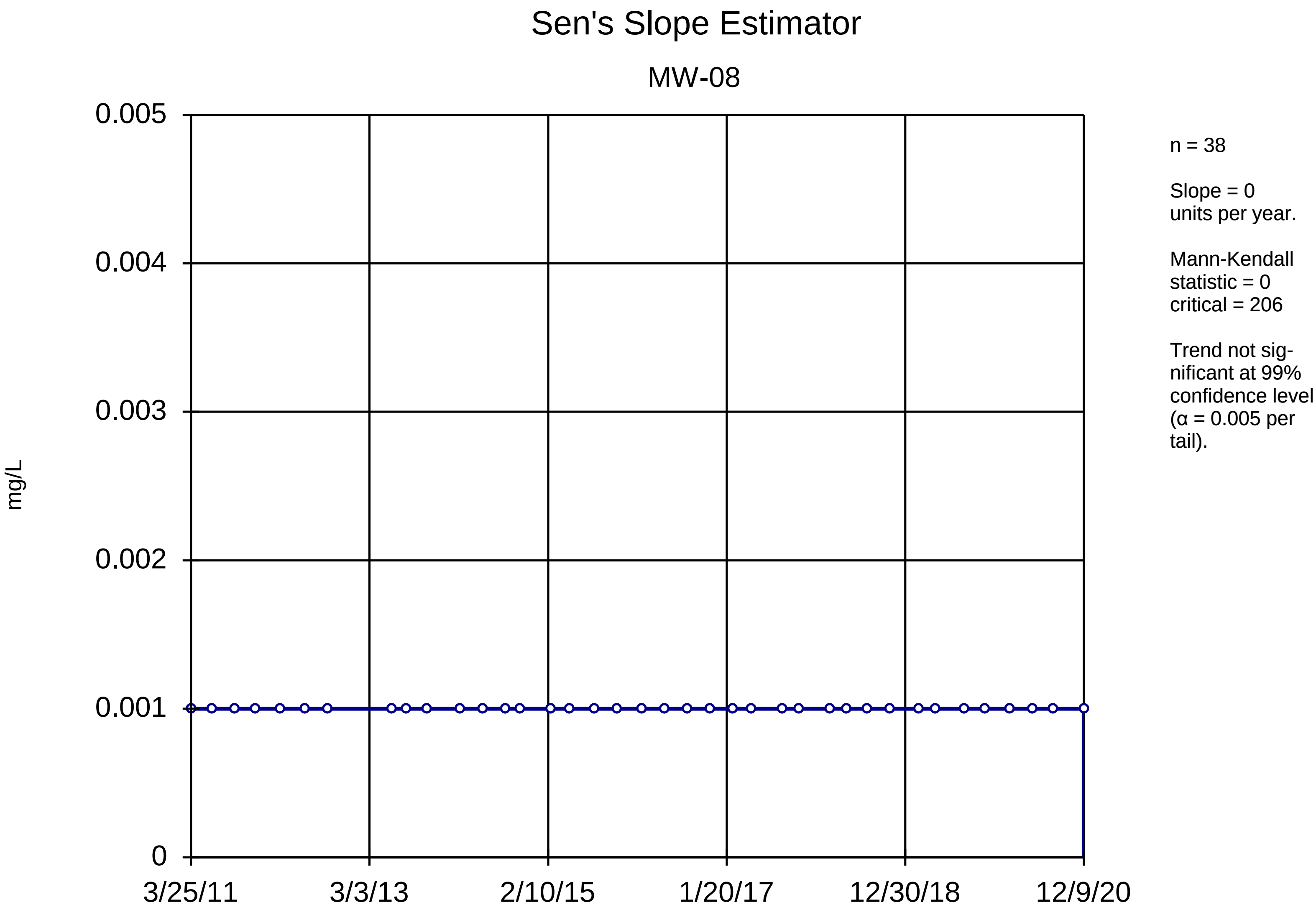
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81705

Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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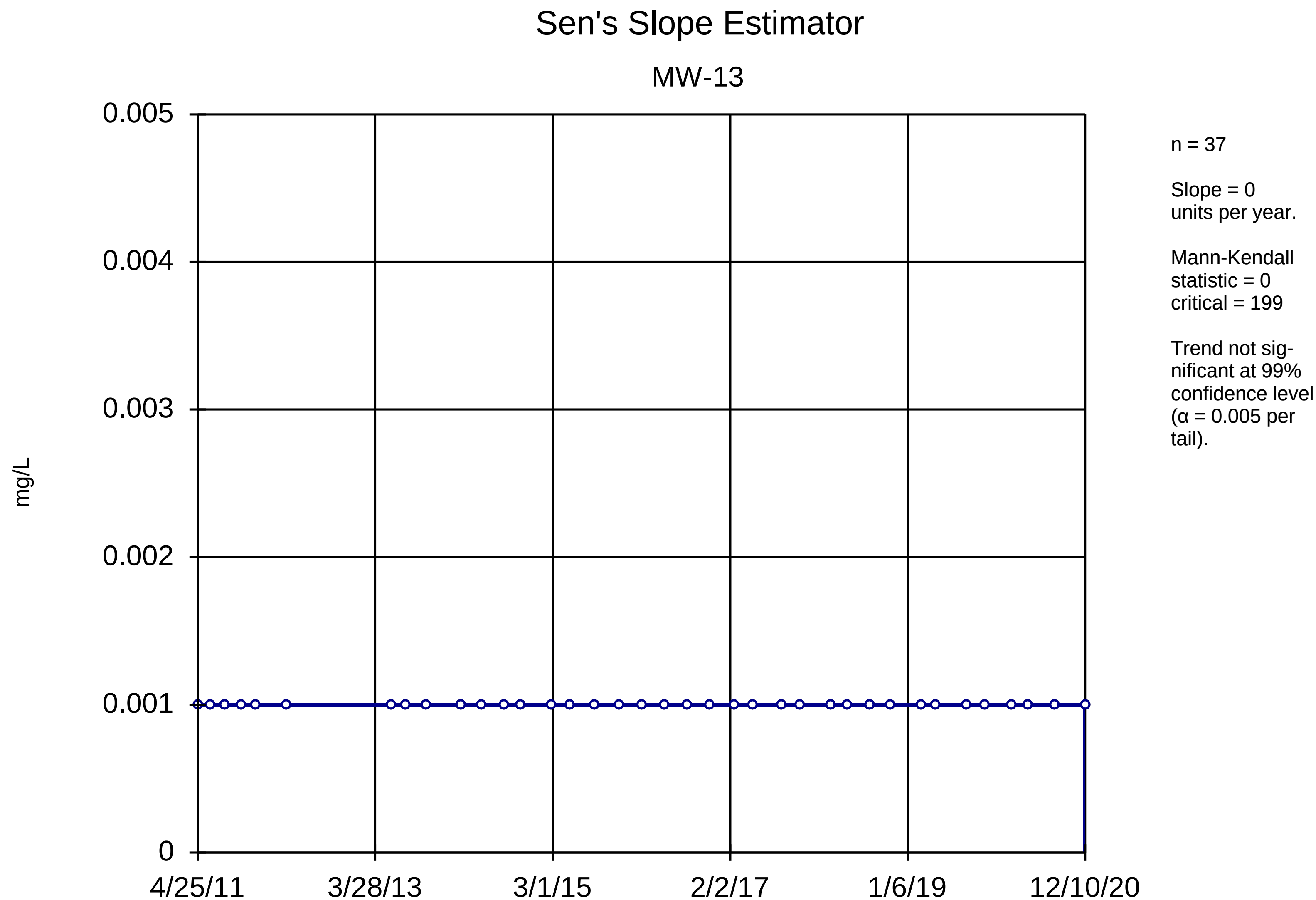
Hollow symbols indicate censored values.

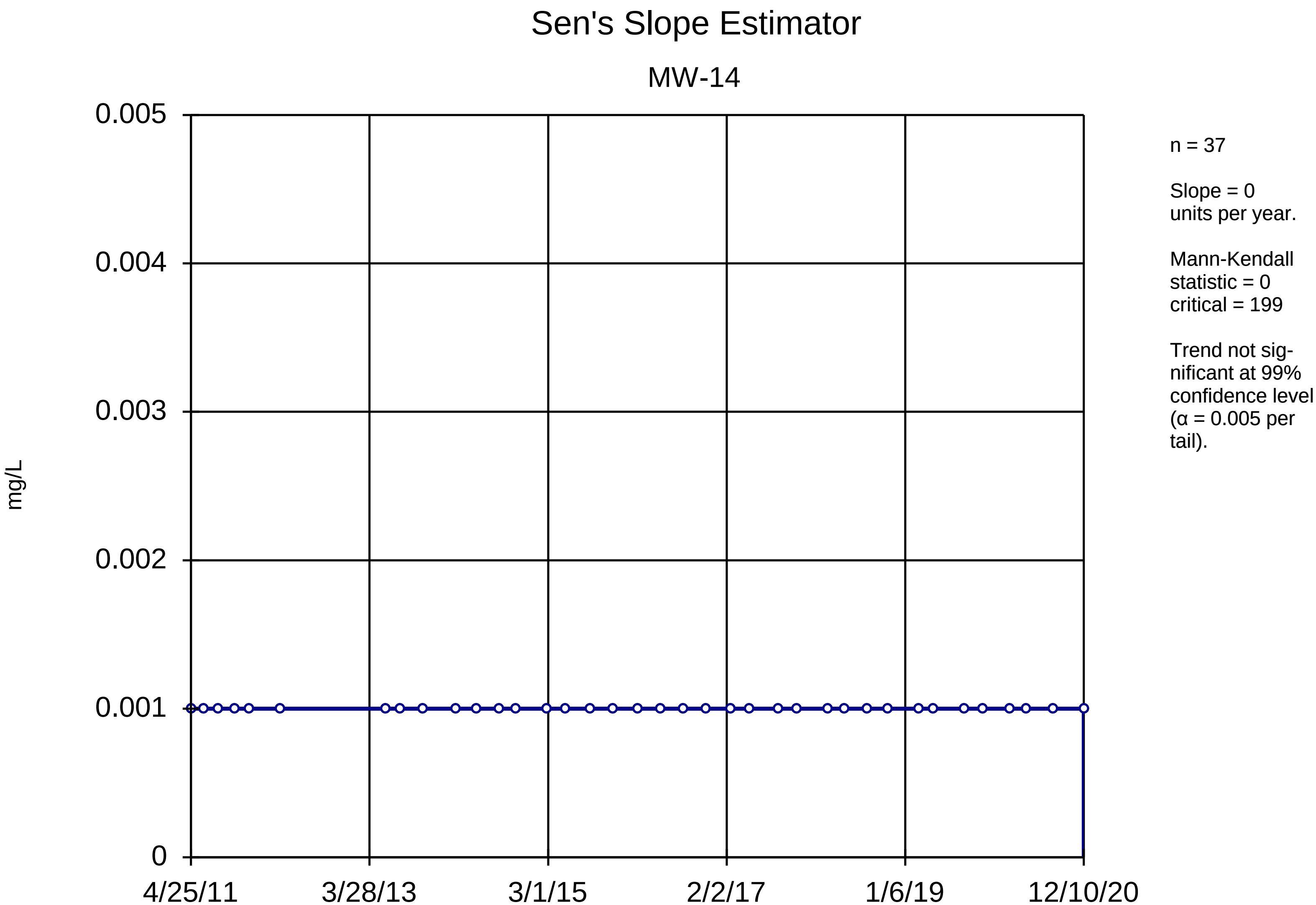



Constituent: Beryllium, Dissolved   Analysis Run 4/2/2021 11:44 AM

Utility Site P   Client: Weaver Consultants Group   Data: Powerton Sanitas Database

MWG13-15_81707

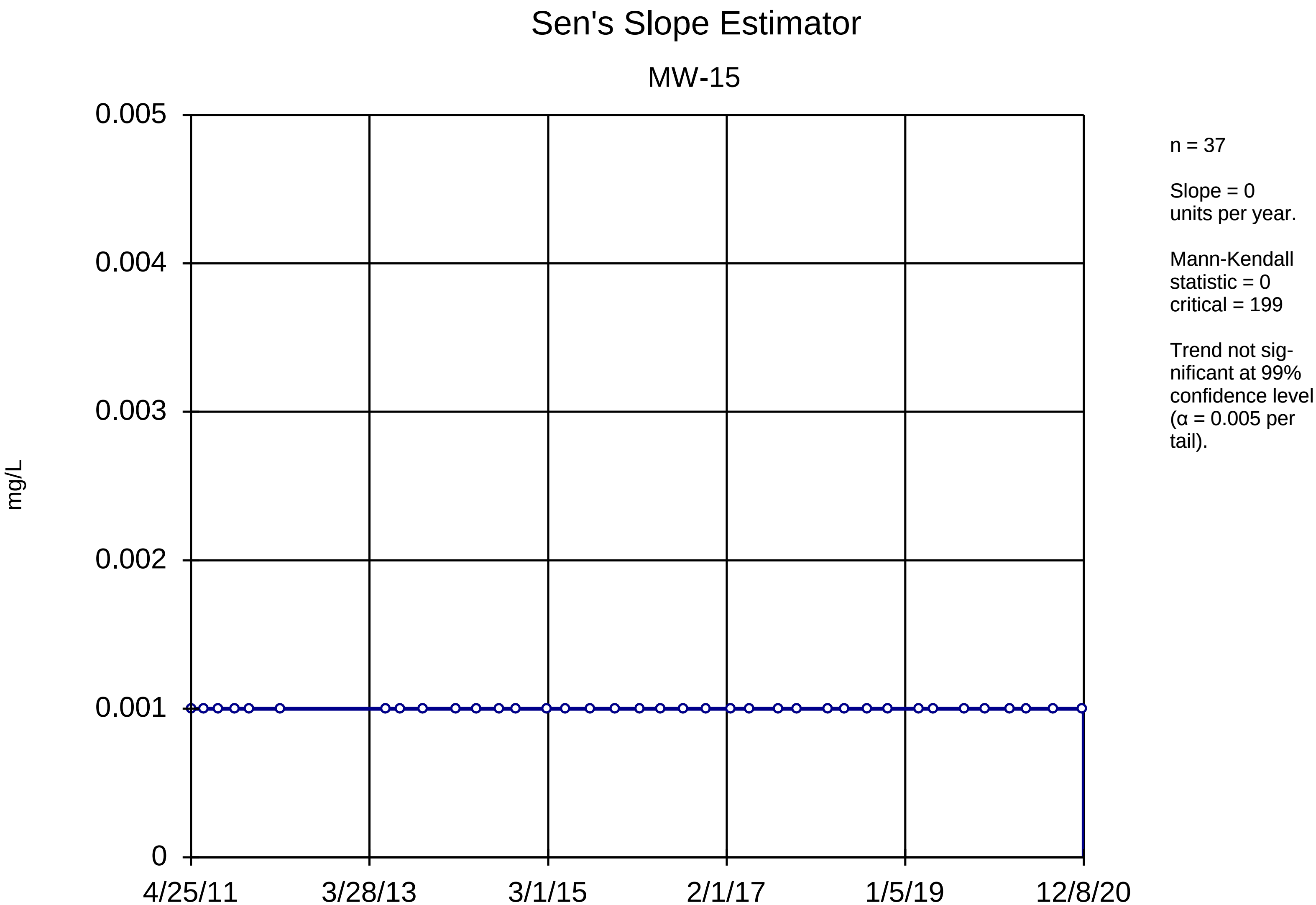
Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81709

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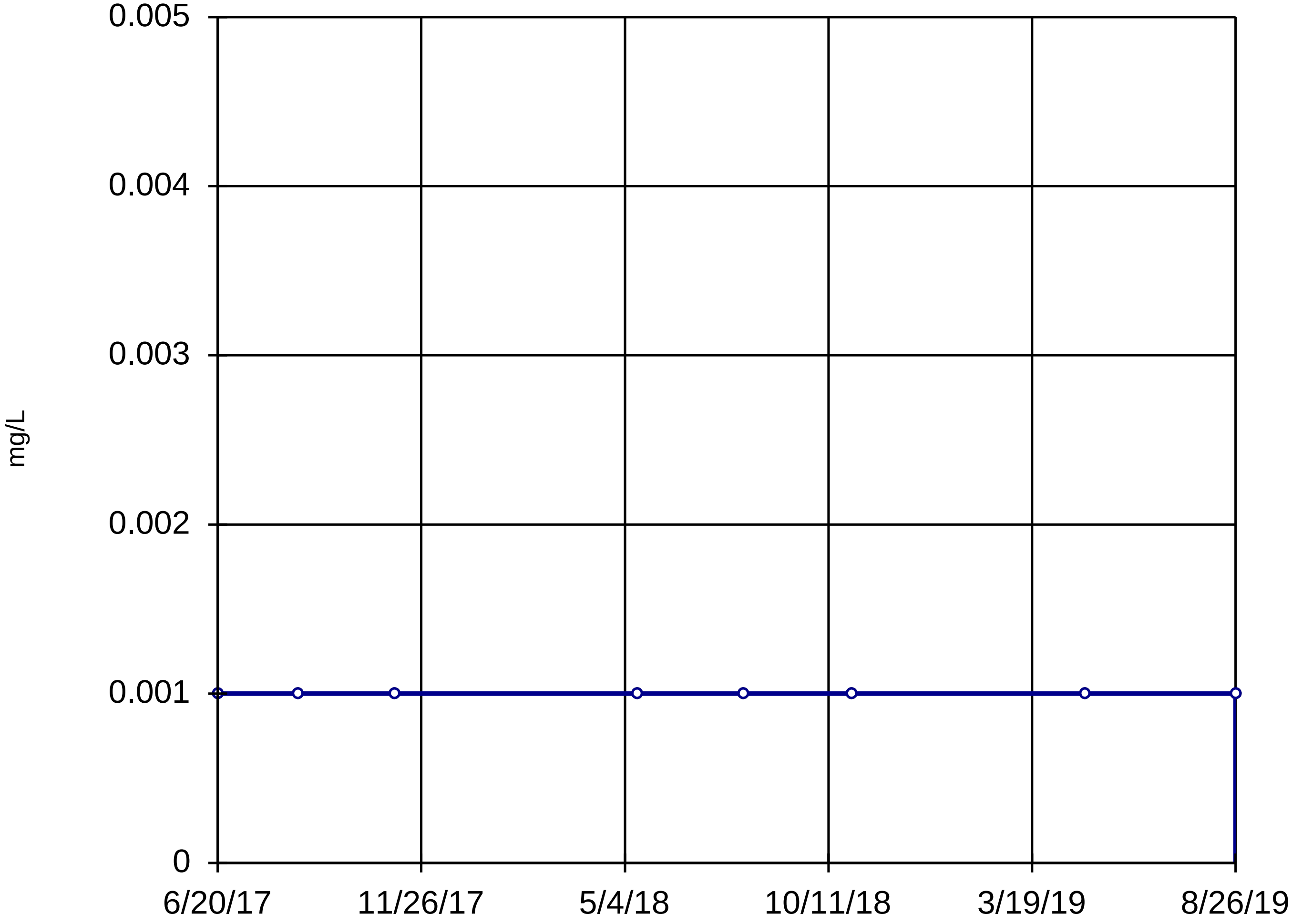
Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-03




n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 21

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Total Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81710

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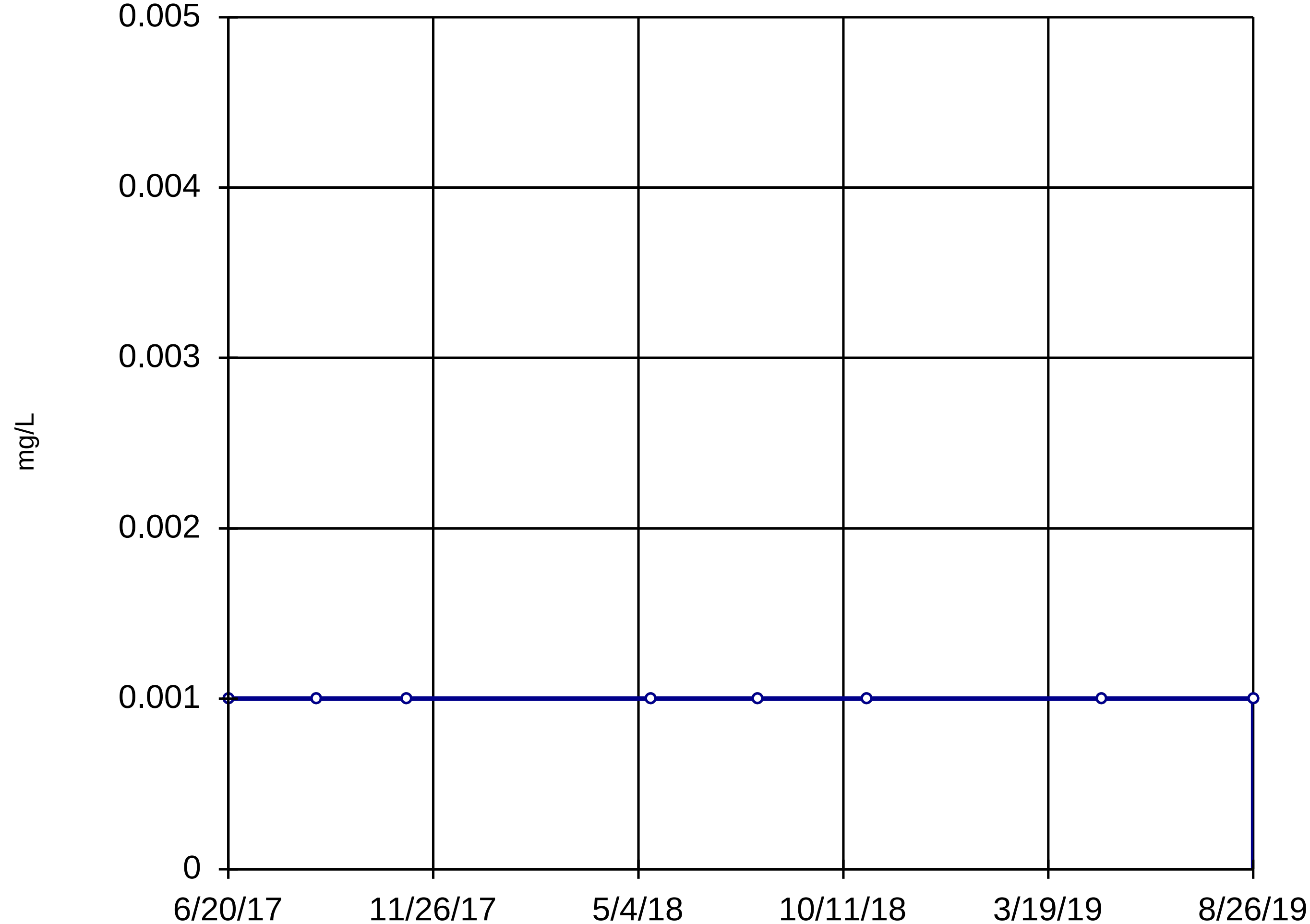
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 21

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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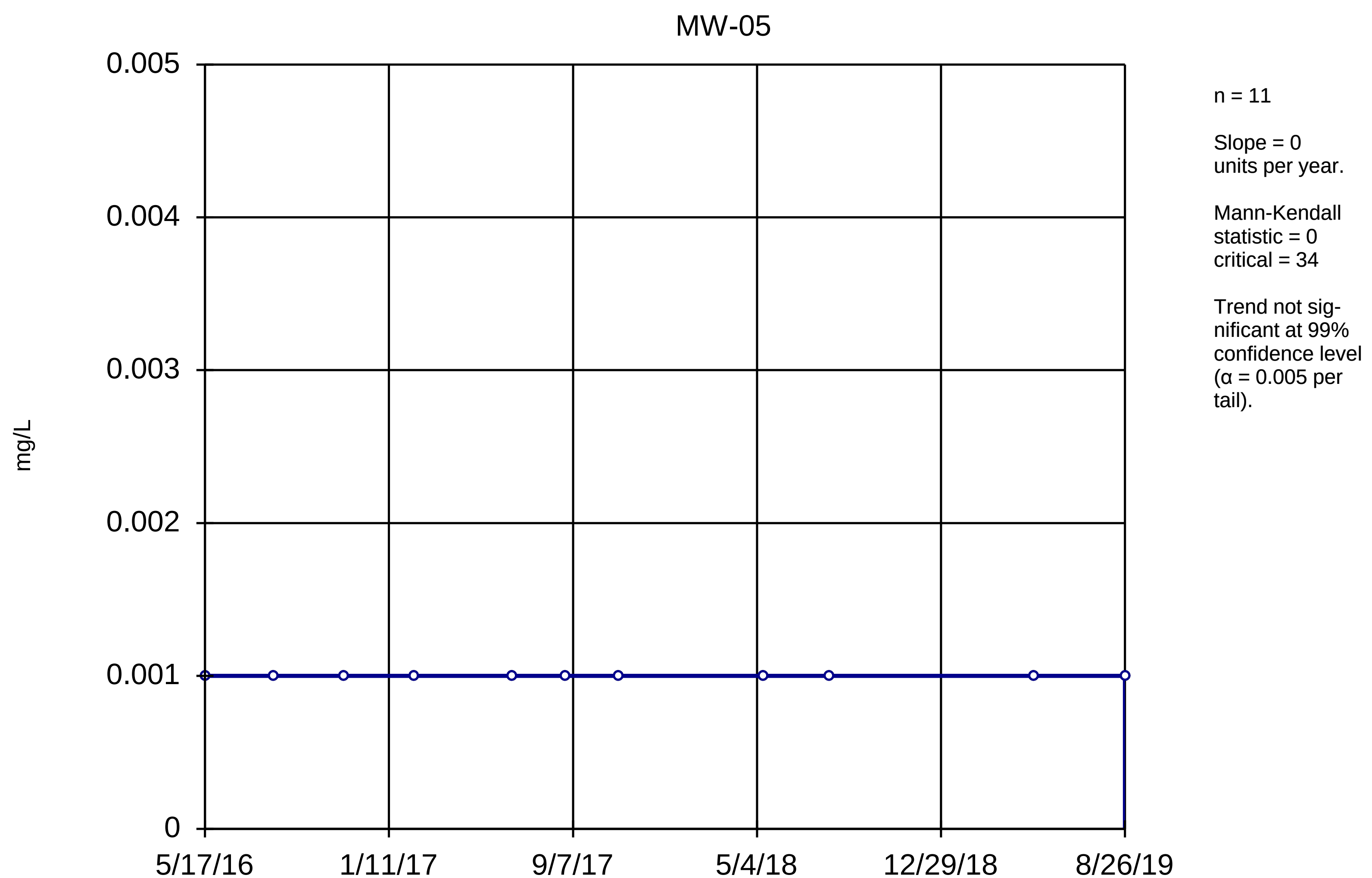
Hollow symbols indicate censored values.

## Sen's Slope Estimator

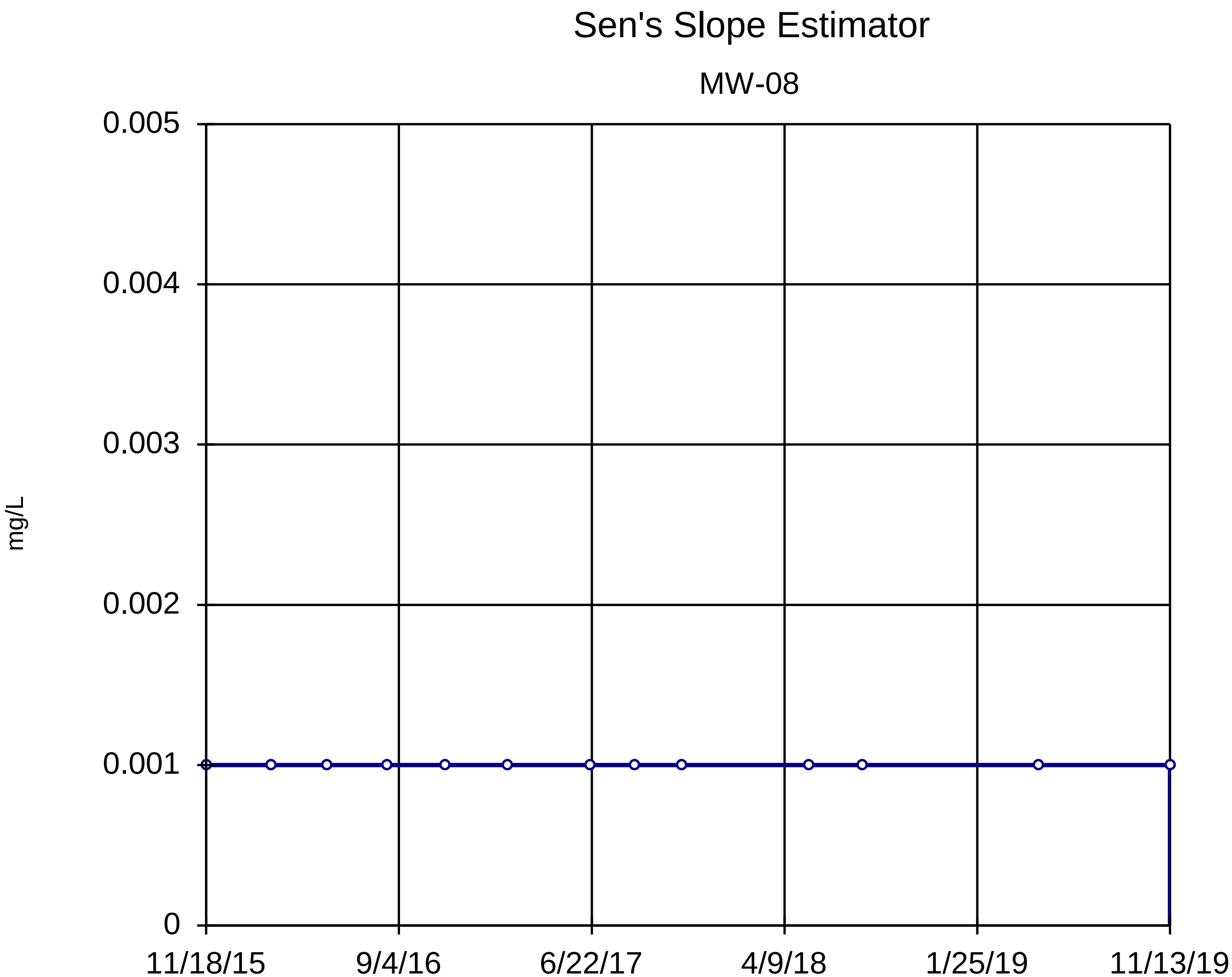



Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81712

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 13

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 43

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:44 AM

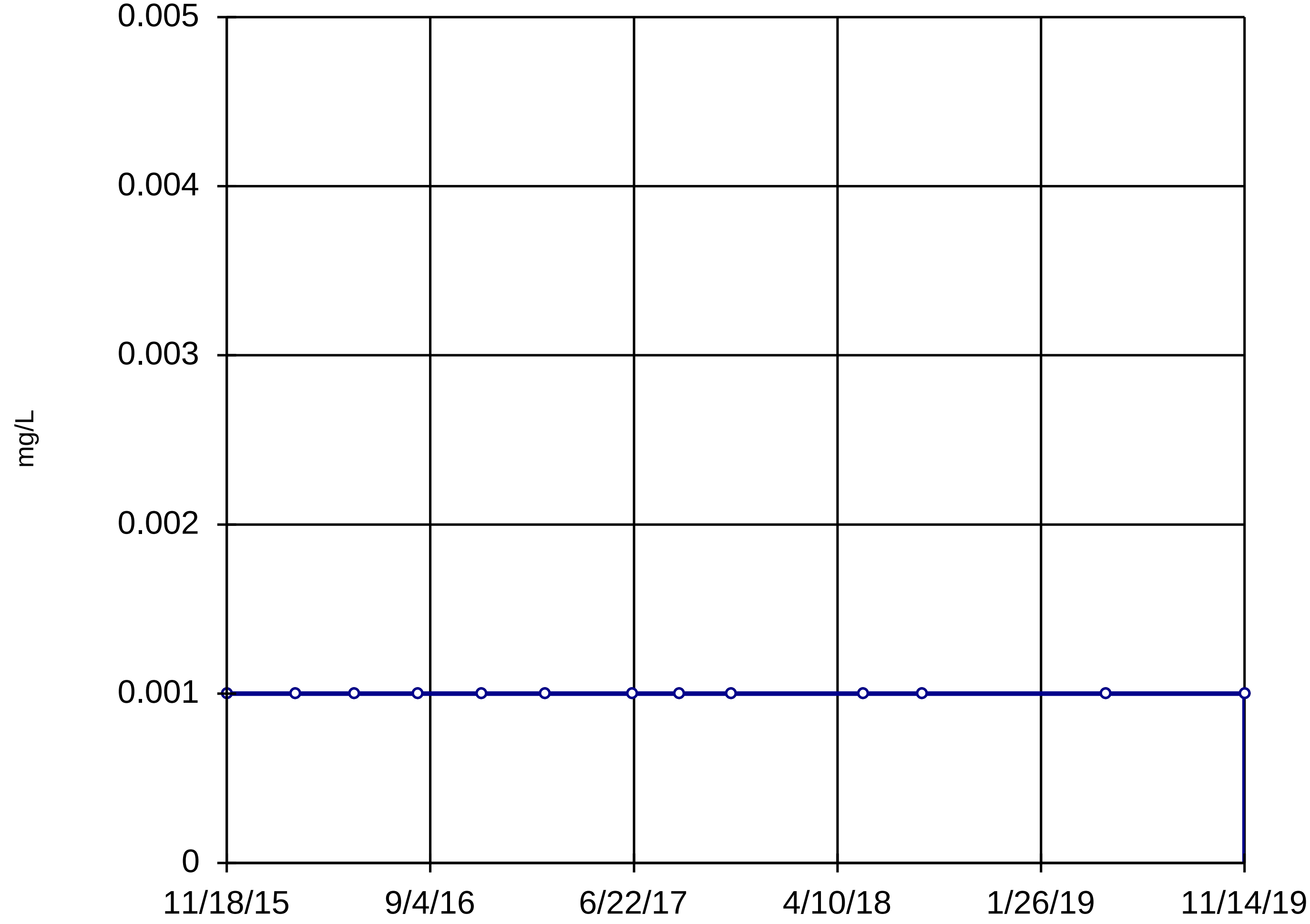
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81713

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-15




n = 13

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 43

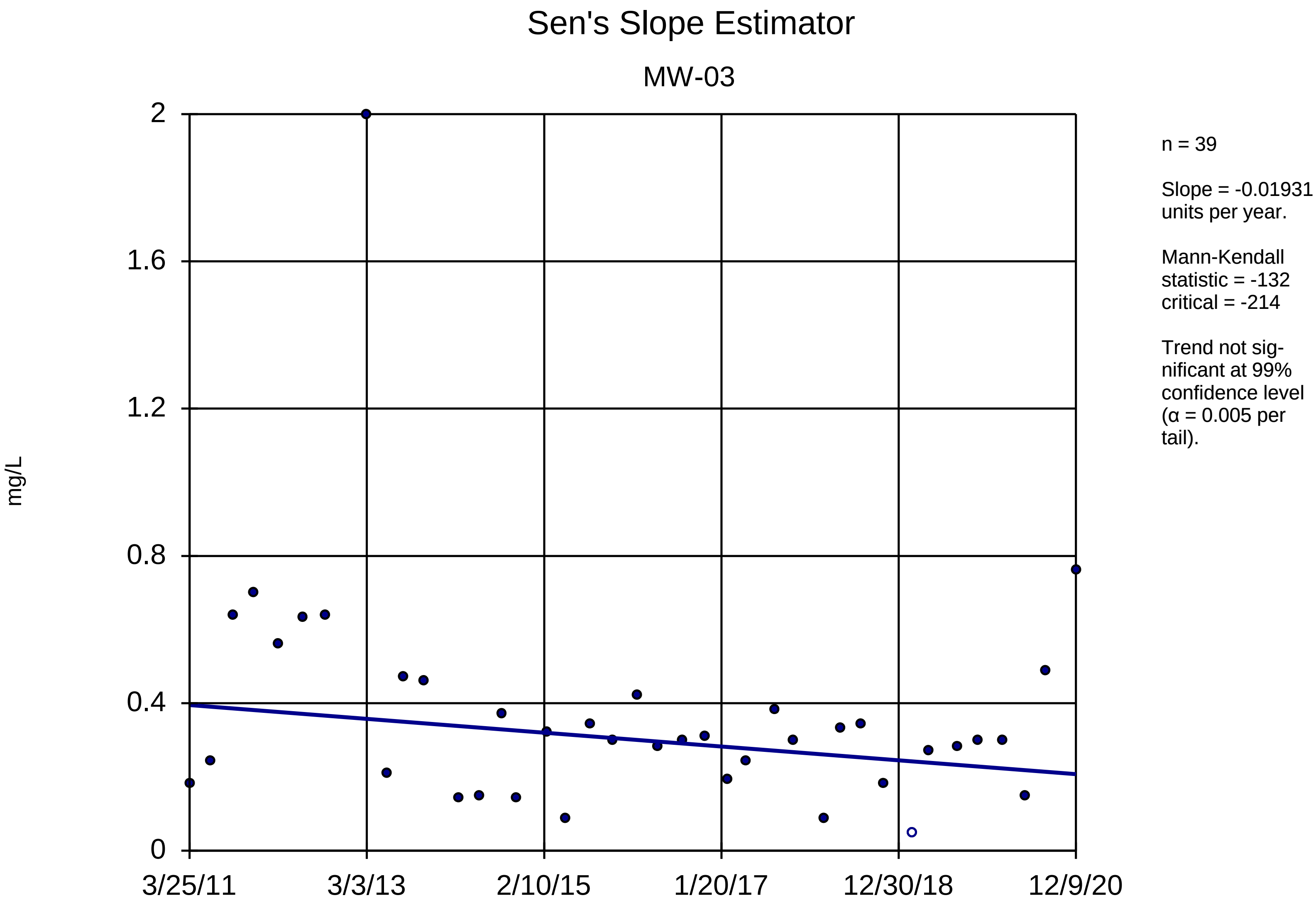
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

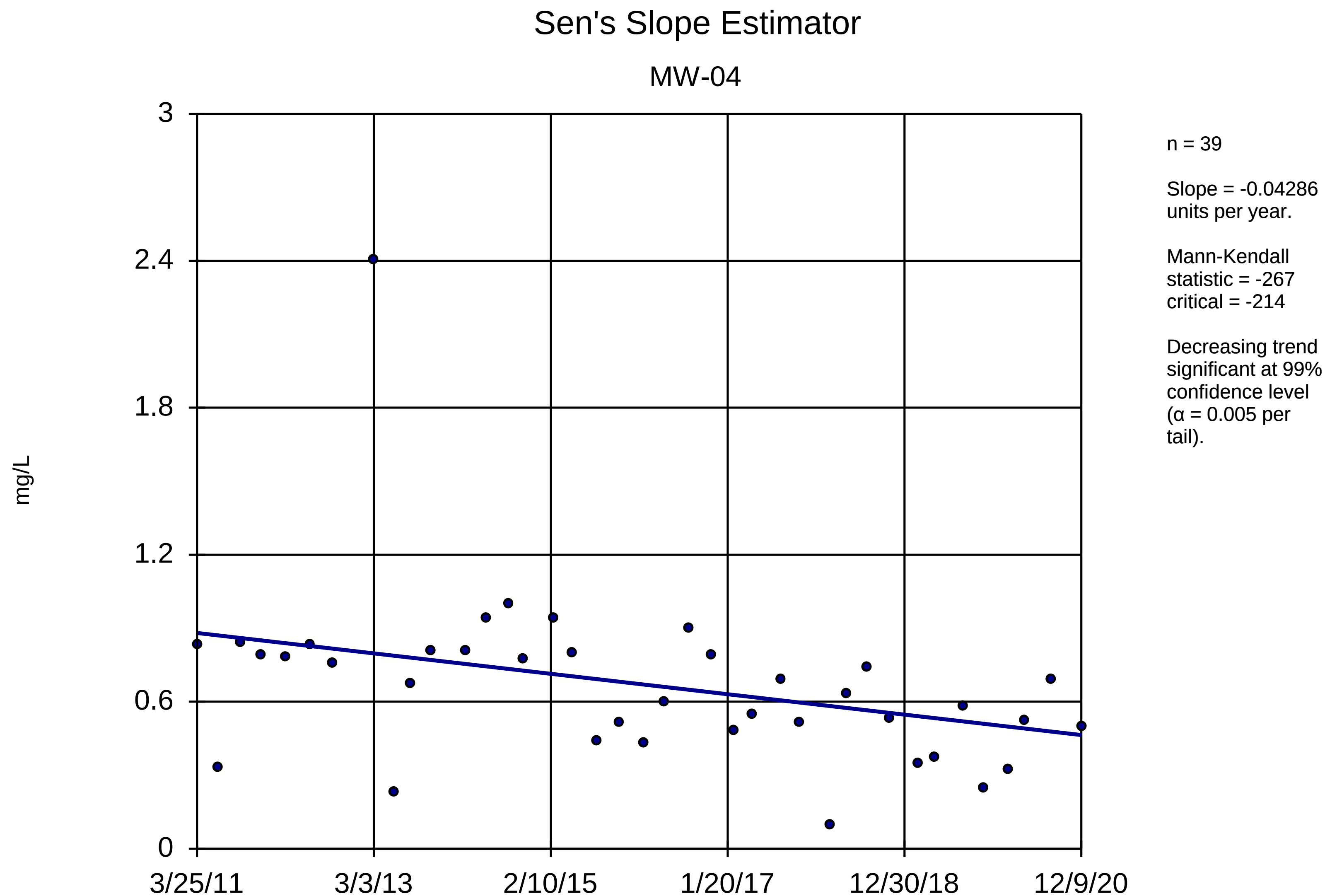
MWG13-15_81714

Hollow symbols indicate censored values.




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

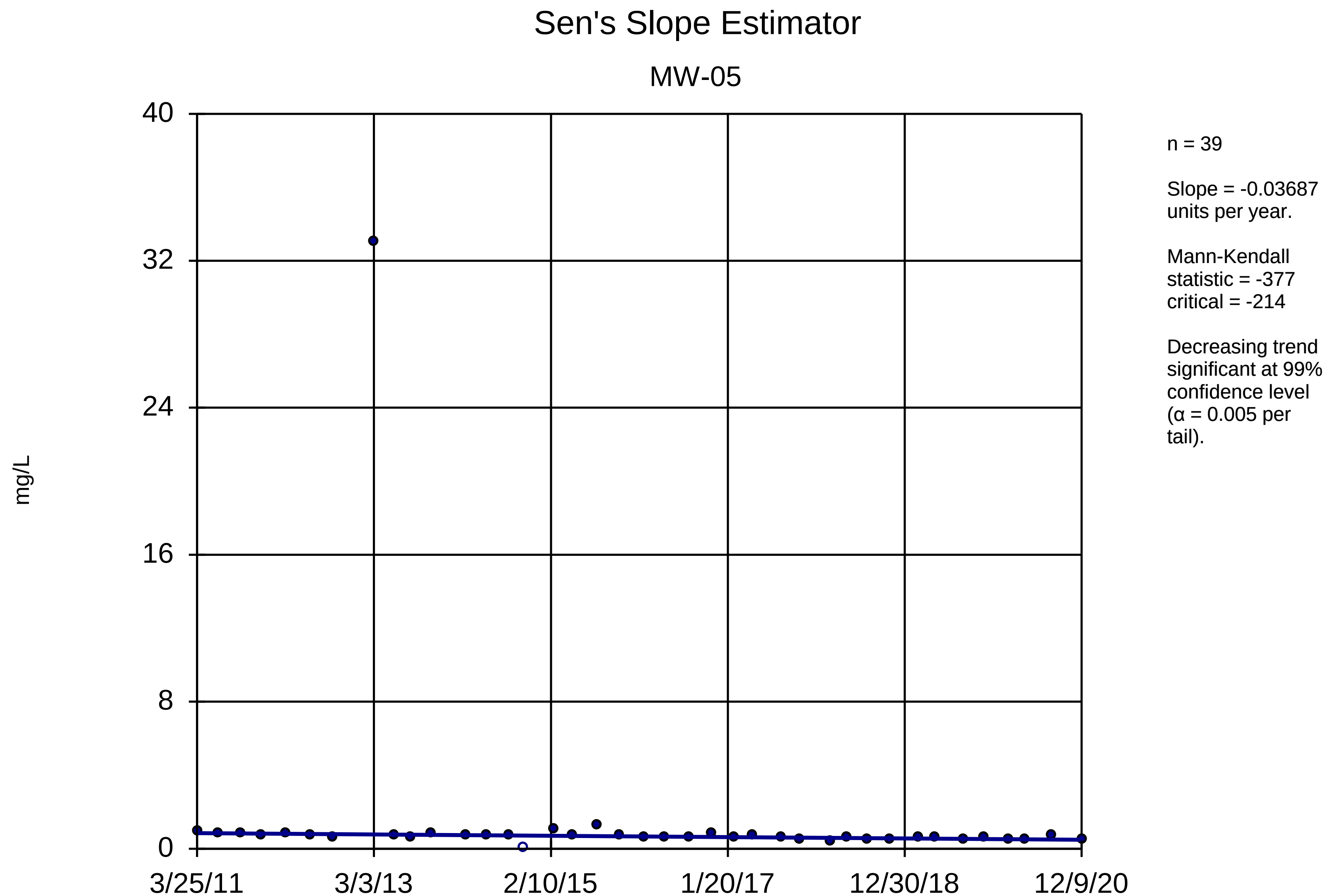



Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81716

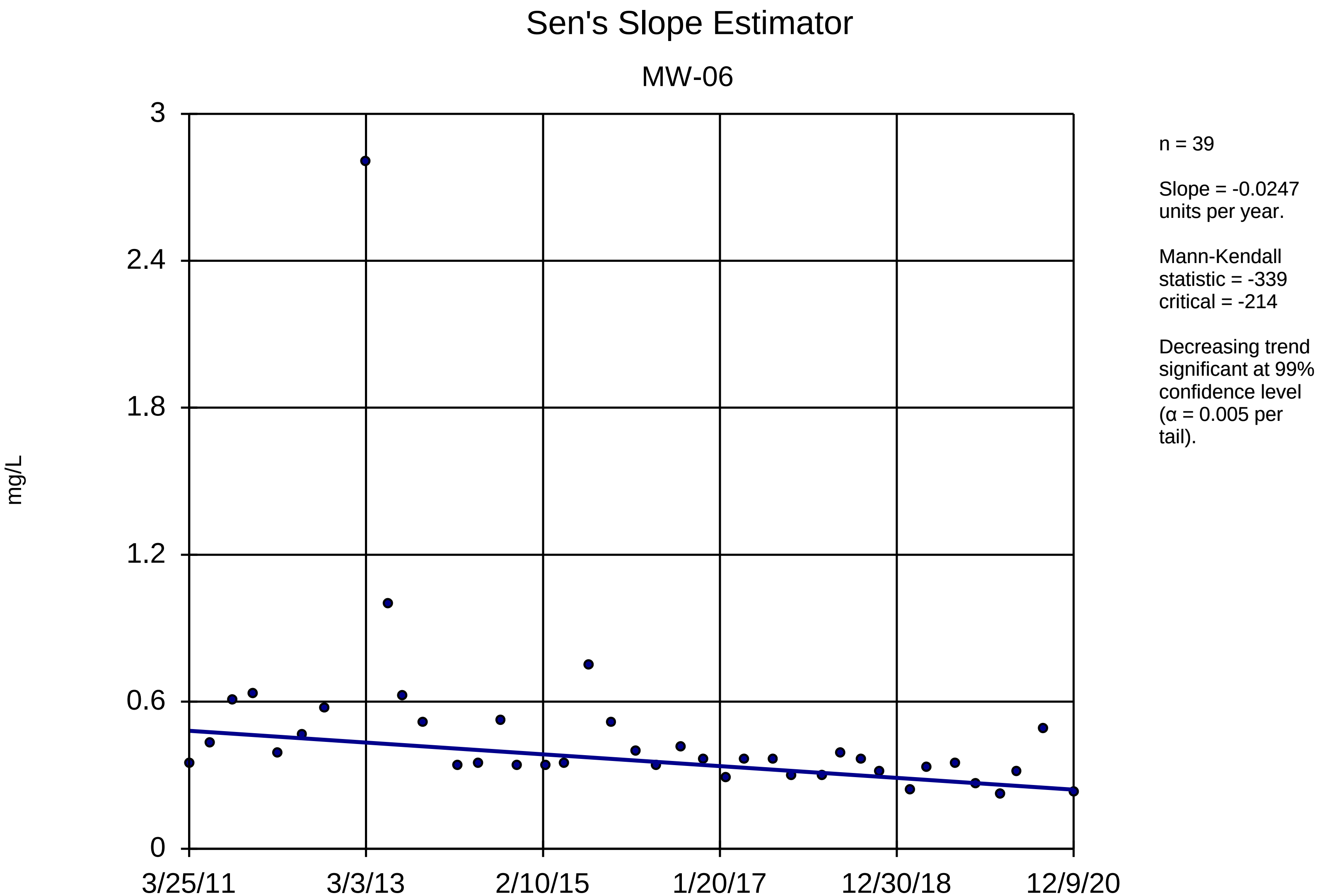
Hollow symbols indicate censored values.




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81717




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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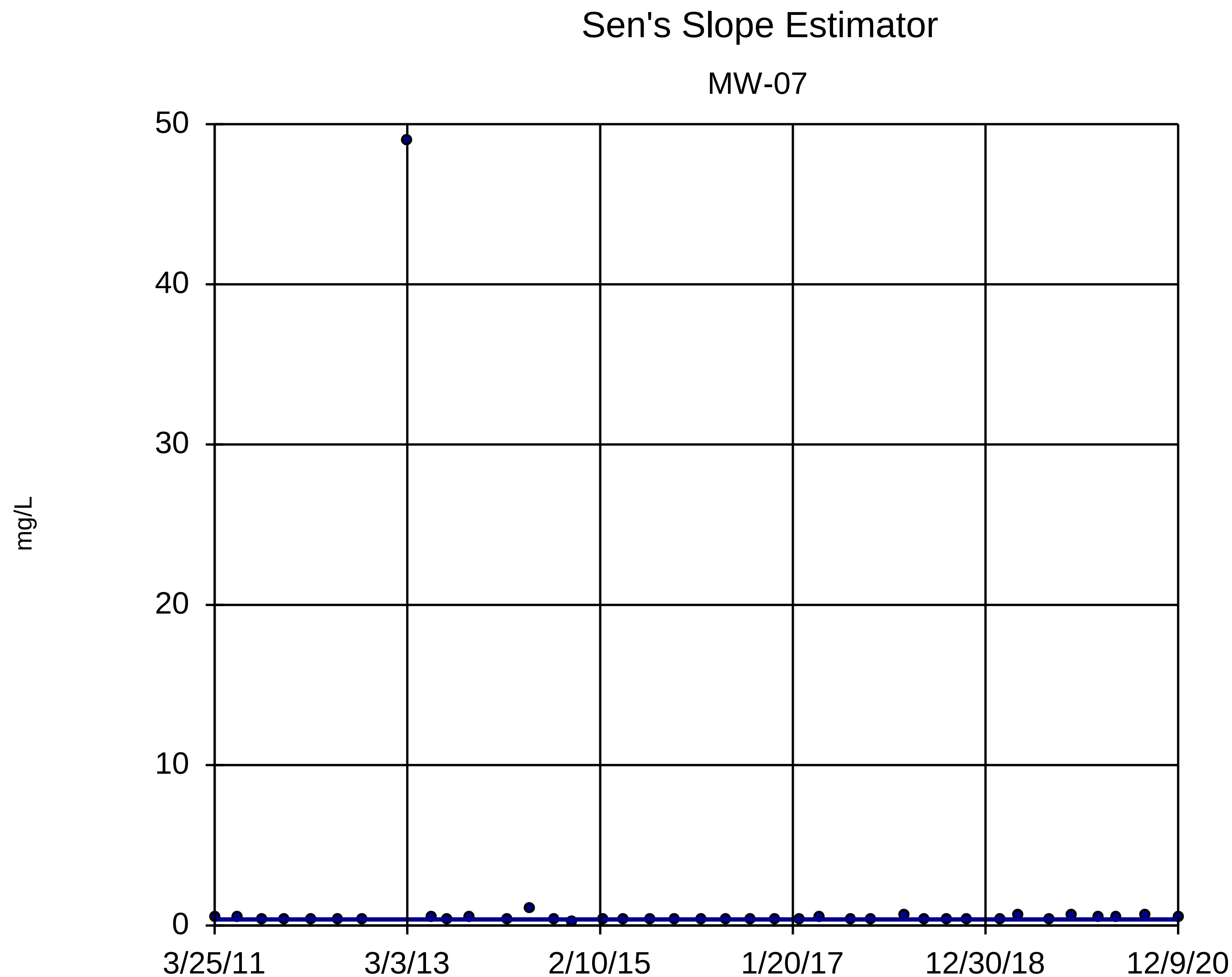



n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 11
critical = 214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

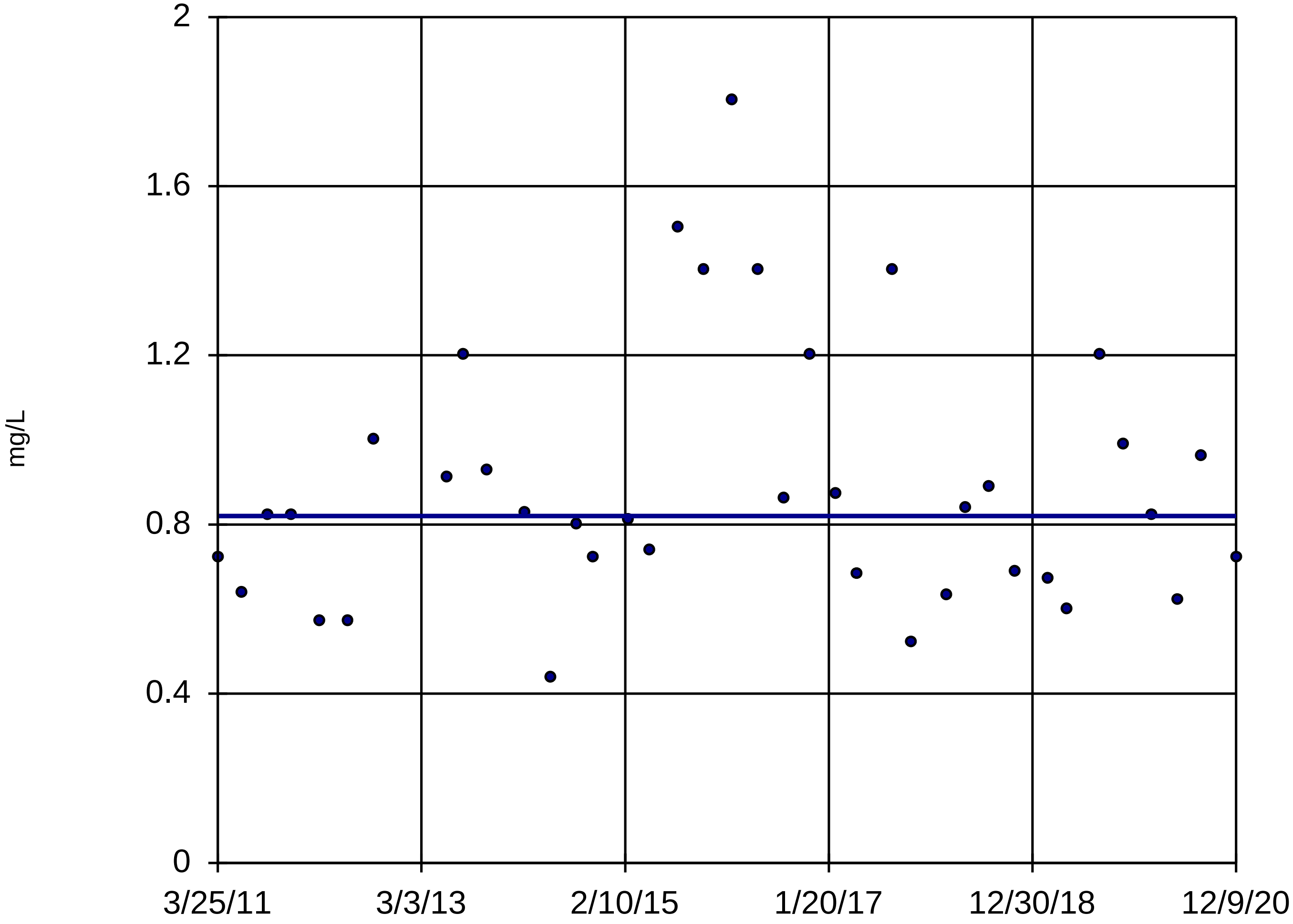
Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81719

## Sen's Slope Estimator

MW-08




n = 38

Slope = 0
units per year.

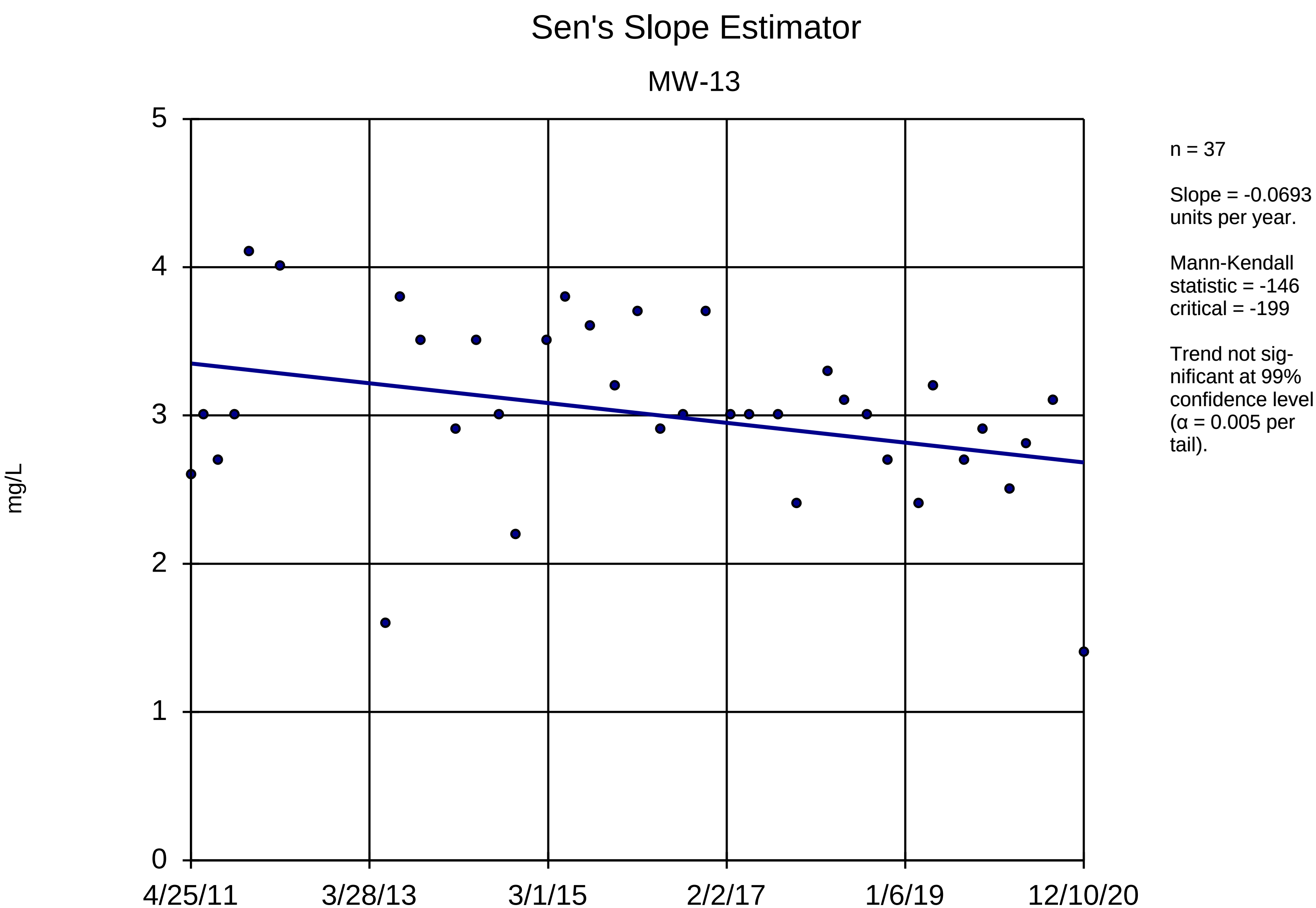
Mann-Kendall
statistic = 12
critical = 206

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Boron, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81720

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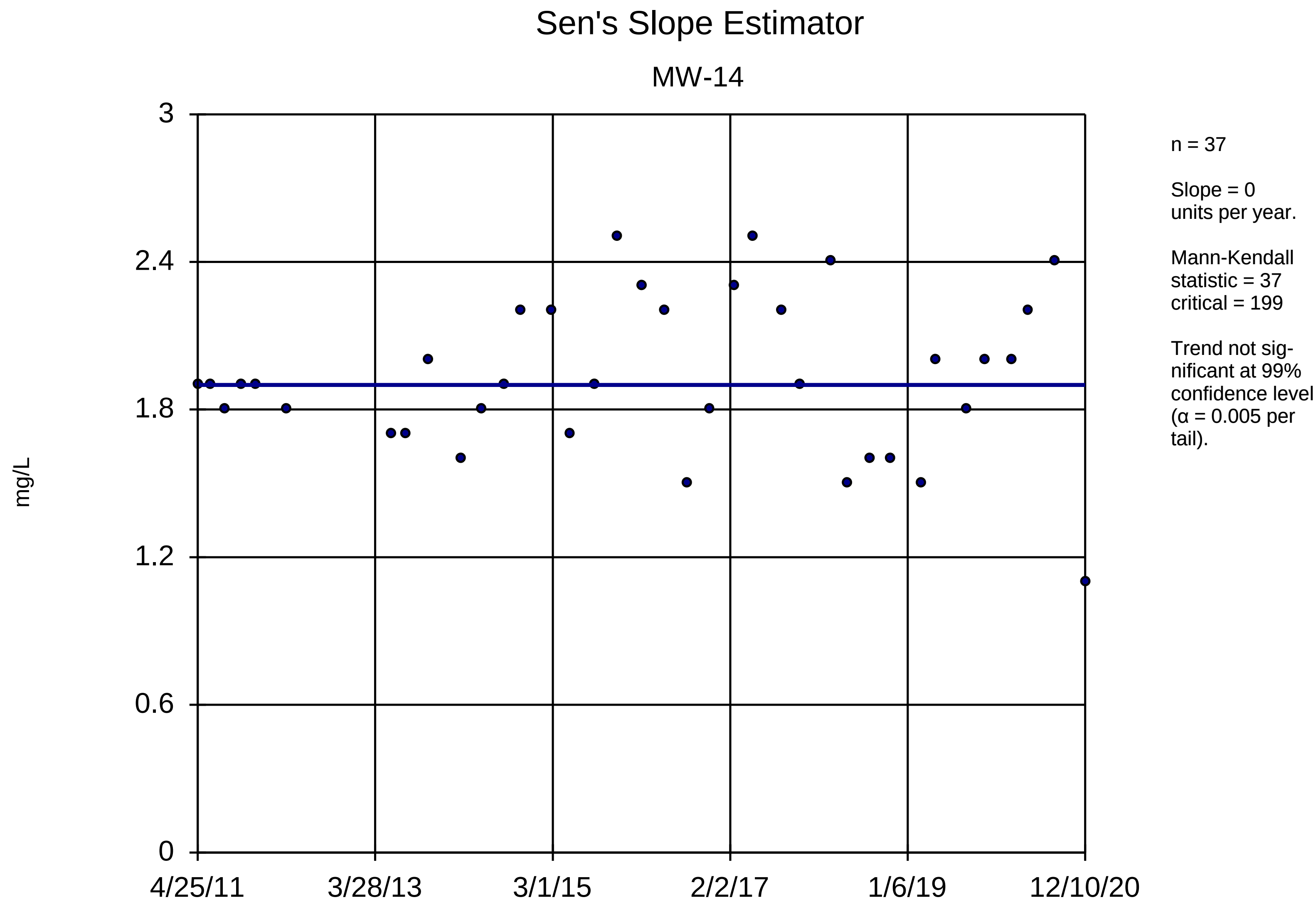
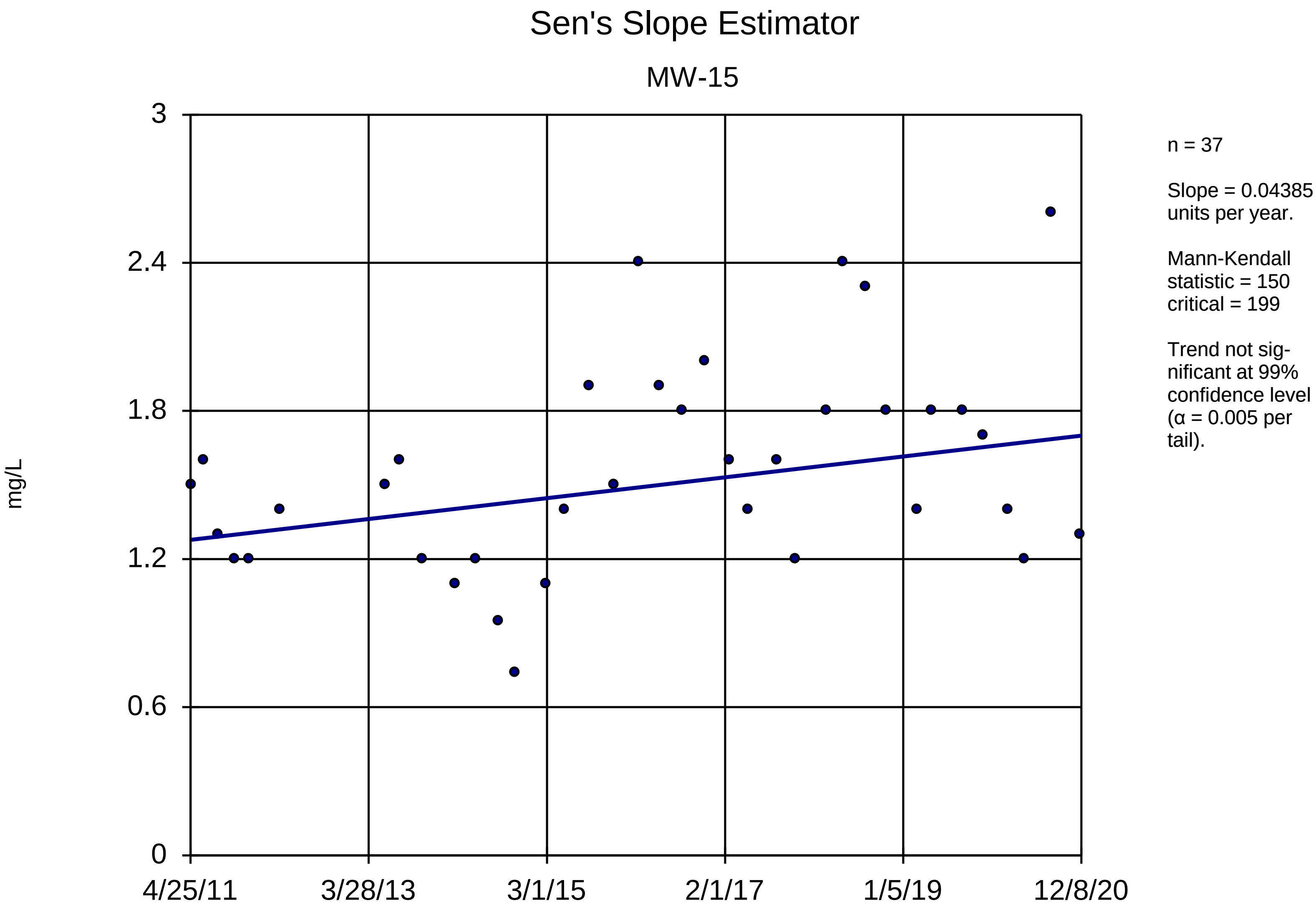
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81721




Constituent: Boron, Dissolved Analysis Run 4/2/2021 11:44 AM

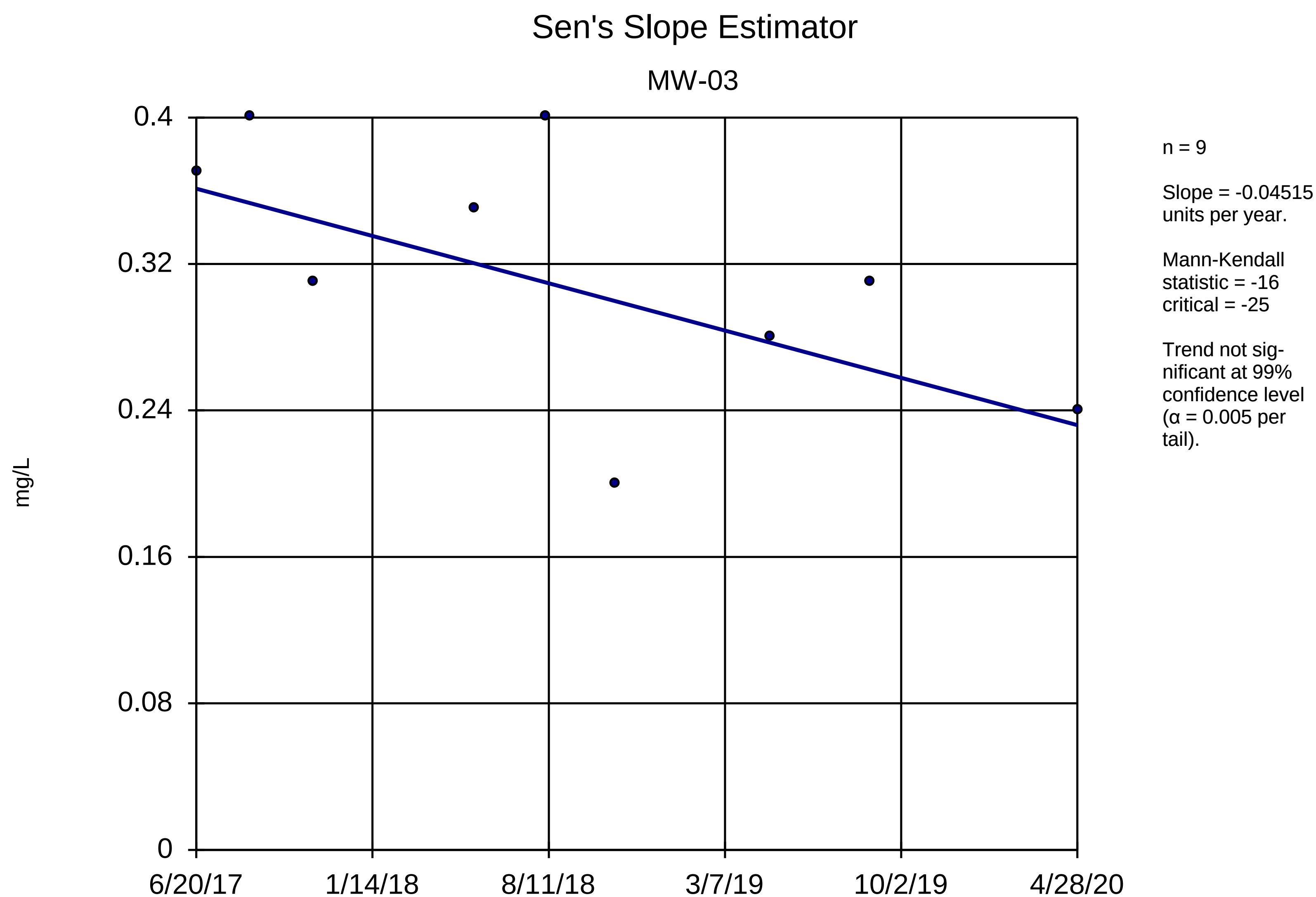
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database




Constituent: Boron, Dissolved Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

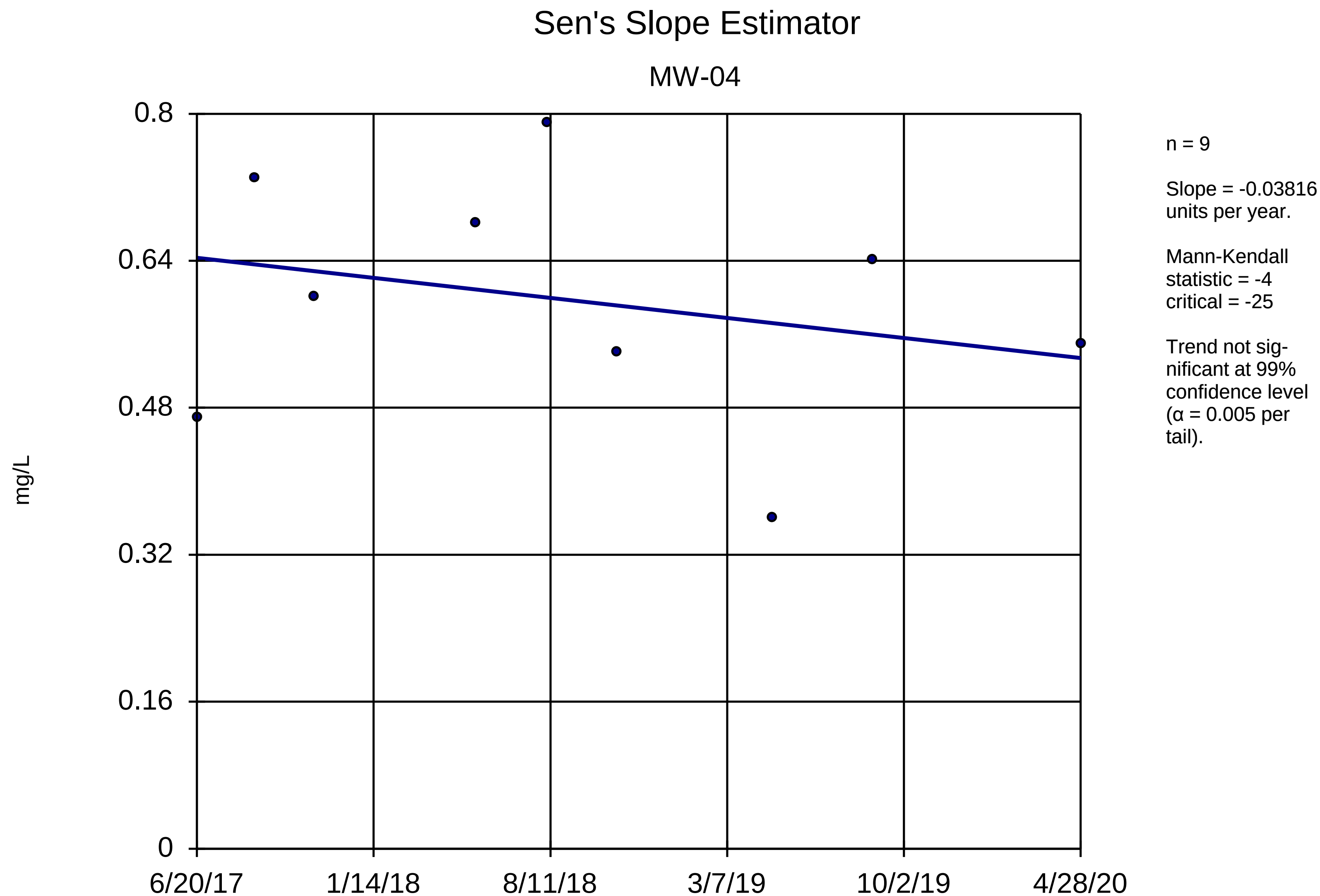
MWG13-15_81723




Constituent: Boron, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

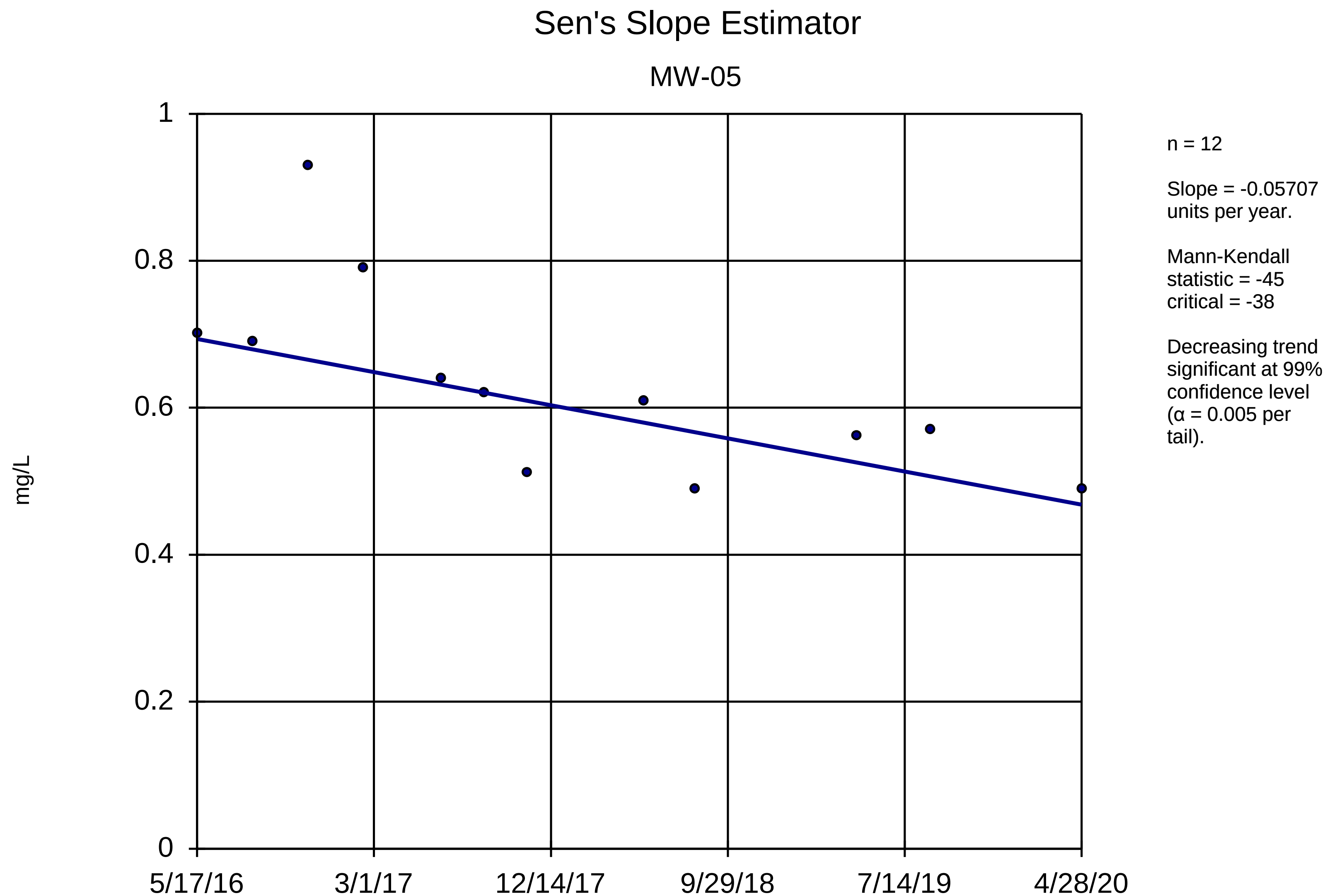
MWG13-15_81724




Constituent: Boron, Total    Analysis Run 4/2/2021 11:44 AM

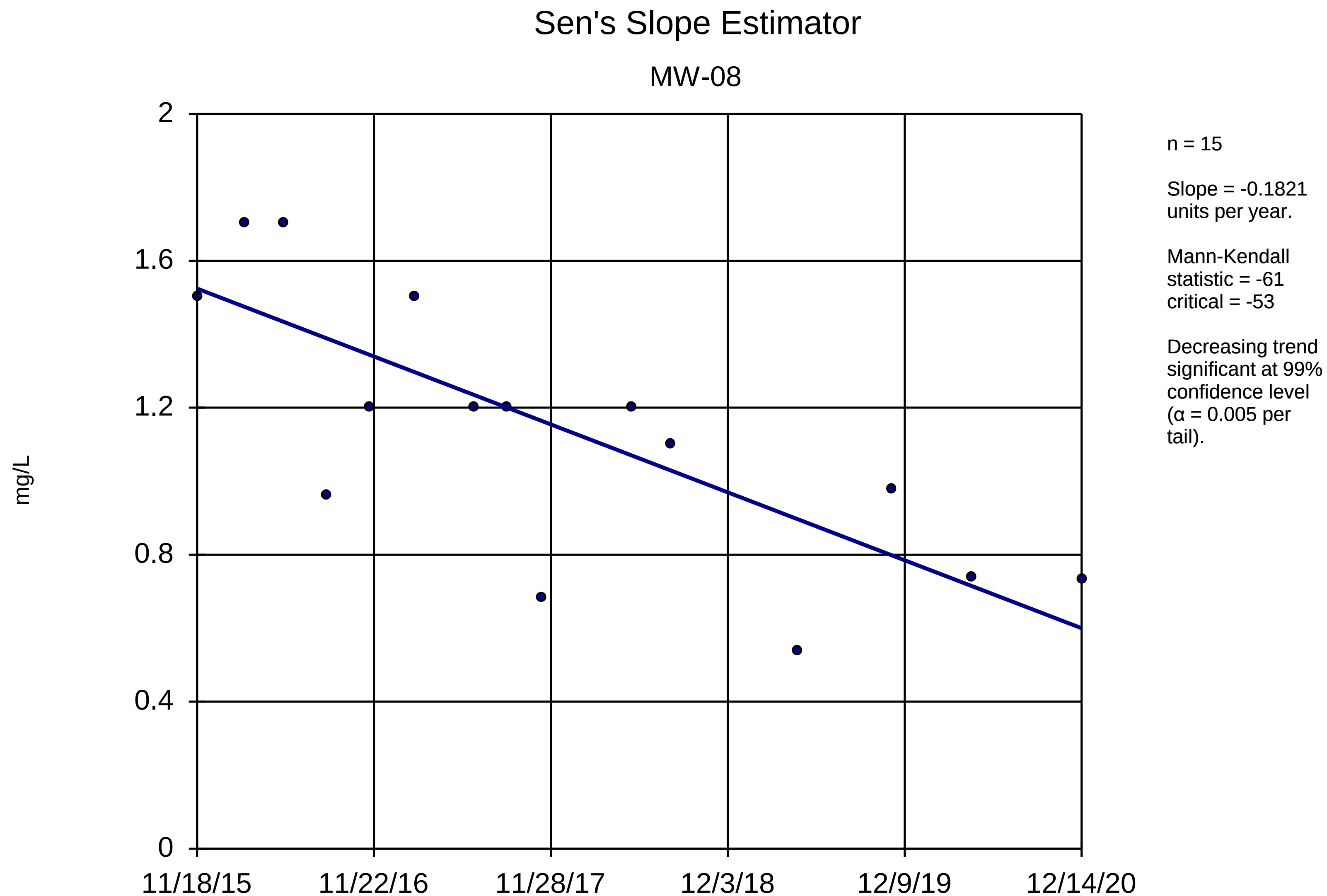
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81725



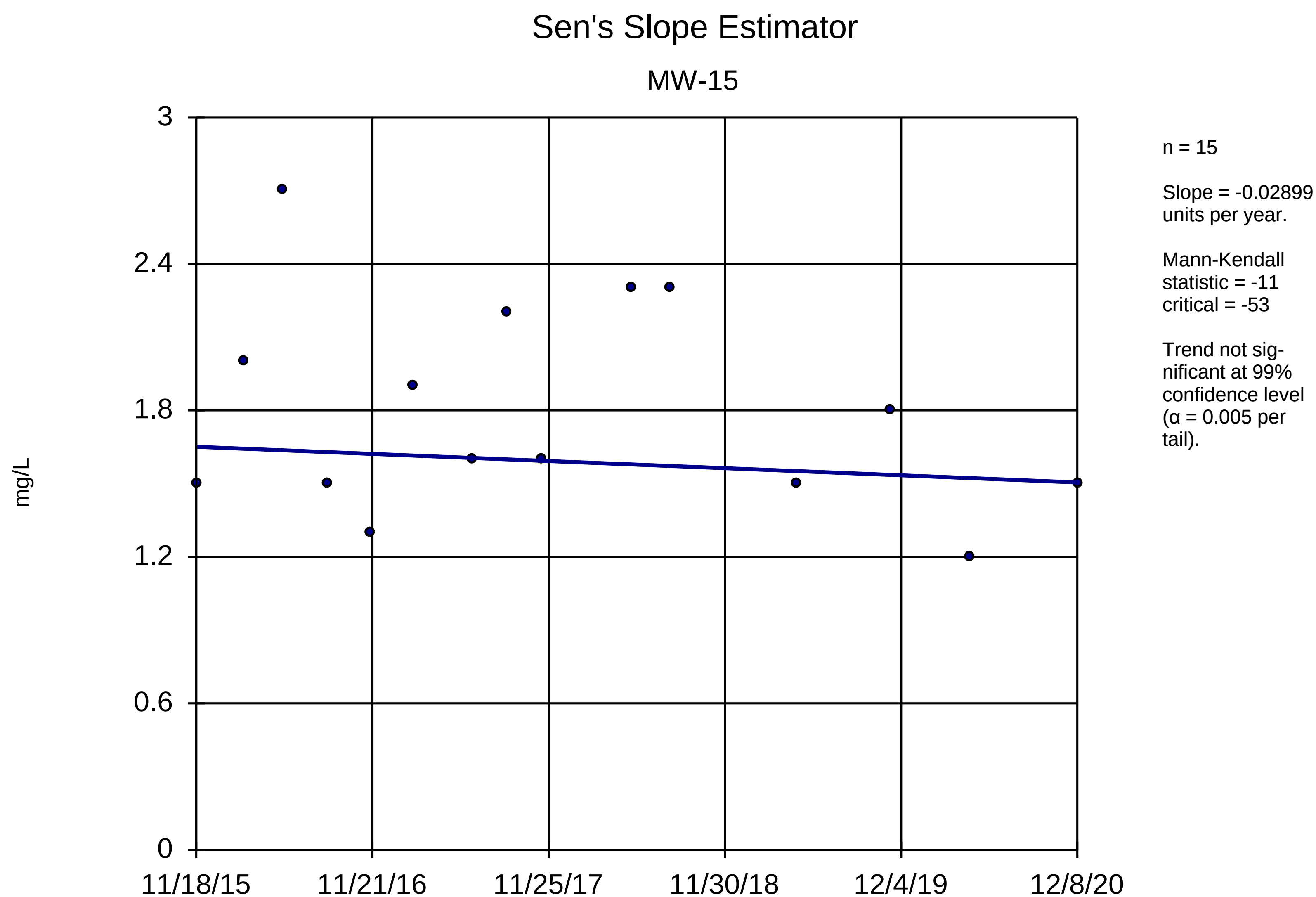

Constituent: Boron, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Boron, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Boron, Total Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

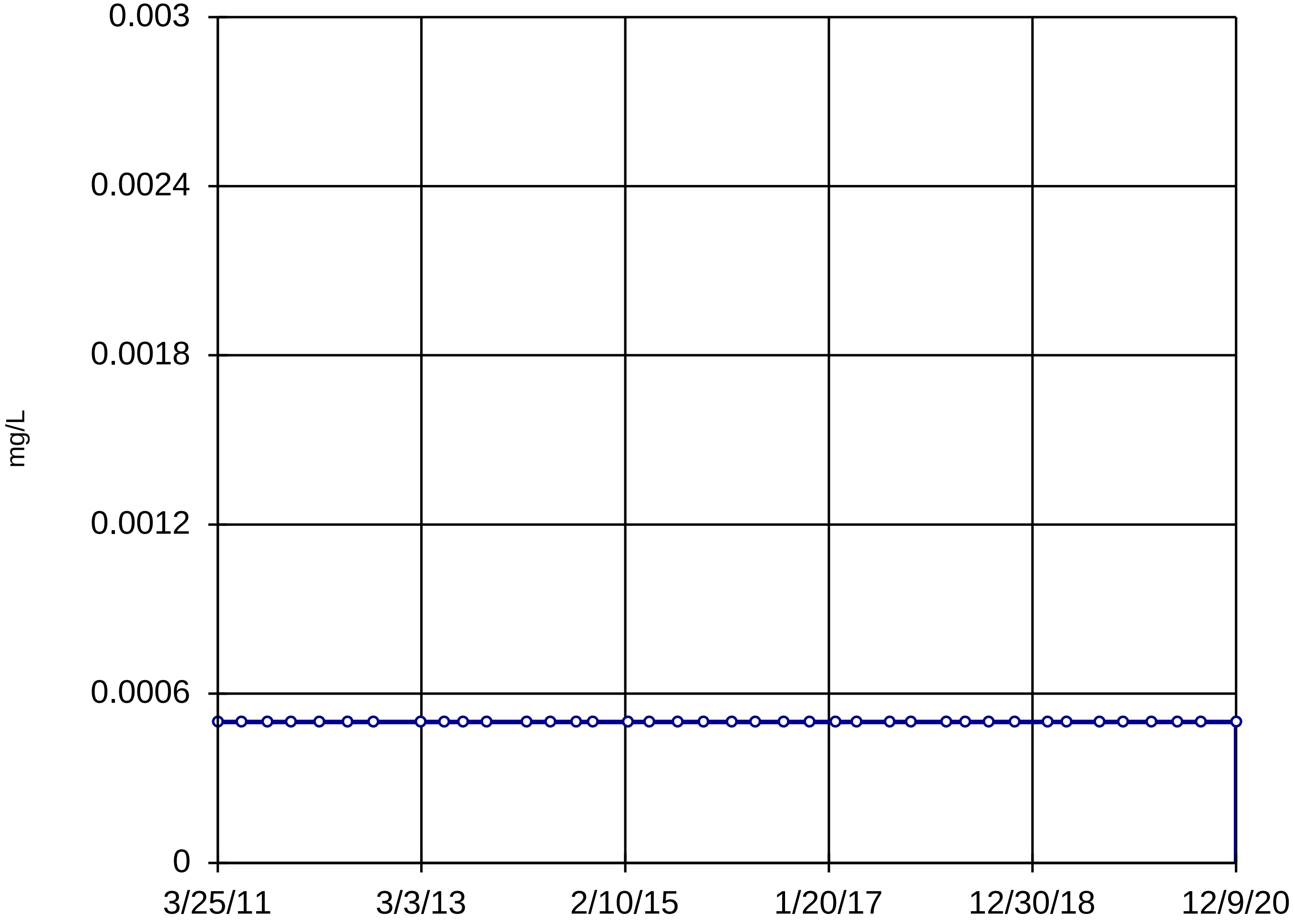
MWG13-15_81728

Electronic Filing: Received, Clerk's Office 01/21/2022


Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81729

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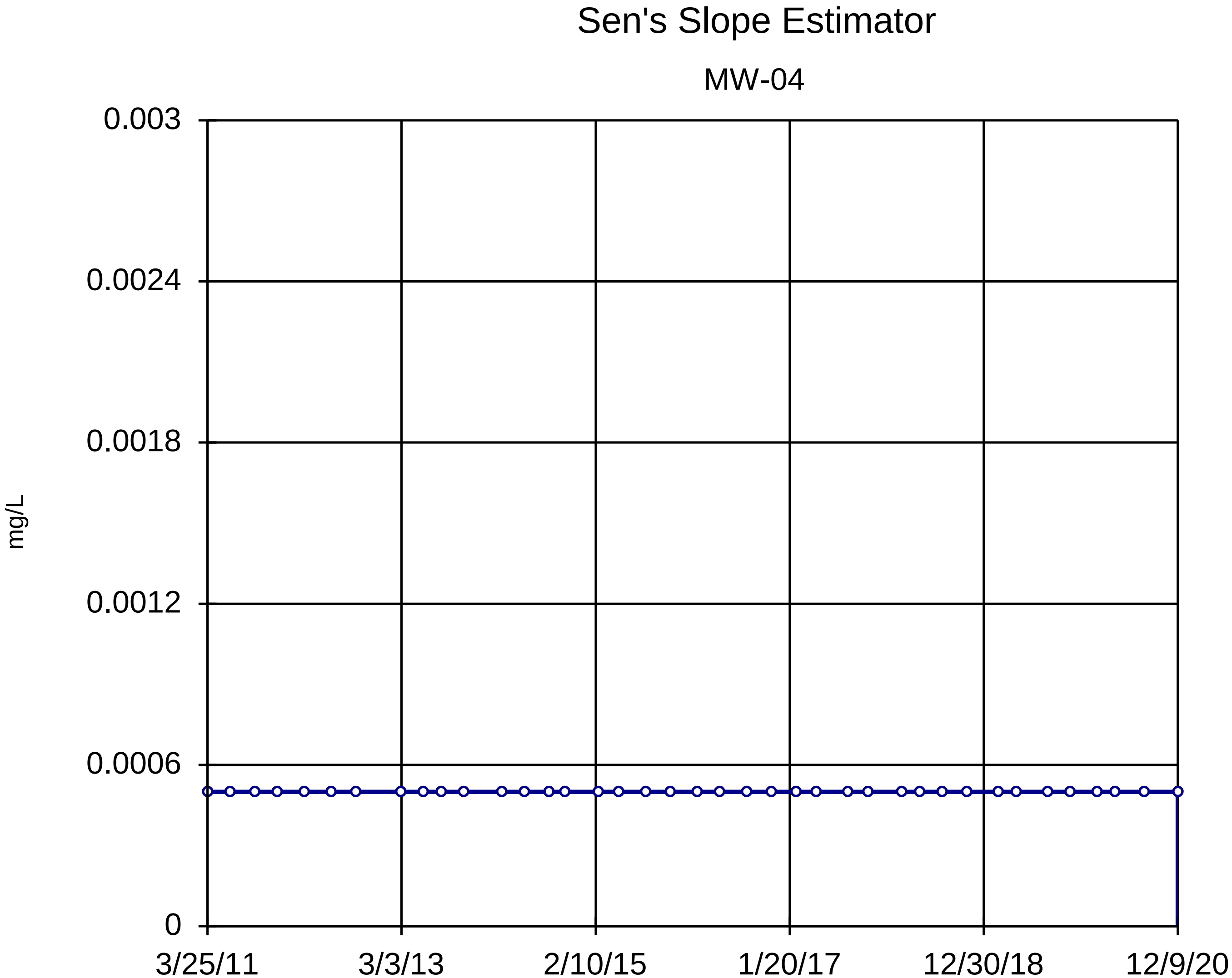
Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

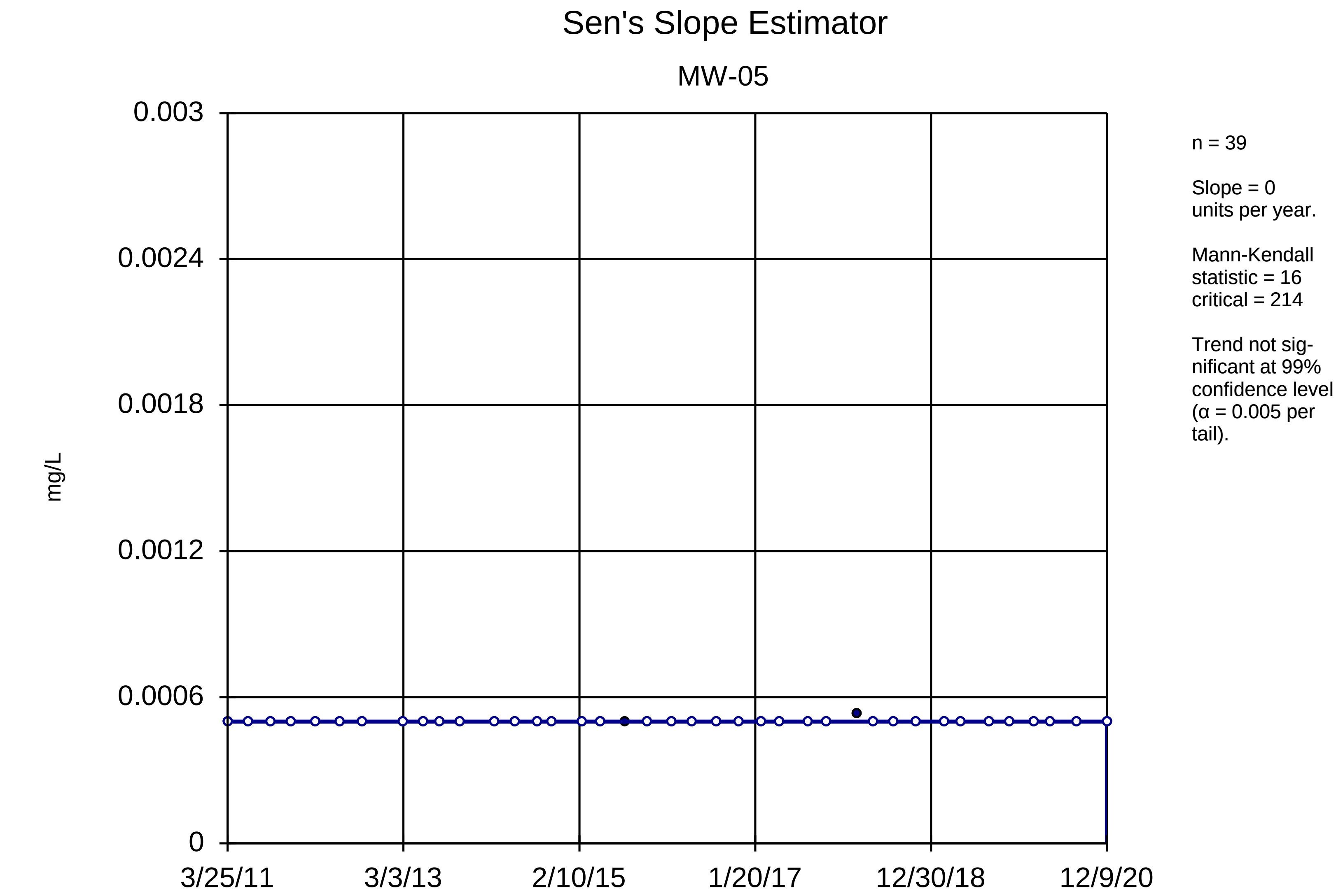
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81730

Hollow symbols indicate censored values.




Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81731

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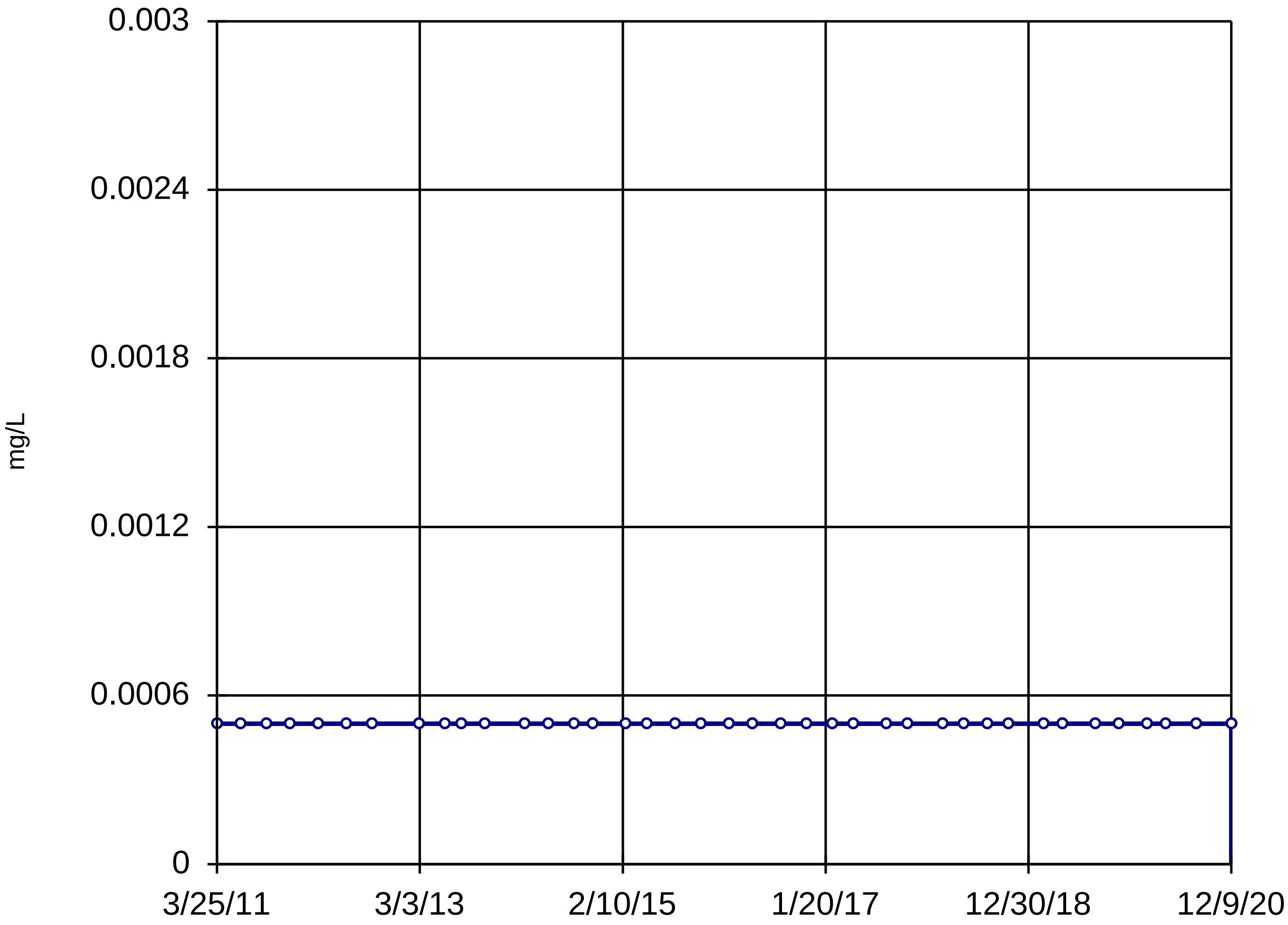
Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-06




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81732

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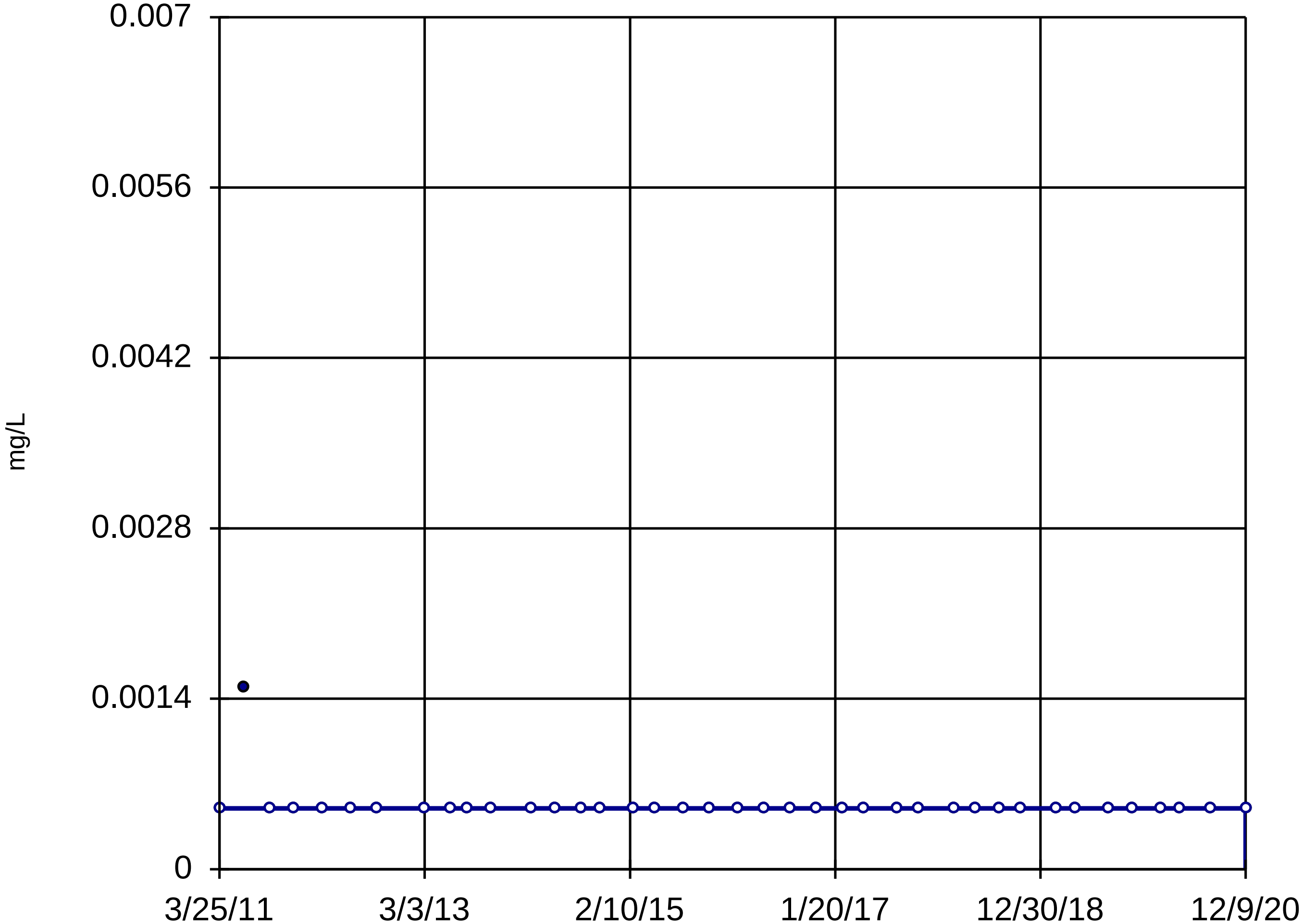
## Sen's Slope Estimator

MW-07




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = -36
critical = -214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81733

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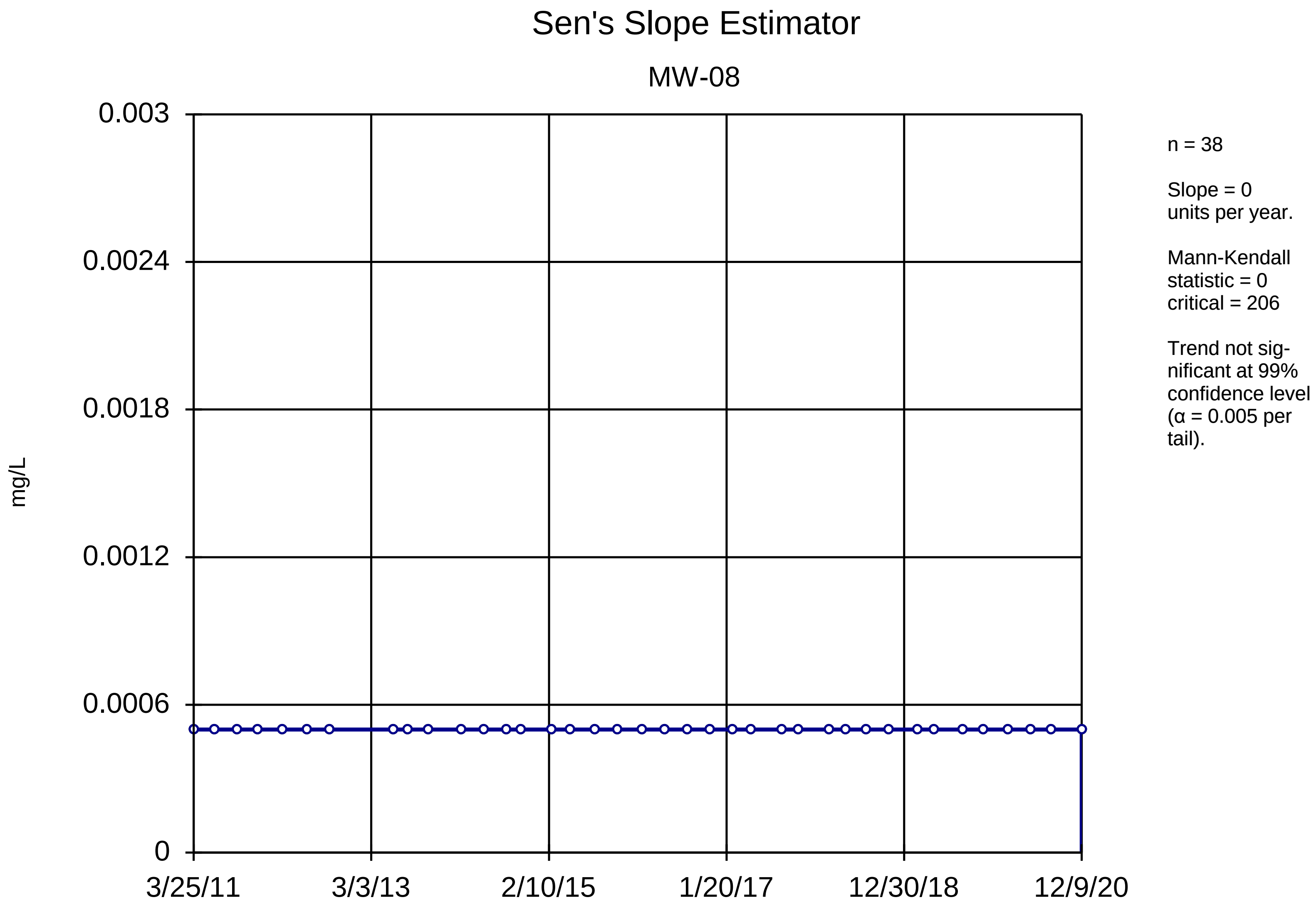
Hollow symbols indicate censored values.

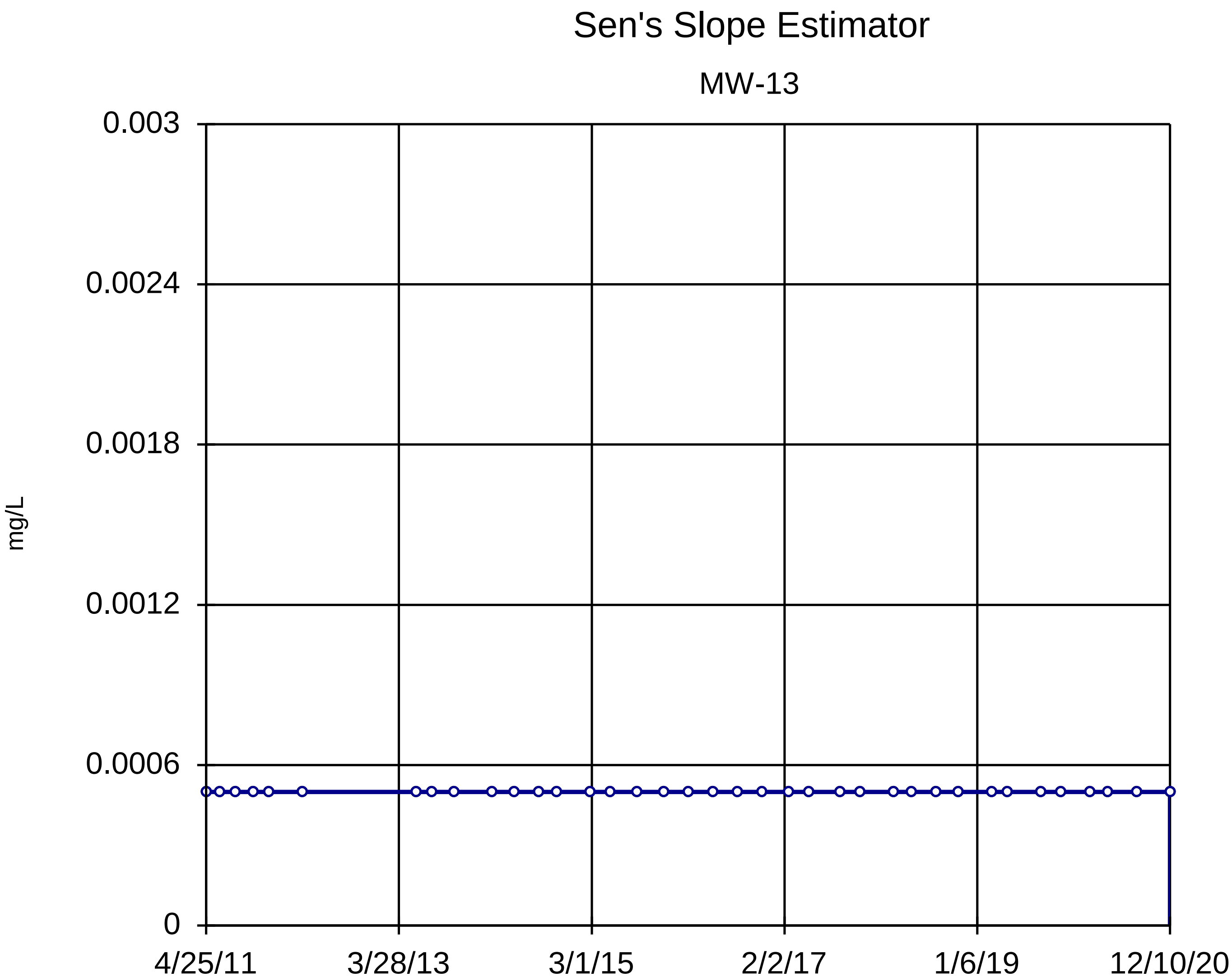



Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81734

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 199

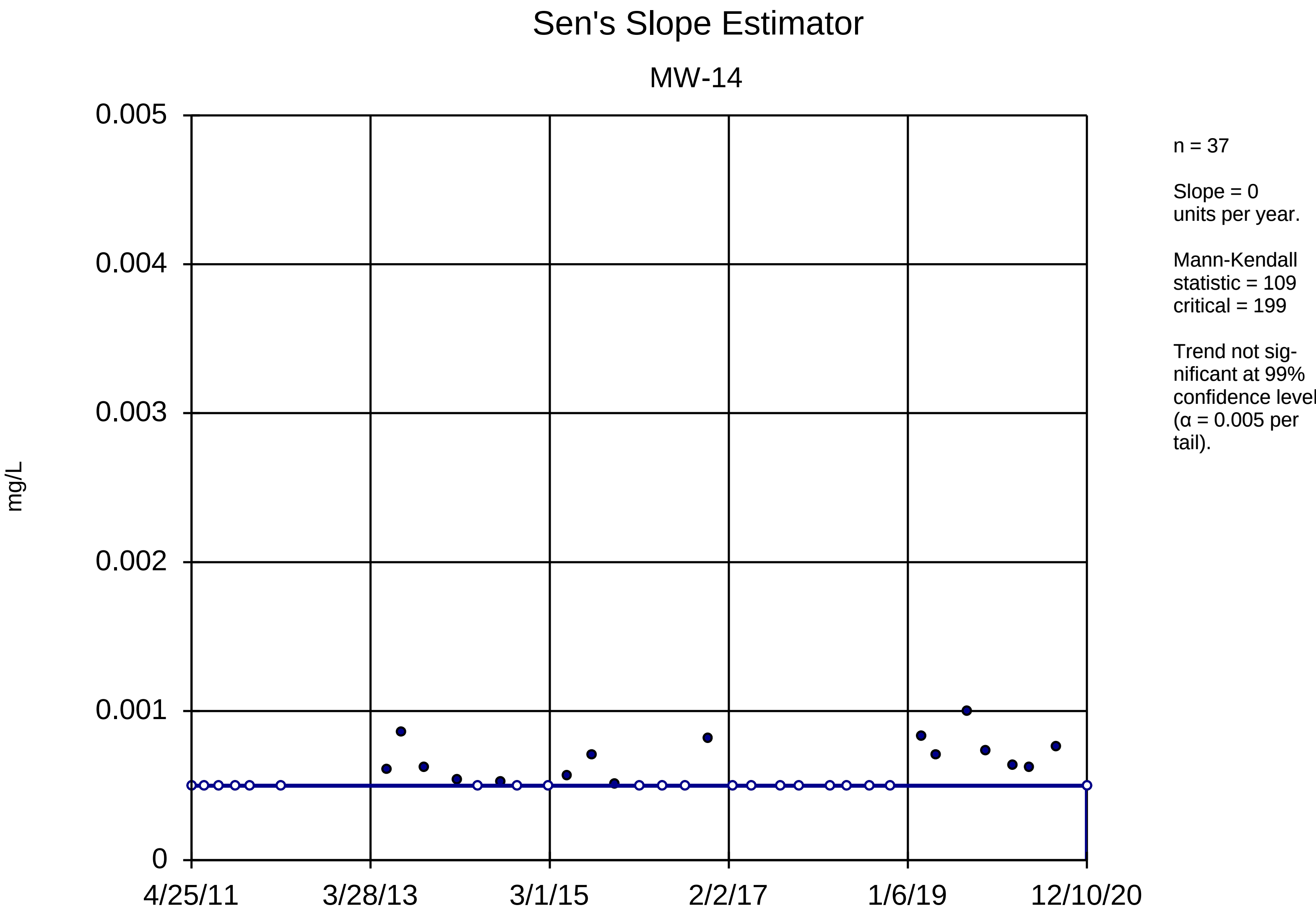
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved Analysis Run 4/2/2021 11:44 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81735

Hollow symbols indicate censored values.

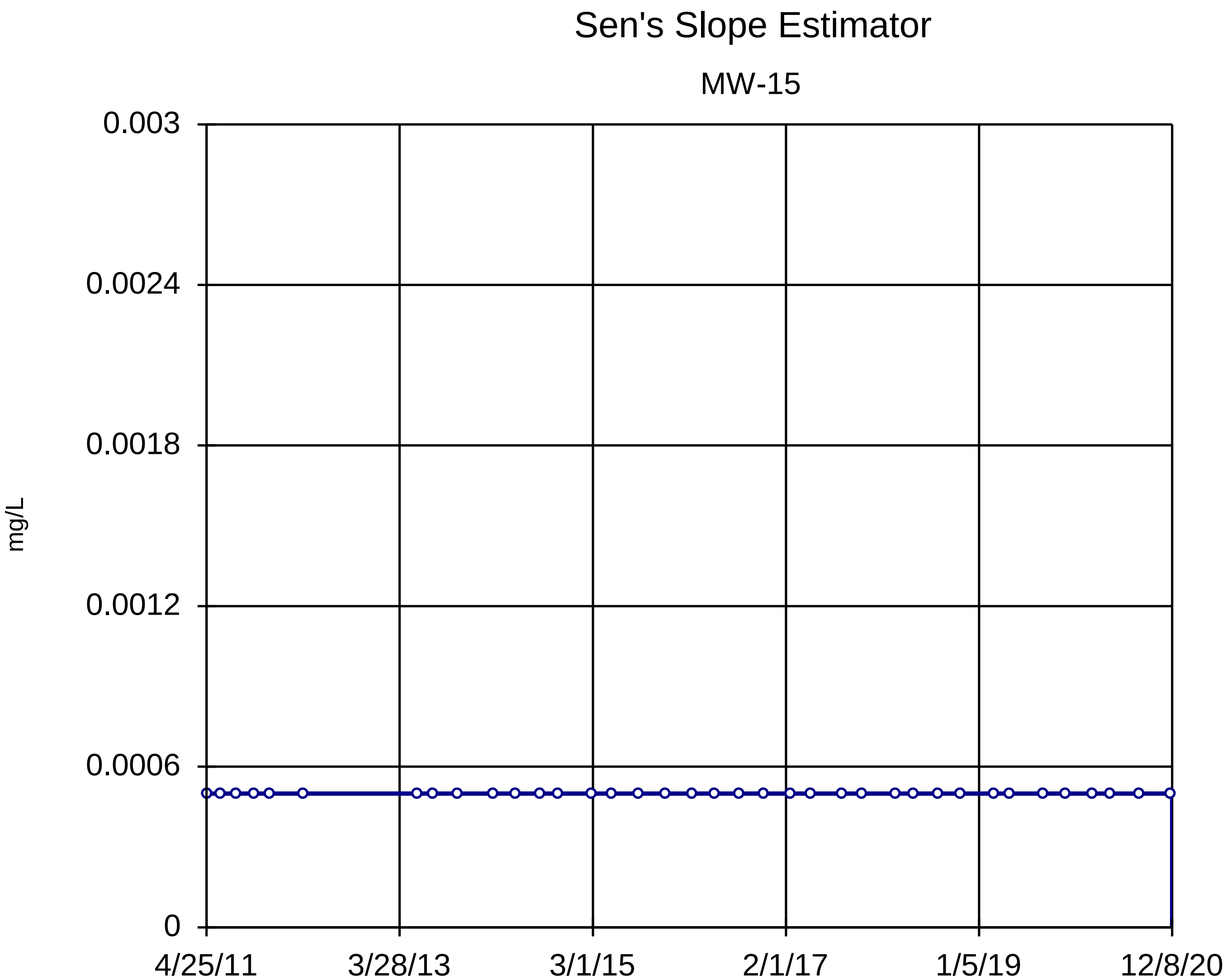



Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81736

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 199

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

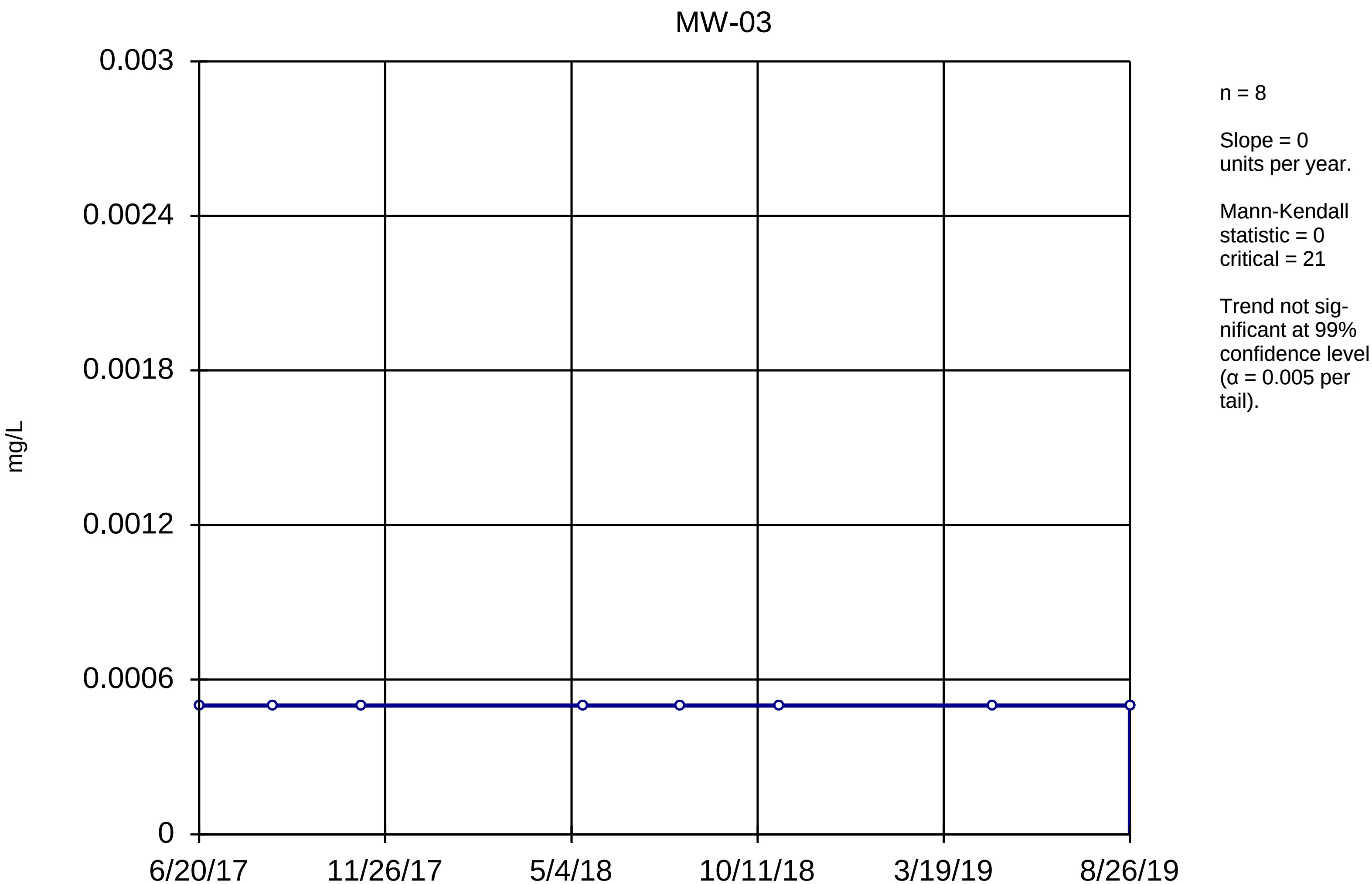
Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81737

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

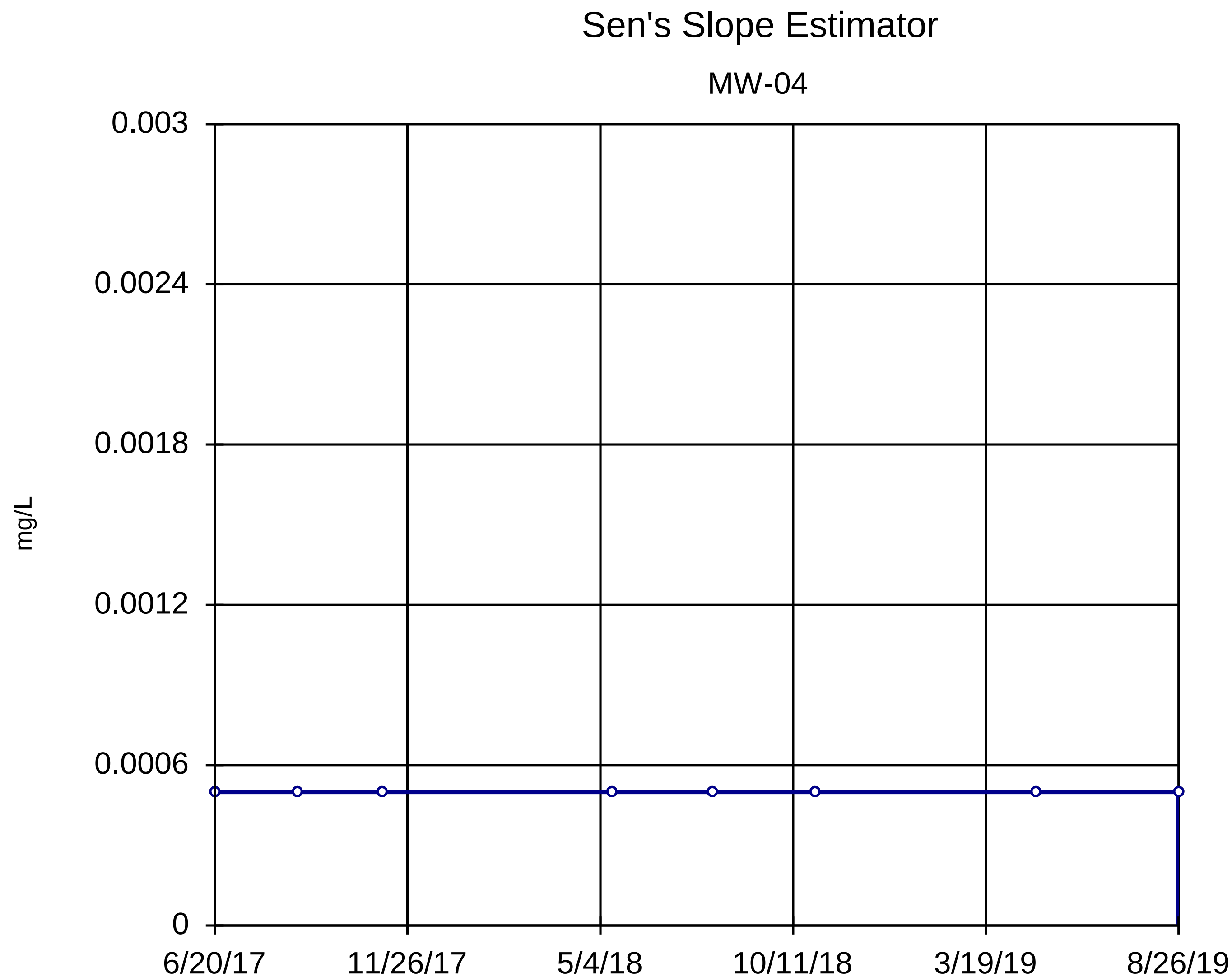
## Sen's Slope Estimator




Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:44 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 21

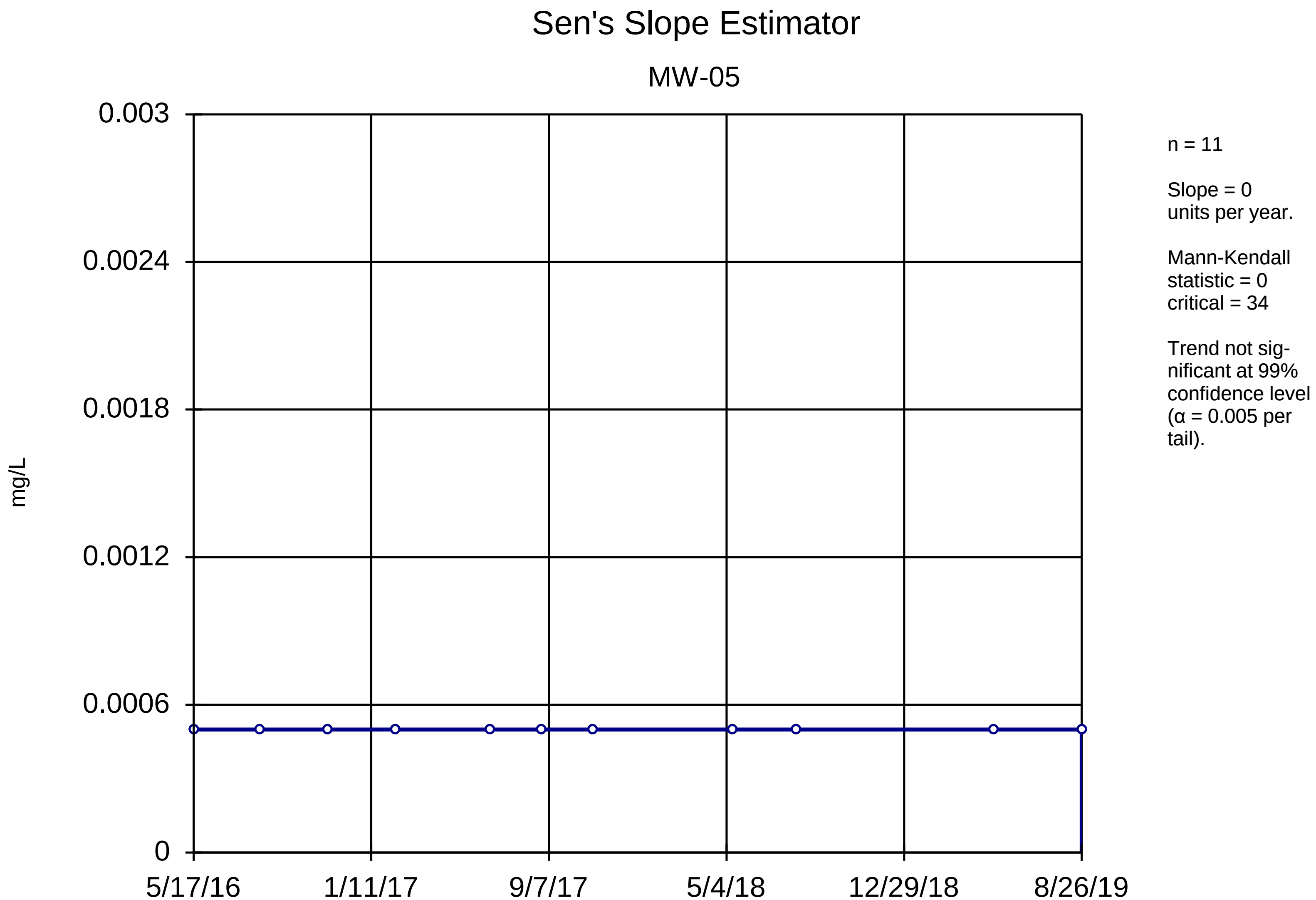
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81739

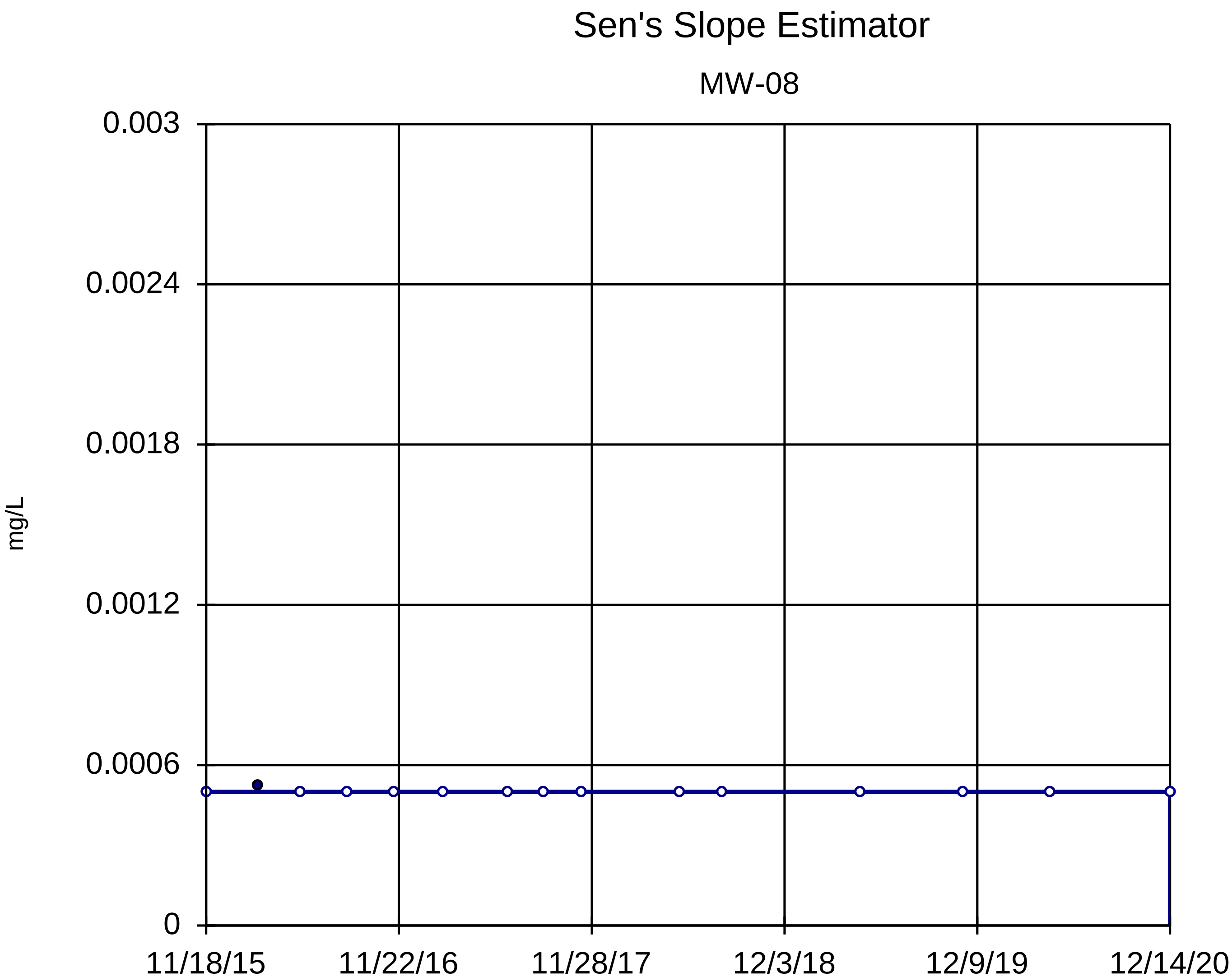
Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




n = 15

Slope = 0
units per year.

Mann-Kendall
statistic = -12
critical = -53

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81741

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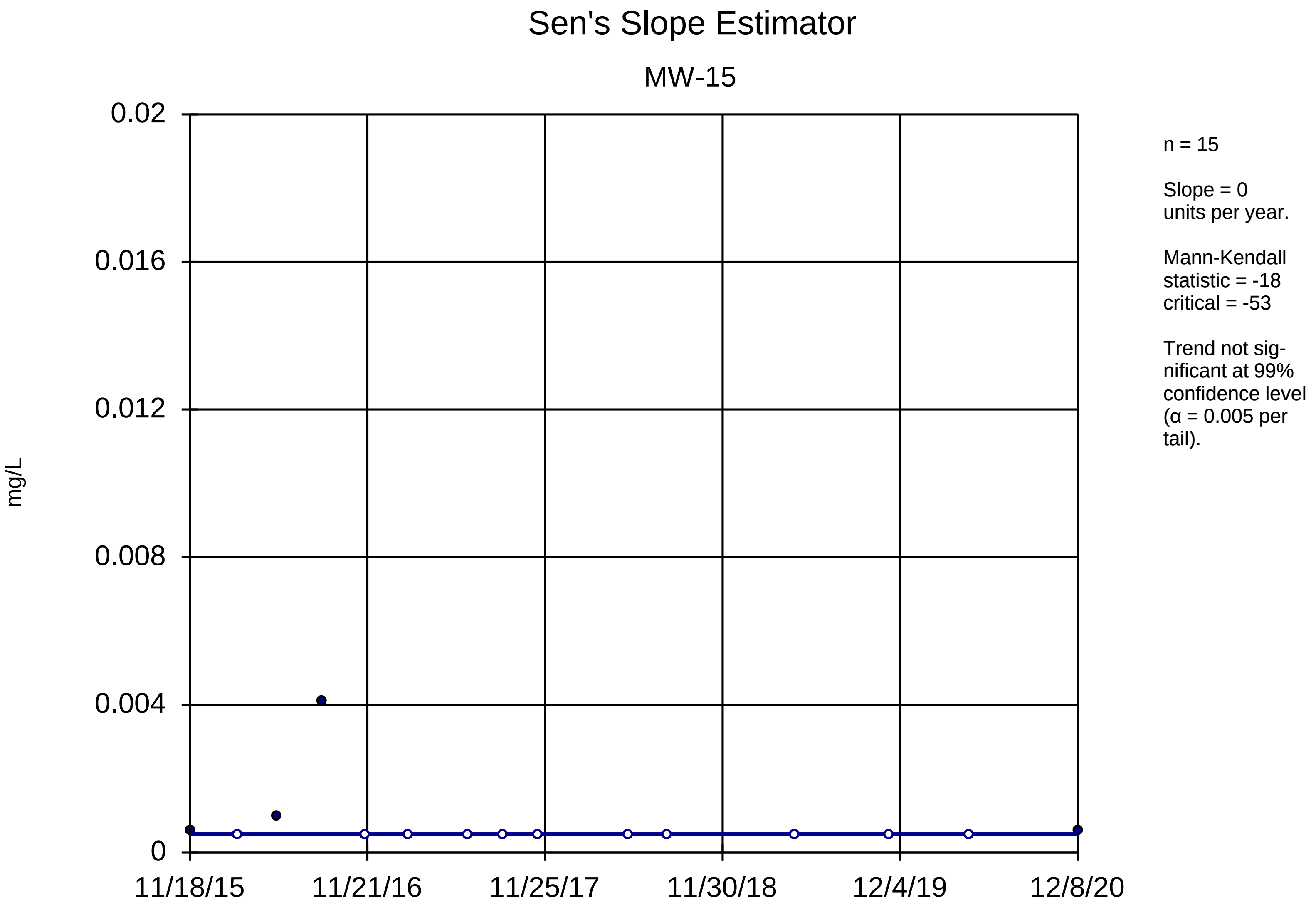
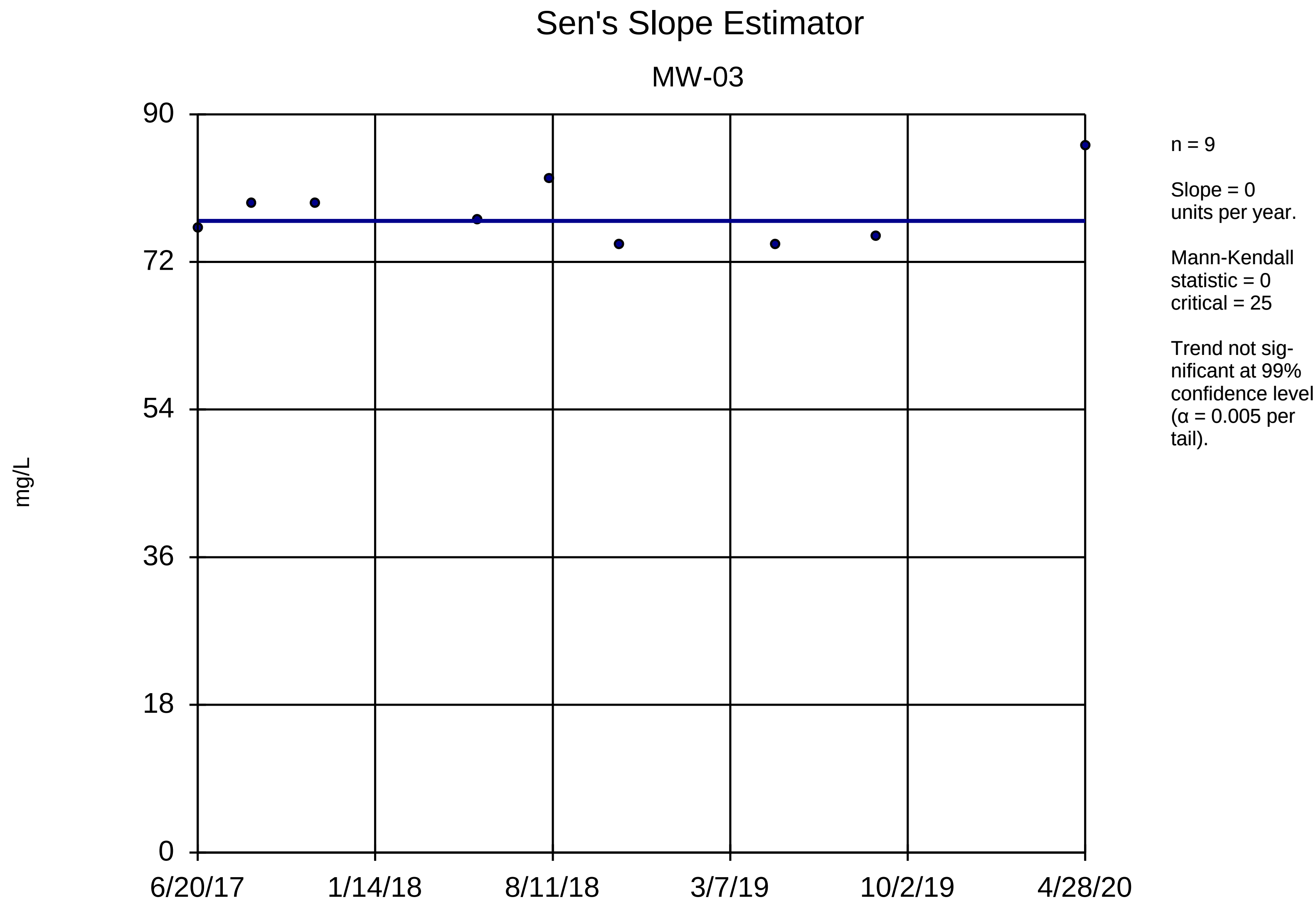
Hollow symbols indicate censored values.




Constituent: Cadmium, Total    Analysis Run 4/2/2021 11:45 AM

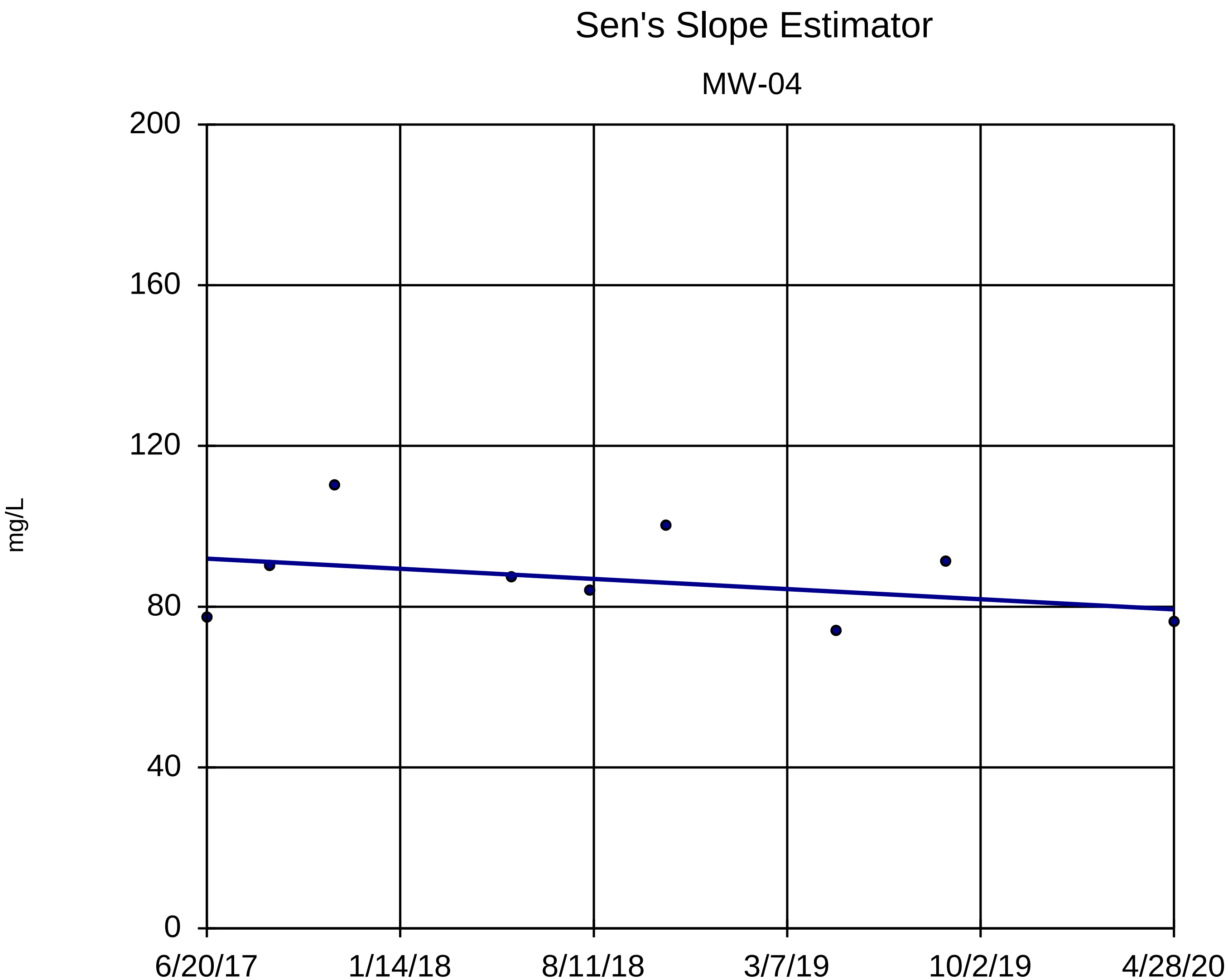
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81742




Constituent: Calcium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




n = 9

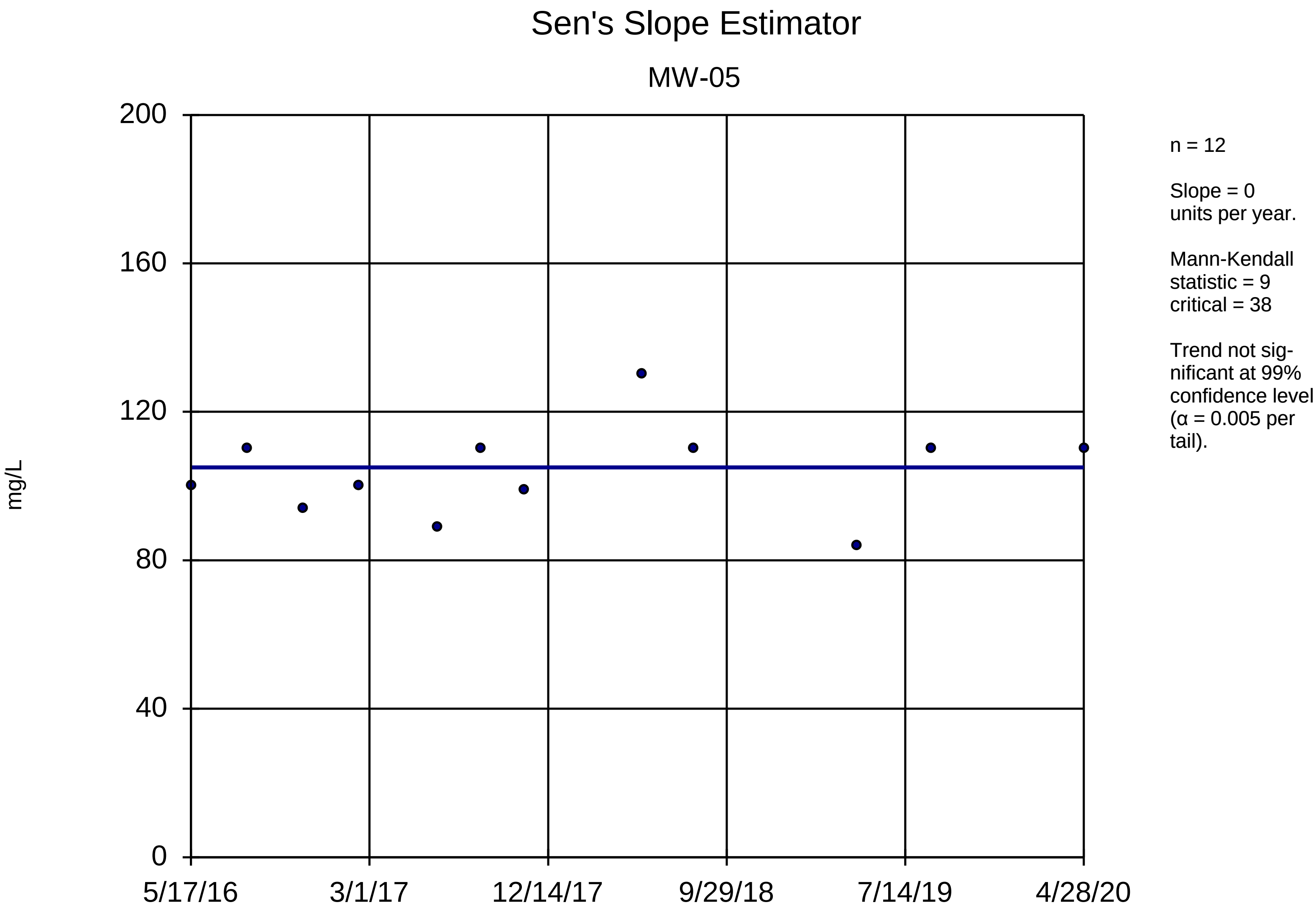
Slope = -4.423 units per year.

Mann-Kendall statistic = -6 critical = -25

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

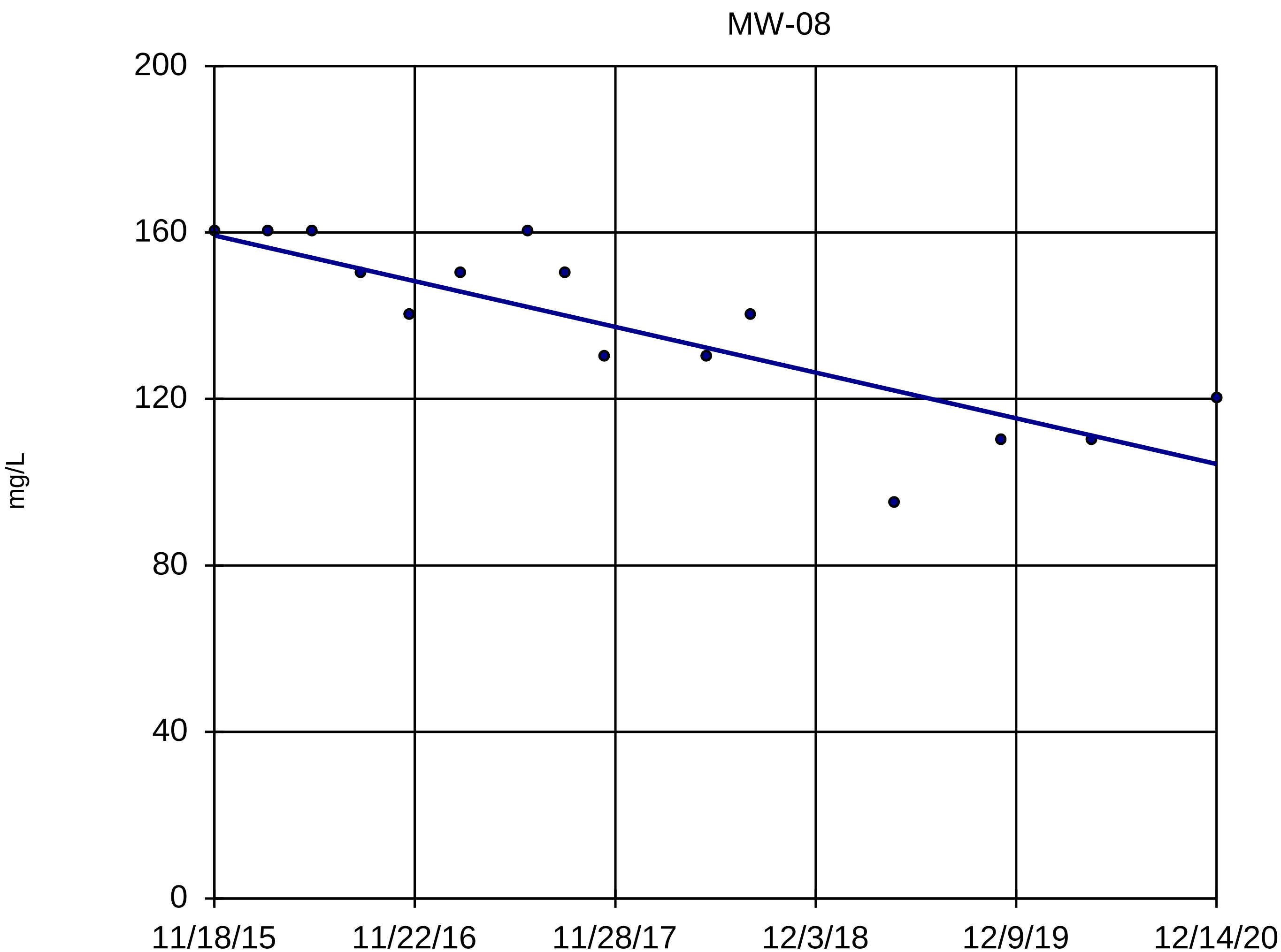



Constituent: Calcium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81745

# Sen's Slope Estimator




n = 15

Slope = -10.81
units per year.

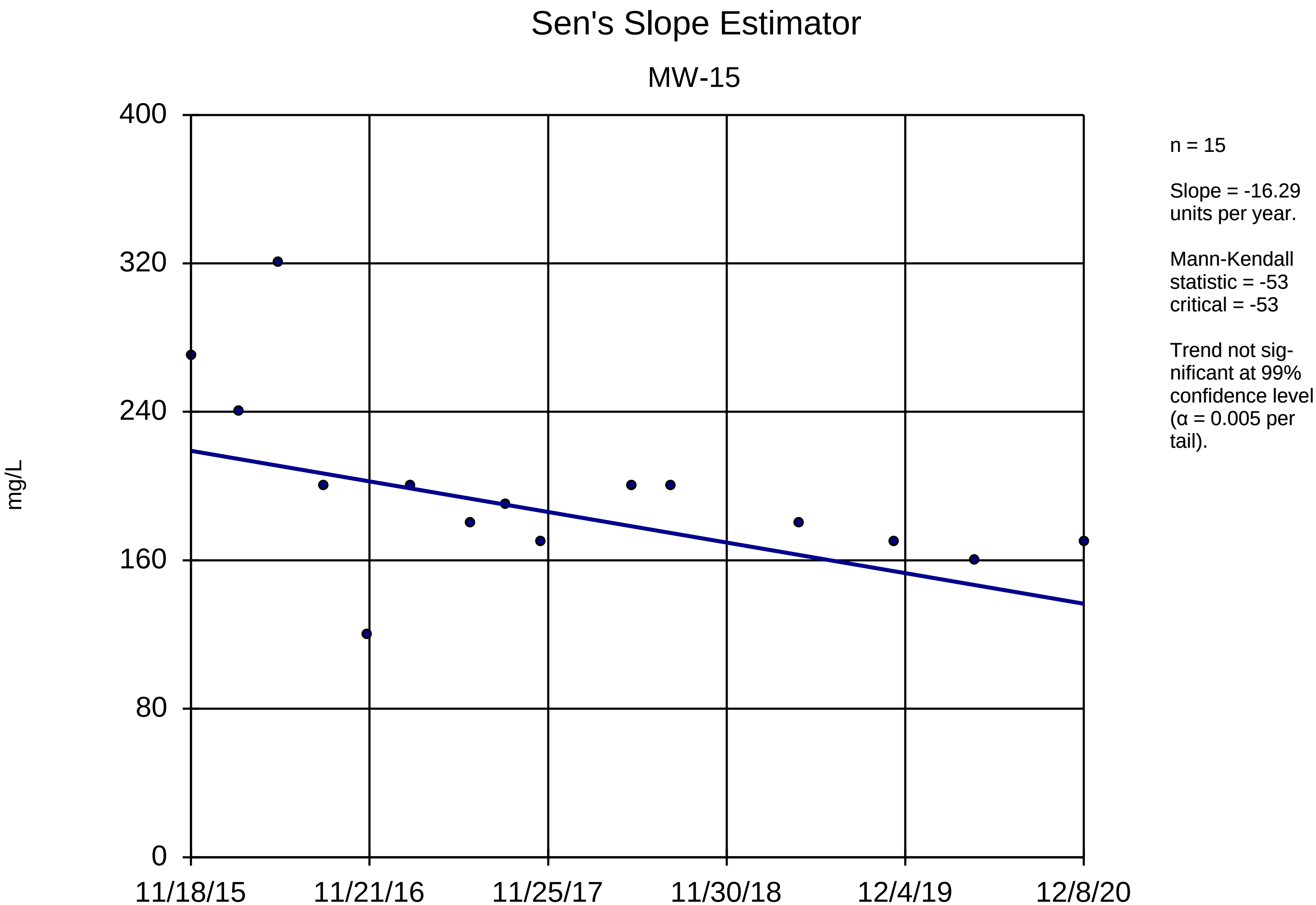
Mann-Kendall
statistic = -69
critical = -53

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Calcium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

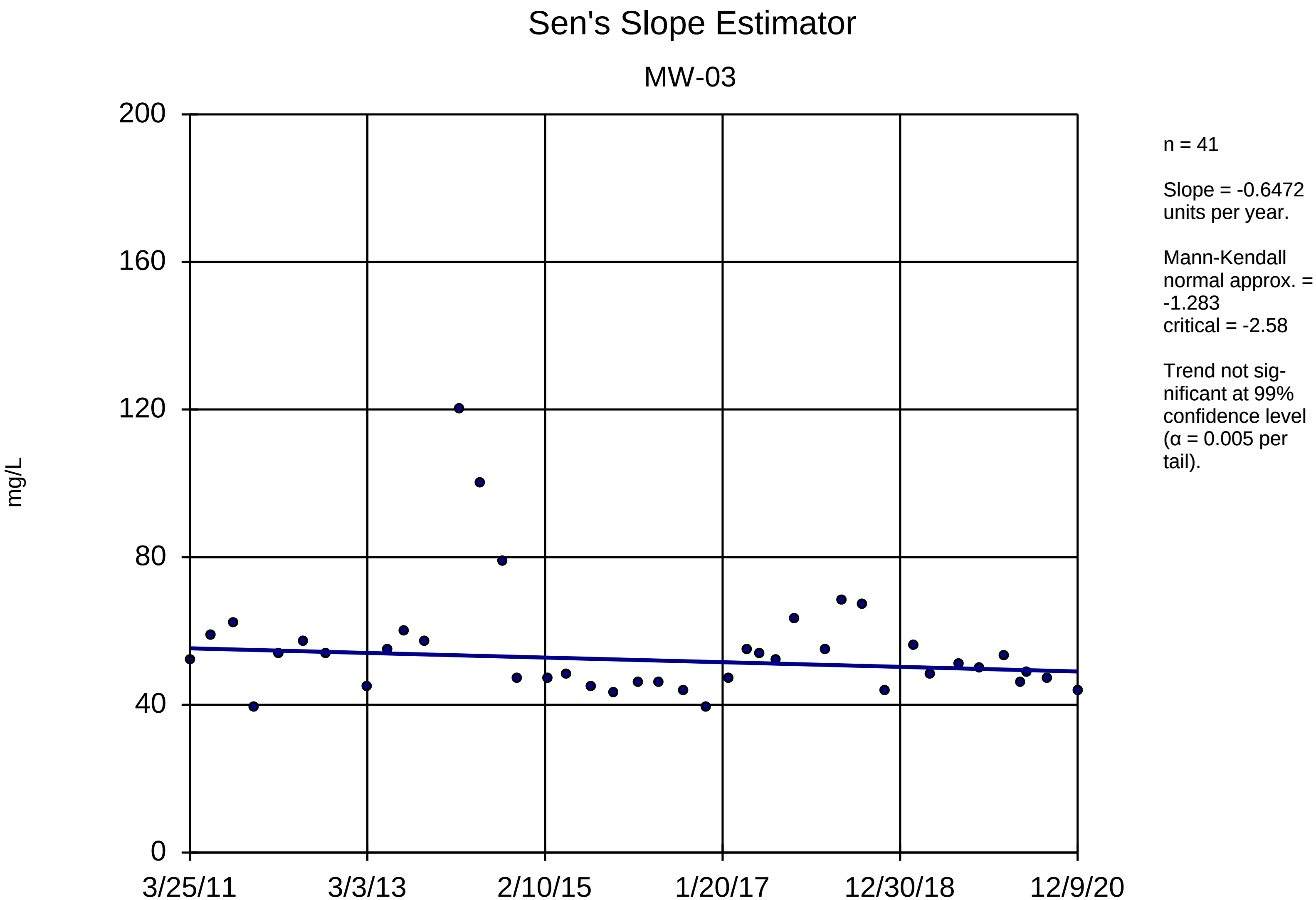
MWG13-15_81746




Constituent: Calcium, Total    Analysis Run 4/2/2021 11:45 AM

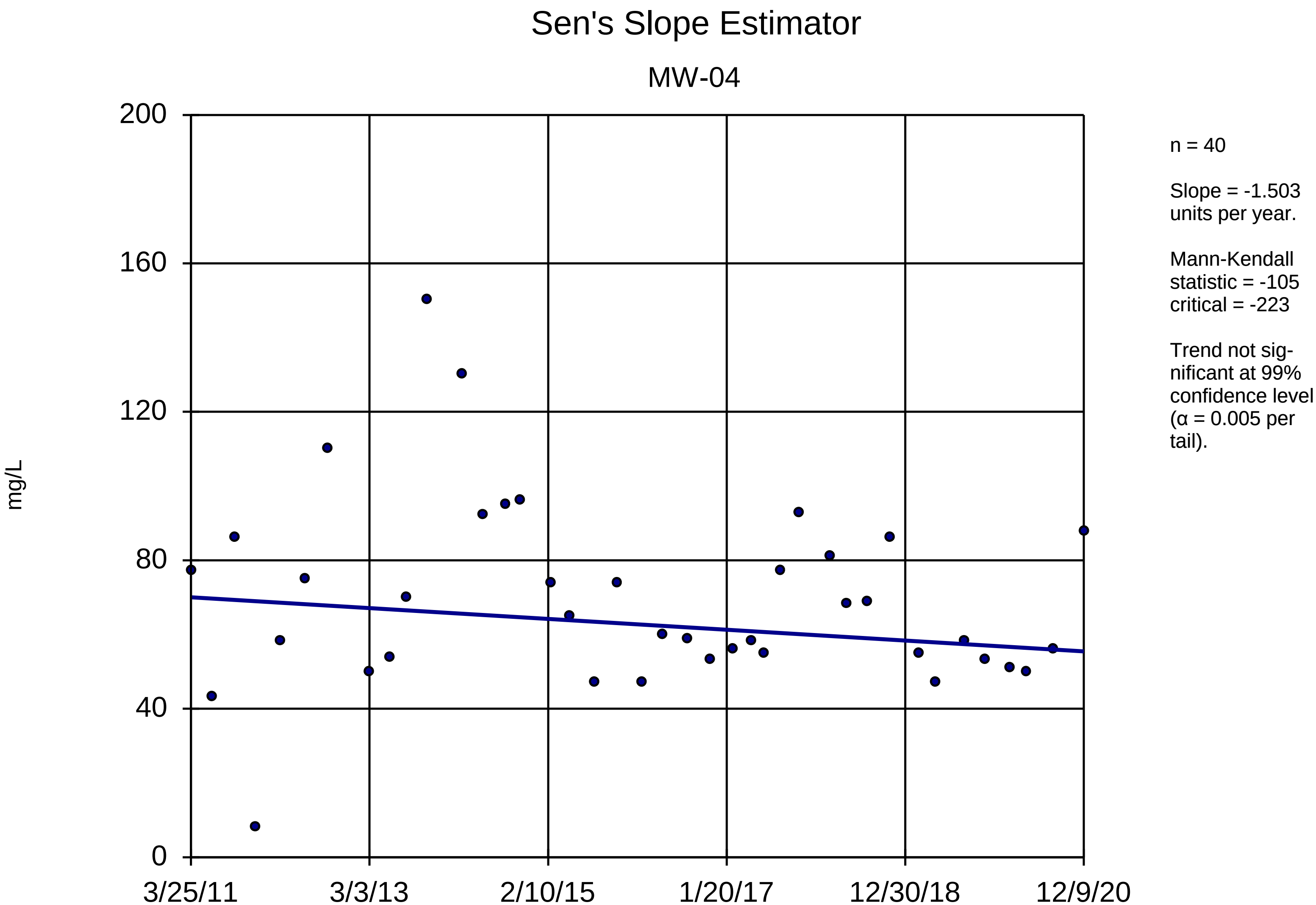
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81747



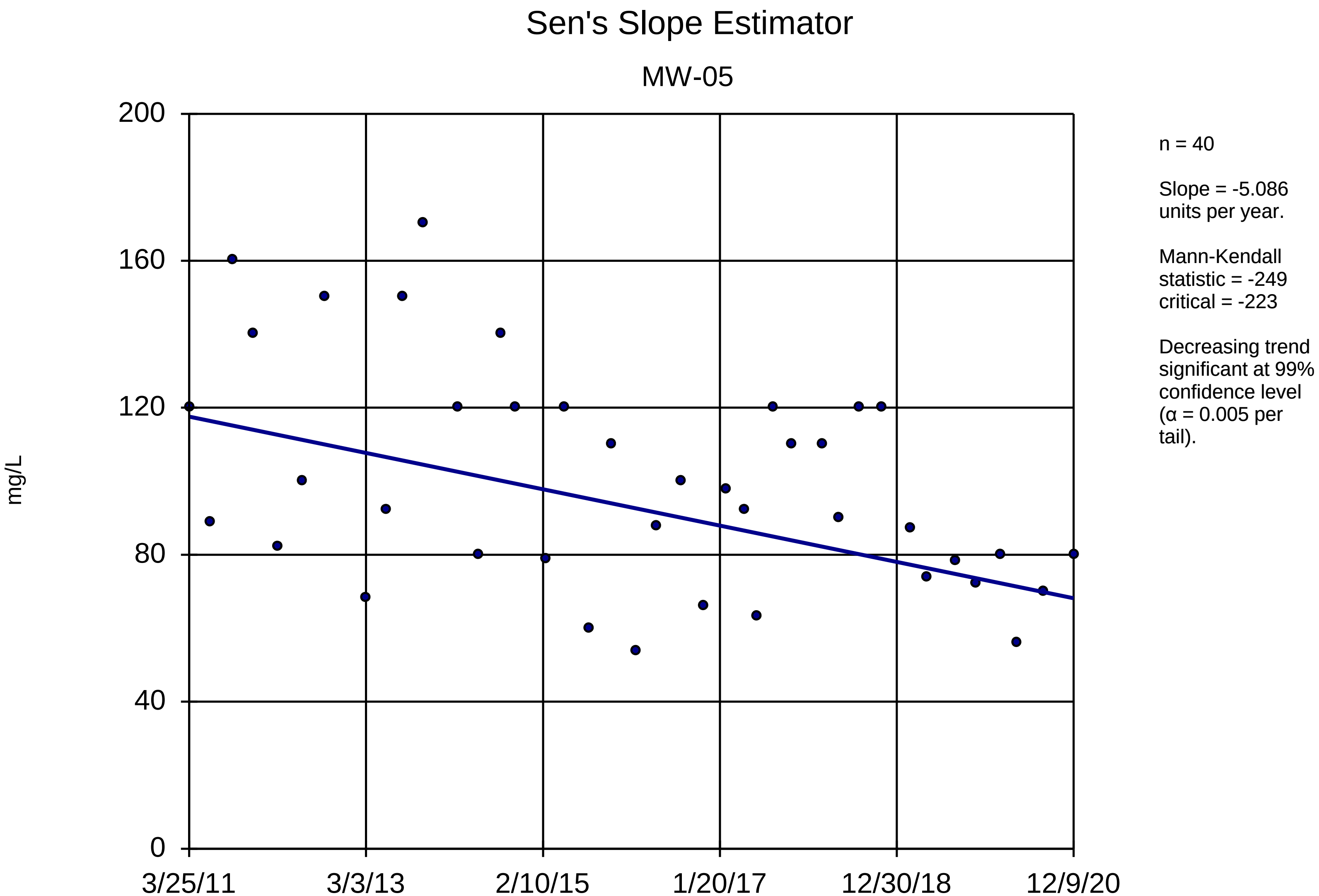

Constituent: Chloride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Chloride Analysis Run 4/2/2021 11:45 AM

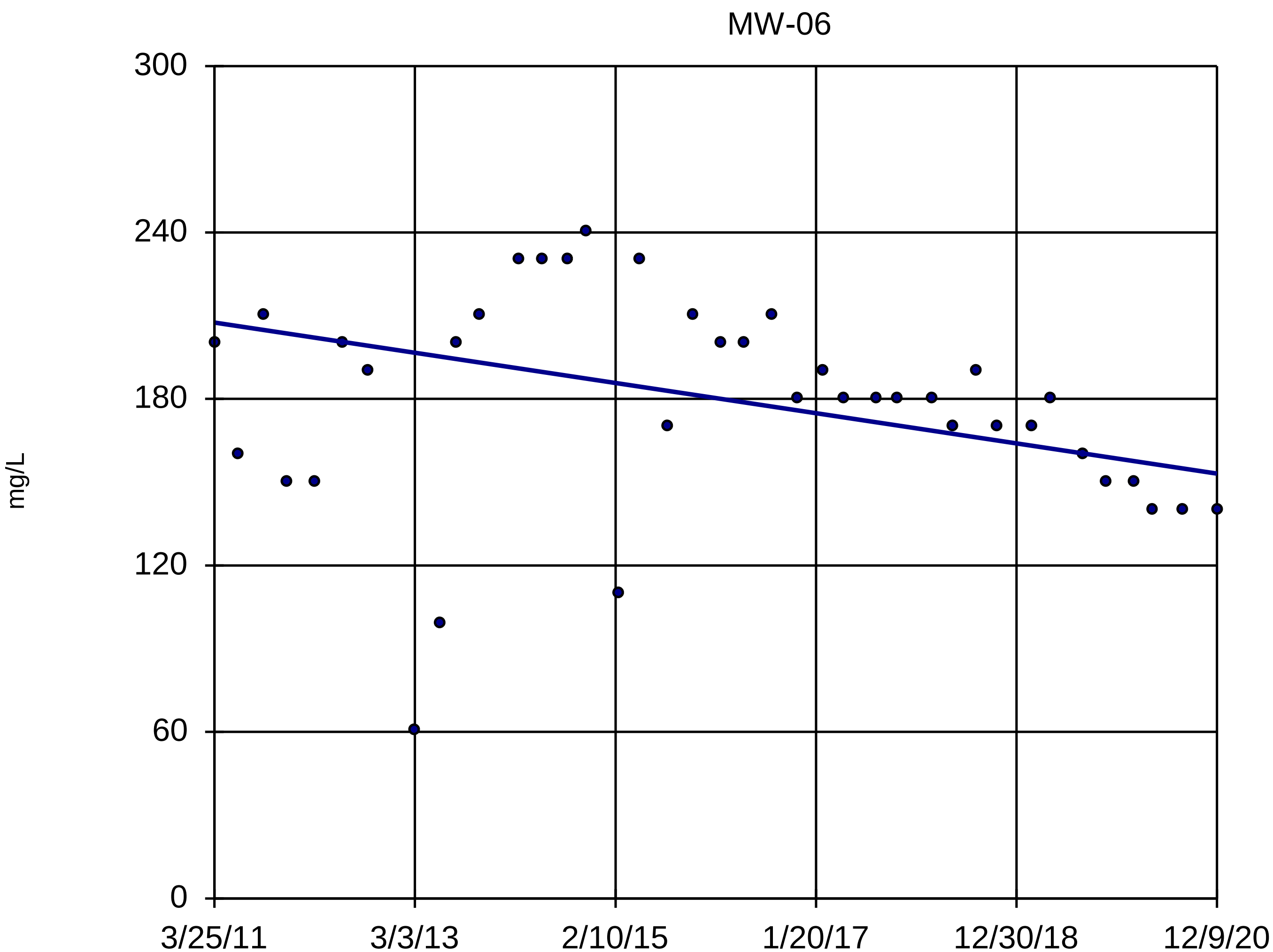
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database




Constituent: Chloride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

# Sen's Slope Estimator




n = 39

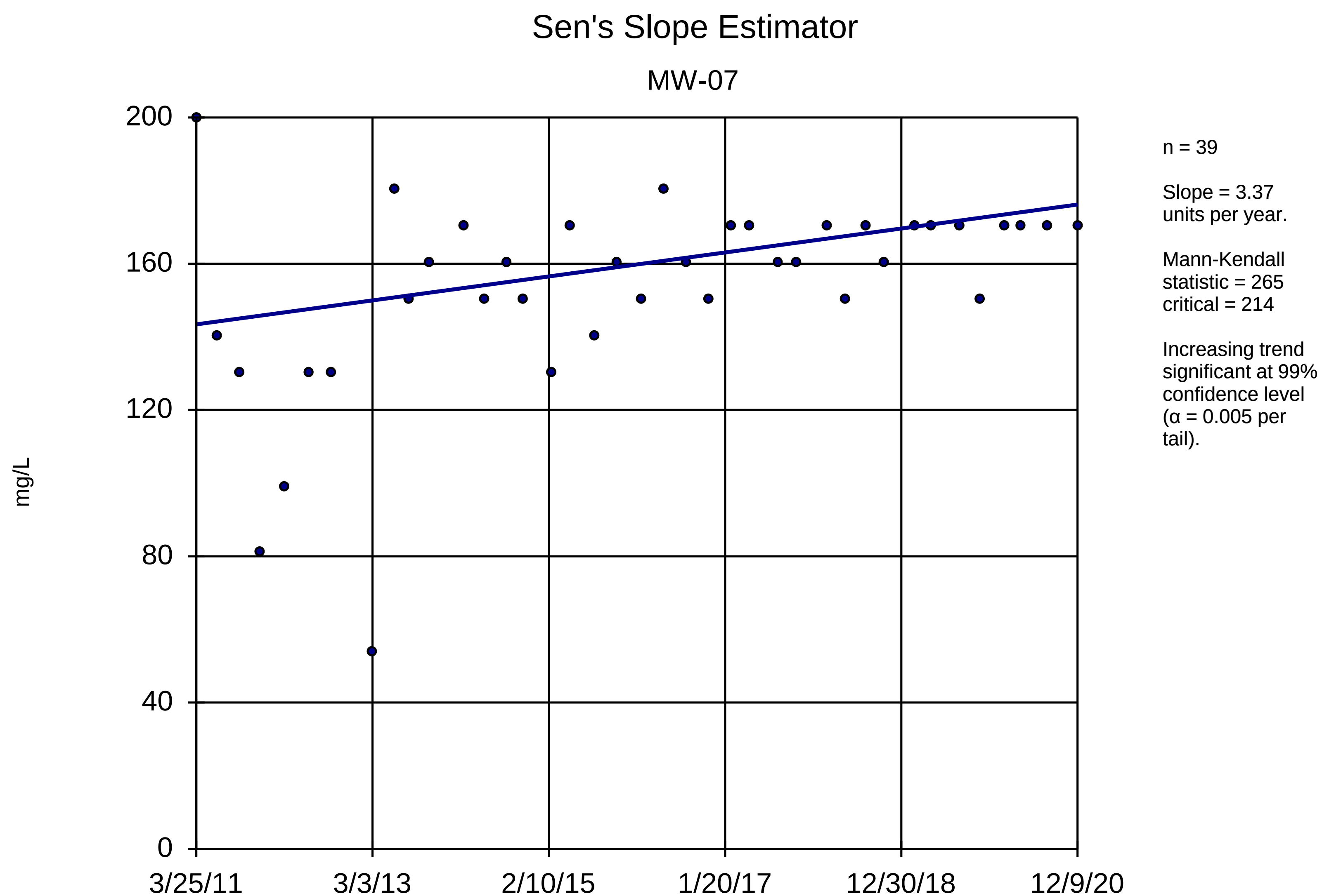
Slope = -5.6
units per year.

Mann-Kendall
statistic = -215
critical = -214

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database



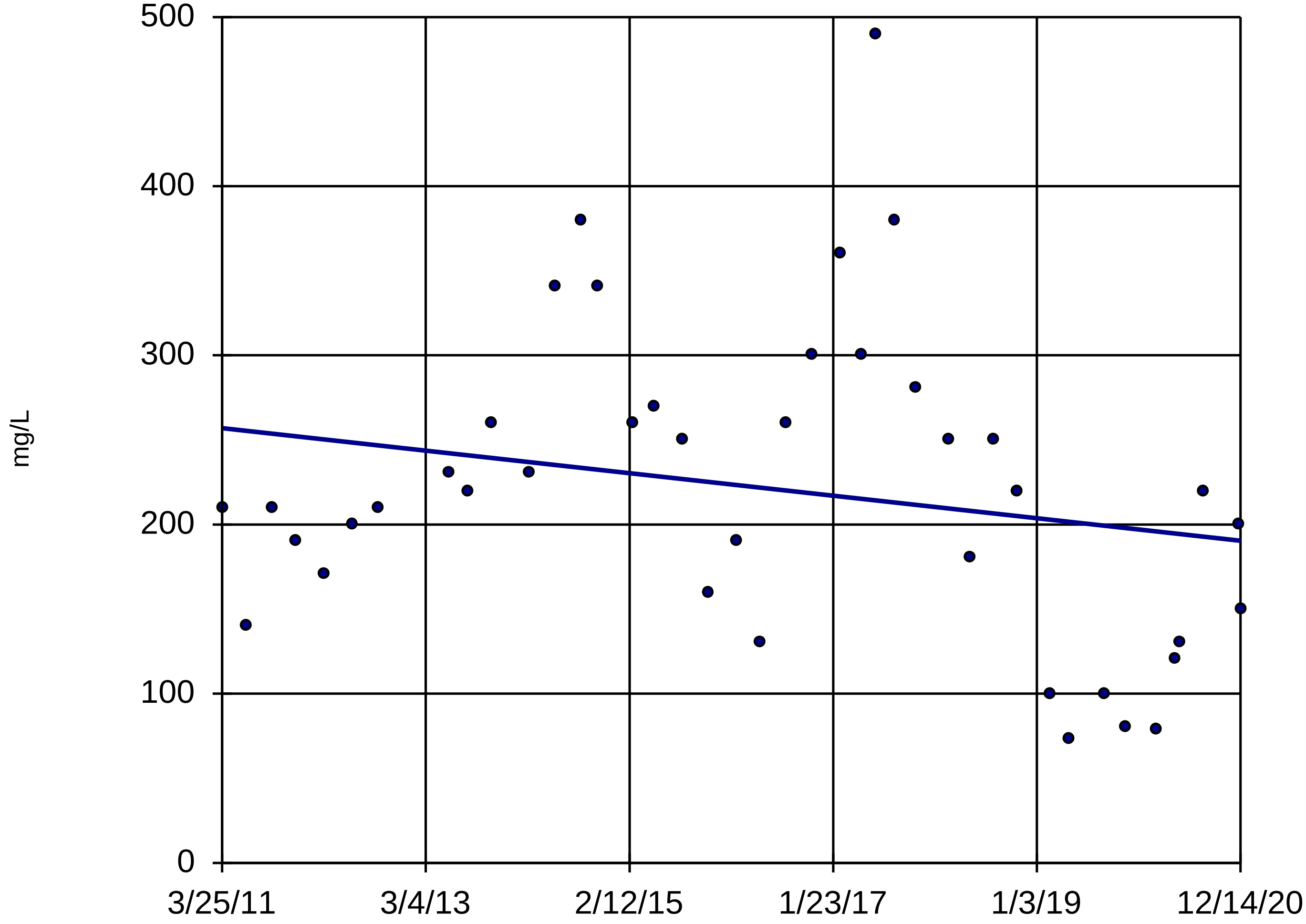

Constituent: Chloride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81752

## Sen's Slope Estimator

MW-08




n = 41

Slope = -6.84 units per year.

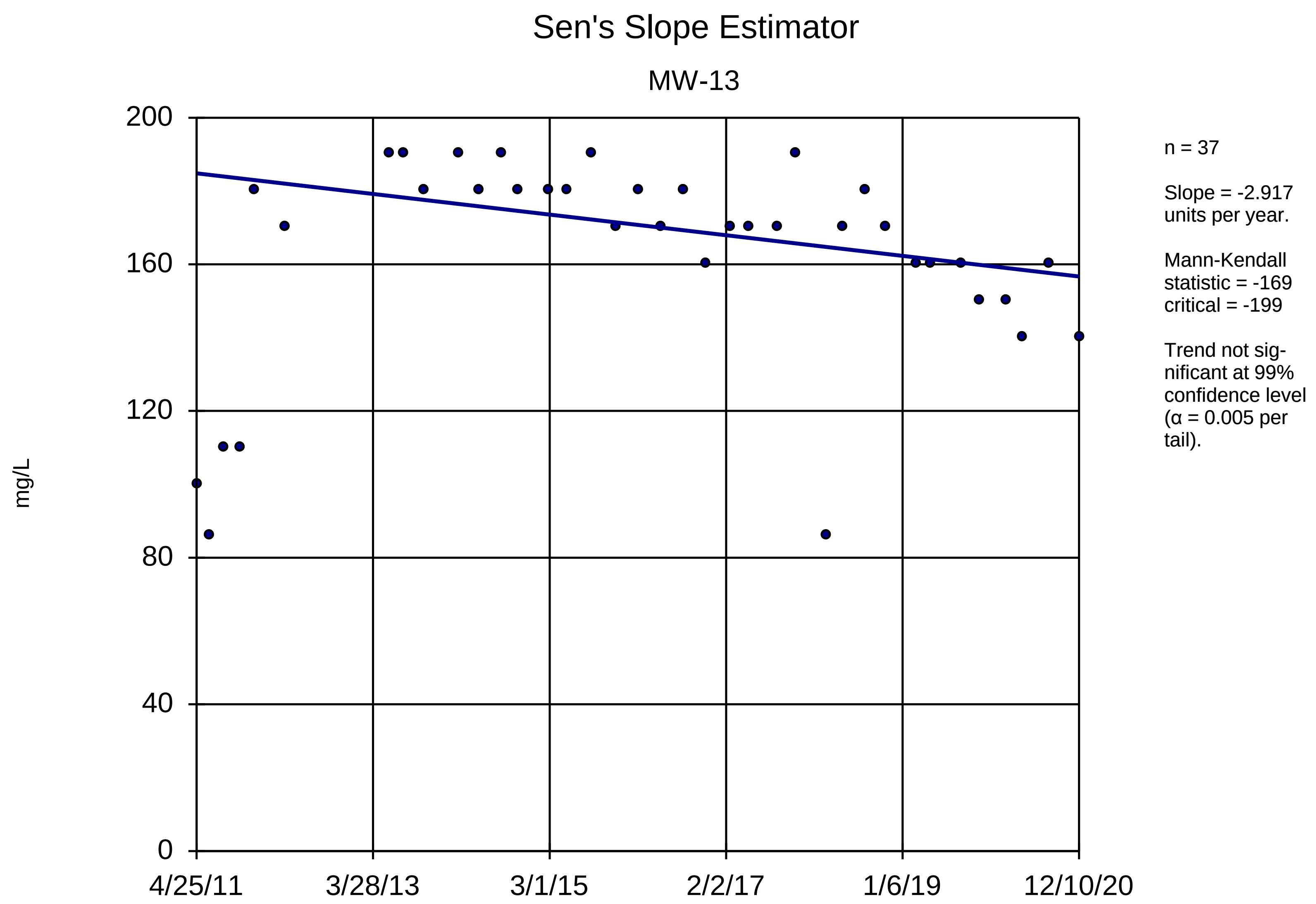
Mann-Kendall normal approx. = -1.249
critical = -2.58

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

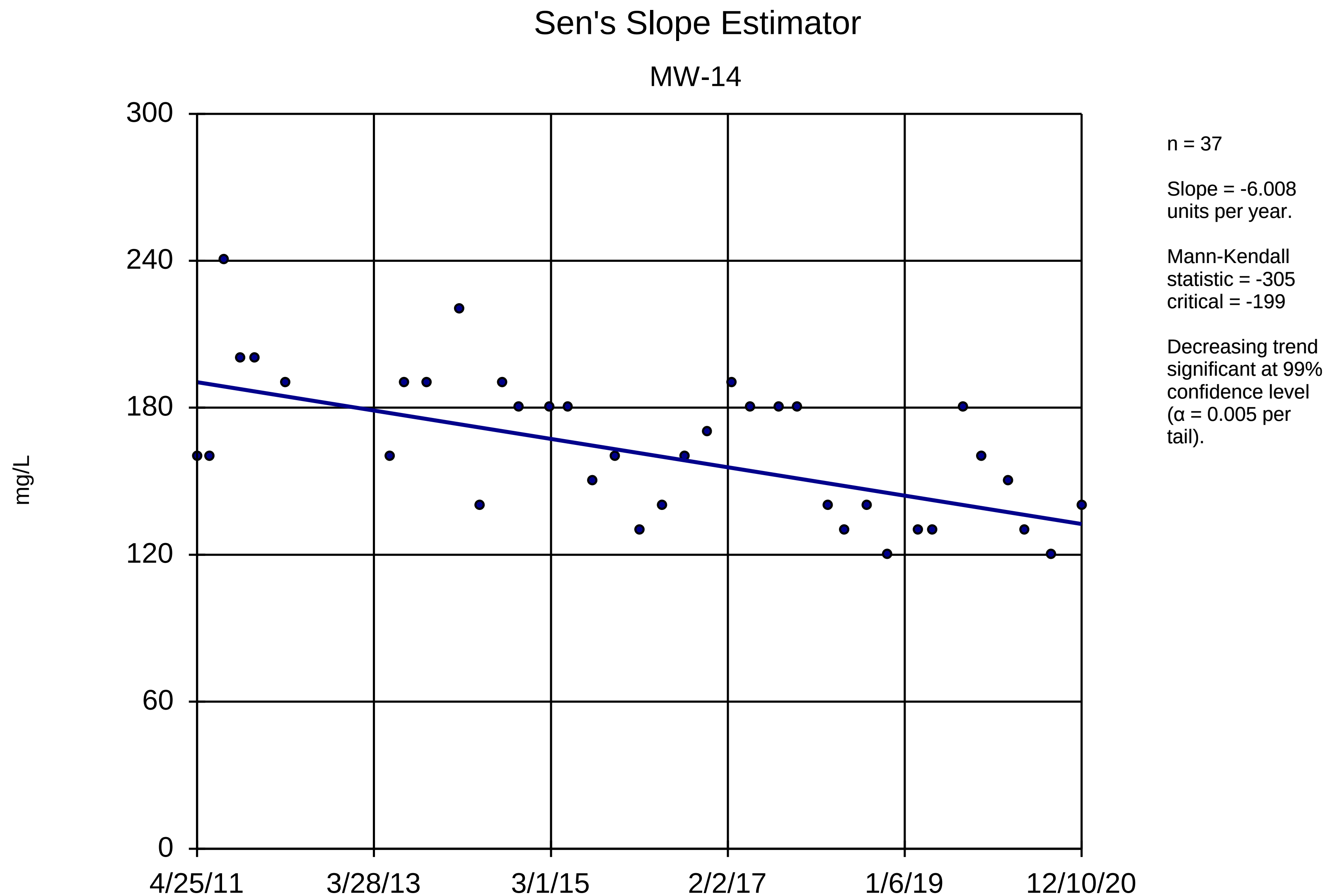
MWG13-15_81753




Constituent: Chloride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

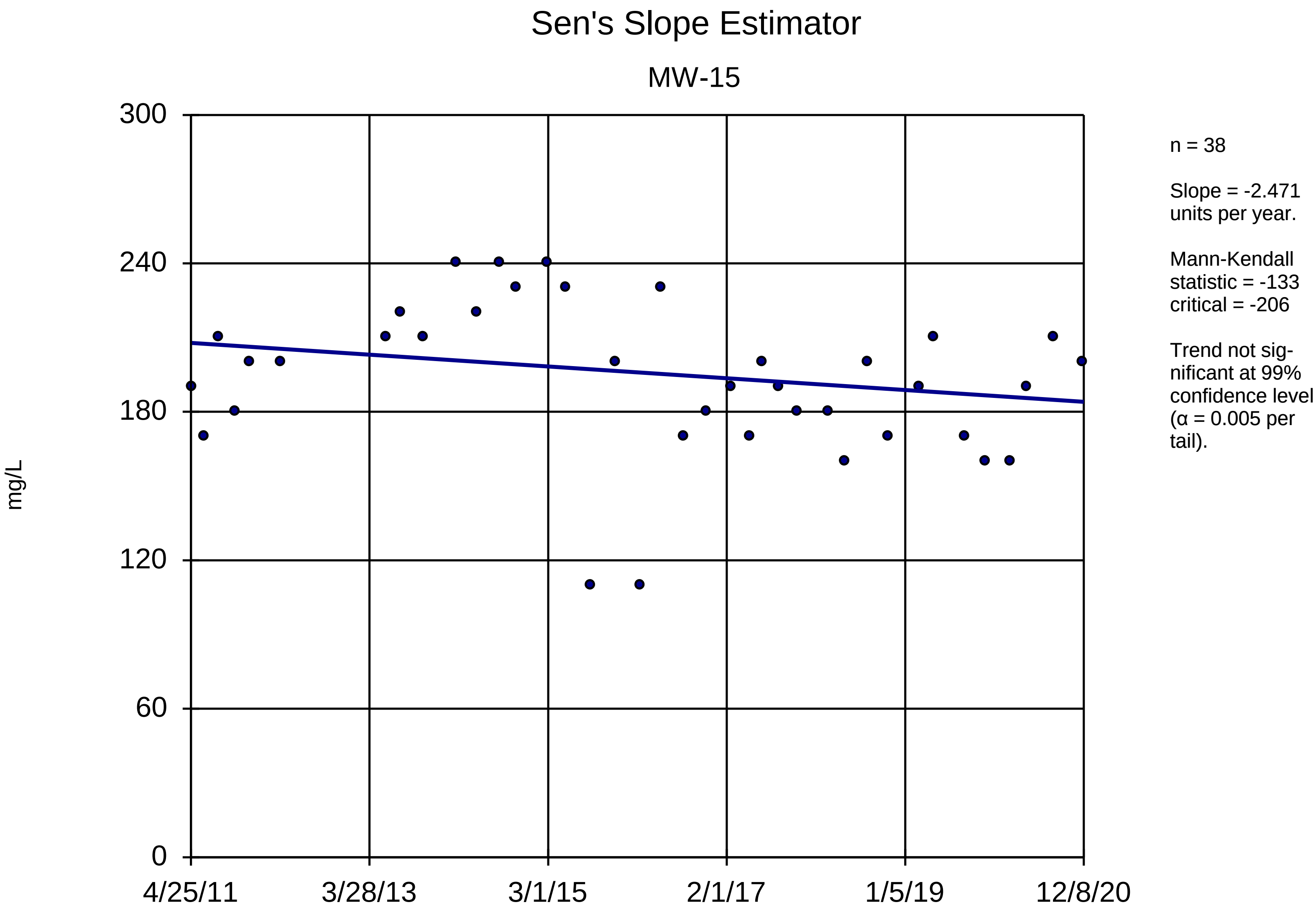
MWG13-15_81754




Constituent: Chloride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81755




Constituent: Chloride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81756

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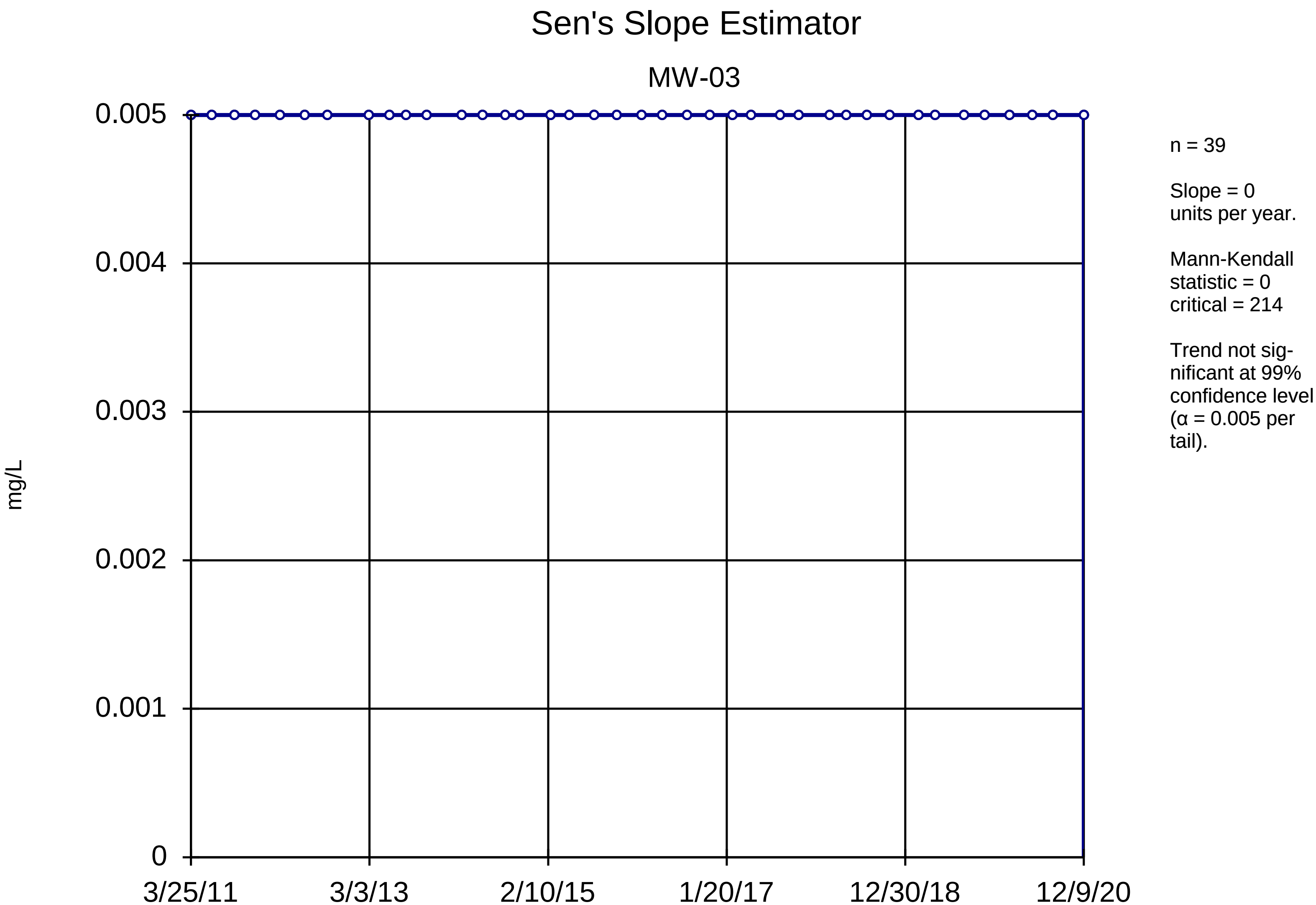
Hollow symbols indicate censored values.

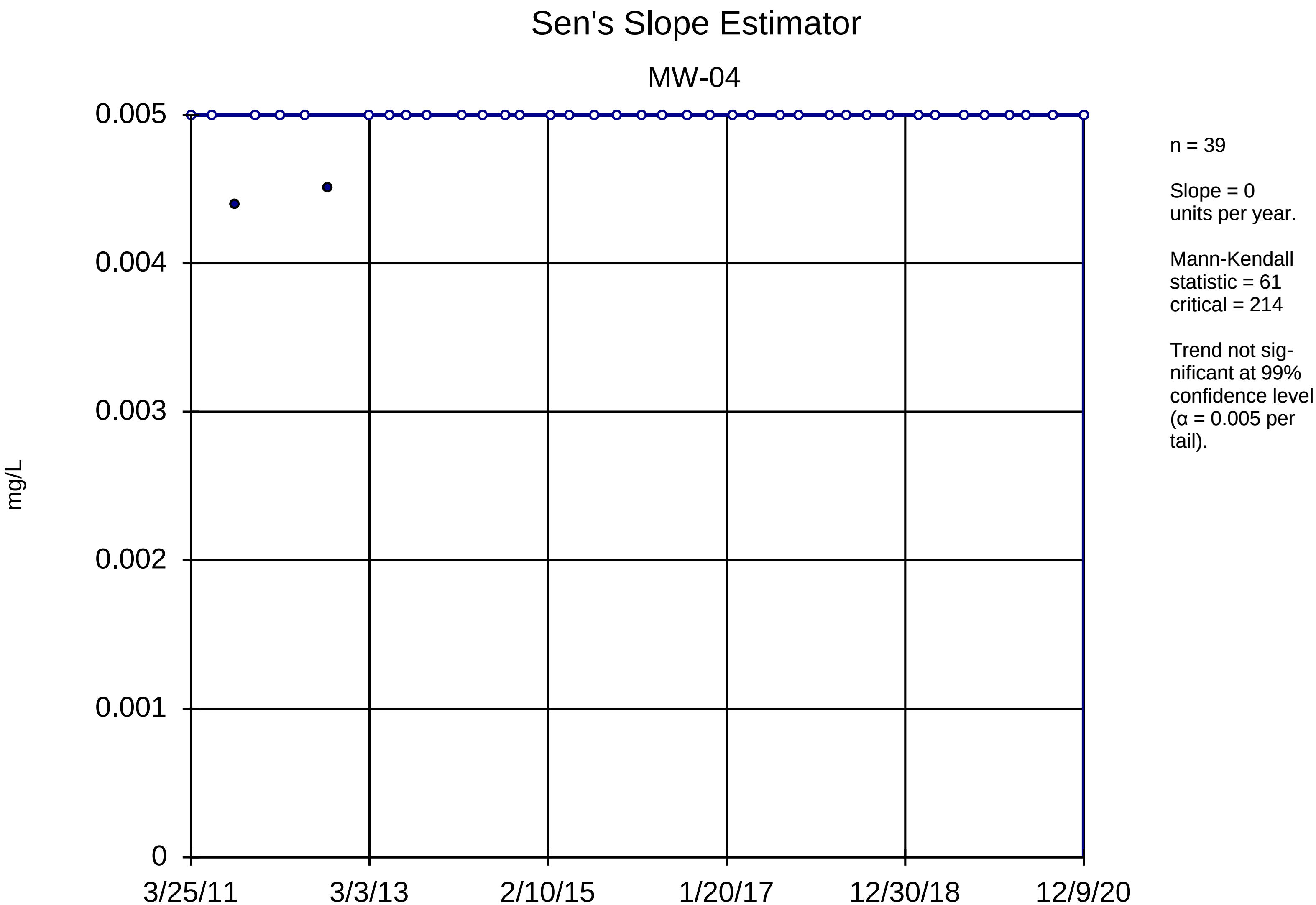



Constituent: Chromium, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81757

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:45 AM

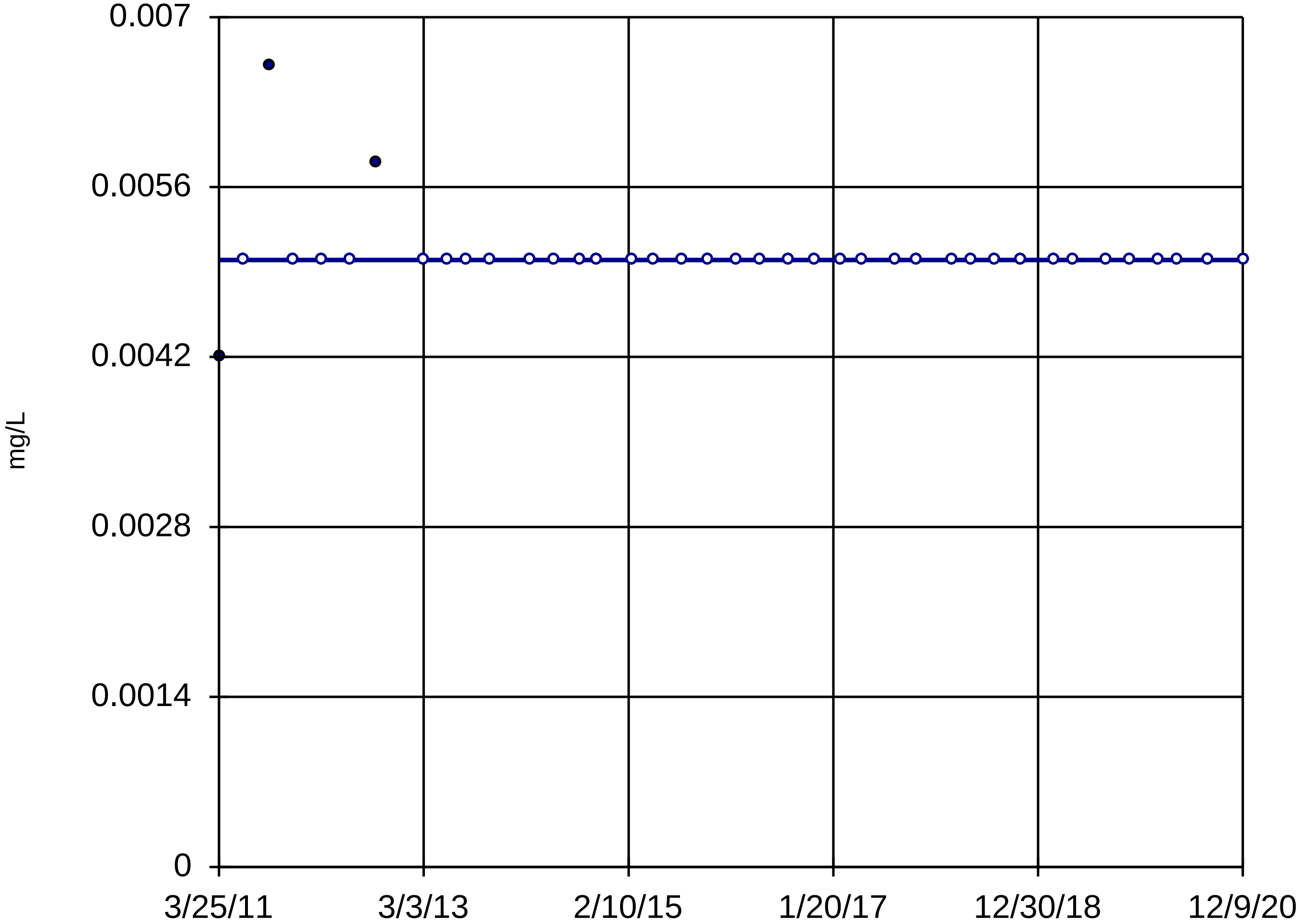
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81758

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-05




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = -25
critical = -214

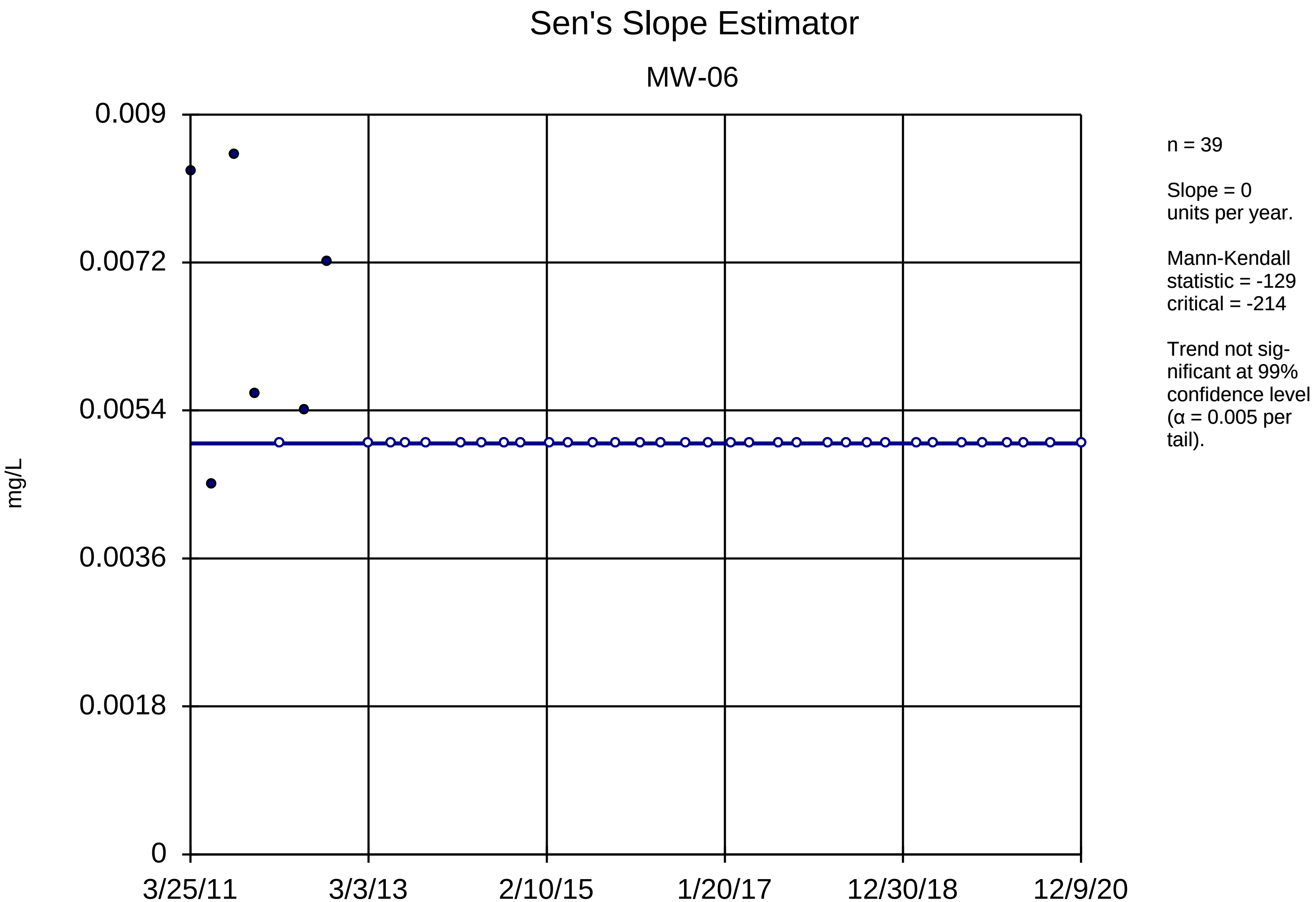
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81759

Hollow symbols indicate censored values.

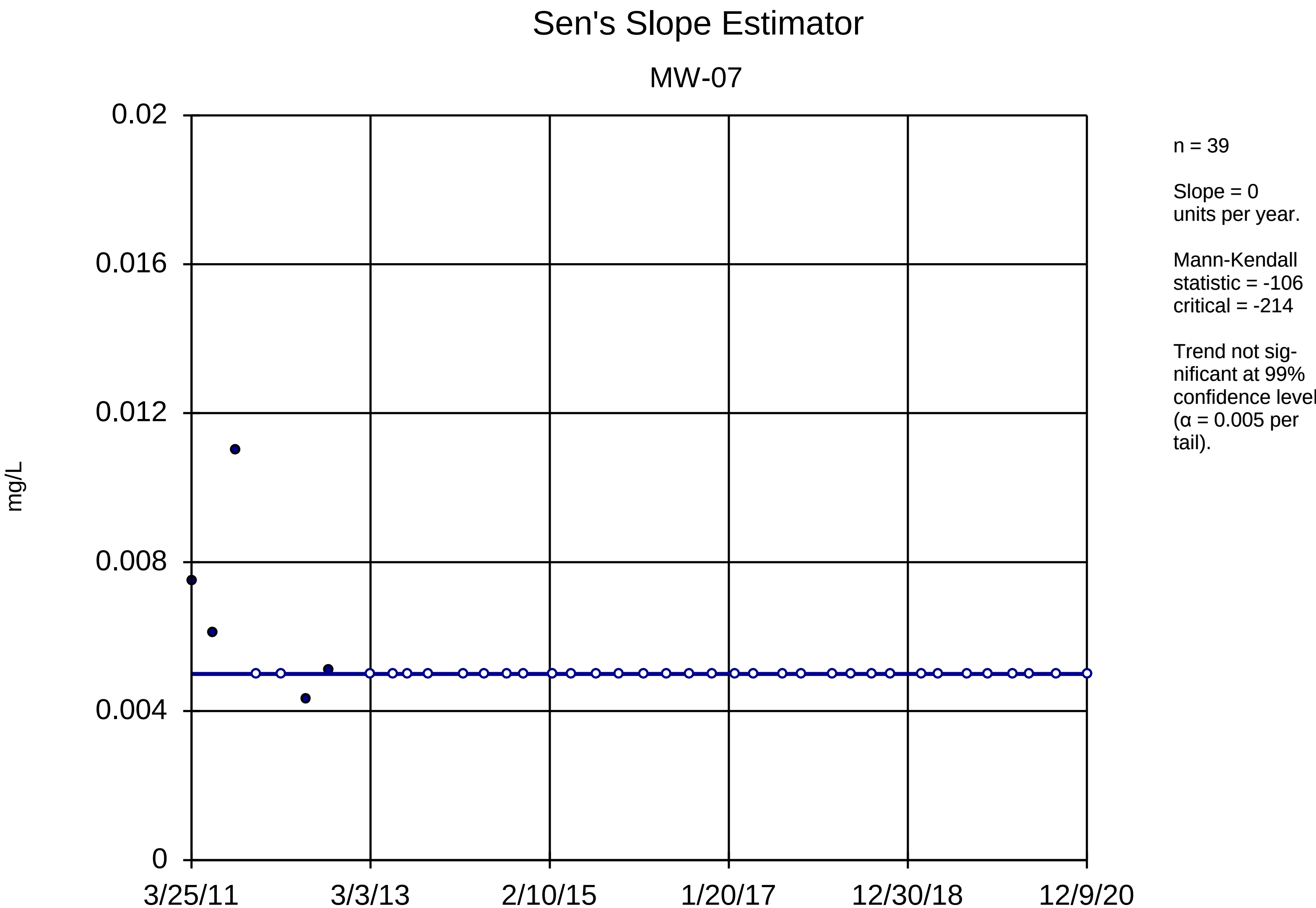



Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81760

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81761

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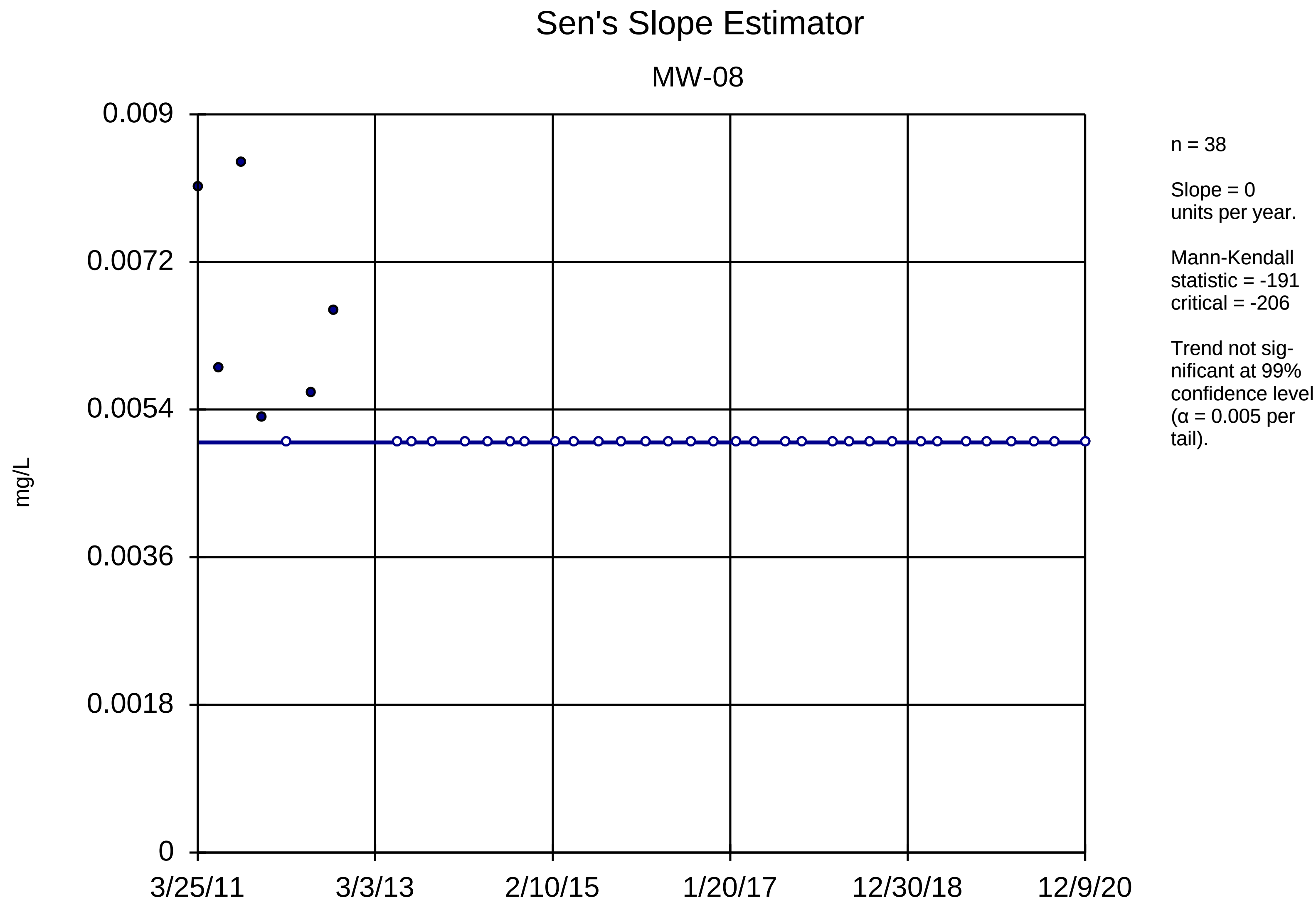
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81762

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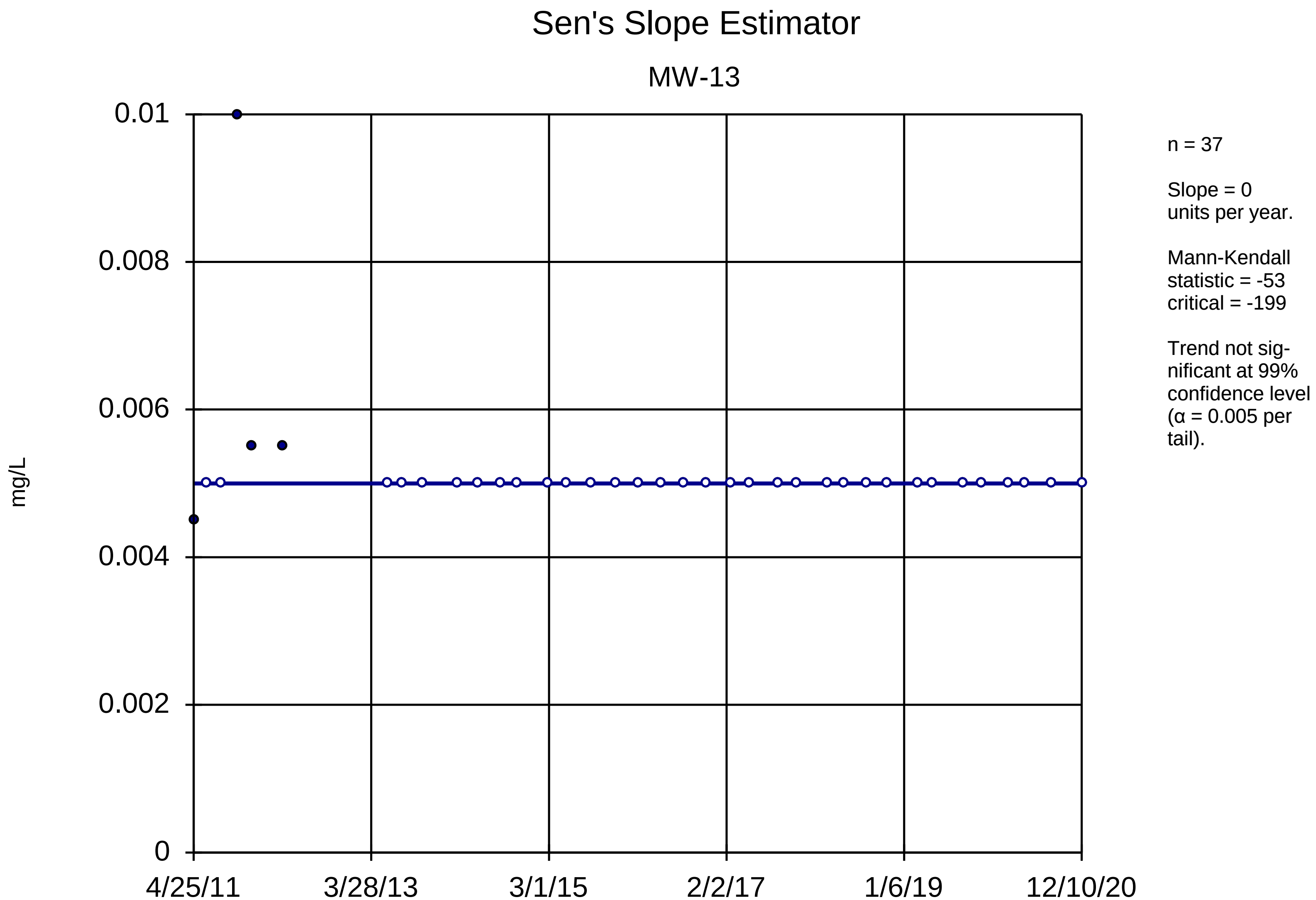
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved Analysis Run 4/2/2021 11:45 AM
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81763

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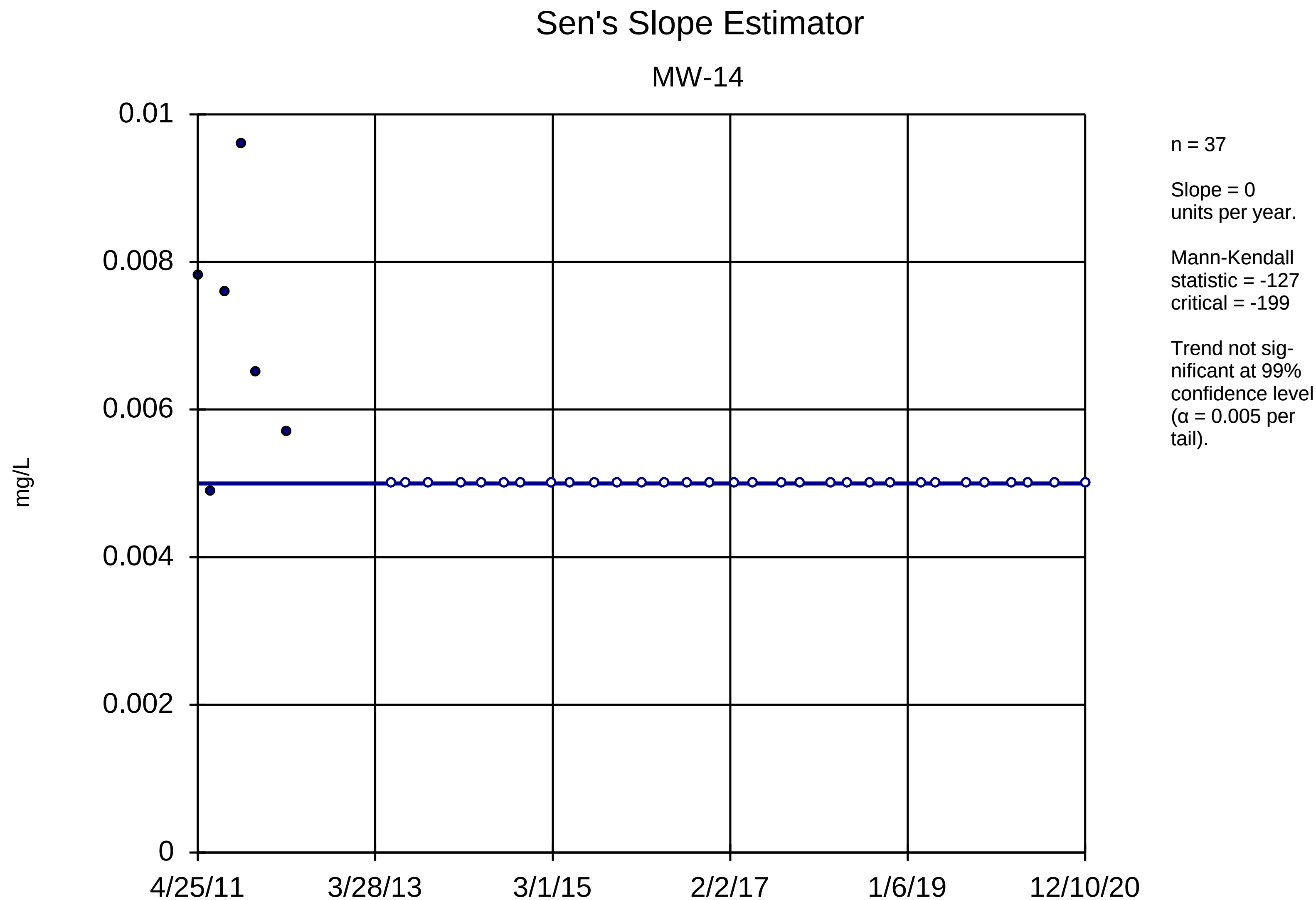
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81764

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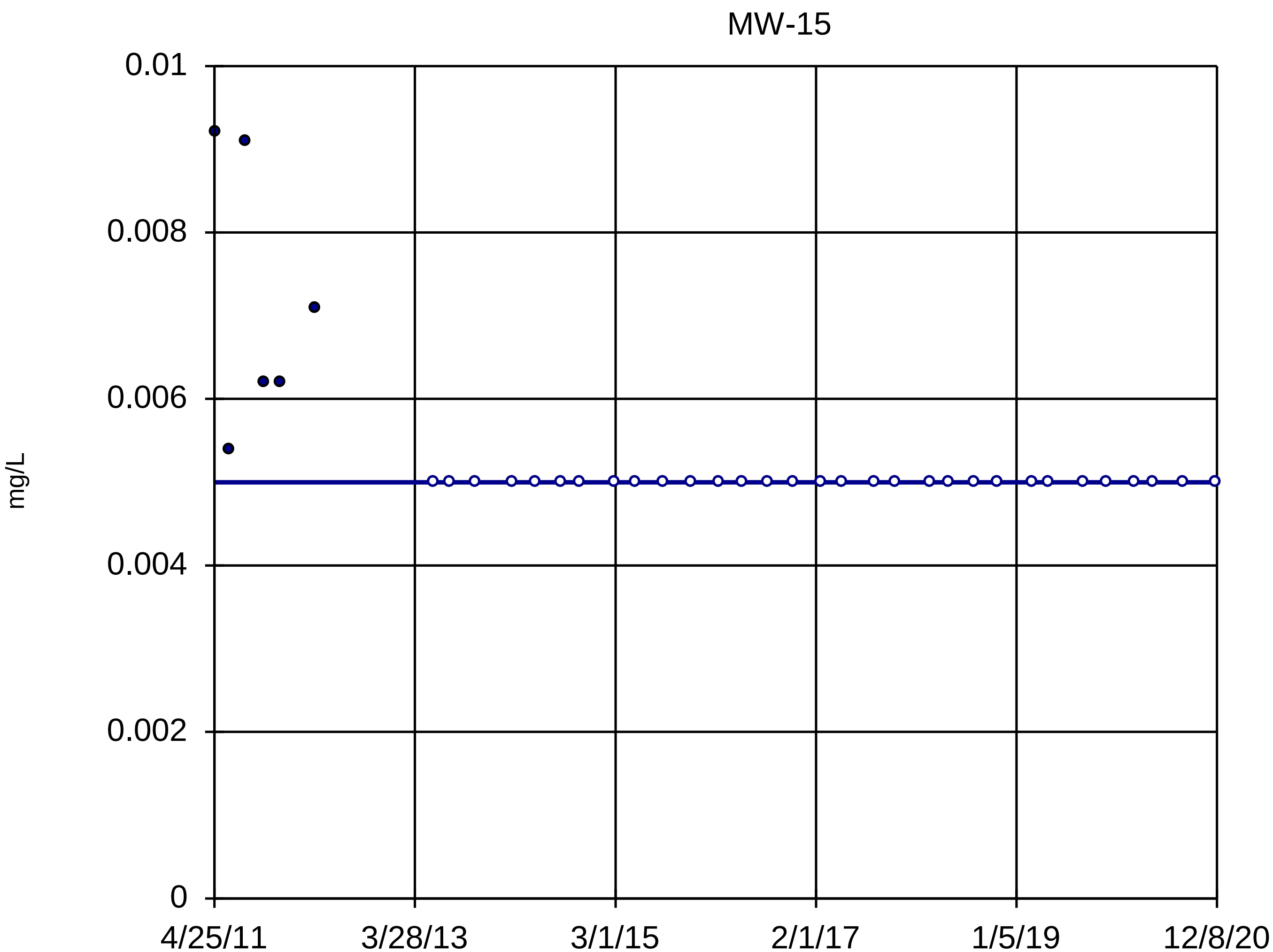
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = -188
critical = -199

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chromium, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81765

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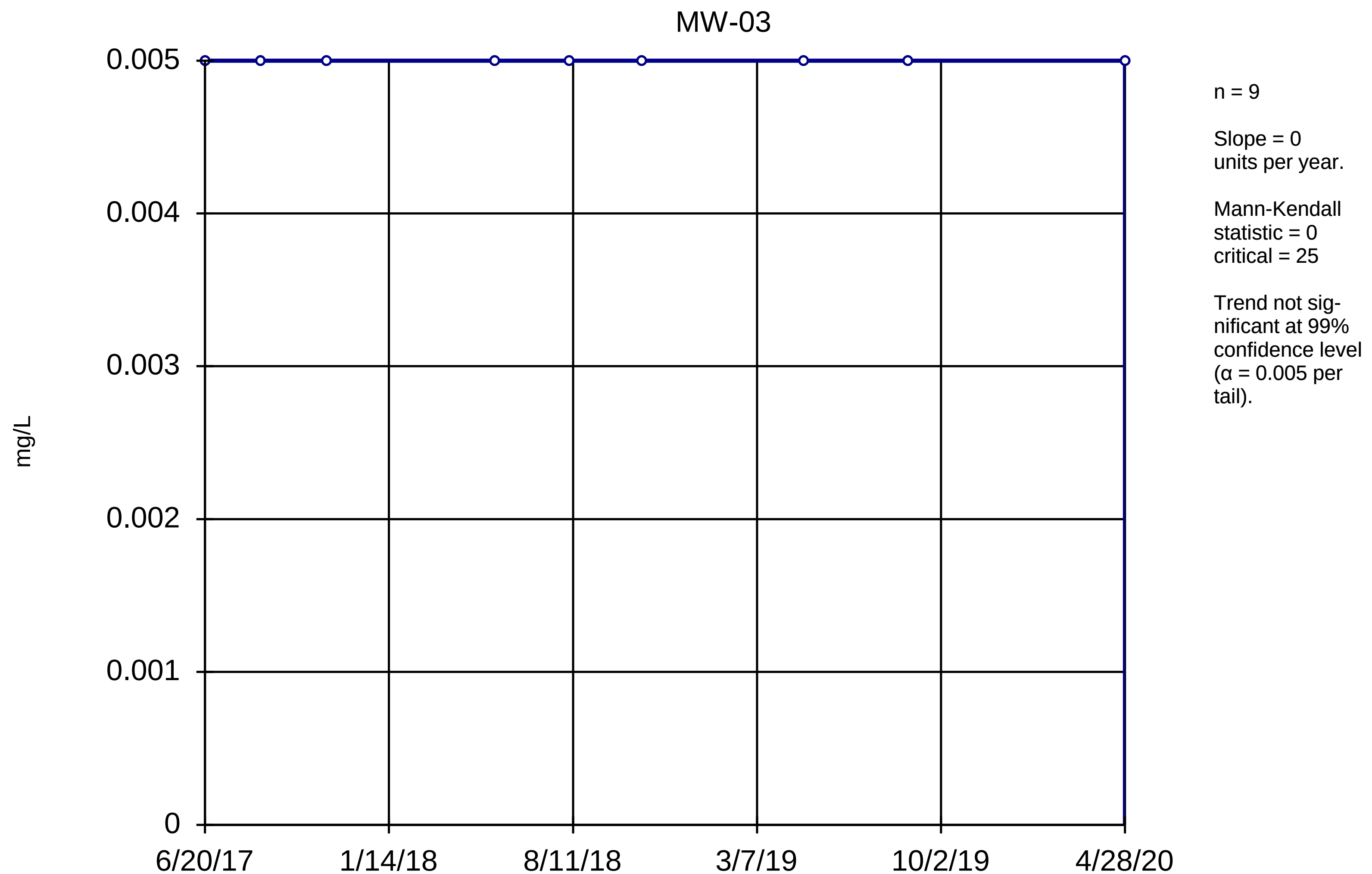
## Sen's Slope Estimator




Constituent: Chromium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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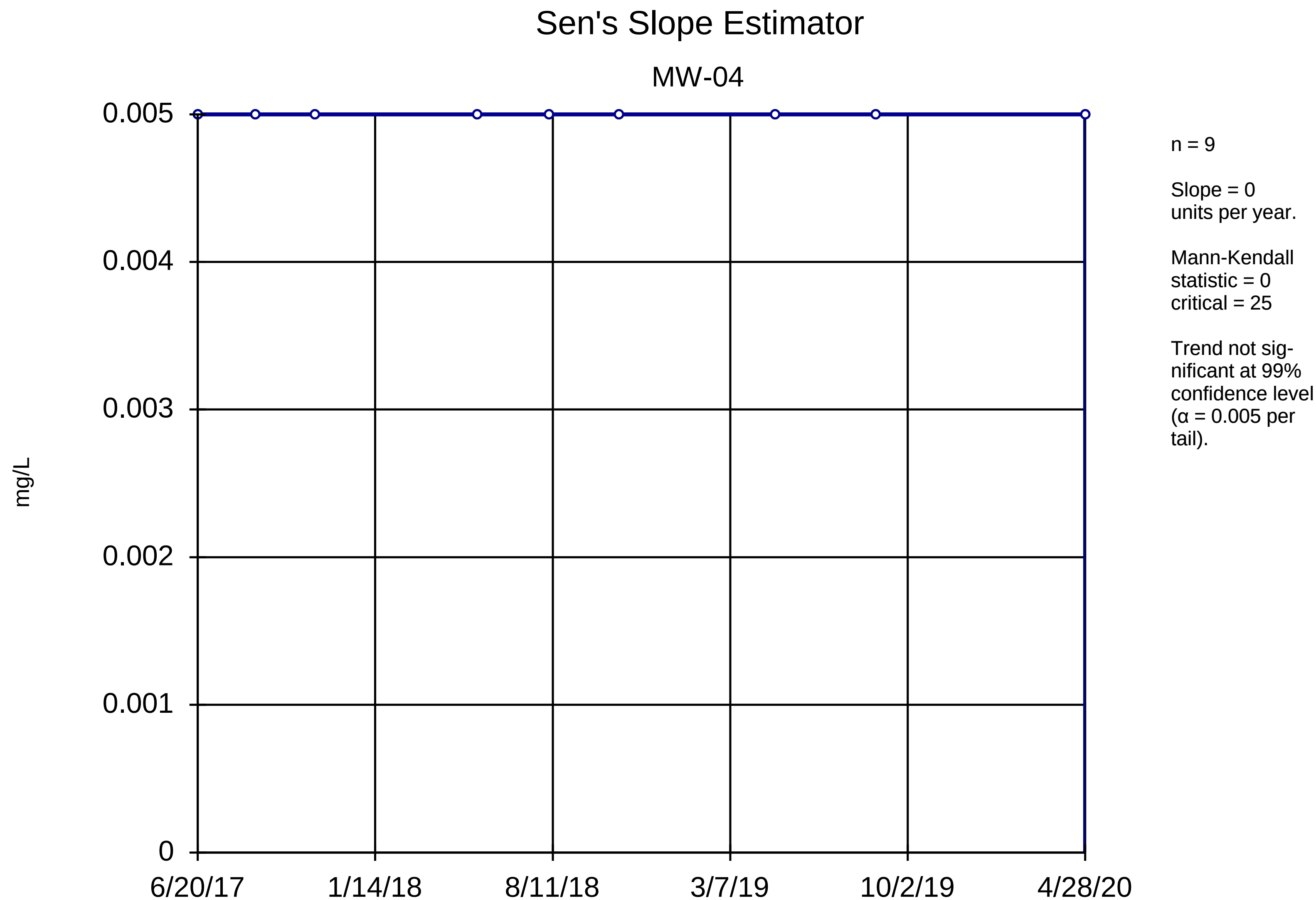
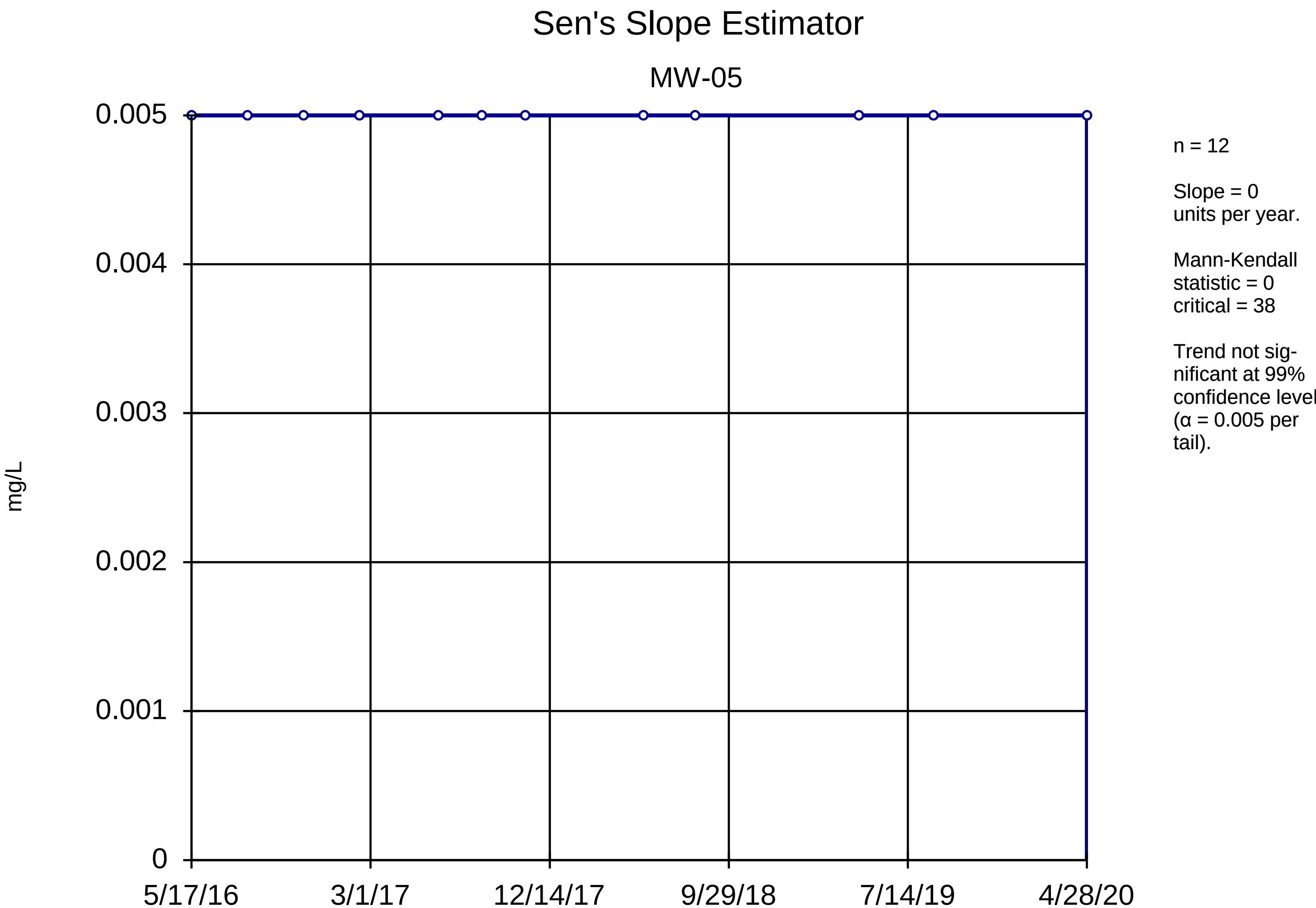
Hollow symbols indicate censored values.




Constituent: Chromium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




Constituent: Chromium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81768

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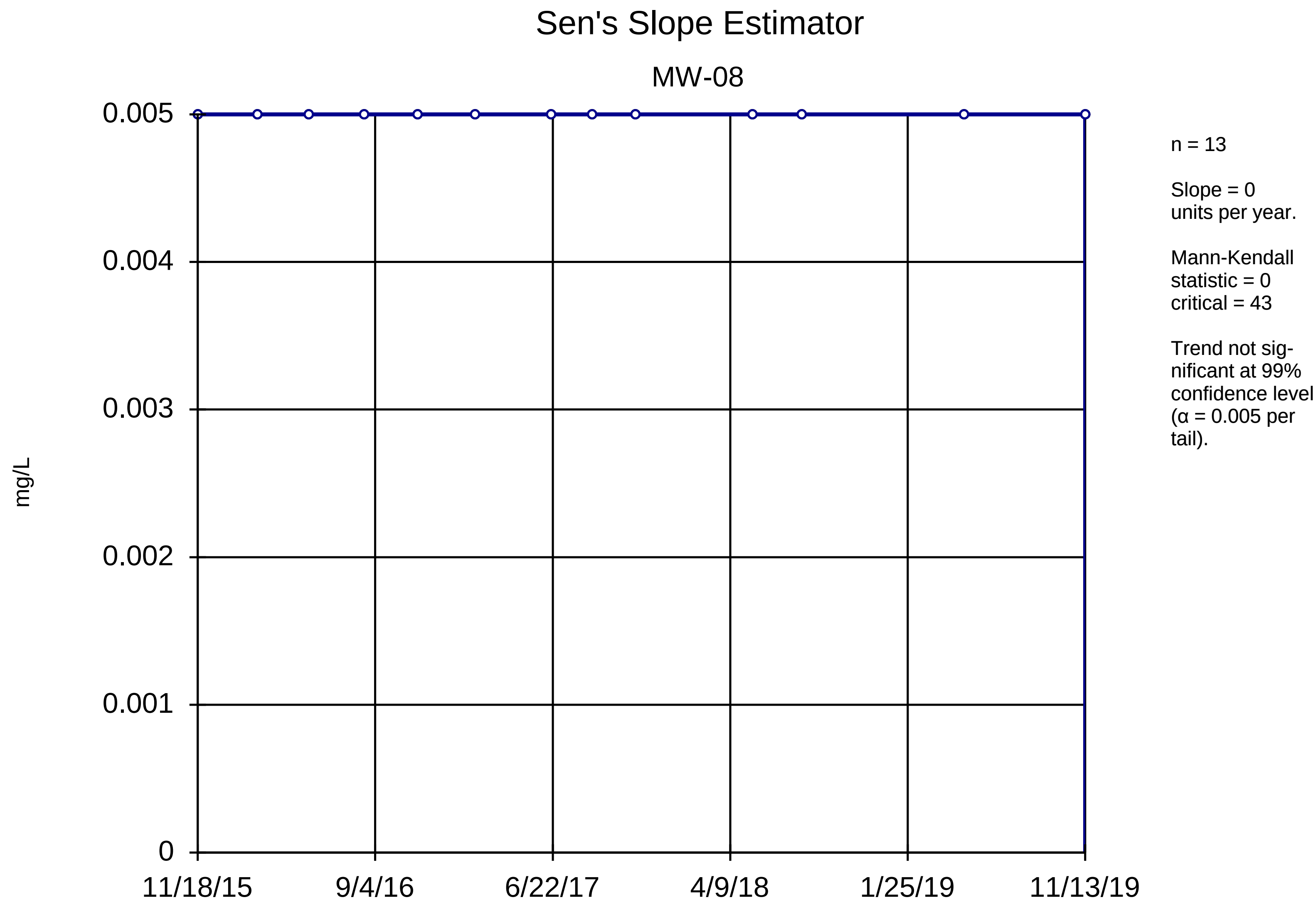
Hollow symbols indicate censored values.

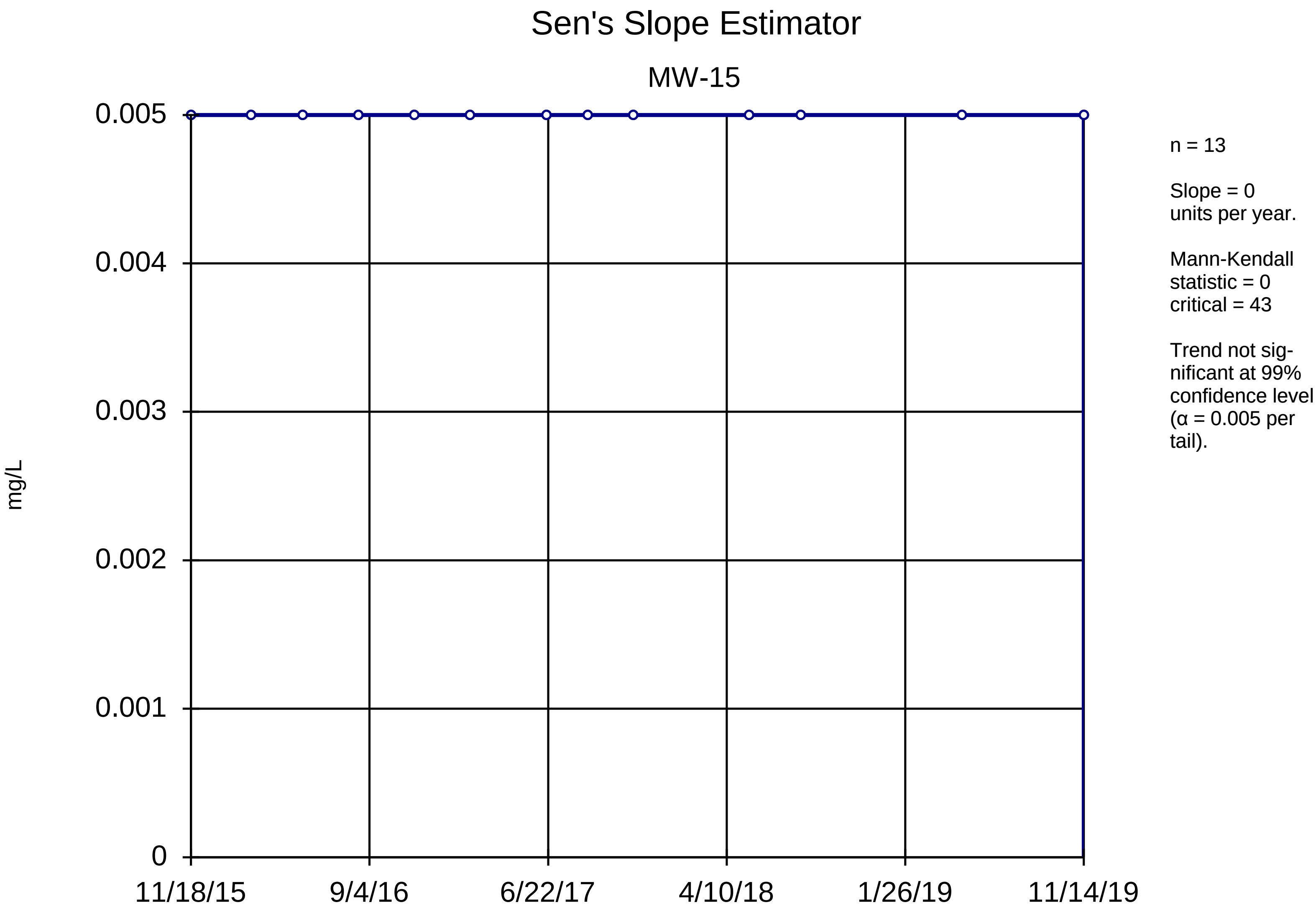



Constituent: Chromium, Total Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81769

Hollow symbols indicate censored values.

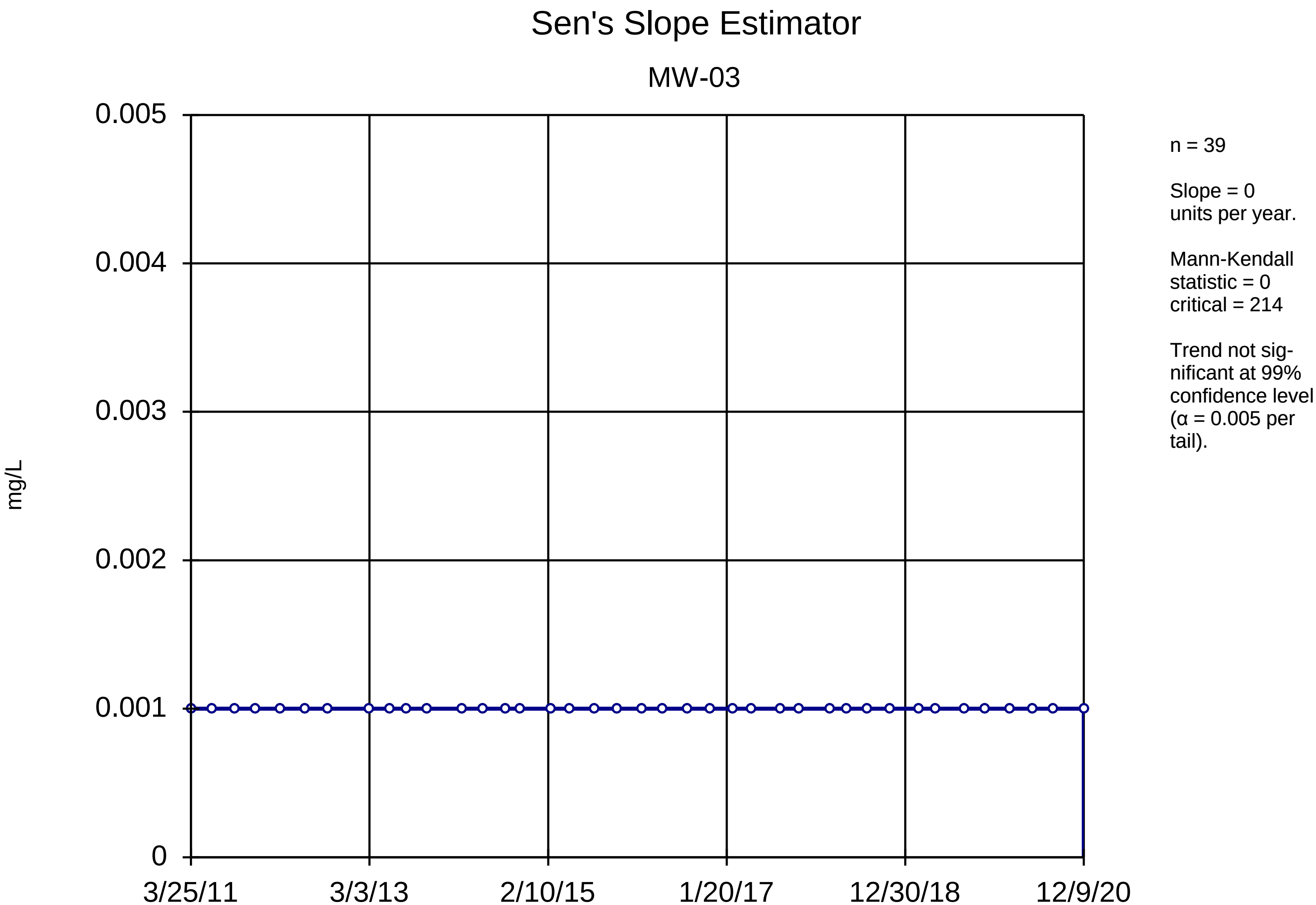



Constituent: Chromium, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81770

Hollow symbols indicate censored values.

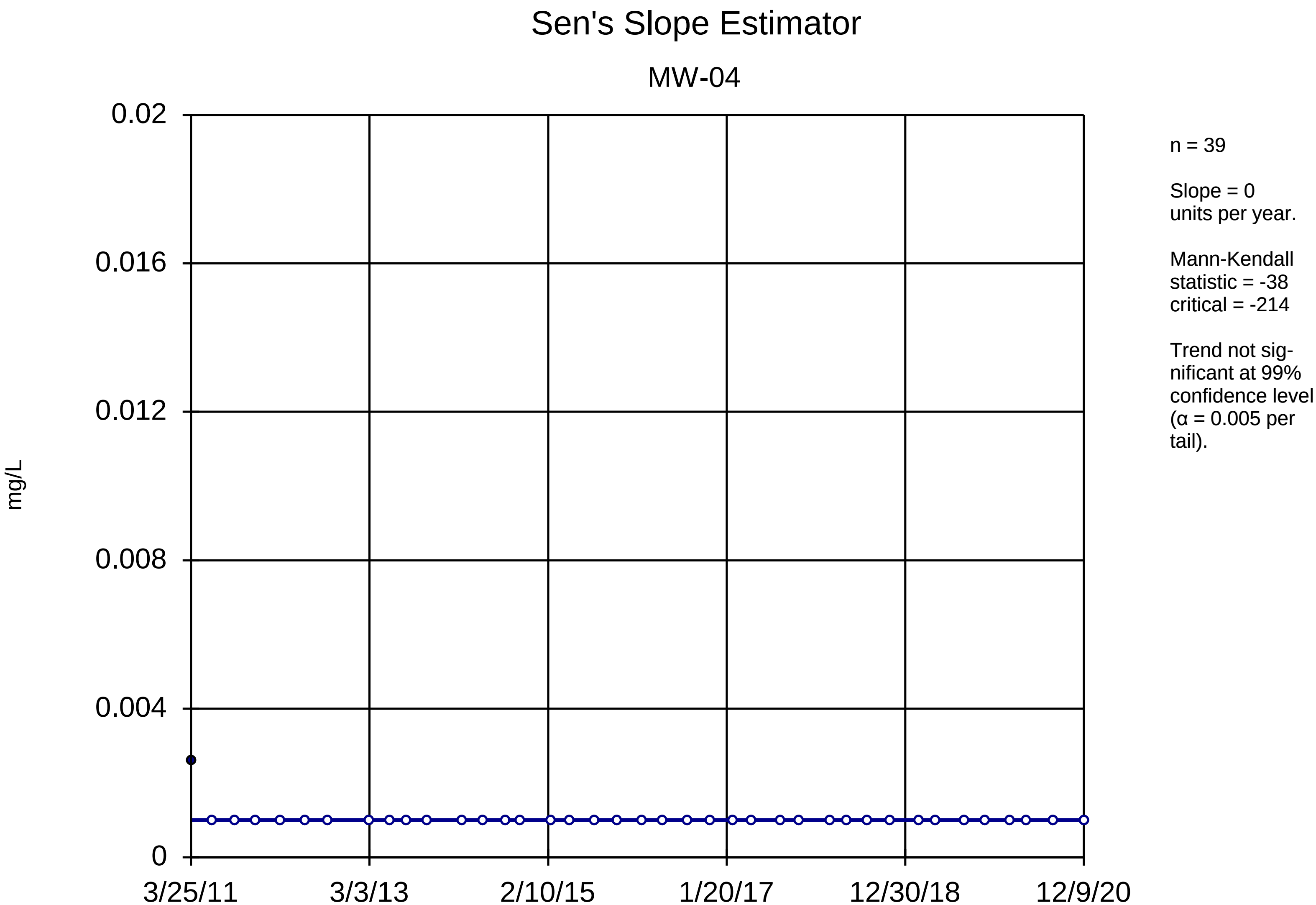



Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81771

Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81772

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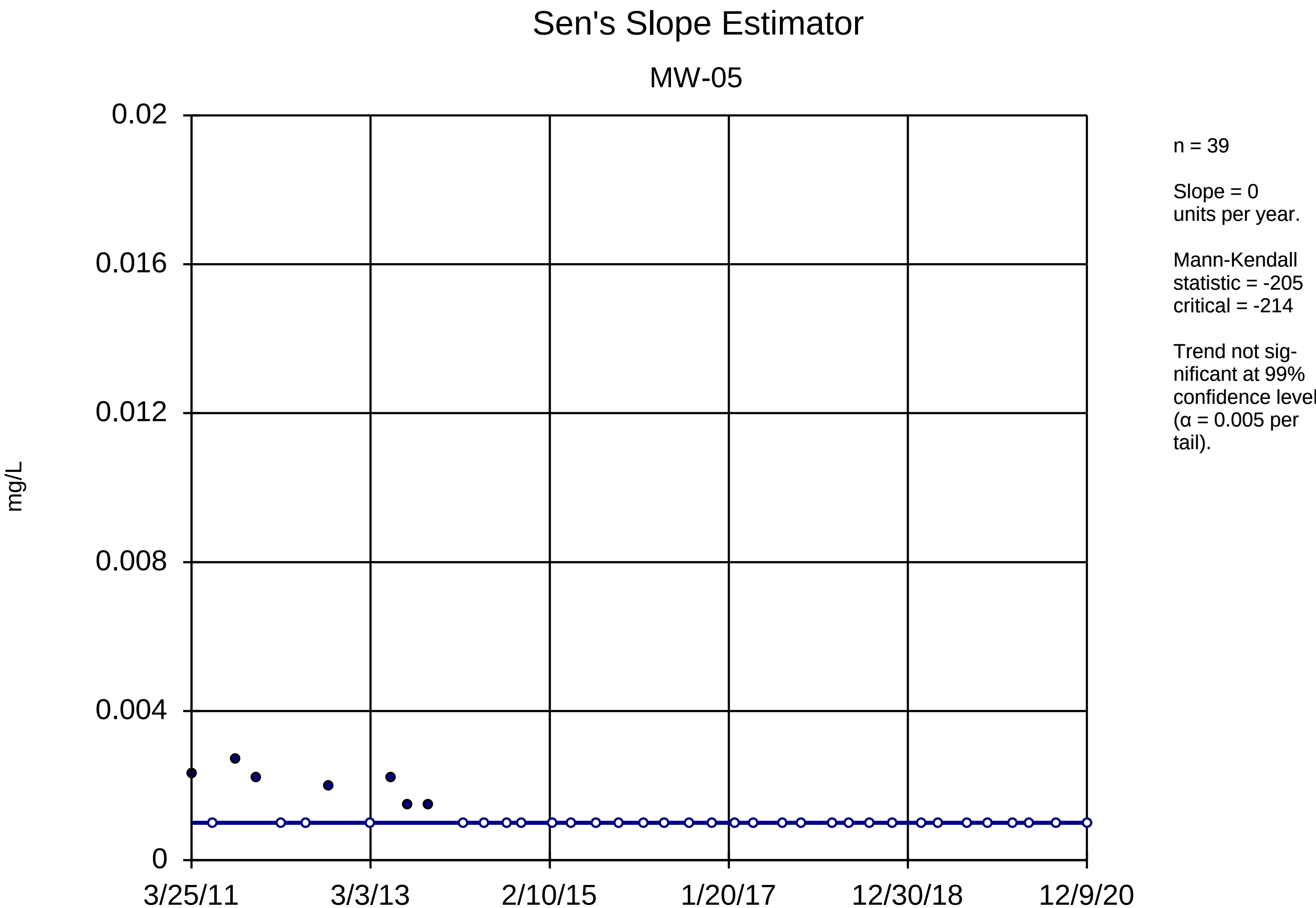
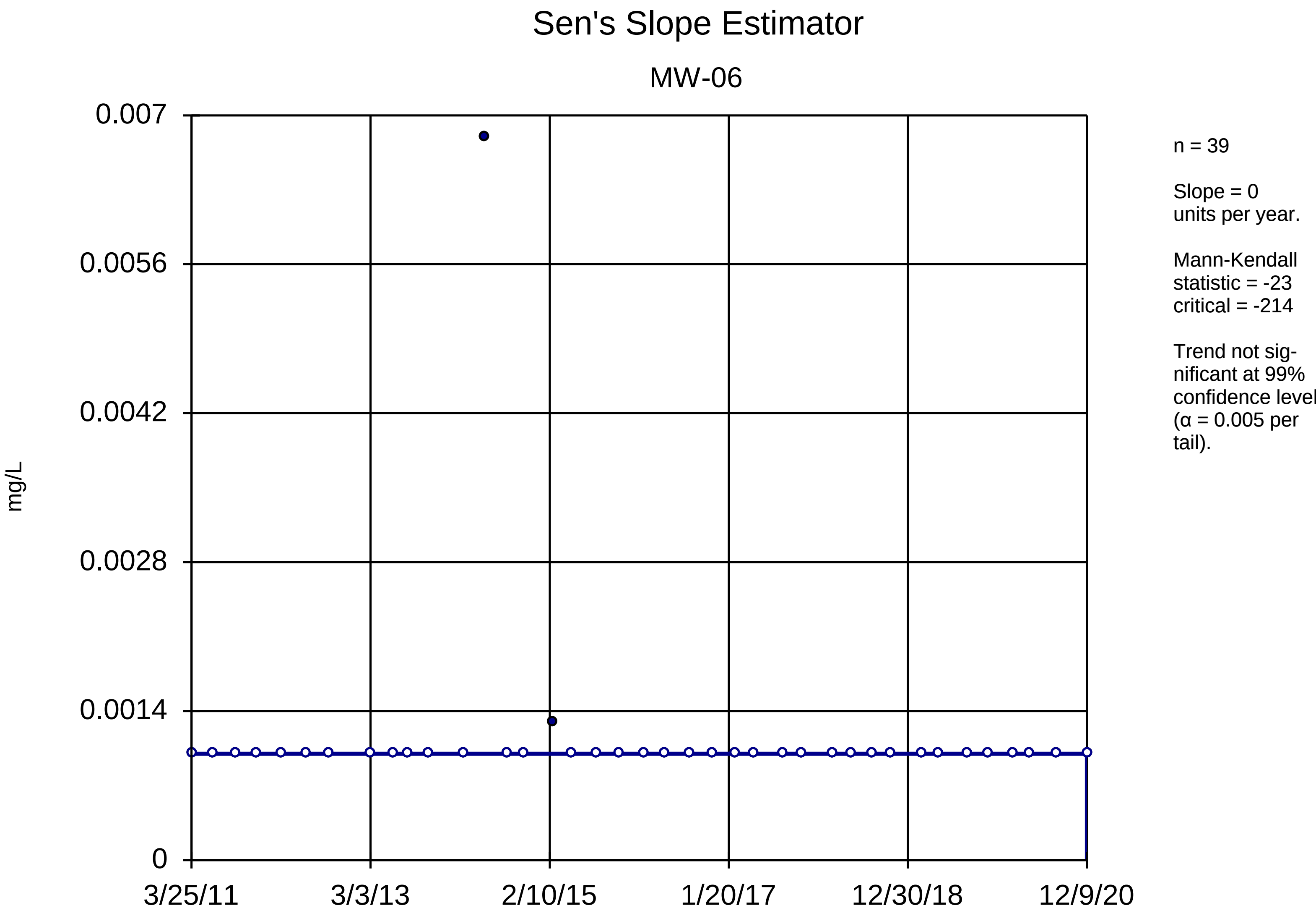
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

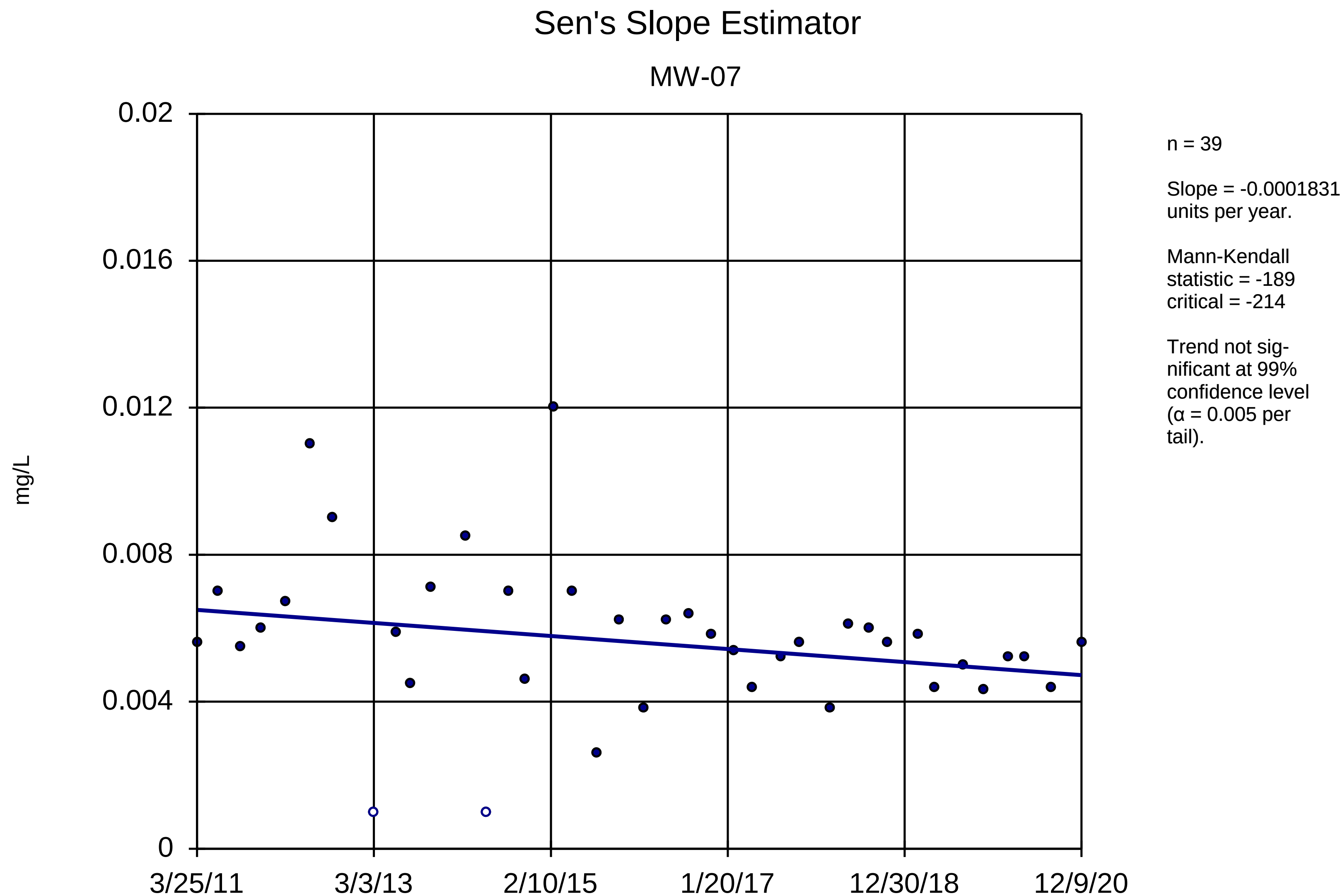
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

Hollow symbols indicate censored values.



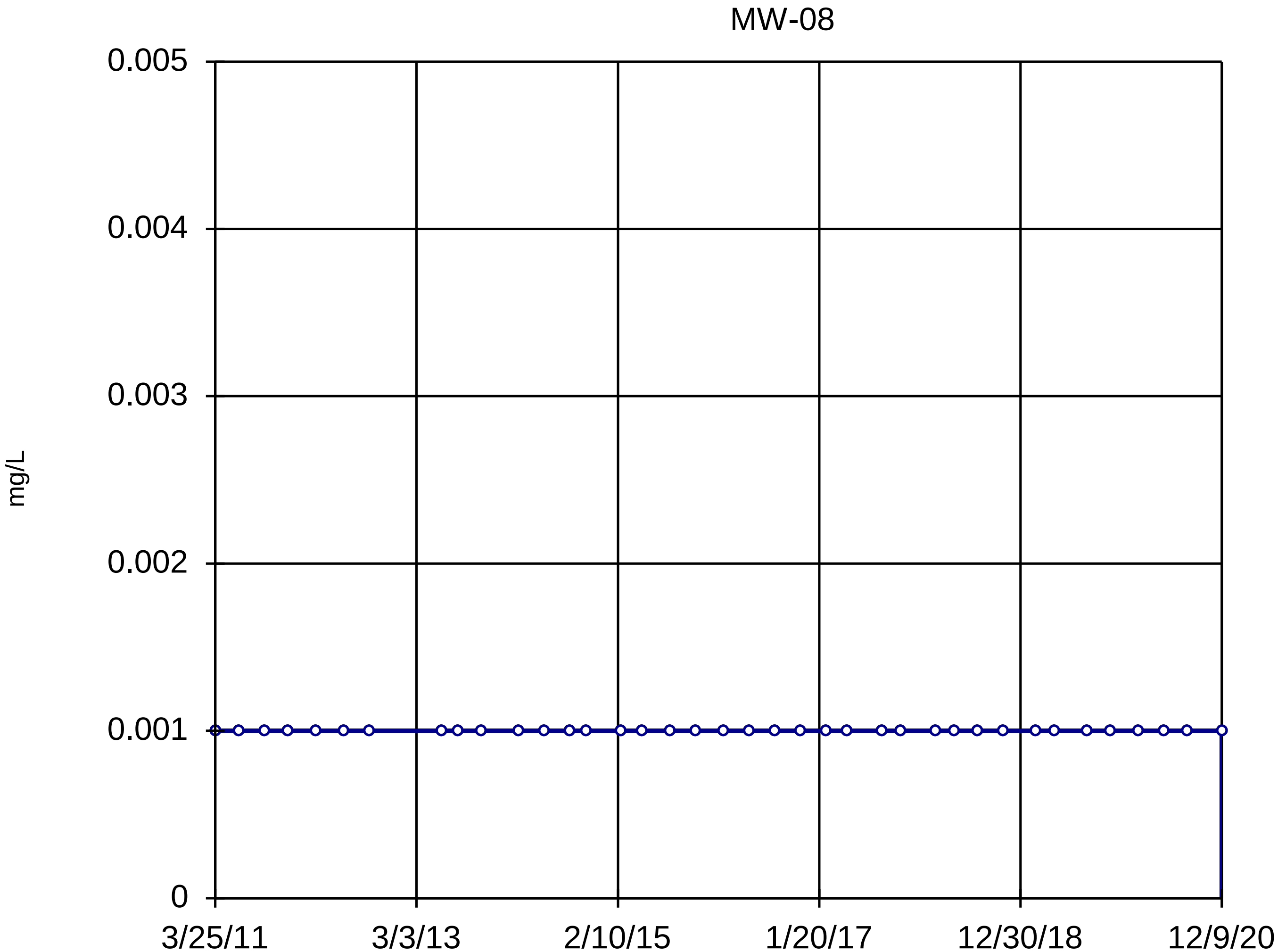

Constituent: Cobalt, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

Electronic Filing: Received, Clerk's Office 01/21/2022


Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 38

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 206

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81776

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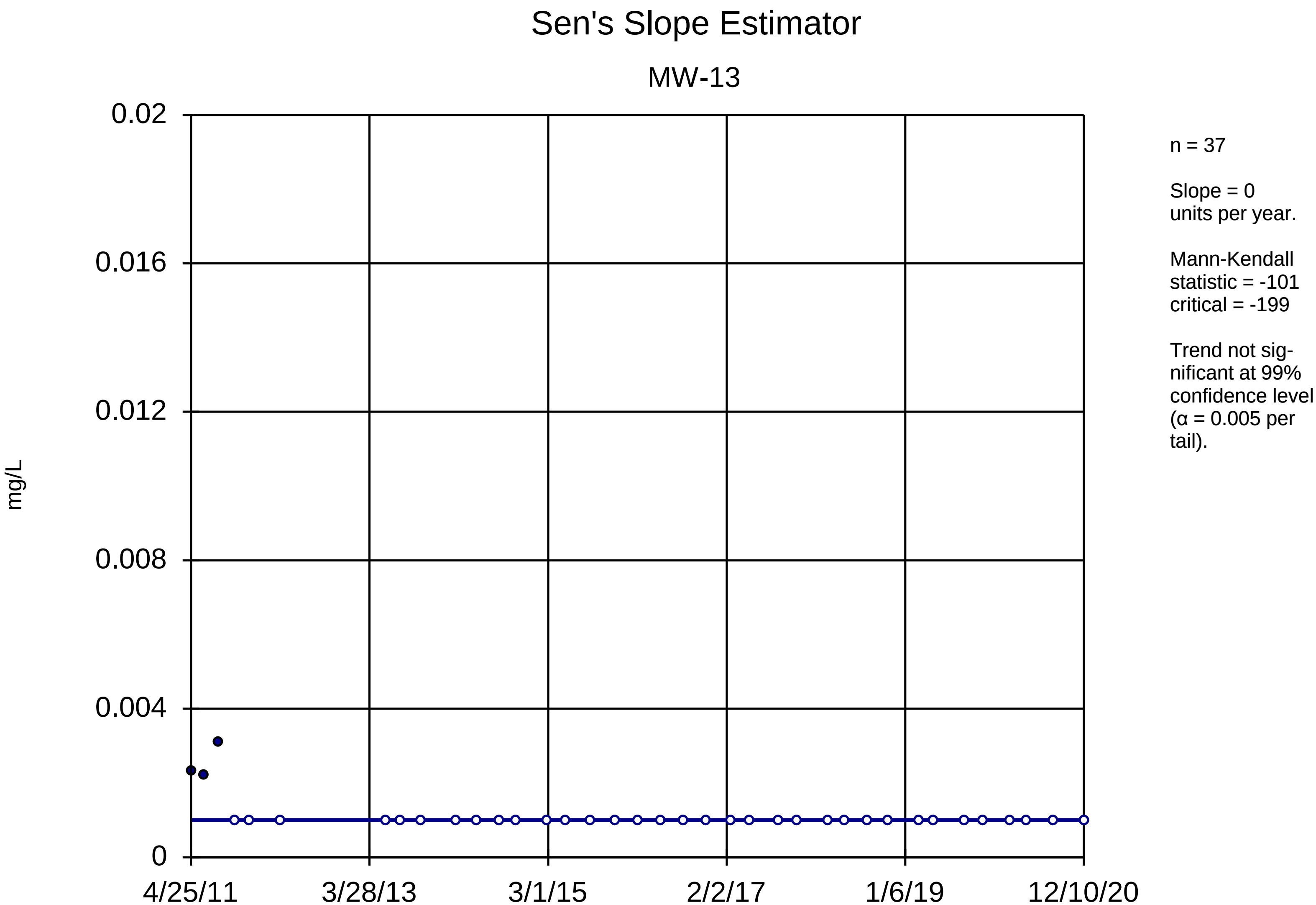
Hollow symbols indicate censored values.

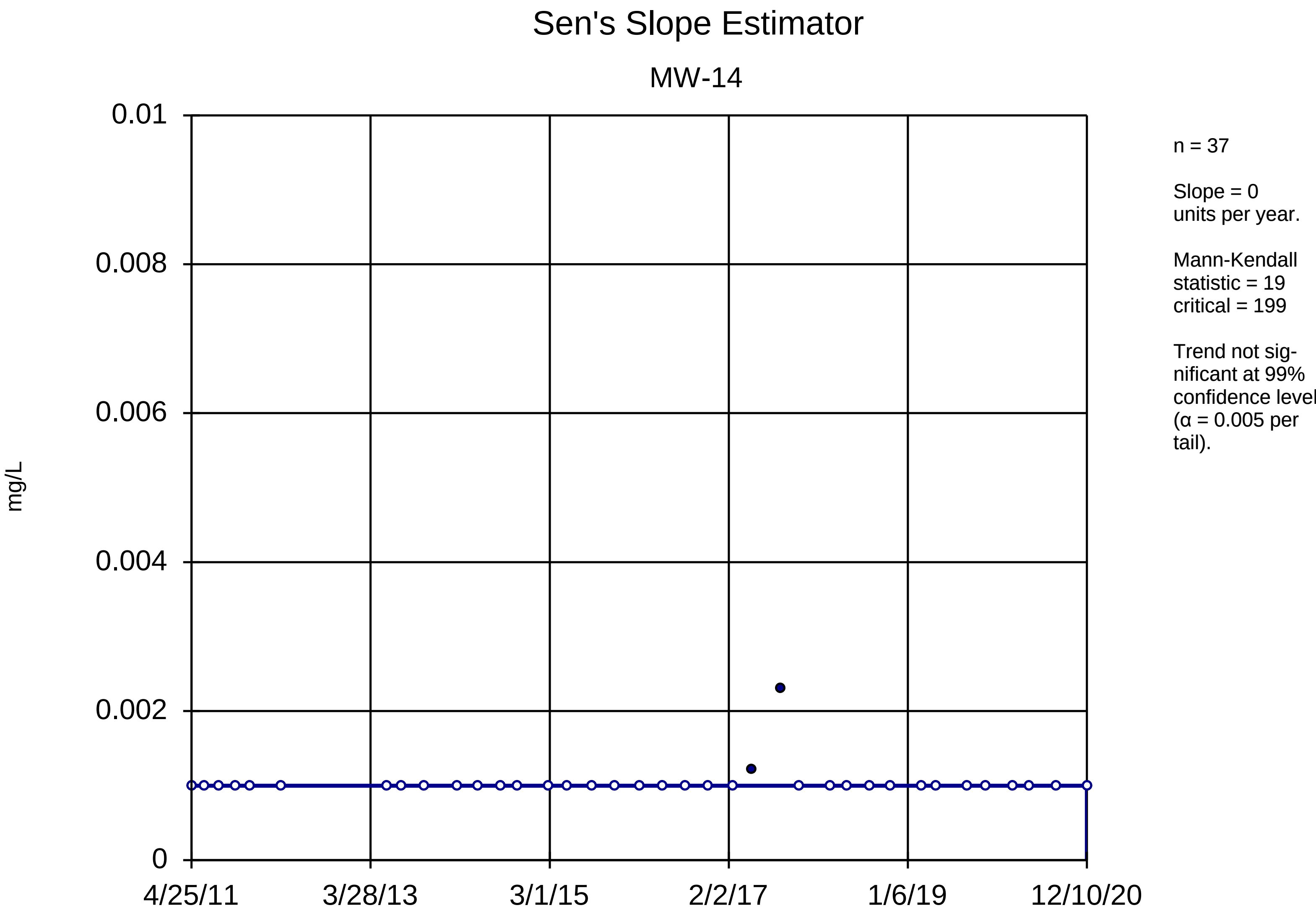



Constituent: Cobalt, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81777

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 11:45 AM

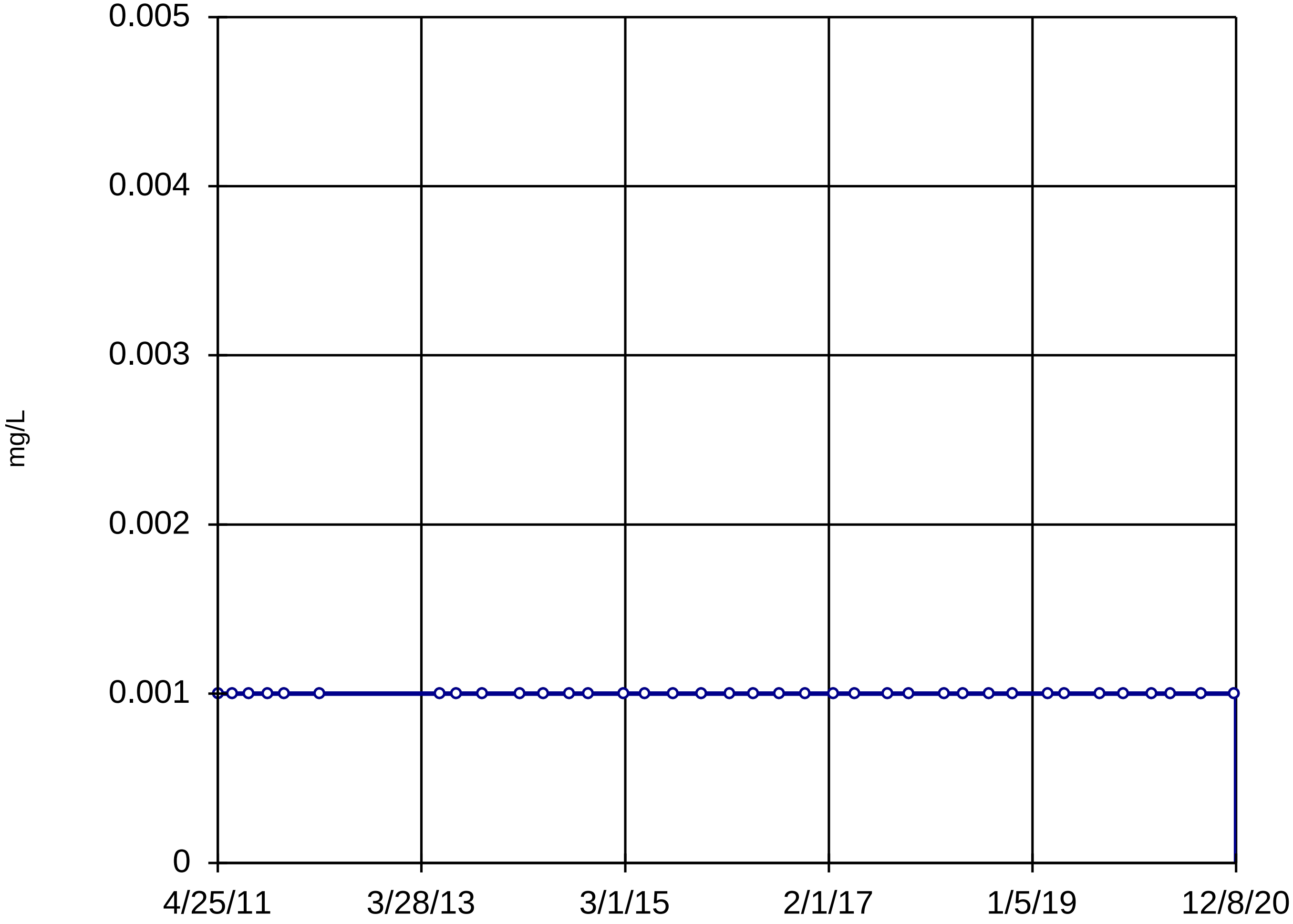
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81778

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-15




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 199

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

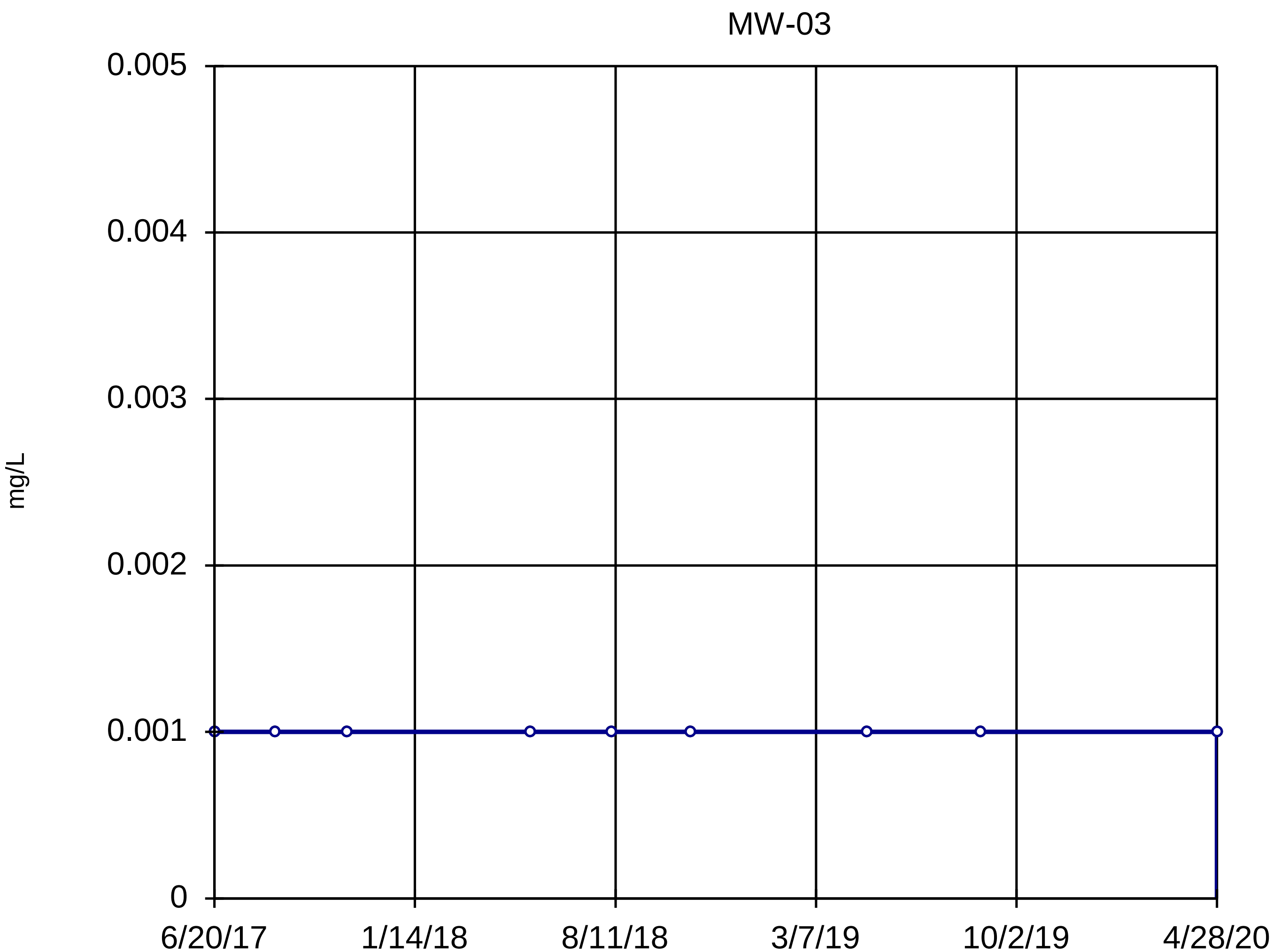
Constituent: Cobalt, Dissolved Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81779

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 9

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 25

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

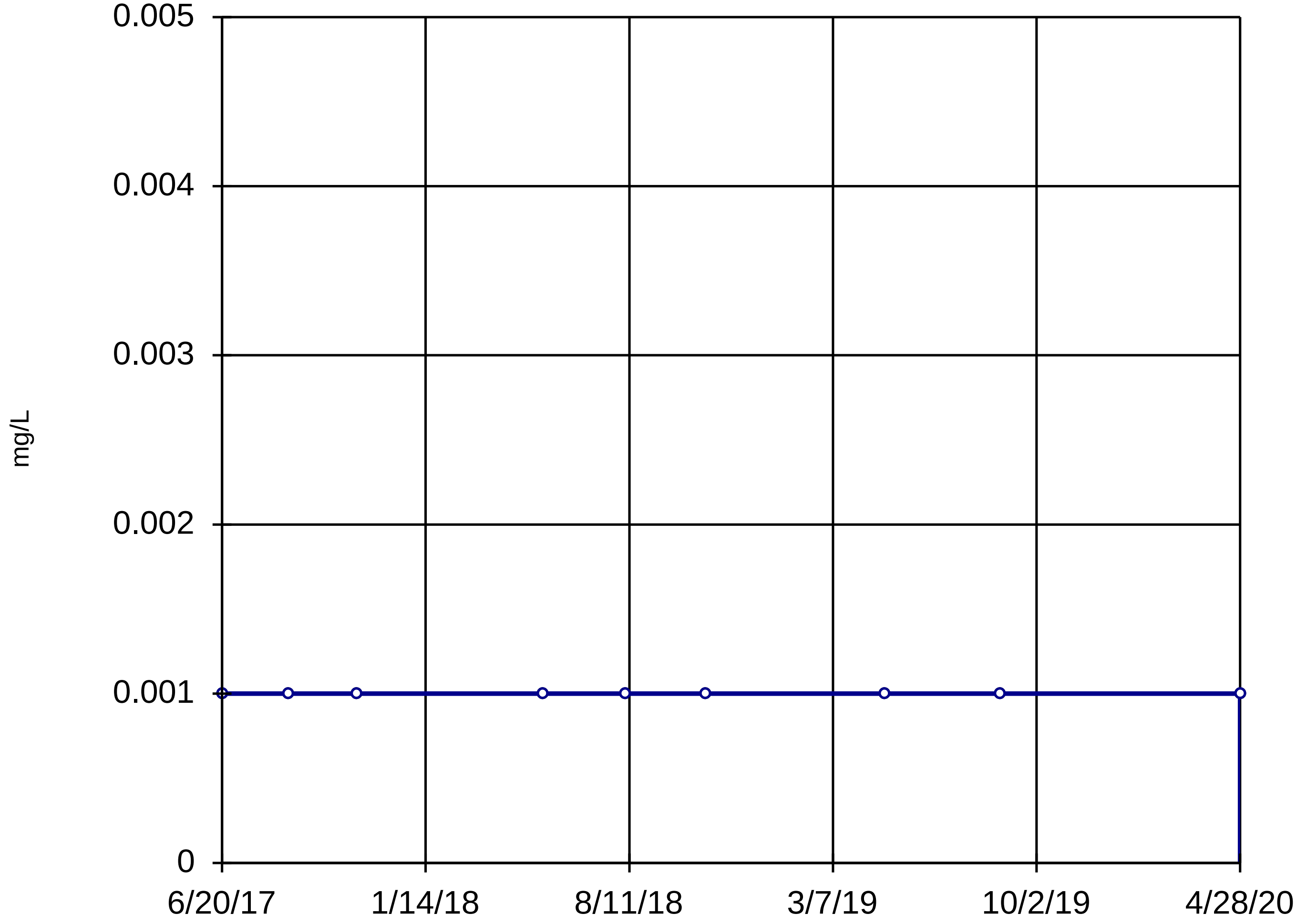
Constituent: Cobalt, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-04




n = 9

Slope = 0
units per year.

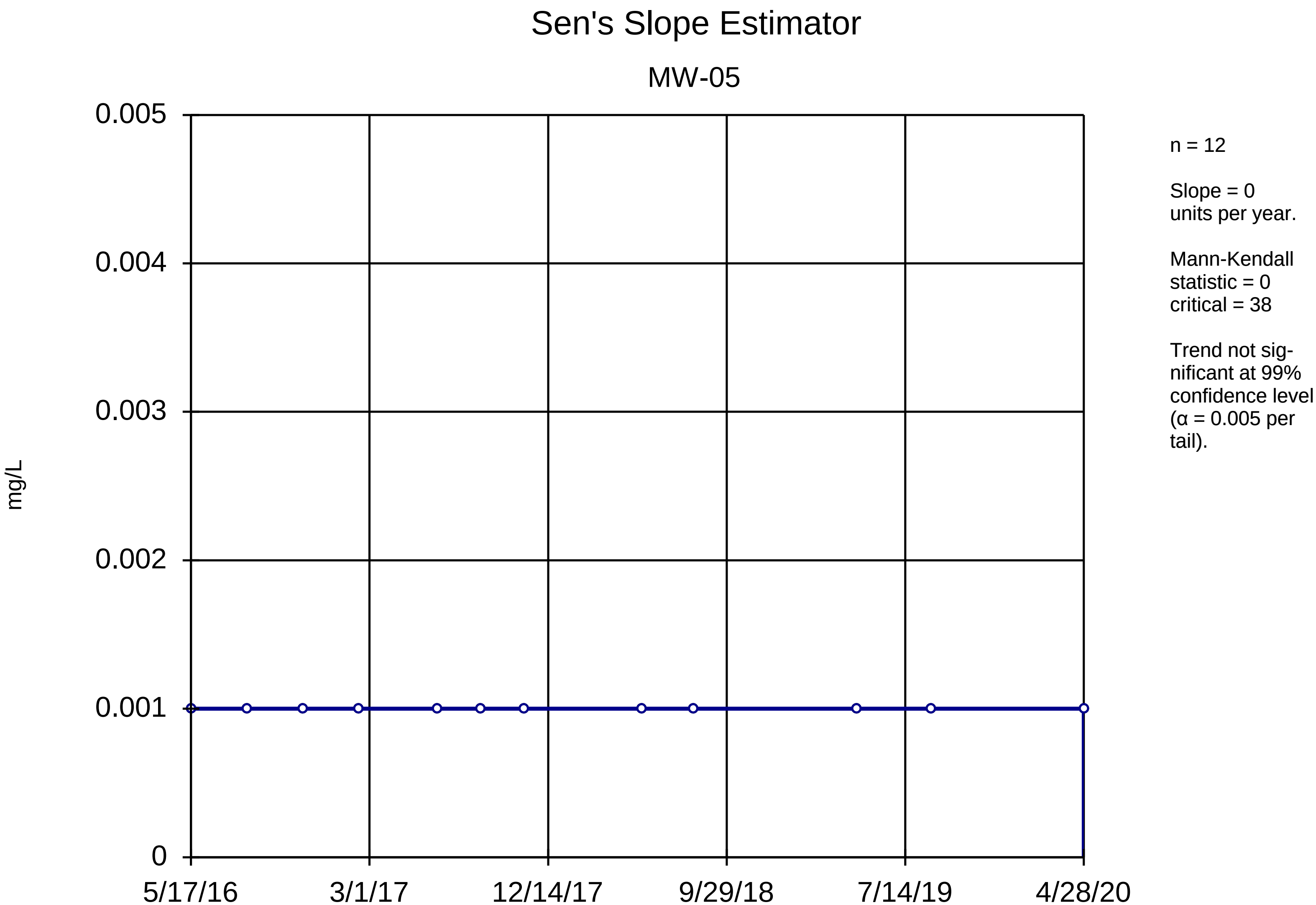
Mann-Kendall
statistic = 0
critical = 25

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

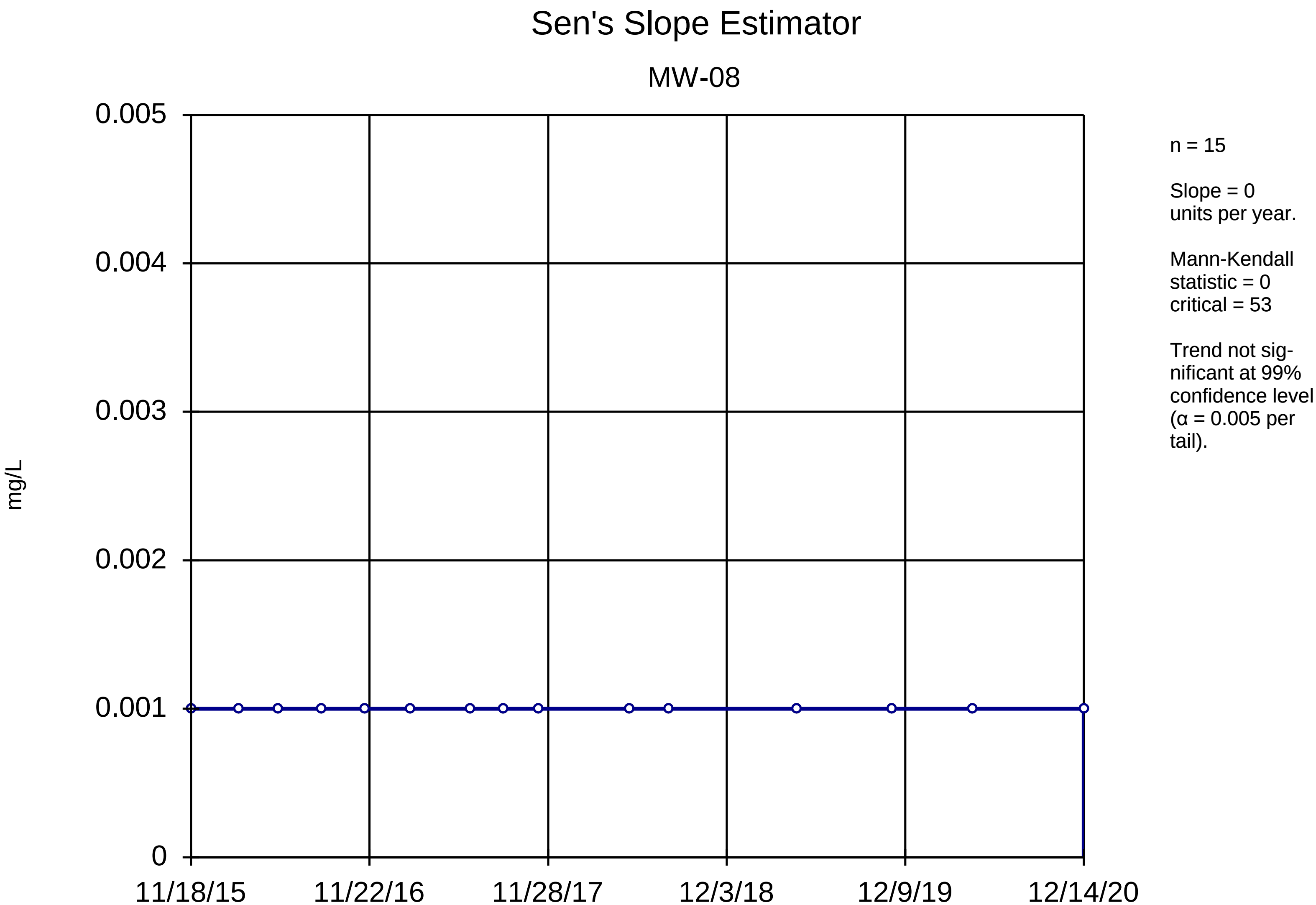



Constituent: Cobalt, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81782

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

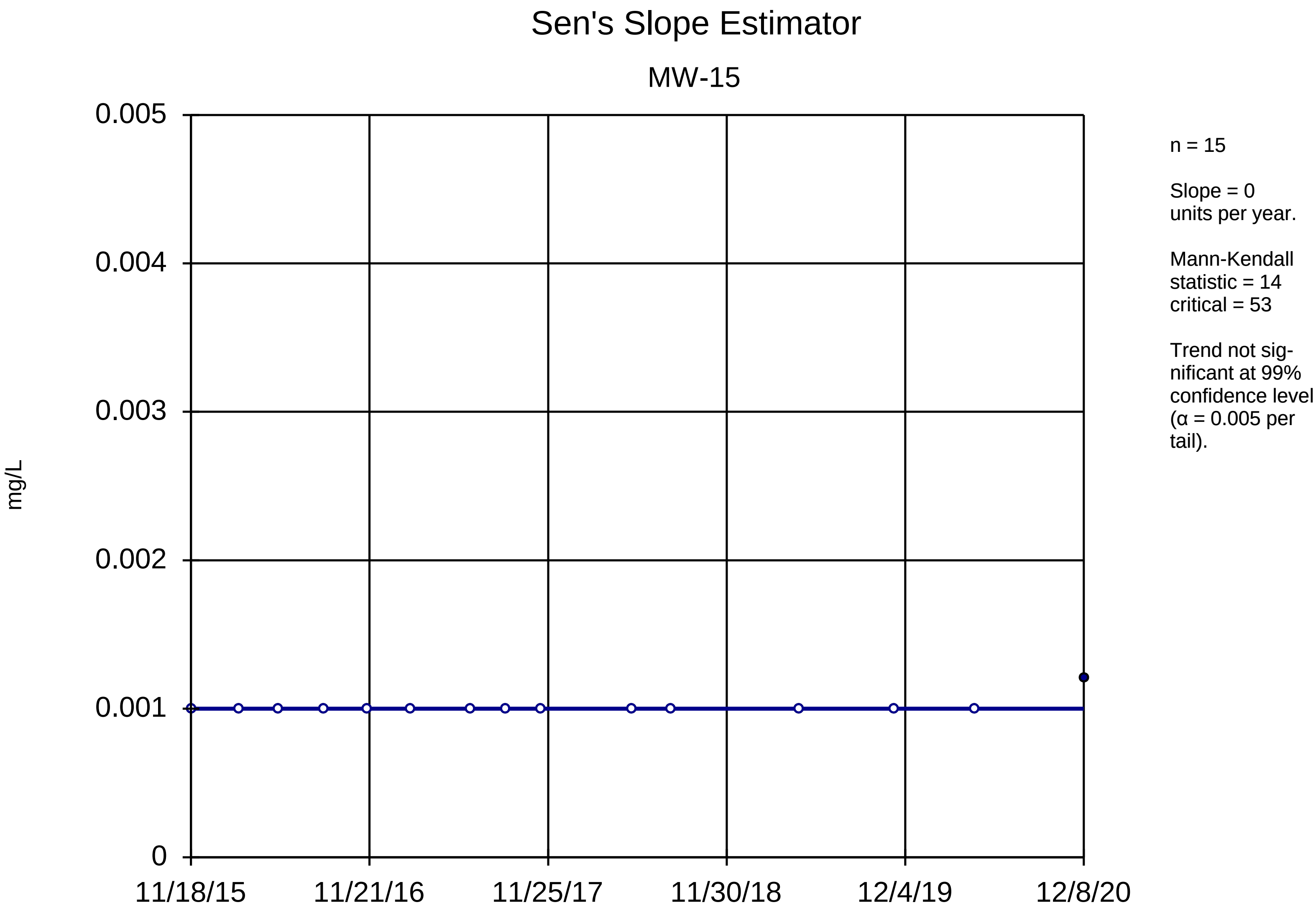



Constituent: Cobalt, Total    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81783

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

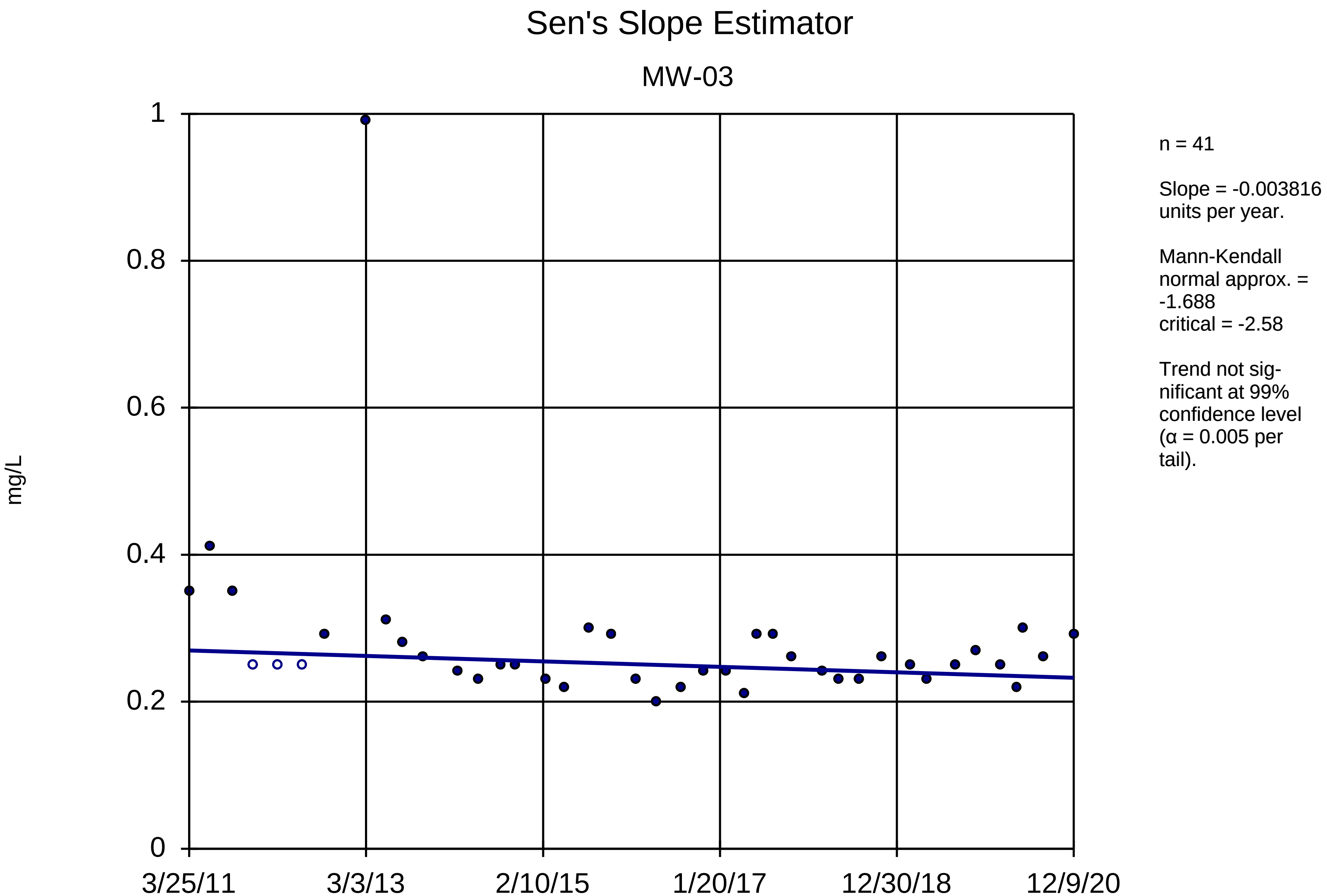



Constituent: Cobalt, Total Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81784

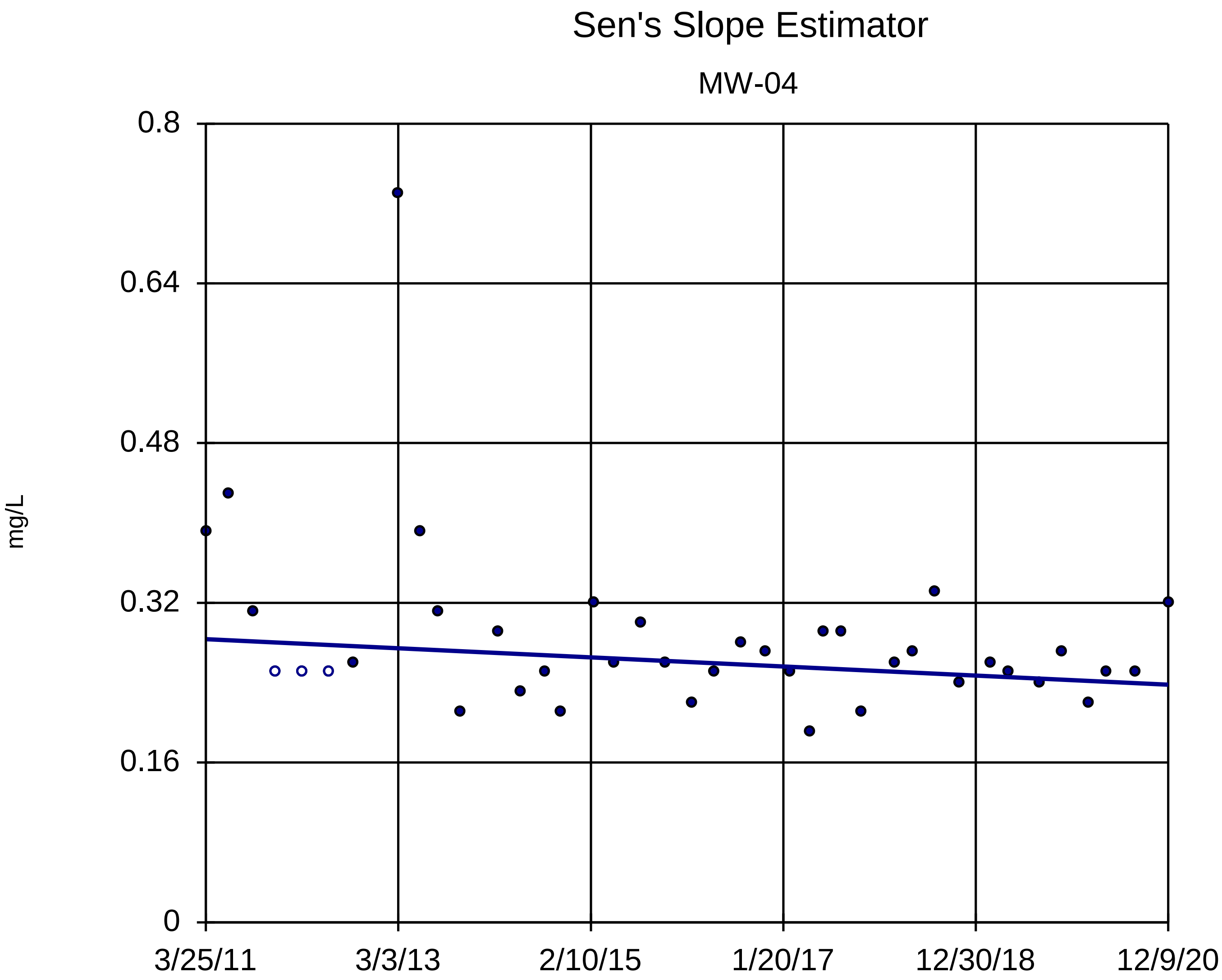
Hollow symbols indicate censored values.




Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 40

Slope = -0.004713
units per year.

Mann-Kendall
statistic = -138
critical = -223

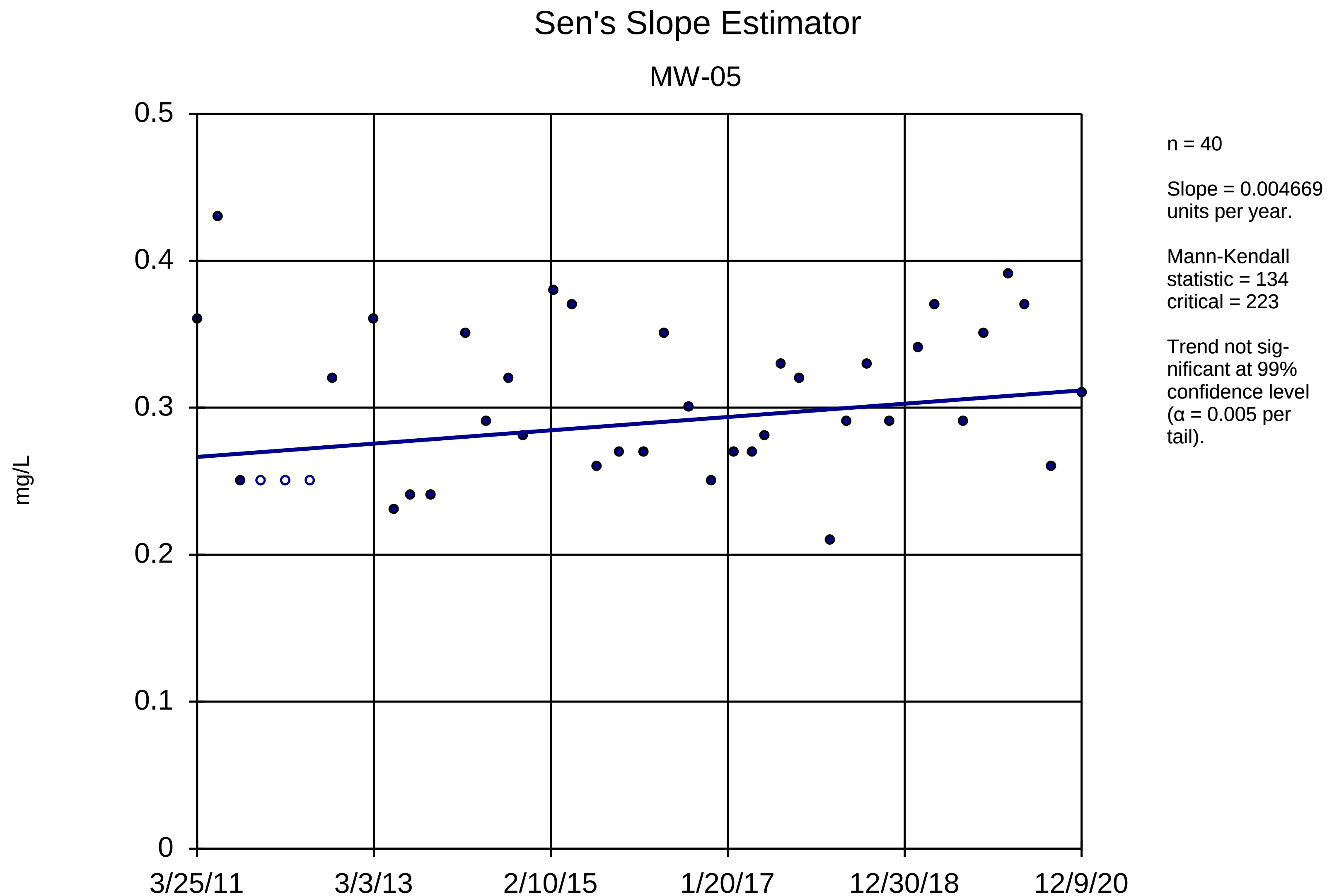
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81786

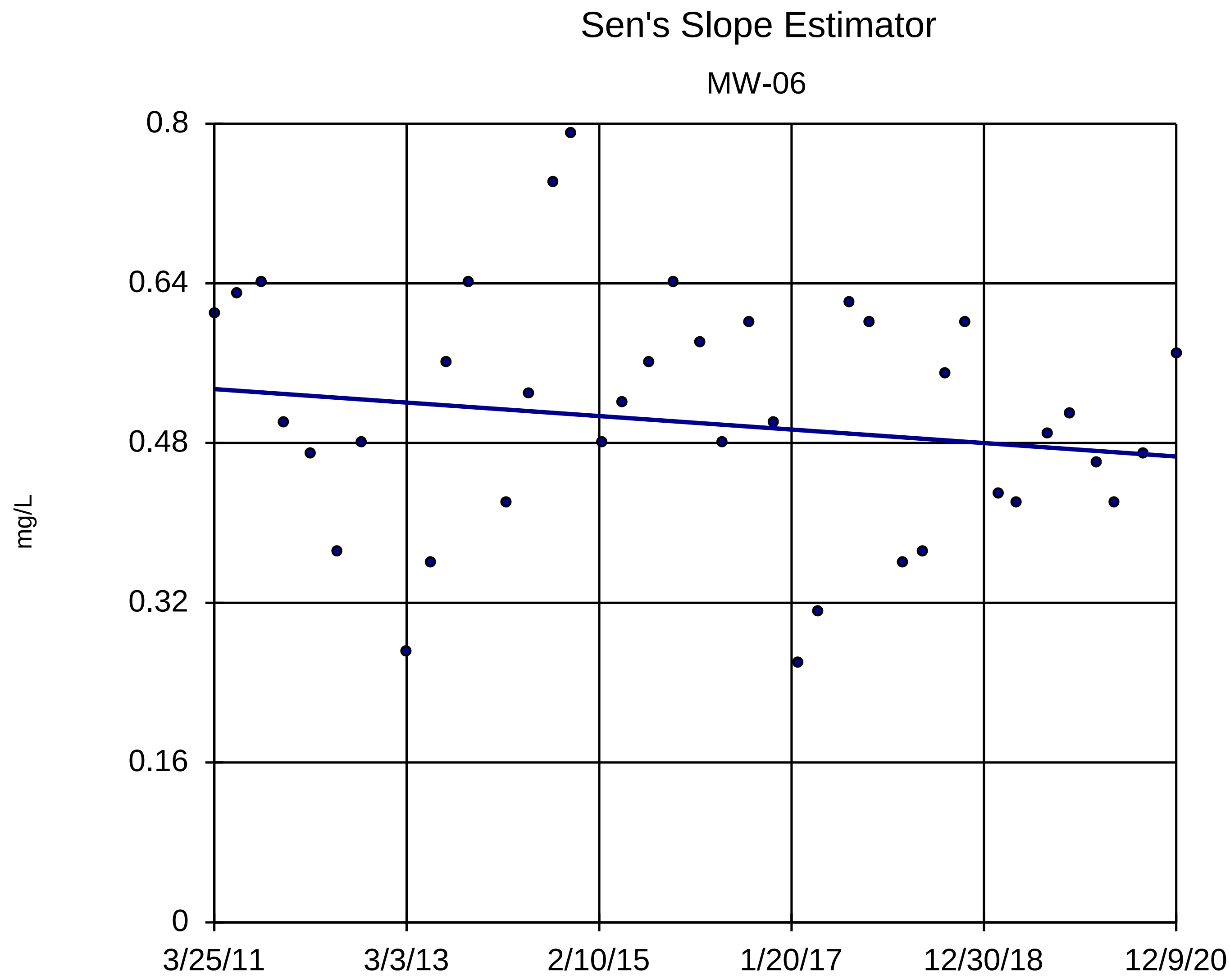
Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81787




n = 39

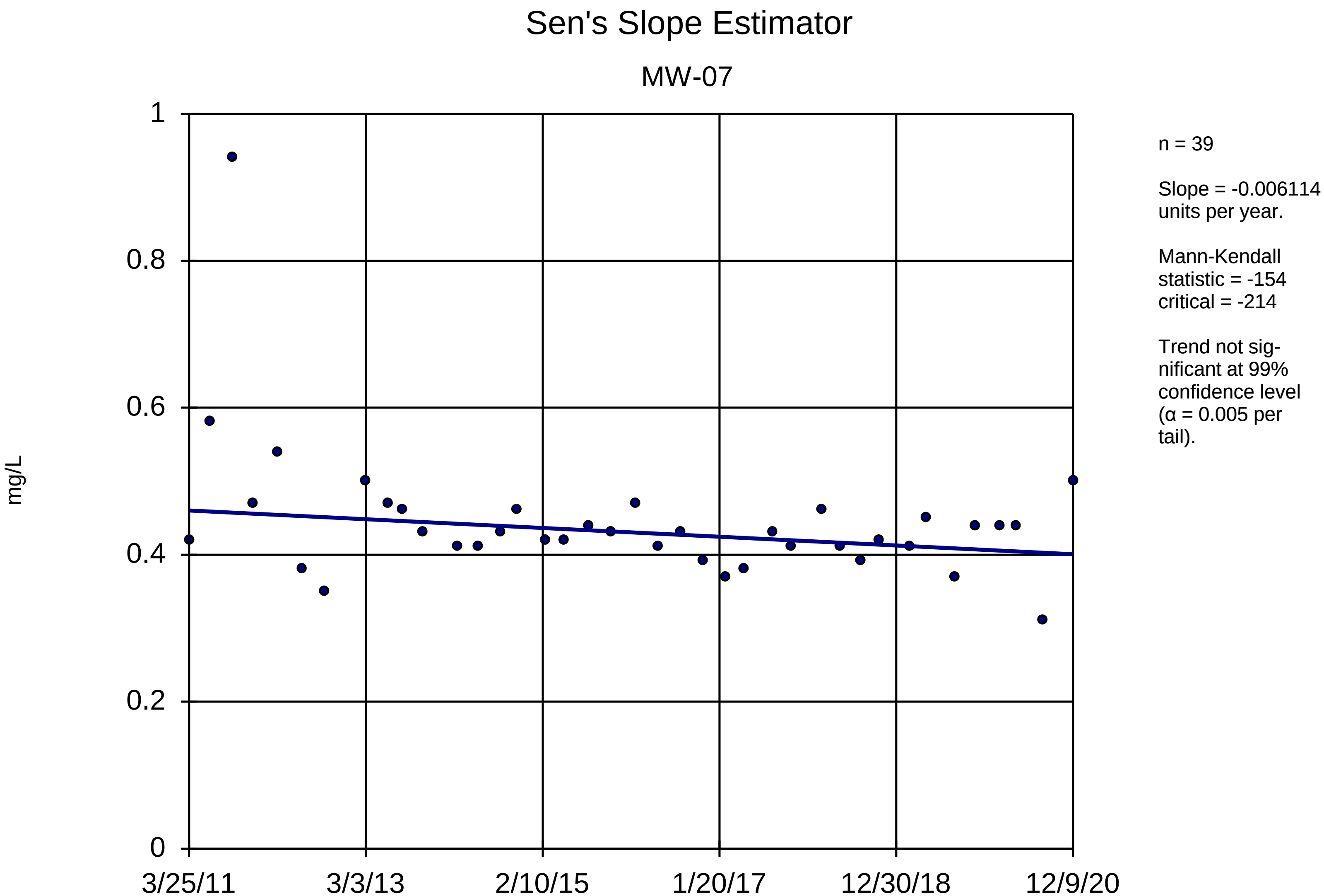
Slope = -0.006948
units per year.

Mann-Kendall
statistic = -90
critical = -214

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

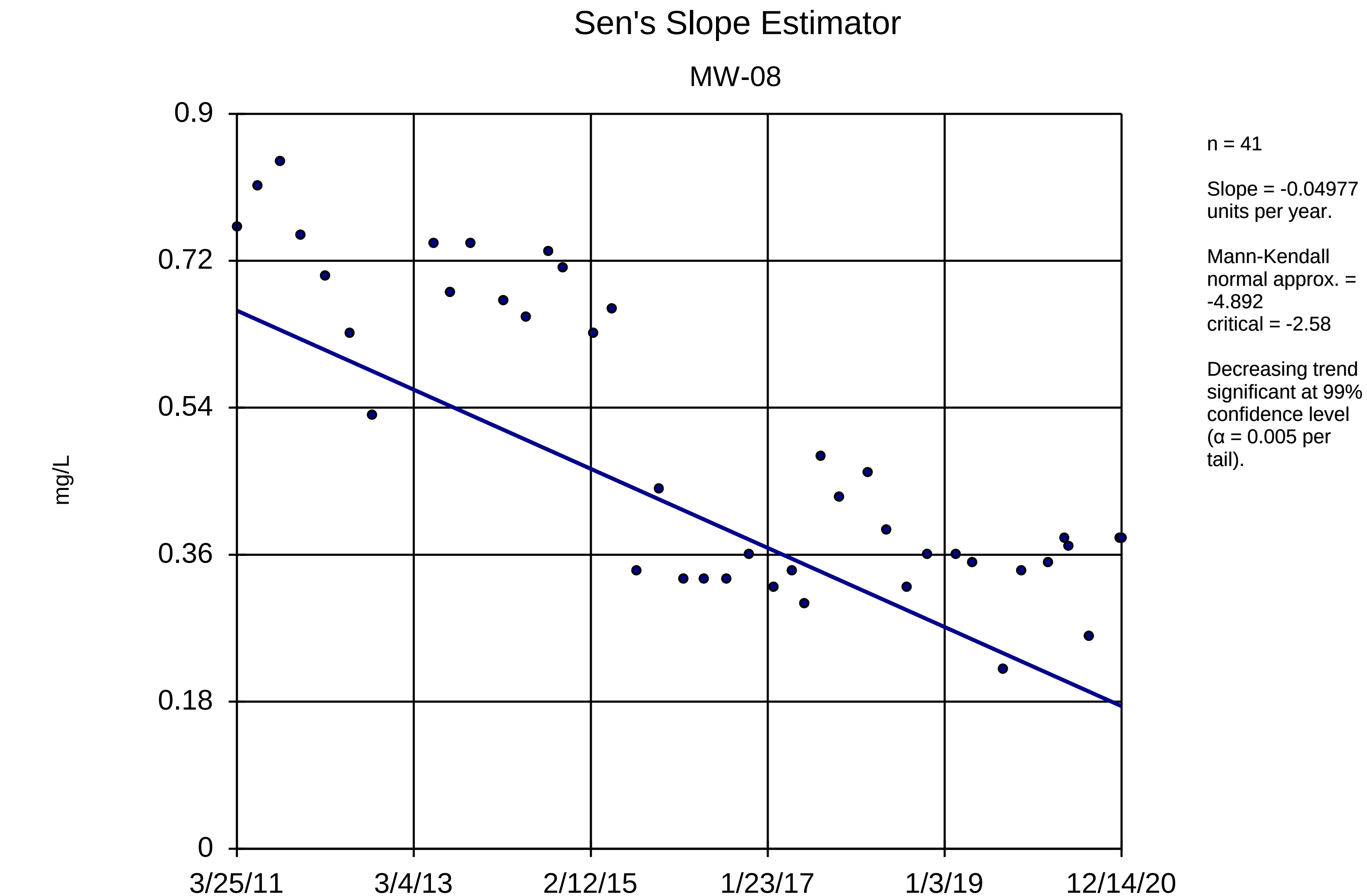
Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Fluoride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database




Constituent: Fluoride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

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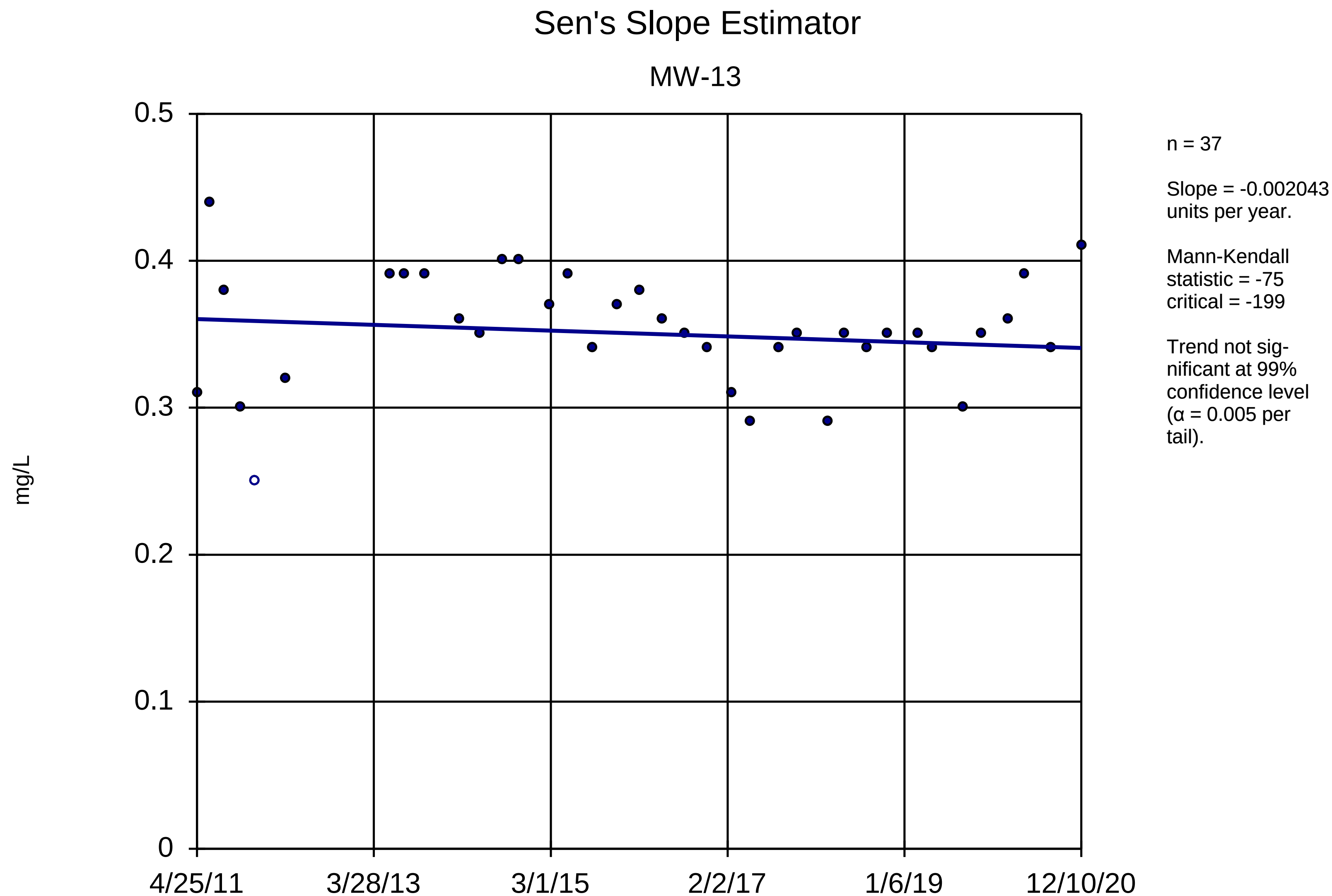
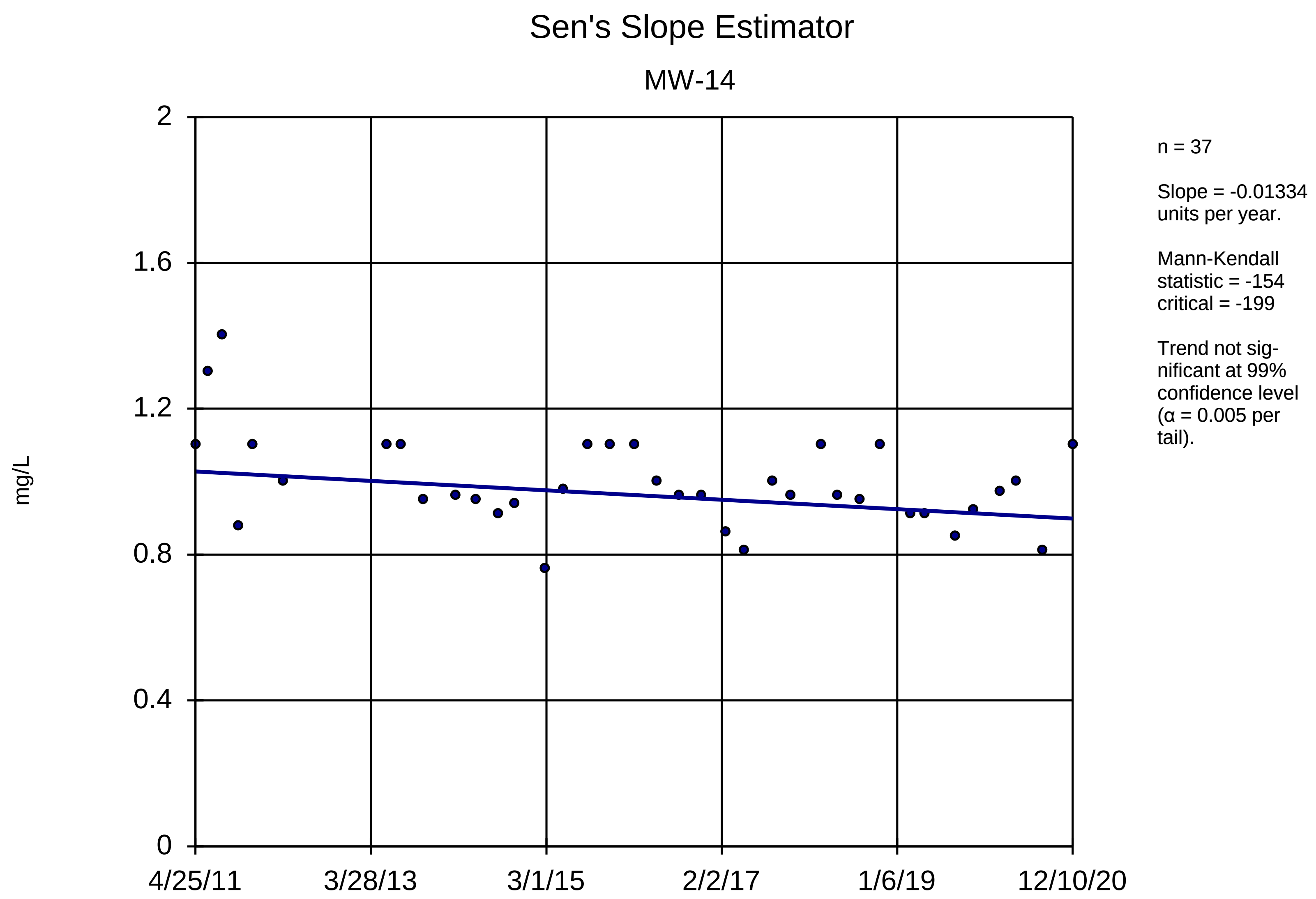
Hollow symbols indicate censored values.




Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

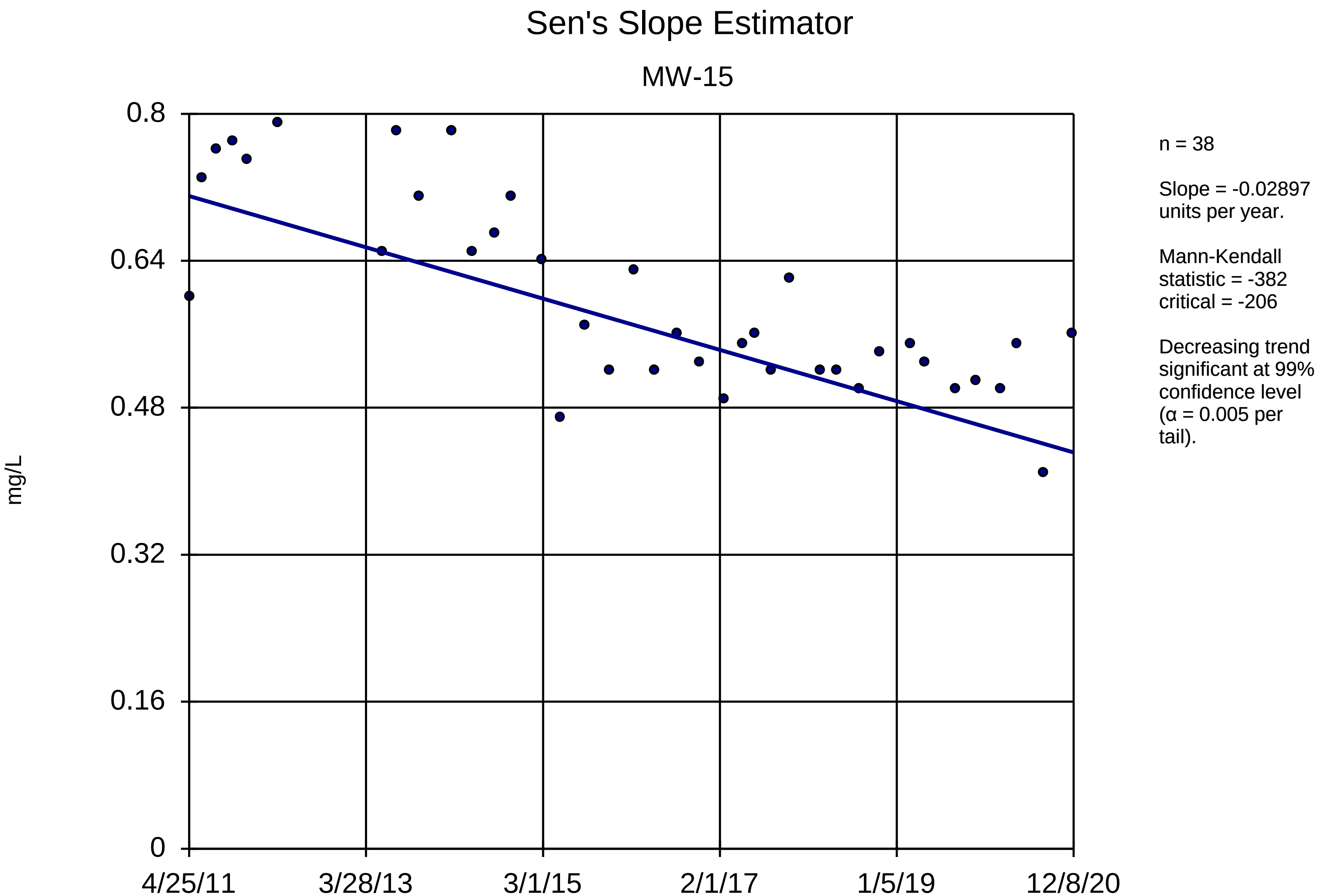
MWG13-15_81791




Constituent: Fluoride    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81792

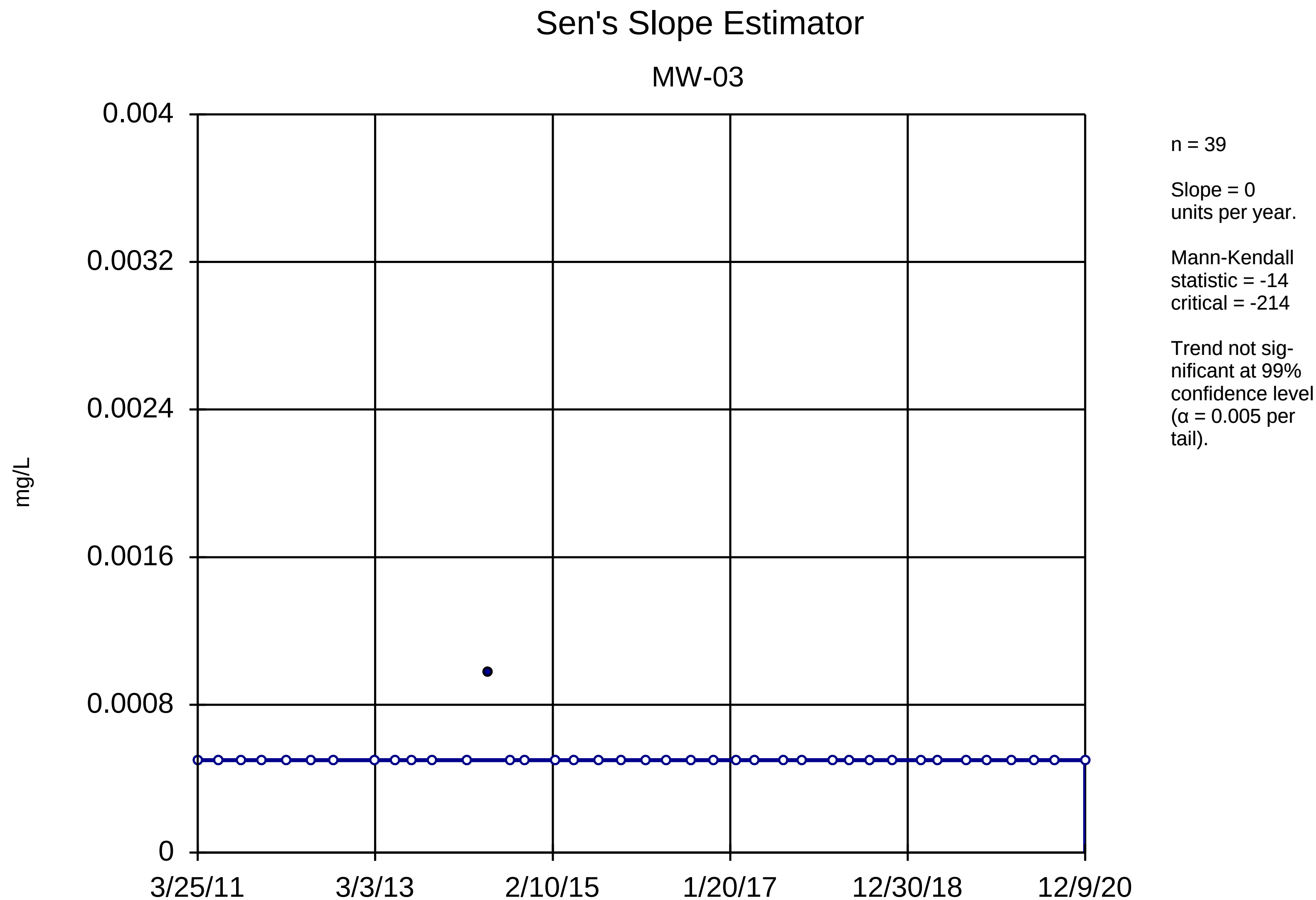



Constituent: Fluoride Analysis Run 4/2/2021 11:45 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81793

Hollow symbols indicate censored values.




Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81794

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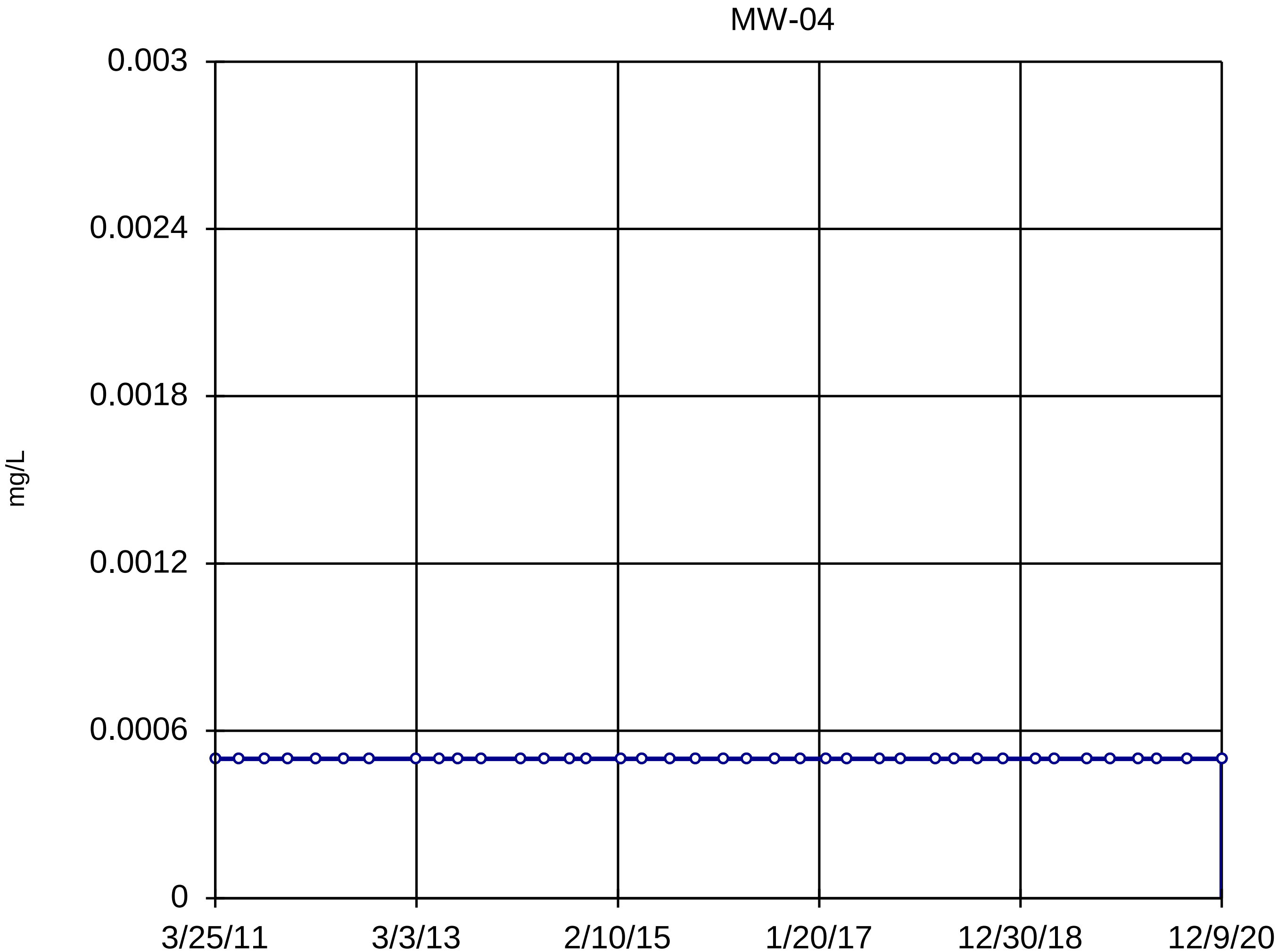
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

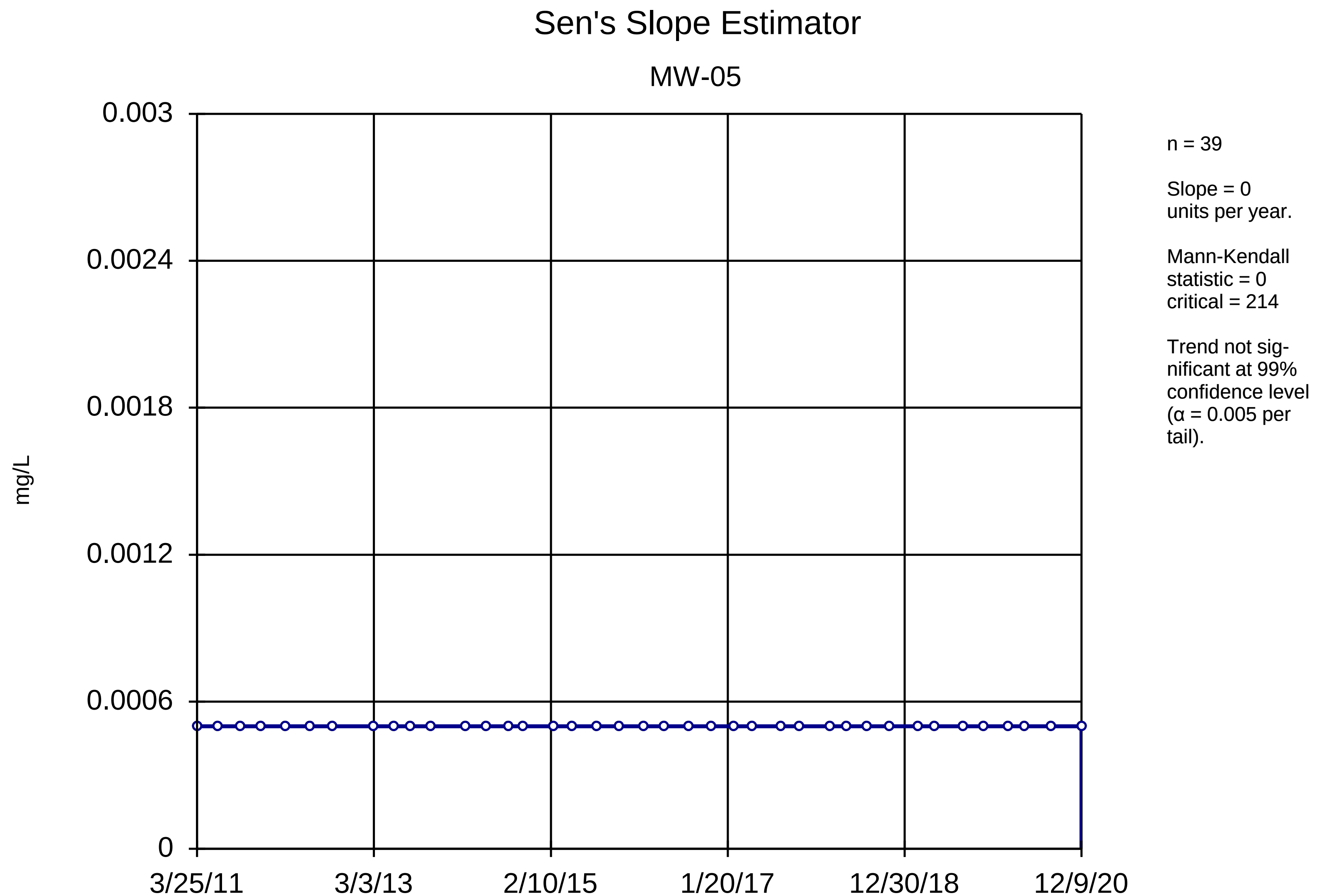
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81795

Hollow symbols indicate censored values.

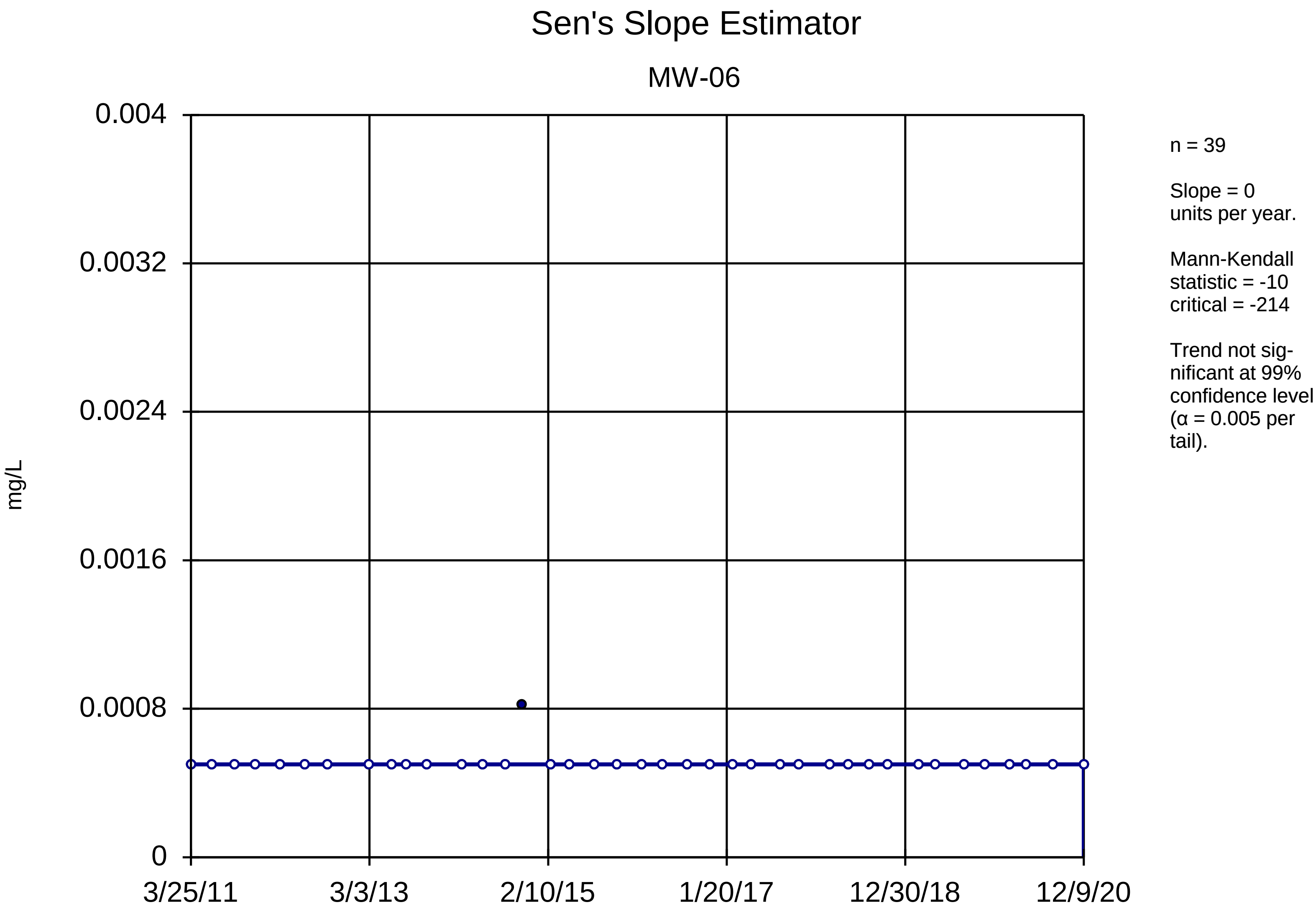



Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81796

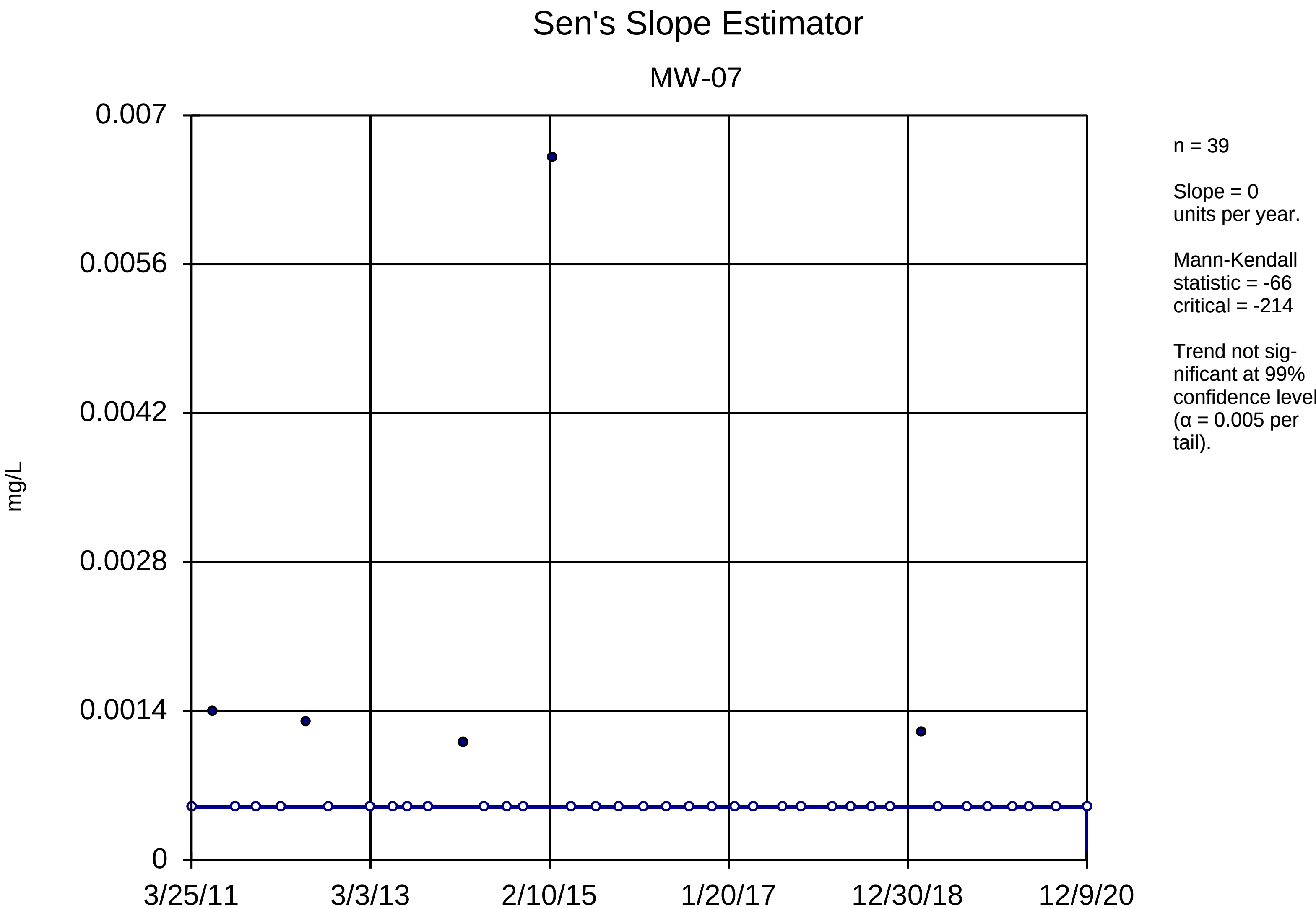
Hollow symbols indicate censored values.




Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:45 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

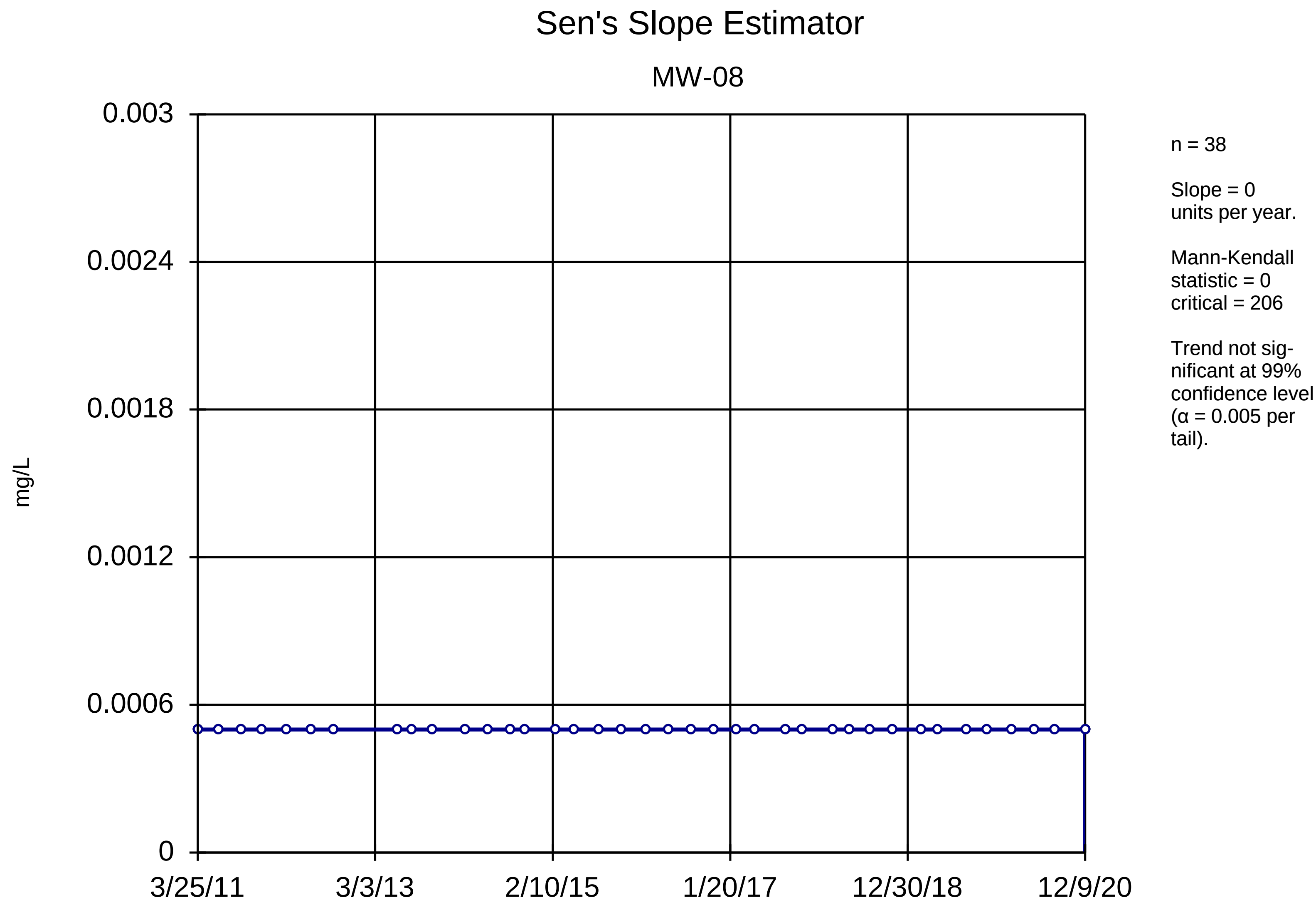



Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81798

Hollow symbols indicate censored values.

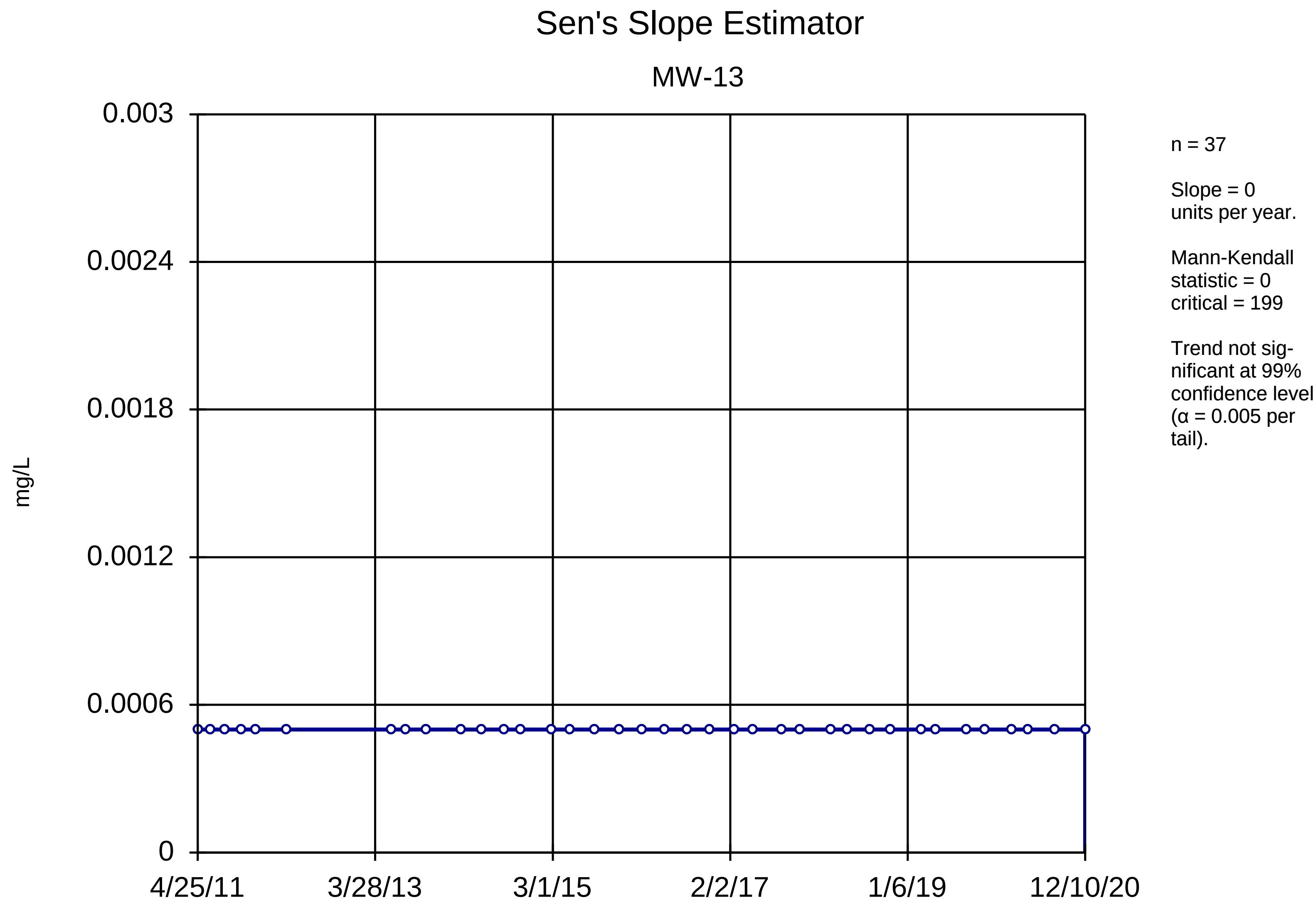



Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81799

Hollow symbols indicate censored values.




Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81800

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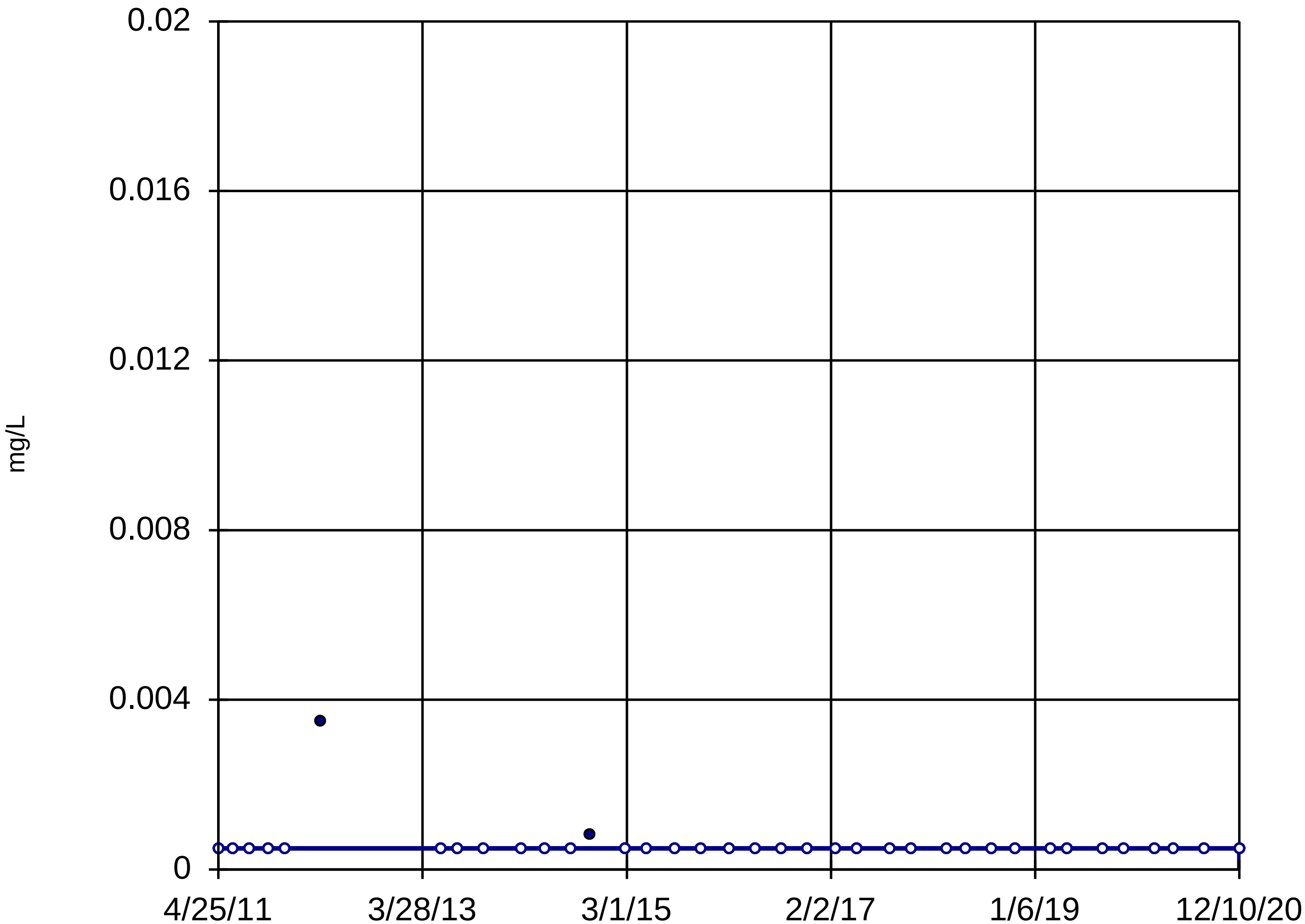
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-14




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = -39
critical = -199

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81801

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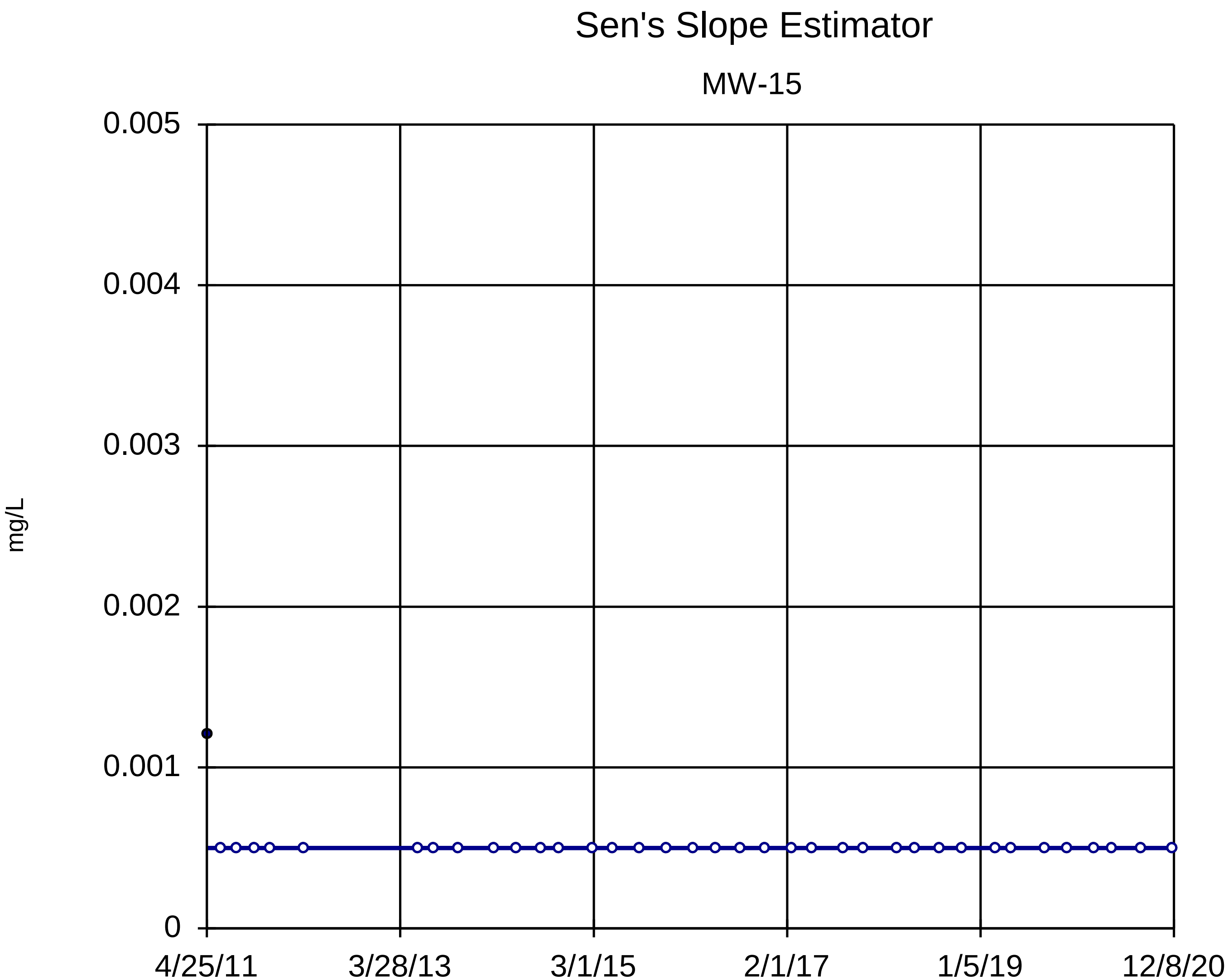
Hollow symbols indicate censored values.




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = -36
critical = -199

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81802

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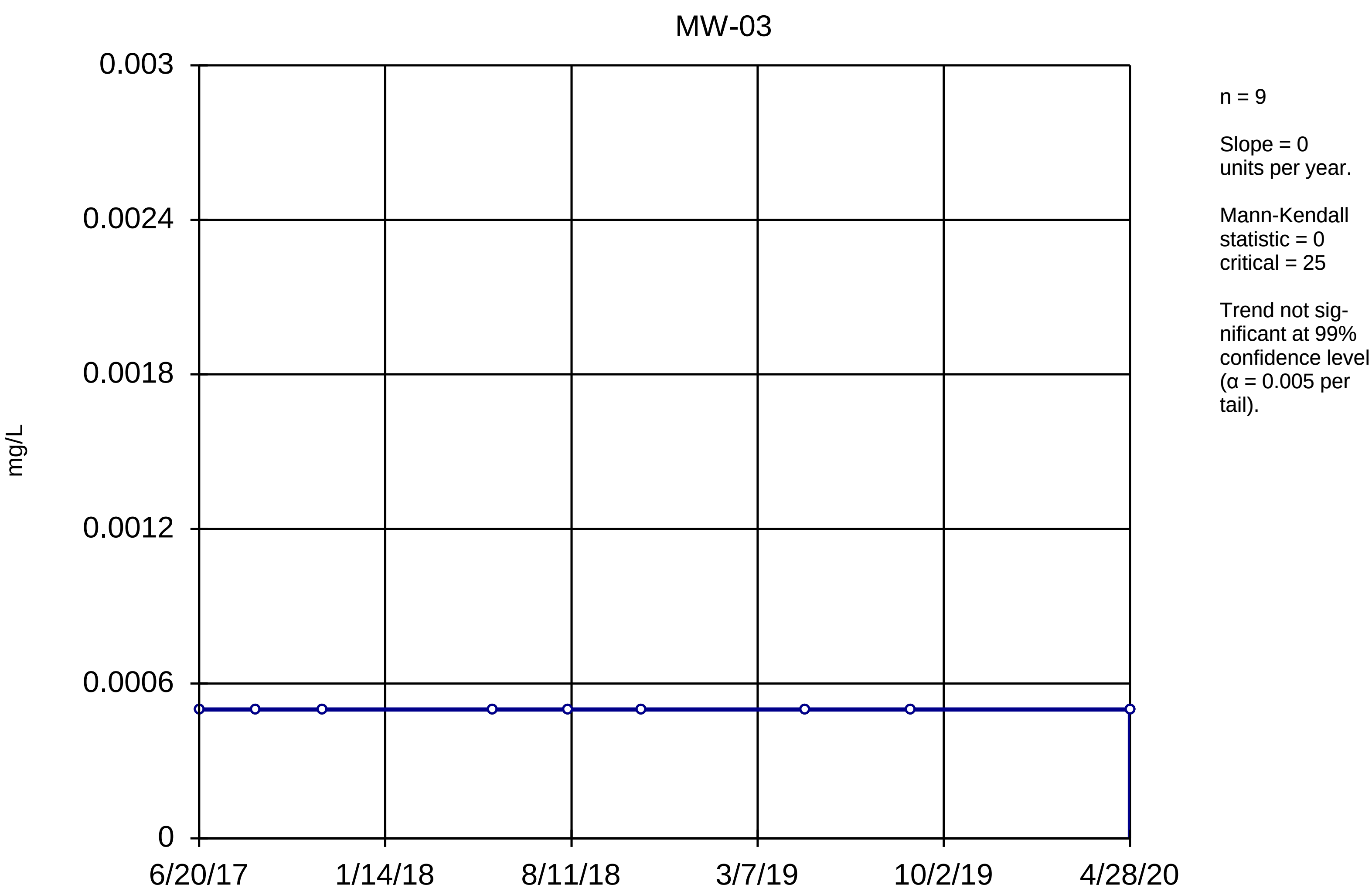
Hollow symbols indicate censored values.

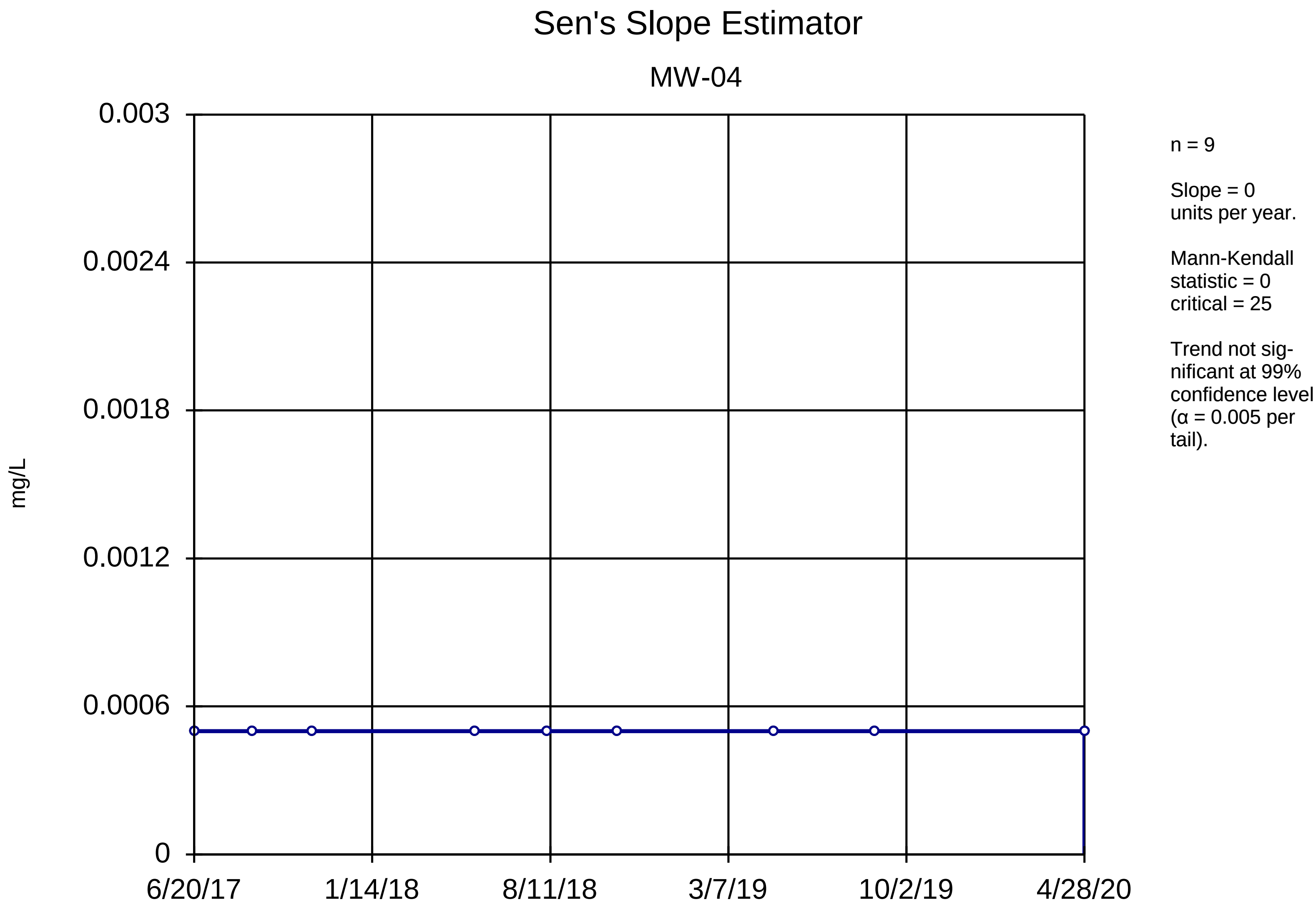
## Sen's Slope Estimator




Constituent: Lead, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

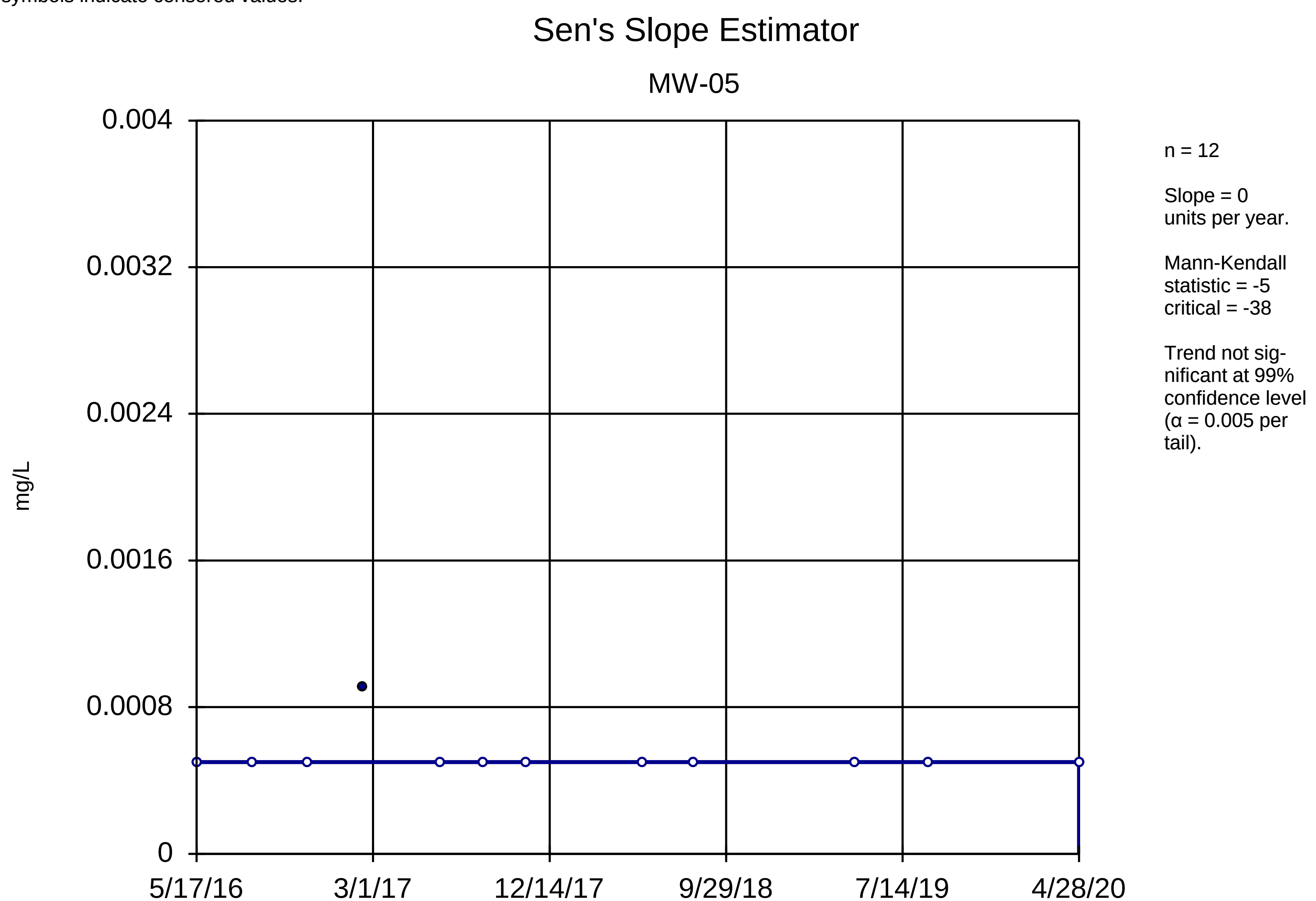



Constituent: Lead, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81804

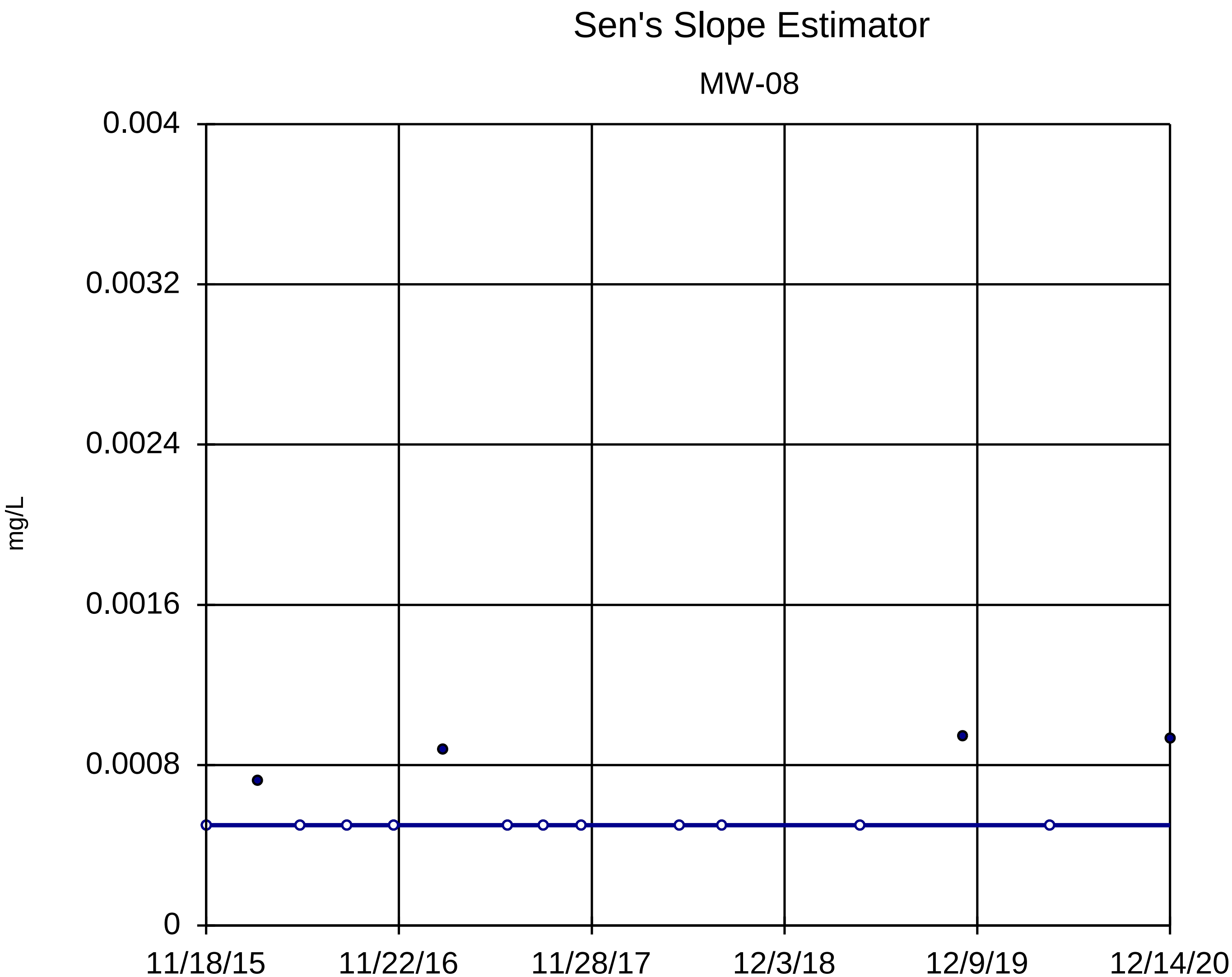
Hollow symbols indicate censored values.




Constituent: Lead, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




n = 15

Slope = 0
units per year.

Mann-Kendall
statistic = 12
critical = 53

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81806

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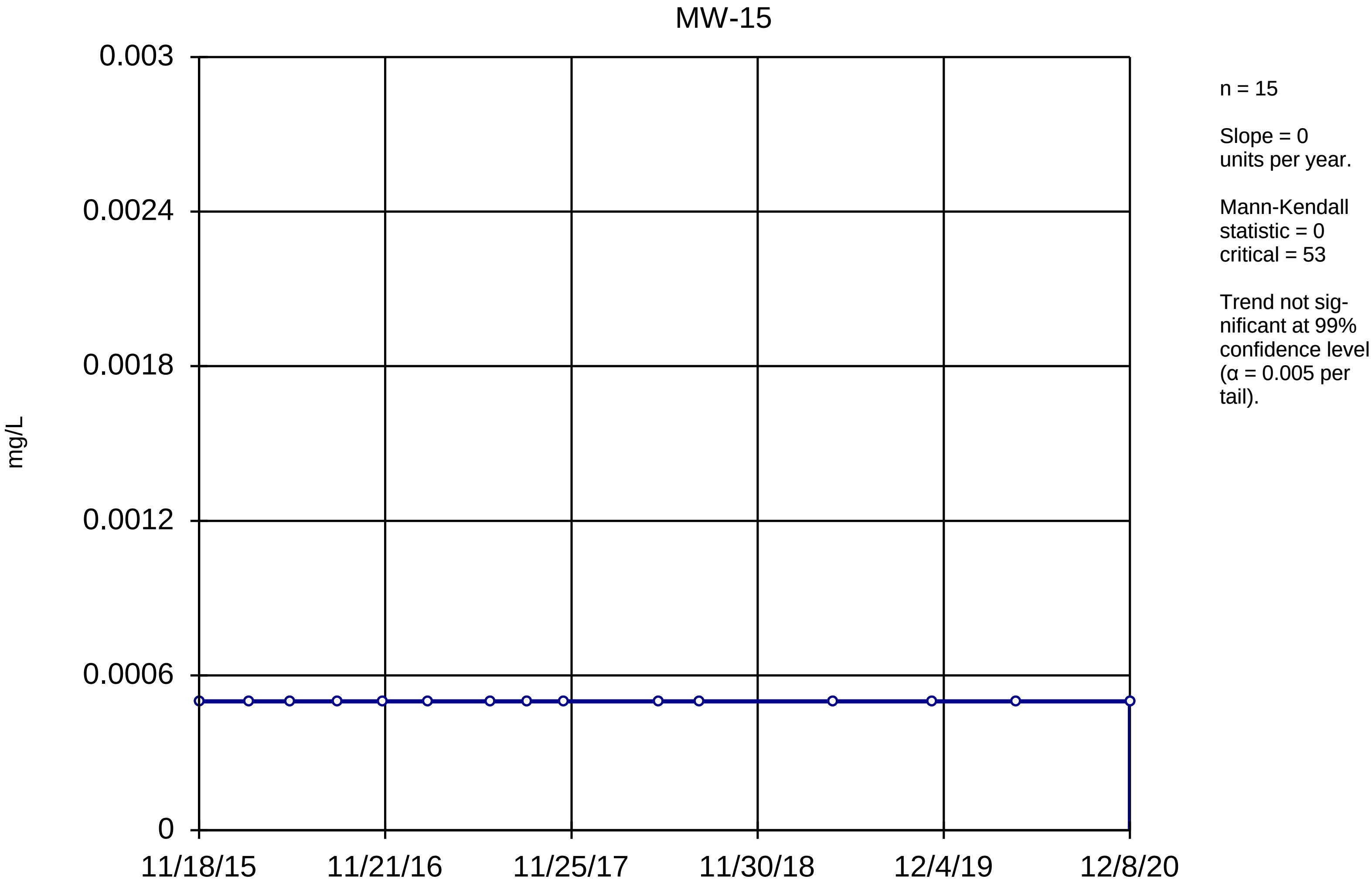
Hollow symbols indicate censored values.

## Sen's Slope Estimator




Constituent: Lead, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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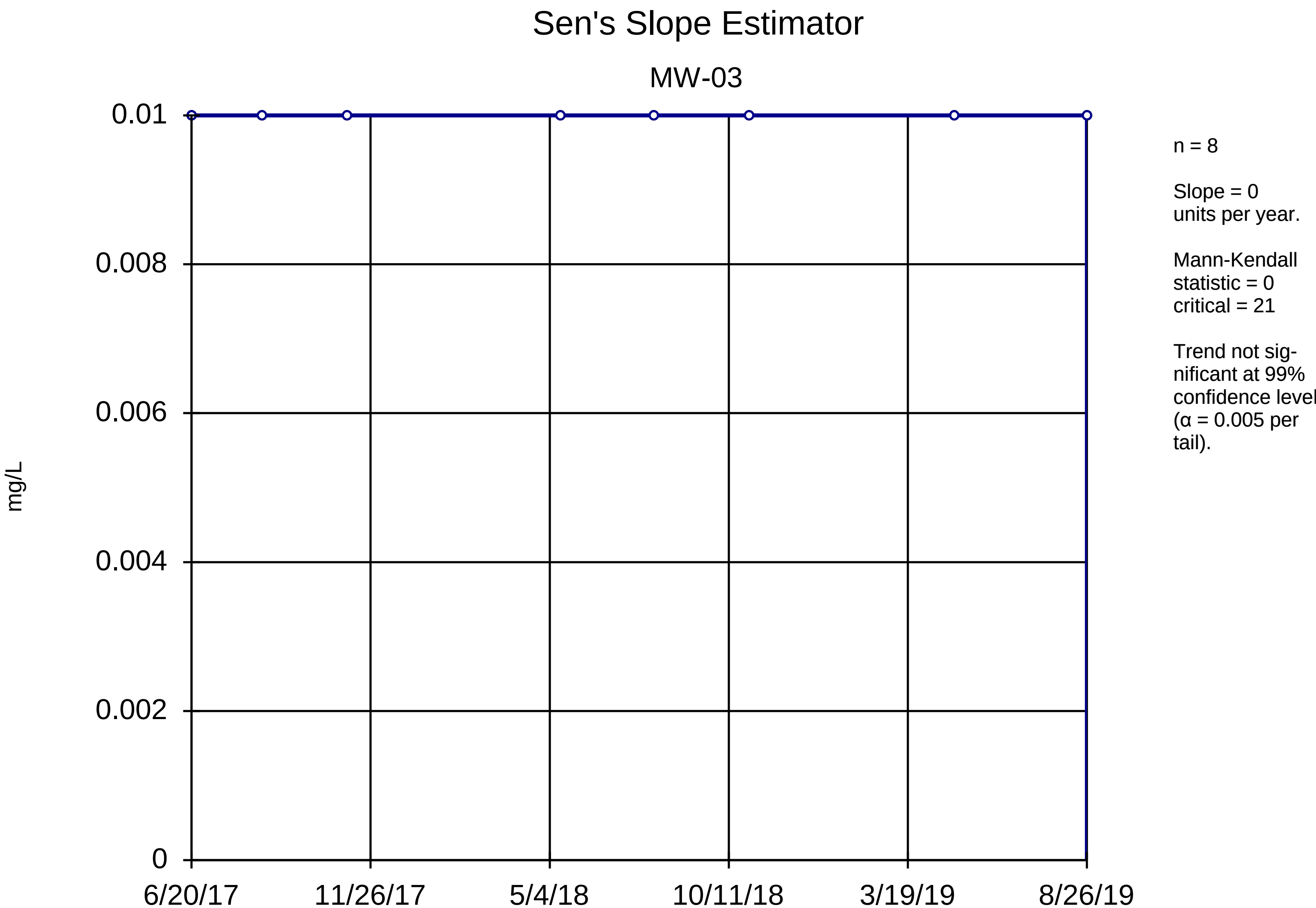
Hollow symbols indicate censored values.

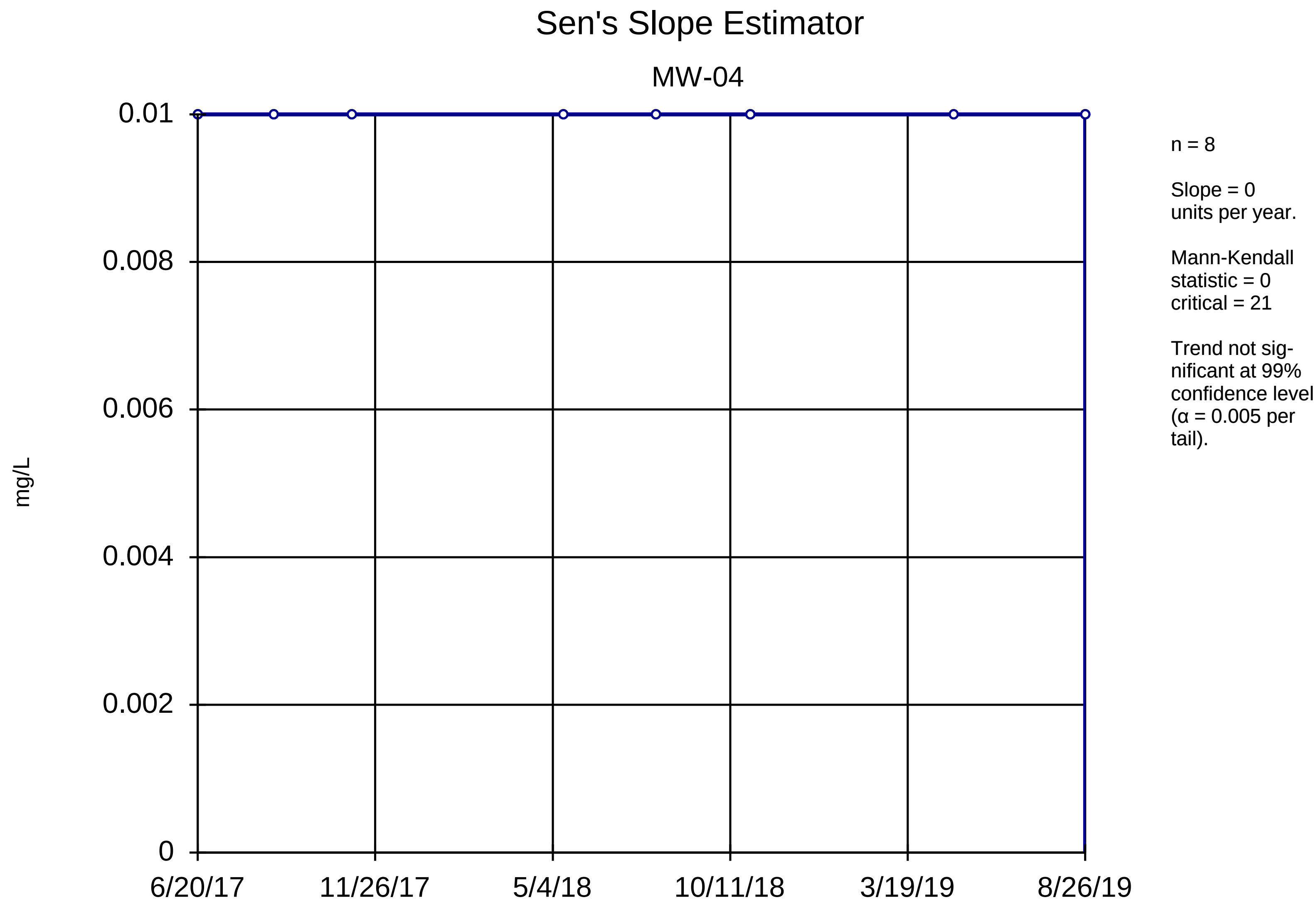



Constituent: Lithium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81808

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Lithium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81809

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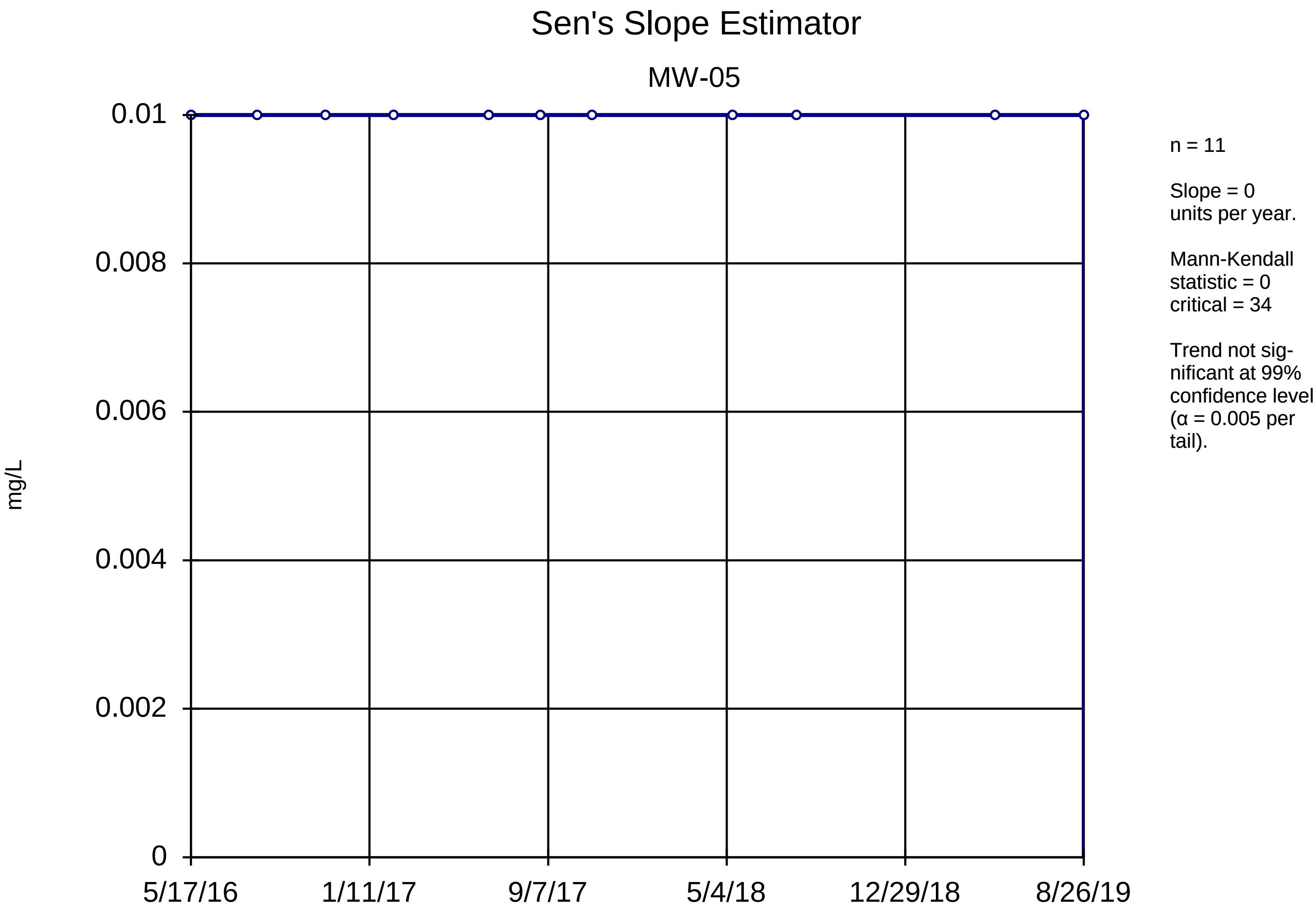
Hollow symbols indicate censored values.

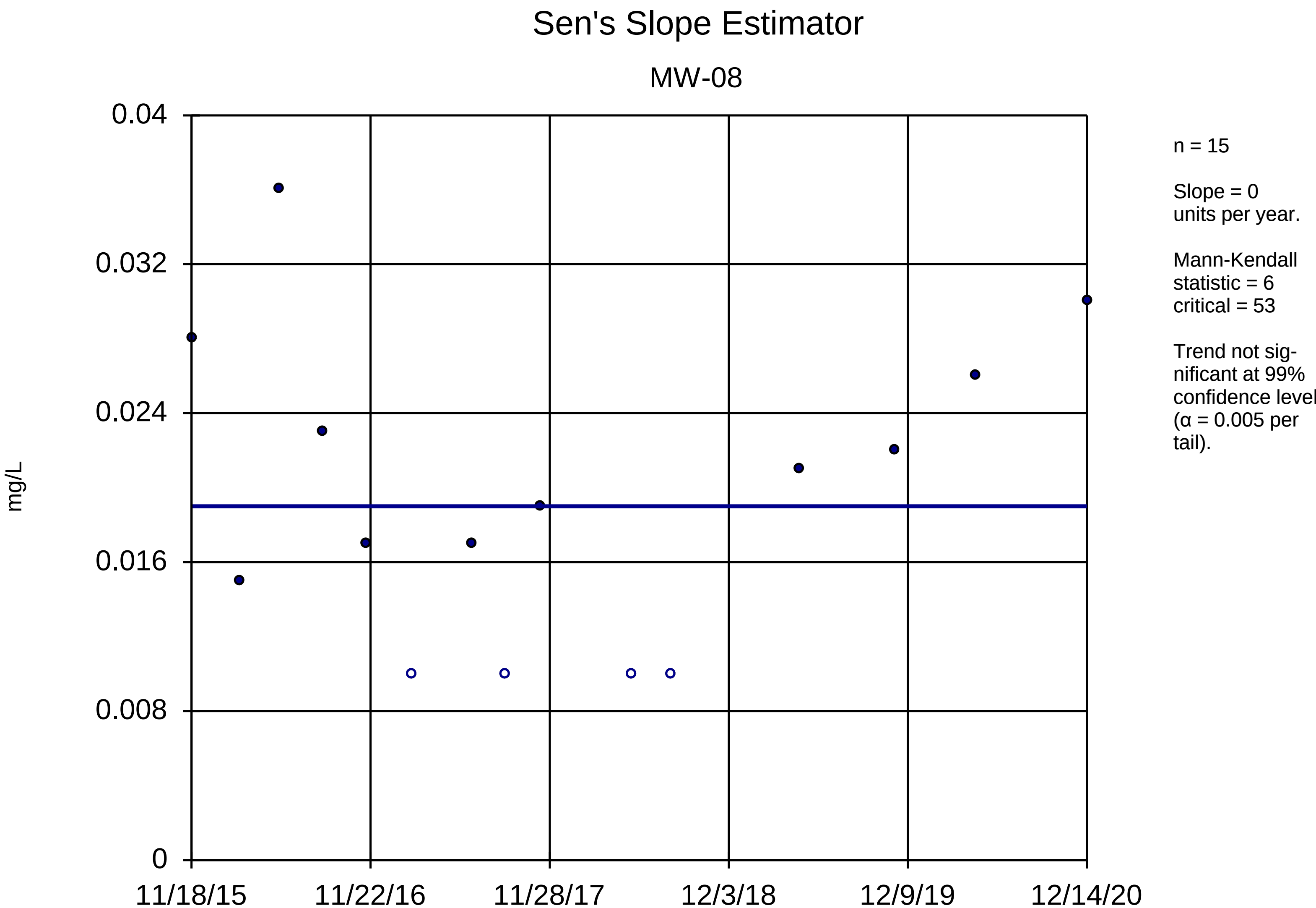



Constituent: Lithium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81810

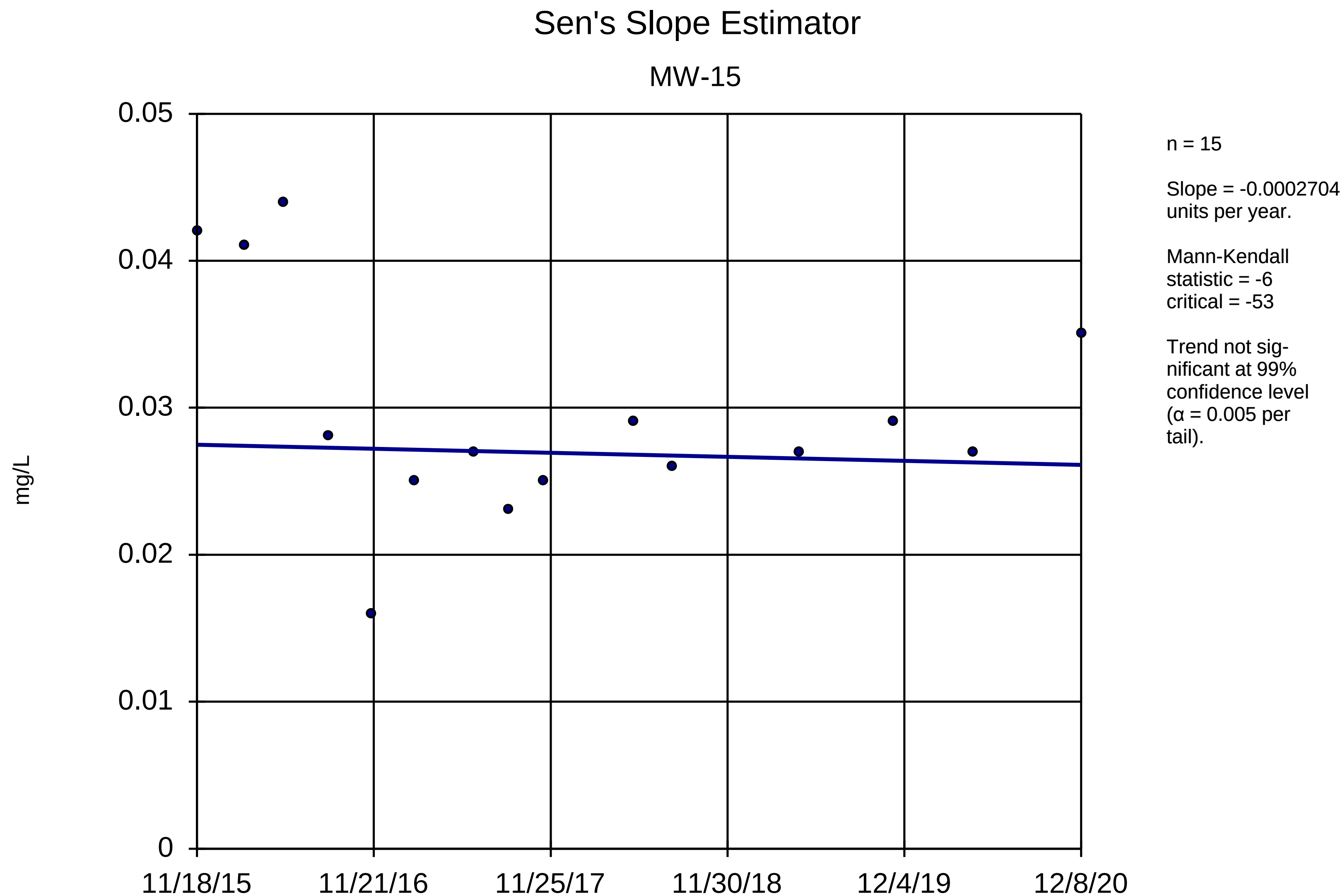
Hollow symbols indicate censored values.




Constituent: Lithium, Total Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81811

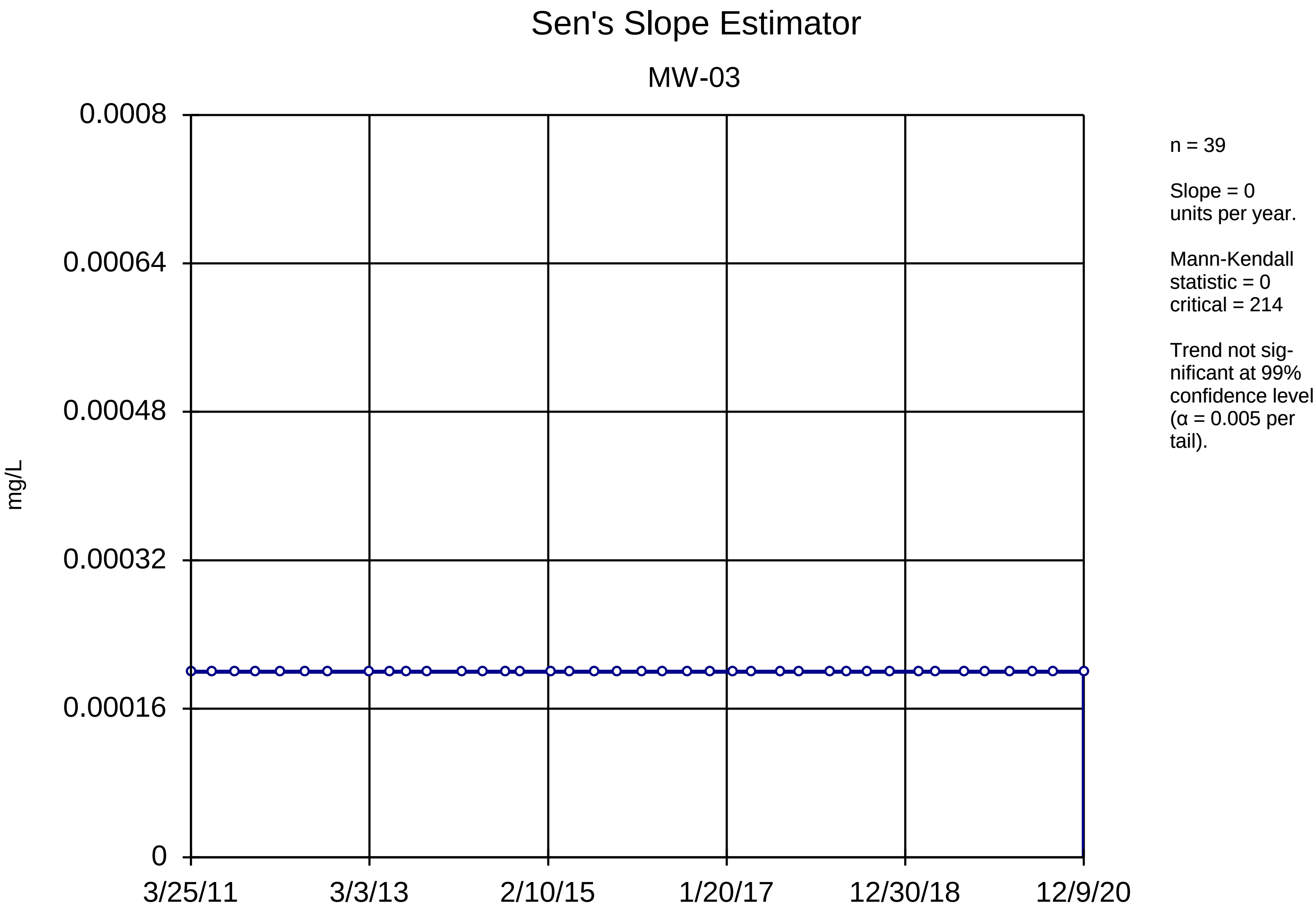



Constituent: Lithium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81812

Hollow symbols indicate censored values.

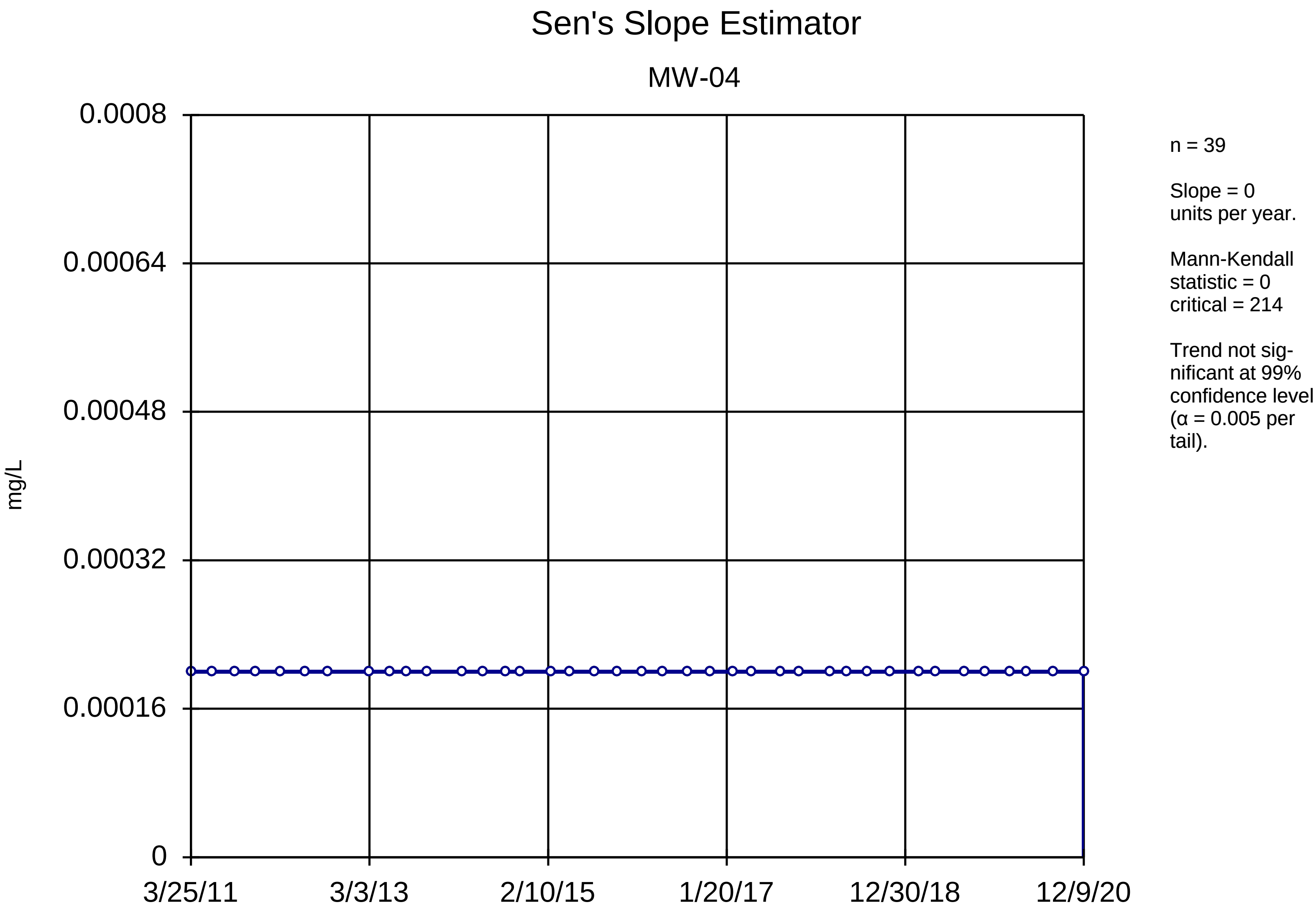



Constituent: Mercury, Dissolved Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81813

Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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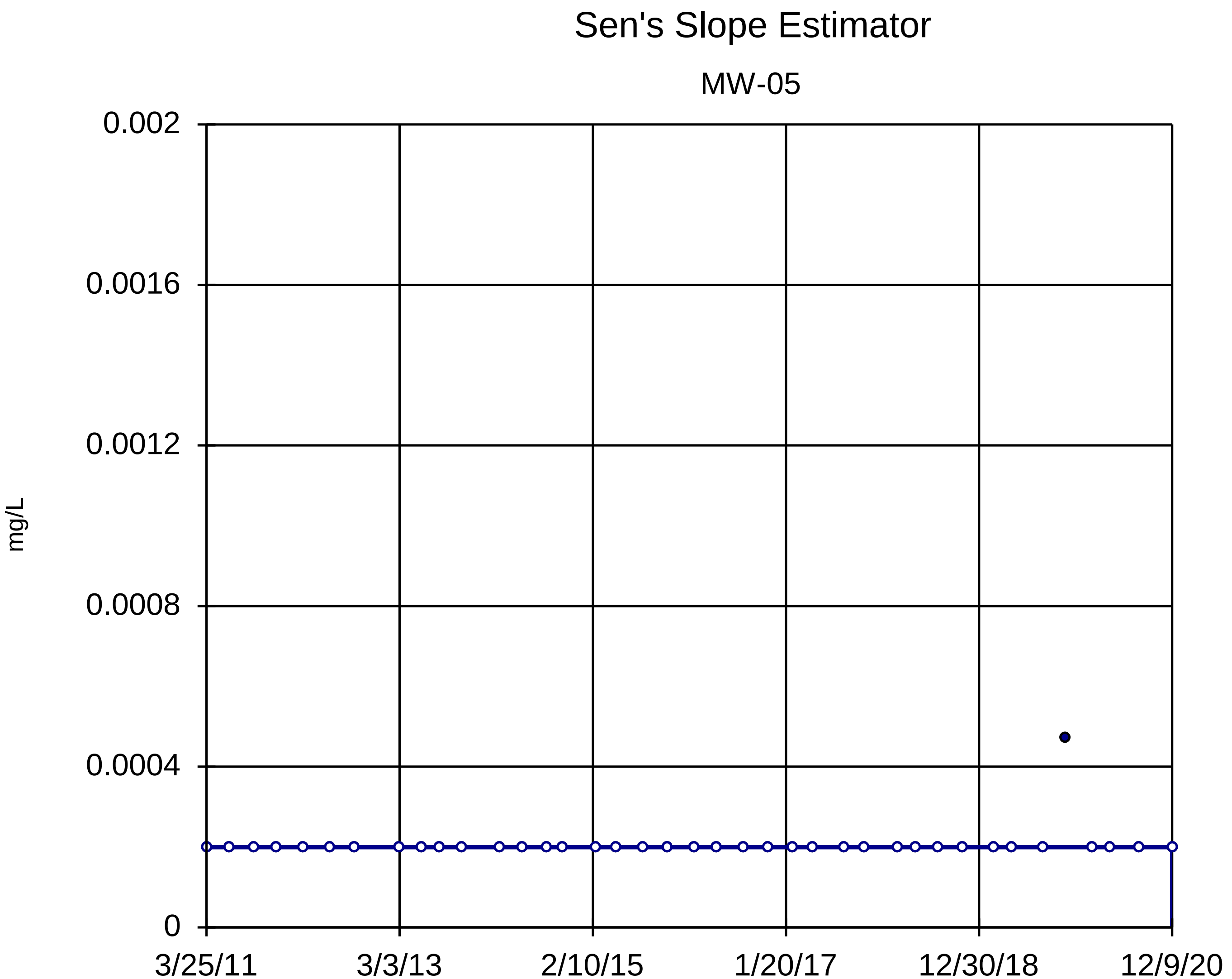
Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 30
critical = 214

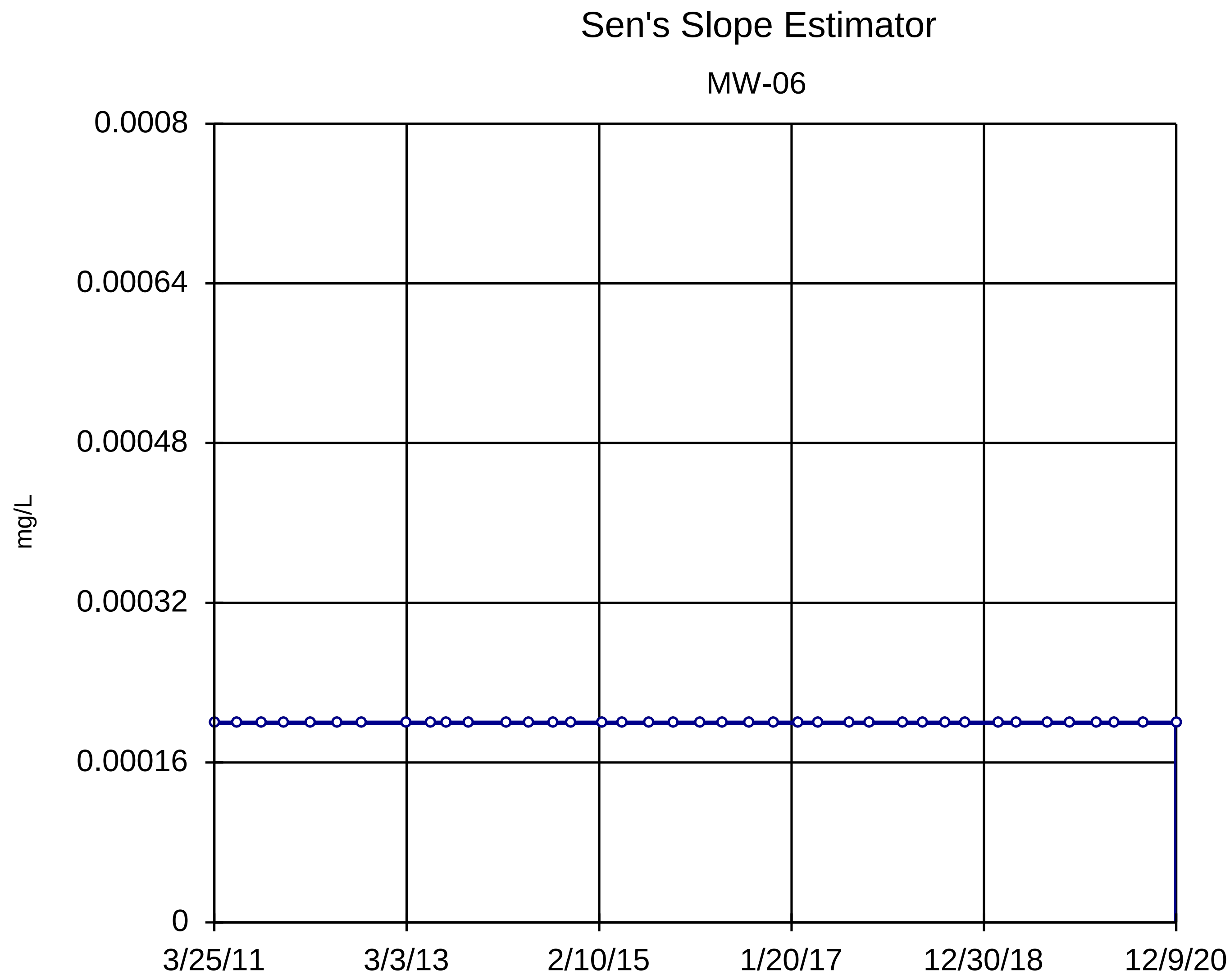
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81815

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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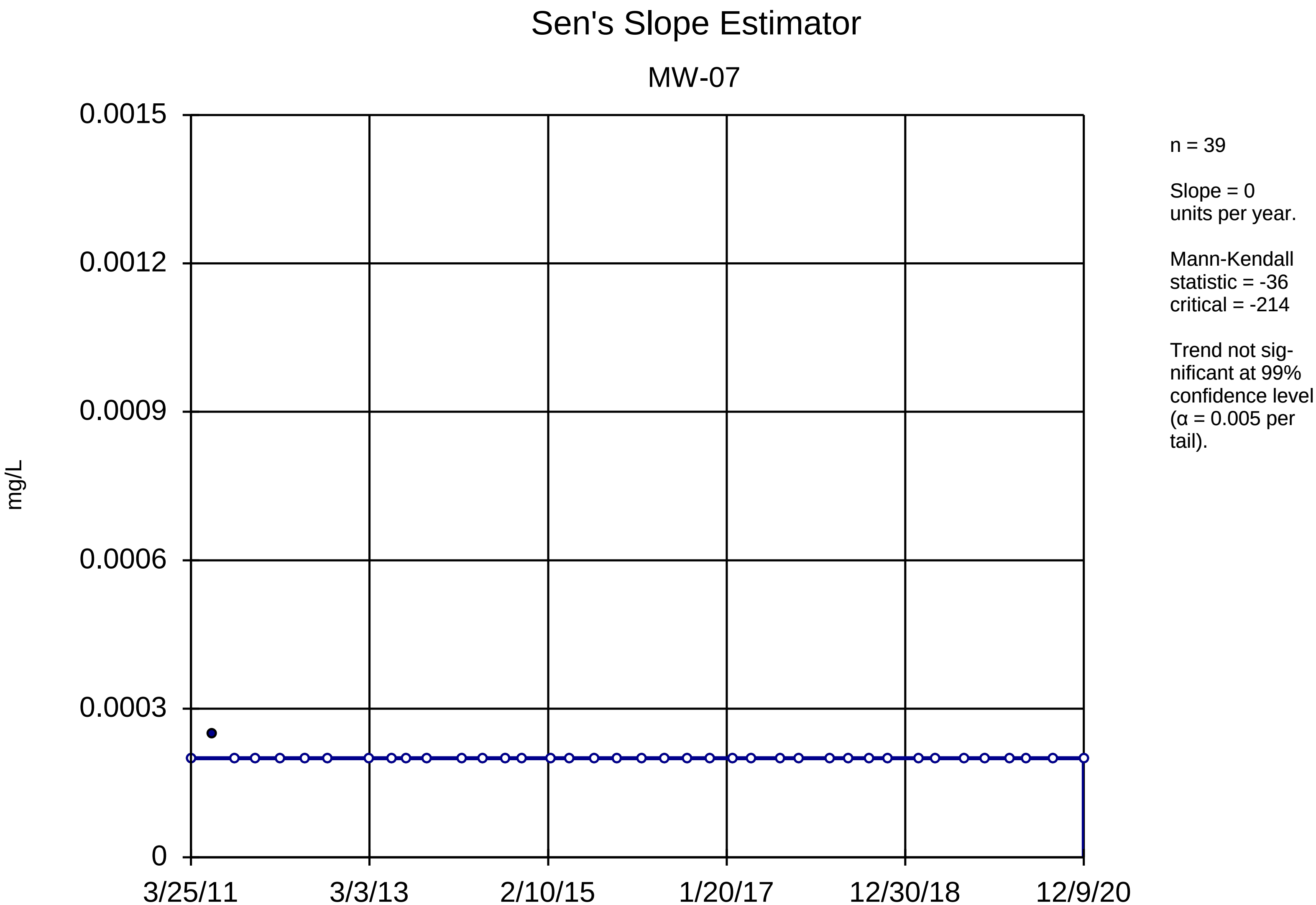
Hollow symbols indicate censored values.



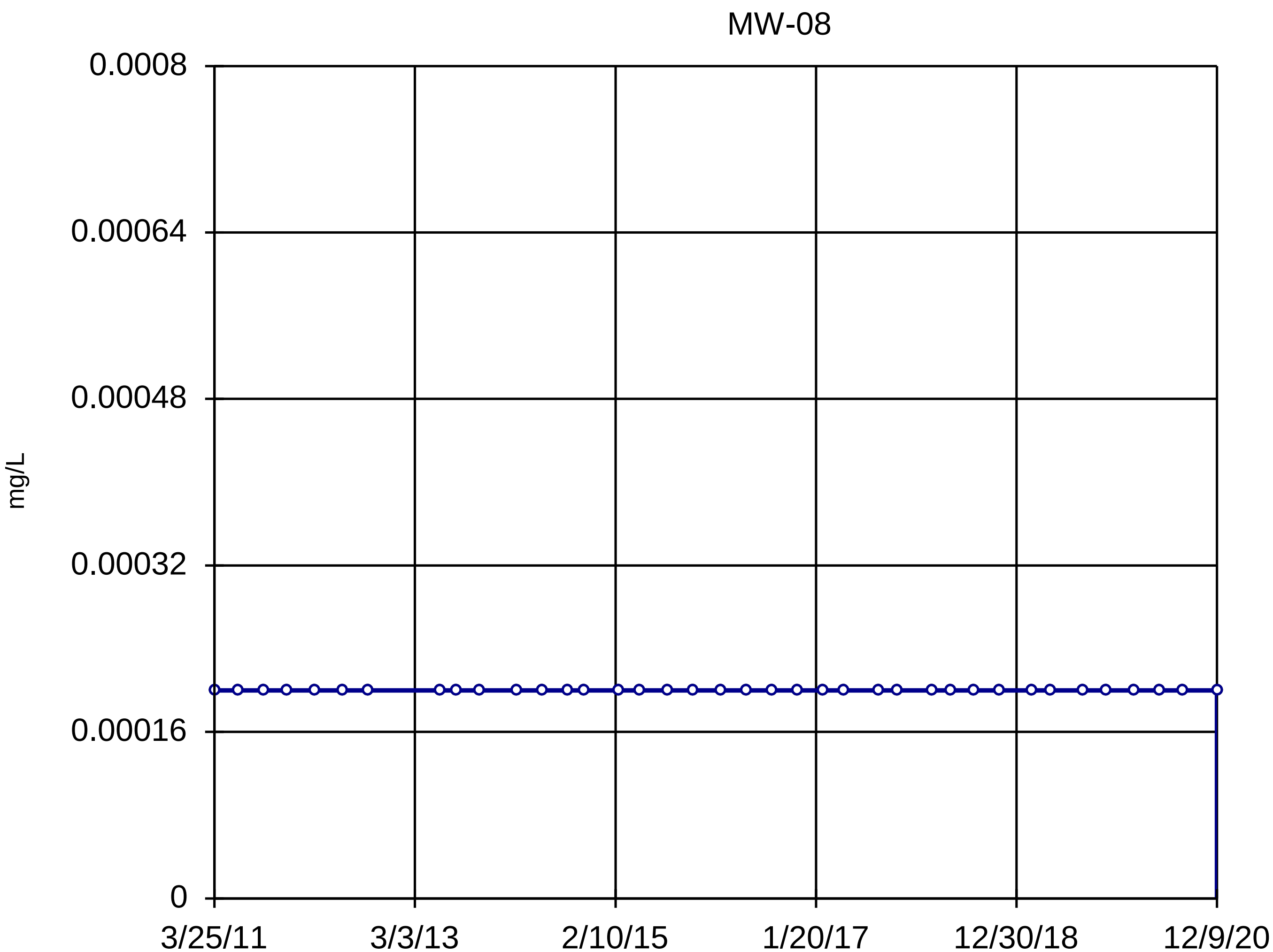

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81817

Hollow symbols indicate censored values.

# Sen's Slope Estimator




n = 38

Slope = 0
units per year.

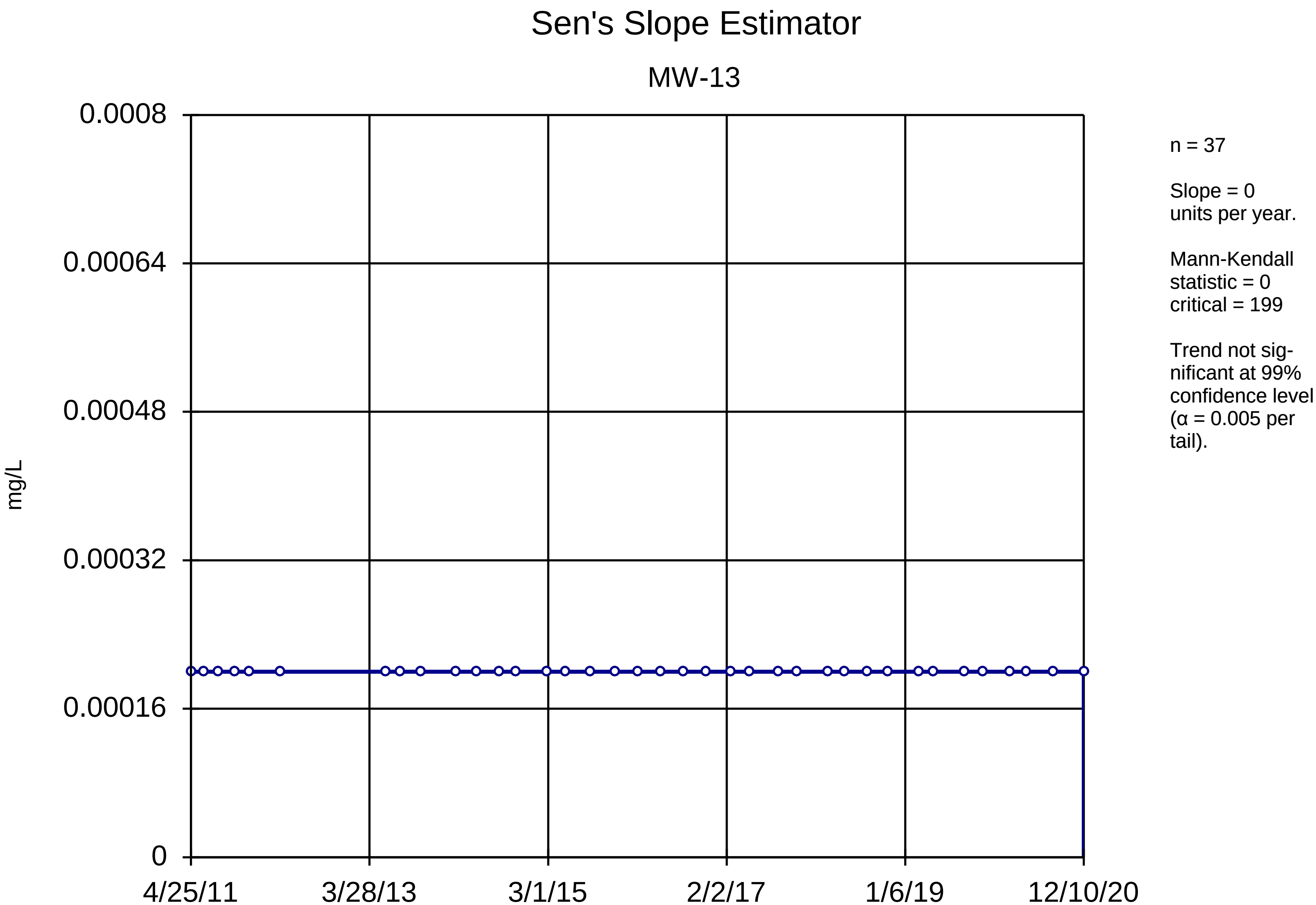
Mann-Kendall
statistic = 0
critical = 206

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved  Analysis Run 4/2/2021 11:46 AM

Utility Site P  Client: Weaver Consultants Group  Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

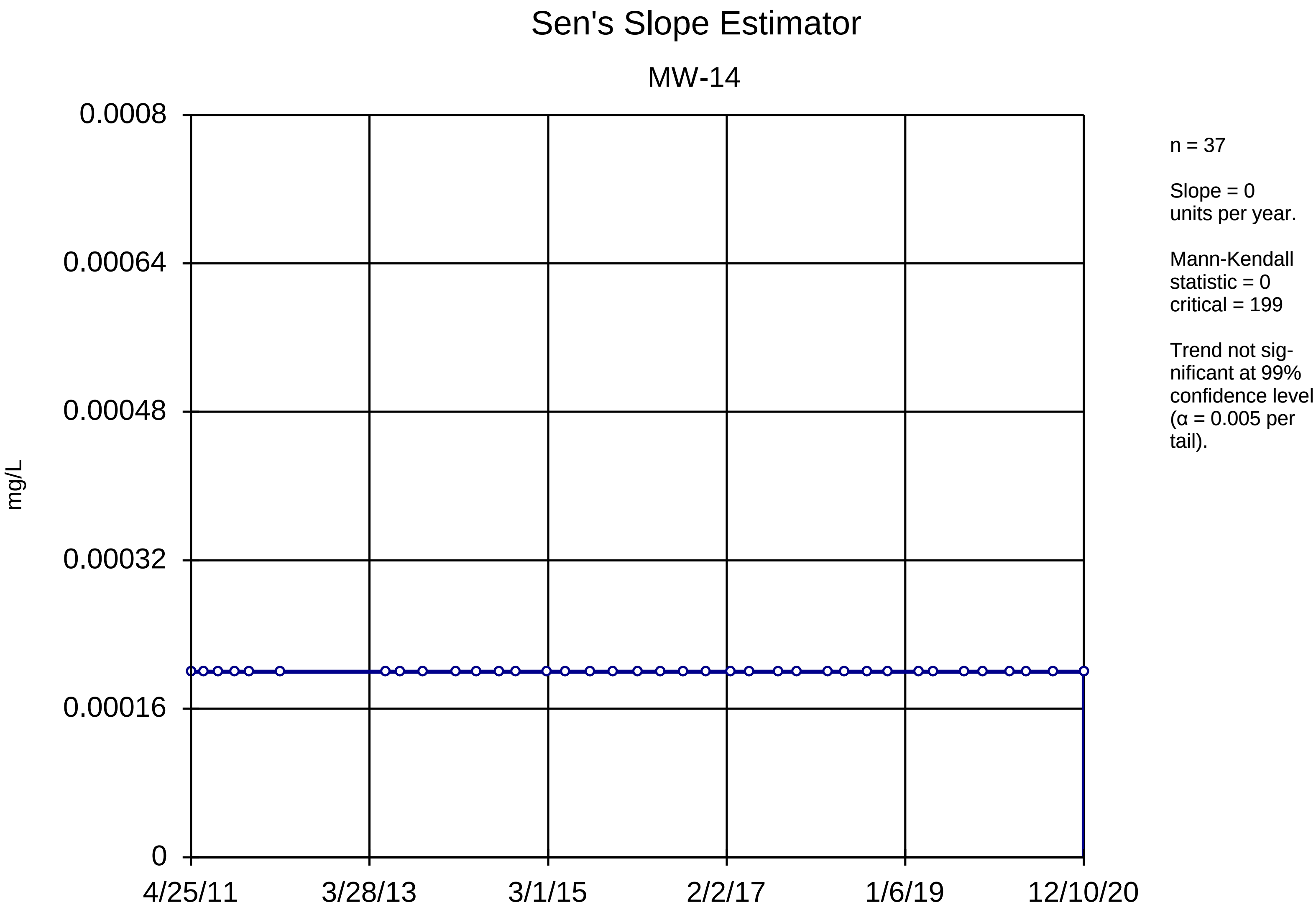



Constituent: Mercury, Dissolved Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81819

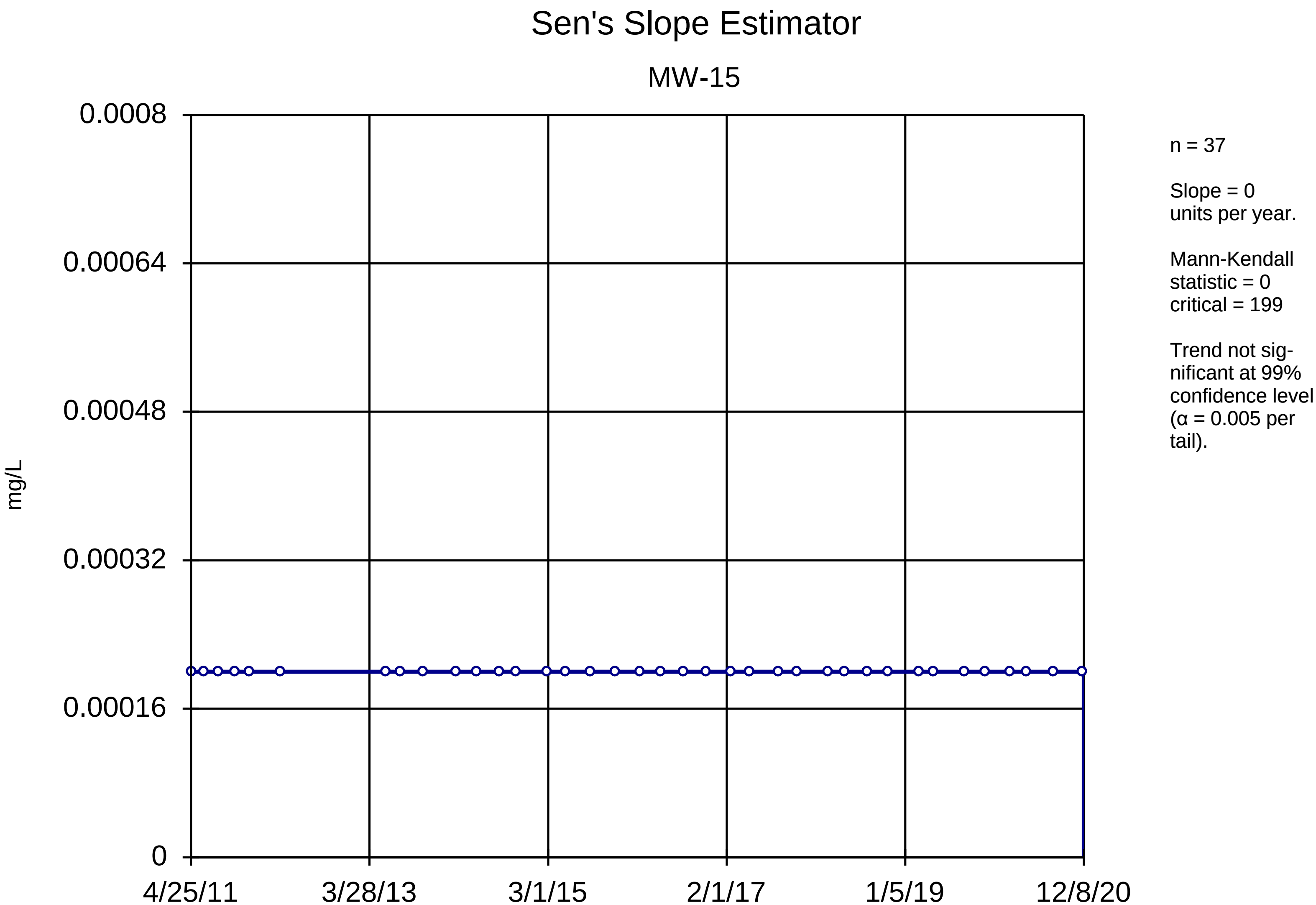
Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 11:46 AM

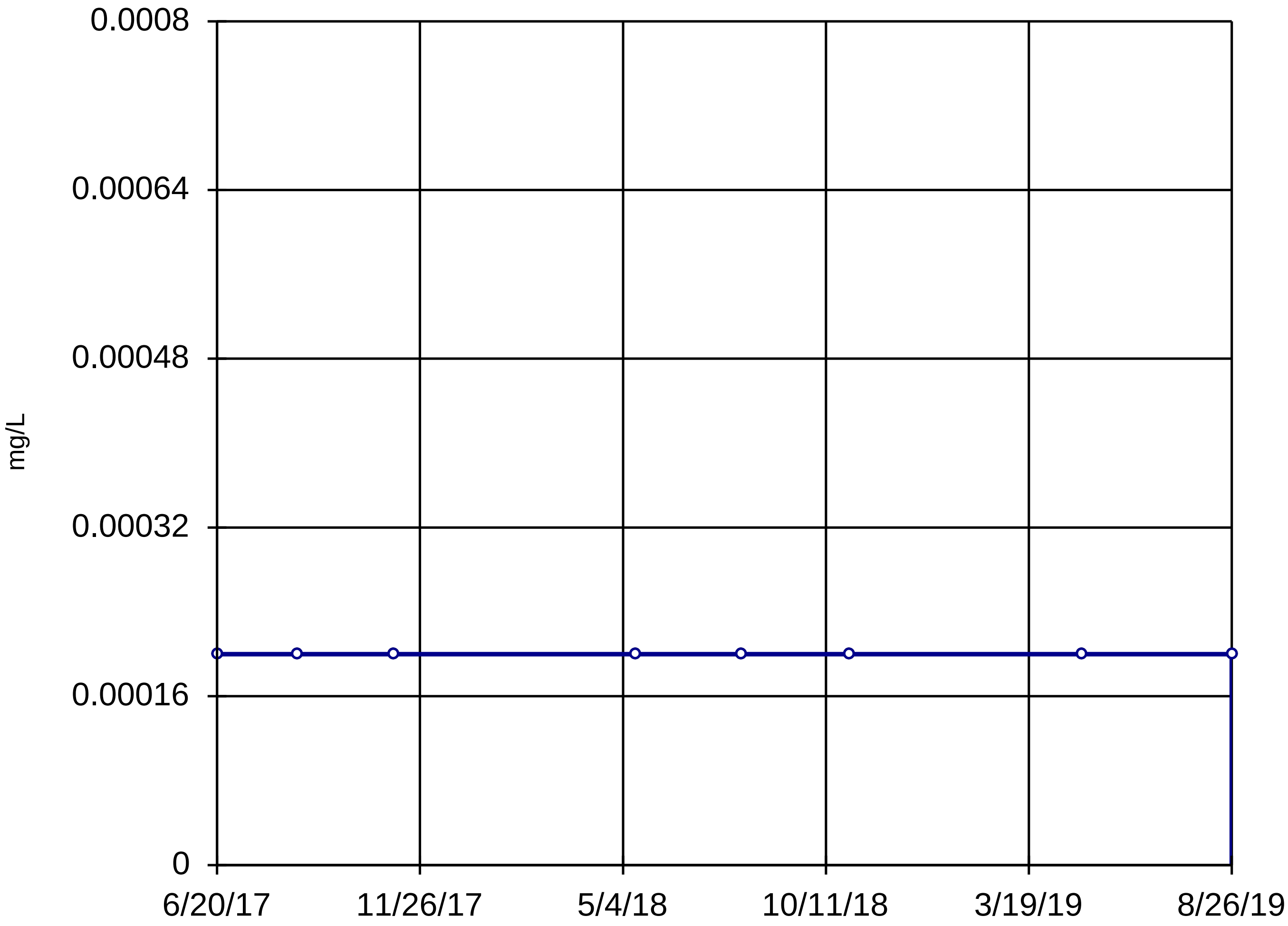
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81821

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-03




n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 21

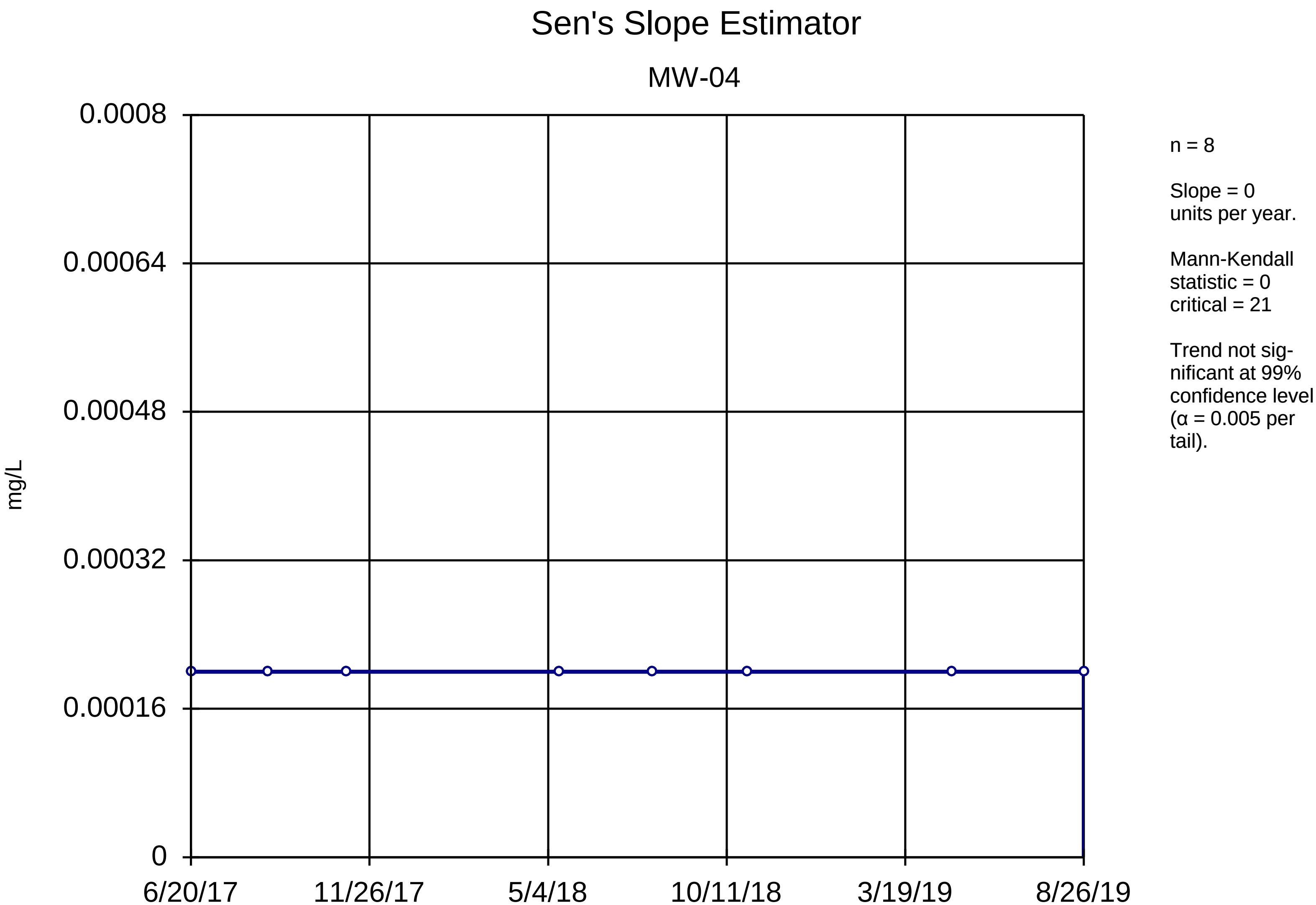
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Mercury, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81822

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

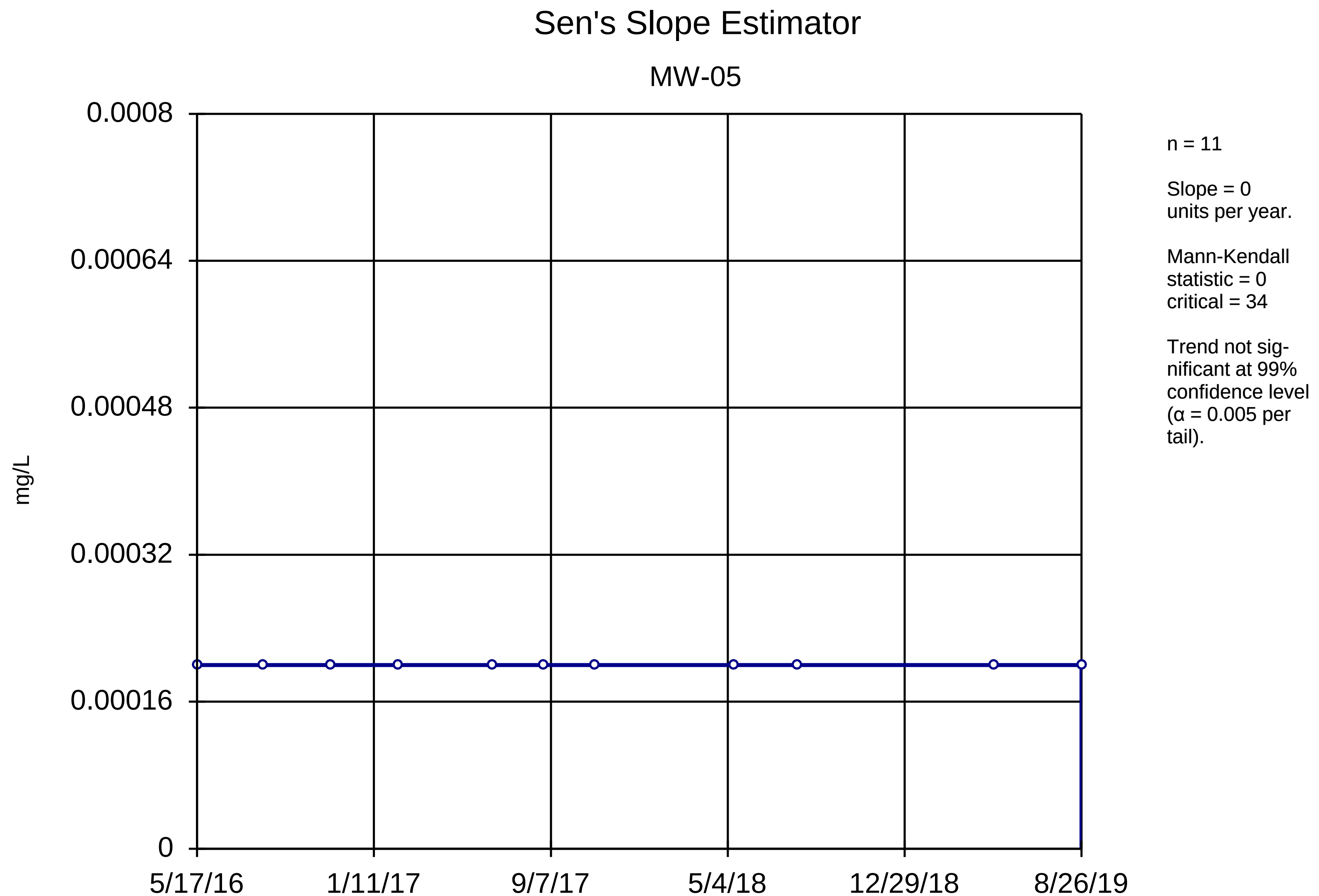



Constituent: Mercury, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81823

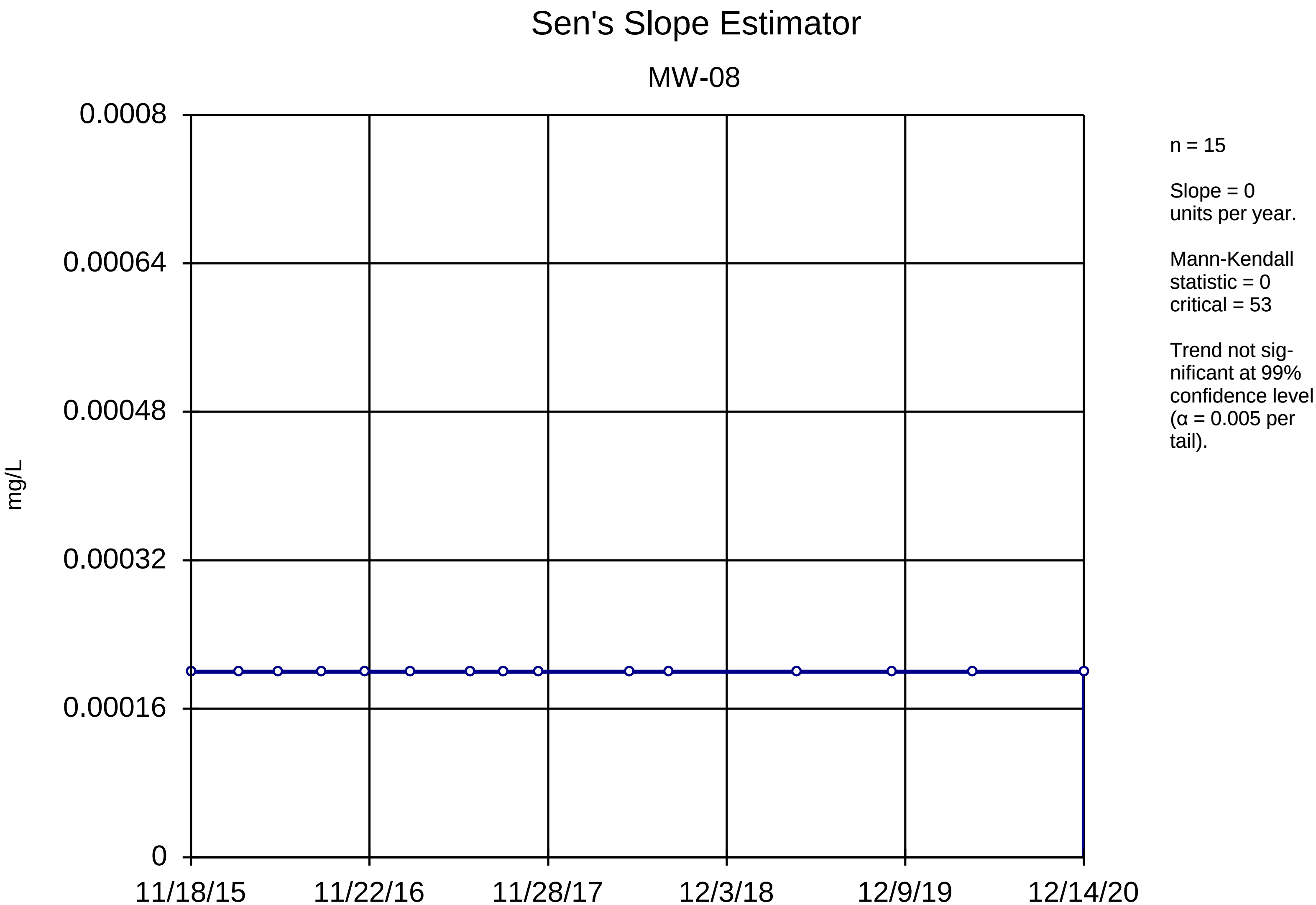
Hollow symbols indicate censored values.




Constituent: Mercury, Total Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

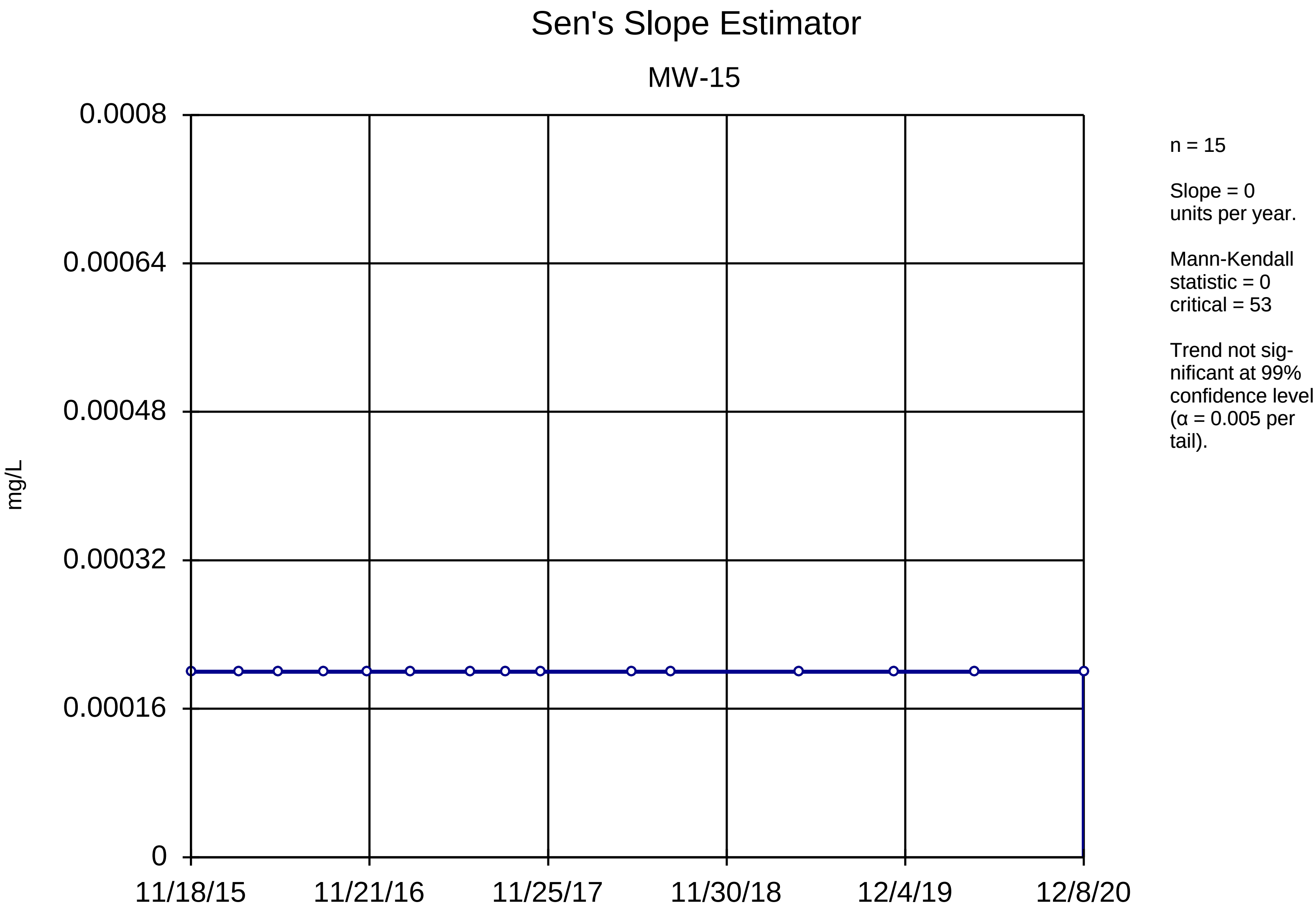
Hollow symbols indicate censored values.




Constituent: Mercury, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

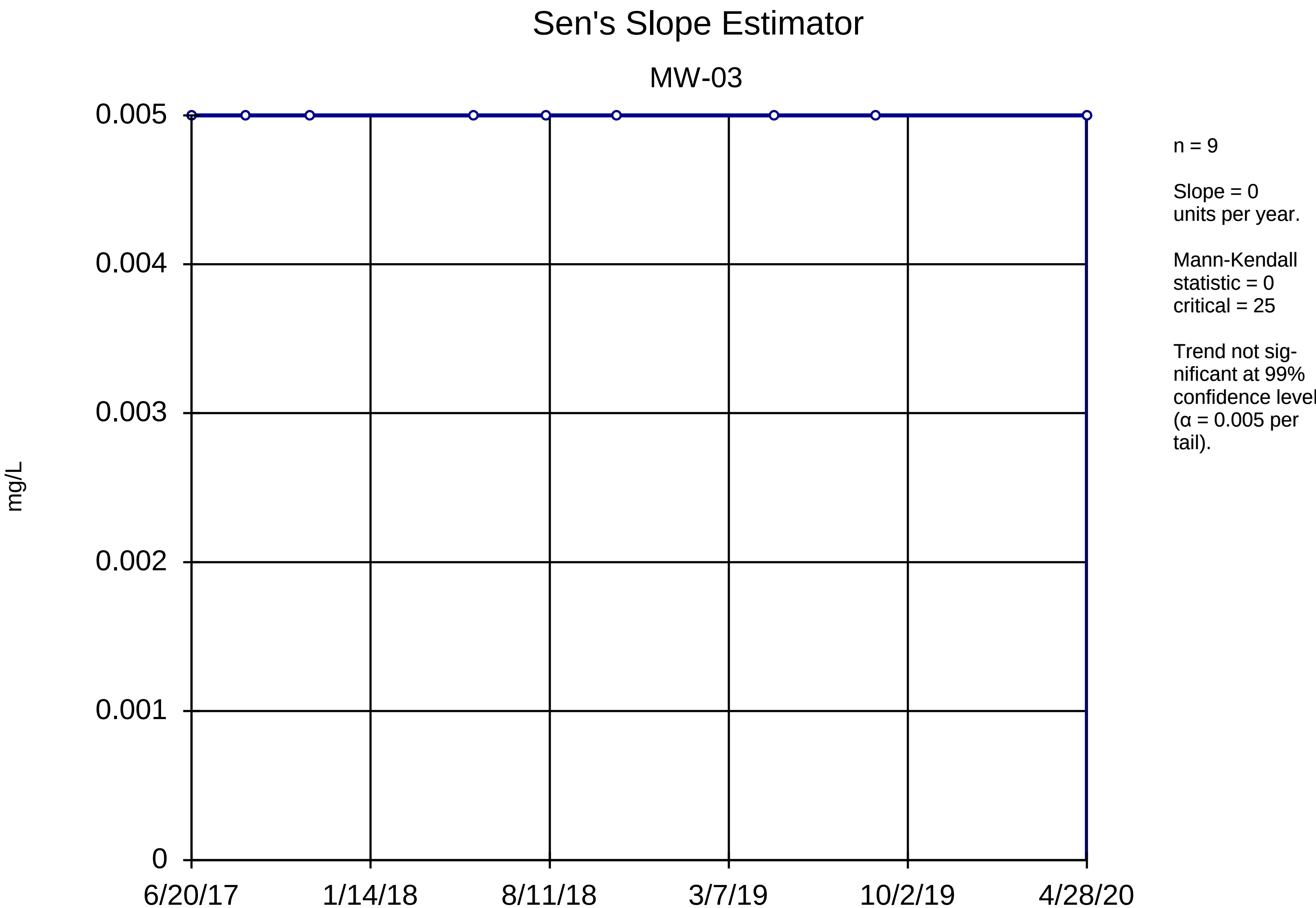
Hollow symbols indicate censored values.




Constituent: Mercury, Total Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

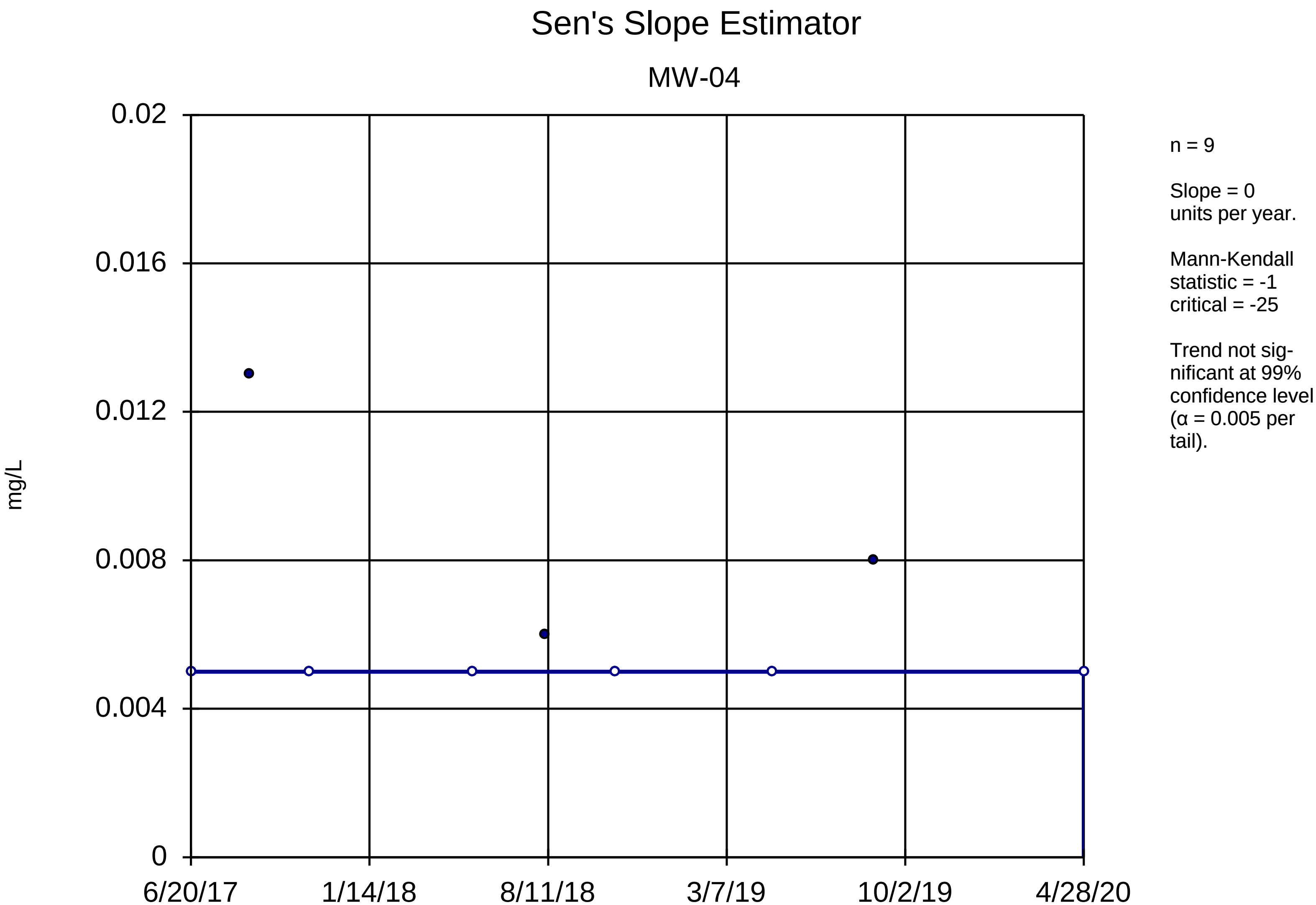
Hollow symbols indicate censored values.




Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.



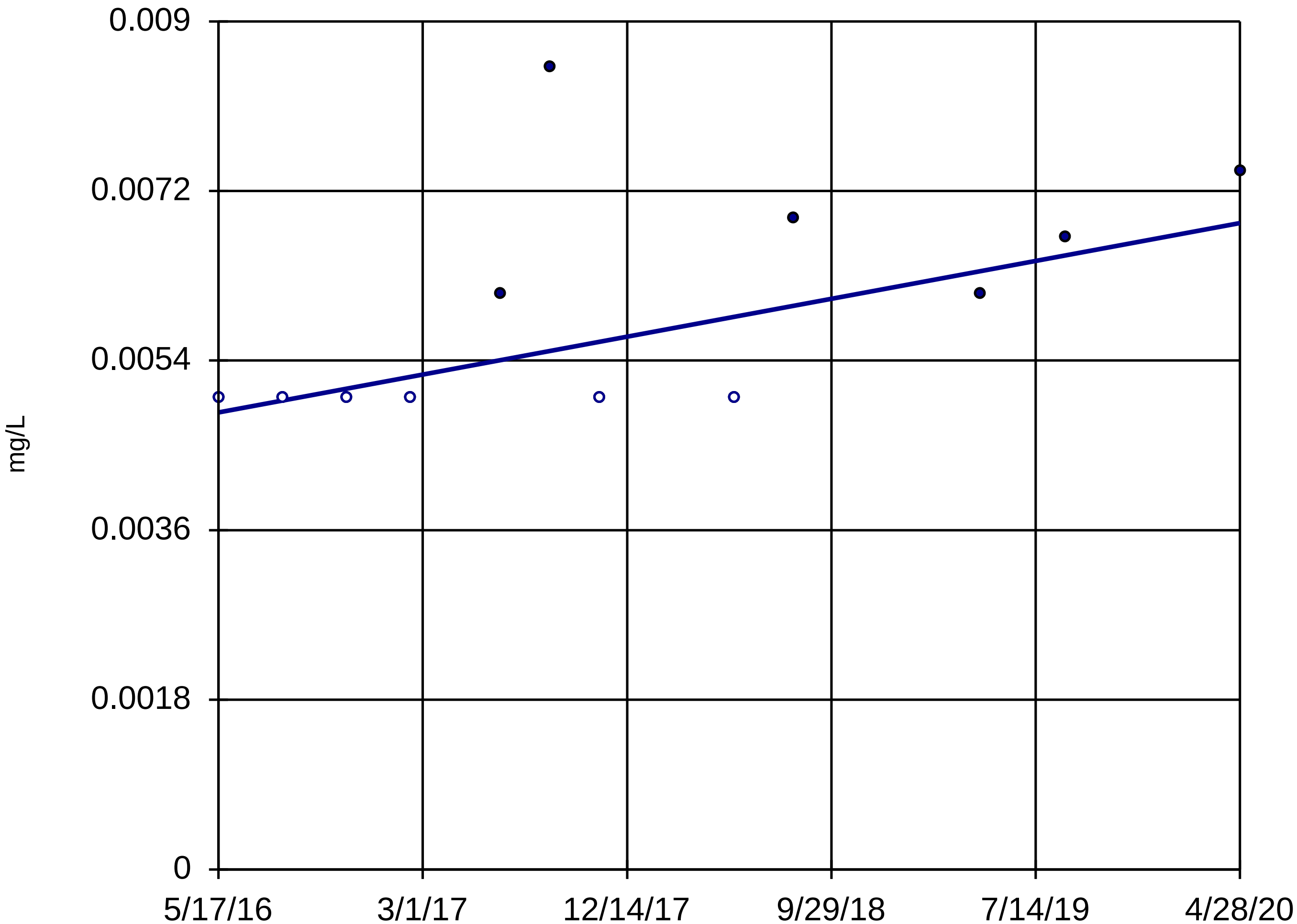

Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-05




n = 12

Slope = 0.0005088 units per year.

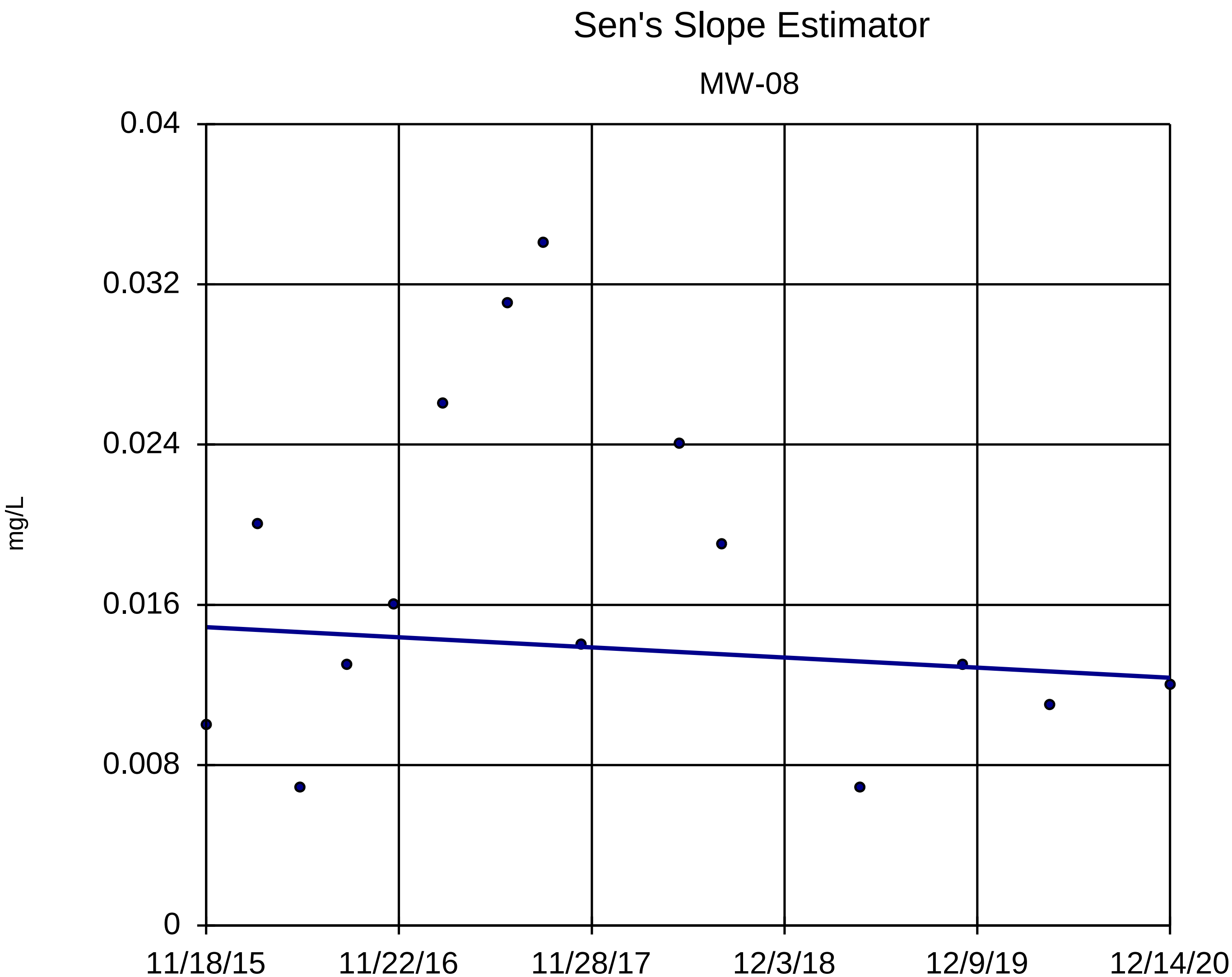
Mann-Kendall statistic = 30 critical = 38

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81829




n = 15

Slope = -0.0004966 units per year.

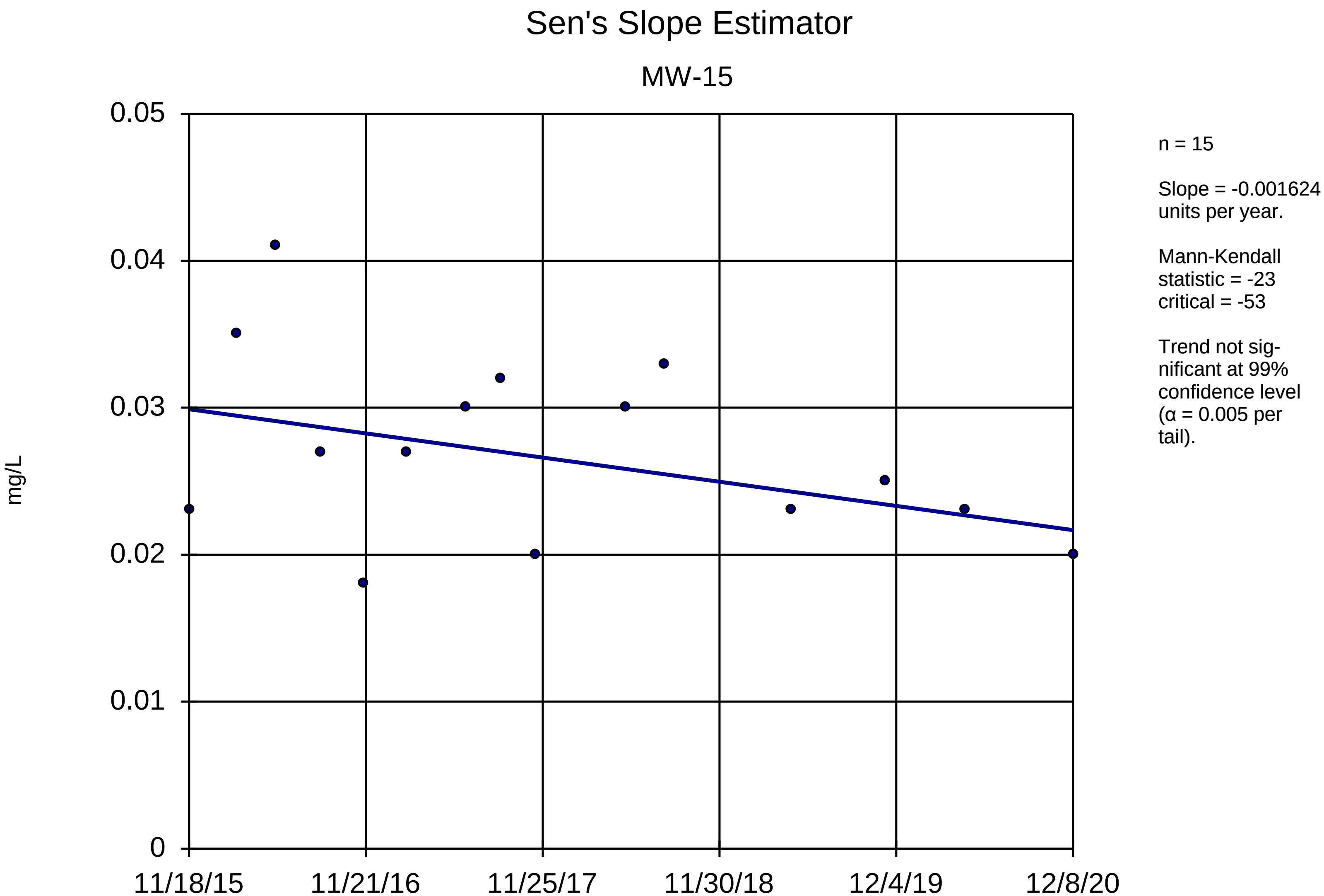
Mann-Kendall statistic = -7 critical = -53

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81830



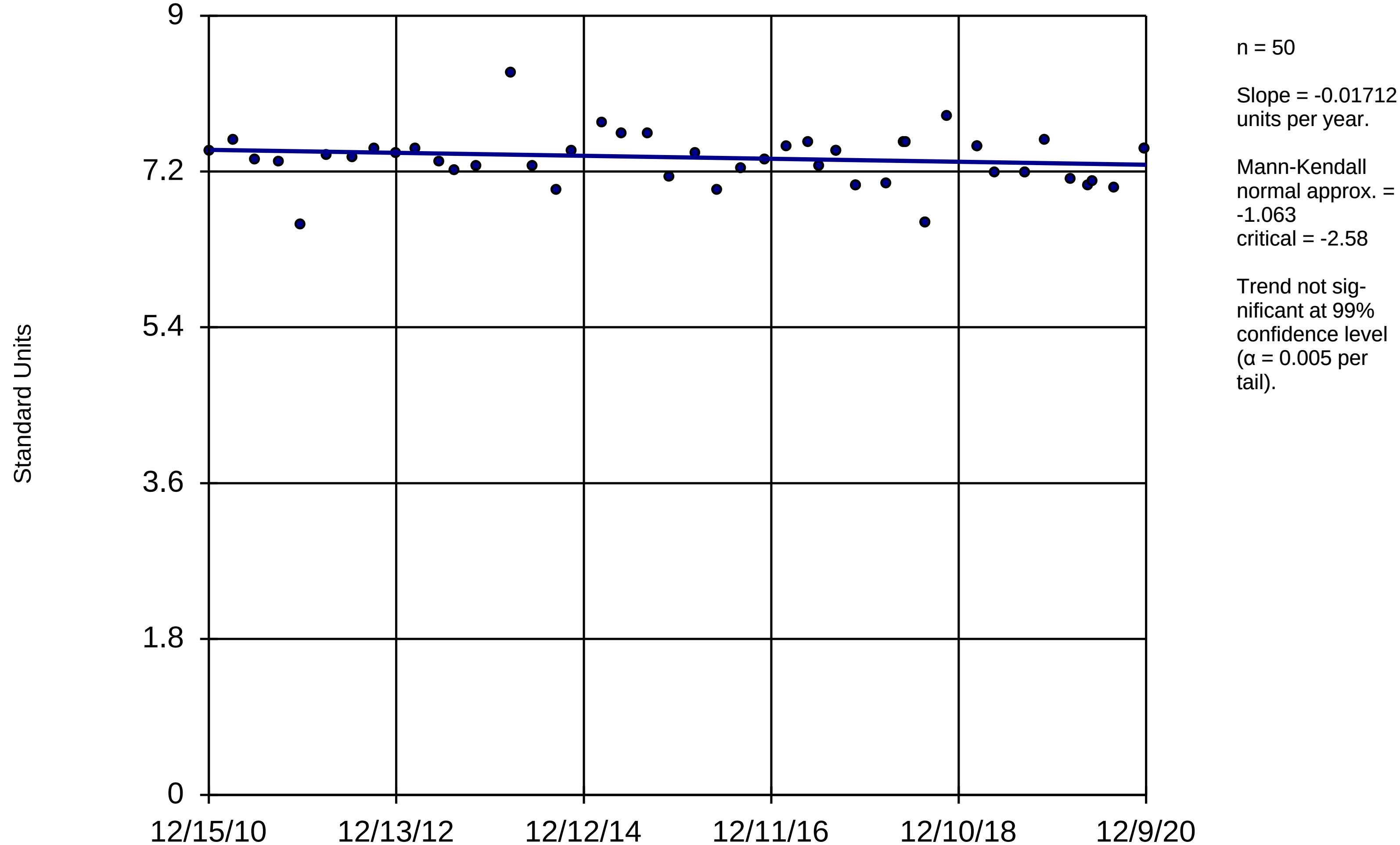

Constituent: Molybdenum, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81831

## Sen's Slope Estimator

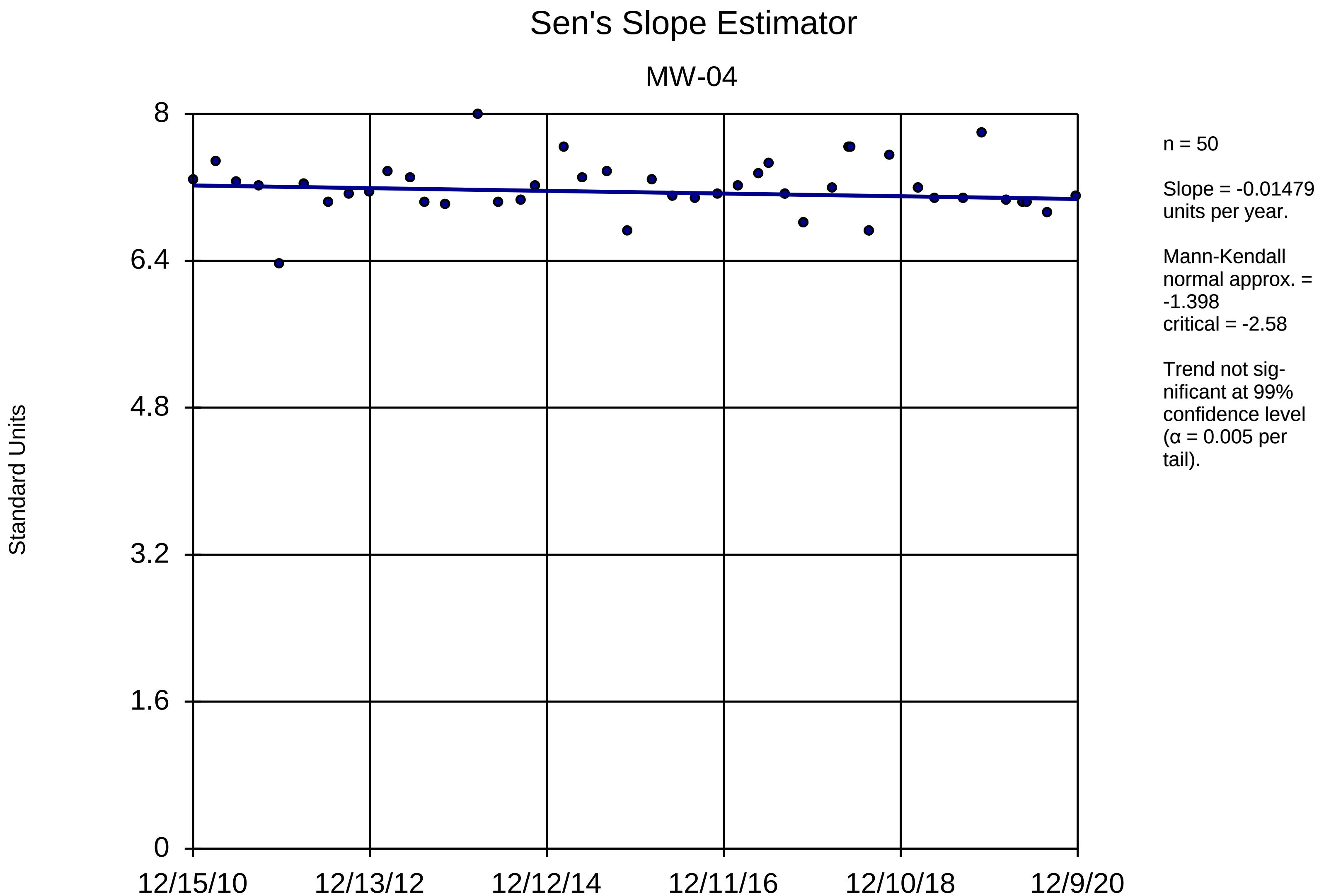
MW-03




Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

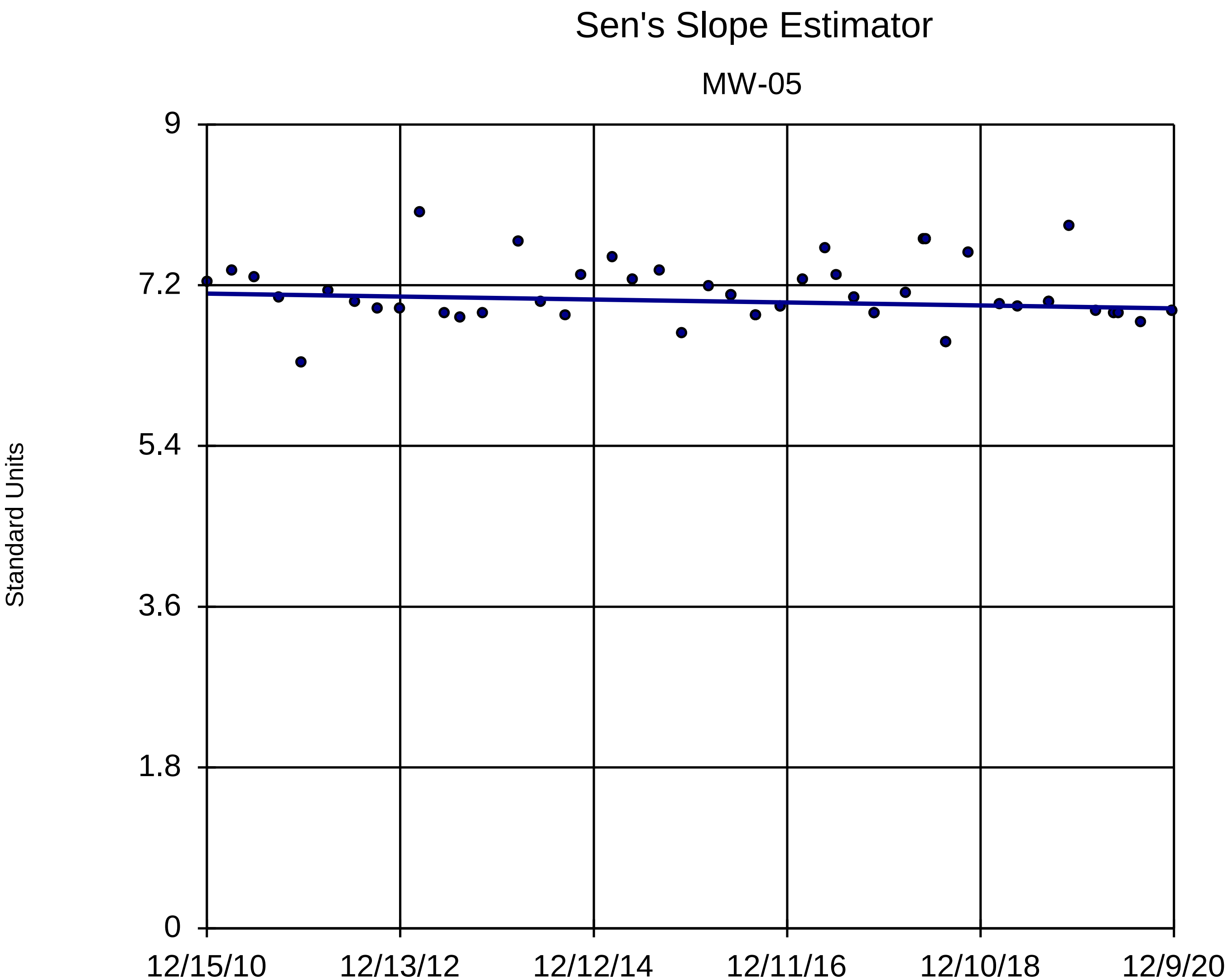
MWG13-15_81832




Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81833




n = 52

Slope = -0.01654 units per year.

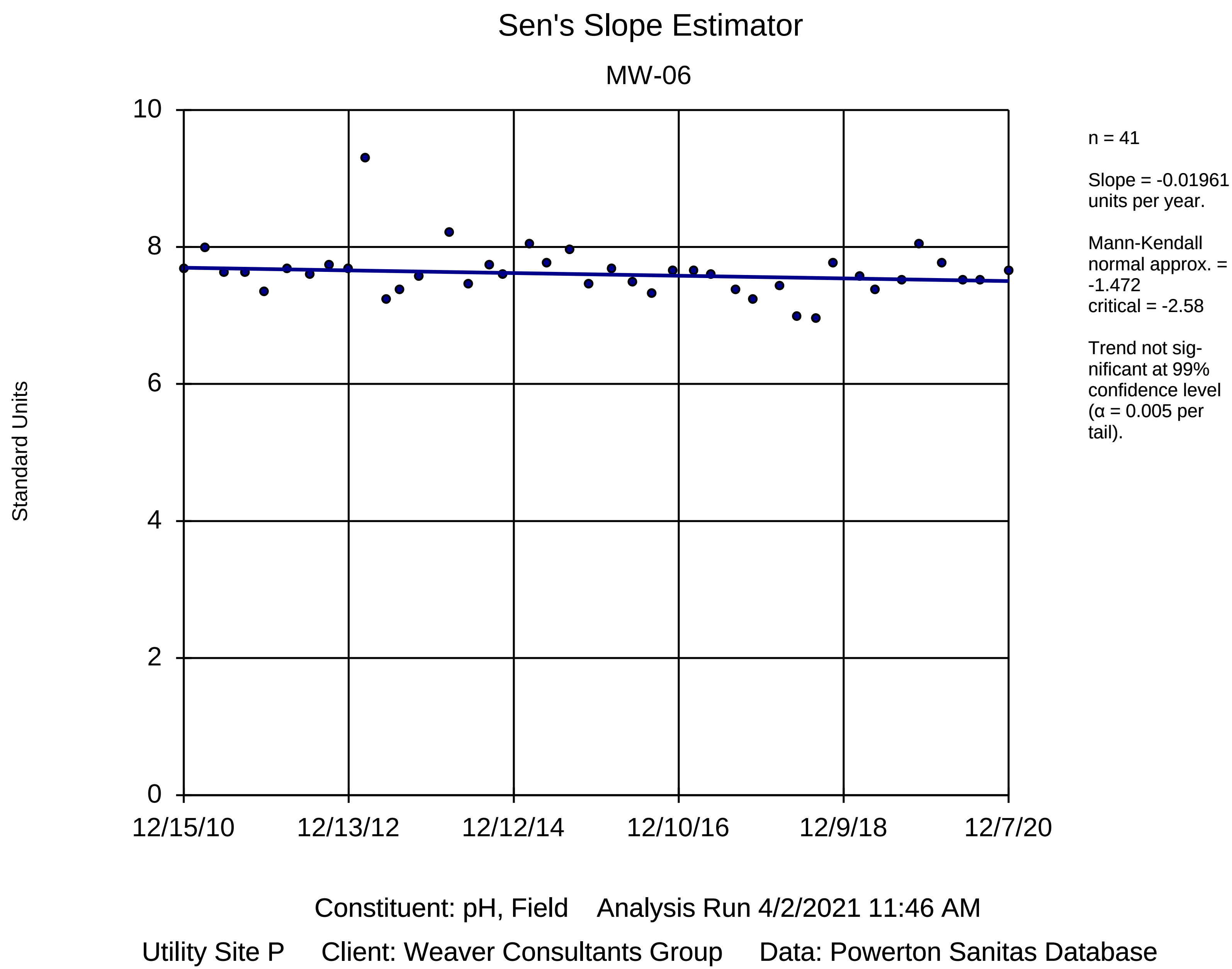
Mann-Kendall normal approx. = -1.217
critical = -2.58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81834




MWG13-15_81835

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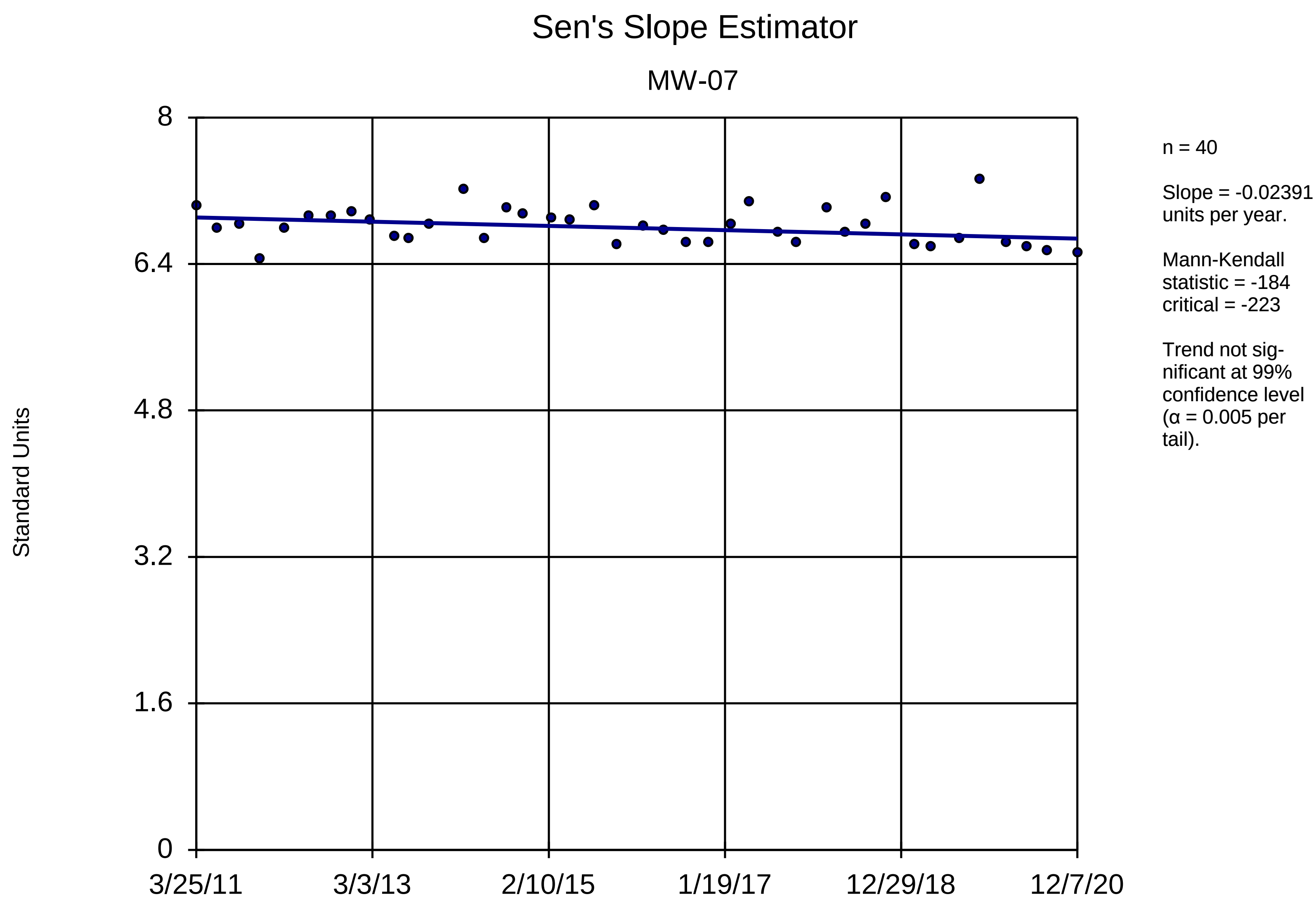
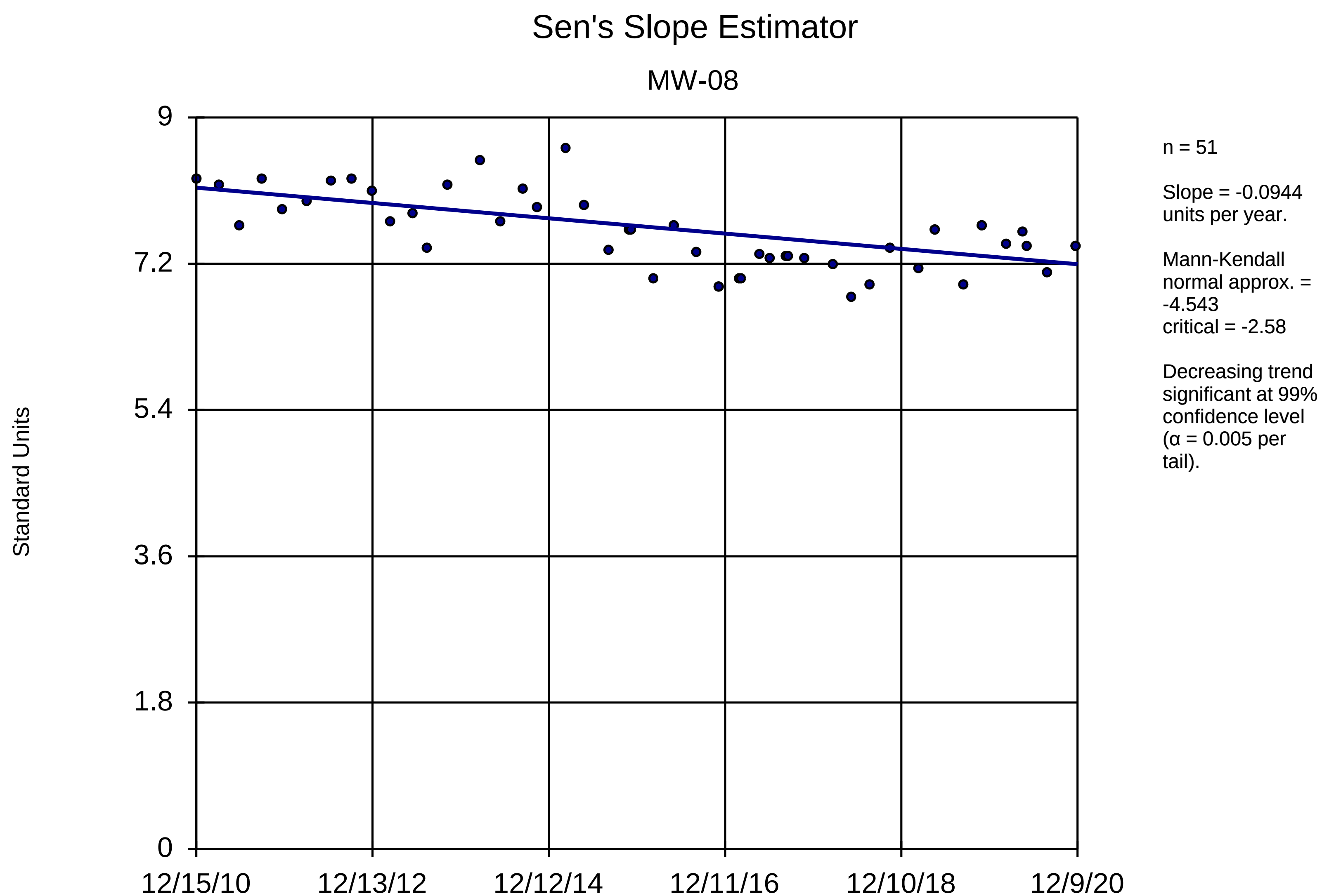


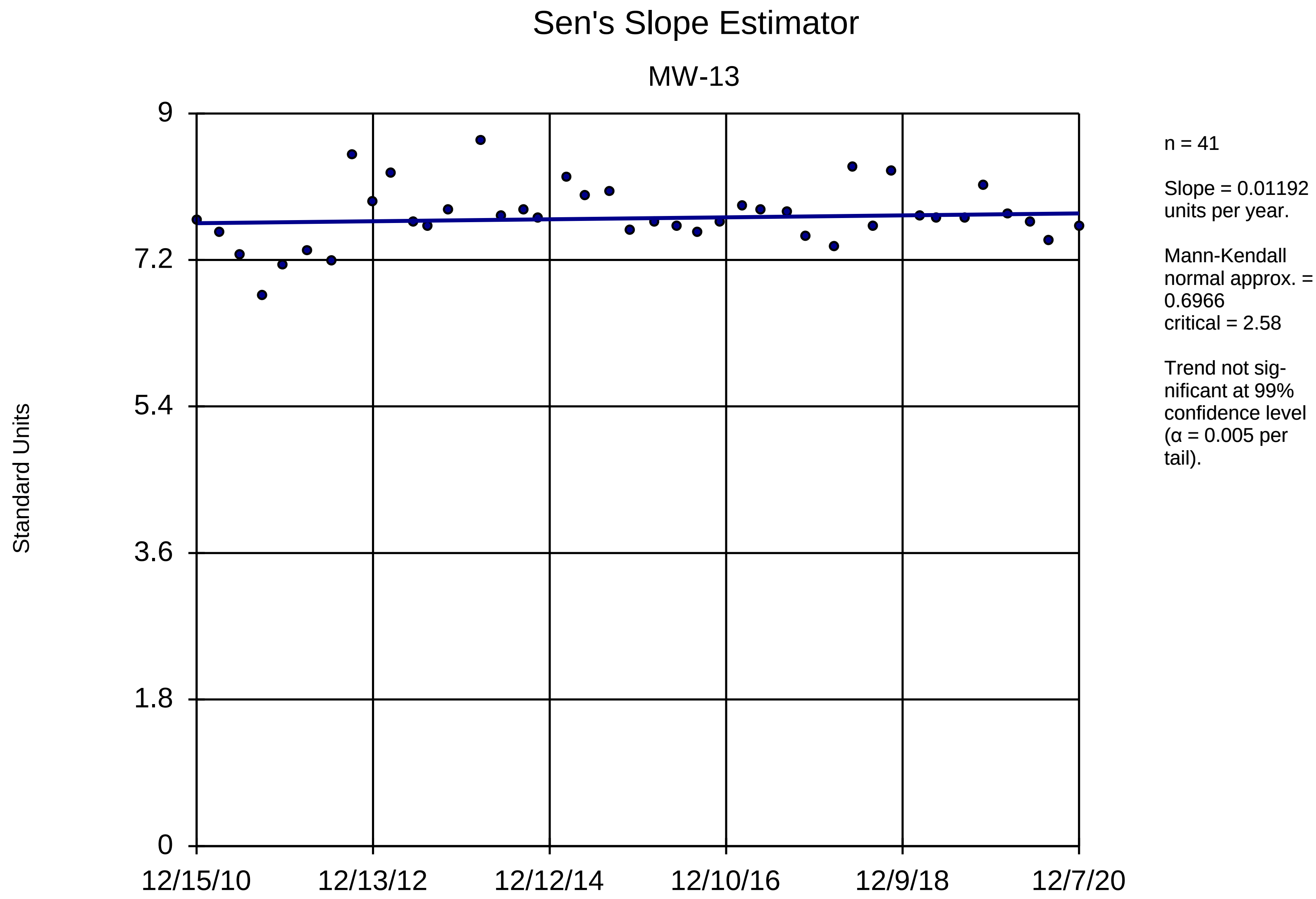

Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

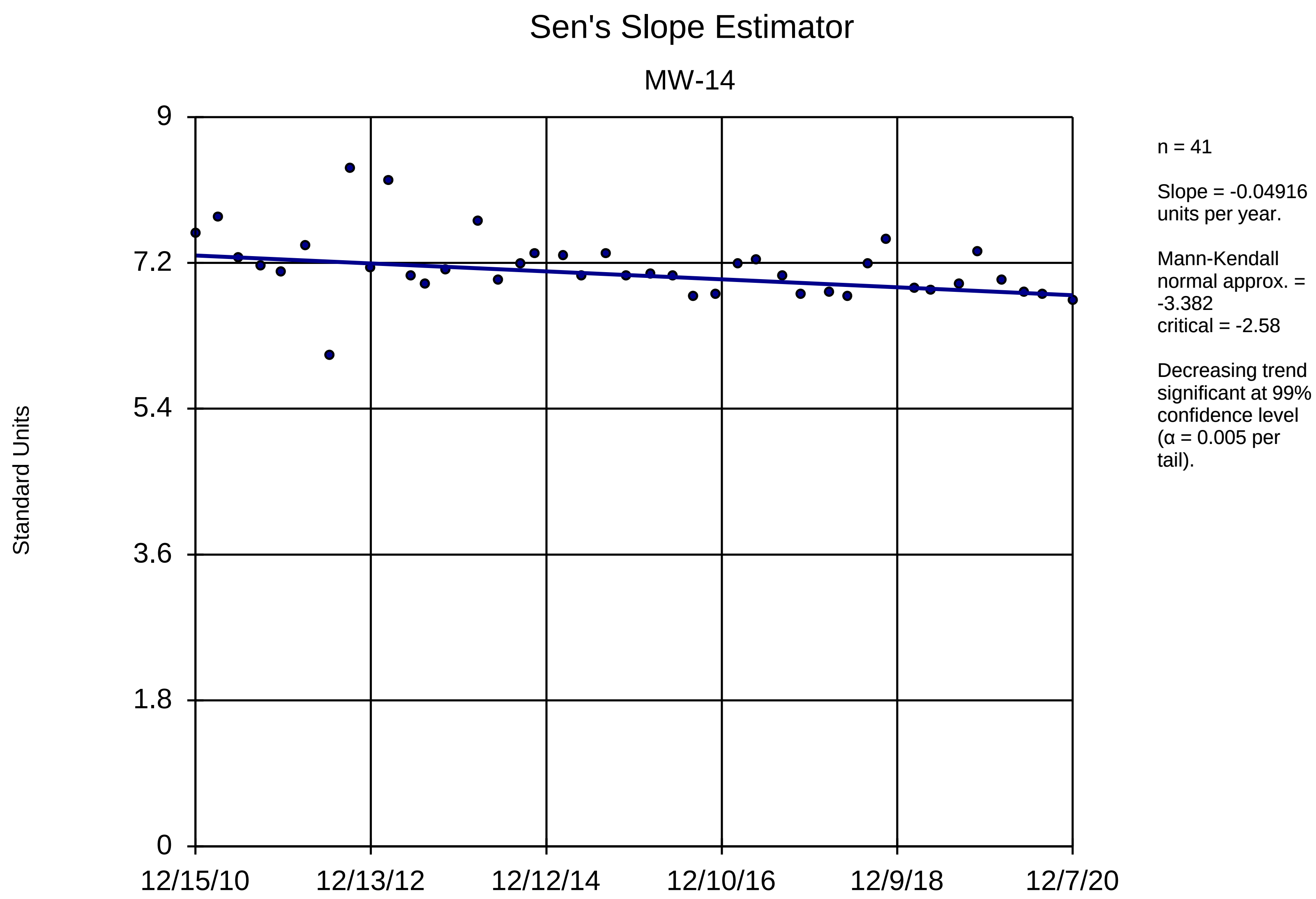
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81838

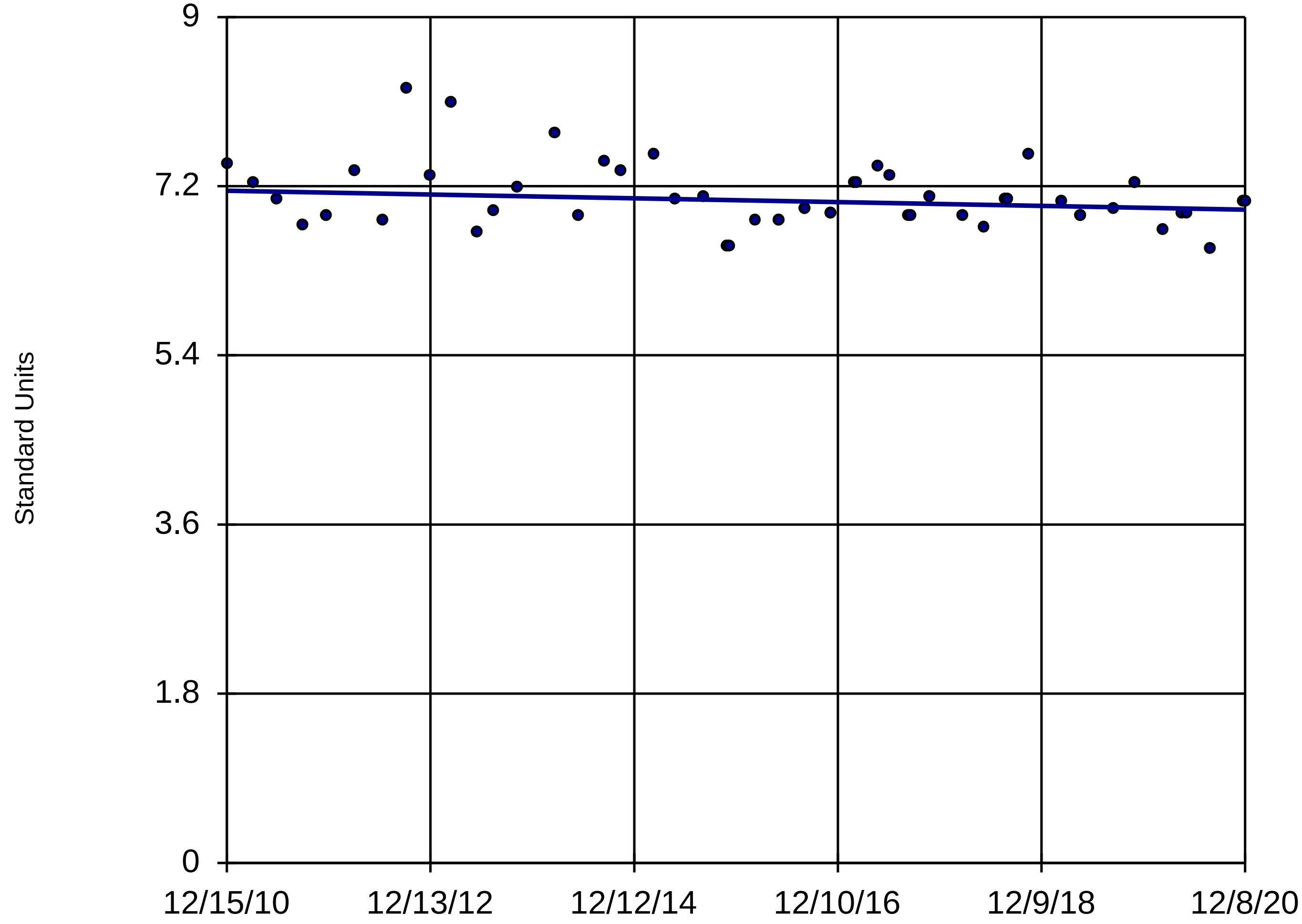



Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

# Sen's Slope Estimator

MW-15




n = 54

Slope = -0.01994 units per year.

Mann-Kendall normal approx. = -1.456 critical = -2.58

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: pH, Field    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81840

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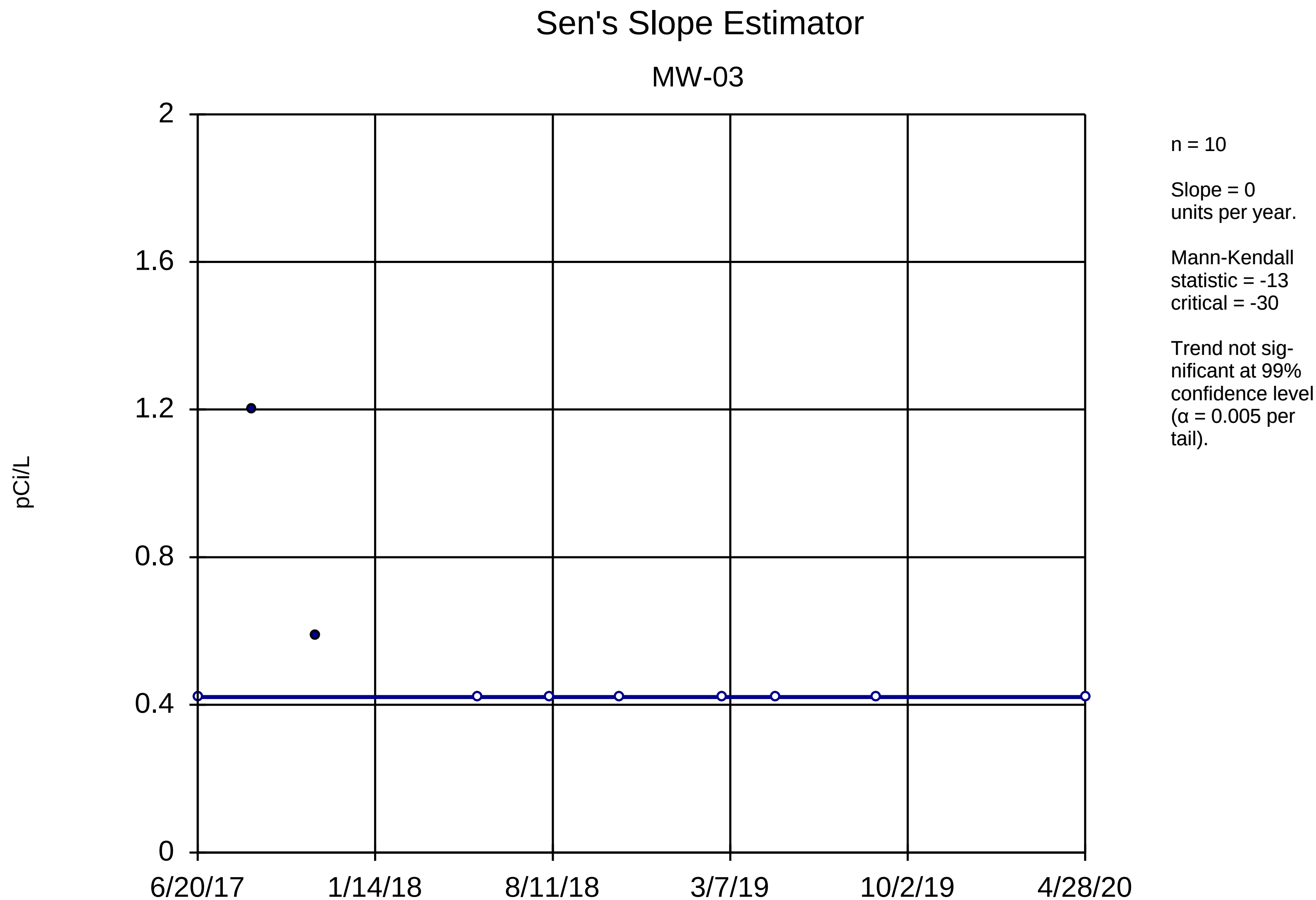
Hollow symbols indicate censored values.




Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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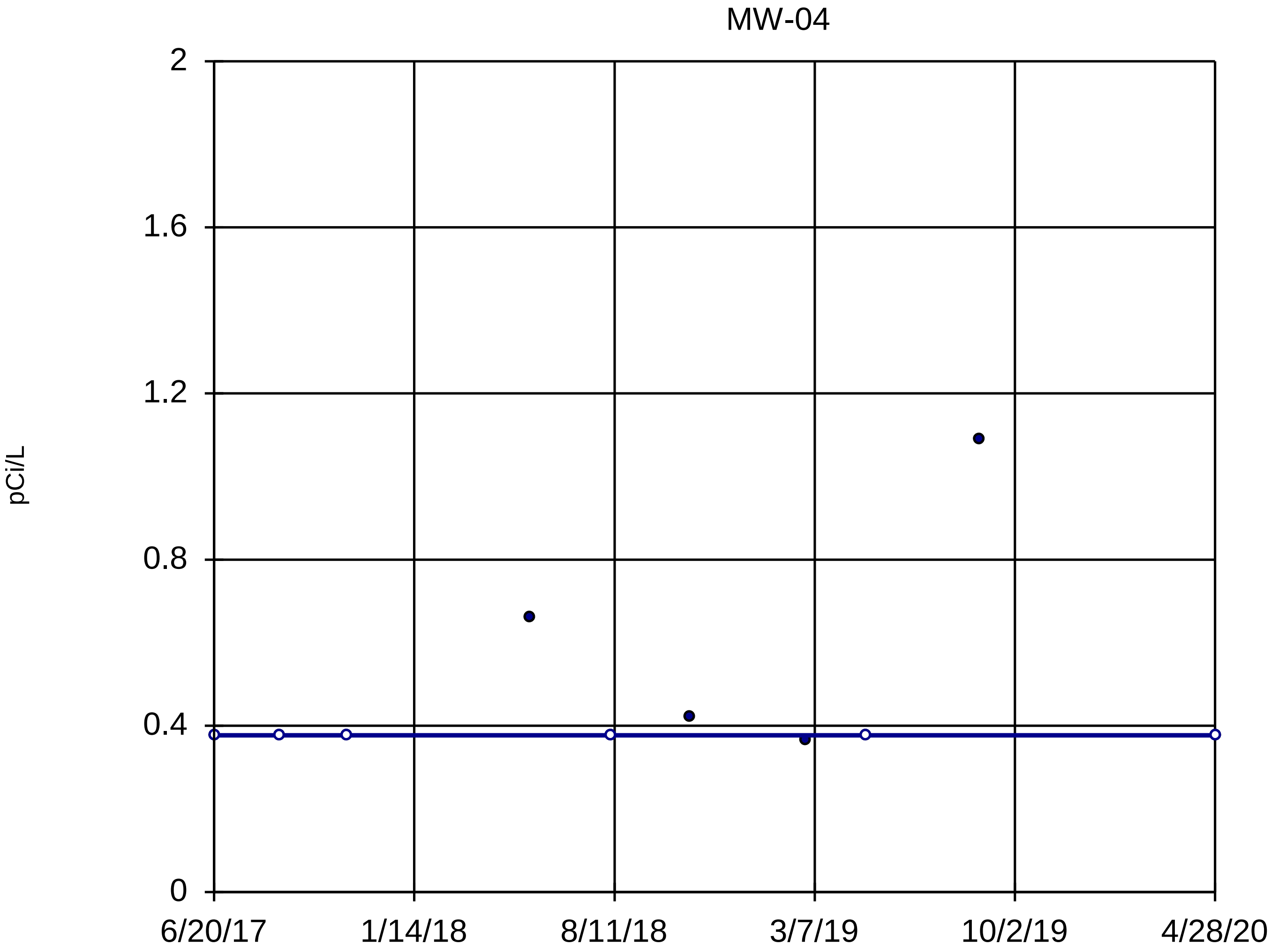
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 4
critical = 30

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

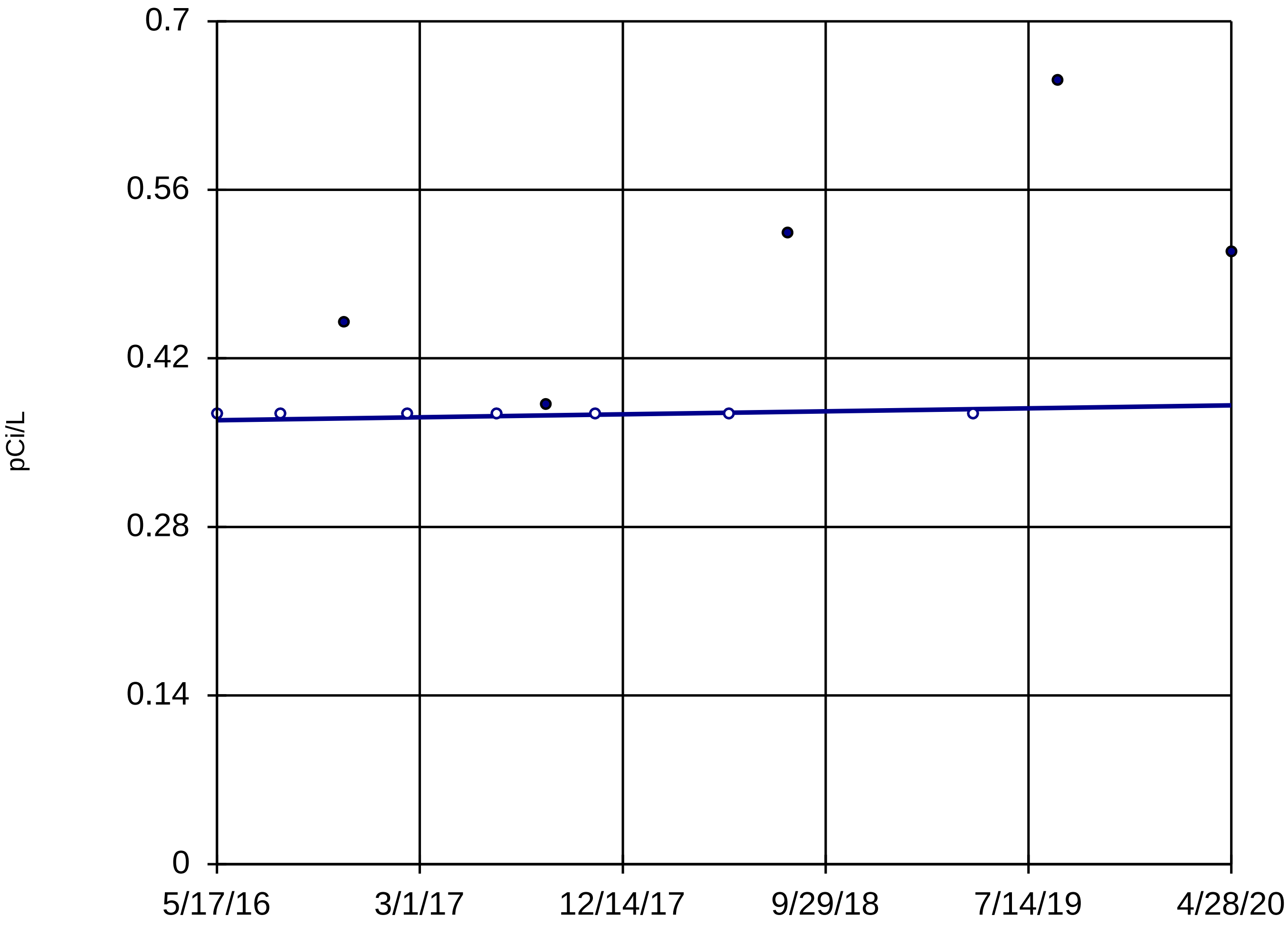
Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-05




n = 12

Slope = 0.00312
units per year.

Mann-Kendall
statistic = 21
critical = 38

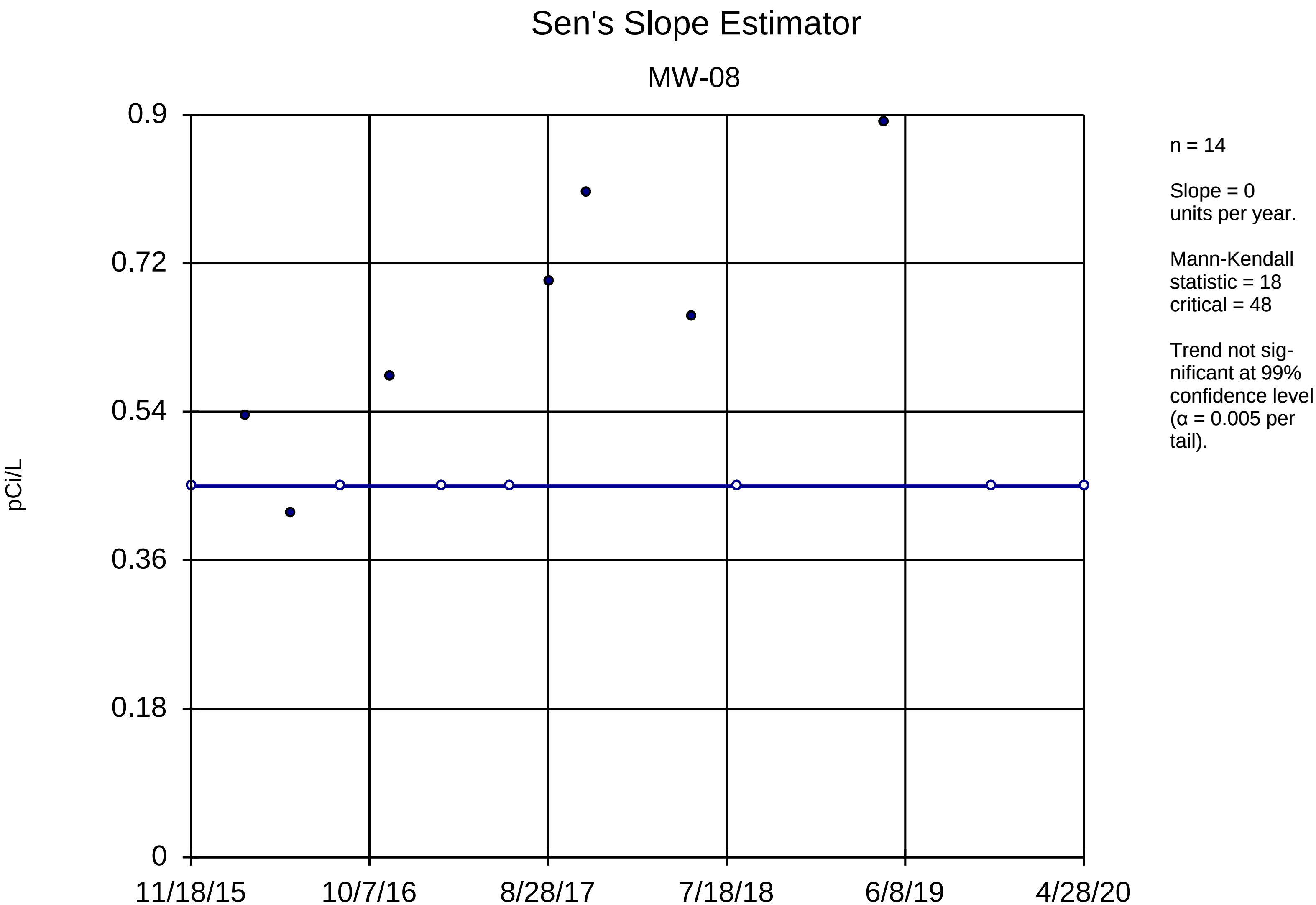
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81843

Hollow symbols indicate censored values.

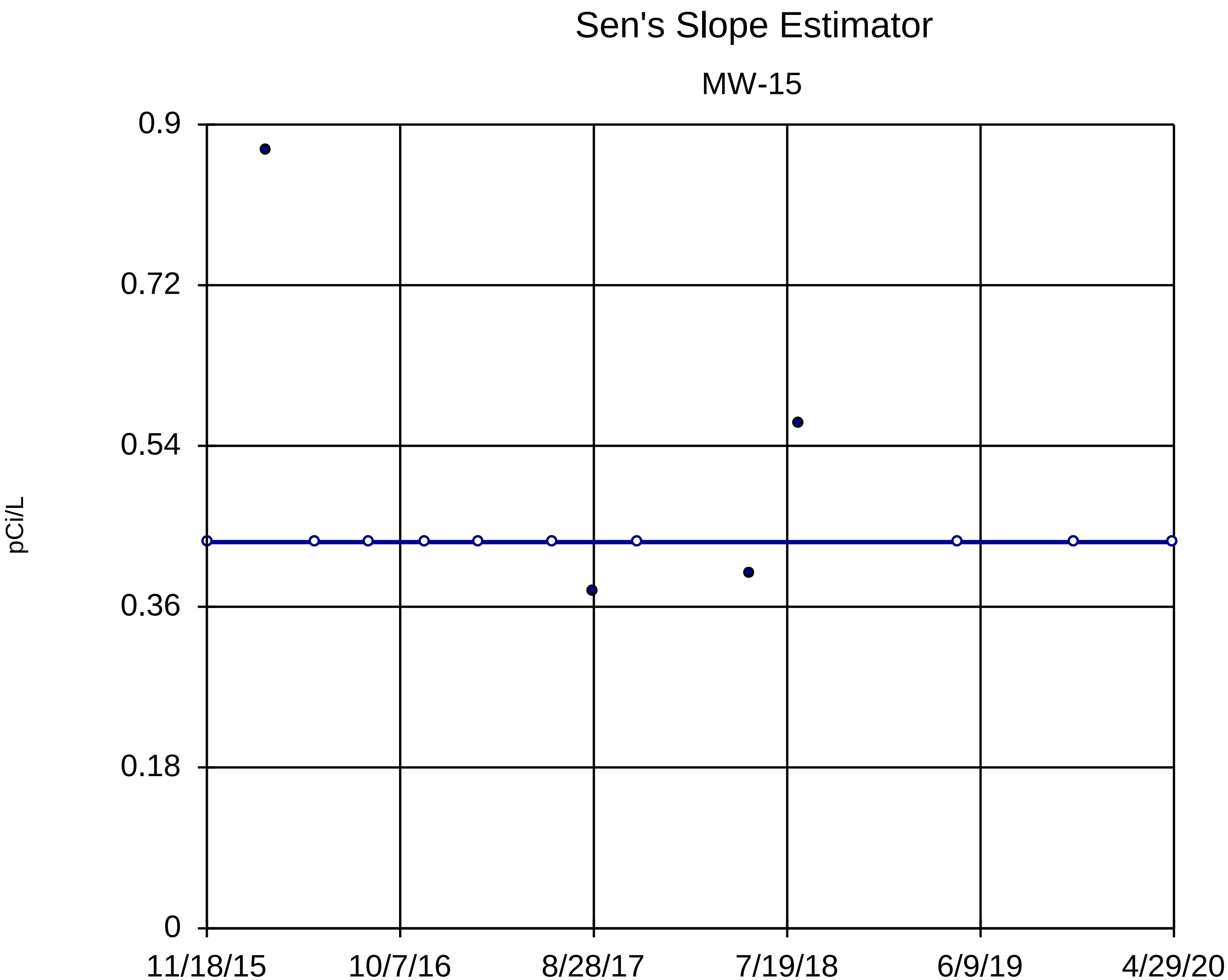



Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81844

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 14

Slope = 0
units per year.

Mann-Kendall
statistic = -10
critical = -48

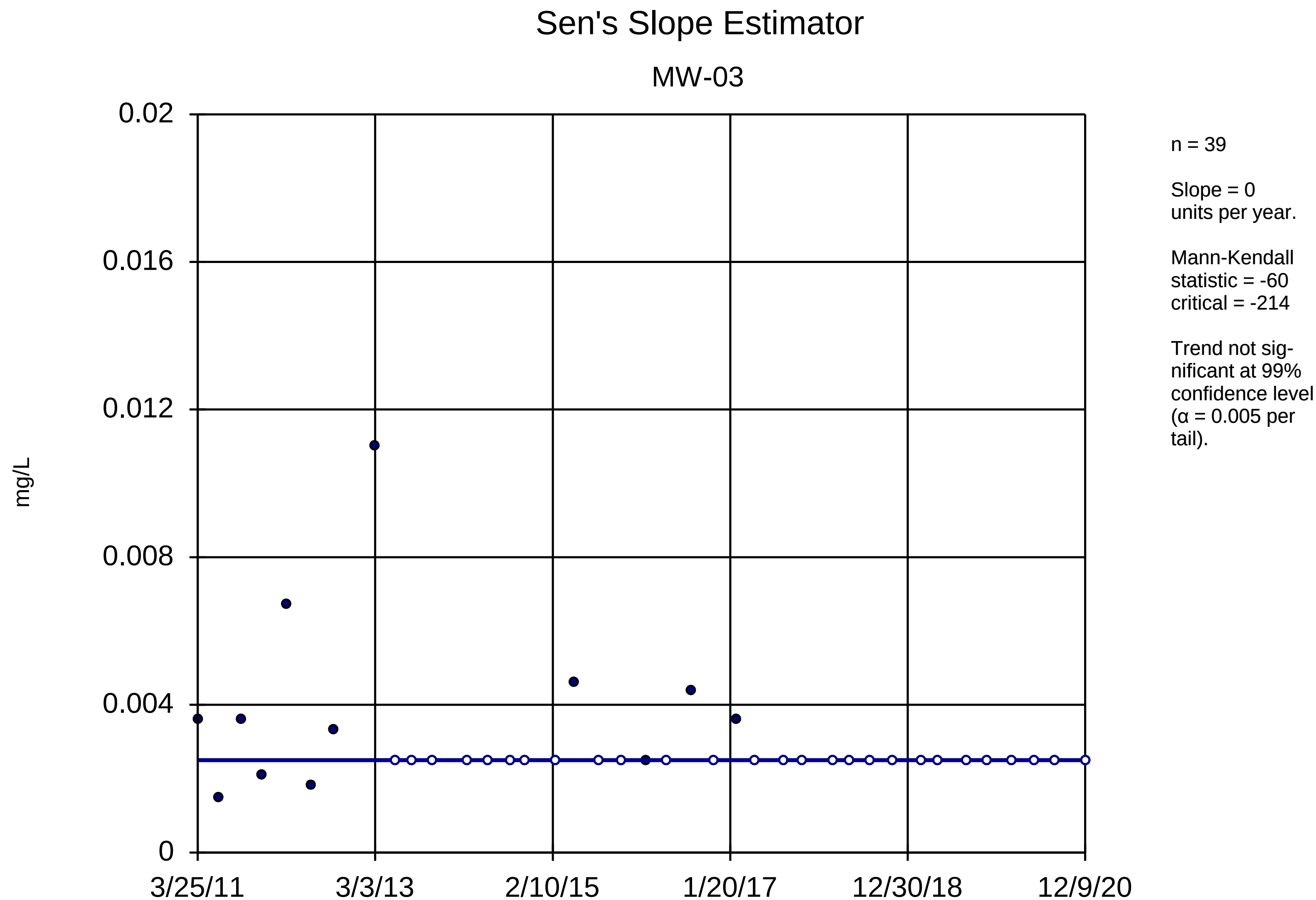
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81845

Hollow symbols indicate censored values.




Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81846

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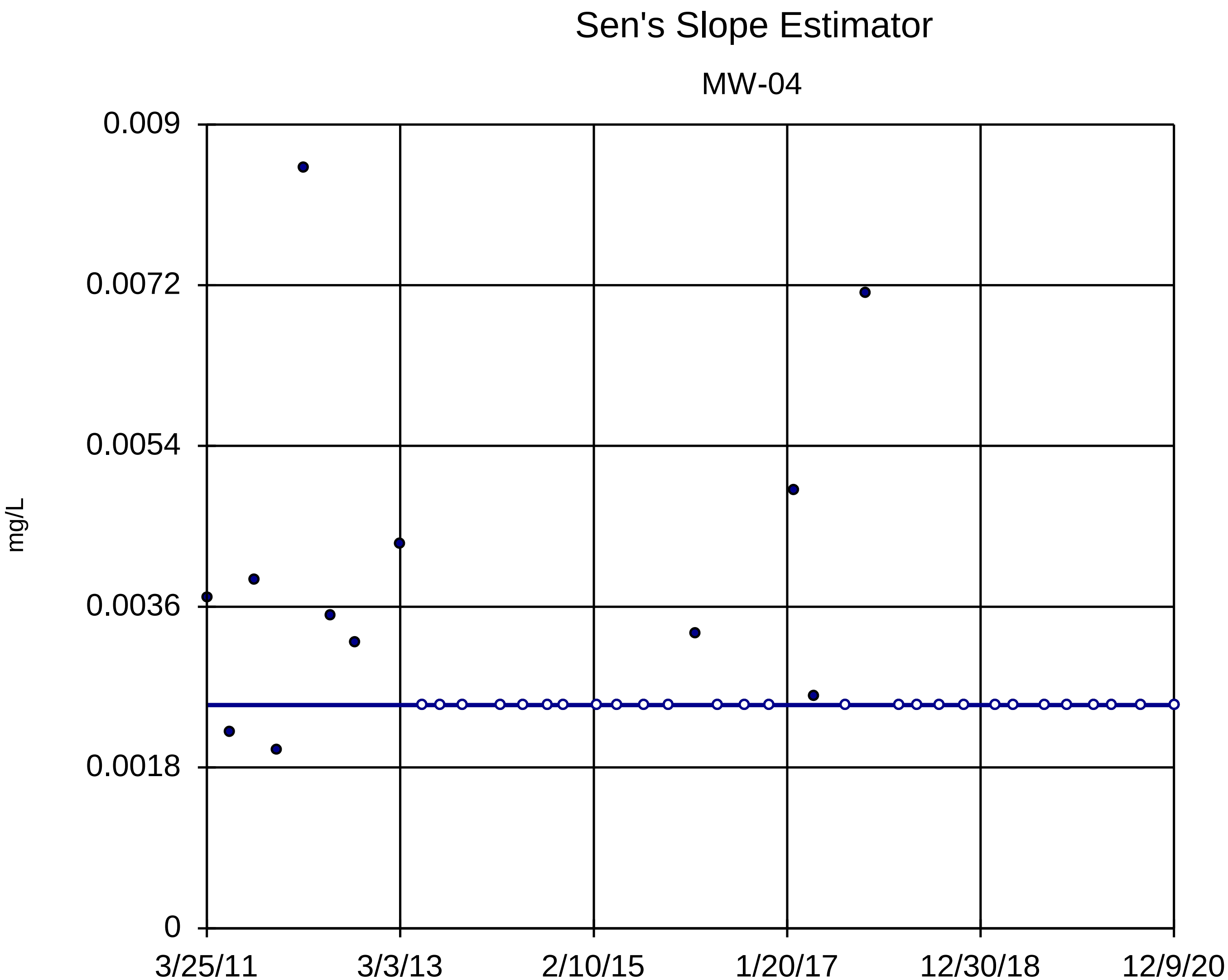
Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

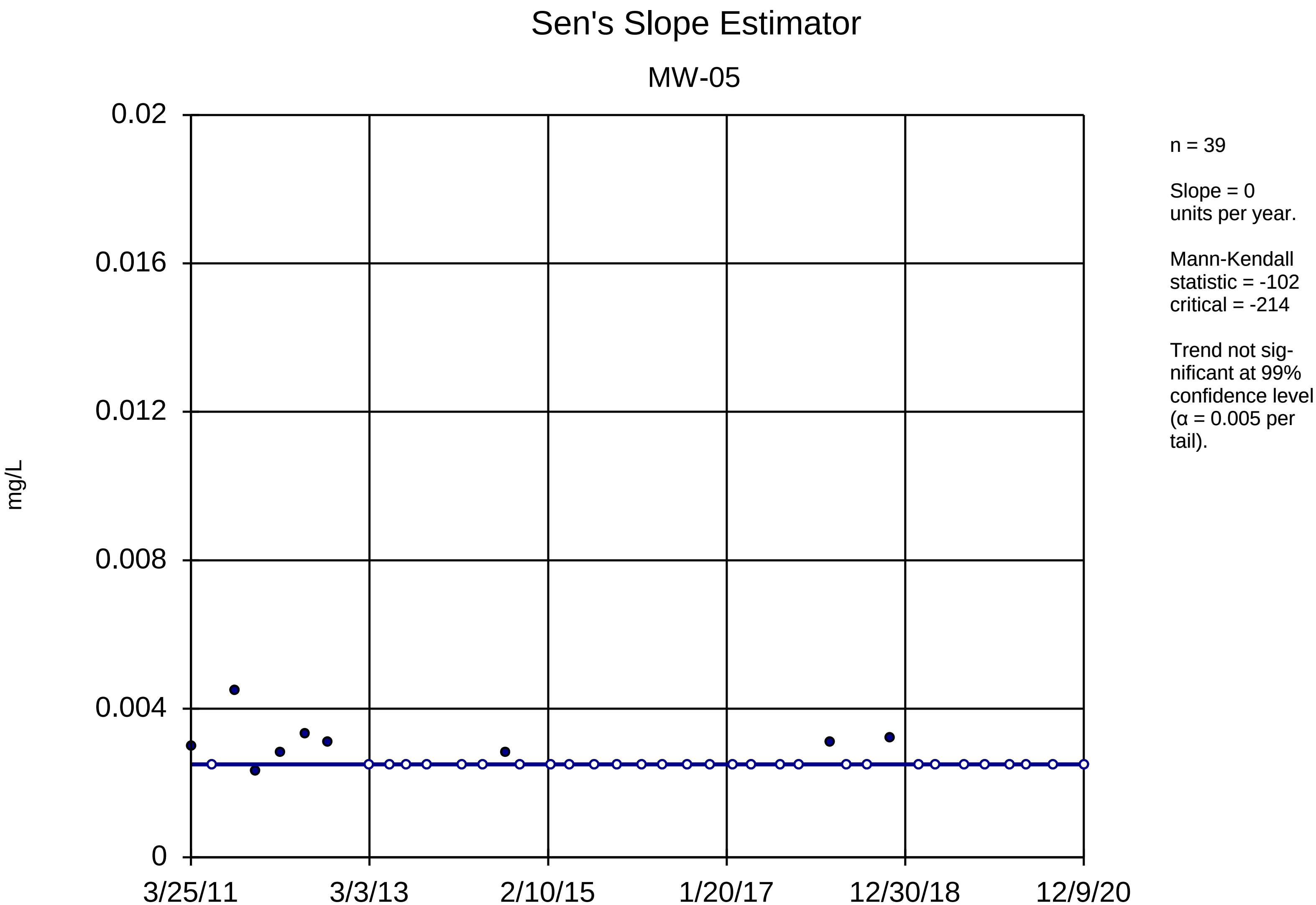
Mann-Kendall
statistic = -96
critical = -214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

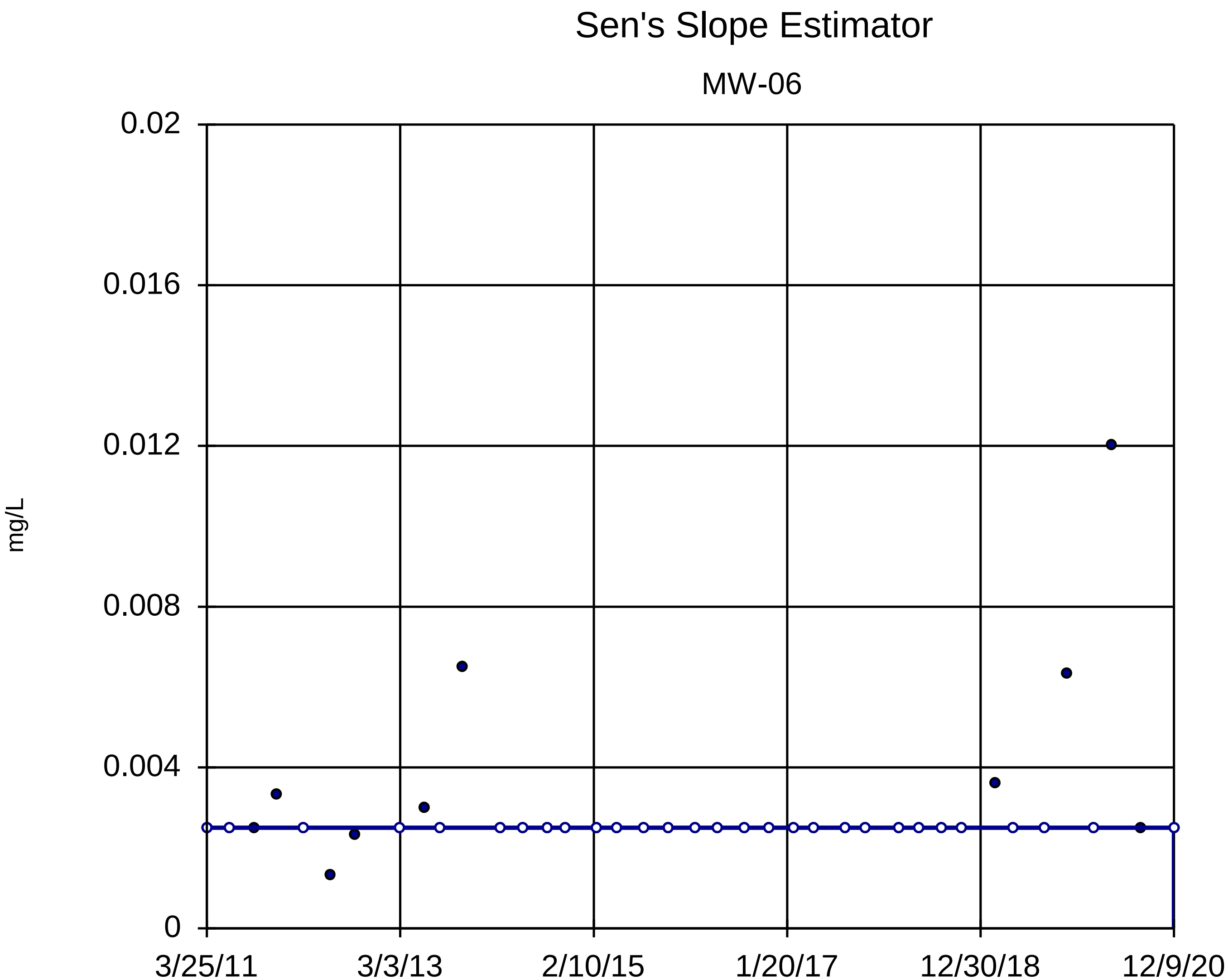



Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81848

Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 72
critical = 214

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Dissolved Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

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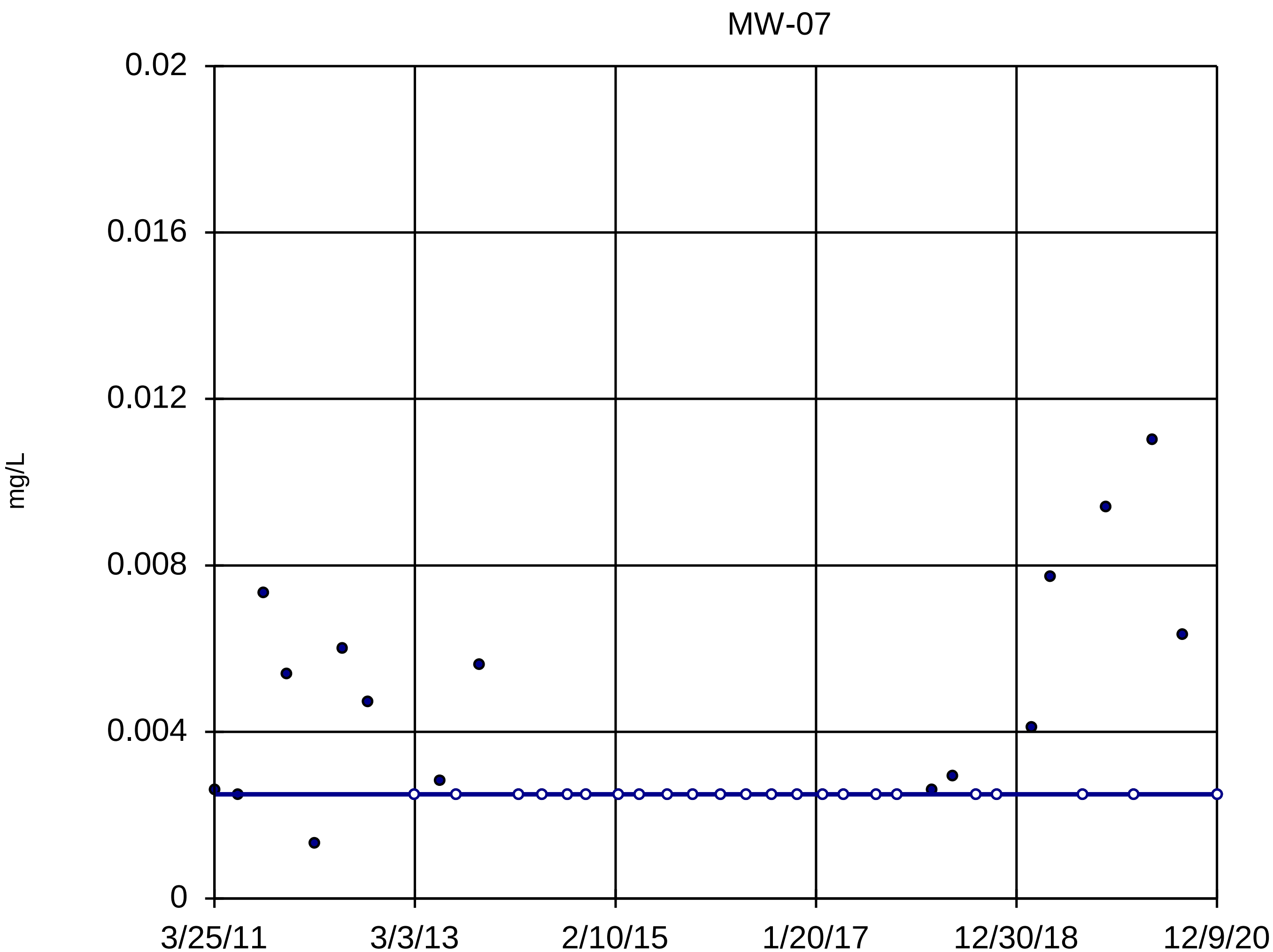
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 36
critical = 214

Trend not significant at 99%
confidence level
(α = 0.005 per
tail).

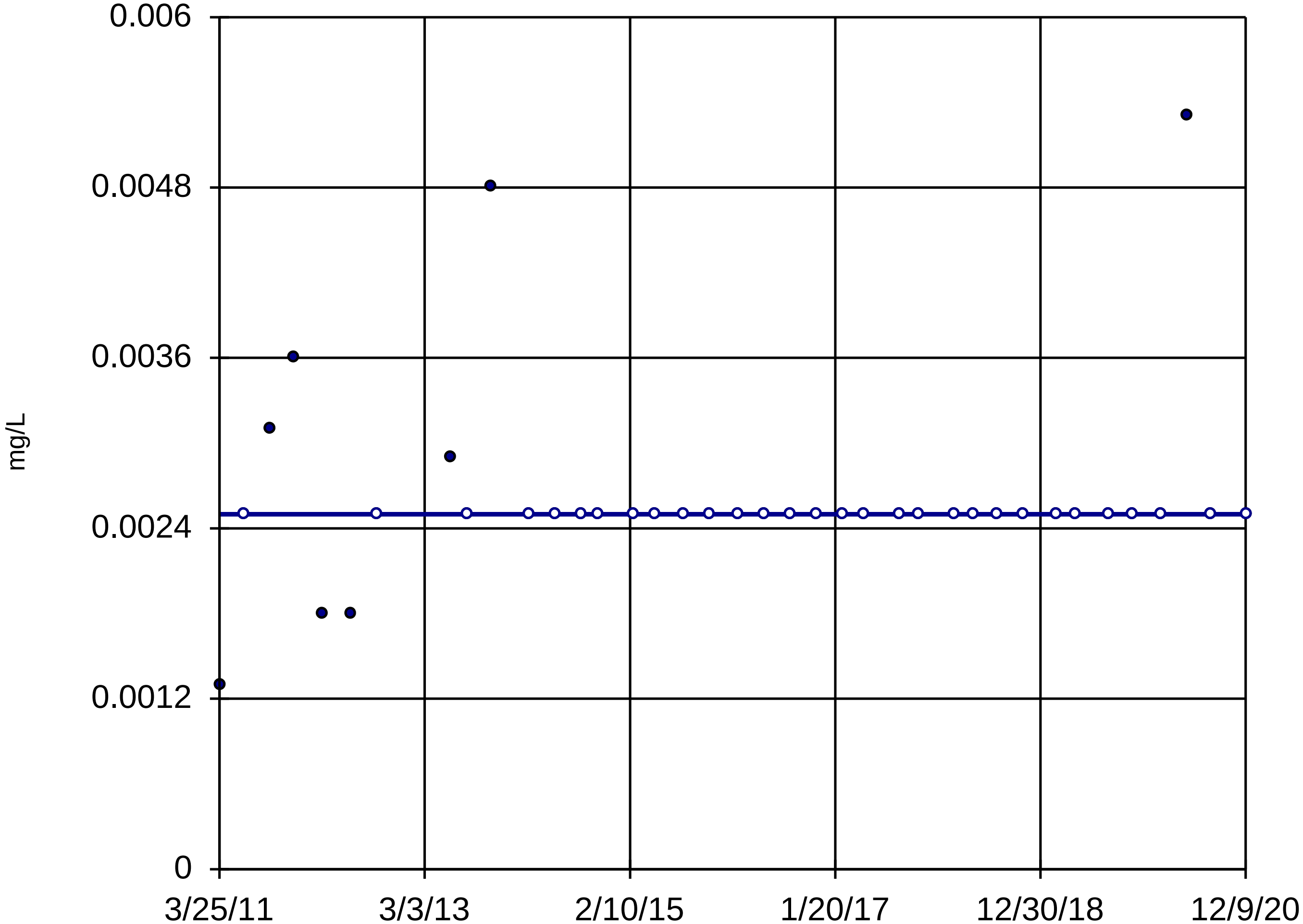
Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-08




n = 38

Slope = 0
units per year.

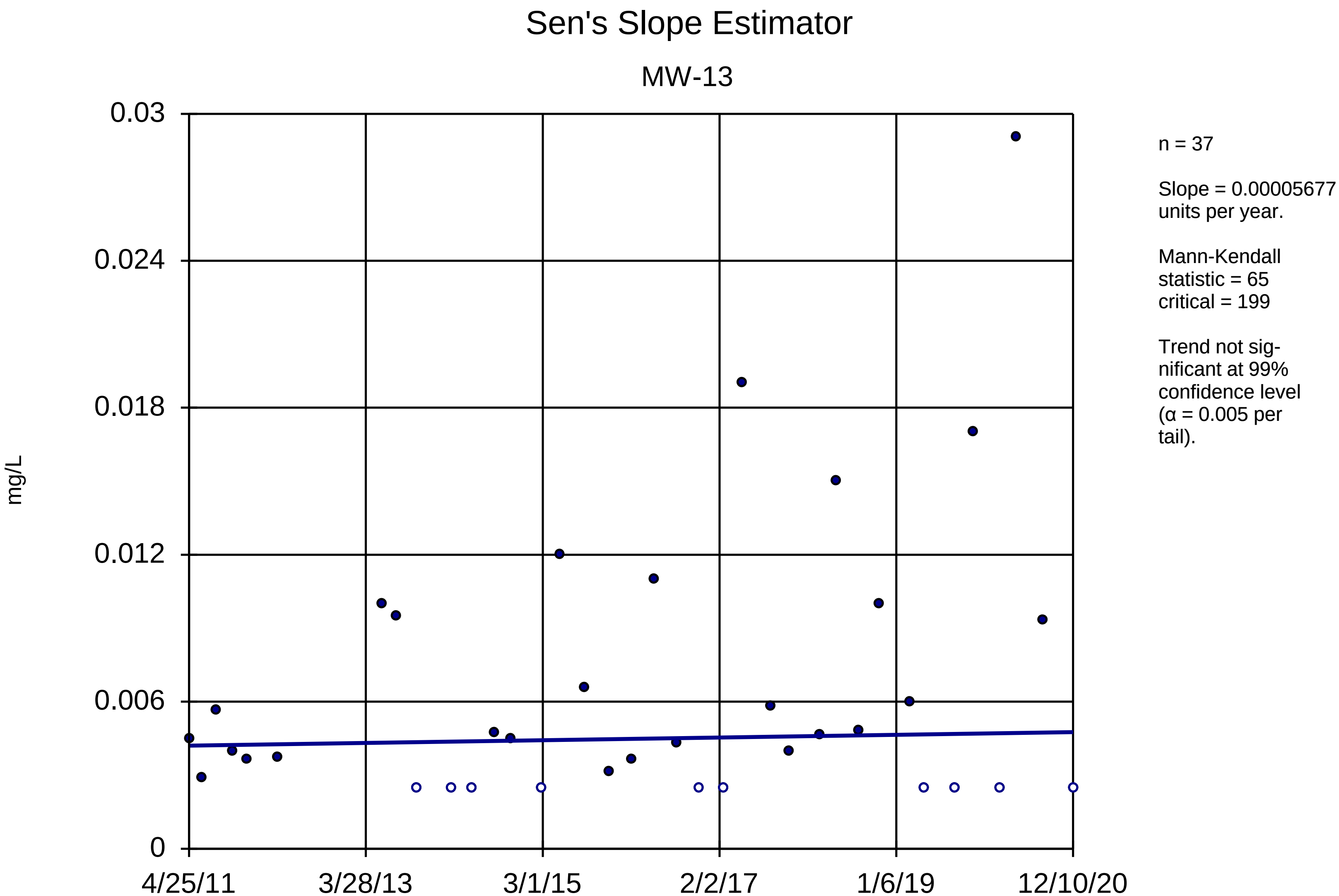
Mann-Kendall
statistic = 21
critical = 206

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

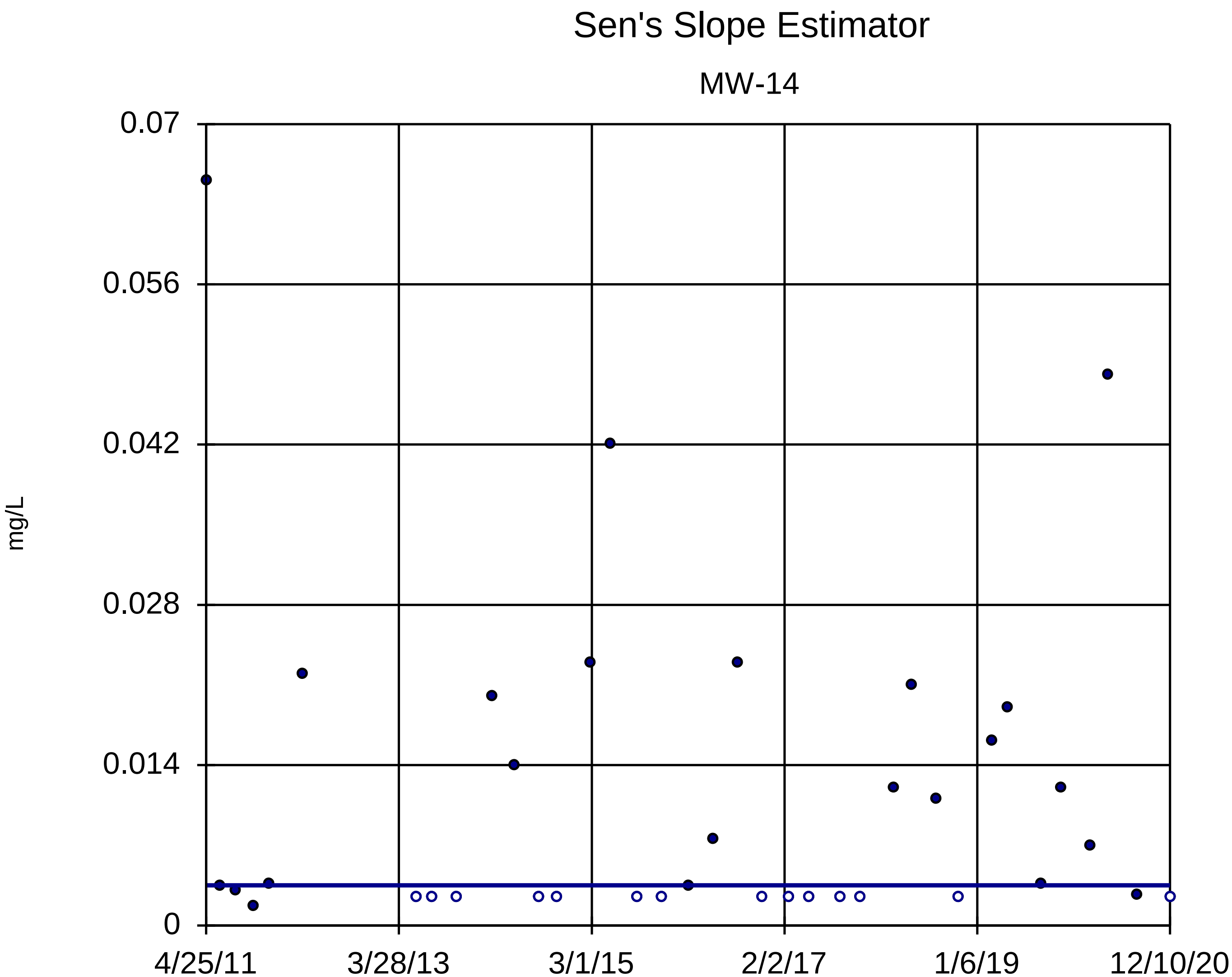



Constituent: Selenium, Dissolved Analysis Run 4/2/2021 11:46 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81852

Hollow symbols indicate censored values.




n = 37

Slope = 0
units per year.

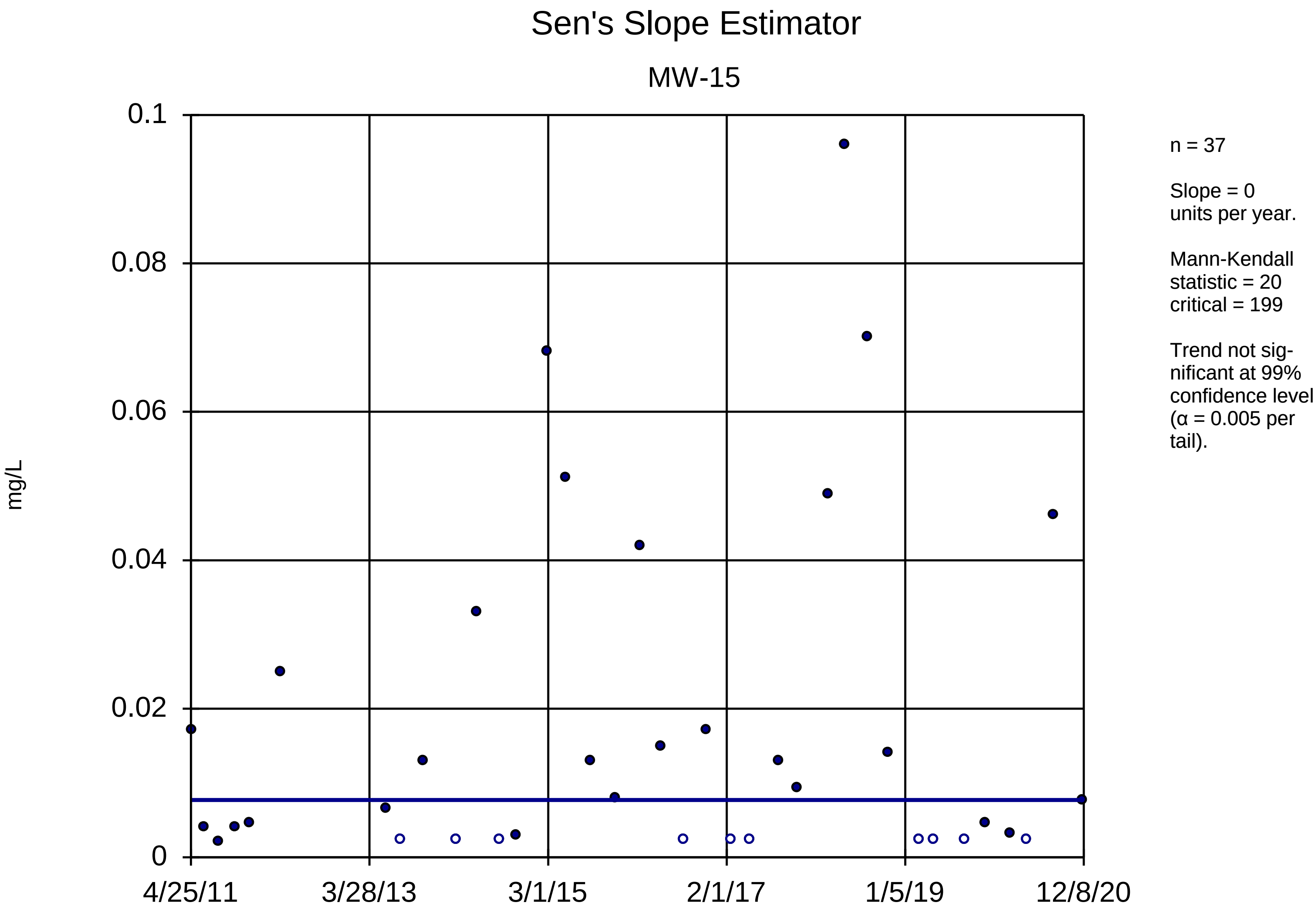
Mann-Kendall
statistic = 34
critical = 199

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

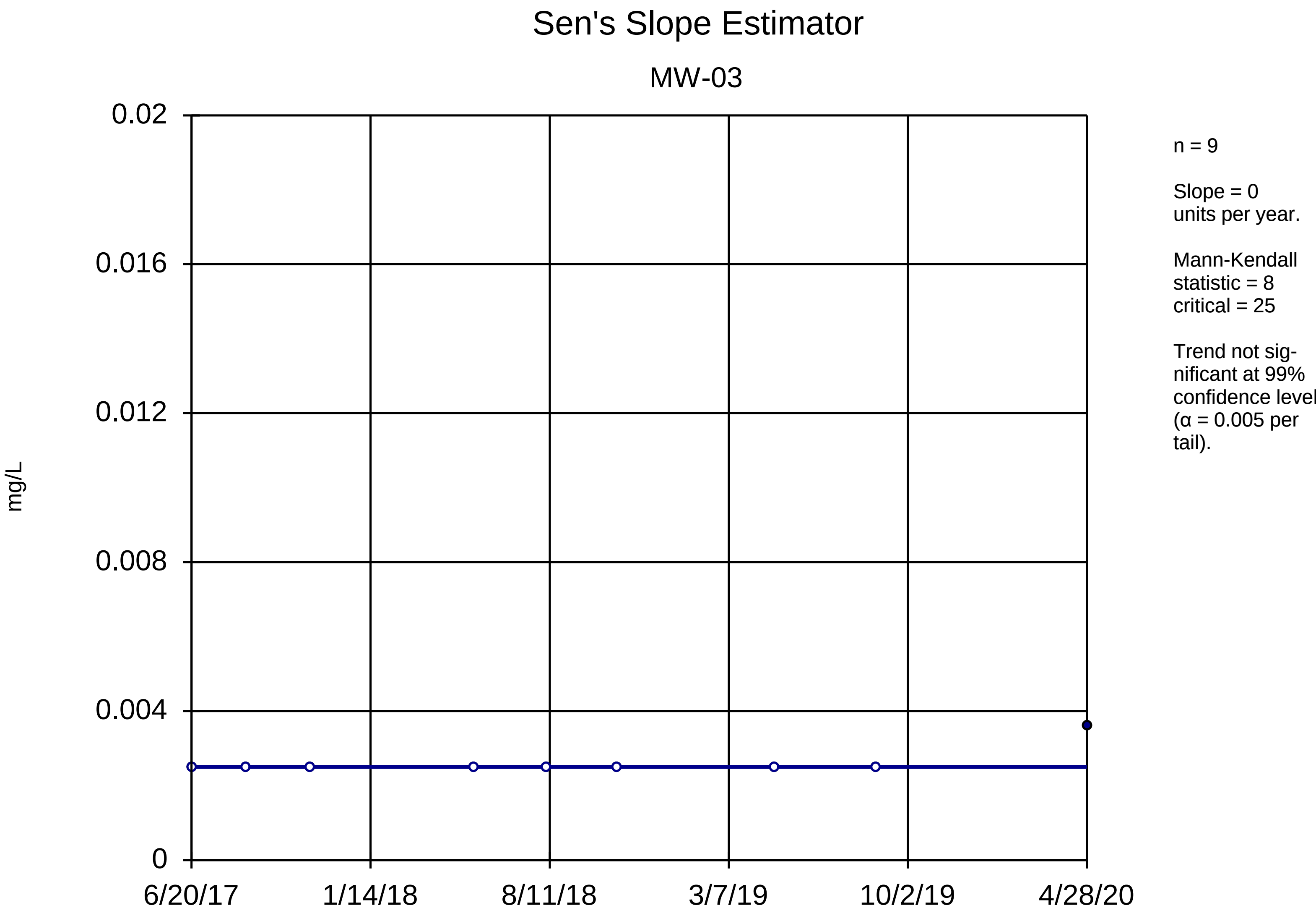



Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81854

Hollow symbols indicate censored values.



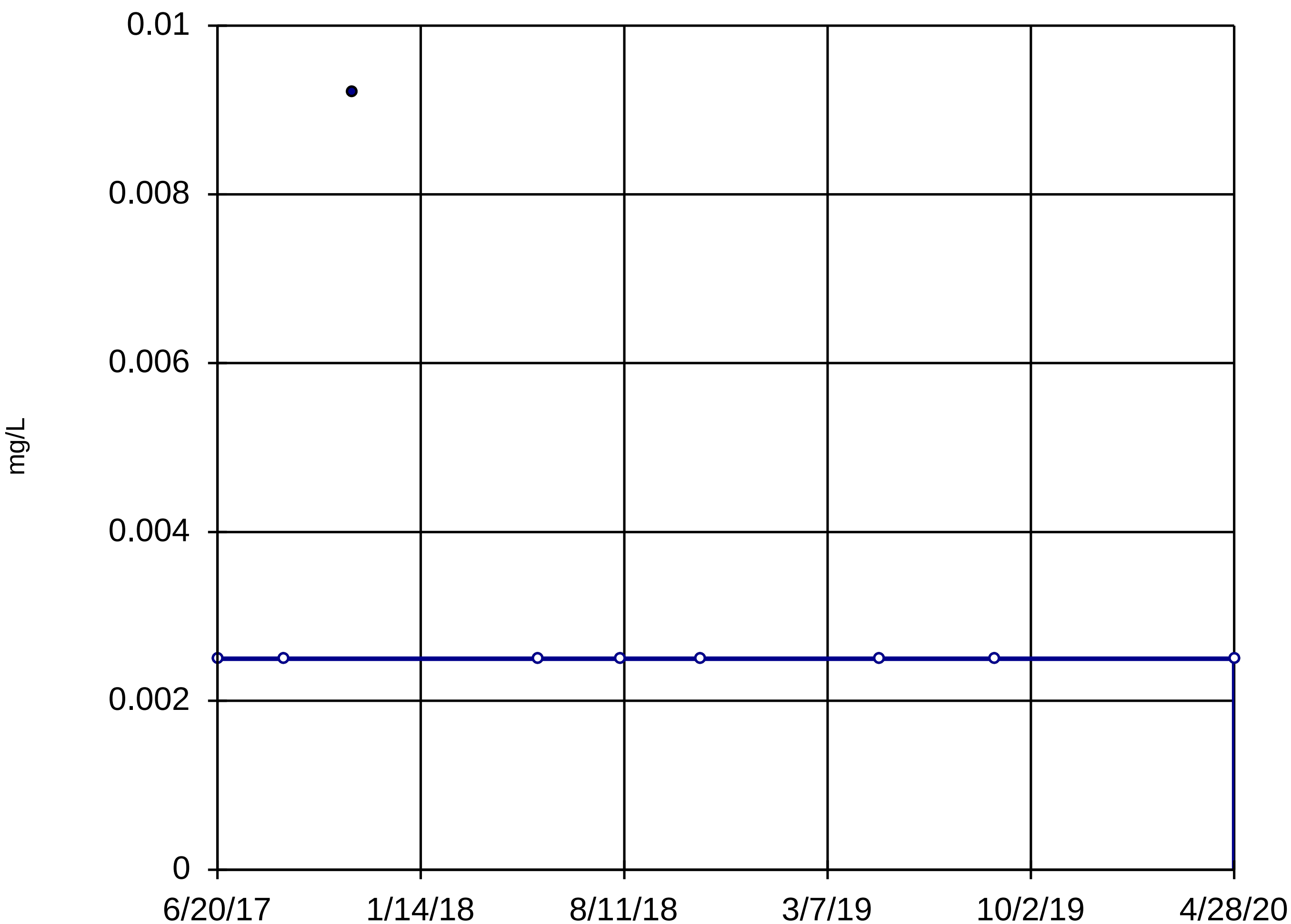

Constituent: Selenium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-04




n = 9

Slope = 0
units per year.

Mann-Kendall
statistic = -4
critical = -25

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Total    Analysis Run 4/2/2021 11:46 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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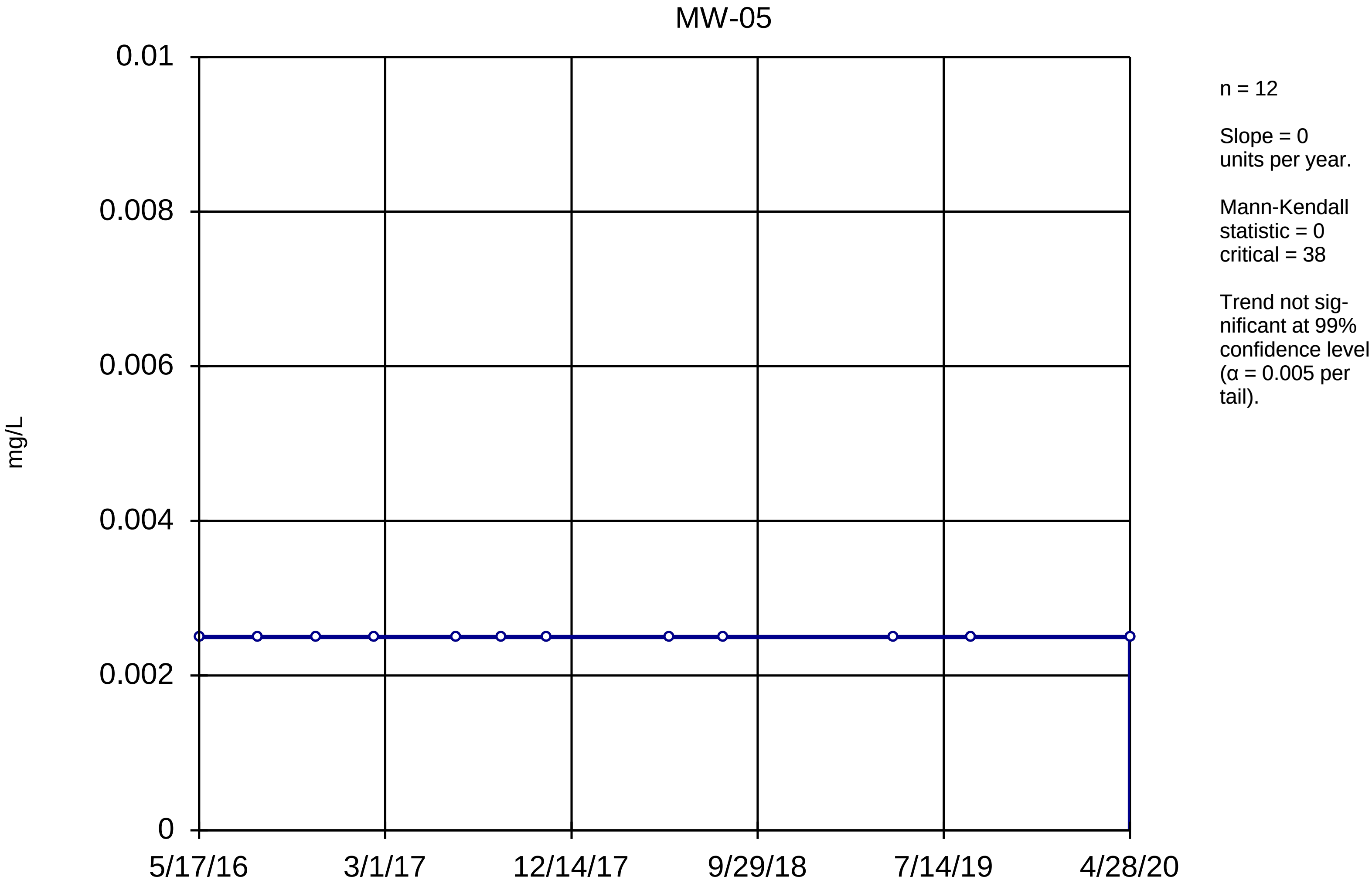
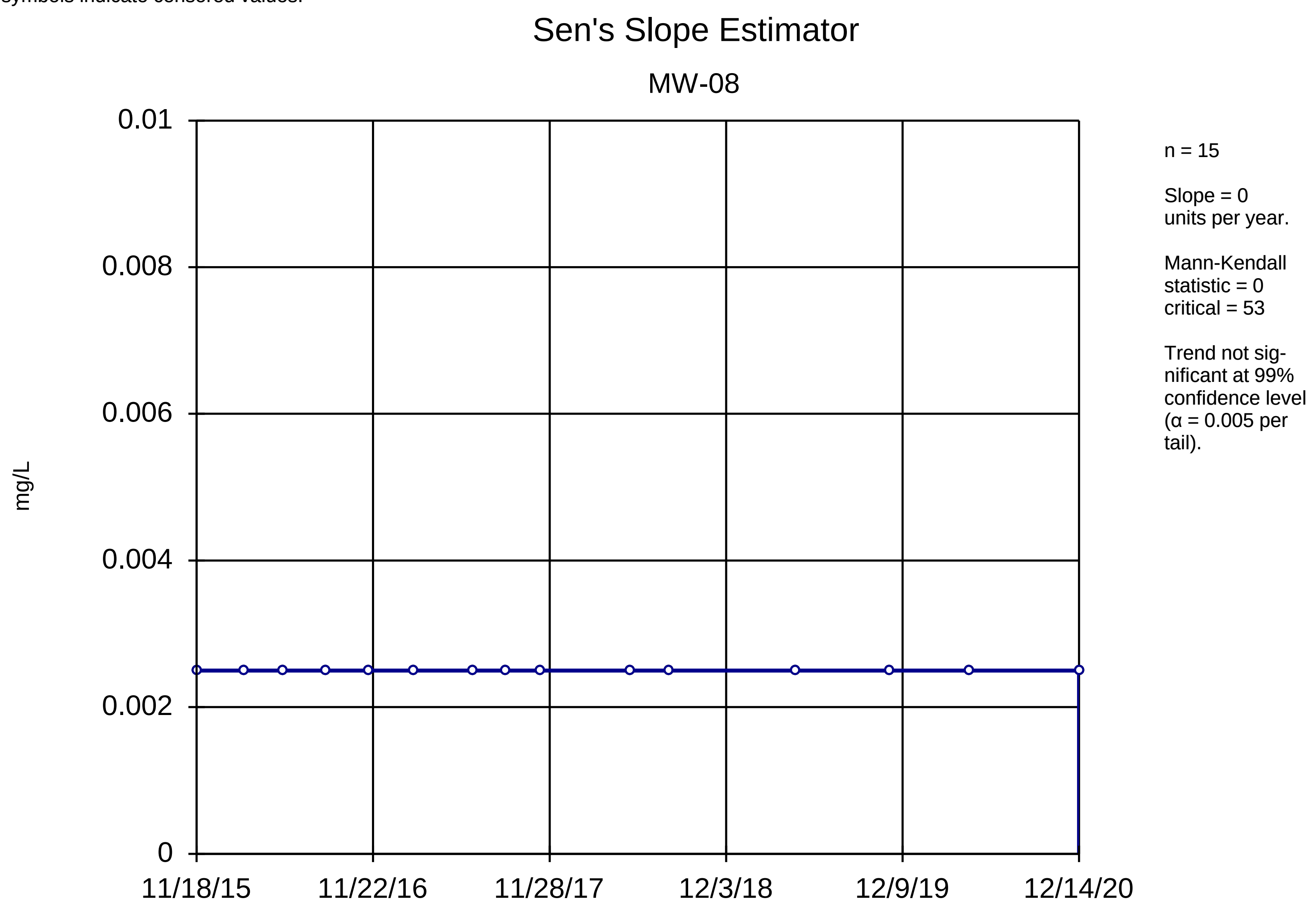
# Sen's Slope Estimator




Constituent: Selenium, Total    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

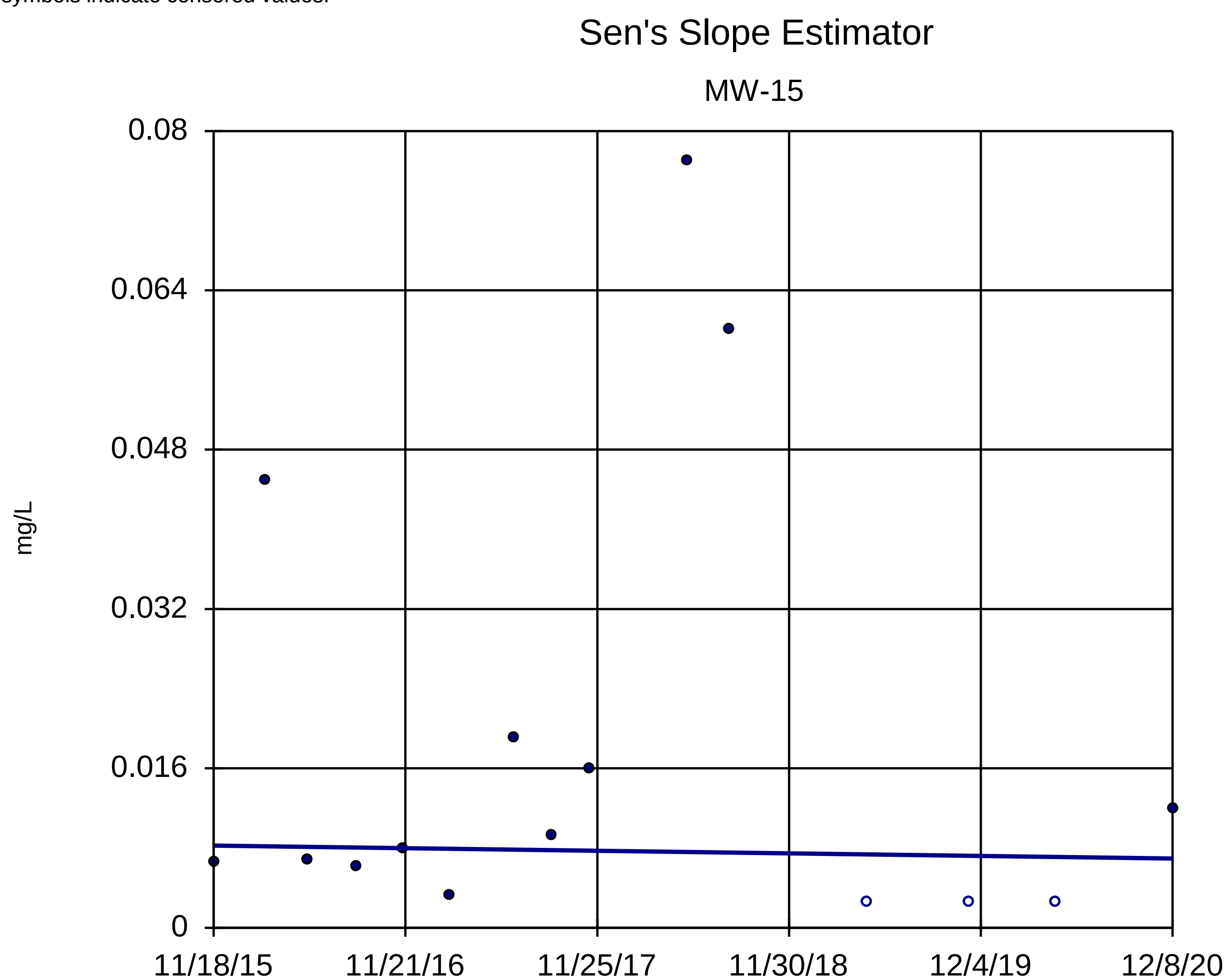



Constituent: Selenium, Total    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81858

Hollow symbols indicate censored values.




n = 15

Slope = -0.0002555 units per year.

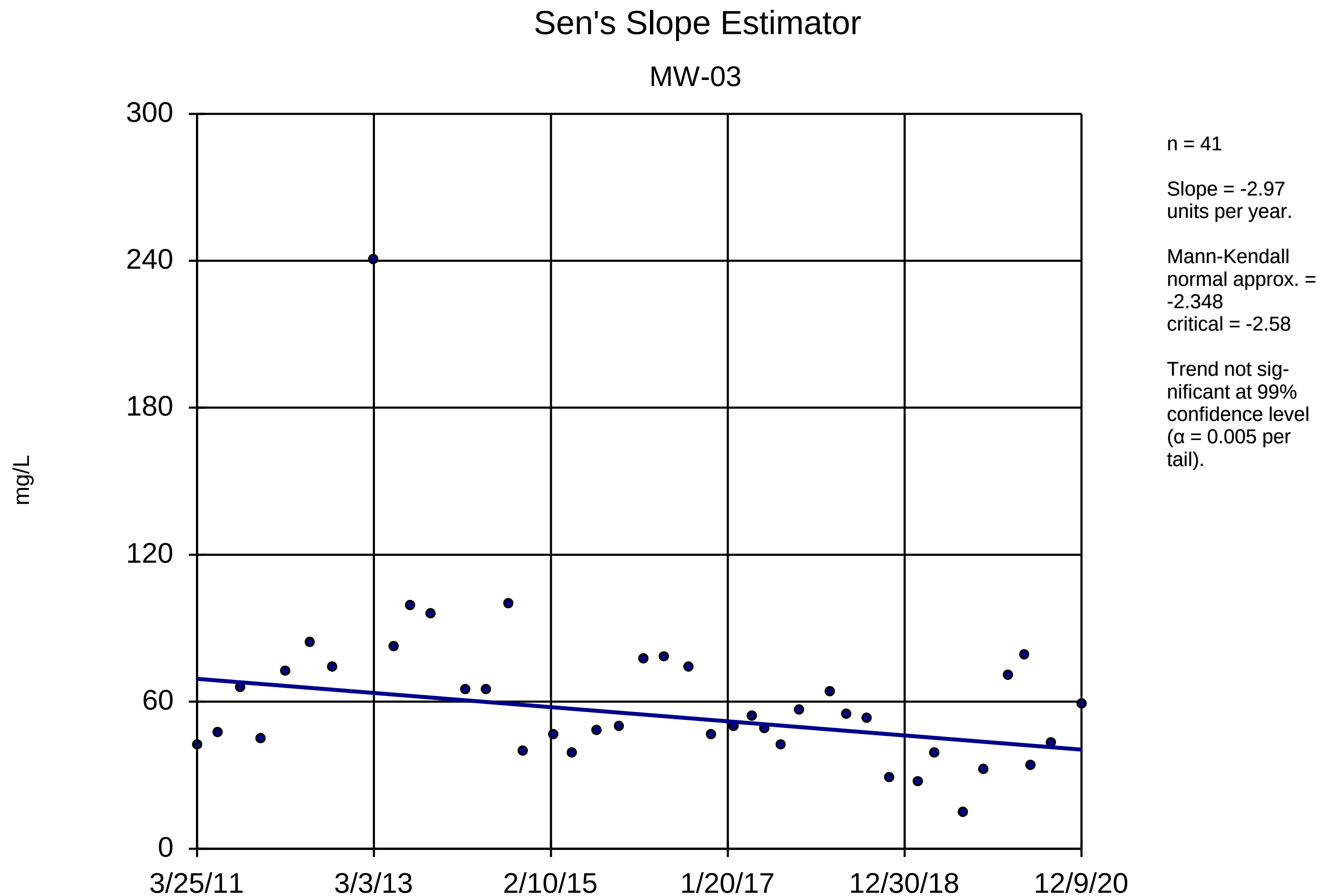
Mann-Kendall statistic = -6 critical = -53

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Total Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

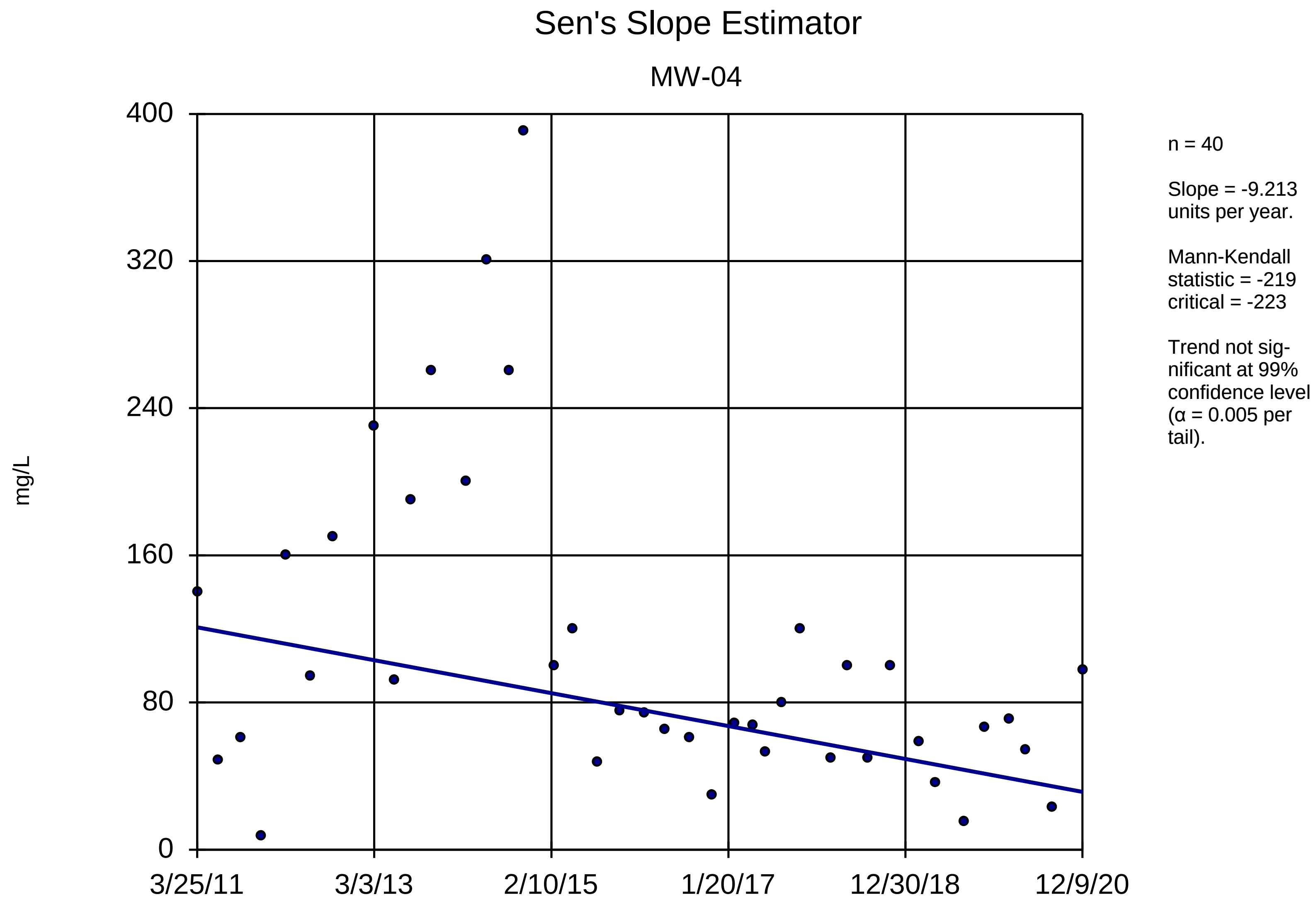
MWG13-15_81859




Constituent: Sulfate Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

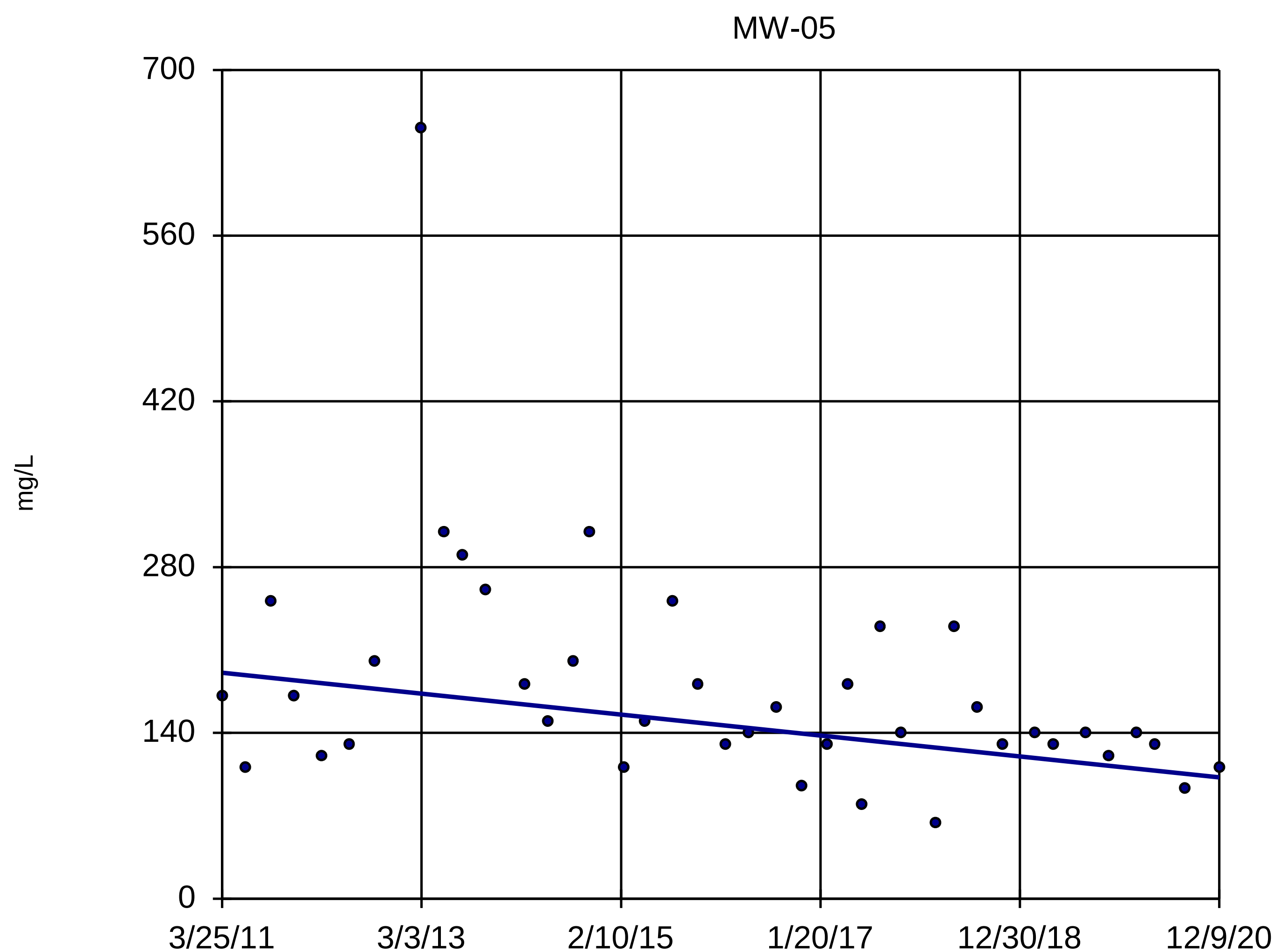
MWG13-15_81860




Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

# Sen's Slope Estimator




n = 40

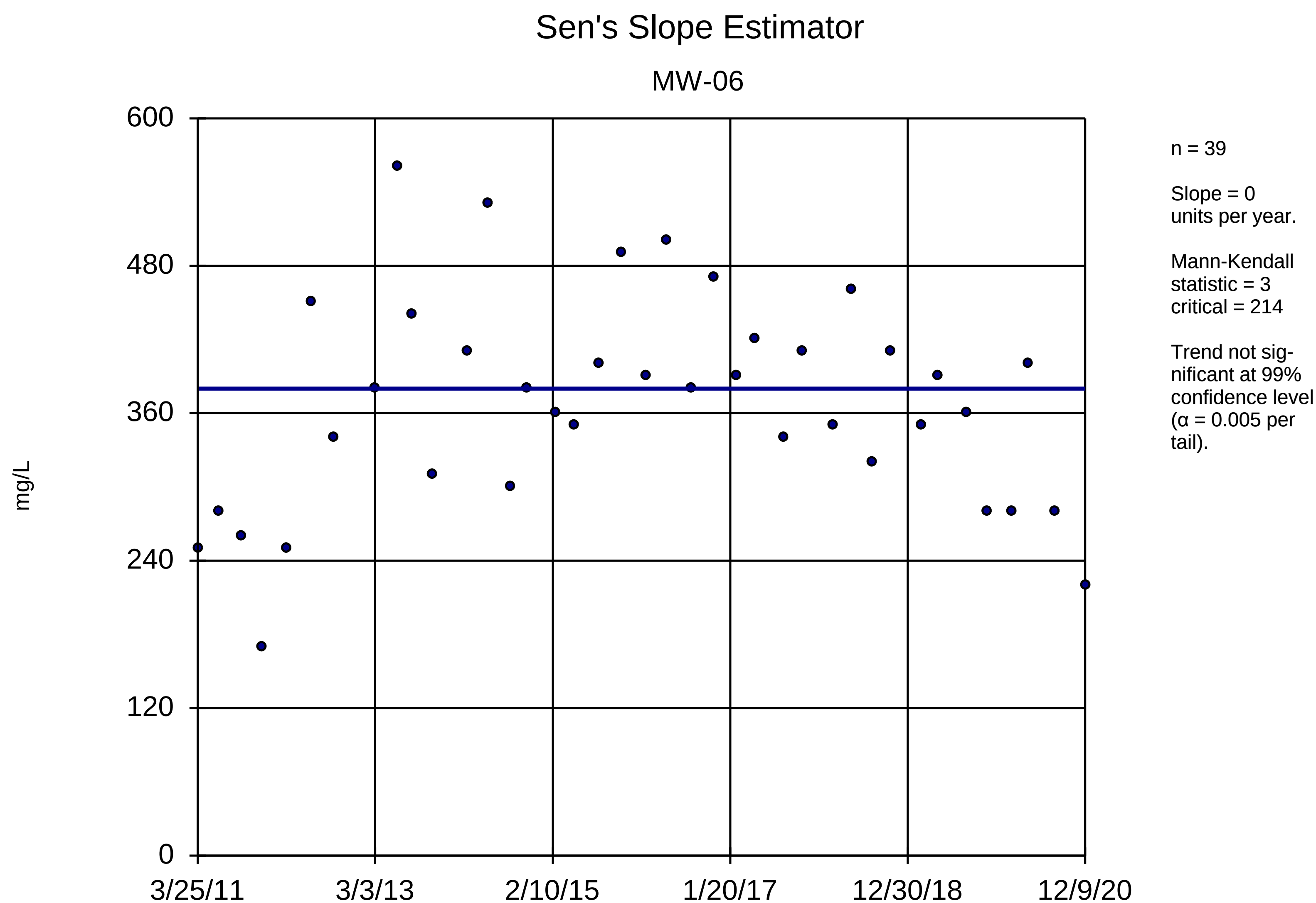
Slope = -9.096 units per year.

Mann-Kendall statistic = -249 critical = -223

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

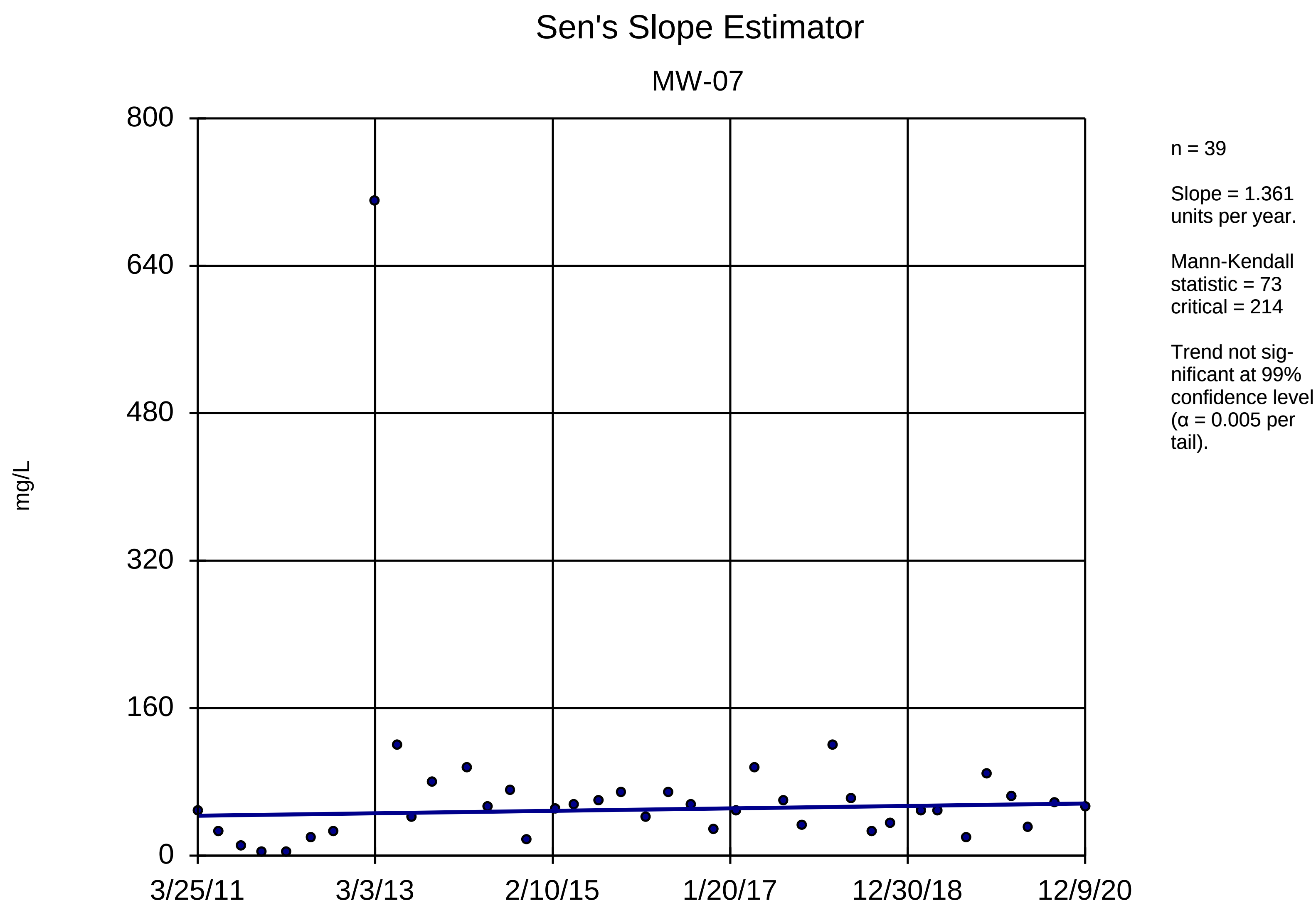
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

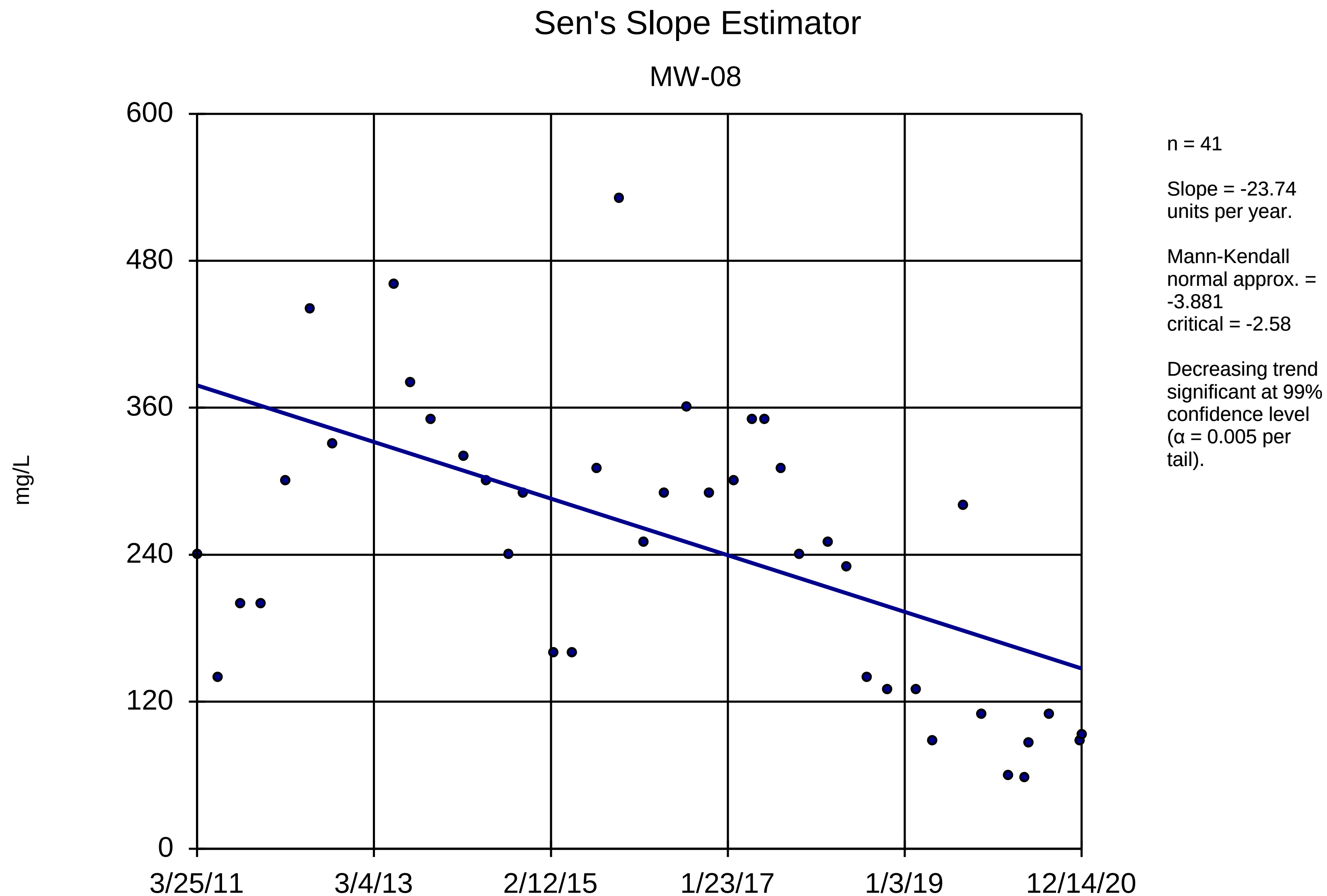
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81863




Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

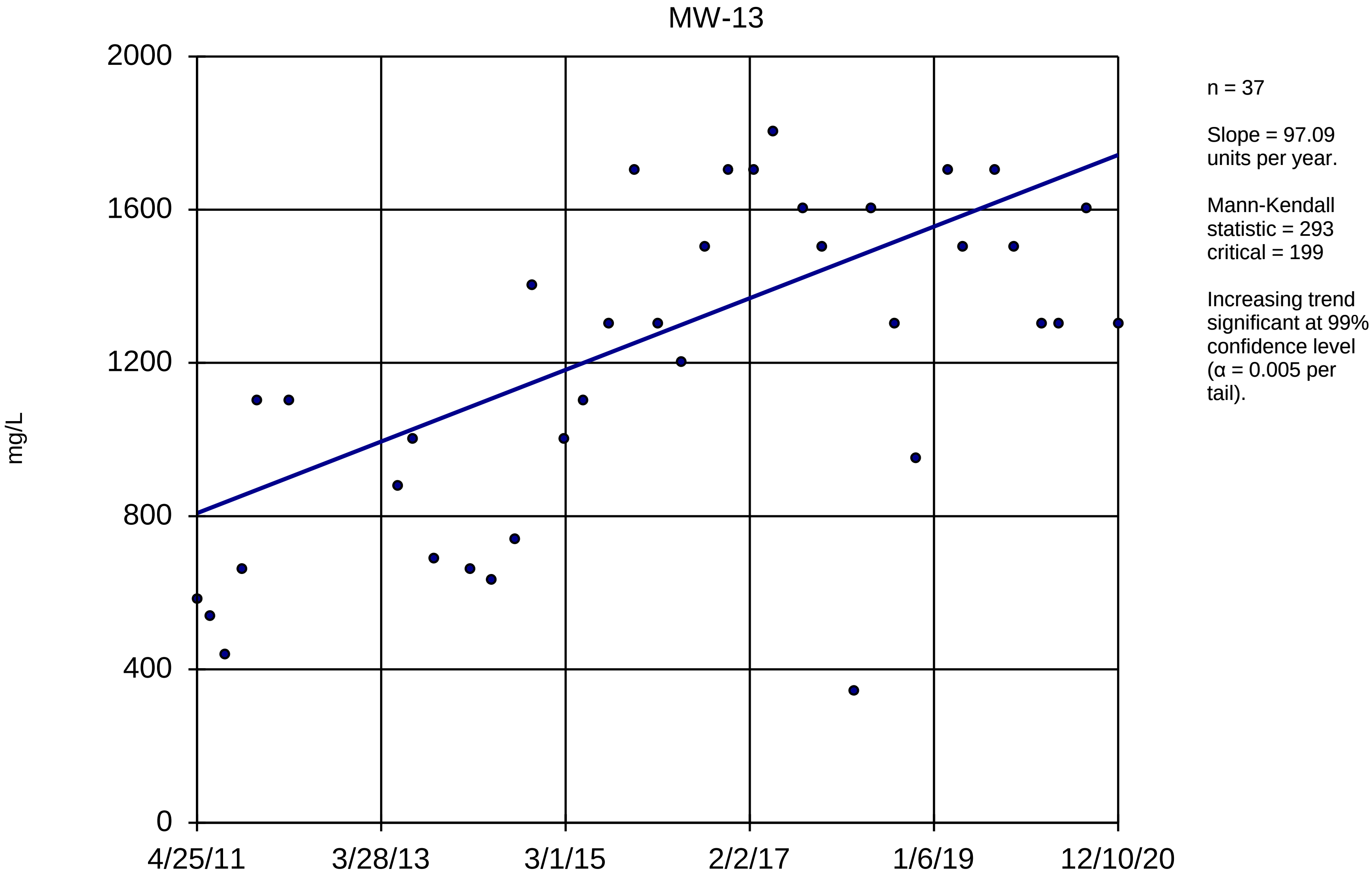
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




Constituent: Sulfate Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

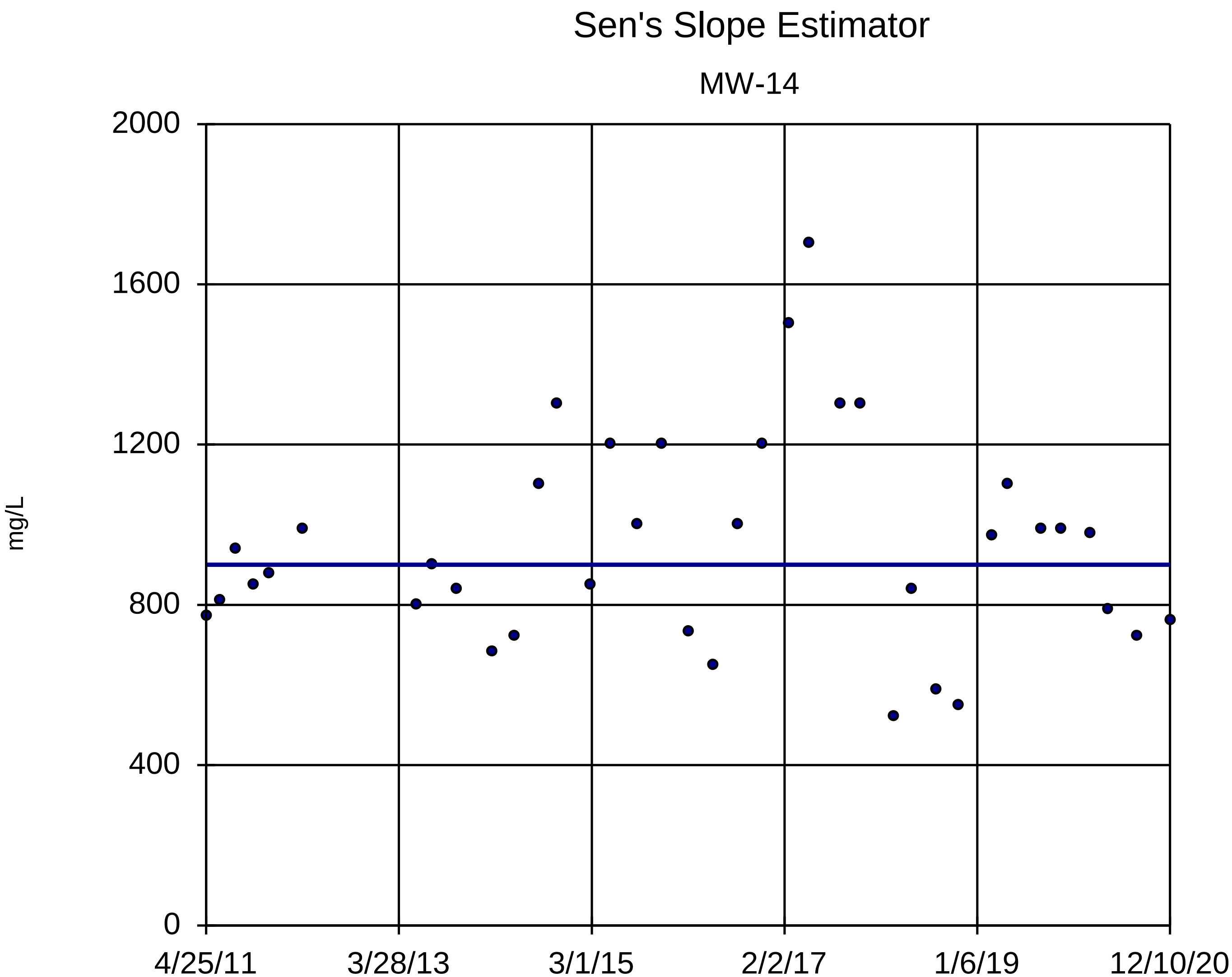
## Sen's Slope Estimator




Constituent: Sulfate  Analysis Run 4/2/2021 11:47 AM

Utility Site P  Client: Weaver Consultants Group  Data: Powerton Sanitas Database

MWG13-15_81866




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = 8
critical = 199

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

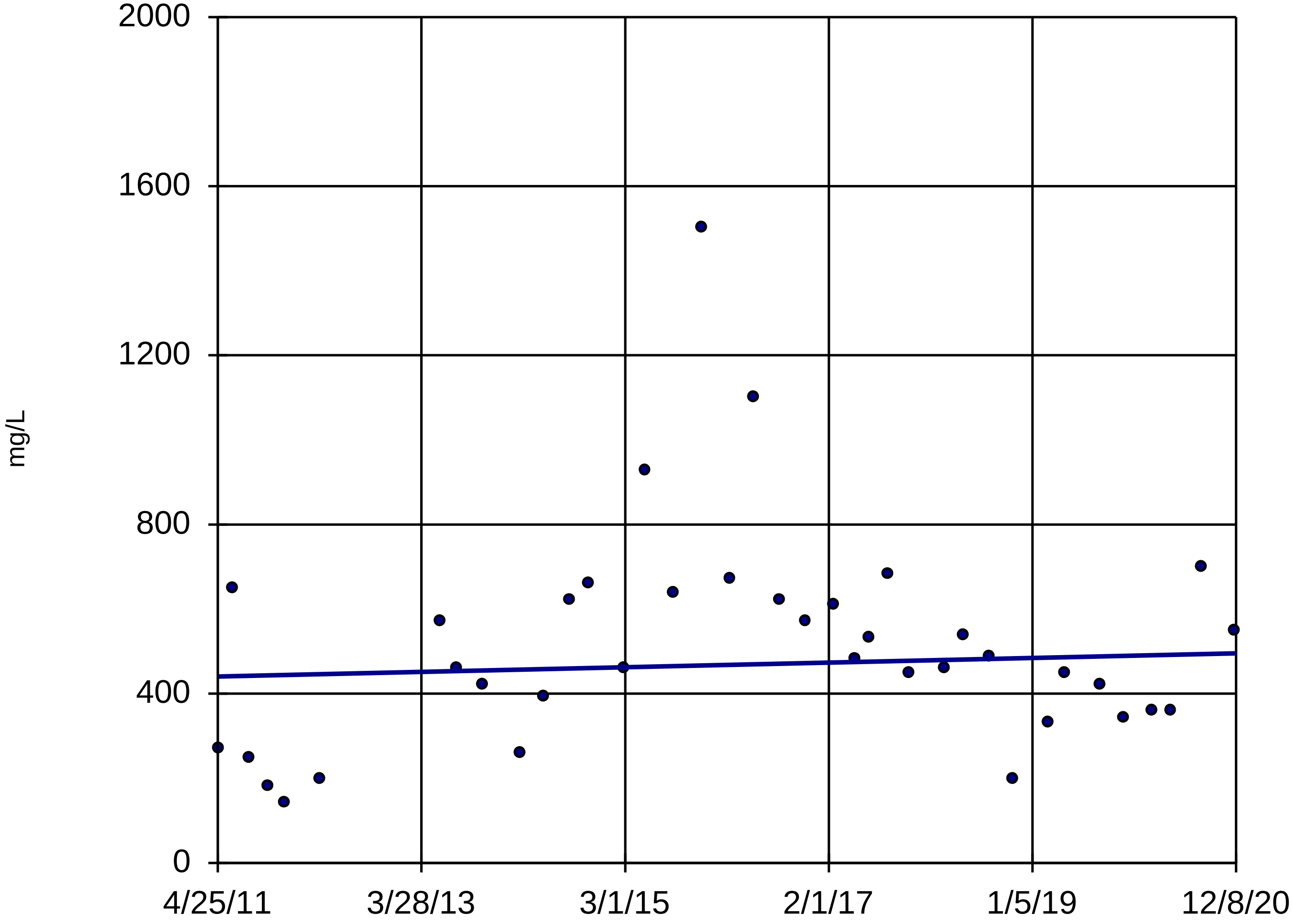
Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81867

# Sen's Slope Estimator

MW-15




n = 38

Slope = 5.709
units per year.

Mann-Kendall
statistic = 28
critical = 206

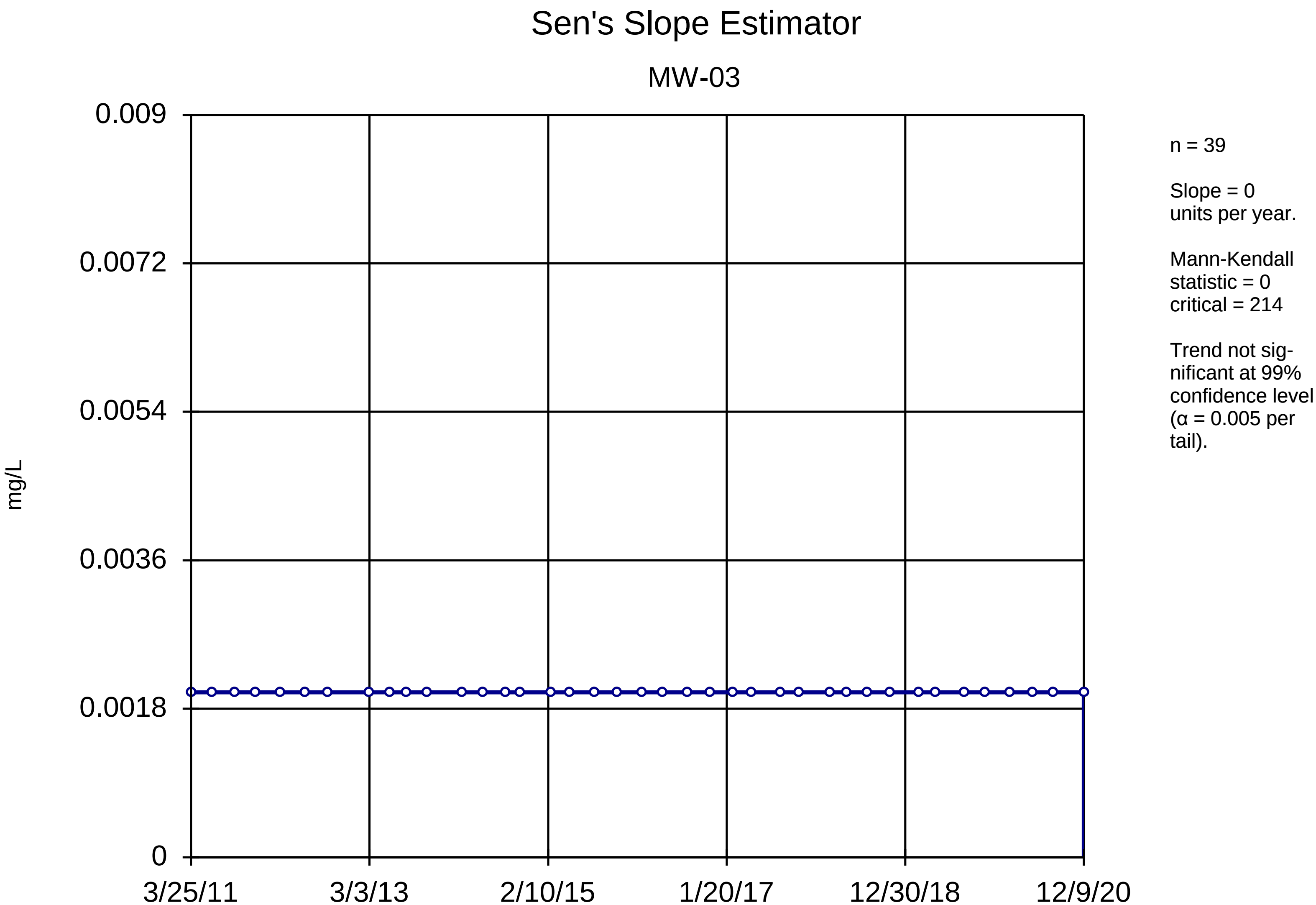
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Sulfate    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81868

Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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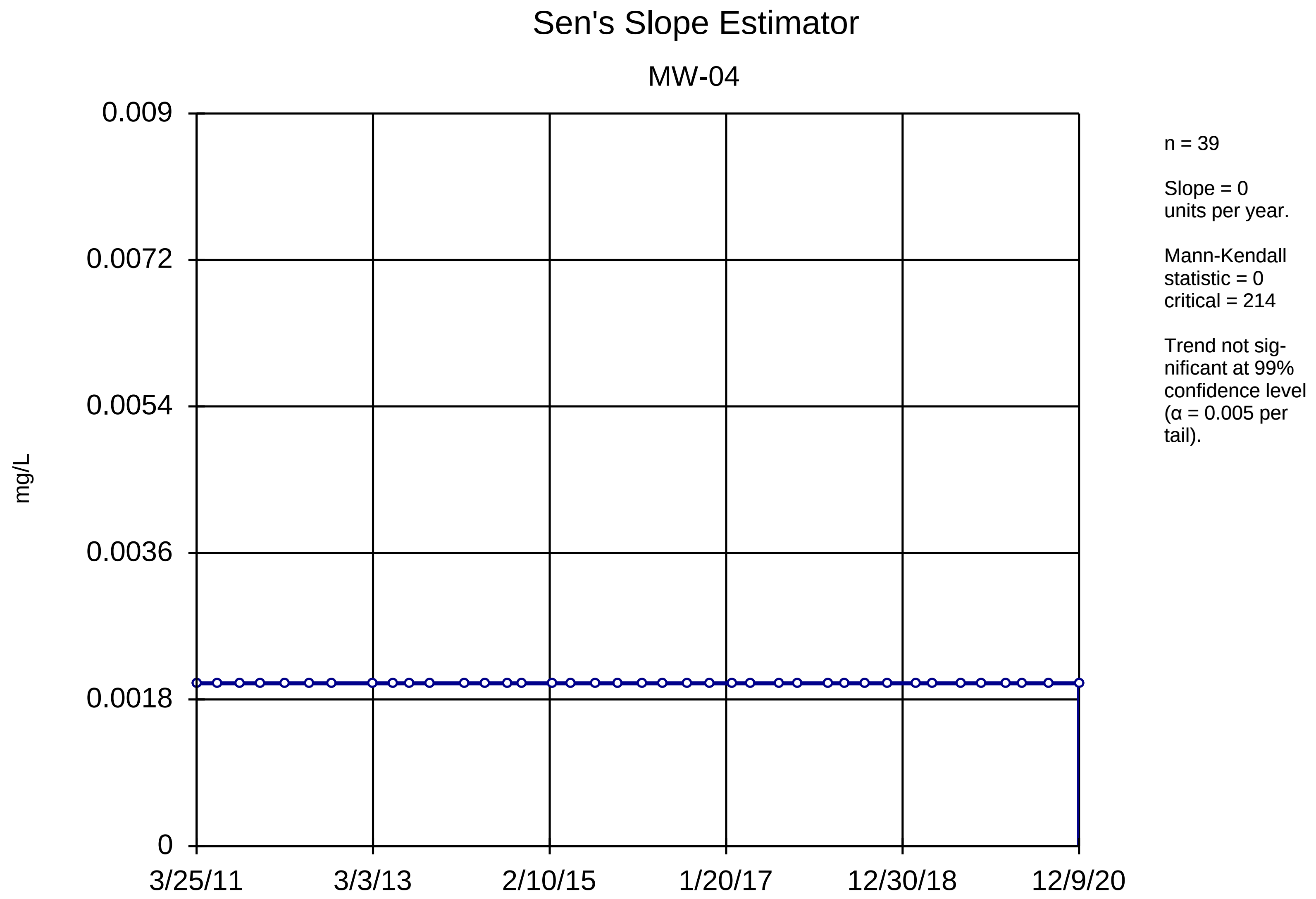
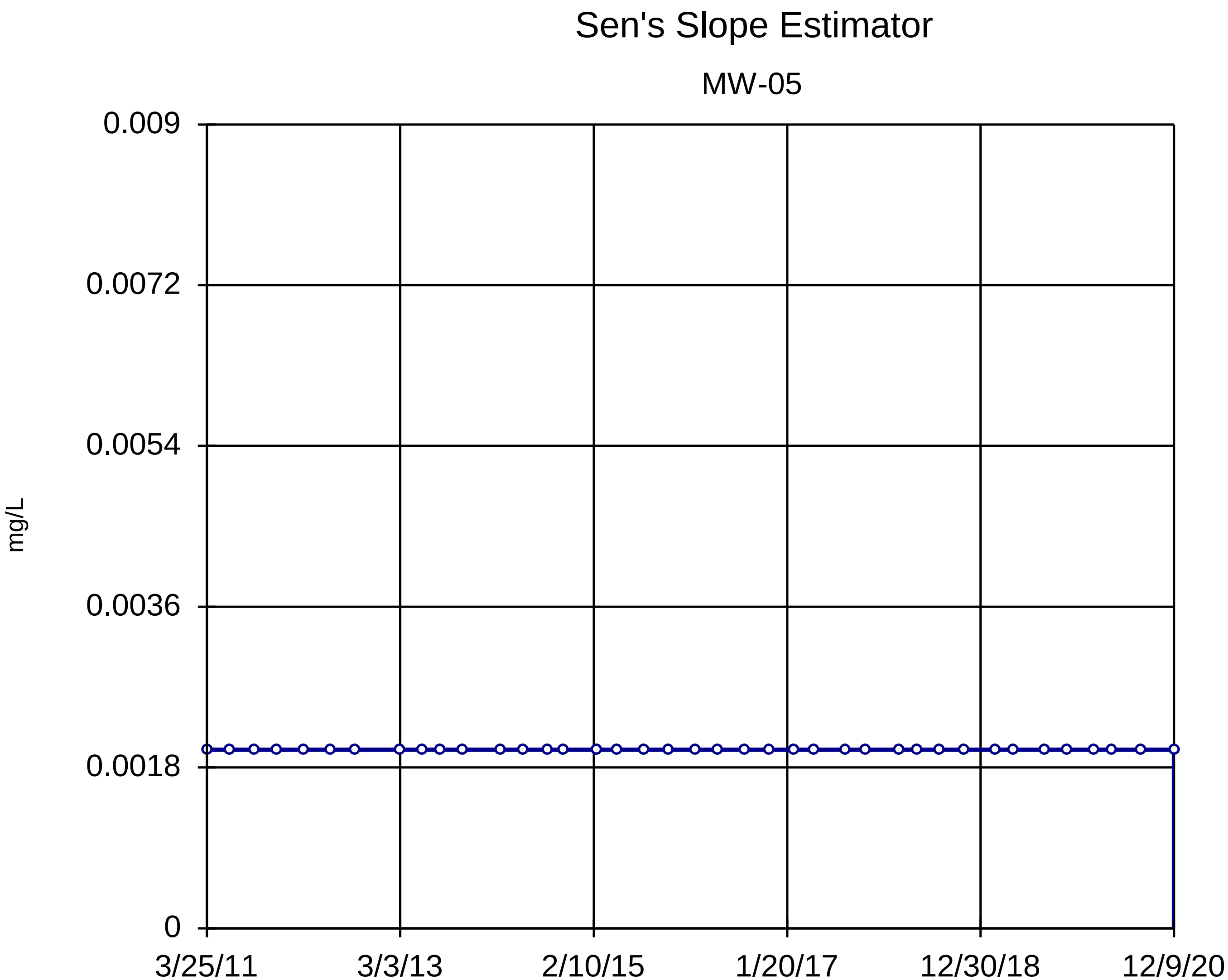



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




n = 39

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 214

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

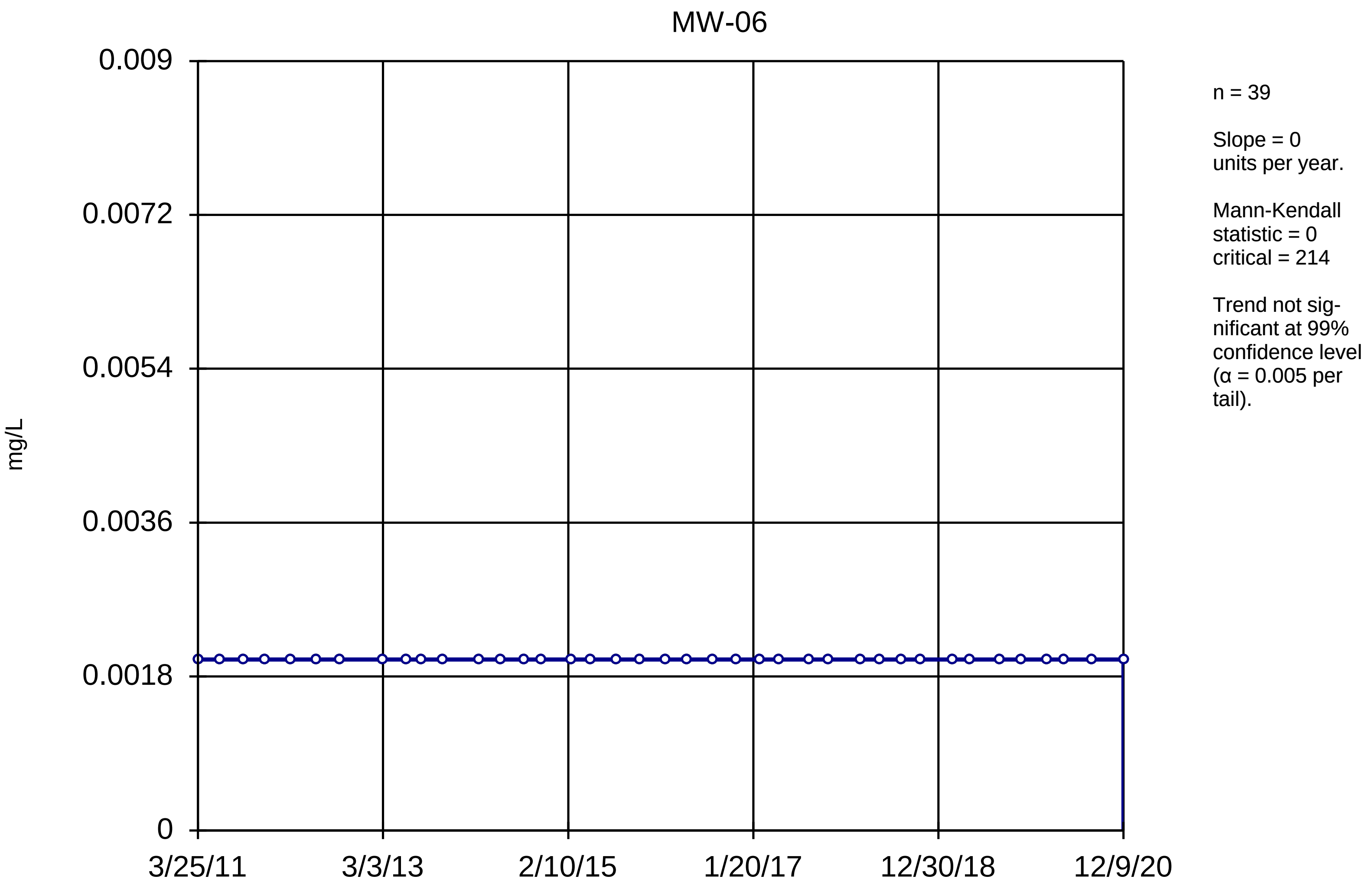
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Electronic Filing: Received, Clerk's Office 01/21/2022



Hollow symbols indicate censored values.

## Sen's Slope Estimator

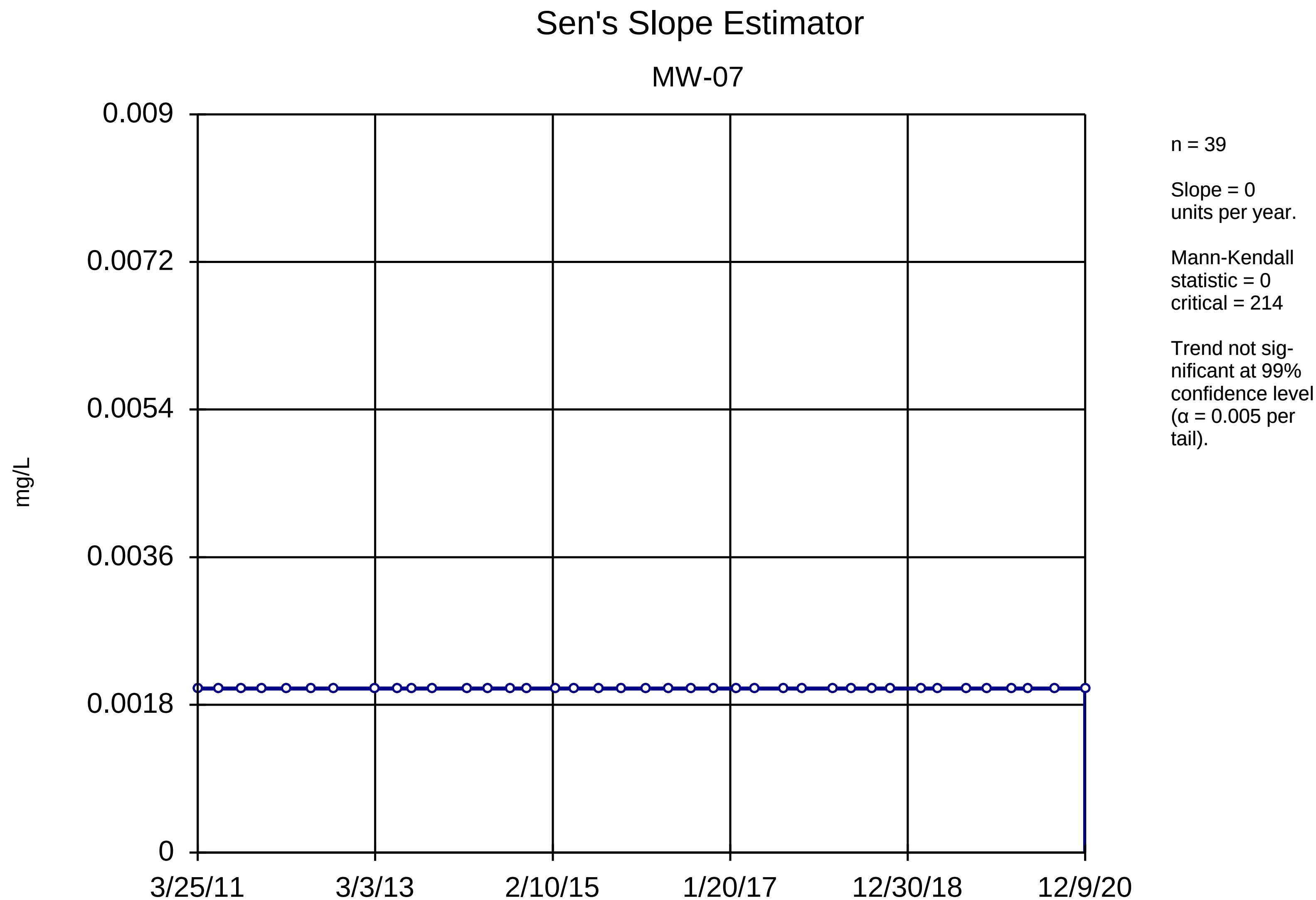



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81872

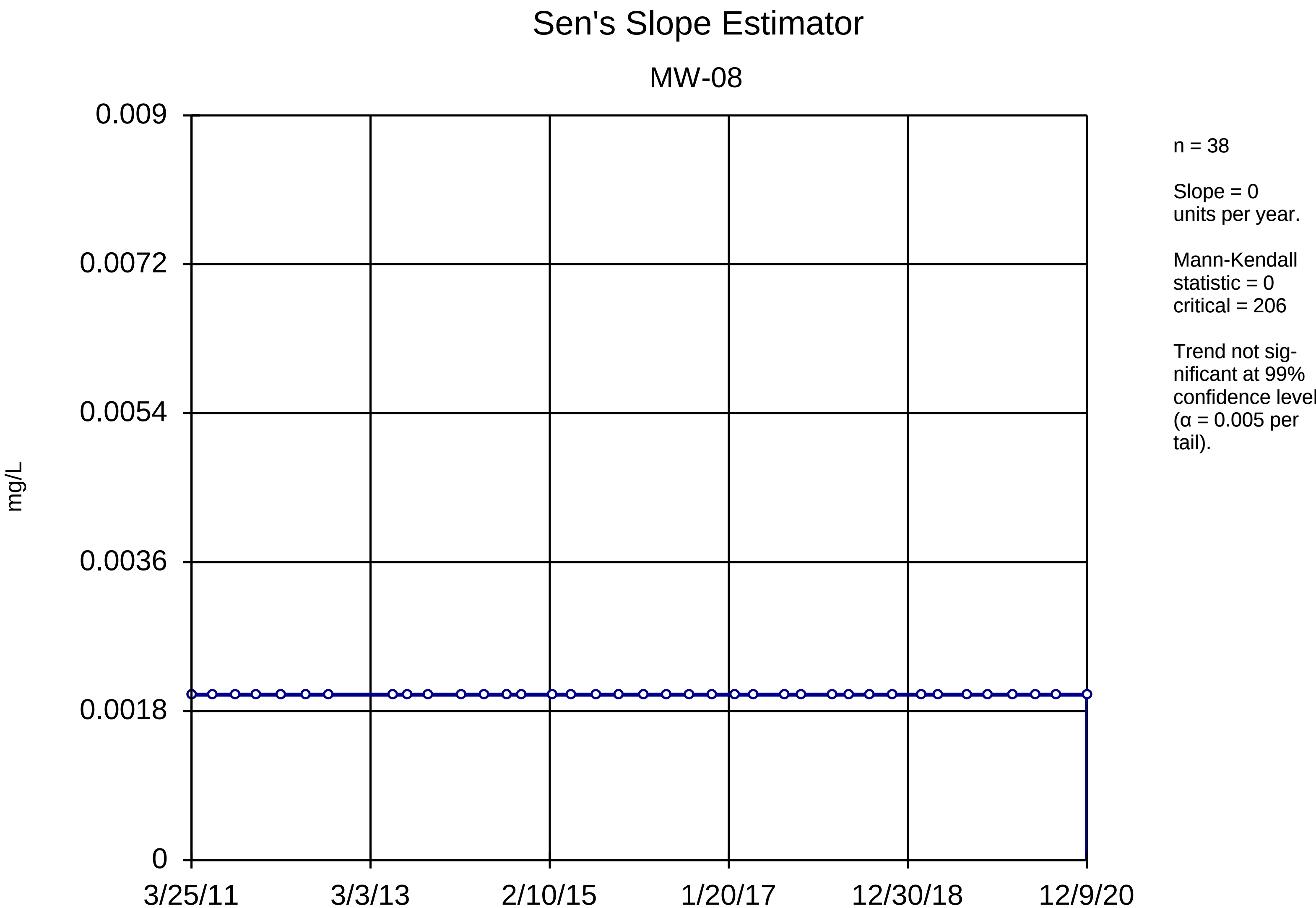
Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

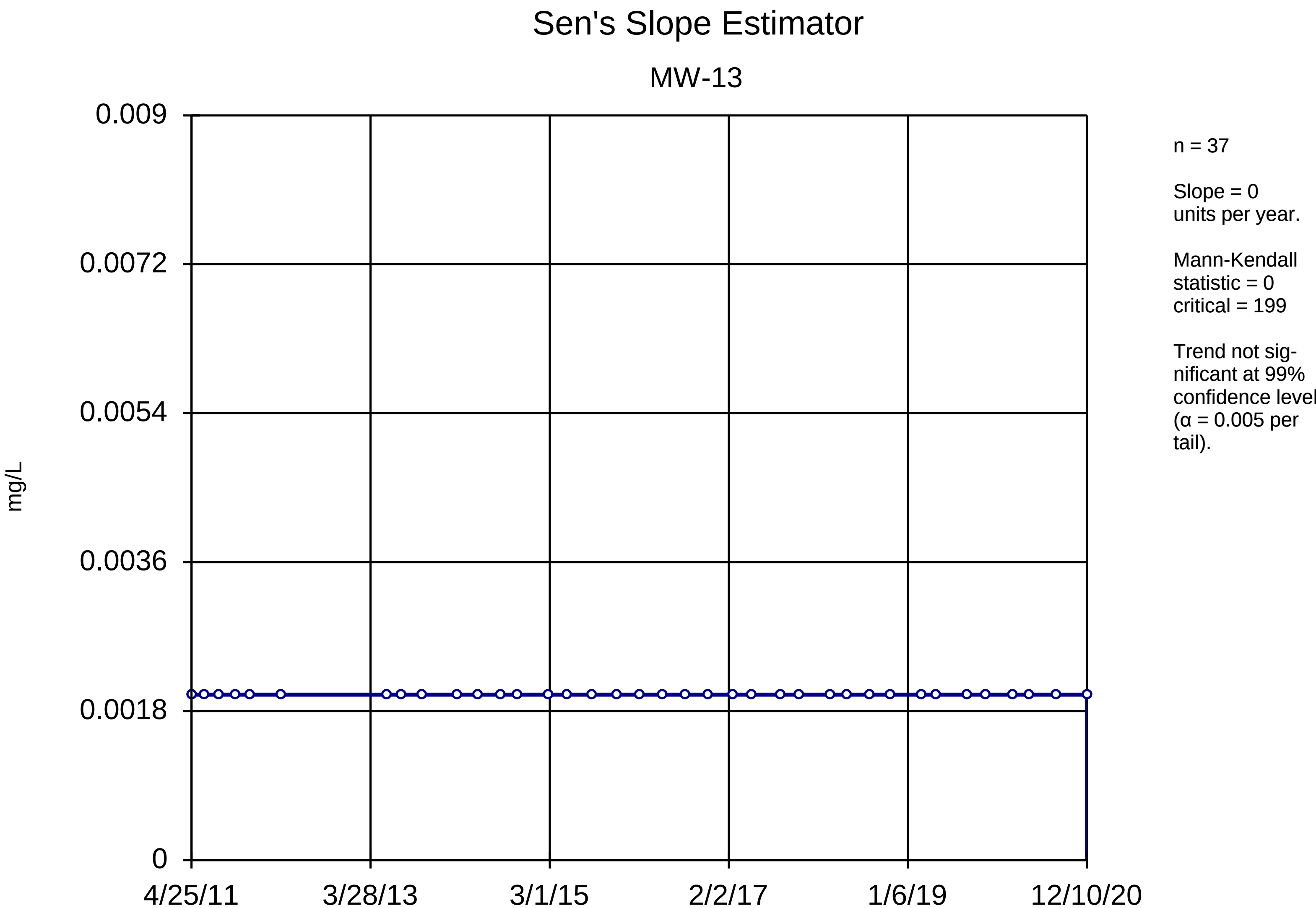
Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81875

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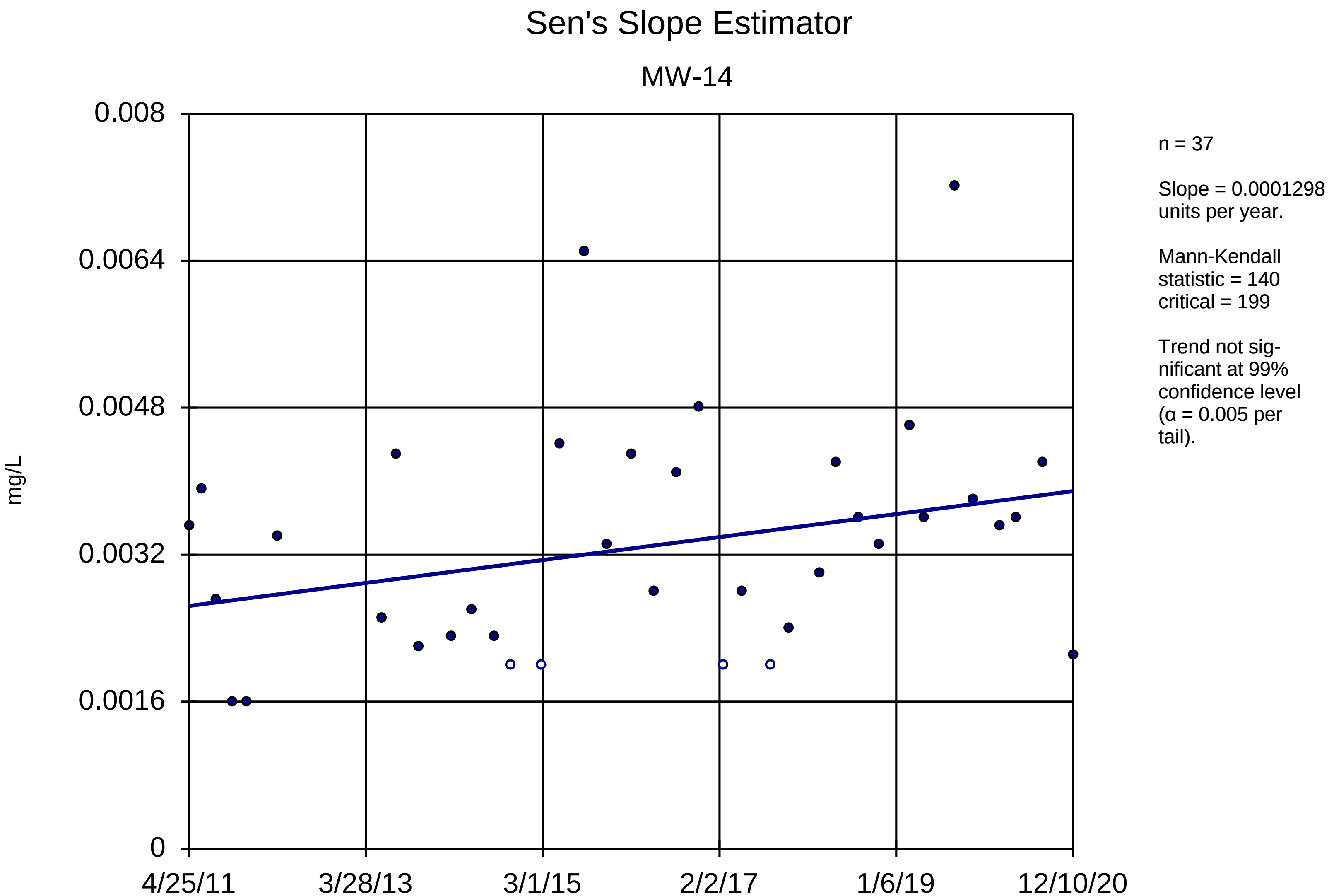
Hollow symbols indicate censored values.



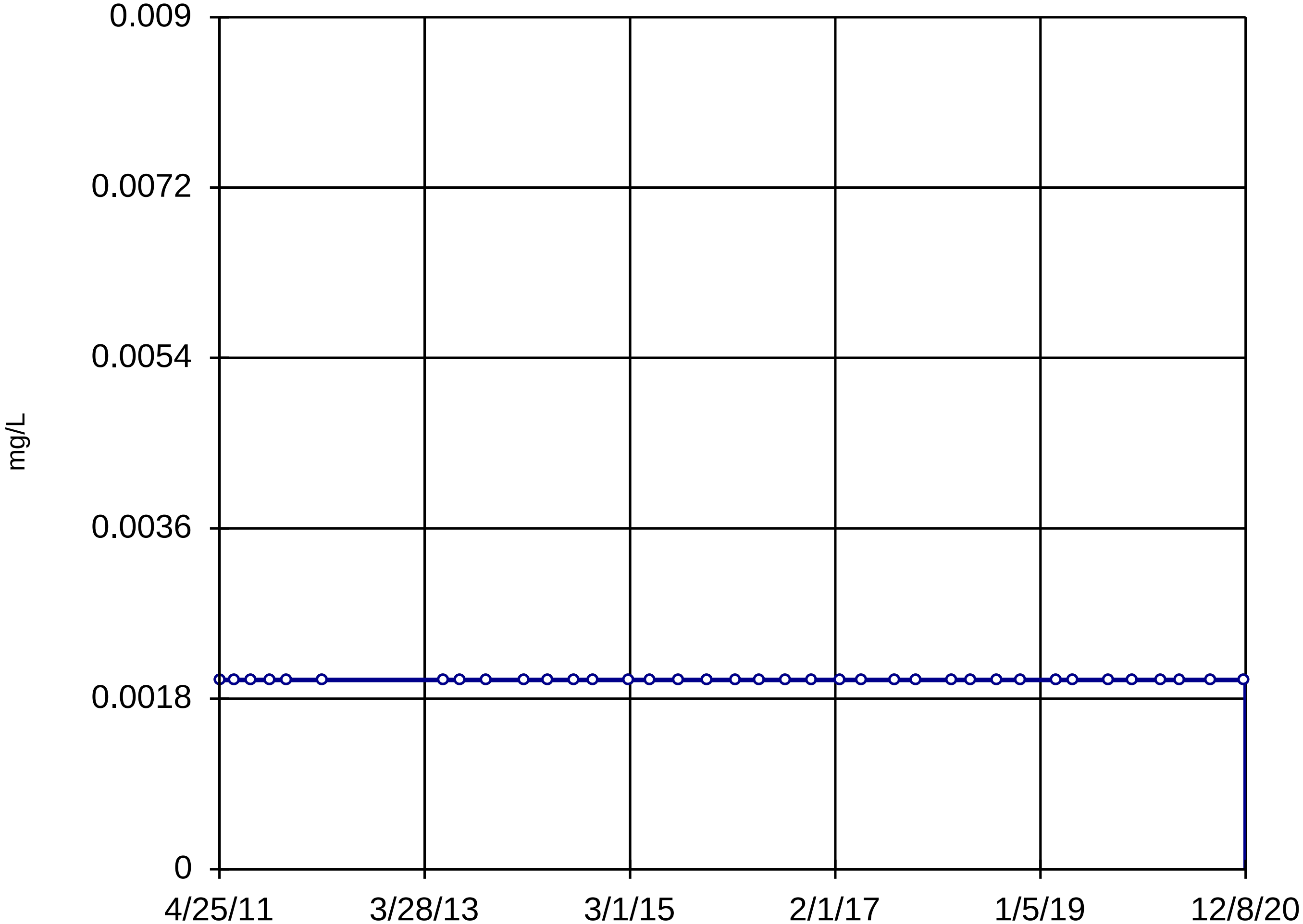

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-15




n = 37

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 199

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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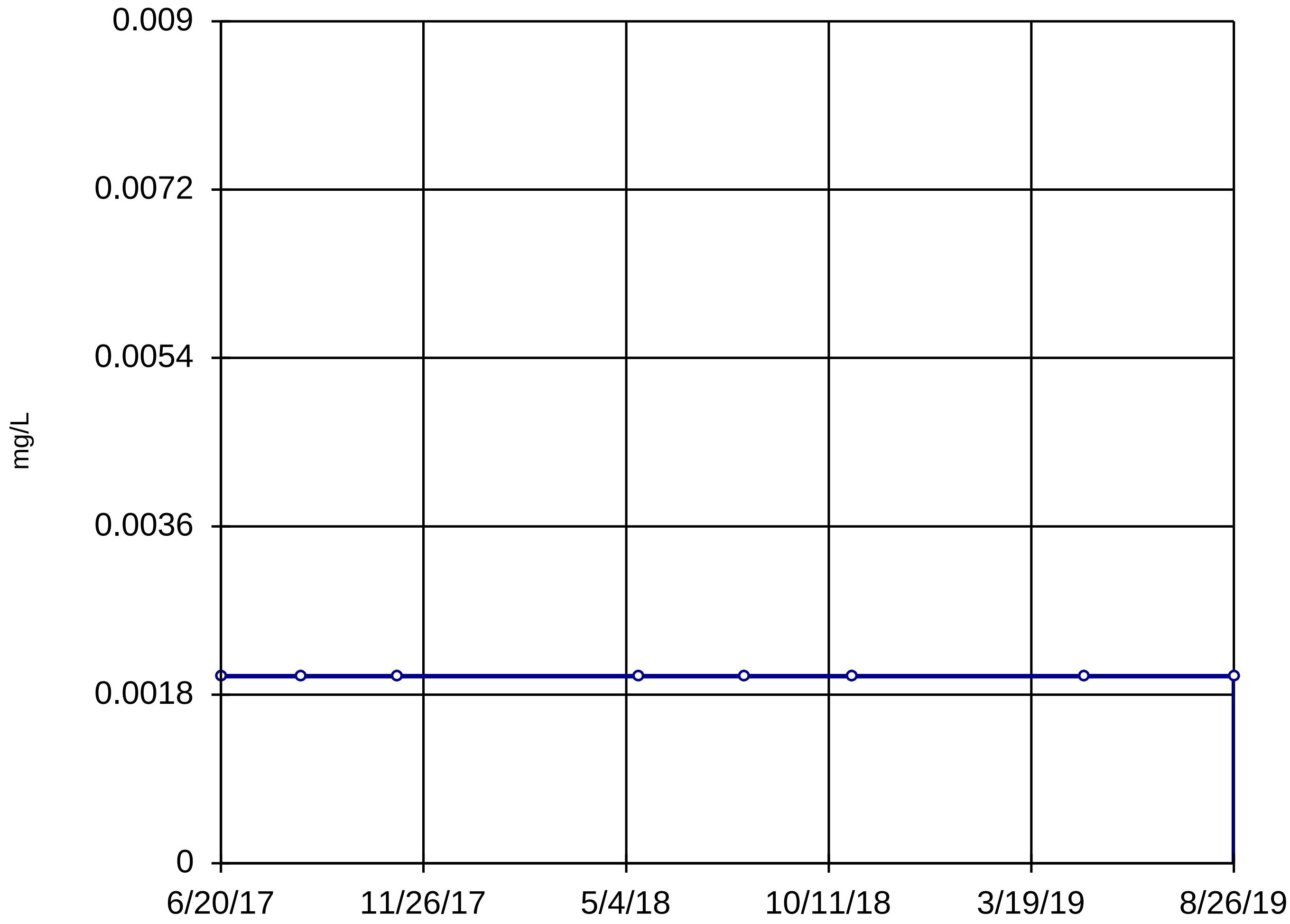
# Sen's Slope Estimator

MW-03




n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 21

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Thallium, Total Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81878

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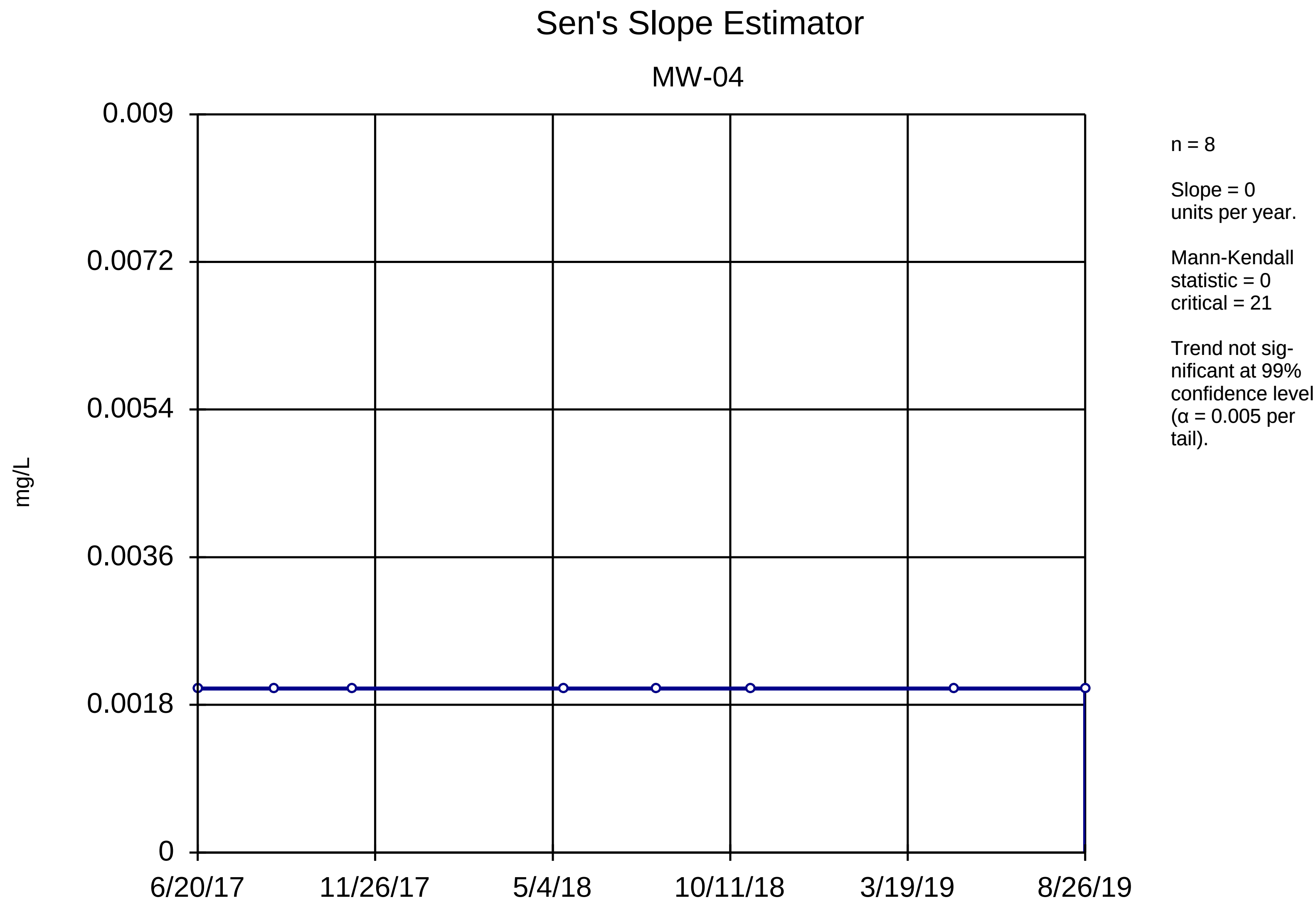
Hollow symbols indicate censored values.




Constituent: Thallium, Total    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

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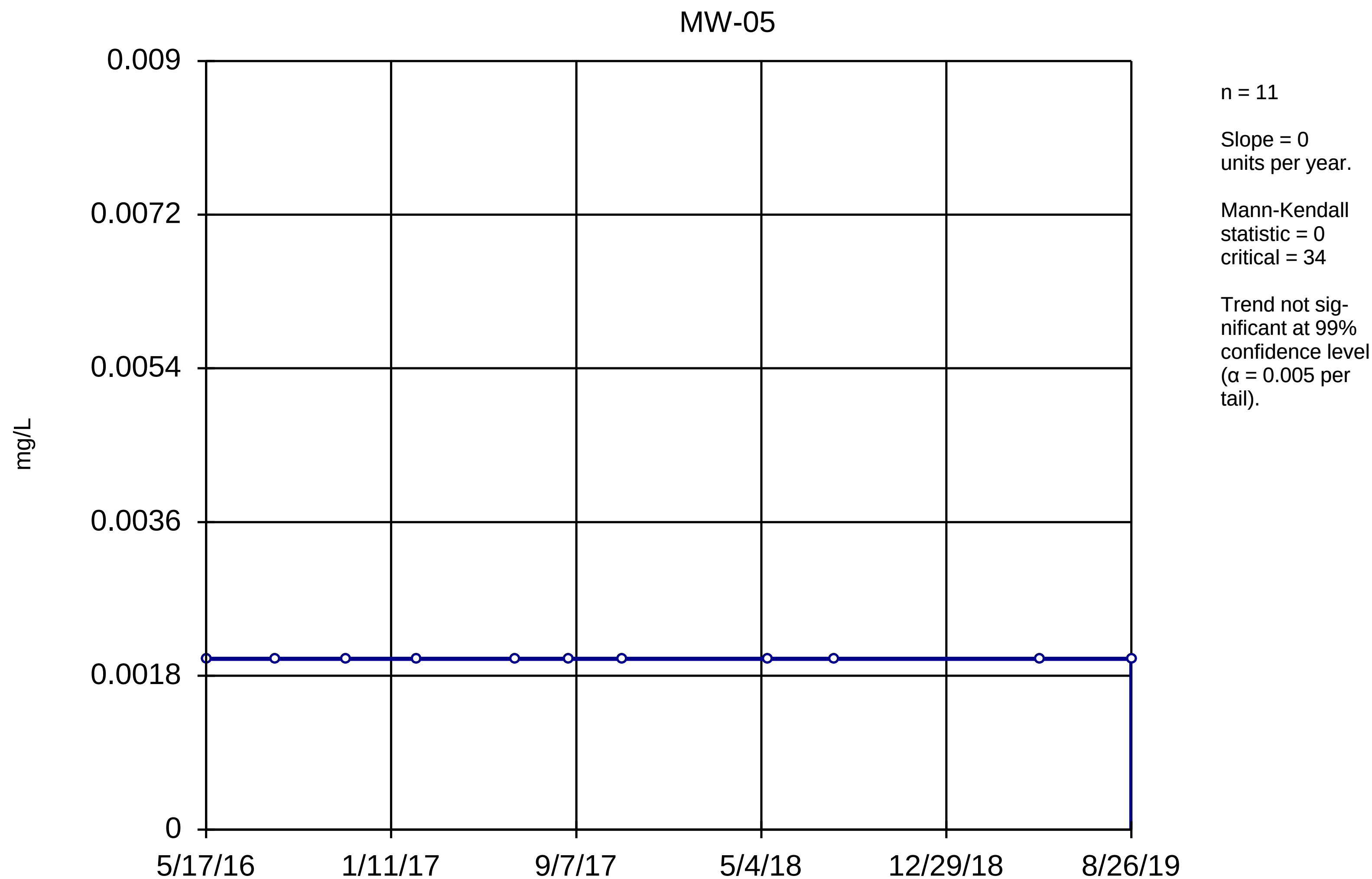
Hollow symbols indicate censored values.

## Sen's Slope Estimator

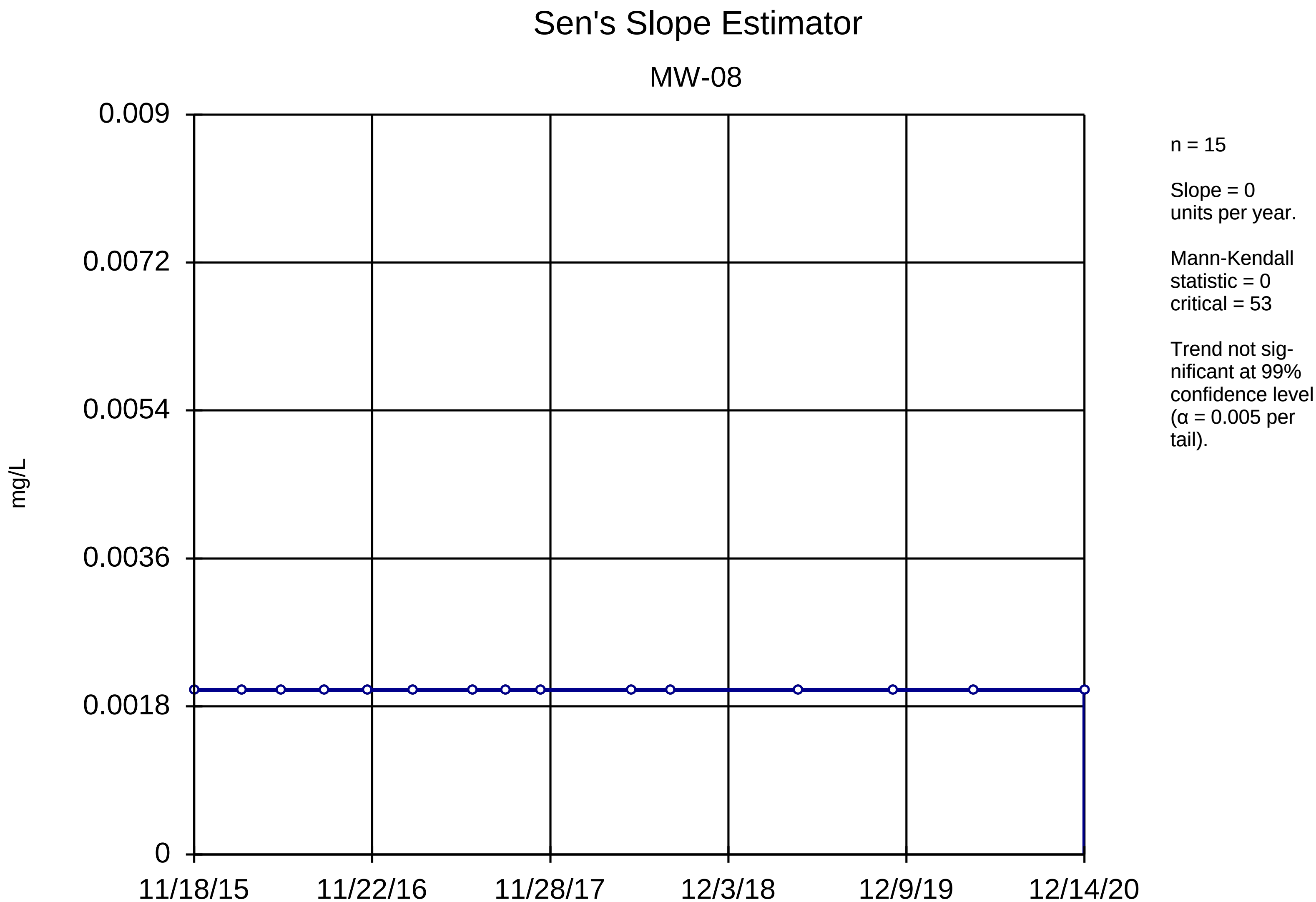



Constituent: Thallium, Total Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81880

Hollow symbols indicate censored values.




Constituent: Thallium, Total    Analysis Run 4/2/2021 11:47 AM

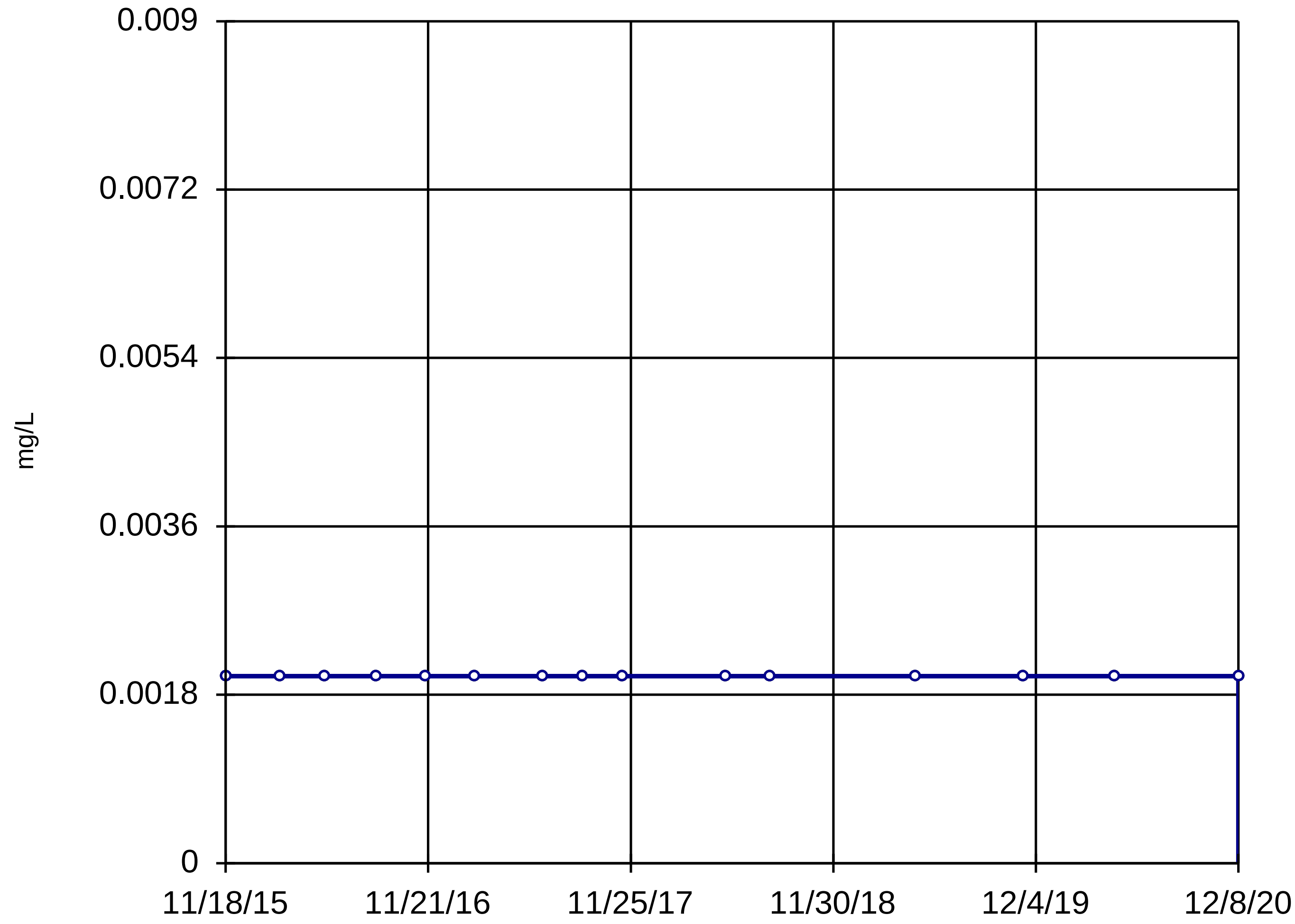
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81881

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-15




n = 15

Slope = 0
units per year.

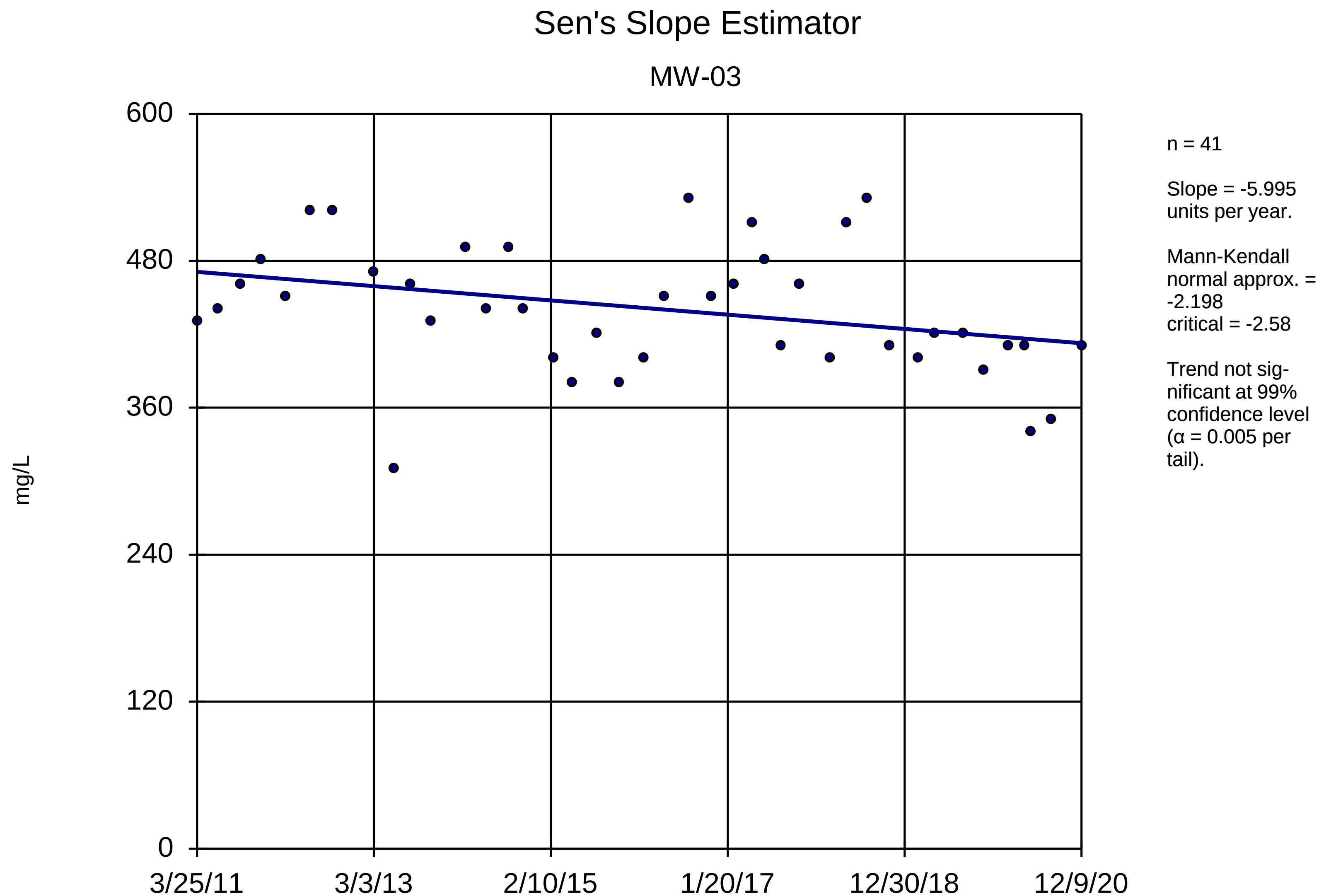
Mann-Kendall
statistic = 0
critical = 53

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Thallium, Total    Analysis Run 4/2/2021 11:47 AM

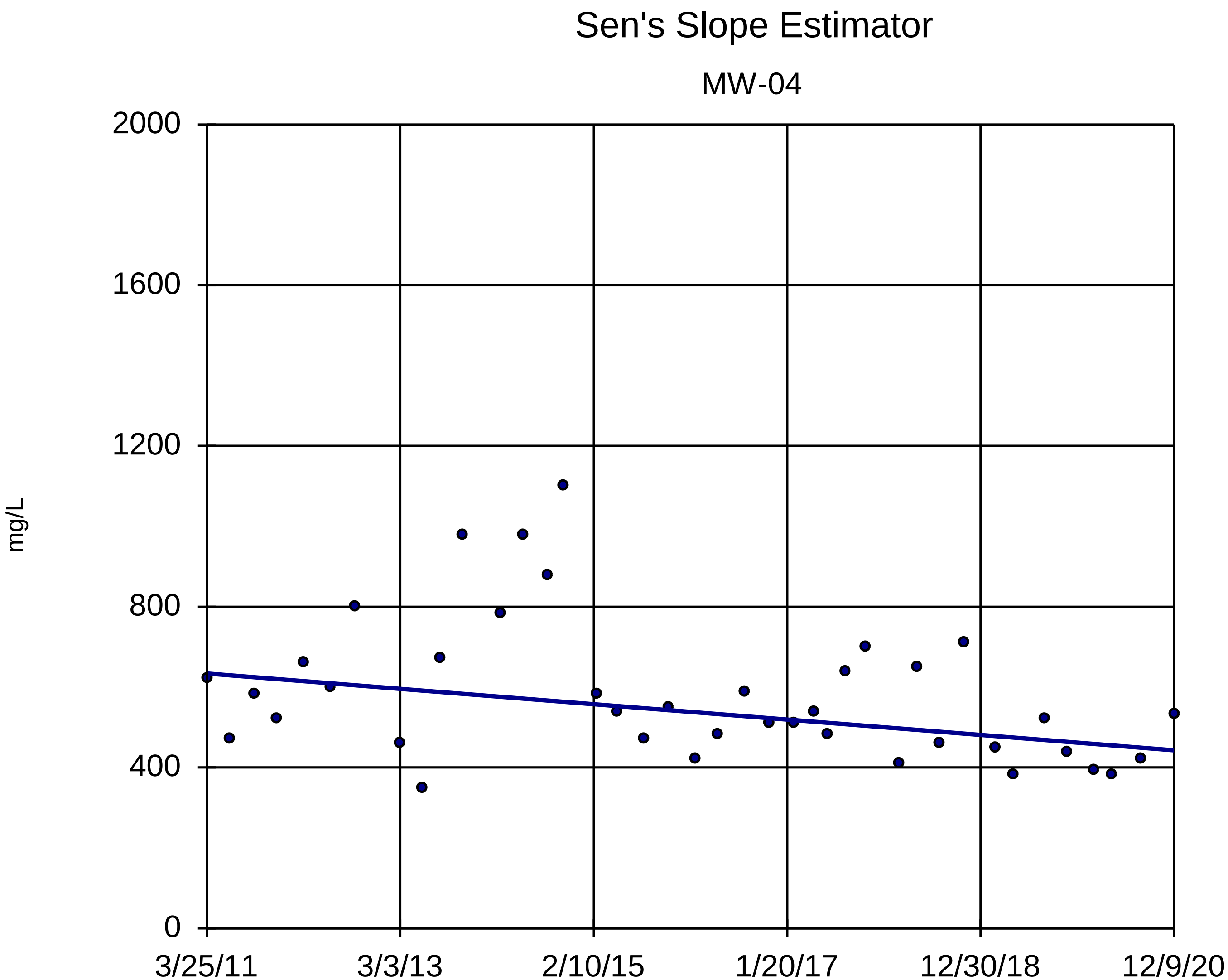
Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81882




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database




n = 40

Slope = -19.65
units per year.

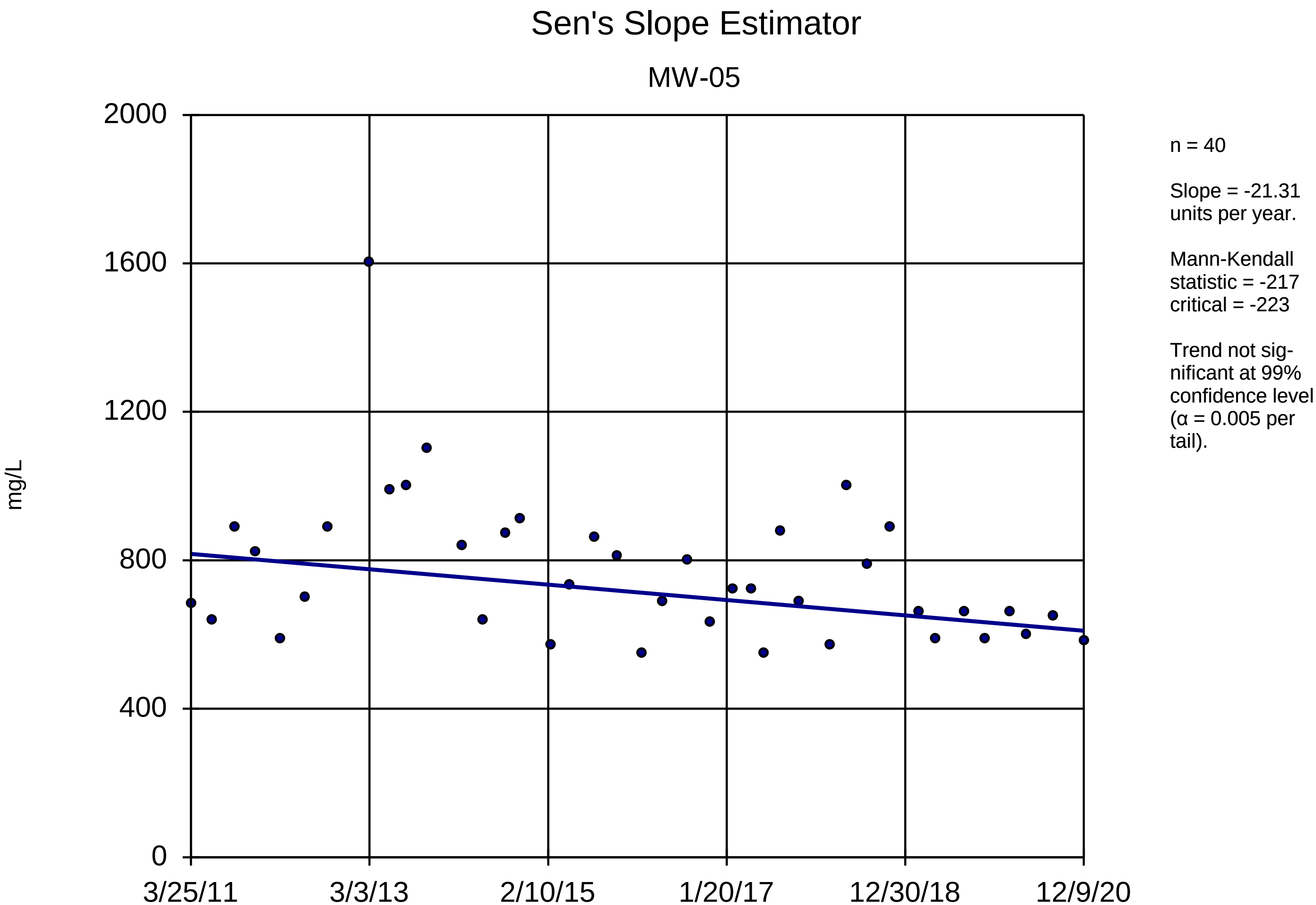
Mann-Kendall
statistic = -224
critical = -223

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:47 AM

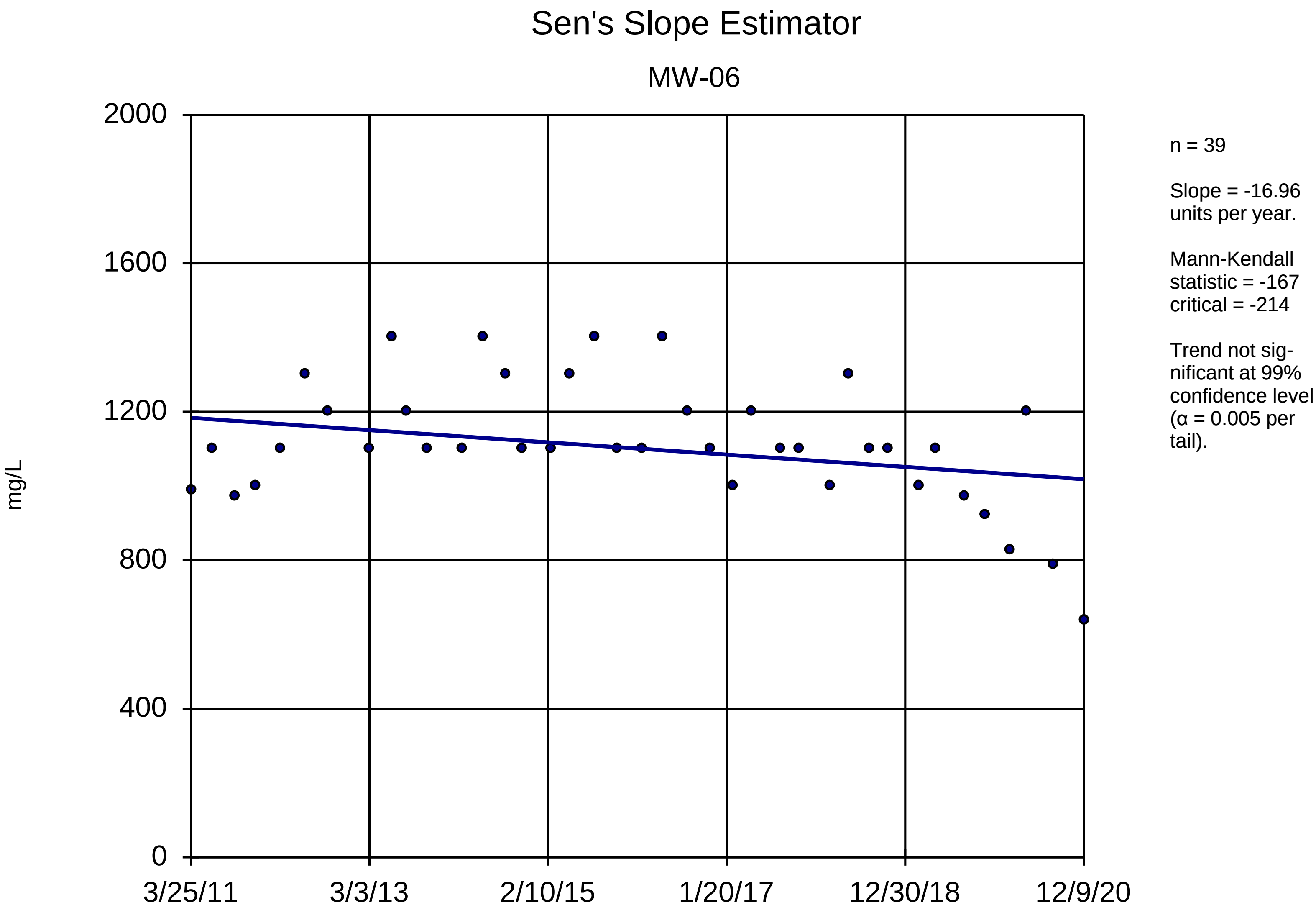
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81884




Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:47 AM

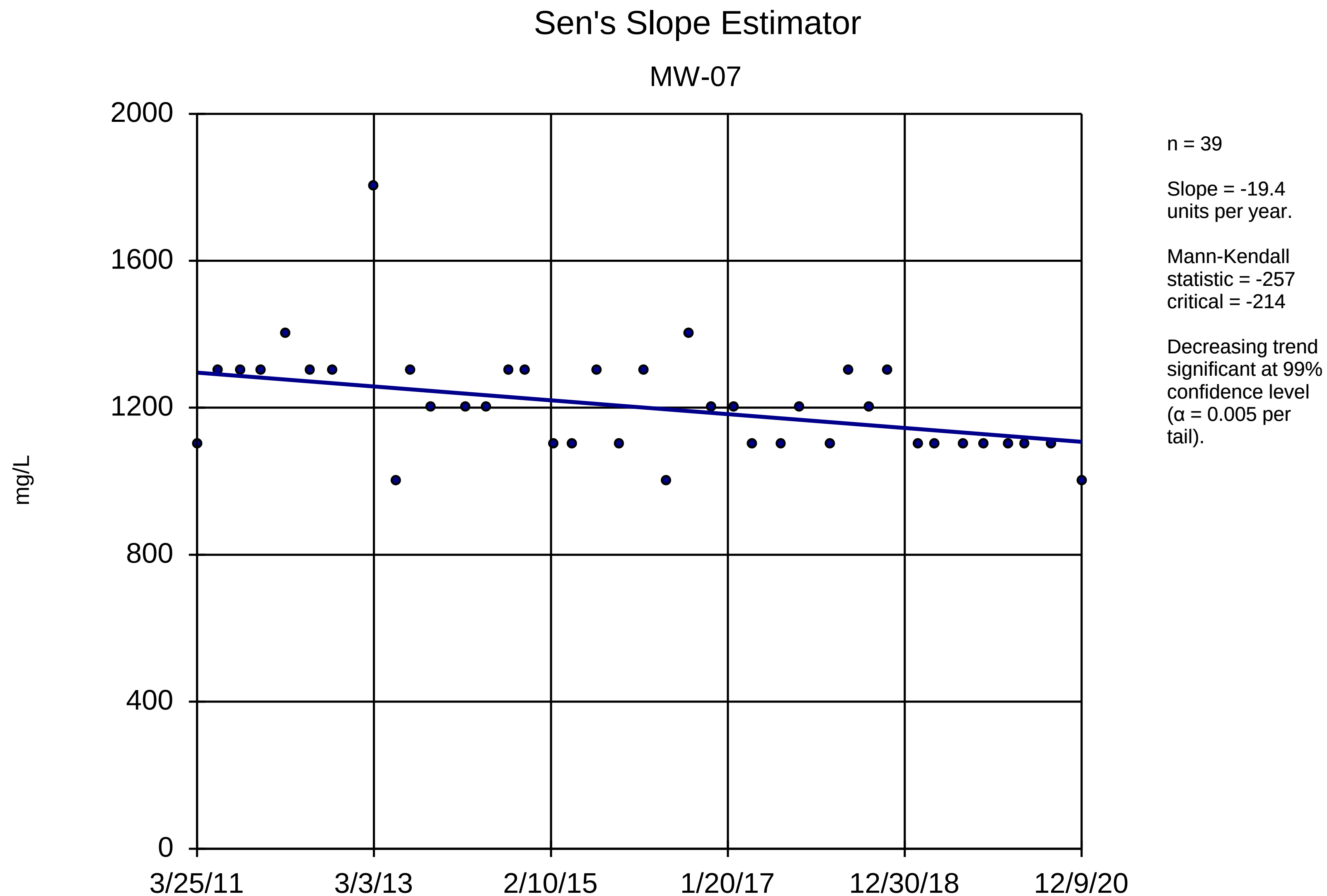
Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81886

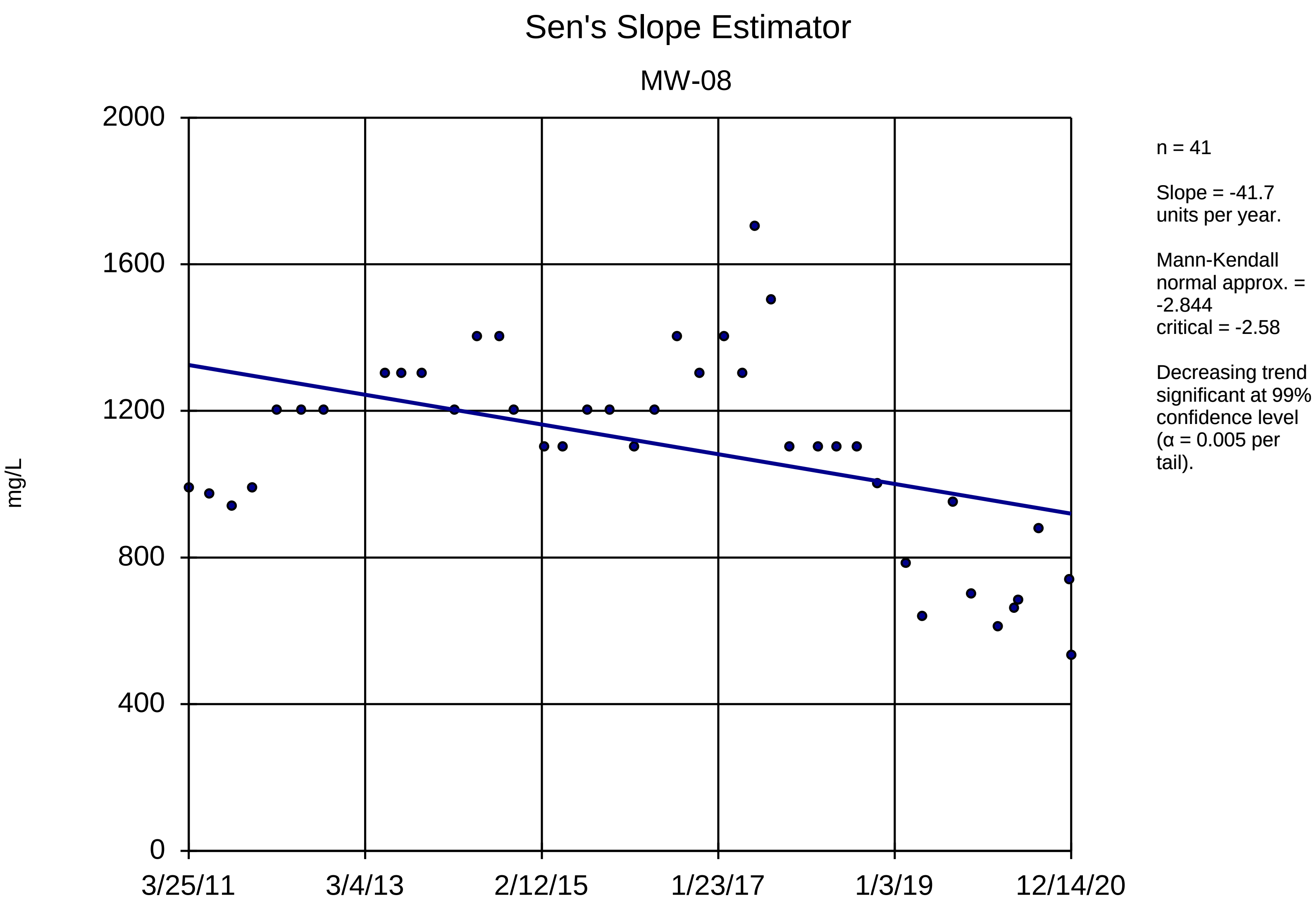



Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

Electronic Filing: Received, Clerk's Office 01/21/2022

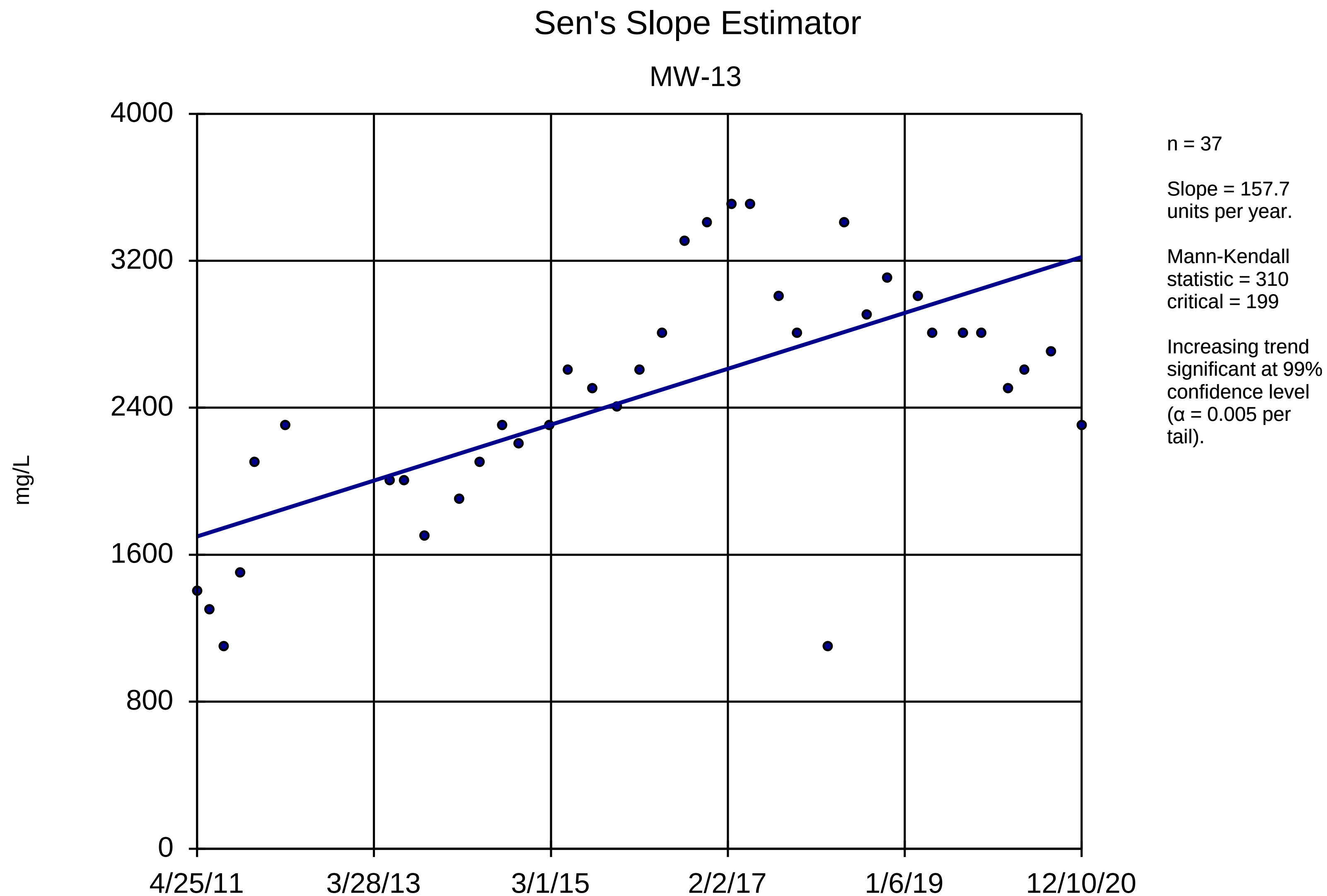





Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

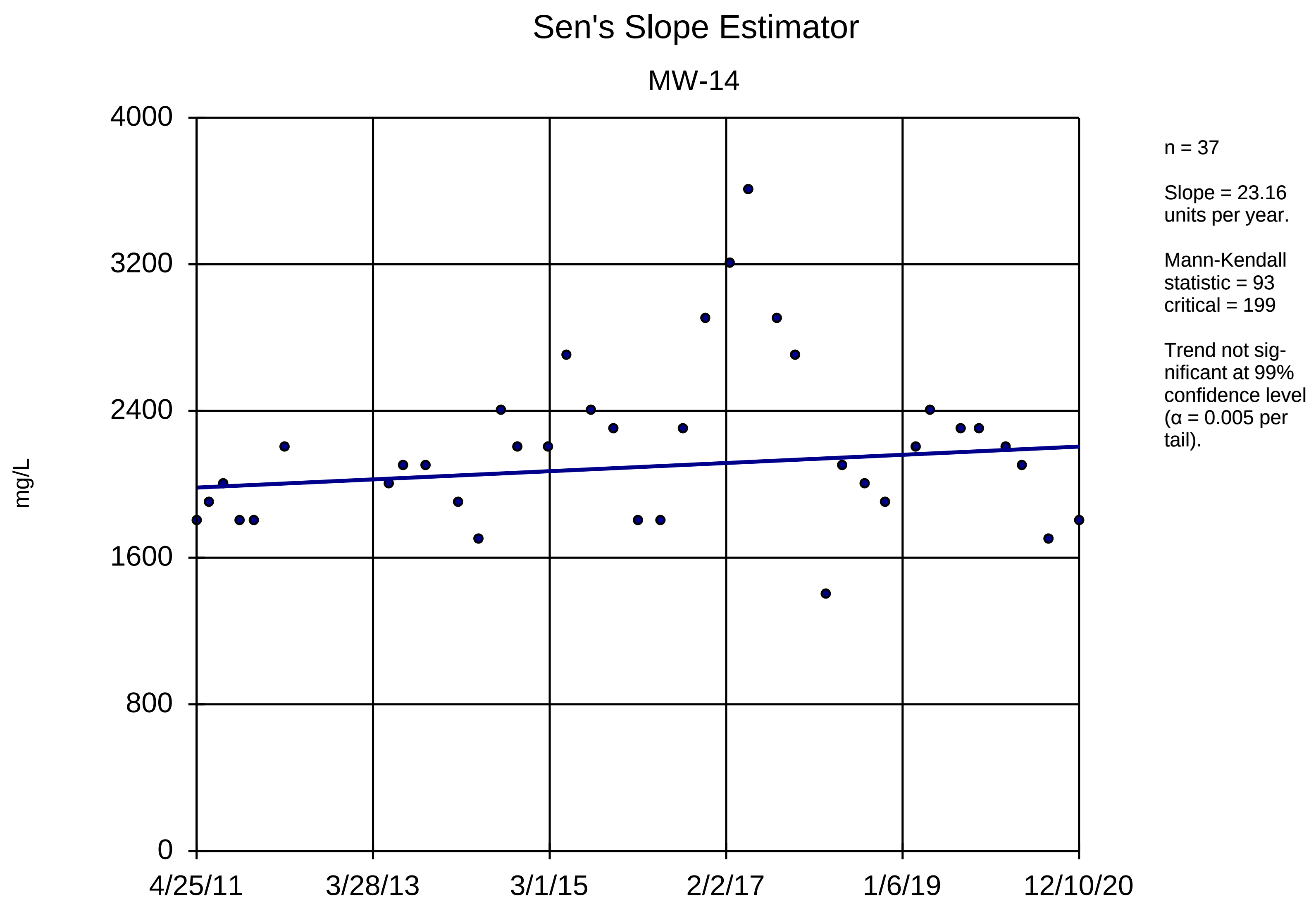
MWG13-15_81888




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

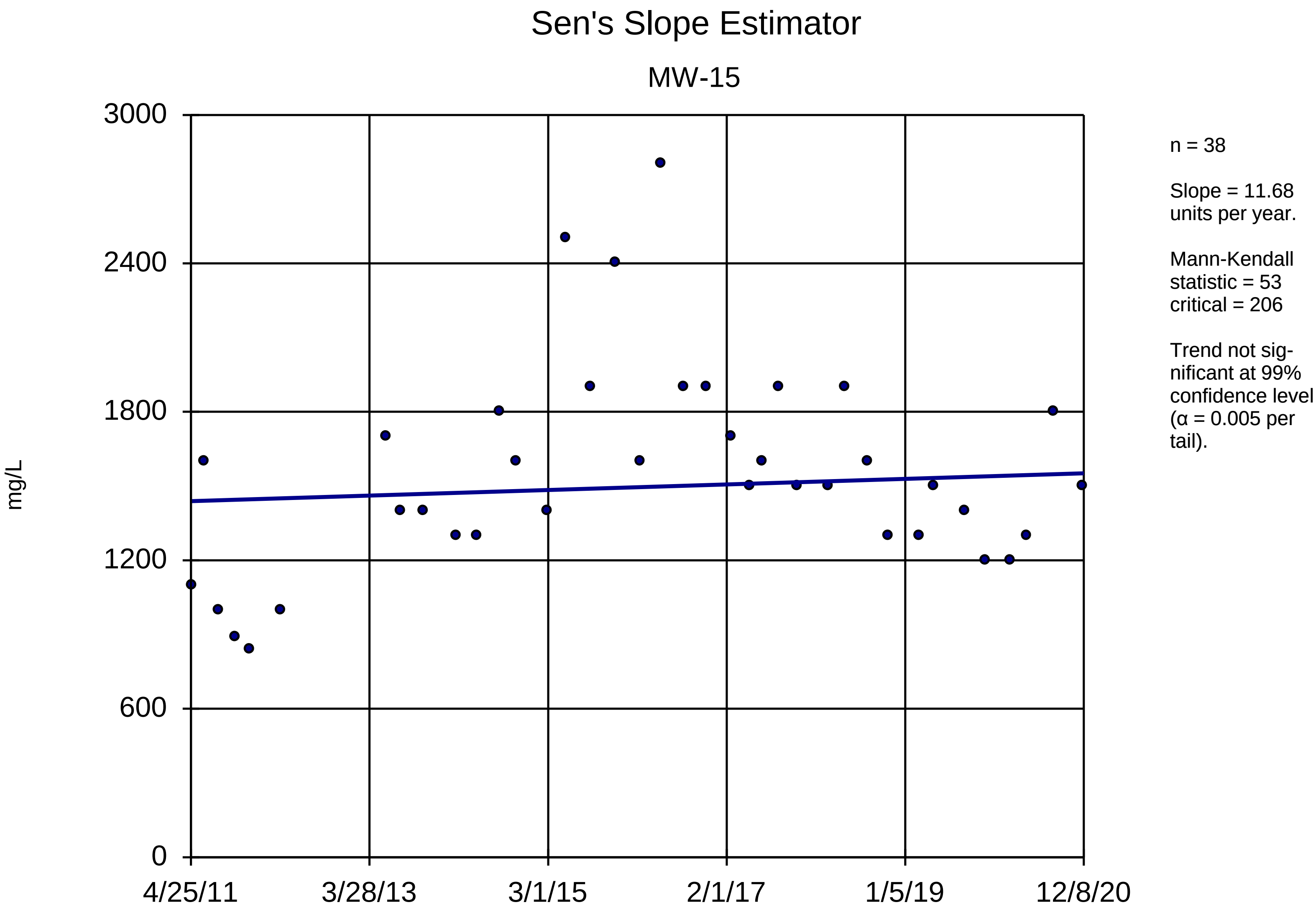
MWG13-15_81889




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 11:47 AM

Utility Site P    Client: Weaver Consultants Group    Data: Powerton Sanitas Database

MWG13-15_81890




Constituent: Total Dissolved Solids Analysis Run 4/2/2021 11:47 AM

Utility Site P Client: Weaver Consultants Group Data: Powerton Sanitas Database

MWG13-15_81891

# Trend Test

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database    Printed 4/2/2021, 12:08 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-12 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| **Arsenic, Dissolved (mg/L)** | **MW-07** | **-0.00019** | **-4.499** | **-2.58** | **Yes** | **41** | **4.878** | **n/a** | **n/a** | **0.01** | **NP** |
| **Arsenic, Dissolved (mg/L)** | **MW-08** | **-0.00...** | **-2.654** | **-2.58** | **Yes** | **41** | **9.756** | **n/a** | **n/a** | **0.01** | **NP** |
| **Arsenic, Dissolved (mg/L)** | **MW-09** | **-0.00...** | **-2.654** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Arsenic, Dissolved (mg/L) | MW-10 | 0.000... | 1.461 | 2.58 | No | 41 | 2.439 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-09 | -0.00... | -7 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-10 | -0.00... | -6 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-11 | 0.00079 | 16 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-12 | 0.000... | 16 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-07 | -0.00... | -1.226 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-08 | -0.00... | -2.136 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Dissolved (mg/L)** | **MW-09** | **0.001298** | **4.034** | **2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Dissolved (mg/L) | MW-10 | -0.00... | -2.049 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-09 | 0.008982 | 29 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-10 | 0 | 4 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-11 | 0.01931 | 17 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-12 | 0.01043 | 10 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-12 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-07 | -0.1286 | -2.013 | -2.58 | No | 41 | 2.439 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-08 | 0.08139 | 2.23 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-09 | 0 | -0.43 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-10 | 0.0763 | 2.026 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-09 | 0 | -7 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-10 | -0.1947 | -33 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-11 | 0 | -6 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-12 | -0.02005 | -8 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-12 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |

# Trend Test



Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database Printed 4/2/2021, 12:08 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium, Total (mg/L) | MW-11 | -3.571 | -40 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Calcium, Total (mg/L) | MW-12 | 2.832 | 14 | 53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-07 | -3.132 | -2.259 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-08 | -5.326 | -2.43 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Chloride (mg/L)** | **MW-09** | **10.04** | **2.639** | **2.58** | **Yes** | **44** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Chloride (mg/L) | MW-10 | 0 | 1.113 | 2.58 | No | 42 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-11 | 6.703 | 43 | 53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-12 | -3.321 | -8 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-12 | 0 | -1 | -30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-07 | 0 | 0.6339 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| **Cobalt, Dissolved (mg/L)** | **MW-08** | **0** | **2.939** | **2.58** | **Yes** | **41** | **82.93** | **n/a** | **n/a** | **0.01** | **NP** |
| Cobalt, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-12 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-07** | **-0.02826** | **-3.542** | **-2.58** | **Yes** | **41** | **2.439** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-08 | -0.00... | -0.8104 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-09 | 0.01394 | 2.167 | 2.58 | No | 44 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-10** | **0.02406** | **3.998** | **2.58** | **Yes** | **42** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-11 | -0.01639 | -19 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Fluoride (mg/L) | MW-12 | -0.02033 | -32 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-07 | 0 | 0.7184 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-09 | 0 | 0.7184 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-09 | 0 | -8 | -30 | No | 10 | 60 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-10 | 0 | -3 | -30 | No | 10 | 80 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-11 | 0 | -11 | -30 | No | 10 | 80 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-12 | 0 | -6 | -30 | No | 10 | 70 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-09 | 0 | 9 | 30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-10 | -0.00... | -9 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-11 | 0 | -7 | -30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-12 | -0.00... | -7 | -30 | No | 10 | 10 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-08 | 0 | 1.564 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-10 | 0 | 0.1268 | 2.58 | No | 41 | 97.56 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-10 | 0 | 7 | 30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |

# Trend Test

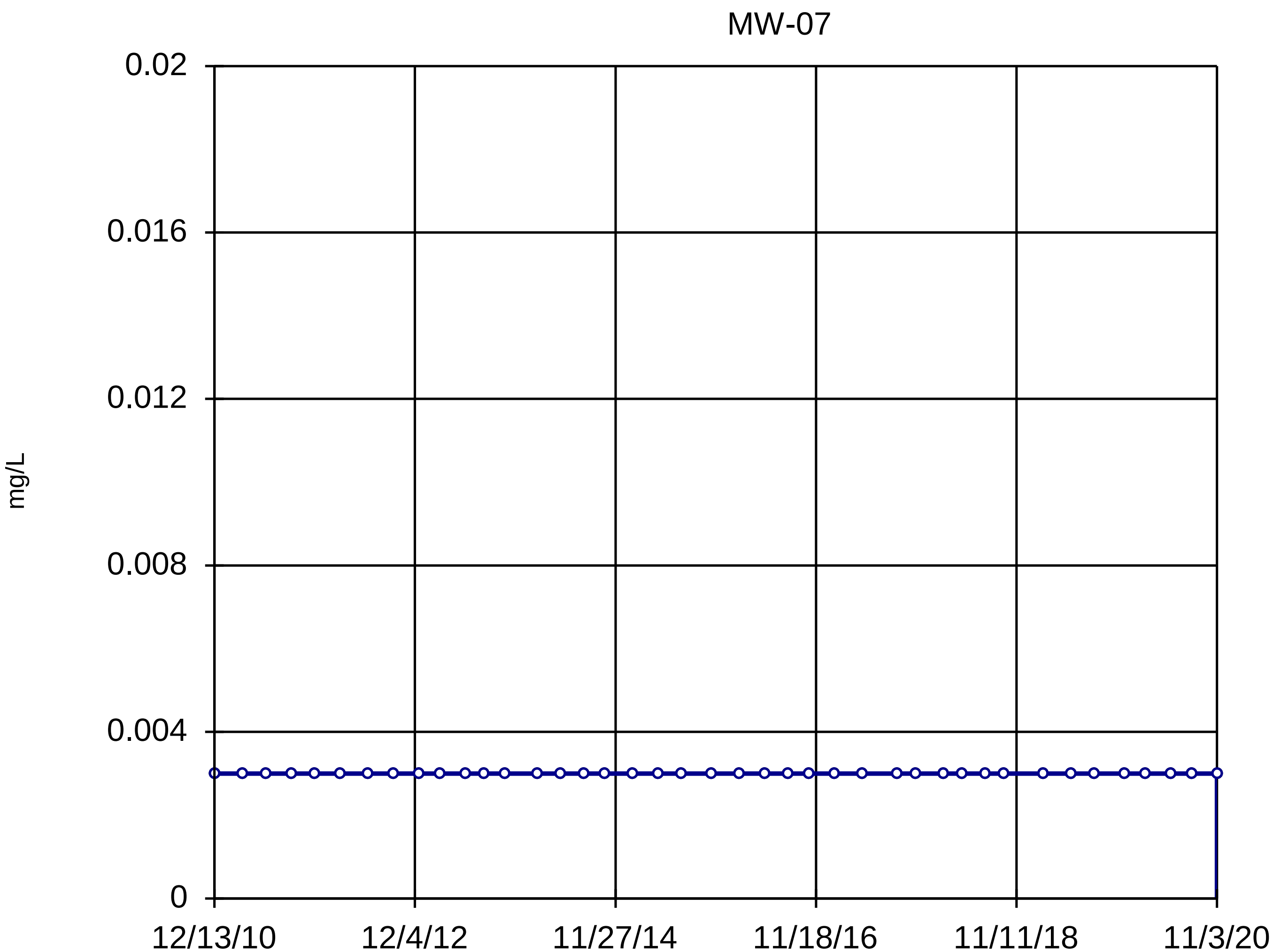


Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database    Printed 4/2/2021, 12:08 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Molybdenum, Total (mg/L) | MW-09 | -0.03011 | -10 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-10 | 0.004063 | 9 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-11 | -0.00... | -7 | -30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-12 | 0.000... | 2 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| **pH, Field (Standard Units)** | **MW-07** | **-0.0954** | **-3.18** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **pH, Field (Standard Units)** | **MW-08** | **-0.06169** | **-4.36** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **pH, Field (Standard Units)** | **MW-09** | **-0.2753** | **-6.593** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **pH, Field (Standard Units)** | **MW-10** | **-0.03769** | **-2.765** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Radium 226 + Radium 228, Combin... | MW-09 | 0 | 5 | 30 | No | 10 | 40 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-10 | -0.01989 | -1 | -30 | No | 10 | 10 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-11 | 0.01931 | 1 | 30 | No | 10 | 0 | n/a | n/a | 0.01 | NP |
| Radium 226 + Radium 228, Combin... | MW-12 | 0 | 5 | 30 | No | 10 | 50 | n/a | n/a | 0.01 | NP |
| **Selenium, Dissolved (mg/L)** | **MW-07** | **0.000...** | **3.258** | **2.58** | **Yes** | **41** | **48.78** | **n/a** | **n/a** | **0.01** | **NP** |
| Selenium, Dissolved (mg/L) | MW-08 | 0 | 1.563 | 2.58 | No | 41 | 58.54 | n/a | n/a | 0.01 | NP |
| **Selenium, Dissolved (mg/L)** | **MW-09** | **-0.00...** | **-4.197** | **-2.58** | **Yes** | **41** | **56.1** | **n/a** | **n/a** | **0.01** | **NP** |
| Selenium, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 85.37 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-09 | 0 | 9 | 30 | No | 10 | 90 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-12 | 0 | 9 | 30 | No | 10 | 50 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-07 | -4.734 | -0.4842 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-08 | 9.21 | 0.9221 | 2.58 | No | 41 | 2.439 | n/a | n/a | 0.01 | NP |
| **Sulfate (mg/L)** | **MW-09** | **-19.97** | **-5.128** | **-2.58** | **Yes** | **44** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Sulfate (mg/L)** | **MW-10** | **-12.33** | **-4.428** | **-2.58** | **Yes** | **42** | **2.381** | **n/a** | **n/a** | **0.01** | **NP** |
| **Sulfate (mg/L)** | **MW-11** | **-19.01** | **-68** | **-53** | **Yes** | **15** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Sulfate (mg/L) | MW-12 | -23.7 | -50 | -53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-07 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-08 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-09 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-10 | 0 | 0 | 2.58 | No | 41 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-09 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-10 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-11 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-12 | 0 | 0 | 30 | No | 10 | 100 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-07 | 0 | -0.05693 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-08 | 14.23 | 1.157 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-09 | -2.653 | -0.537 | -2.58 | No | 44 | 0 | n/a | n/a | 0.01 | NP |
| **Total Dissolved Solids (mg/L)** | **MW-10** | **-12.03** | **-3.225** | **-2.58** | **Yes** | **42** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Total Dissolved Solids (mg/L) | MW-11 | 0 | 2 | 53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-12 | 14.48 | 12 | 53 | No | 15 | 0 | n/a | n/a | 0.01 | NP |

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81895

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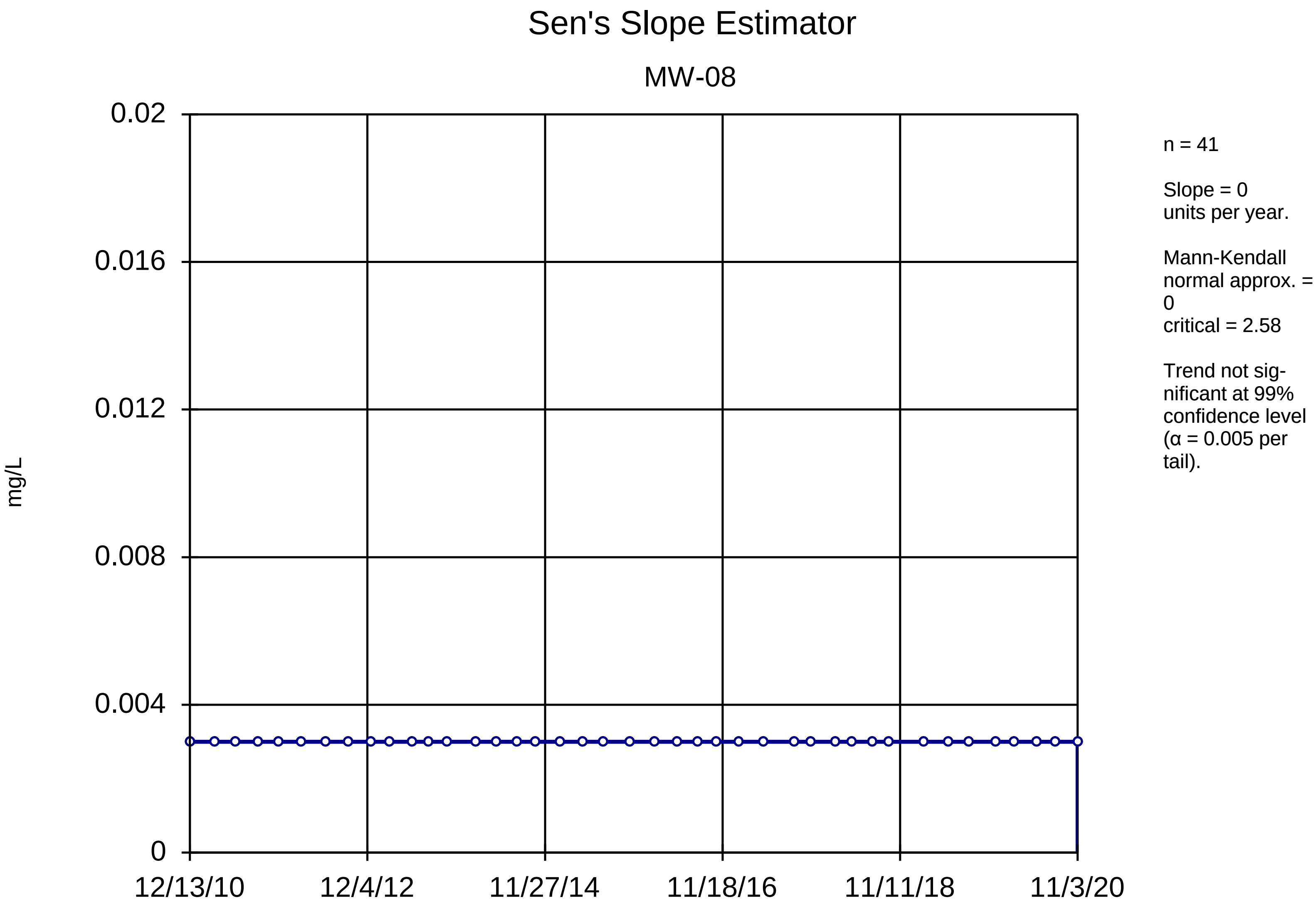
Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved Analysis Run 4/2/2021 12:05 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81896

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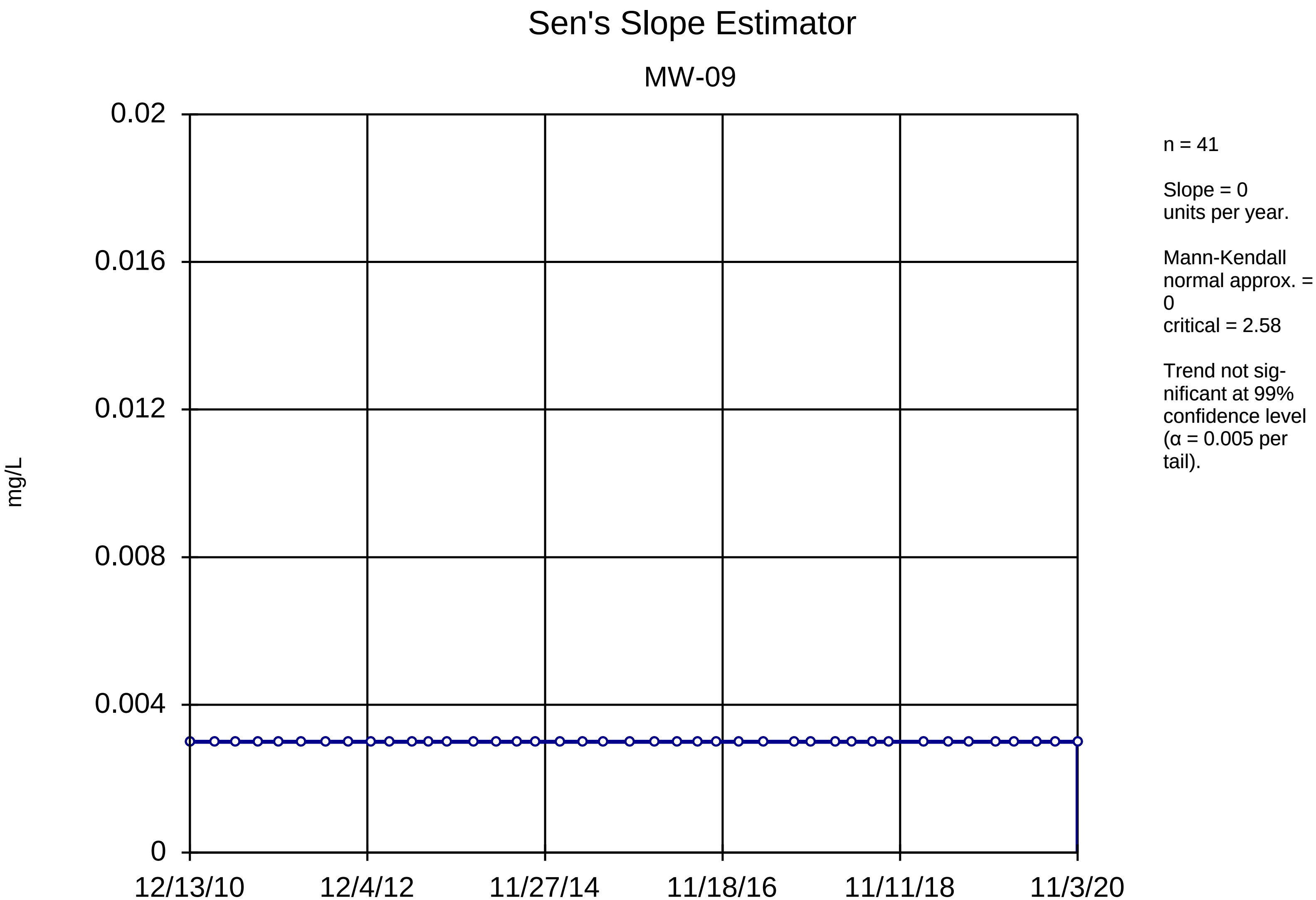


Constituent: Antimony, Dissolved Analysis Run 4/2/2021 12:05 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81897

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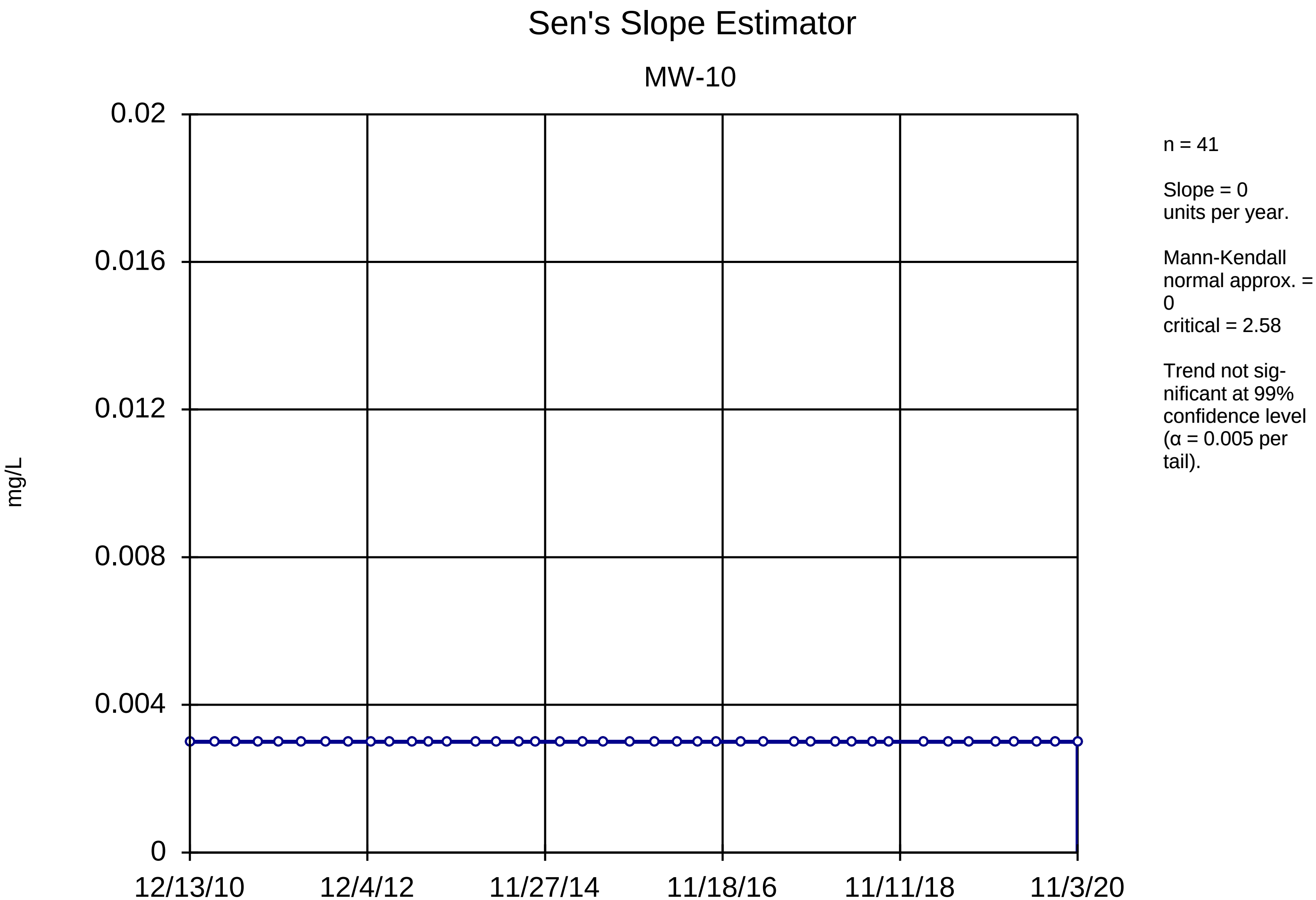


Constituent: Antimony, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81898

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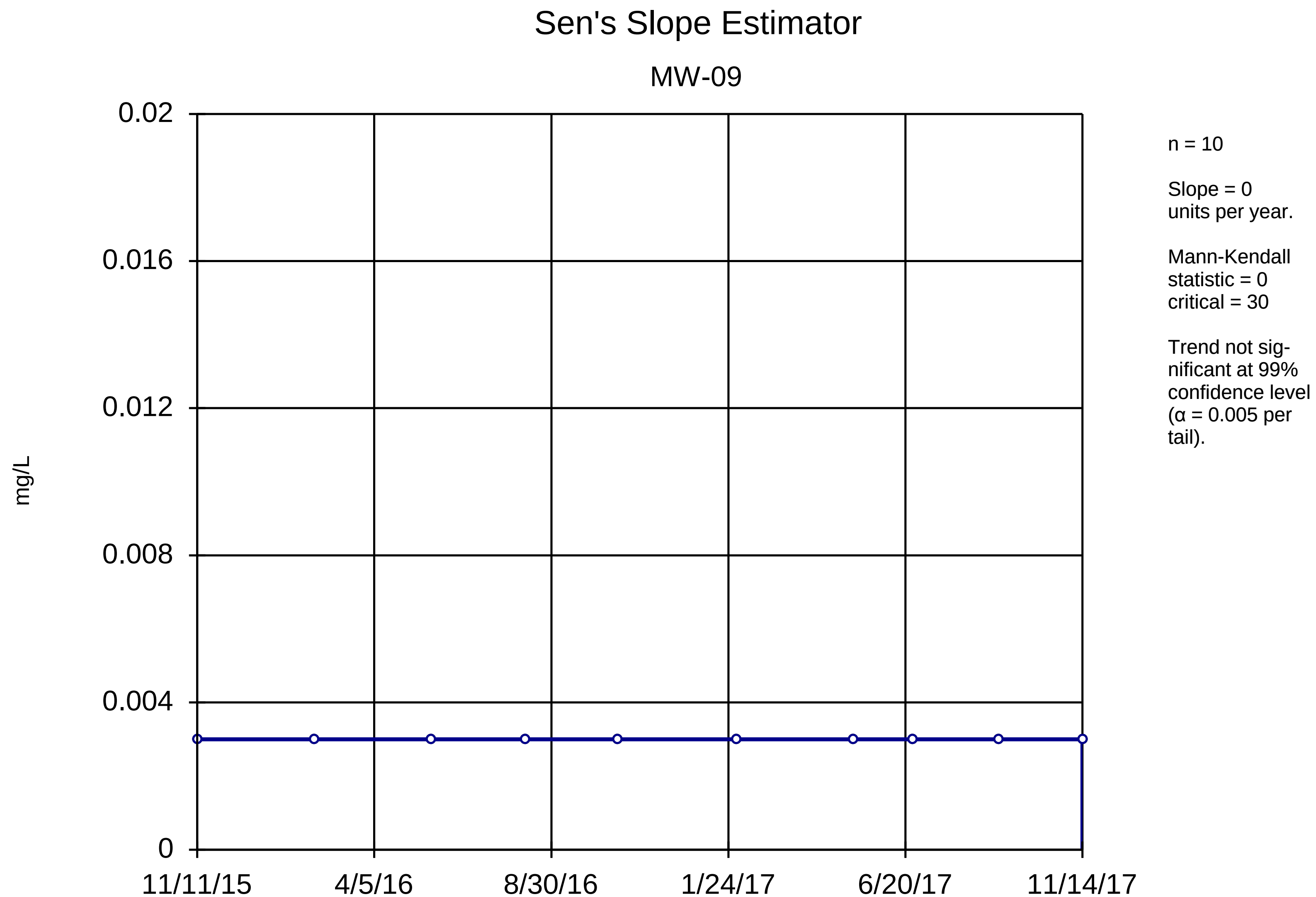
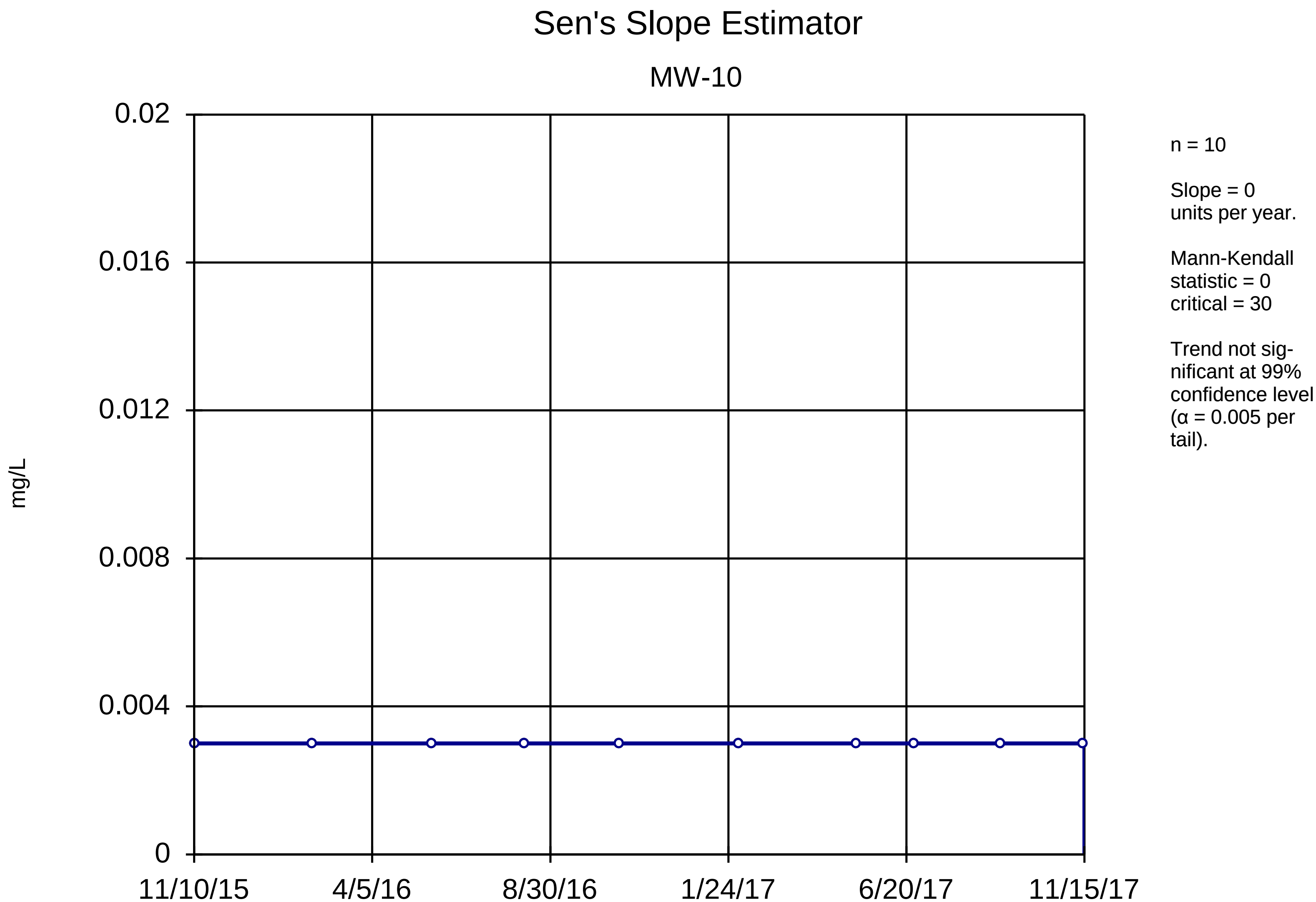



Constituent: Antimony, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

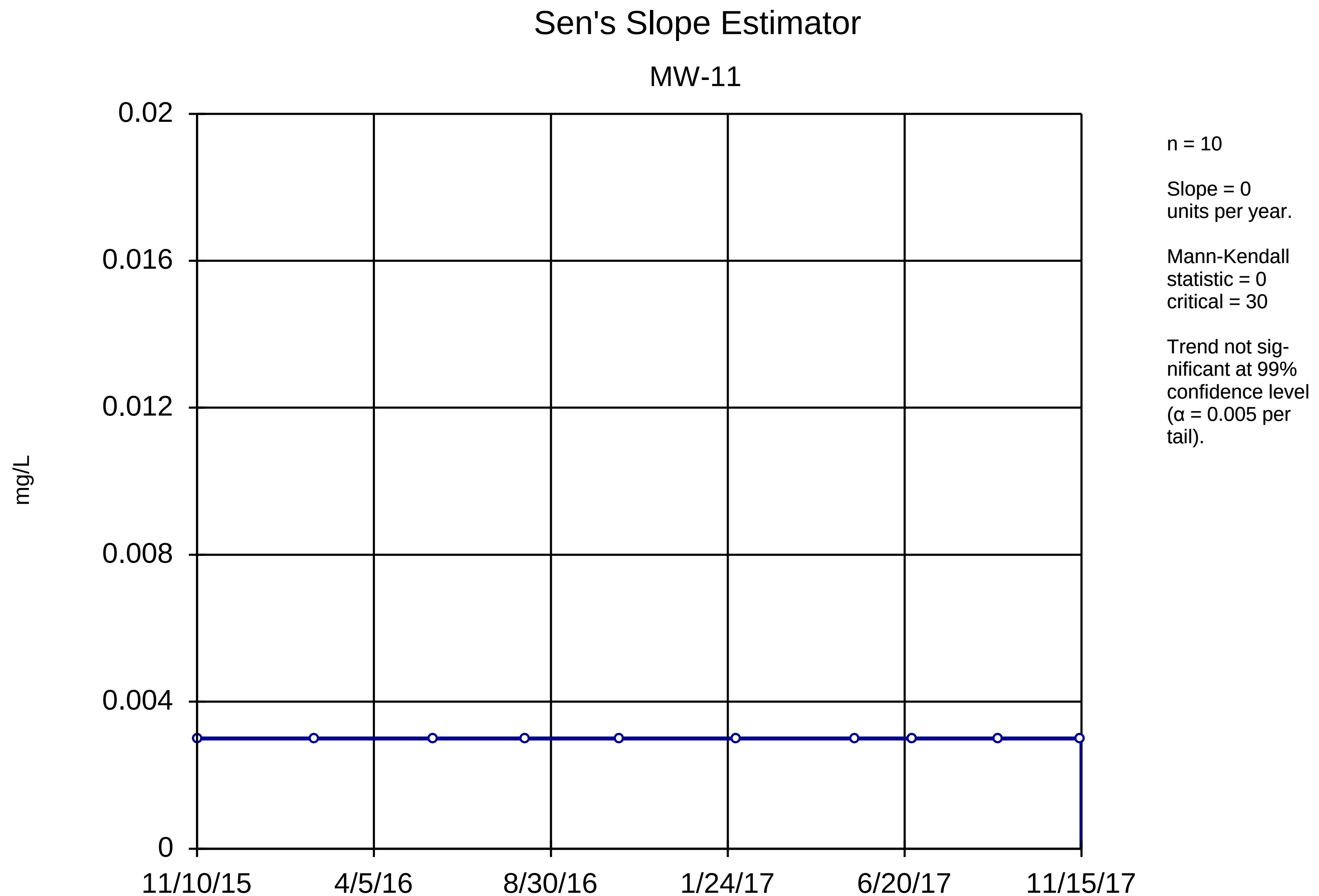
Hollow symbols indicate censored values.




Constituent: Antimony, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.




Constituent: Antimony, Total    Analysis Run 4/2/2021 12:05 PM

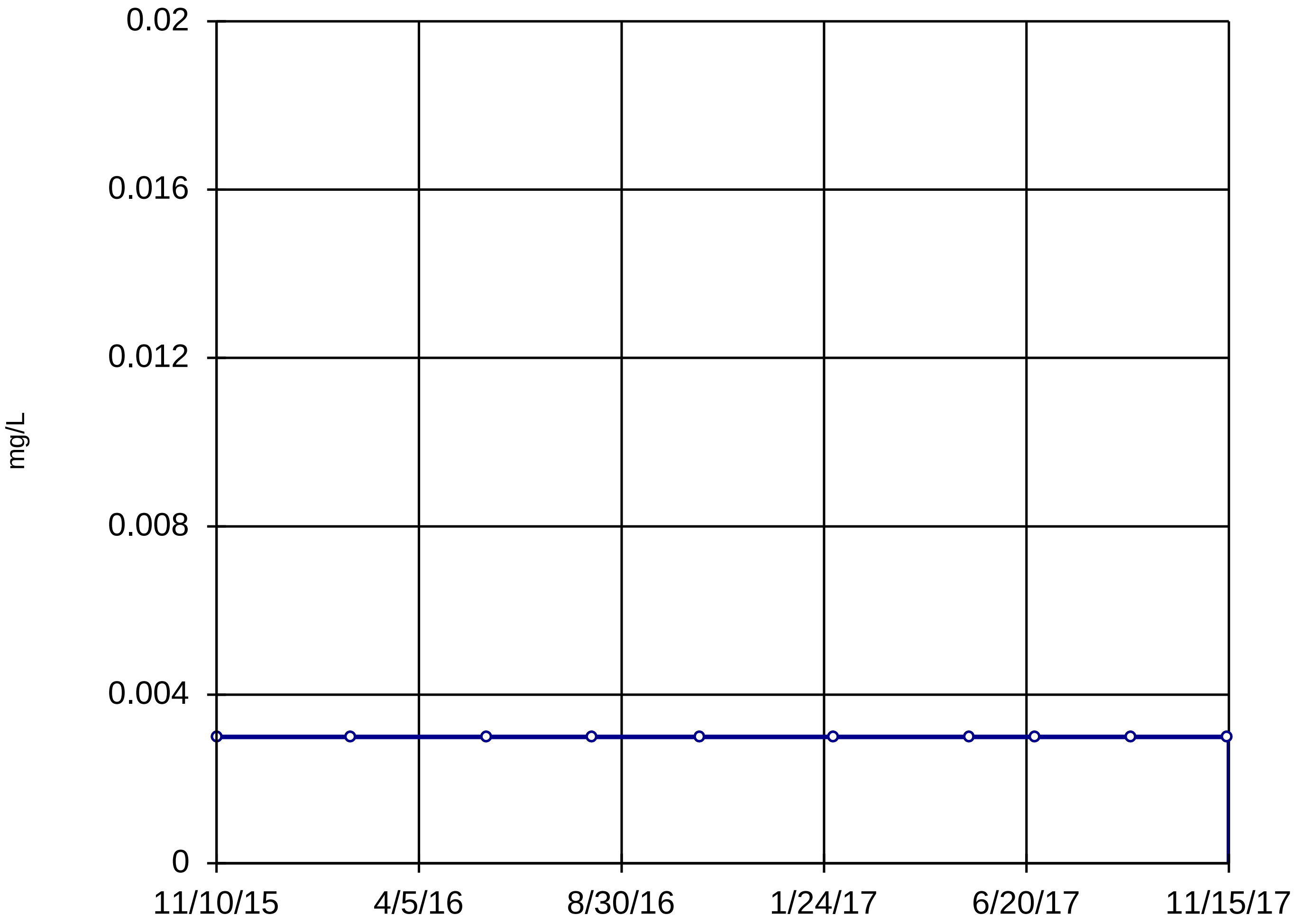
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81901

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-12




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81902

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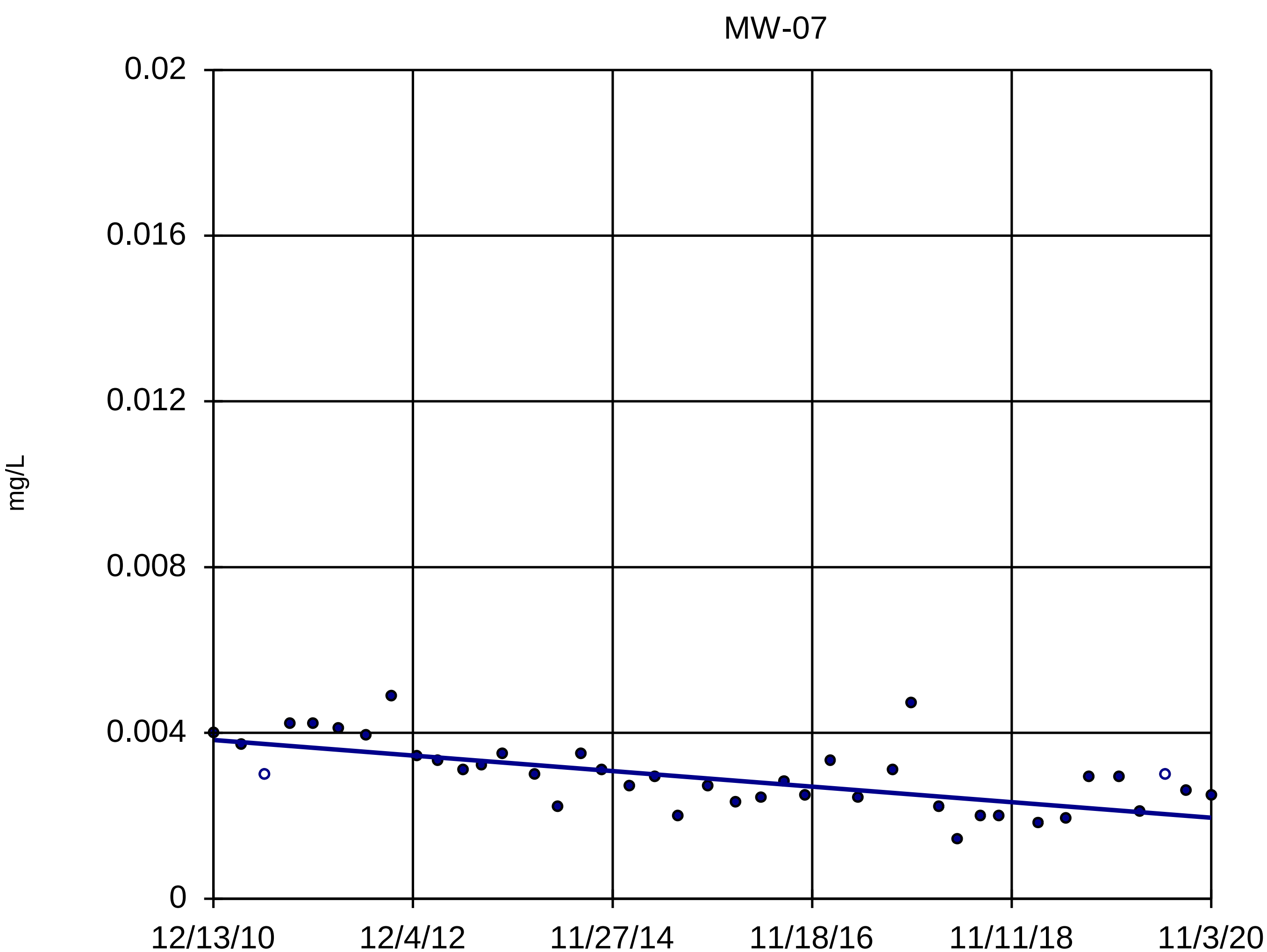
# Sen's Slope Estimator




n = 41

Slope = -0.00019 units per year.

Mann-Kendall normal approx. = -4.499
critical = -2.58

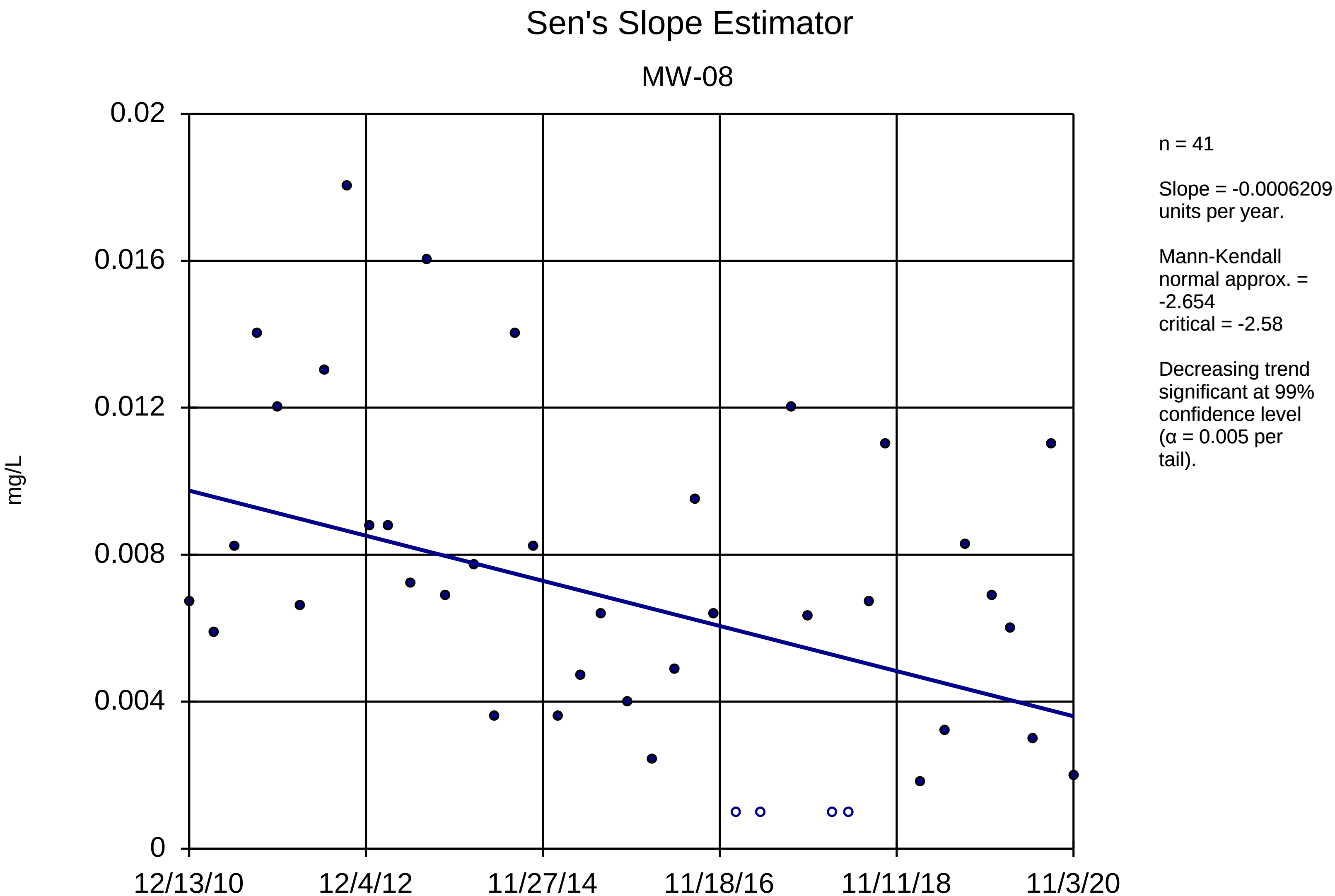
Decreasing trend significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81903

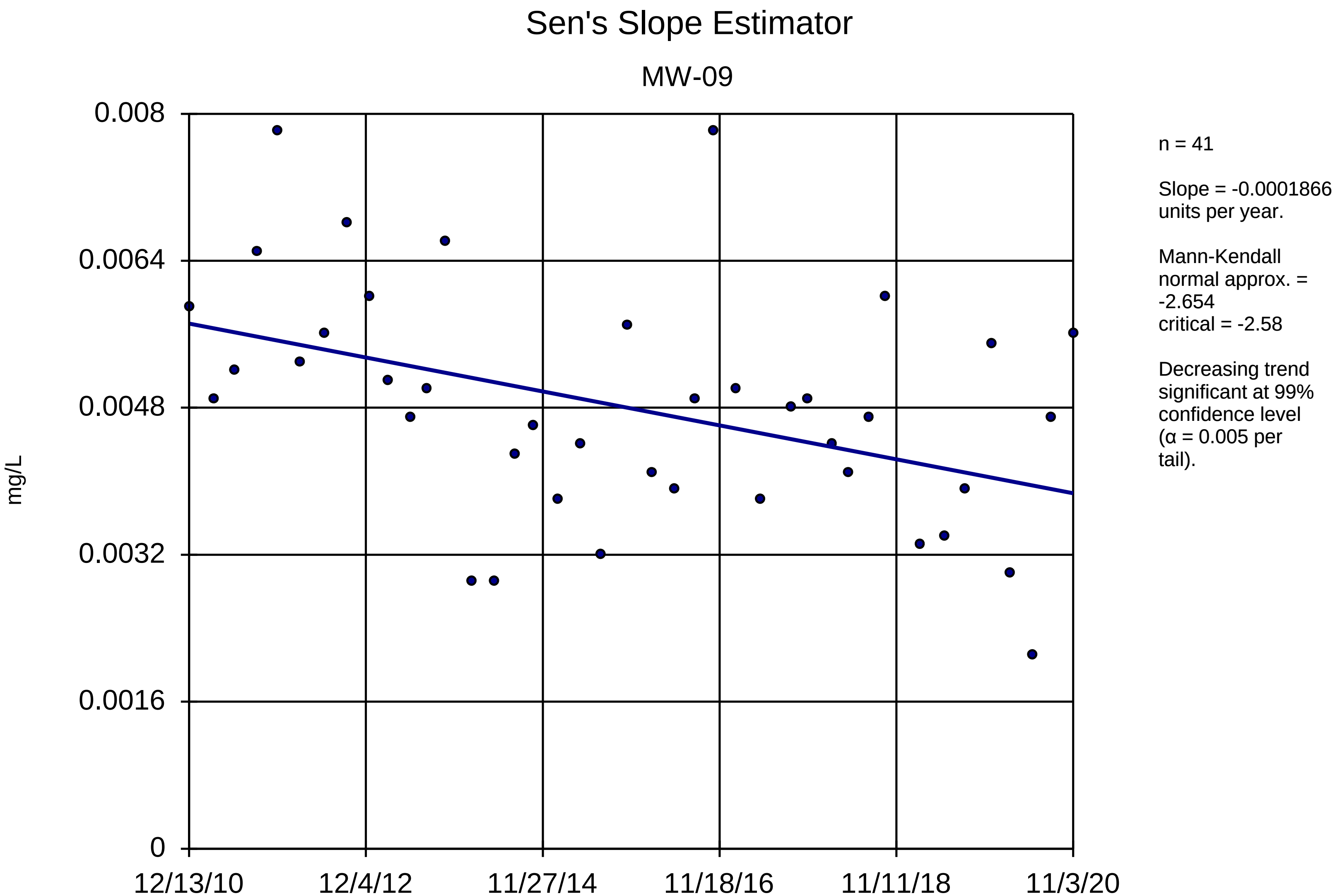
Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81904

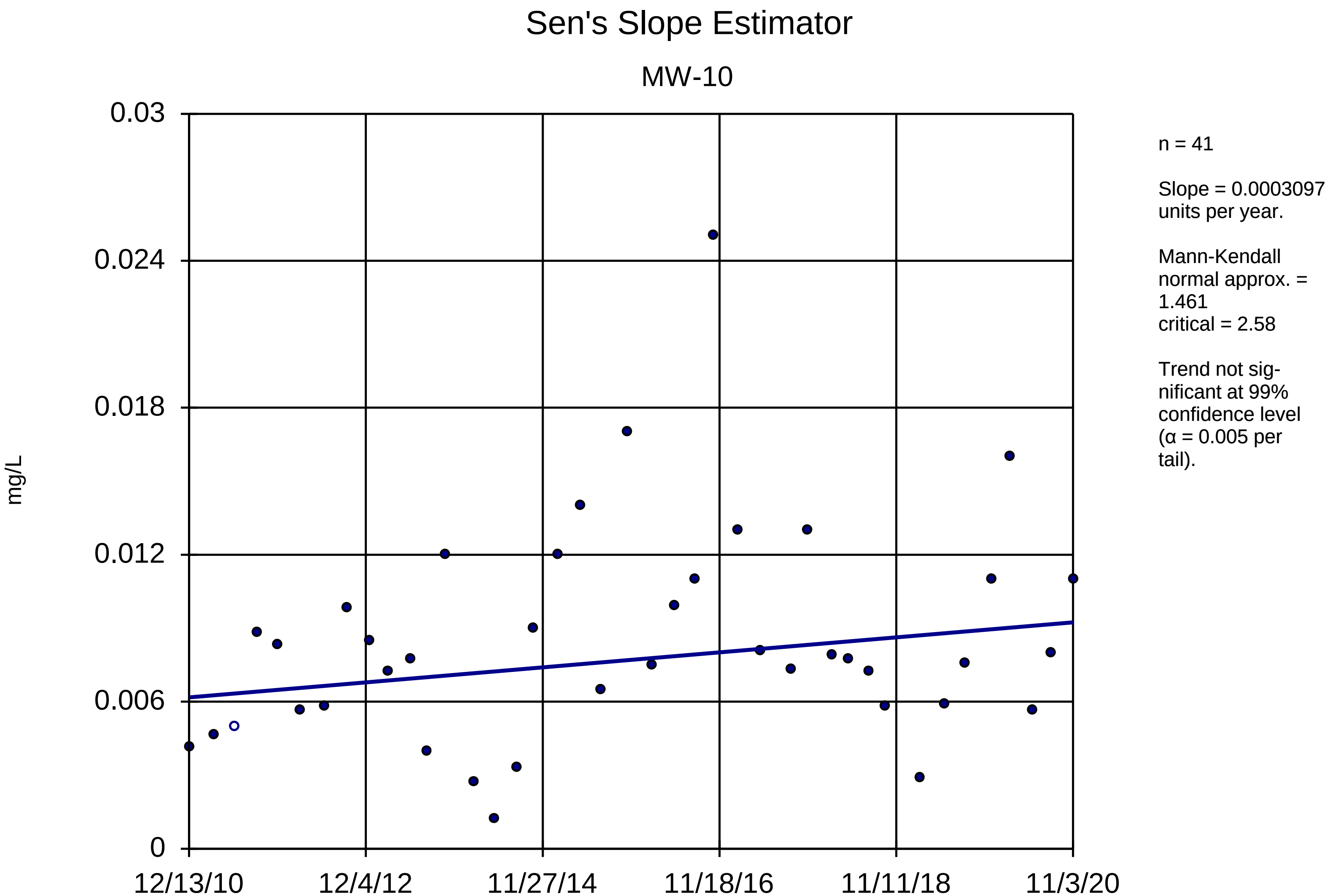



Constituent: Arsenic, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81905

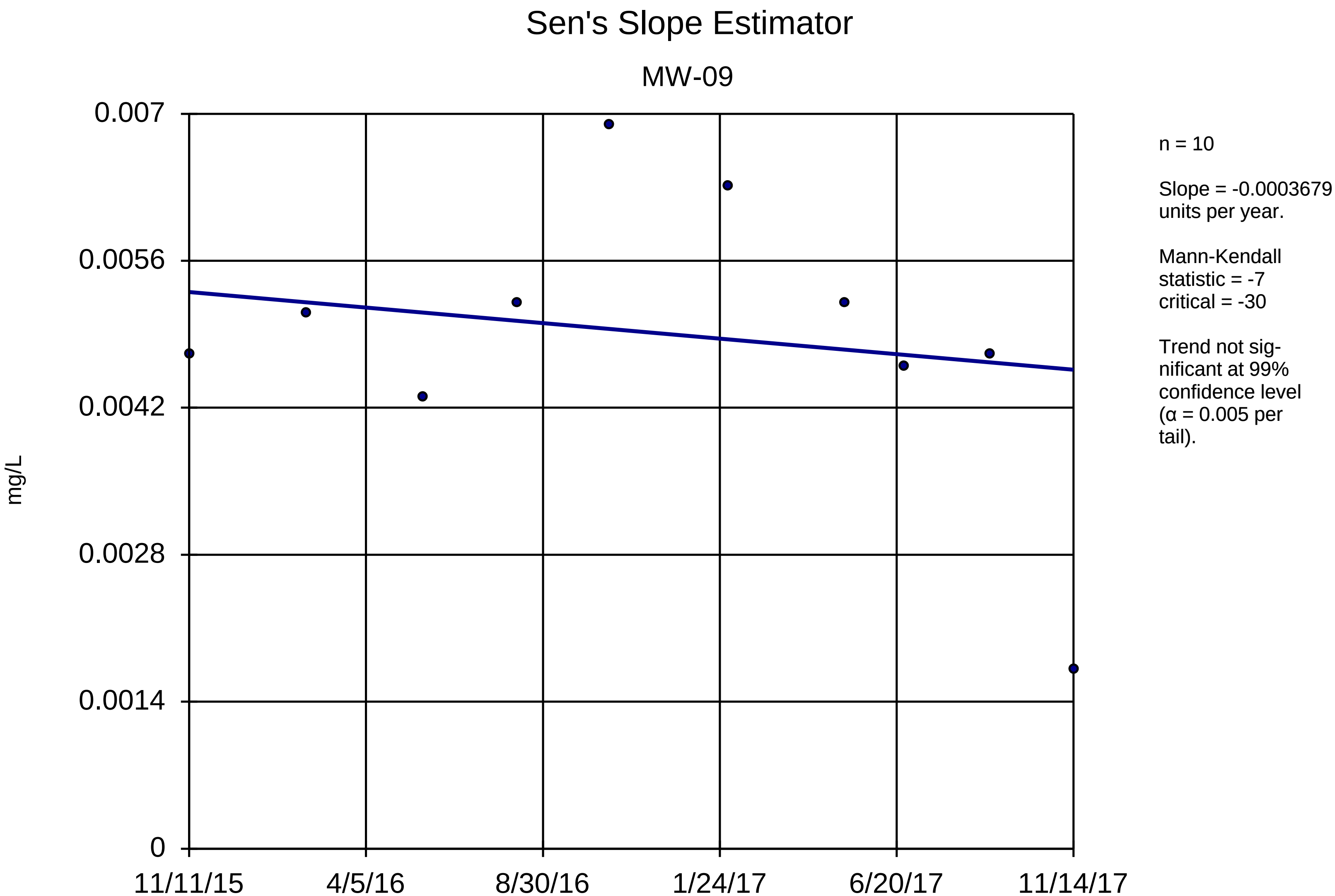
Hollow symbols indicate censored values.




Constituent: Arsenic, Dissolved Analysis Run 4/2/2021 12:05 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

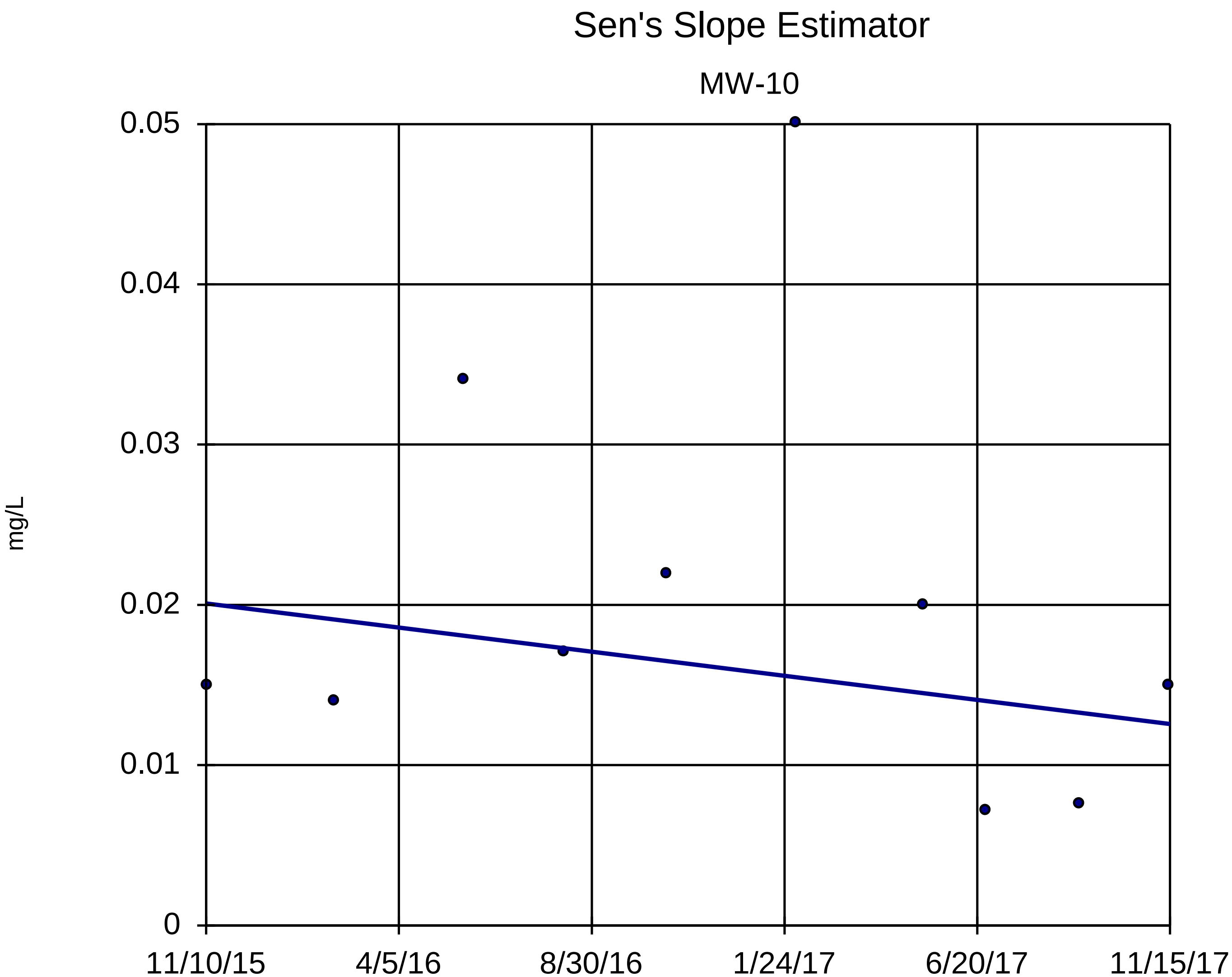
MWG13-15_81906




Constituent: Arsenic, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81907




n = 10

Slope = -0.003724 units per year.

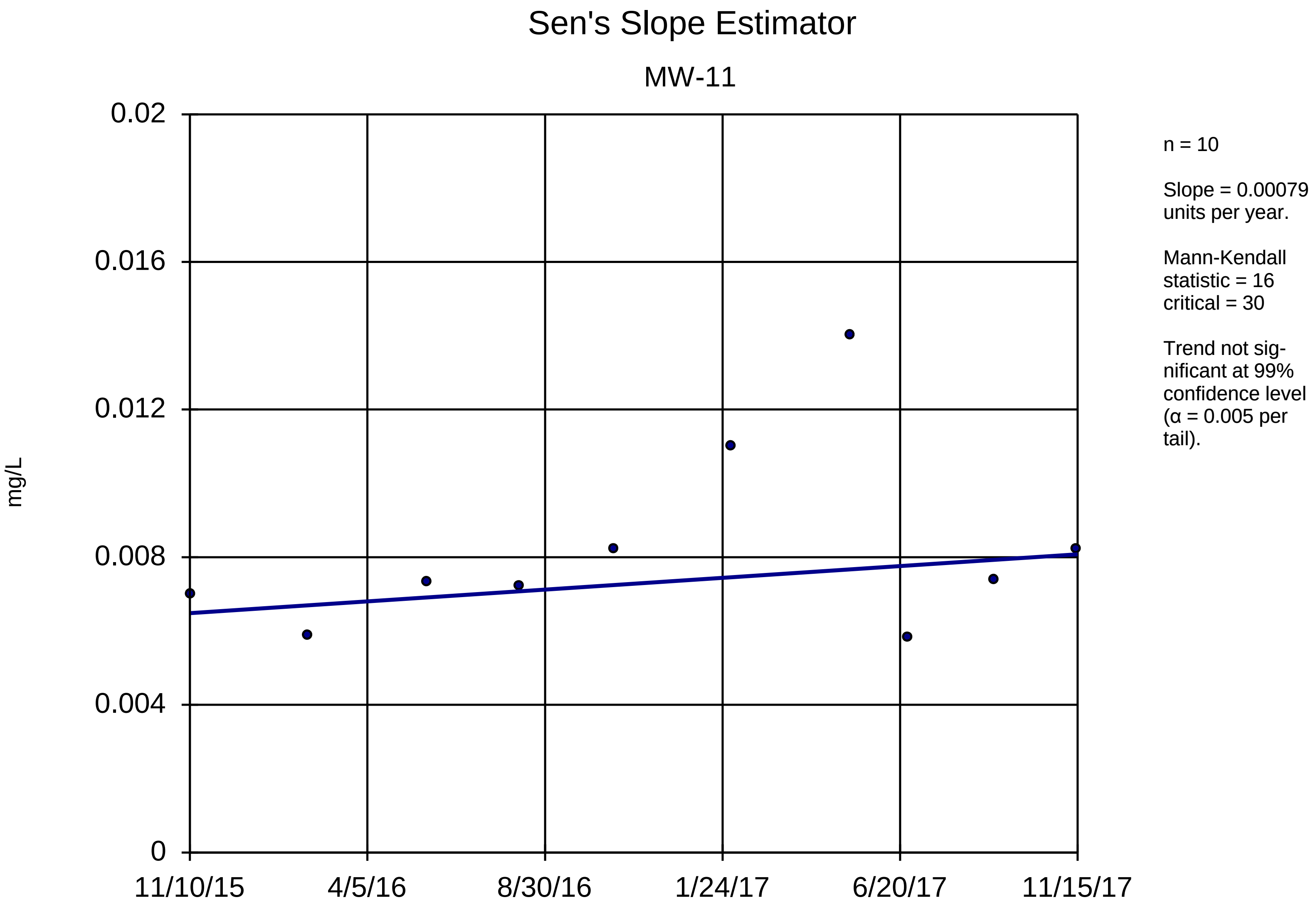
Mann-Kendall statistic = -6 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81908



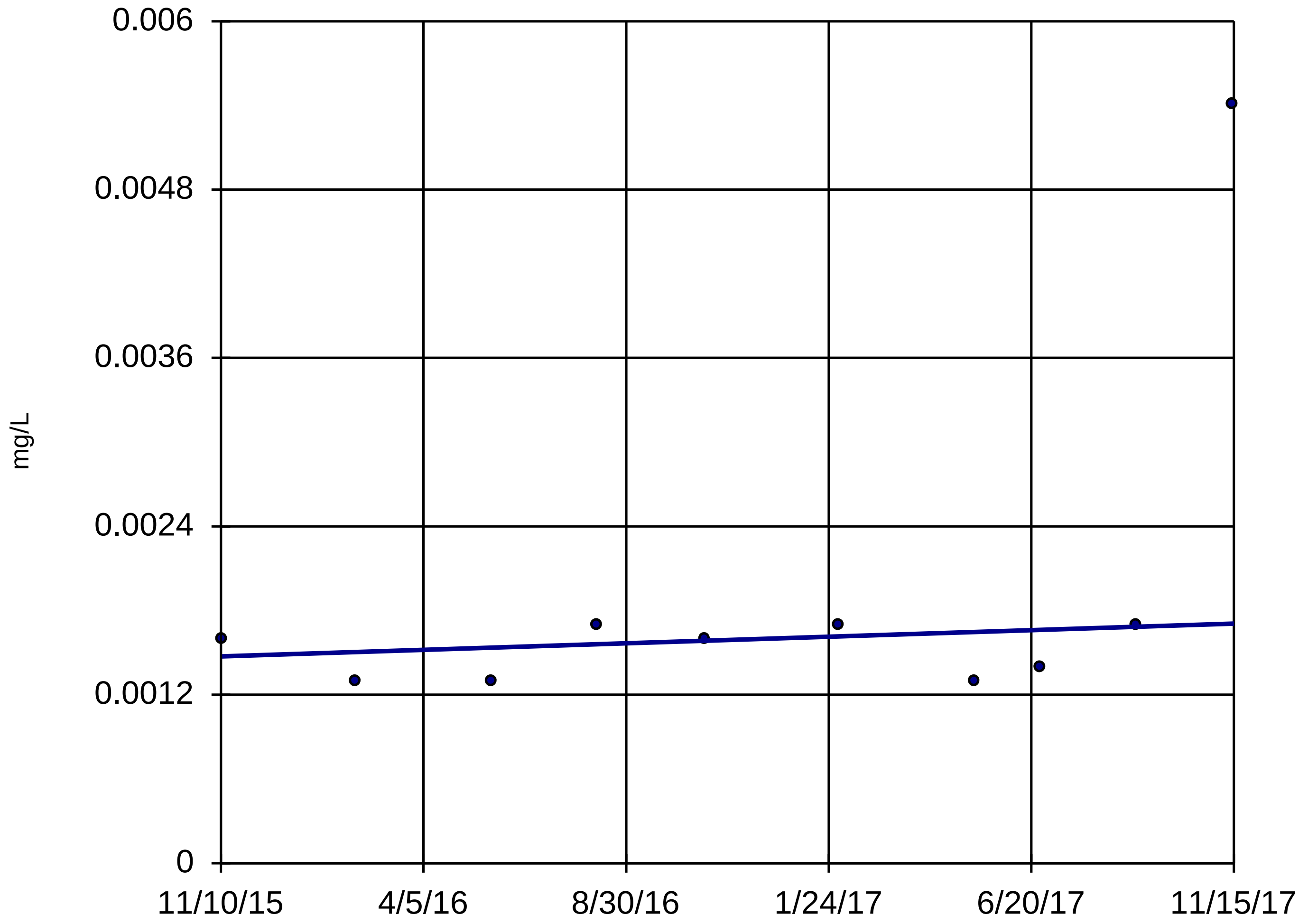

Constituent: Arsenic, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81909

## Sen's Slope Estimator

MW-12




n = 10

Slope = 0.0001159 units per year.

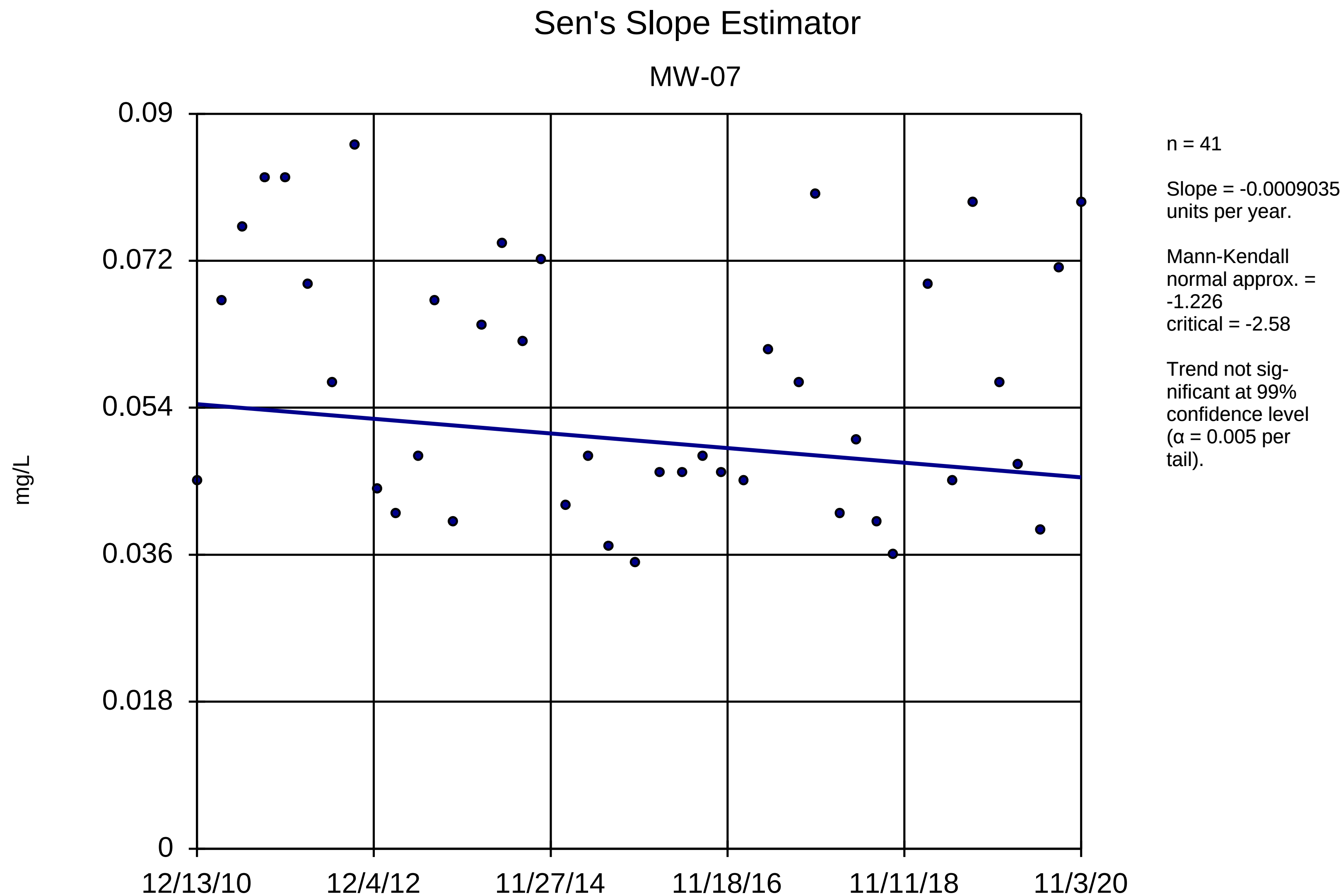
Mann-Kendall statistic = 16 critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Arsenic, Total Analysis Run 4/2/2021 12:05 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

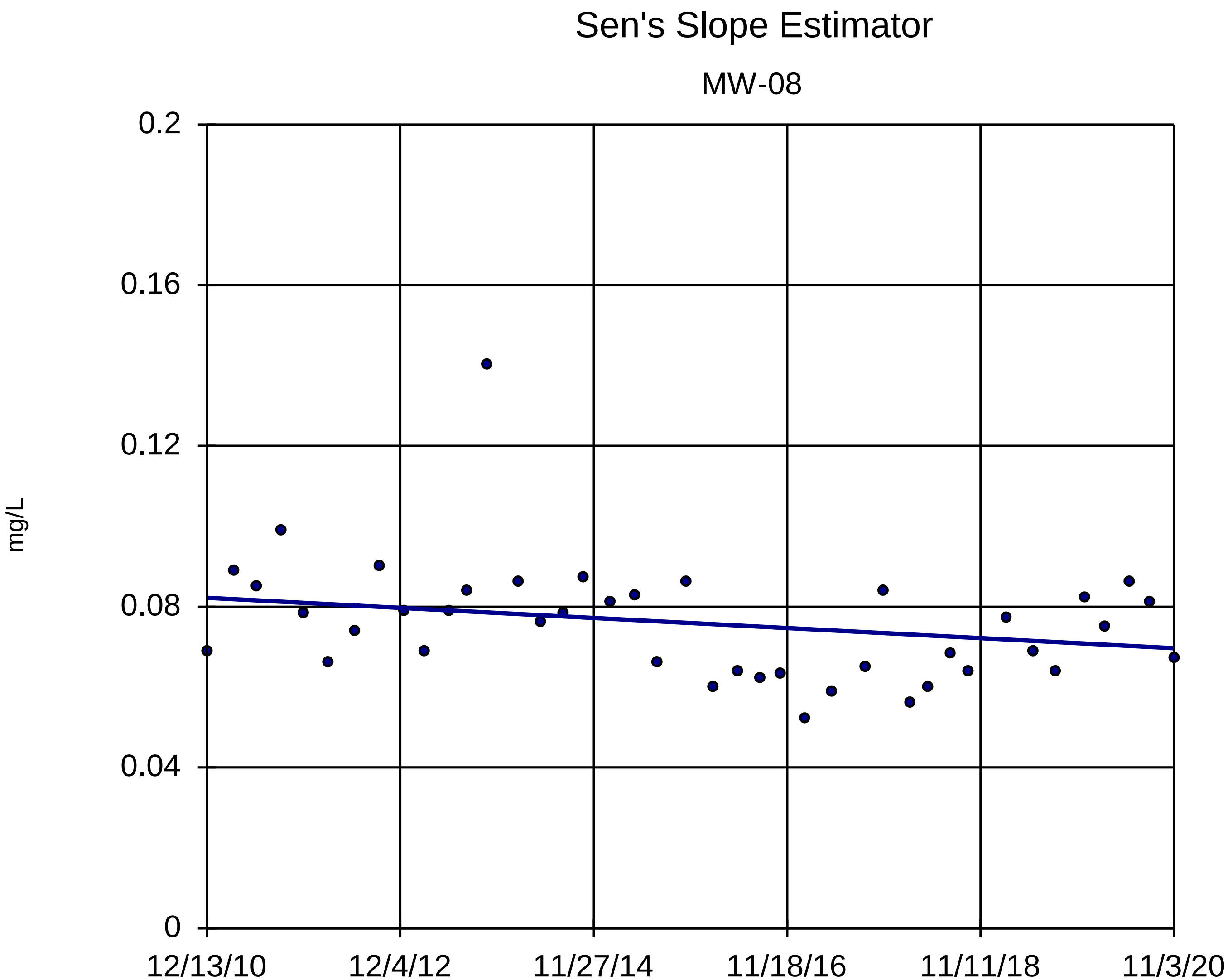
MWG13-15_81910




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81911




n = 41

Slope = -0.001274 units per year.

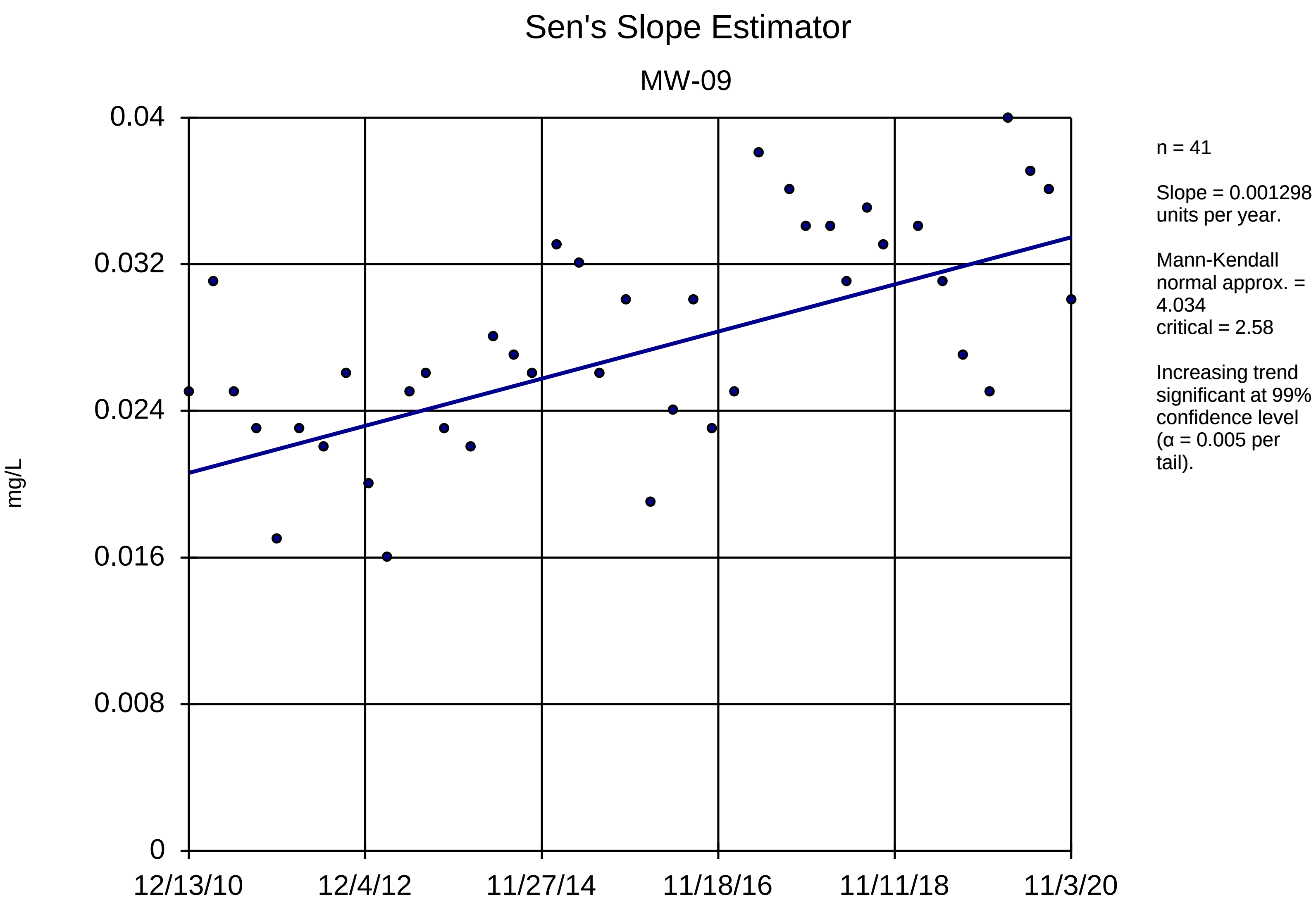
Mann-Kendall normal approx. = -2.136 critical = -2.58

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

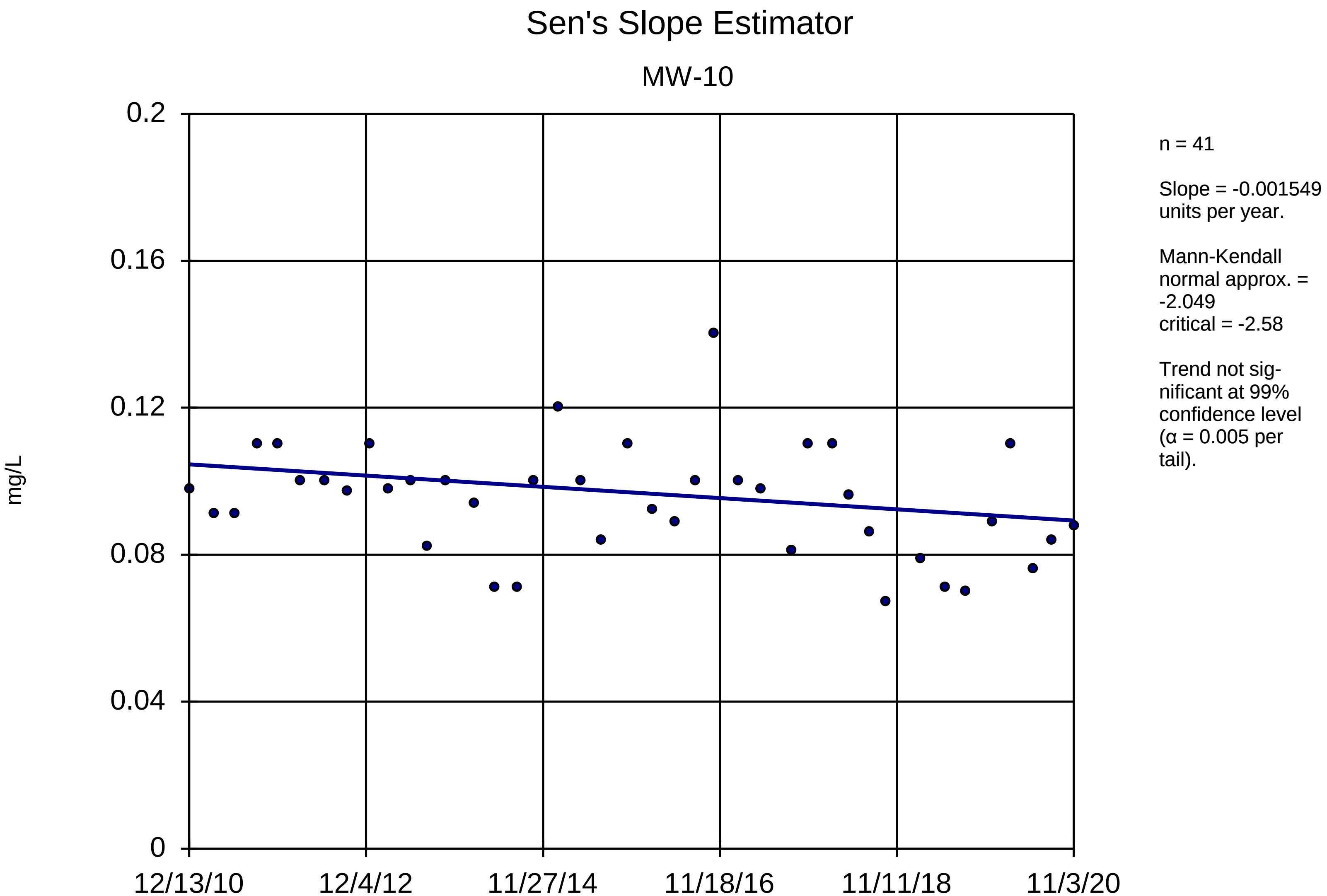
MWG13-15_81912




Constituent: Barium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

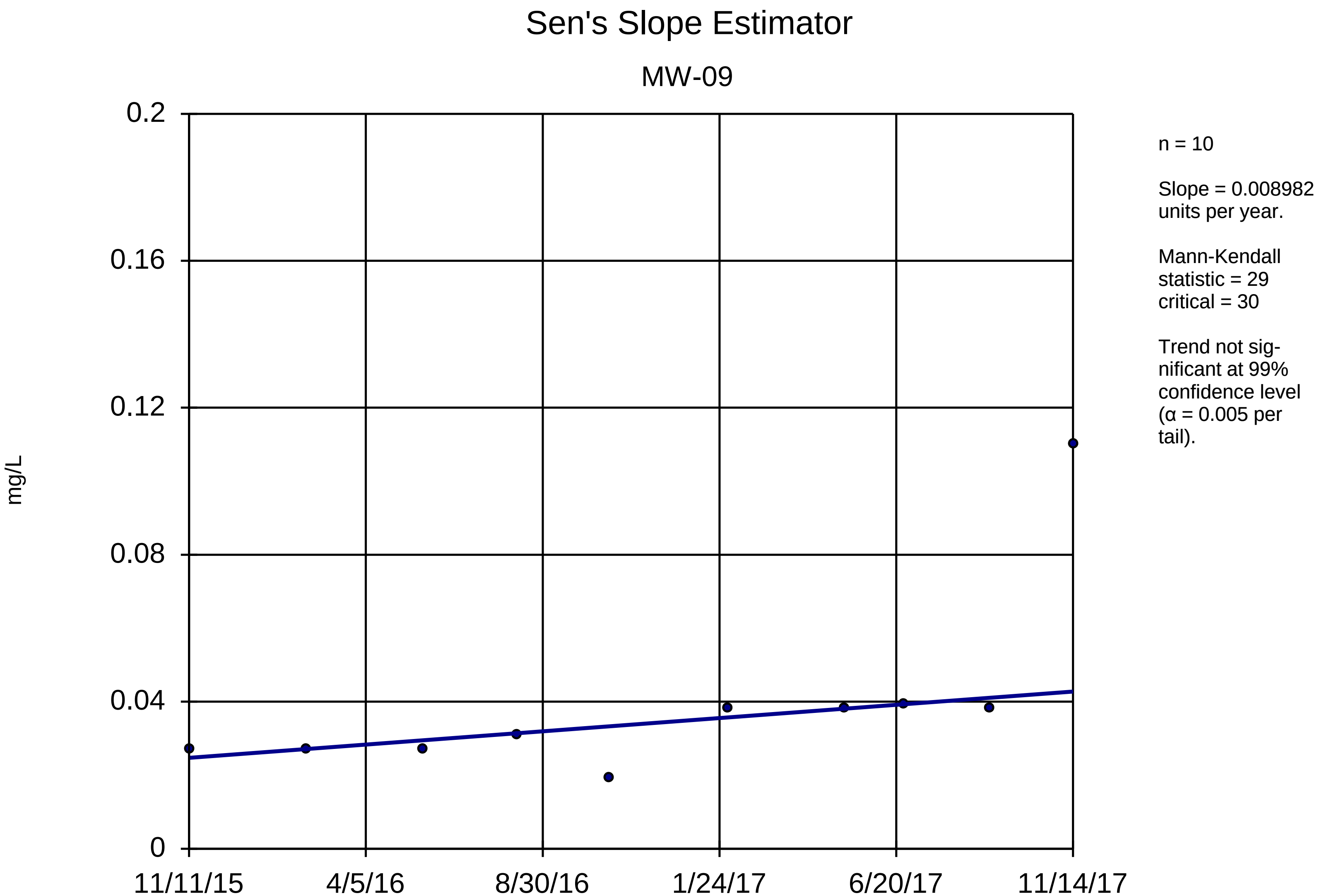
MWG13-15_81913




Constituent: Barium, Dissolved Analysis Run 4/2/2021 12:05 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

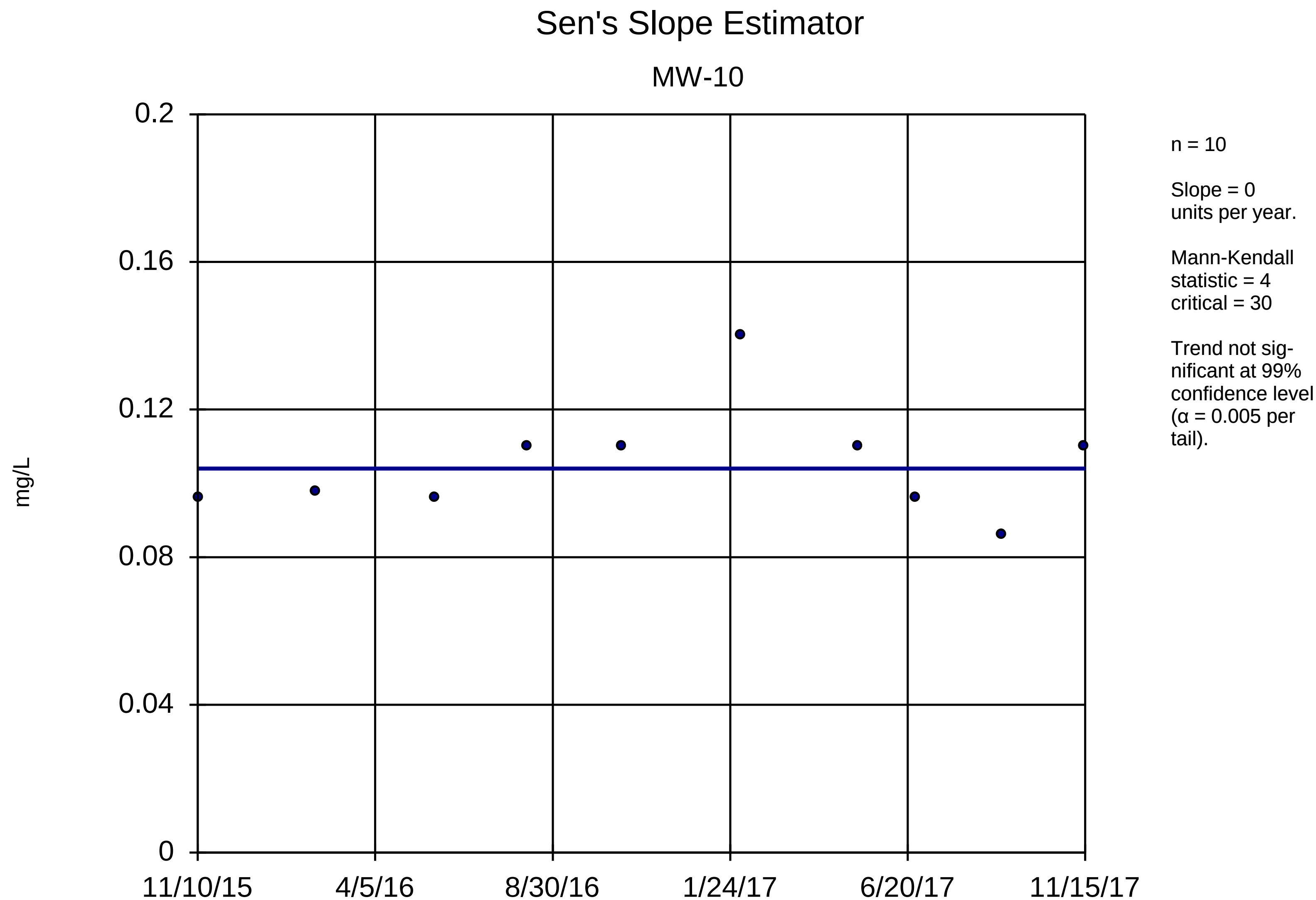
MWG13-15_81914




Constituent: Barium, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

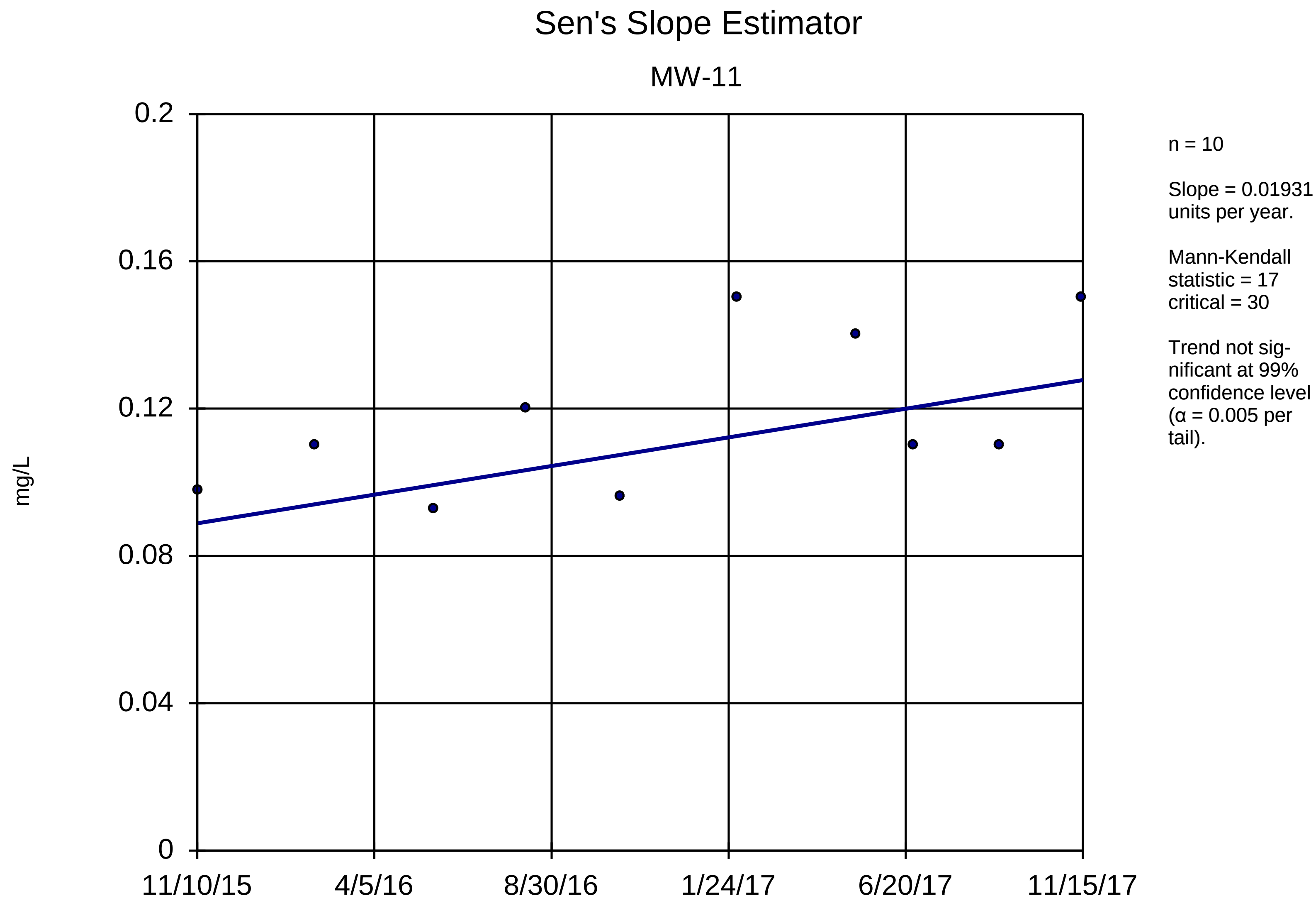
MWG13-15_81915




Constituent: Barium, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

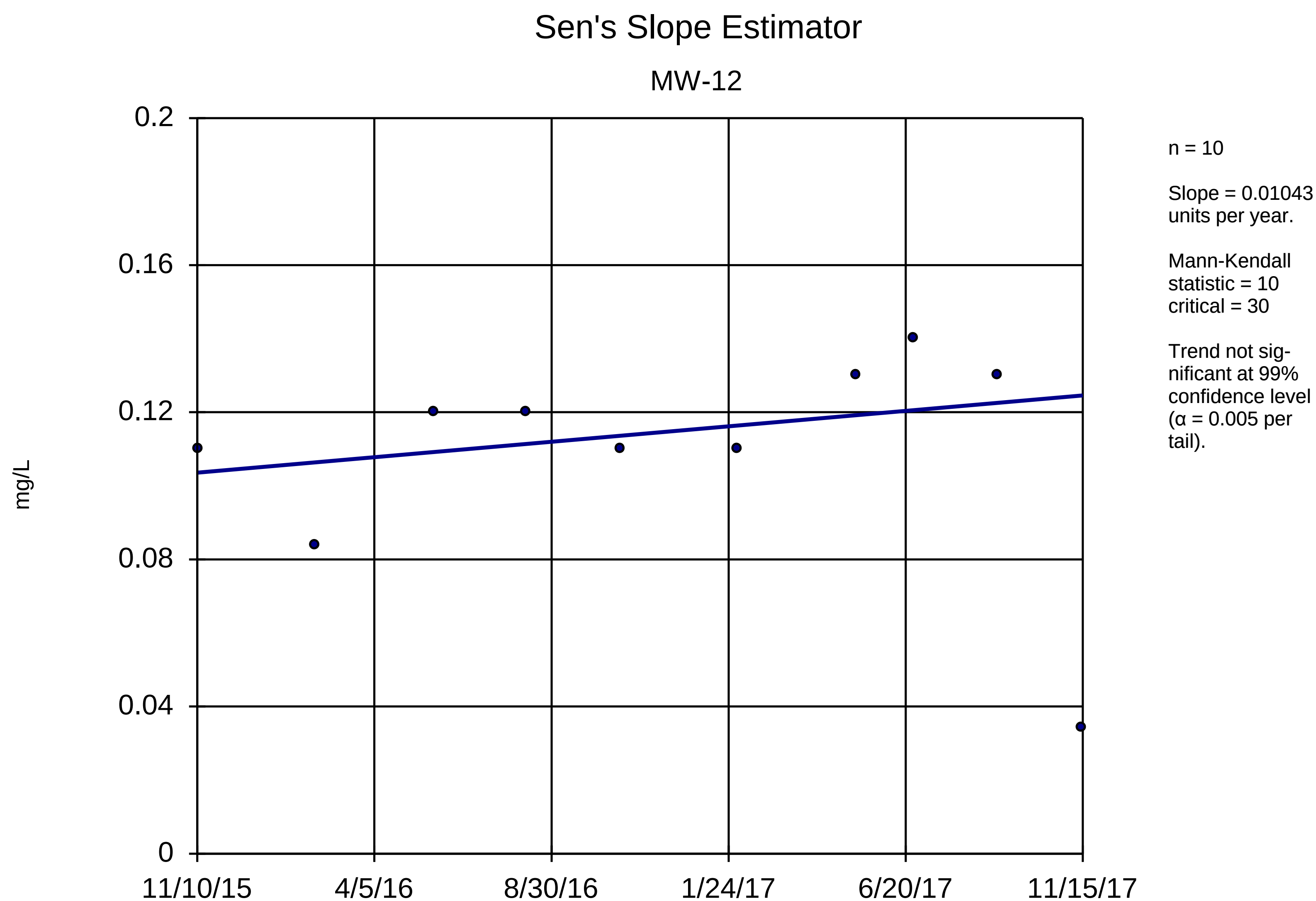
MWG13-15_81916




Constituent: Barium, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81917




Constituent: Barium, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81918

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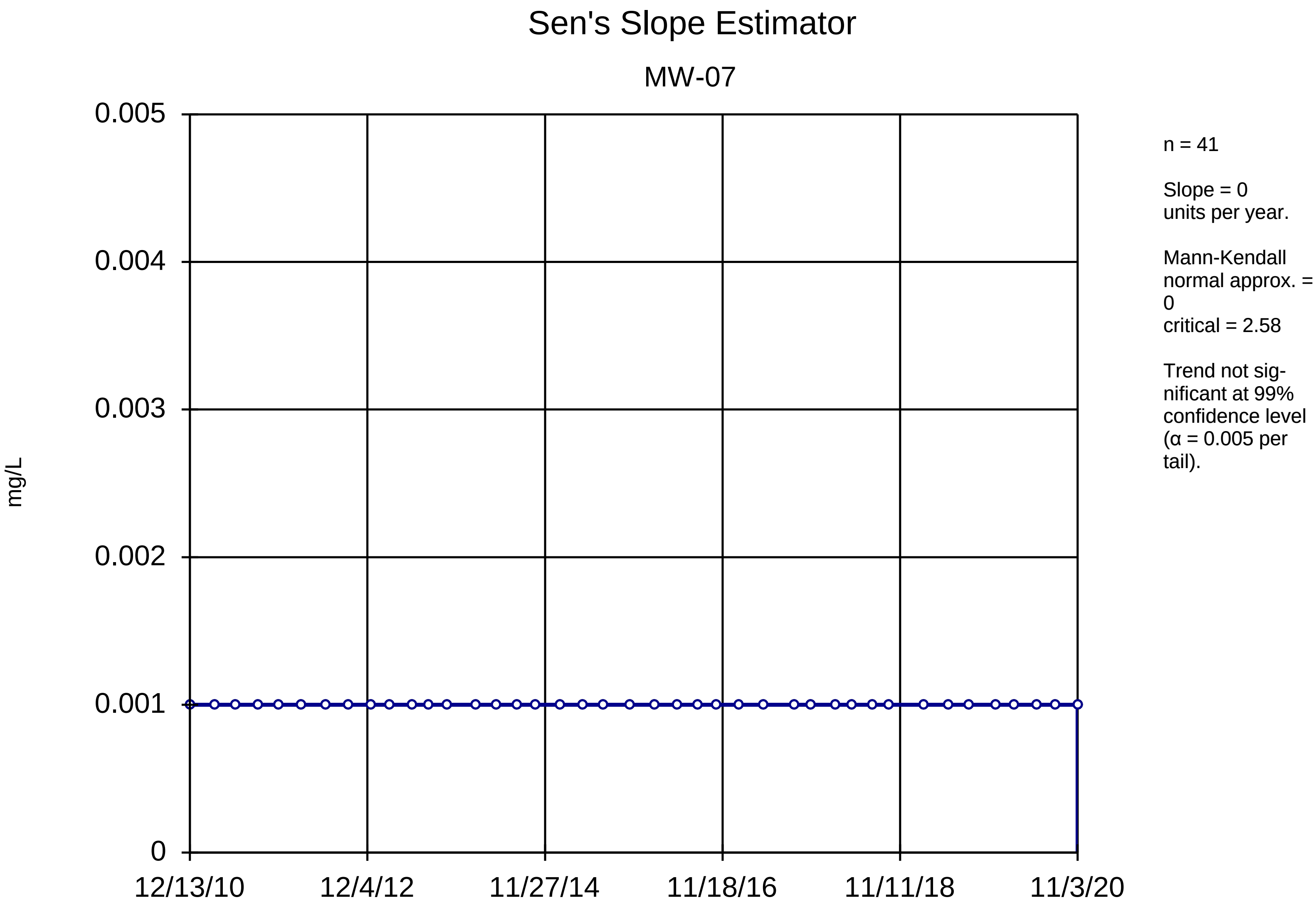



Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 12:05 PM

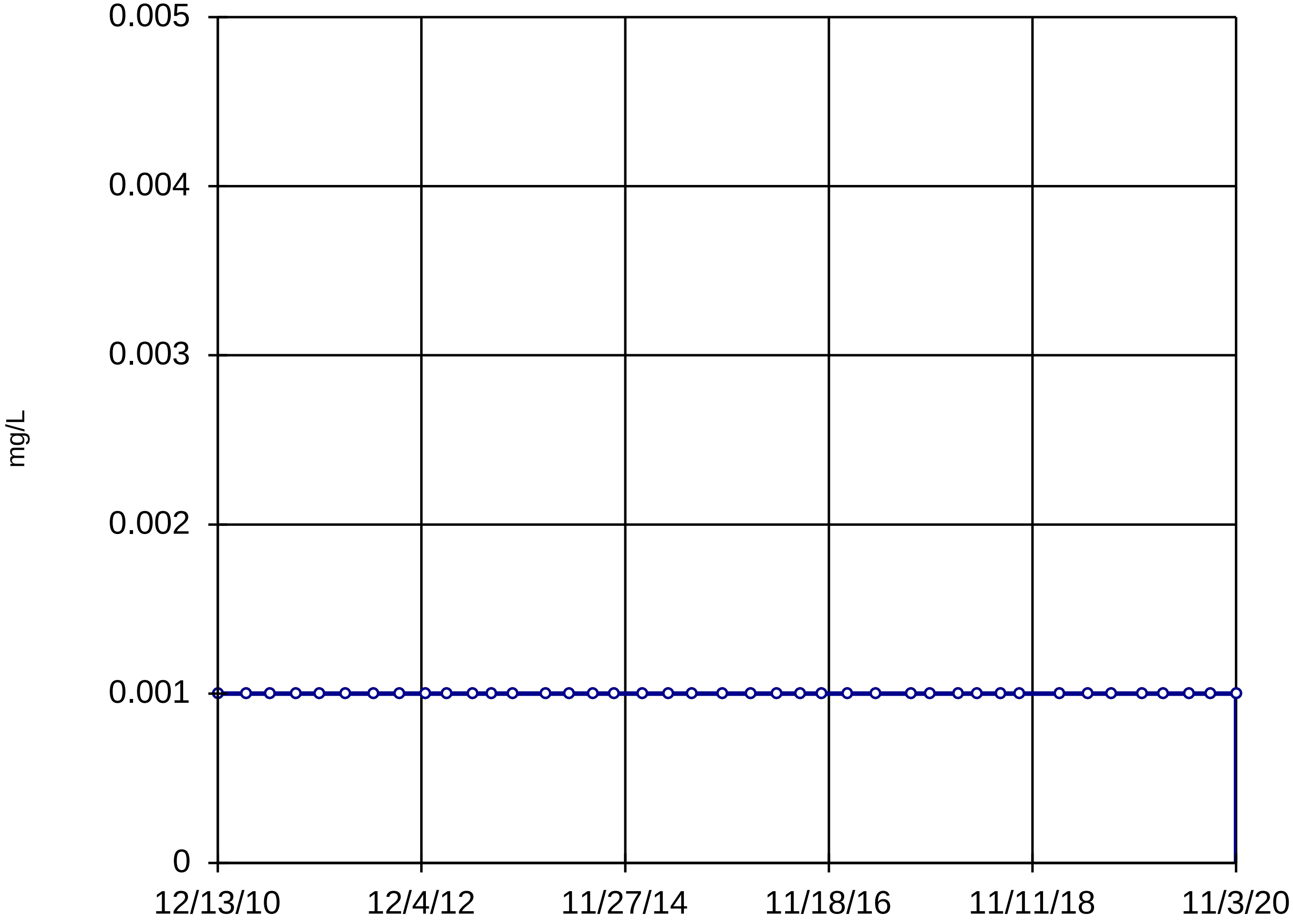
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81919

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-08




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0
critical = 2.58

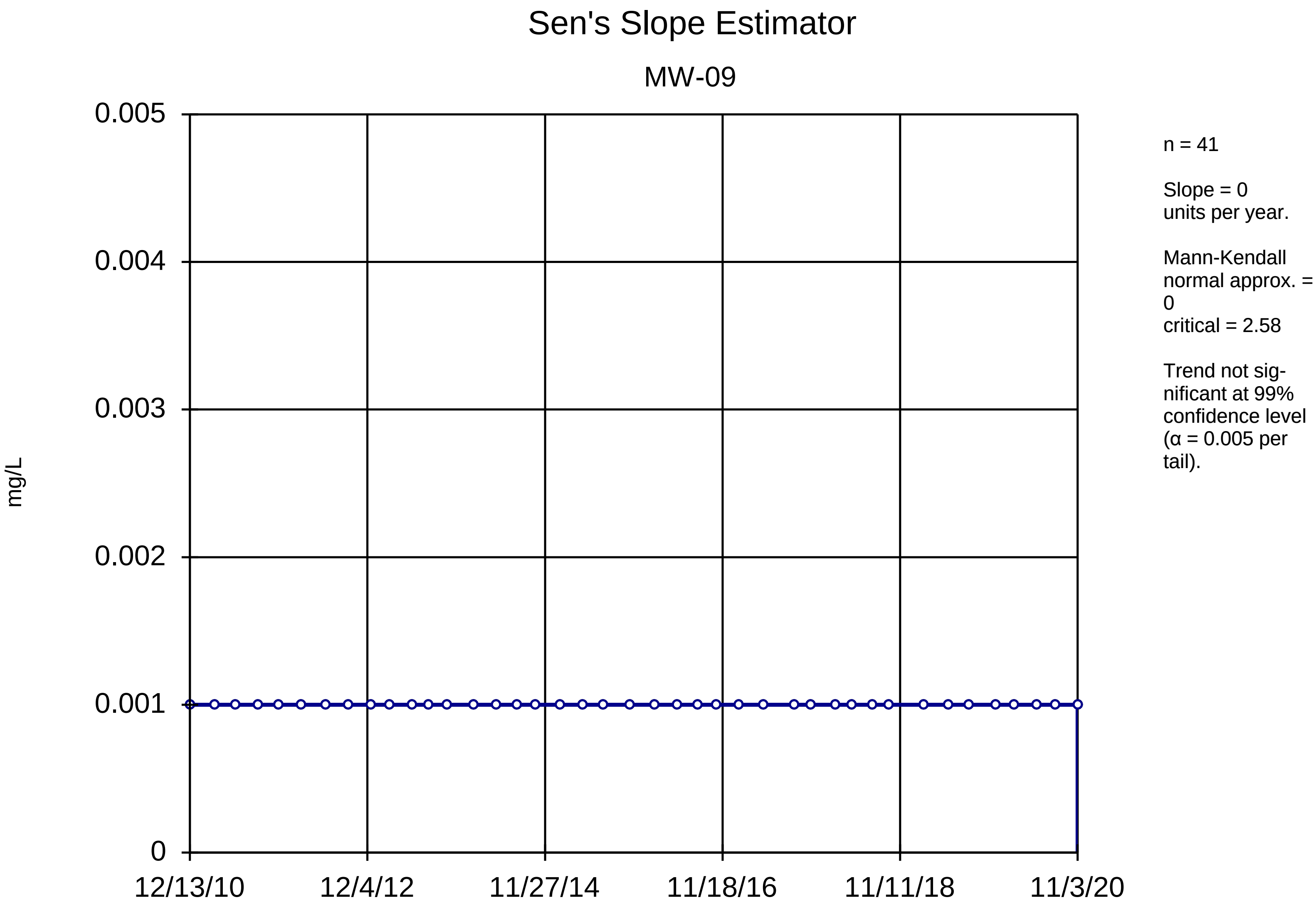
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81920

Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81921

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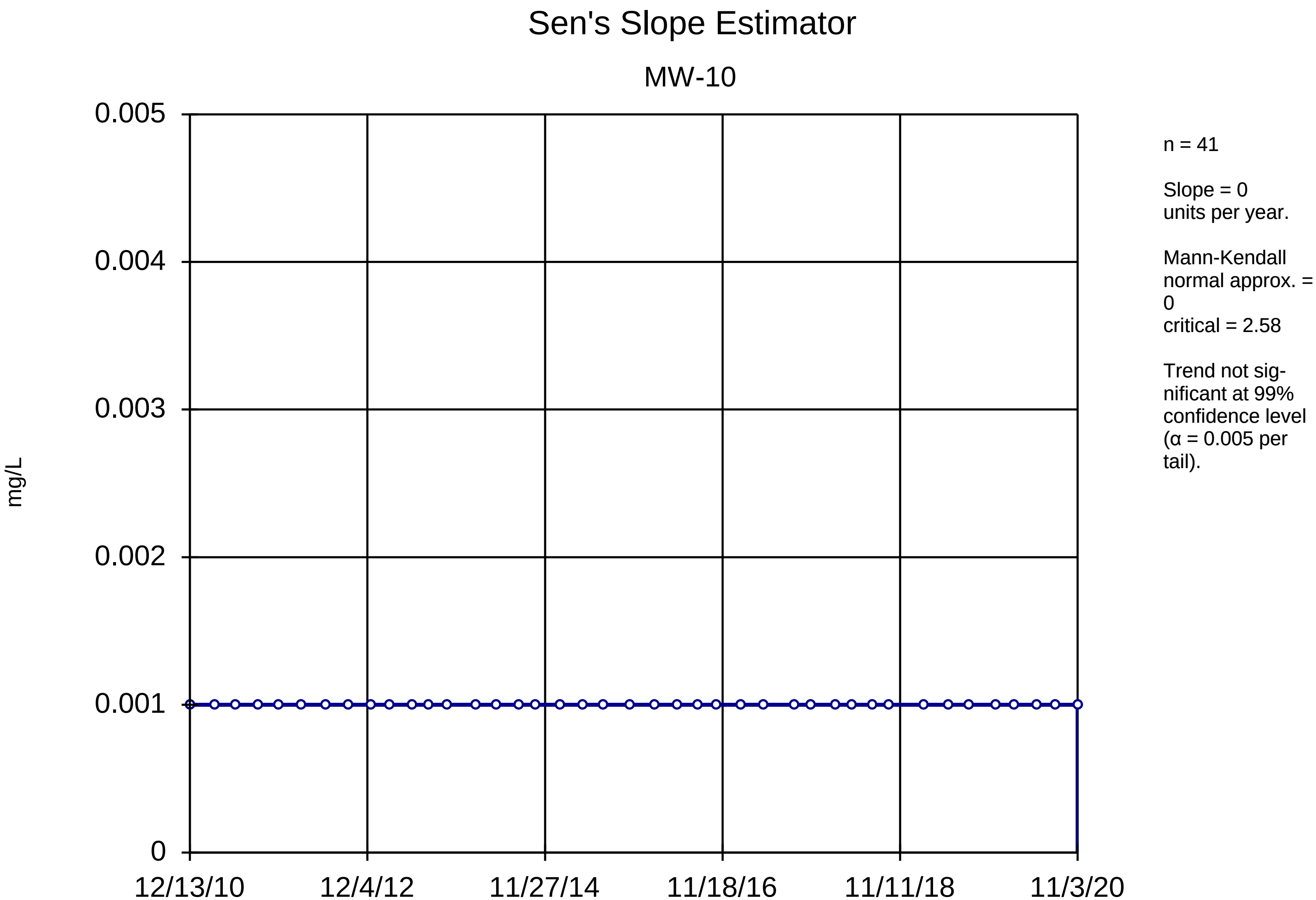
Hollow symbols indicate censored values.

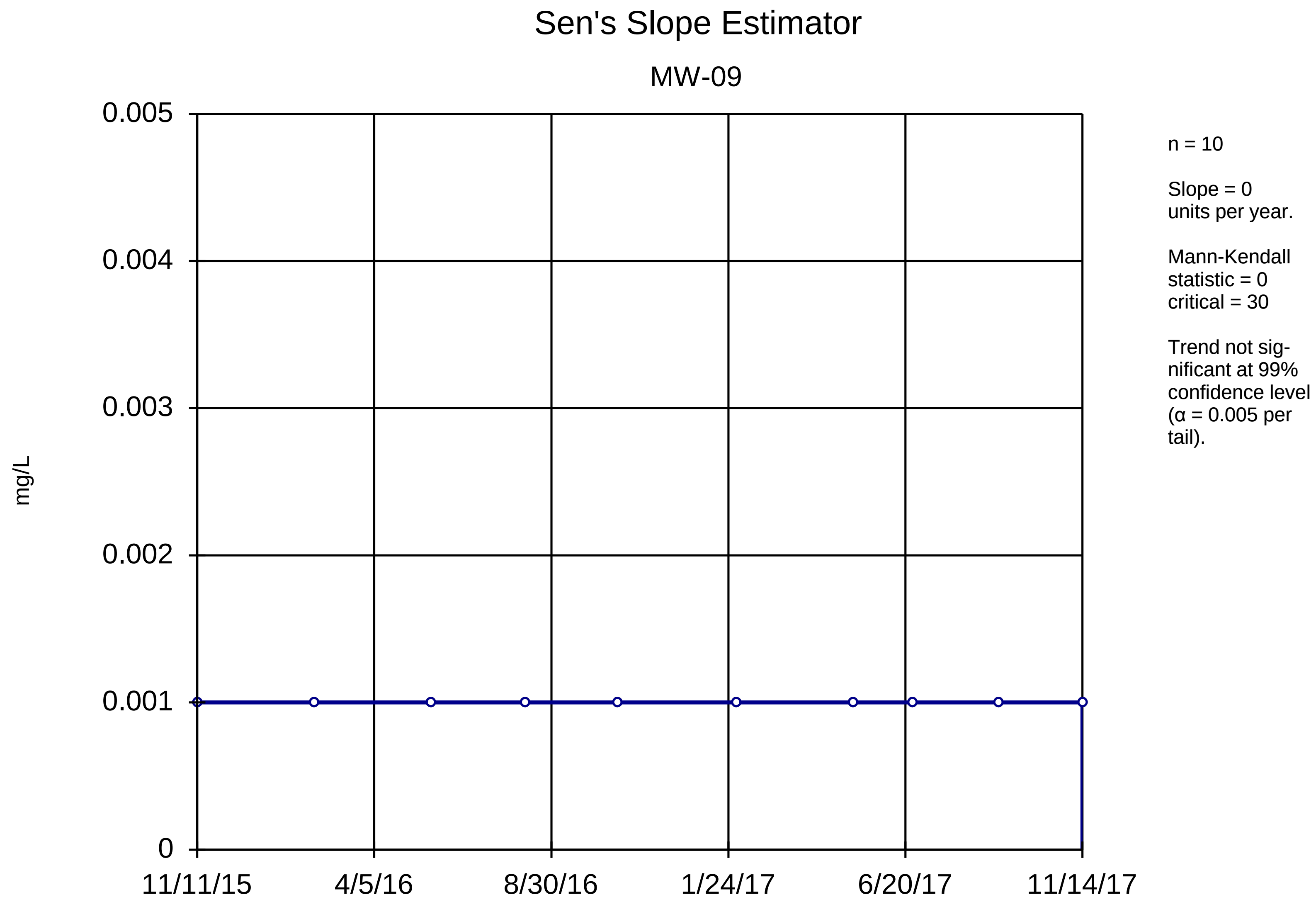



Constituent: Beryllium, Dissolved    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81922

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Beryllium, Total Analysis Run 4/2/2021 12:05 PM

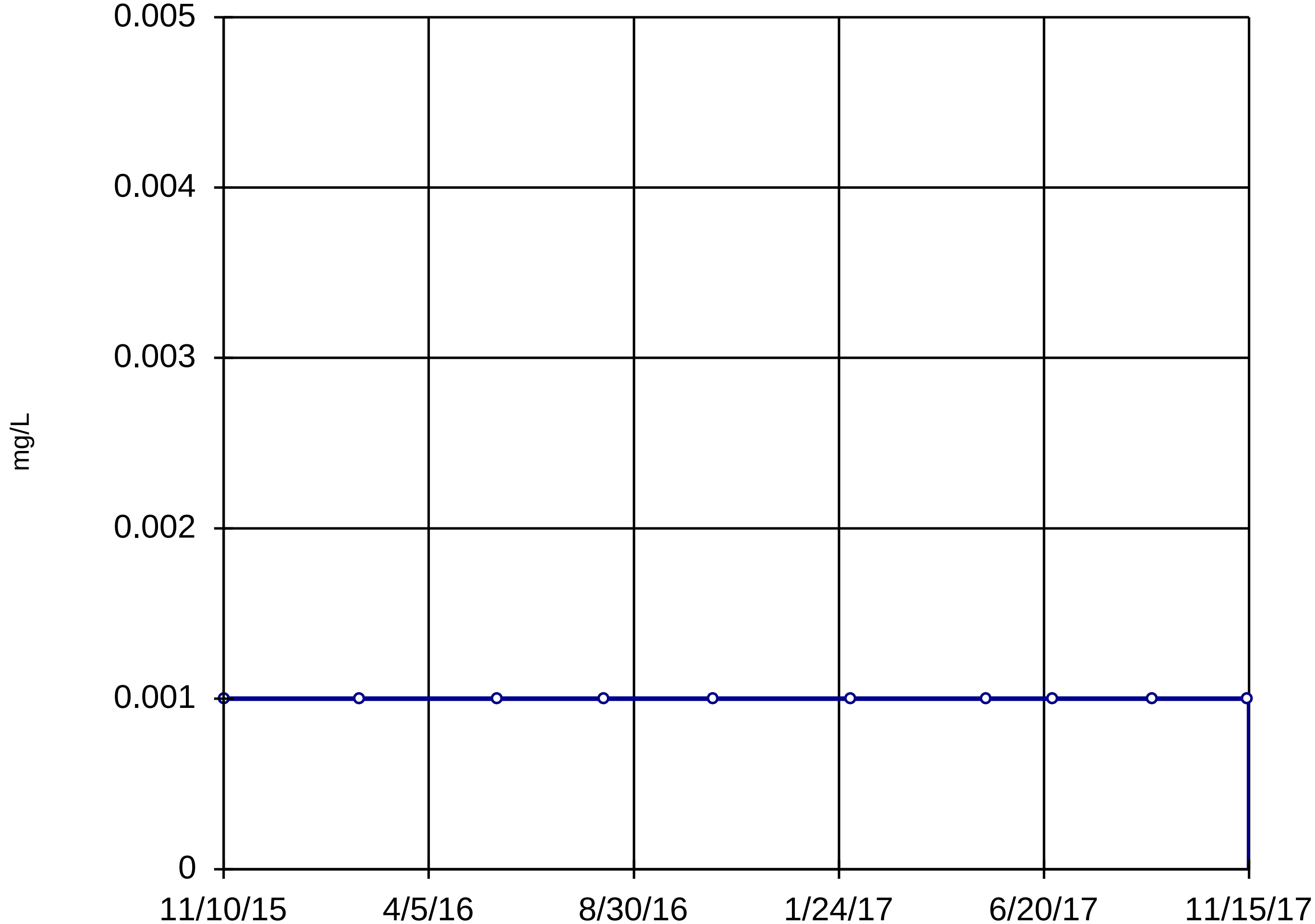
Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81923

Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-10




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 12:05 PM

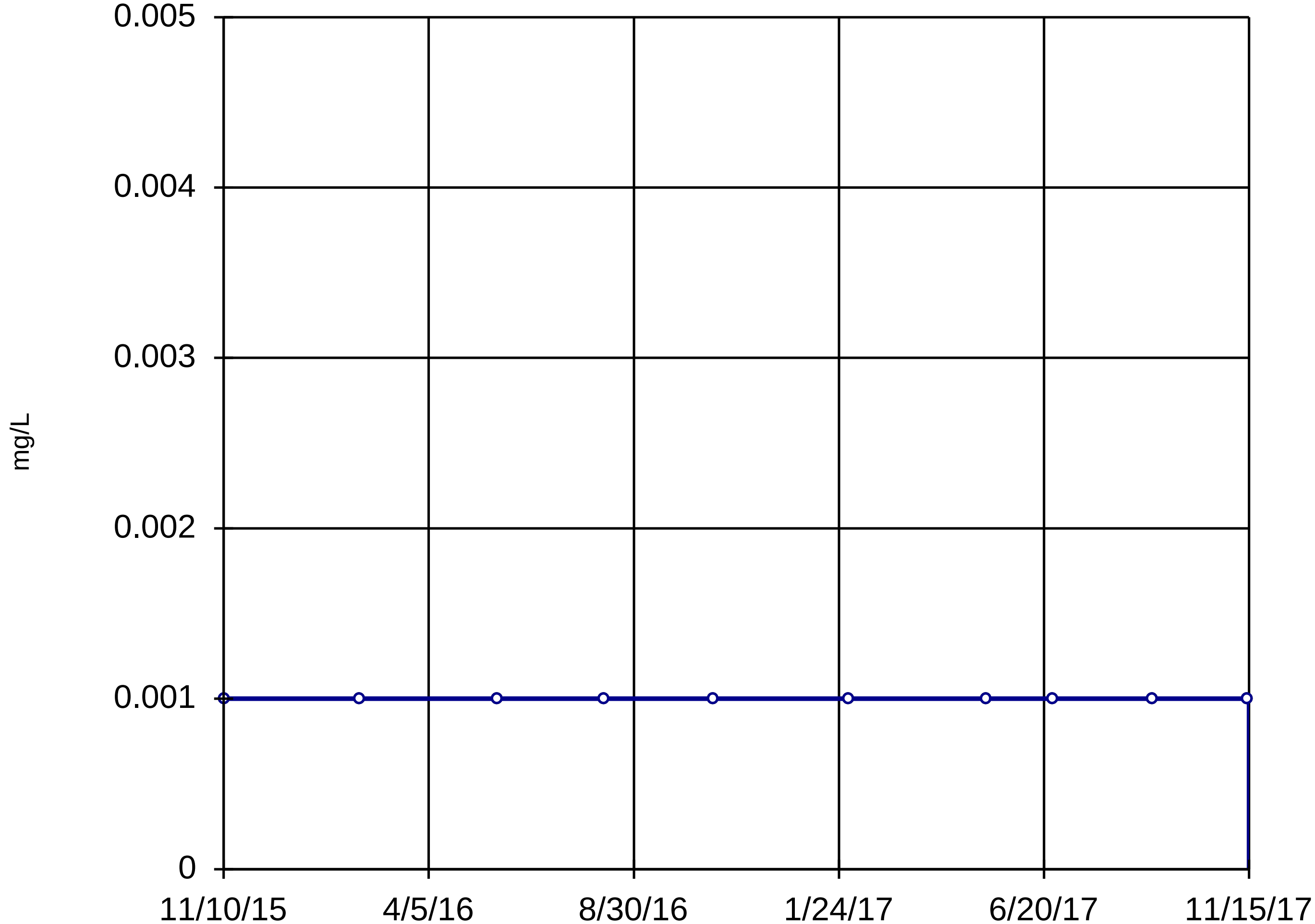
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81924

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-11




n = 10

Slope = 0
units per year.

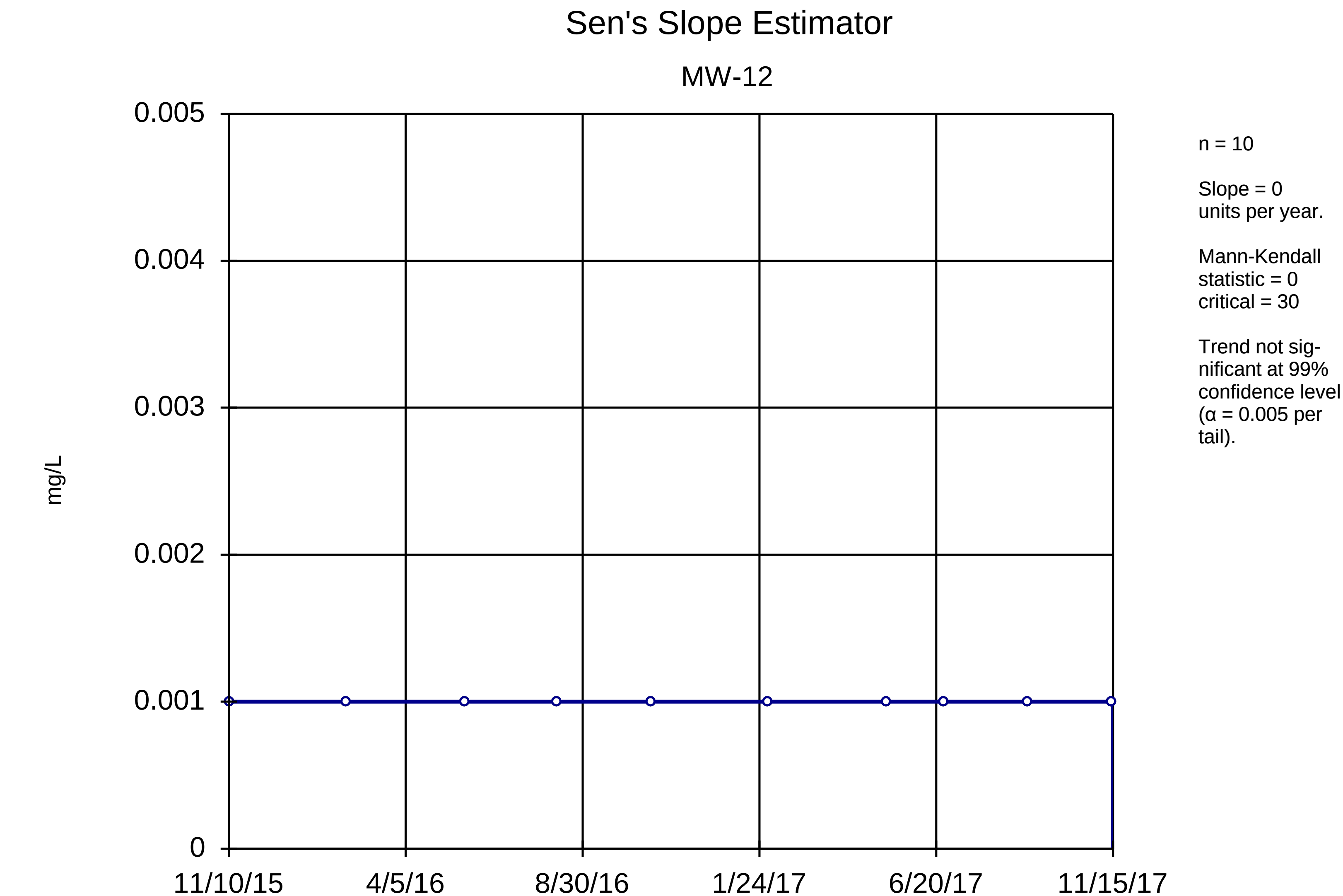
Mann-Kendall
statistic = 0
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Beryllium, Total    Analysis Run 4/2/2021 12:05 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

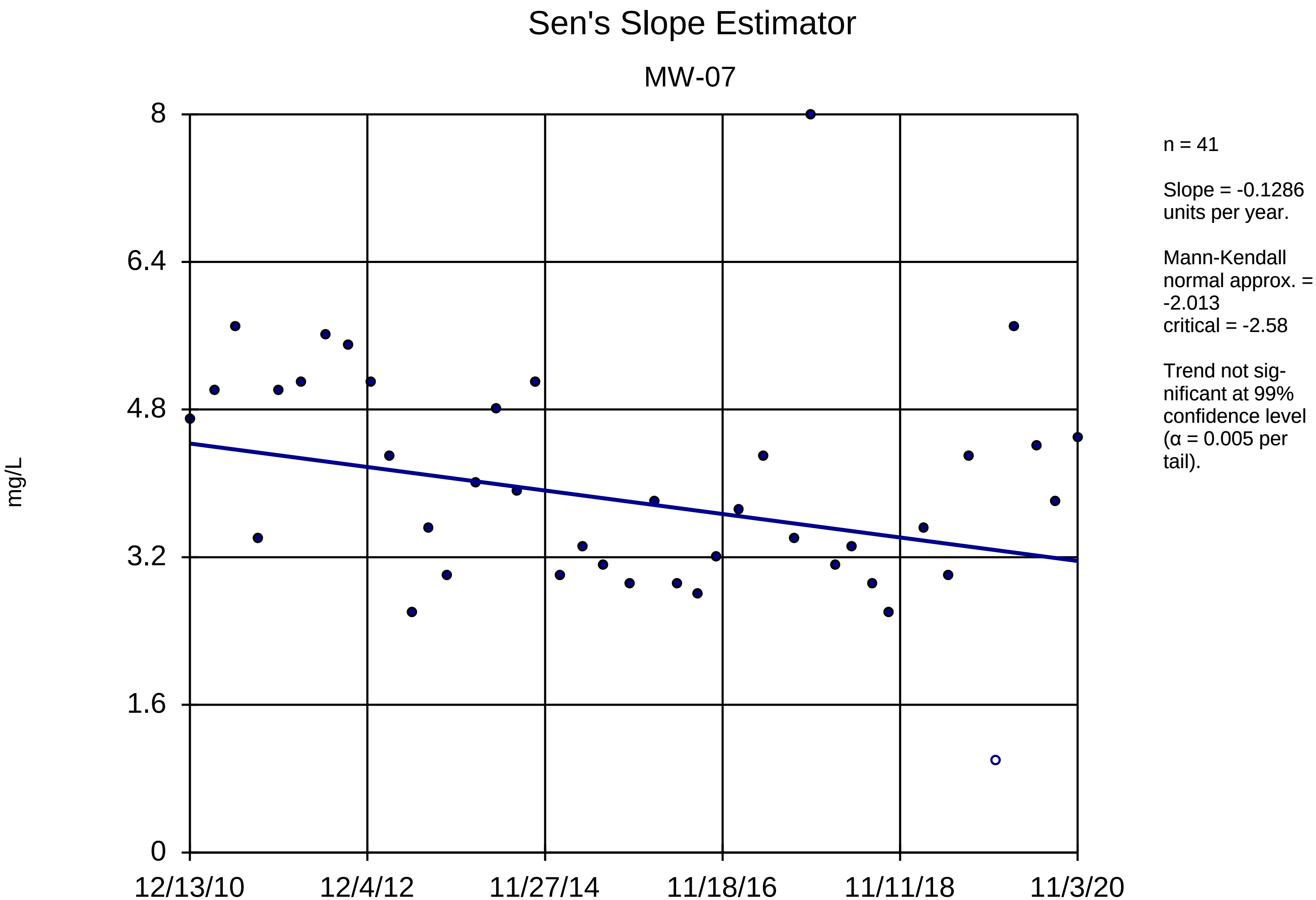
Hollow symbols indicate censored values.




Constituent: Beryllium, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

Hollow symbols indicate censored values.




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81927

Electronic Filing: Received, Clerk's Office 01/21/2022

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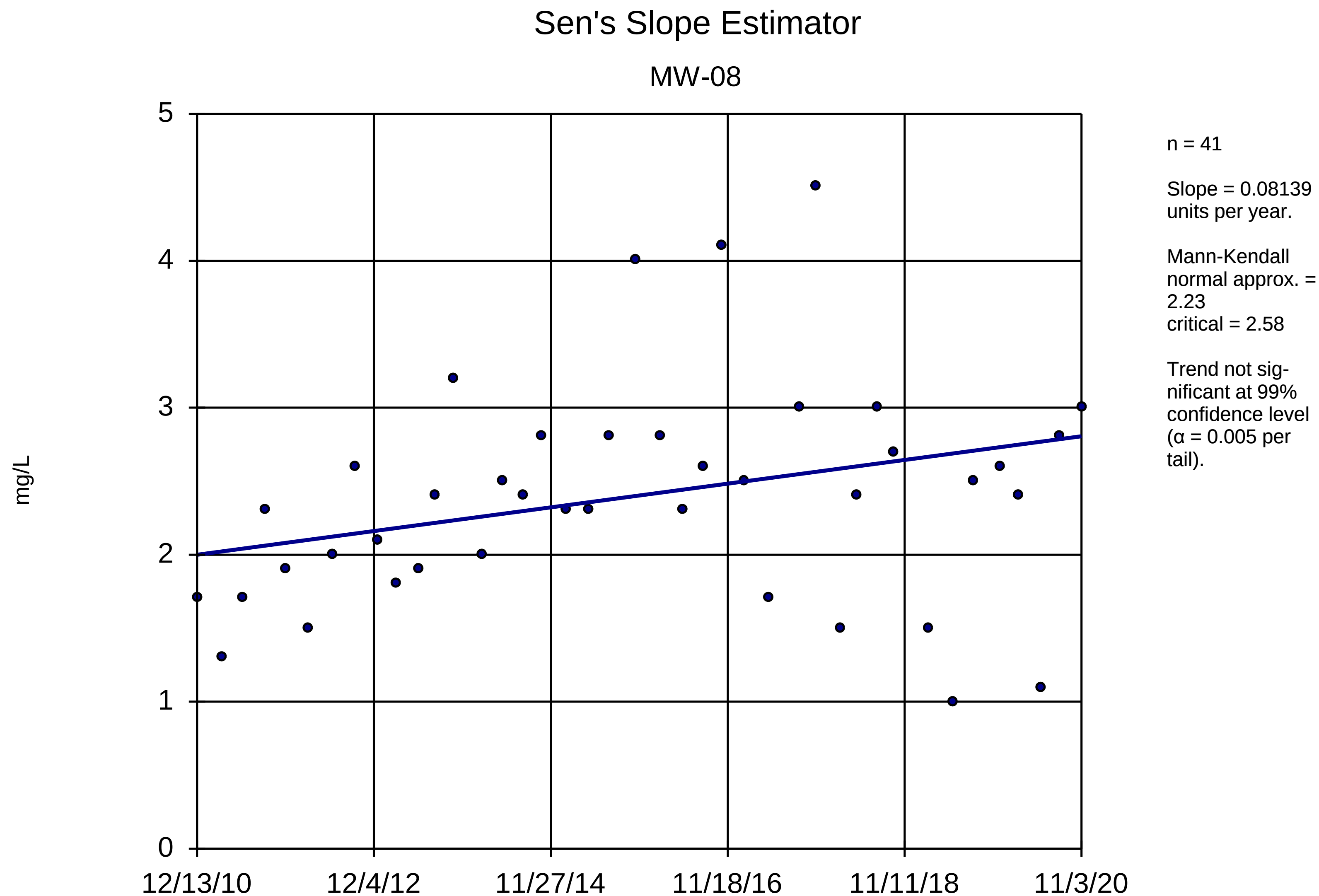
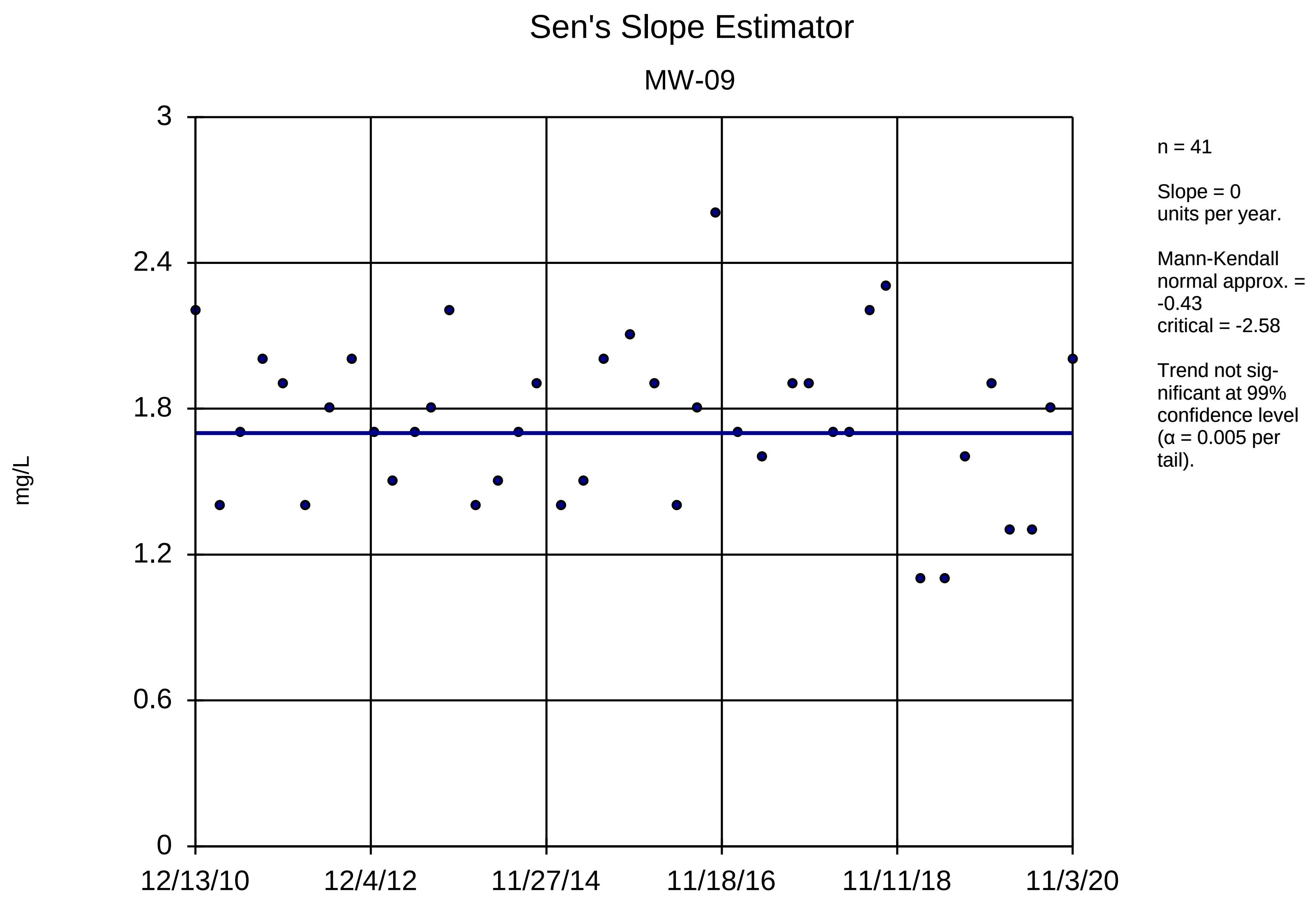



Constituent: Boron, Dissolved Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81928

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA

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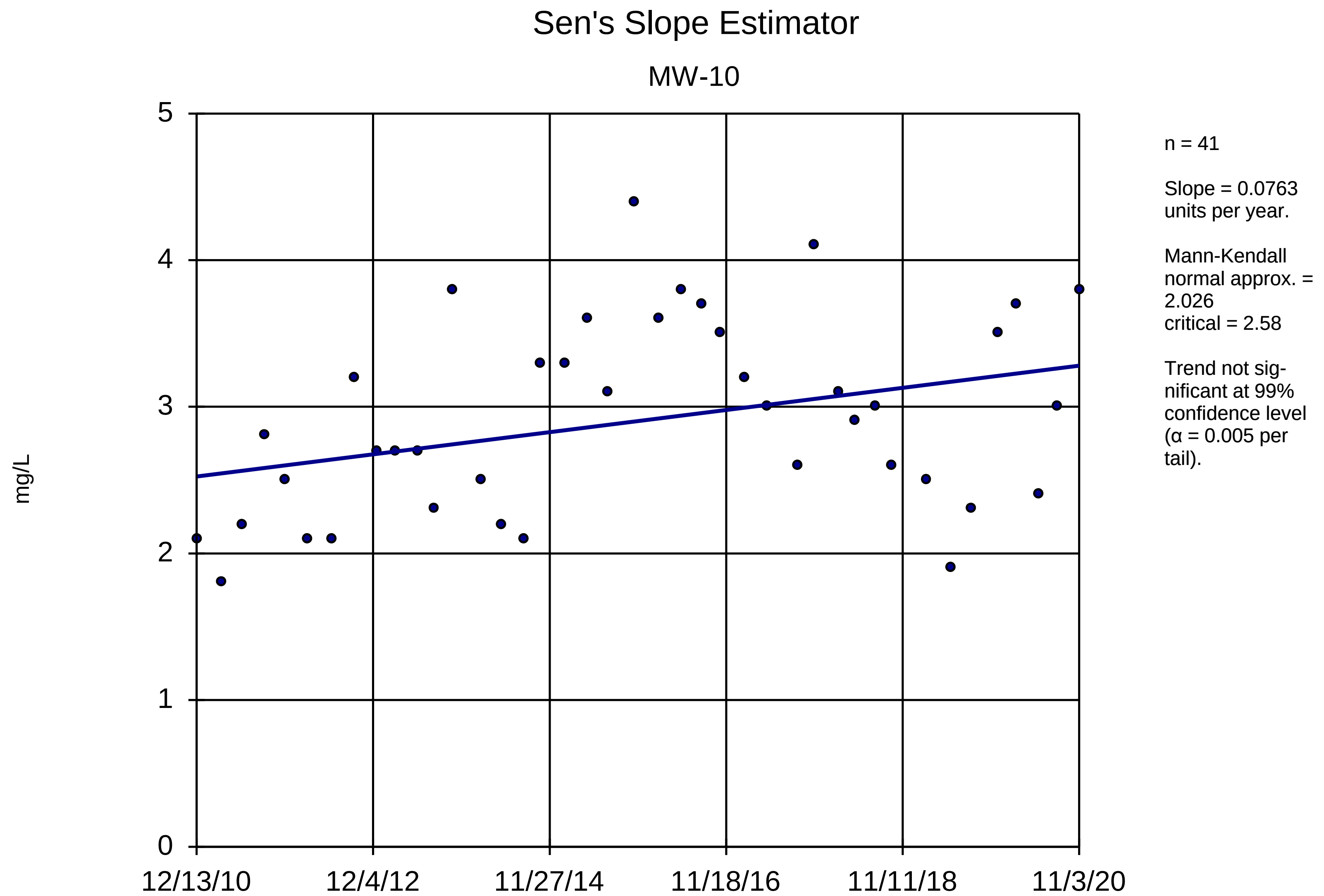
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

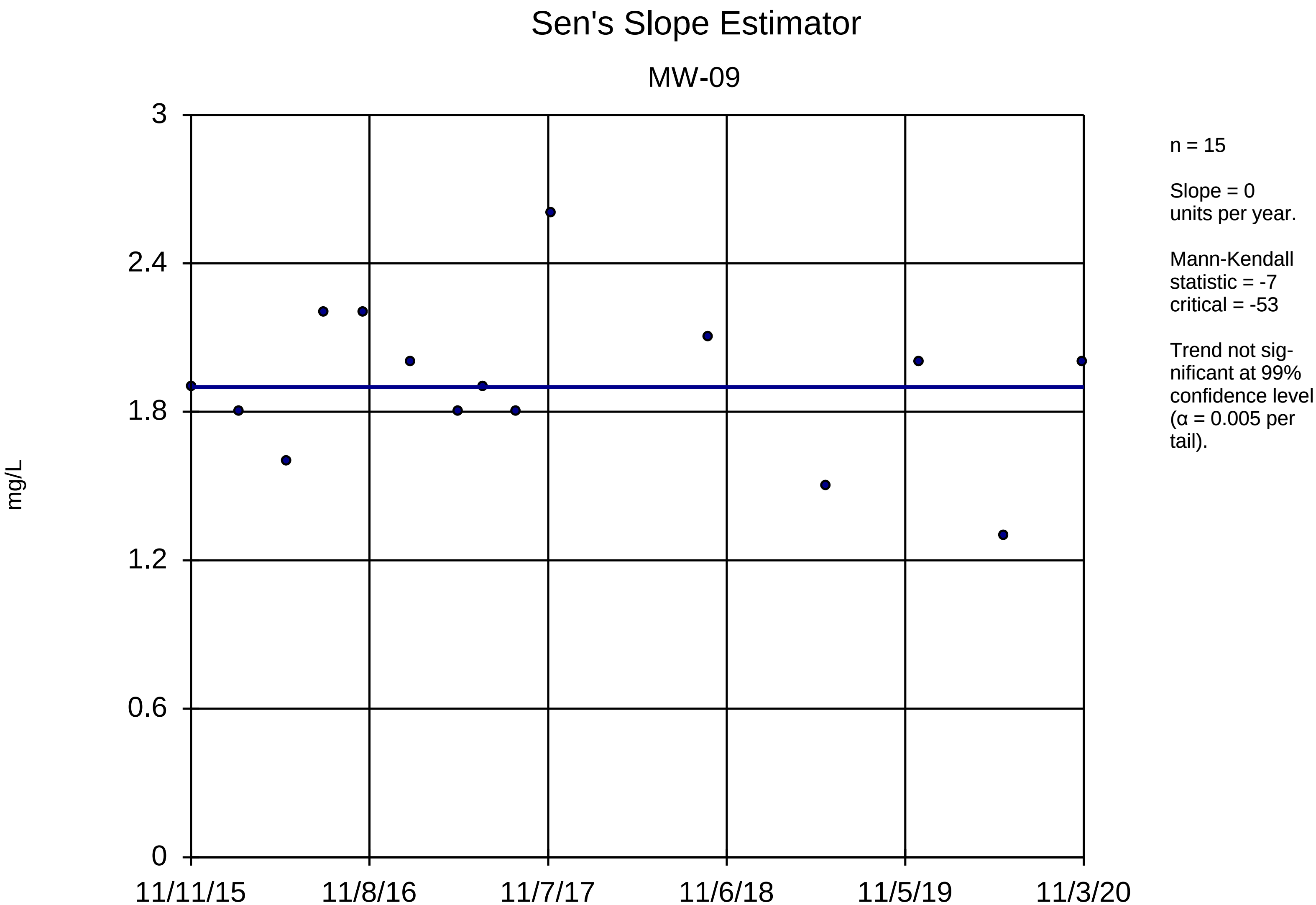
MWG13-15_81929




Constituent: Boron, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

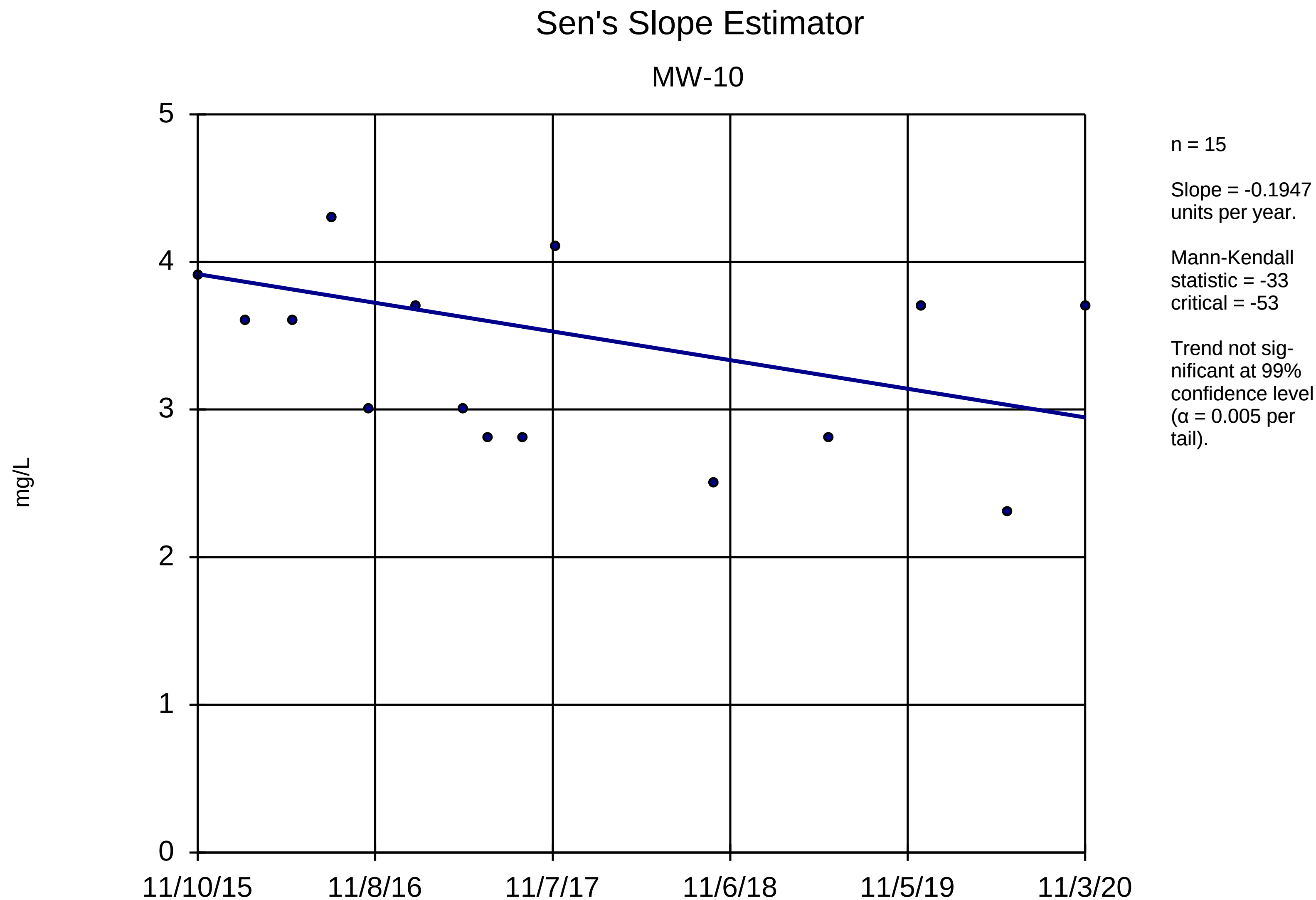
MWG13-15_81930




Constituent: Boron, Total Analysis Run 4/2/2021 12:06 PM

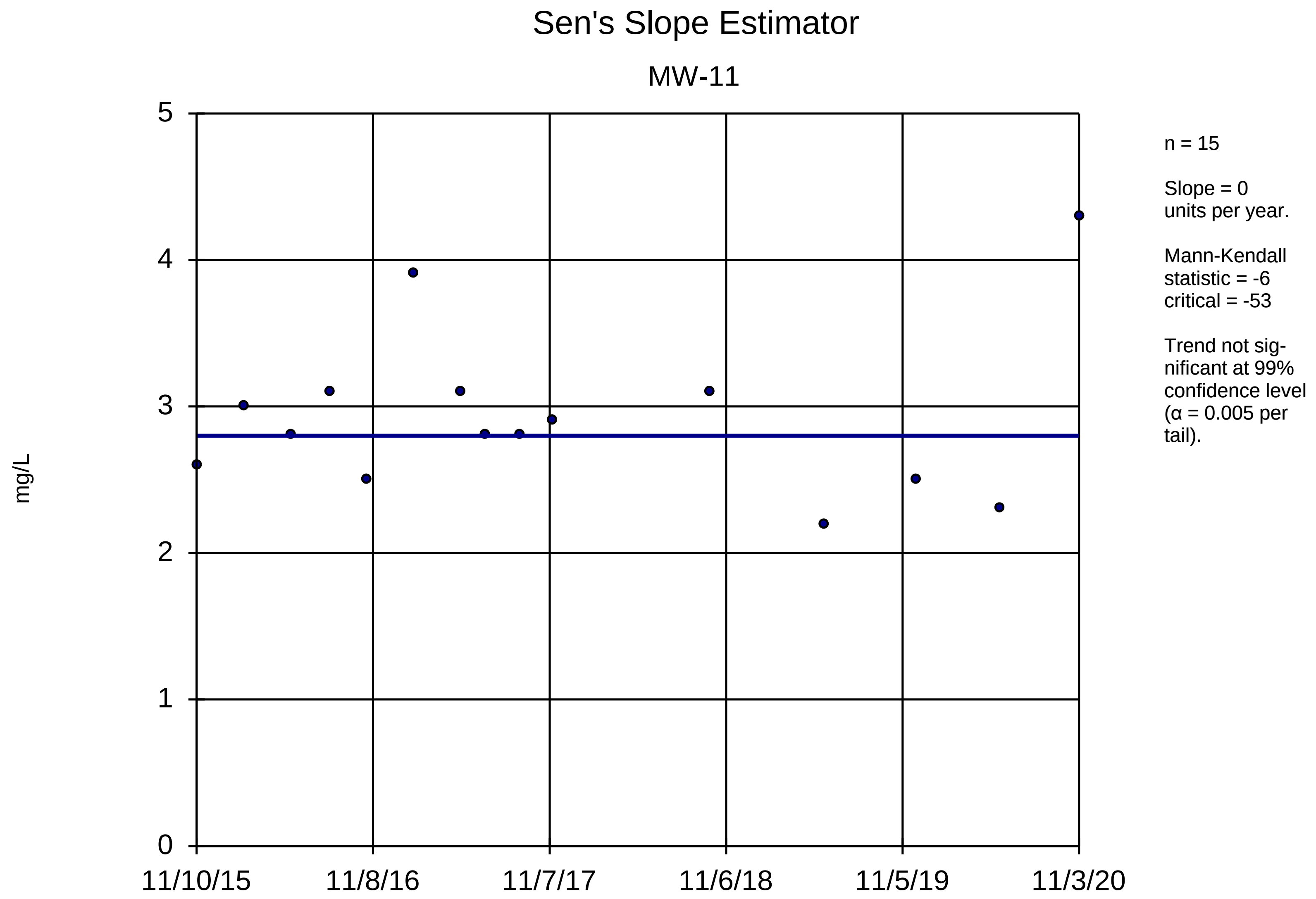
Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81931




Constituent: Boron, Total    Analysis Run 4/2/2021 12:06 PM

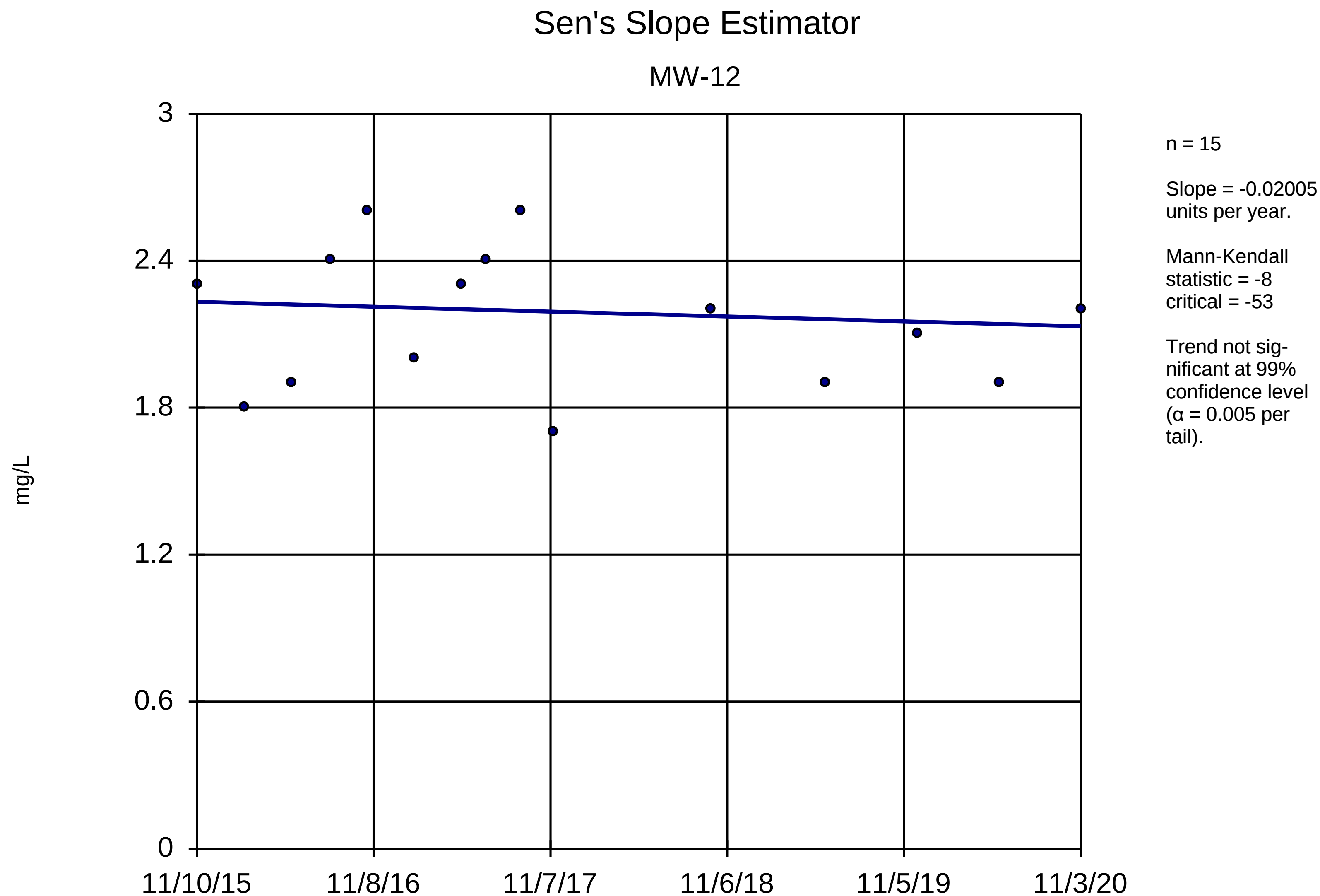
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: Boron, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81933

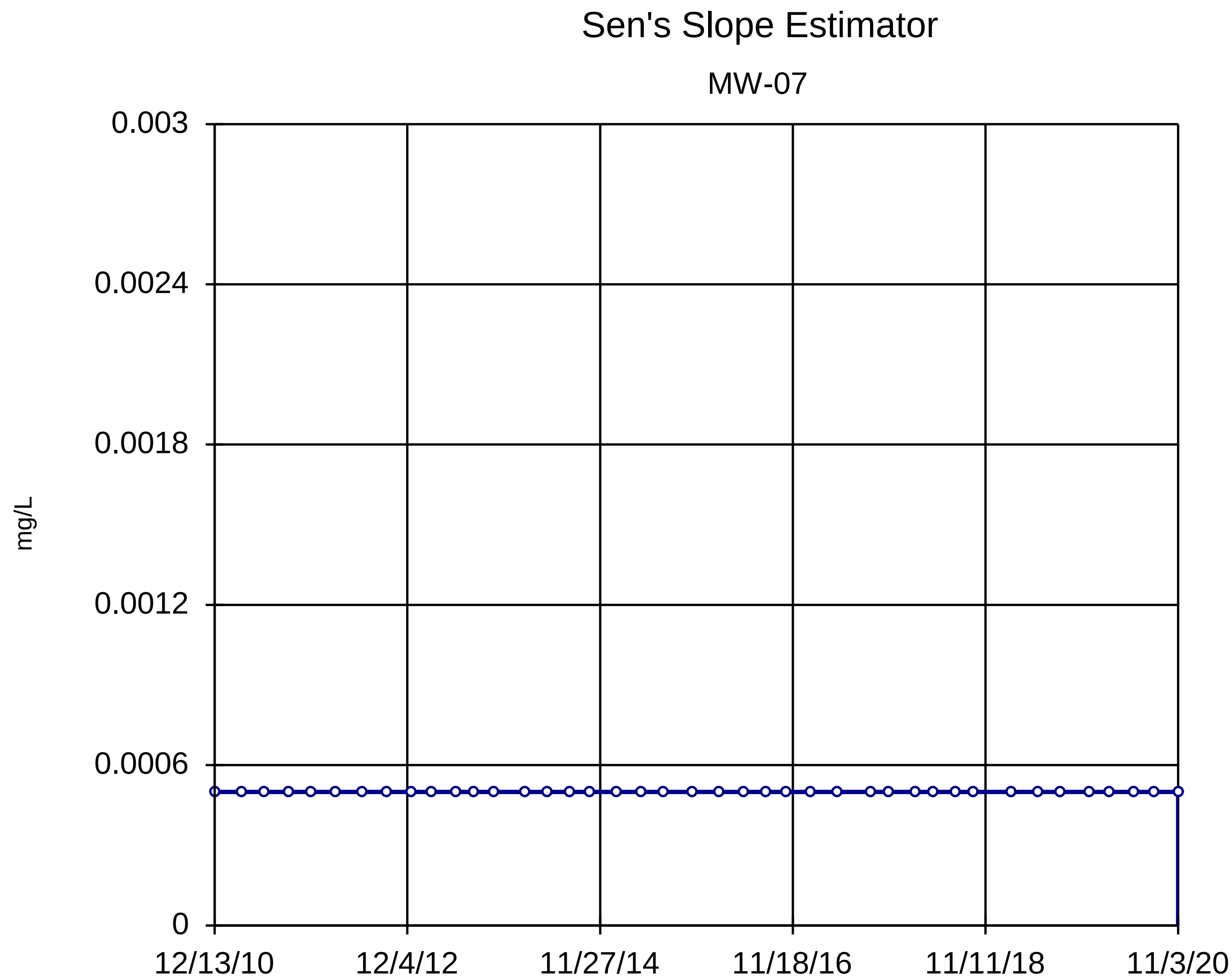



Constituent: Boron, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81934

Hollow symbols indicate censored values.




n = 41

Slope = 0
units per year.

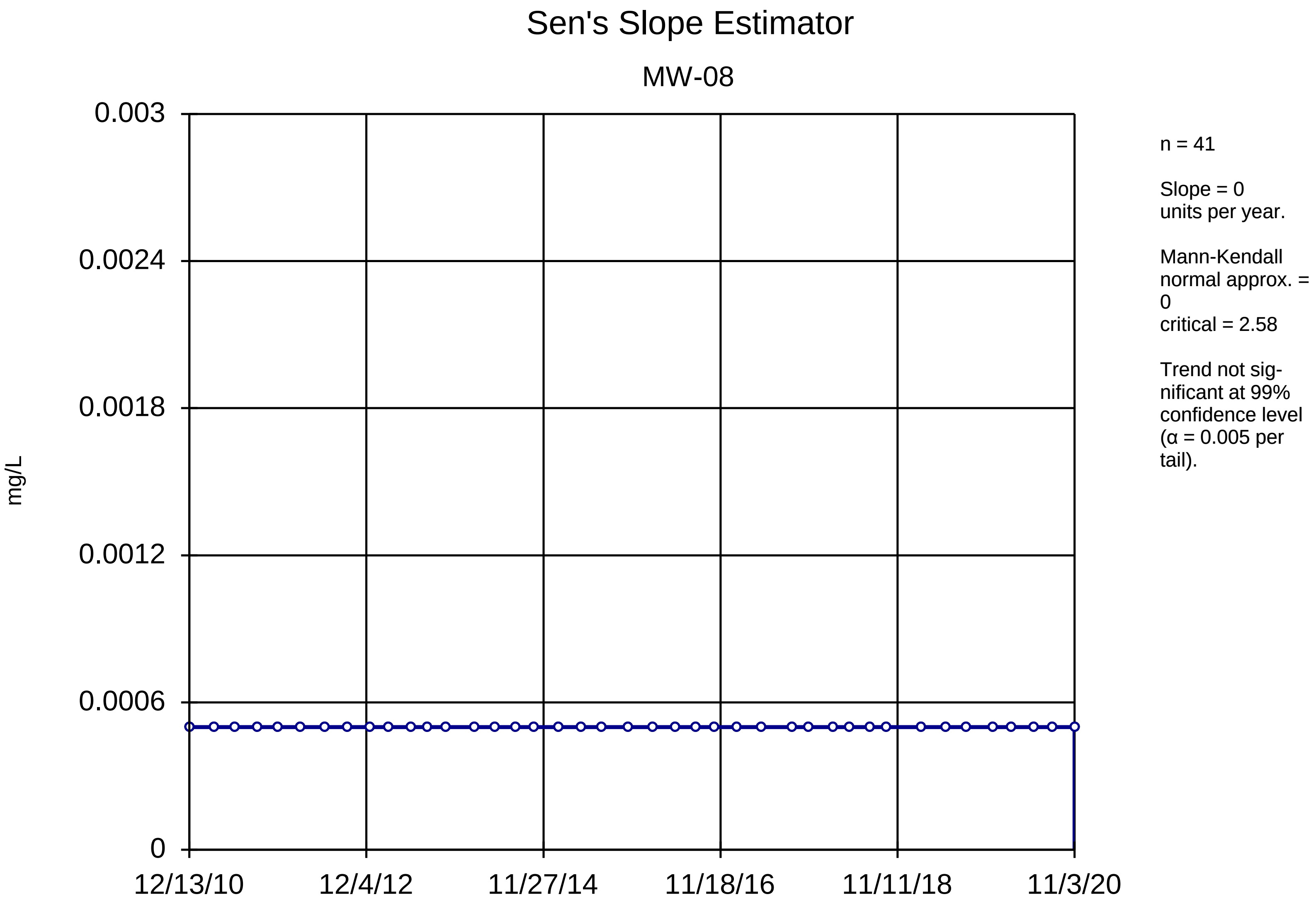
Mann-Kendall
normal approx. =
0
critical = 2.58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.

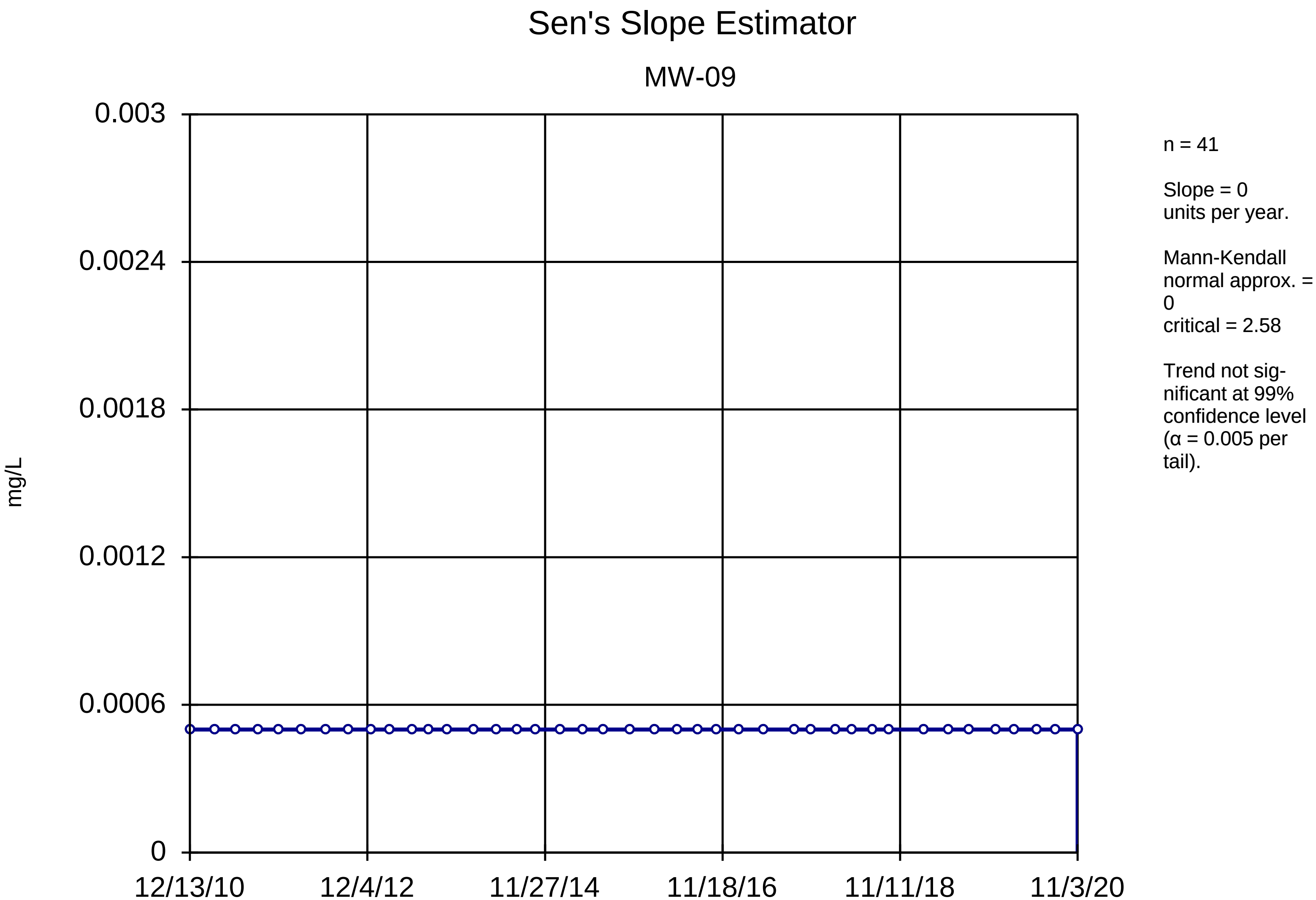



Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81936

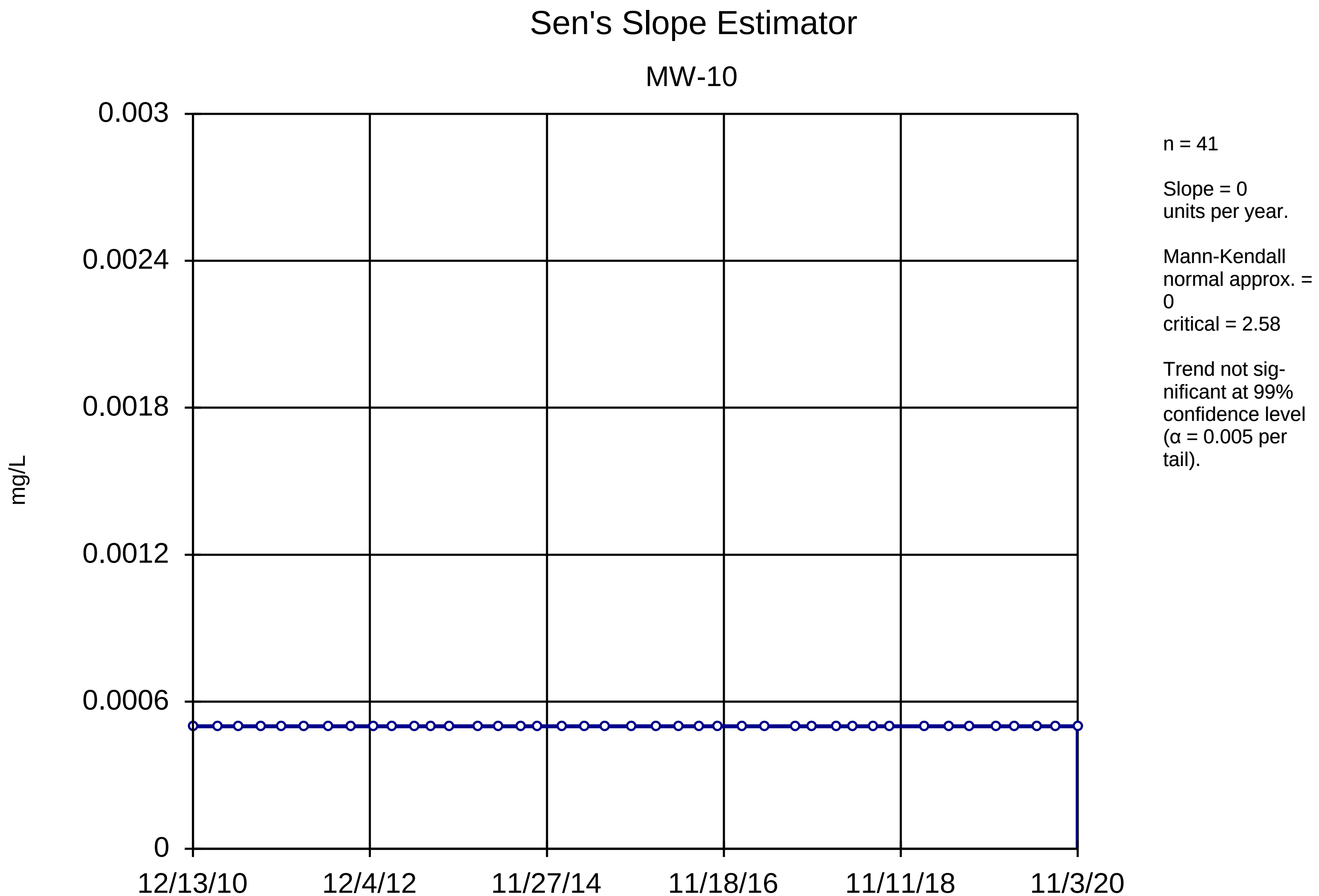
Hollow symbols indicate censored values.




Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.




Constituent: Cadmium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81938

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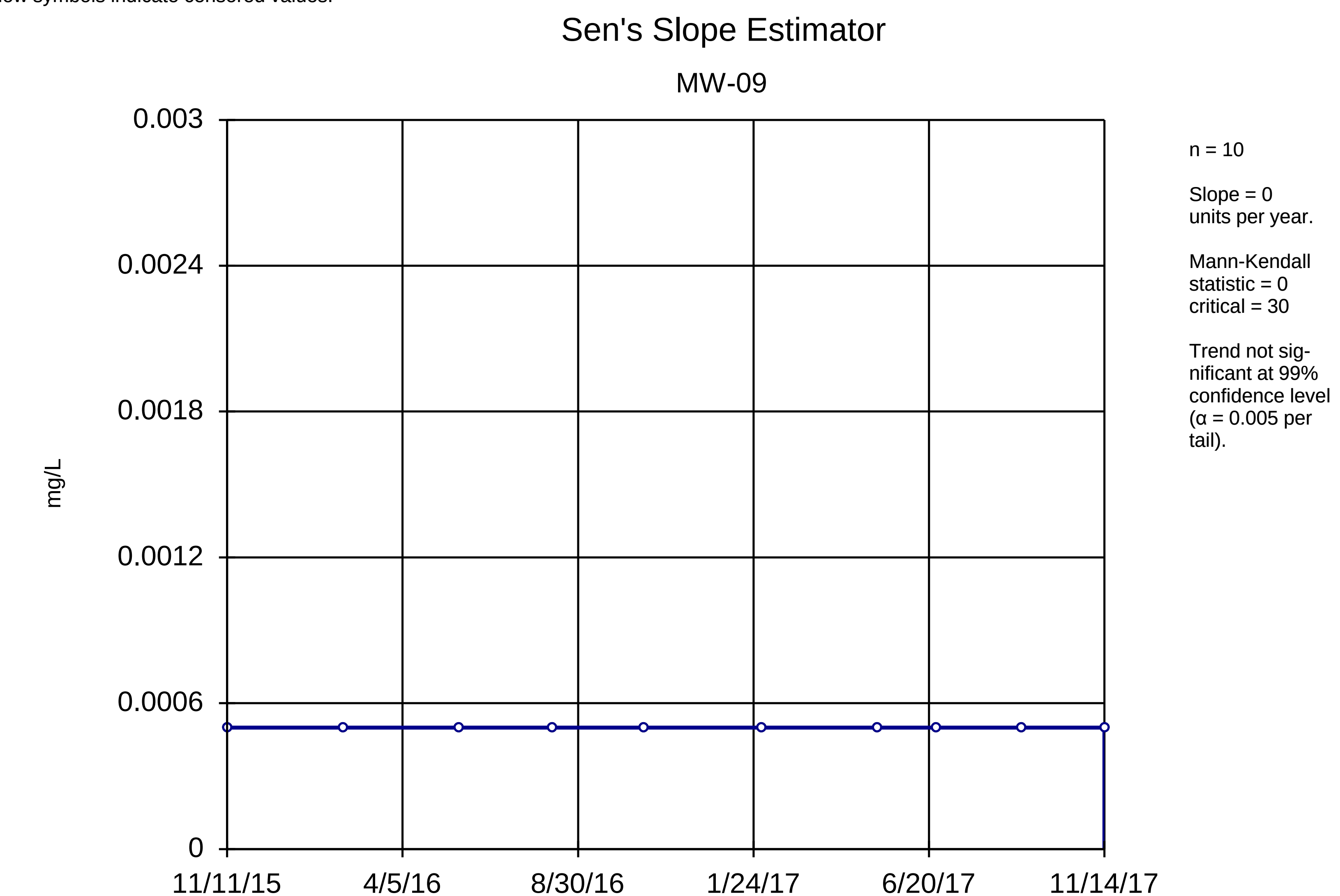
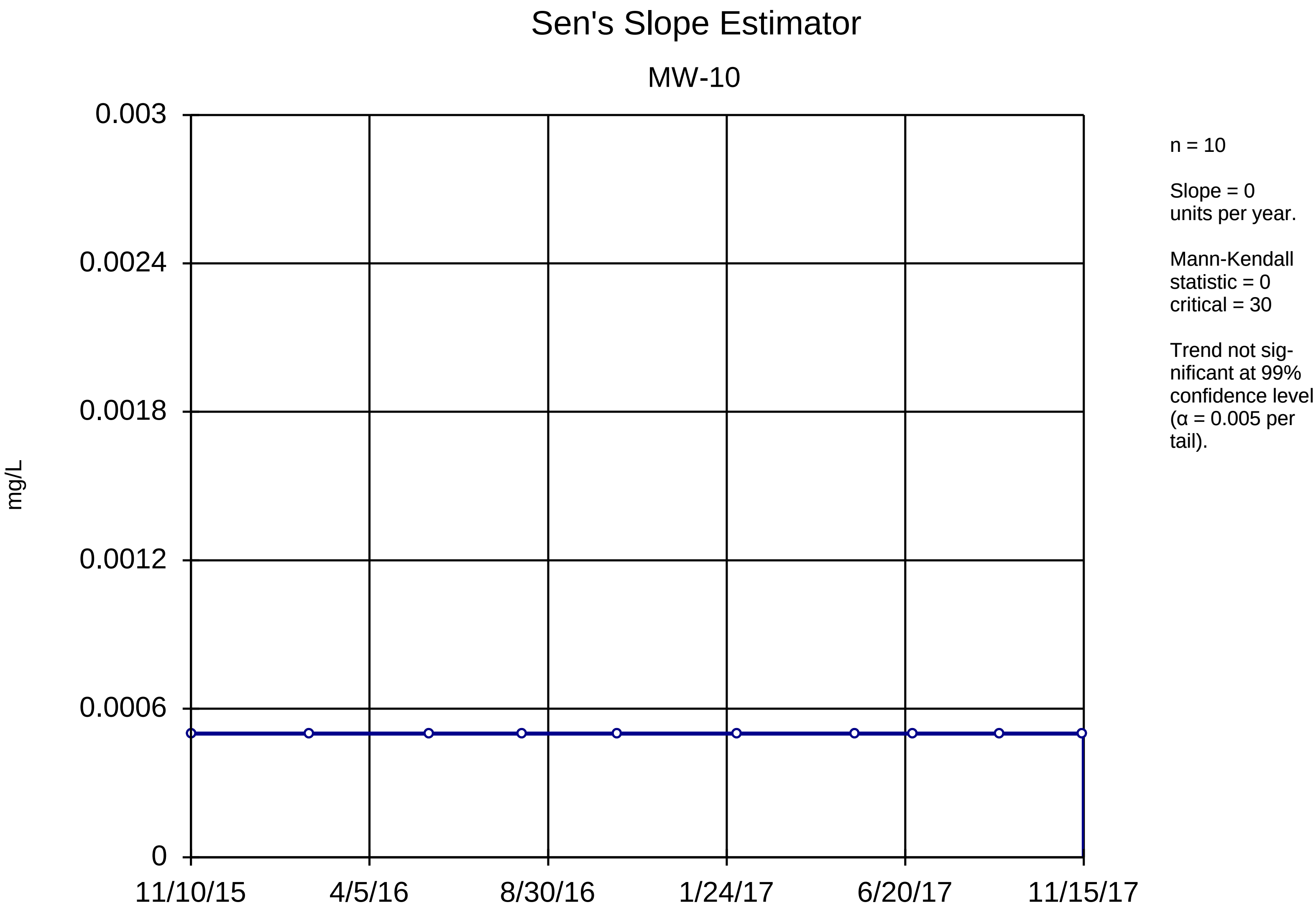



Constituent: Cadmium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.

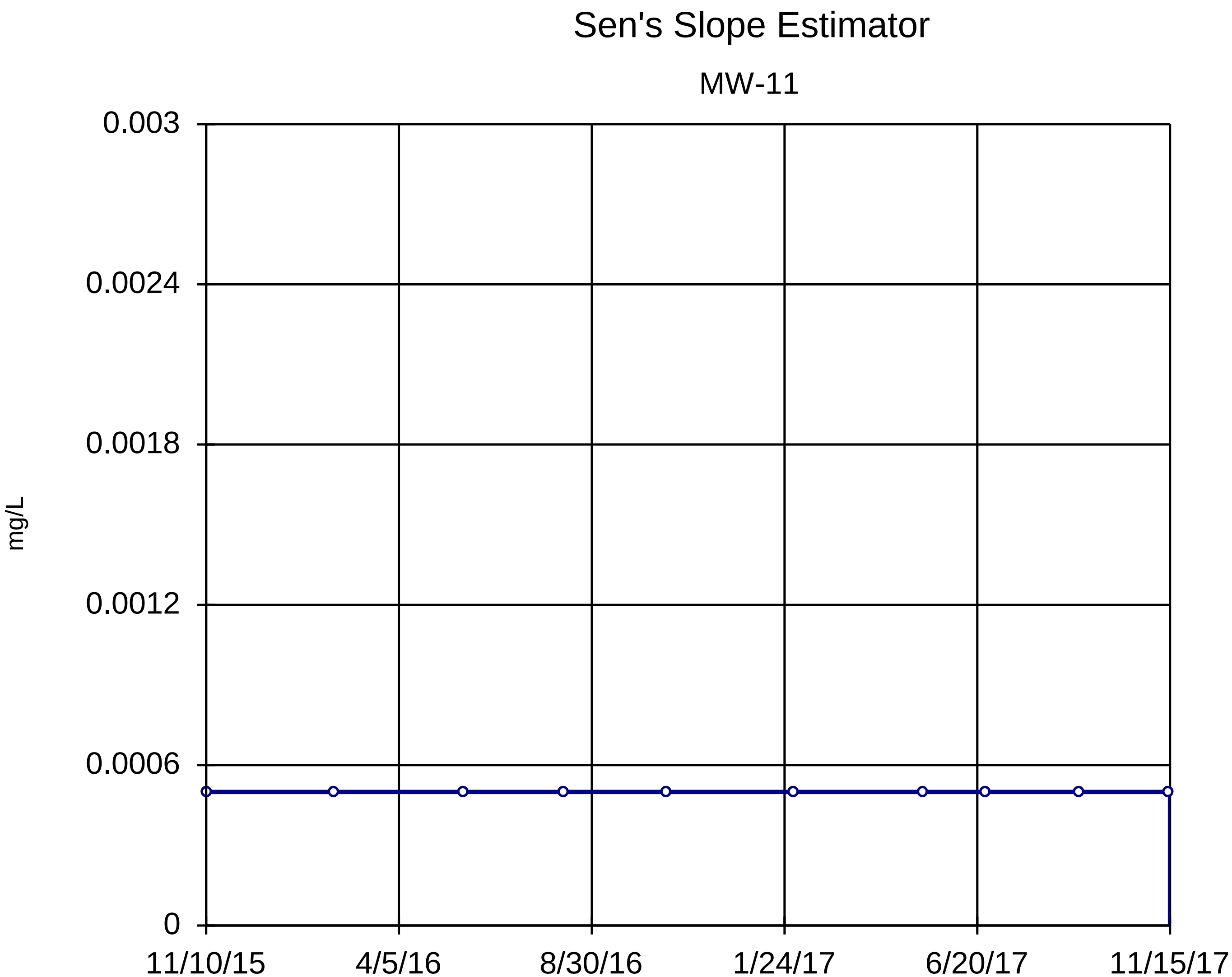



Constituent: Cadmium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81940

Hollow symbols indicate censored values.




n = 10

Slope = 0
units per year.

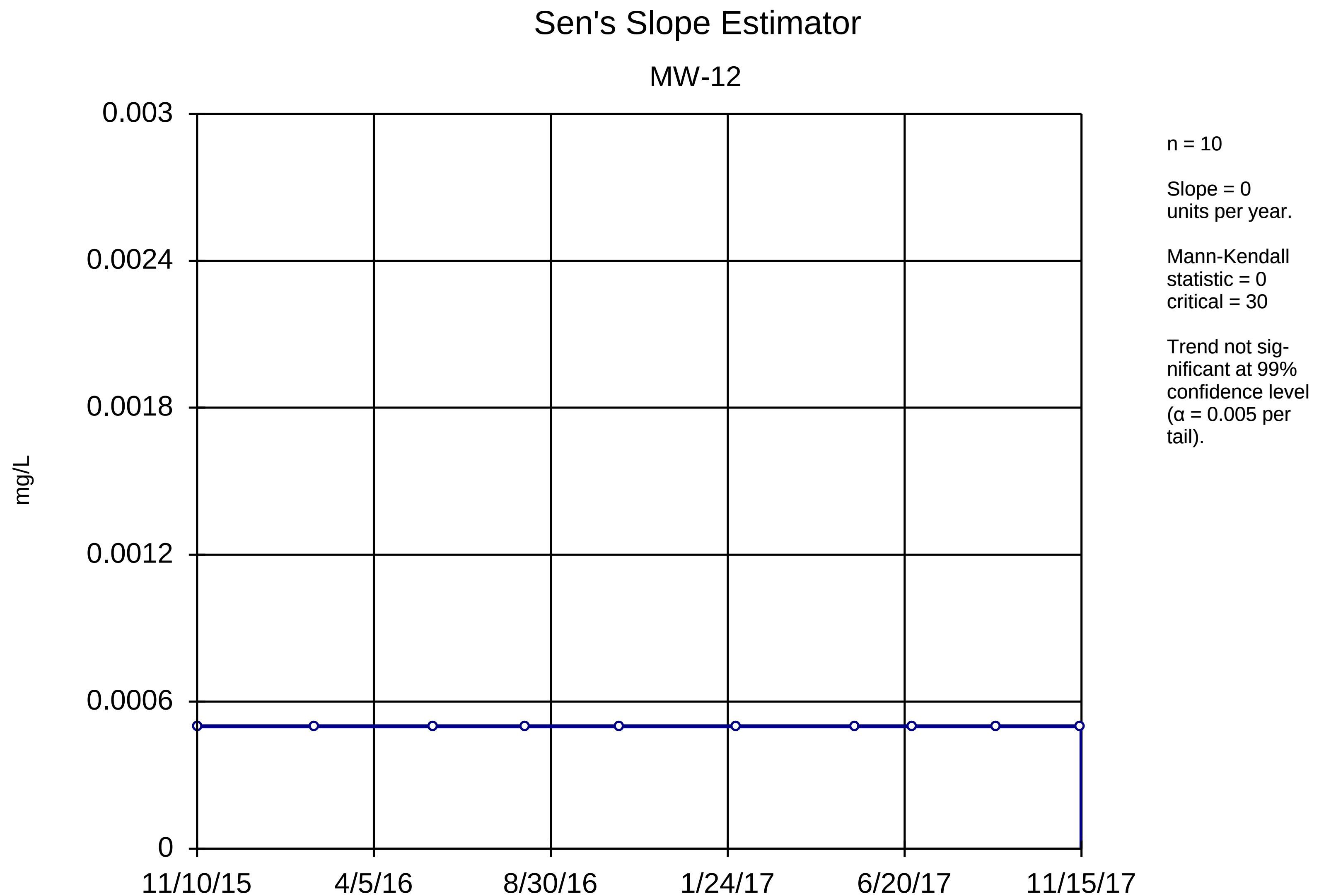
Mann-Kendall
statistic = 0
critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.




Constituent: Cadmium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81942

Electronic Filing: Received, Clerk's Office 01/21/2022

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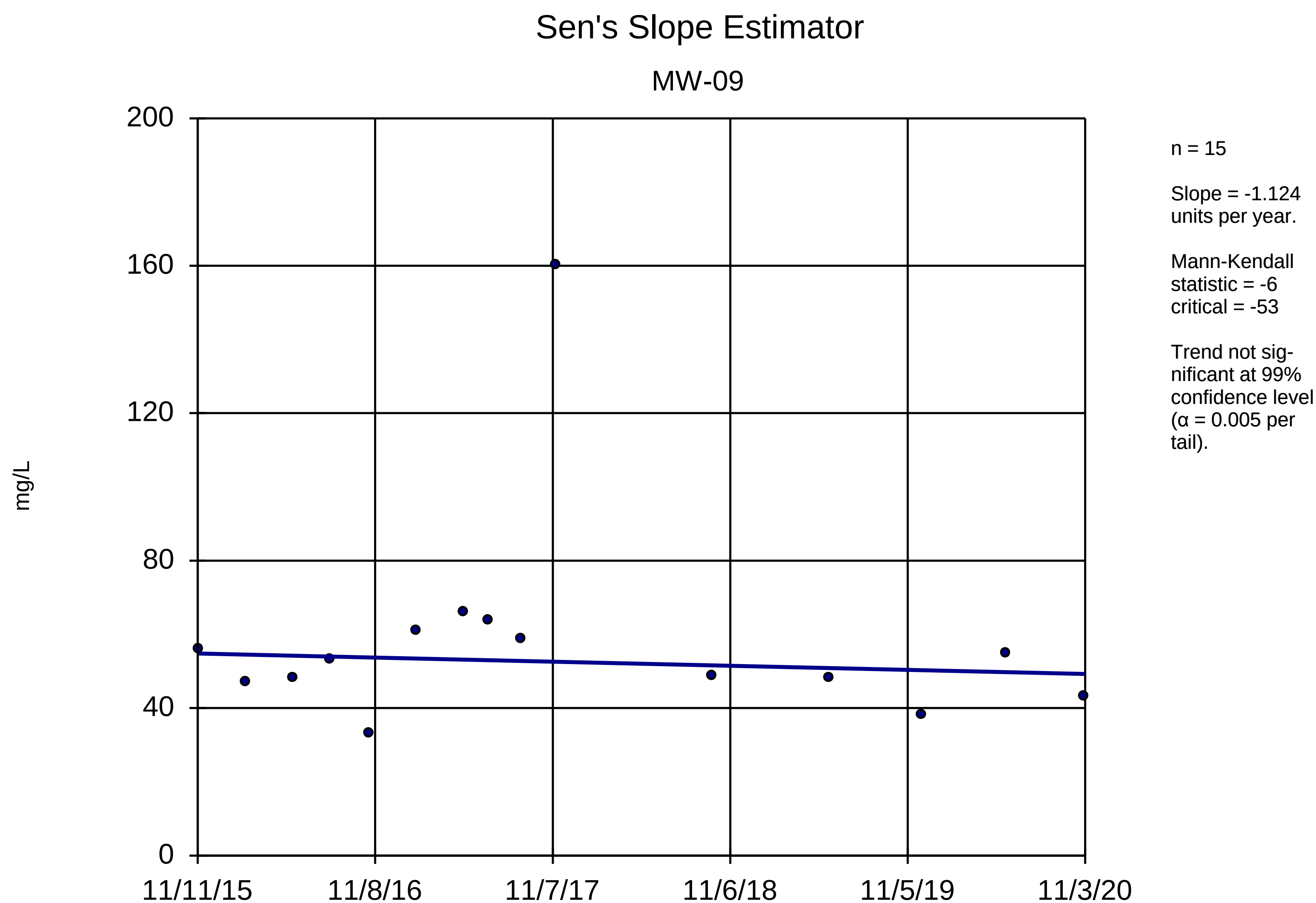
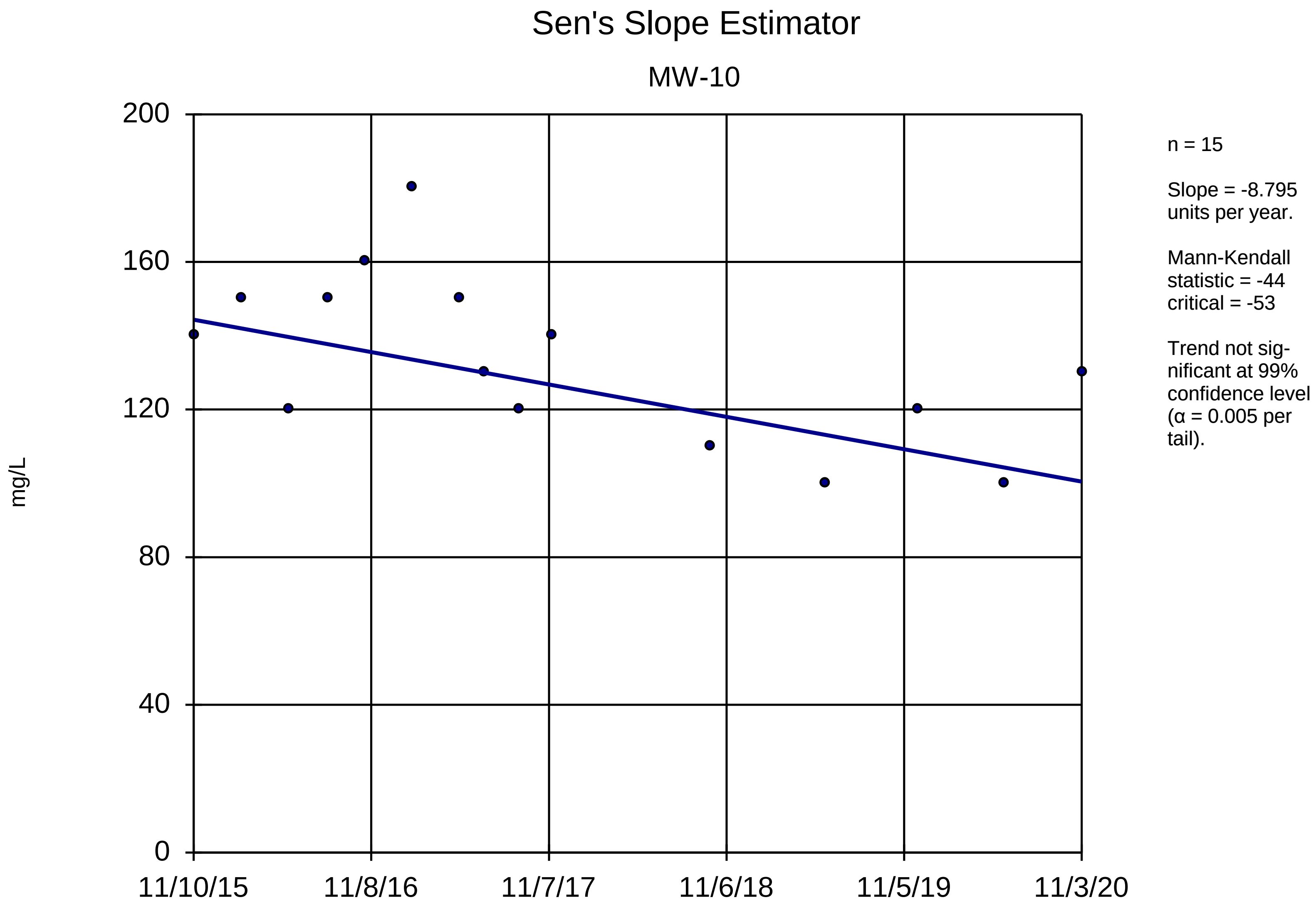



Constituent: Calcium, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

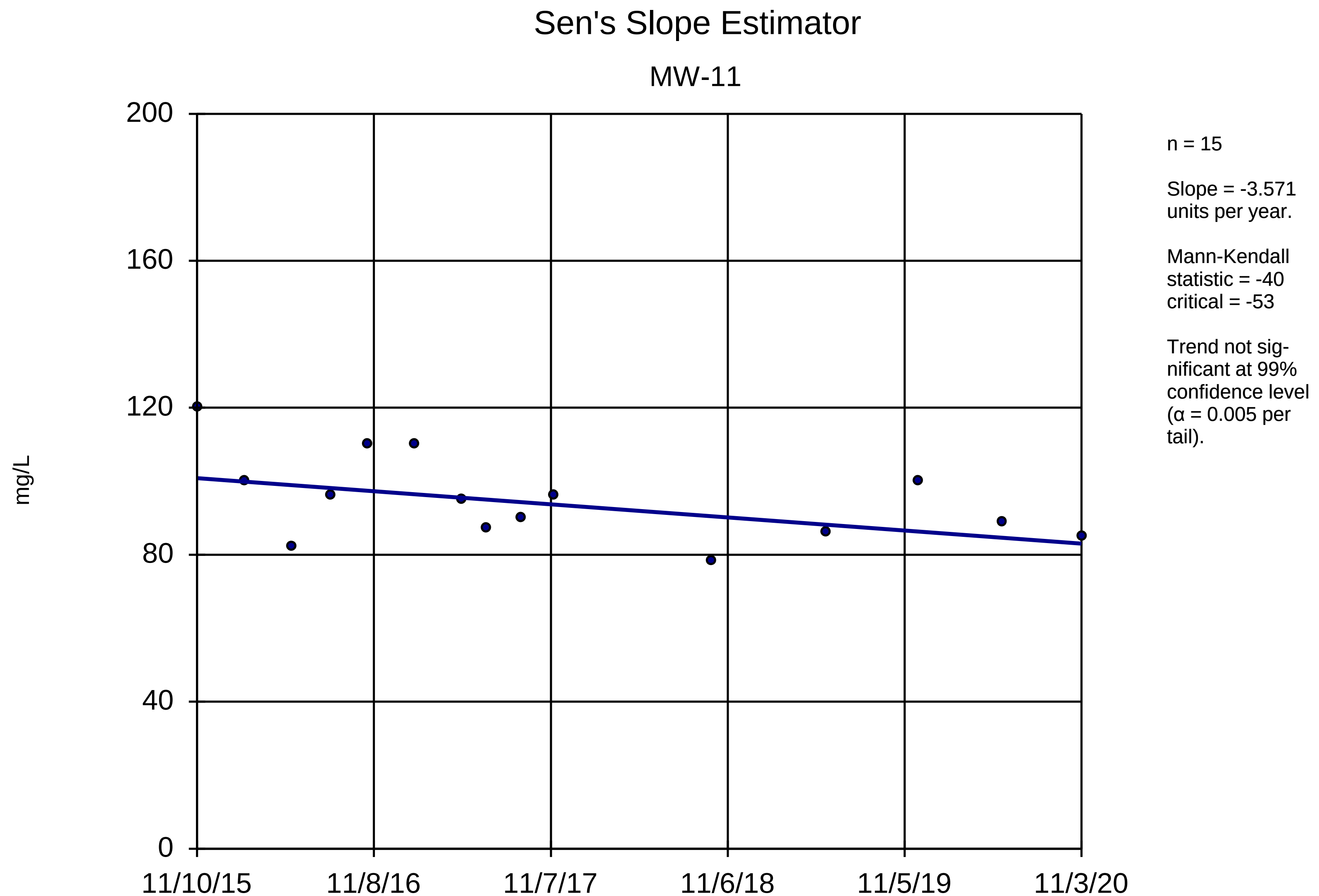
MWG13-15_81943




Constituent: Calcium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

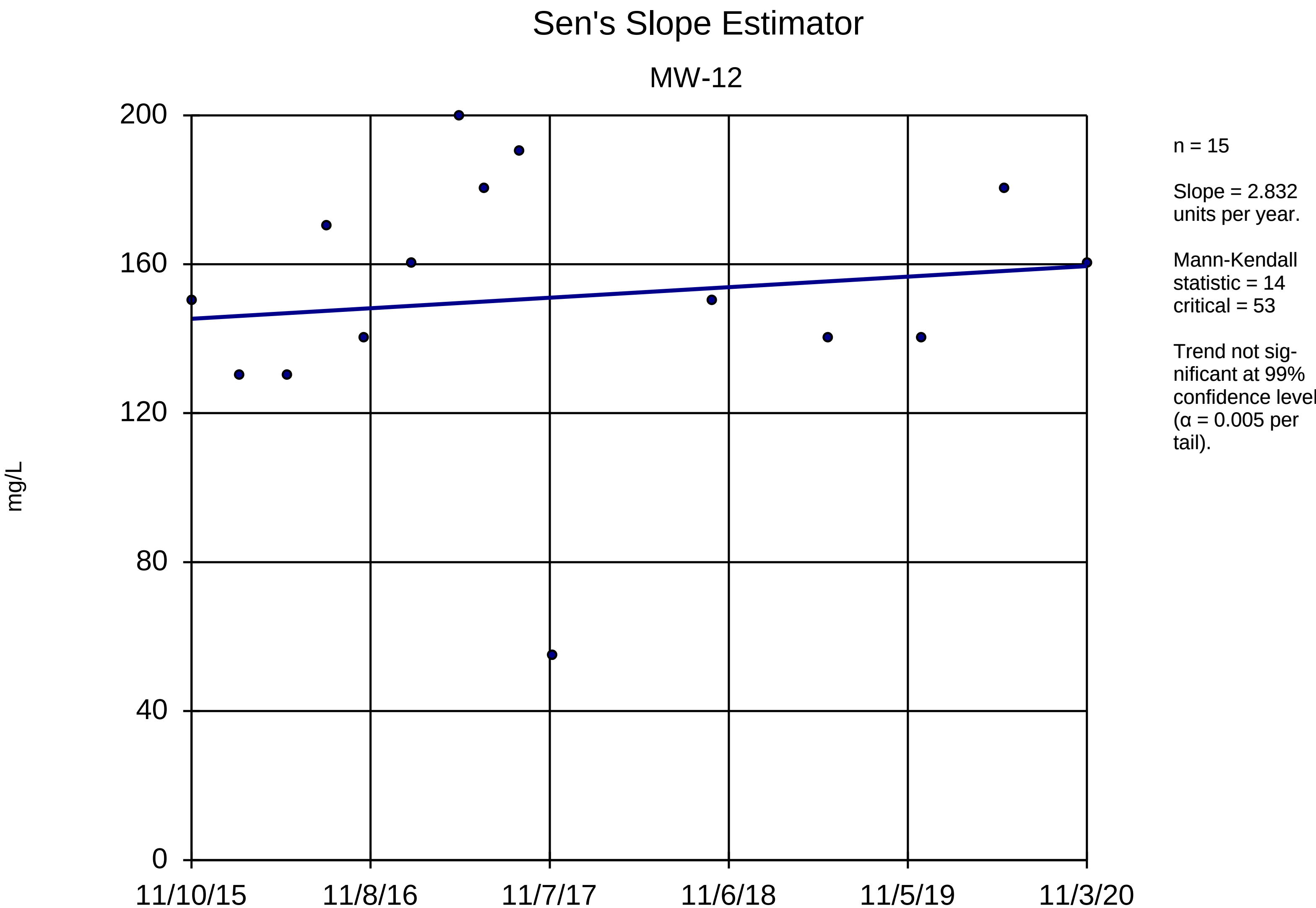
MWG13-15_81944




Constituent: Calcium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

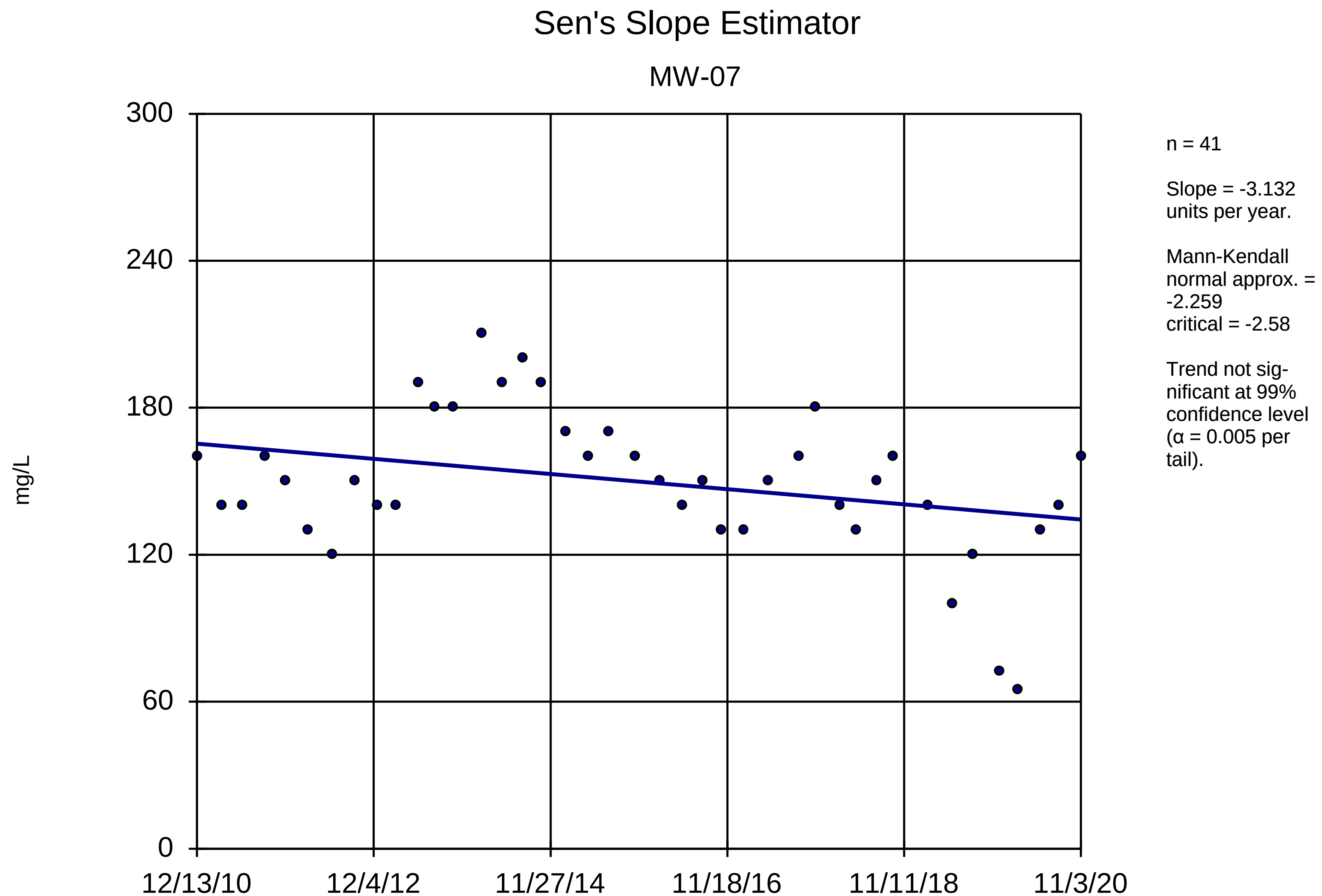
MWG13-15_81945




Constituent: Calcium, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

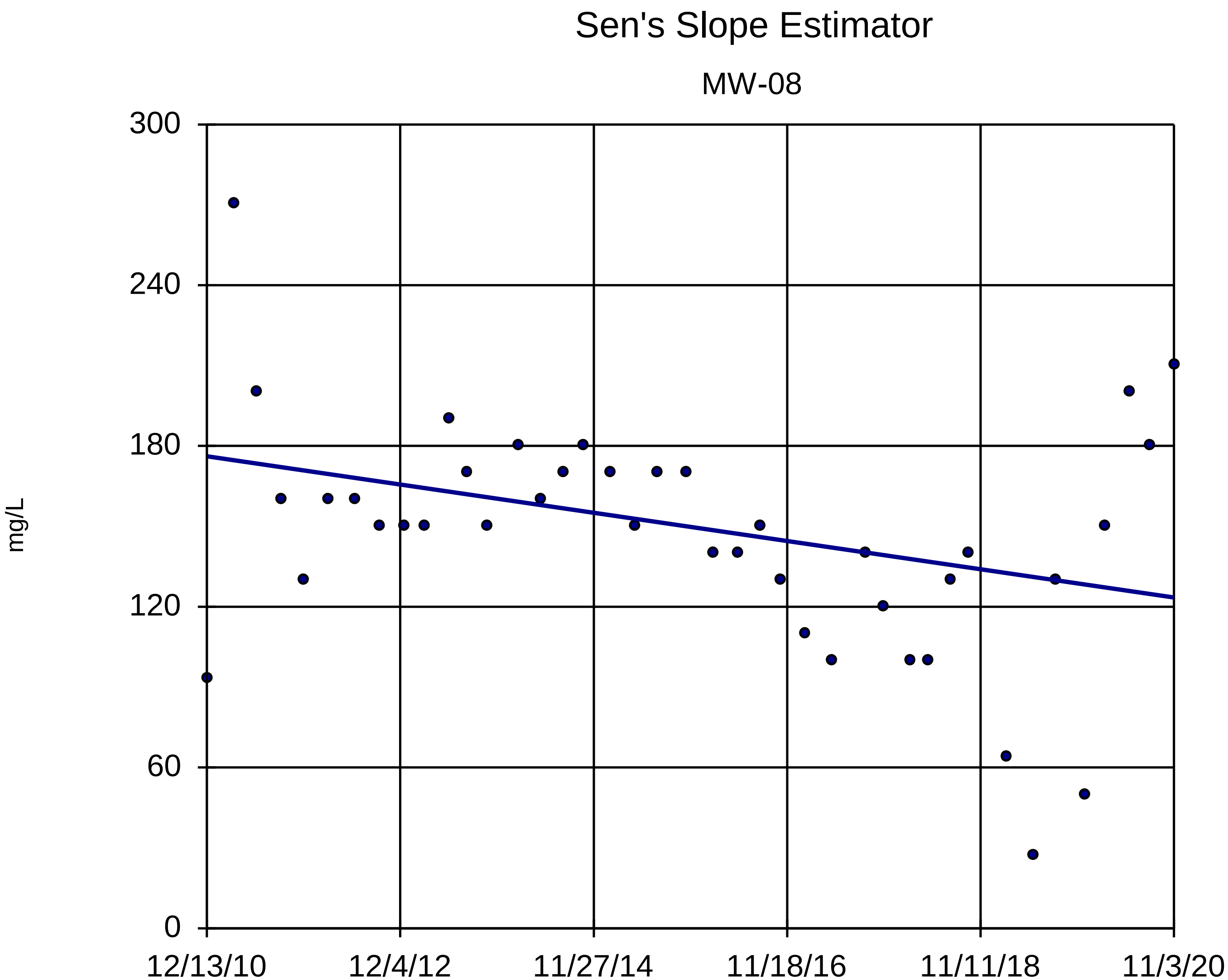
MWG13-15_81946




Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81947




n = 41

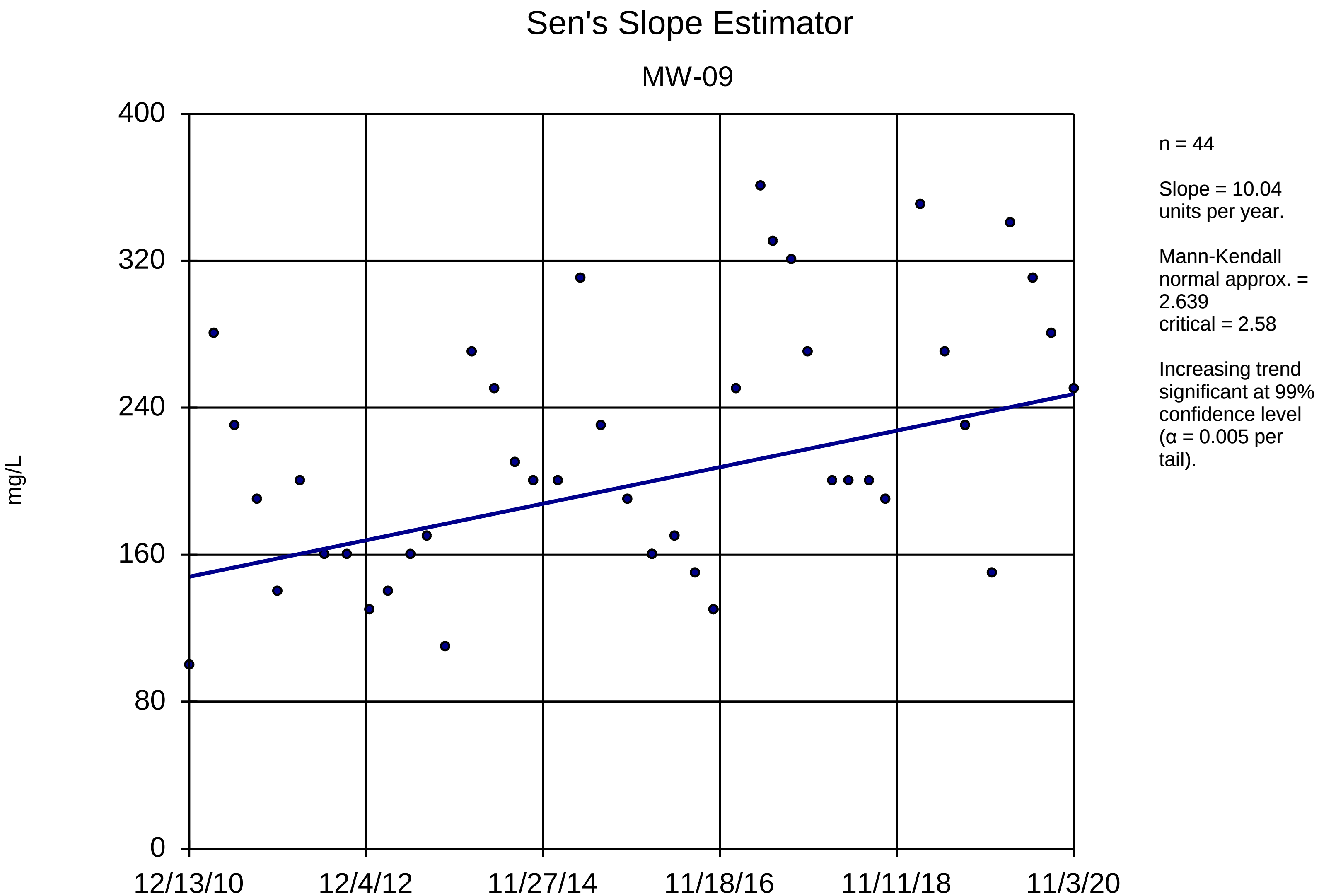
Slope = -5.326
units per year.

Mann-Kendall
normal approx. =
-2.43
critical = -2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

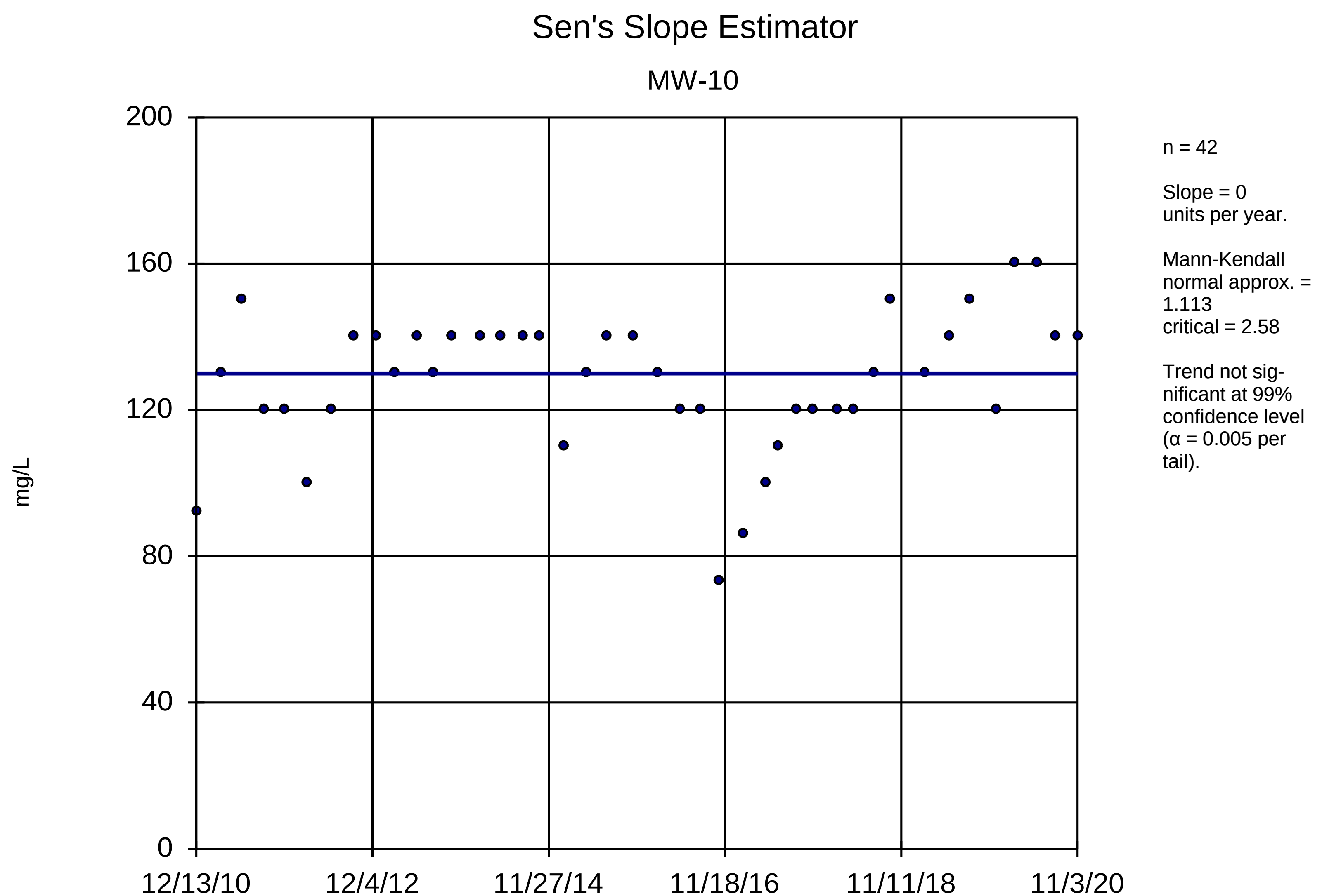
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81949



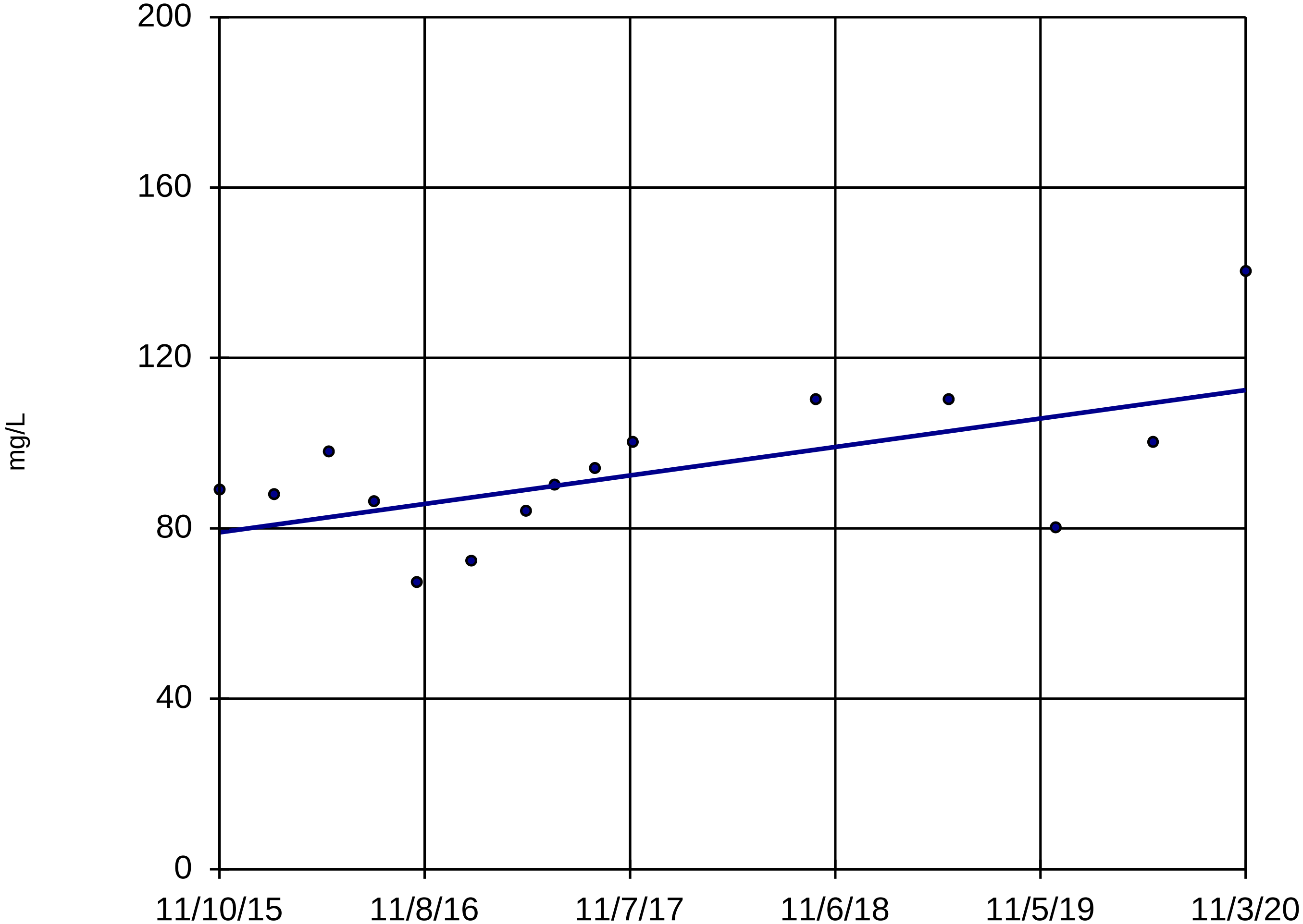

Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81950

## Sen's Slope Estimator

MW-11




n = 15

Slope = 6.703 units per year.

Mann-Kendall statistic = 43 critical = 53

Trend not significant at 99% confidence level (α = 0.005 per tail).

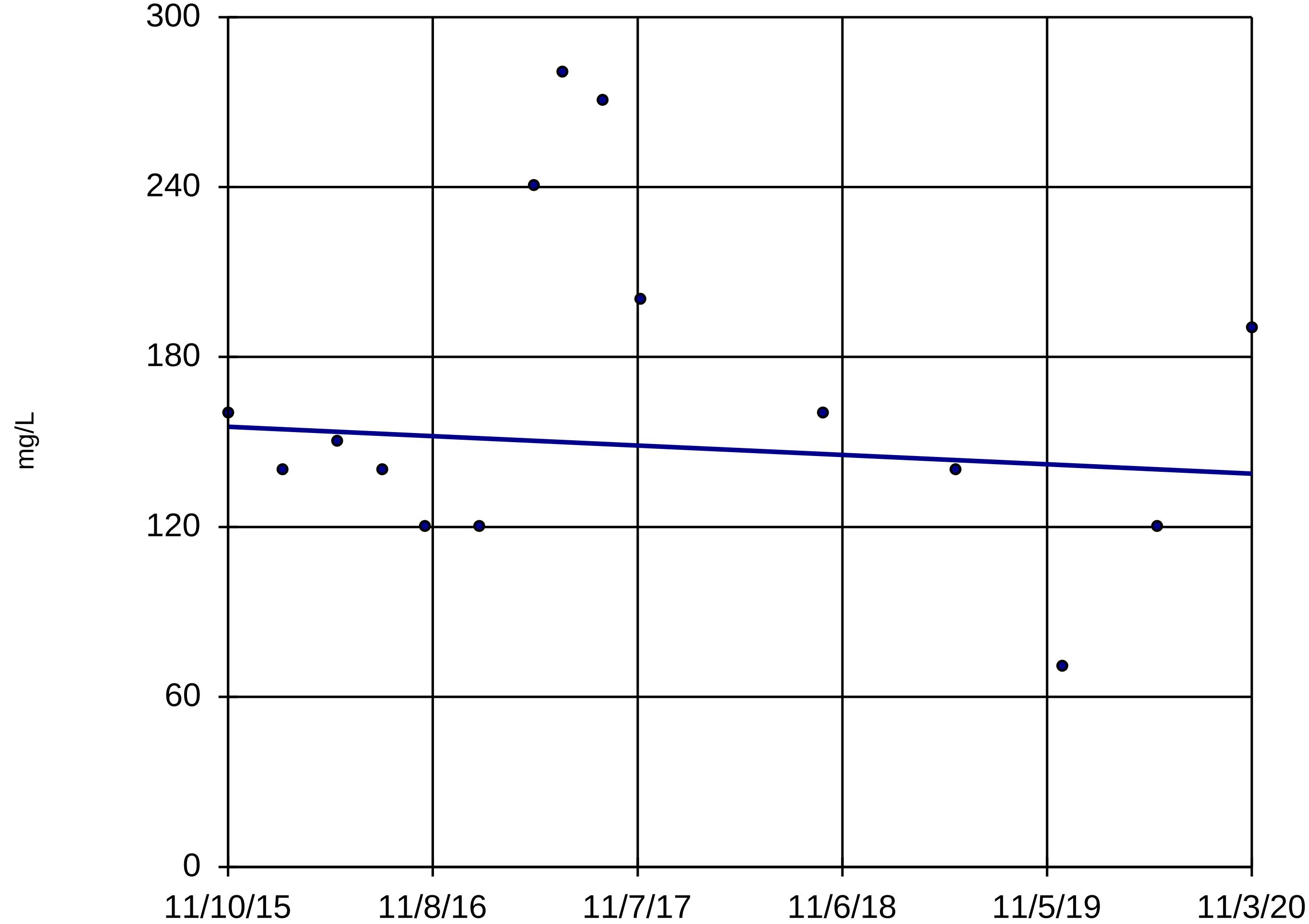
Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81951

# Sen's Slope Estimator

MW-12




n = 15

Slope = -3.321 units per year.

Mann-Kendall statistic = -8 critical = -53

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81952

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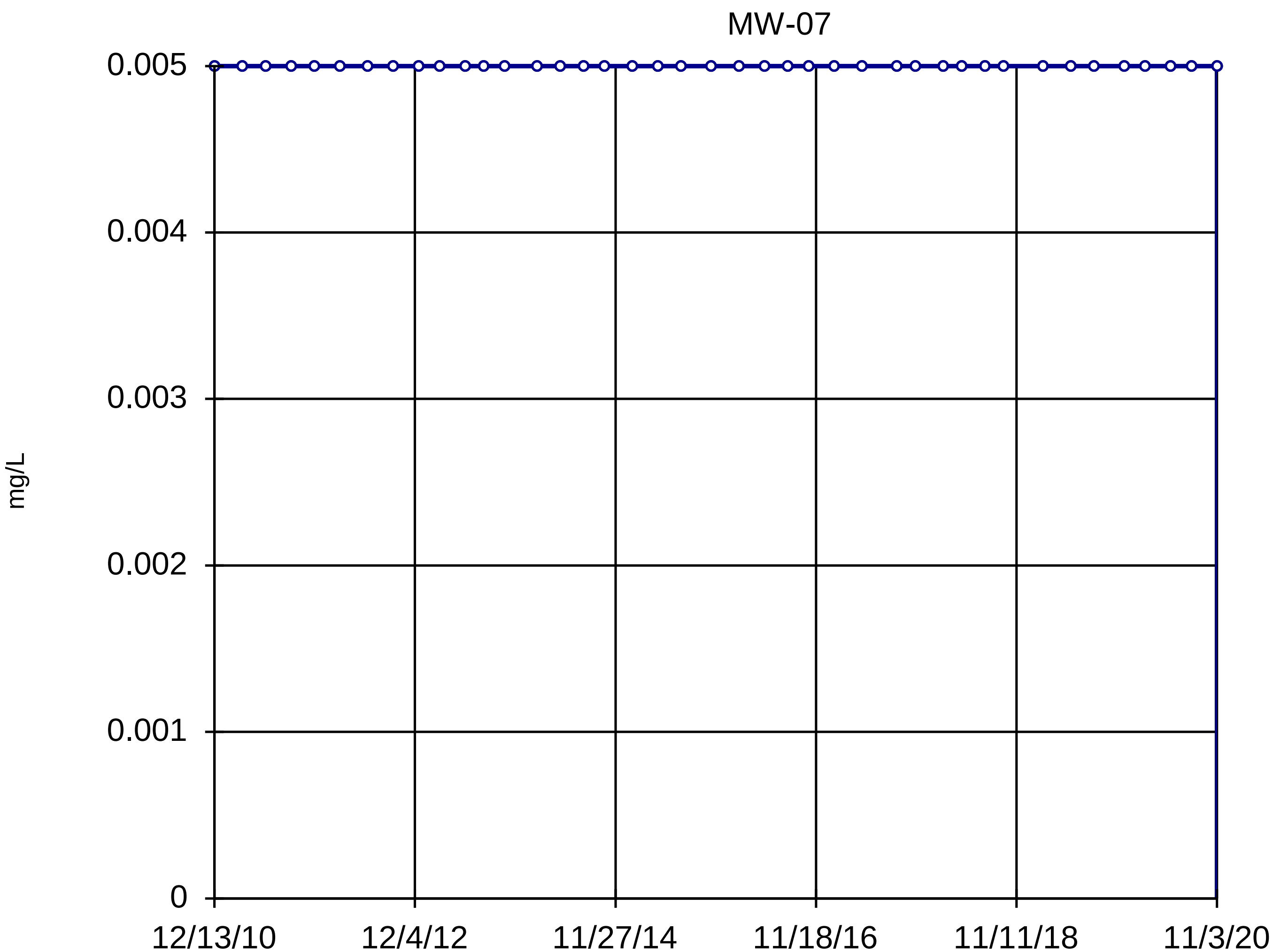
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0
critical = 2.58

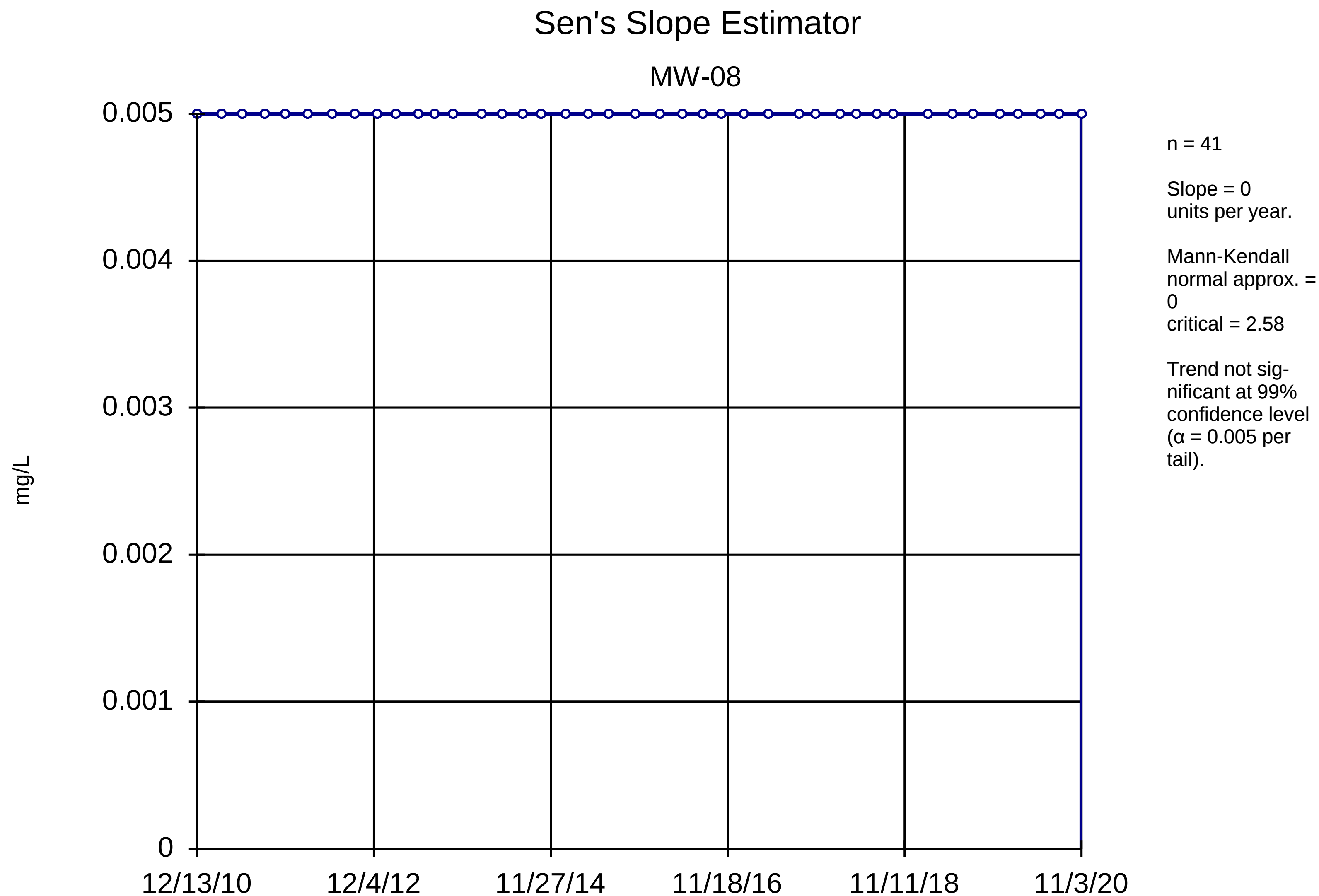
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81953

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81954

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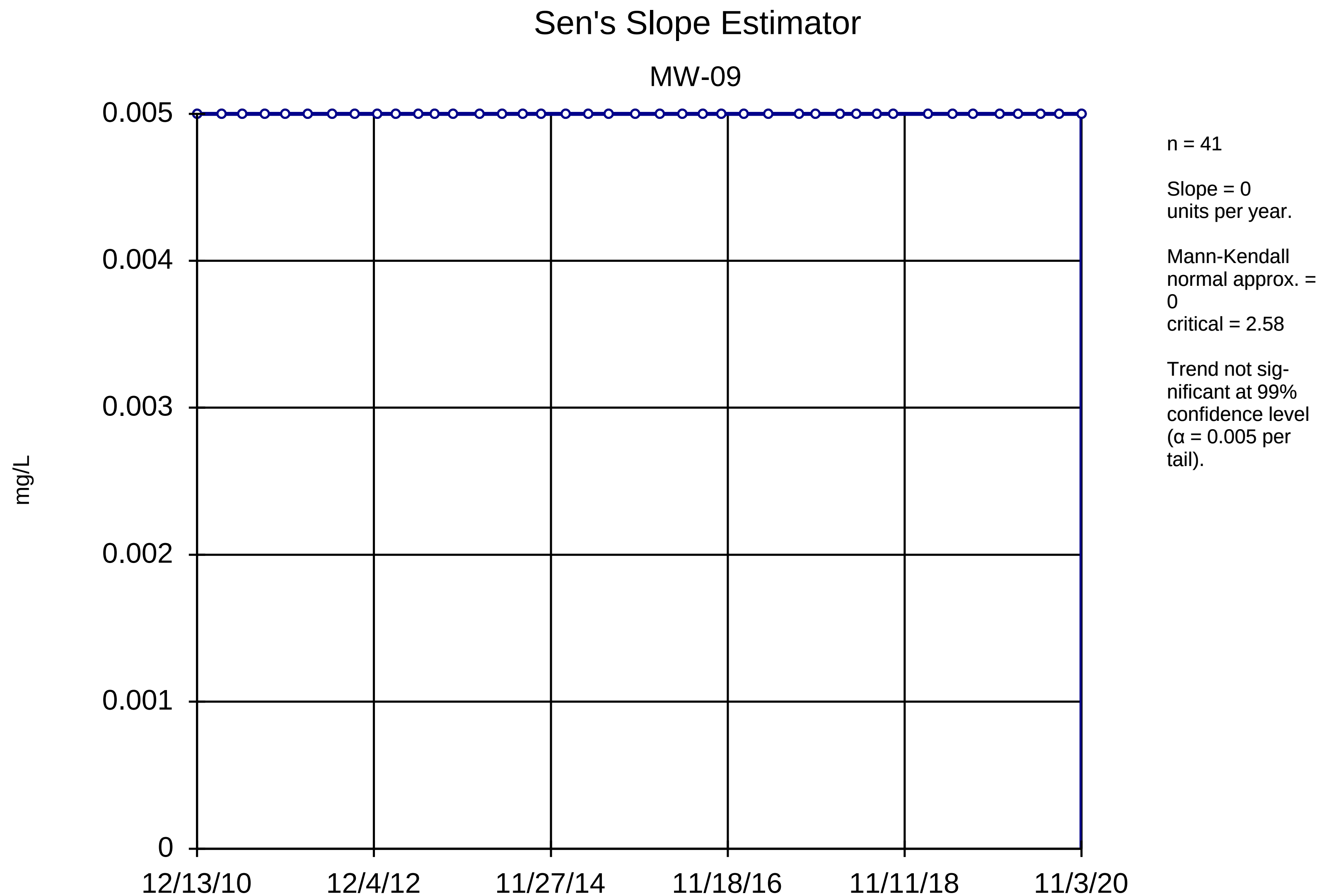
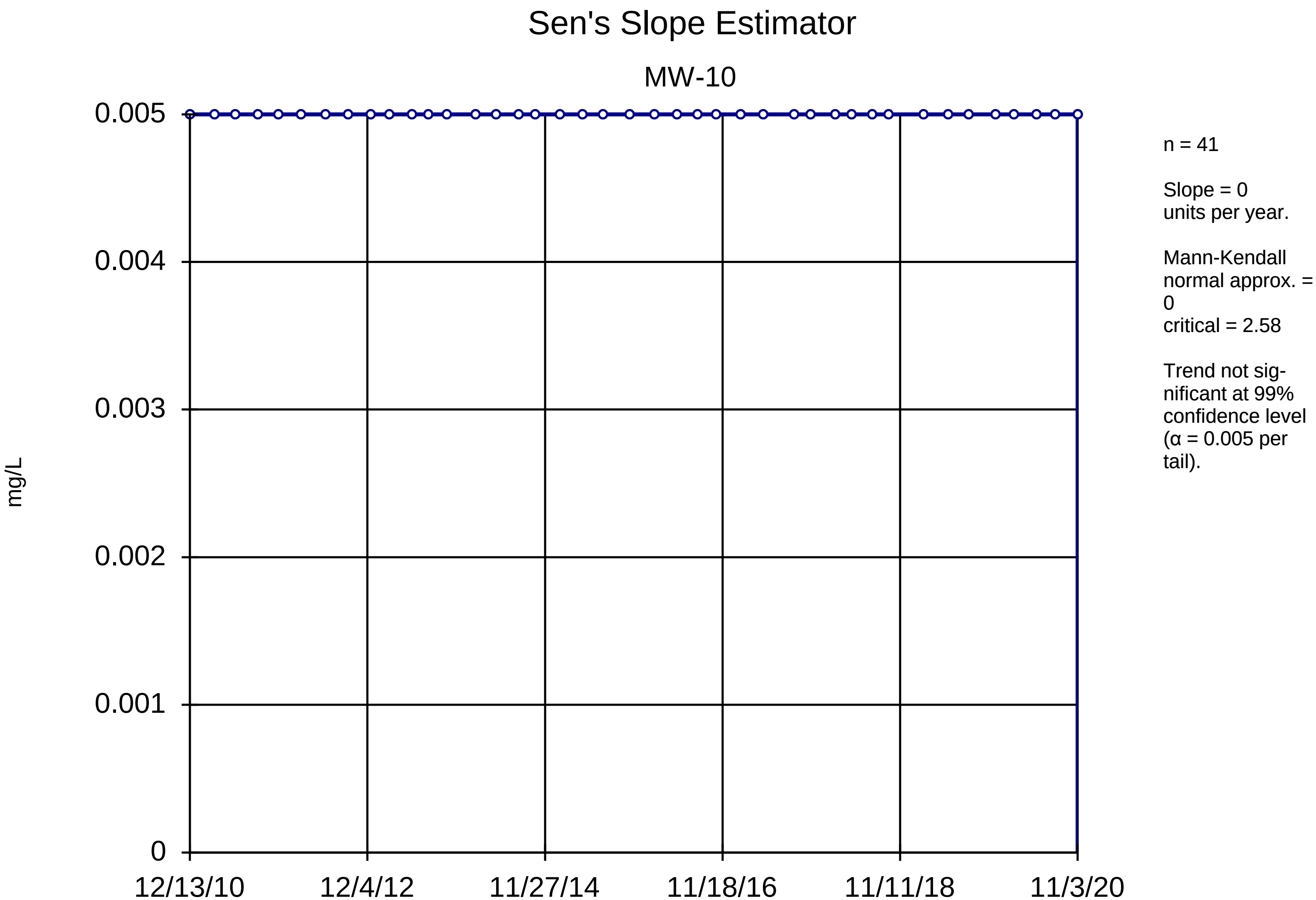



Constituent: Chromium, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81955

Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81956

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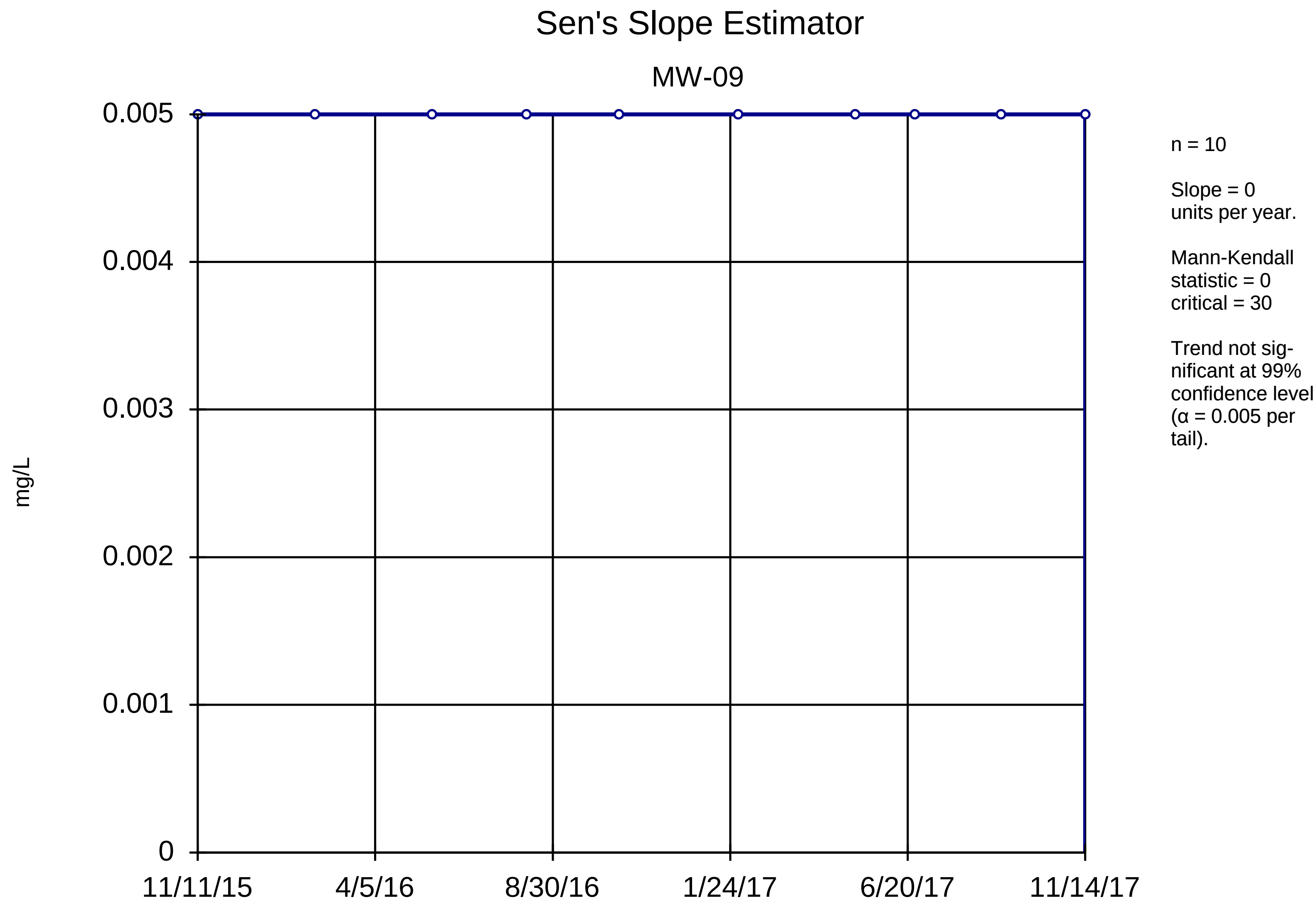
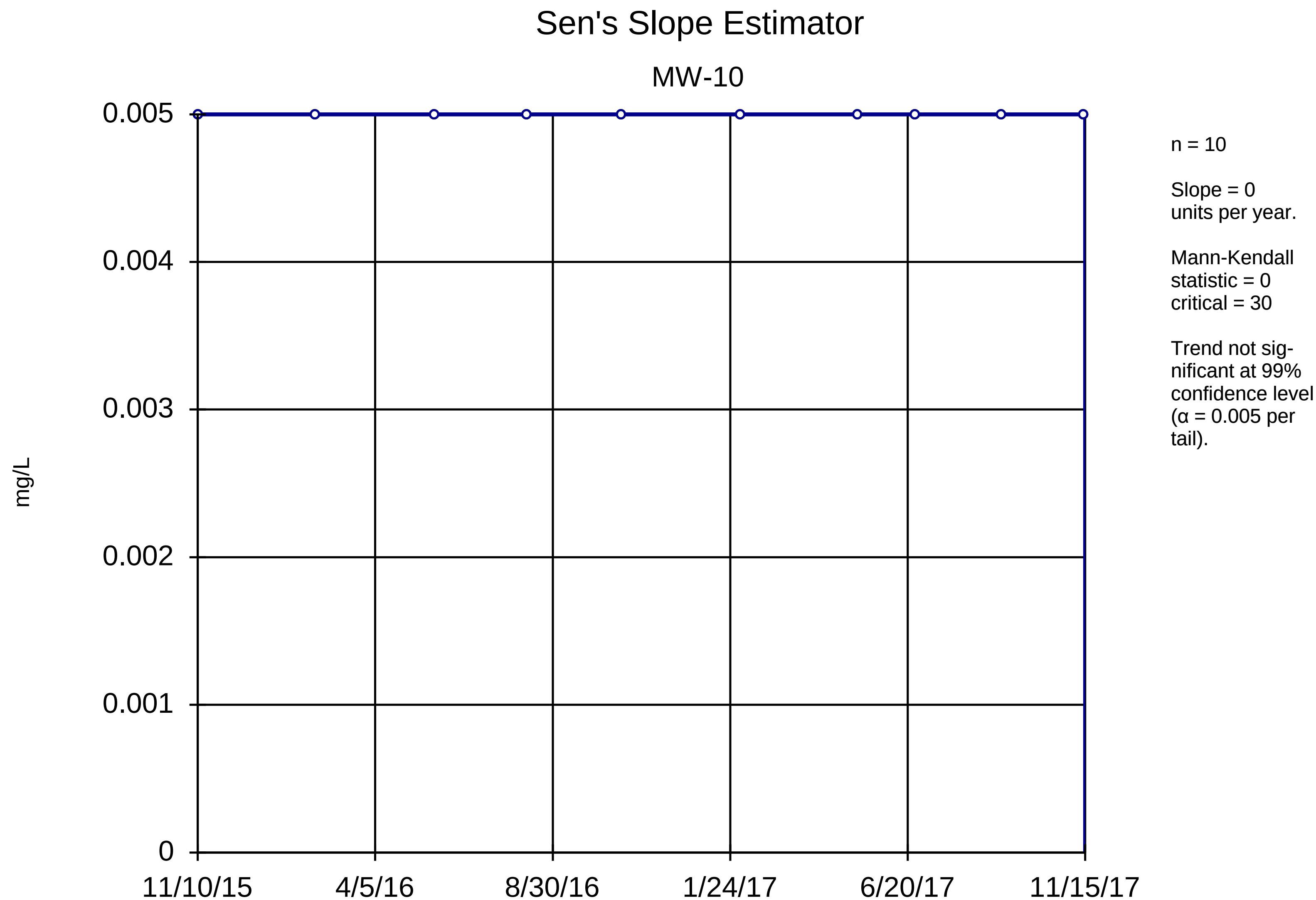



Constituent: Chromium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81957

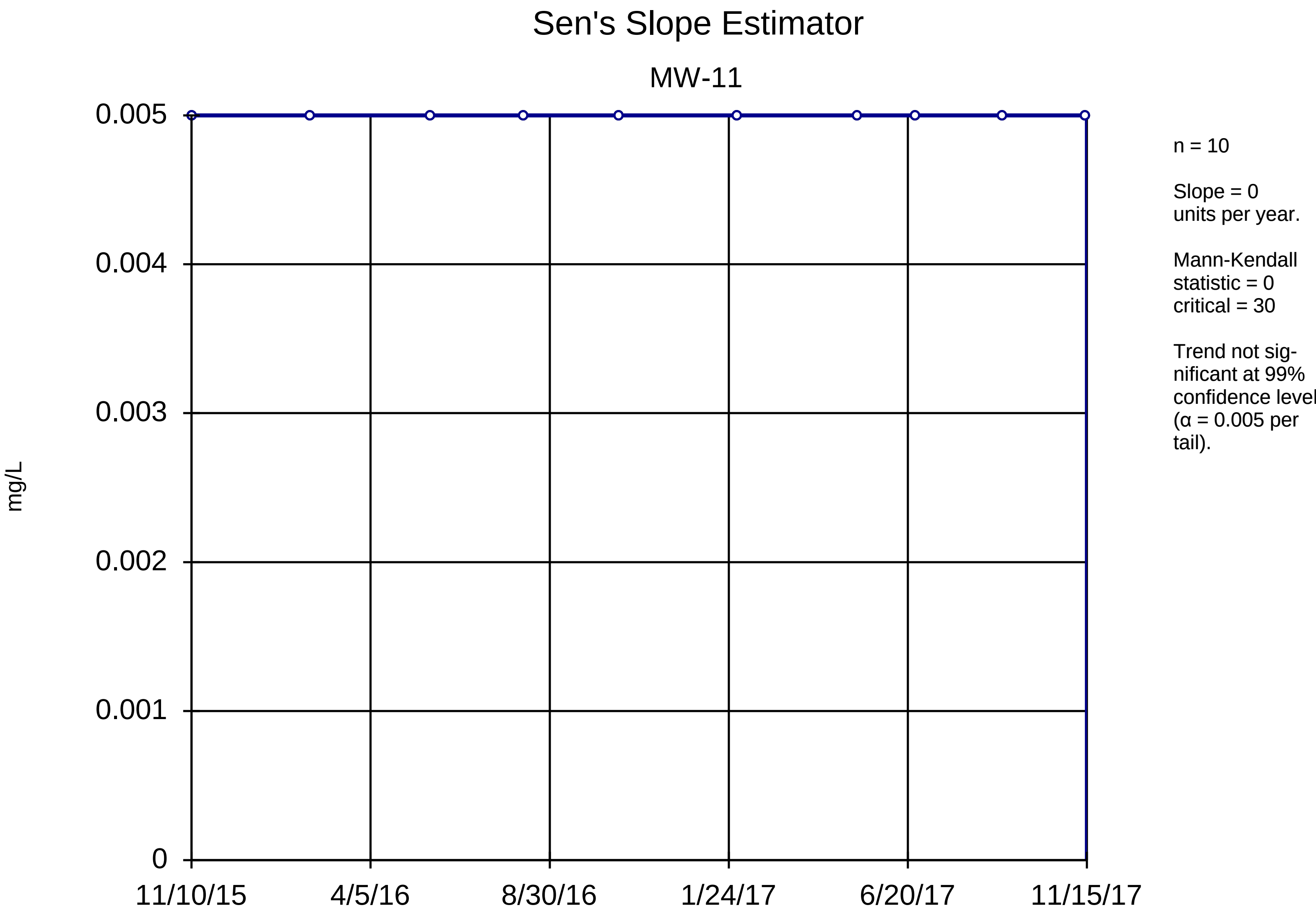
Hollow symbols indicate censored values.




Constituent: Chromium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.




Constituent: Chromium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81959

Electronic Filing: Received, Clerk's Office 01/21/2022

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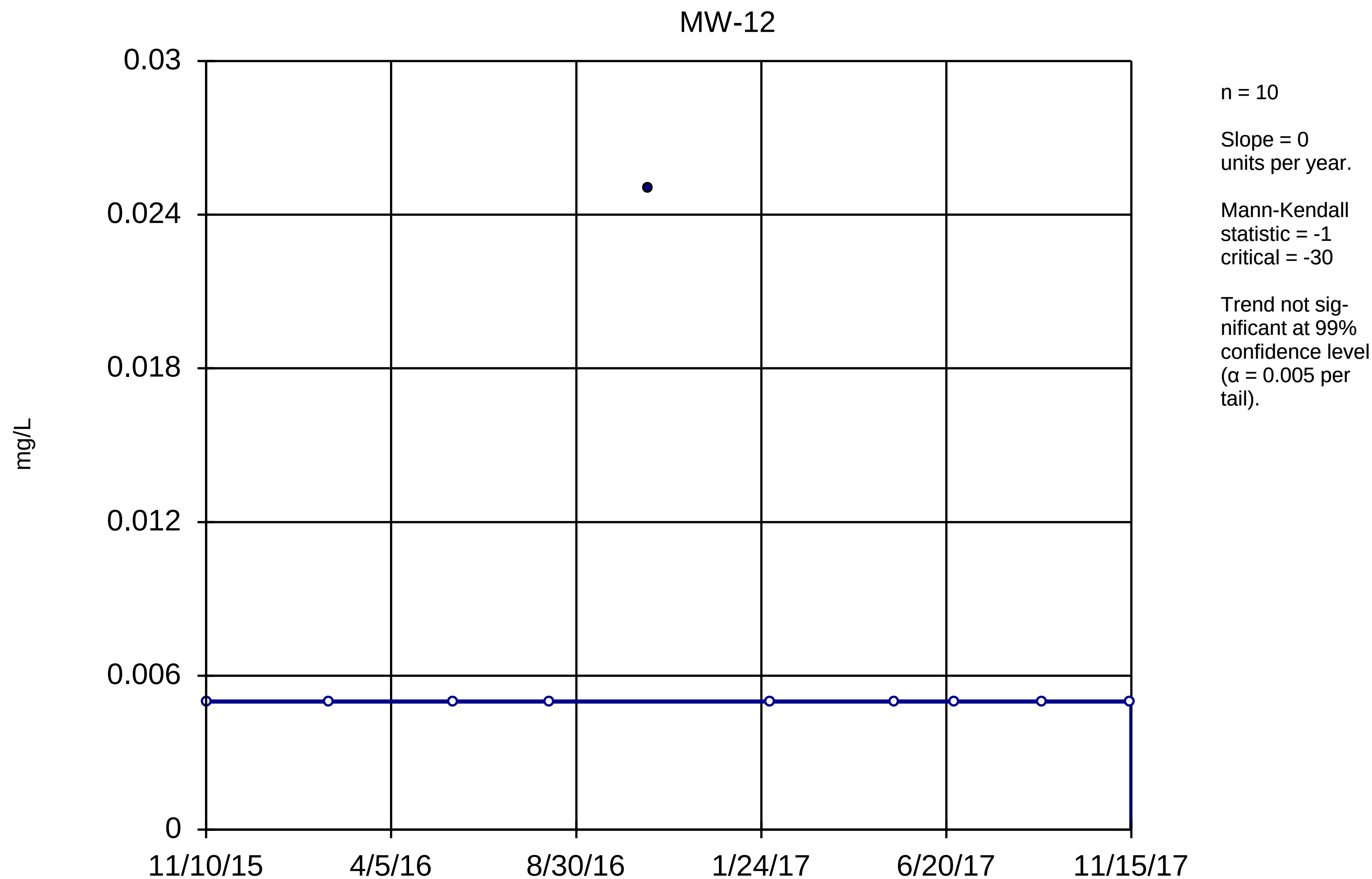
Hollow symbols indicate censored values.

## Sen's Slope Estimator

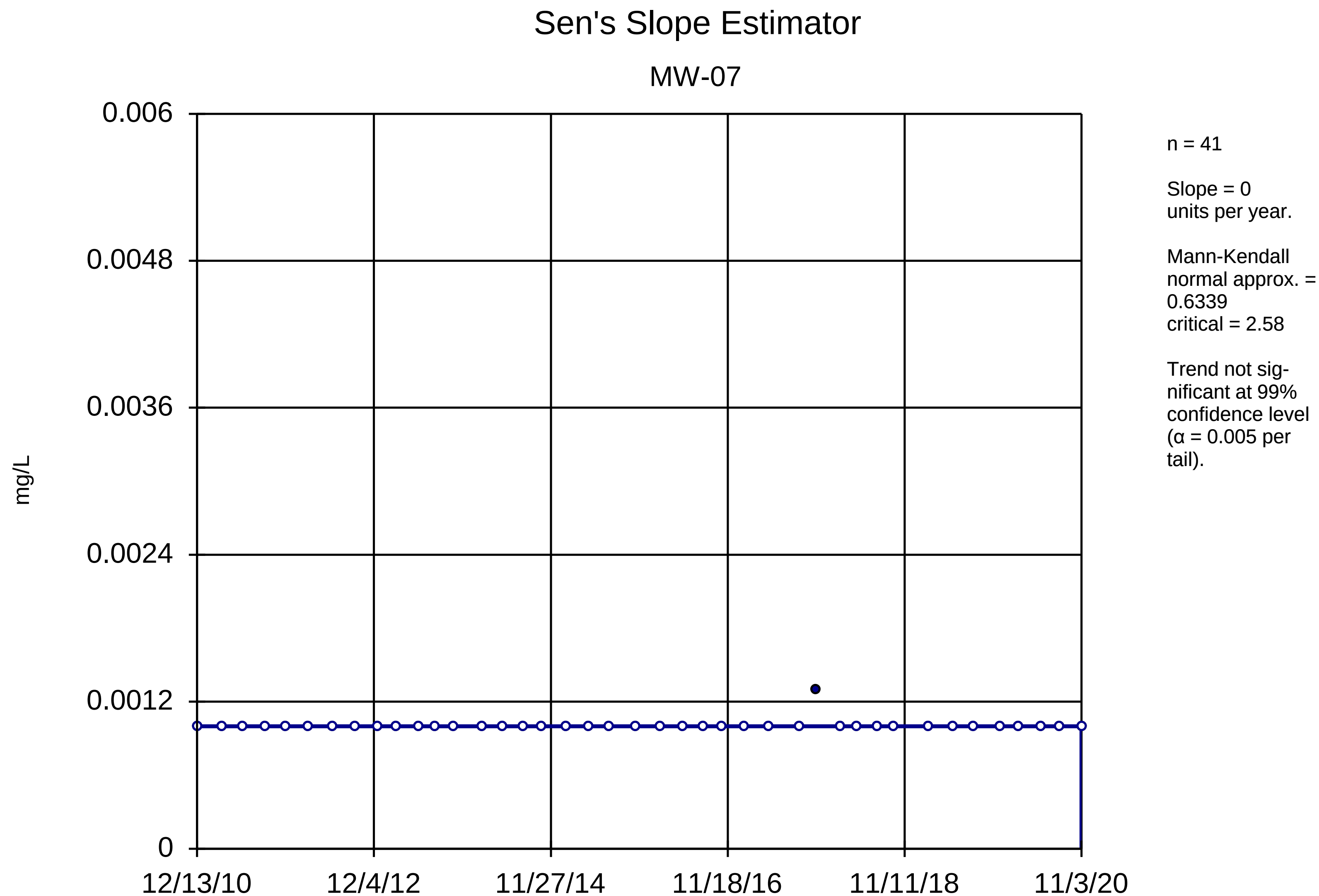



Constituent: Chromium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81960

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

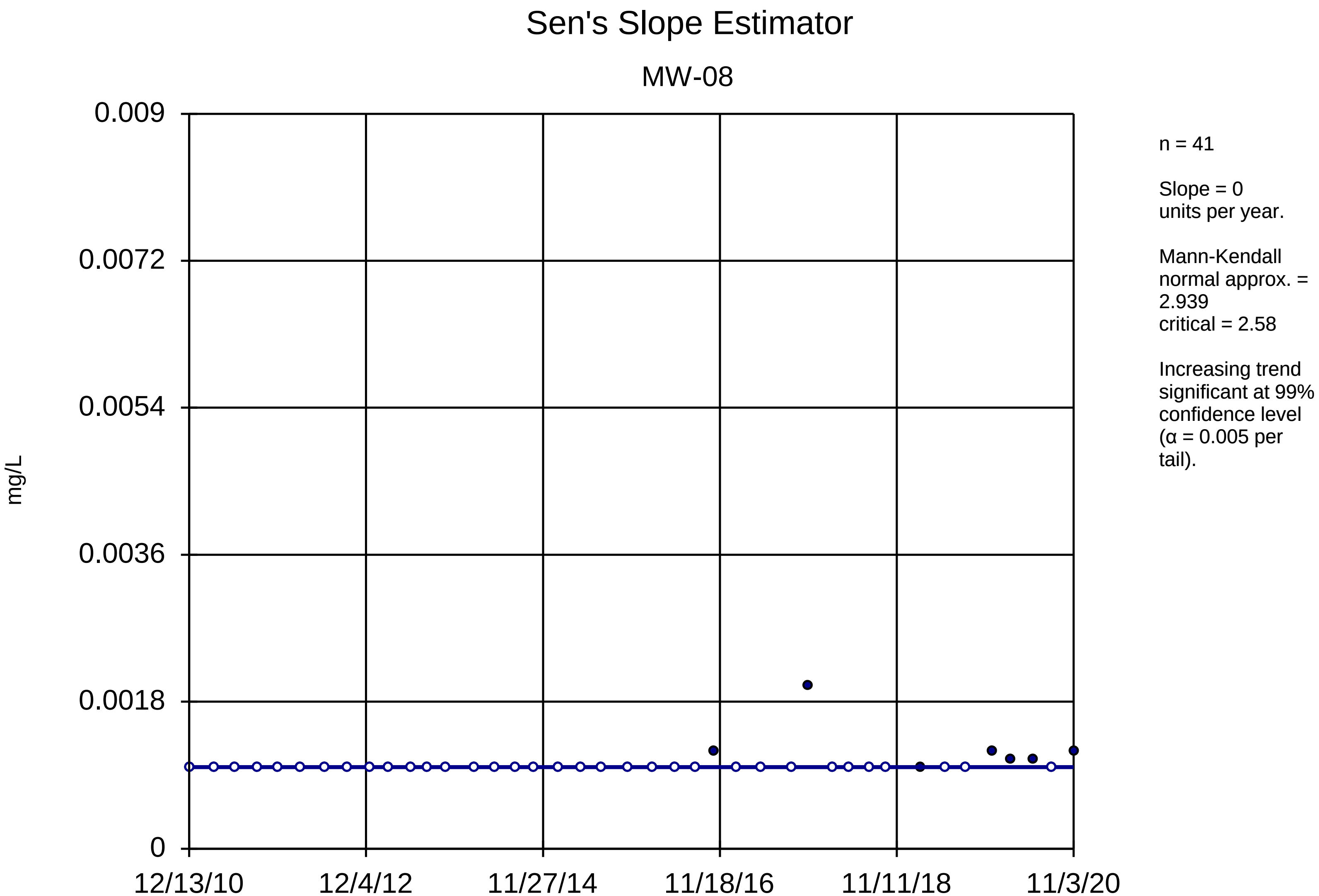



Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81961

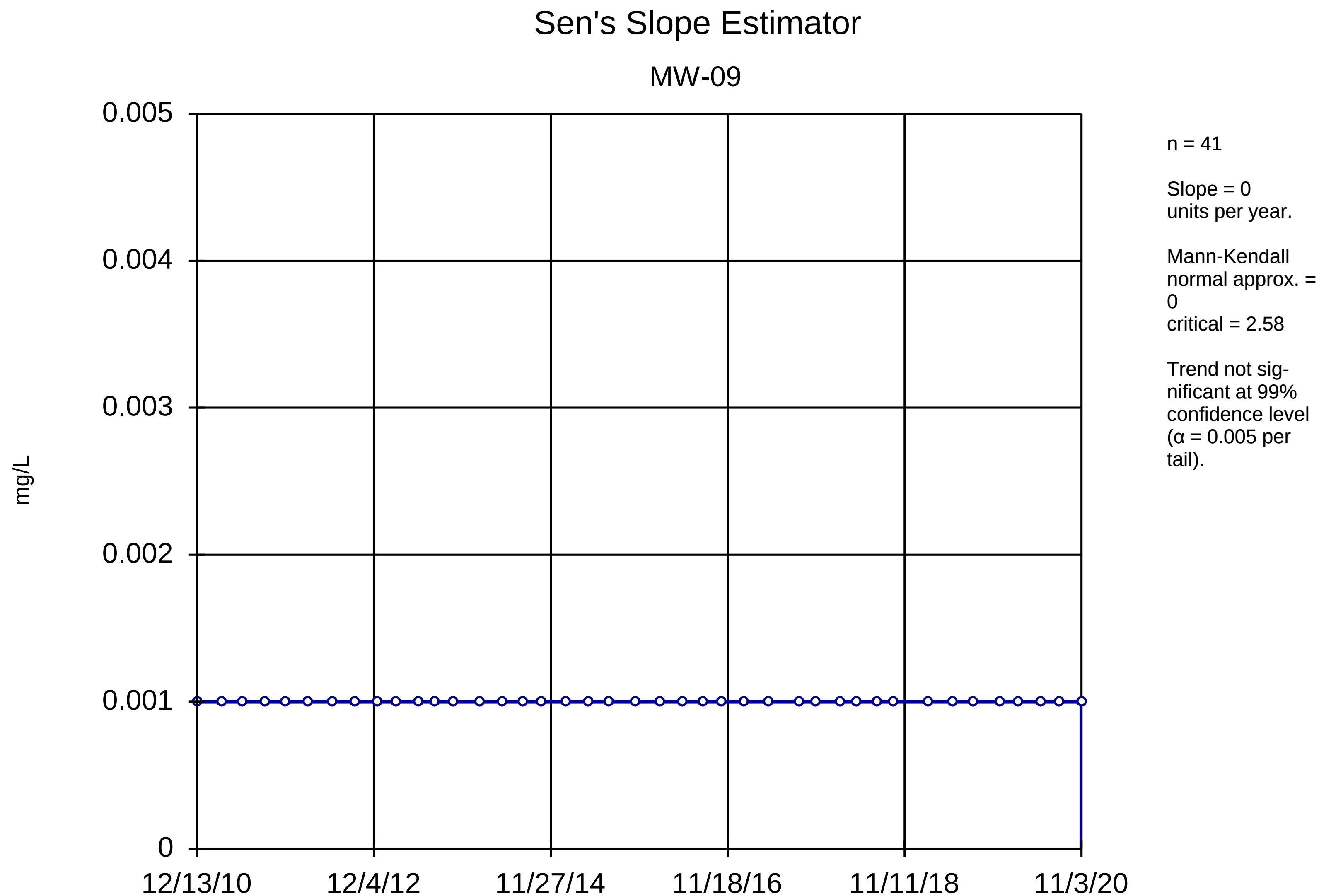
Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.

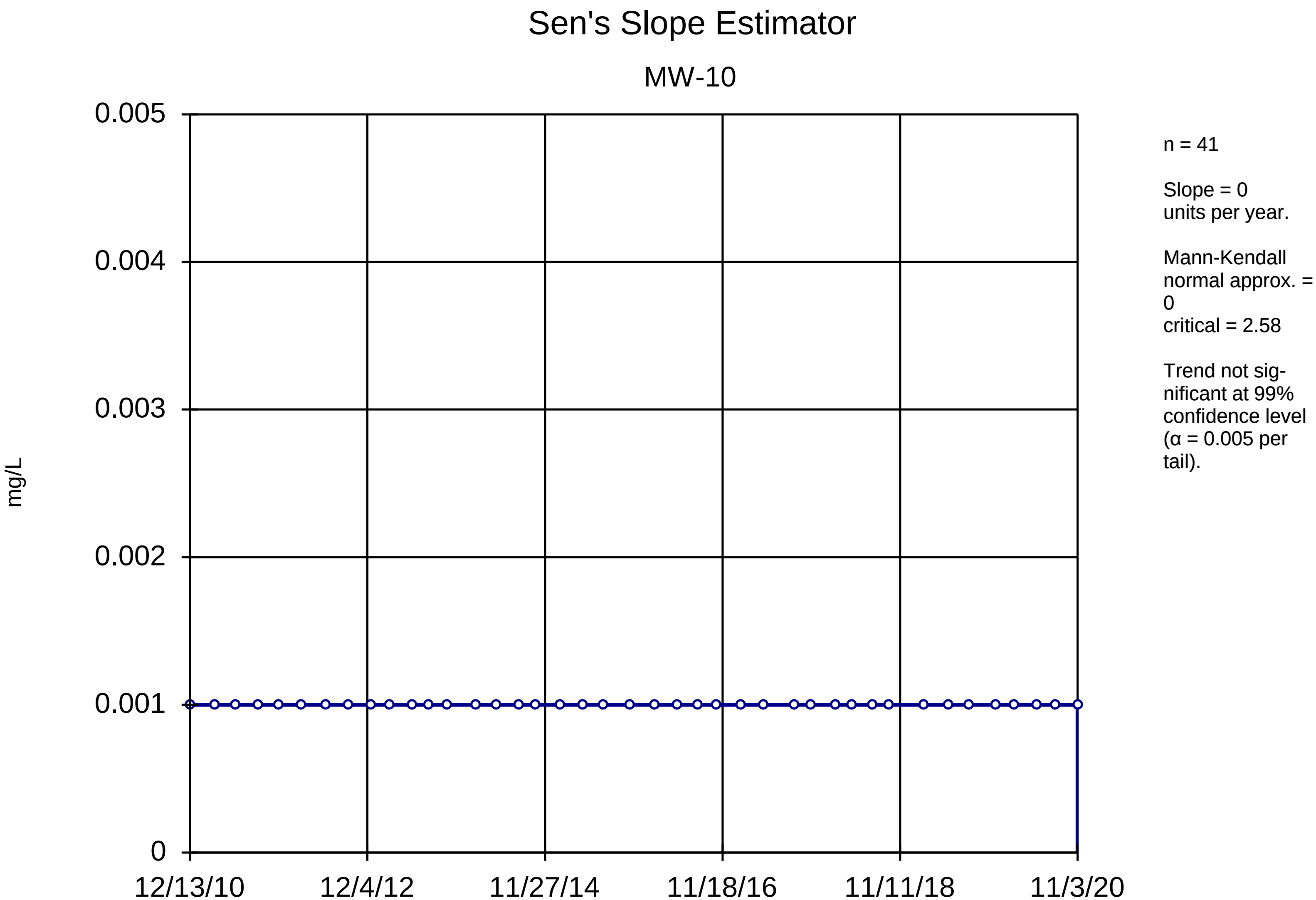



Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81963

Hollow symbols indicate censored values.




Constituent: Cobalt, Dissolved    Analysis Run 4/2/2021 12:06 PM

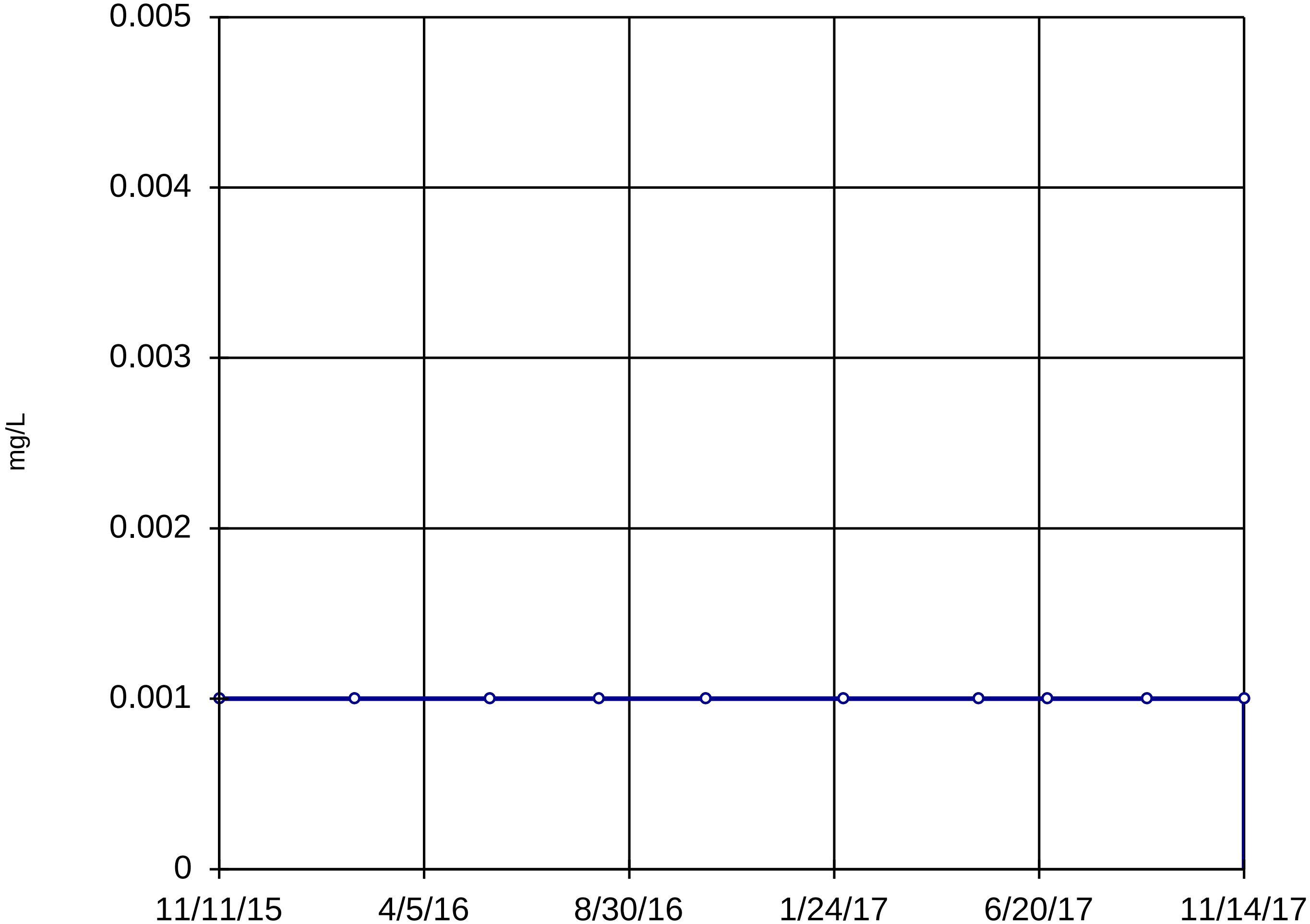
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81964

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-09




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

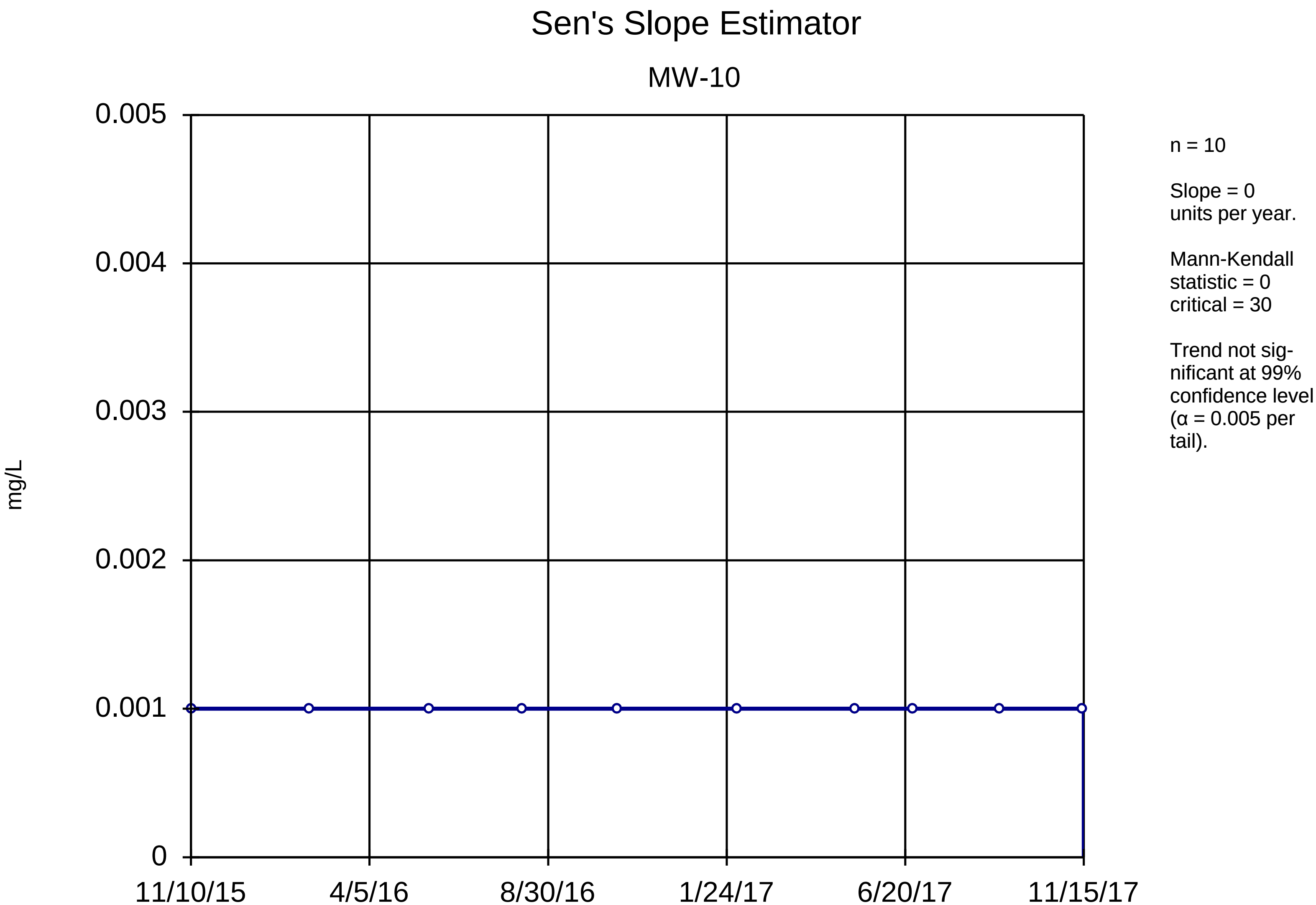
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Cobalt, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81965

Hollow symbols indicate censored values.

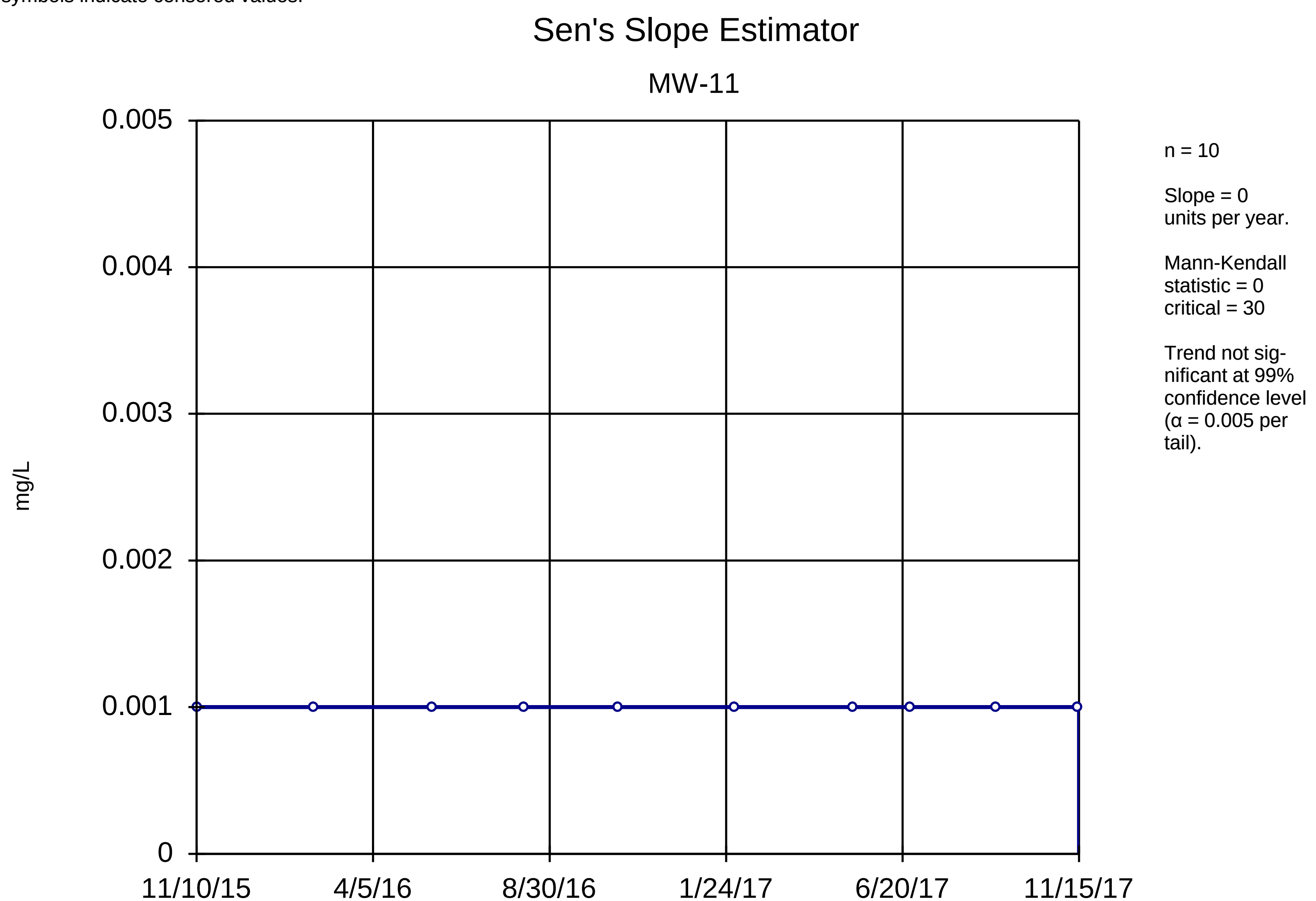



Constituent: Cobalt, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81966

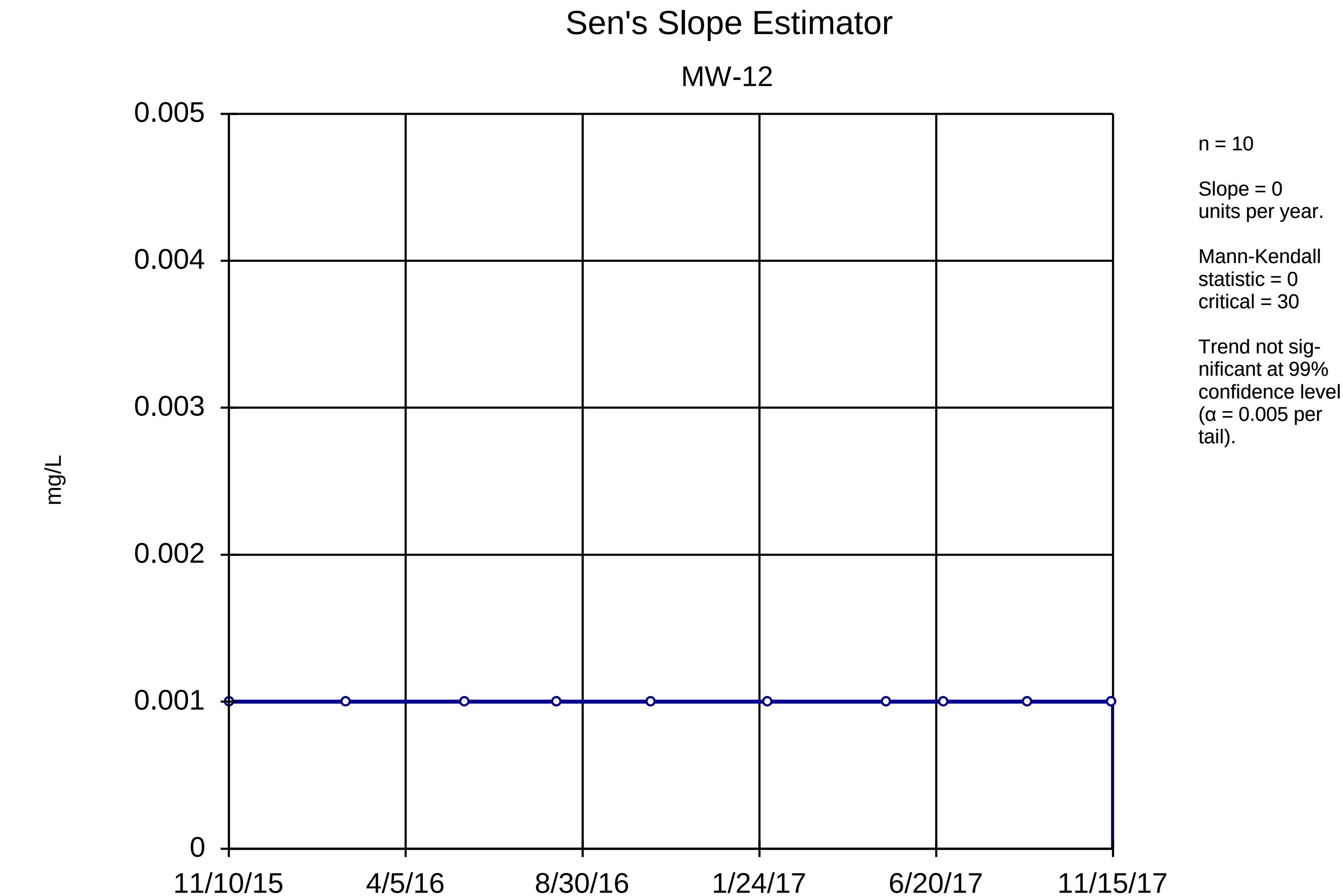
Hollow symbols indicate censored values.




Constituent: Cobalt, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Hollow symbols indicate censored values.

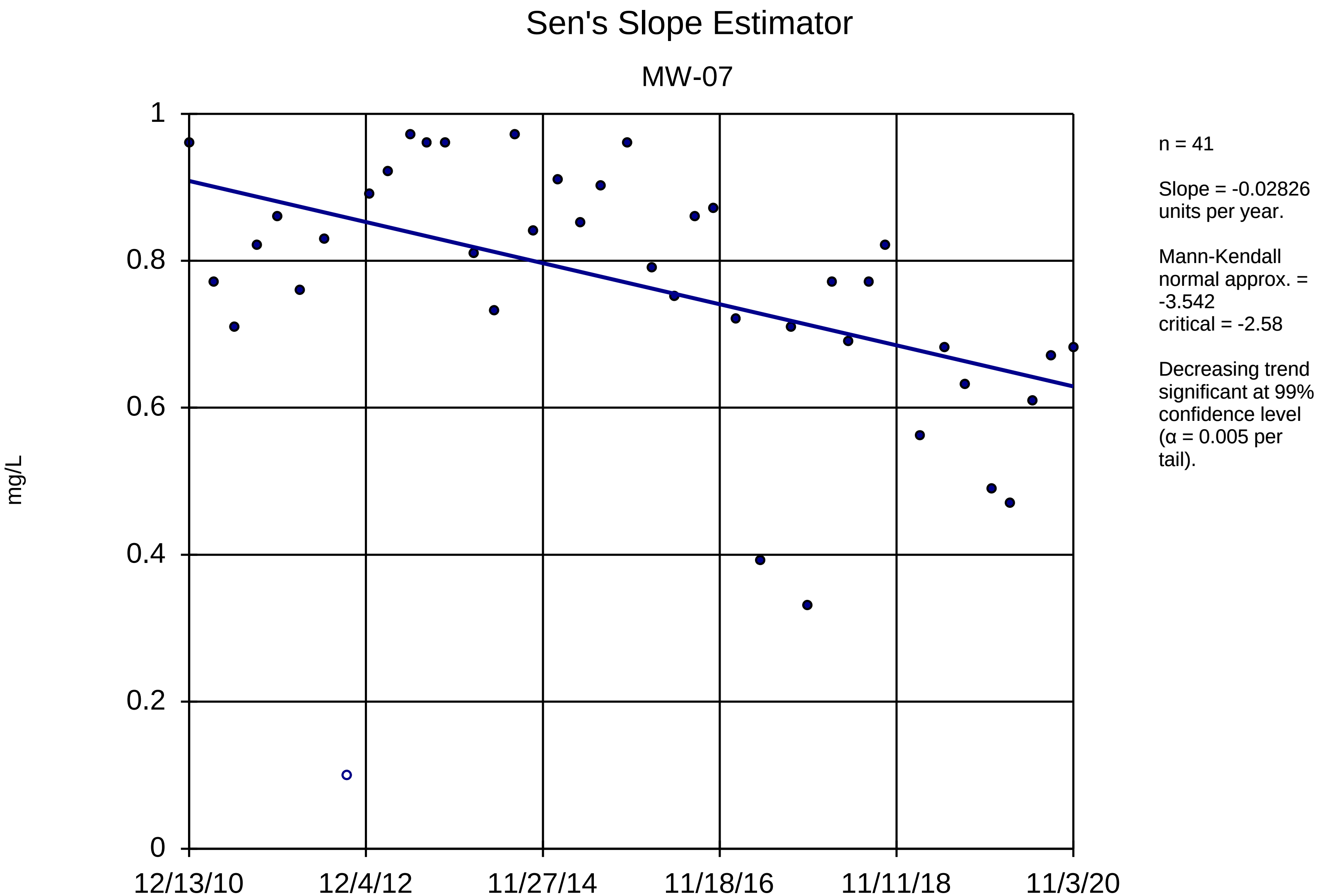



Constituent: Cobalt, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

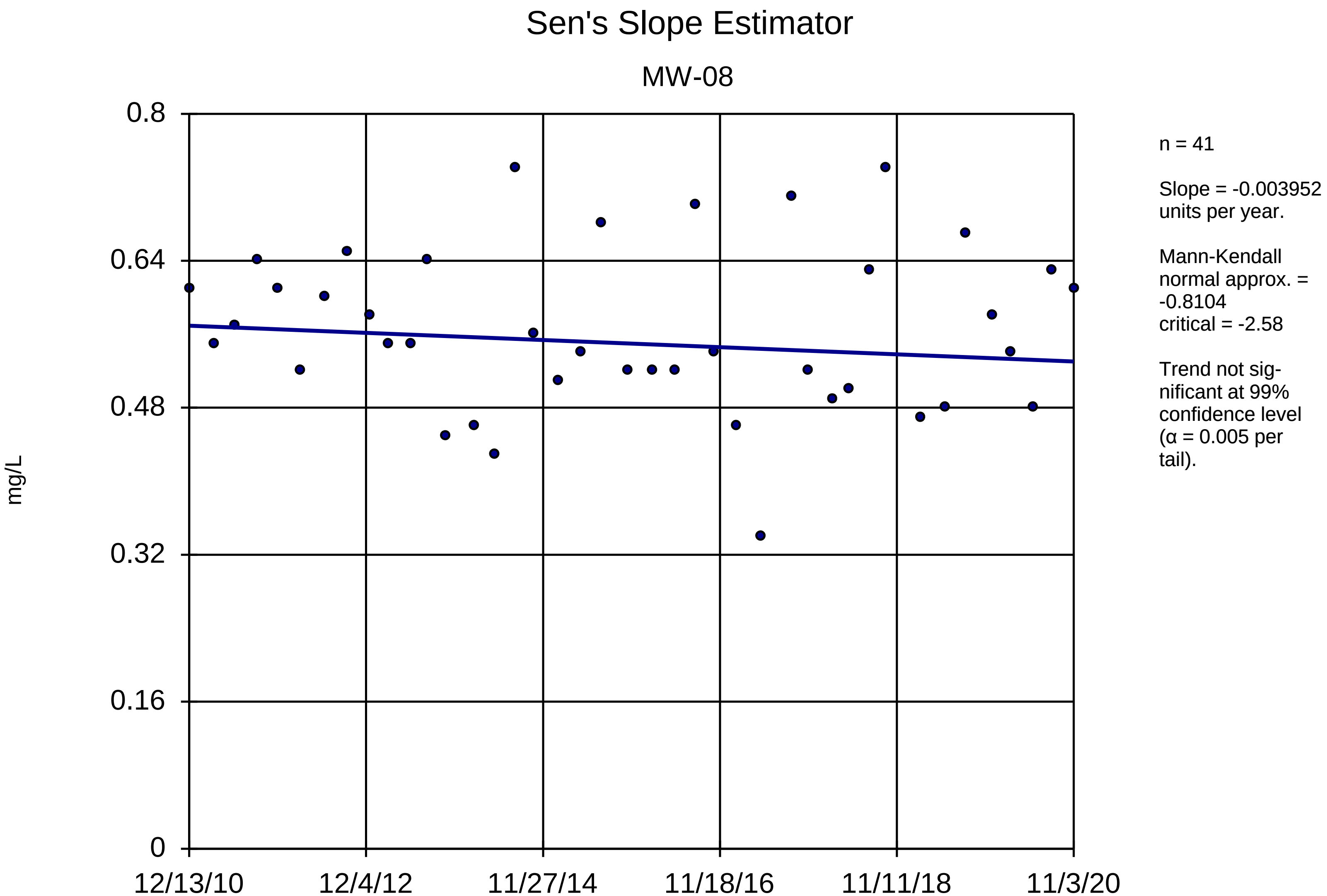
MWG13-15_81968

Hollow symbols indicate censored values.




Constituent: Fluoride    Analysis Run 4/2/2021 12:06 PM

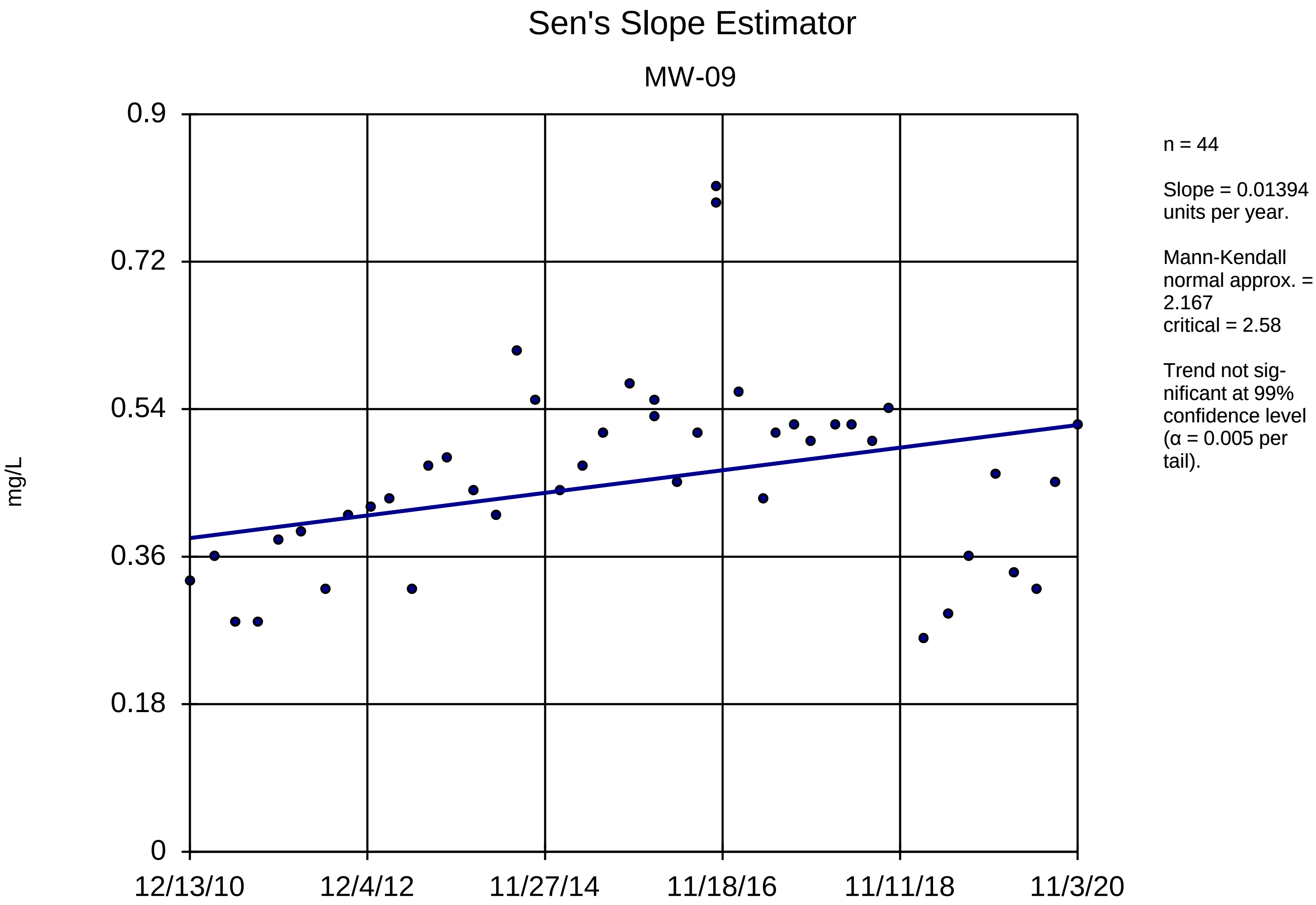
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: Fluoride Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81970



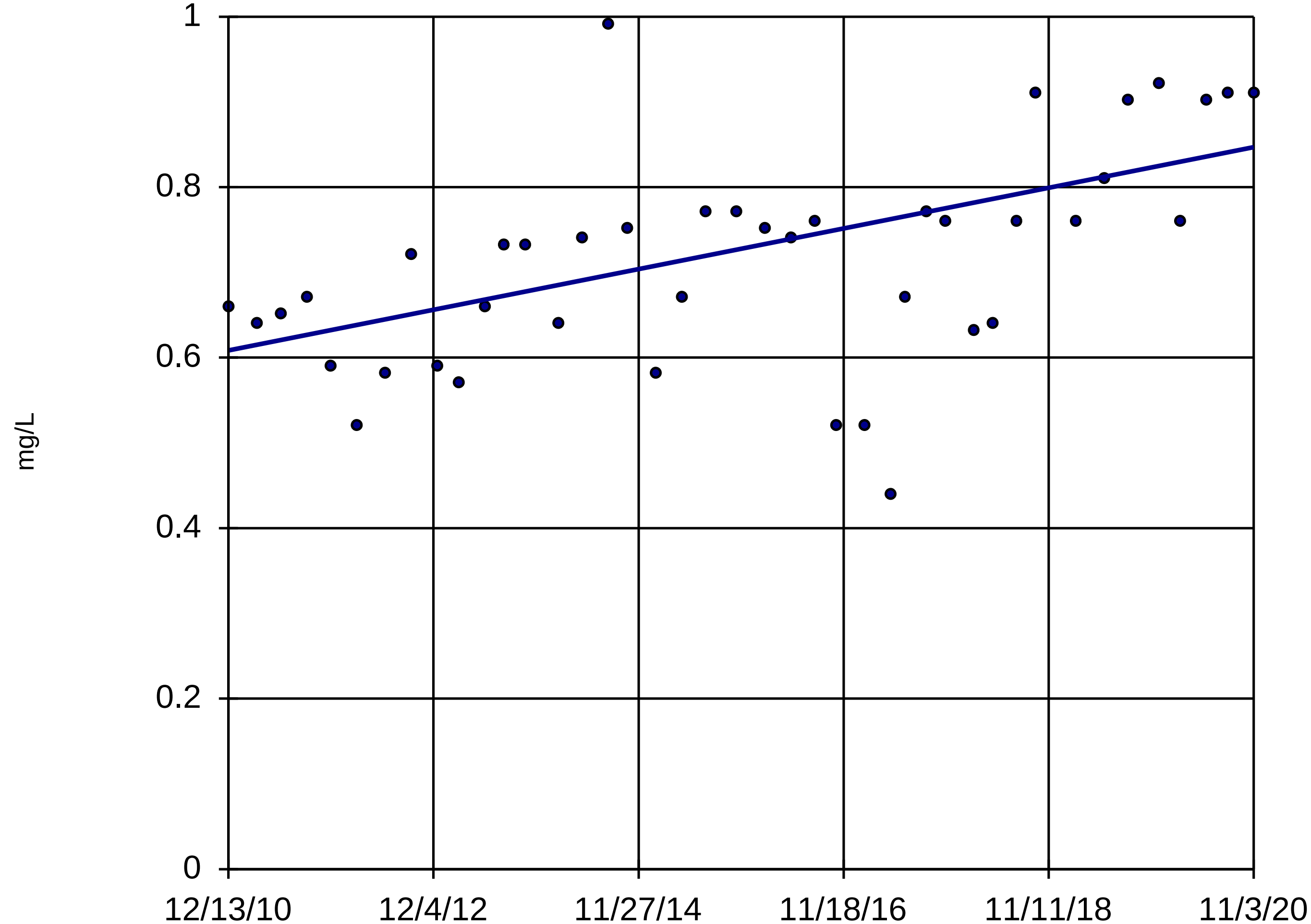

Constituent: Fluoride Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81971

# Sen's Slope Estimator

## MW-10




n = 42

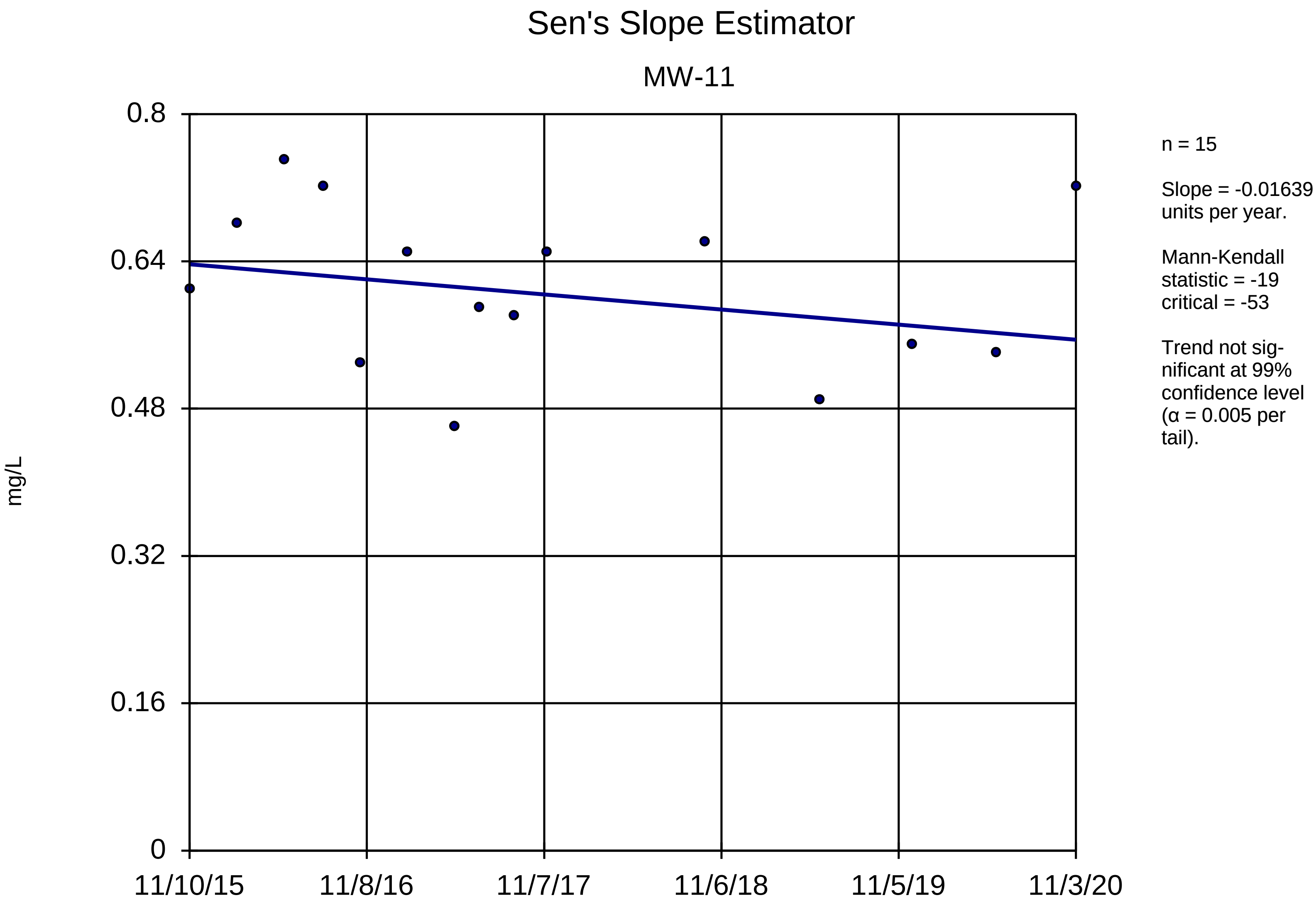
Slope = 0.02406 units per year.

Mann-Kendall normal approx. = 3.998
critical = 2.58

Increasing trend significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Fluoride    Analysis Run 4/2/2021 12:06 PM

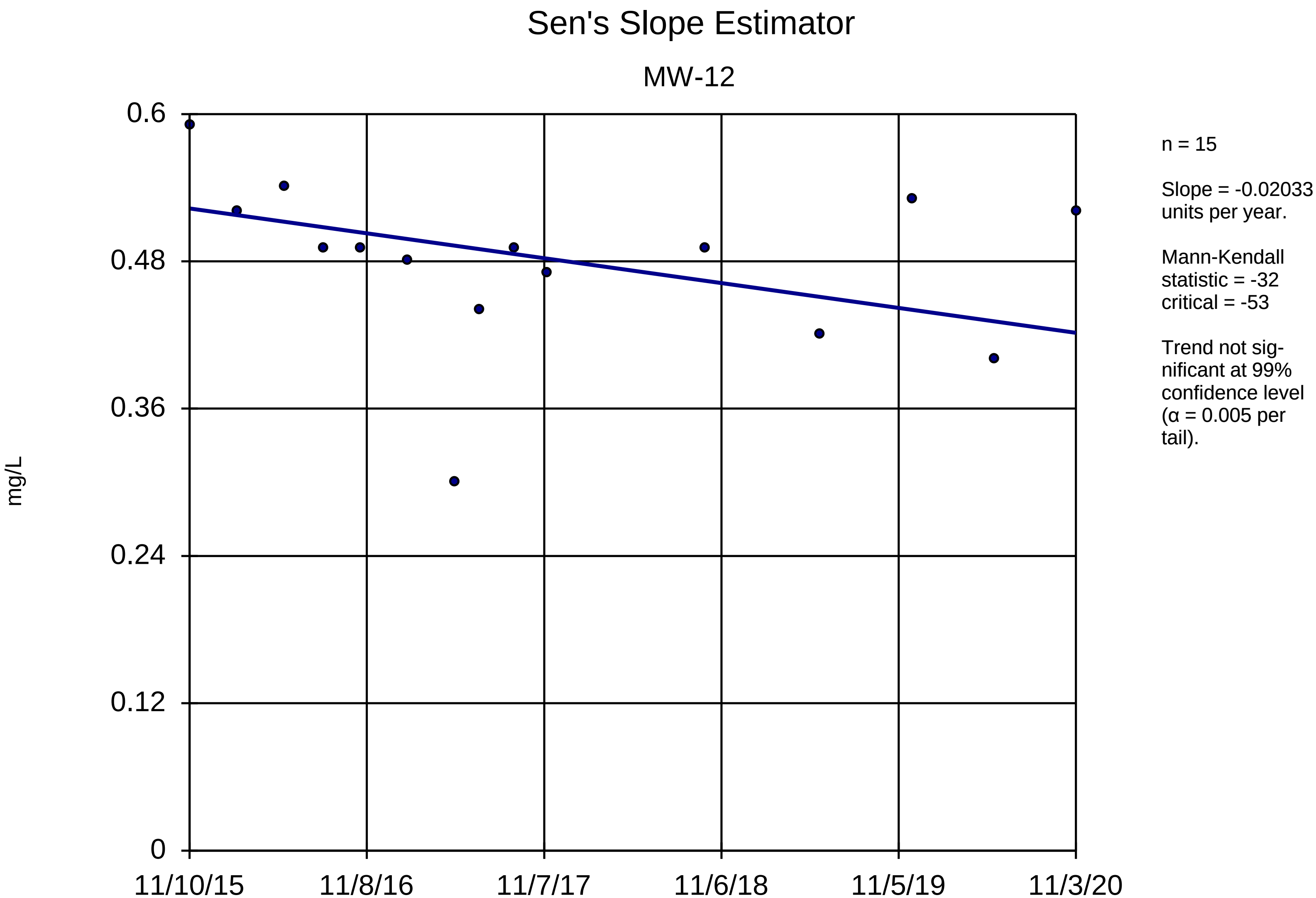
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: Fluoride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81973

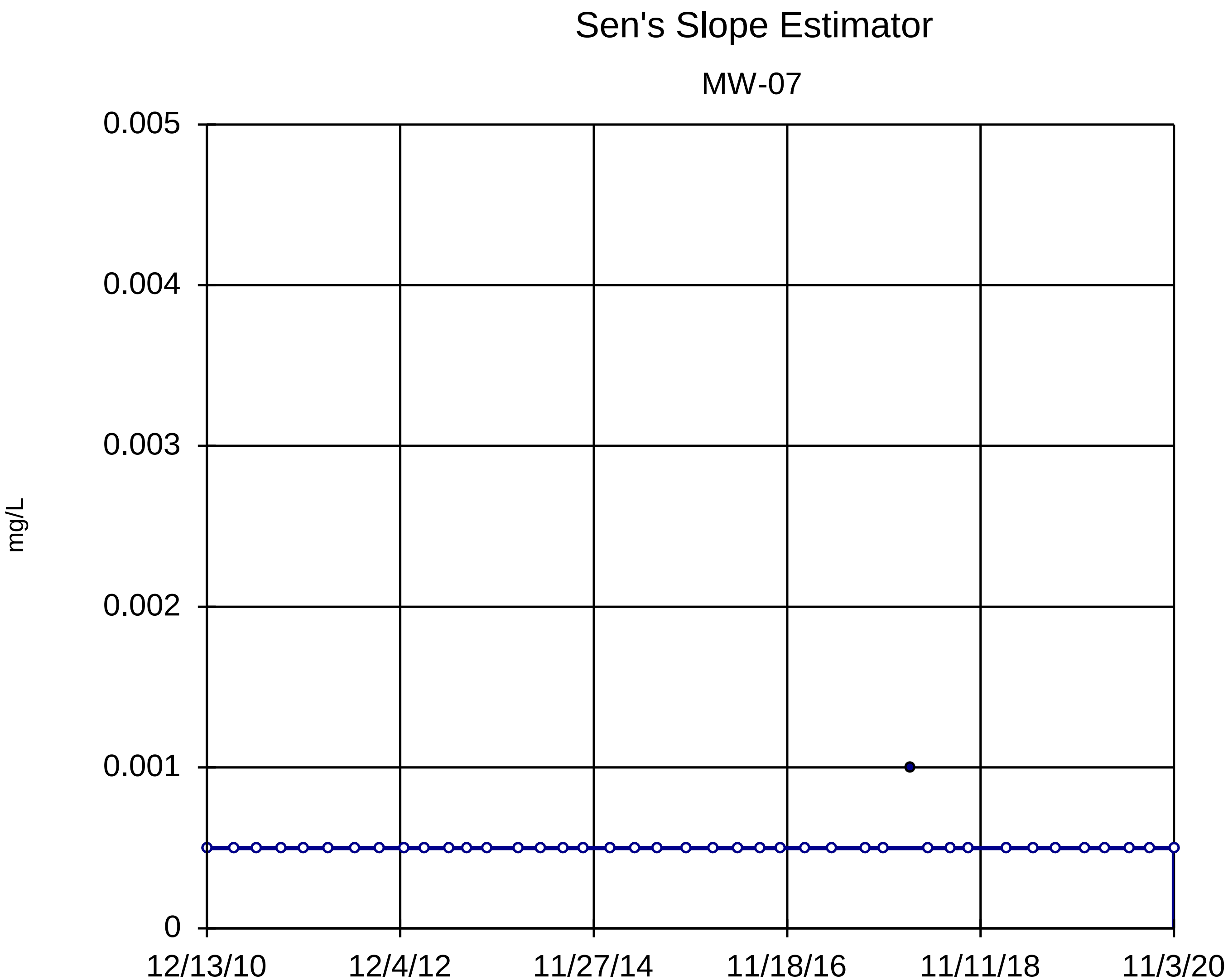



Constituent: Fluoride    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

Electronic Filing: Received, Clerk's Office 01/21/2022


Hollow symbols indicate censored values.




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0.7184
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81975

Electronic Filing: Received, Clerk's Office 01/21/2022

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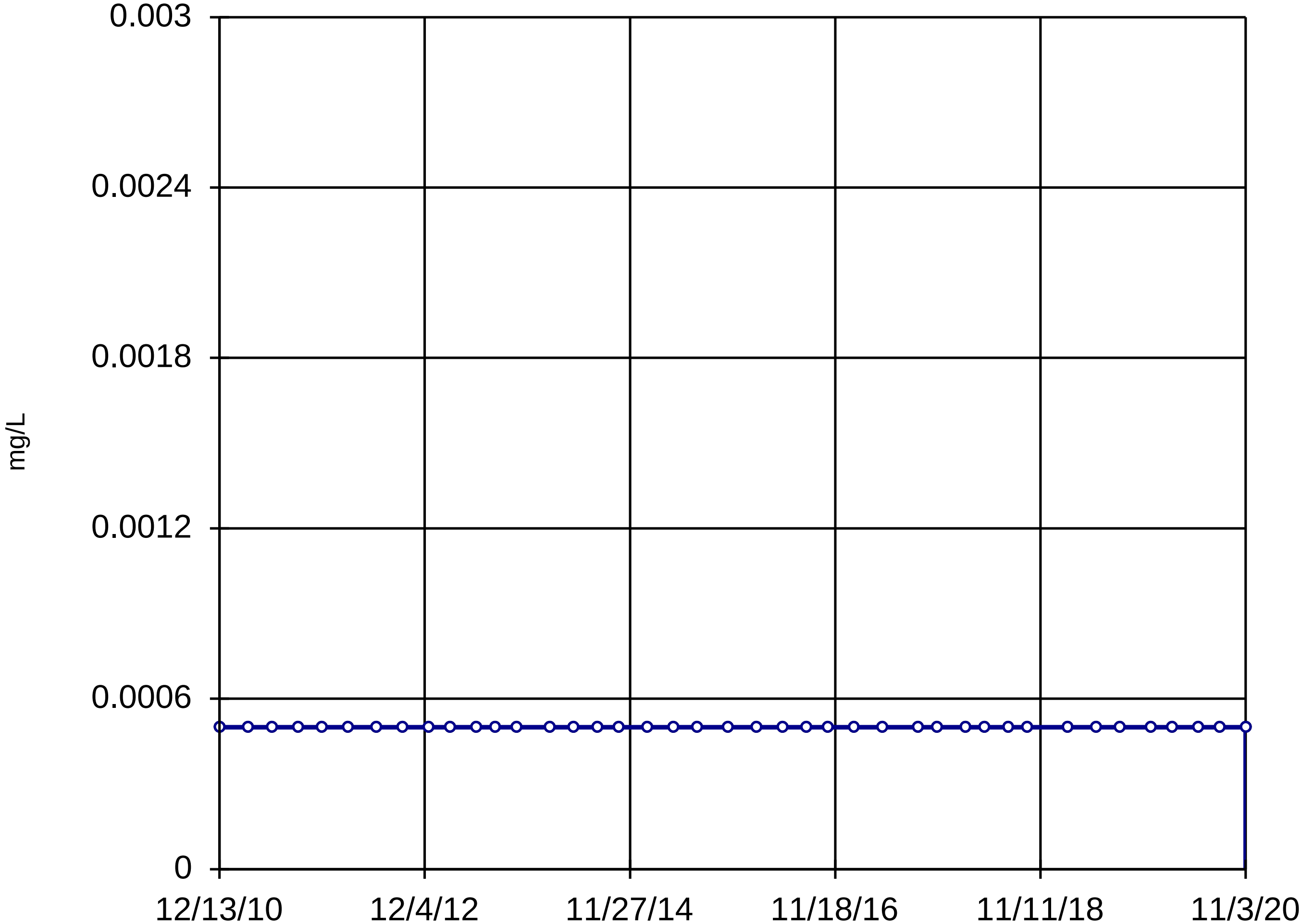
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-08




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0
critical = 2.58

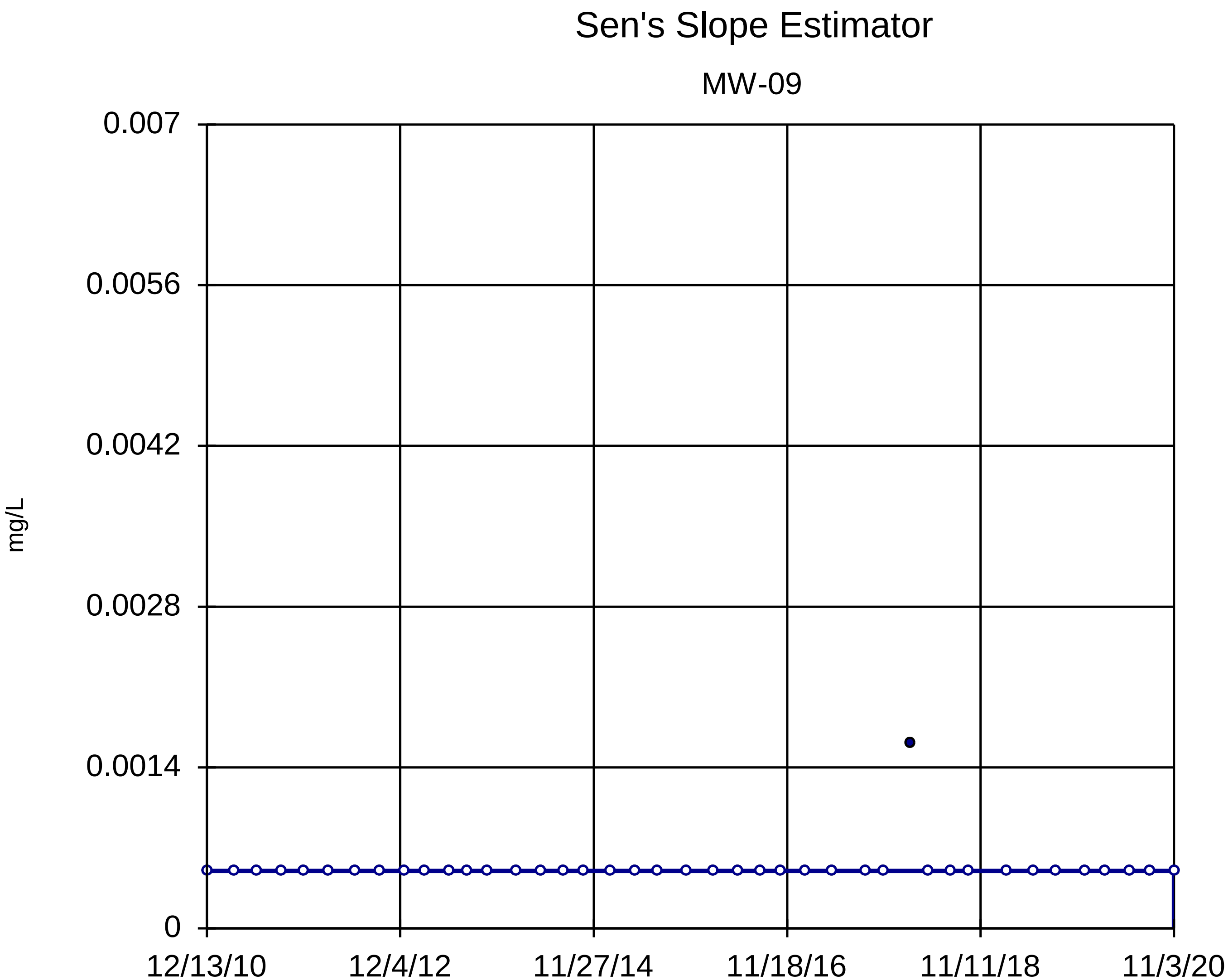
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81976

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0.7184
critical = 2.58

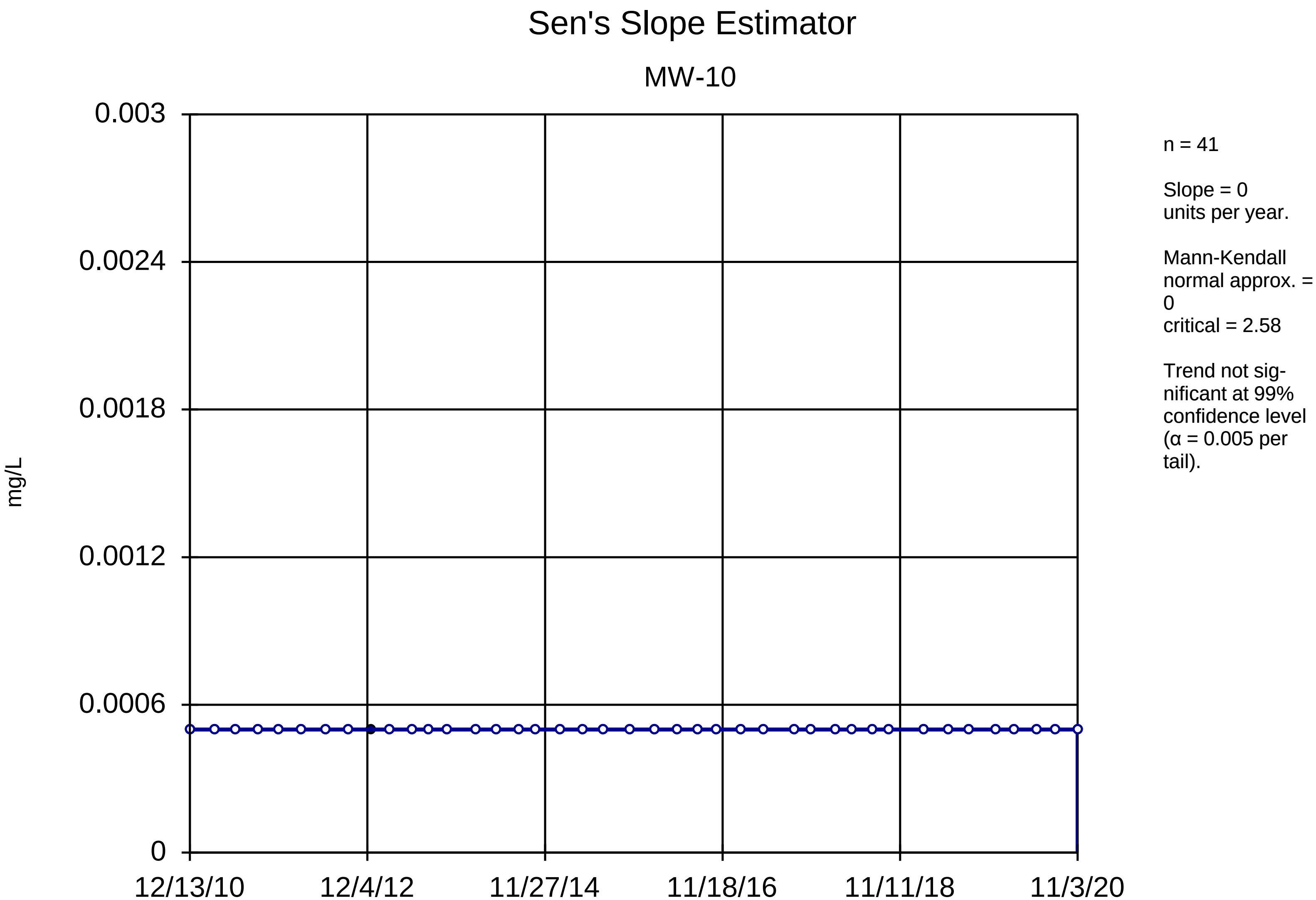
Trend not significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Dissolved    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81977

Hollow symbols indicate censored values.

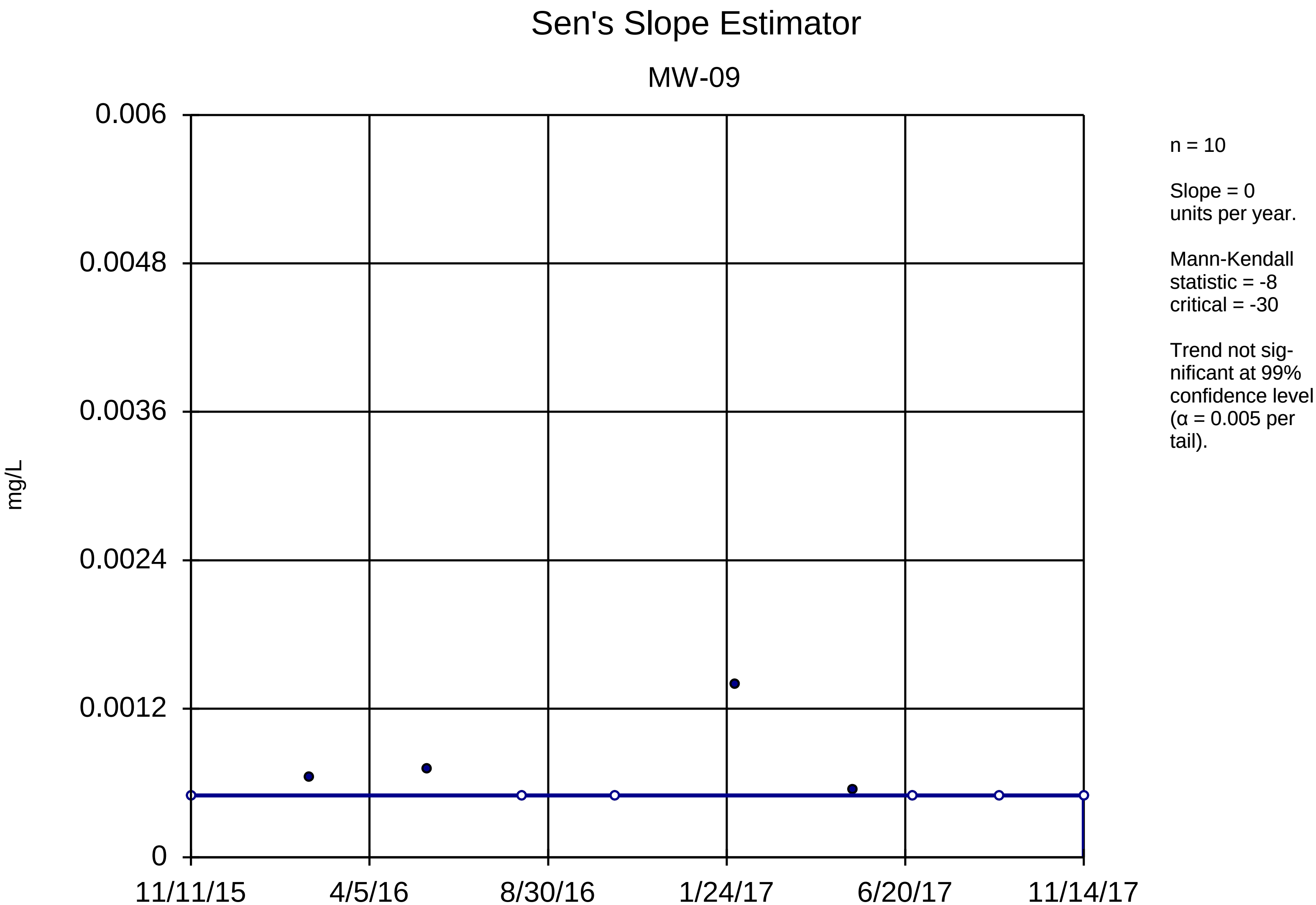



Constituent: Lead, Dissolved Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81978

Hollow symbols indicate censored values.

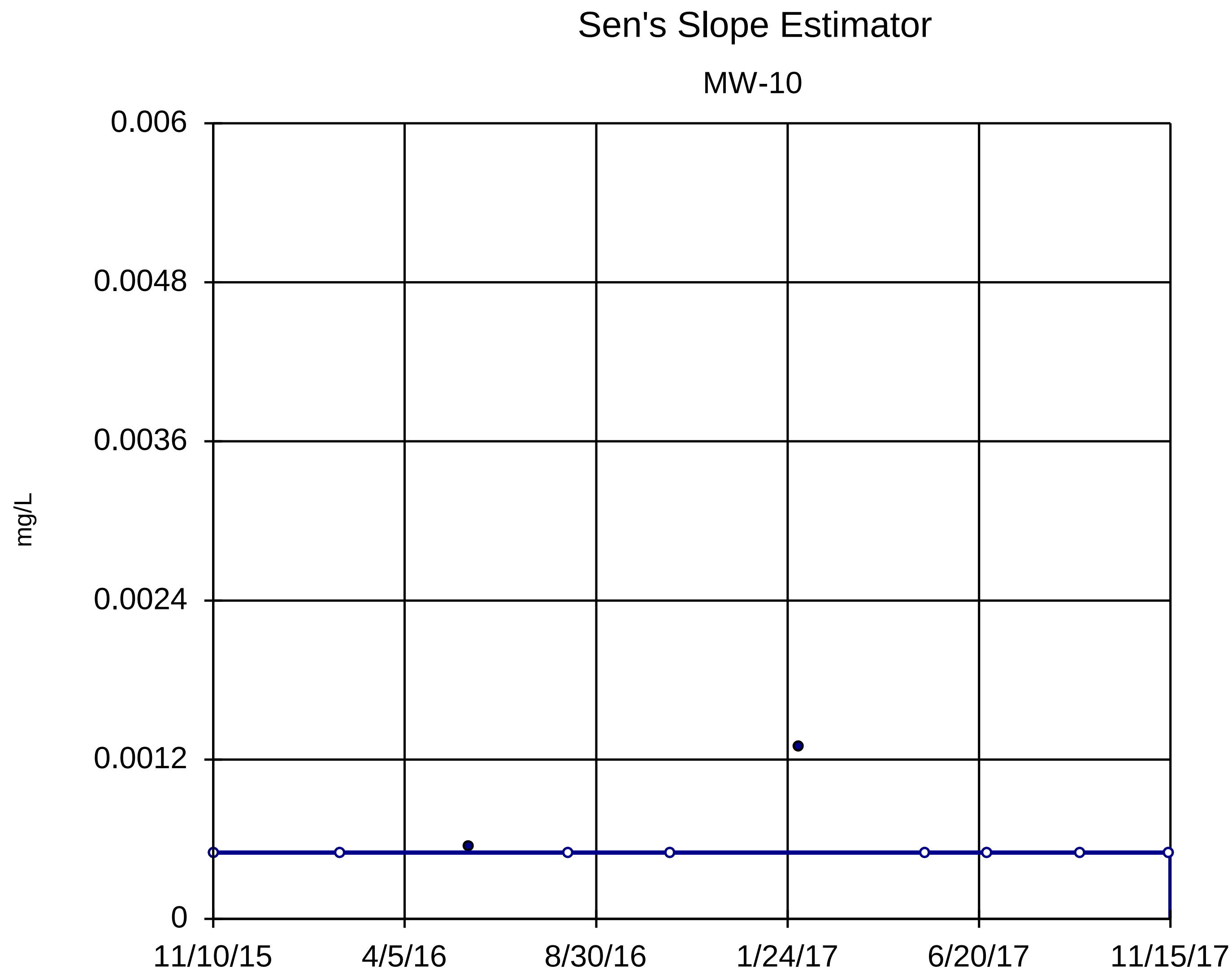



Constituent: Lead, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81979

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = -3
critical = -30

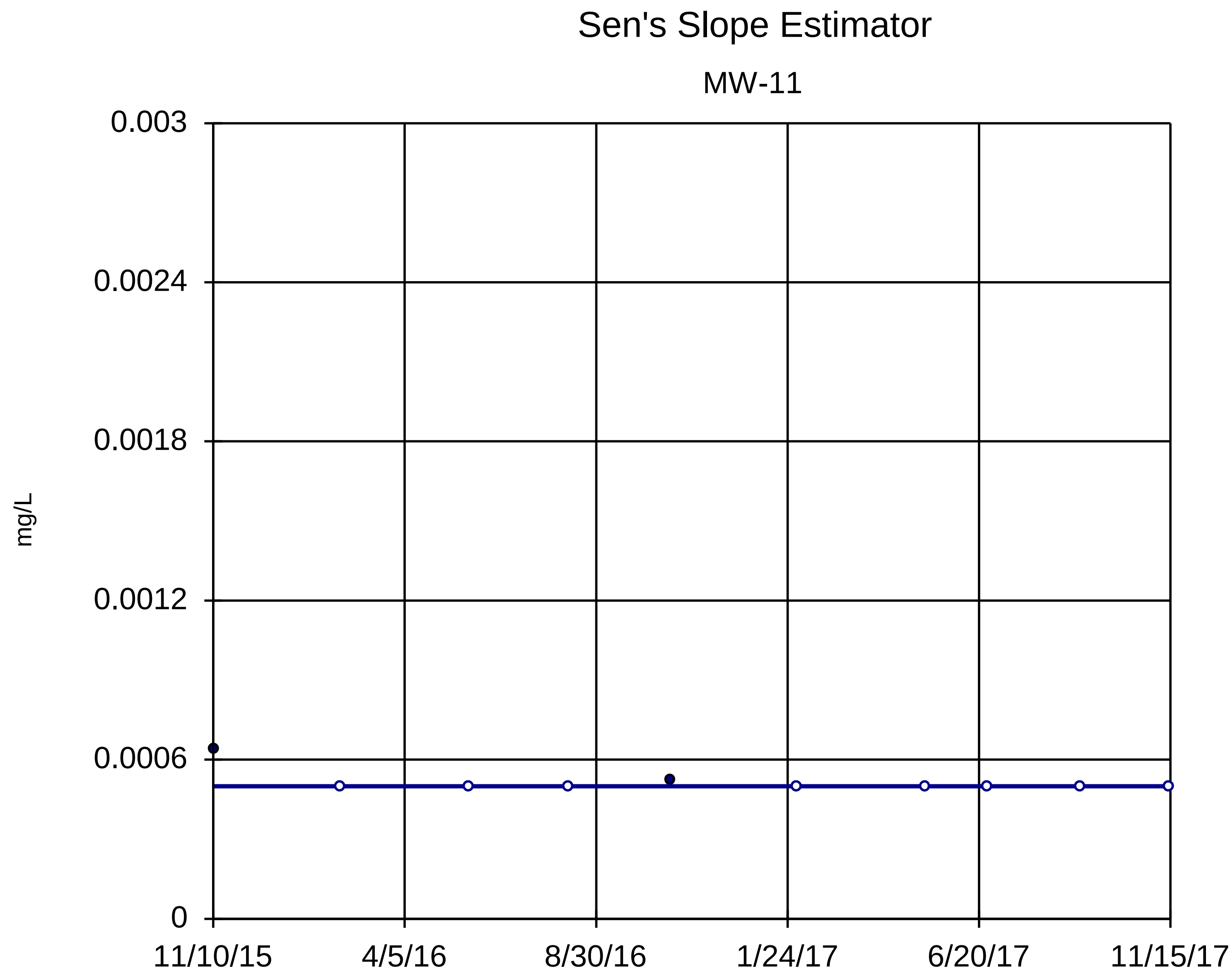
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81980

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = -11
critical = -30

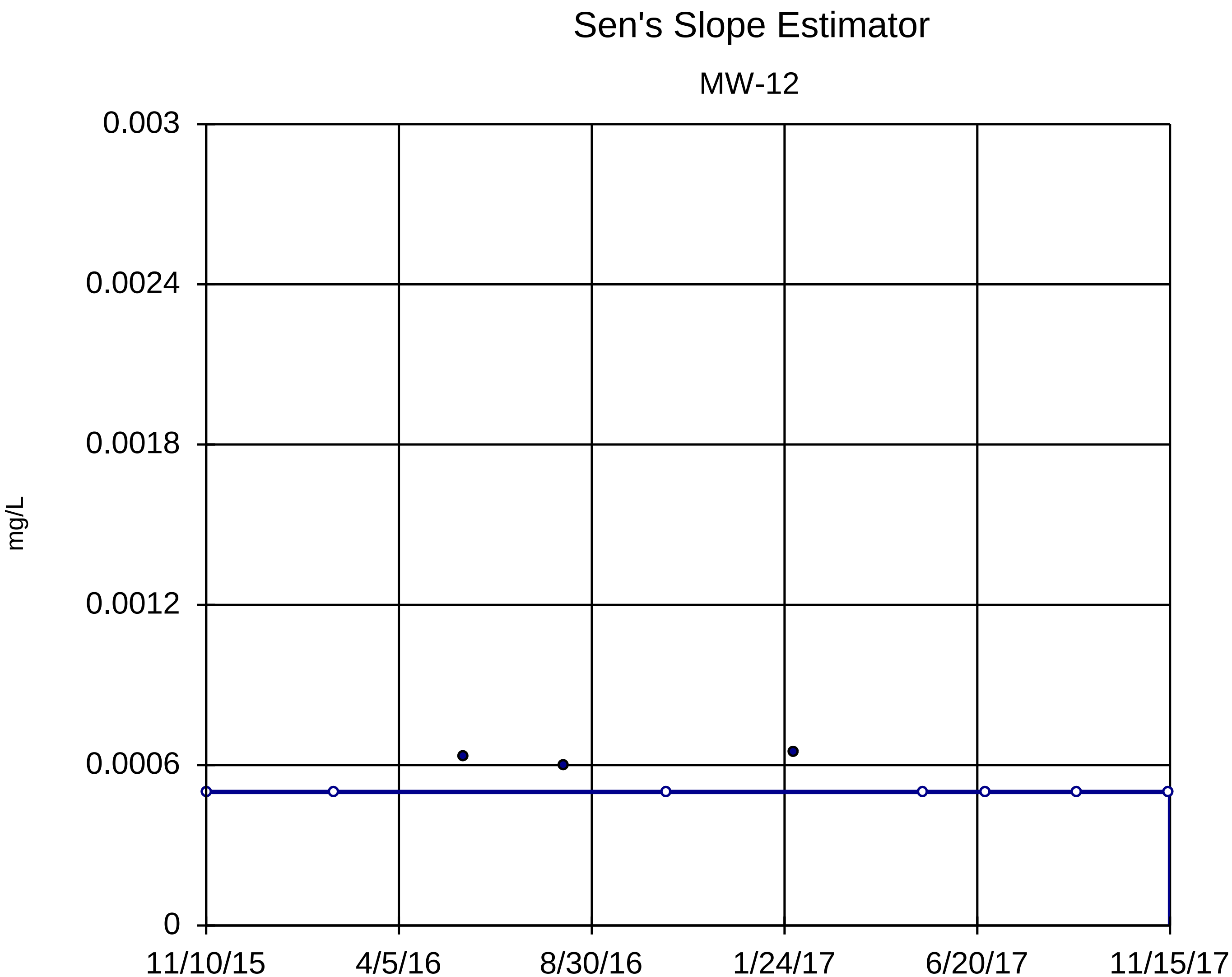
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81981

Hollow symbols indicate censored values.




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = -6
critical = -30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/2/2021 12:06 PM

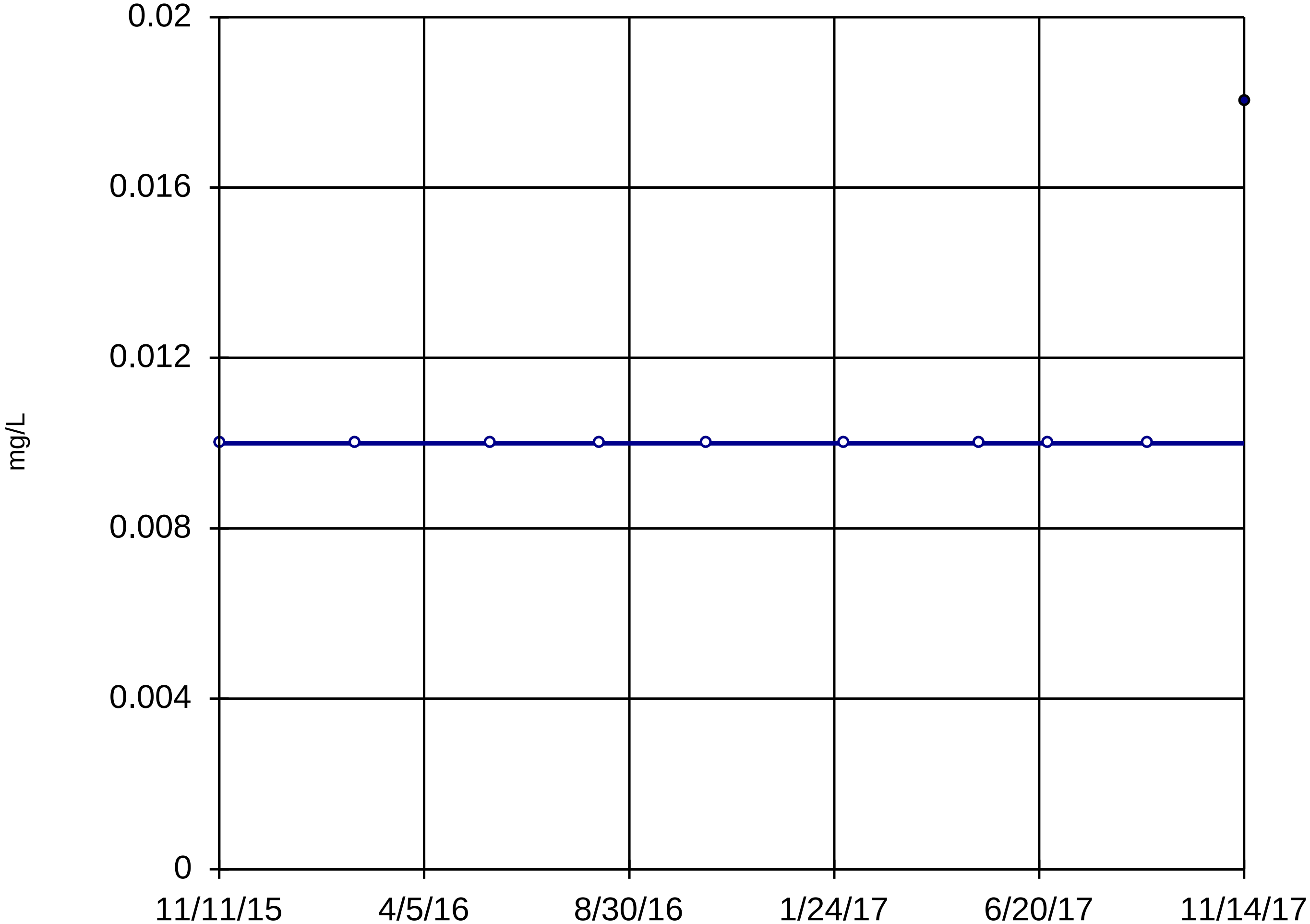
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81982

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-09




n = 10

Slope = 0
units per year.

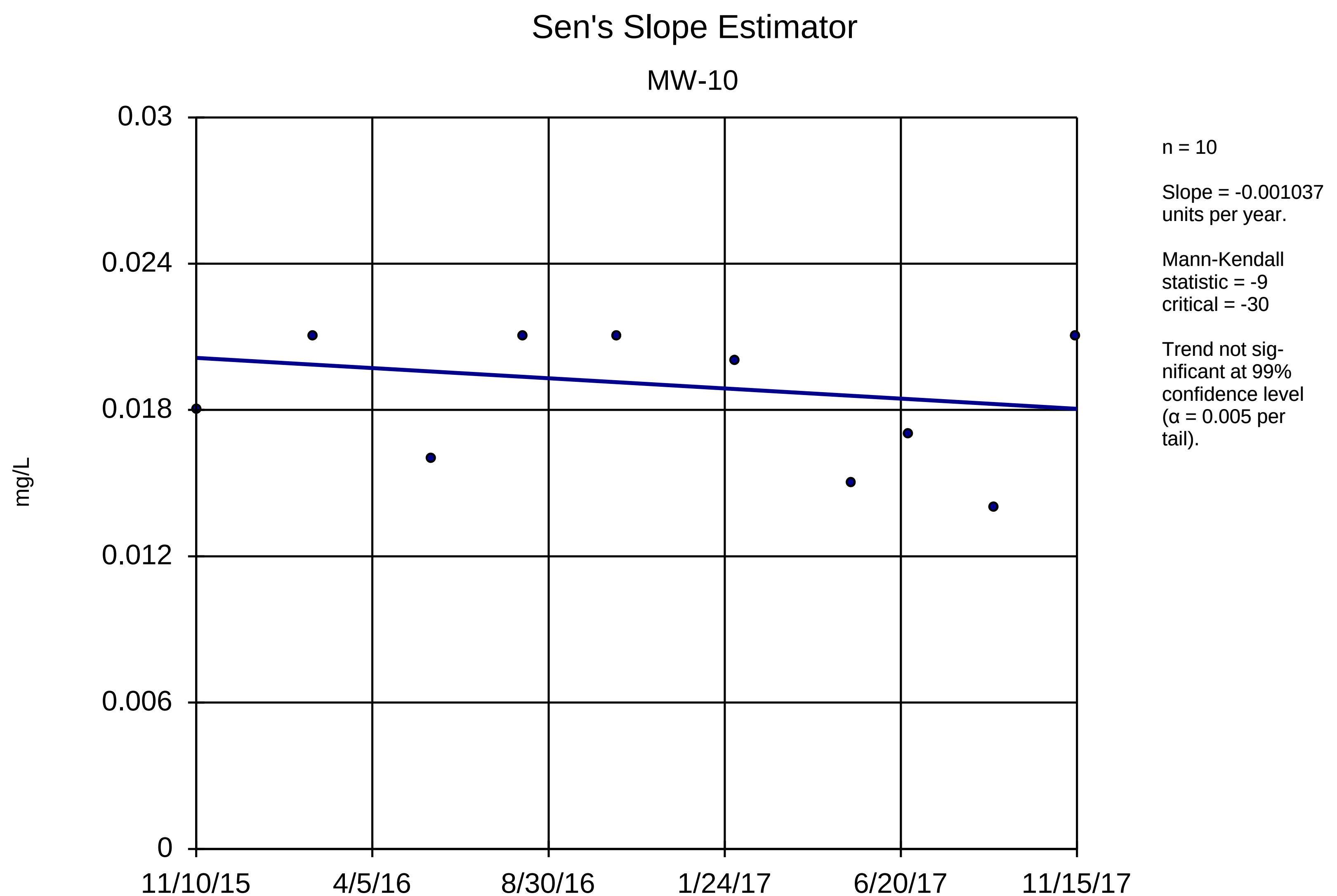
Mann-Kendall
statistic = 9
critical = 30

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lithium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

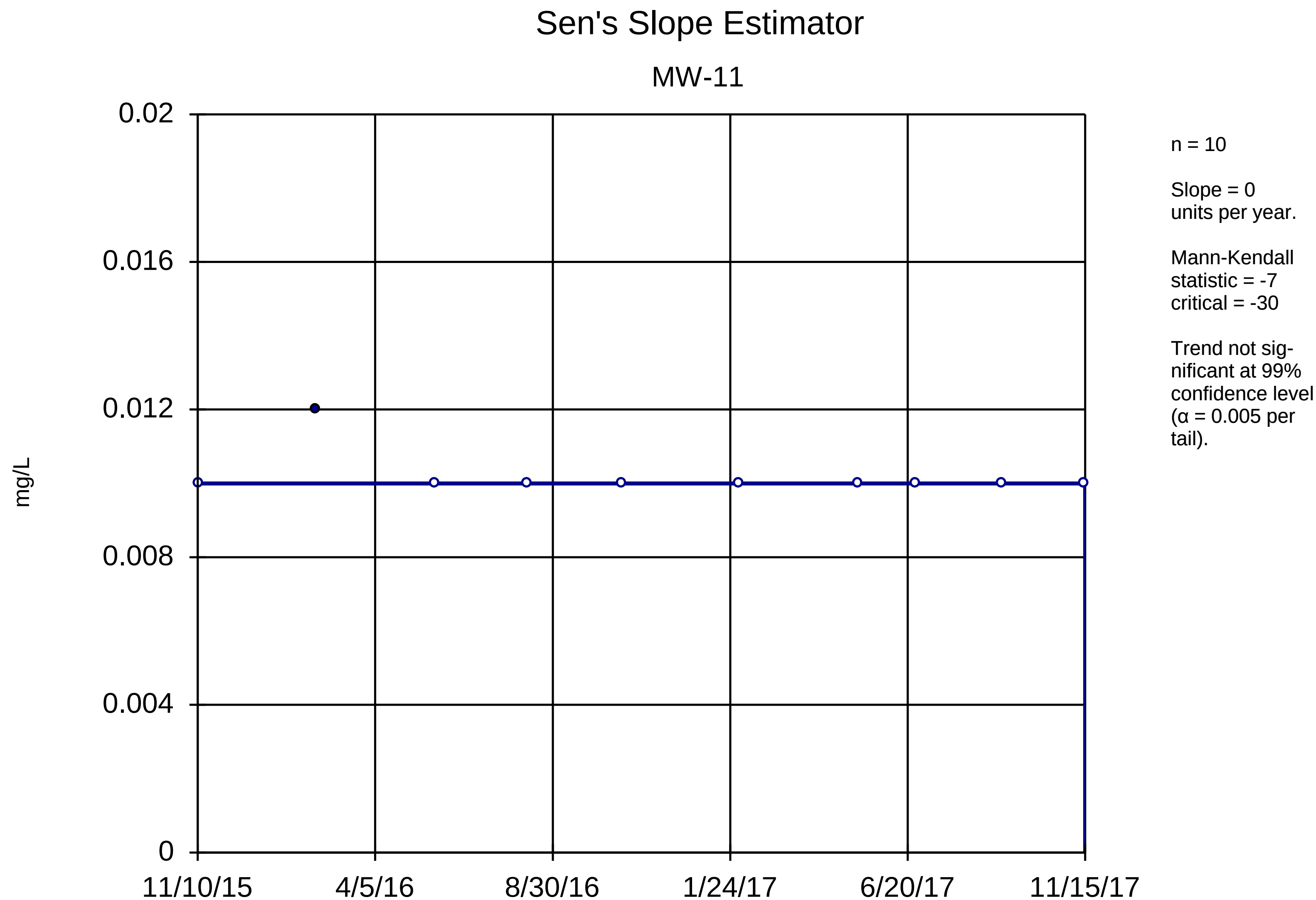
MWG13-15_81983




Constituent: Lithium, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

Hollow symbols indicate censored values.

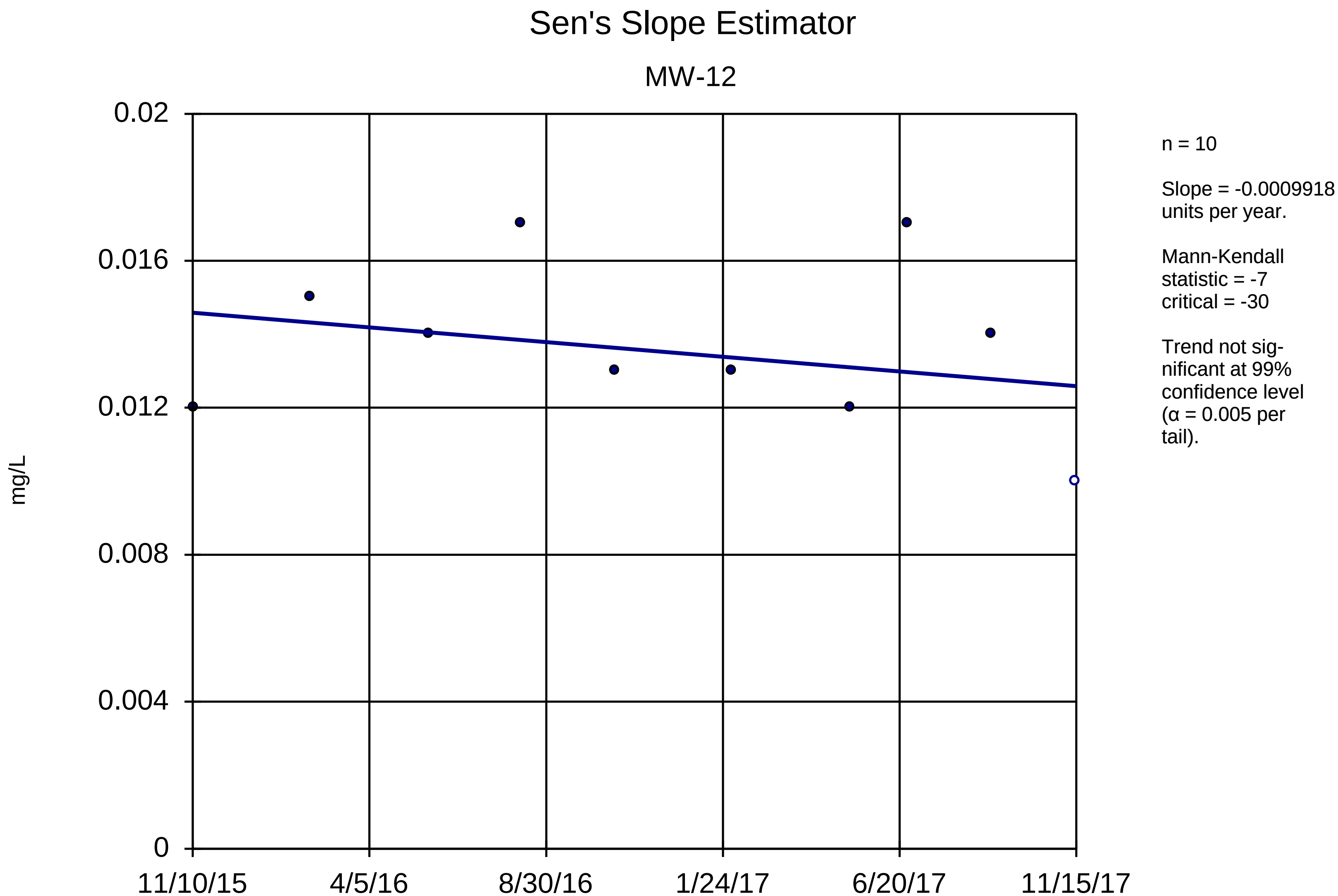



Constituent: Lithium, Total    Analysis Run 4/2/2021 12:06 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81985

Hollow symbols indicate censored values.

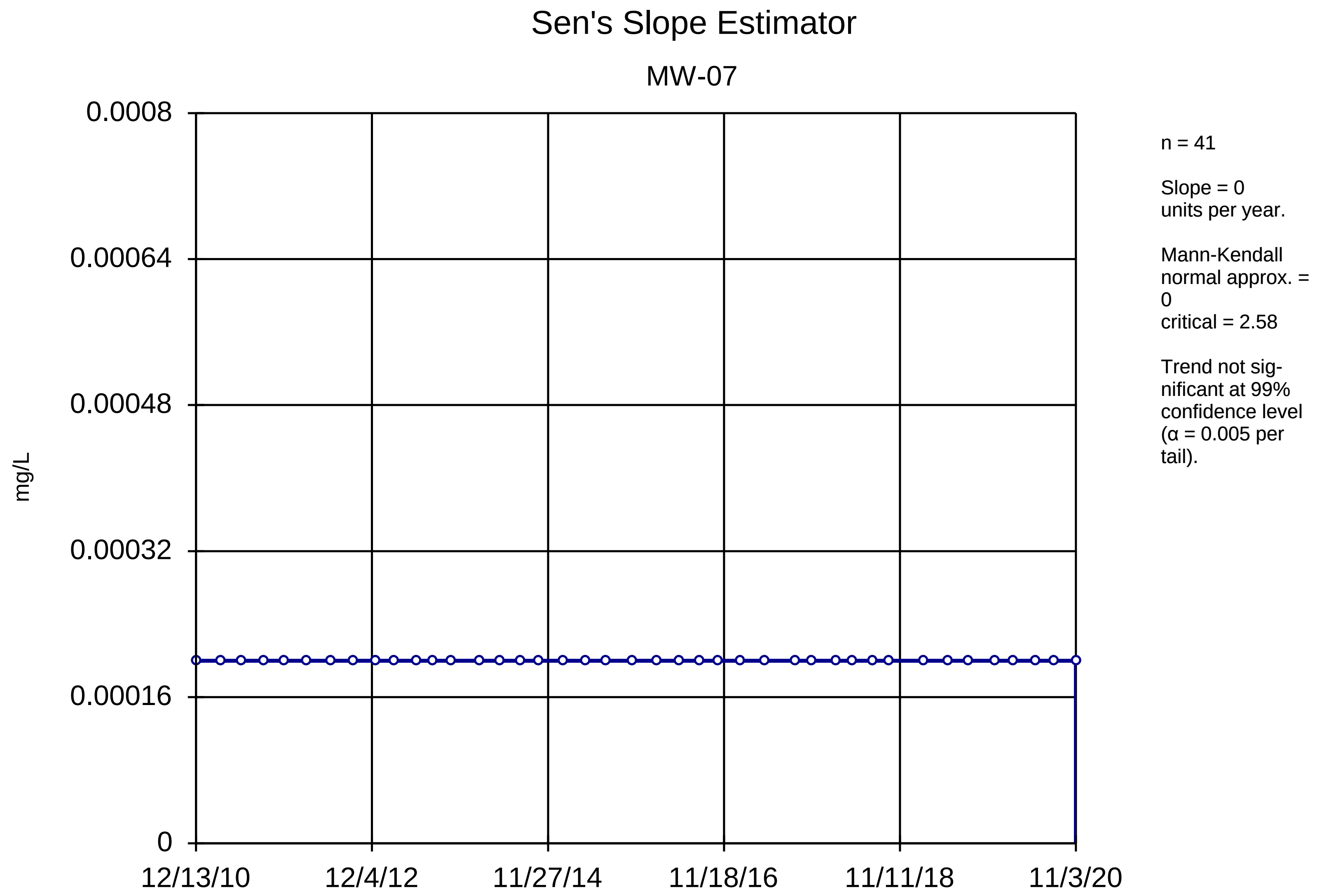



Constituent: Lithium, Total Analysis Run 4/2/2021 12:06 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81986

Hollow symbols indicate censored values.




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 12:07 PM

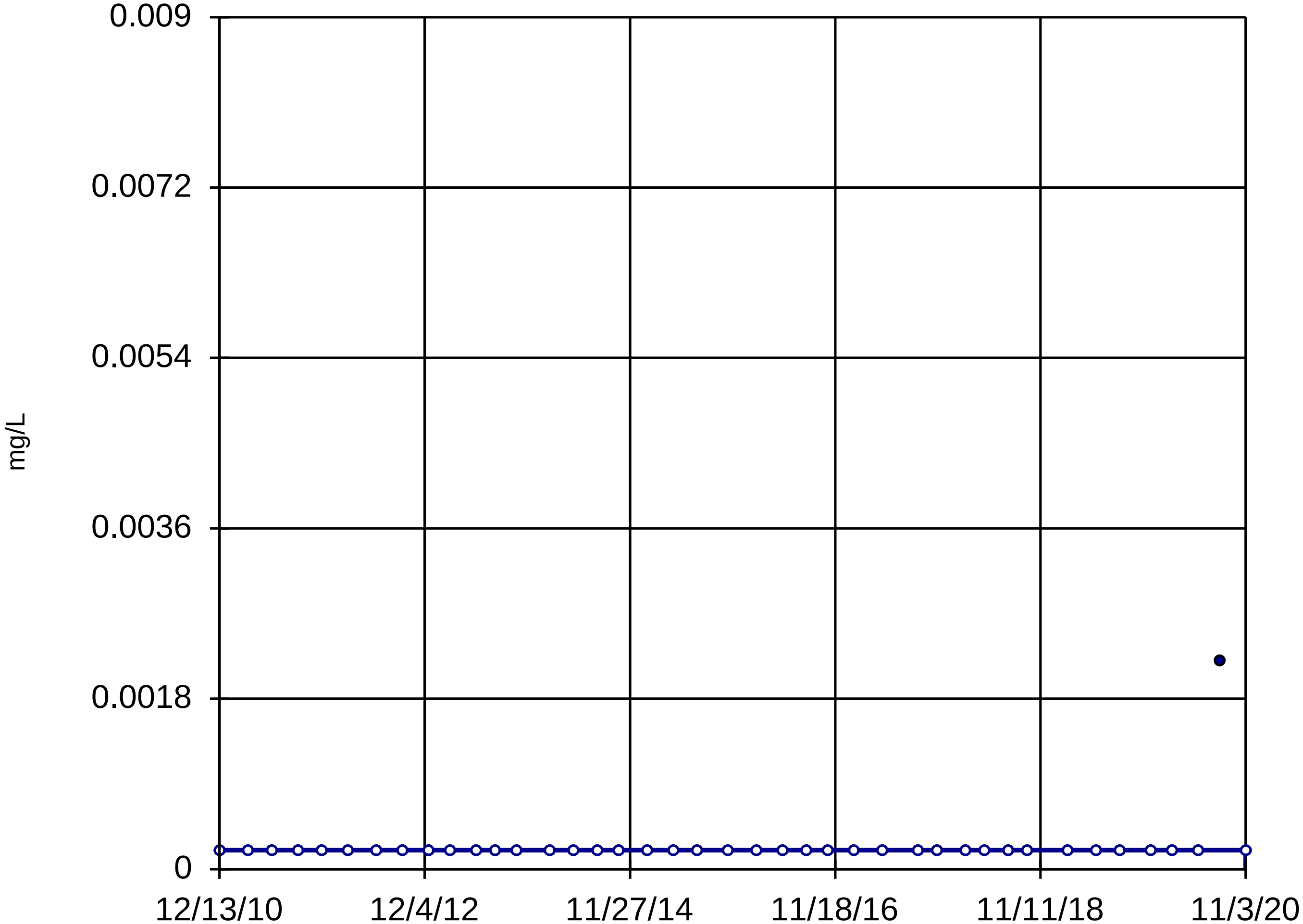
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81987

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-08




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
1.564
critical = 2.58

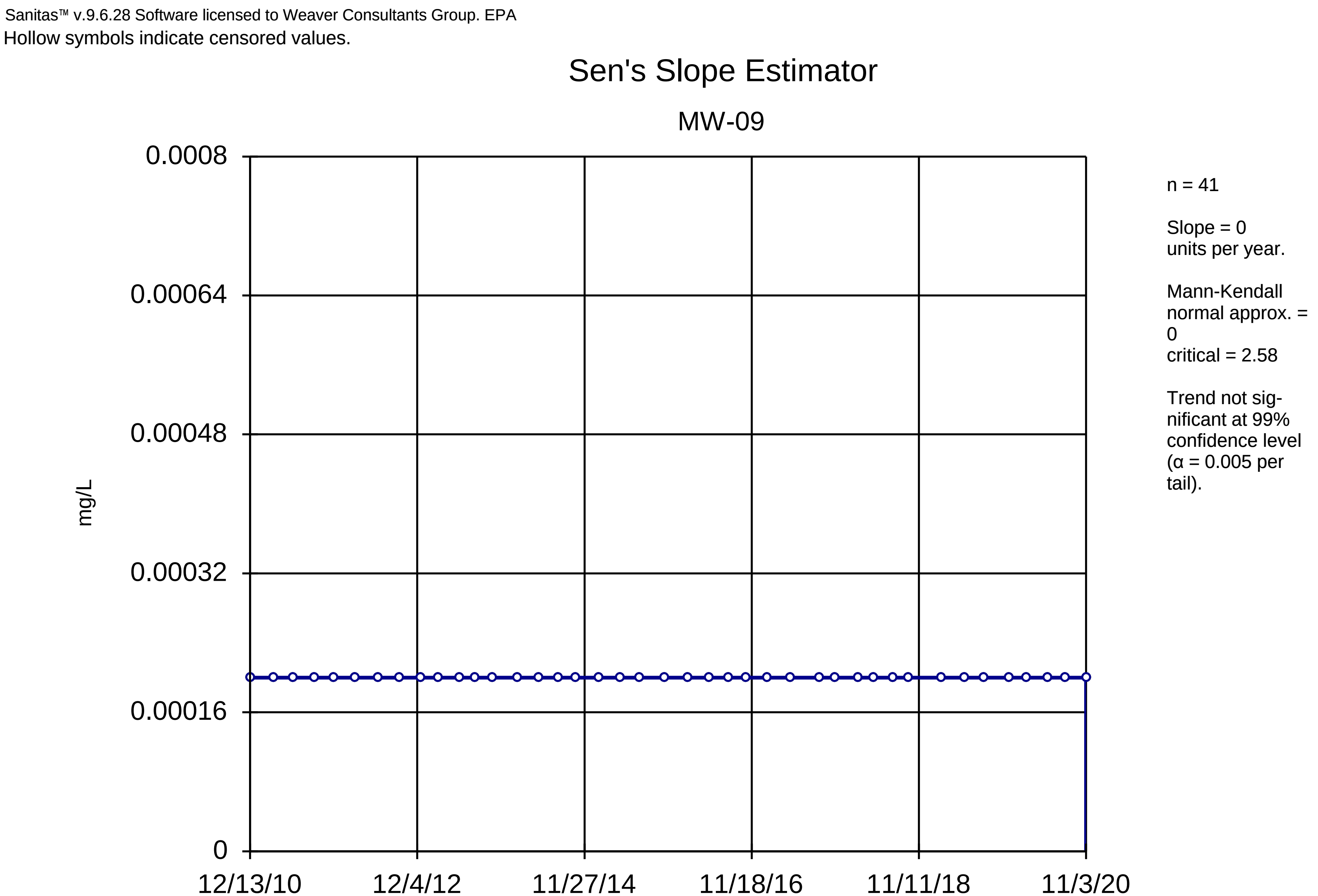
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81988

Electronic Filing: Received, Clerk's Office 01/21/2022




Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 12:07 PM

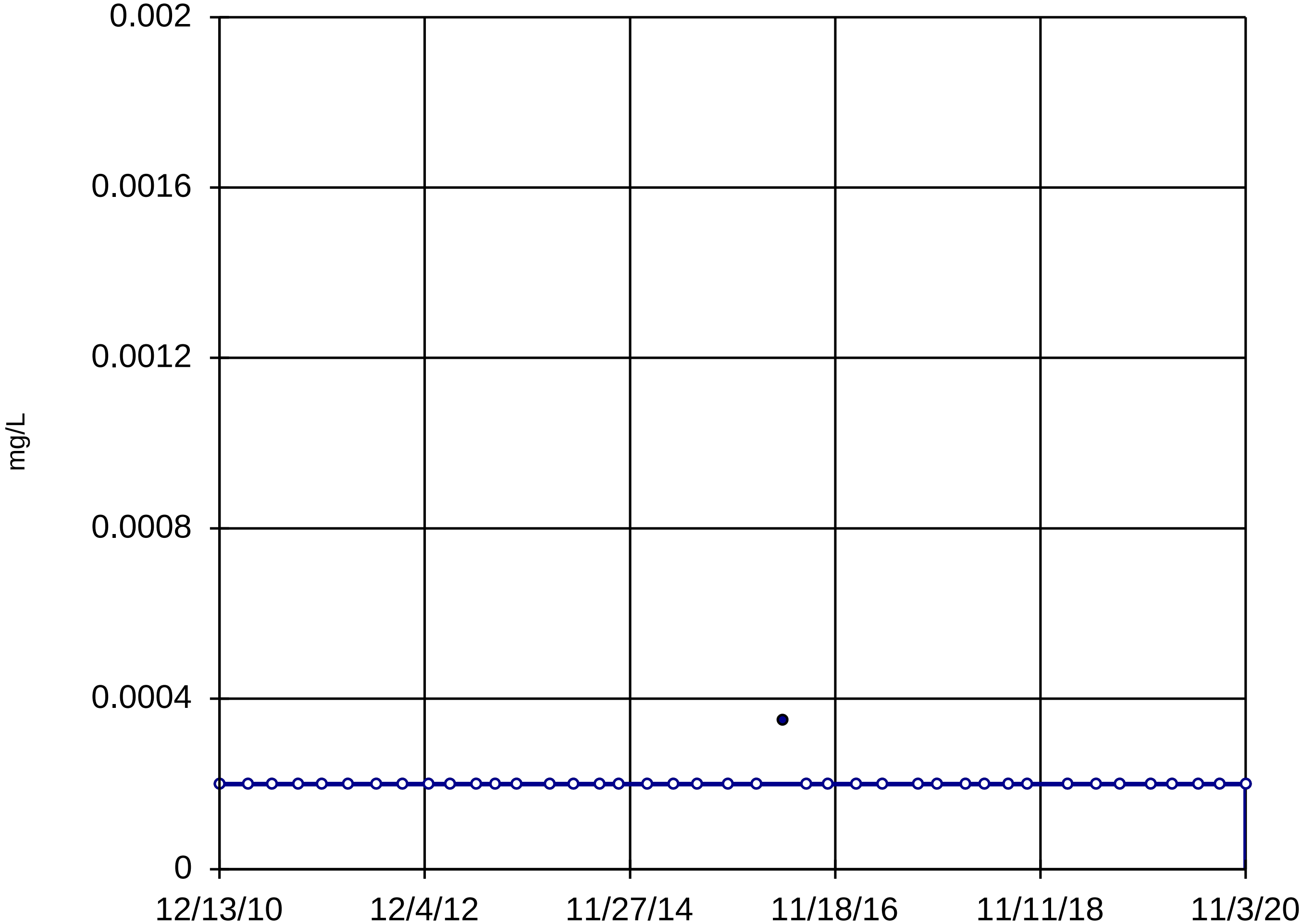
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81989

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-10




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0.1268
critical = 2.58

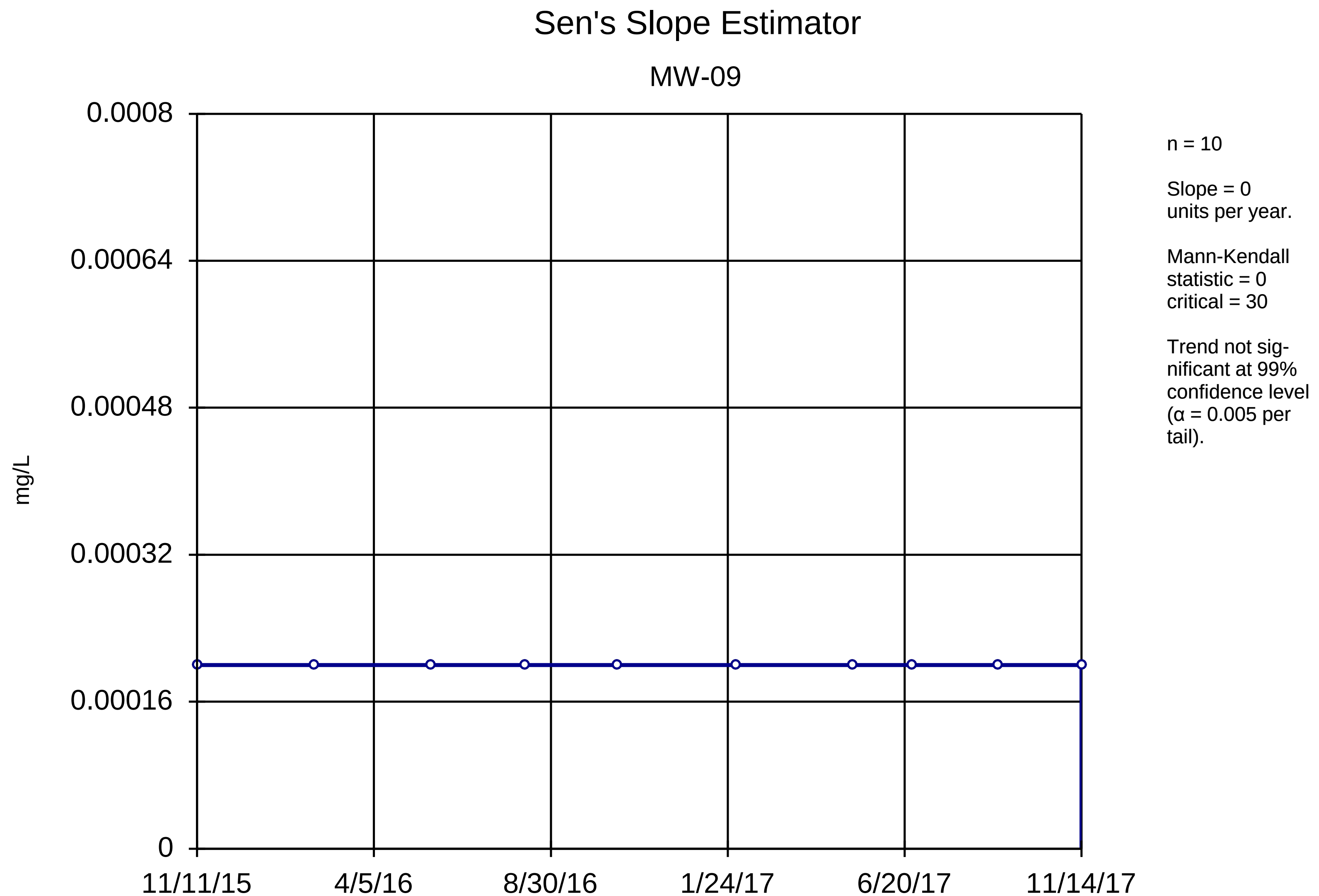
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81990

Hollow symbols indicate censored values.

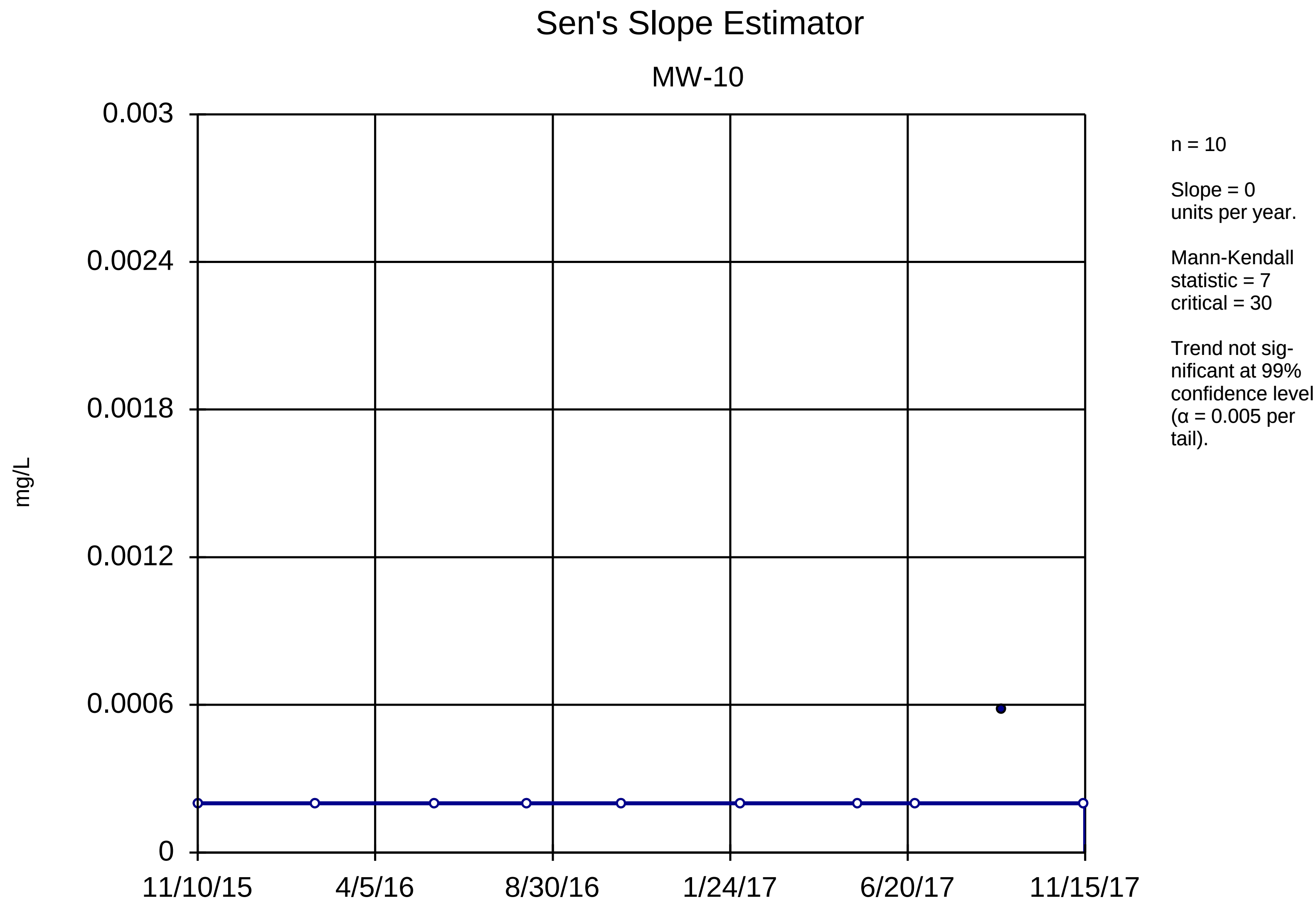



Constituent: Mercury, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81991

Hollow symbols indicate censored values.

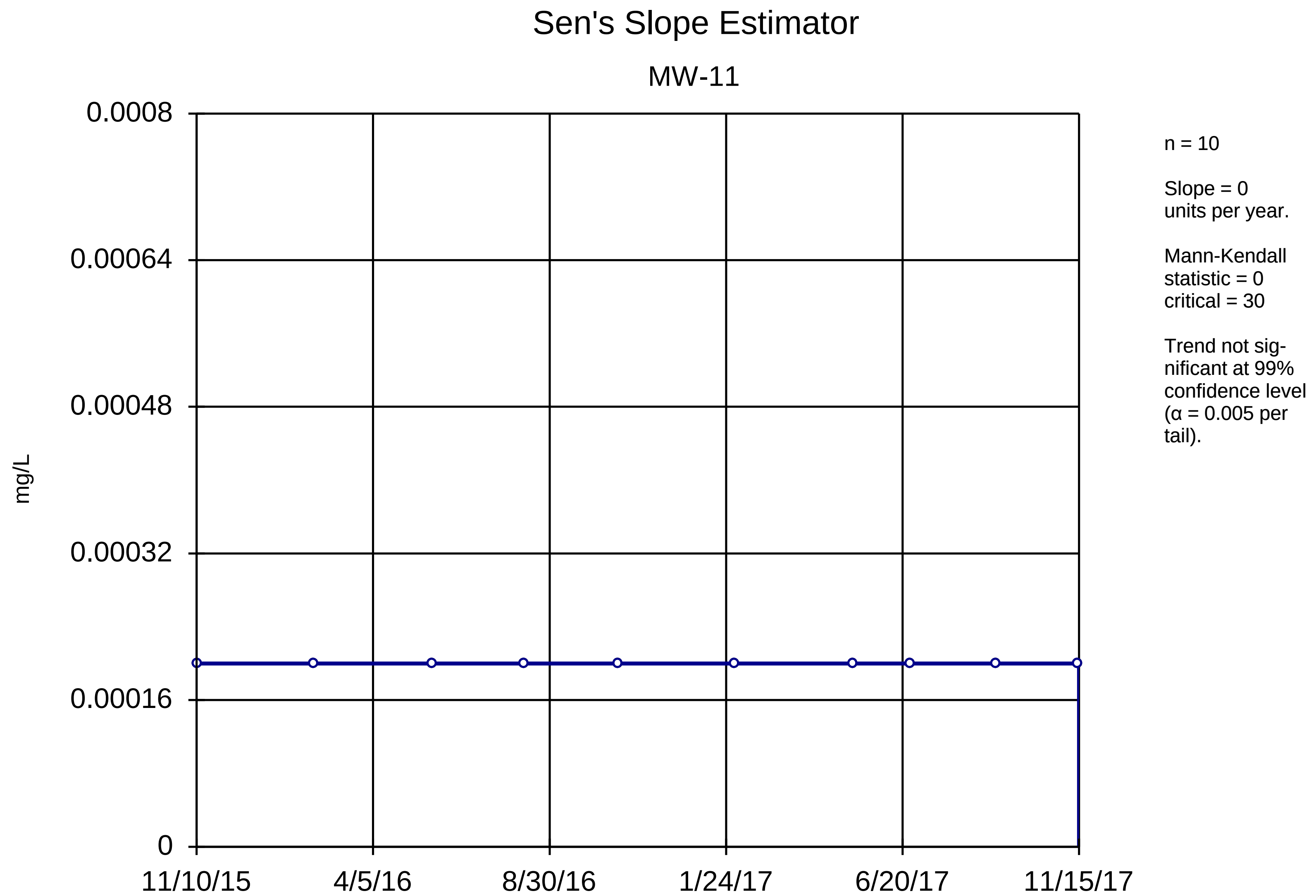



Constituent: Mercury, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81992

Hollow symbols indicate censored values.

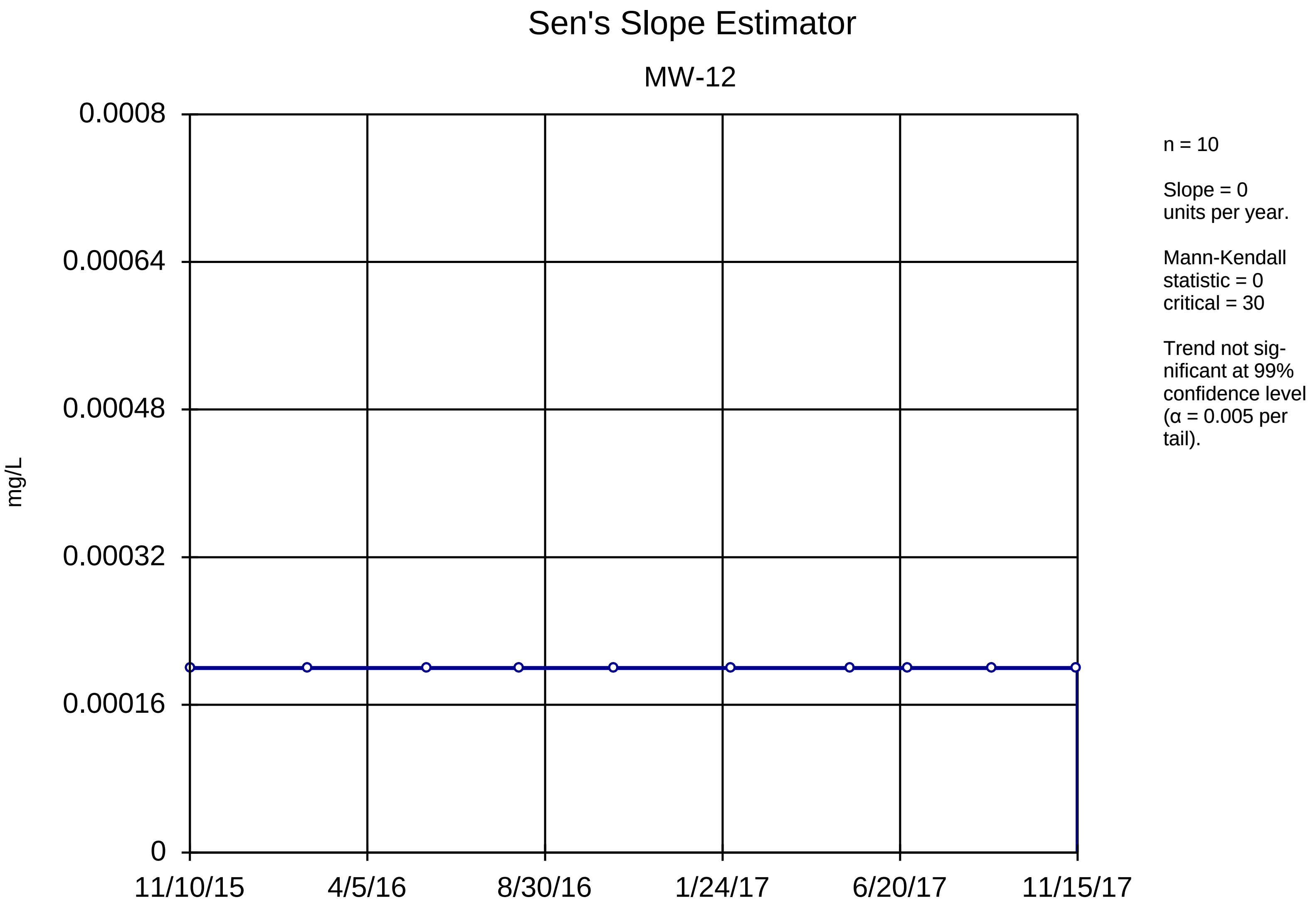



Constituent: Mercury, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_81993

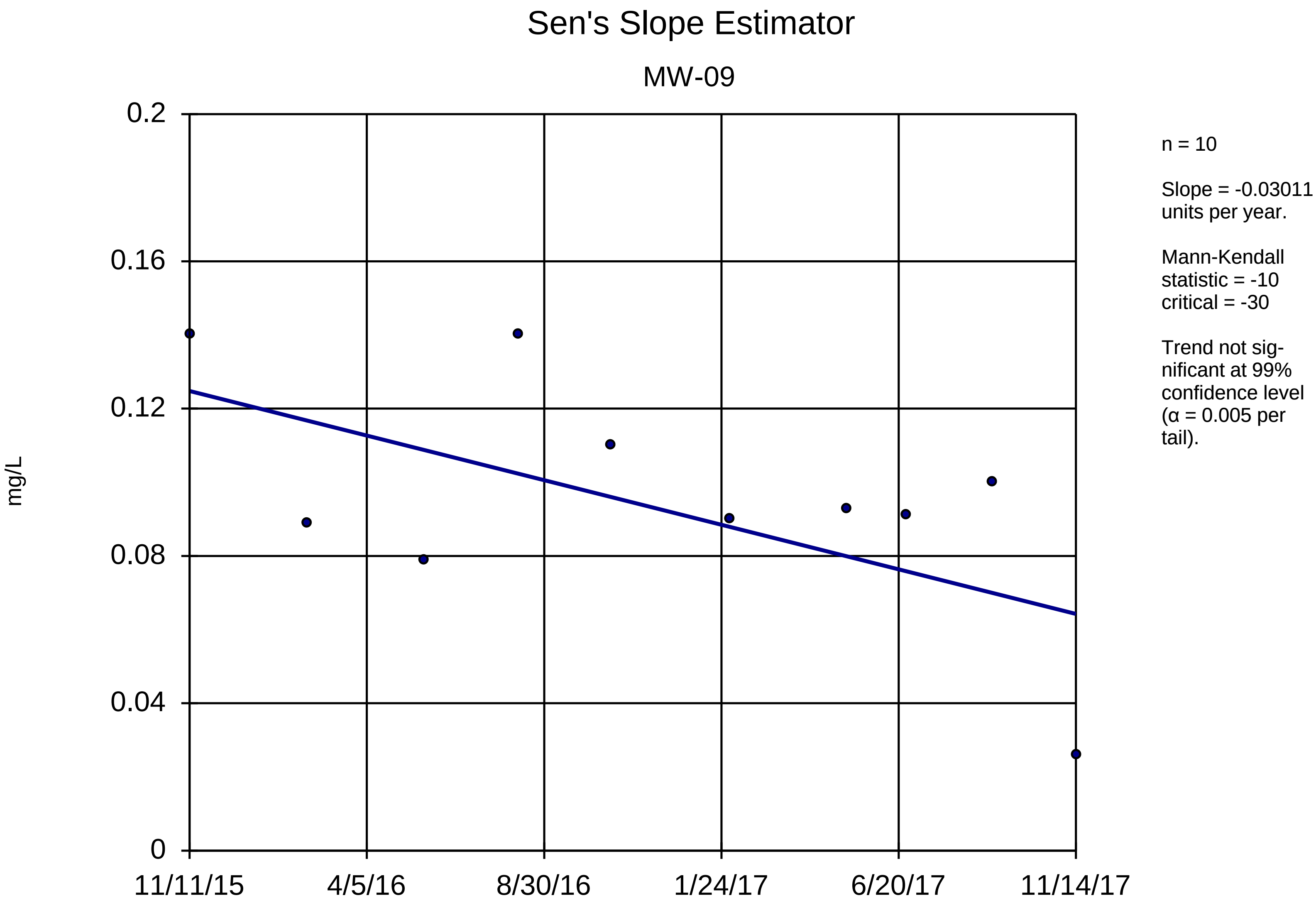
Hollow symbols indicate censored values.




Constituent: Mercury, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

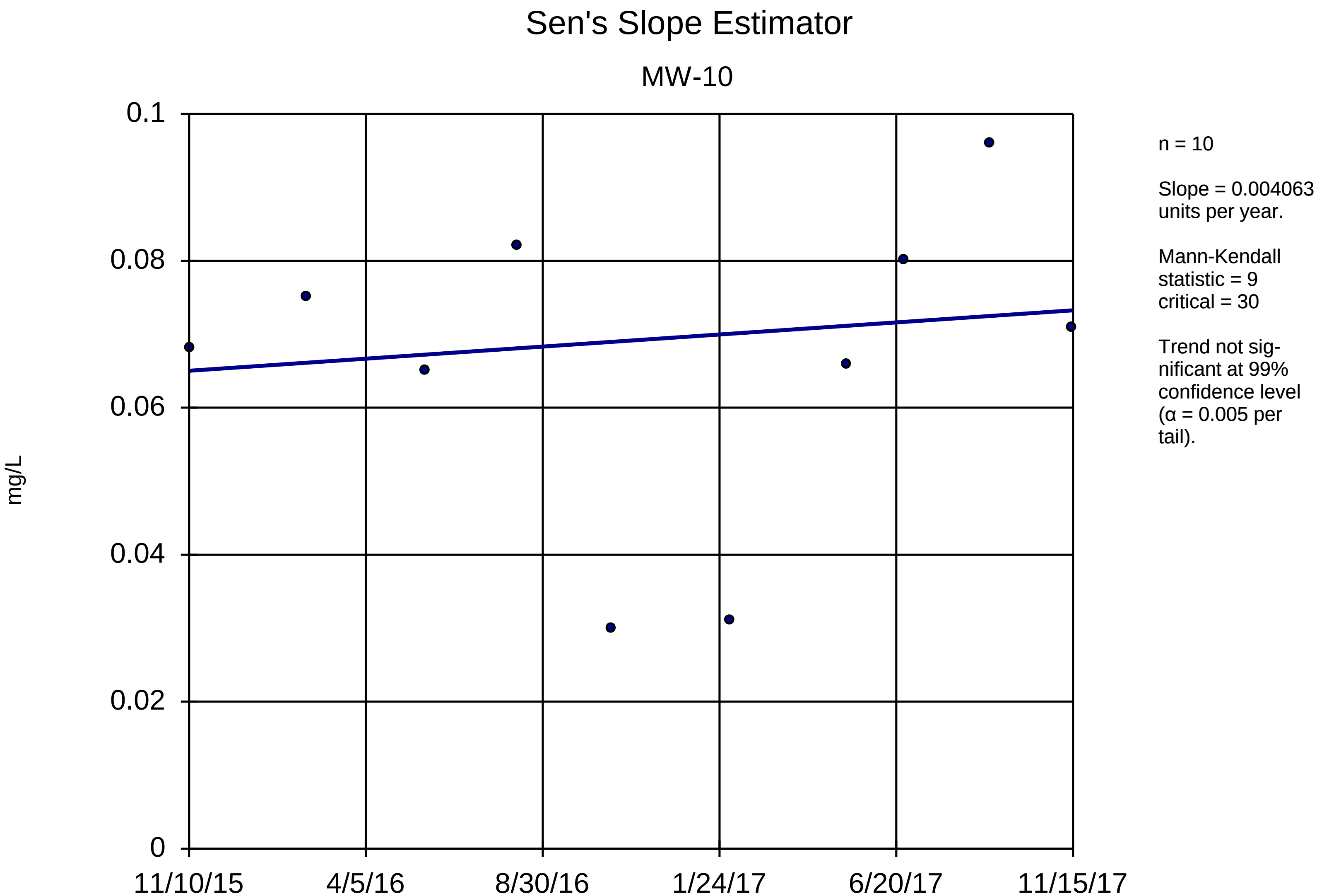
MWG13-15_81994




Constituent: Molybdenum, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

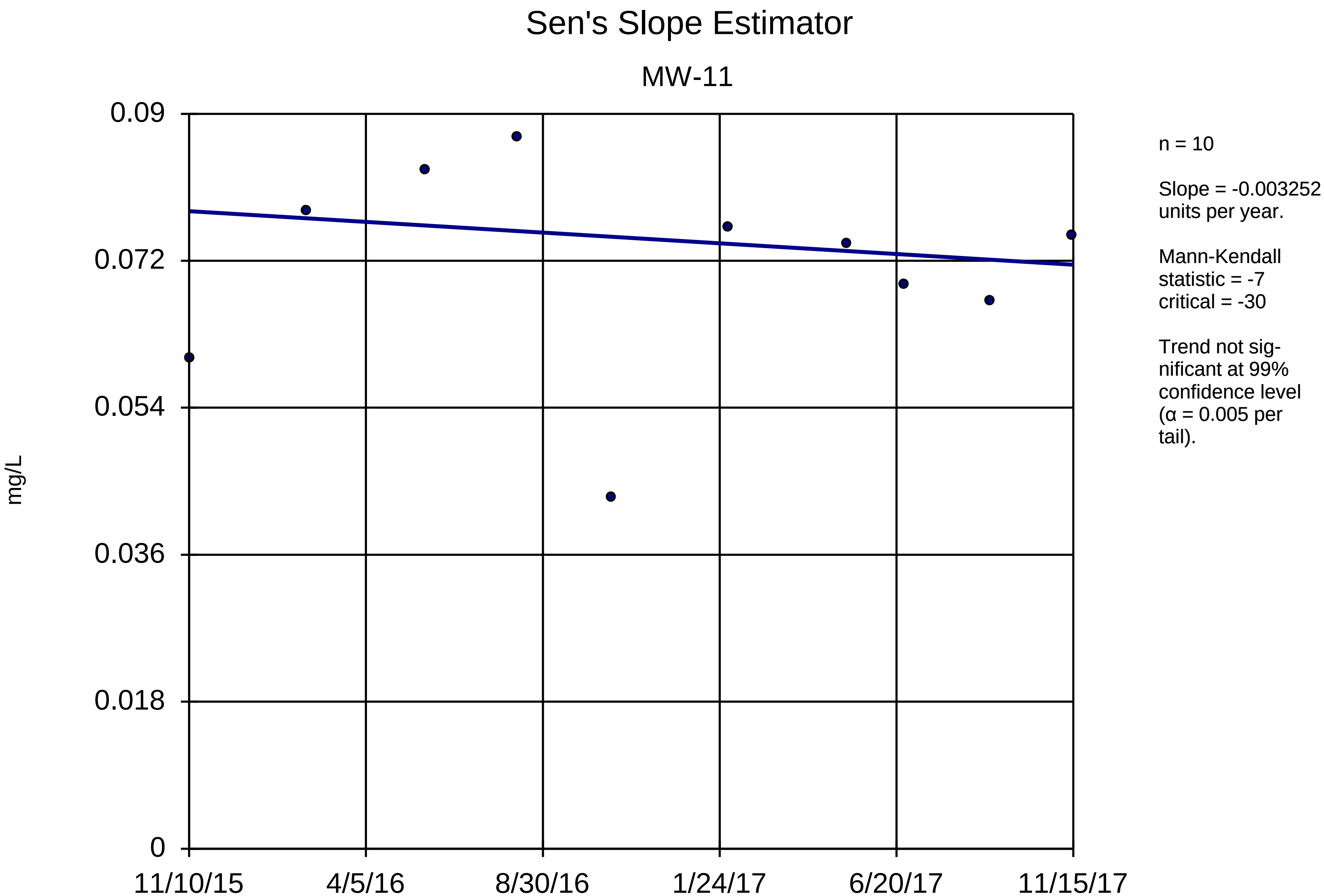
MWG13-15_81995




Constituent: Molybdenum, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

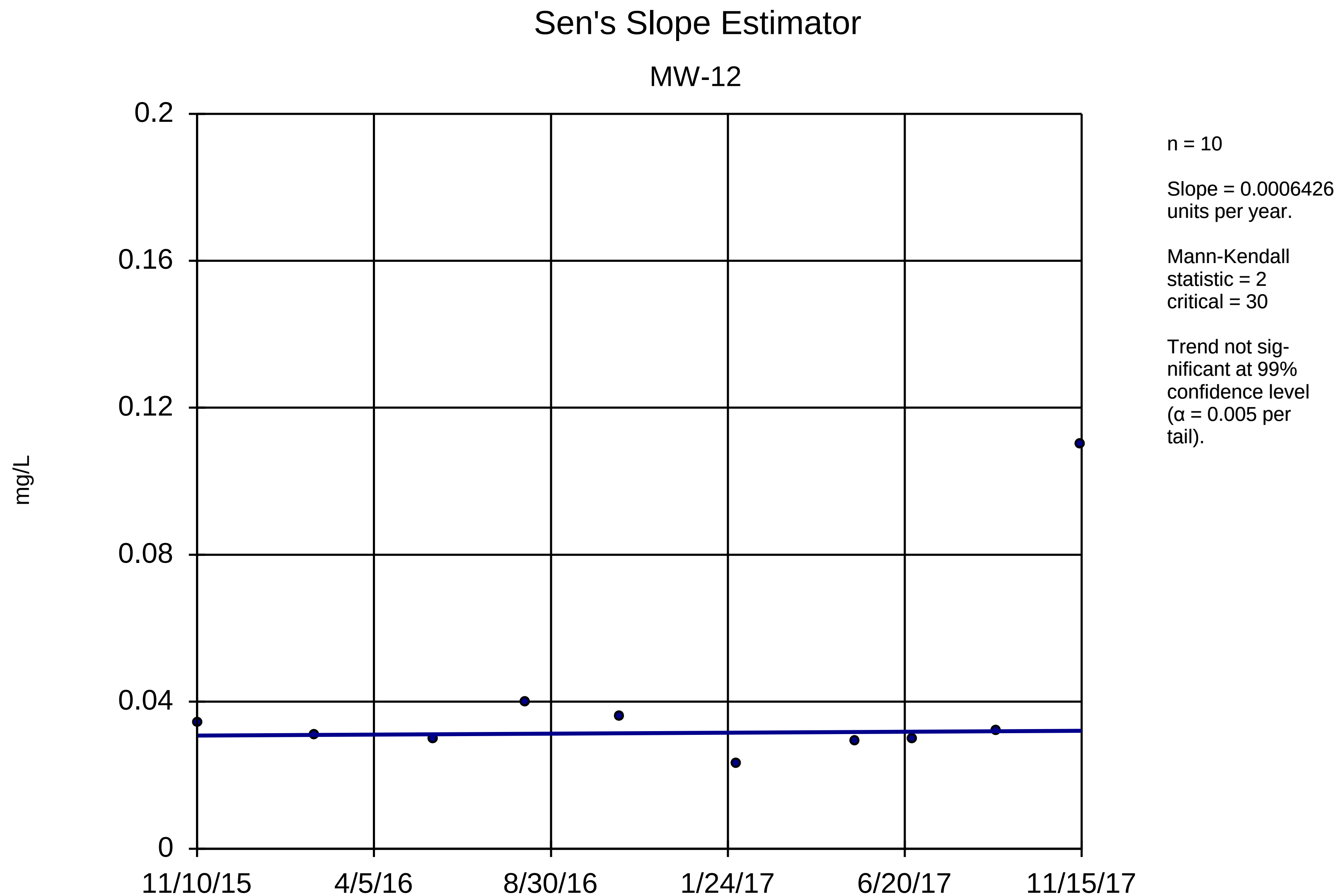
MWG13-15_81996




Constituent: Molybdenum, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

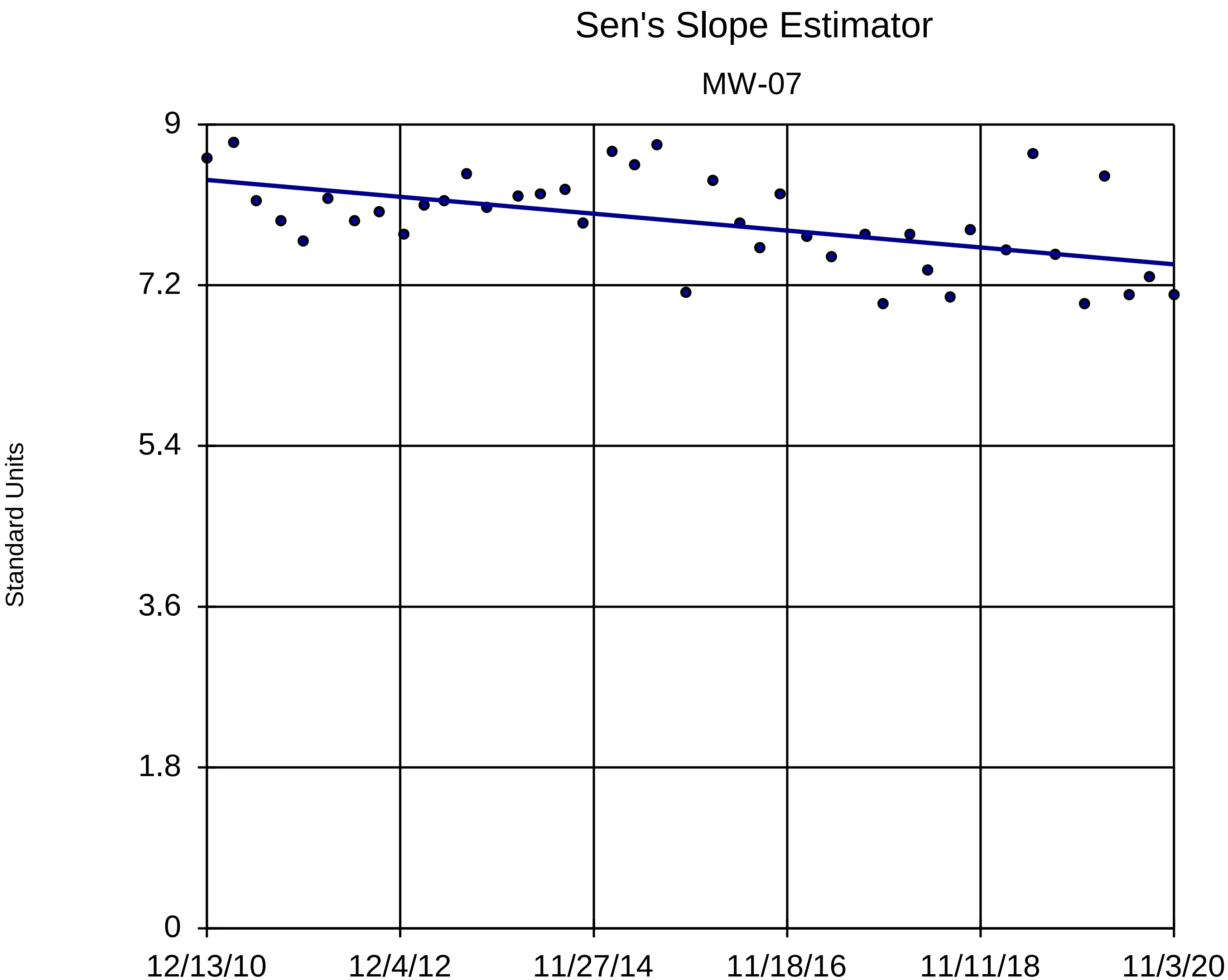
MWG13-15_81997




Constituent: Molybdenum, Total Analysis Run 4/2/2021 12:07 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_81998




n = 41

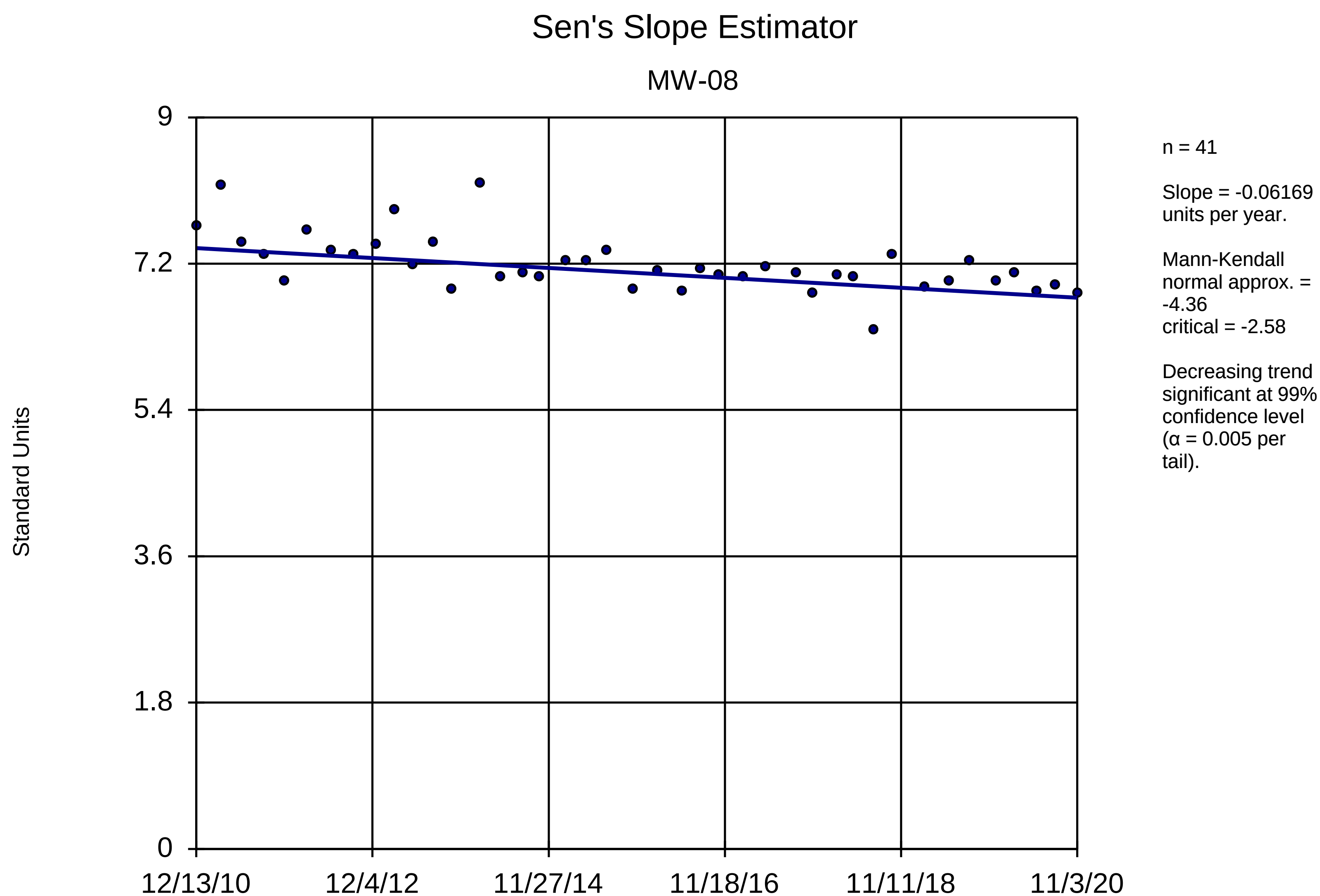
Slope = -0.0954 units per year.

Mann-Kendall normal approx. = -3.18
critical = -2.58

Decreasing trend significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: pH, Field    Analysis Run 4/2/2021 12:07 PM

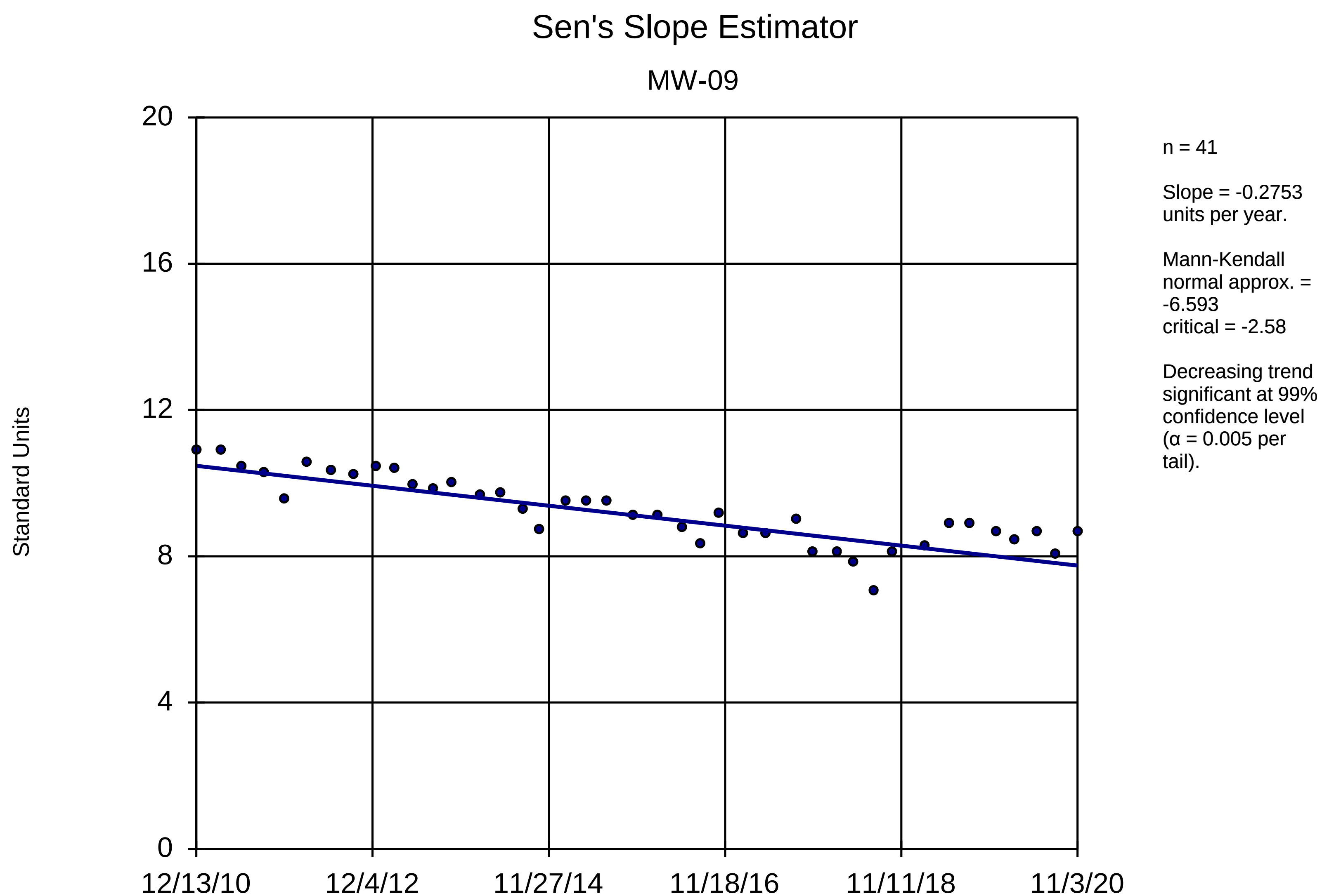
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: pH, Field    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

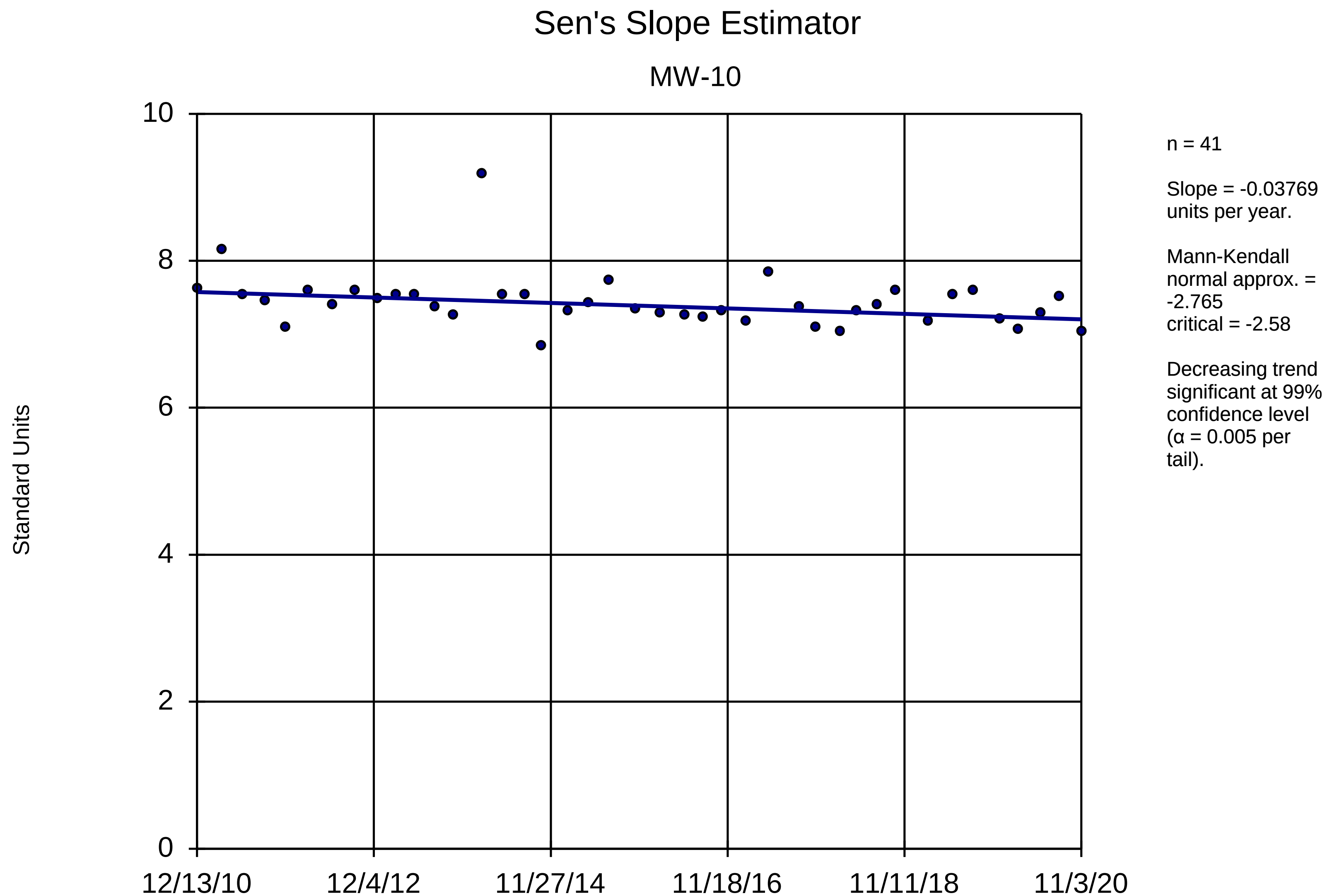
MWG13-15_82000




Constituent: pH, Field    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82001




Constituent: pH, Field    Analysis Run 4/2/2021 12:07 PM

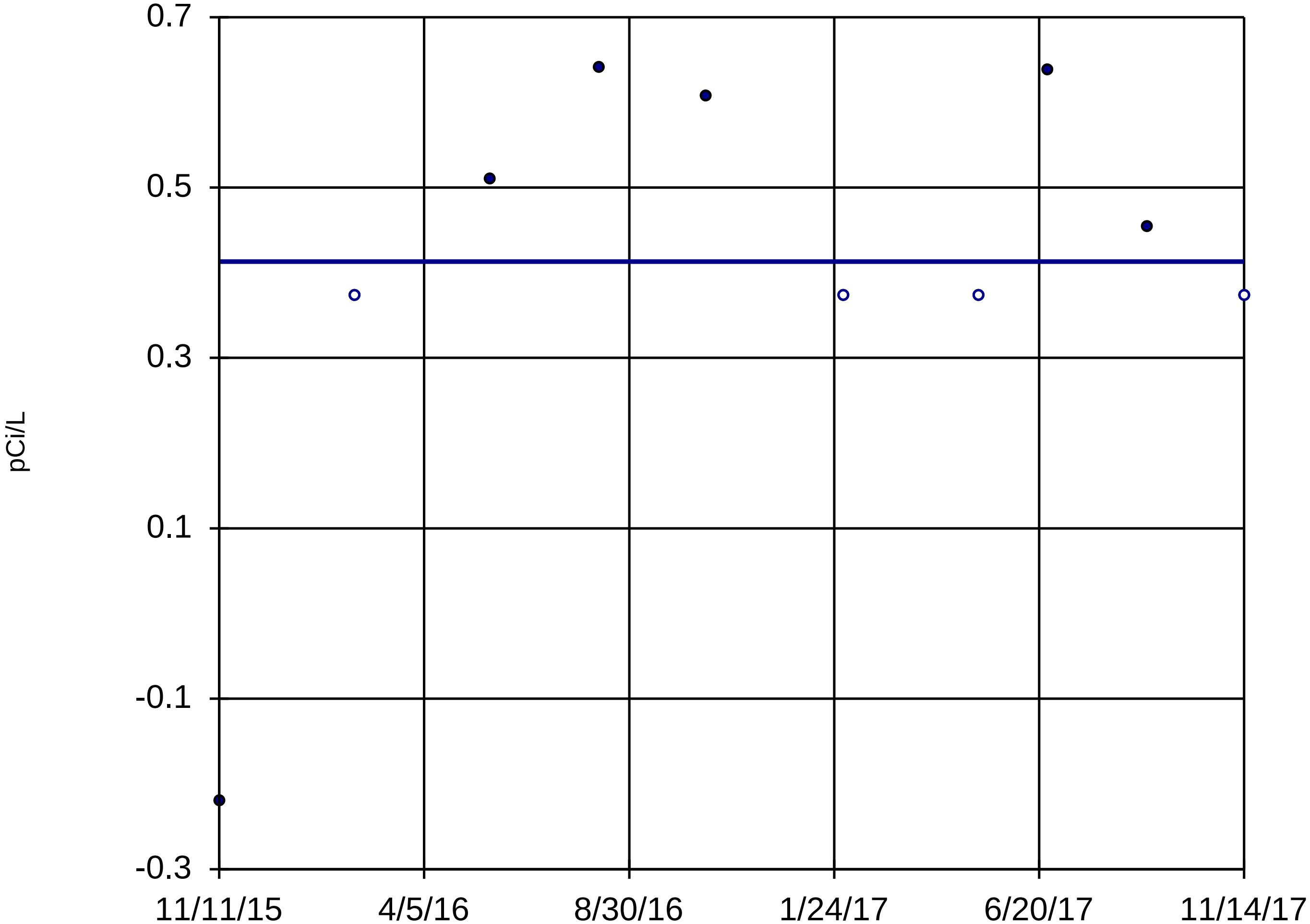
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82002

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-09




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 5
critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

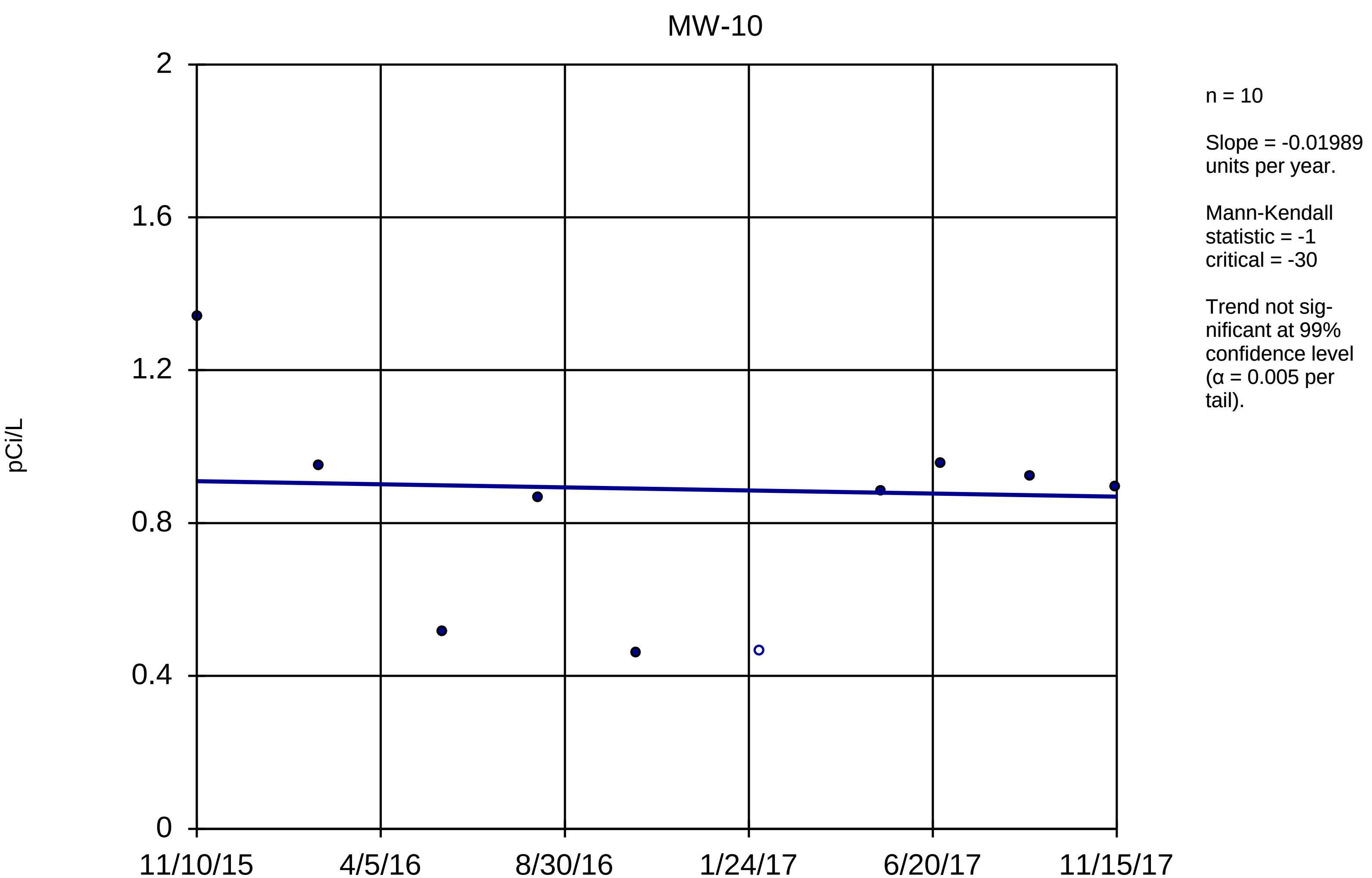
Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82003

Hollow symbols indicate censored values.

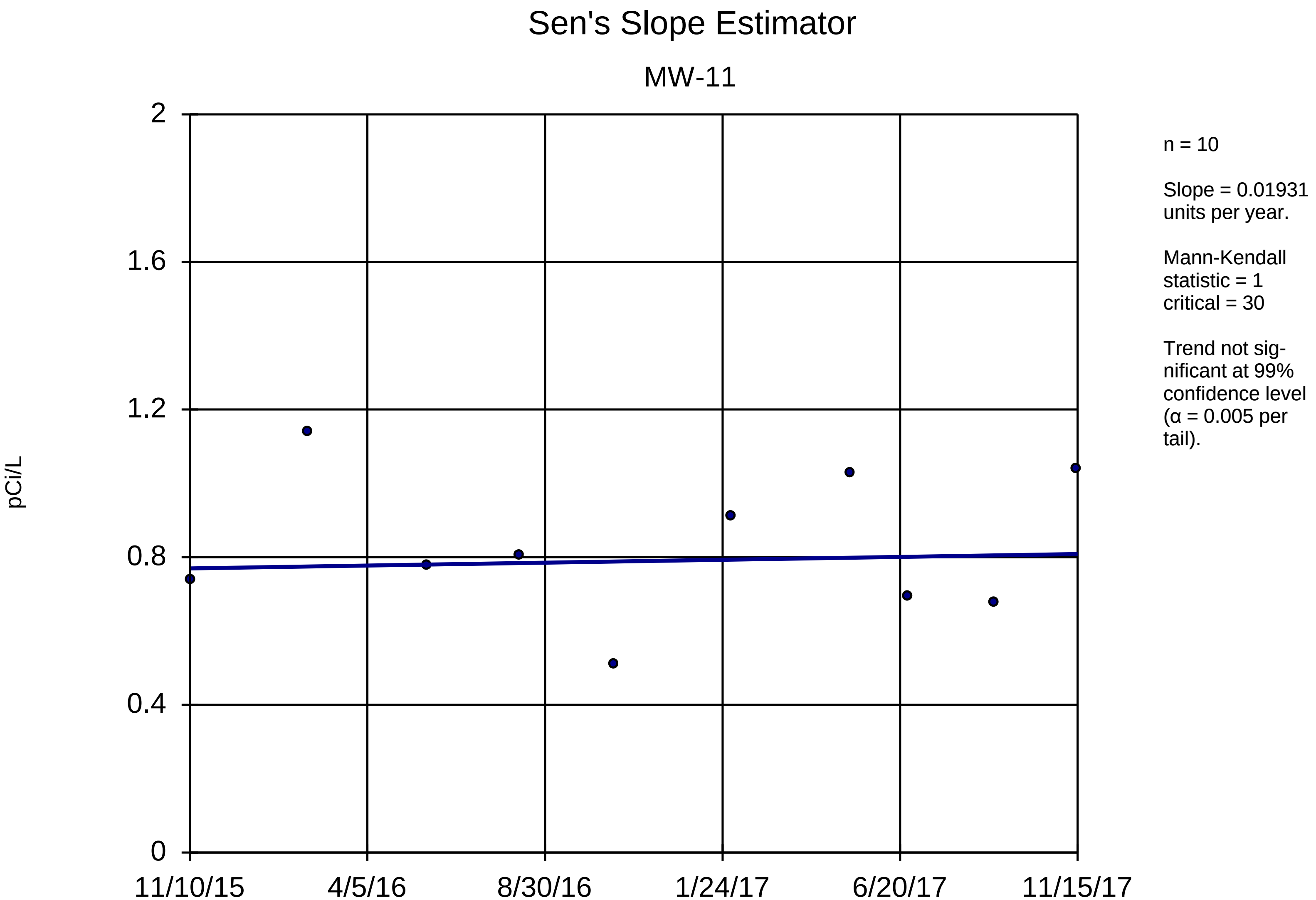
## Sen's Slope Estimator




Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82004




Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 12:07 PM

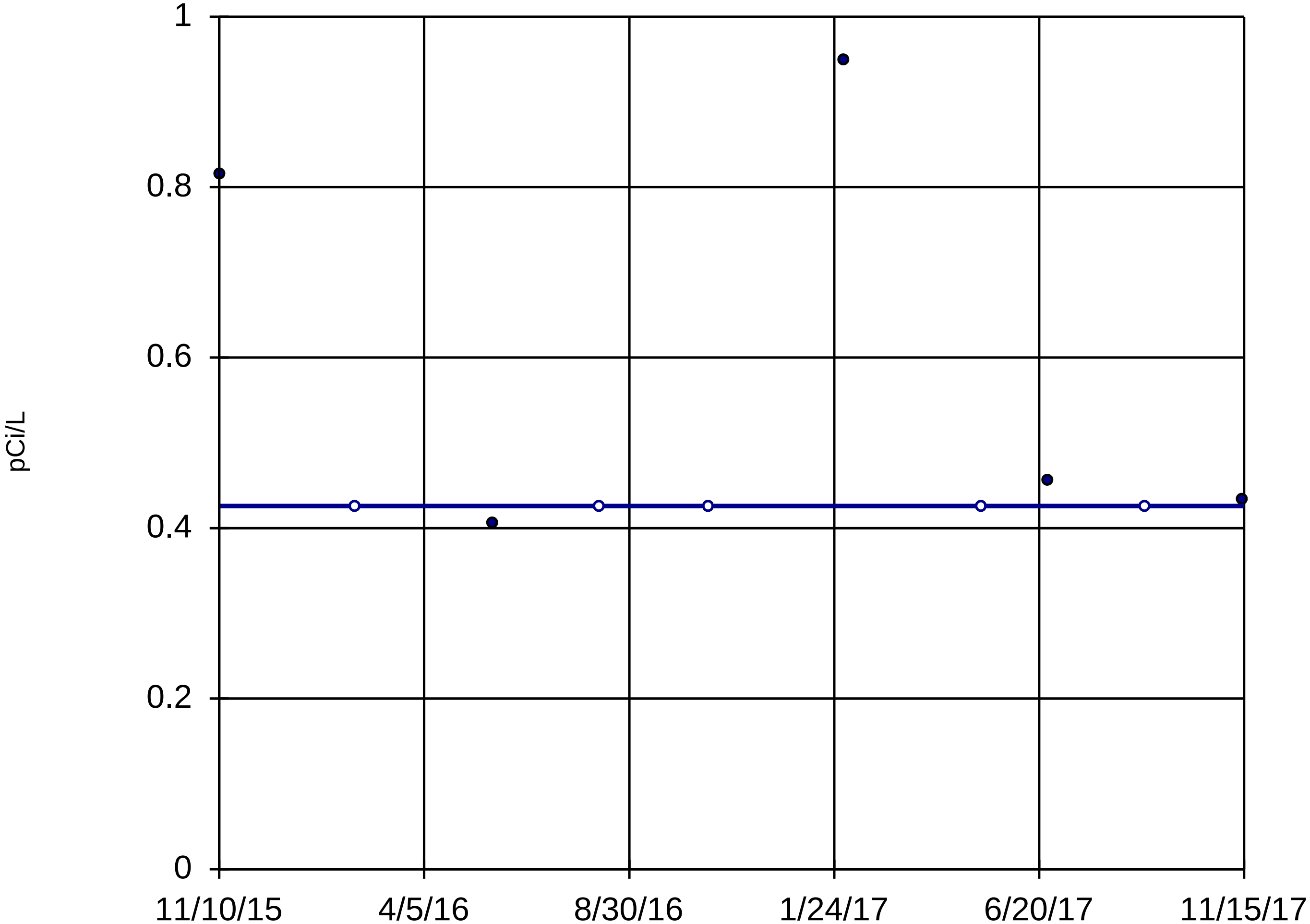
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82005

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-12




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 5
critical = 30

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Radium 226 + Radium 228, Combined    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82006

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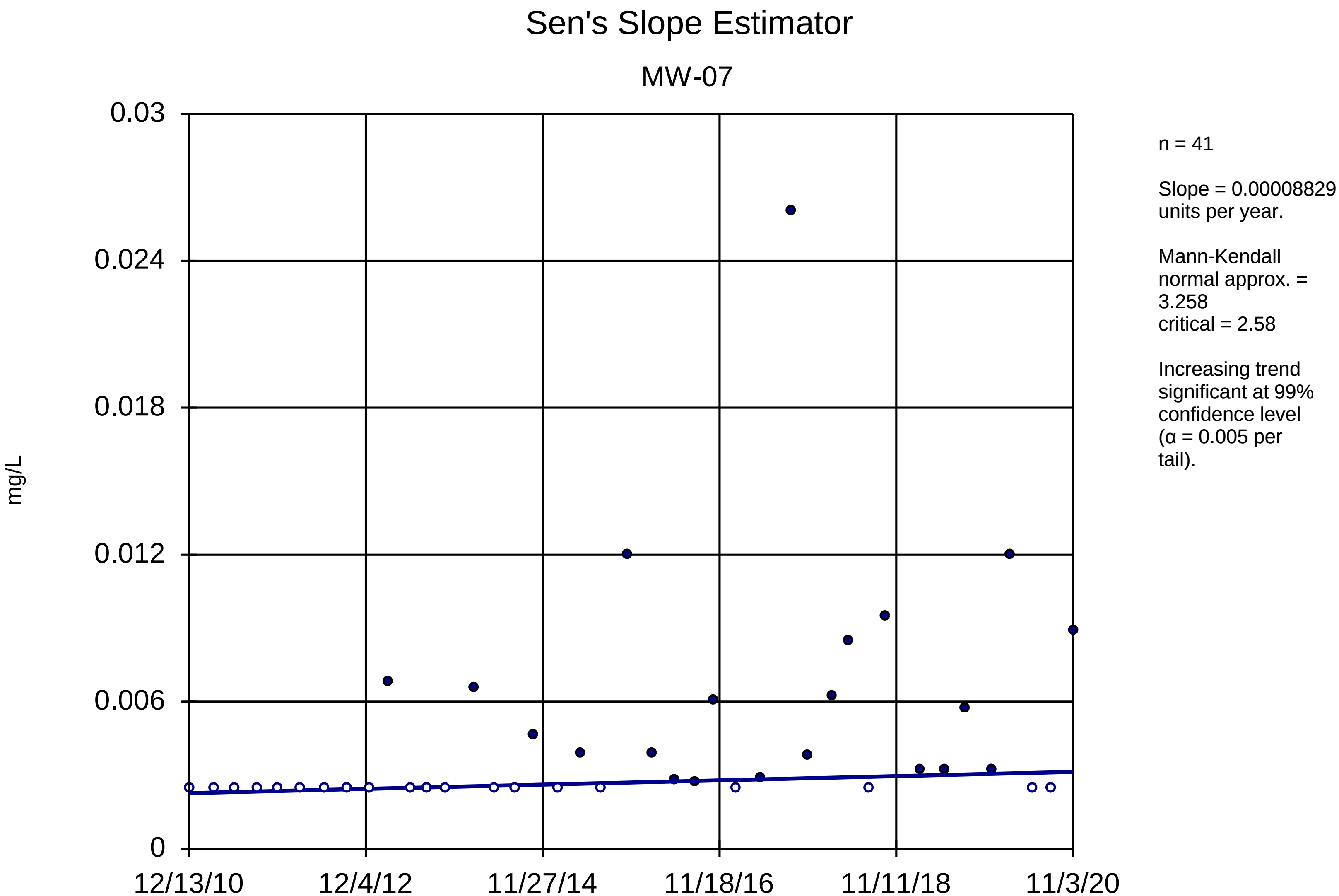
Hollow symbols indicate censored values.

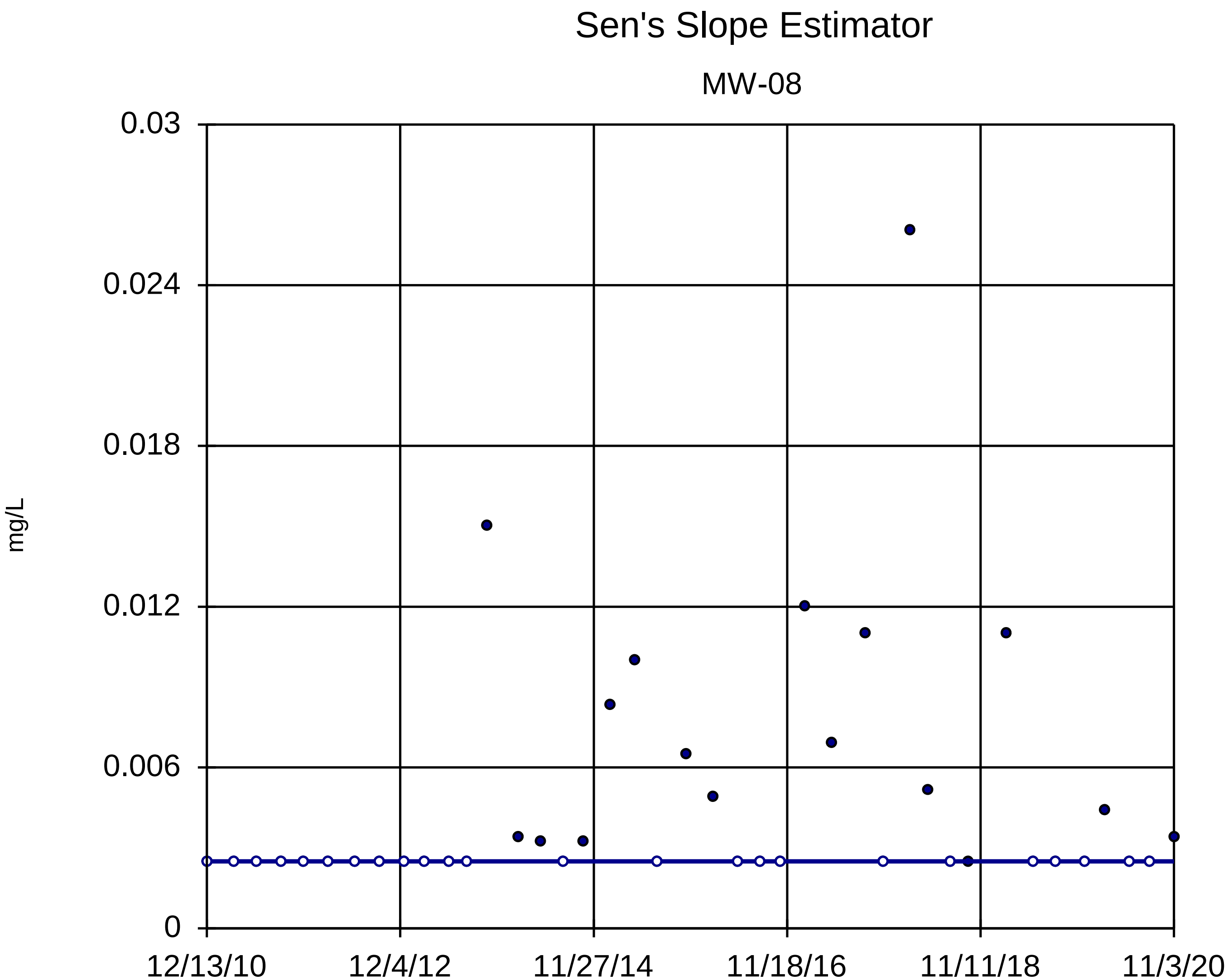



Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82007

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
1.563
critical = 2.58

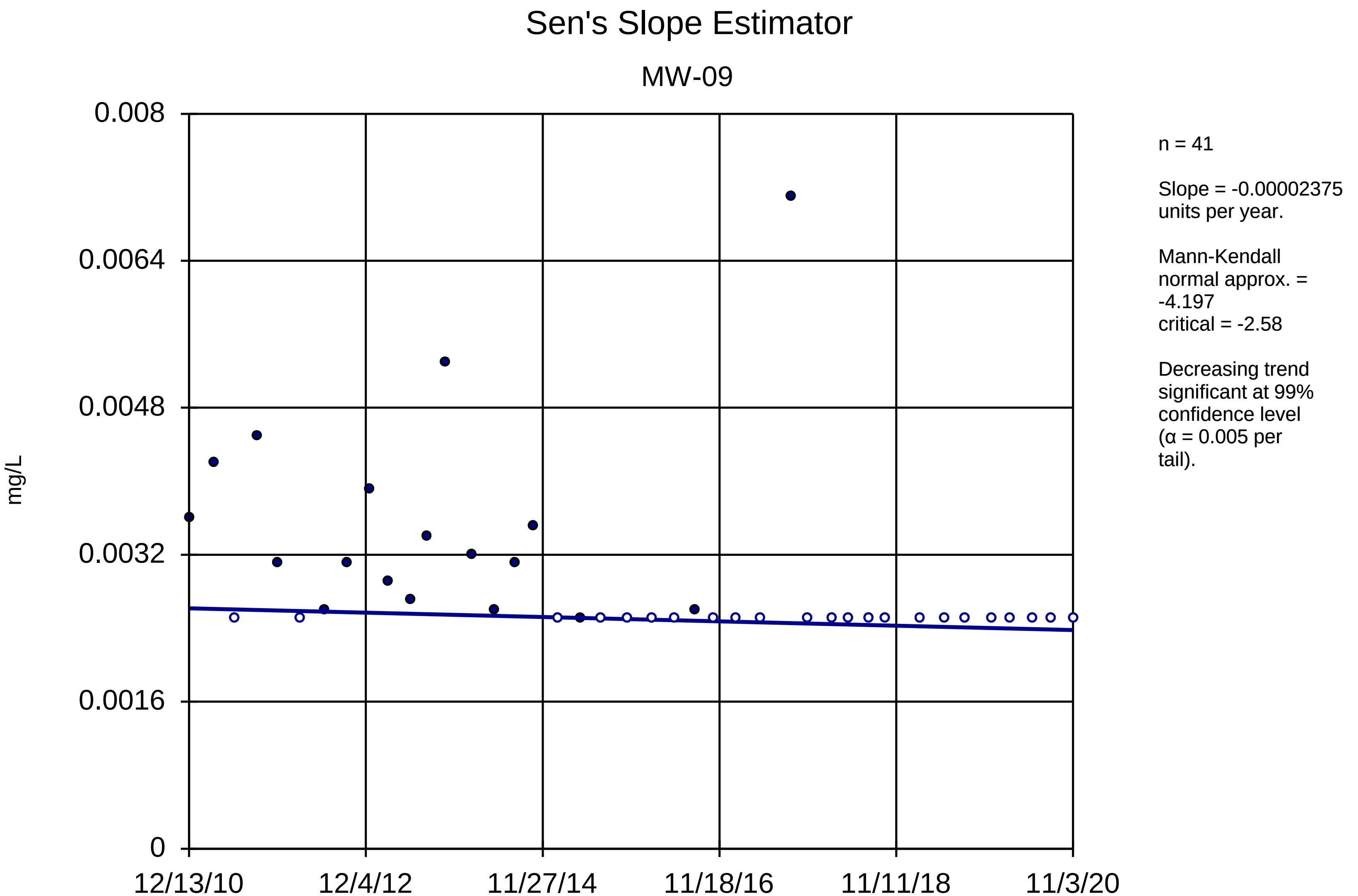
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82008

Hollow symbols indicate censored values.

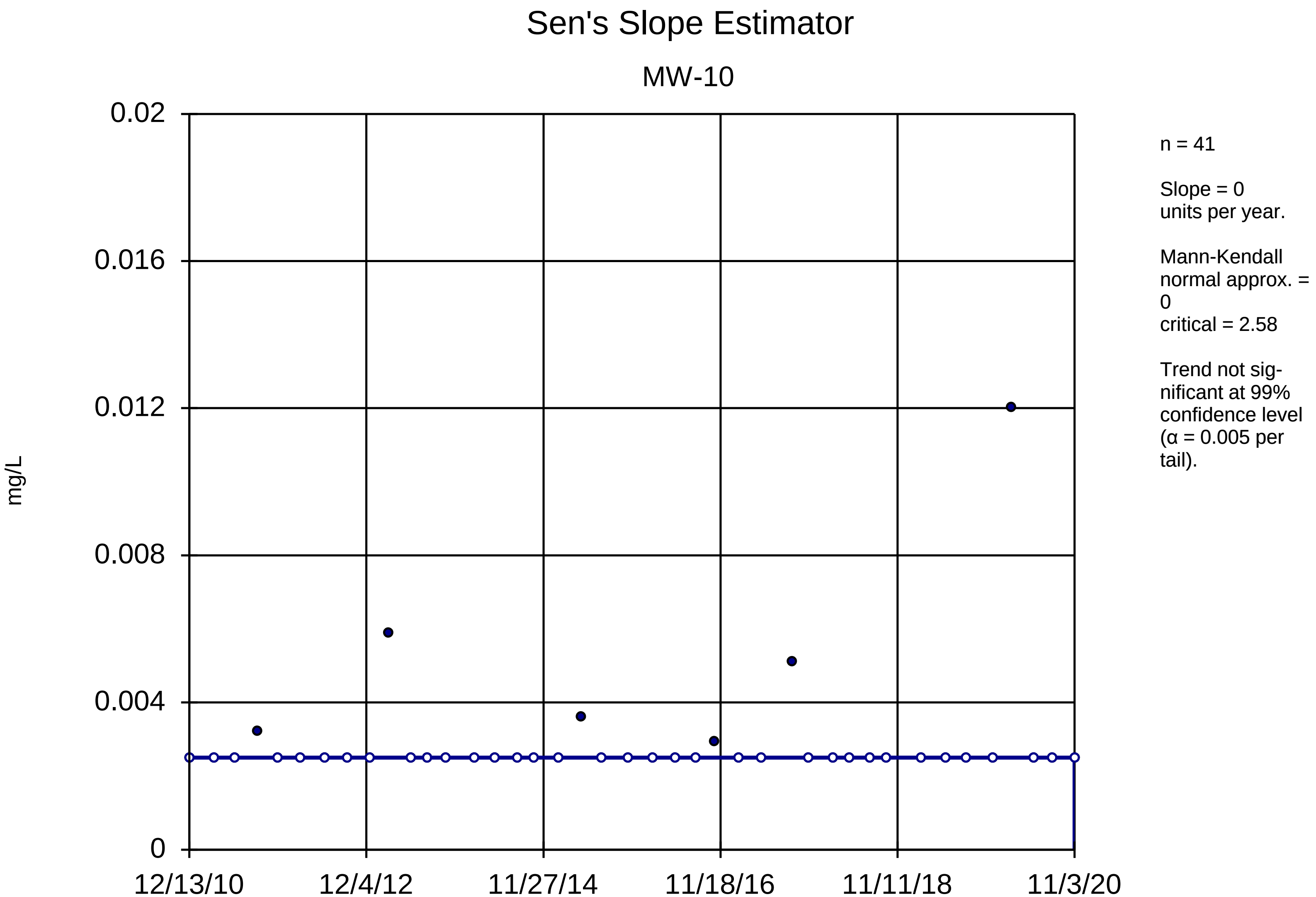



Constituent: Selenium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82009

Hollow symbols indicate censored values.

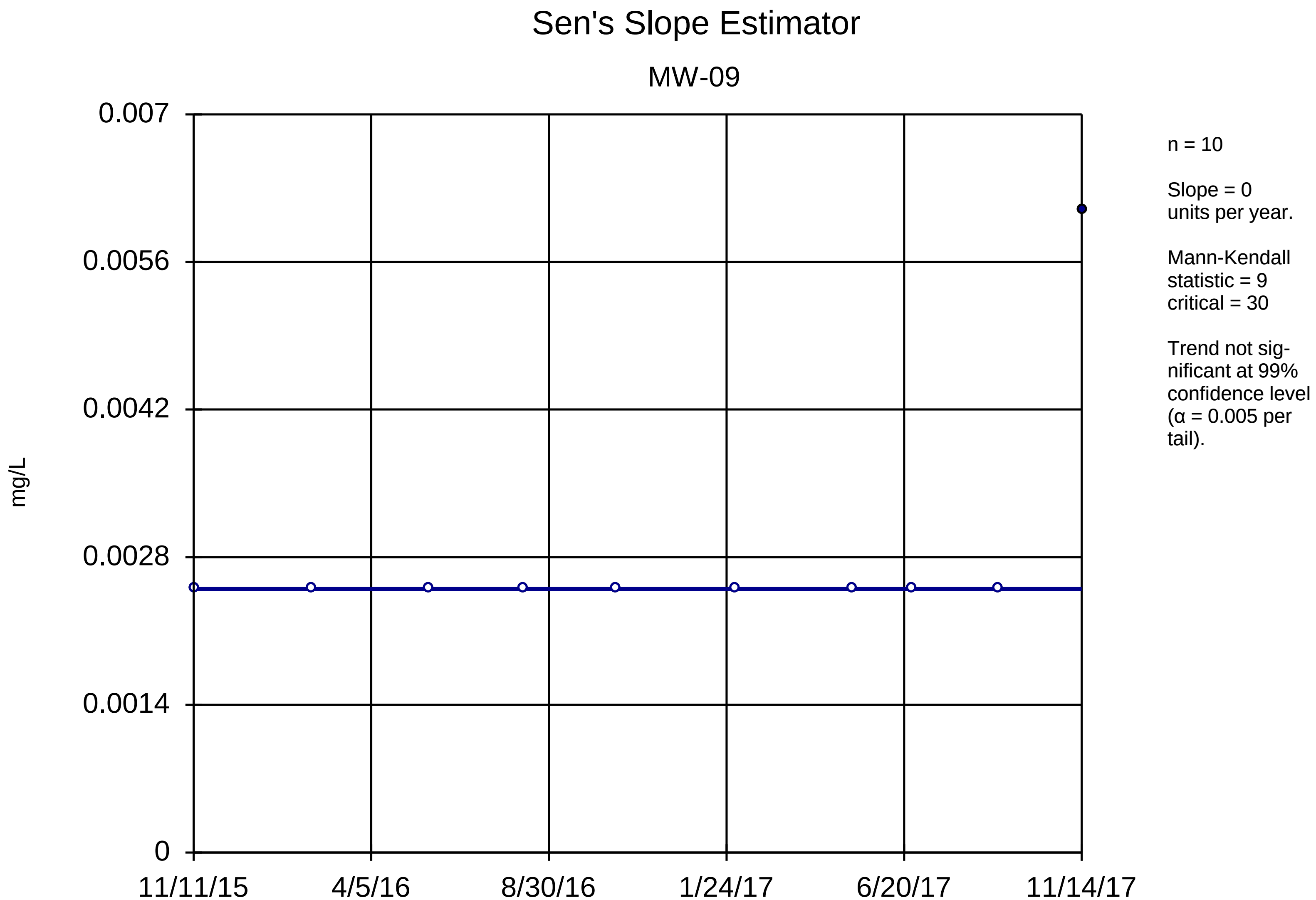



Constituent: Selenium, Dissolved Analysis Run 4/2/2021 12:07 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_82010

Hollow symbols indicate censored values.




Constituent: Selenium, Total    Analysis Run 4/2/2021 12:07 PM

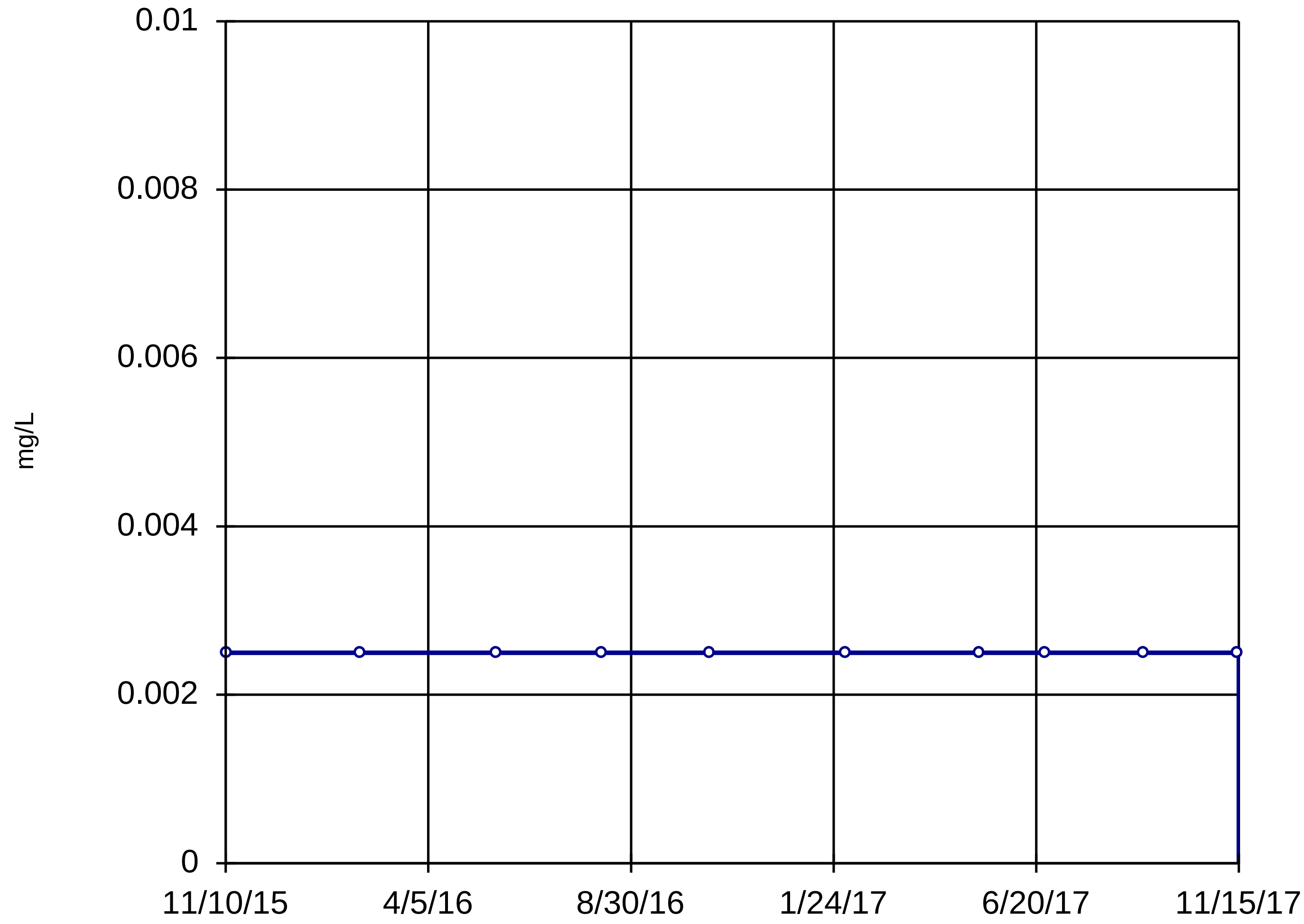
Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82011

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-10




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

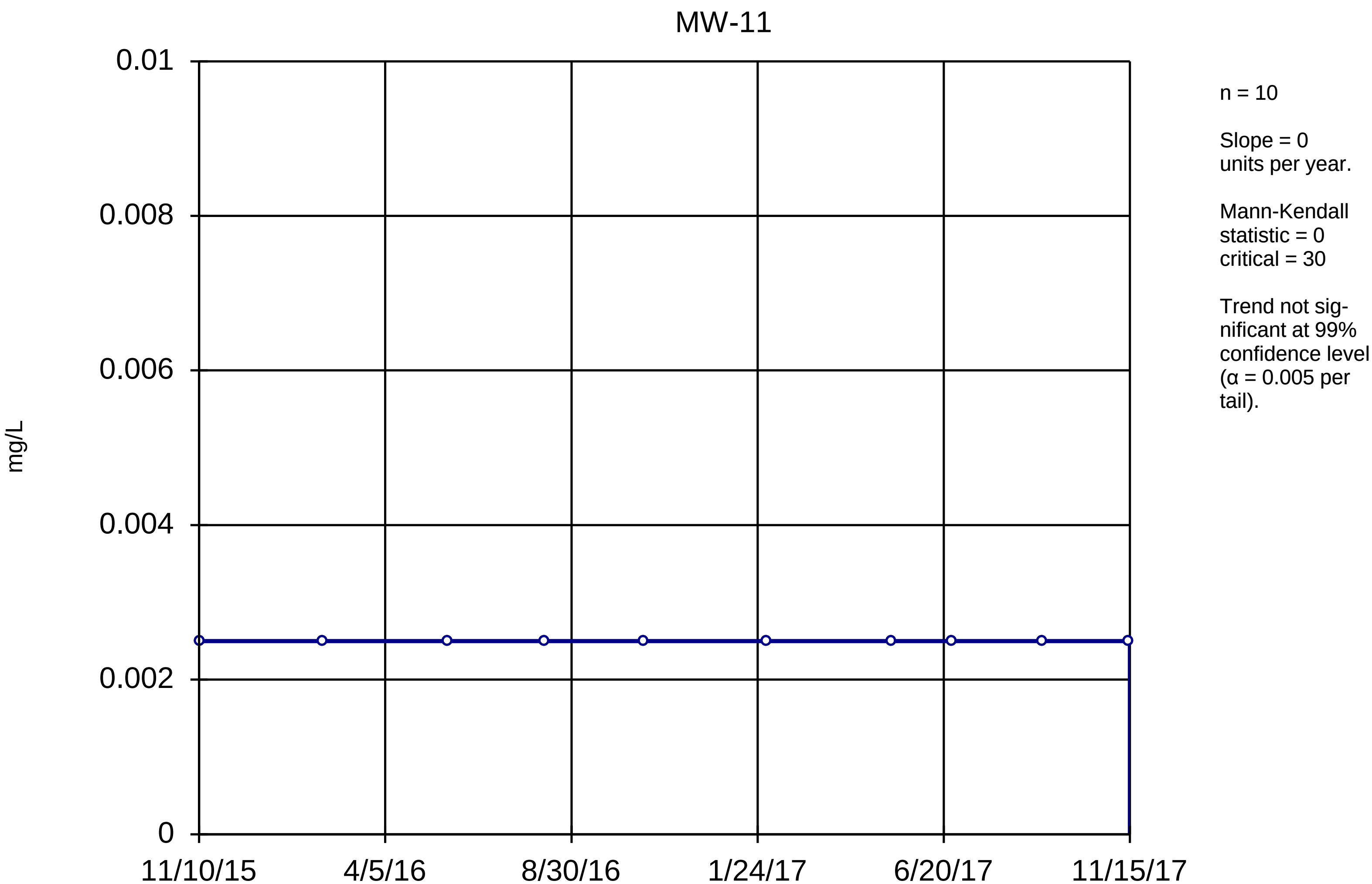
Constituent: Selenium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82012

Hollow symbols indicate censored values.

## Sen's Slope Estimator



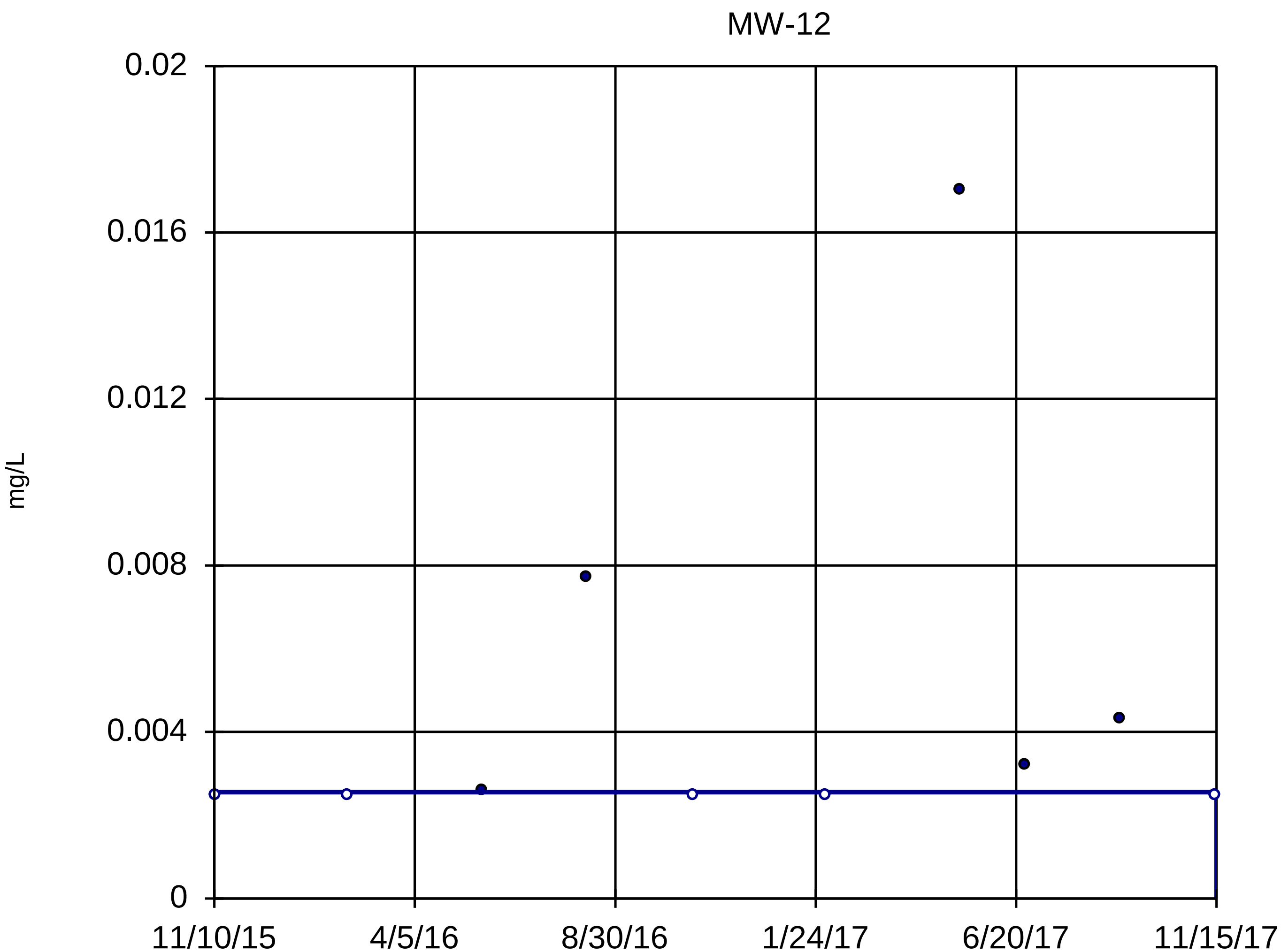

Constituent: Selenium, Total Analysis Run 4/2/2021 12:07 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_82013

Hollow symbols indicate censored values.

# Sen's Slope Estimator




n = 10

Slope = 0
units per year.

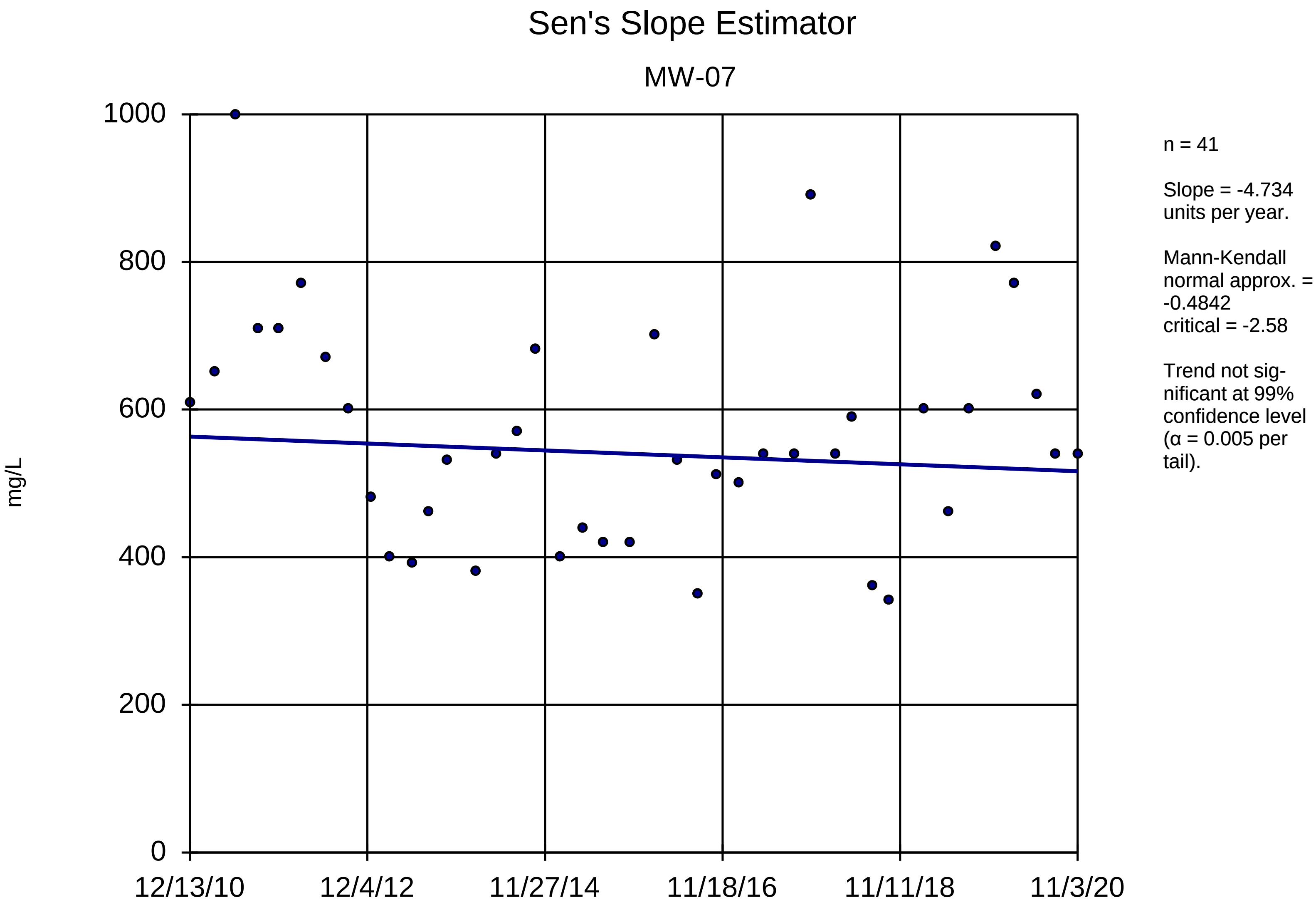
Mann-Kendall
statistic = 9
critical = 30

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Selenium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82014




Constituent: Sulfate    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82015

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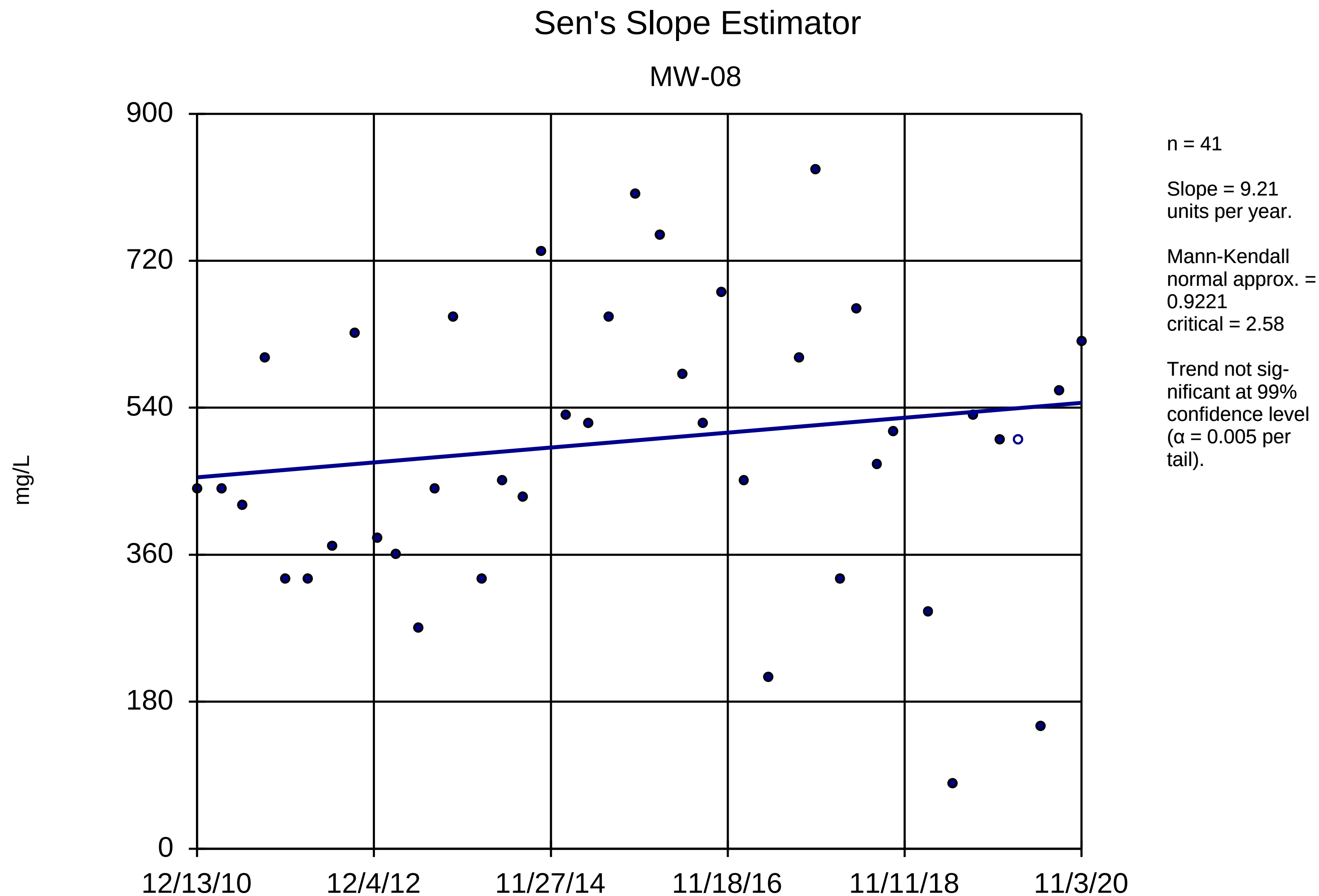
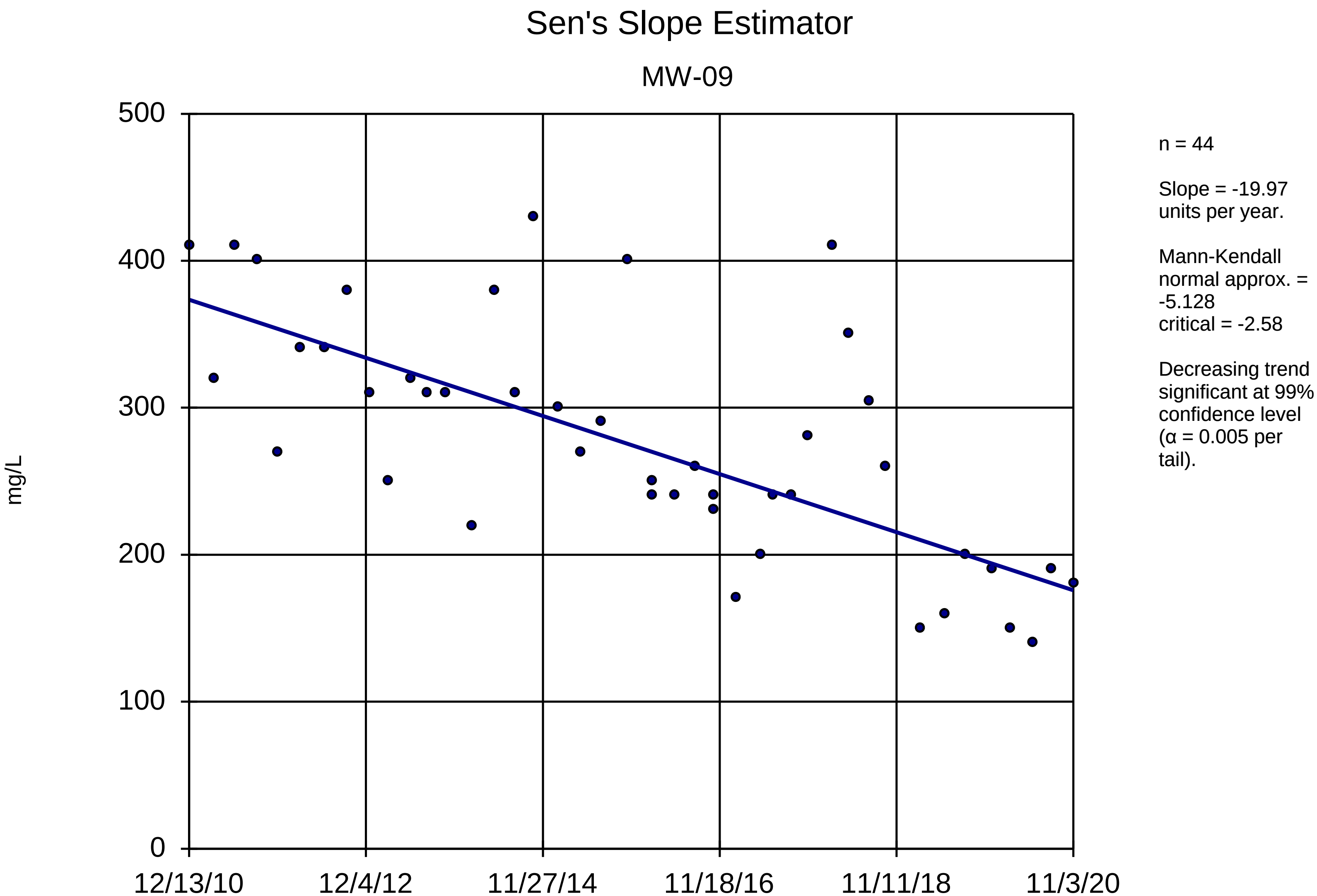
Hollow symbols indicate censored values.




Constituent: Sulfate  Analysis Run 4/2/2021 12:07 PM

Utility Site WC  Client: Weaver Consultants Group  Data: Will County Sanitas Database

MWG13-15_82016

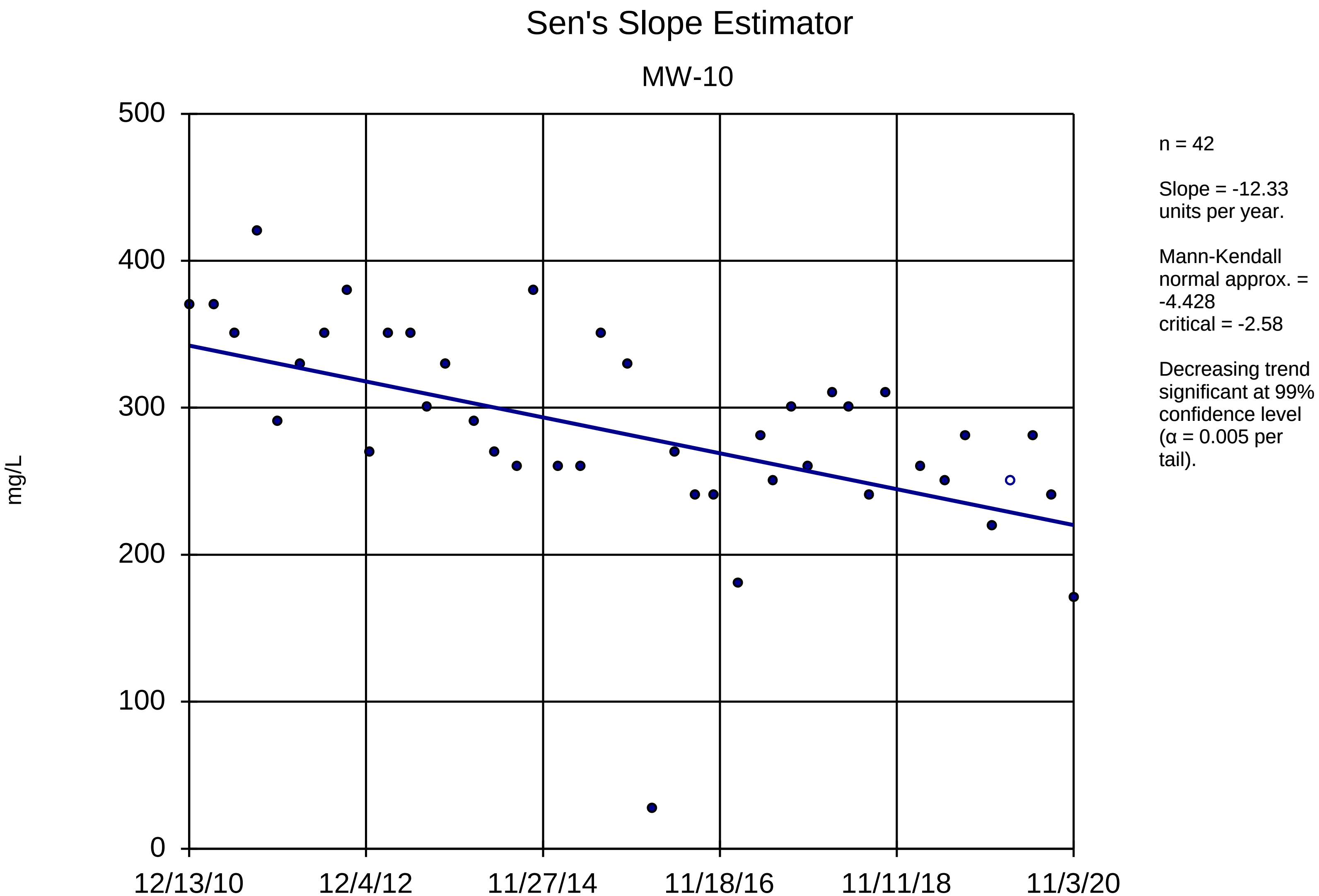



Constituent: Sulfate    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82017

Hollow symbols indicate censored values.




Constituent: Sulfate    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82018

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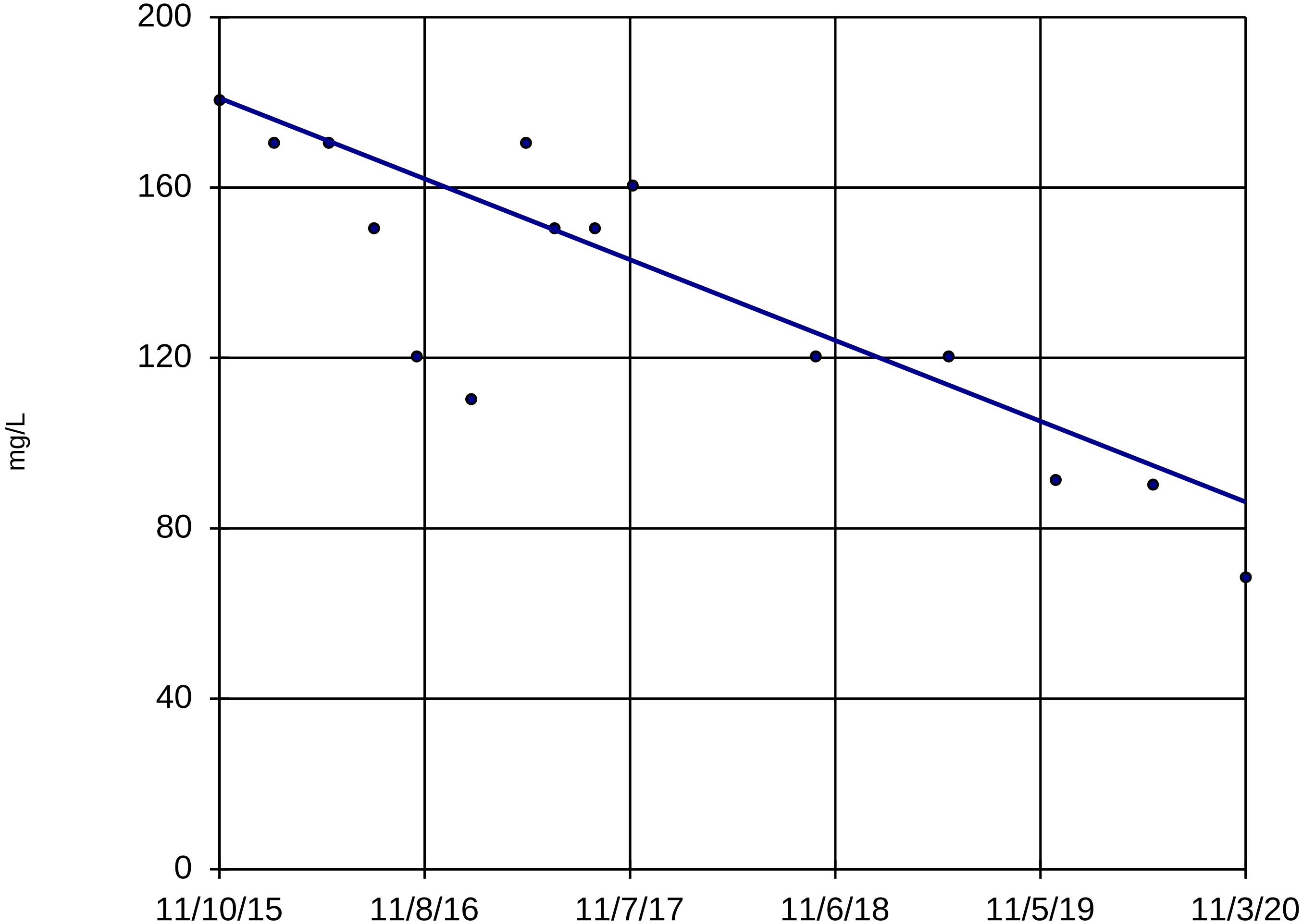
# Sen's Slope Estimator

## MW-11




n = 15

Slope = -19.01 units per year.

Mann-Kendall statistic = -68 critical = -53

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

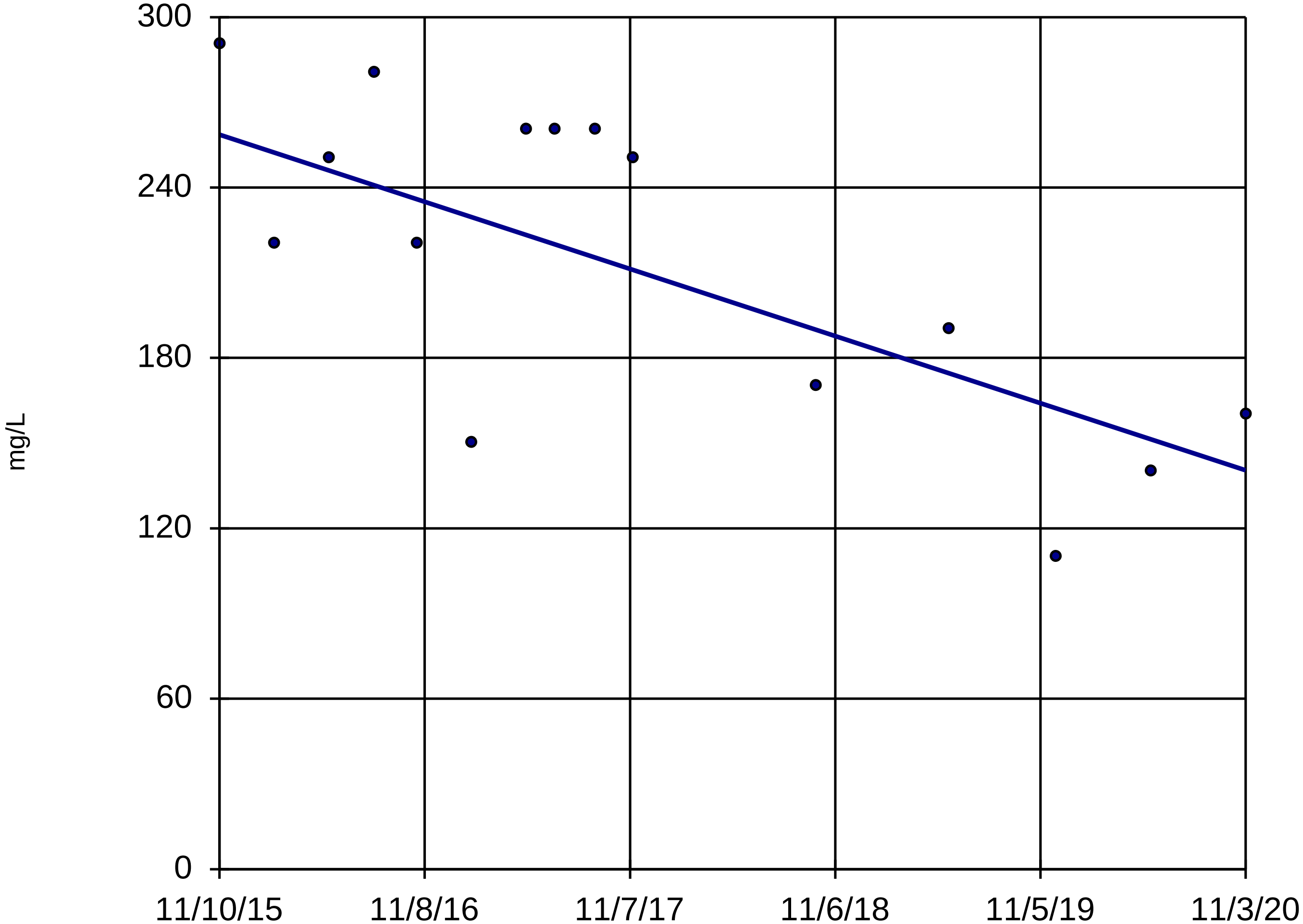
Constituent: Sulfate Analysis Run 4/2/2021 12:07 PM

Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_82019

# Sen's Slope Estimator

MW-12




n = 15

Slope = -23.7 units per year.

Mann-Kendall statistic = -50 critical = -53

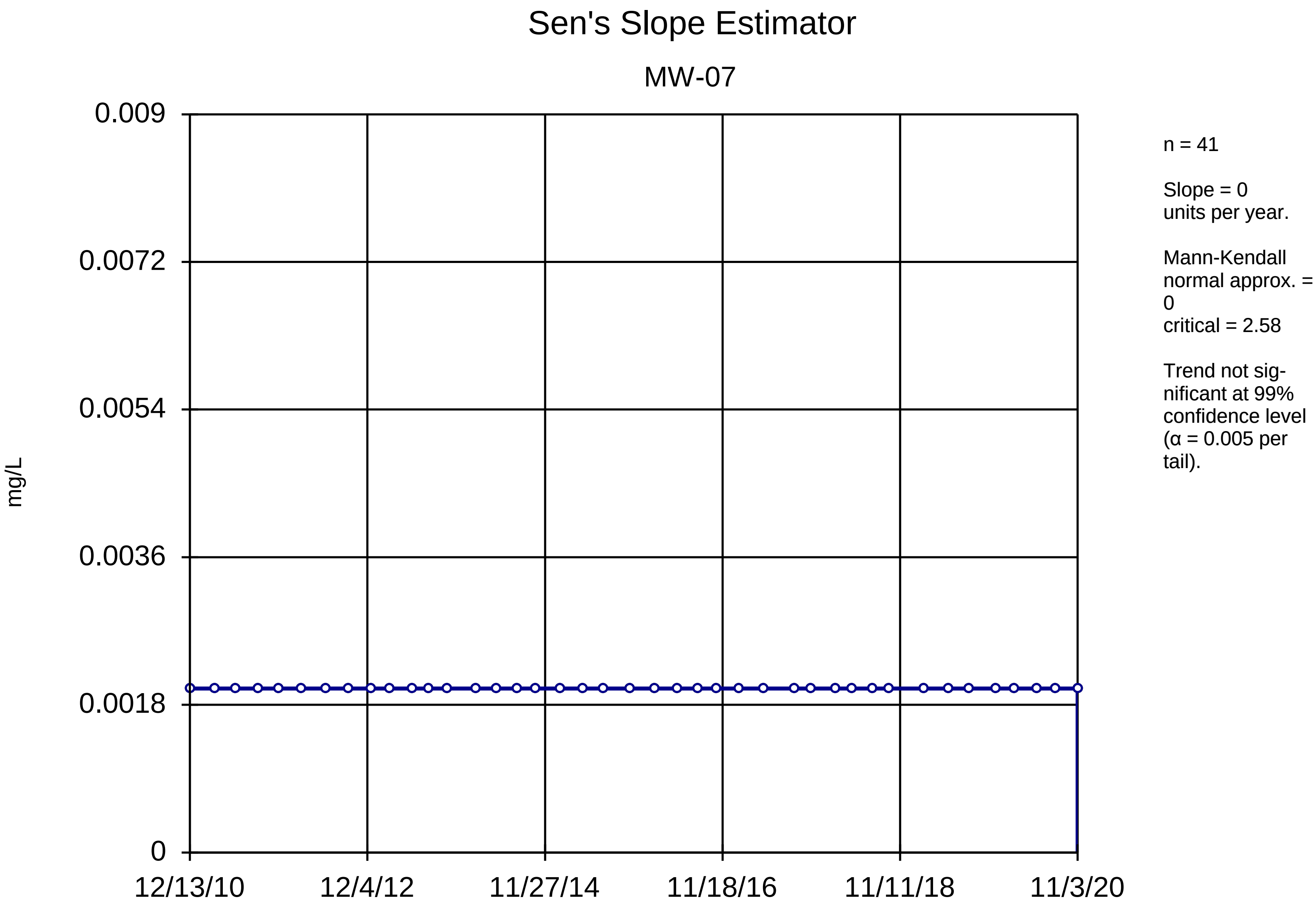
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82020

Hollow symbols indicate censored values.



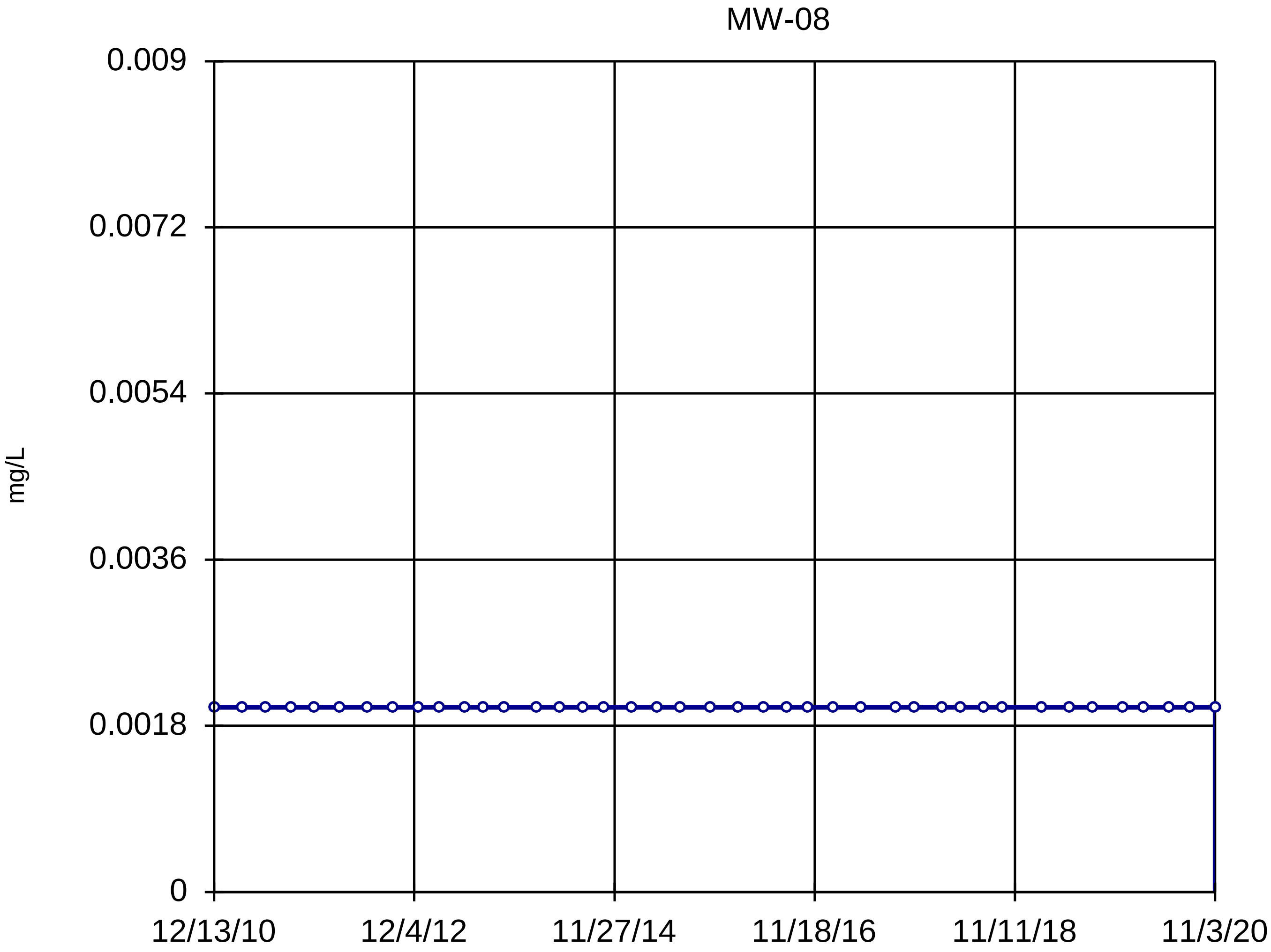

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82021

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 41

Slope = 0
units per year.

Mann-Kendall
normal approx. =
0
critical = 2.58

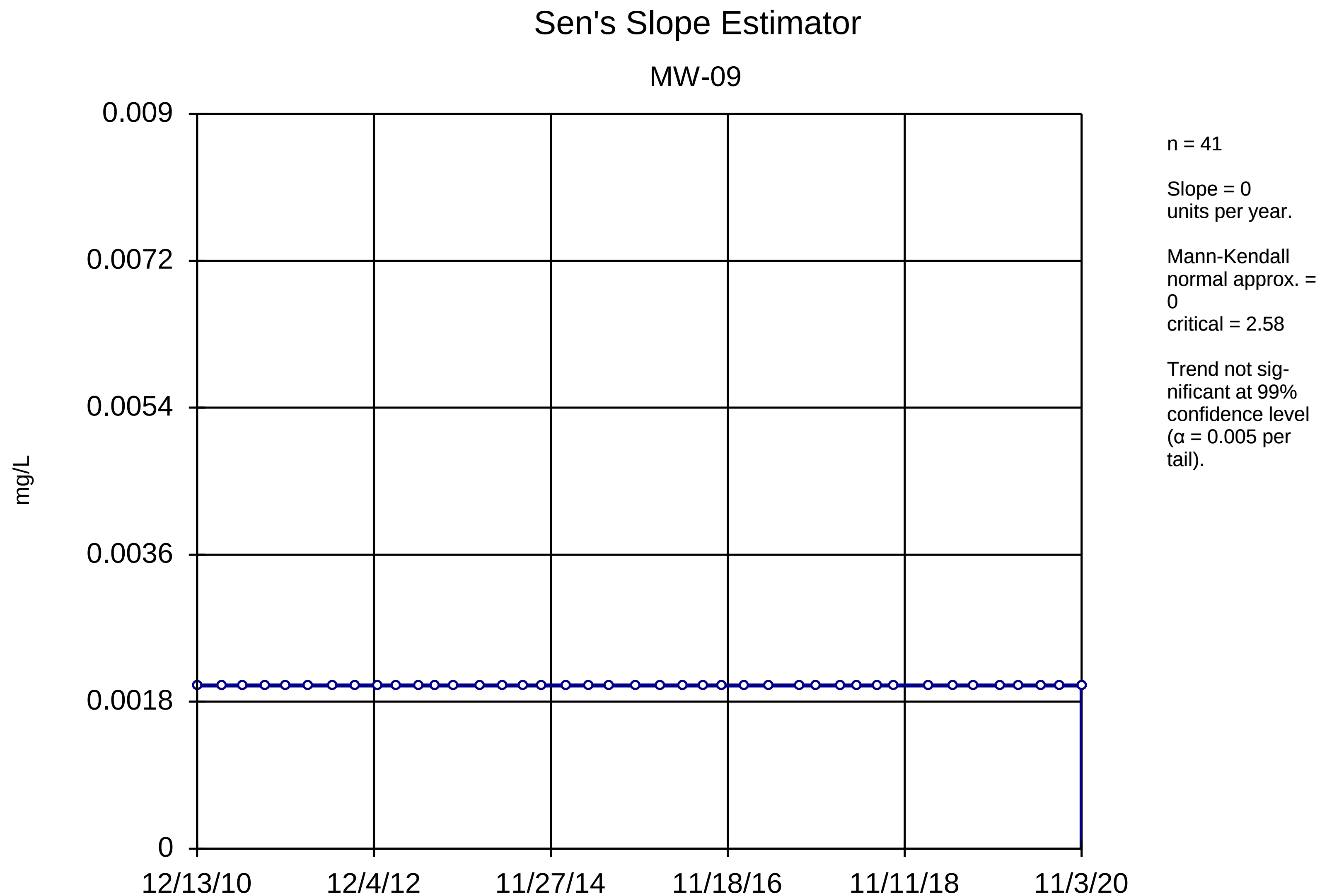
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82022

Hollow symbols indicate censored values.

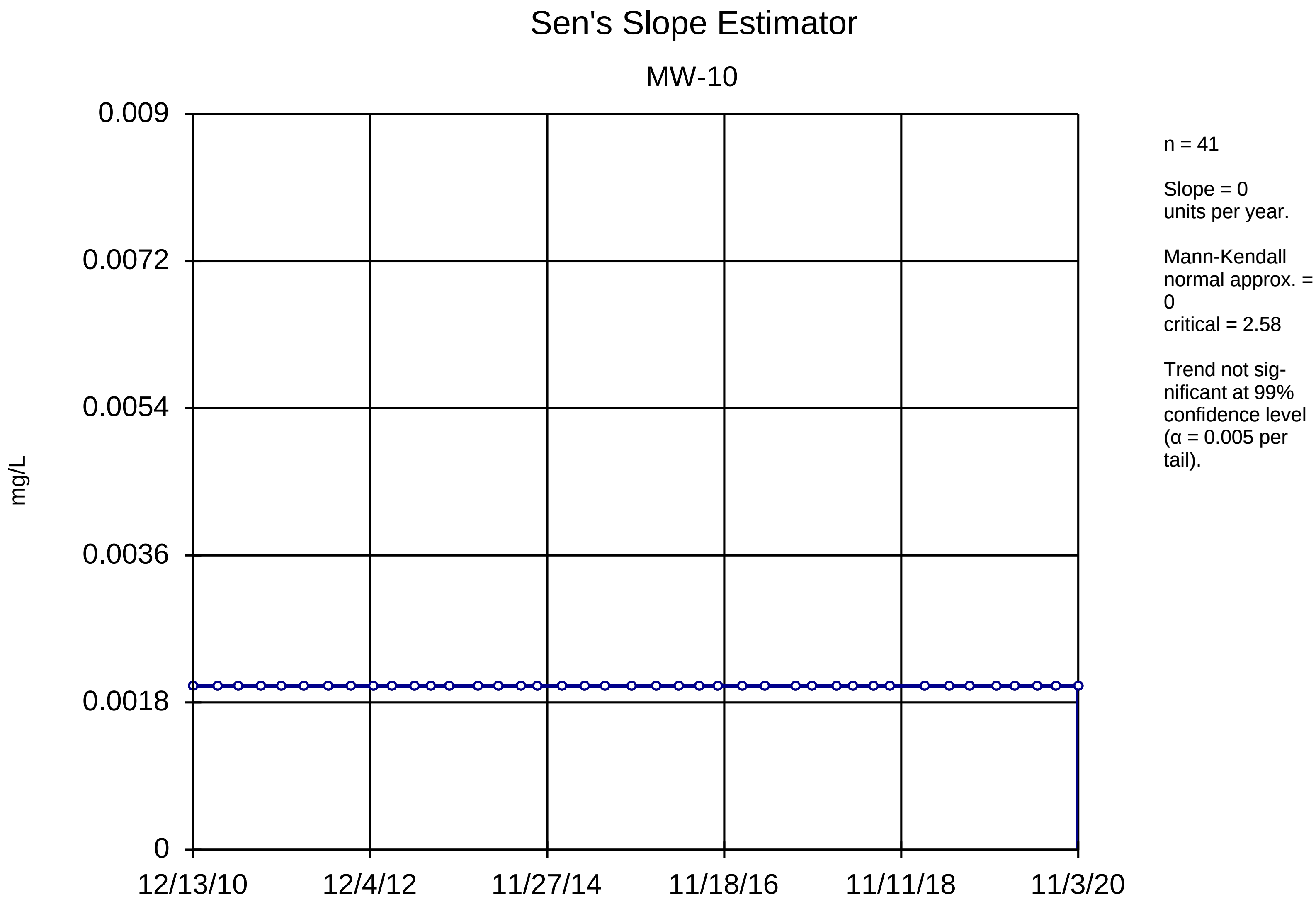



Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82023

Hollow symbols indicate censored values.




Constituent: Thallium, Dissolved    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82024

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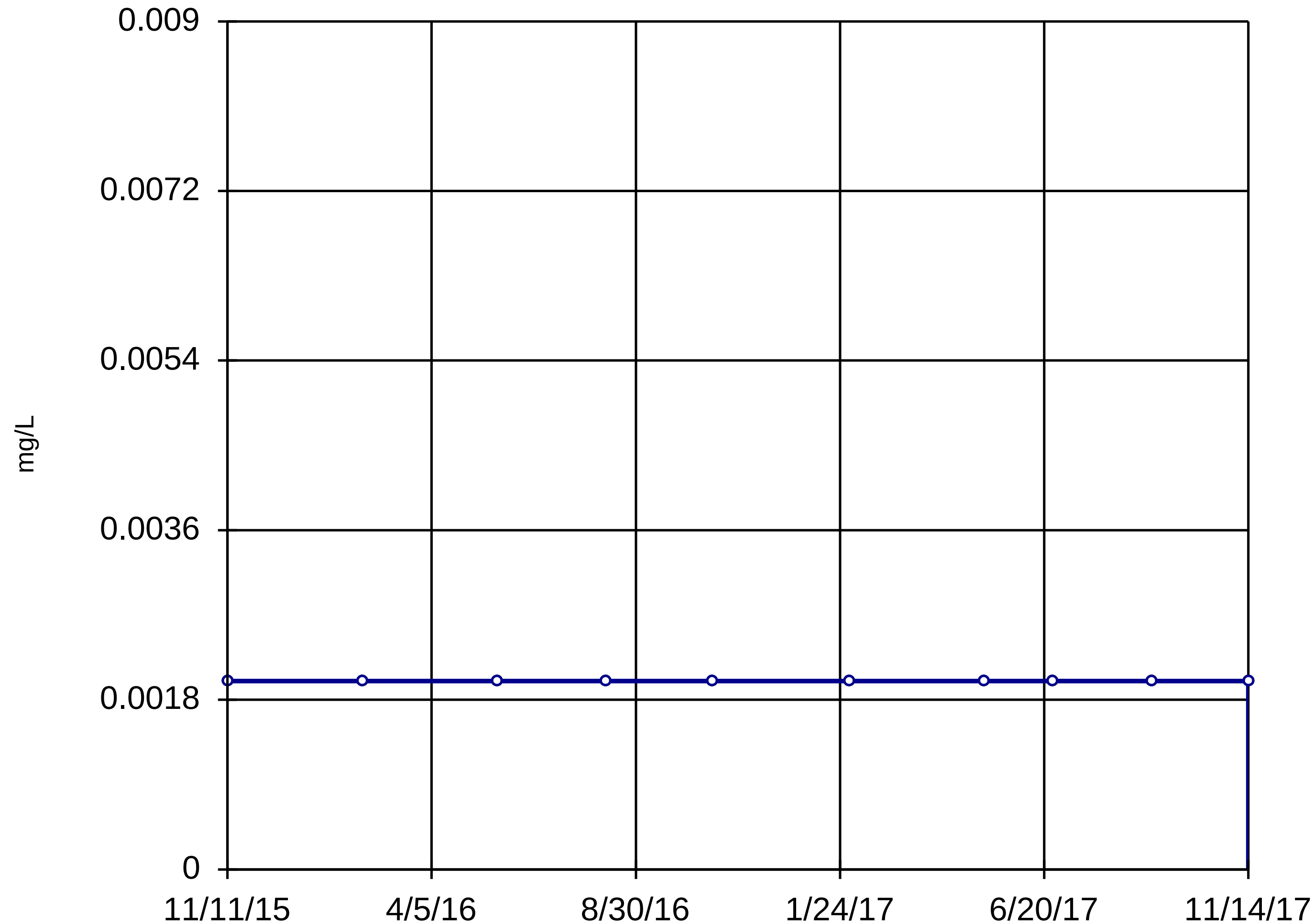
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-09




n = 10

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 30

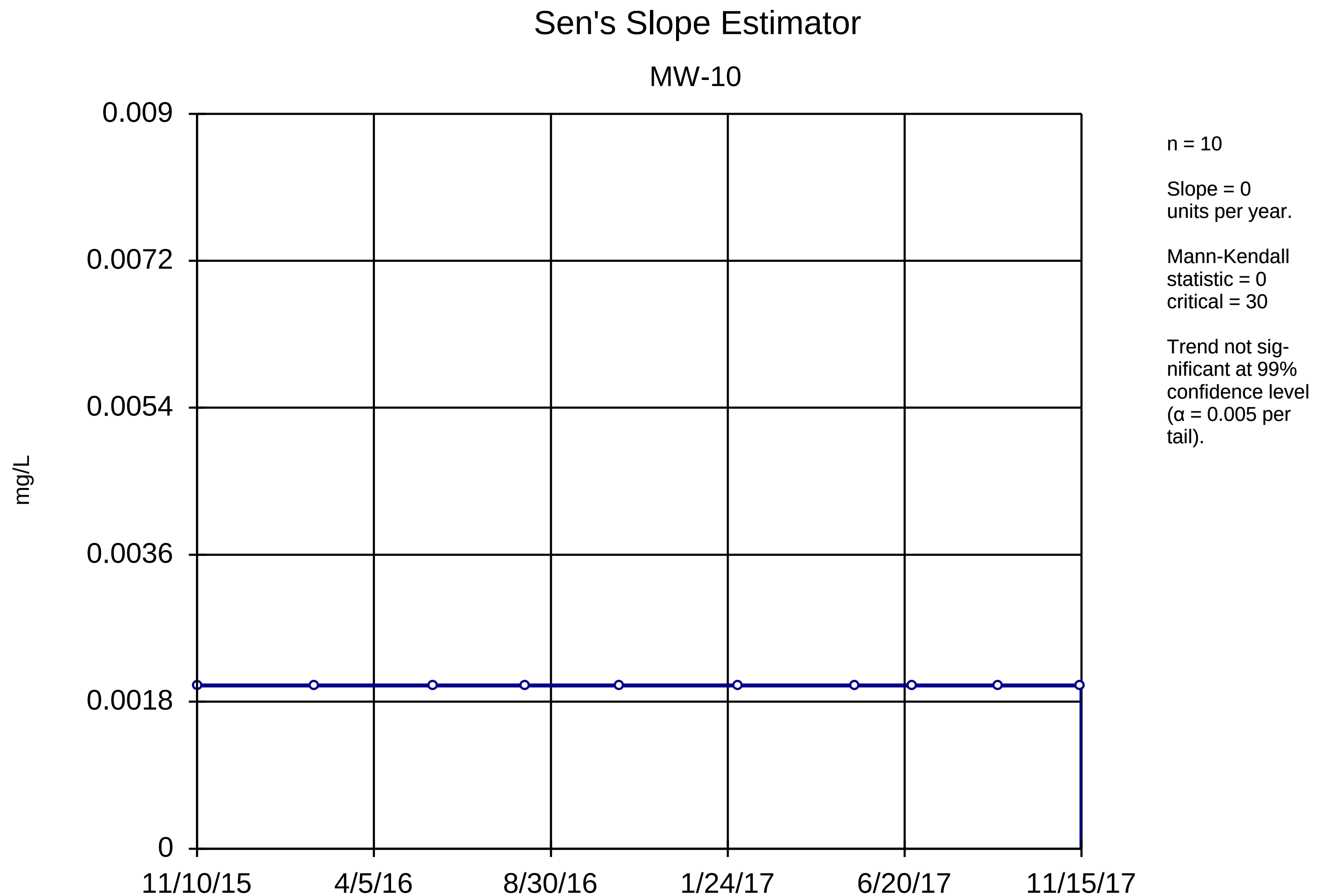
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Thallium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82025

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

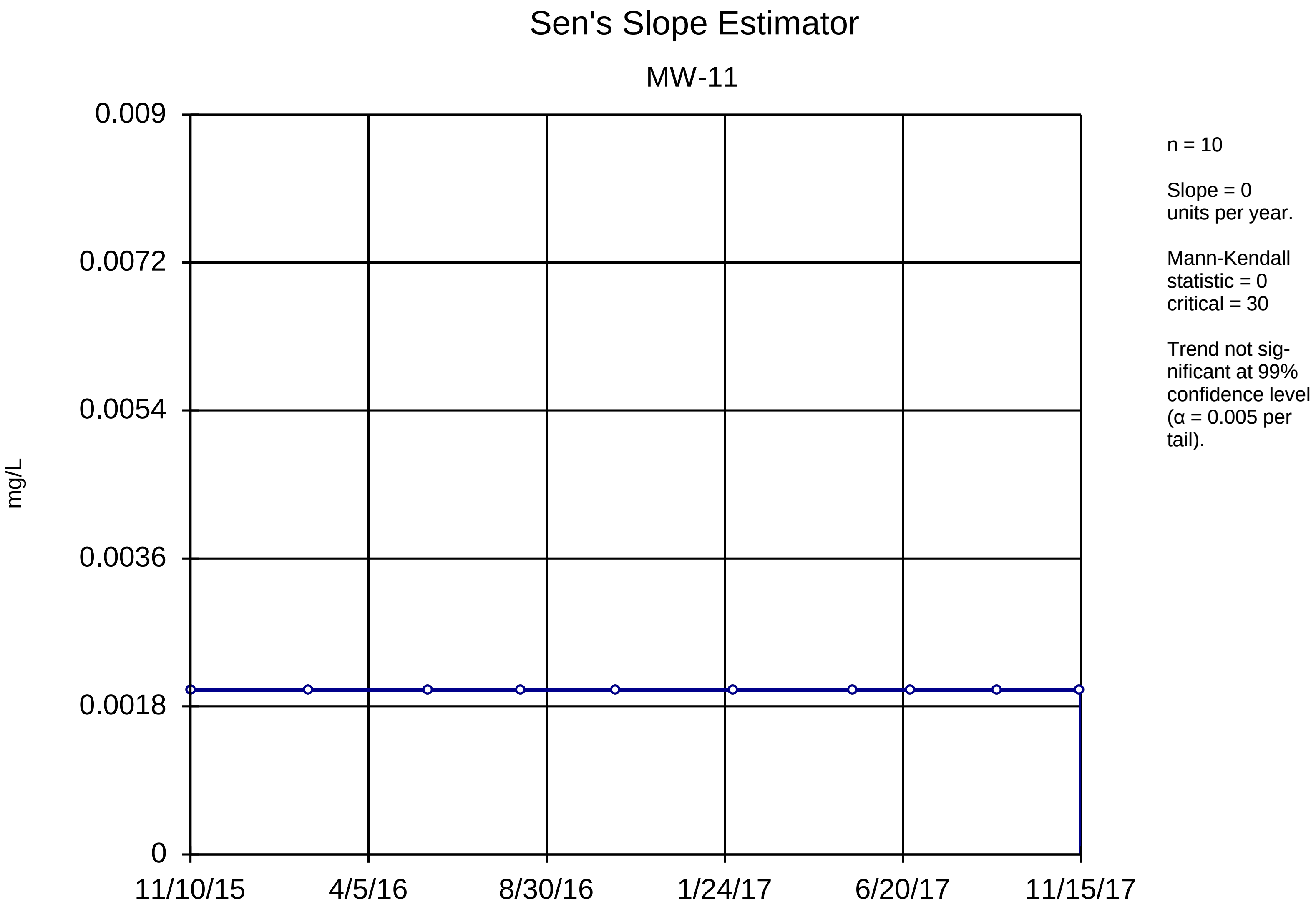



Constituent: Thallium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82026

Hollow symbols indicate censored values.

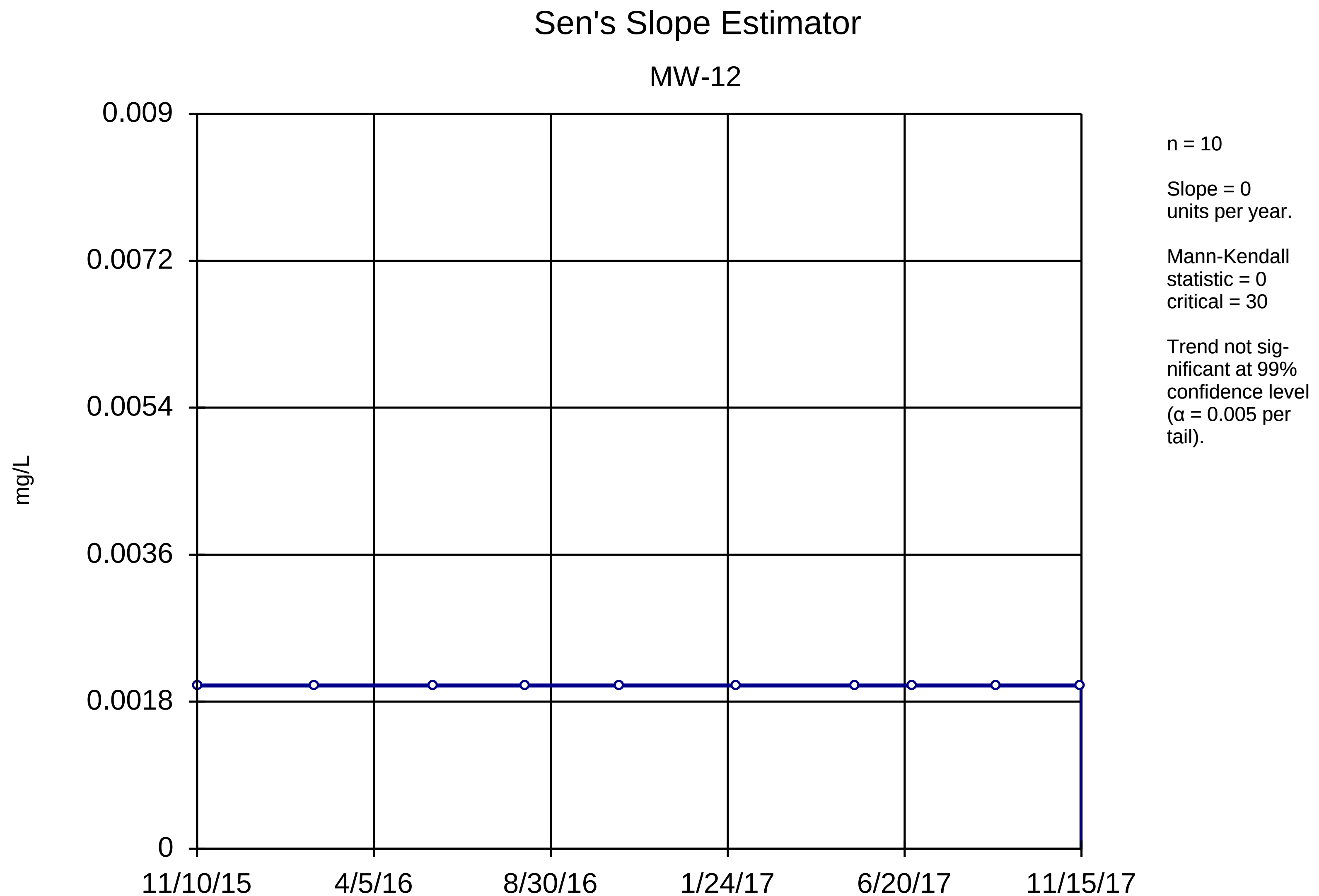



Constituent: Thallium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82027

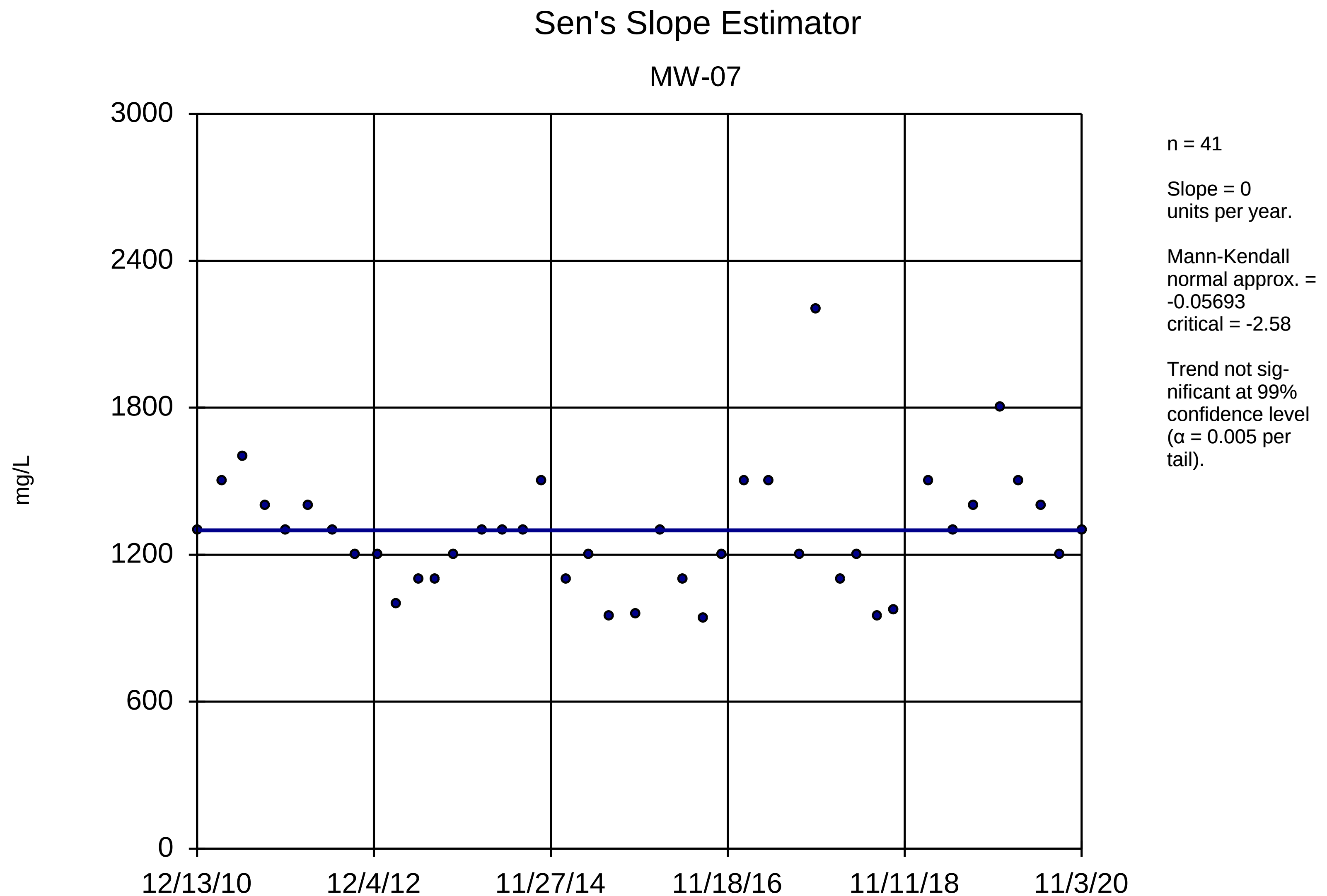
Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Thallium, Total    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82028



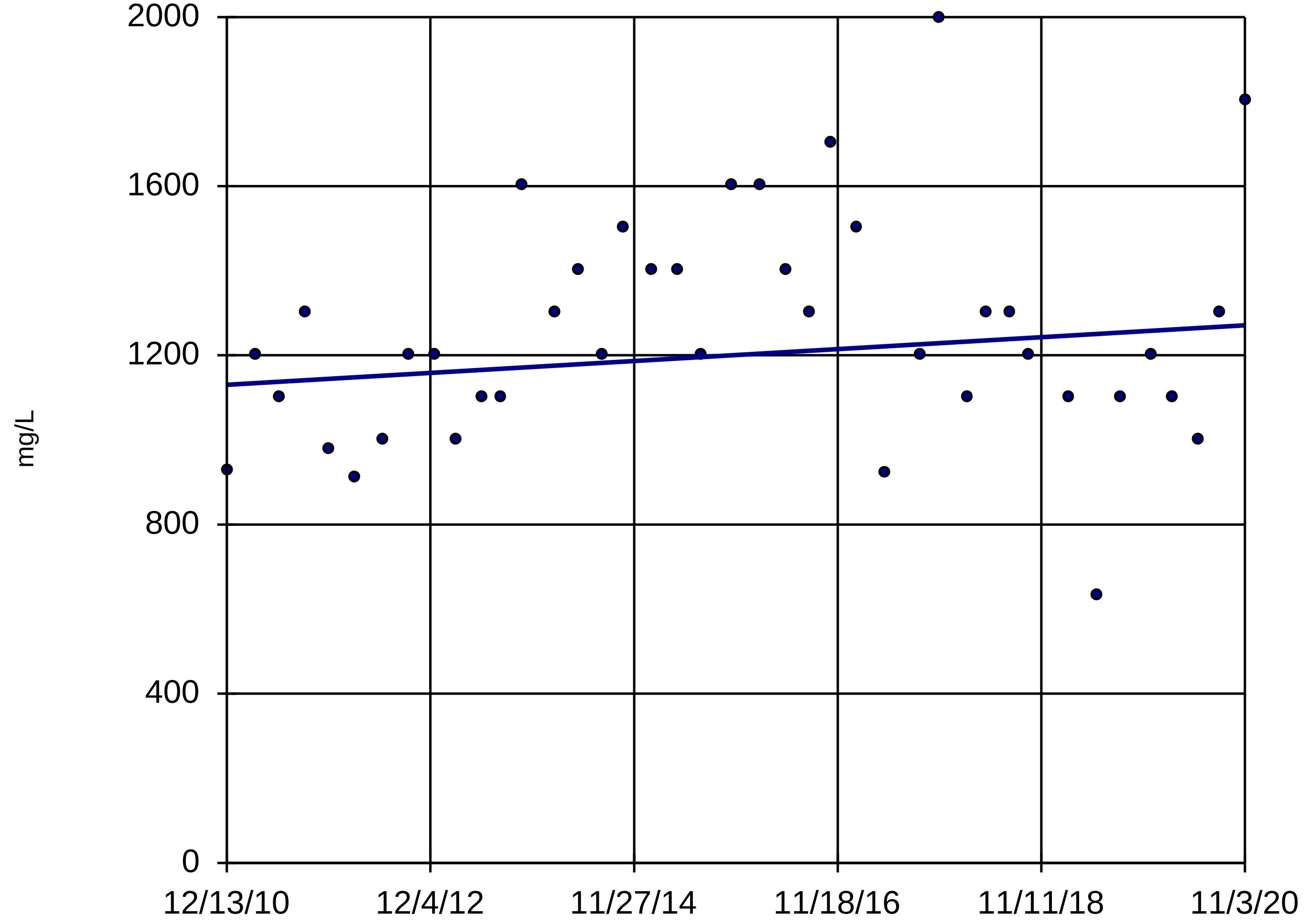

Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82029

## Sen's Slope Estimator

MW-08




n = 41

Slope = 14.23 units per year.

Mann-Kendall normal approx. = 1.157
critical = 2.58

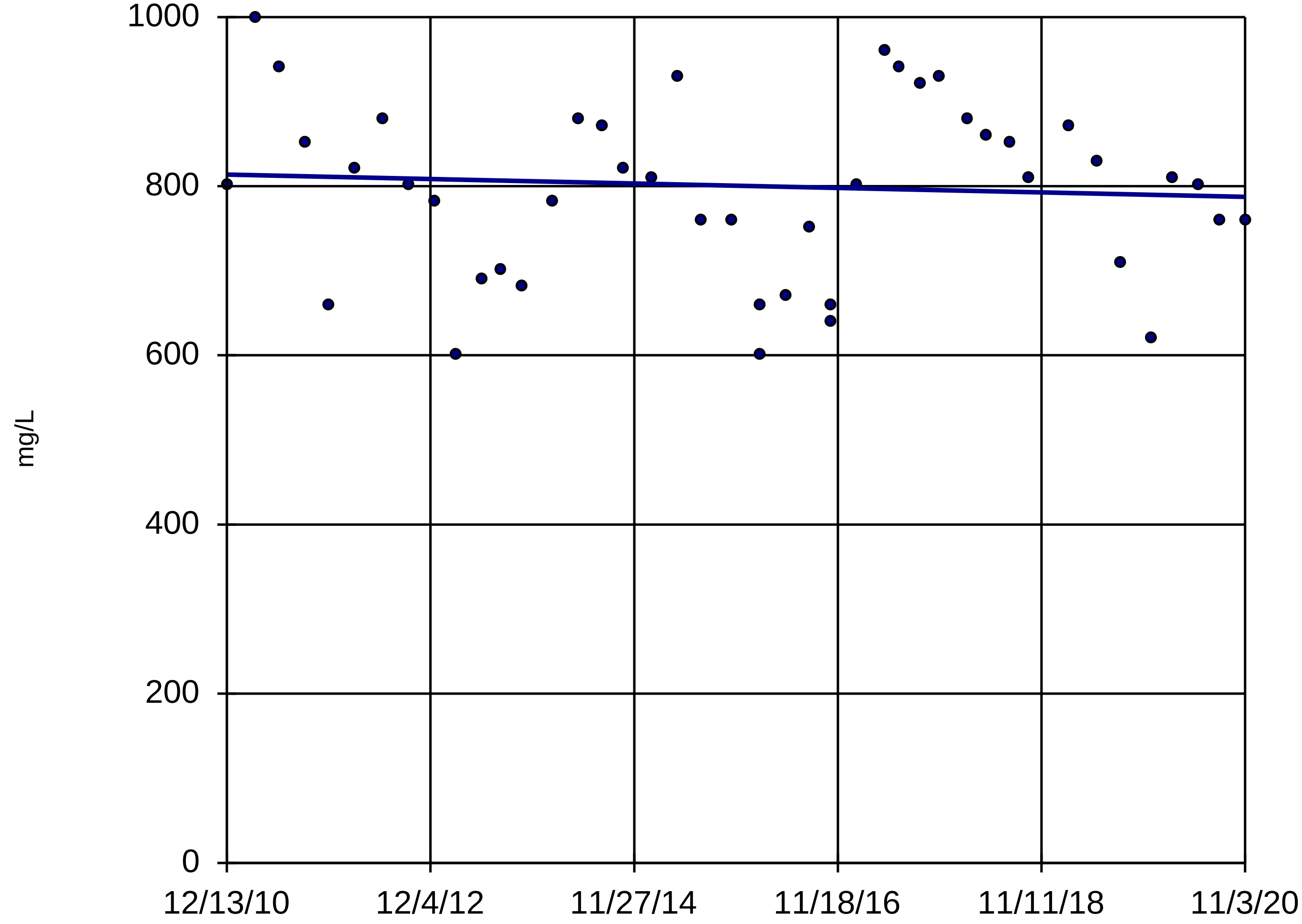
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

## Sen's Slope Estimator

MW-09




n = 44

Slope = -2.653 units per year.

Mann-Kendall normal approx. = -0.537 critical = -2.58

Trend not significant at 99% confidence level (α = 0.005 per tail).

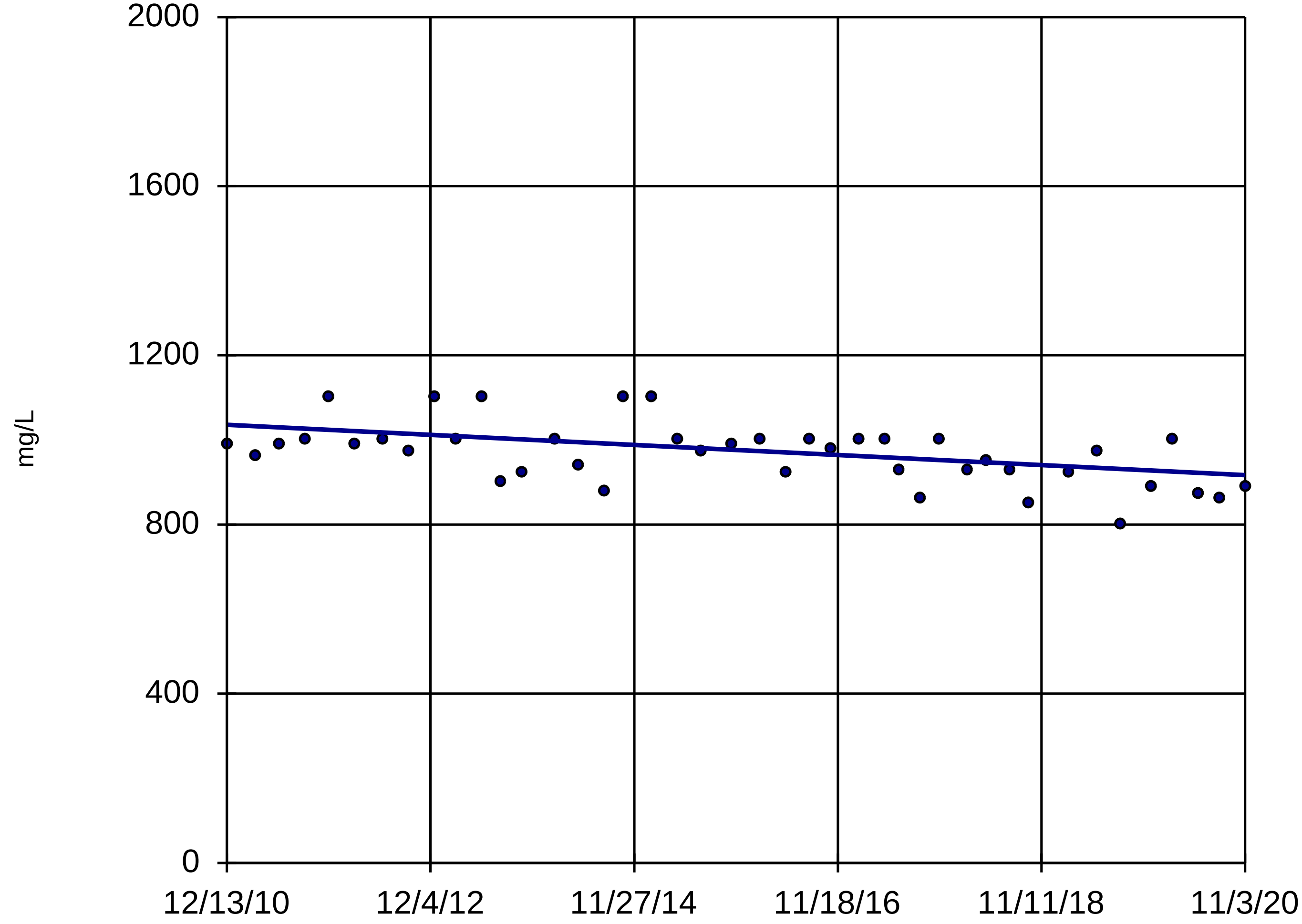
Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82031

# Sen's Slope Estimator

MW-10




n = 42

Slope = -12.03 units per year.

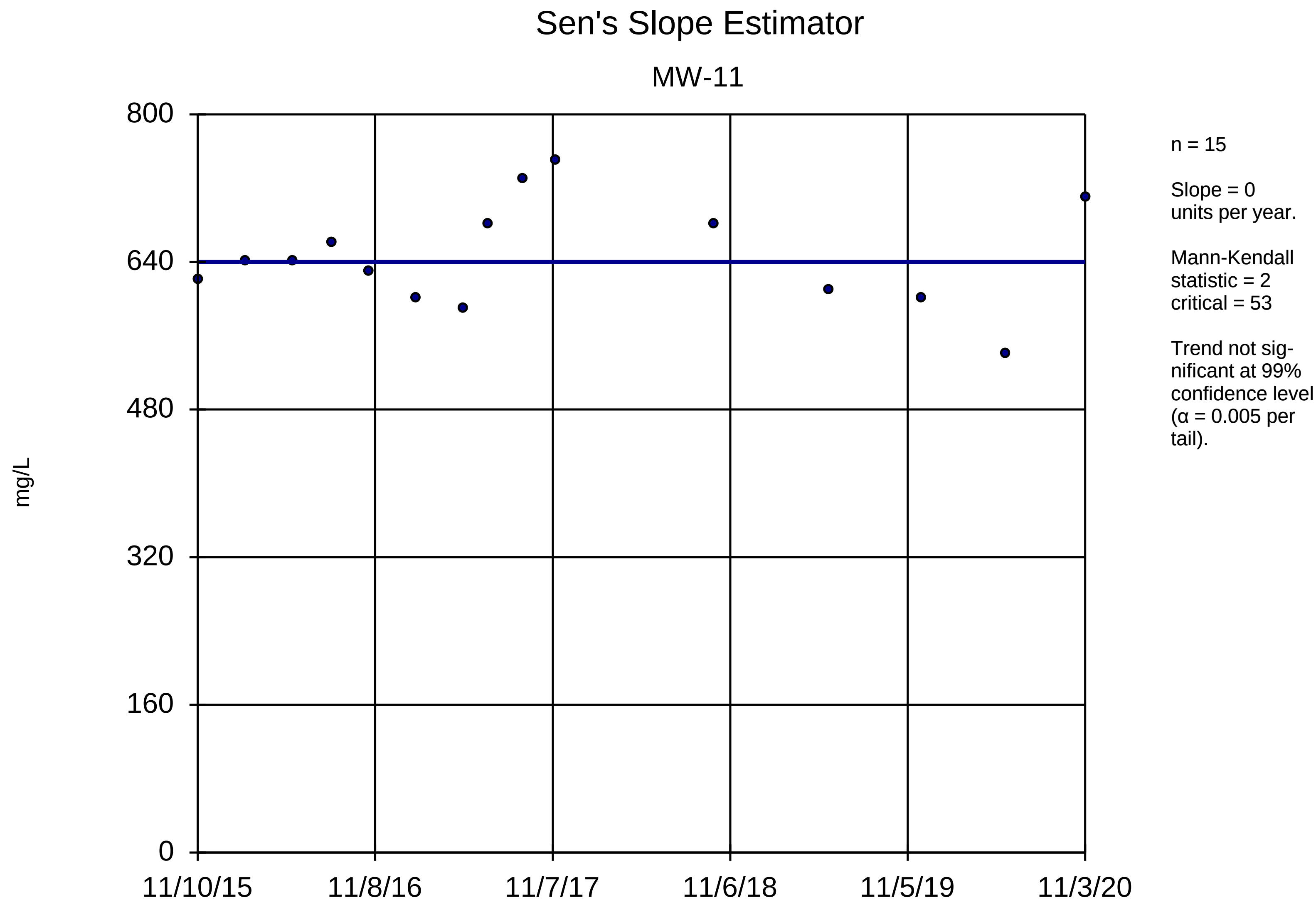
Mann-Kendall normal approx. = -3.225 critical = -2.58

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 4/2/2021 12:07 PM

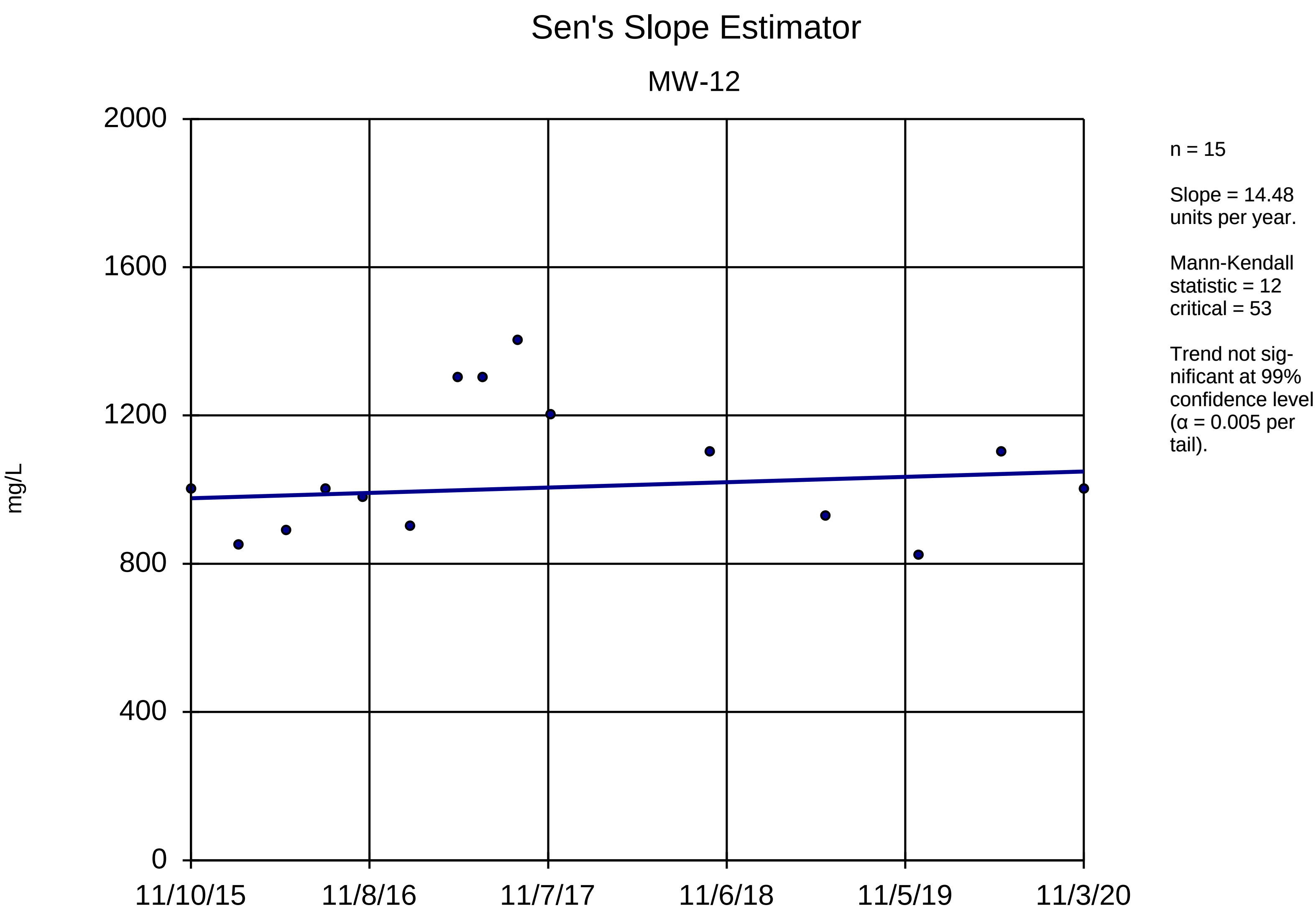
Utility Site WC Client: Weaver Consultants Group Data: Will County Sanitas Database

MWG13-15_82032




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database




Constituent: Total Dissolved Solids    Analysis Run 4/2/2021 12:07 PM

Utility Site WC    Client: Weaver Consultants Group    Data: Will County Sanitas Database

MWG13-15_82034

# Trend Test

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database Printed 4/14/2021, 1:06 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony, Dissolved (mg/L) | MW-01 | 0 | -35 | -111 | No | 25 | 92 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-02 | 0 | -24 | -111 | No | 25 | 96 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-03 | 0 | -24 | -111 | No | 25 | 96 | n/a | n/a | 0.01 | NP |
| Antimony, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Antimony, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-01 | 0.004007 | 31 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-02 | -0.00... | -56 | -111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-03 | 0.000... | 4 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Dissolved (mg/L) | MW-04 | 0.000... | 71 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| **Arsenic, Total (mg/L)** | **MW-01** | **-0.01647** | **-94** | **-92** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Arsenic, Total (mg/L)** | **MW-02** | **-0.00...** | **-97** | **-92** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Arsenic, Total (mg/L) | MW-03 | -0.00... | -21 | -92 | No | 22 | 0 | n/a | n/a | 0.01 | NP |
| Arsenic, Total (mg/L) | MW-04 | -0.00... | -38 | -92 | No | 22 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-01 | -0.00... | -84 | -111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-02 | 0.000... | 22 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-03 | 0.000... | 50 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Dissolved (mg/L) | MW-04 | 0.000... | 9 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| **Barium, Total (mg/L)** | **MW-01** | **0.004937** | **100** | **92** | **Yes** | **22** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Barium, Total (mg/L) | MW-02 | 0.002744 | 64 | 92 | No | 22 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-03 | 0.00474 | 84 | 92 | No | 22 | 0 | n/a | n/a | 0.01 | NP |
| Barium, Total (mg/L) | MW-04 | -0.00... | -42 | -92 | No | 22 | 0 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Beryllium, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| **Boron, Dissolved (mg/L)** | **MW-01** | **-0.1131** | **-117** | **-111** | **Yes** | **25** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Boron, Dissolved (mg/L)** | **MW-02** | **0.2228** | **167** | **111** | **Yes** | **25** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Boron, Dissolved (mg/L) | MW-03 | 0.06854 | 50 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Dissolved (mg/L) | MW-04 | 0 | 1 | 111 | No | 25 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-01 | 0.09787 | 33 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-02 | -0.03136 | -6 | -58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-03 | 0.3447 | 48 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Boron, Total (mg/L) | MW-04 | 0.1715 | 39 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cadmium, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |

# Trend Test



Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database    Printed 4/14/2021, 1:06 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium, Total (mg/L) | MW-03 | 11.85 | 42 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Calcium, Total (mg/L) | MW-04 | 0 | 3 | 58 | No | 16 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-01 | 0.1215 | 0.1687 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-02 | 0 | 0.1353 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-03 | -2.053 | -1.225 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chloride (mg/L) | MW-04 | -1.93 | -2.26 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Chromium, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Cobalt, Total (mg/L) | MW-04 | 0 | 4 | 92 | No | 22 | 86.36 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-01** | **-0.03192** | **-5.049** | **-2.58** | **Yes** | **41** | **2.439** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-02 | 0 | 0.08998 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Fluoride (mg/L)** | **MW-03** | **-0.03942** | **-2.99** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Fluoride (mg/L) | MW-04 | -0.01311 | -0.8769 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-03 | 0 | 8 | 111 | No | 25 | 96 | n/a | n/a | 0.01 | NP |
| Lead, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-01 | 0 | 1 | 92 | No | 22 | 95.45 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Lead, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-02 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-03 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Lithium, Total (mg/L) | MW-04 | 0 | 0 | 34 | No | 11 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Mercury, Total (mg/L) | MW-04 | 0 | -3 | -92 | No | 22 | 95.45 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-01 | -0.00... | -15 | -34 | No | 11 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-02 | -0.00... | -21 | -34 | No | 11 | 0 | n/a | n/a | 0.01 | NP |
| Molybdenum, Total (mg/L) | MW-03 | 0.003691 | 11 | 34 | No | 11 | 0 | n/a | n/a | 0.01 | NP |

# Trend Test



Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database Printed 4/14/2021, 1:06 PM

| Constituent | Well | Slope | Calc. | Critical | Sig. | N | %NDs | Normality | Xform | Alpha | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH, Field (Standard Units) | MW-02 | -0.06572 | -1.696 | -2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **pH, Field (Standard Units)** | **MW-03** | **-0.1512** | **-3.168** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **pH, Field (Standard Units)** | **MW-04** | **-0.07213** | **-3.091** | **-2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| Radium-226 (pCi/L) | MW-01 | 0 | 7 | 58 | No | 16 | 62.5 | n/a | n/a | 0.01 | NP |
| Radium-226 (pCi/L) | MW-02 | 0 | 3 | 58 | No | 16 | 62.5 | n/a | n/a | 0.01 | NP |
| Radium-226 (pCi/L) | MW-03 | 0 | 9 | 58 | No | 16 | 62.5 | n/a | n/a | 0.01 | NP |
| Radium-228 (pCi/L) | MW-01 | 0 | -9 | -58 | No | 16 | 93.75 | n/a | n/a | 0.01 | NP |
| Radium-228 (pCi/L) | MW-02 | 0 | -16 | -58 | No | 16 | 75 | n/a | n/a | 0.01 | NP |
| Radium-228 (pCi/L) | MW-03 | 0 | -4 | -58 | No | 16 | 75 | n/a | n/a | 0.01 | NP |
| Radium-228 (pCi/L) | MW-04 | -0.00... | -32 | -58 | No | 16 | 50 | n/a | n/a | 0.01 | NP |
| Selenium, Dissolved (mg/L) | MW-01 | -0.00... | -84 | -111 | No | 25 | 16 | n/a | n/a | 0.01 | NP |
| **Selenium, Dissolved (mg/L)** | **MW-02** | **-0.00...** | **-112** | **-111** | **Yes** | **25** | **44** | **n/a** | **n/a** | **0.01** | **NP** |
| **Selenium, Dissolved (mg/L)** | **MW-03** | **-0.00...** | **-122** | **-111** | **Yes** | **25** | **28** | **n/a** | **n/a** | **0.01** | **NP** |
| Selenium, Dissolved (mg/L) | MW-04 | -0.00027 | -86 | -111 | No | 25 | 52 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-01 | -1.4e-11 | -43 | -92 | No | 22 | 50 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-02 | 0 | 1 | 92 | No | 22 | 54.55 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-03 | 0.000... | 67 | 92 | No | 22 | 36.36 | n/a | n/a | 0.01 | NP |
| Selenium, Total (mg/L) | MW-04 | 0 | -3 | -92 | No | 22 | 22.73 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-01 | 6.09 | 1.5 | 2.58 | No | 41 | 7.317 | n/a | n/a | 0.01 | NP |
| Sulfate (mg/L) | MW-02 | 9.876 | 2.346 | 2.58 | No | 41 | 7.317 | n/a | n/a | 0.01 | NP |
| **Sulfate (mg/L)** | **MW-03** | **16.66** | **4.033** | **2.58** | **Yes** | **41** | **7.317** | **n/a** | **n/a** | **0.01** | **NP** |
| Sulfate (mg/L) | MW-04 | 12.94 | 2.206 | 2.58 | No | 41 | 7.317 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-01 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-02 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-03 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Dissolved (mg/L) | MW-04 | 0 | 0 | 111 | No | 25 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-01 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-02 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-03 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Thallium, Total (mg/L) | MW-04 | 0 | 0 | 92 | No | 22 | 100 | n/a | n/a | 0.01 | NP |
| Total Dissolved Solids (mg/L) | MW-01 | 5.458 | 1.138 | 2.58 | No | 41 | 0 | n/a | n/a | 0.01 | NP |
| **Total Dissolved Solids (mg/L)** | **MW-02** | **15.76** | **2.778** | **2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Total Dissolved Solids (mg/L)** | **MW-03** | **34.41** | **4.97** | **2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |
| **Total Dissolved Solids (mg/L)** | **MW-04** | **32.68** | **3.417** | **2.58** | **Yes** | **41** | **0** | **n/a** | **n/a** | **0.01** | **NP** |

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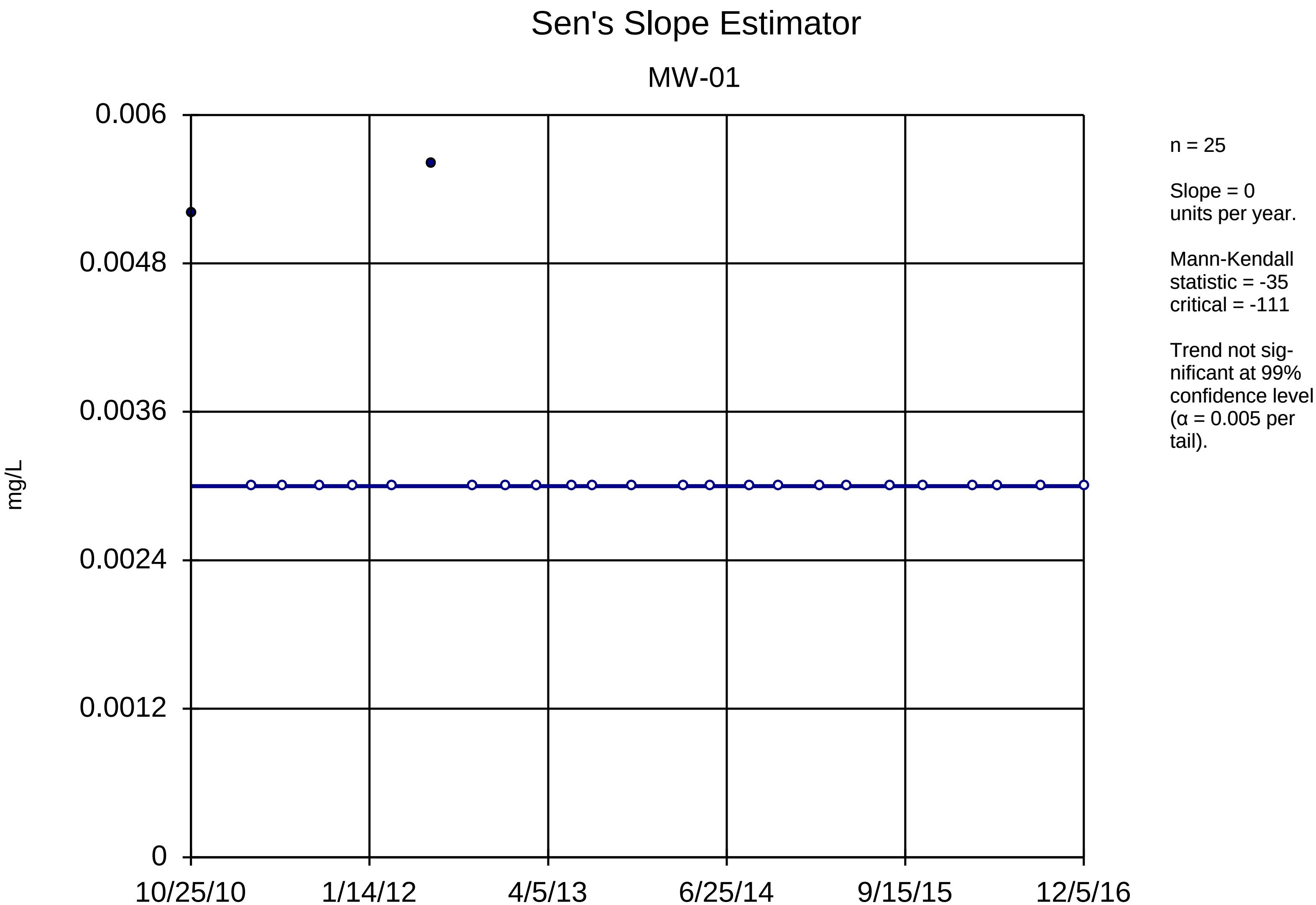
Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/14/2021 1:00 PM

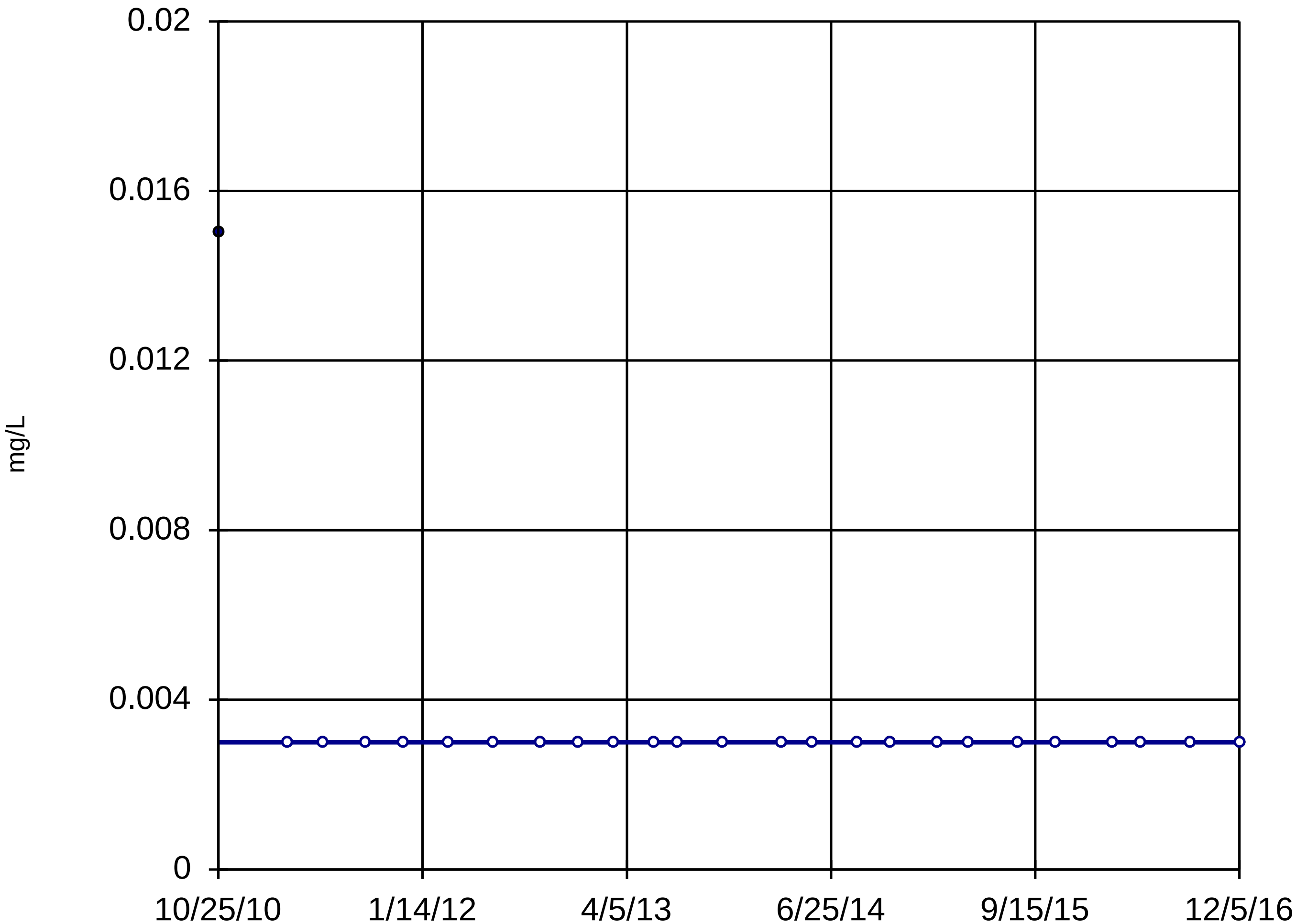
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82038

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-02




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = -24
critical = -111

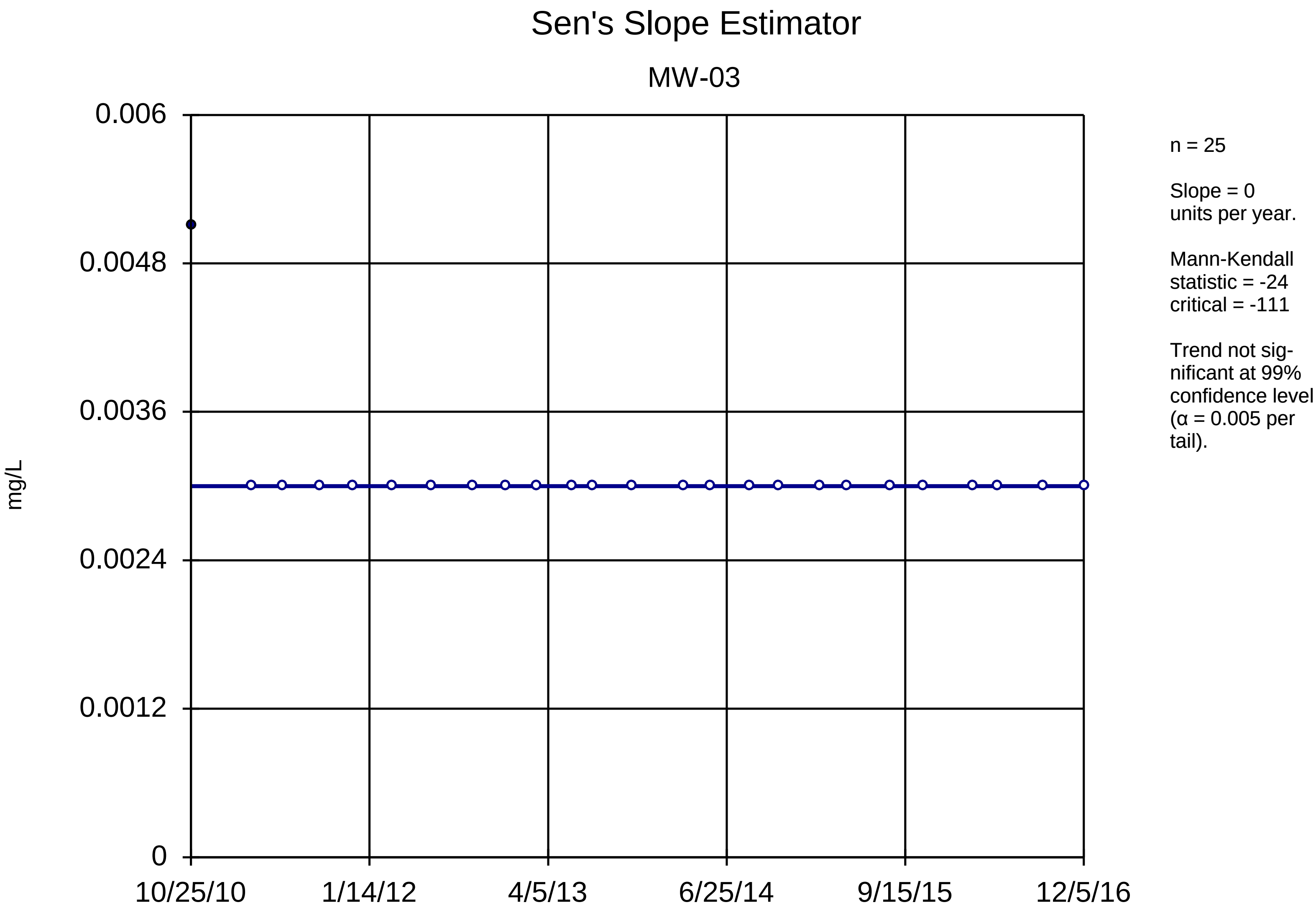
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Dissolved    Analysis Run 4/14/2021 1:00 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82039

Hollow symbols indicate censored values.




Constituent: Antimony, Dissolved    Analysis Run 4/14/2021 1:00 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82040

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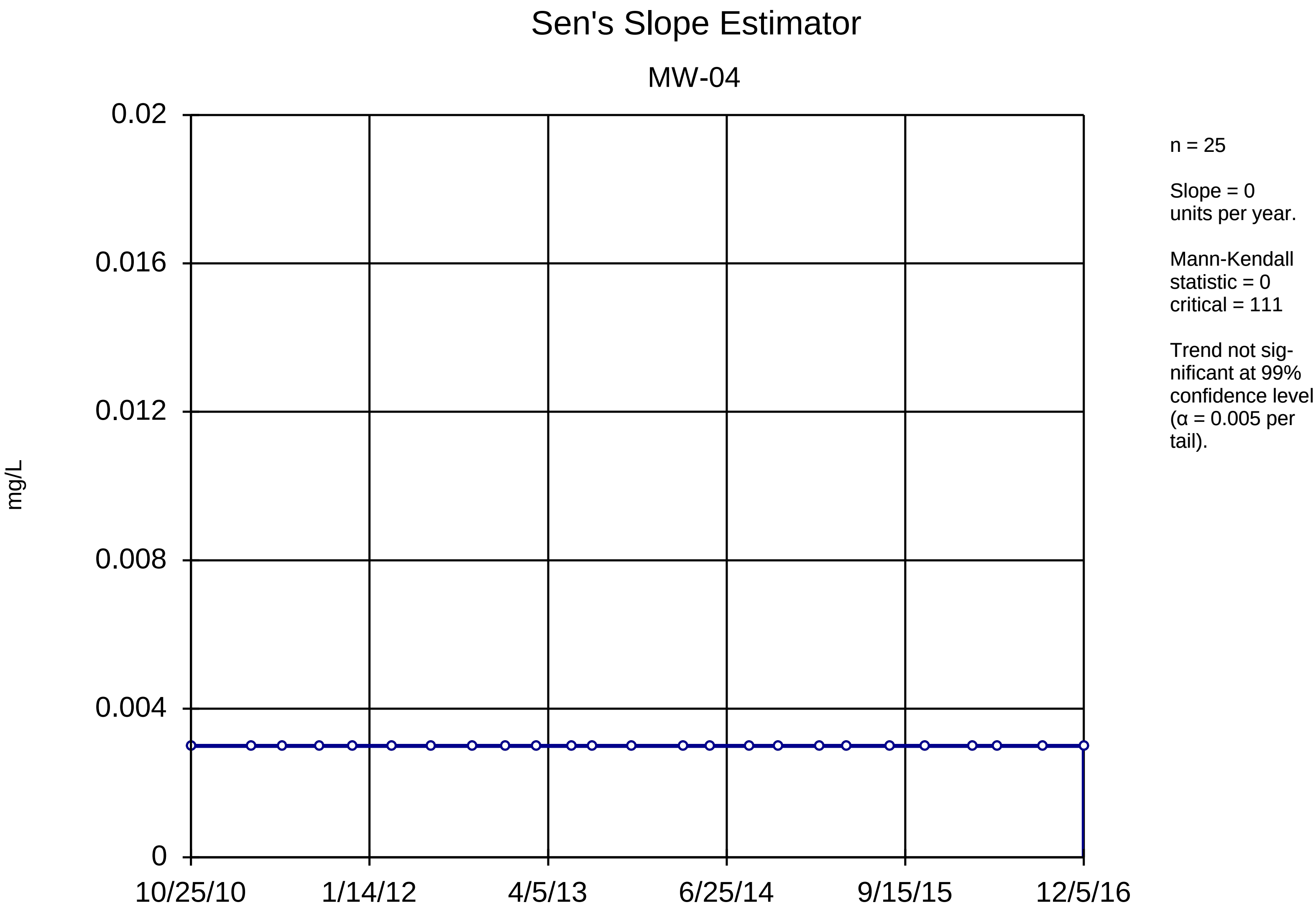


Constituent: Antimony, Dissolved Analysis Run 4/14/2021 1:00 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82041

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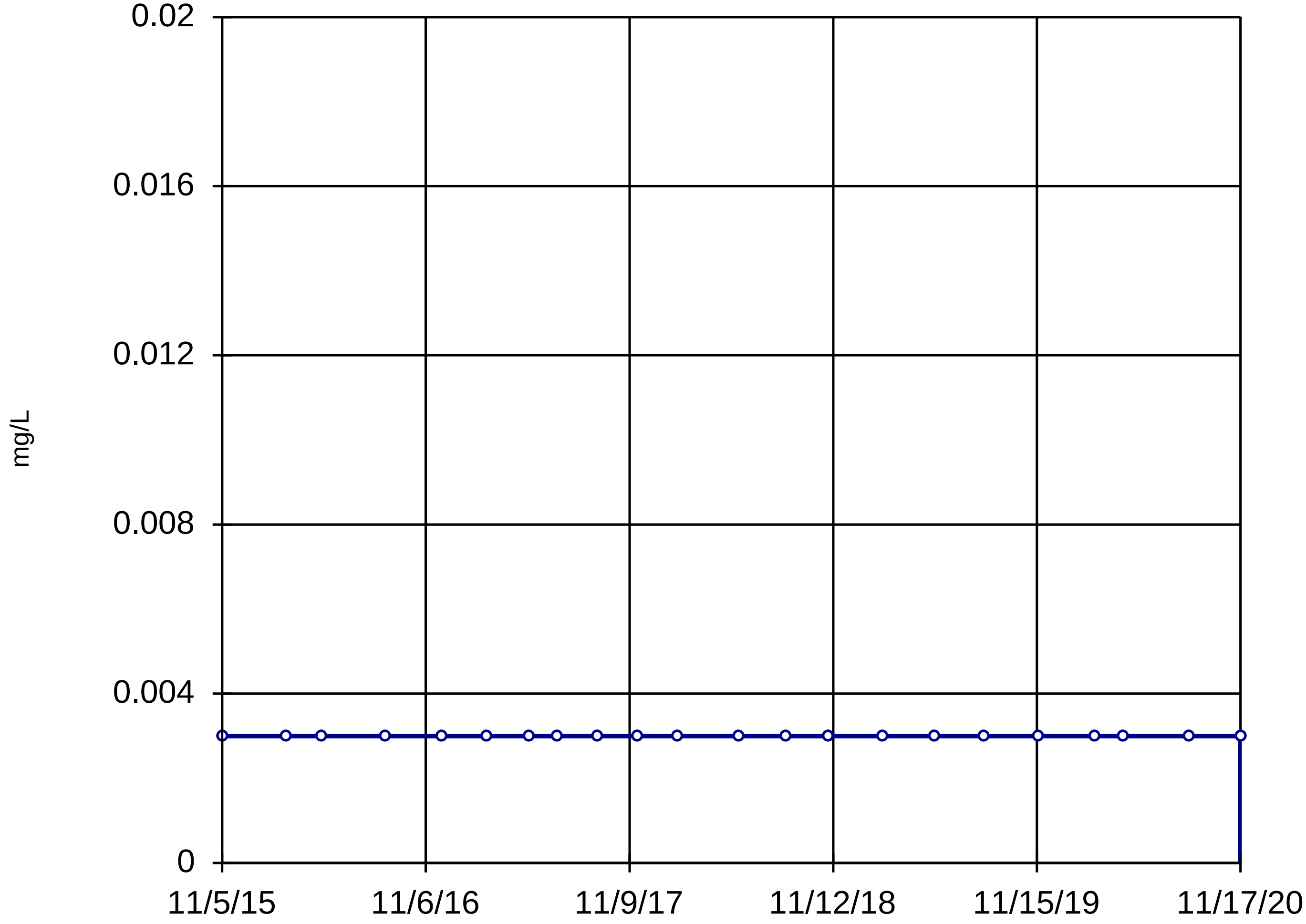
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-01




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Antimony, Total Analysis Run 4/14/2021 1:00 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82042

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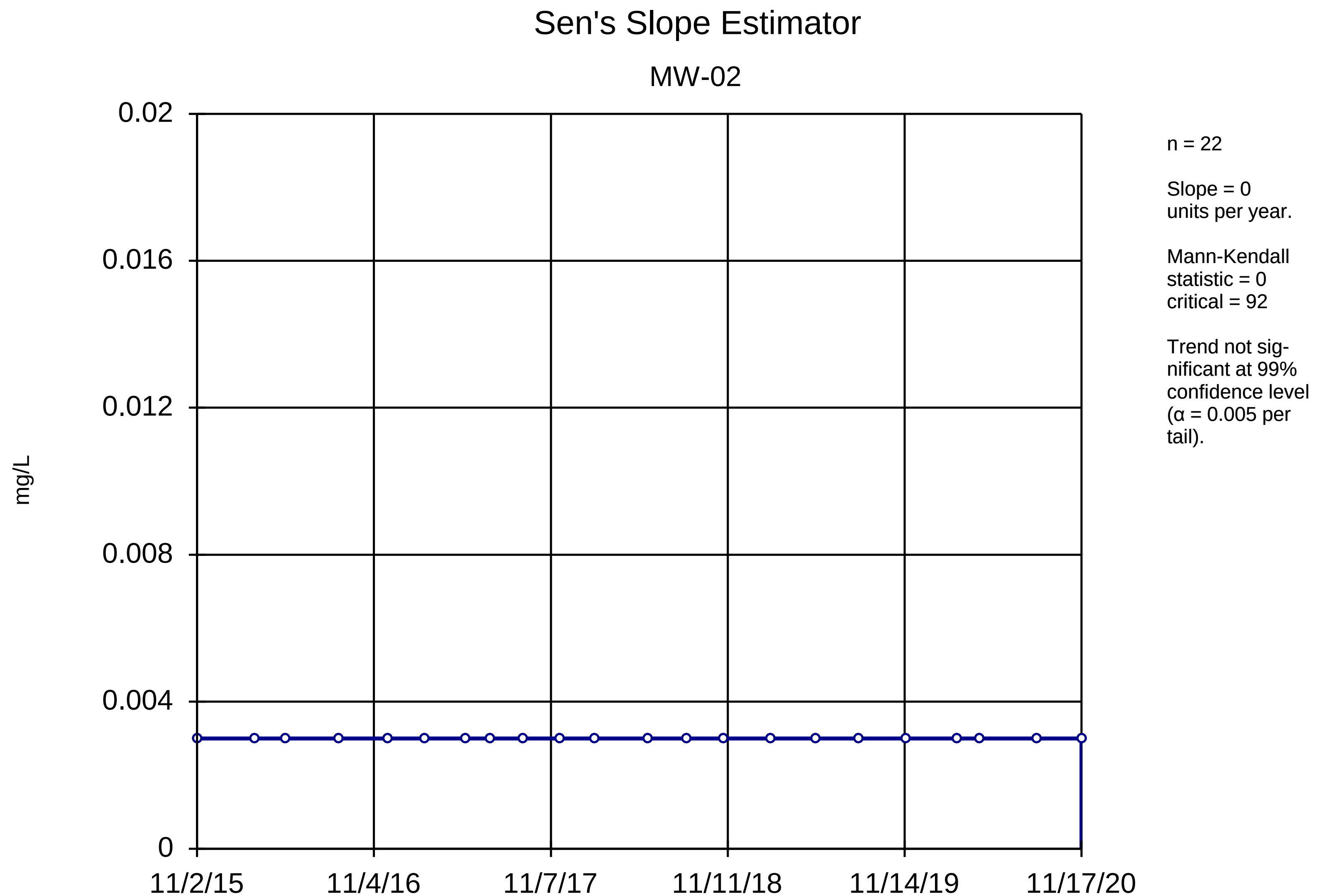
Hollow symbols indicate censored values.

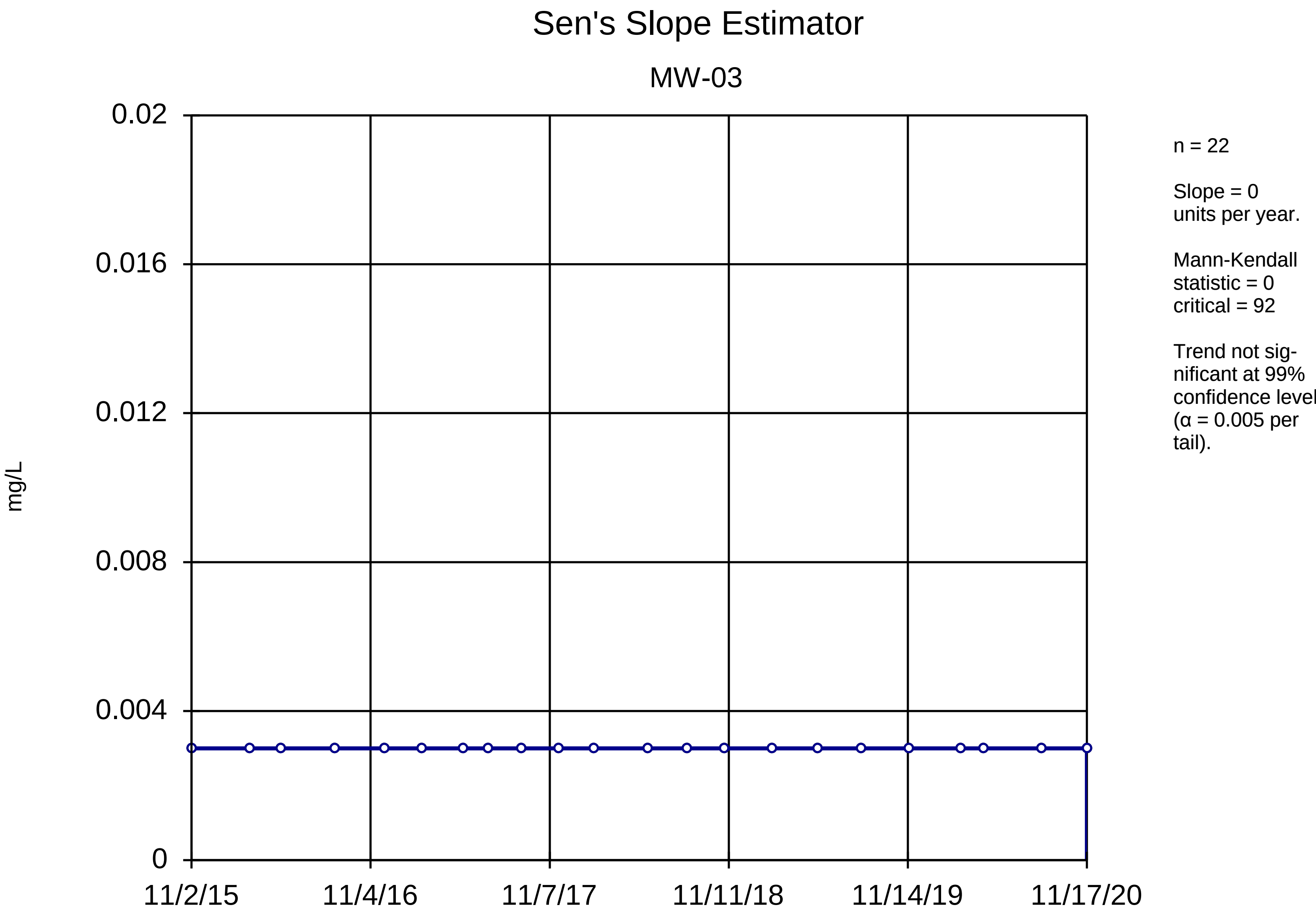



Constituent: Antimony, Total    Analysis Run 4/14/2021 1:00 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82043

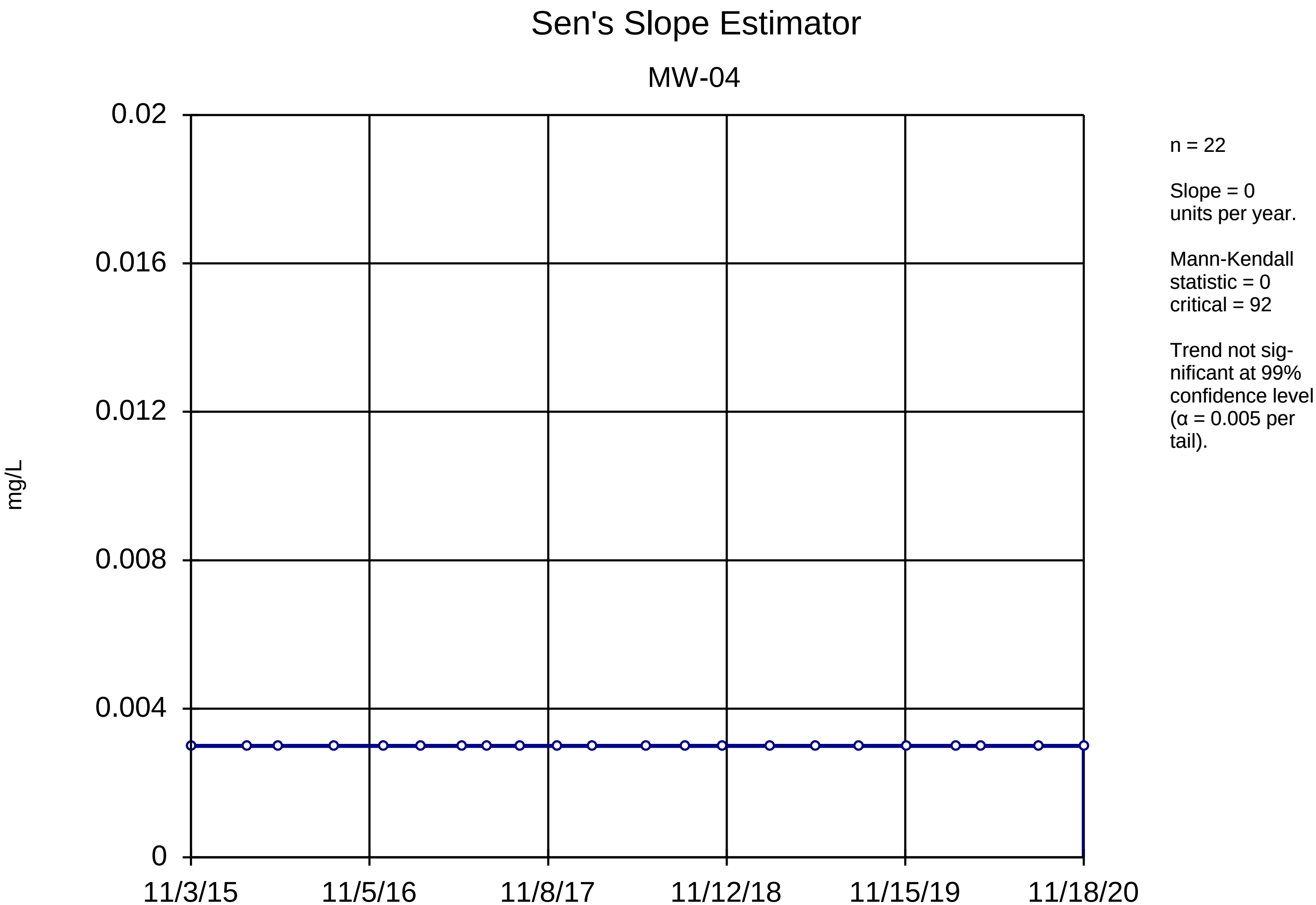
Hollow symbols indicate censored values.




Constituent: Antimony, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

Hollow symbols indicate censored values.

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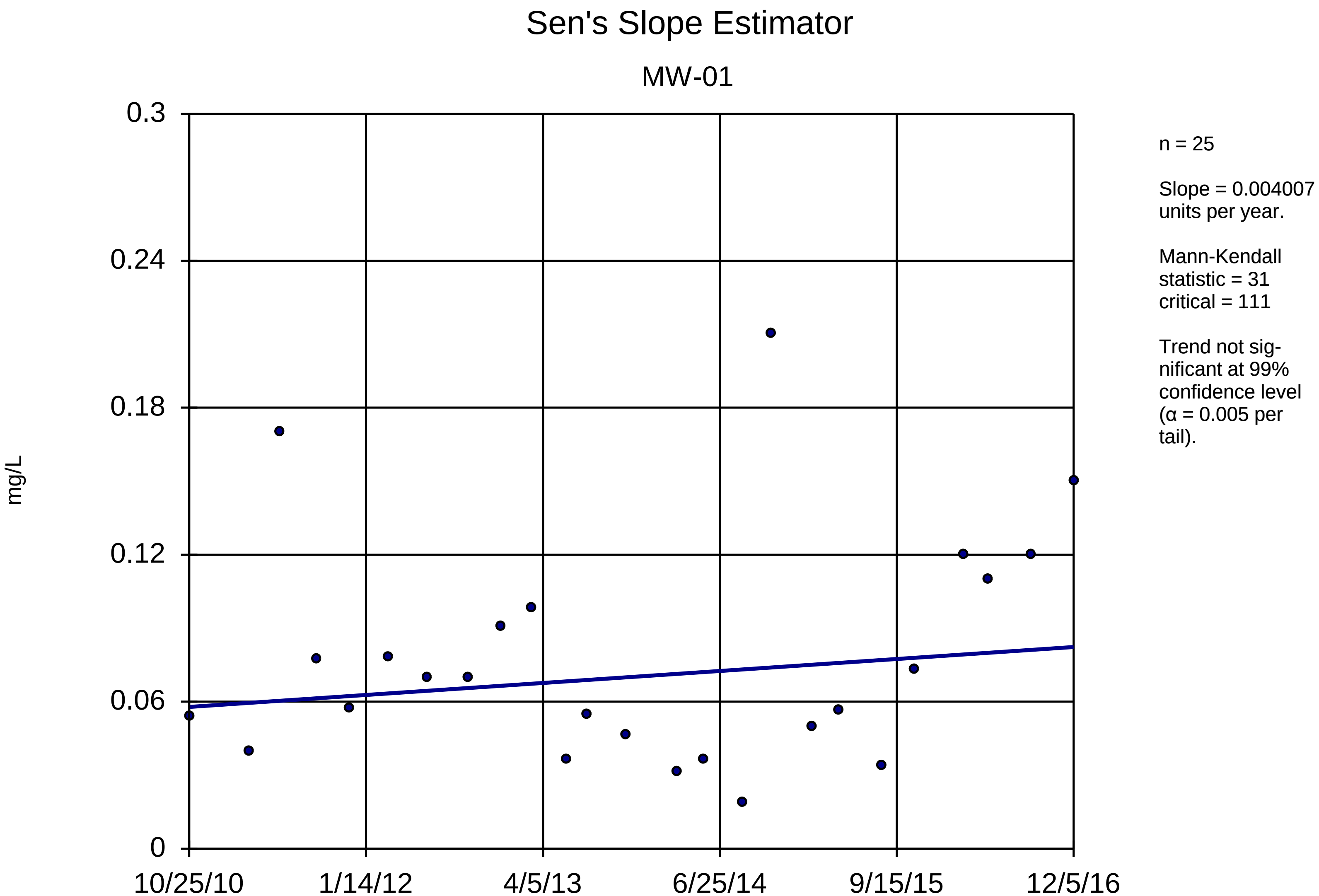
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

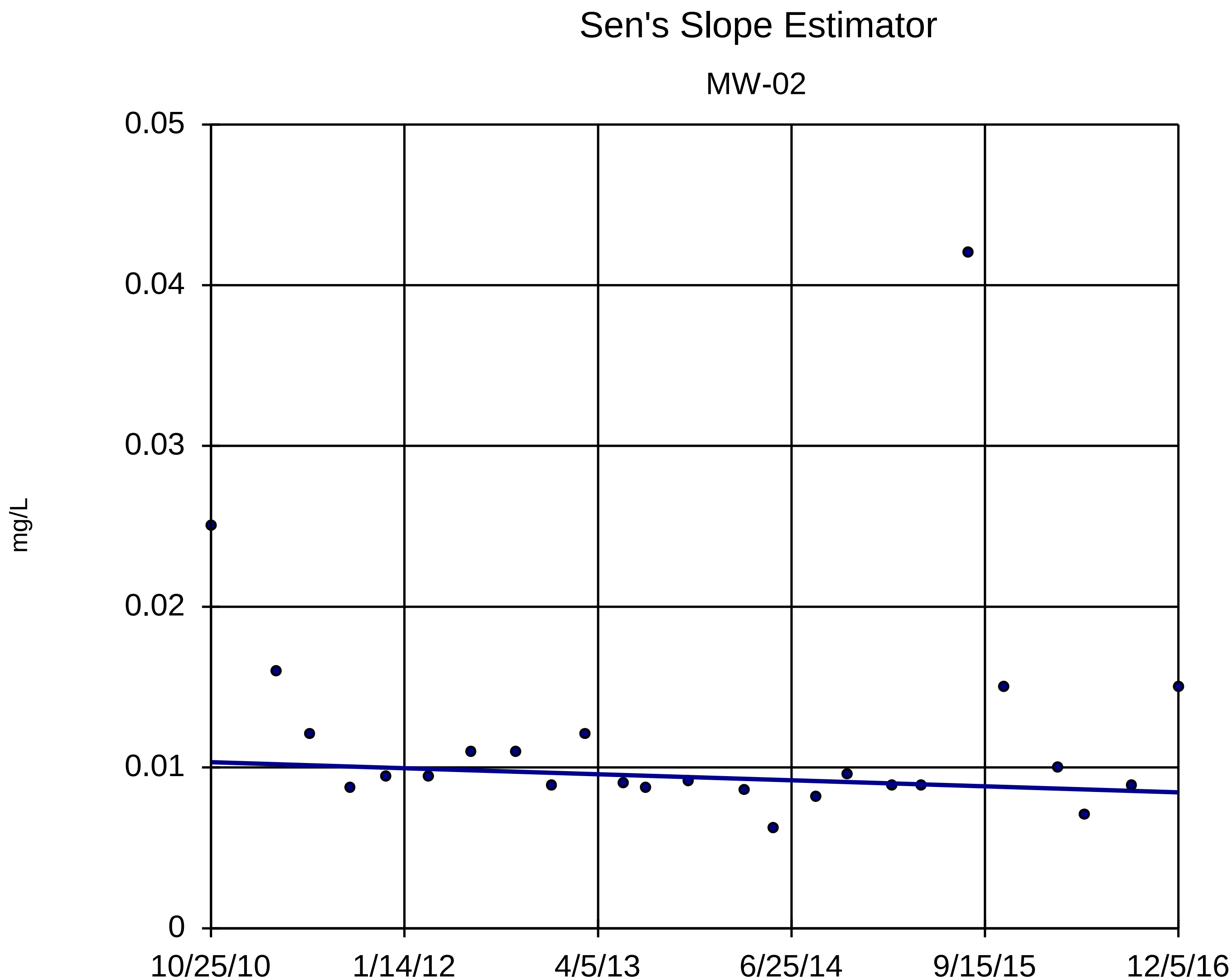
MWG13-15_82045




Constituent: Arsenic, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82046




n = 25

Slope = -0.0003061 units per year.

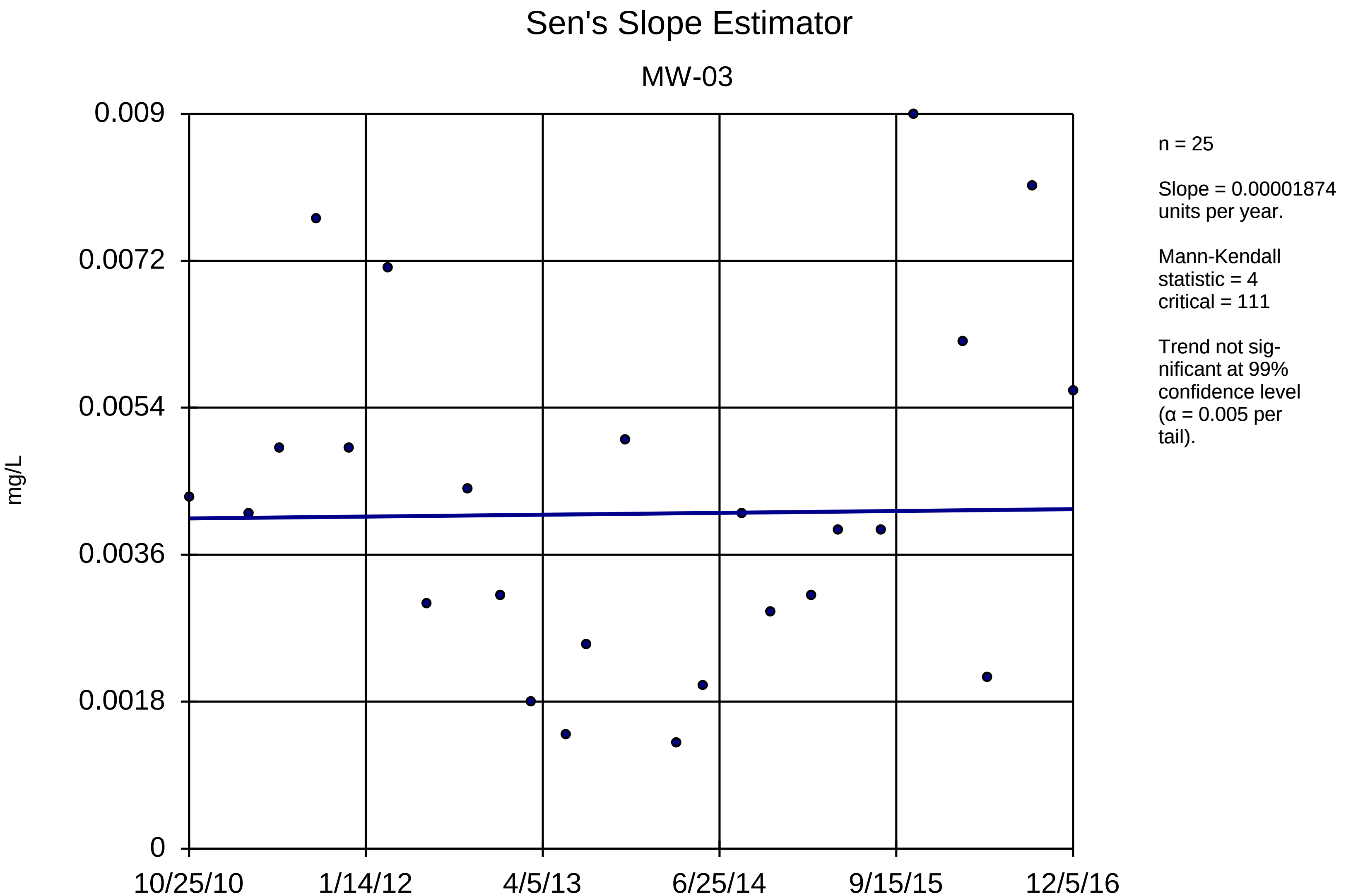
Mann-Kendall statistic = -56 critical = -111

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Arsenic, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

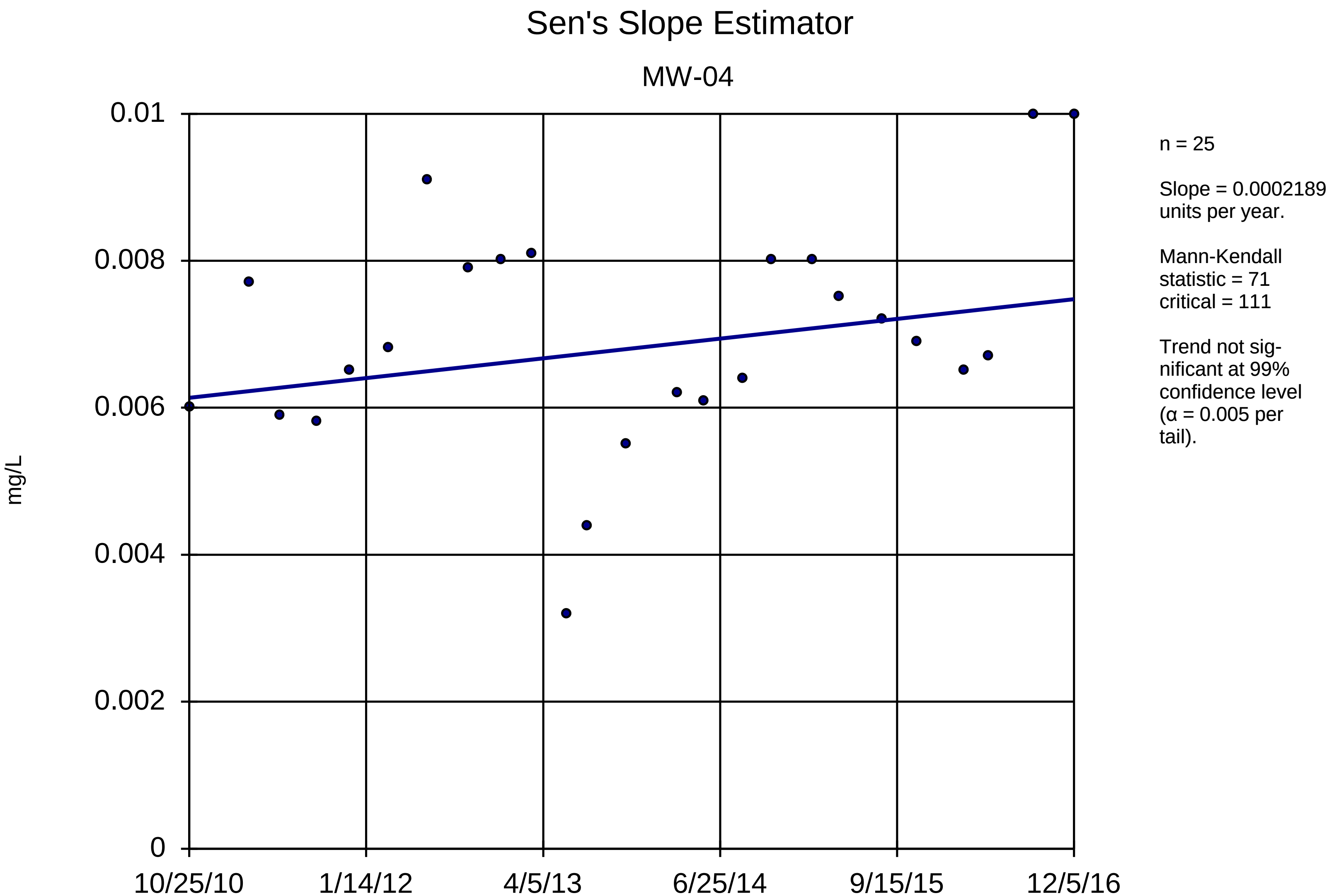
MWG13-15_82047




Constituent: Arsenic, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

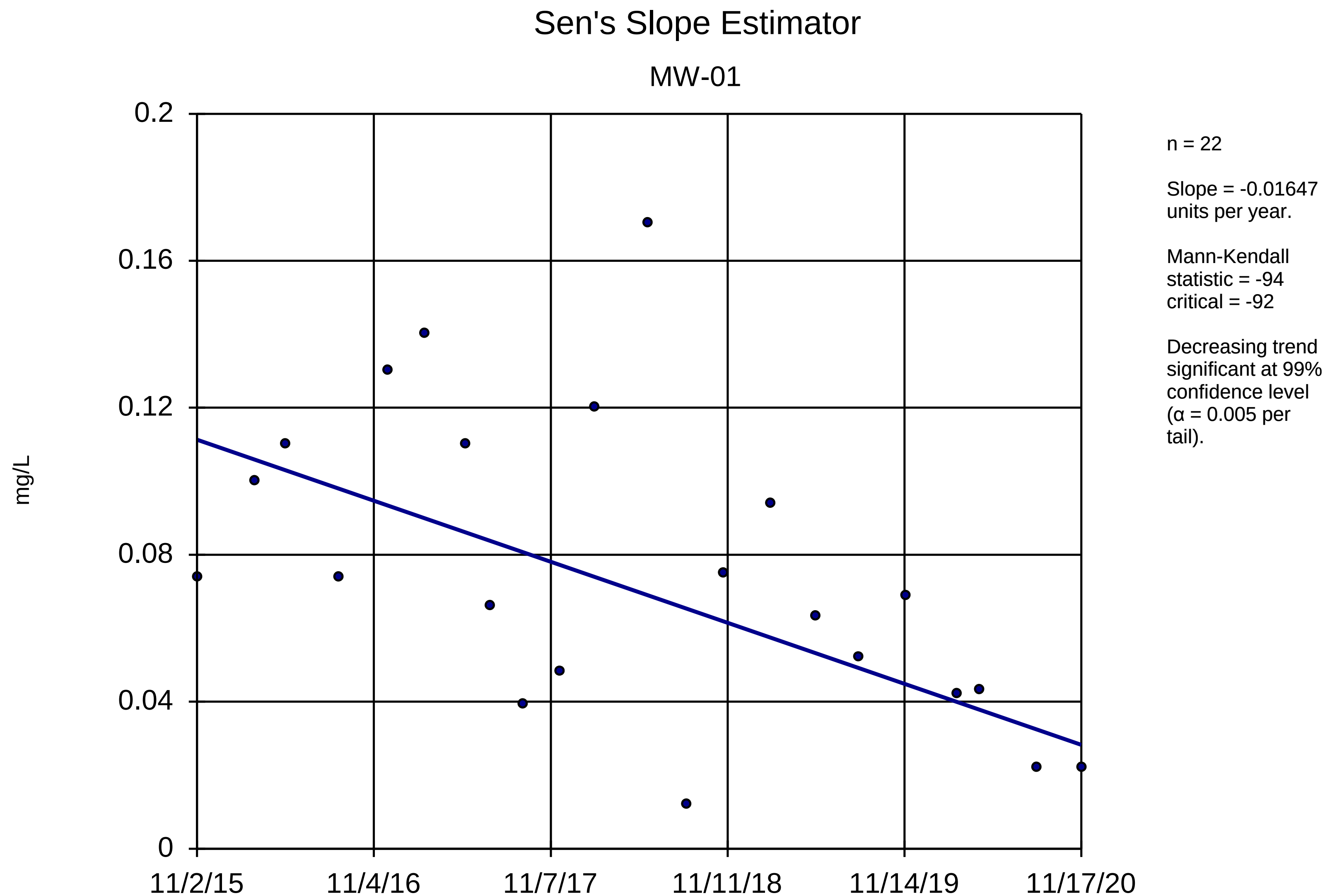
MWG13-15_82048




Constituent: Arsenic, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

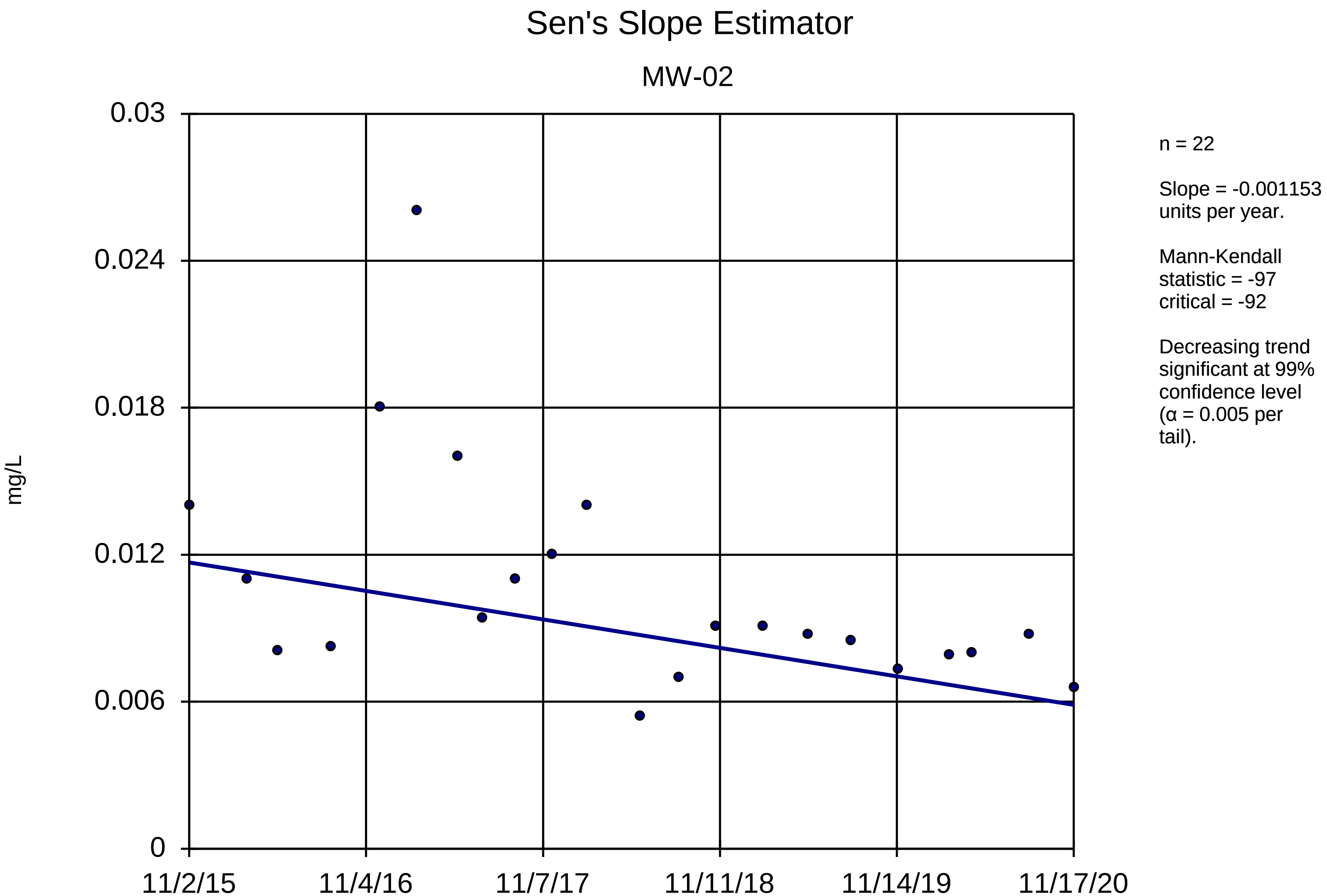
MWG13-15_82049




Constituent: Arsenic, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82050



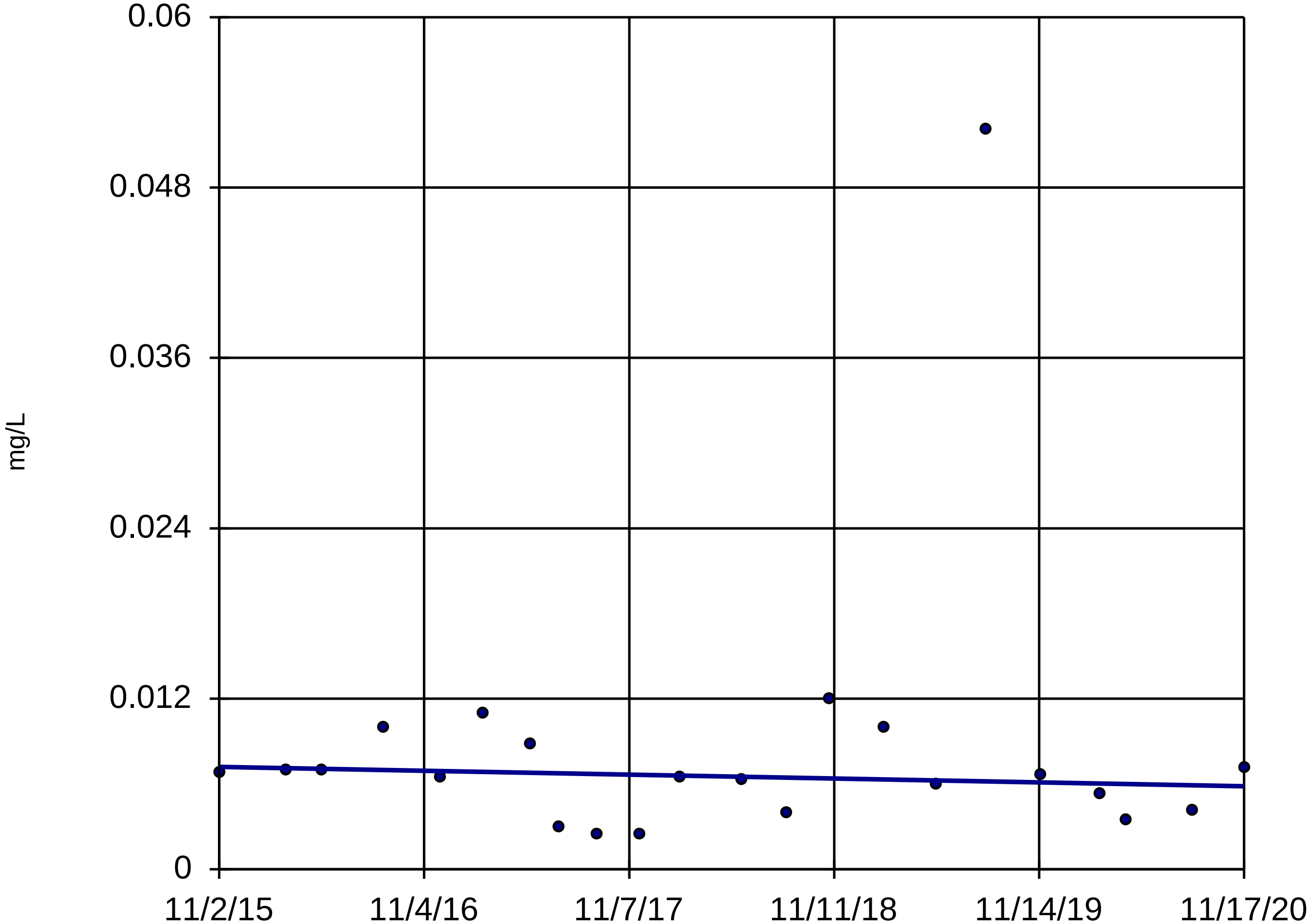

Constituent: Arsenic, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82051

## Sen's Slope Estimator

MW-03




n = 22

Slope = -0.0002674 units per year.

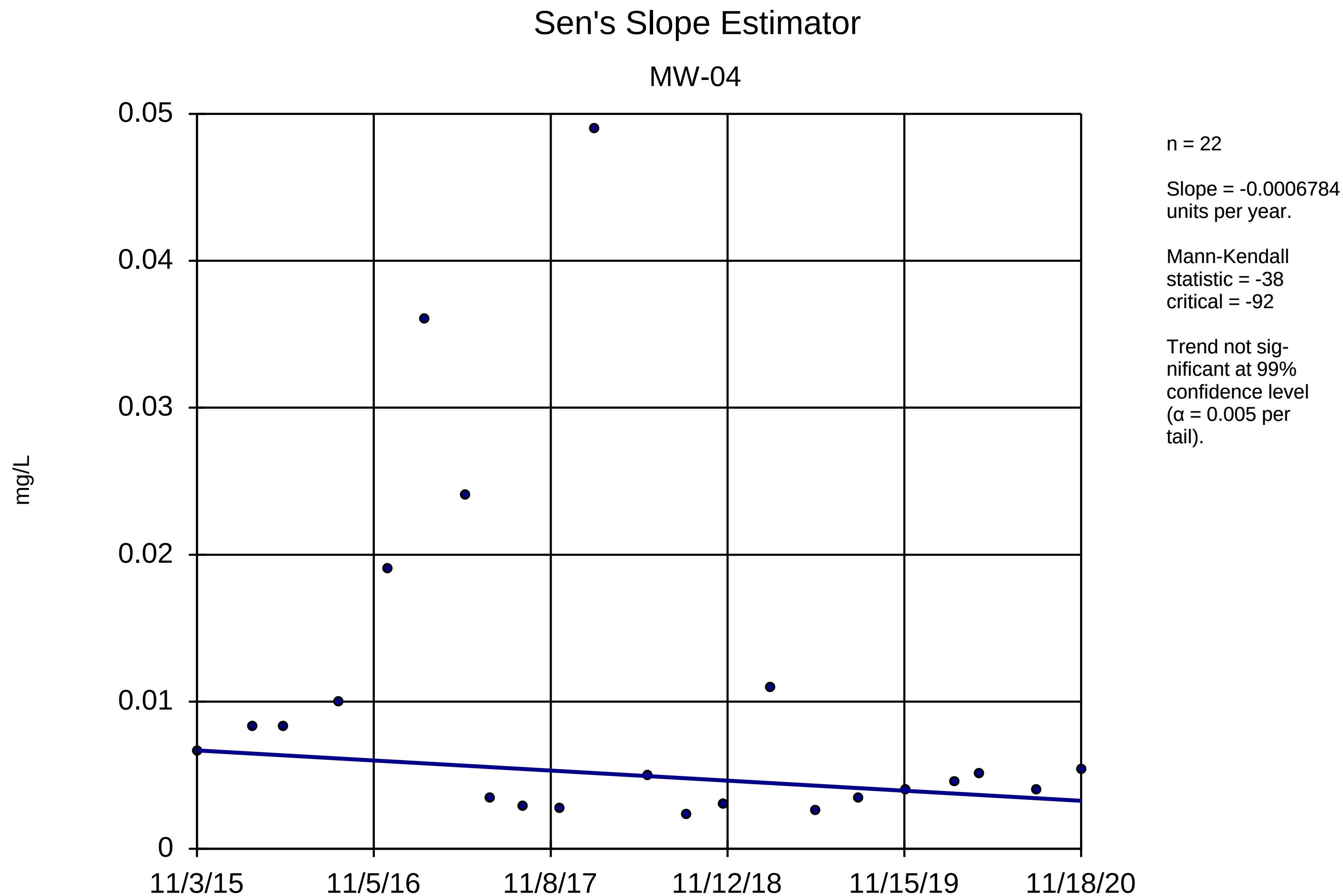
Mann-Kendall statistic = -21 critical = -92

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82052



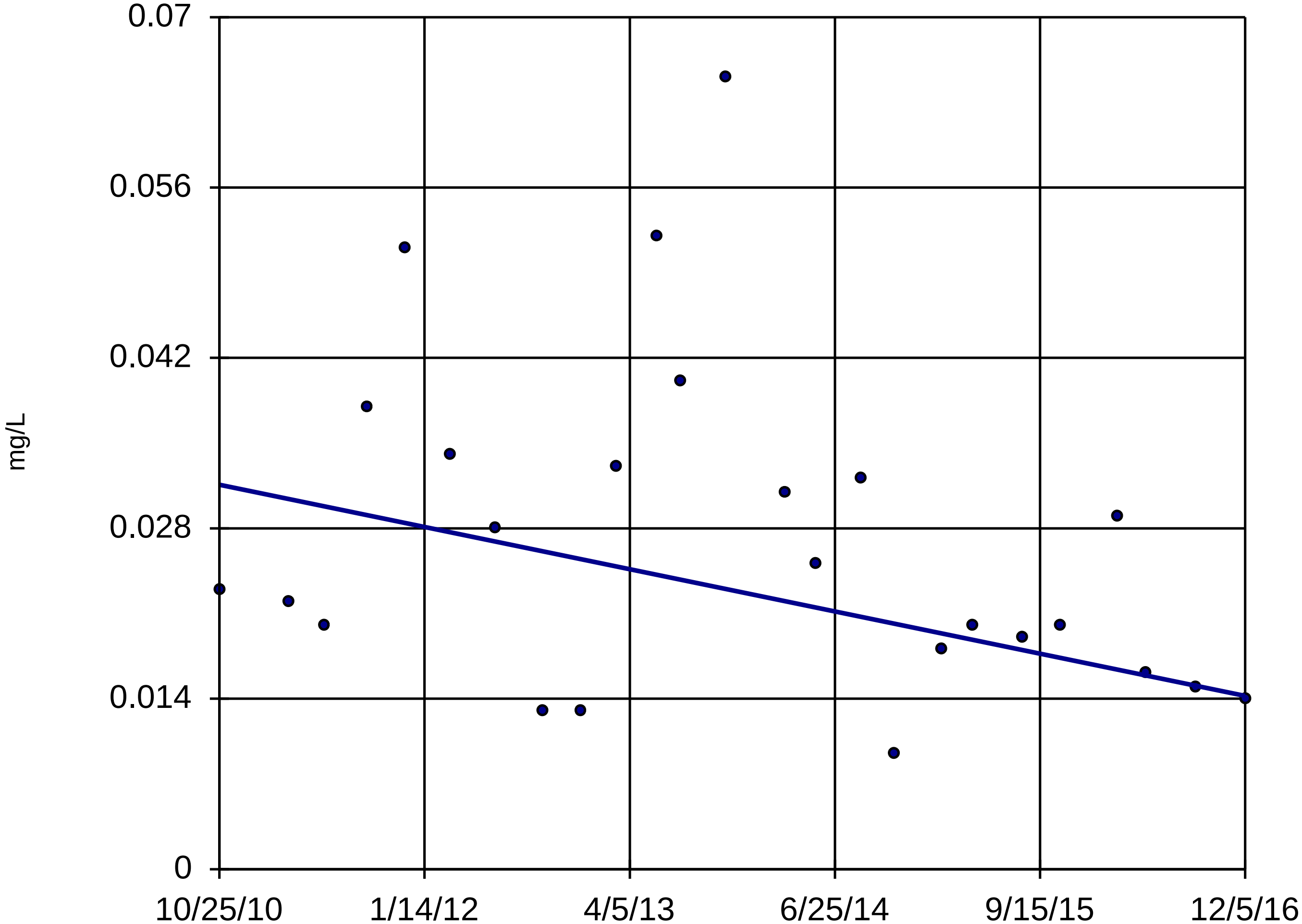

Constituent: Arsenic, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82053

## Sen's Slope Estimator

MW-01




n = 25

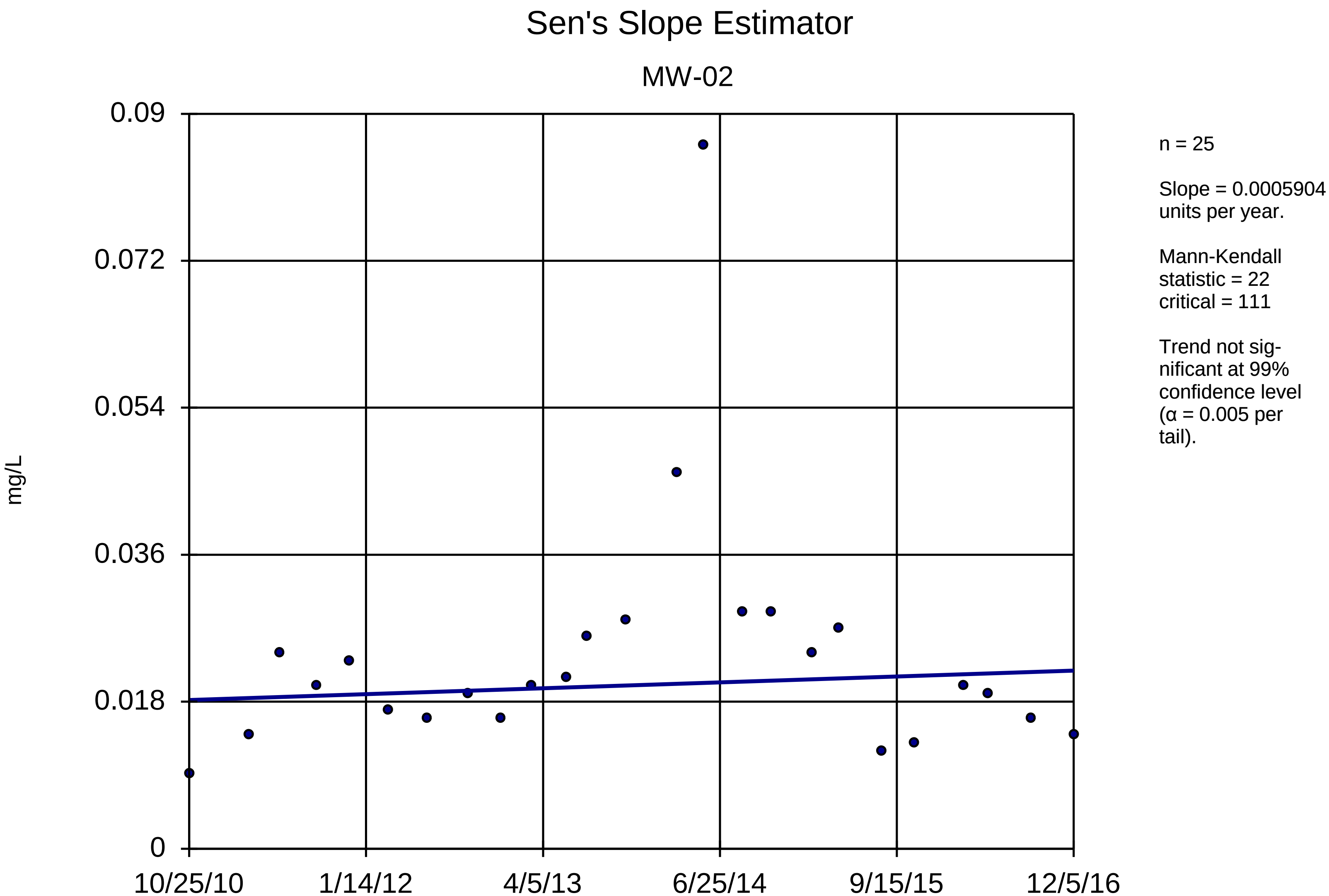
Slope = -0.002836 units per year.

Mann-Kendall statistic = -84 critical = -111

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Barium, Dissolved    Analysis Run 4/14/2021 1:01 PM

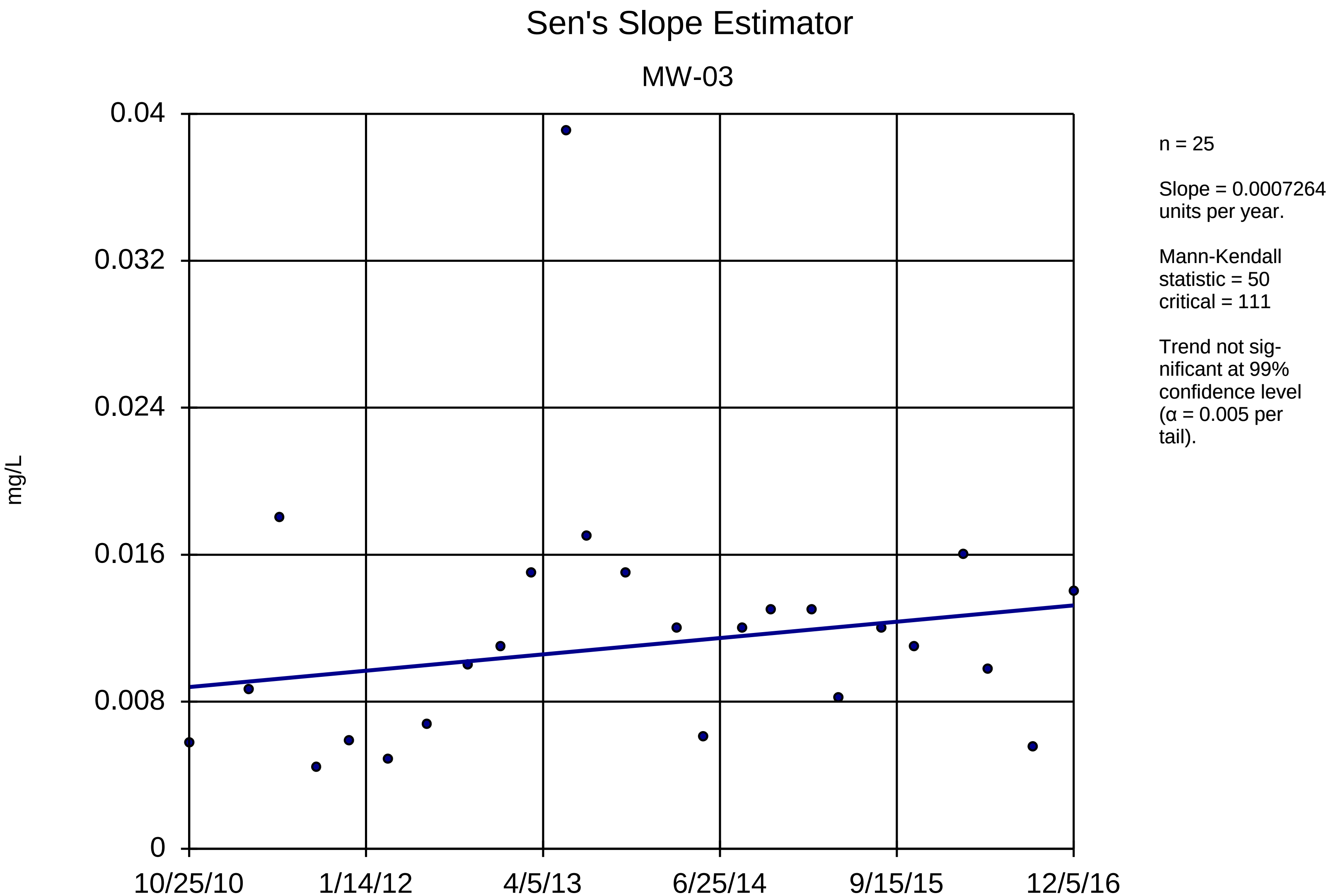
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database




Constituent: Barium, Dissolved Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

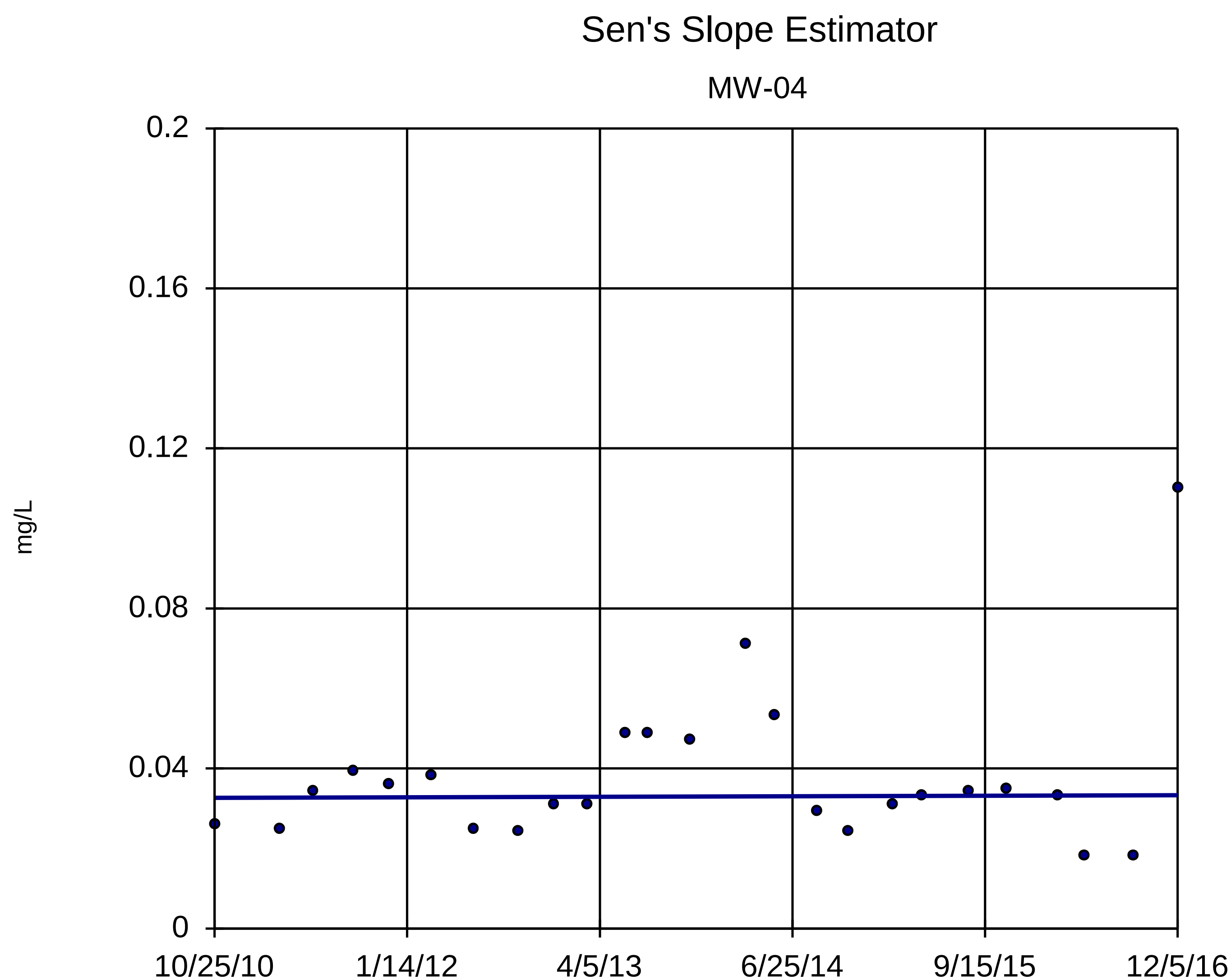
MWG13-15_82055




Constituent: Barium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82056




n = 25

Slope = 0.0001138 units per year.

Mann-Kendall statistic = 9 critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

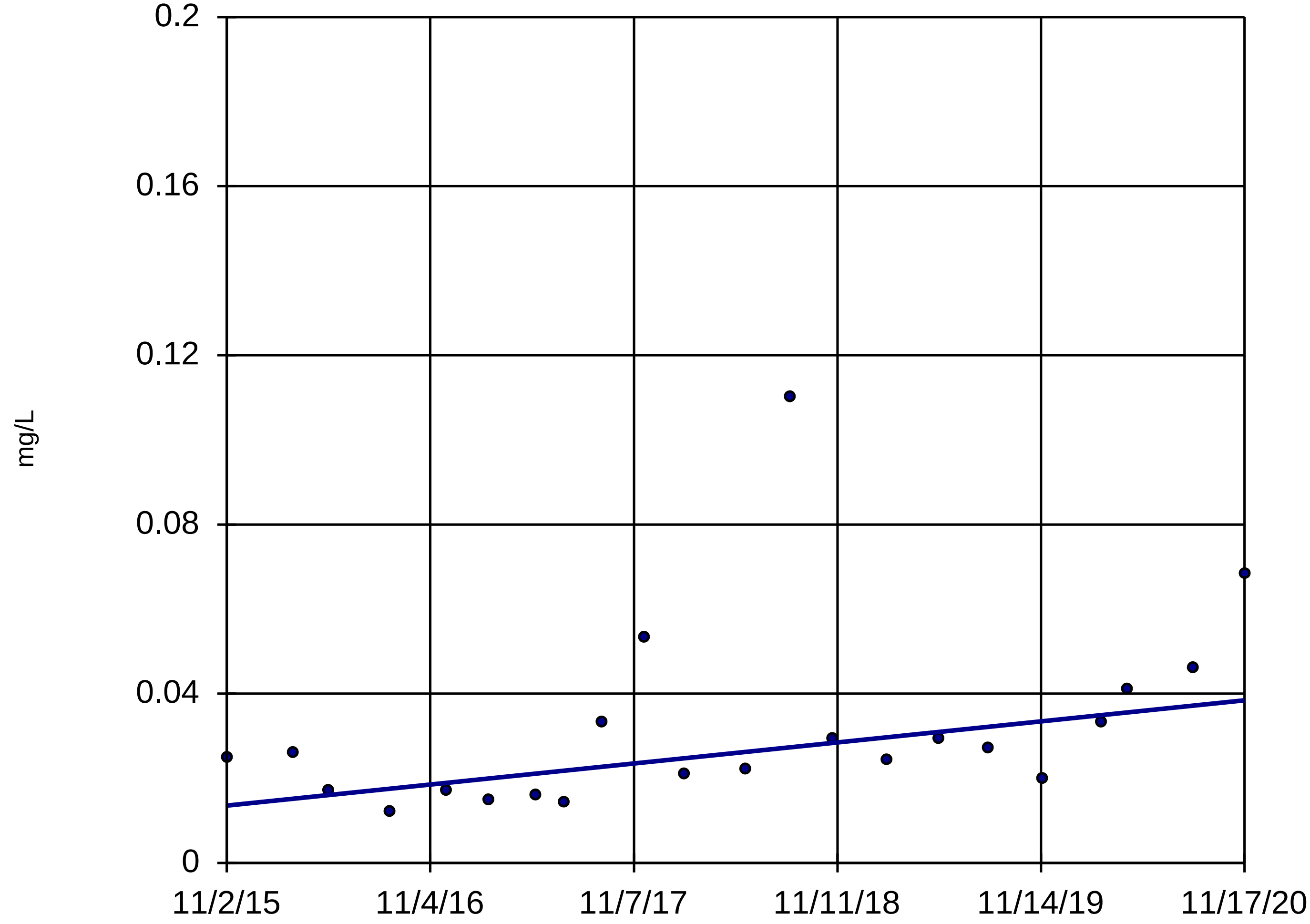
Constituent: Barium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82057

Sen's Slope Estimator

MW-01




n = 22

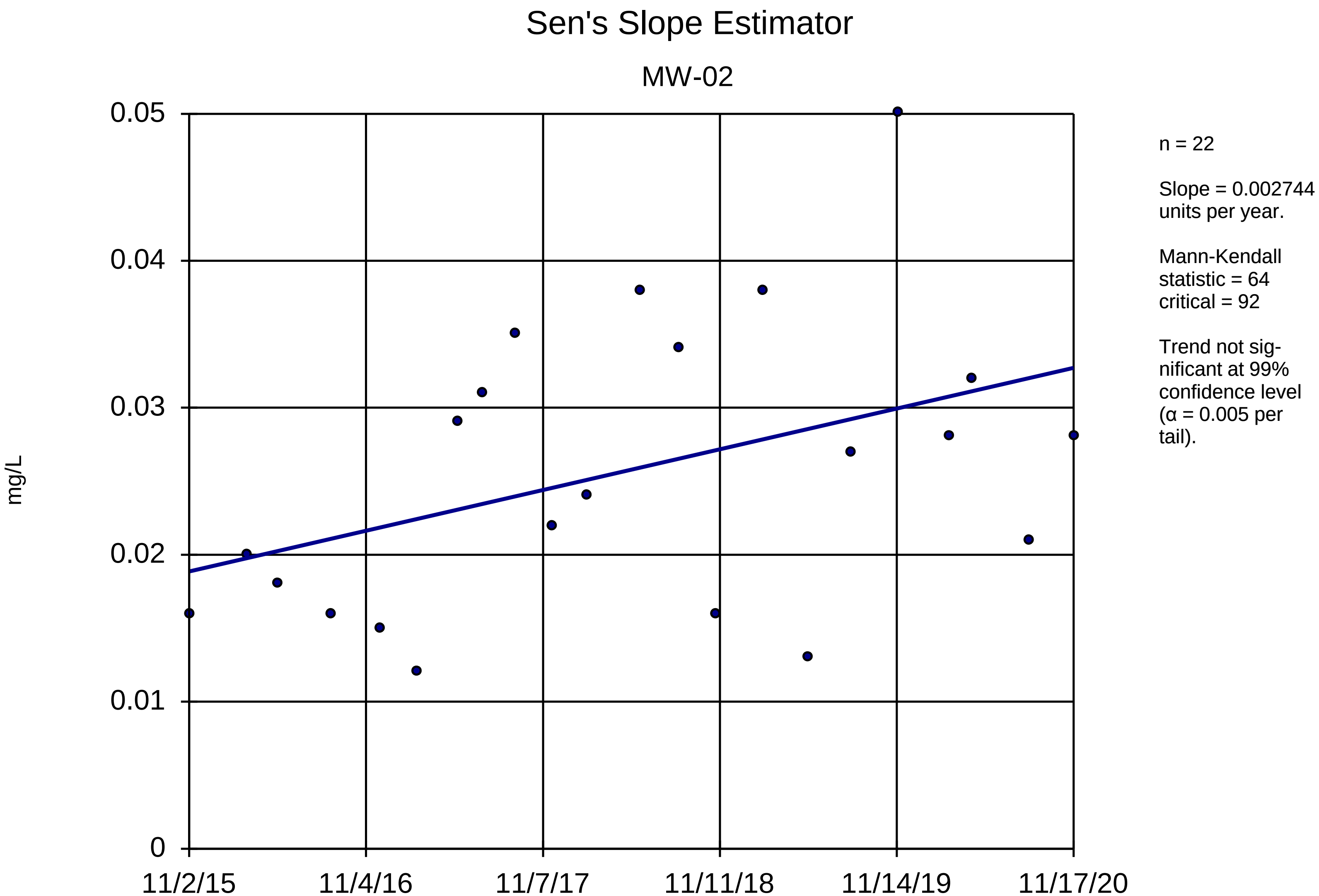
Slope = 0.004937 units per year.

Mann-Kendall statistic = 100 critical = 92

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium, Total  Analysis Run 4/14/2021 1:01 PM

Utility Site W  Client: Weaver Consultants Group  Data: Waukegan Sanitas Database




Constituent: Barium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82059

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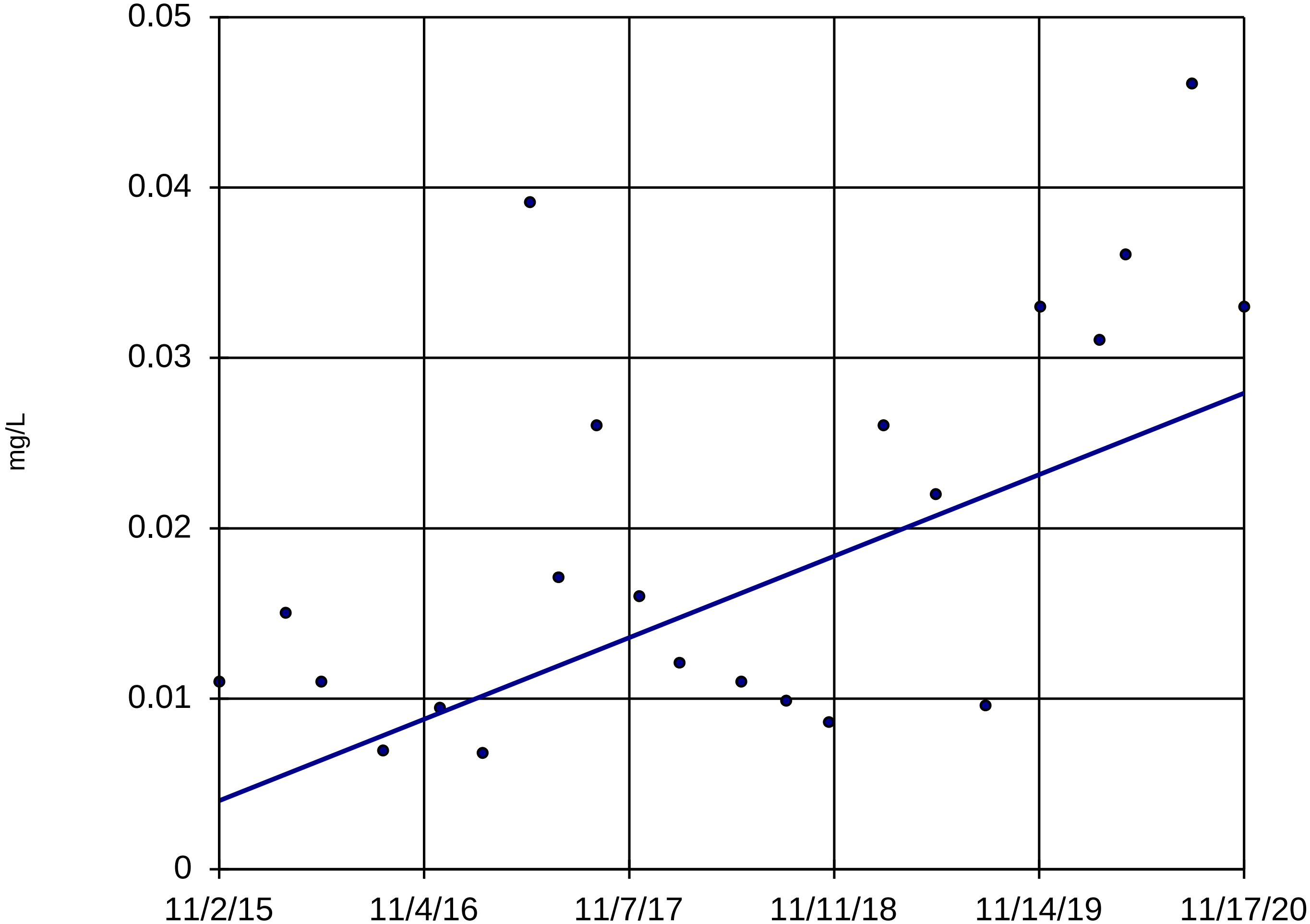
## Sen's Slope Estimator

MW-03




n = 22

Slope = 0.00474 units per year.

Mann-Kendall statistic = 84 critical = 92

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82060

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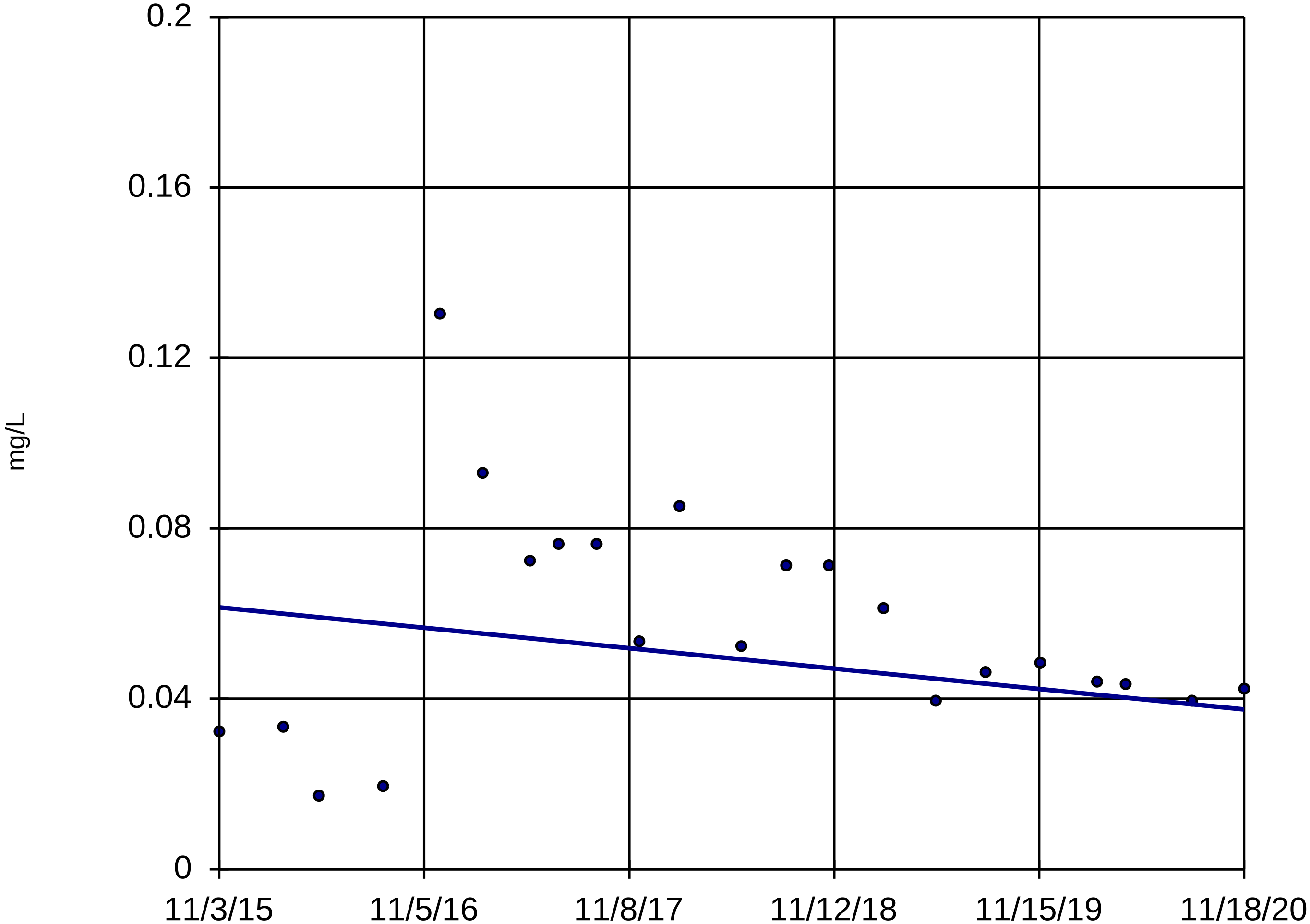
# Sen's Slope Estimator

MW-04




n = 22

Slope = -0.004747 units per year.

Mann-Kendall statistic = -42 critical = -92

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82061

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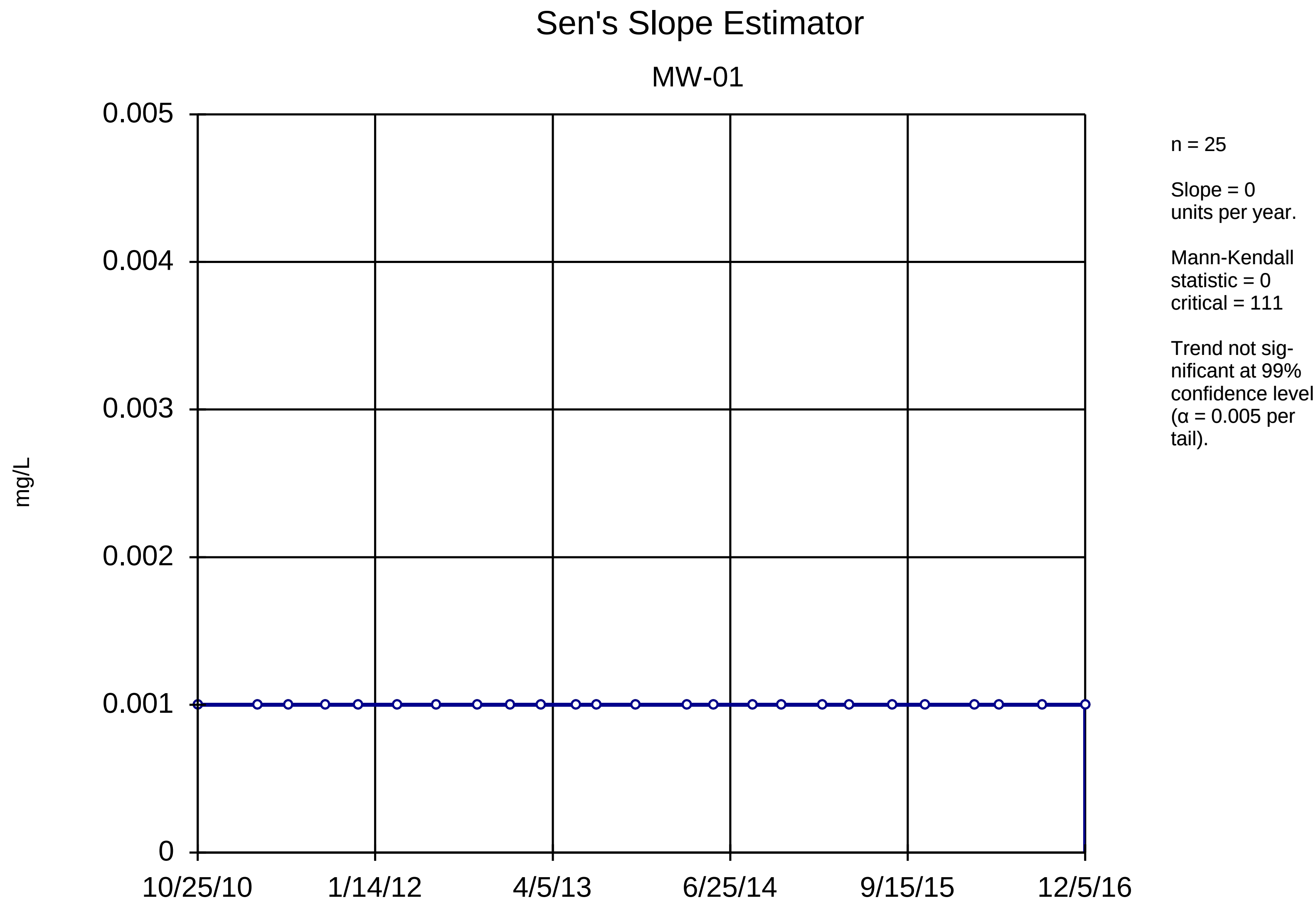
Hollow symbols indicate censored values.

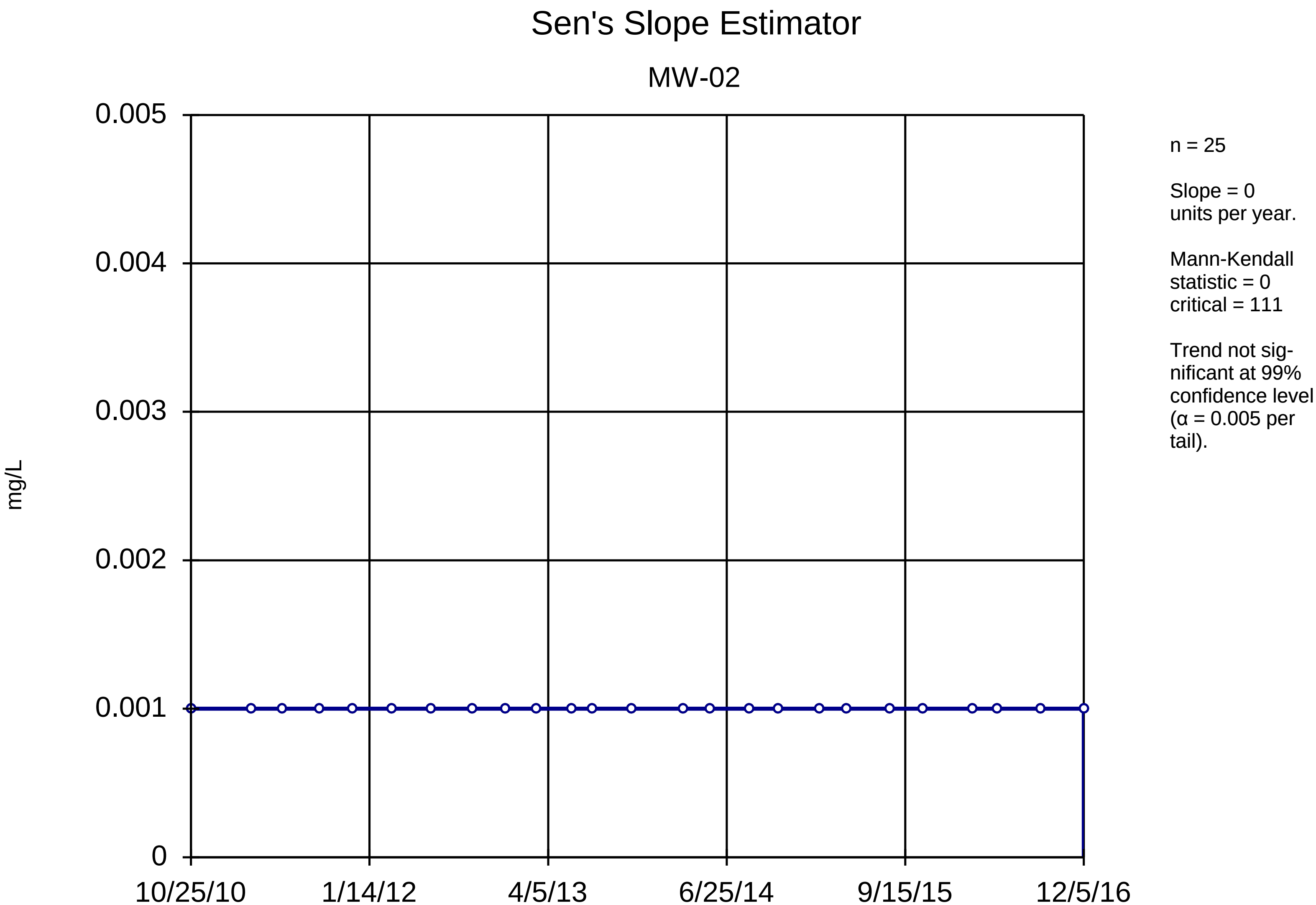



Constituent: Beryllium, Dissolved Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82062

Hollow symbols indicate censored values.




Constituent: Beryllium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

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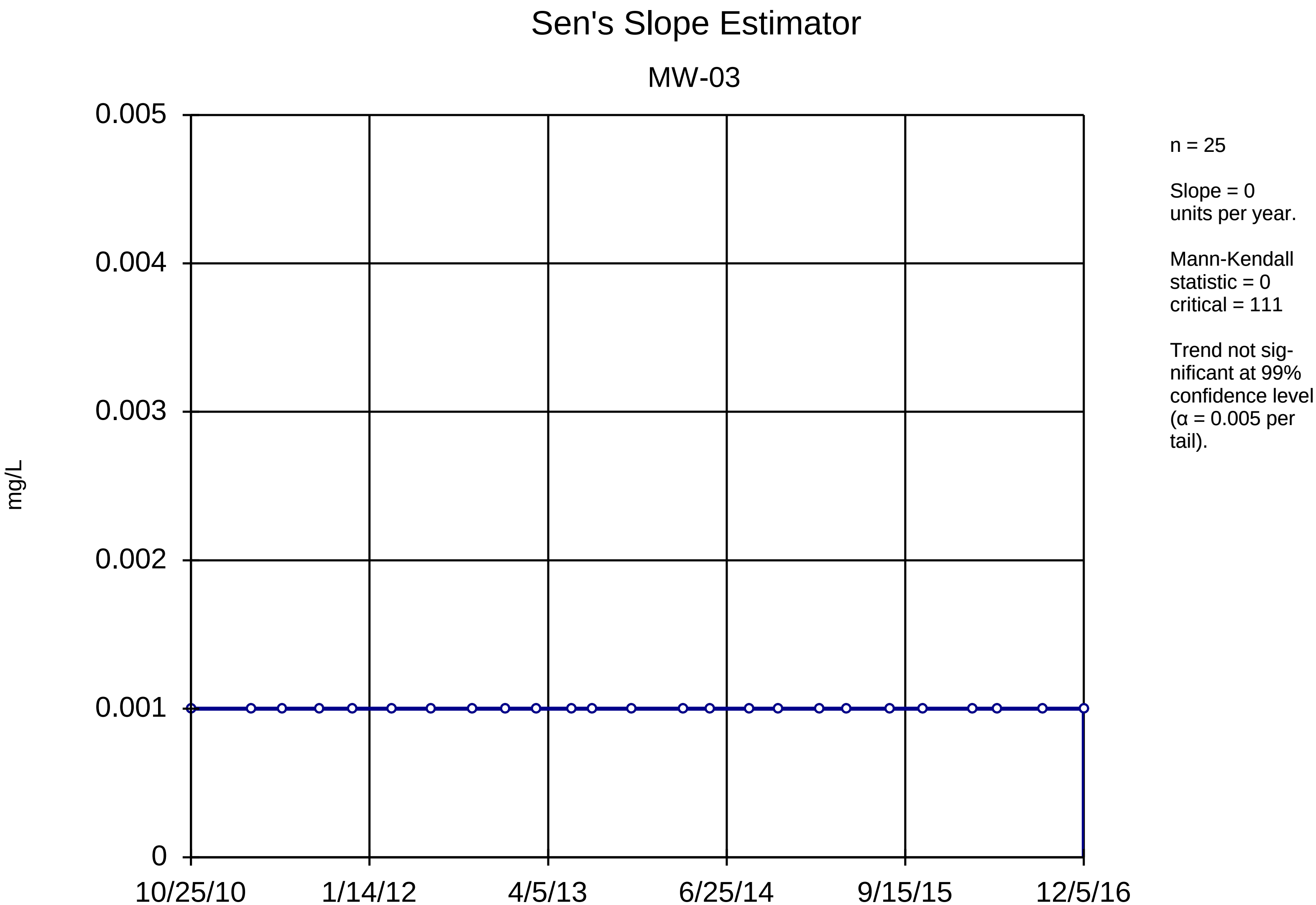
Hollow symbols indicate censored values.

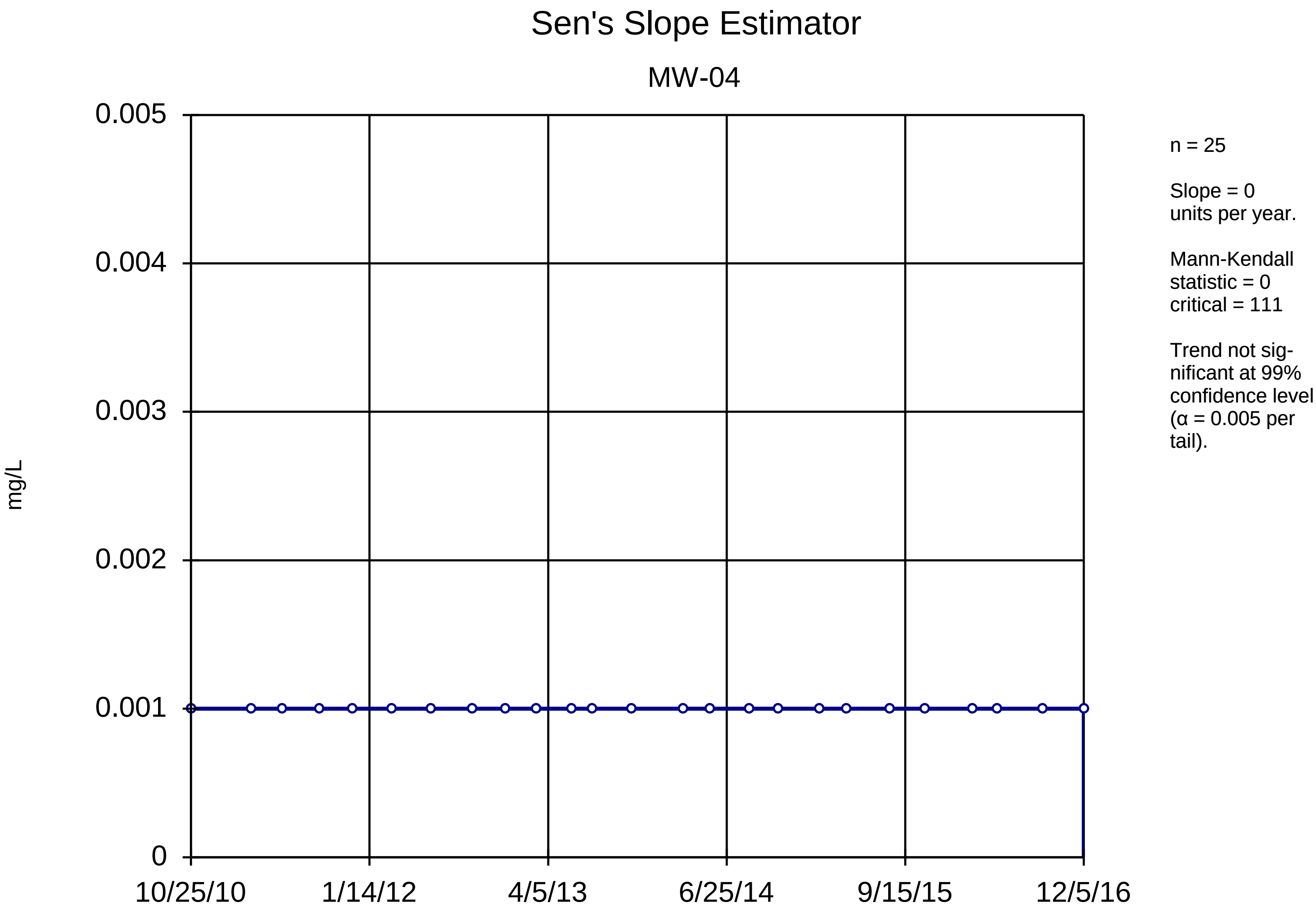



Constituent: Beryllium, Dissolved Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82064

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

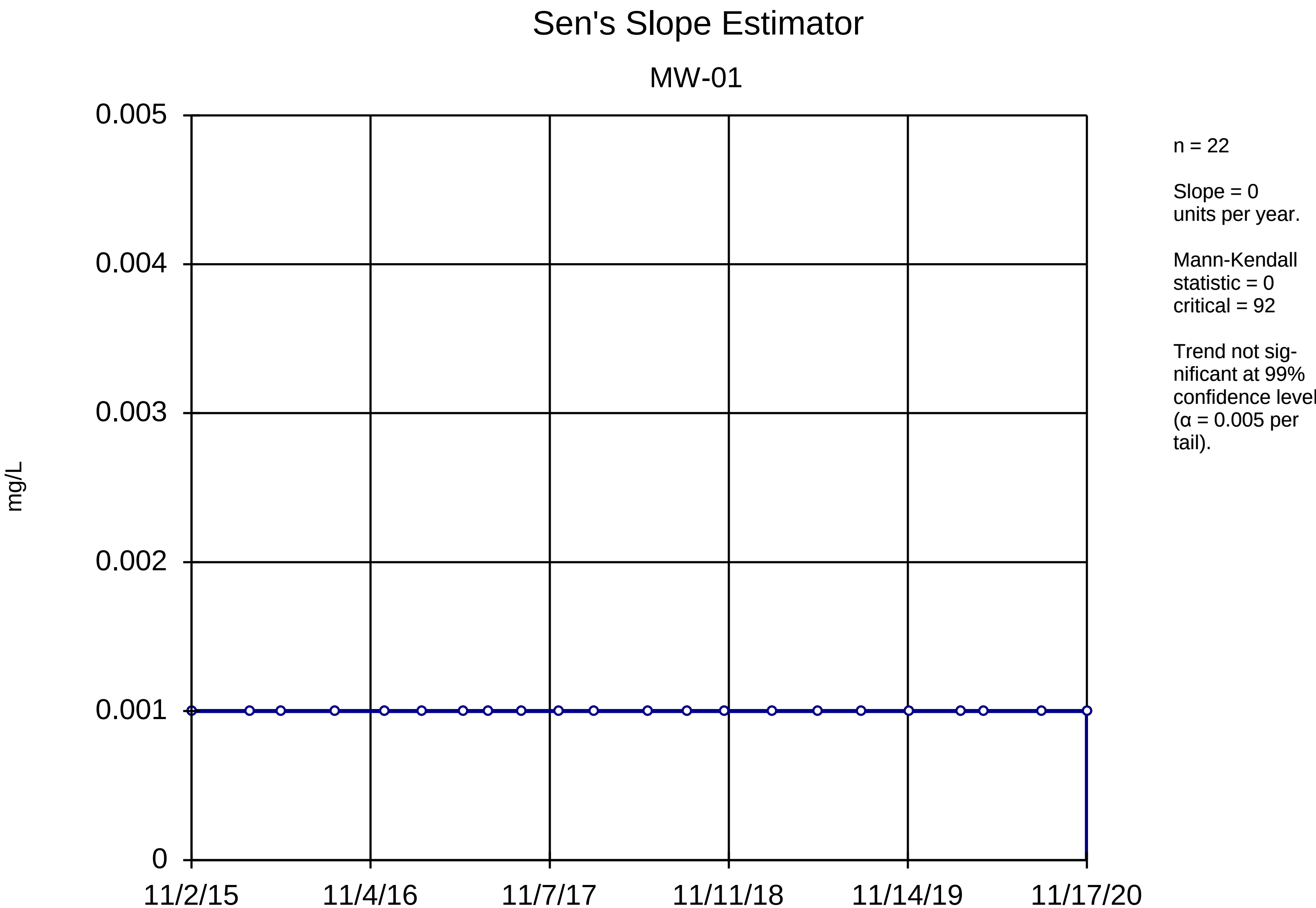



Constituent: Beryllium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82065

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

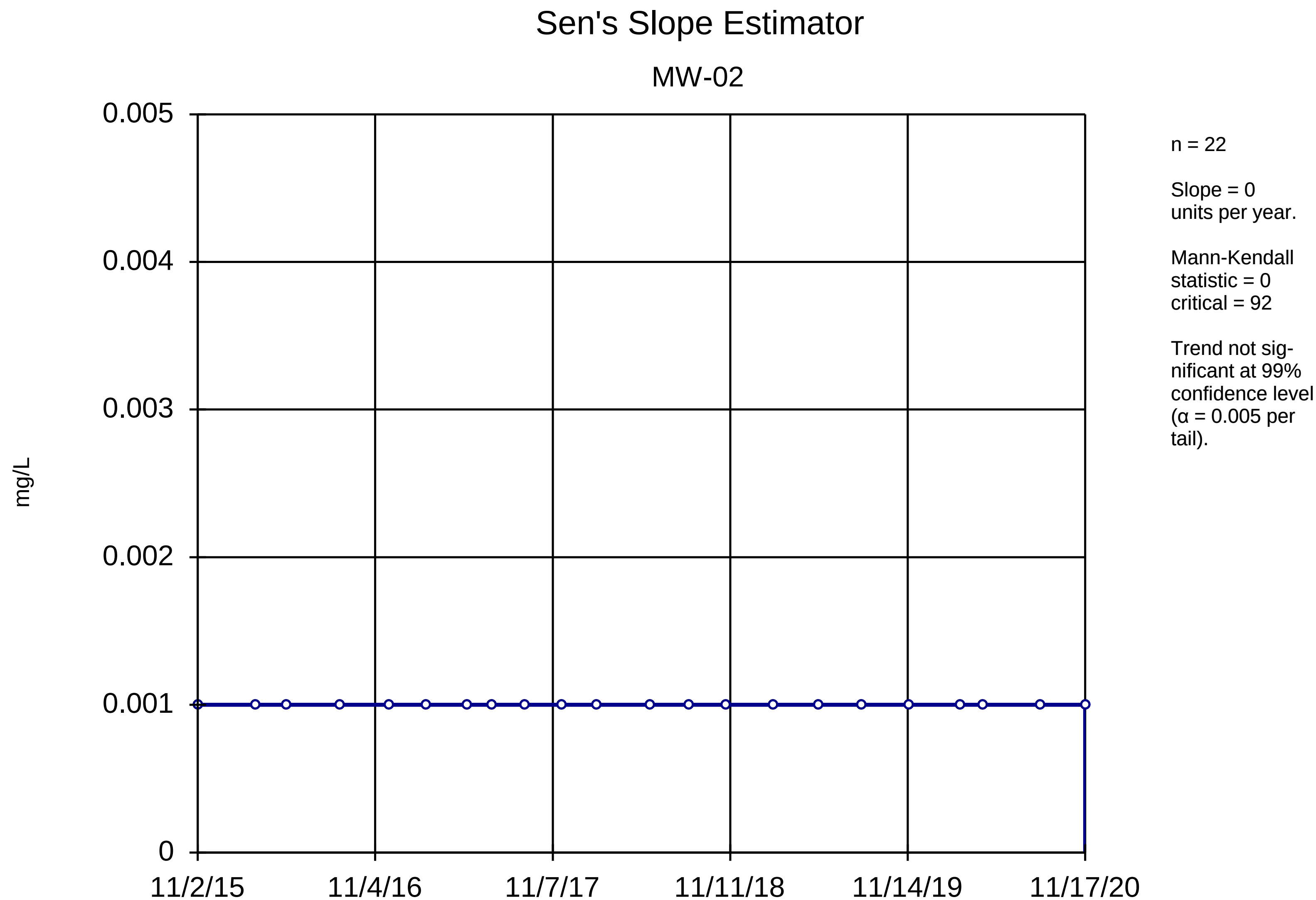



Constituent: Beryllium, Total Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82066

Hollow symbols indicate censored values.




Constituent: Beryllium, Total    Analysis Run 4/14/2021 1:01 PM

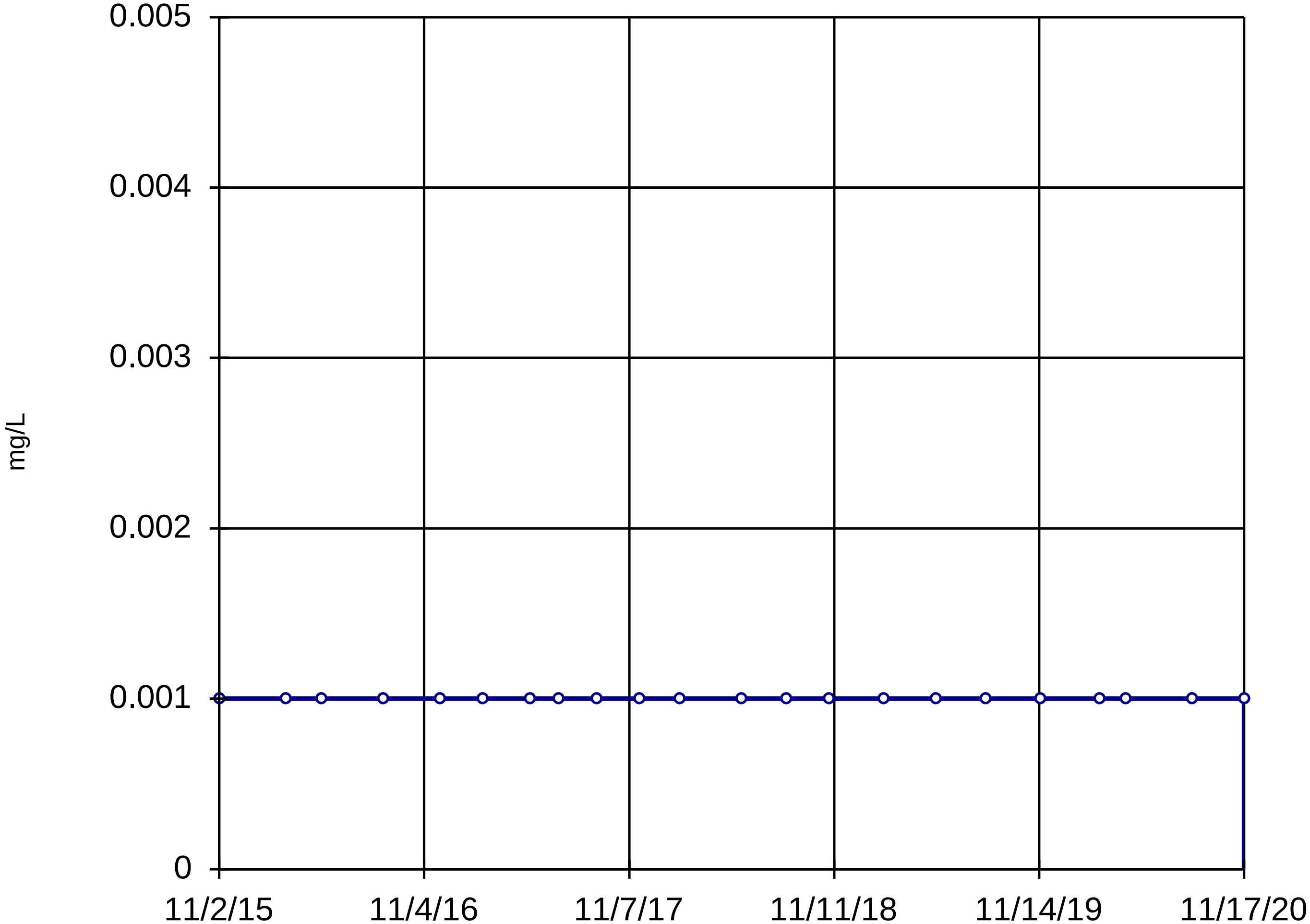
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82067

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-03




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Beryllium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82068

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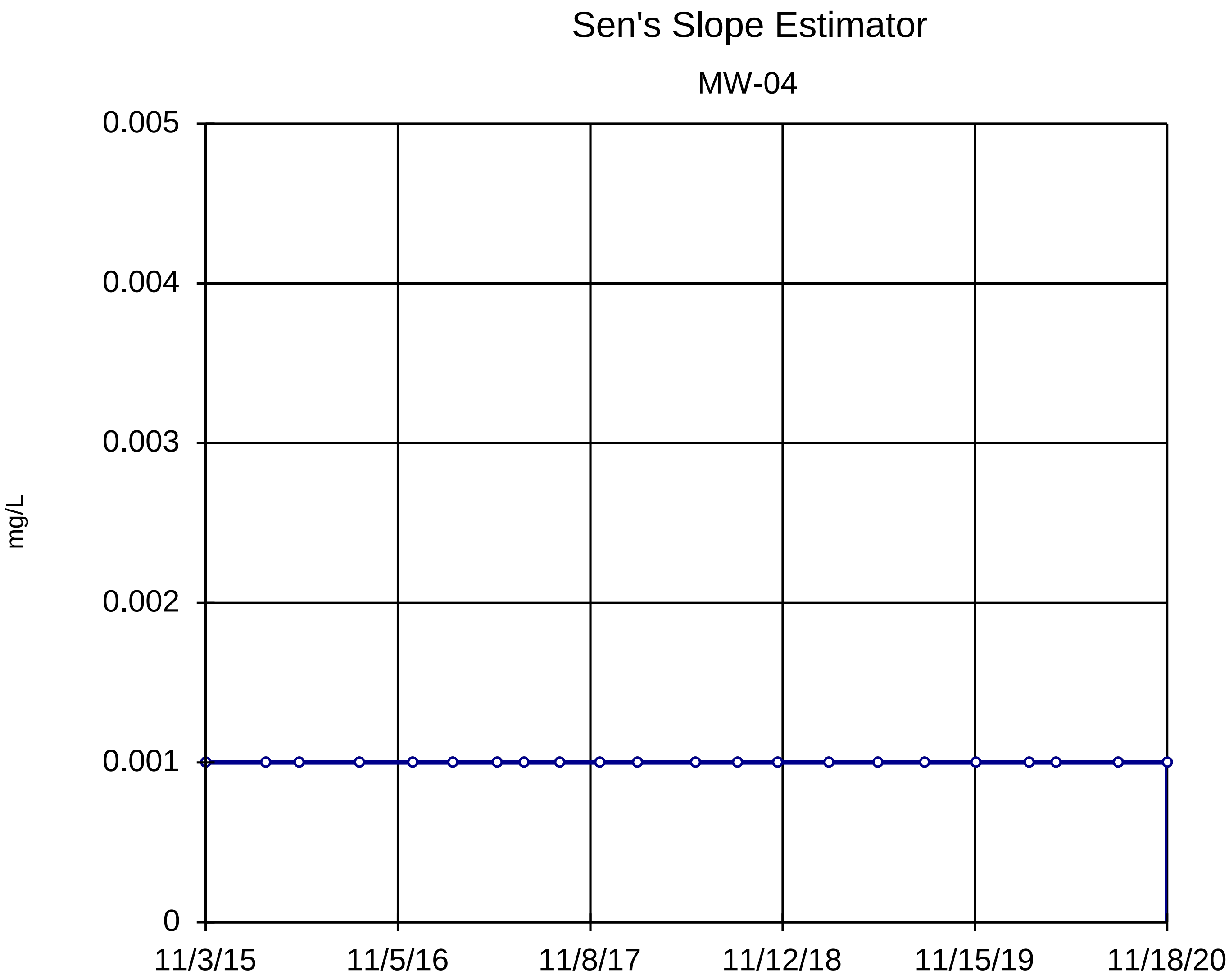
Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

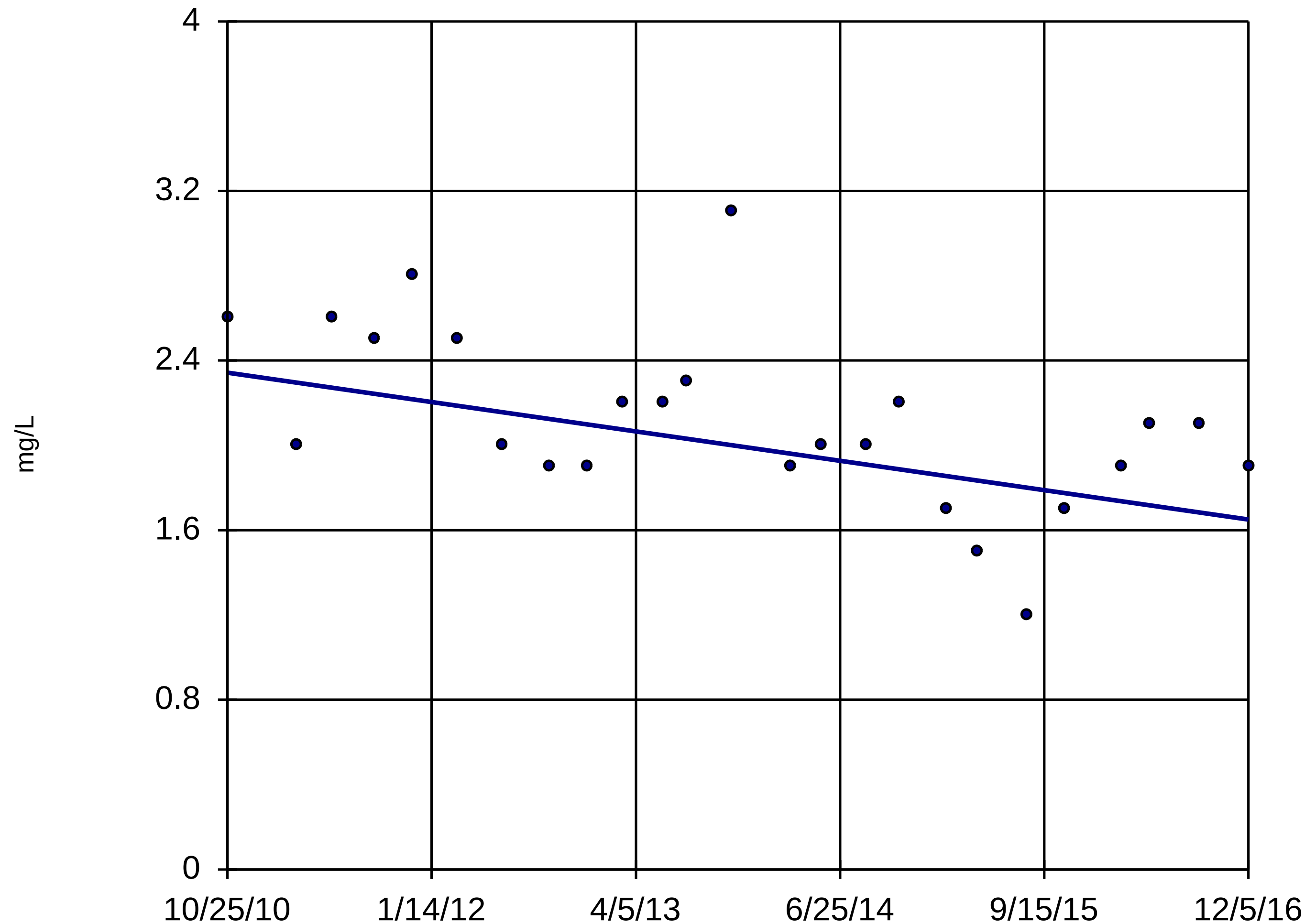
Constituent: Beryllium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82069

## Sen's Slope Estimator

MW-01




n = 25

Slope = -0.1131
units per year.

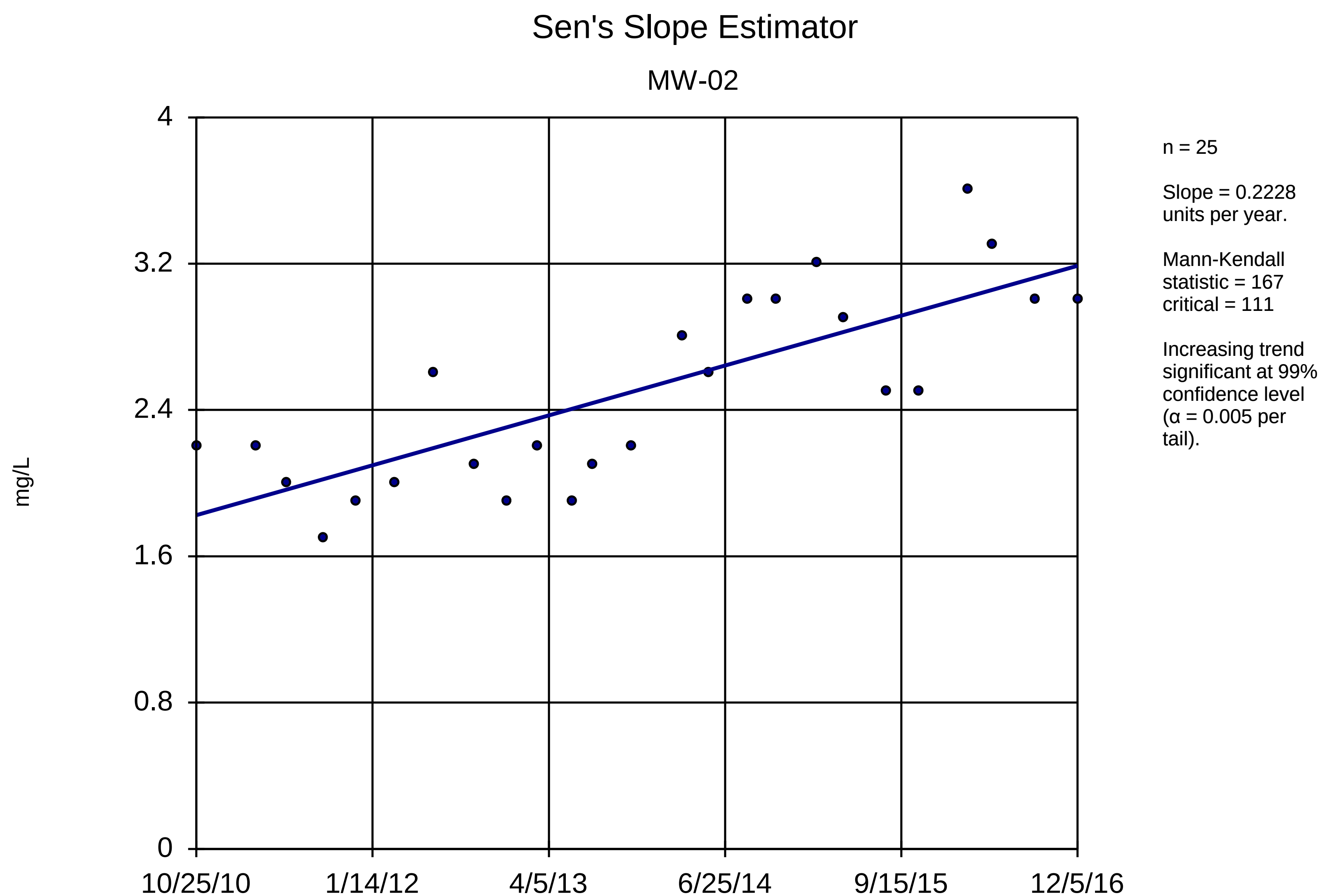
Mann-Kendall
statistic = -117
critical = -111

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Boron, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

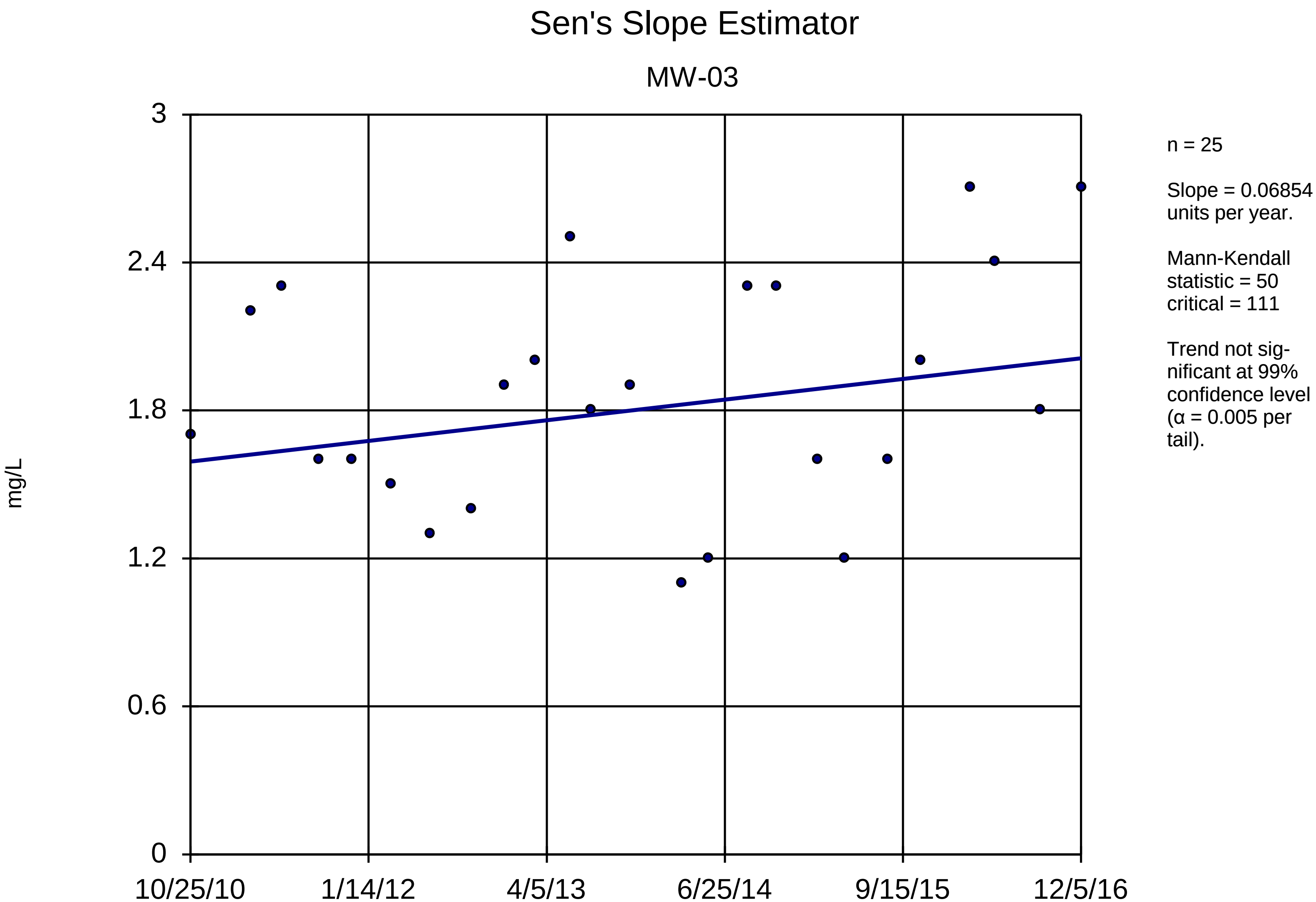
MWG13-15_82070




Constituent: Boron, Dissolved Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

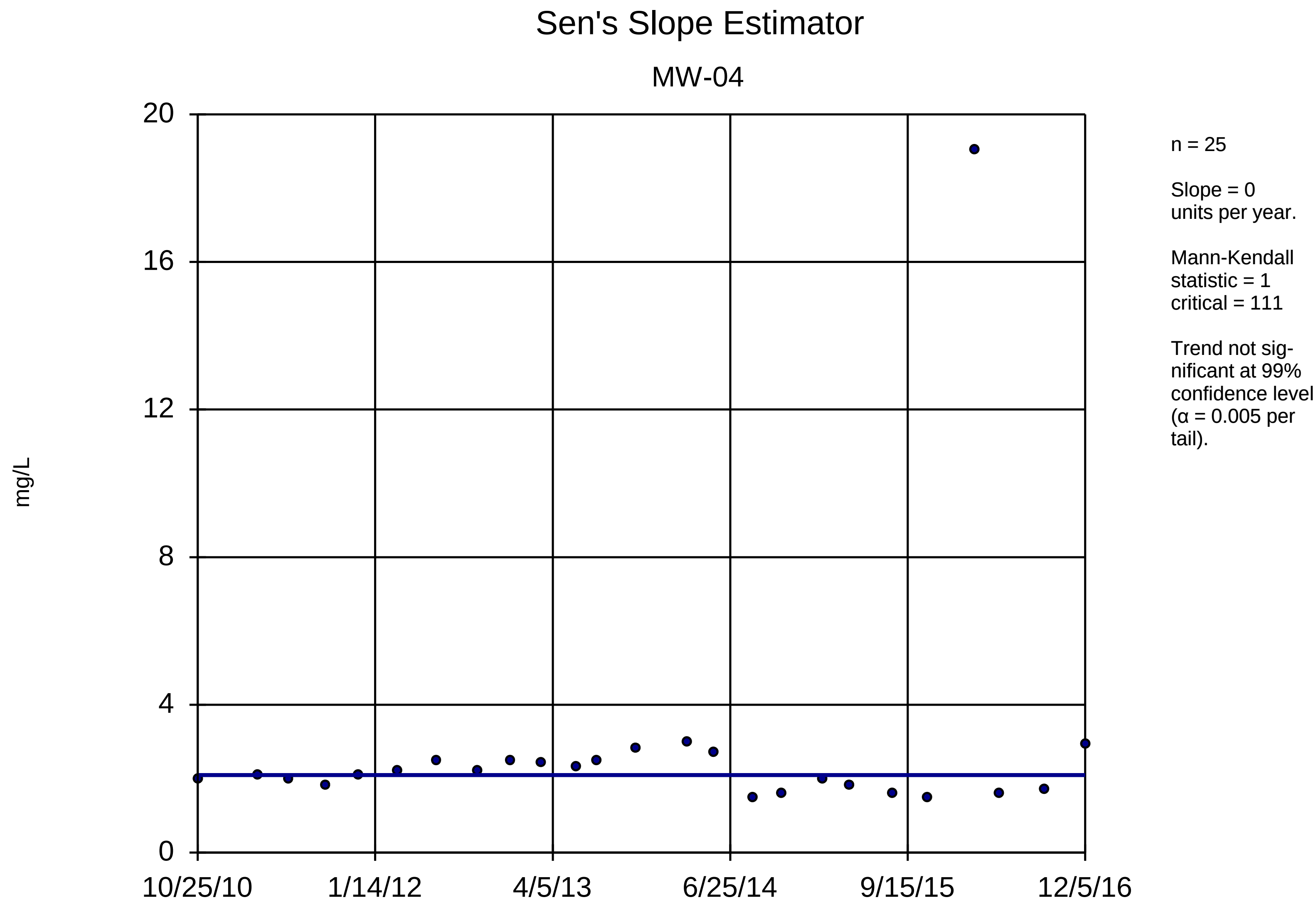
MWG13-15_82071




Constituent: Boron, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82072



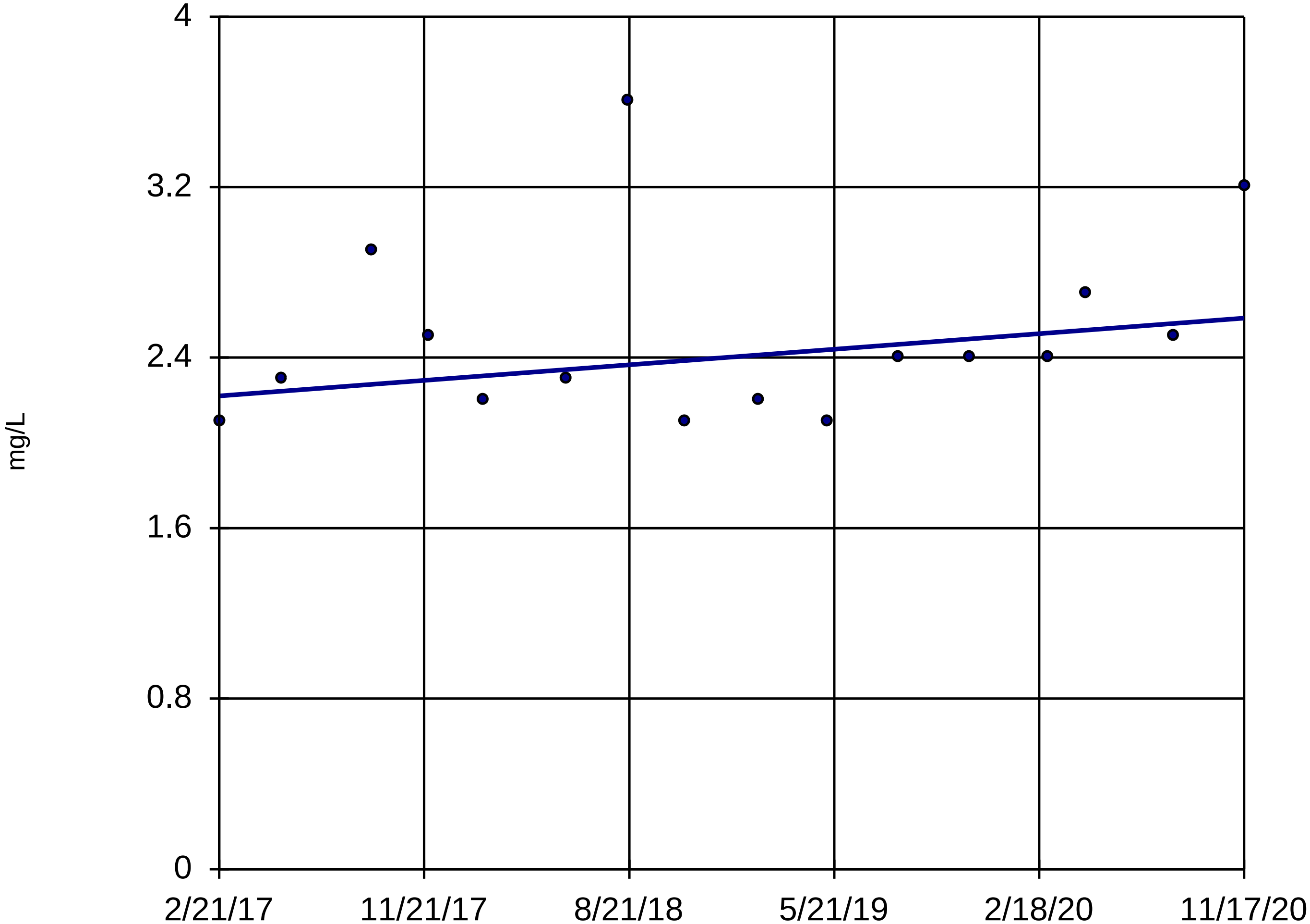

Constituent: Boron, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82073

## Sen's Slope Estimator

MW-01




n = 16

Slope = 0.09787 units per year.

Mann-Kendall statistic = 33 critical = 58

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82074

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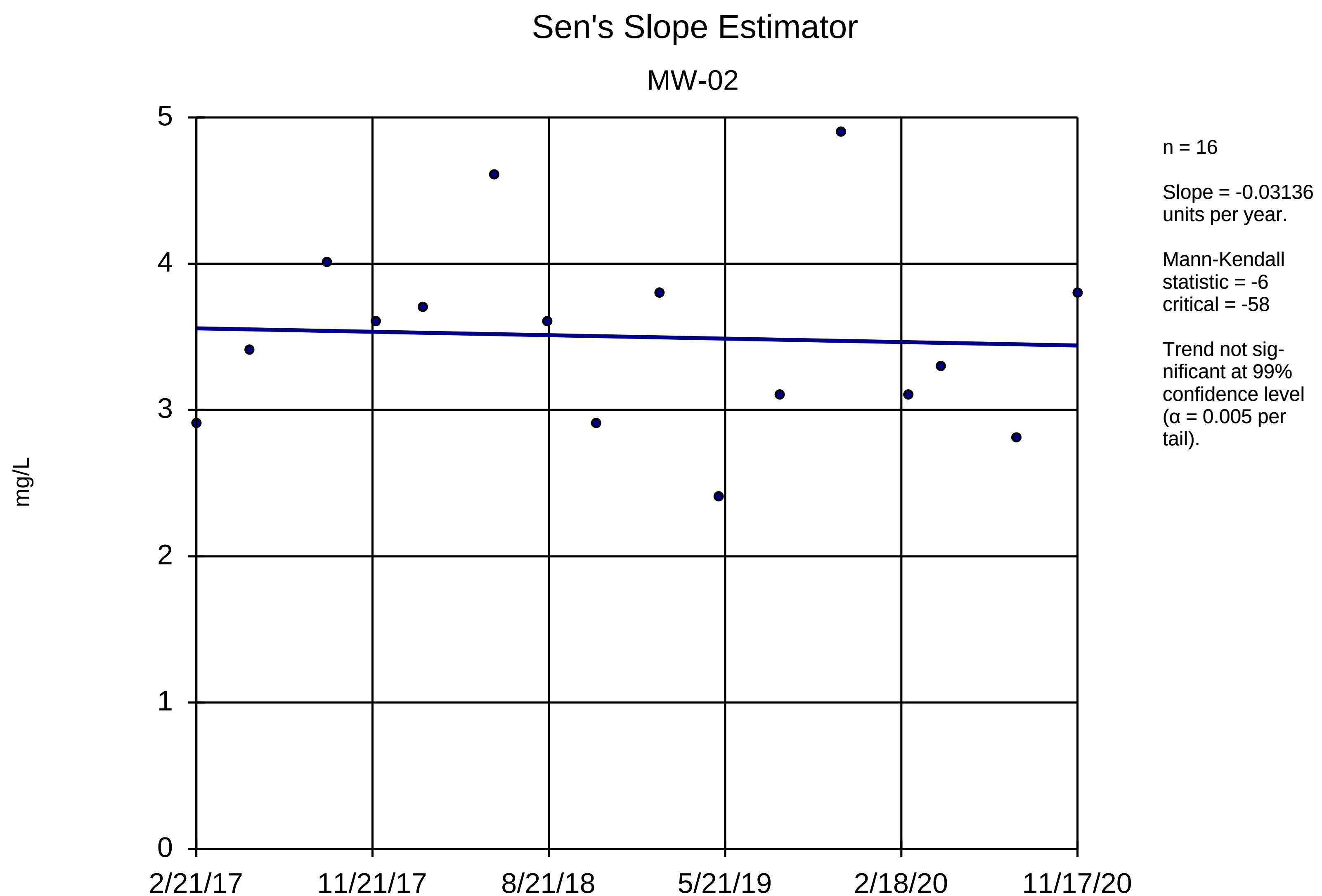


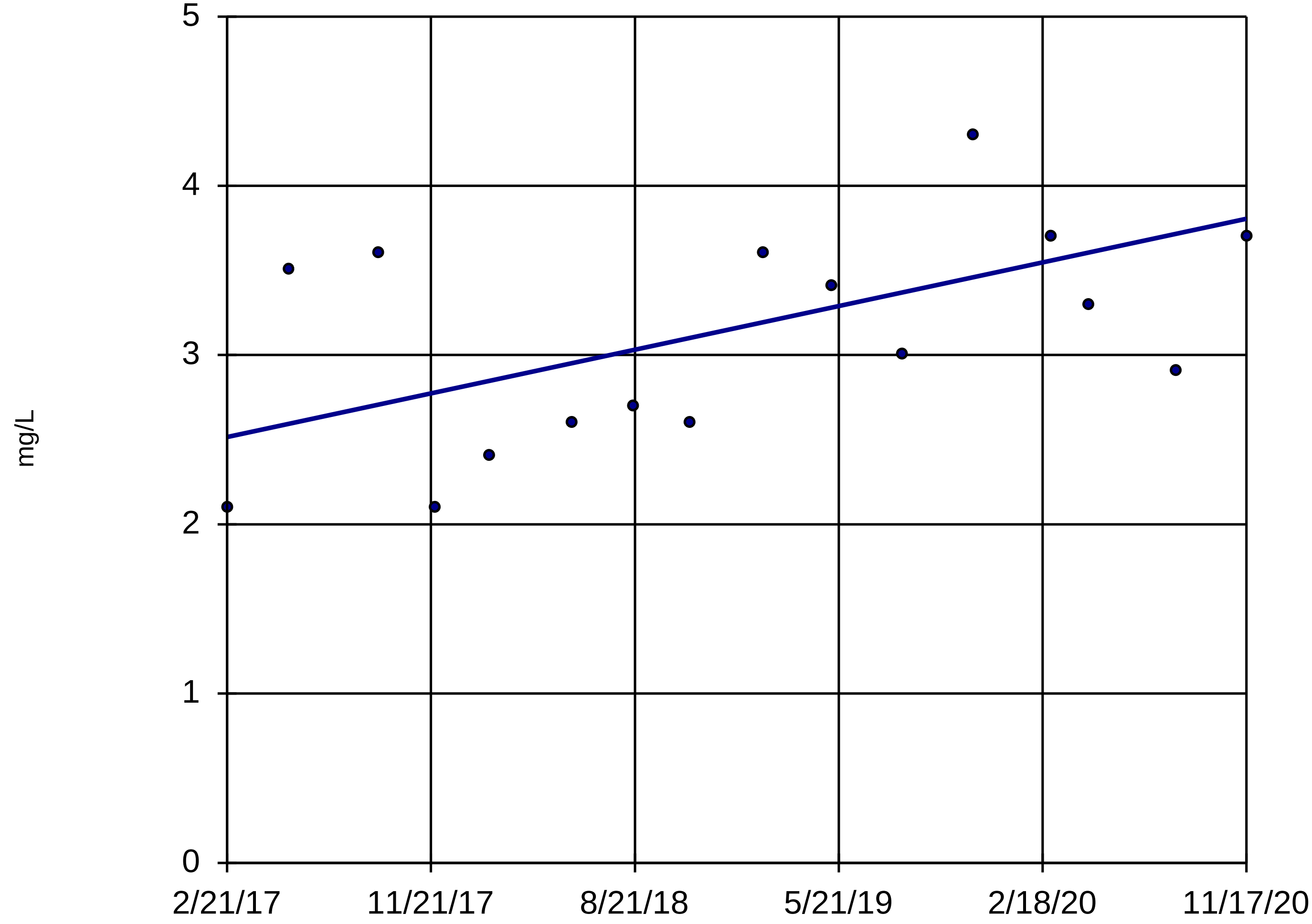

Constituent: Boron, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82075

# Sen's Slope Estimator

MW-03




n = 16

Slope = 0.3447
units per year.

Mann-Kendall
statistic = 48
critical = 58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

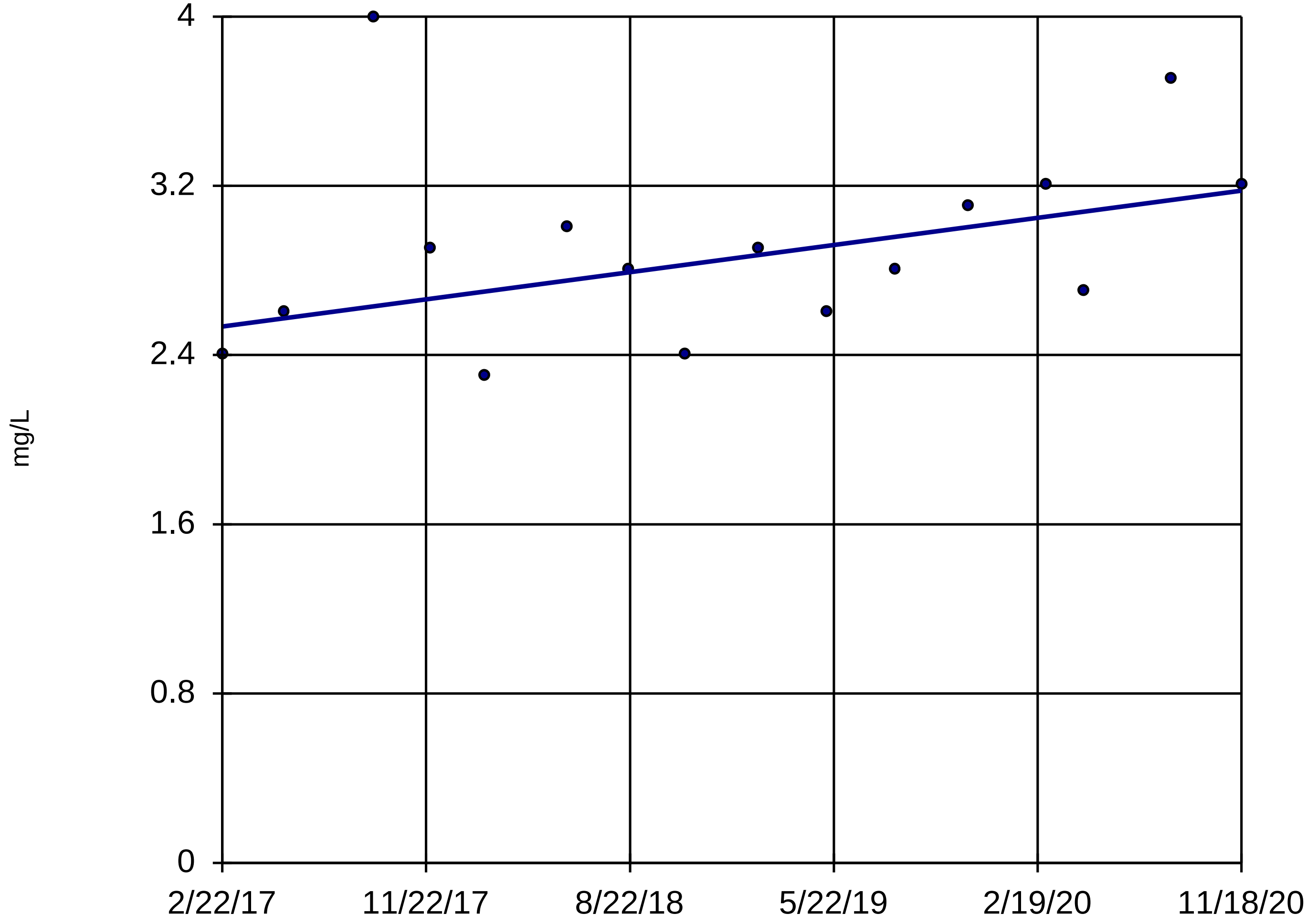
Constituent: Boron, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82076

## Sen's Slope Estimator

MW-04




n = 16

Slope = 0.1715 units per year.

Mann-Kendall statistic = 39 critical = 58

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82077

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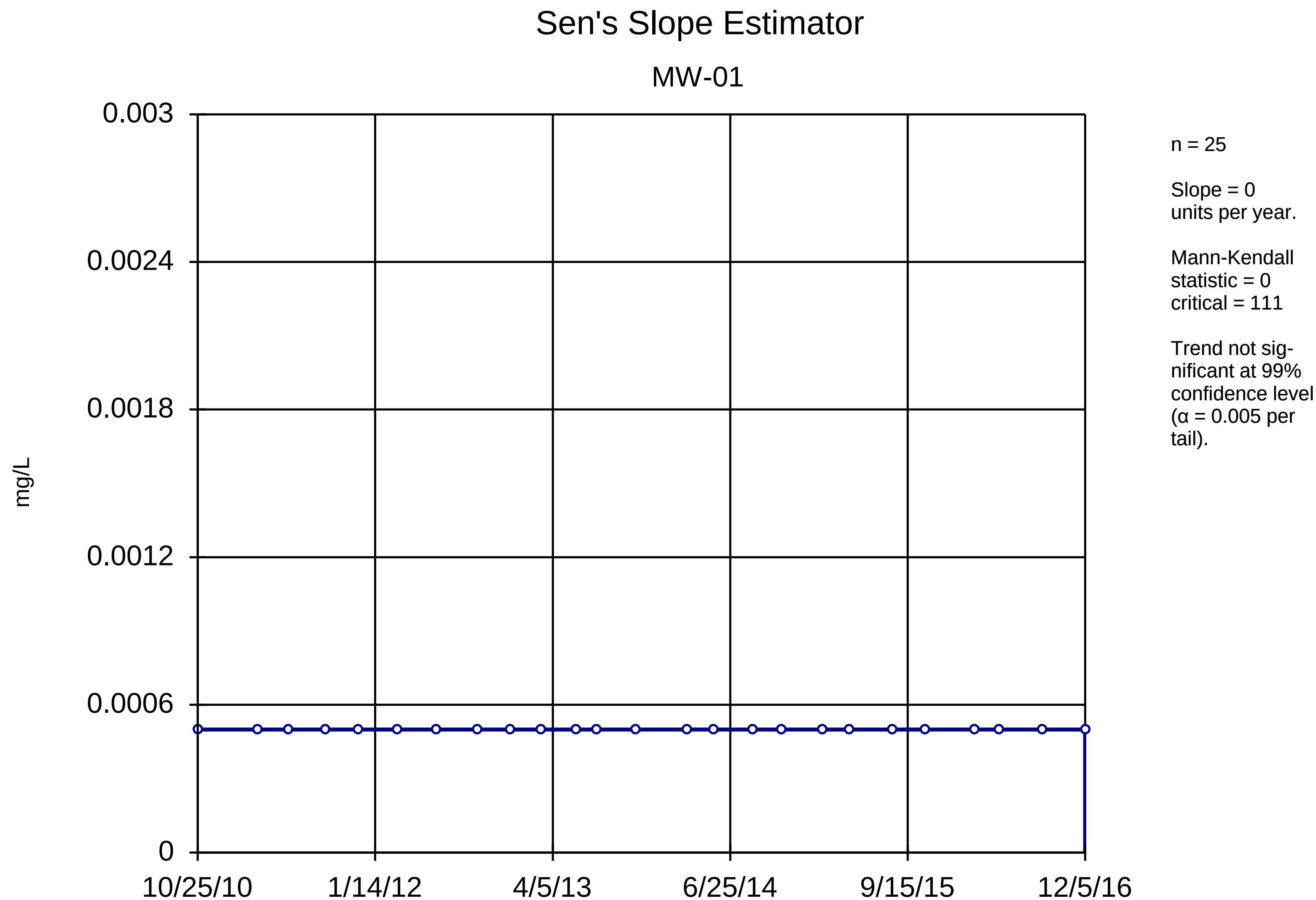
Hollow symbols indicate censored values.

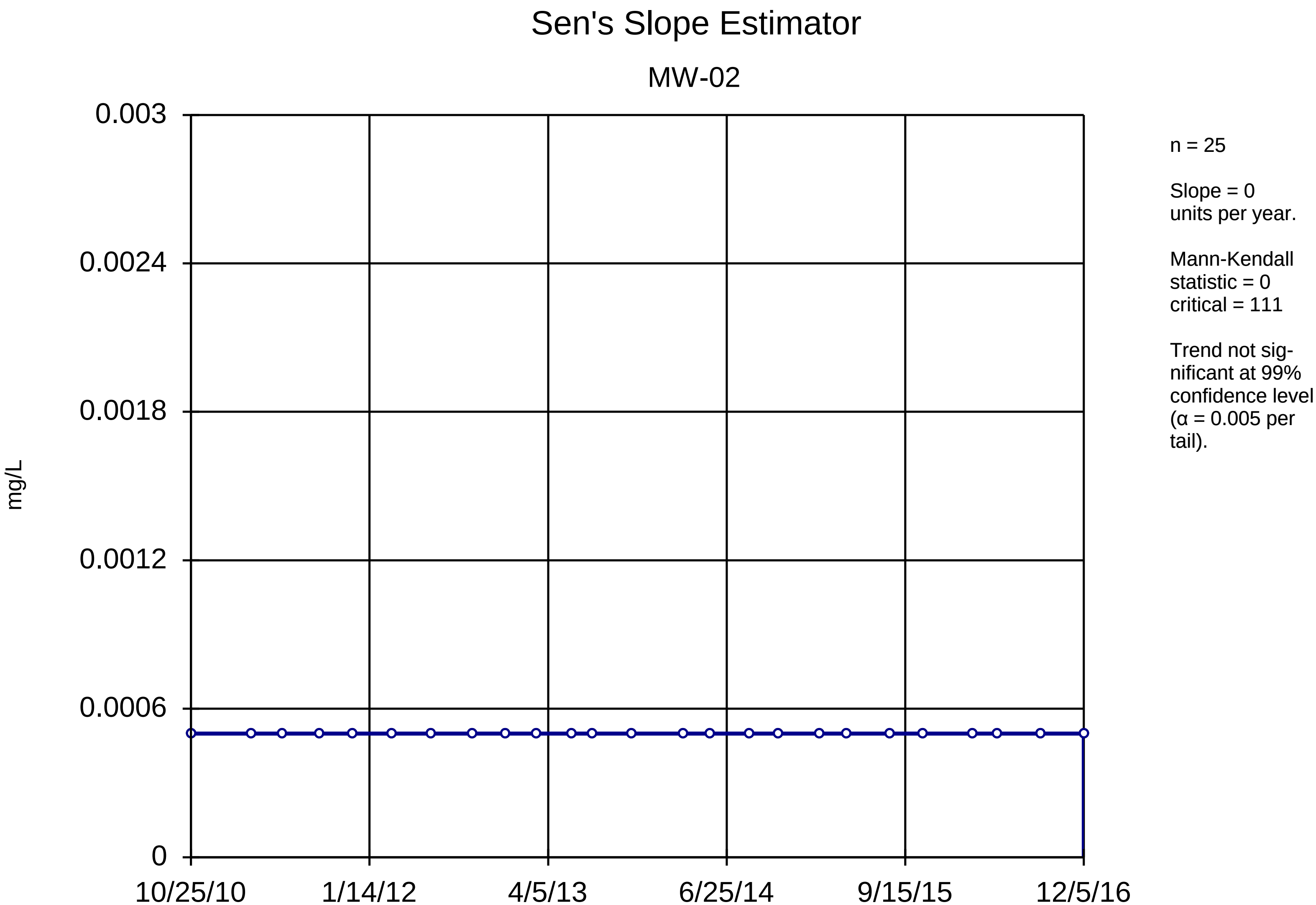



Constituent: Cadmium, Dissolved Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82078

Hollow symbols indicate censored values.

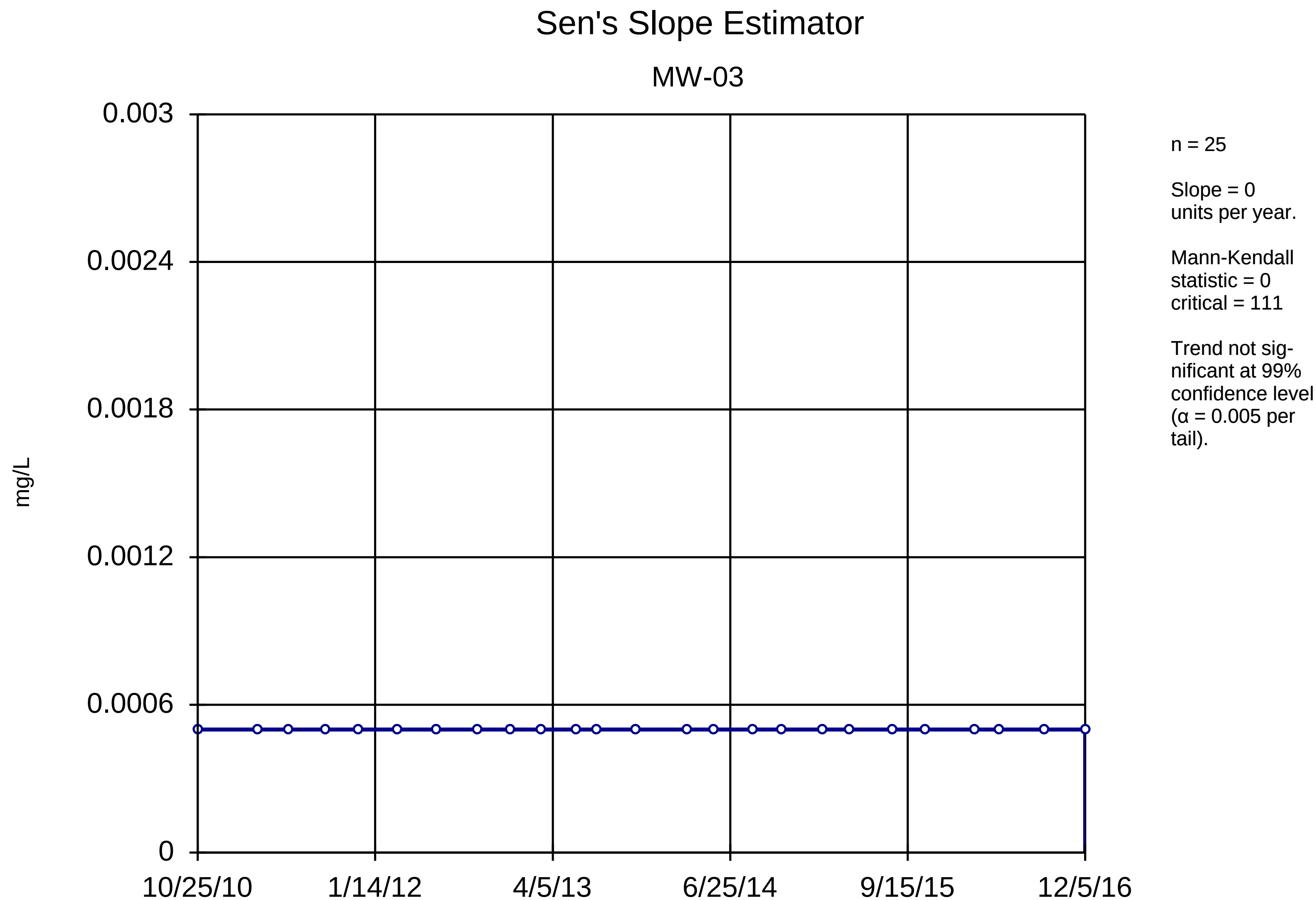



Constituent: Cadmium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82079

Hollow symbols indicate censored values.

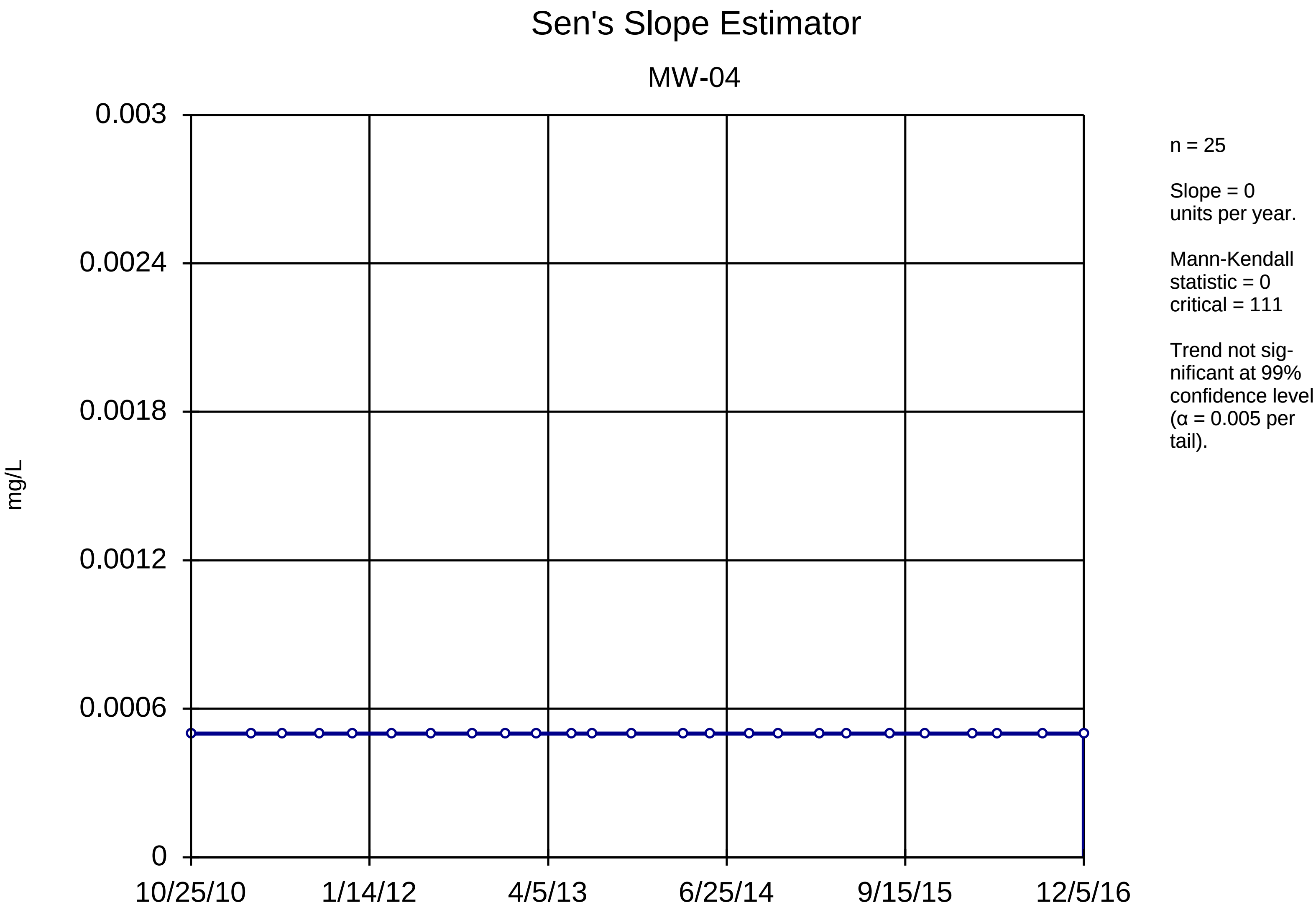



Constituent: Cadmium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82080

Hollow symbols indicate censored values.

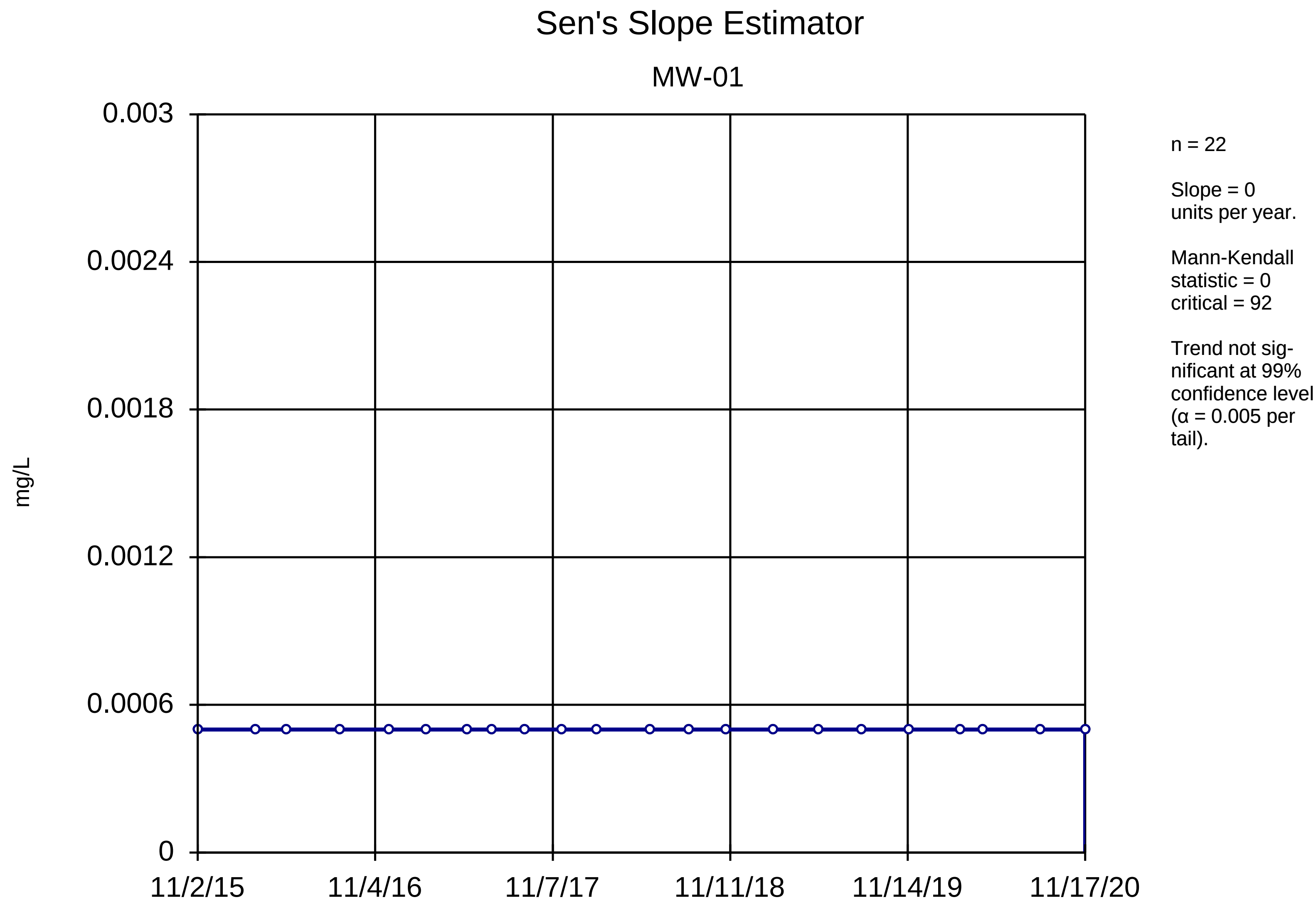



Constituent: Cadmium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82081

Hollow symbols indicate censored values.

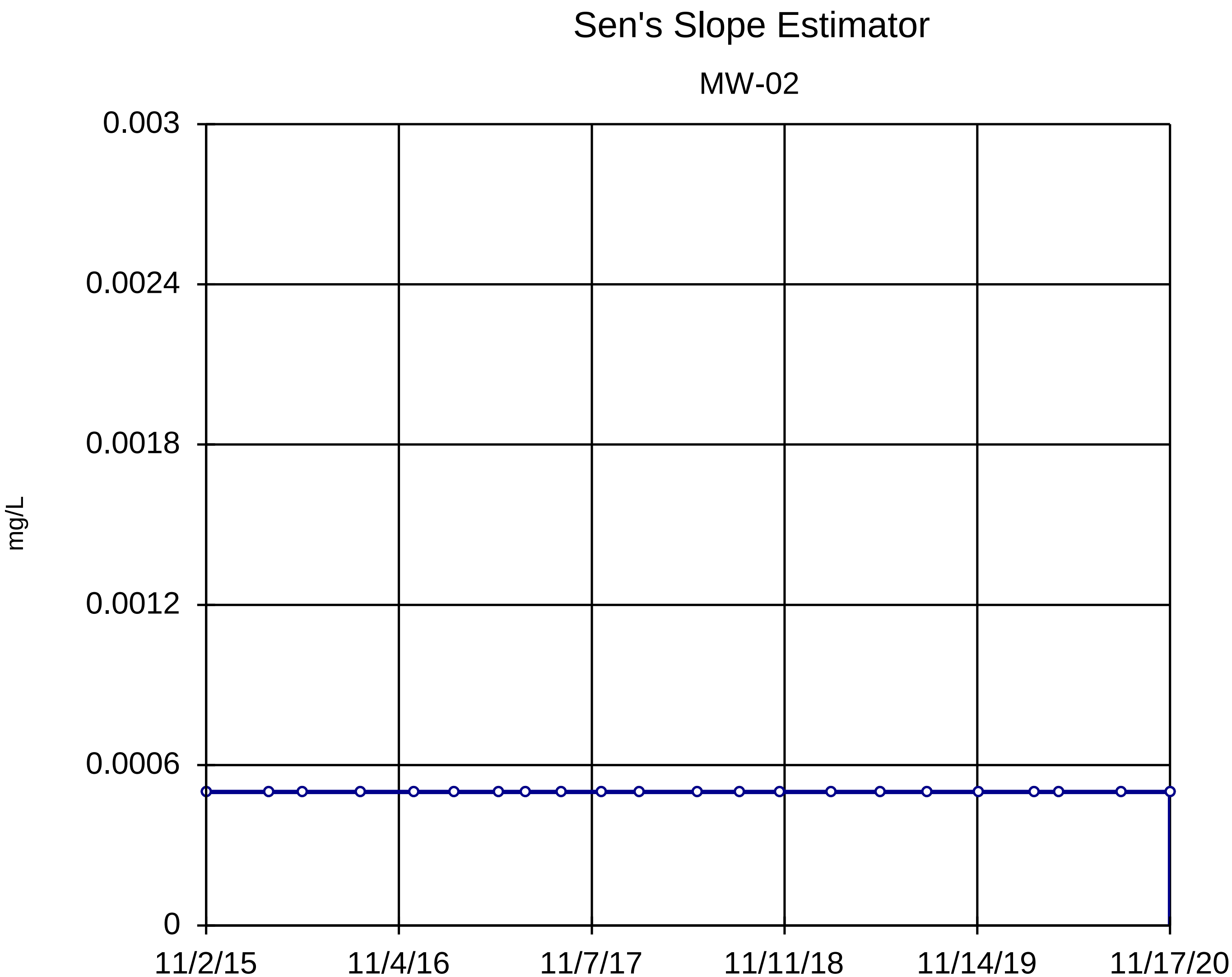



Constituent: Cadmium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82082

Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82083

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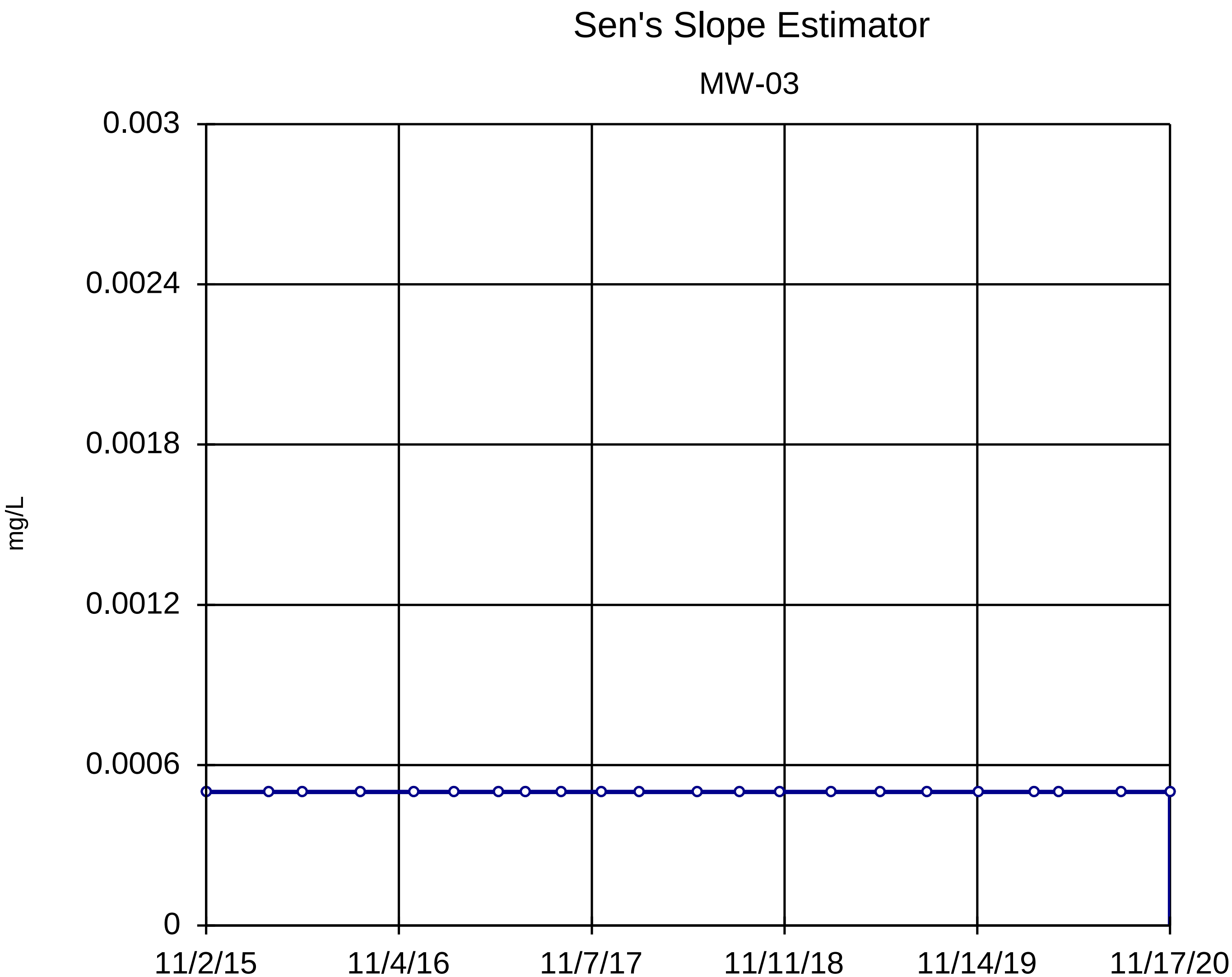
Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

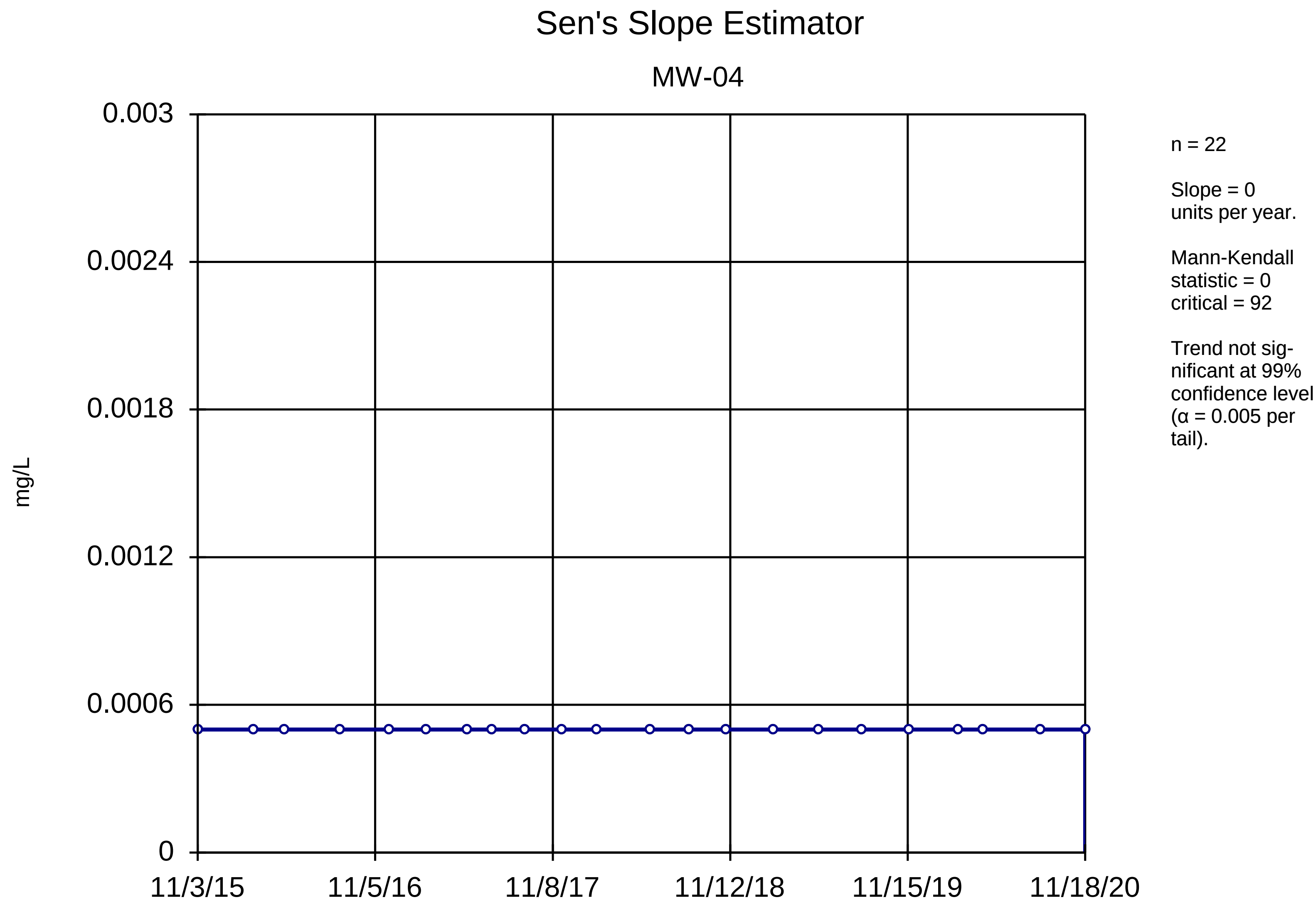
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cadmium, Total Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82084

Hollow symbols indicate censored values.



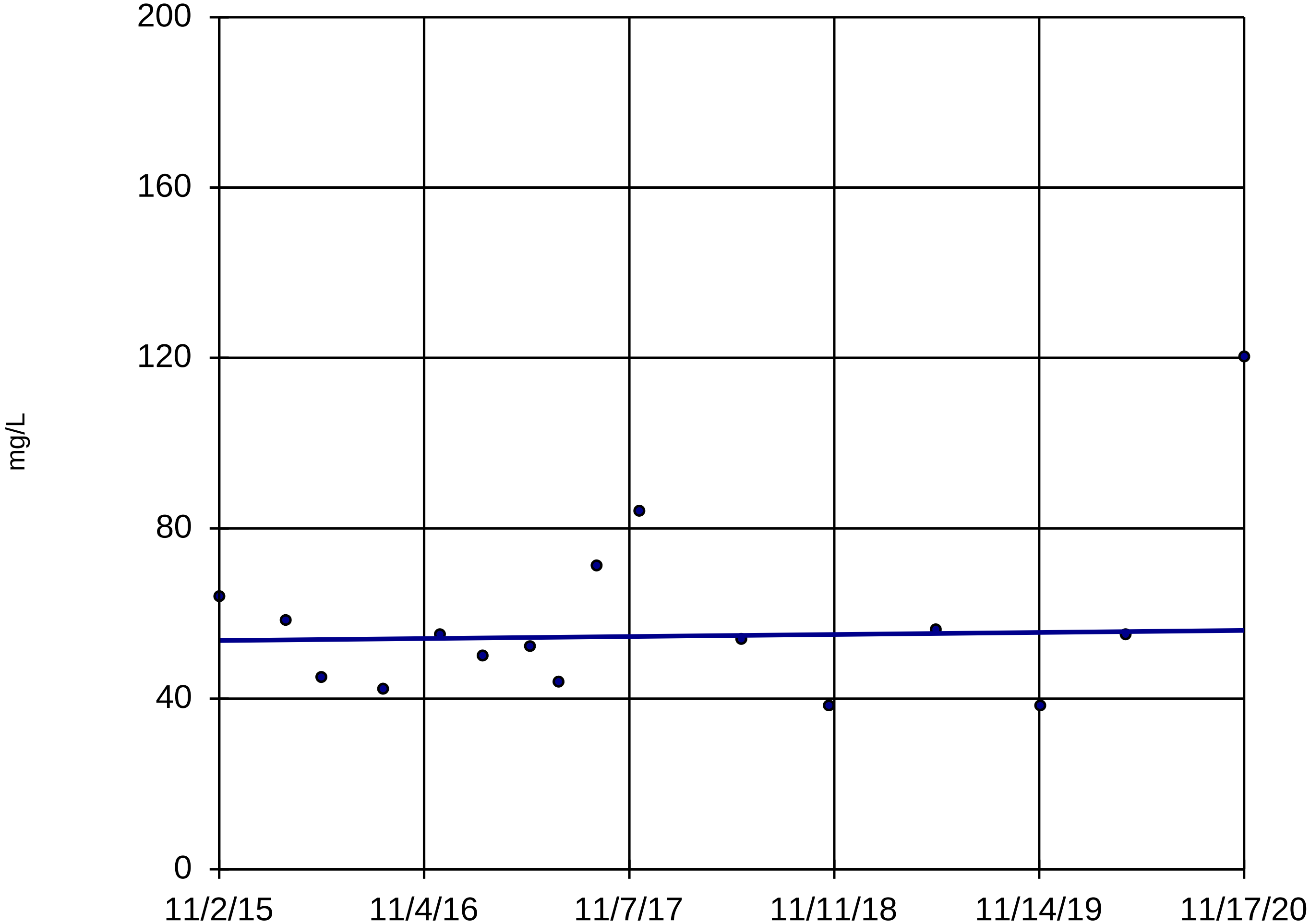

Constituent: Cadmium, Total Analysis Run 4/14/2021 1:01 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82085

## Sen's Slope Estimator

MW-01




n = 16

Slope = 0.4684
units per year.

Mann-Kendall
statistic = 4
critical = 58

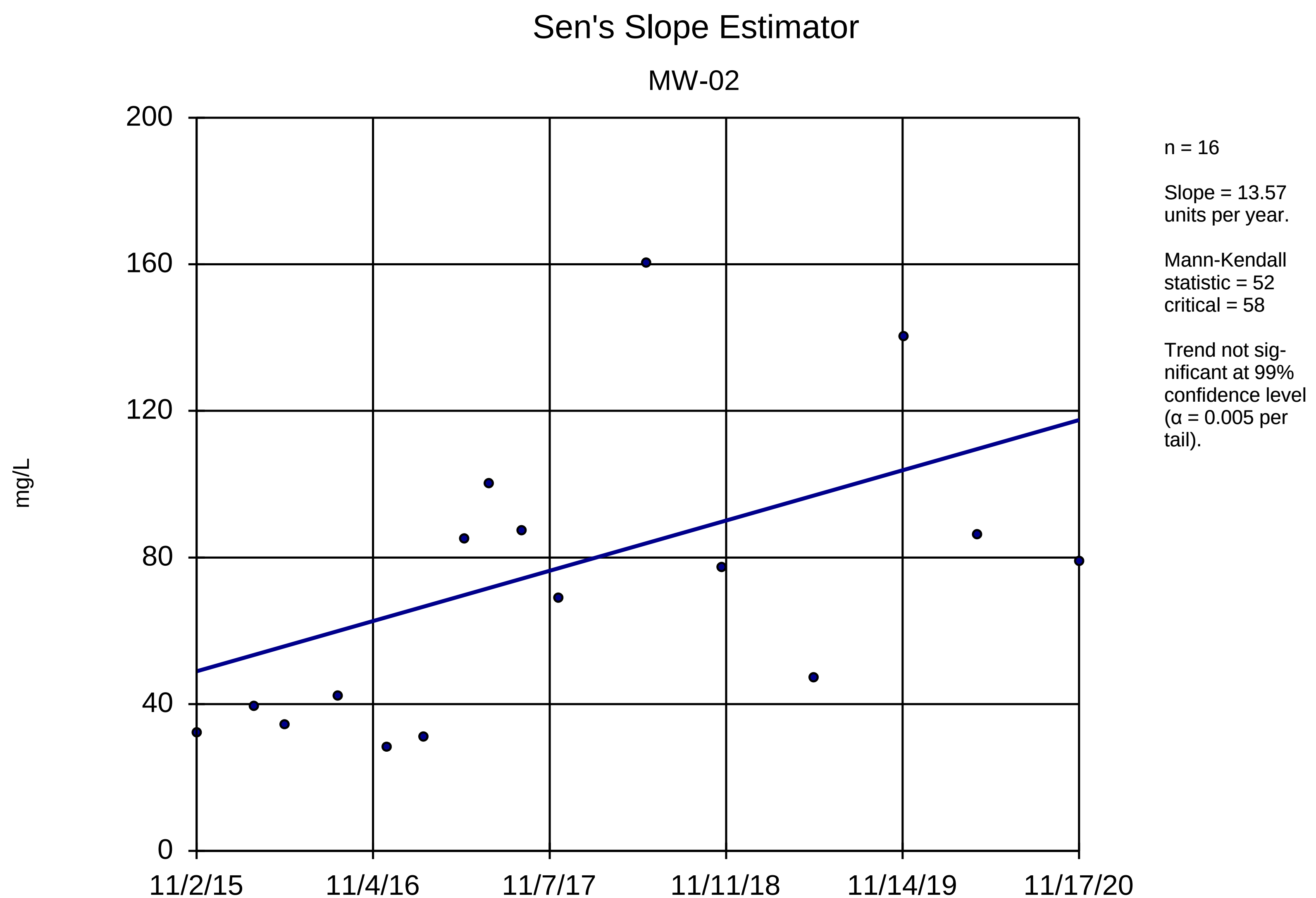
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Calcium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

Electronic Filing: Received, Clerk's Office 01/21/2022

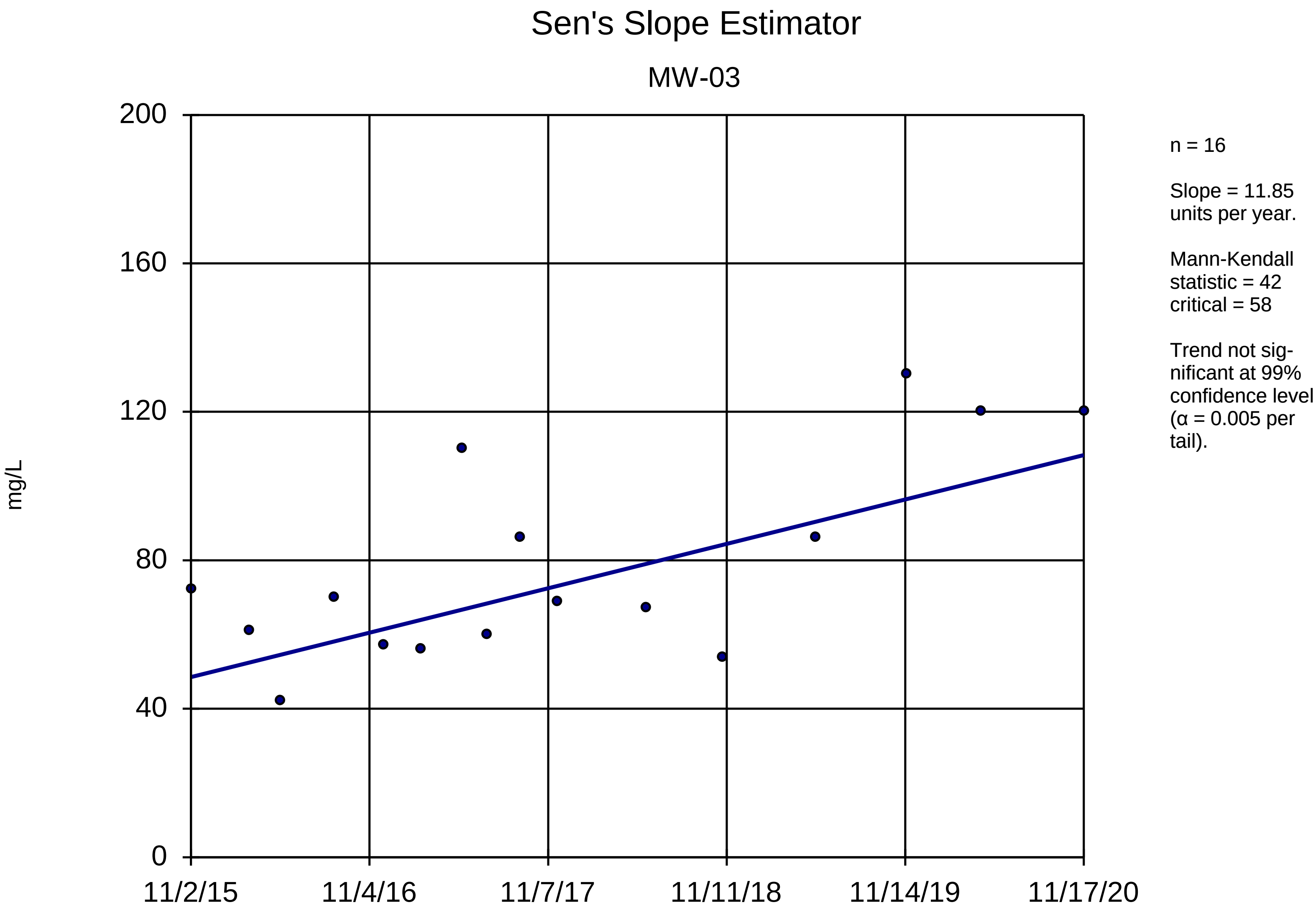





Constituent: Calcium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

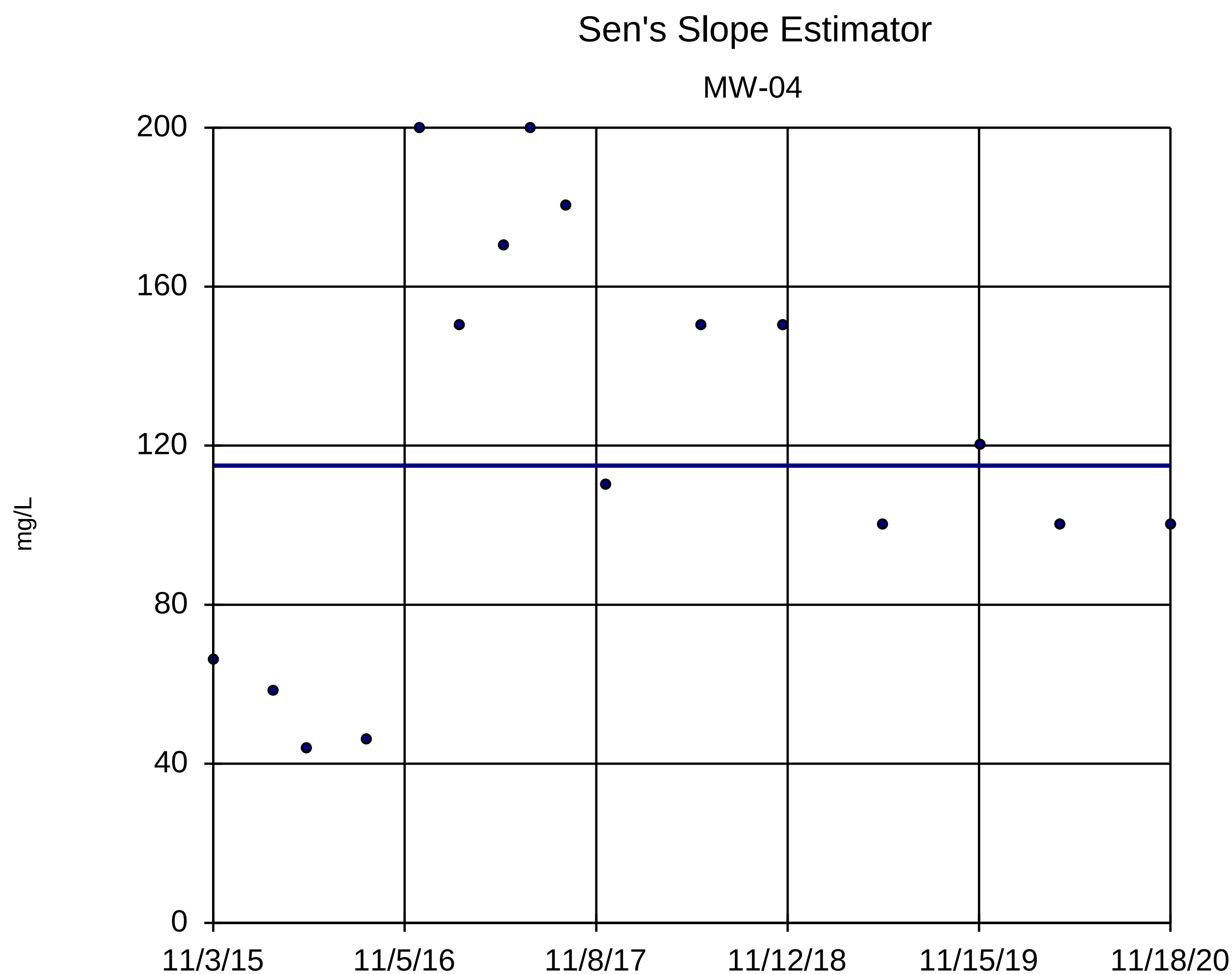
MWG13-15_82087




Constituent: Calcium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82088




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = 3
critical = 58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

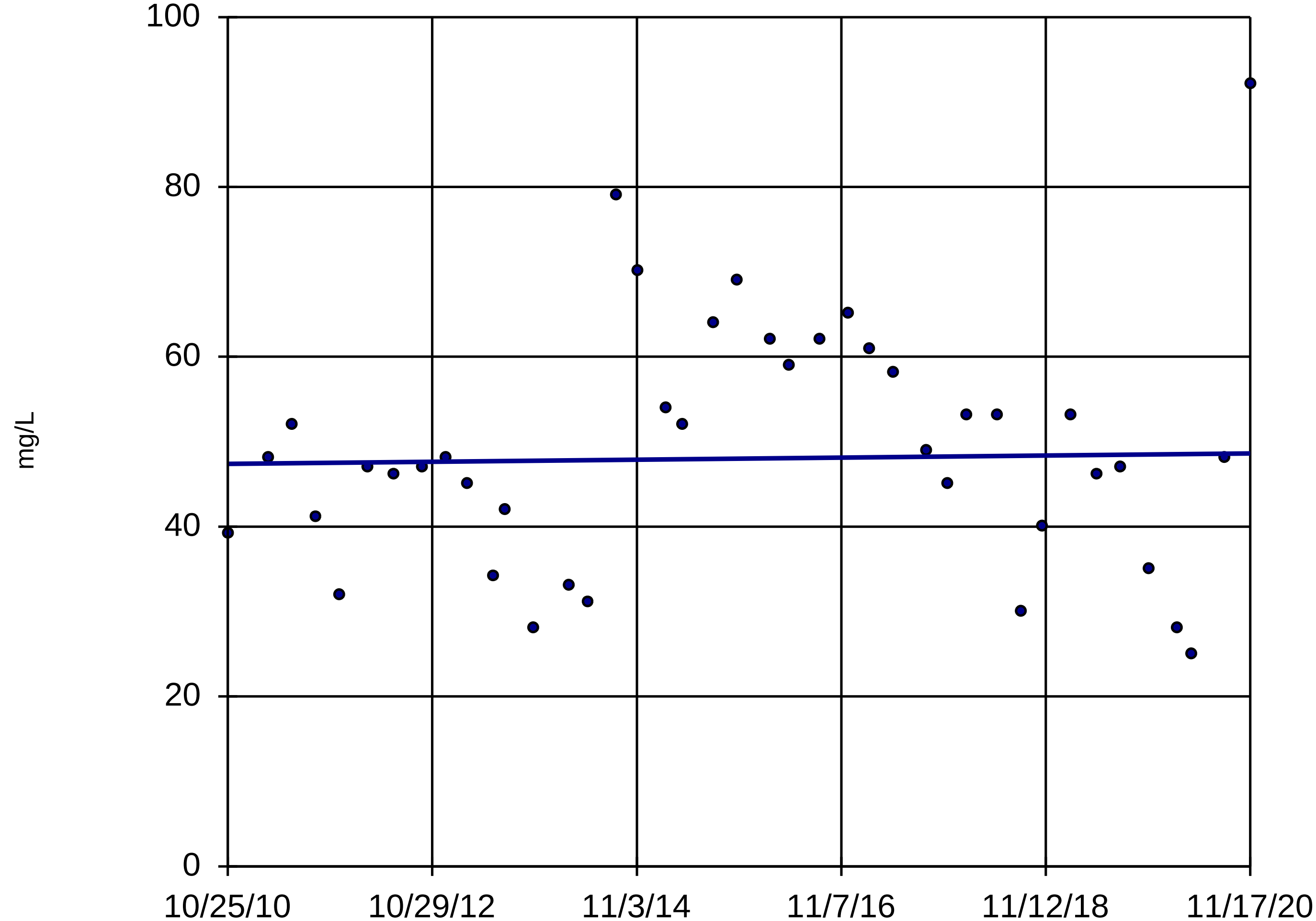
Constituent: Calcium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82089

## Sen's Slope Estimator

MW-01




n = 41

Slope = 0.1215
units per year.

Mann-Kendall
normal approx. =
0.1687
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

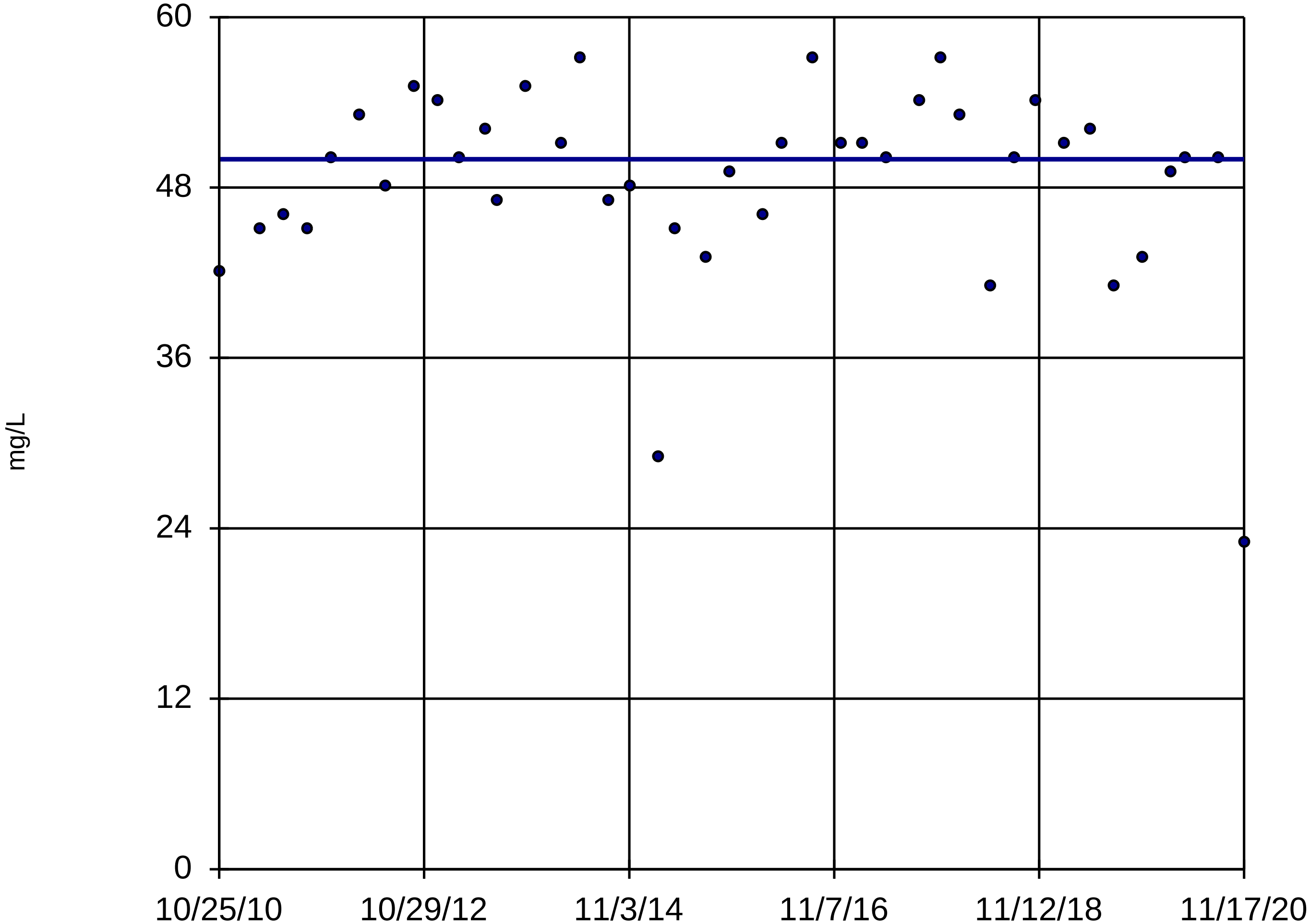
Constituent: Chloride    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82090

## Sen's Slope Estimator

MW-02




n = 41

Slope = 0
units per year.

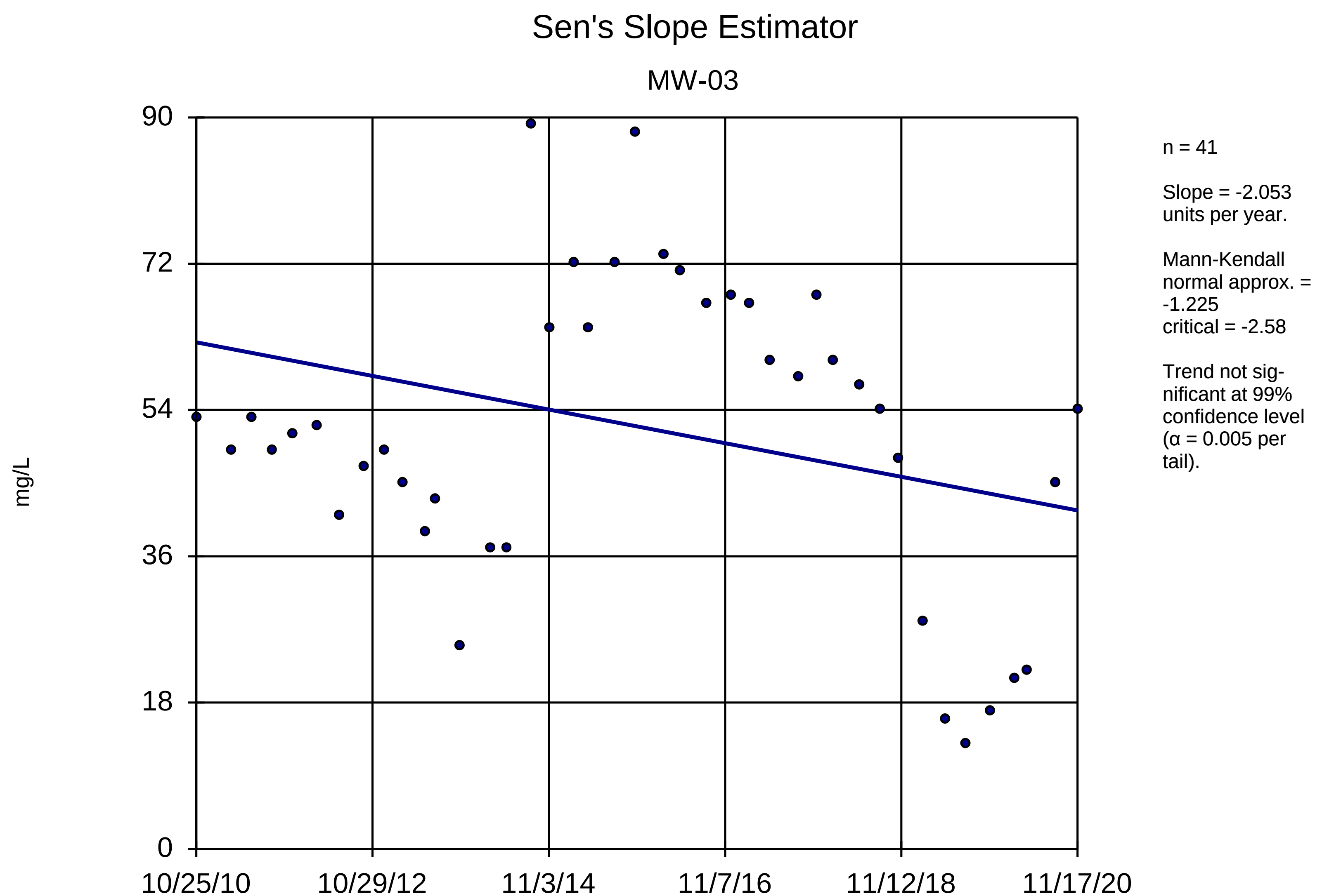
Mann-Kendall
normal approx. =
0.1353
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Chloride    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

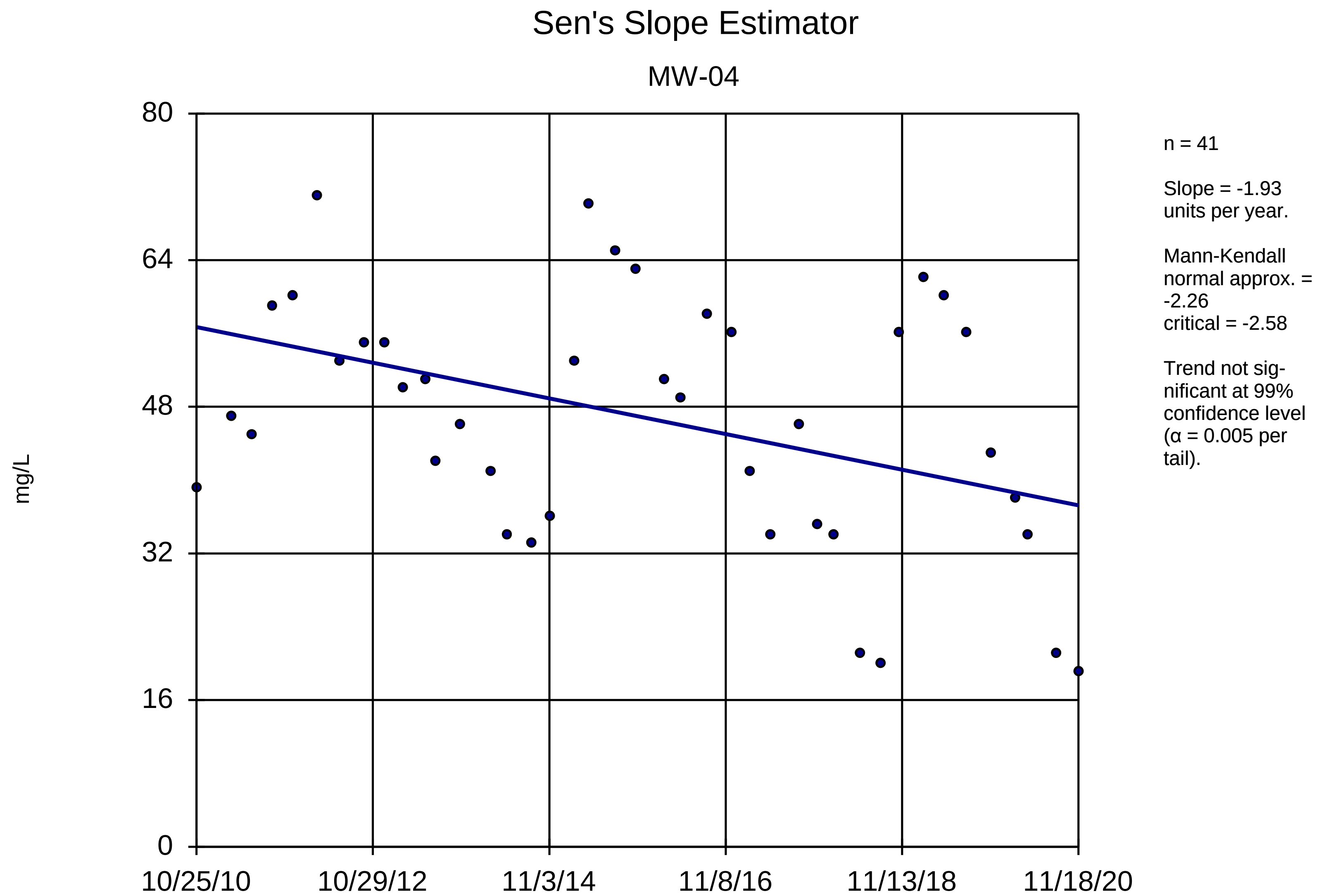
MWG13-15_82091




Constituent: Chloride    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82092




Constituent: Chloride    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

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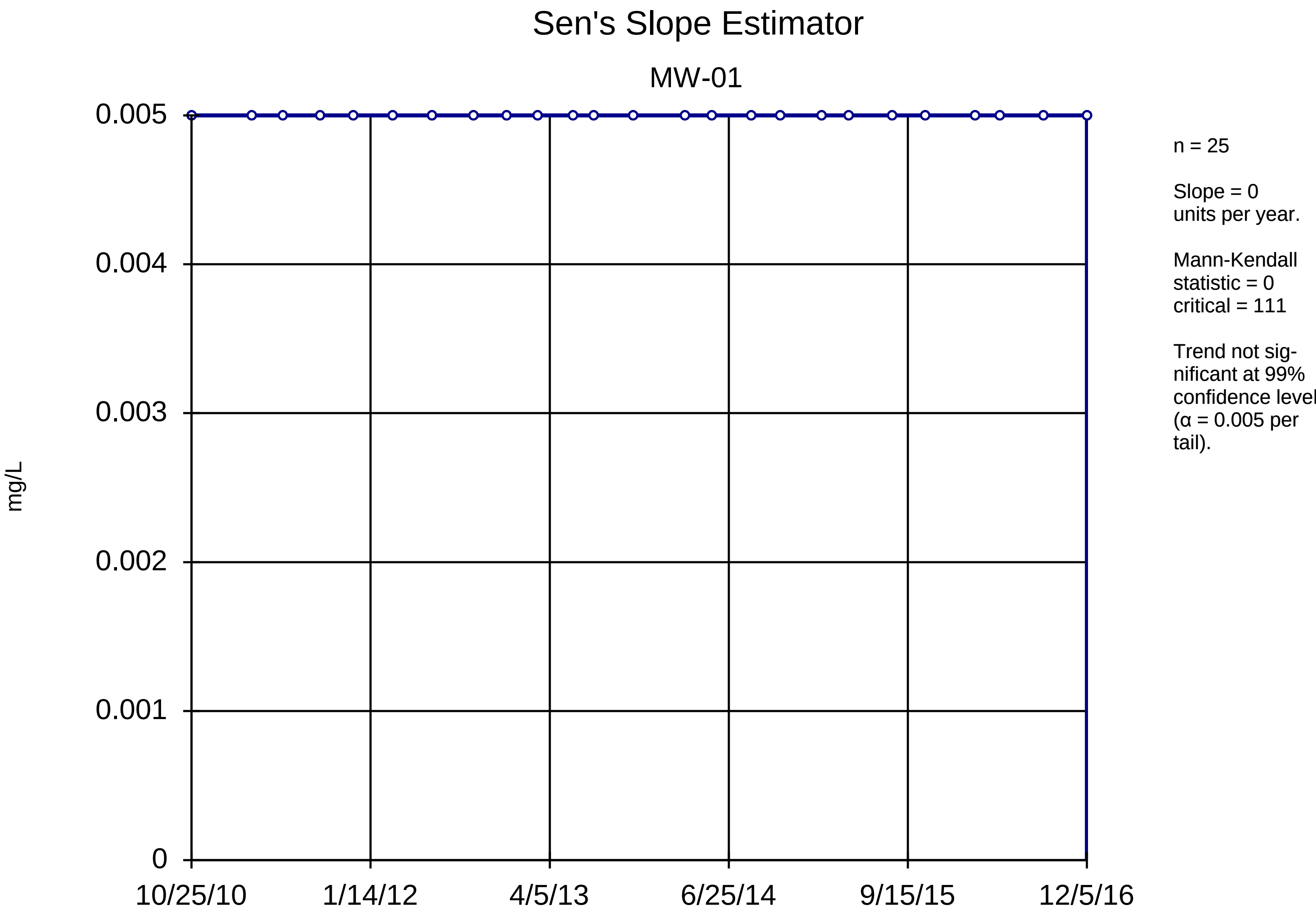
Hollow symbols indicate censored values.




Constituent: Chromium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82094

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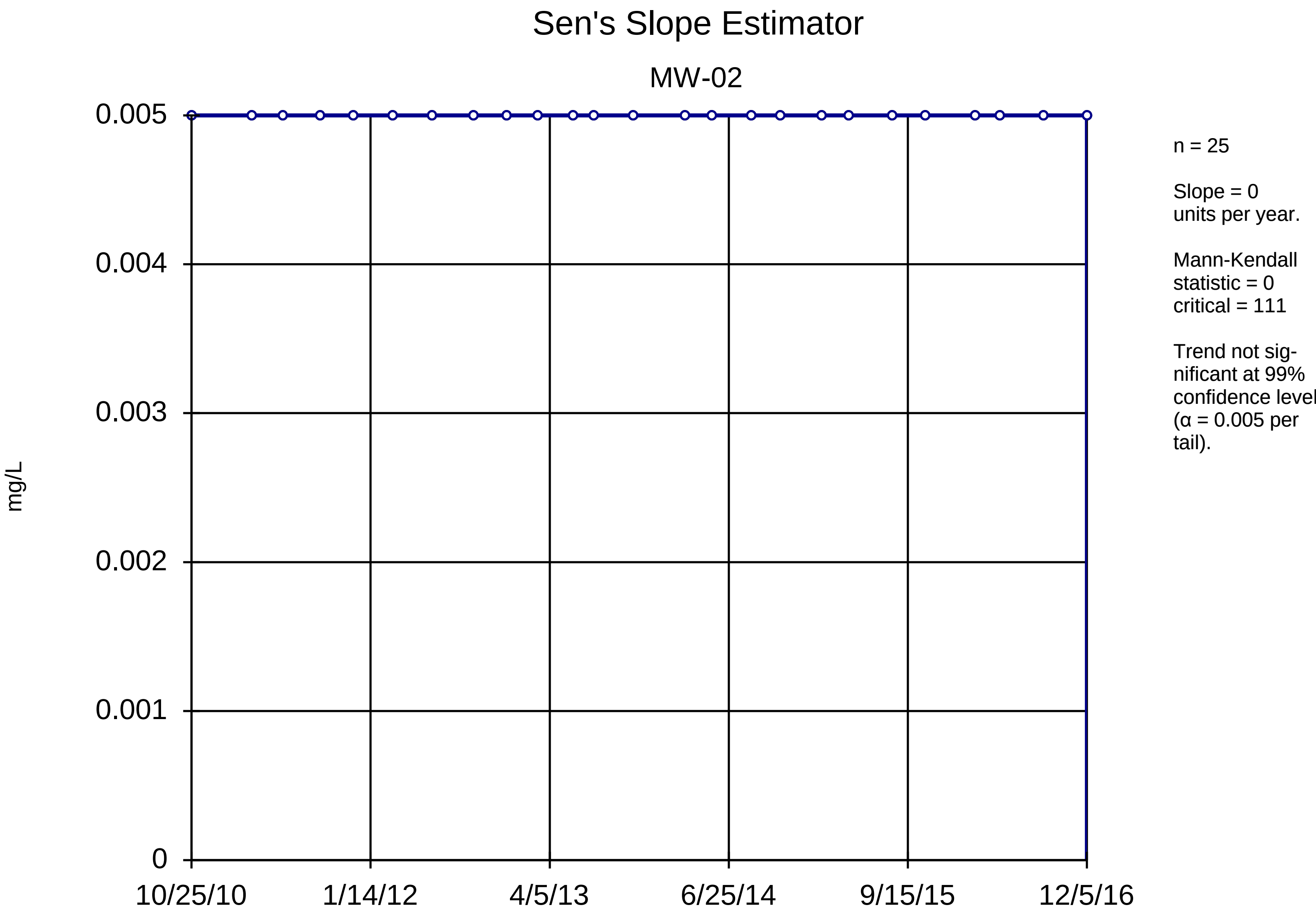
Hollow symbols indicate censored values.

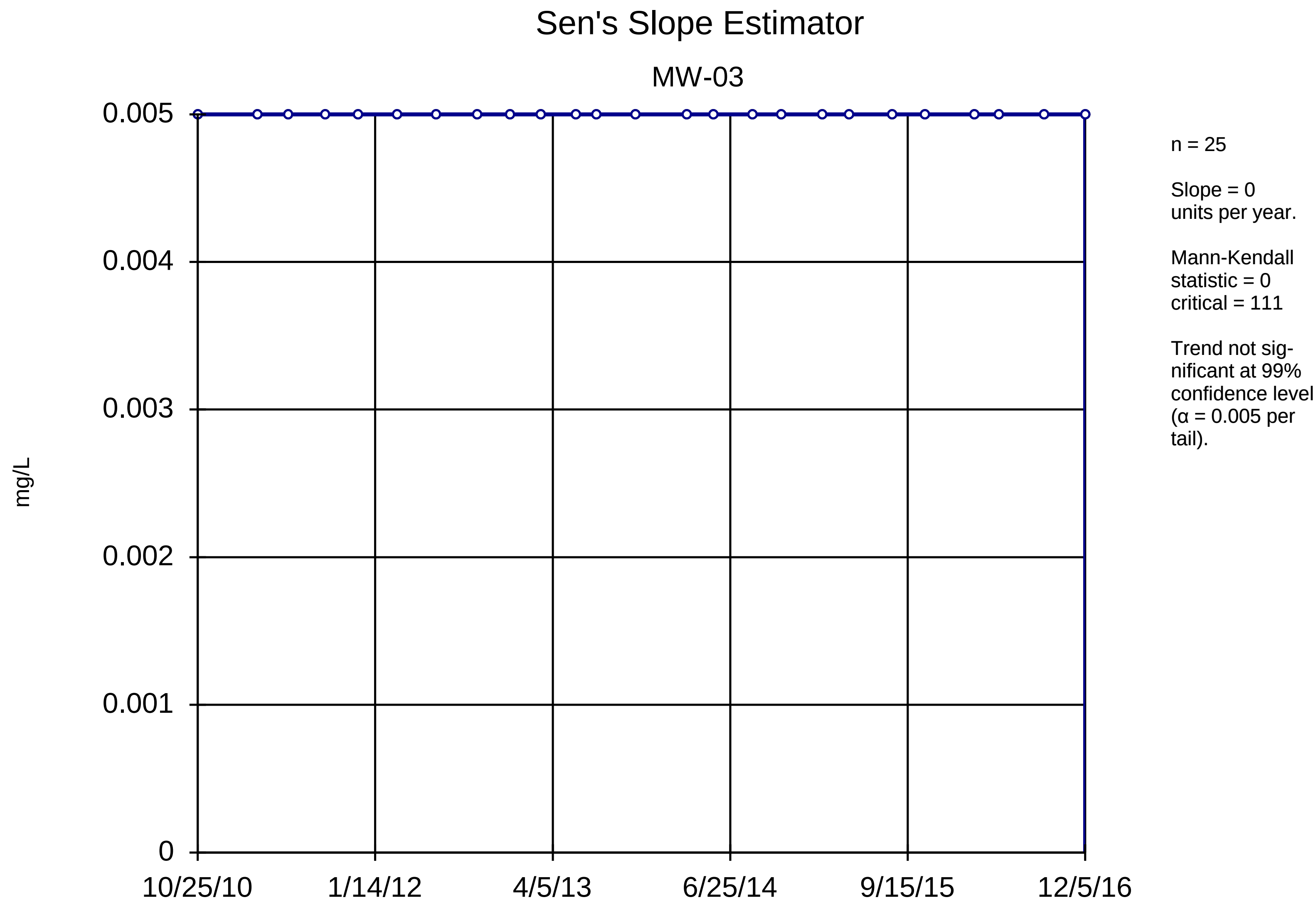



Constituent: Chromium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82095

Hollow symbols indicate censored values.



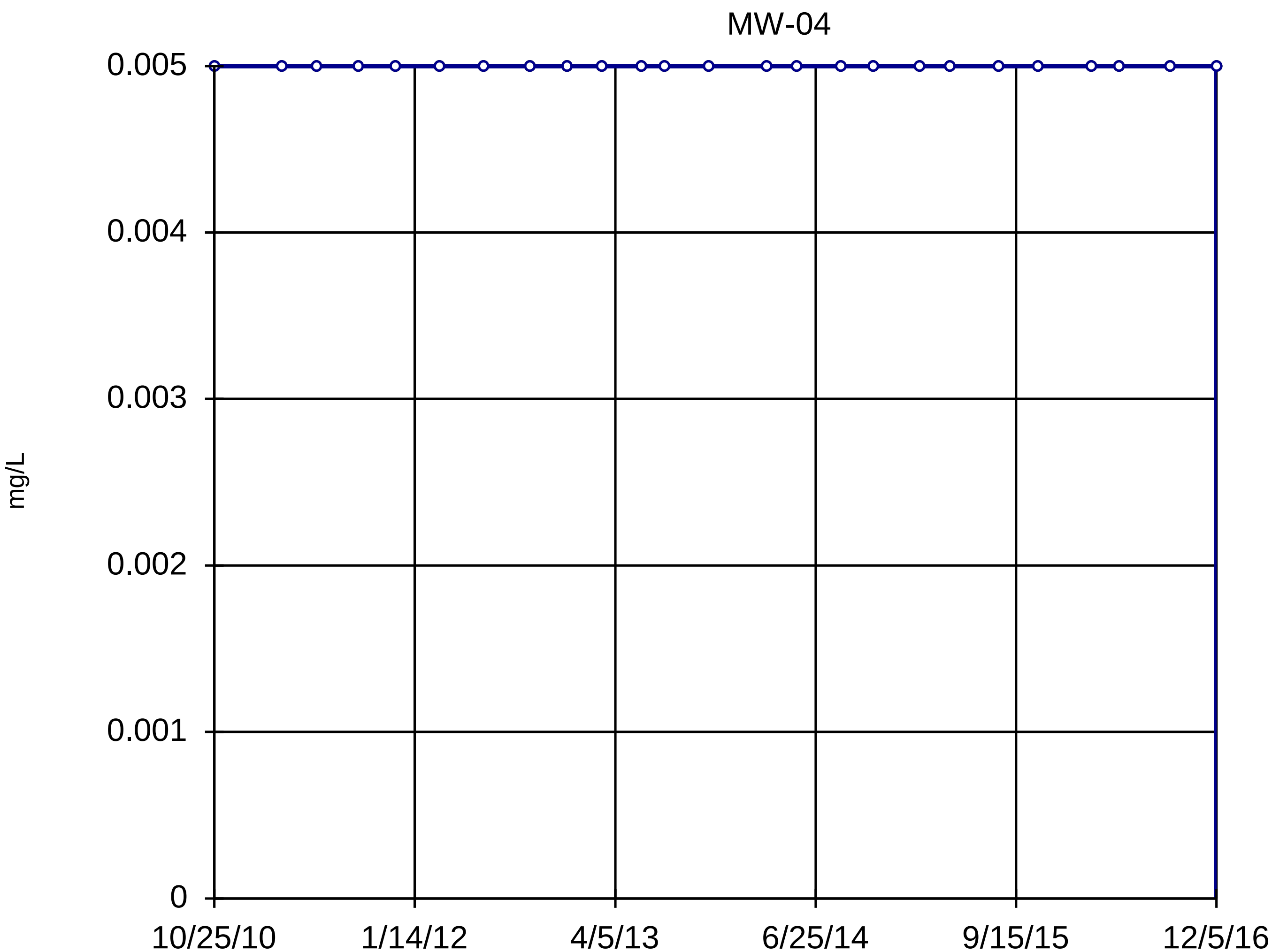

Constituent: Chromium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82096

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Chromium, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82097

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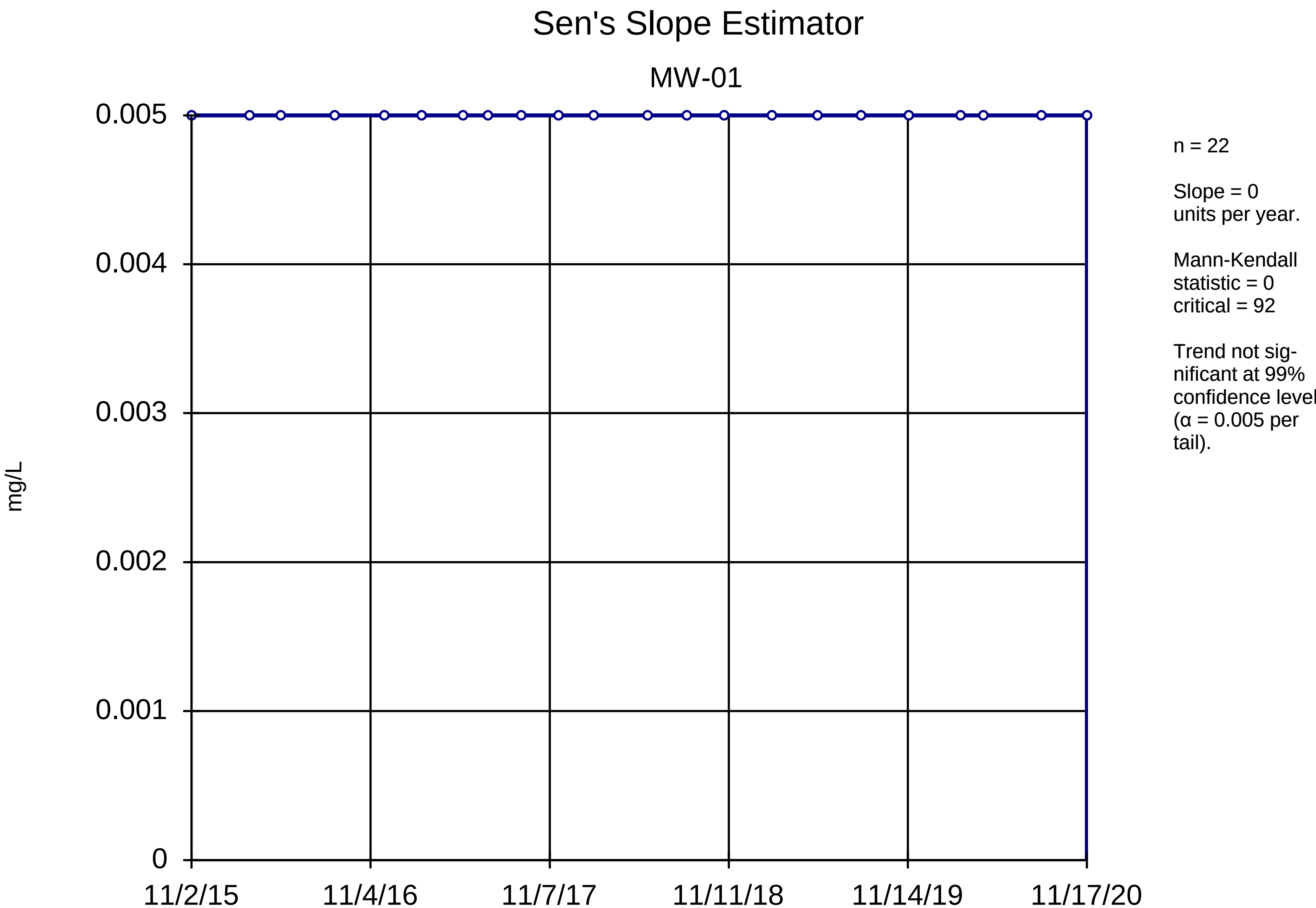
Hollow symbols indicate censored values.

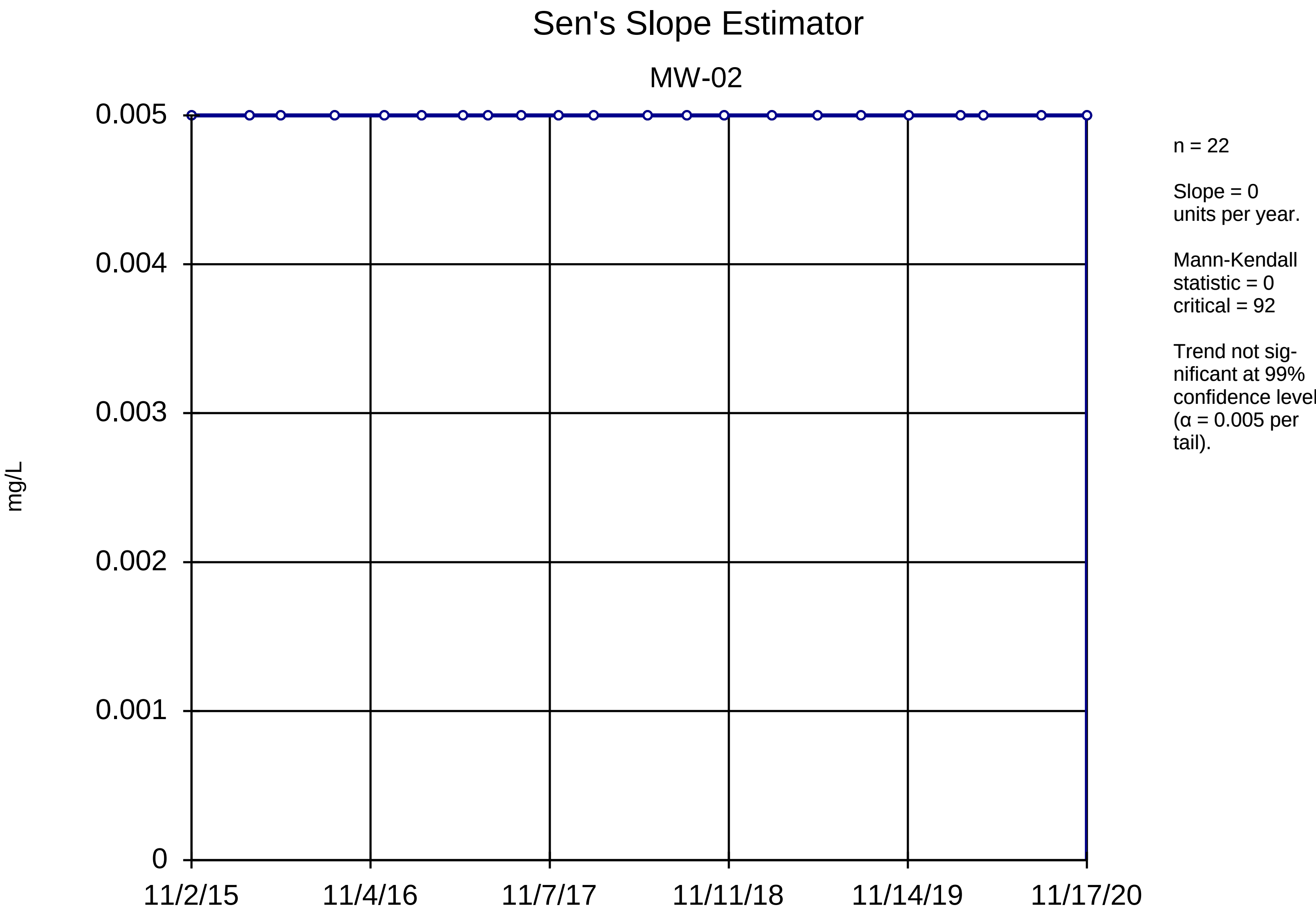



Constituent: Chromium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82098

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

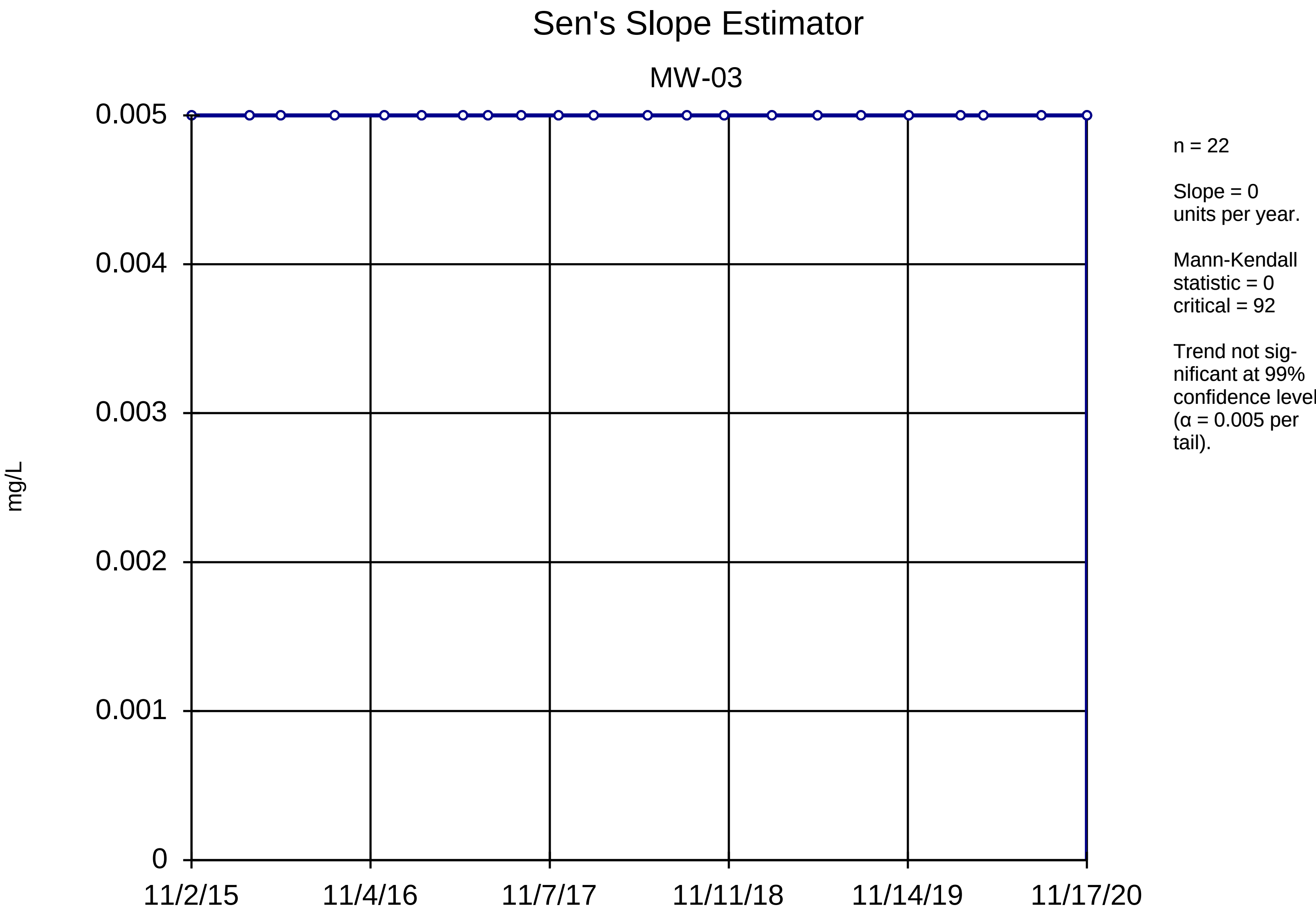



Constituent: Chromium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82099

Hollow symbols indicate censored values.

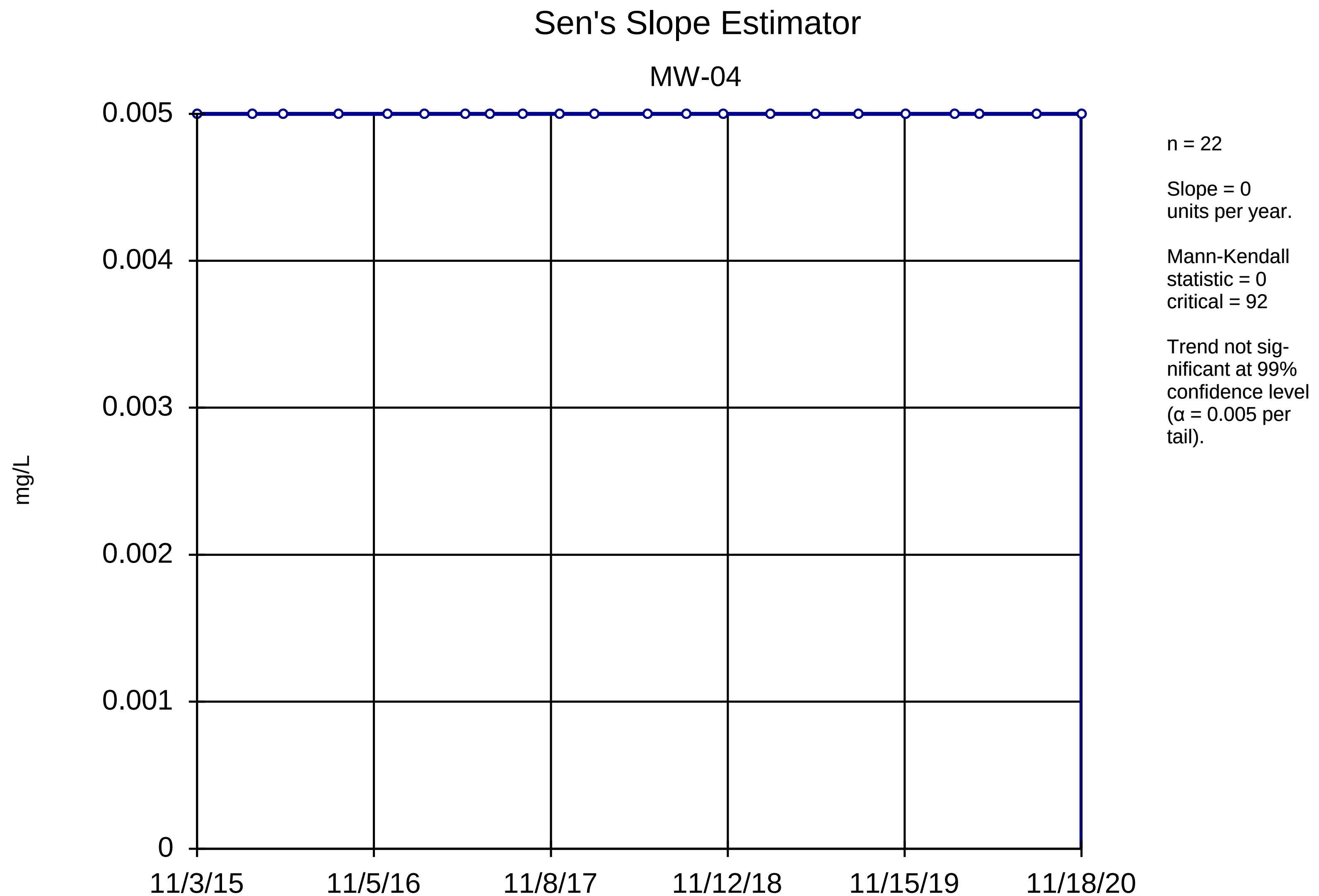



Constituent: Chromium, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82100

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Chromium, Total    Analysis Run 4/14/2021 1:01 PM

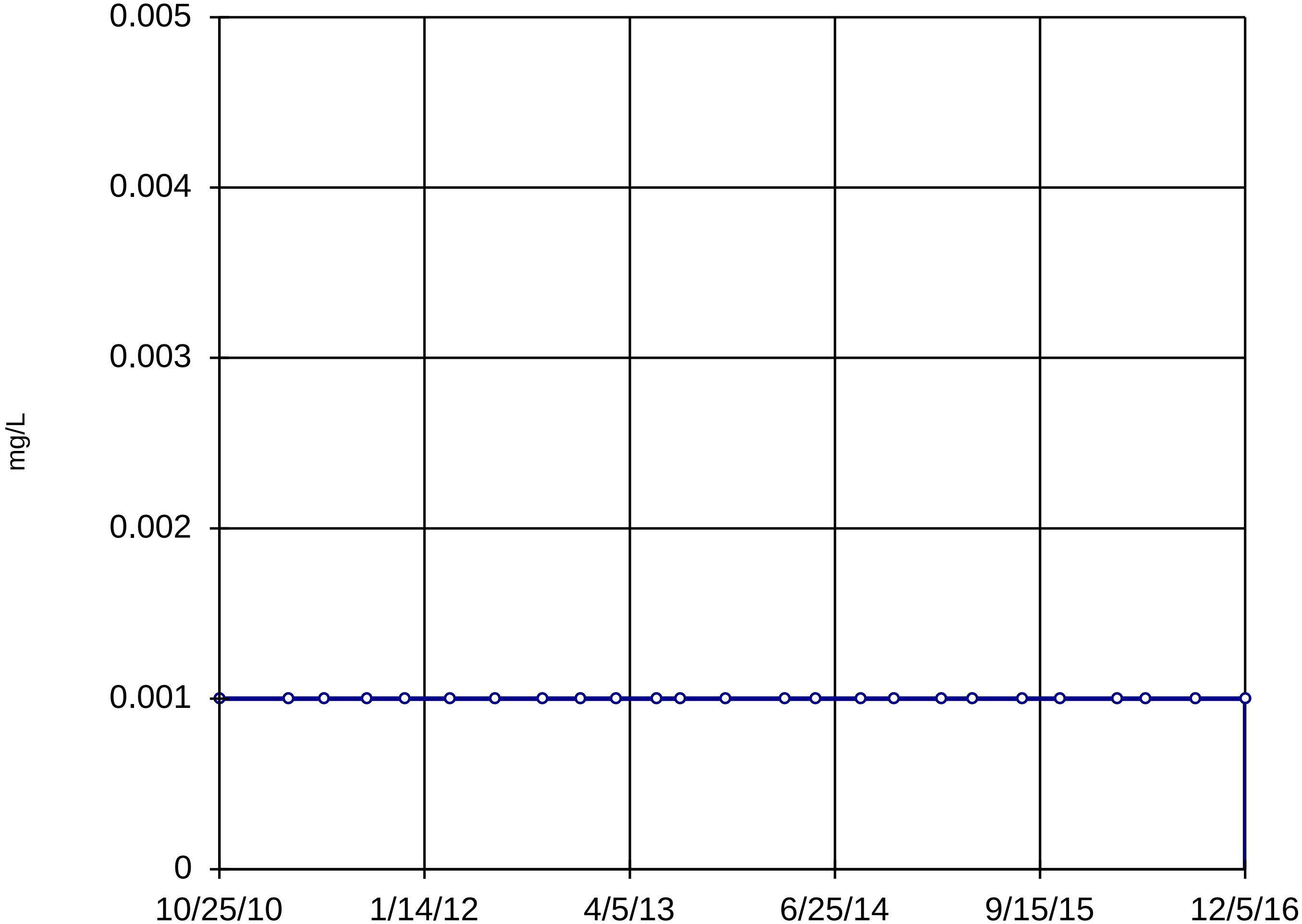
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82101

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-01




n = 25

Slope = 0
units per year.

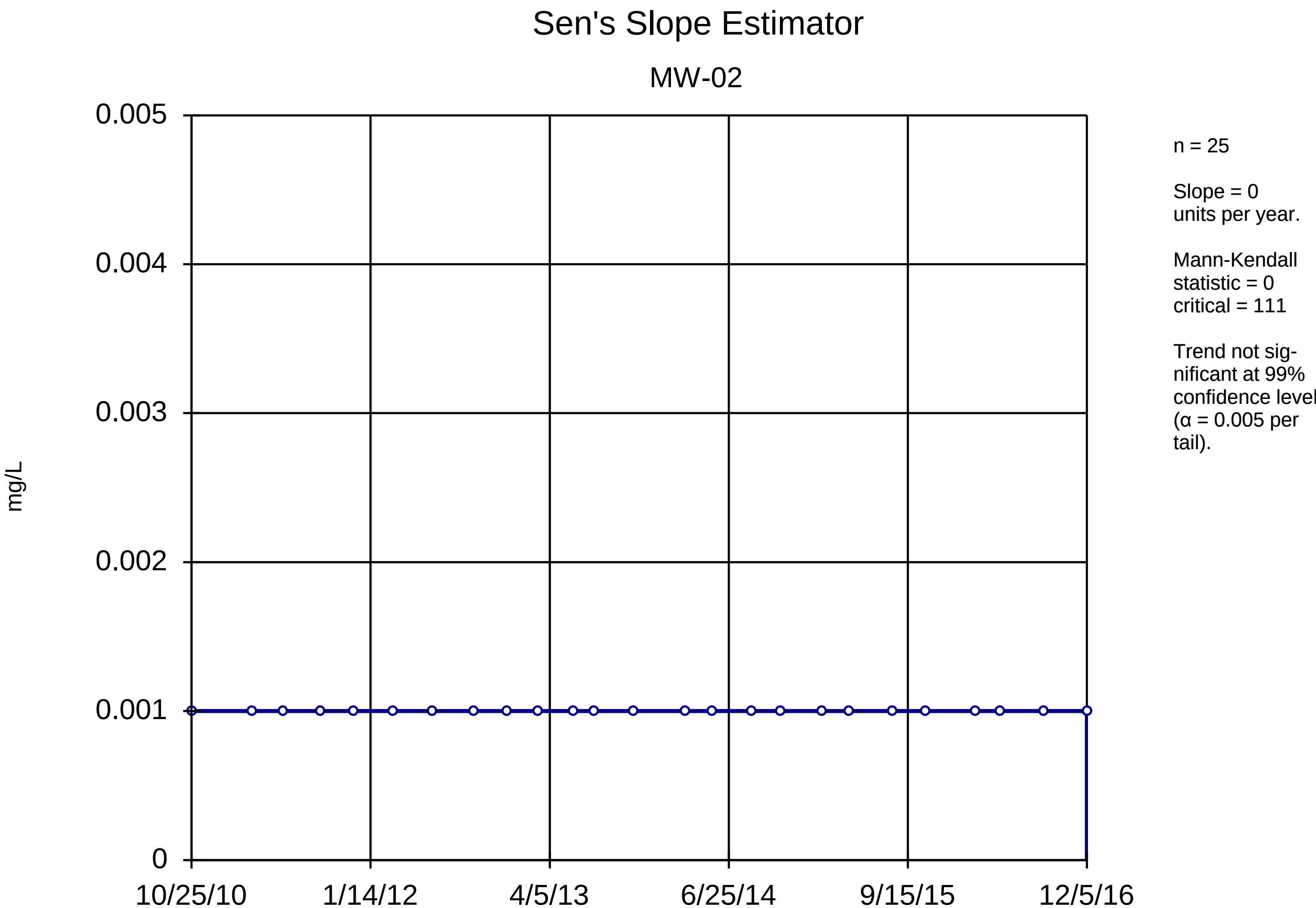
Mann-Kendall
statistic = 0
critical = 111

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

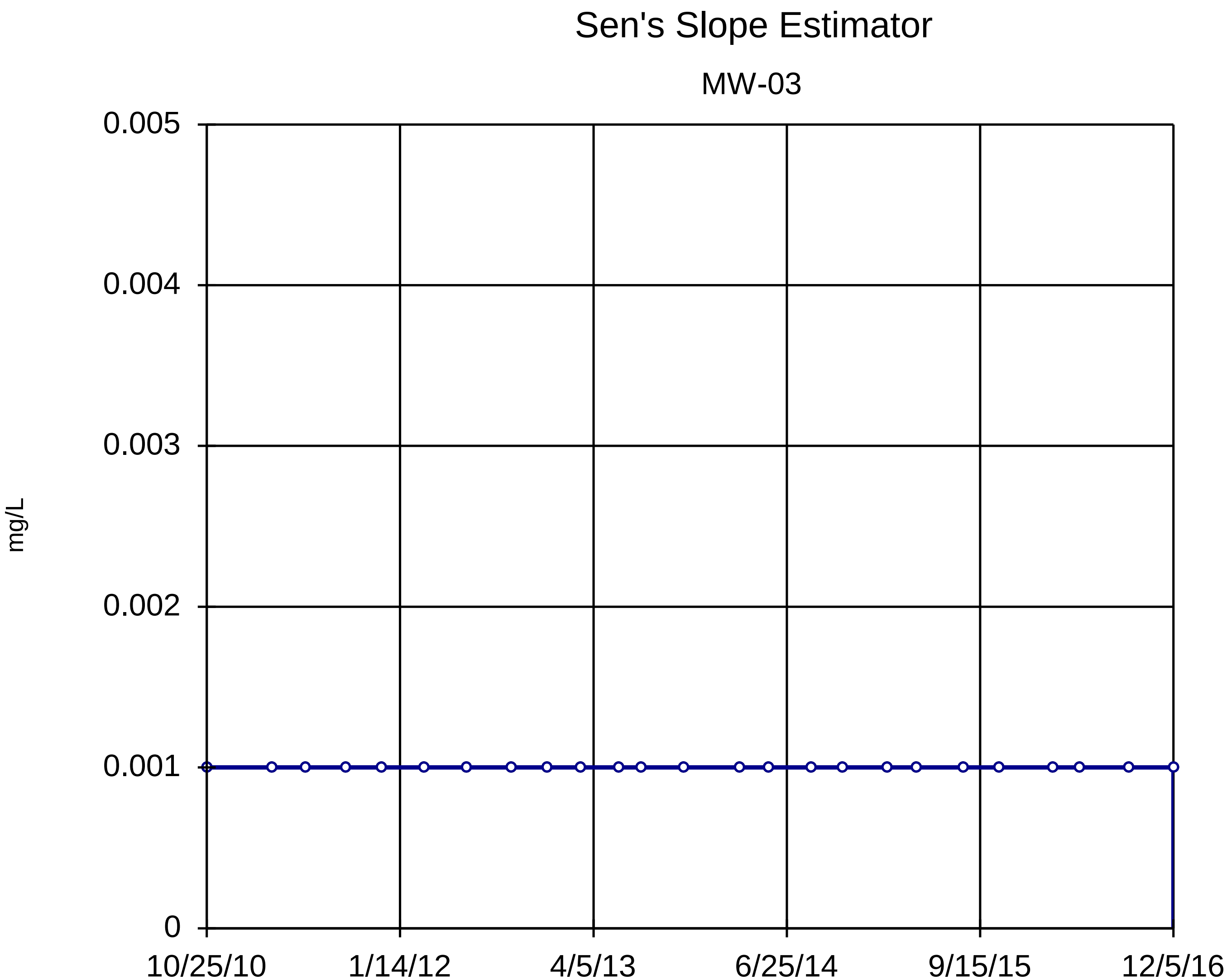



Constituent: Cobalt, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82103

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

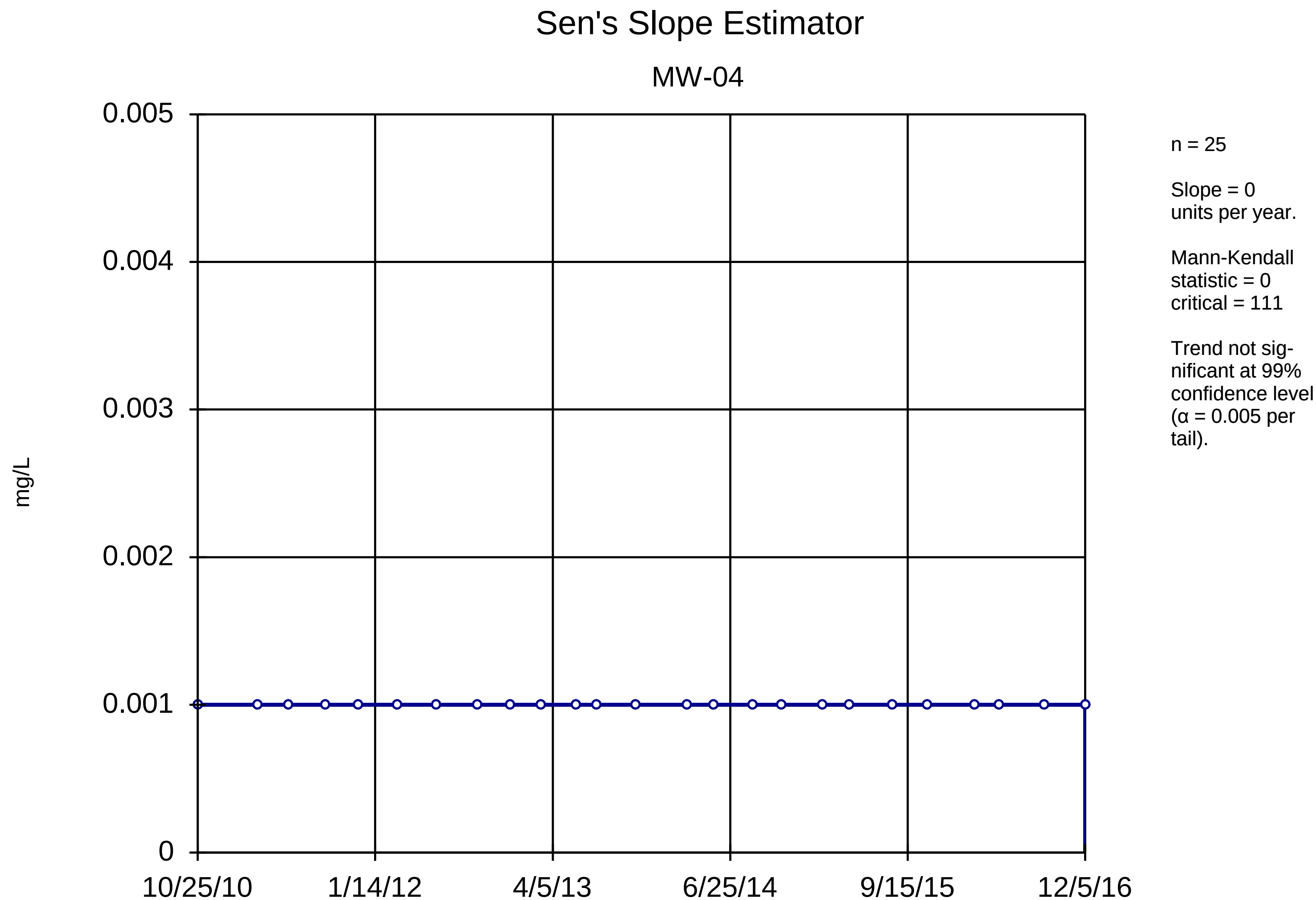
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82104

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

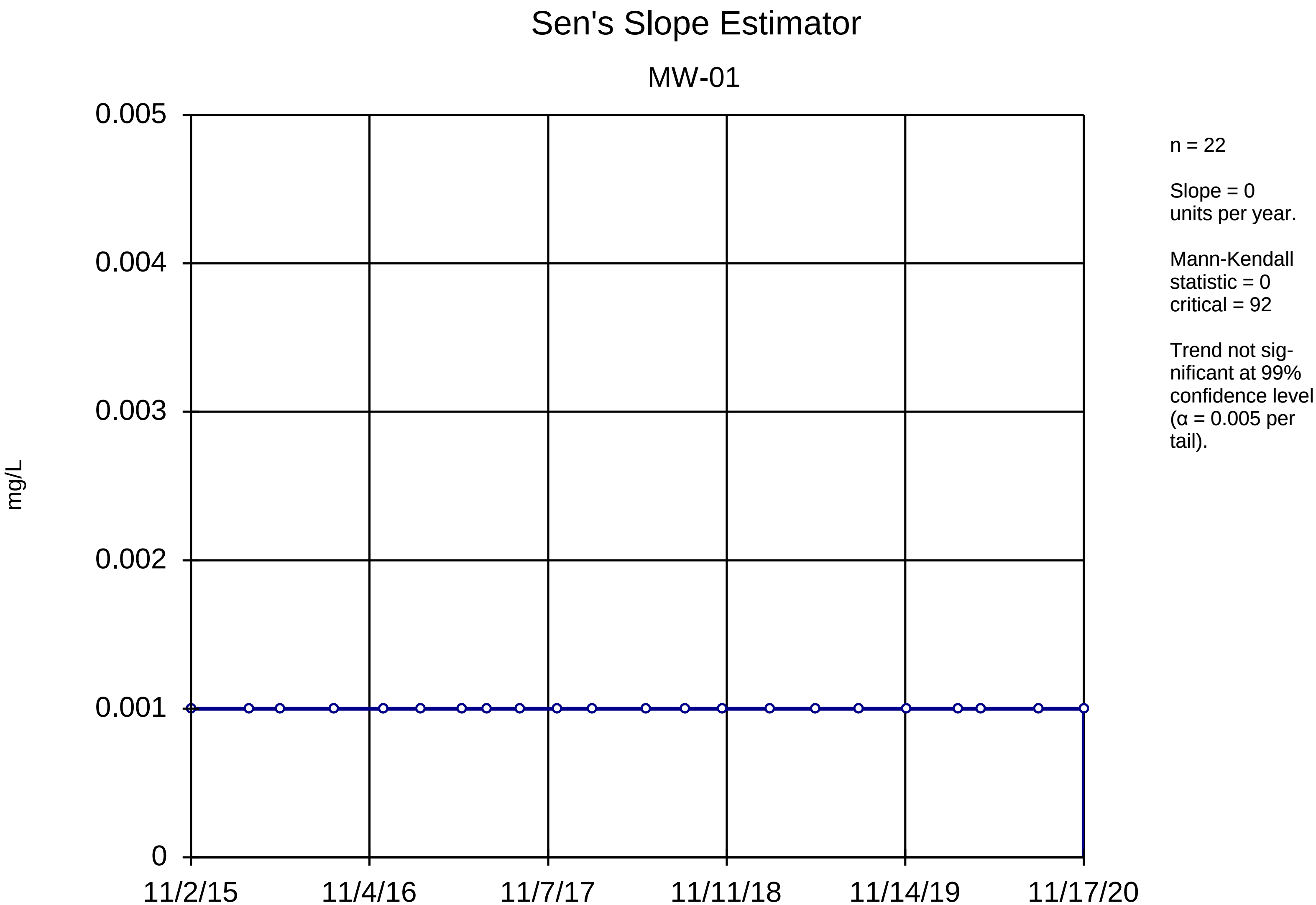



Constituent: Cobalt, Dissolved    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82105

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

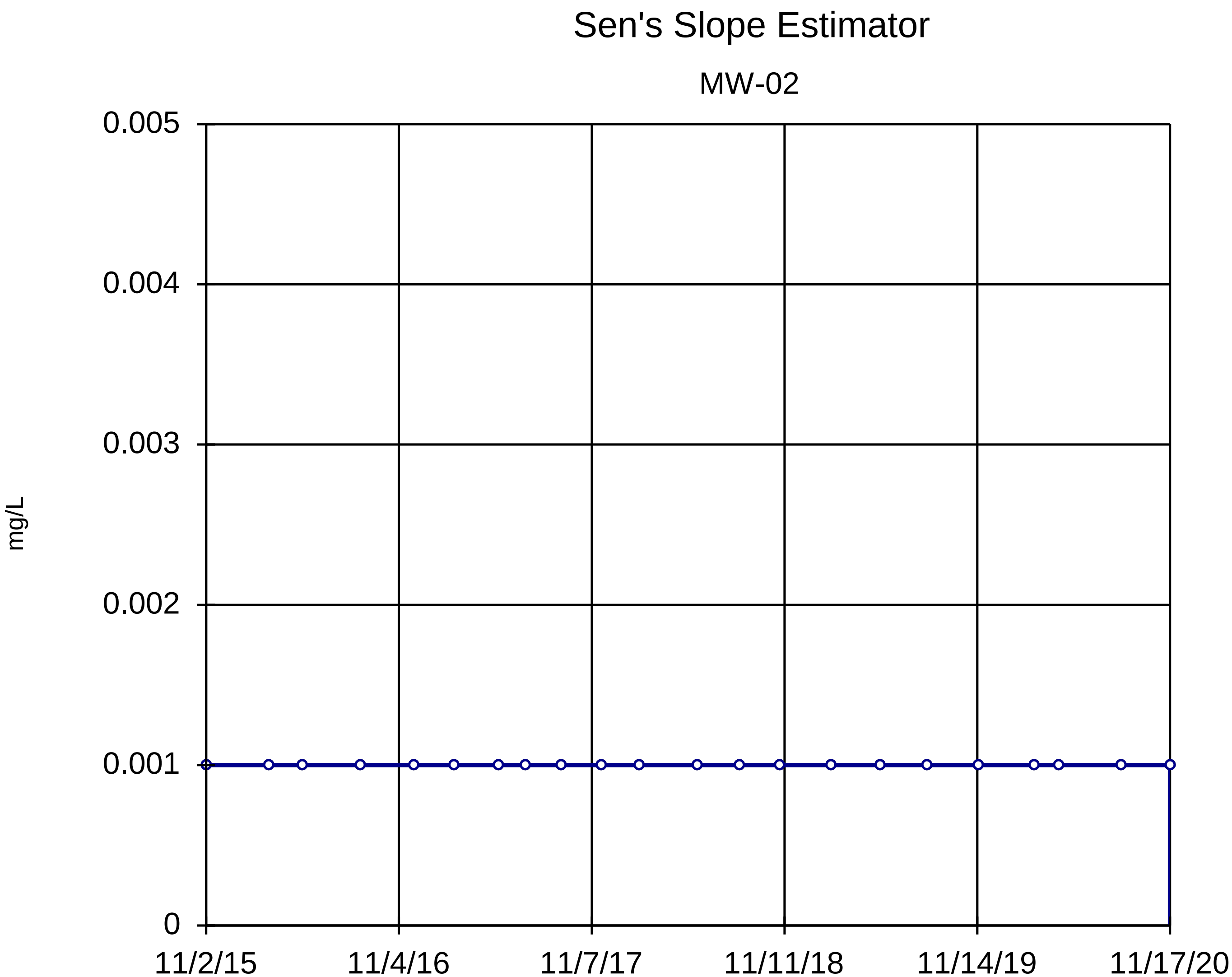



Constituent: Cobalt, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82106

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

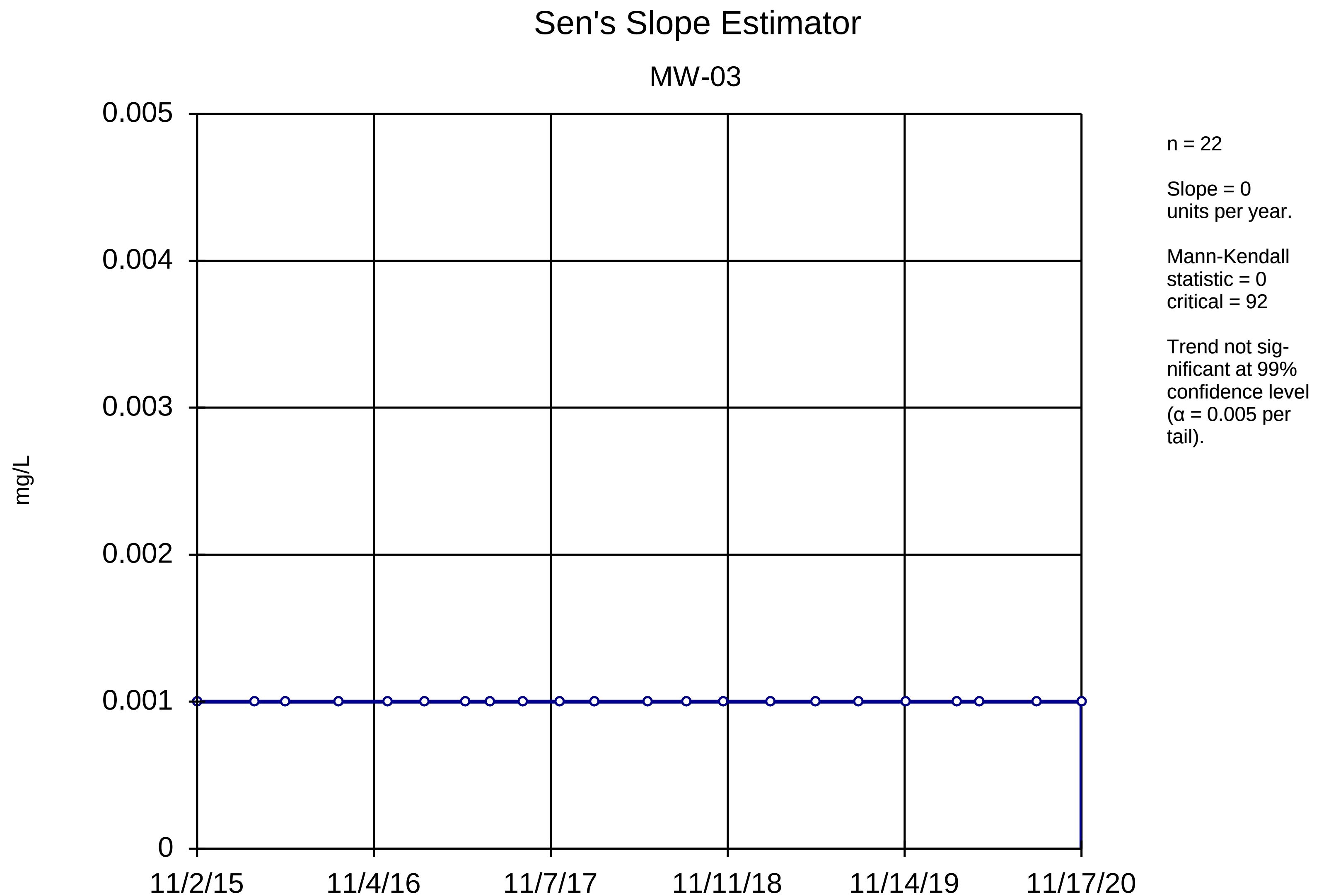
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Cobalt, Total    Analysis Run 4/14/2021 1:01 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82107

Hollow symbols indicate censored values.

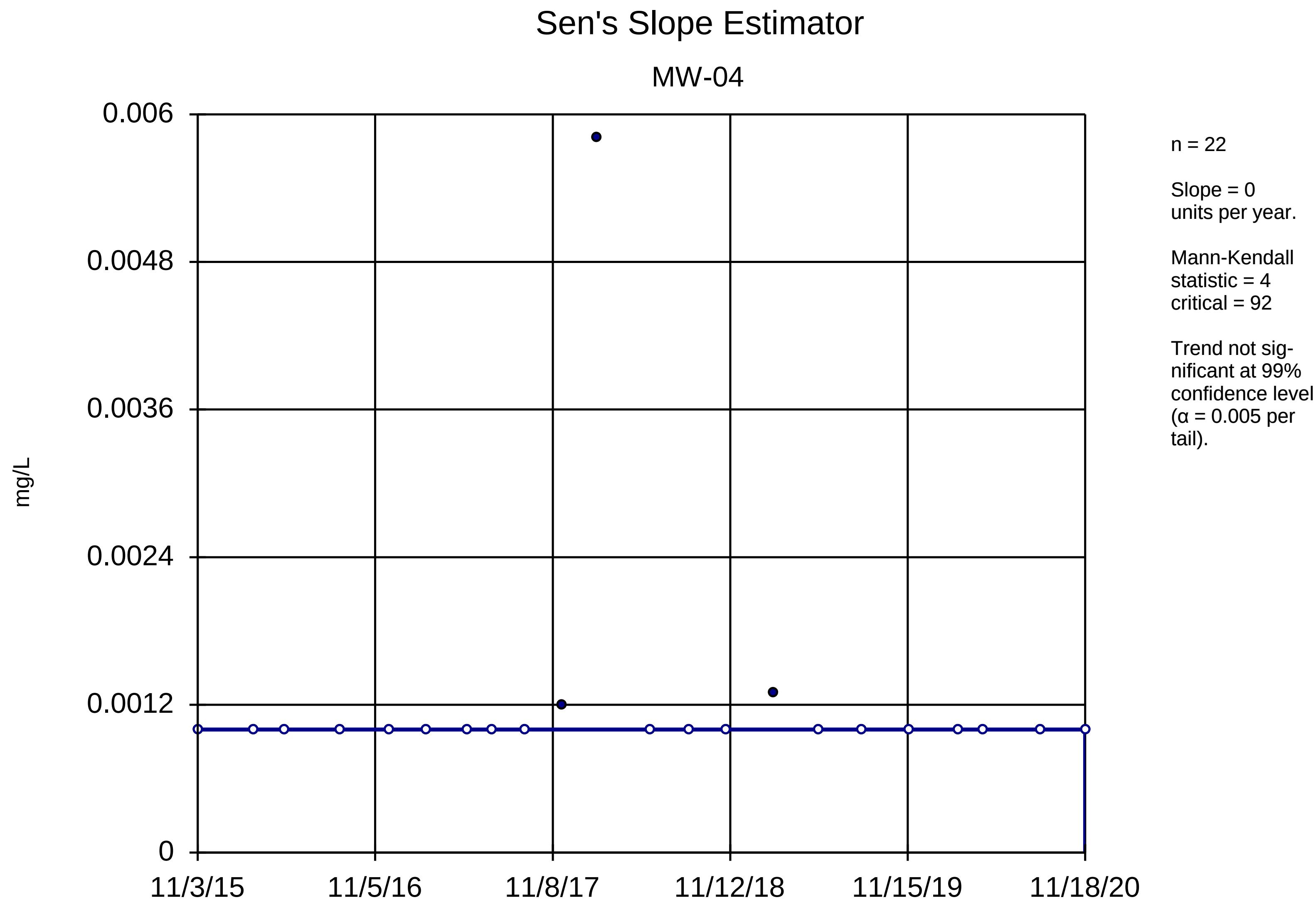



Constituent: Cobalt, Total Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82108

Hollow symbols indicate censored values.




Constituent: Cobalt, Total    Analysis Run 4/14/2021 1:02 PM

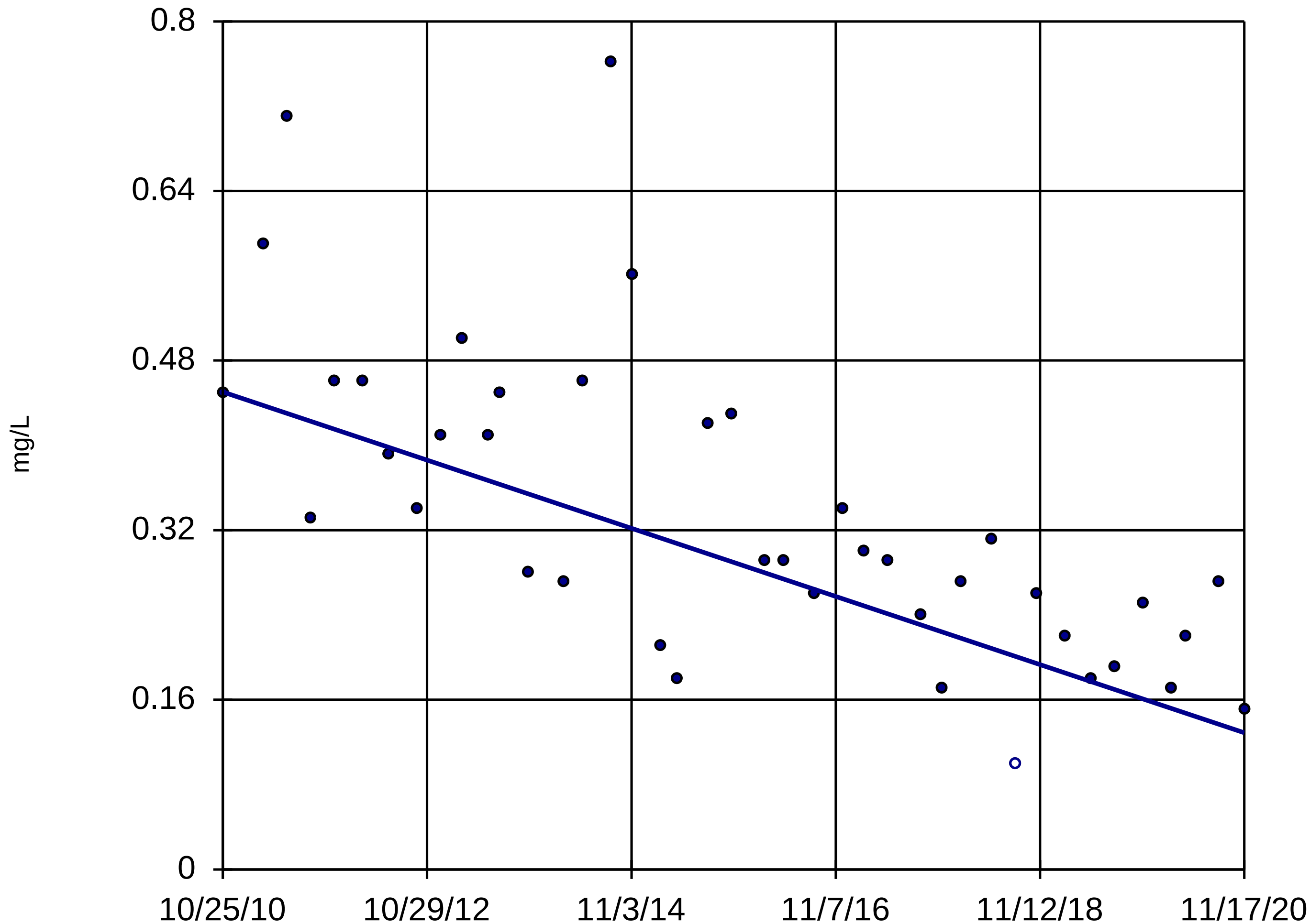
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82109

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-01




n = 41

Slope = -0.03192
units per year.

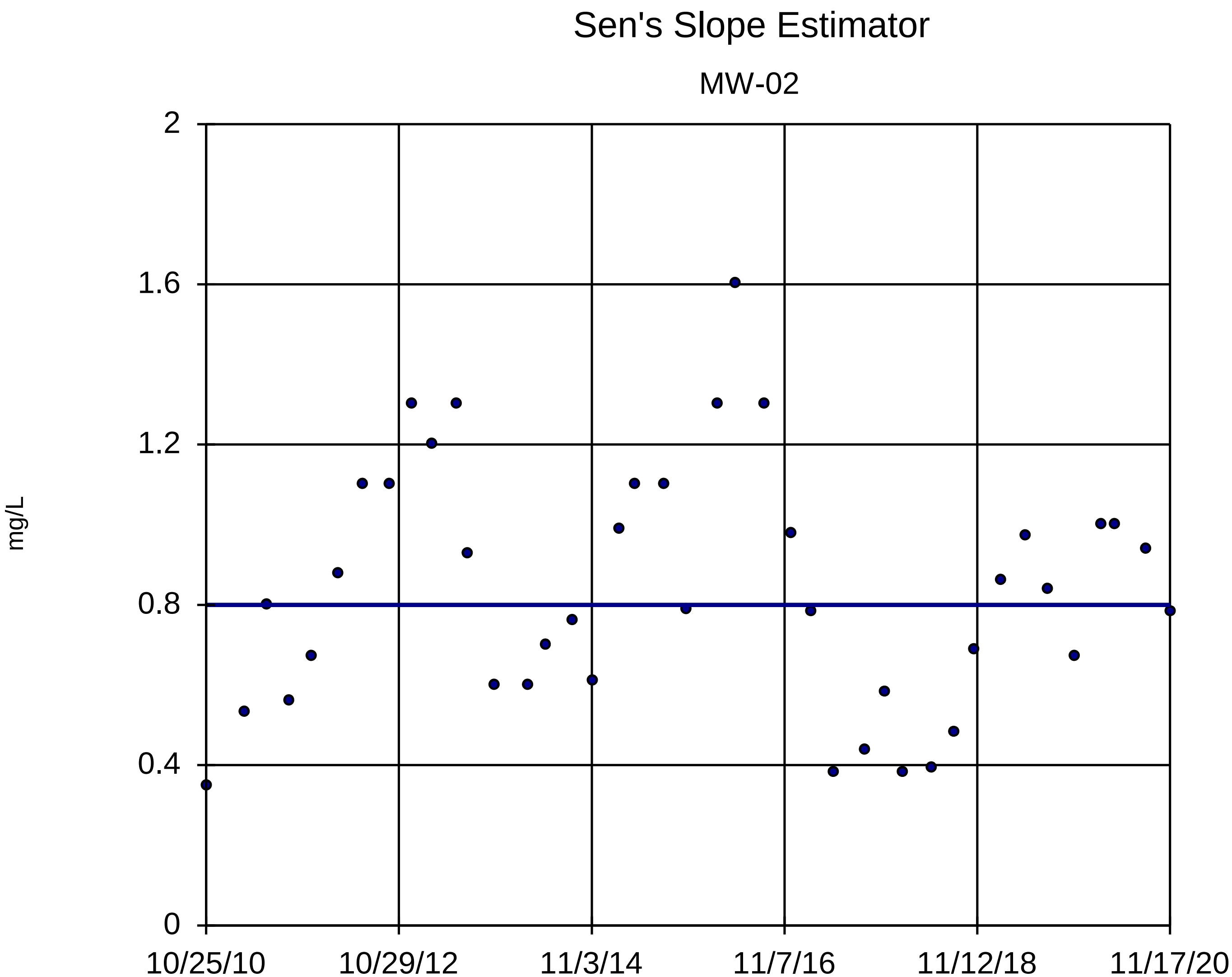
Mann-Kendall
normal approx. =
-5.049
critical = -2.58

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82110




n = 41

Slope = 0
units per year.

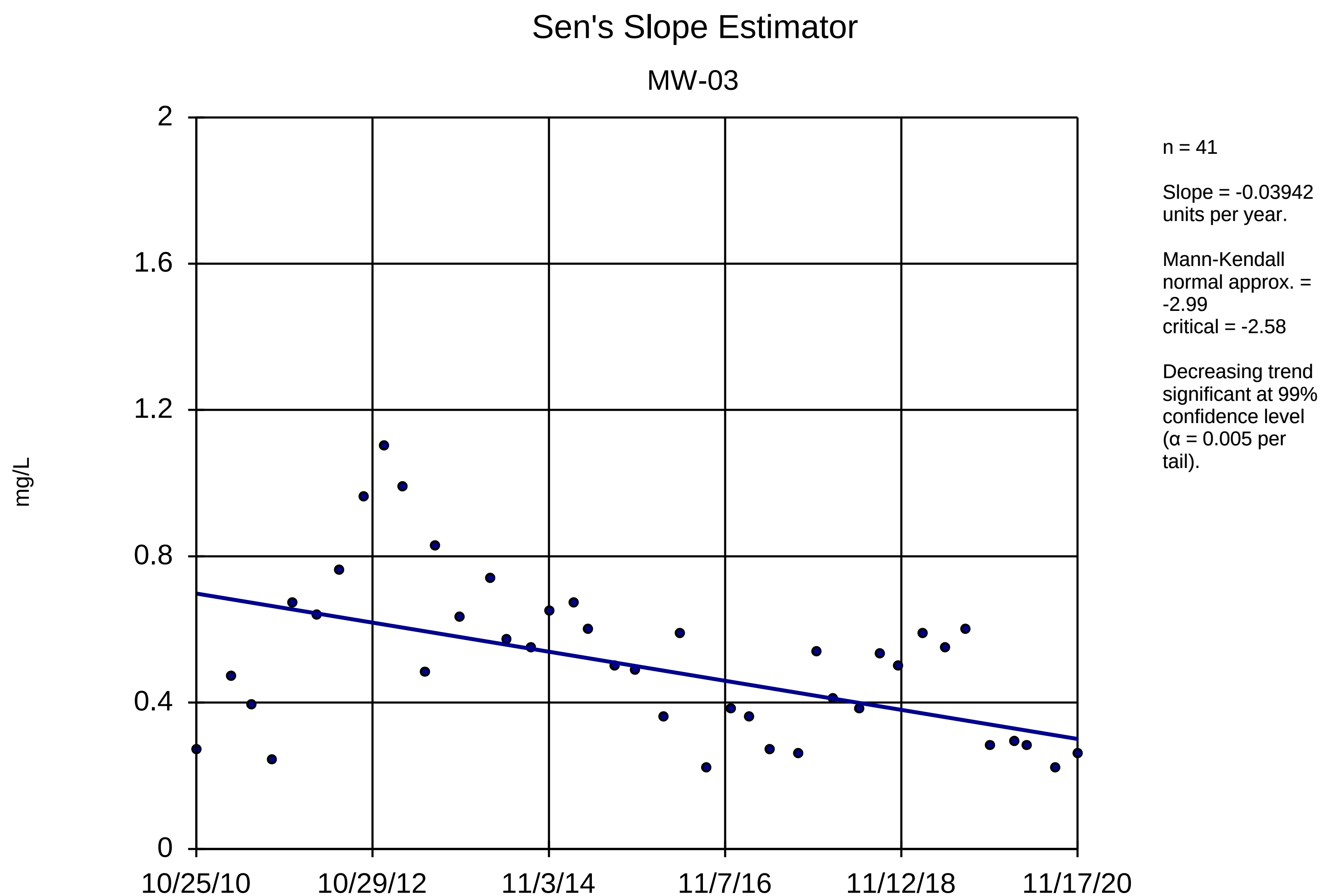
Mann-Kendall
normal approx. =
0.08998
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82111



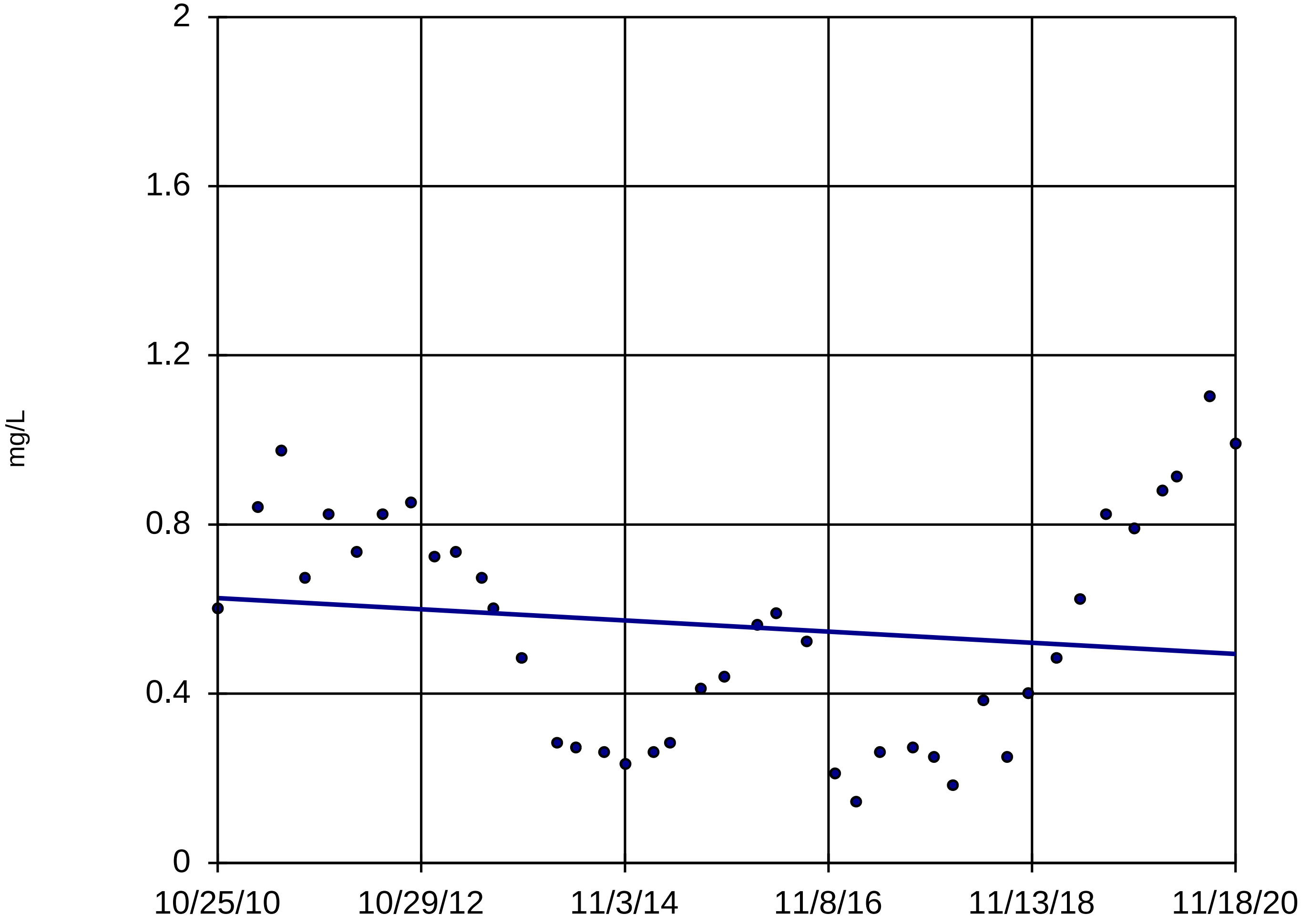

Constituent: Fluoride Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82112

# Sen's Slope Estimator

MW-04




n = 41

Slope = -0.01311
units per year.

Mann-Kendall
normal approx. =
-0.8769
critical = -2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Fluoride    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82113

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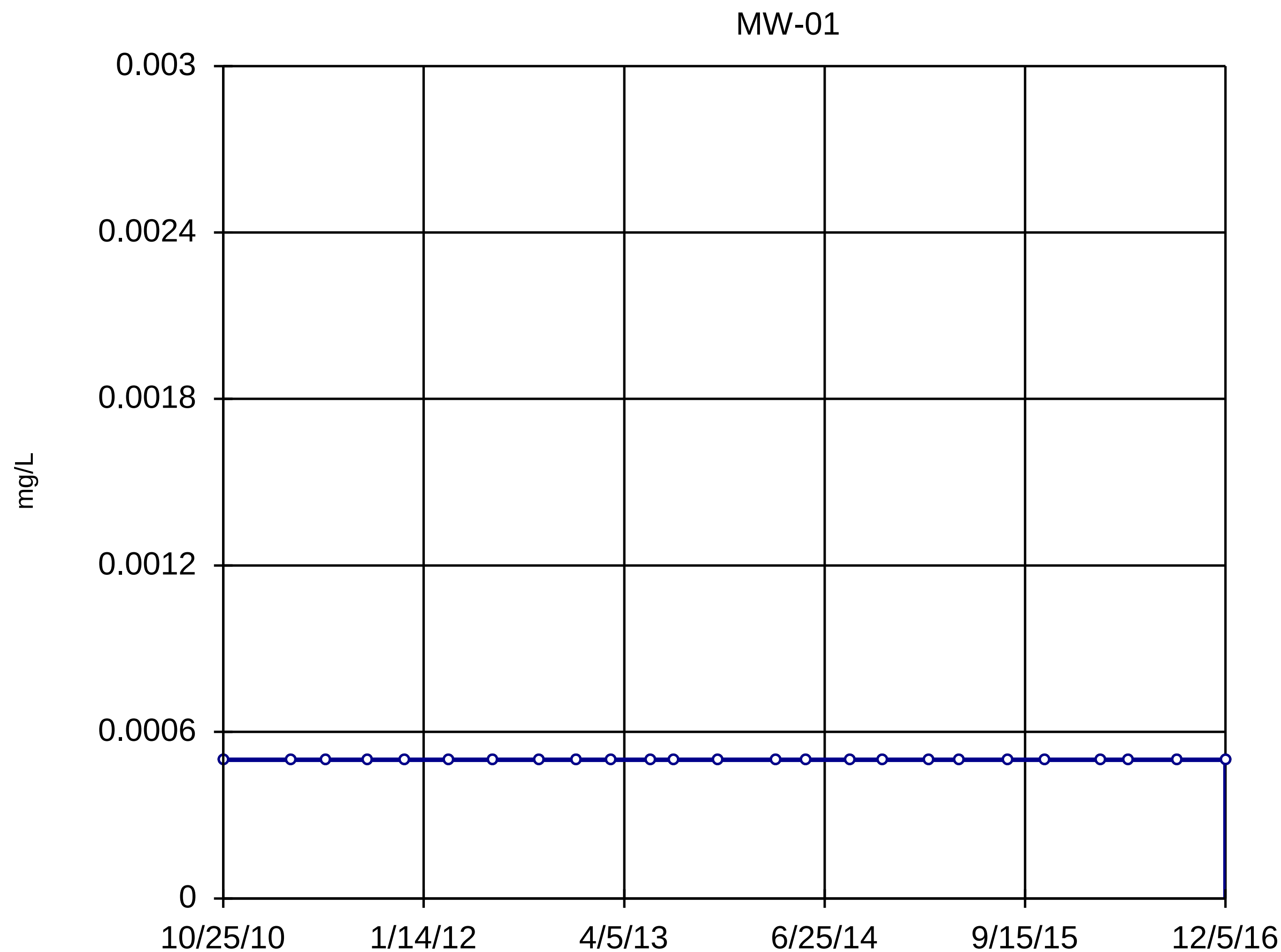
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82114

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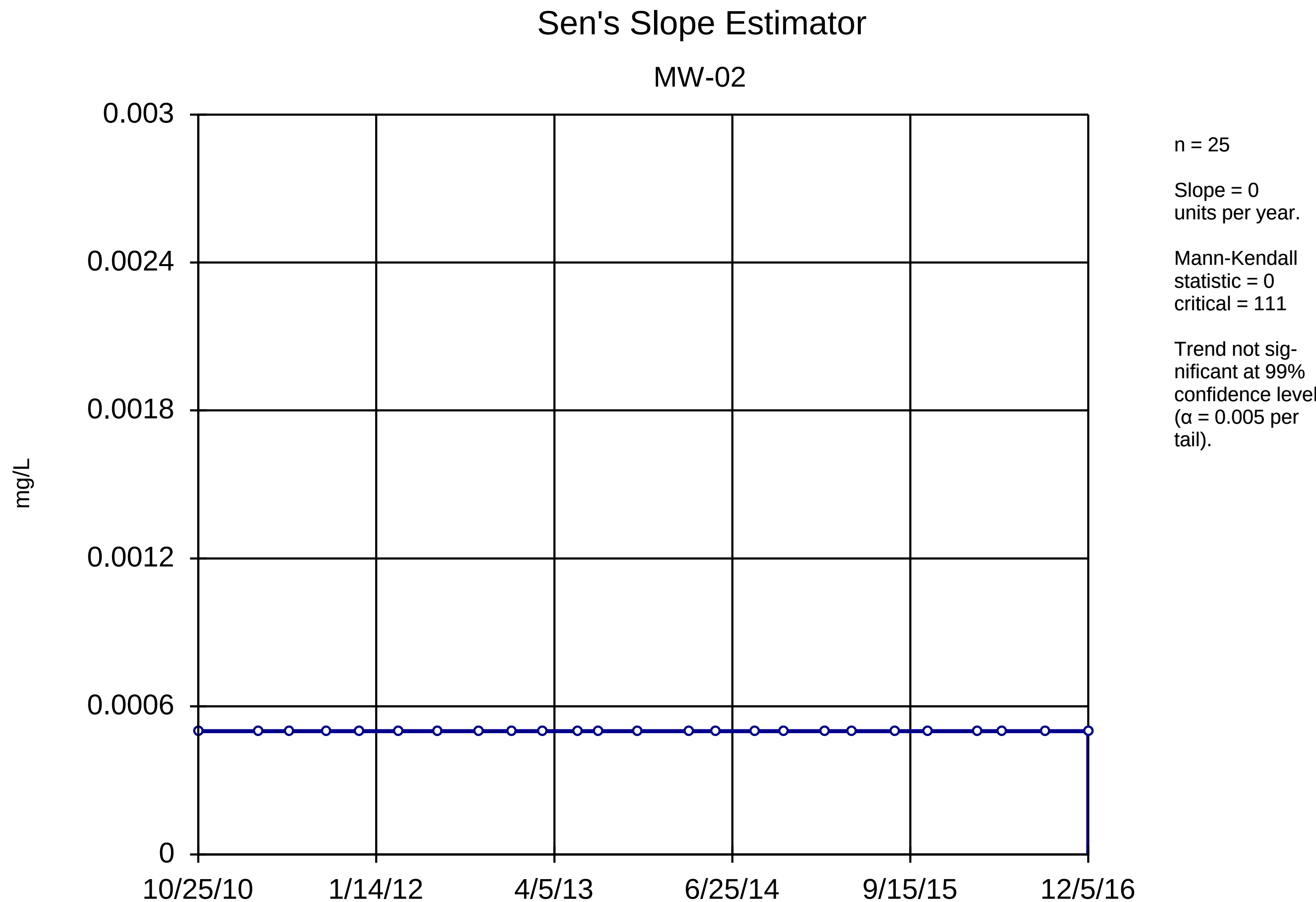
Hollow symbols indicate censored values.

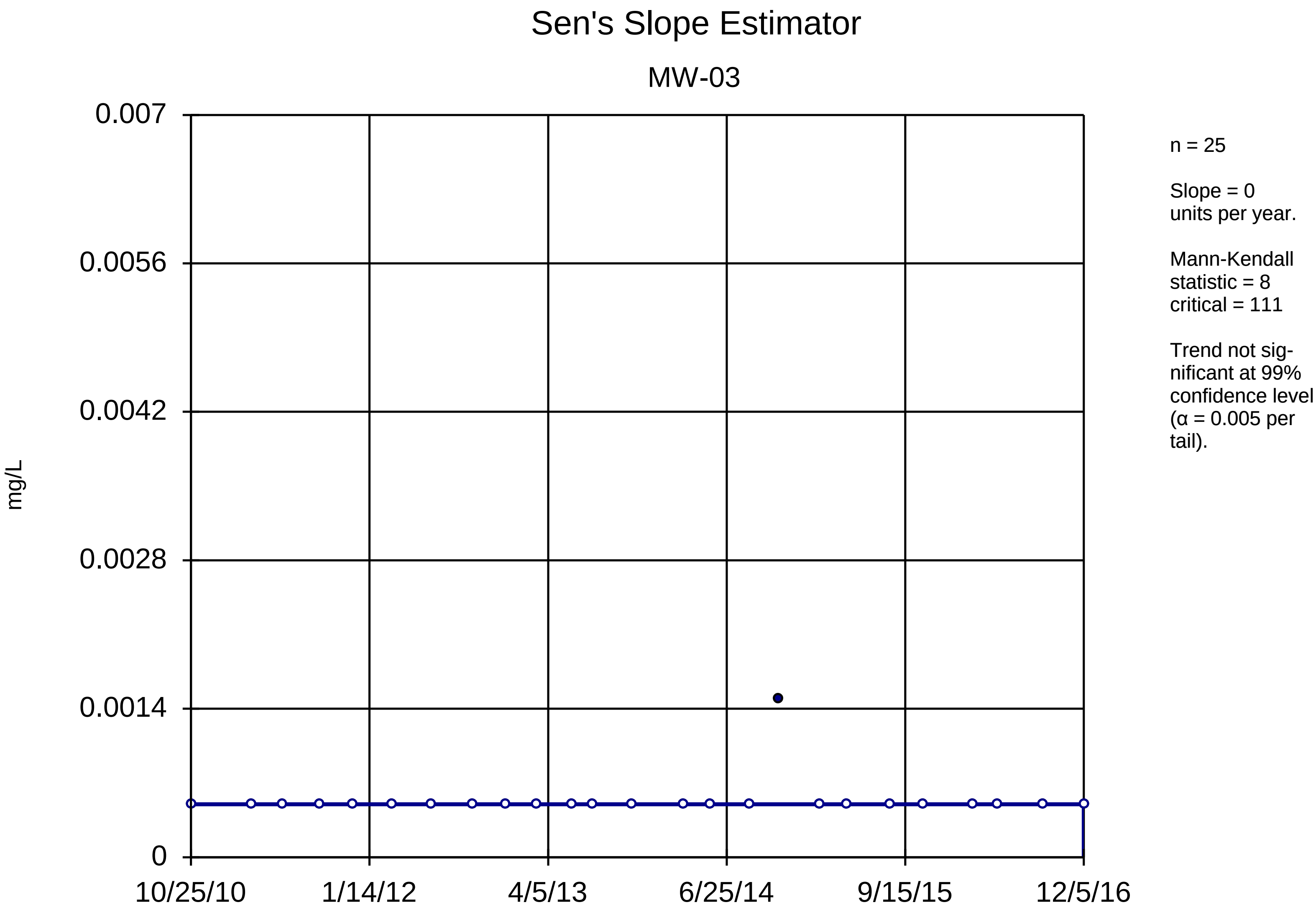



Constituent: Lead, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82115

Hollow symbols indicate censored values.



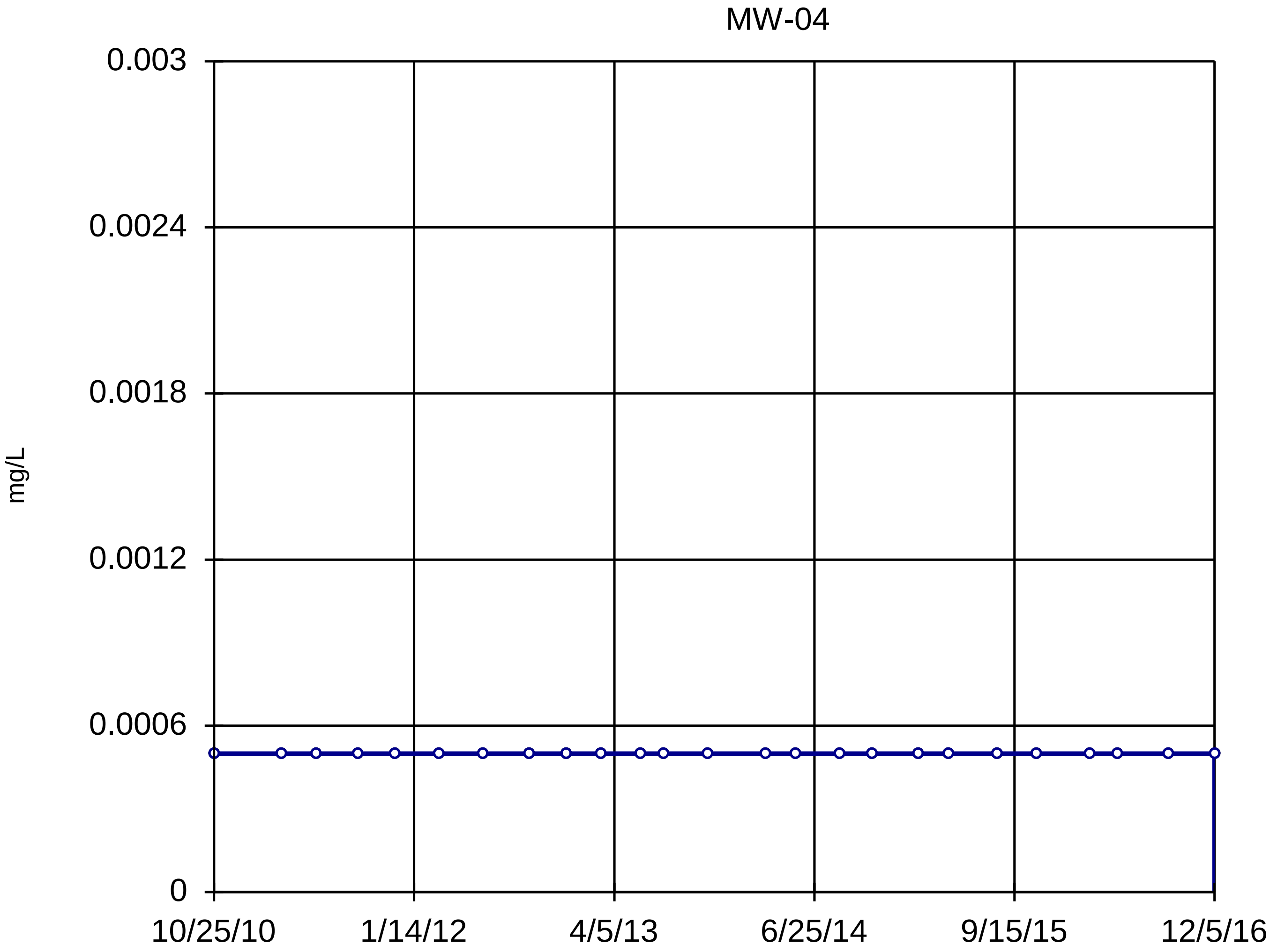

Constituent: Lead, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82116

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

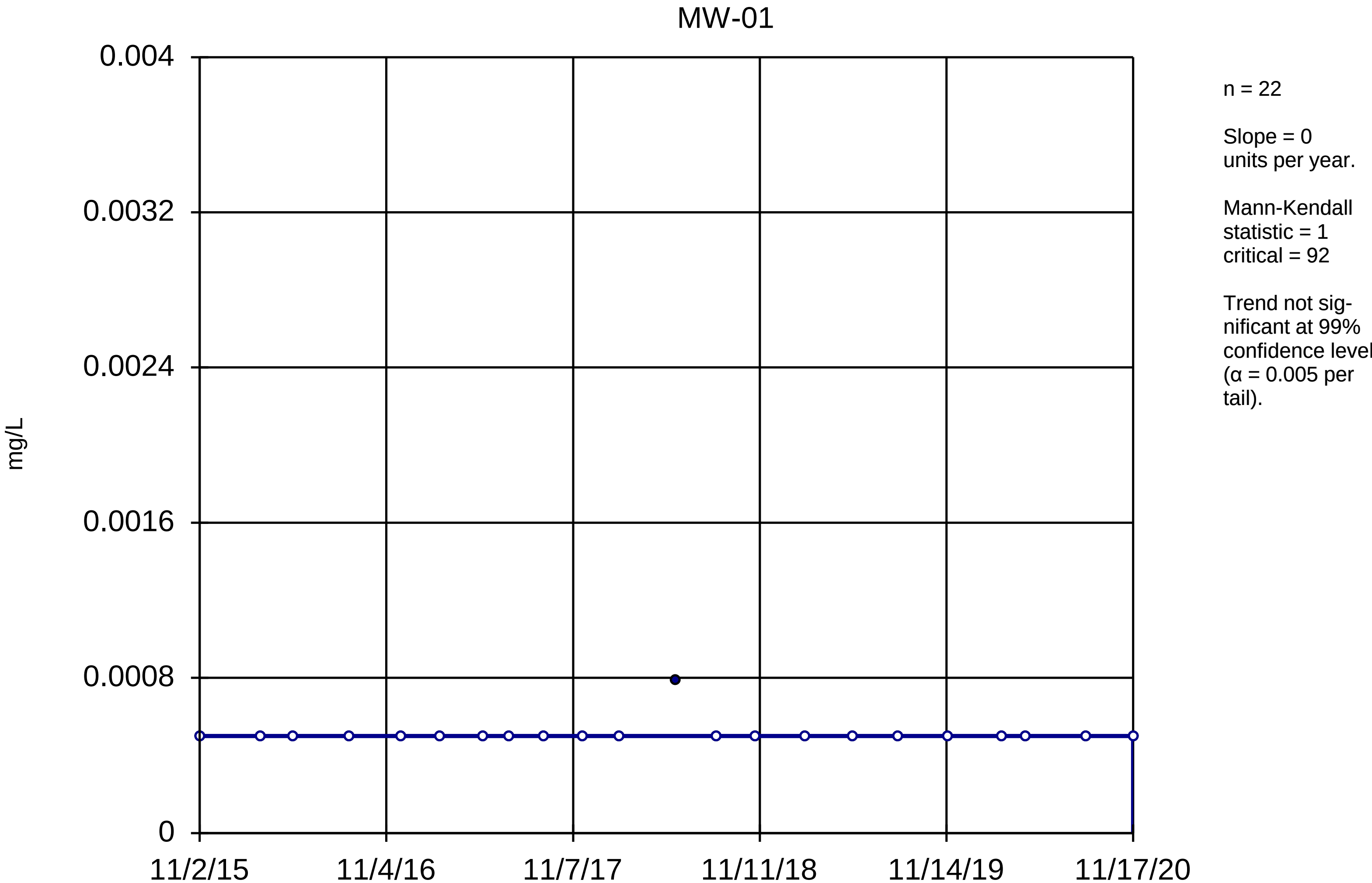
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator

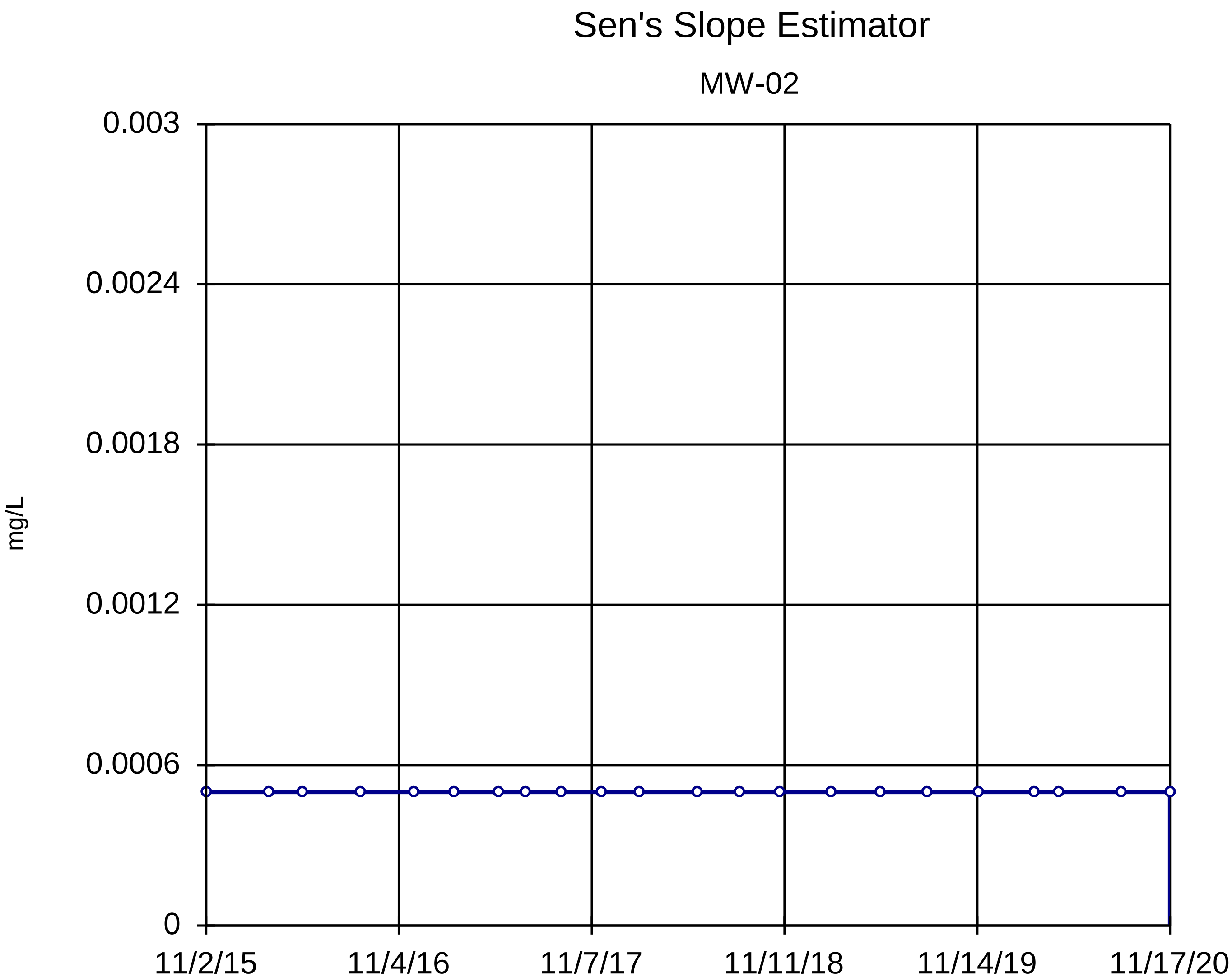



Constituent: Lead, Total Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82118

Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

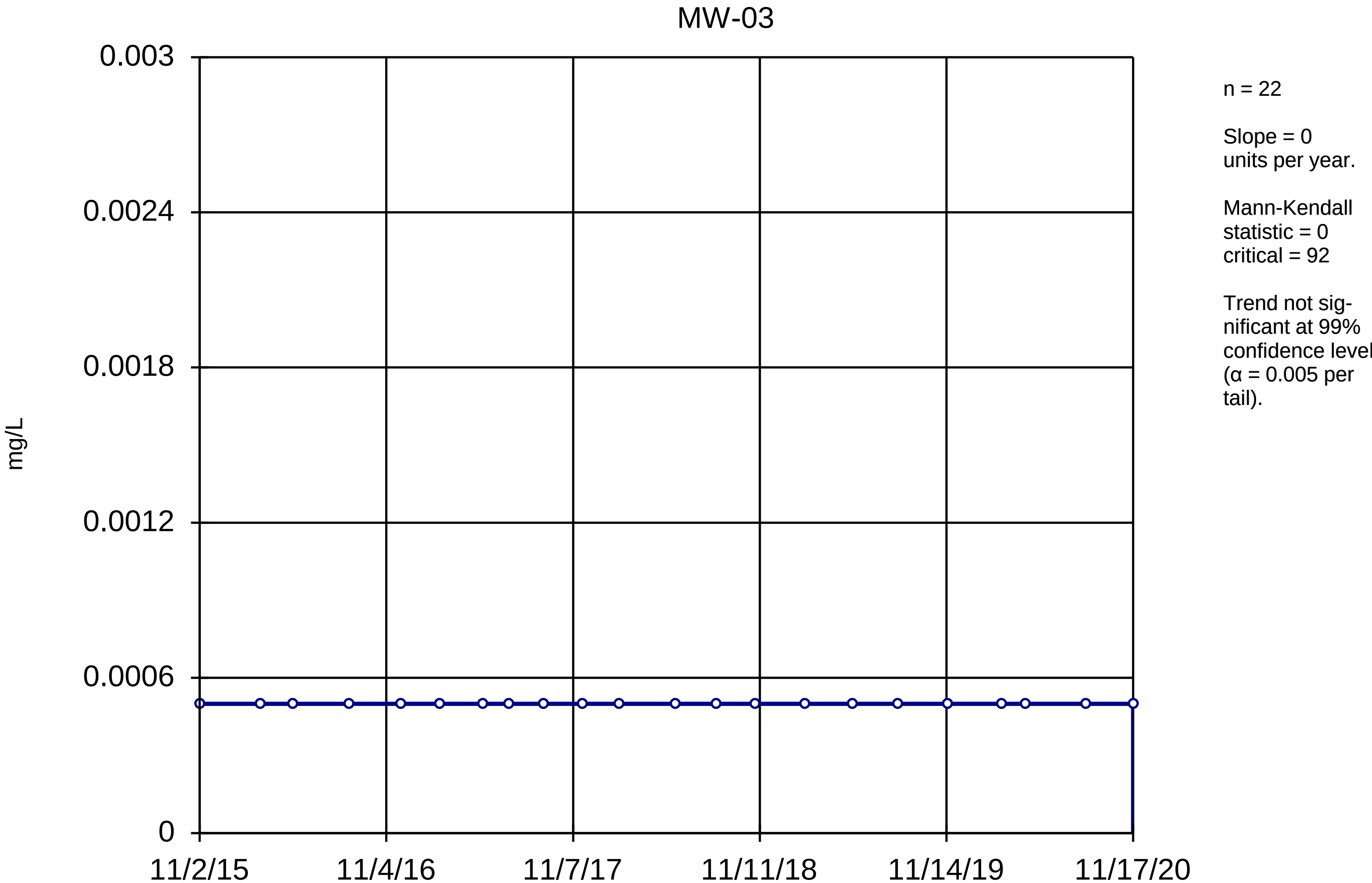
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

Hollow symbols indicate censored values.

## Sen's Slope Estimator




Constituent: Lead, Total    Analysis Run 4/14/2021 1:02 PM

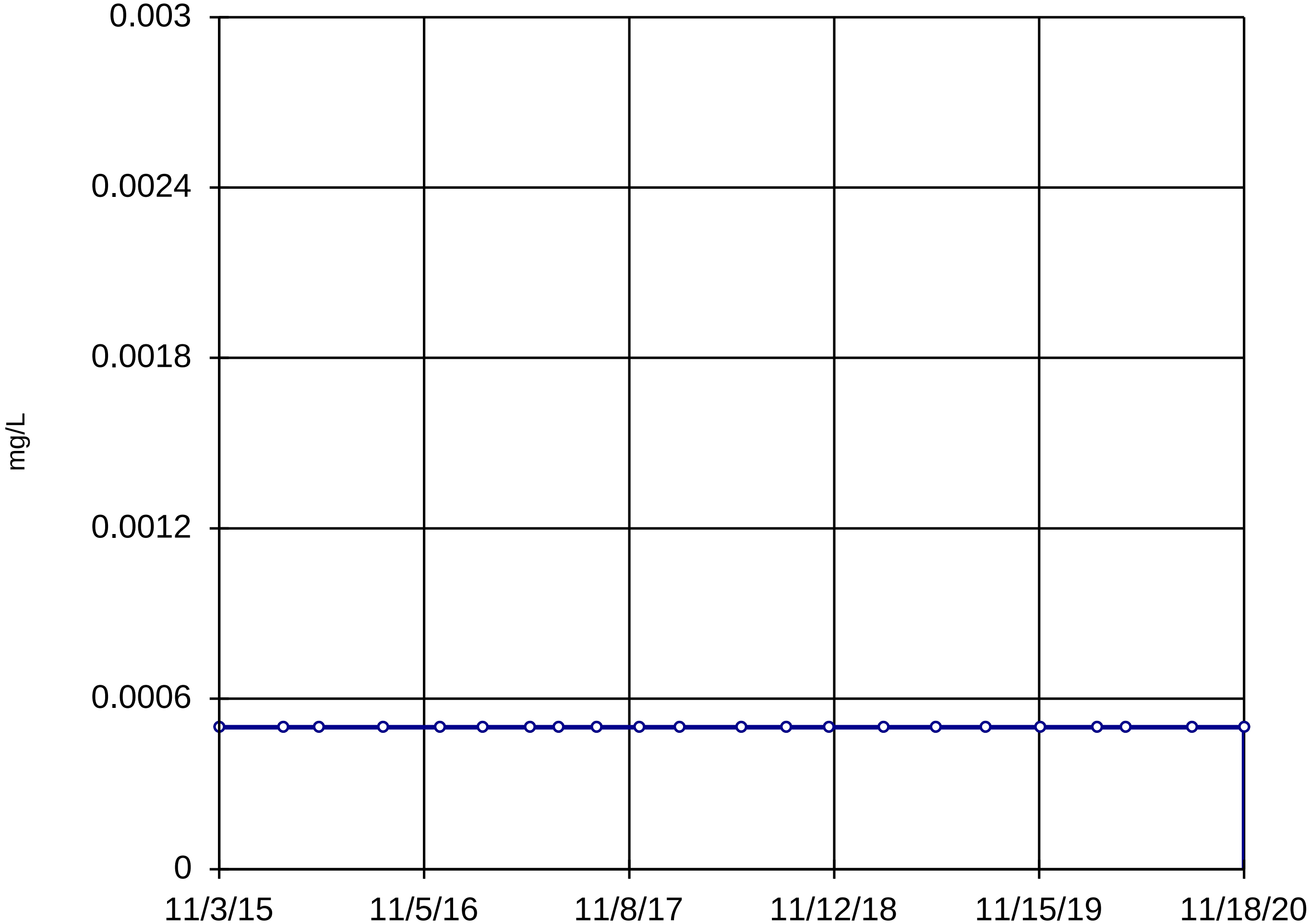
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82120

Hollow symbols indicate censored values.

# Sen's Slope Estimator

## MW-04




n = 22

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 92

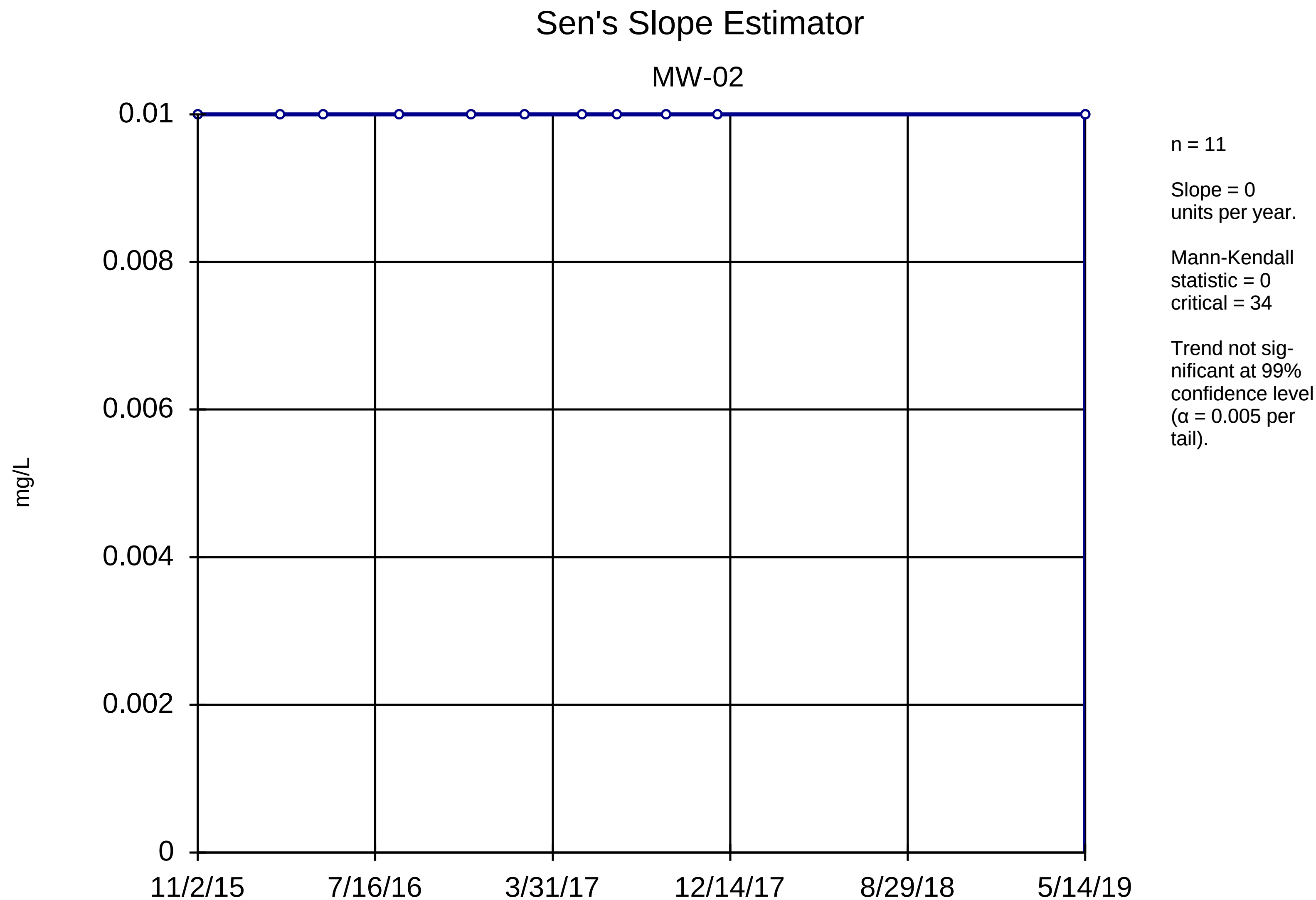
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Lead, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82121

Hollow symbols indicate censored values.




Constituent: Lithium, Total Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

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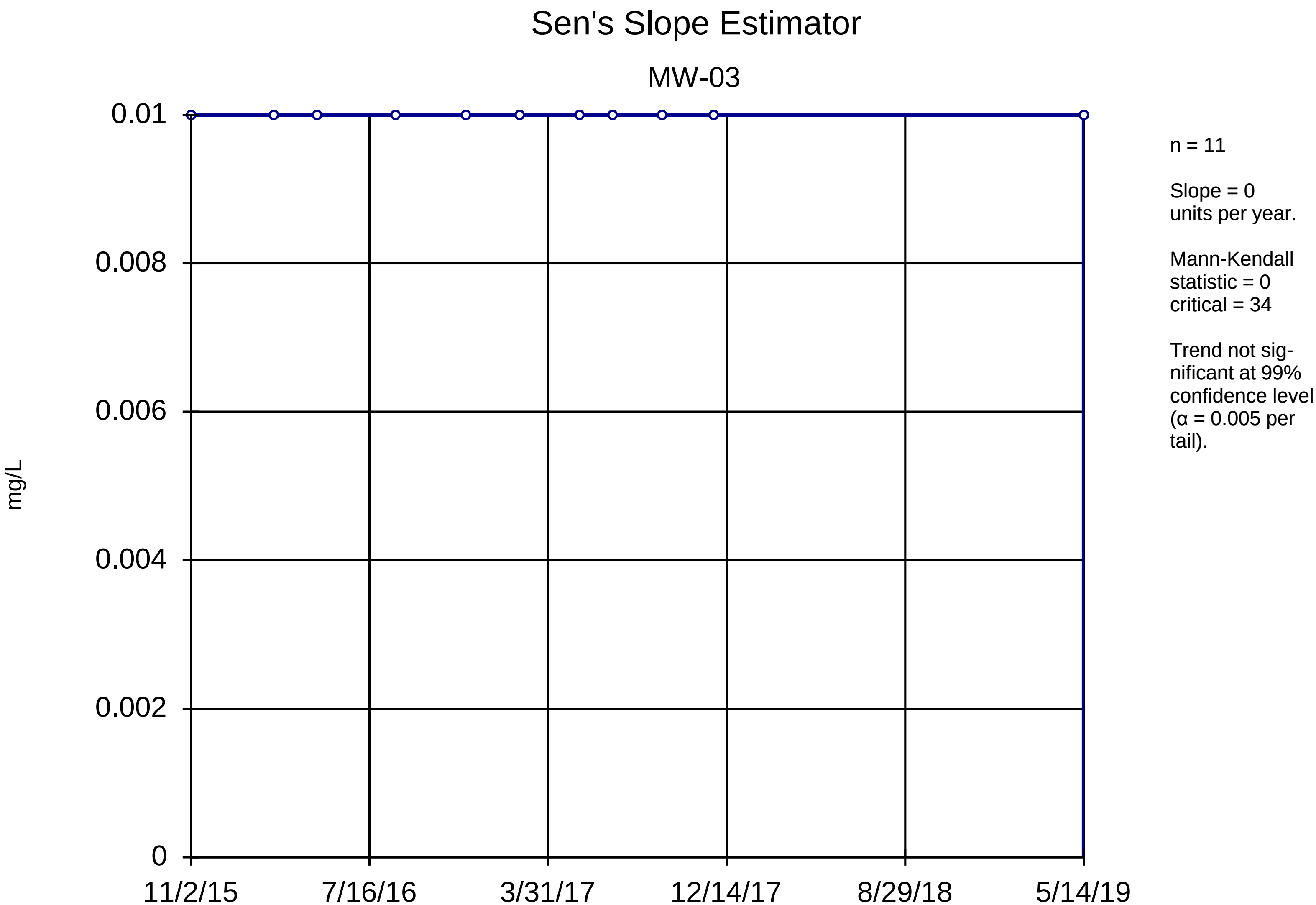
Hollow symbols indicate censored values.

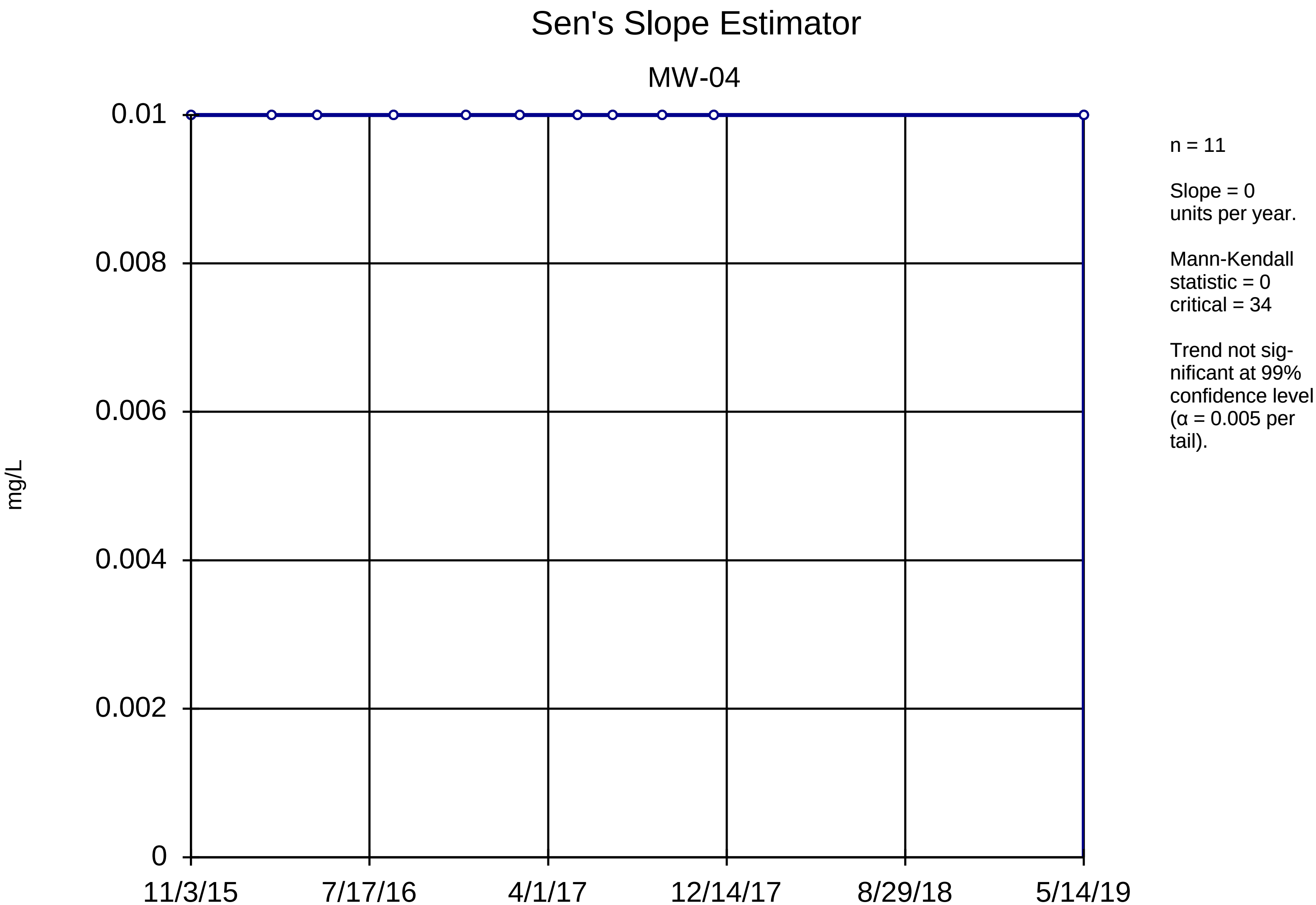



Constituent: Lithium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82123

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Lithium, Total    Analysis Run 4/14/2021 1:02 PM

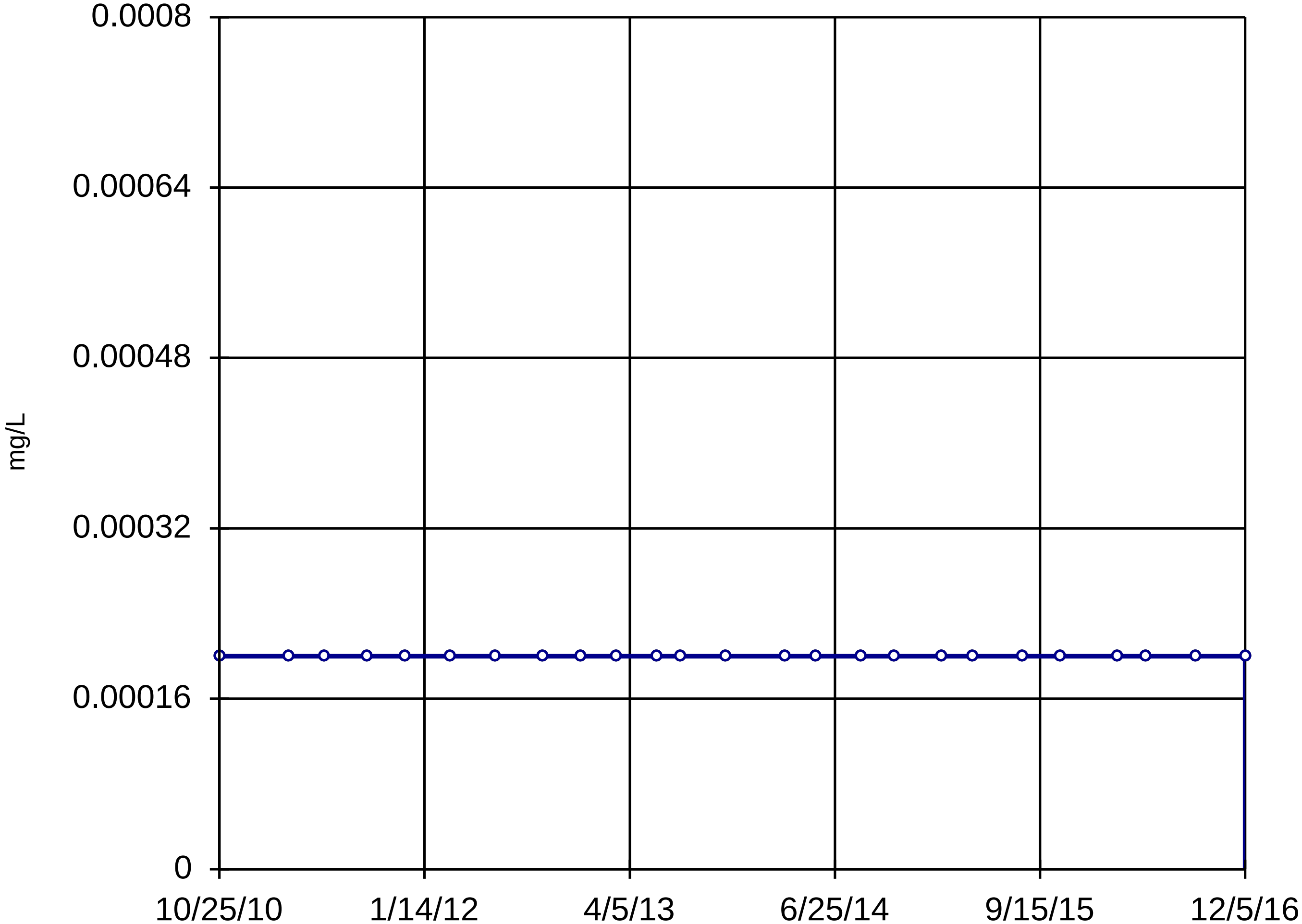
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82124

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-01




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Mercury, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82125

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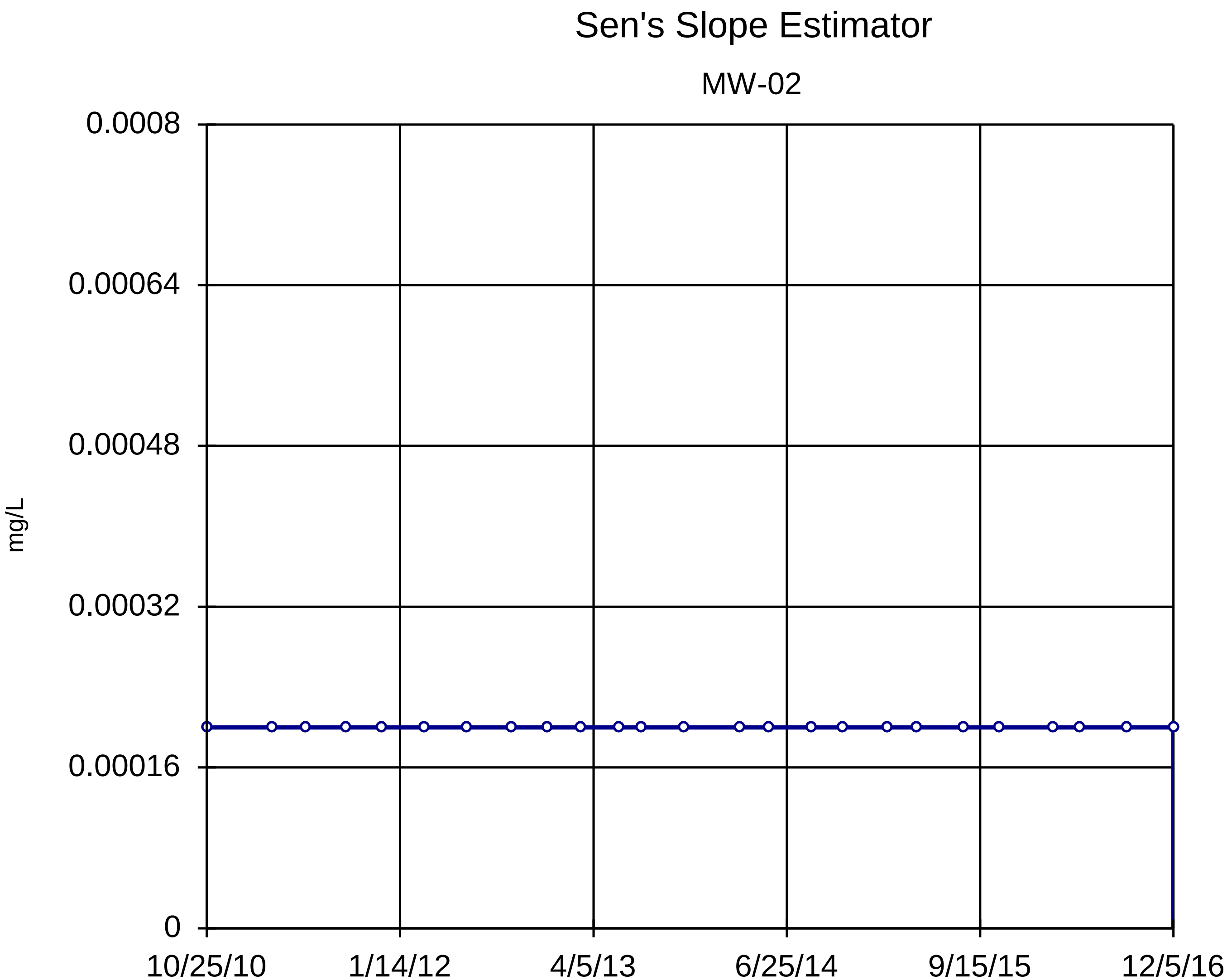
Hollow symbols indicate censored values.




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

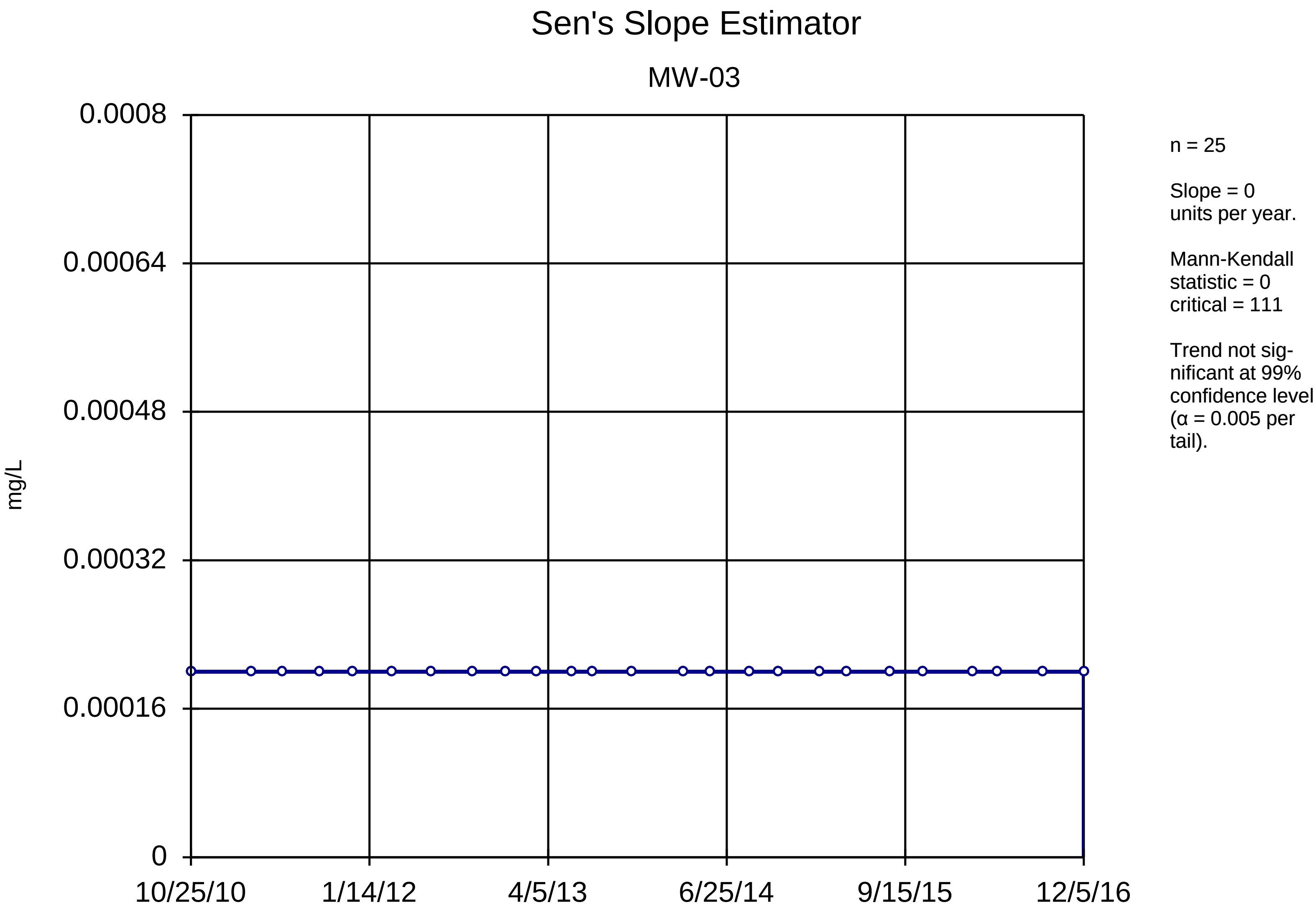
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82126

Hollow symbols indicate censored values.

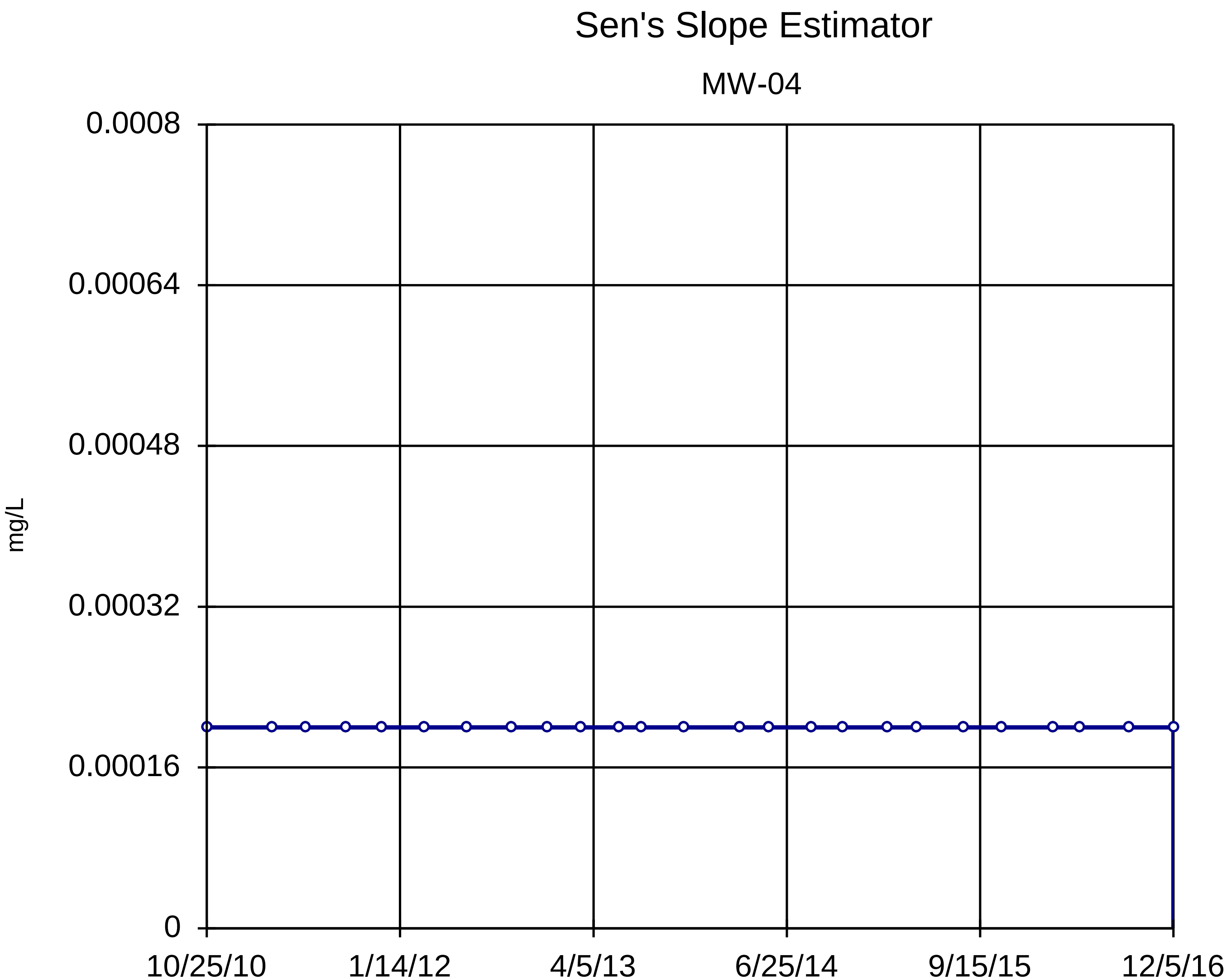



Constituent: Mercury, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82127

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 25

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 111

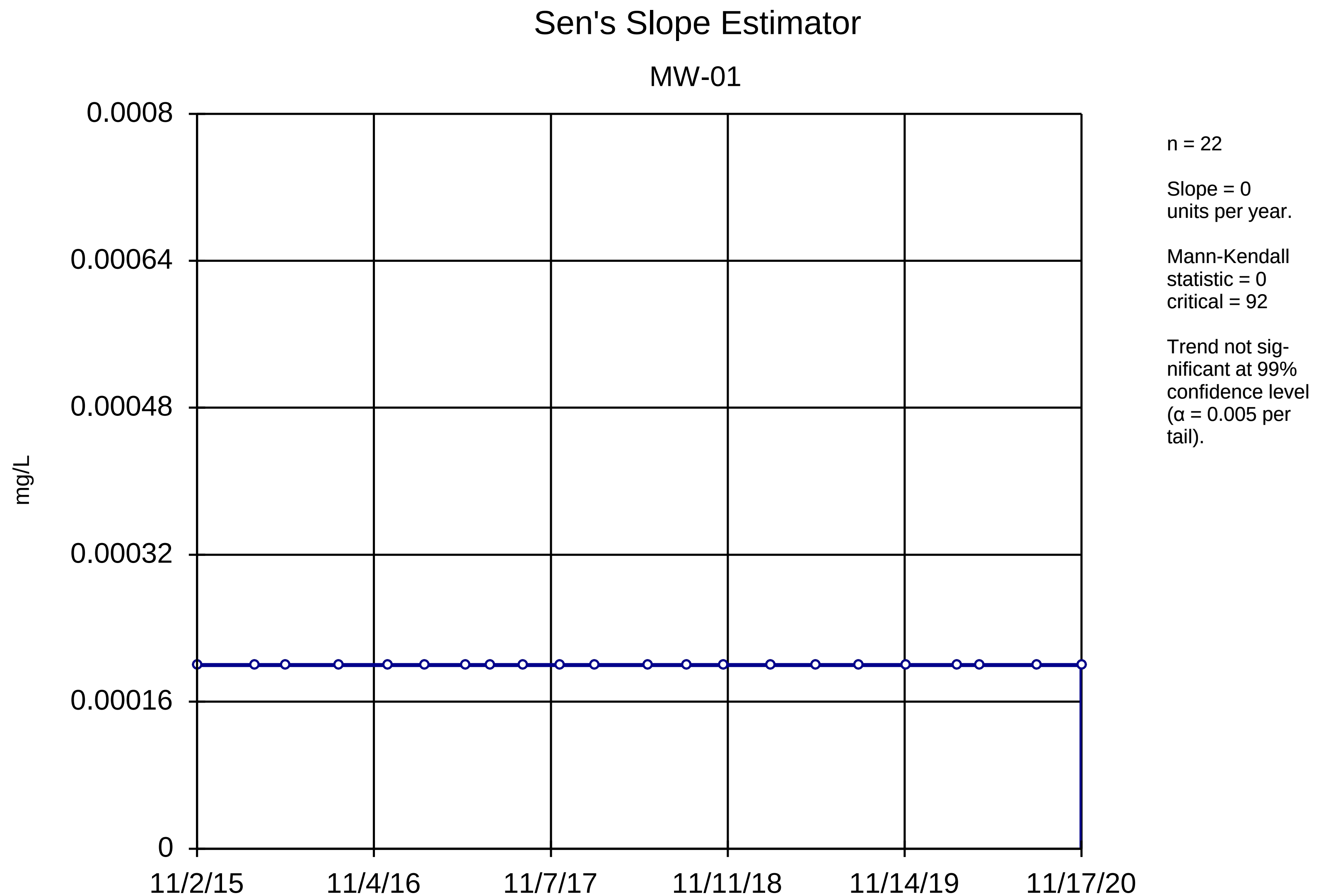
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82128

Hollow symbols indicate censored values.



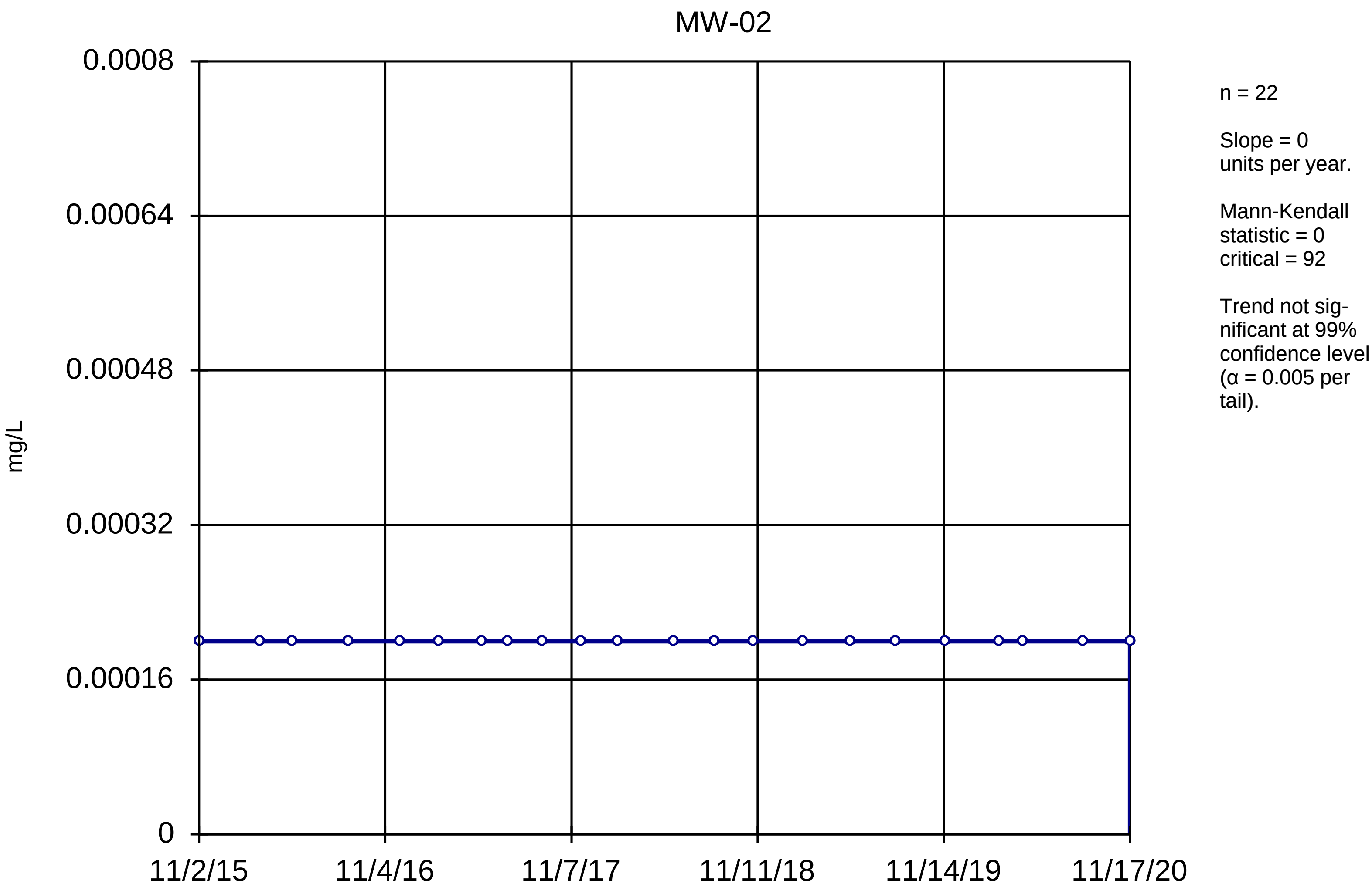

Constituent: Mercury, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82129

Hollow symbols indicate censored values.

# Sen's Slope Estimator




Constituent: Mercury, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82130

Electronic Filing: Received, Clerk's Office 01/21/2022

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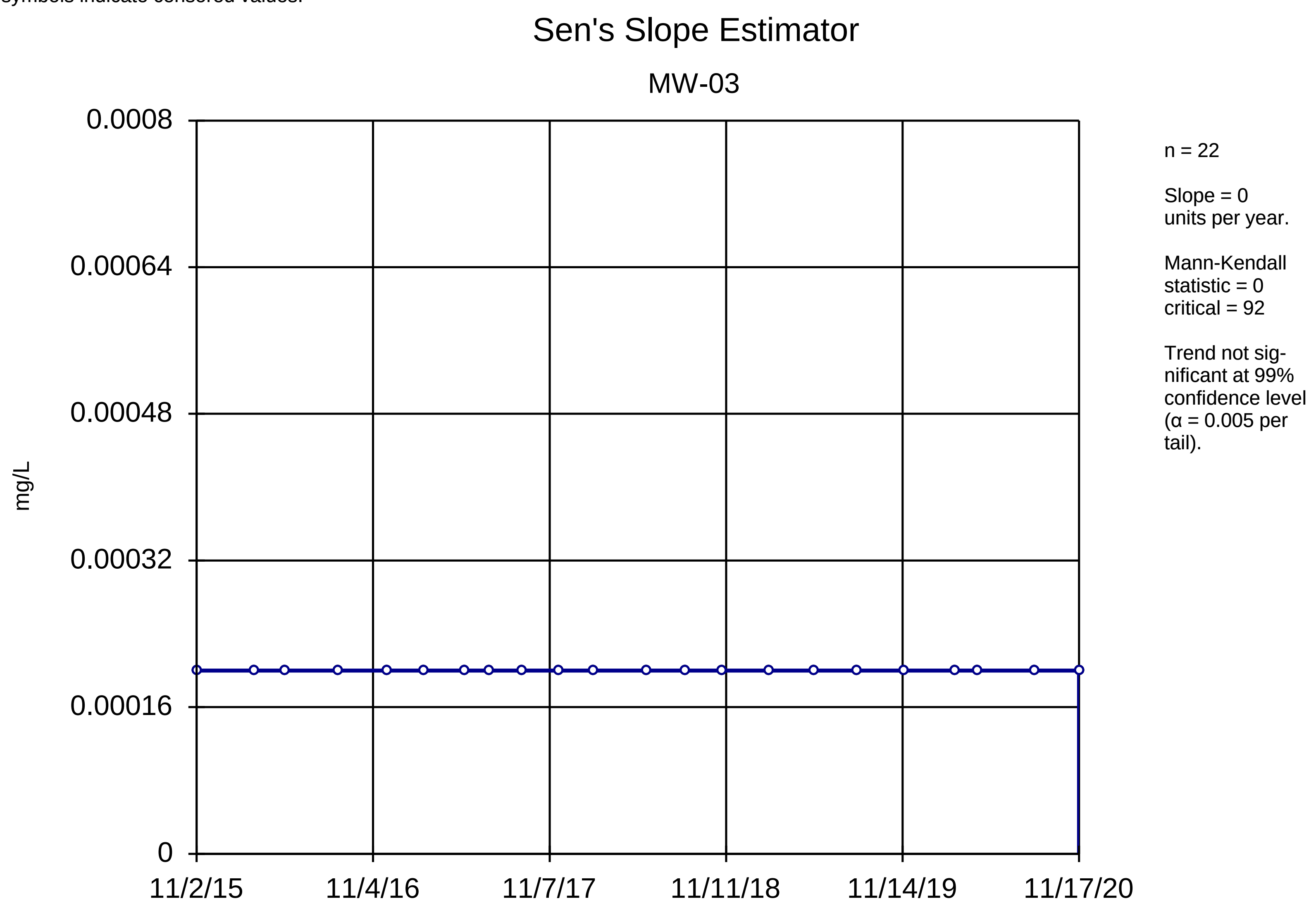
Hollow symbols indicate censored values.

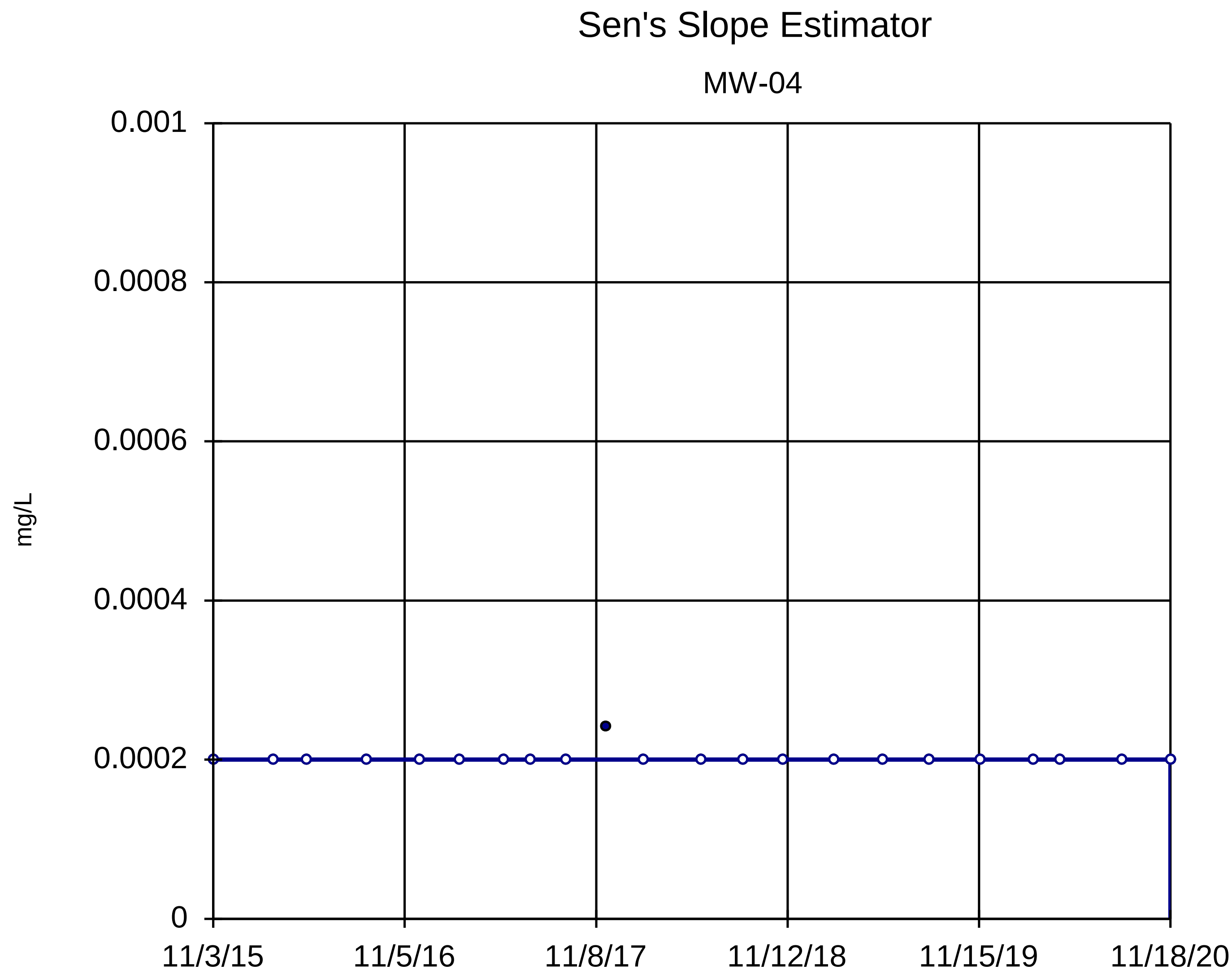



Constituent: Mercury, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82131

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 22

Slope = 0
units per year.

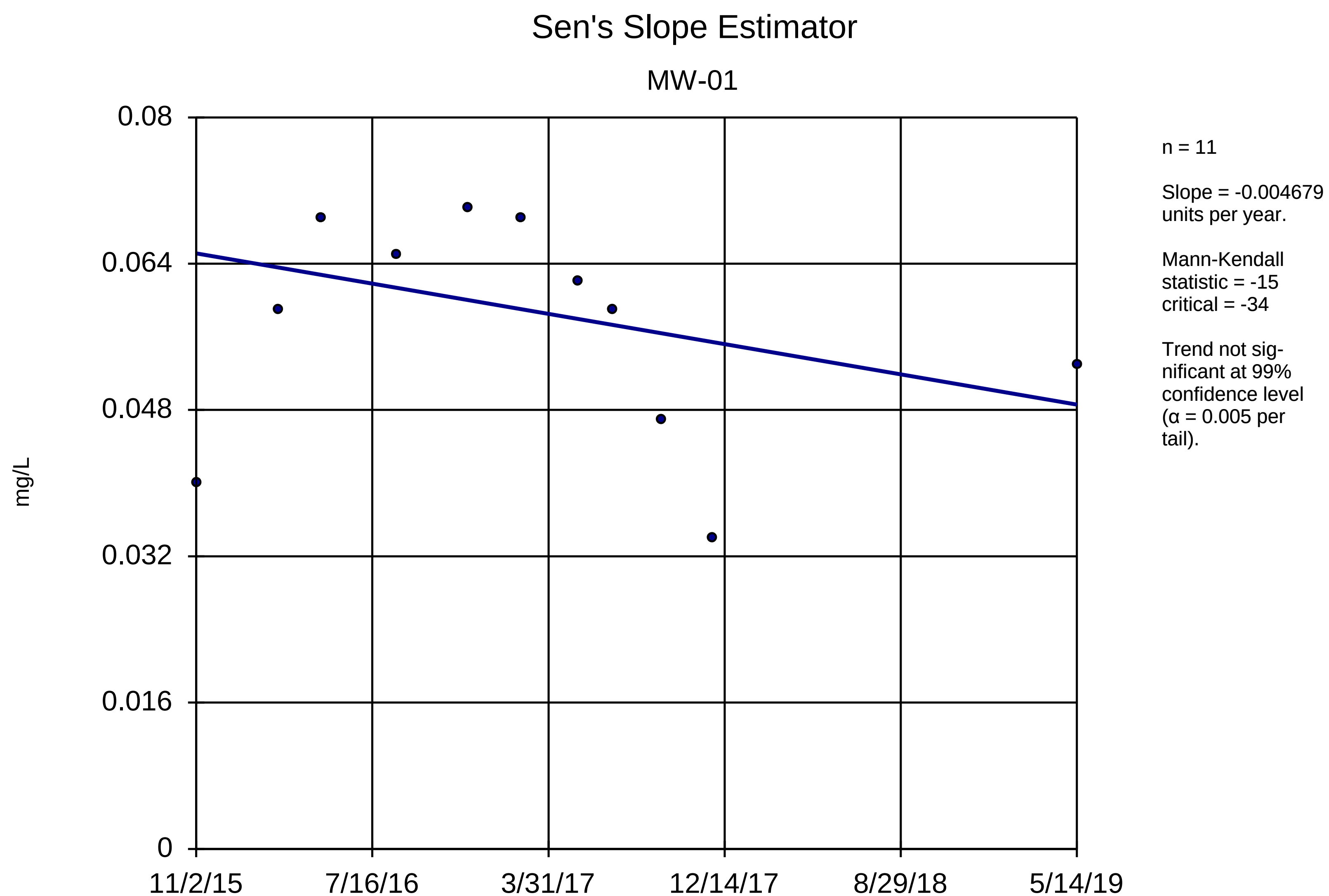
Mann-Kendall
statistic = -3
critical = -92

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Mercury, Total  Analysis Run 4/14/2021 1:02 PM

Utility Site W  Client: Weaver Consultants Group  Data: Waukegan Sanitas Database

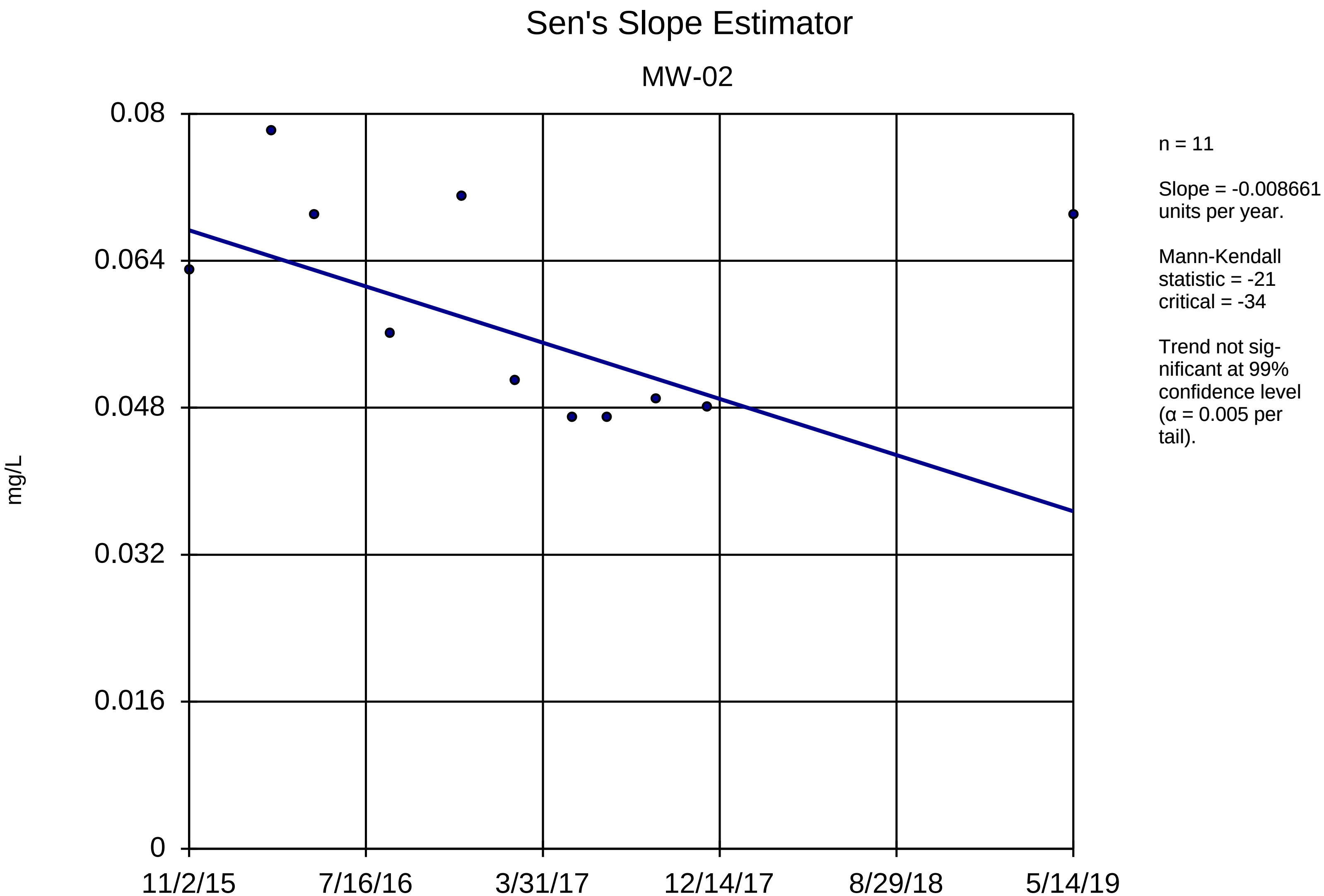
MWG13-15_82132




Constituent: Molybdenum, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

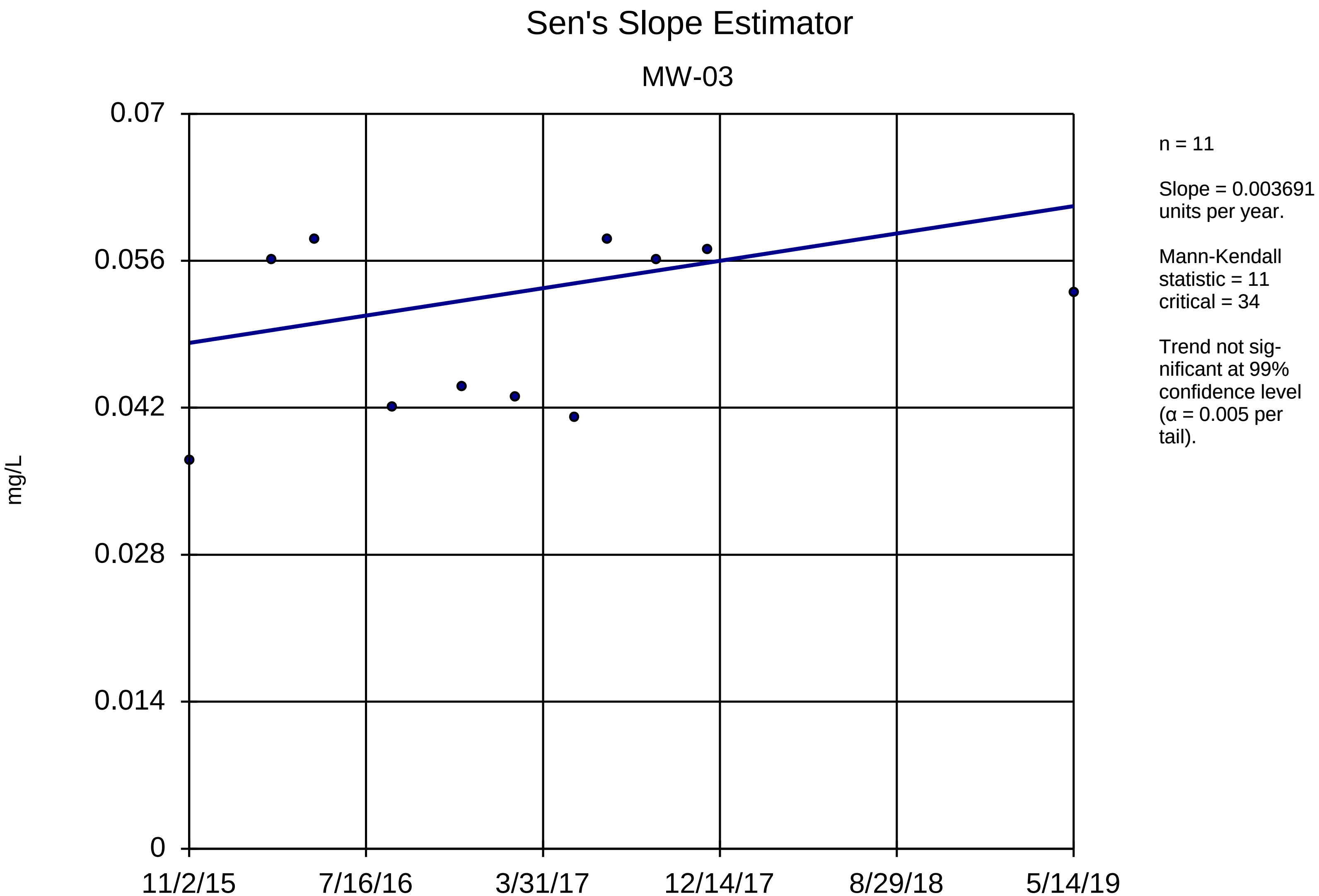
MWG13-15_82133




Constituent: Molybdenum, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

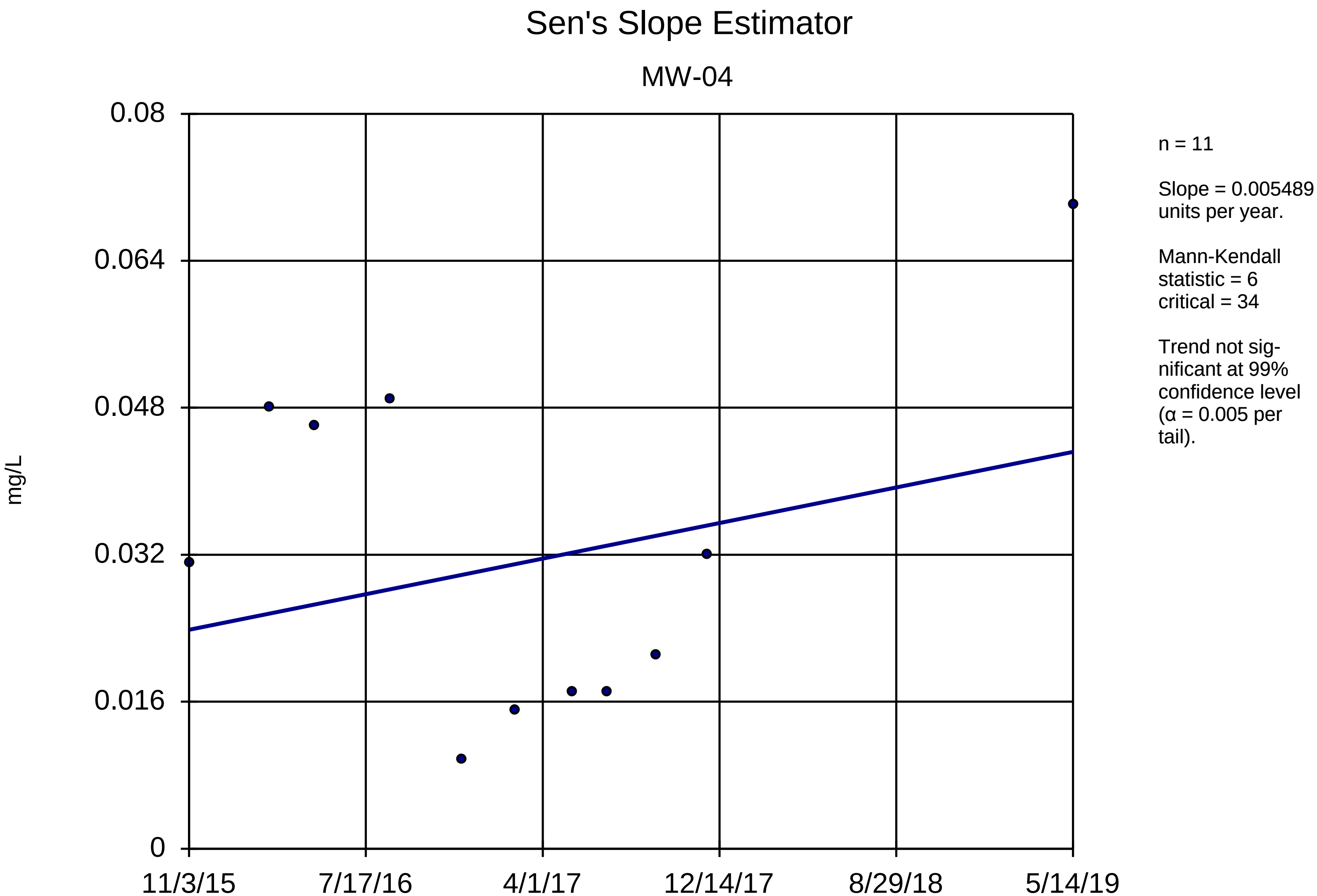
MWG13-15_82134




Constituent: Molybdenum, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

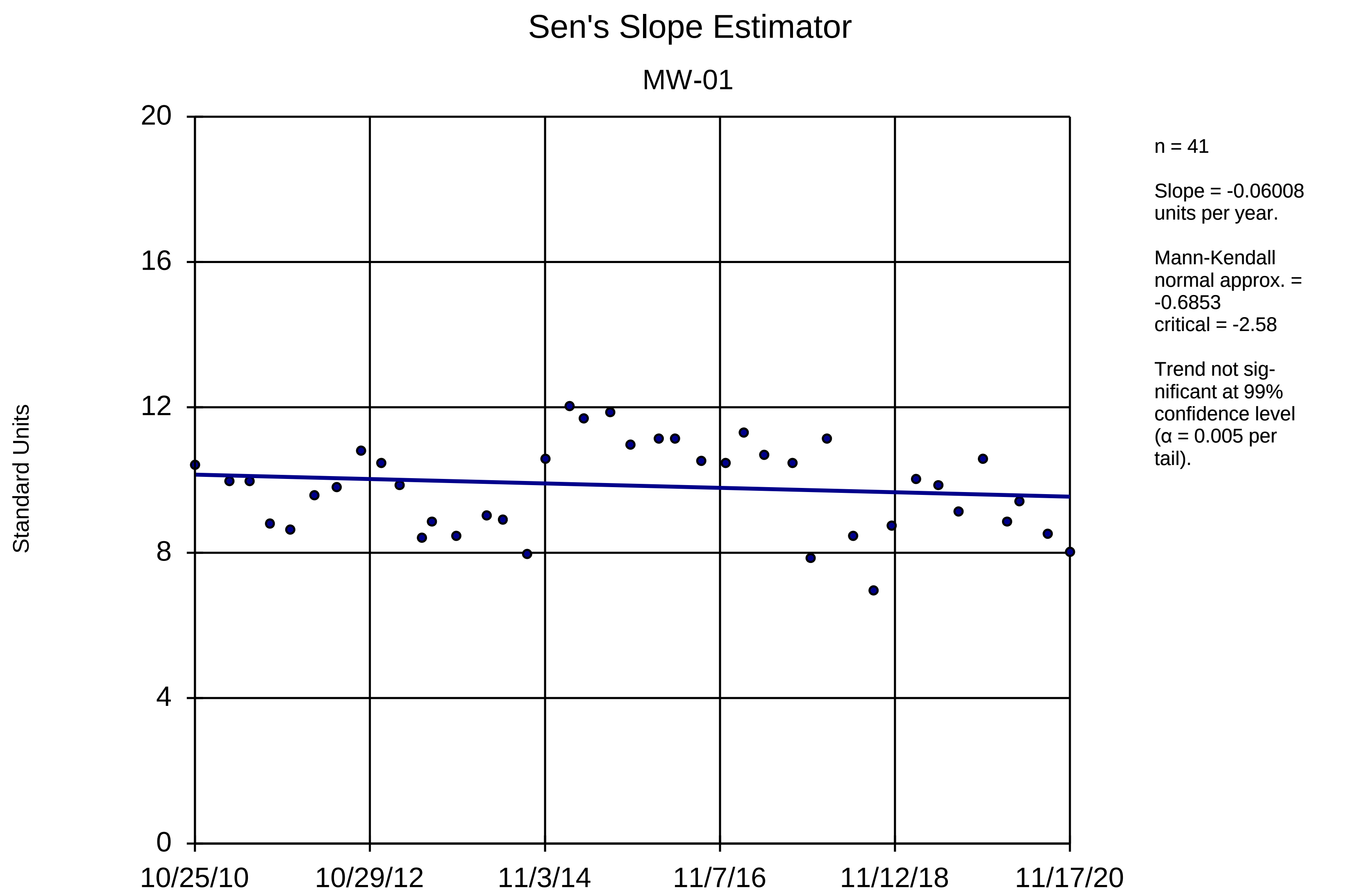
MWG13-15_82135




Constituent: Molybdenum, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82136



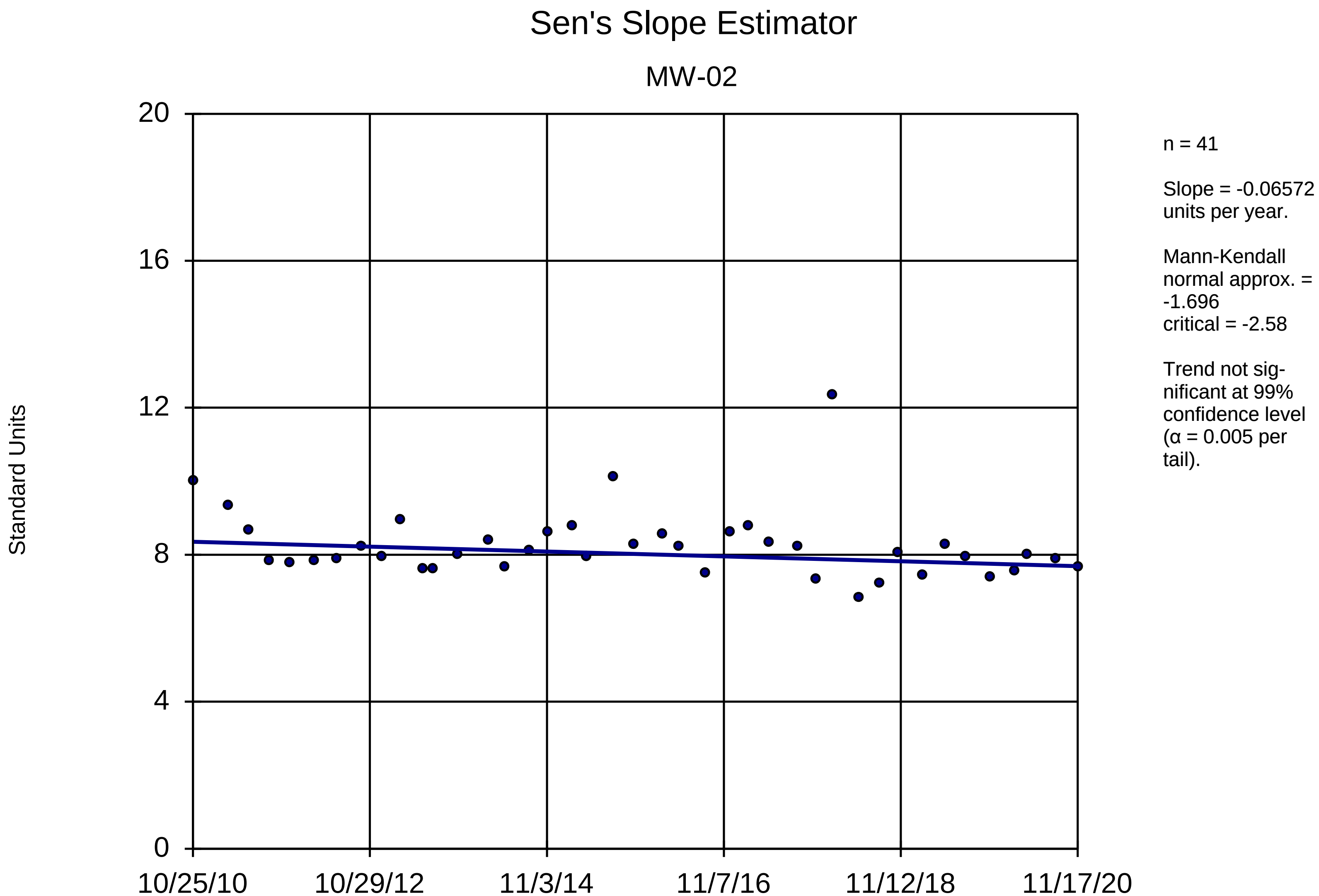

Constituent: pH, Field    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82137

Electronic Filing: Received, Clerk's Office 01/21/2022

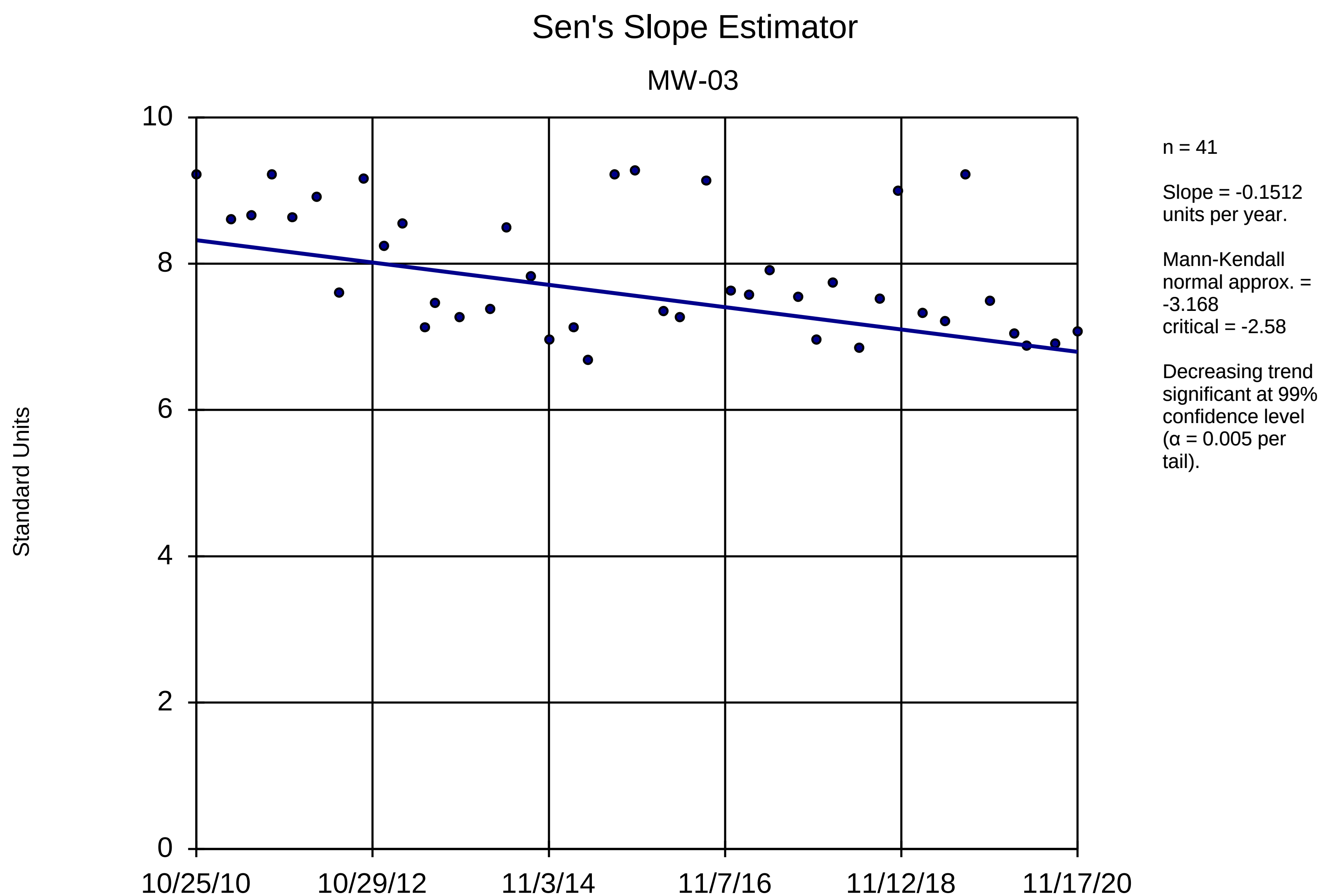





Constituent: pH, Field    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

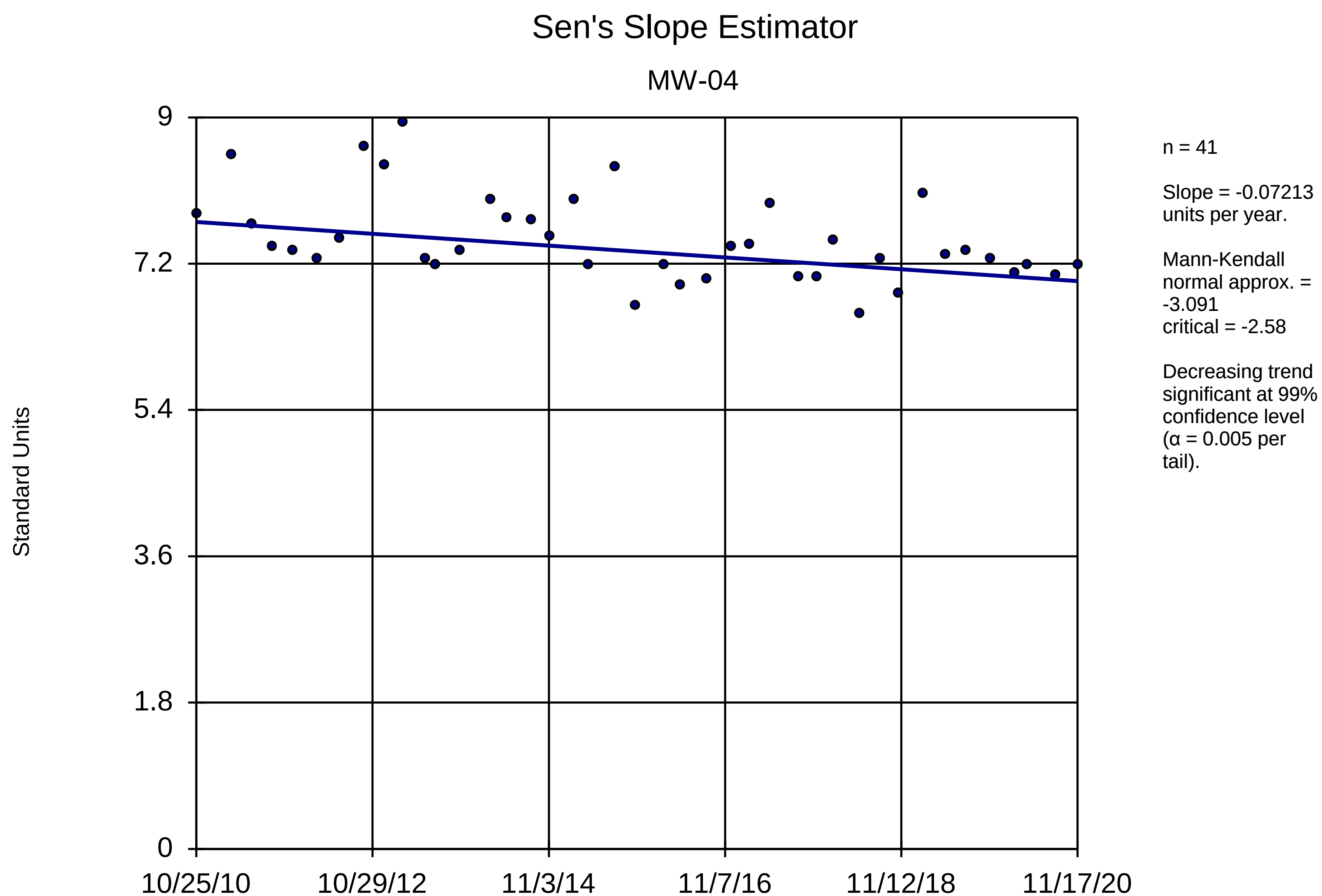
MWG13-15_82138




Constituent: pH, Field    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82139




Constituent: pH, Field    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

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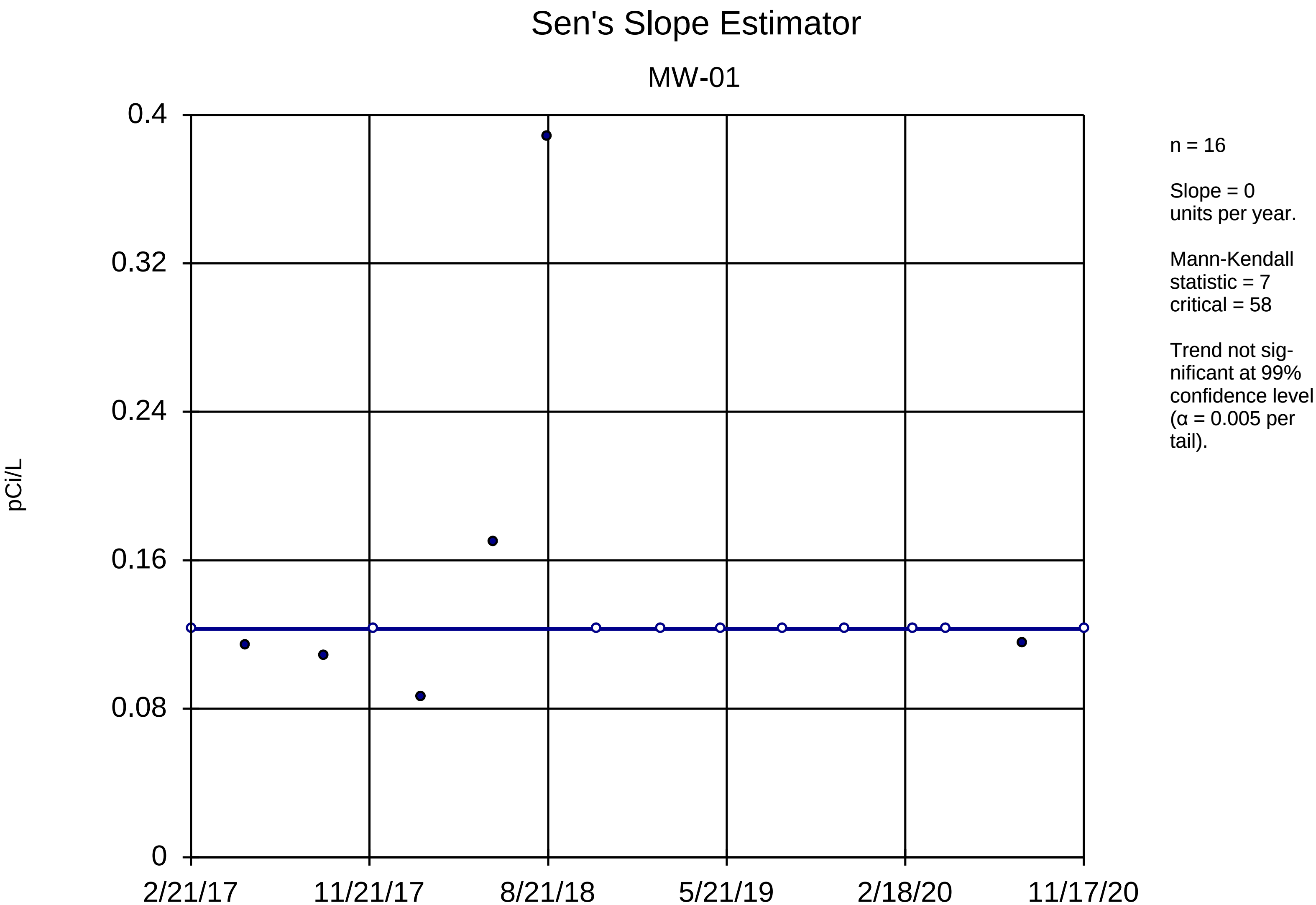
Hollow symbols indicate censored values.

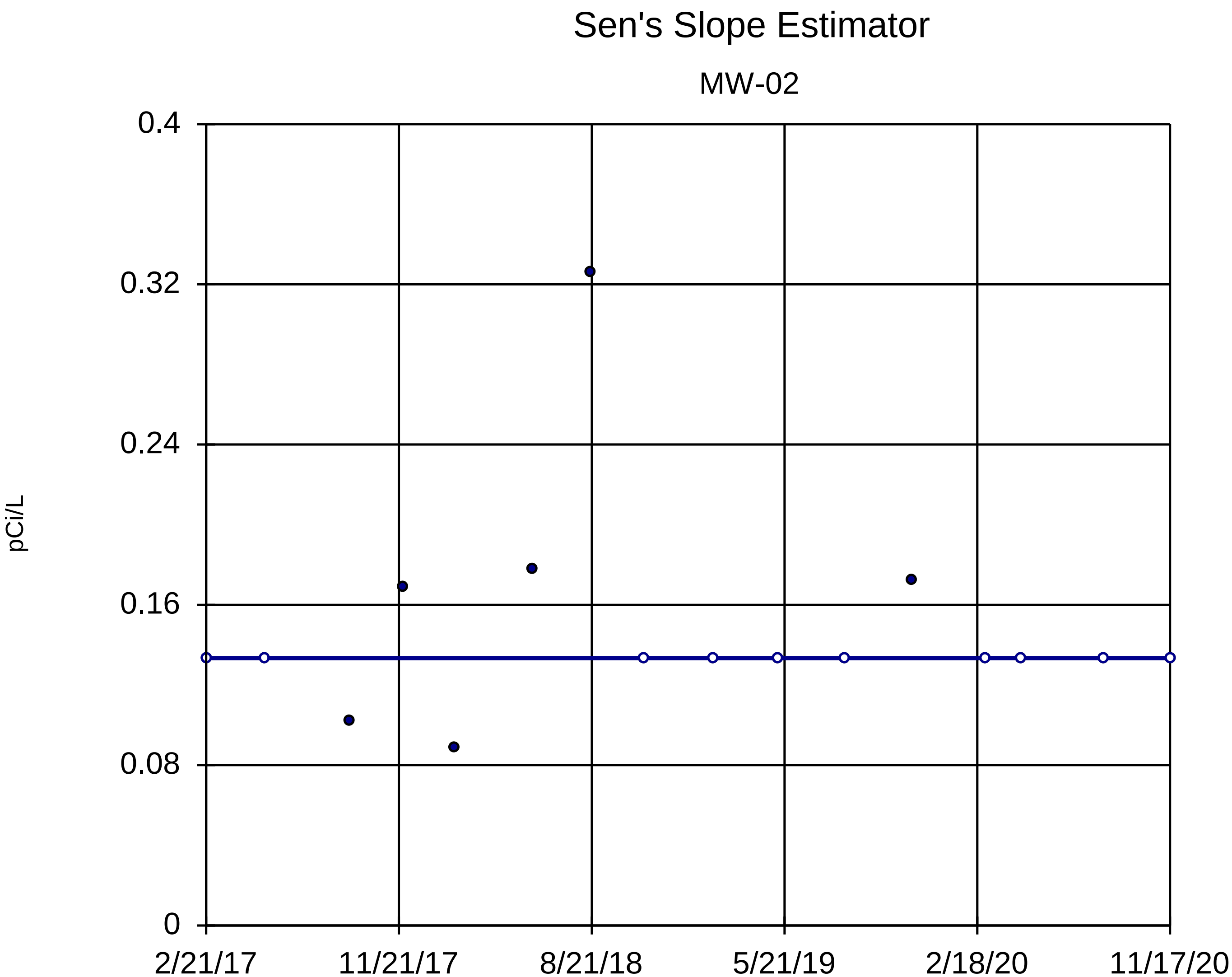



Constituent: Radium-226 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82141

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = 3
critical = 58

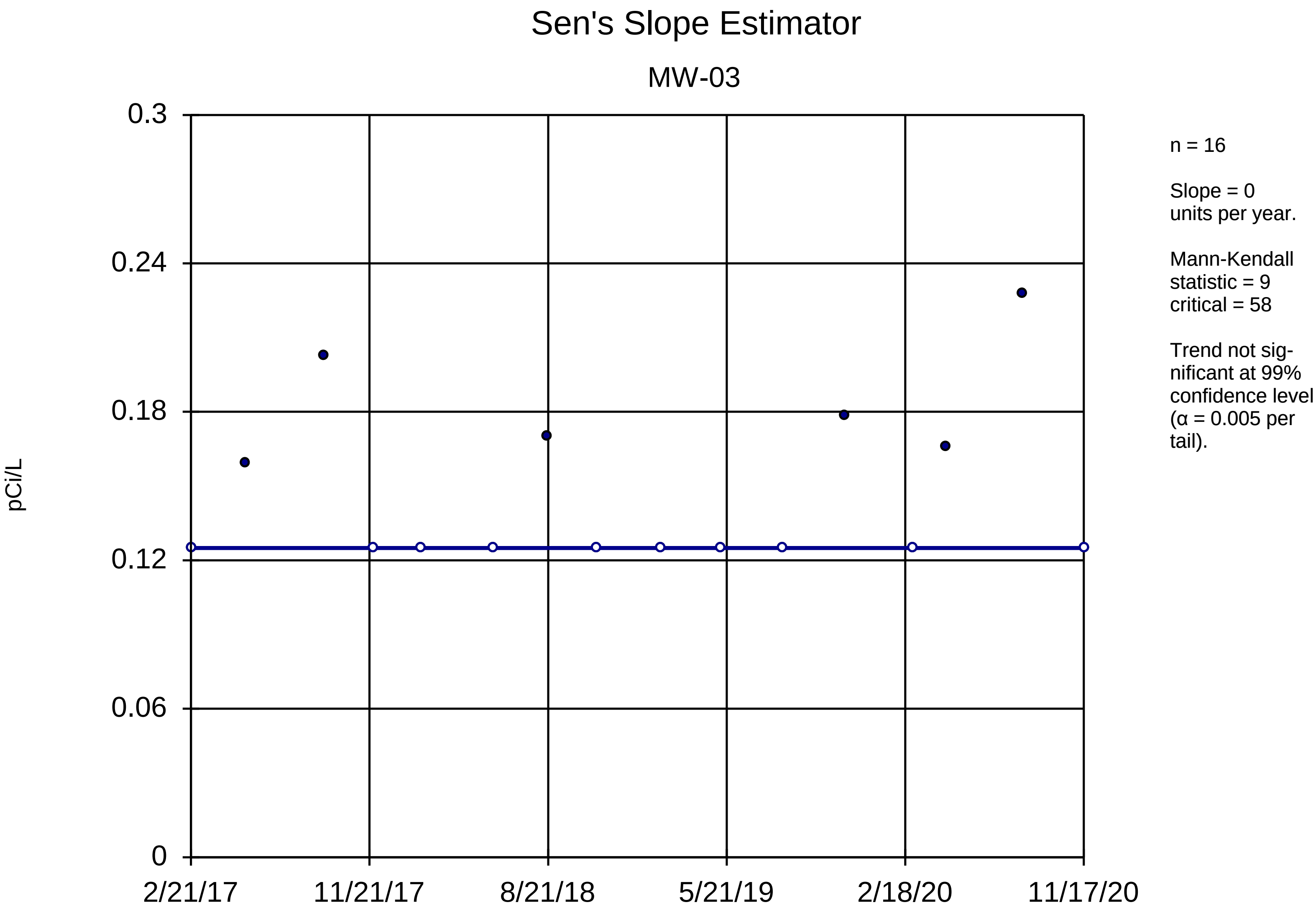
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Radium-226 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82142

Hollow symbols indicate censored values.



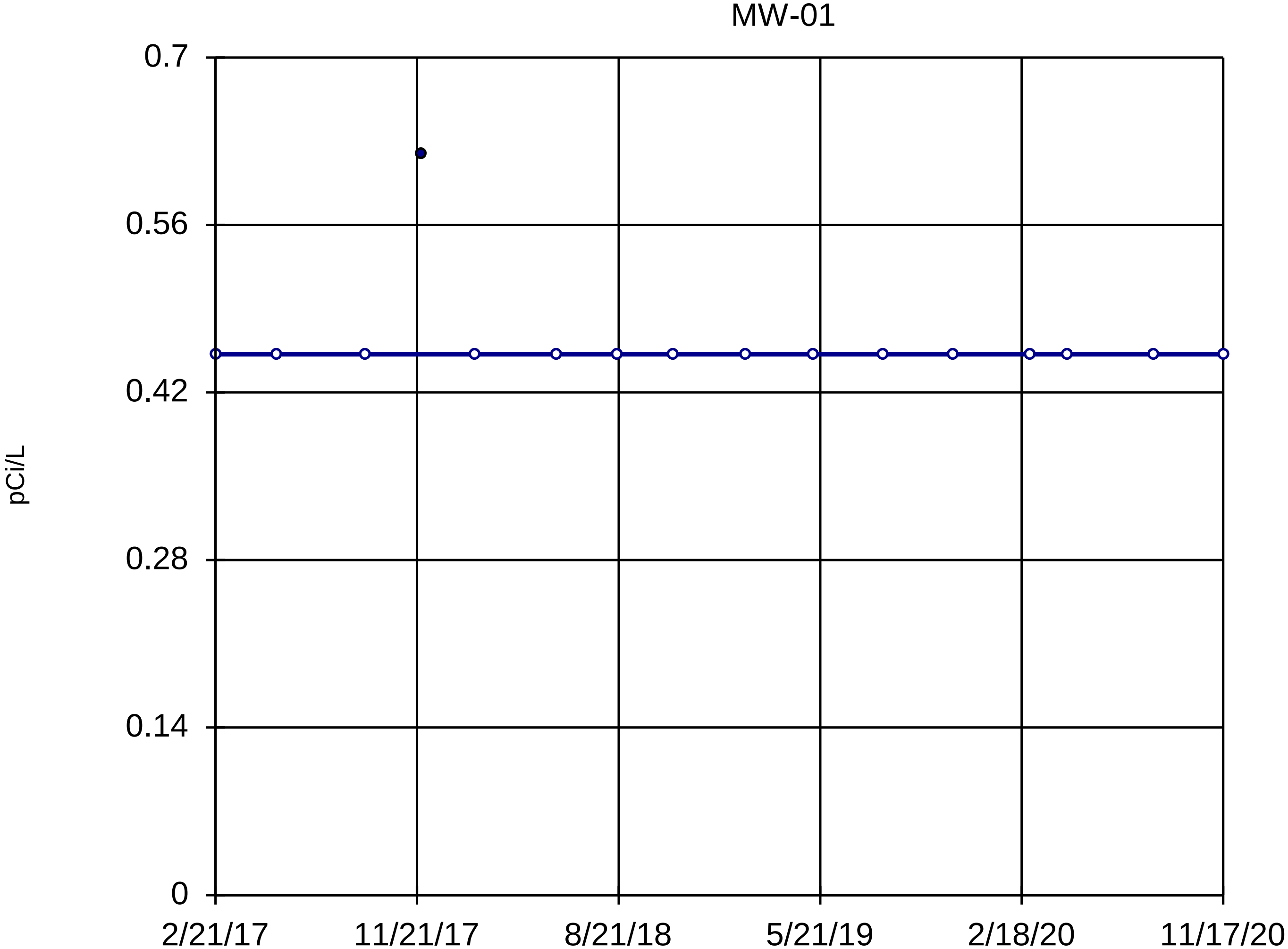

Constituent: Radium-226 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82143

Hollow symbols indicate censored values.

## Sen's Slope Estimator




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = -9
critical = -58

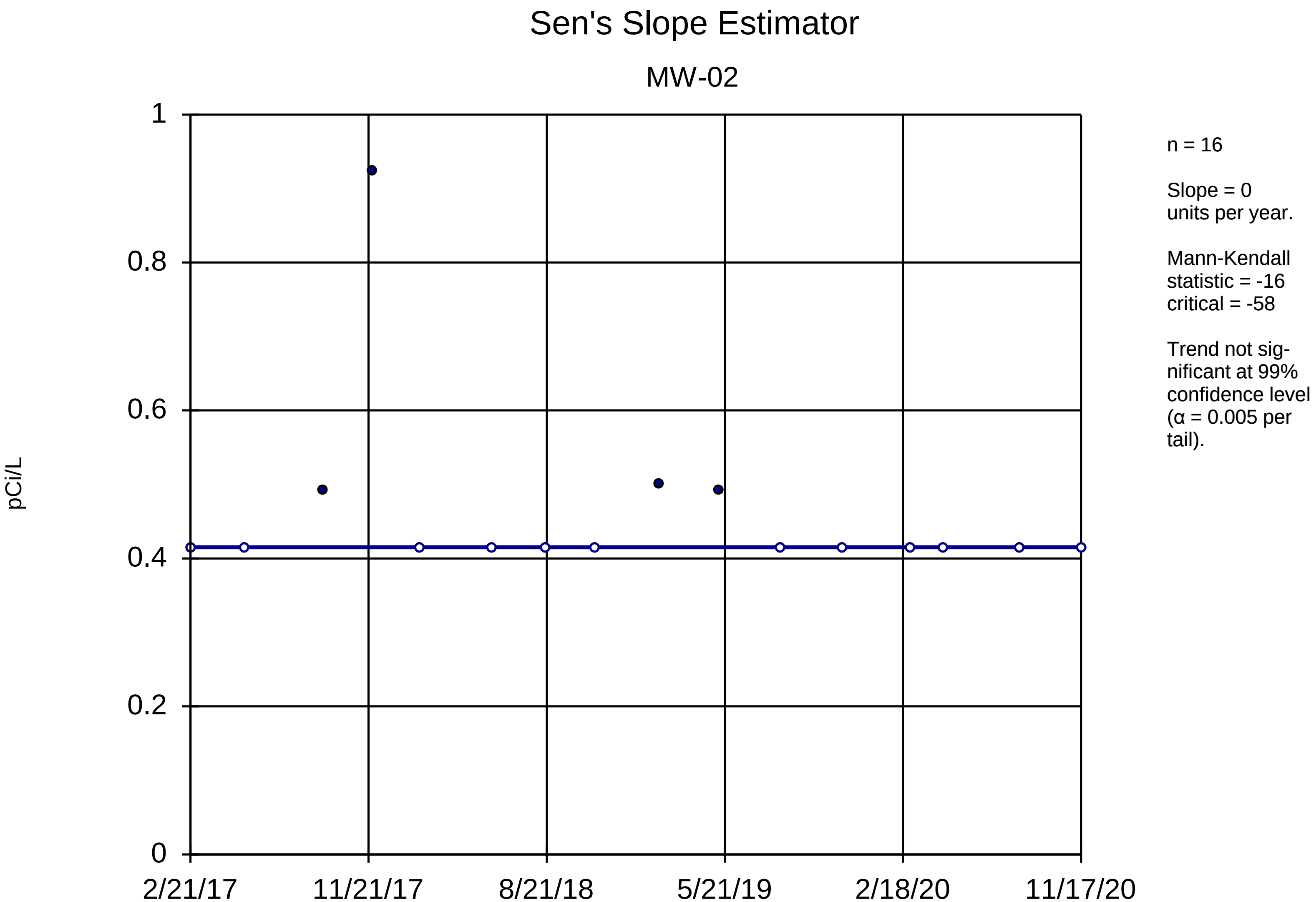
Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Radium-228 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82144

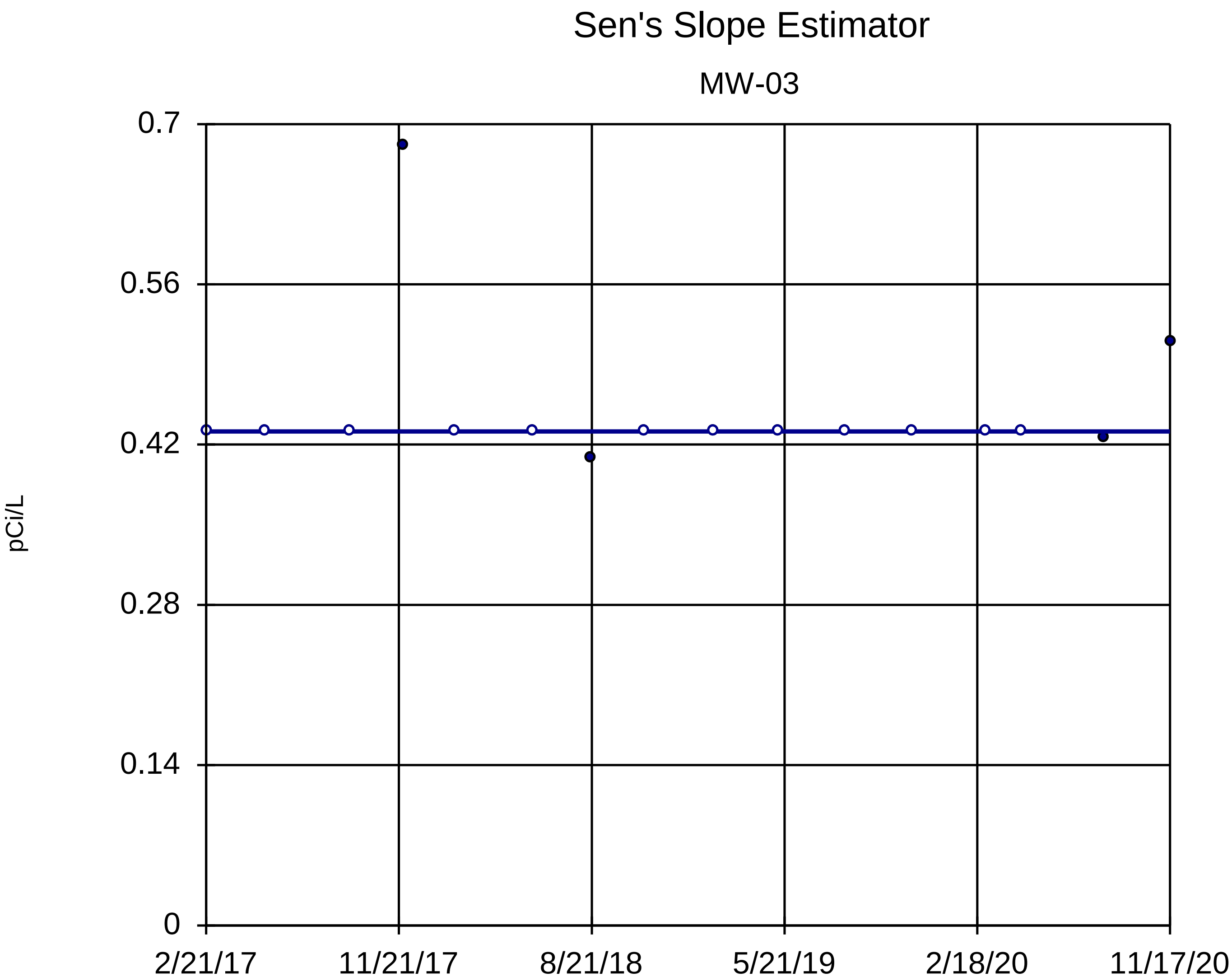
Hollow symbols indicate censored values.




Constituent: Radium-228 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




n = 16

Slope = 0
units per year.

Mann-Kendall
statistic = -4
critical = -58

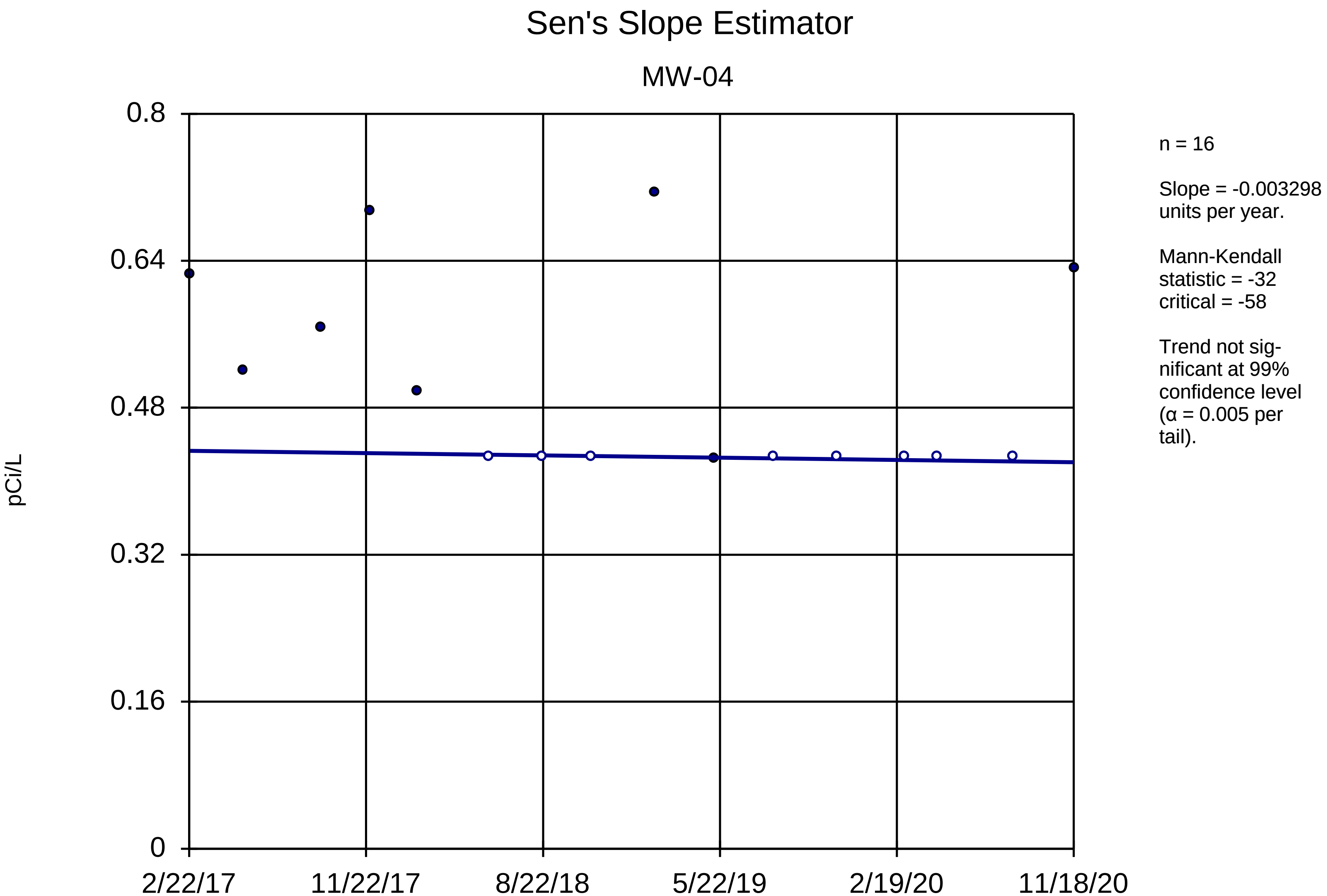
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Radium-228 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82146

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

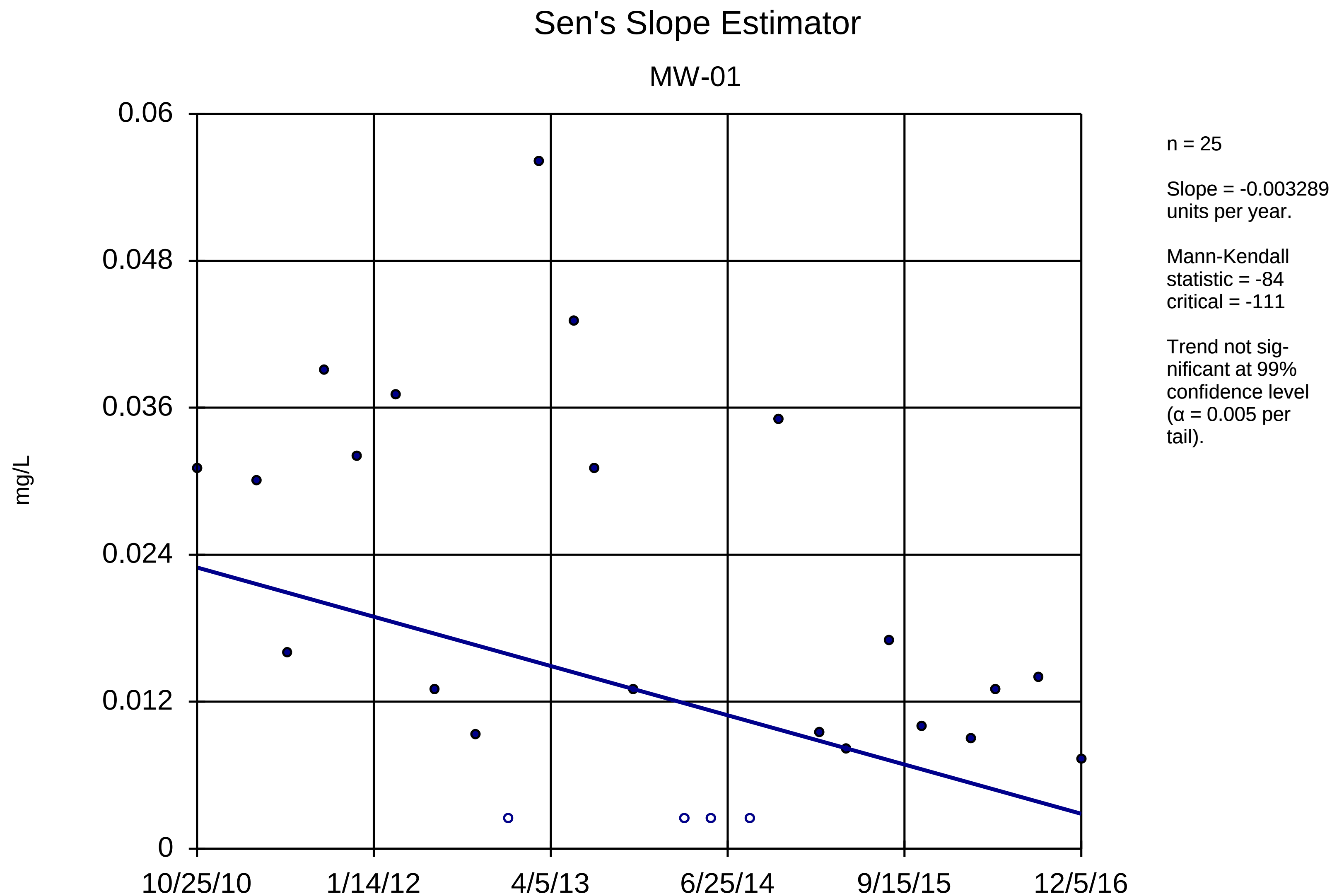



Constituent: Radium-228 Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82147

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Selenium, Dissolved    Analysis Run 4/14/2021 1:02 PM

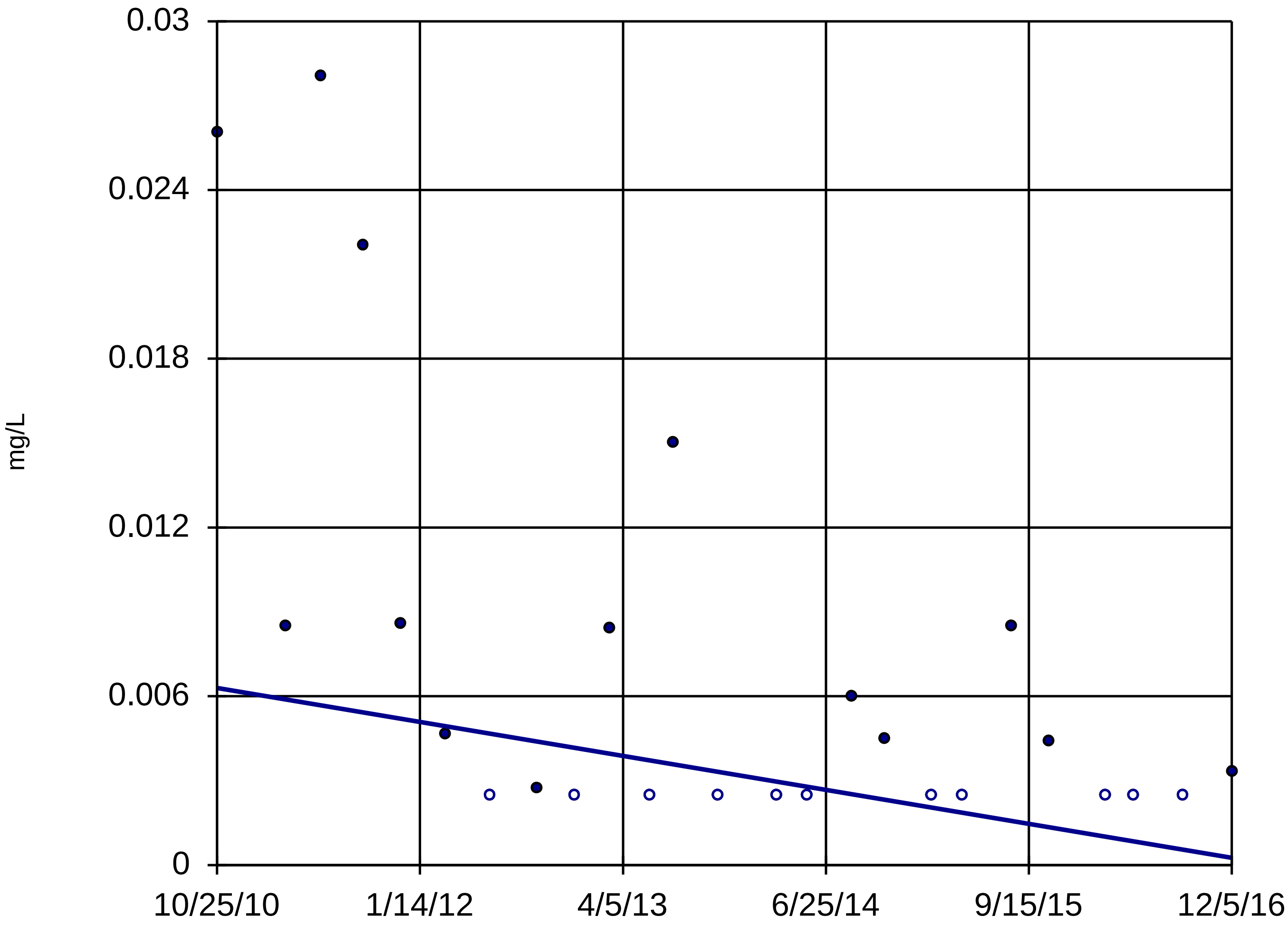
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82148

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-02




n = 25

Slope = -0.000987
units per year.

Mann-Kendall
statistic = -112
critical = -111

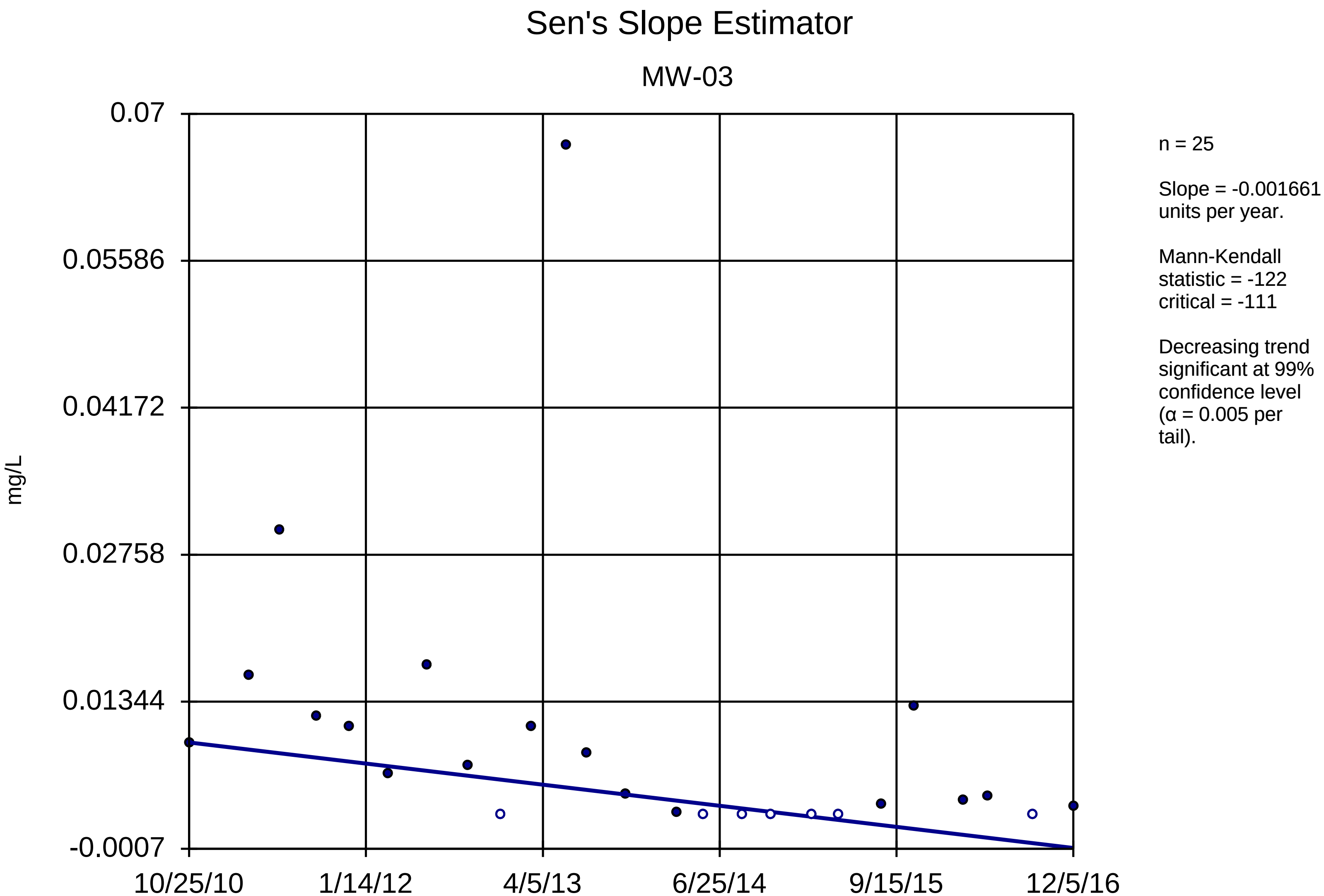
Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82149

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

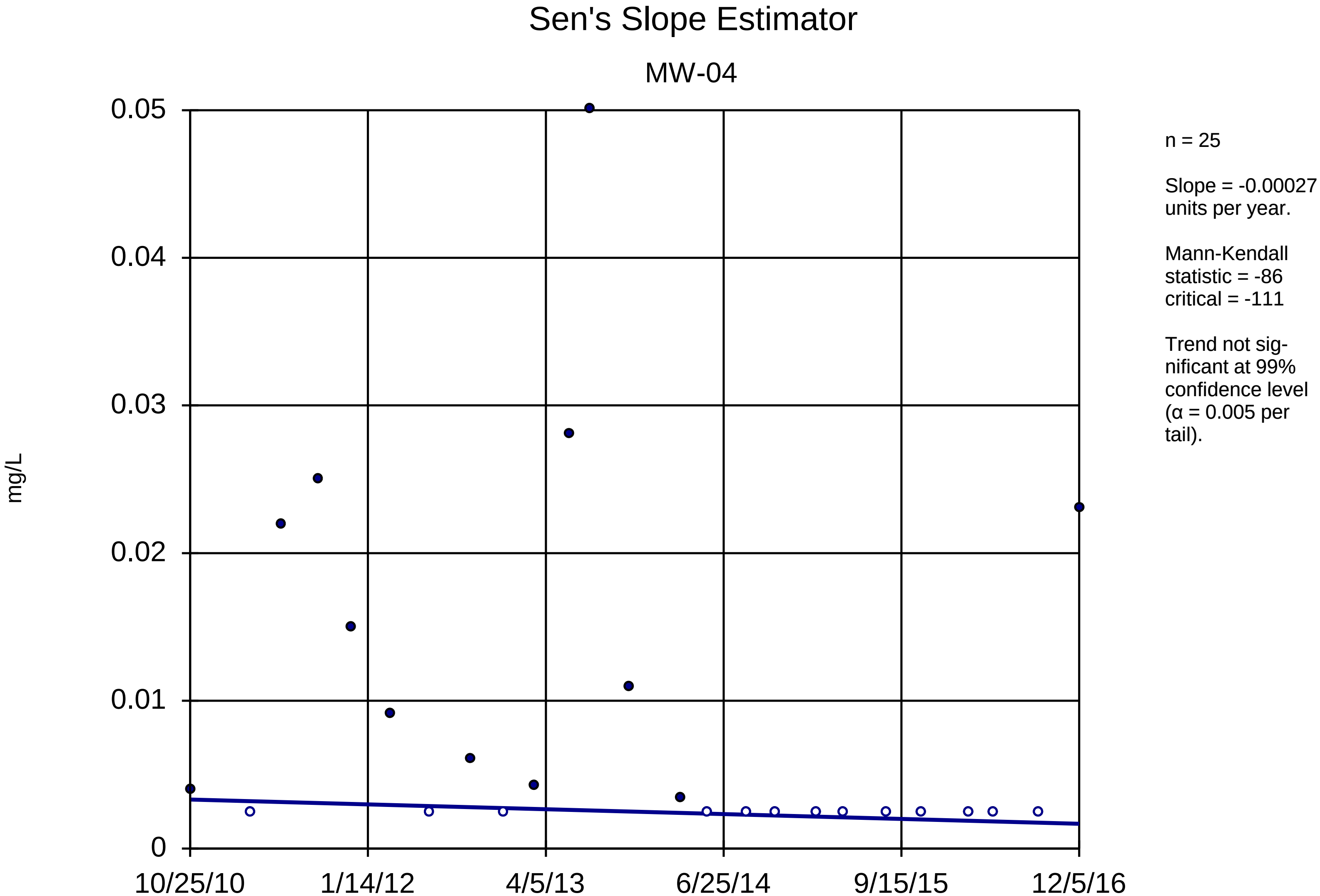



Constituent: Selenium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82150

Hollow symbols indicate censored values.




Constituent: Selenium, Dissolved Analysis Run 4/14/2021 1:02 PM

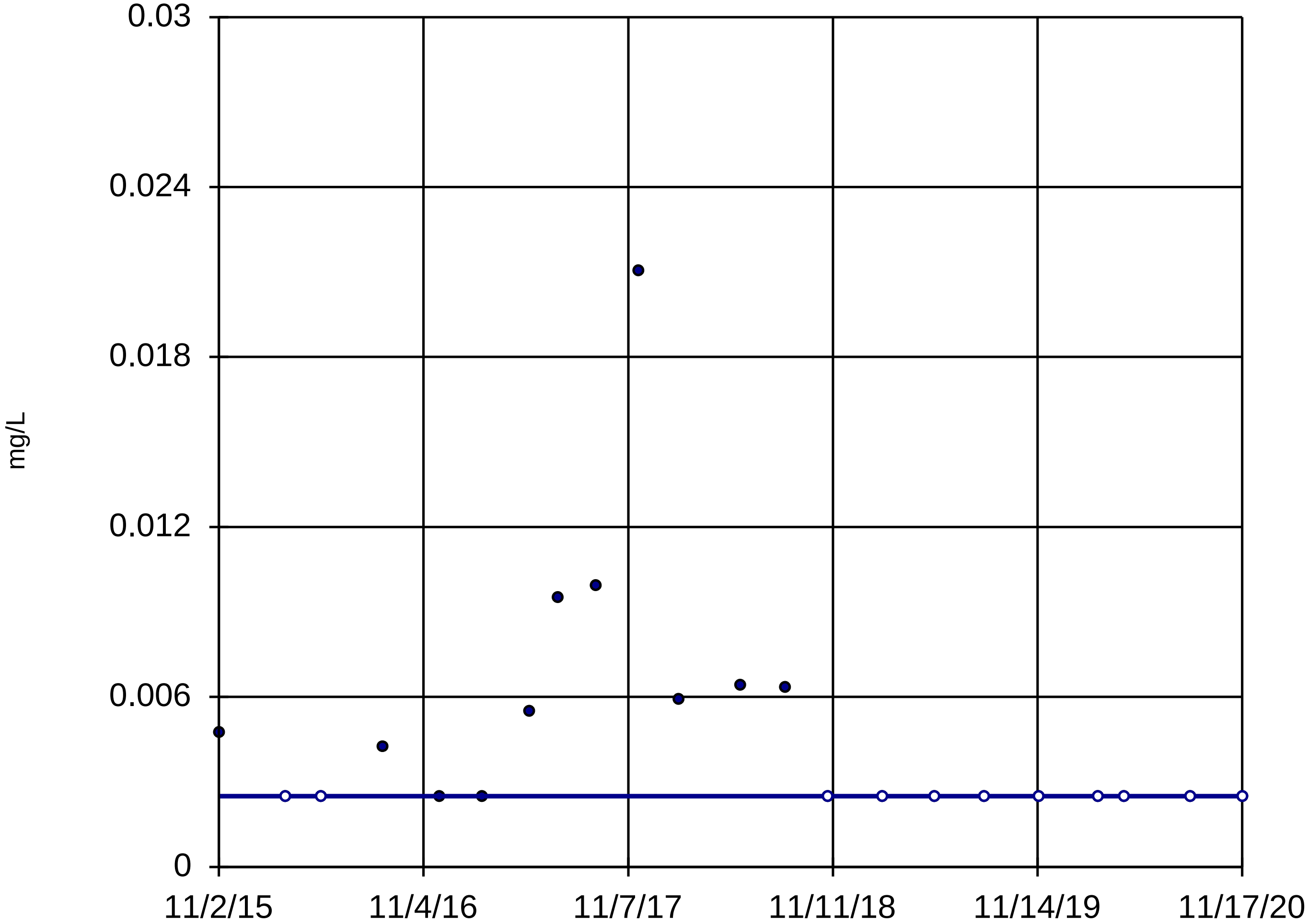
Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82151

Hollow symbols indicate censored values.

# Sen's Slope Estimator

MW-01




n = 22

Slope = -1.4e-11
units per year.

Mann-Kendall
statistic = -43
critical = -92

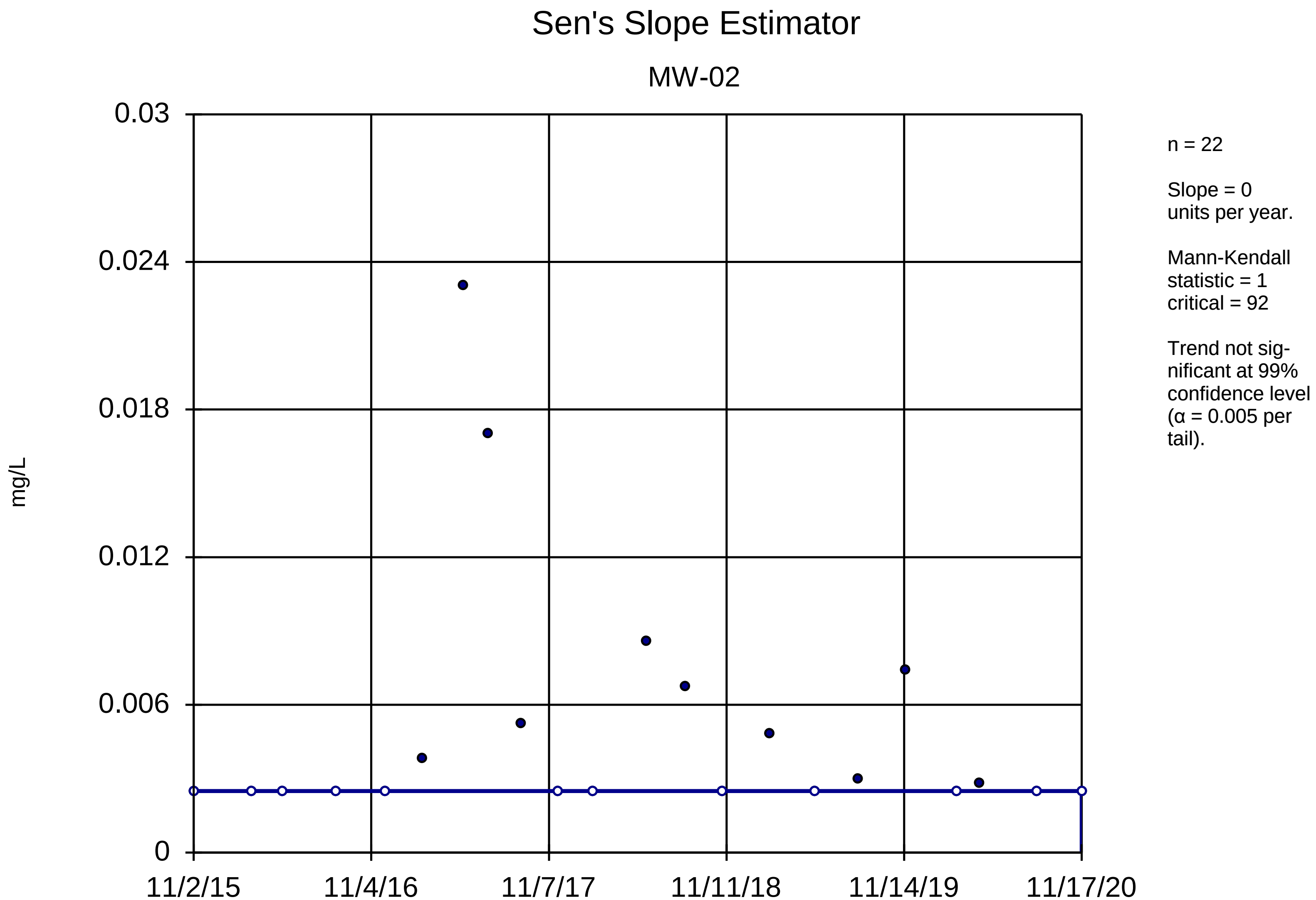
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Selenium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82152

Hollow symbols indicate censored values.

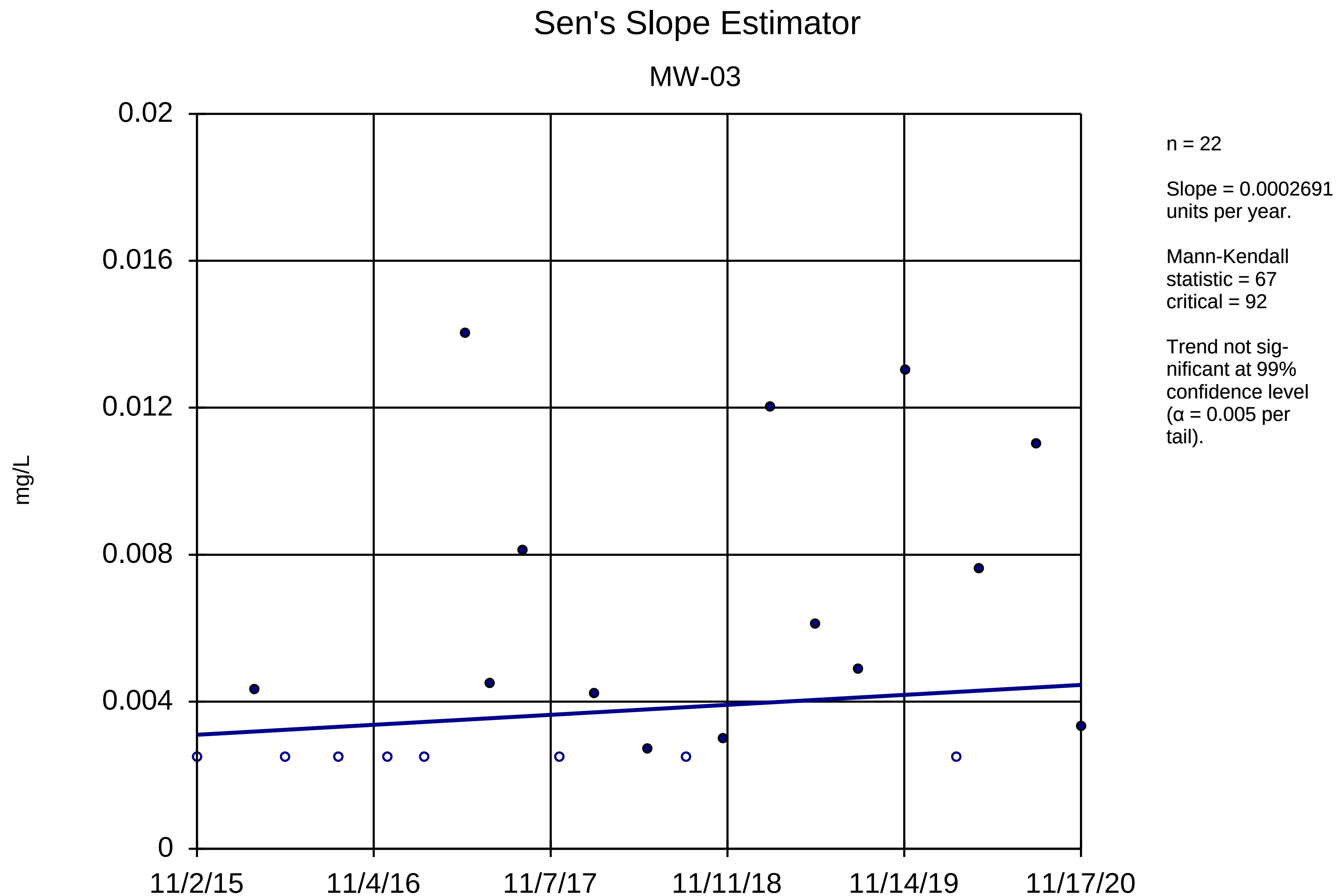



Constituent: Selenium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82153

Hollow symbols indicate censored values.

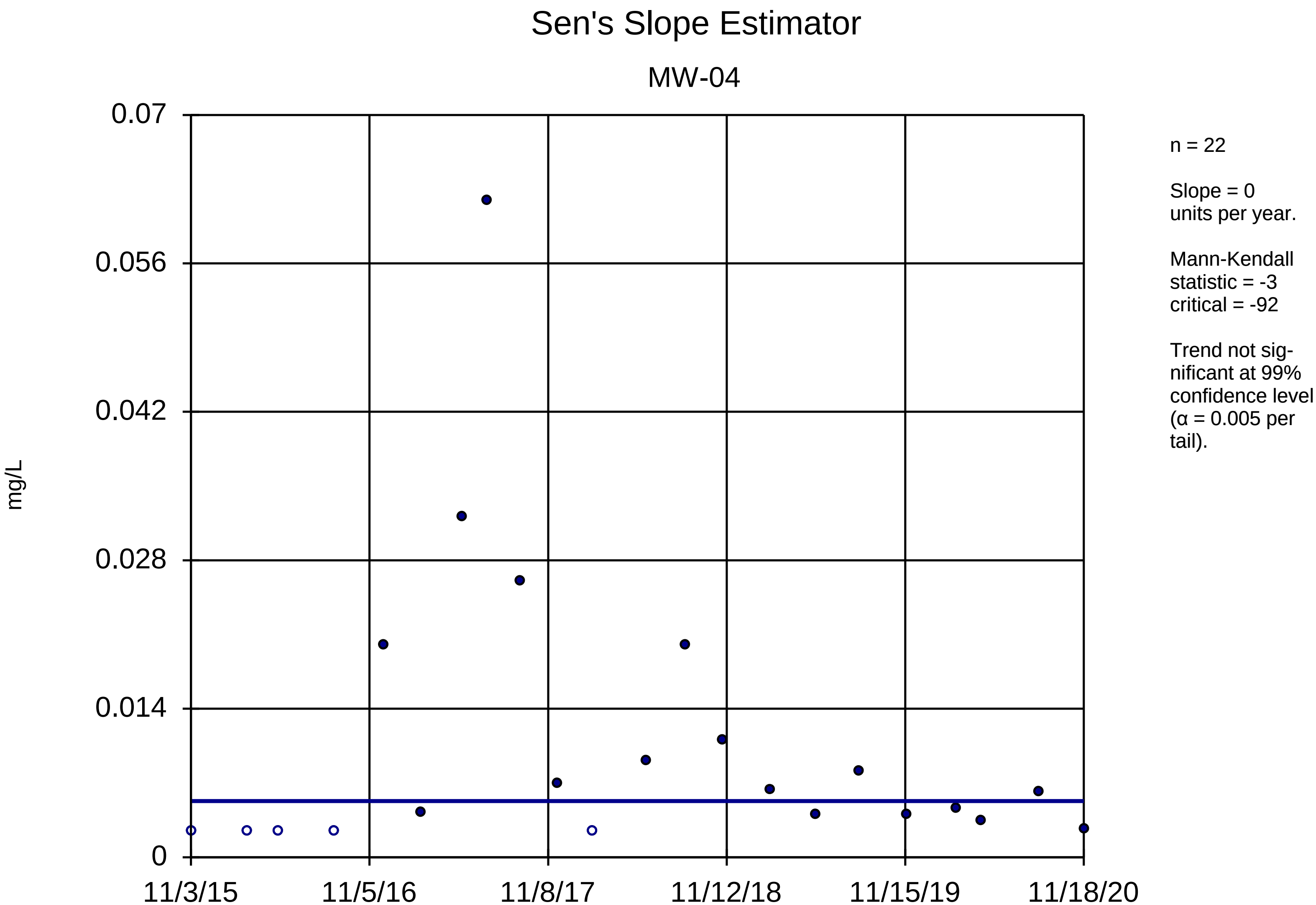



Constituent: Selenium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82154

Hollow symbols indicate censored values.

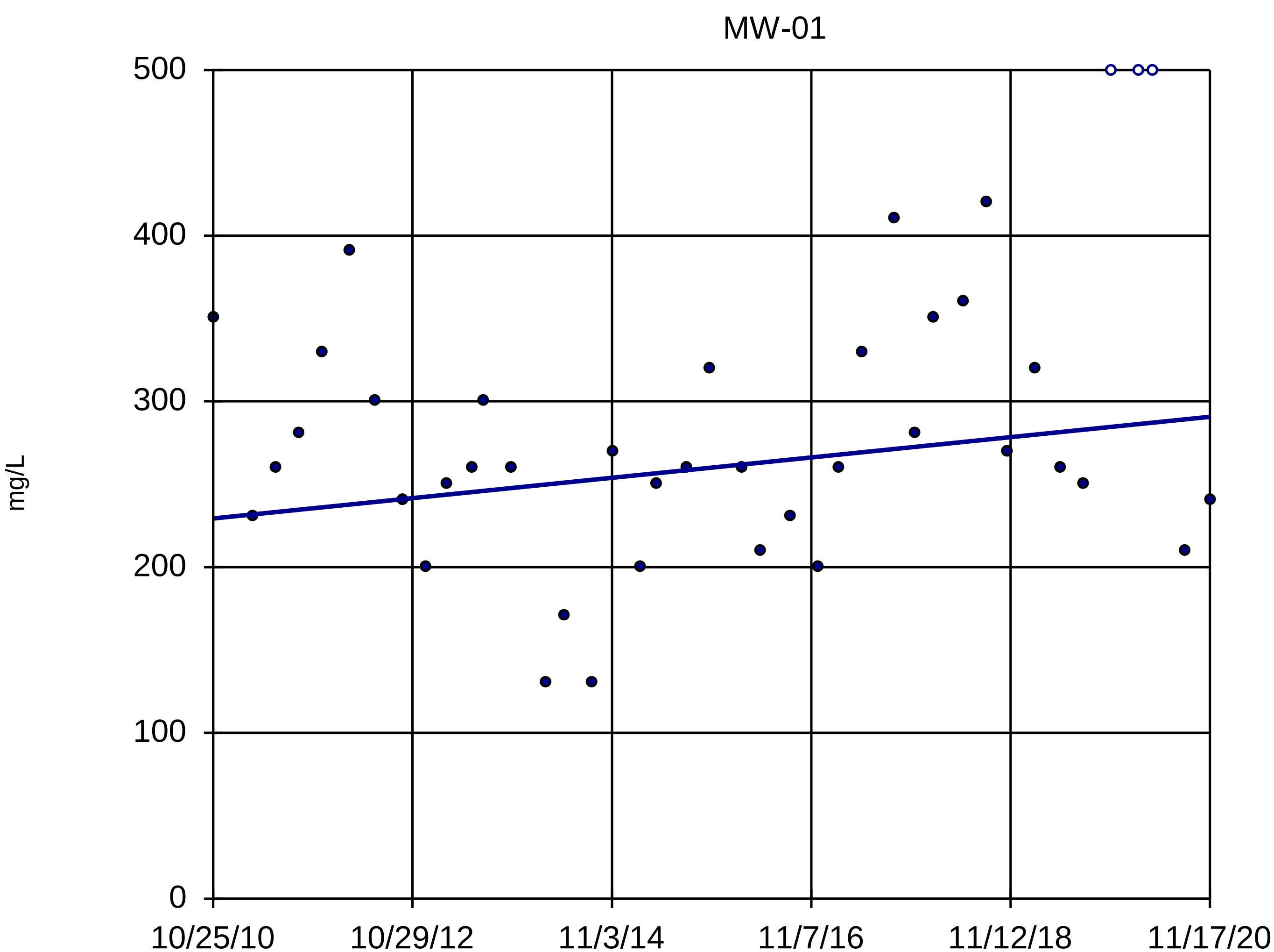



Constituent: Selenium, Total Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82155

Hollow symbols indicate censored values.




n = 41

Slope = 6.09
units per year.

Mann-Kendall
normal approx. =
1.5
critical = 2.58

Trend not significant at 99% confidence level ($\alpha$ = 0.005 per tail).

Constituent: Sulfate Analysis Run 4/14/2021 1:02 PM

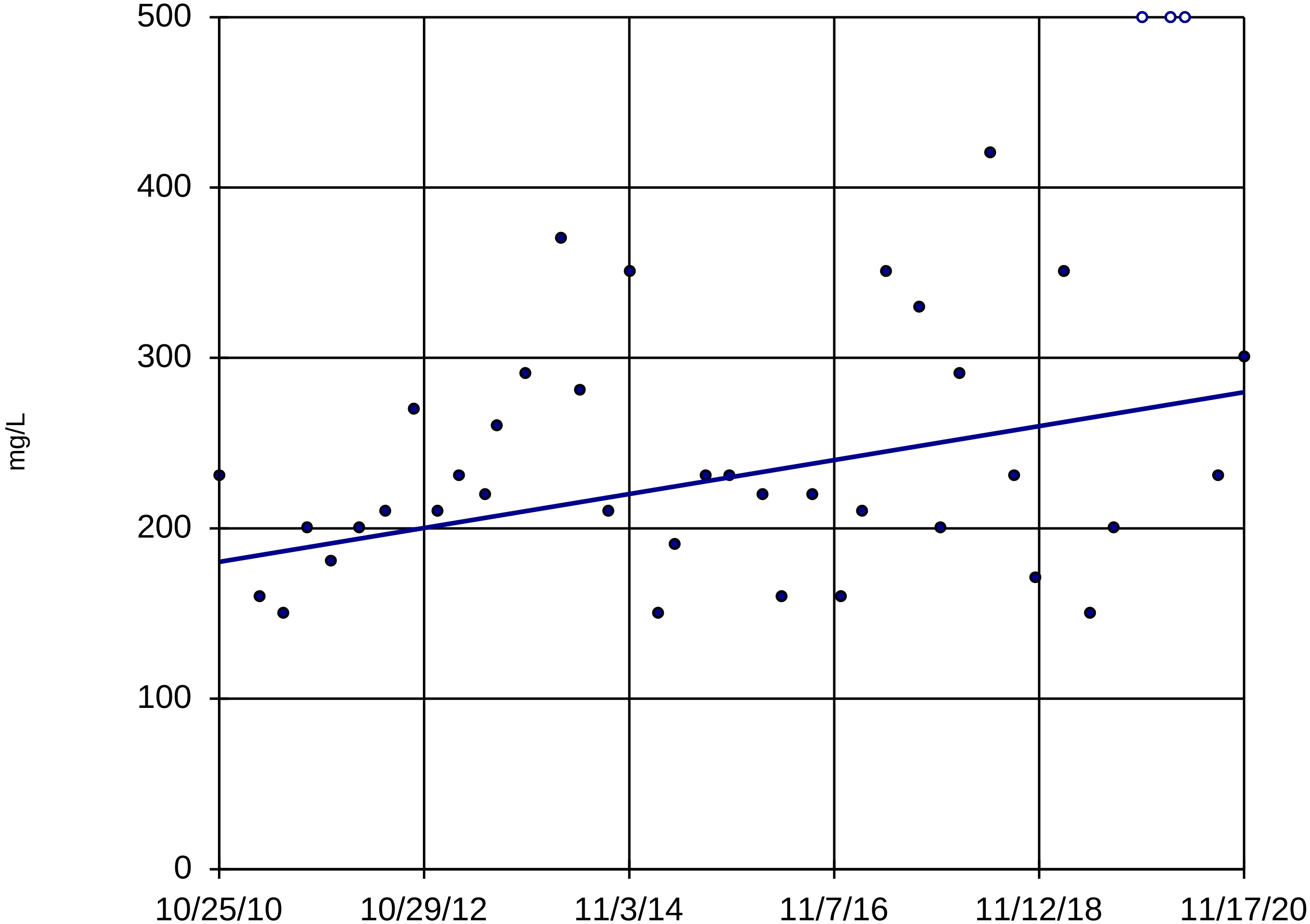
Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82156

Hollow symbols indicate censored values.

## Sen's Slope Estimator

MW-02




n = 41

Slope = 9.876
units per year.

Mann-Kendall
normal approx. =
2.346
critical = 2.58

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Sulfate    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82157

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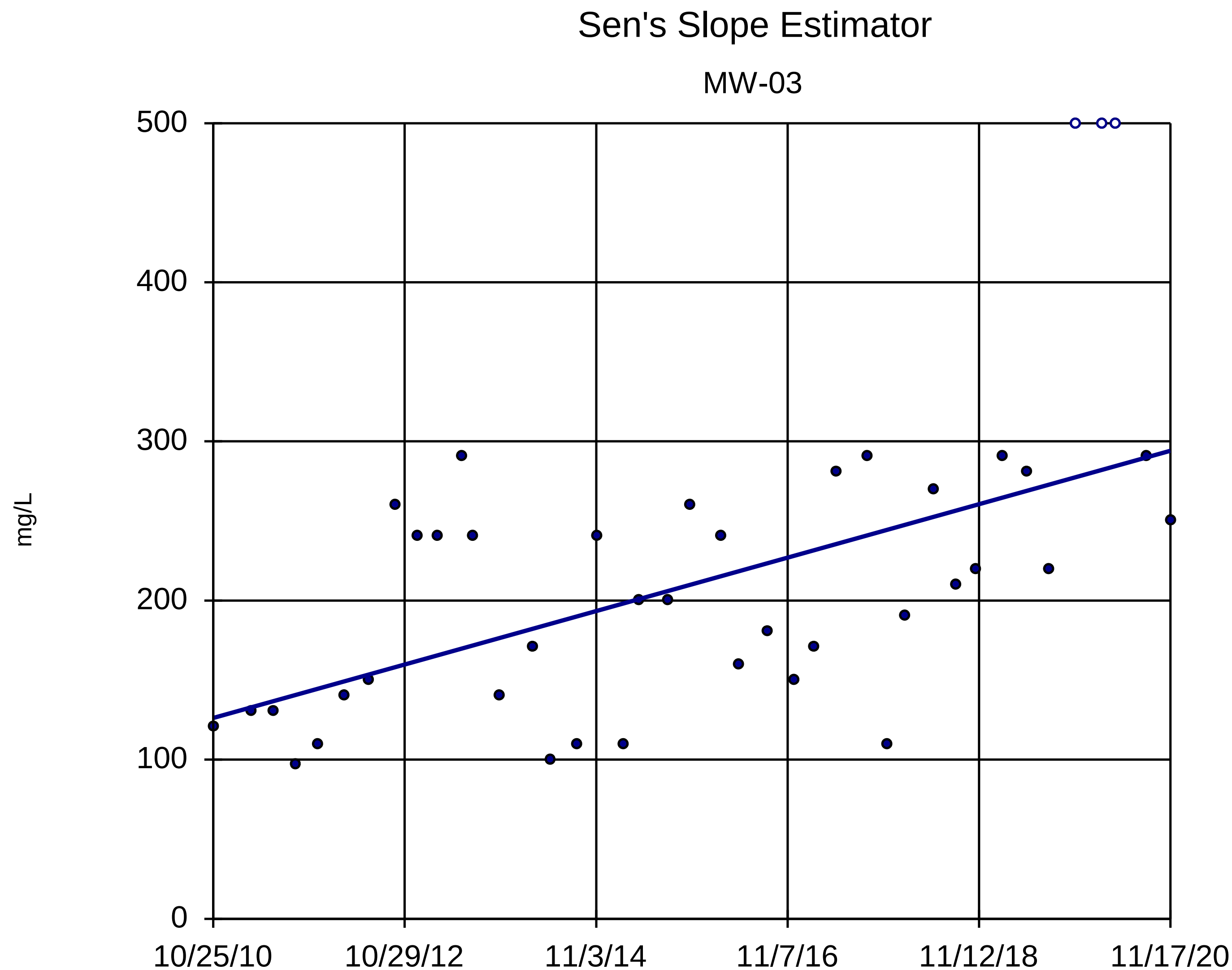
Hollow symbols indicate censored values.




n = 41

Slope = 16.66 units per year.

Mann-Kendall normal approx. = 4.033
critical = 2.58

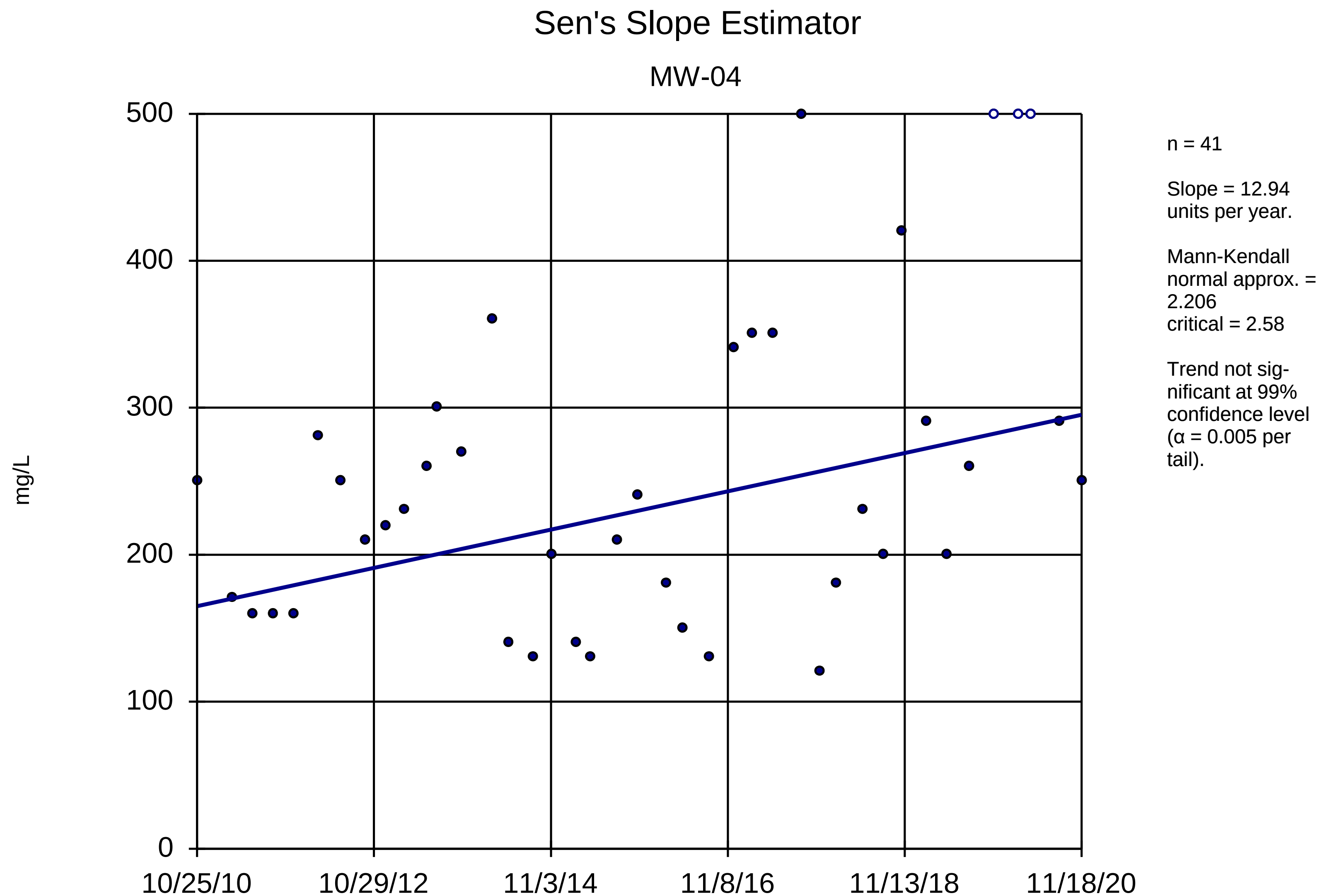
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82158

Hollow symbols indicate censored values.

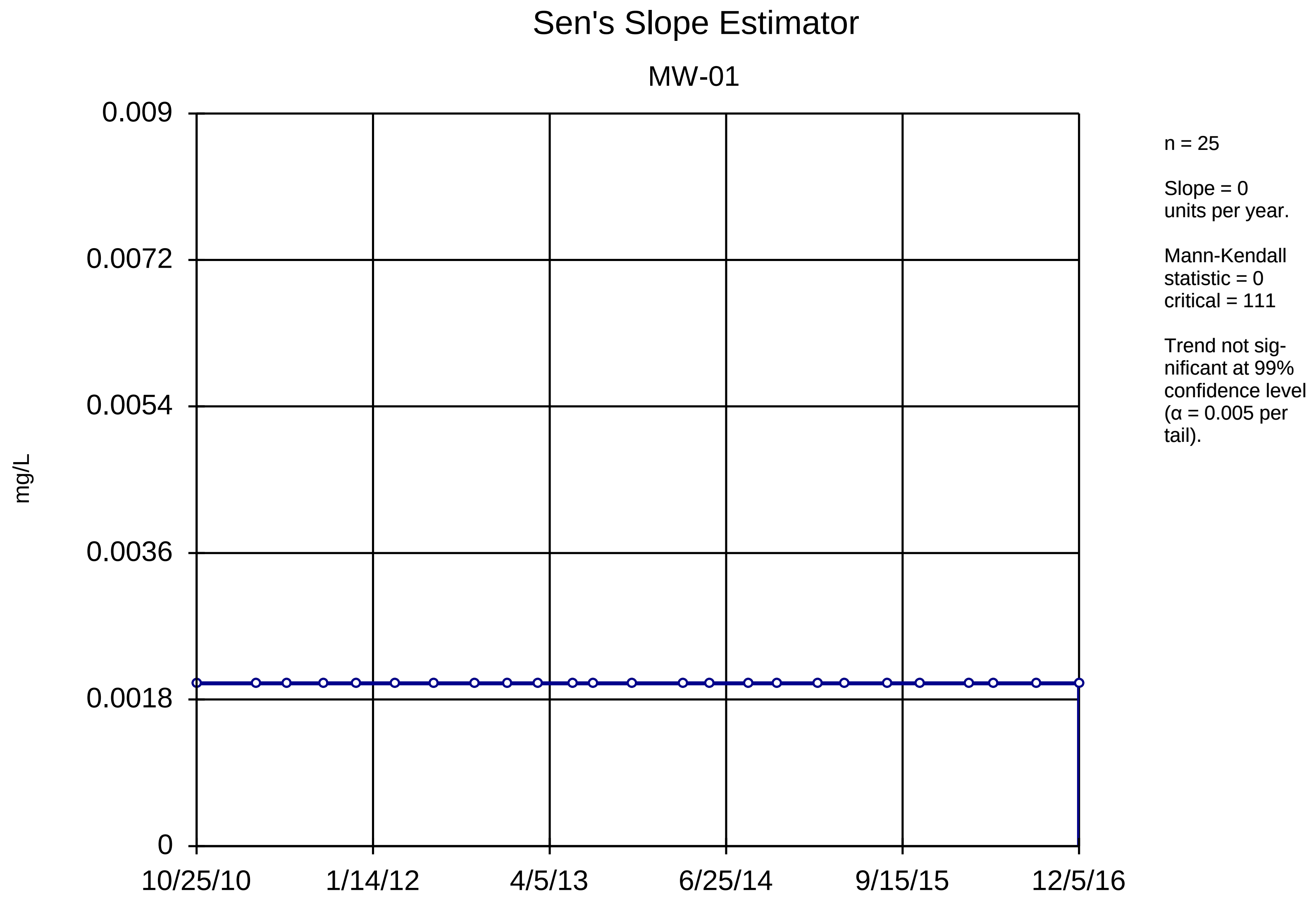



Constituent: Sulfate    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82159

Hollow symbols indicate censored values.



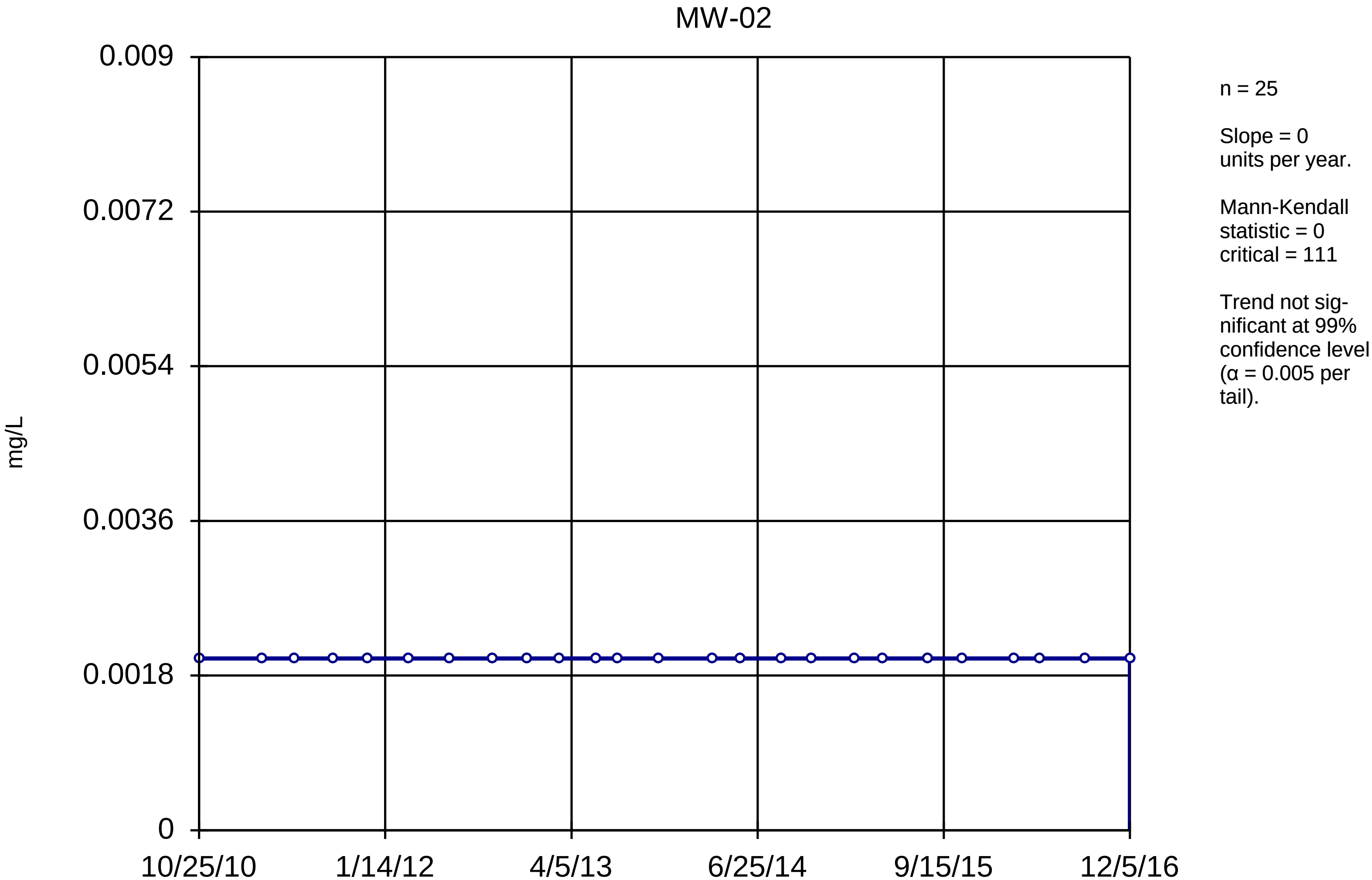

Constituent: Thallium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82160

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

## Sen's Slope Estimator

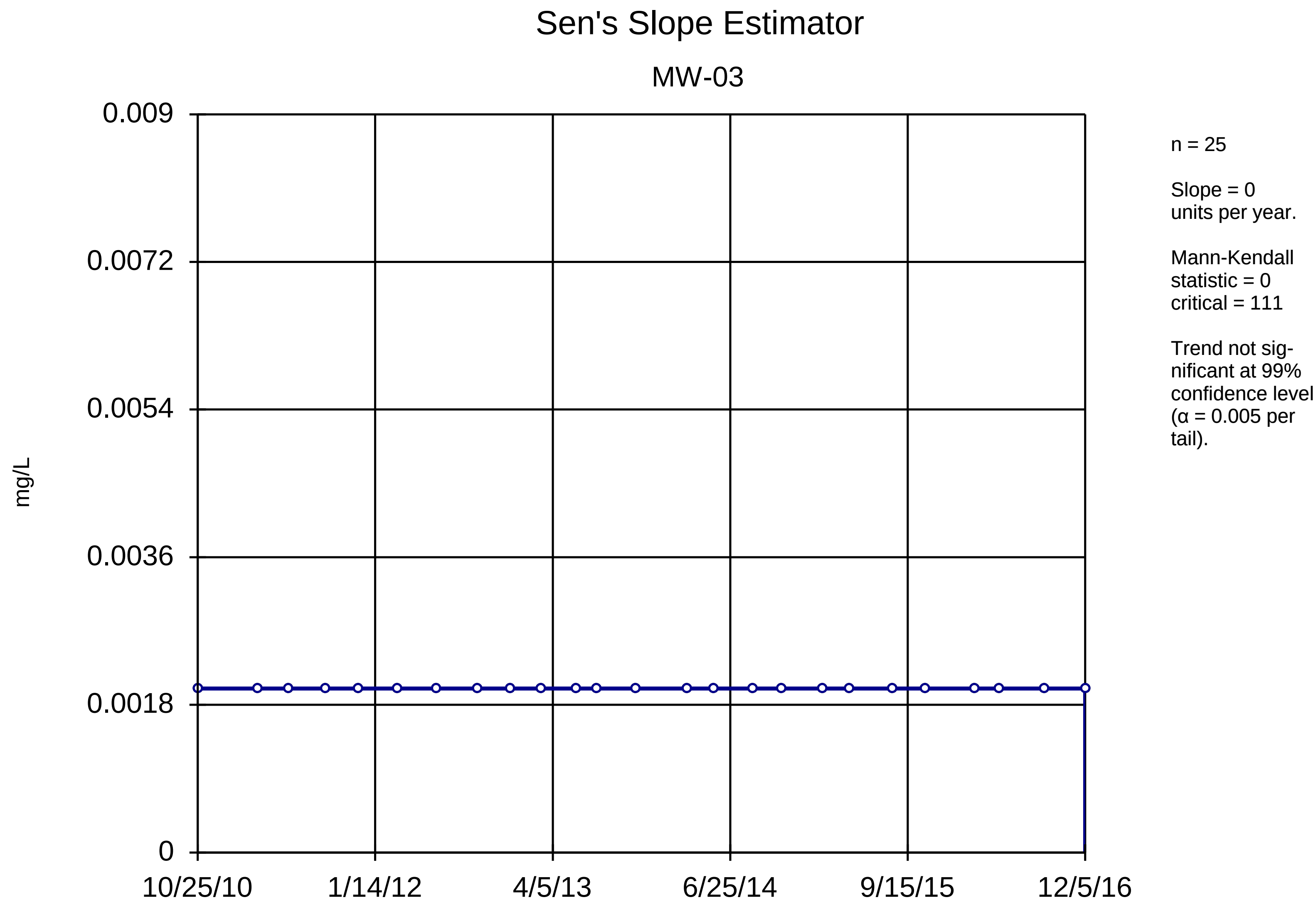



Constituent: Thallium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82161

Hollow symbols indicate censored values.

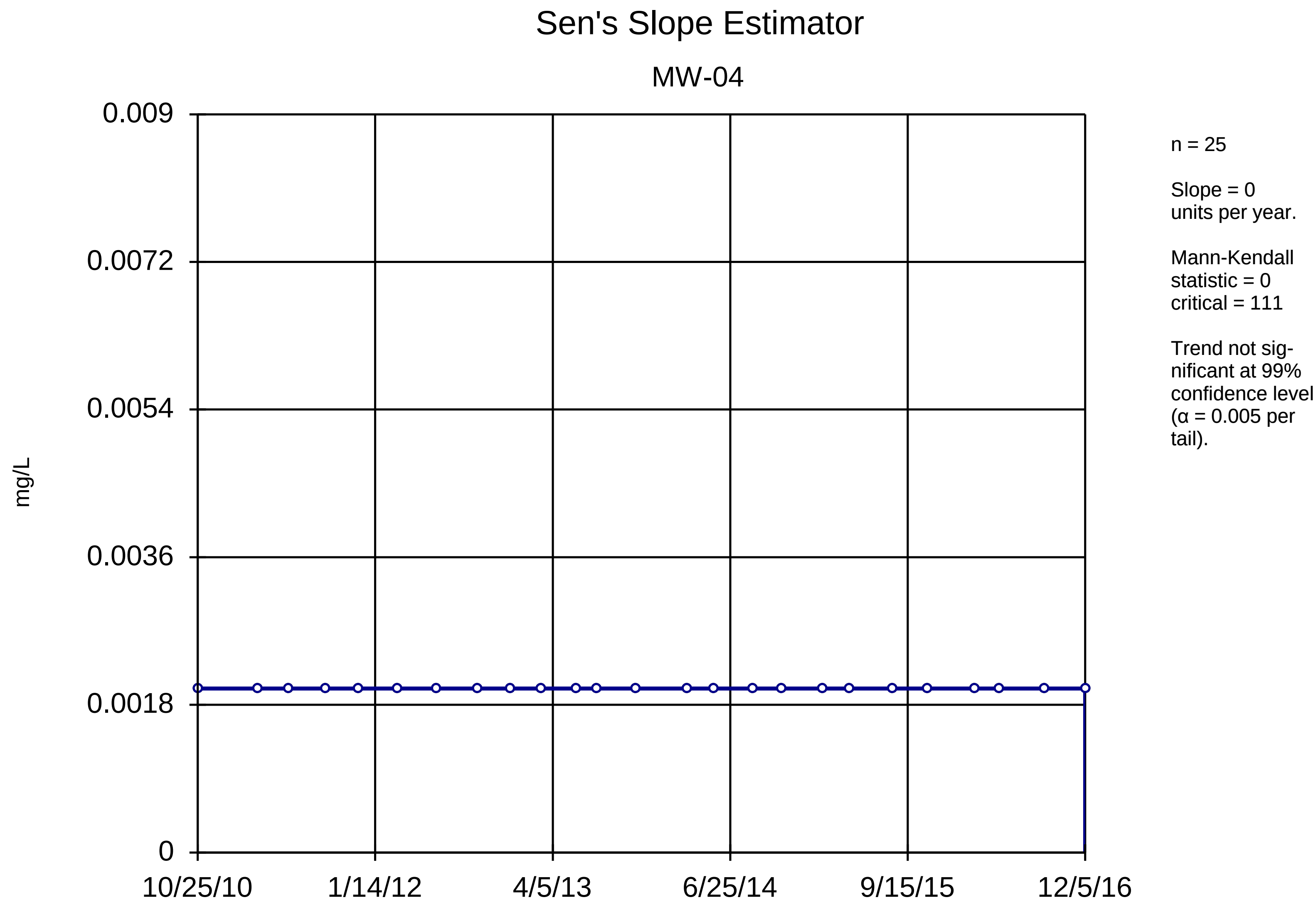



Constituent: Thallium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82162

Hollow symbols indicate censored values.

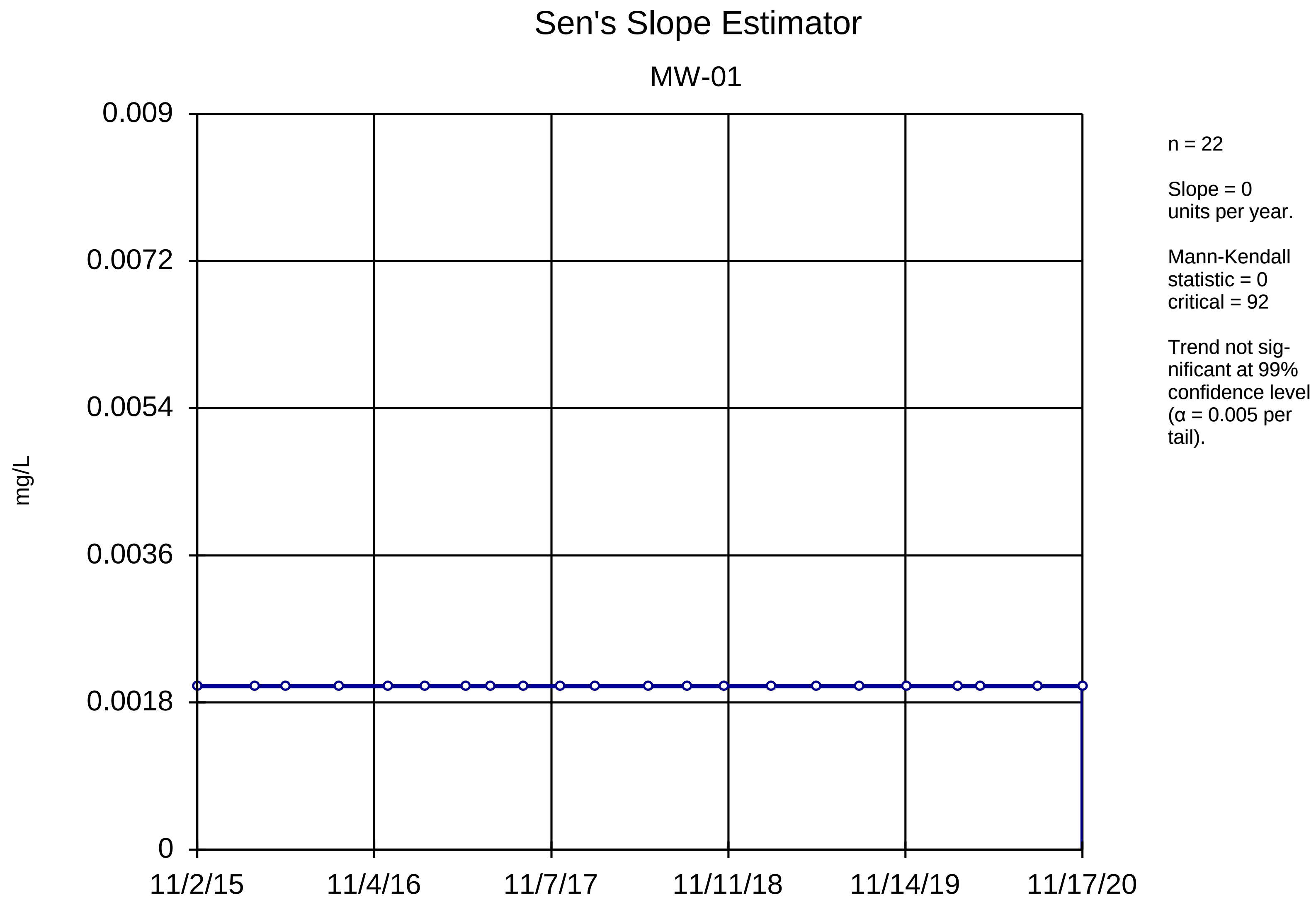



Constituent: Thallium, Dissolved    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82163

Hollow symbols indicate censored values.

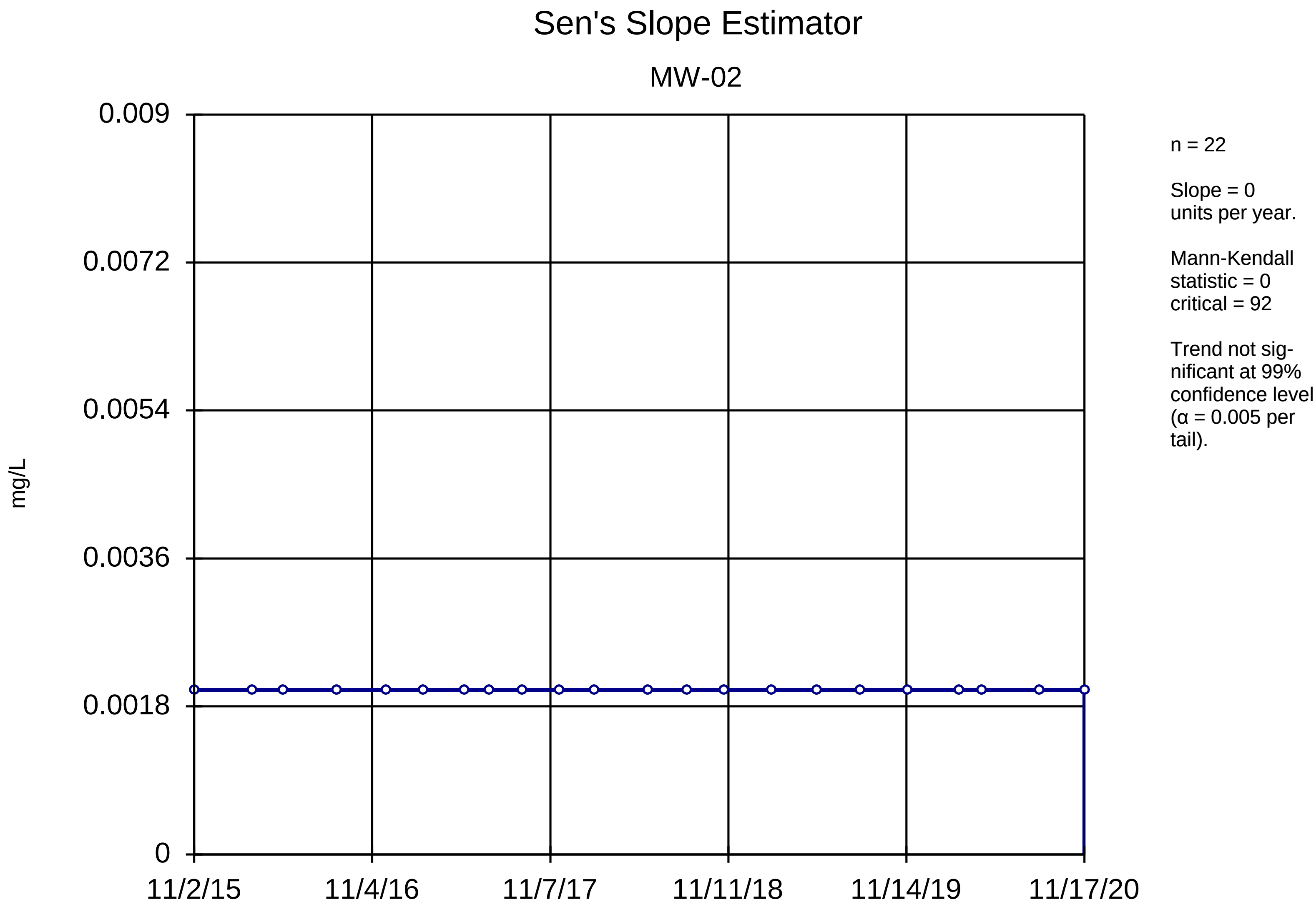



Constituent: Thallium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82164

Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.

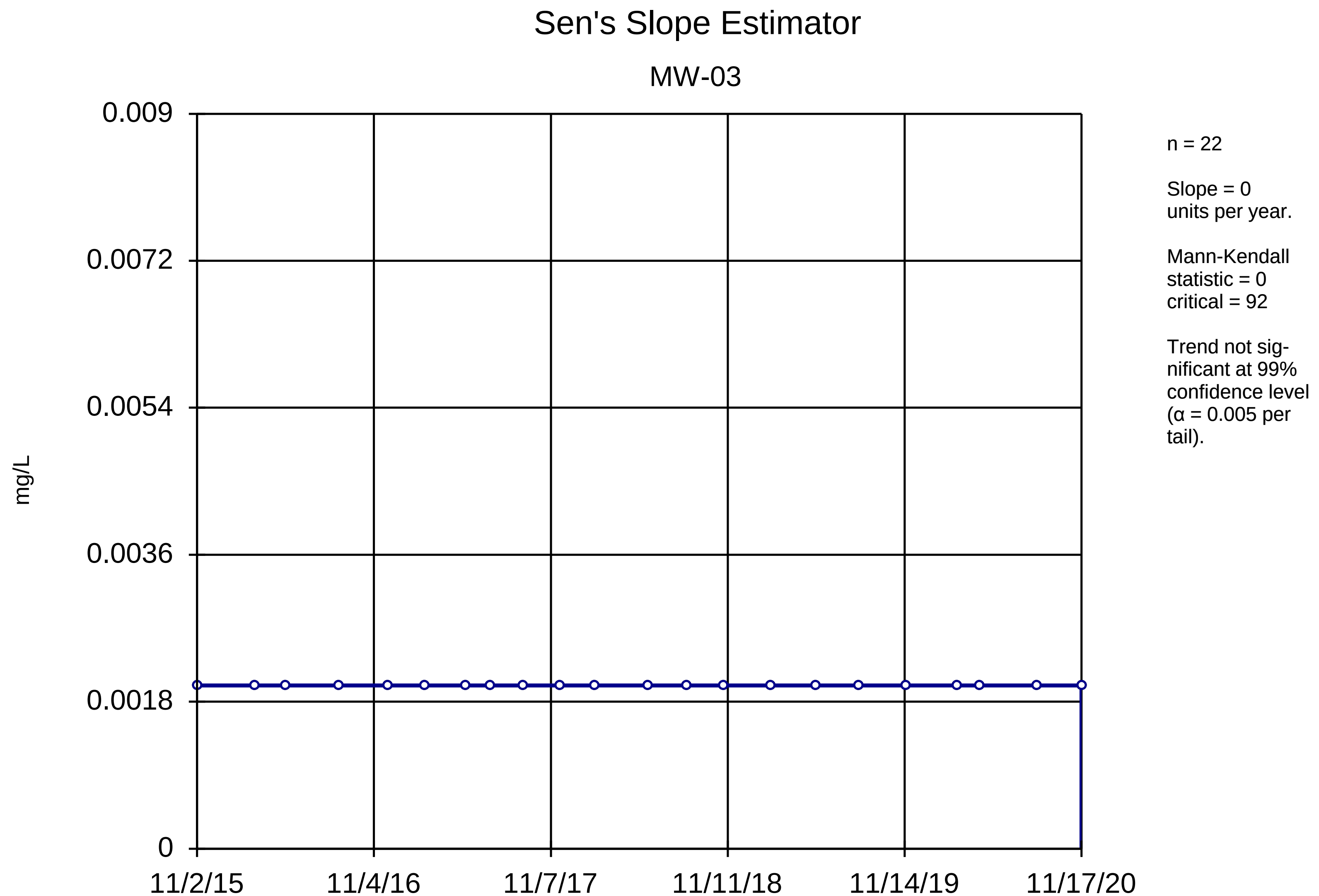



Constituent: Thallium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82165

Hollow symbols indicate censored values.

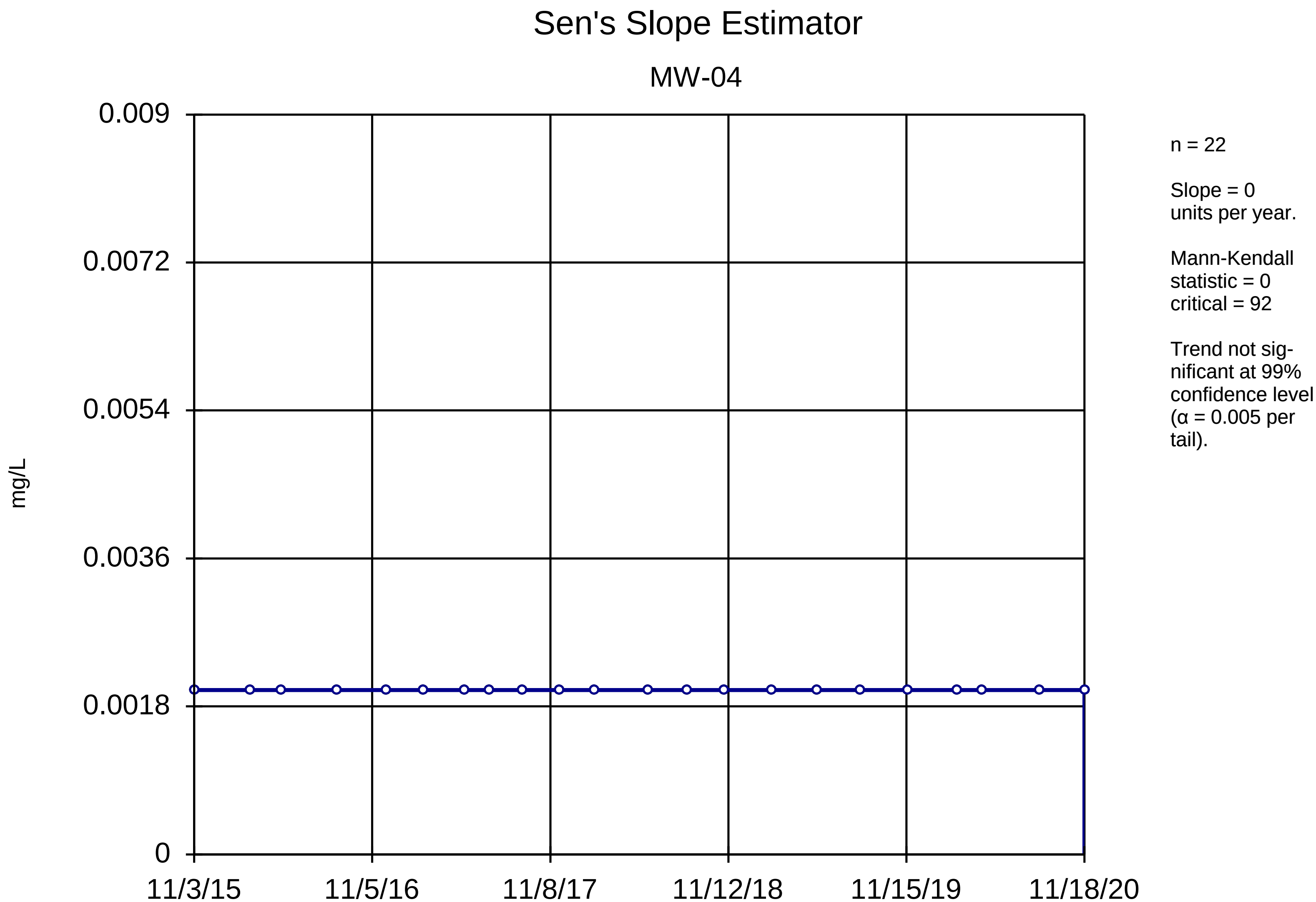



Constituent: Thallium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

MWG13-15_82166

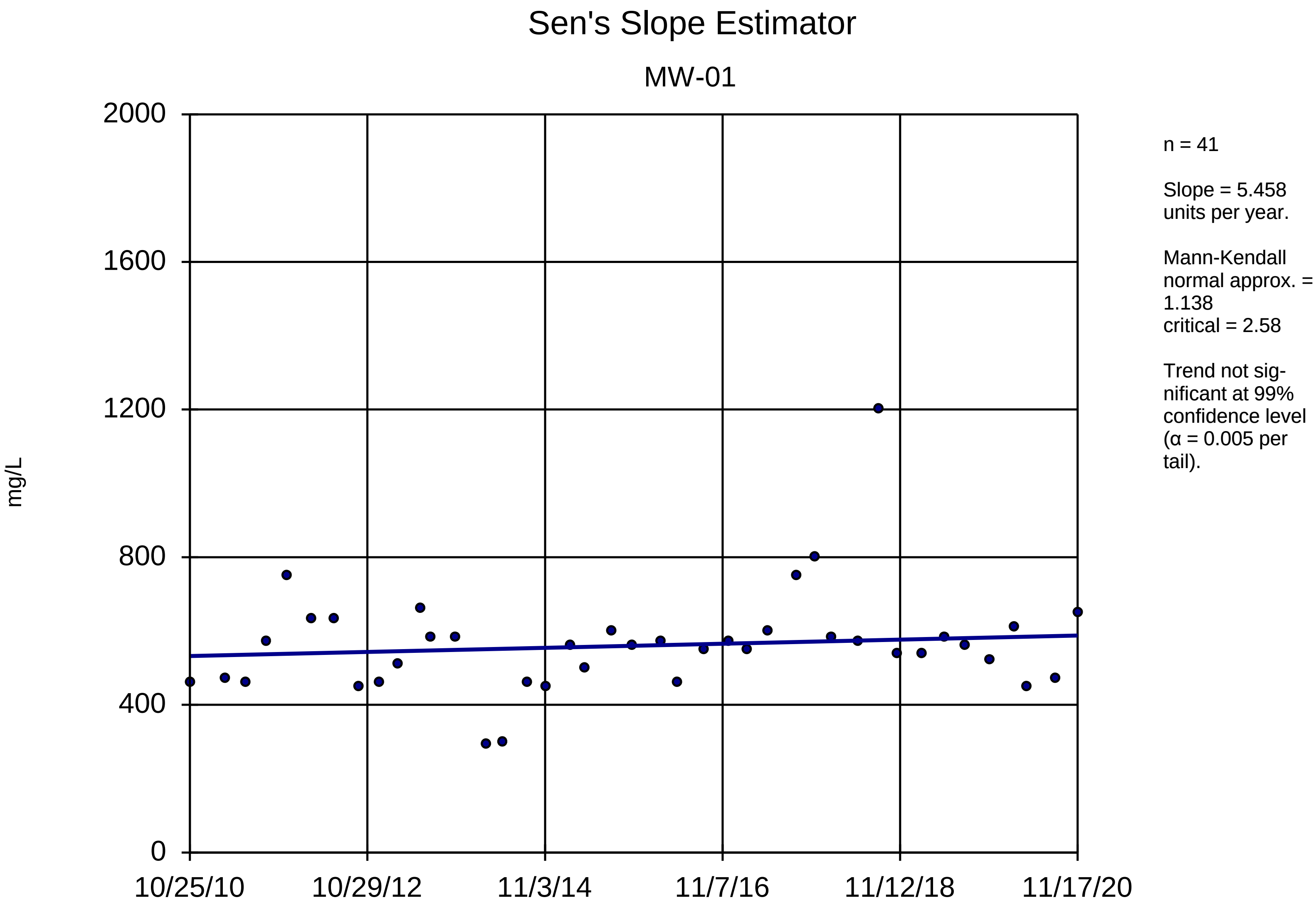
Sanitas™ v.9.6.28 Software licensed to Weaver Consultants Group. EPA
Hollow symbols indicate censored values.




Constituent: Thallium, Total    Analysis Run 4/14/2021 1:02 PM

Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database

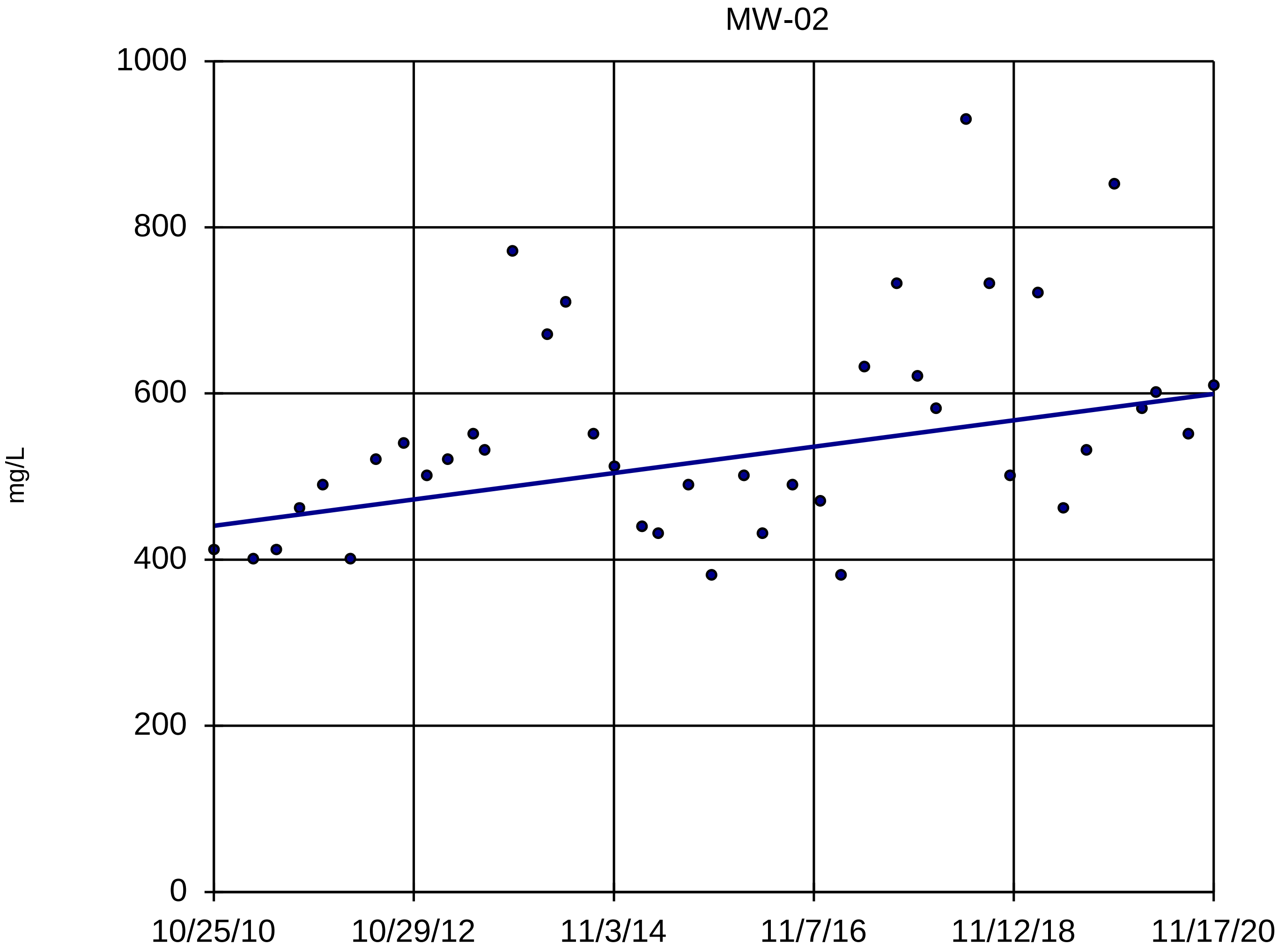
MWG13-15_82167




Constituent: Total Dissolved Solids Analysis Run 4/14/2021 1:02 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

# Sen's Slope Estimator




n = 41

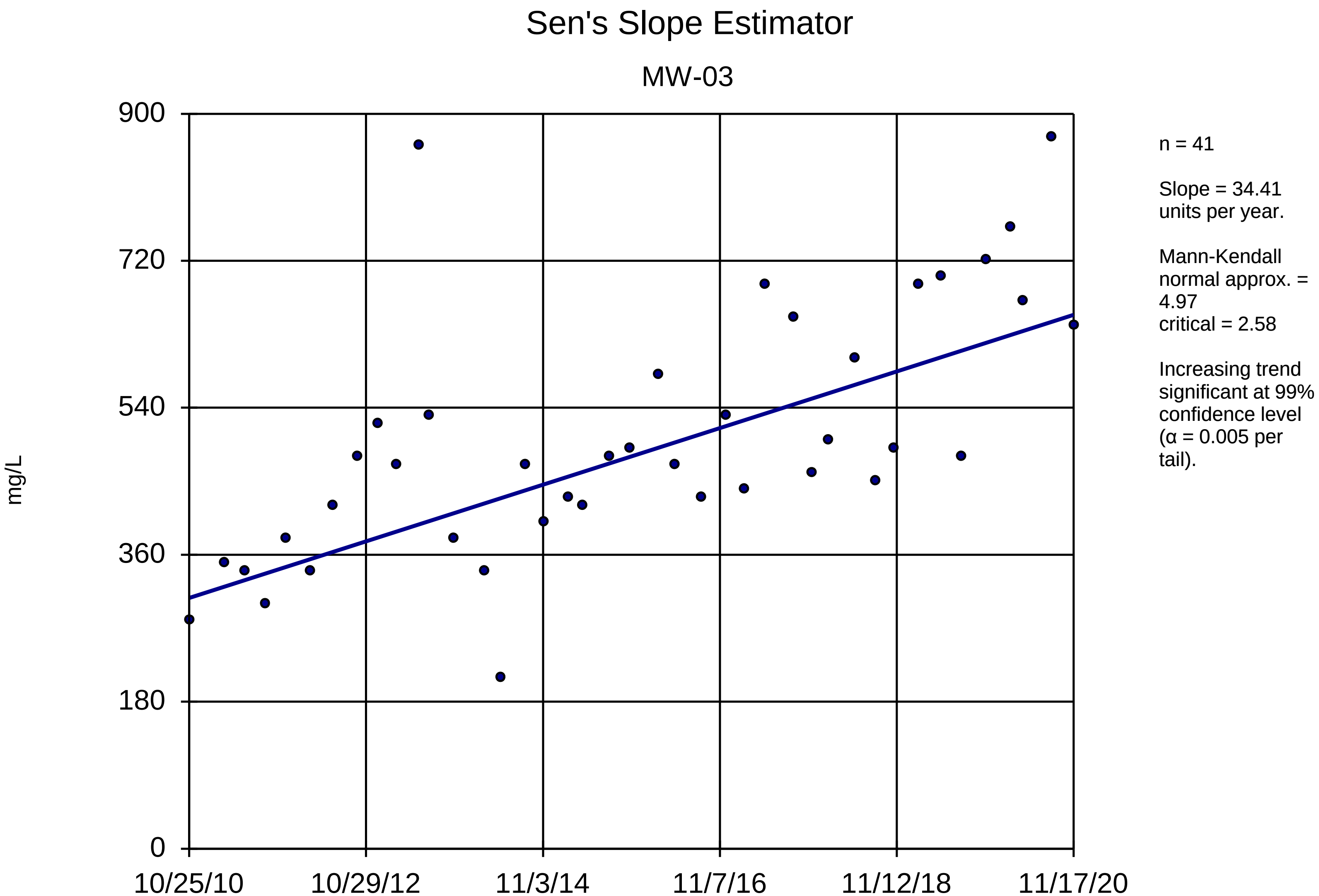
Slope = 15.76 units per year.

Mann-Kendall normal approx. = 2.778
critical = 2.58

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids    Analysis Run 4/14/2021 1:03 PM

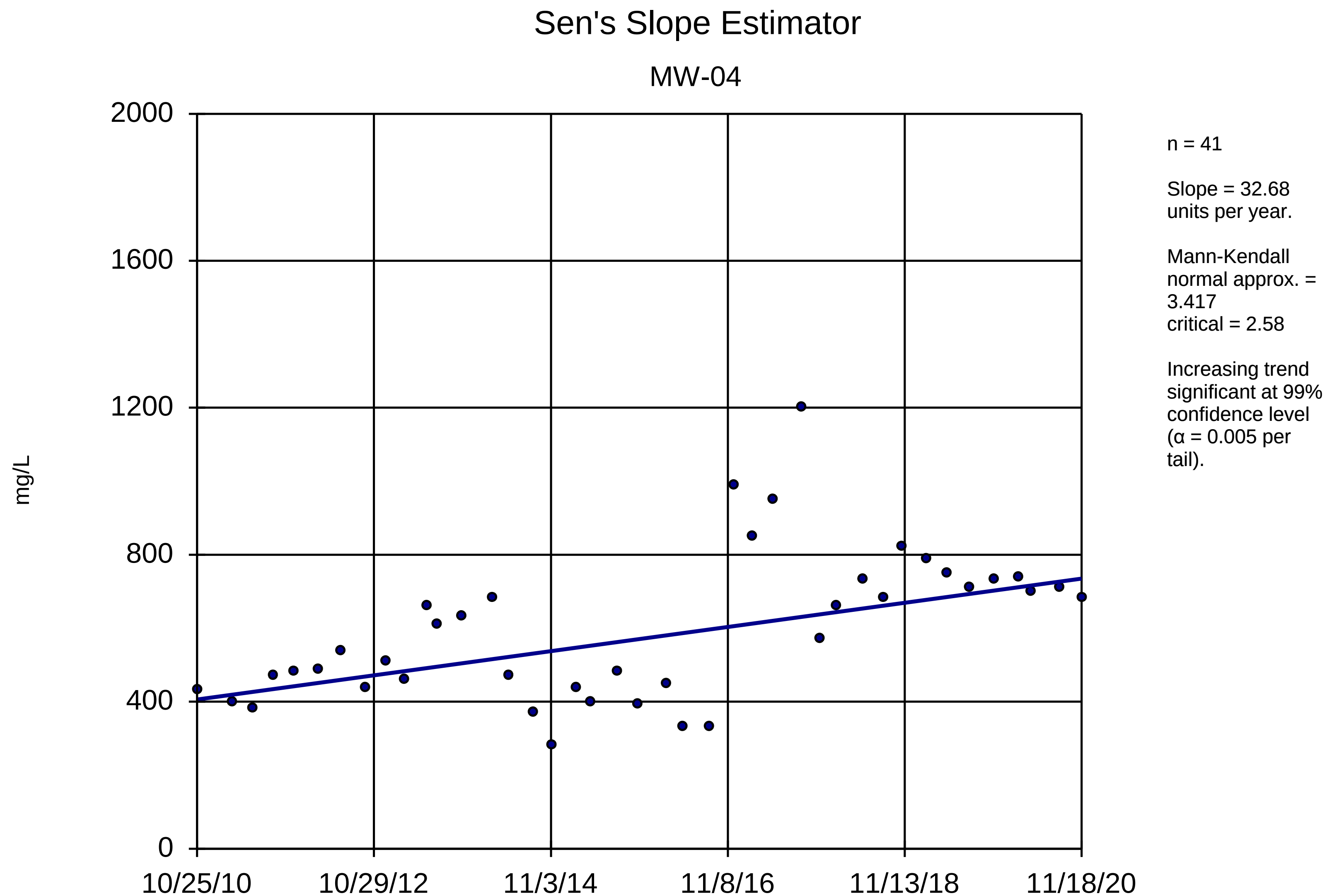
Utility Site W    Client: Weaver Consultants Group    Data: Waukegan Sanitas Database




Constituent: Total Dissolved Solids Analysis Run 4/14/2021 1:03 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82170




Constituent: Total Dissolved Solids Analysis Run 4/14/2021 1:03 PM

Utility Site W Client: Weaver Consultants Group Data: Waukegan Sanitas Database

MWG13-15_82171

# Appendix D

# Comparison of Groundwater Concentrations to Surface Water Standards

| Constituent | CAS | Units | Surface Water Standards (1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | General Use (2) | | | | Lake Michigan Basin (3) | | | |
| | | | Chronic | | Acute (4) | | Chronic | | Acute (4) | |
| Antimony | 7440-36-0 | mg/L | 0.32 | (2e) | 1.2 | (2e) | -- | | -- | |
| Arsenic | 7440-38-2 | mg/L | 0.19 | (2a) | 0.36 | (2a) | 0.148 | (3a) | 0.34 | (3a) |
| Barium | 7440-39-3 | mg/L | 5.0 | (2b) | -- | | 5.0 | (3b) | -- | |
| Beryllium | 7440-41-7 | mg/L | -- | | -- | | -- | | -- | |
| Boron | 7440-42-8 | mg/L | 7.6 | (2a) | 40.1 | (2a) | 7.6 | (3a) | 40.1 | (3a) |
| Cadmium | 7440-43-9 | mg/L | 0.0017 | (2a,i) | 0.0195 | (2a,i) | 0.0037 | | 0.0091 | |
| Calcium | 7440-70-2 | mg/L | -- | | -- | | -- | | -- | |
| Chloride | 16887-00-6 | mg/L | 500 | (2b) | -- | | 500 | (3b) | -- | |
| Chromium | 7440-47-3 | mg/L | 0.13 | (2a,ii) | 1.0 | (2a,ii) | 0.011 | | 0.016 | |
| Cobalt | 7440-48-4 | mg/L | -- | | -- | | -- | | -- | |
| Fluoride | 16984-48-8 | mg/L | 4.0 | (2a,iii) | 14.6 | (2a,iii) | 4.0 | | 14.6 | |
| Lead | 7439-92-1 | mg/L | 0.033 | (2a,iv) | 0.160 | (2a,iv) | 0.011 | | 0.204 | |
| Lithium | 7439-93-2 | mg/L | -- | | -- | | -- | | -- | |
| Mercury, dissolved | 7439-97-6 | mg/L | 0.0011 | (2a) | 0.0022 | | -- | | -- | |
| Mercury, total | 7439-97-6 | mg/L | 0.000012 | (2f) | -- | | 0.00091 | (3d) | 0.0017 | (3d) |
| Molybdenum | 7439-98-7 | mg/L | -- | | -- | | -- | | -- | |
| pH | -- | s.u. | 6.5 - 9.0 | (2d) | -- | | 6.5 - 9.0 | (3c) | -- | |
| Radium 226 + 228 | 7440-14-4 | pCi/L | 3.75 | (2a) | -- | | 3.75 | | -- | |
| Selenium | 7782-49-2 | mg/L | 1.0 | | -- | | 5.0 | (3a) | n/a | |
| Sulfate | 18785-72-3 | mg/L | site-specific | (2c) | -- | | 500 | (3b) | -- | |
| *Joliet* | 18785-72-3 | mg/L | 1360 | (2c) | -- | | 500 | (3b) | -- | |
| *Powerton* | 18785-72-3 | mg/L | 1440 | (2c) | -- | | 500 | (3b) | -- | |
| *Waukegan* | 18785-72-3 | mg/L | 1440 | (2c) | -- | | 500 | (3b) | -- | |
| *Will County* | 18785-72-3 | mg/L | 1460 | (2c) | -- | | 500 | (3b) | -- | |
| Thallium | 7440-28-0 | mg/L | 0.003 | (2f) | 0.086 | (2e) | n/a | | n/a | |
| Total Dissolved Solids | -- | mg/L | -- | | -- | | 1,000 | (3b) | -- | |

**Notes**:

(1) IL Water Quality Standards (WQS) used as surface water standard for evaluating hypothetical human/ecological exposure scenarios. In the absence of WQS, IL Water Quality Criteria (WQC) are

(2) Concentration represents an Illinois General Use WQS as defined in 35 IAC 302, Subpart B or an Illinois Derived WQC (lower of aquatic life and human health WQC):

(a) 35 IAC 302.208(e), Numerical Water Quality Standards for the Protection of Aquatic Life

(i) Standard for dissolved cadmium is a hardness (H)-dependent value, calculated as follows (see also footnote 5):

Chronic = exp[-3.490+0.7852*ln(H)]*(1.101672-[ln(H)(0.041383])*1E-3 mg/µg

Acute = exp[-2.918+1.128*ln(H)]*(1.138672-[ln(H)(0.041383])*1E-3 mg/µg

(ii) Standard for chromium is a hardness (H)-dependent value, calculated as follows (see also footnote 5):

Chronic = exp[0.6848+0.8190*ln(H)]*0.860*1E-3 mg/µg

Acute = exp[3.7256+0.8190*ln(H)]*0.316*1E-3 mg/µg

(iii) Standard for fluoride is a hardness (H)-dependent value, calculated as follows (see also footnote 5):

Chronic = exp[6.0445+0.5394*ln(H)]*1E-3 mg/µg, but shall not exceed 4.0 mg/L

Acute = exp[6.7319+0.5394*ln(H)]*1E-3 mg/µg

(iv) Standard for lead is a hardness (H)-dependent value, calculated as follows (see also footnote 5):

Chronic = exp[-2.863+1.273*ln(H)]*{1.46203-[(ln(H))(0.145712)]}*1E-3 mg/µg

Acute = exp[-1.301+1.273*ln(H)]*{1.46203-[(ln(H))(0.145712)]}*1E-3 mg/µg

(b) 35 IAC 302.208(g), Single-Value Standards

(c) 35 IAC 302.208(h)(2)(A), WQS for Sulfate; standard is hardness (H) and chloride (Cl) dependent, and calculated as follows (see also footnotes 5 and 6):

Chronic = exp[1276.7+5.508*(H)-1.457(Cl)]*0.65

(d) 35 IAC 302.204, pH

(e) Illinois WQC for the protection of aquatic life.

(f) Illinois WQC for the protection of human health (applicable to chronic values only).

(3) Concentration represents an Illinois Lake Michigan Basin WQS as defined in 35 IAC 302, Subpart E. Note that of the four subject sites, Lake Michigan Basin WQS are only applicable to the Waukegan Station.

(a) 35 IAC 302.504(a), Lake Michigan Basin Water Quality Standards for Chemical Constituents.

(b) 35 IAC 302.504(b)

(c) IAC 302.503, pH

(d) 35 IAC 302.504(e)

(4) Chronic values are used as the primary effects values for this evaluation; however, acute values are also presented for completeness.

(5) Site-specific hardness data is not available. Based on data from the IL Water Quality Database (http://ilrdss.isws.illinois.edu/WQ/), a value of 200 mg/L is . considered a conservative estimate for the Site

(6) Sulfate WQS calculated using the average chloride concentration for available data, which are as follows:

| | | |
|---|---|---|
| Joliet | 201 | mg/L |
| Powerton | 115.4 | mg/L |
| Waukegan | 115.8 | mg/L |
| Will County | 92.7 | mg/L |

**Definitions**

"--" = value not available n/a = not applicable

mg/L = milligrams per liter s.u. = standard unit

MWG13-15_82173

Comparison of Downgradient Average Groundwater Analytical Results to Surface Water Standards
Joliet 29 Station

| Constituent[1] | Units | Surface Water Standard[2] | Groundwater Analytical Results - Average Concentrations | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MW-01 | MW-02 | MW-03 | MW-04 | MW-06 | MW-07 |
| Antimony, Dissolved | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Antimony, Total | mg/L | 0.32 | -- | -- | <0.003 | <0.003 | -- | -- |
| Arsenic, Dissolved | mg/L | 0.19 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Arsenic, Total | mg/L | 0.19 | -- | -- | 0.001 | 0.001 | -- | -- |
| Barium, Dissolved | mg/L | 5 | 0.109 | 0.096 | 0.094 | 0.082 | 0.123 | 0.116 |
| Barium, Total | mg/L | 5 | -- | -- | 0.095 | 0.086 | -- | -- |
| Beryllium, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Beryllium, Total | mg/L | N/A | -- | -- | <0.001 | <0.001 | -- | -- |
| Boron, Dissolved | mg/L | 7.6 | 0.254 | 0.257 | 0.379 | 0.379 | 0.244 | 0.241 |
| Boron, Total | mg/L | 7.6 | -- | -- | 0.422 | 0.379 | -- | -- |
| Cadmium, Dissolved | mg/L | 0.0017 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0006 |
| Cadmium, Total | mg/L | 0.0017 | -- | -- | <0.0005 | <0.0005 | -- | -- |
| Calcium, Total | mg/L | N/A | -- | -- | 97.4 | 99.3 | -- | -- |
| Chloride | mg/L | 500 | 155 | 225 | 222 | 214 | 185 | 195 |
| Chromium, Dissolved | mg/L | 0.13 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium, Total | mg/L | 0.13 | -- | -- | <0.005 | <0.009 | -- | -- |
| Cobalt, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | 0.004 | <0.001 | <0.001 |
| Cobalt, Total | mg/L | N/A | -- | -- | <0.001 | 0.008 | -- | -- |
| Fluoride | mg/L | 4 | 0.41 | 0.45 | 0.43 | 0.45 | 0.35 | 0.31 |
| Lead, Dissolved | mg/L | 0.03 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0007 |
| Lead, Total | mg/L | 0.03 | -- | -- | <0.0005 | 0.0006 | -- | -- |
| Lithium, Total | mg/L | N/A | -- | -- | 0.0115 | 0.0124 | -- | -- |
| Mercury, Dissolved | mg/L | 0.0011 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Mercury, Total | mg/L | 0.000012 | -- | -- | <0.0002 | <0.0002 | -- | -- |
| Molybdenum, Total | mg/L | N/A | -- | -- | 0.0066 | 0.0076 | -- | -- |
| pH, Field | S.U. | 6.5 - 9.0 | 7.17 | 7.33 | 7.32 | 7.32 | 7.51 | 7.49 |
| Radium 226 + 228, Combined | pCi/L | 3.75 | -- | -- | 0.432 | 0.413 | -- | -- |
| Selenium, Dissolved | mg/L | 1.0 | 0.006 | 0.003 | 0.004 | <0.003 | -- | -- |
| Selenium, Total | mg/L | 1.0 | -- | -- | 0.004 | <0.003 | -- | -- |
| Sulfate | mg/L | 1360* | 109 | 97 | 121 | 118 | 112 | 123 |
| Thallium, Dissolved | mg/L | 0.003 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Thallium, Total | mg/L | 0.003 | -- | -- | <0.002 | <0.002 | -- | -- |
| Total Dissolved Solids | mg/L | N/A | 702 | 792 | 883 | 847 | 736 | 762 |

Exceeds Surface Water Standard

Average concentrations between December 2010 and October 2020 as calculated by Sanitas™ Software

"<" = Constituent non-detect in 75% or more samples; reporting limit presented as average.

"--" = Constituent not analyzed

N/A = Standard not established for this constituent

[1]Constituents analyzed are coal-combustion residual (CCR) constituents as identified in Appendices III and IV to 40 CFR Part 257.

[2] Surface Water Standard values obtained from the Illinois General Use Water Quality Standards (WQS) as defined in 35 IAC 302, Subpart B or, in the absence of Illinois WQS, the Illinois Water Quality Criteria (WQC) as shown in Table 1.

*Site-specific Water Quality Standard for Sulfate per 35 IAC 302.208(h)(2)(A); standard is hardness (H) and chloride (Cl) dependent, and calculated as follows =exp[1276.7+5.508*(H)-1.457(Cl)]*0.65

**Comparison of Downgradient Average Groundwater Analytical Results to Surface Water Standards**
**Powerton Station**

| Constituent[1] | Units | Surface Water Standard[2] | Groundwater Analytical Results - Average Concentrations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MW-03 | MW-04 | MW-05 | MW-06 | MW-07 | MW-08 | MW-13 | MW-14 | MW-15 |
| Antimony, Dissolved | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 |
| Antimony, Total | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | -- | -- | <0.003 | -- | -- | <0.003 |
| Arsenic, Dissolved | mg/L | 0.19 | 0.001 | 0.001 | 0.001 | 0.007 | 0.161 | 0.002 | 0.024 | 0.003 | 0.003 |
| Arsenic, Total | mg/L | 0.19 | 0.001 | <0.001 | <0.001 | -- | -- | 0.003 | -- | -- | 0.021 |
| Barium, Dissolved | mg/L | 5 | 0.060 | 0.038 | 0.057 | 0.103 | 0.471 | 0.106 | 0.163 | 0.051 | 0.072 |
| Barium, Total | mg/L | 5 | 0.064 | 0.035 | 0.054 | -- | -- | 0.103 | -- | -- | 0.065 |
| Beryllium, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Beryllium, Total | mg/L | N/A | <0.001 | <0.001 | <0.001 | -- | -- | <0.001 | -- | -- | <0.001 |
| Boron, Dissolved | mg/L | 7.6 | 0.373 | 0.667 | 1.485 | 0.474 | 1.664 | 0.889 | 3.022 | 1.924 | 1.562 |
| Boron, Total | mg/L | 7.6 | 0.318 | 0.596 | 0.633 | -- | -- | 1.129 | -- | -- | 1.793 |
| Cadmium, Dissolved | mg/L | 0.0017 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.0005 |
| Cadmium, Total | mg/L | 0.0017 | <0.0005 | <0.0005 | <0.0005 | -- | -- | <0.0005 | -- | -- | 0.0007 |
| Calcium, Total | mg/L | N/A | 78 | 88 | 104 | -- | -- | 138 | -- | -- | 198 |
| Chloride | mg/L | 500 | 55 | 69 | 99 | 178 | 153 | 222 | 162 | 165 | 193 |
| Chromium, Dissolved | mg/L | 0.13 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium, Total | mg/L | 0.13 | <0.005 | <0.005 | <0.005 | -- | -- | <0.005 | -- | -- | <0.005 |
| Cobalt, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 | 0.006 | <0.001 | <0.001 | <0.001 | <0.001 |
| Cobalt, Total | mg/L | N/A | <0.001 | <0.001 | <0.001 | -- | -- | <0.001 | -- | -- | <0.001 |
| Fluoride | mg/L | 4 | 0.280 | 0.283 | 0.304 | 0.508 | 0.443 | 0.492 | 0.352 | 0.996 | 0.598 |
| Lead, Dissolved | mg/L | 0.03 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0007 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Lead, Total | mg/L | 0.03 | <0.0005 | <0.0005 | <0.0005 | -- | -- | 0.0006 | -- | -- | <0.0005 |
| Lithium, Total | mg/L | N/A | <0.01 | <0.01 | <0.01 | -- | -- | 0.02 | -- | -- | 0.03 |
| Mercury, Dissolved | mg/L | 0.0011 | <0.0002 | <0.0002 | <0.0002 | -- | -- | <0.0002 | -- | -- | <0.0002 |
| Mercury, Total | mg/L | 0.000012 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Molybdenum, Total | mg/L | N/A | <0.005 | 0.006 | 0.006 | -- | -- | 0.017 | -- | -- | 0.027 |
| pH, Field | S.U. | 6.5 - 9.0 | 7.33 | 7.18 | 7.11 | 7.62 | 6.81 | 7.61 | 7.73 | 7.13 | 7.11 |
| Radium 226 + 228, Comb | pCi/L | 3.75 | 0.516 | 0.507 | 0.456 | -- | -- | 0.539 | -- | -- | 0.459 |
| Selenium, Dissolved | mg/L | 1 | 0.003 | 0.003 | 0.003 | 0.003 | 0.004 | 0.003 | 0.007 | 0.011 | 0.018 |
| Selenium, Total | mg/L | 1 | <0.0025 | 0.0032 | <0.0025 | -- | -- | <0.0025 | -- | -- | 0.0184 |
| Sulfate | mg/L | 1440* | 62 | 108 | 177 | 367 | 67 | 243 | 1,187 | 946 | 513 |
| Thallium, Dissolved | mg/L | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.003 | <0.001 |
| Thallium, Total | mg/L | 0.003 | <0.001 | <0.001 | <0.001 | -- | -- | <0.001 | -- | -- | <0.001 |
| Total Dissolved Solids | mg/L | N/A | 438 | 580 | 765 | 1,113 | 1,205 | 1,089 | 2,449 | 2,192 | 1,553 |

Exceeds Surface Water Standard

Average concentrations between March 2011 and December 2020 as calculated by Sanitas™ Software

"<" = Constituent non-detect in 75% or more samples; reporting limit presented as average.

"--" = Constituent not analyzed

N/A = Standard not established for this constituent

[1]Constituents analyzed are coal-combustion residual (CCR) constituents as identified in Appendices III and IV to 40 CFR Part 257.

[2] Surface Water Standard values obtained from the Illinois General Use Water Quality Standards (WQS) as defined in 35 IAC 302, Subpart B or, in the absence of Illinois WQS, the Illinois Water Quality Criteria (WQC) as shown in **Table 1**.

*Site-specific Water Quality Standard for Sulfate per 35 IAC 302.208(h)(2)(A); standard is hardness (H) and chloride (Cl) dependent, and calculated as follows =exp[1276.7+5.508*(H)-1.457(Cl)]*0.65

MWG13-15_82175

**Comparison of Downgradient Average Groundwater Analytical Results to Surface Water Standards**
**Will Co. Station**

| Constituent[1] | Units | Surface Water Standard[2] | Groundwater Analytical Results - Average Concentrations | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | MW-07 | MW-08 | MW-09 | MW-10 | MW-11 | MW-12 |
| Antimony, Dissolved | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | <0.003 | -- | -- |
| Antimony, Total | mg/L | 0.32 | -- | -- | <0.003 | <0.003 | <0.003 | <0.003 |
| Arsenic, Dissolved | mg/L | 0.19 | 0.003 | 0.007 | 0.005 | 0.008 | -- | -- |
| Arsenic, Total | mg/L | 0.19 | -- | -- | 0.005 | 0.020 | 0.008 | 0.002 |
| Barium, Dissolved | mg/L | 5 | 0.057 | 0.076 | 0.028 | 0.094 | -- | -- |
| Barium, Total | mg/L | 5 | -- | -- | 0.039 | 0.105 | 0.118 | 0.109 |
| Beryllium, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 | -- | -- |
| Beryllium, Total | mg/L | N/A | -- | -- | <0.001 | <0.001 | <0.001 | <0.001 |
| Boron, Dissolved | mg/L | 7.6 | 3.97 | 2.38 | 1.75 | 2.92 | -- | -- |
| Boron, Total | mg/L | 7.6 | -- | -- | 1.91 | 3.32 | 2.93 | 2.15 |
| Cadmium, Dissolved | mg/L | 0.001720142 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | -- | -- |
| Cadmium, Total | mg/L | 0.001720142 | -- | -- | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Calcium, Total | mg/L | N/A | -- | -- | 59 | 133 | 95 | 152 |
| Chloride | mg/L | 500 | 149 | 146 | 214 | 128 | 94 | 167 |
| Chromium, Dissolved | mg/L | 0.13 | <0.005 | <0.005 | <0.005 | <0.005 | -- | -- |
| Chromium, Total | mg/L | 0.13 | -- | -- | <0.005 | <0.005 | <0.005 | <0.005 |
| Cobalt, Dissolved | mg/L | N/A | <0.001 | 0.001 | <0.001 | <0.001 | -- | -- |
| Cobalt, Total | mg/L | N/A | -- | -- | <0.001 | <0.001 | <0.001 | <0.001 |
| Fluoride | mg/L | 4 | 0.750 | 0.563 | 0.457 | 0.713 | 0.612 | 0.478 |
| Lead, Dissolved | mg/L | 0.03 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | -- | -- |
| Lead, Total | mg/L | 0.03 | -- | -- | 0.0006 | 0.0006 | 0.0005 | 0.0005 |
| Lithium, Total | mg/L | N/A | -- | -- | 0.01 | 0.02 | 0.01 | 0.01 |
| Mercury, Dissolved | mg/L | 0.0011 | <0.002 | <0.002 | <0.002 | <0.002 | -- | -- |
| Mercury, Total | mg/L | 0.000012 | -- | -- | <0.002 | <0.002 | <0.002 | <0.002 |
| Molybdenum, Total | mg/L | N/A | -- | -- | 0.096 | 0.066 | 0.071 | 0.040 |
| pH, Field | S.U. | 6.5 - 9.0 | 7.90 | 7.18 | 9.22 | 7.43 | -- | -- |
| Radium 226 + 228, Comb | pCi/L | 3.75 | -- | -- | 0.429 | 0.819 | 0.832 | 0.514 |
| Selenium, Dissolved | mg/L | 1 | 0.0047 | 0.0048 | 0.0030 | 0.0030 | -- | -- |
| Selenium, Total | mg/L | 1 | -- | -- | 0.0029 | <0.0025 | <0.0025 | 0.0047 |
| Sulfate | mg/L | 1460* | 565 | 486 | 278 | 292 | 135 | 214 |
| Thallium, Dissolved | mg/L | 0.003 | <0.002 | <0.002 | <0.002 | <0.002 | -- | -- |
| Thallium, Total | mg/L | 0.003 | -- | -- | <0.002 | <0.002 | <0.002 | <0.002 |
| Total Dissolved Solids | mg/L | N/A | 1,287 | 1,253 | 793 | 966 | 645 | 1,051 |

Exceeds Surface Water Standard

Average concentrations between December 2010 and November 2020 as calculated by Sanitas™ Software

"<" = Constituent non-detect in 75% or more samples; reporting limit presented as average.

"--" = Constituent not analyzed

N/A = Standard not established for this constituent

[1]Constituents analyzed are coal-combustion residual (CCR) constituents as identified in Appendices III and IV to 40 CFR Part 257.

[2] Surface Water Standard values obtained from the Illinois General Use Water Quality Standards (WQS) as defined in 35 IAC 302, Subpart B or, in the absence of Illinois WQS, the Illinois Water Quality Criteria (WQC) as shown in **Table 1**.

MWG13-15_82176

## Comparison of Downgradient Average Groundwater Analytical Results to Surface Water Standards
## Waukegan Station

| Constituent[1] | Units | Surface Water Standard[2] | Groundwater Analytical Results - Average Concentrations | | | |
|---|---|---|---|---|---|---|
| | | | MW-01 | MW-02 | MW-03 | MW-04 |
| Antimony, Dissolved | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | <0.003 |
| Antimony, Total | mg/L | 0.32 | <0.003 | <0.003 | <0.003 | <0.003 |
| Arsenic, Dissolved | mg/L | 0.148 | 0.078 | 0.012 | 0.004 | 0.007 |
| Arsenic, Total | mg/L | 0.148 | 0.076 | 0.011 | 0.001 | 0.010 |
| Barium, Dissolved | mg/L | 5 | 0.027 | 0.024 | 0.012 | 0.038 |
| Barium, Total | mg/L | 5 | 0.032 | 0.026 | 0.020 | 0.056 |
| Beryllium, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Beryllium, Total | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Boron, Dissolved | mg/L | 7.6 | 2.11 | 2.50 | 1.86 | 2.81 |
| Boron, Total | mg/L | 7.6 | 2.49 | 3.49 | 3.09 | 2.91 |
| Cadmium, Dissolved | mg/L | 0.0037 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cadmium, Total | mg/L | 0.0037 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chloride | mg/L | 500 | 49 | 48 | 51 | 46 |
| Chromium, Dissolved | mg/L | 0.011 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium, Total | mg/L | 0.011 | <0.005 | <0.005 | <0.005 | <0.005 |
| Cobalt, Dissolved | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Cobalt, Total | mg/L | N/A | <0.001 | <0.001 | <0.001 | <0.001 |
| Fluoride | mg/L | 4 | 0.338 | 0.837 | 0.514 | 0.550 |
| Lead, Dissolved | mg/L | 0.011 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Lead, Total | mg/L | 0.011 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Lithium, Total | mg/L | N/A | -- | 0.01 U | 0.01 U | 0.01 U |
| Mercury, Dissolved | mg/L | 0.0000031 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Mercury, Total | mg/L | 0.00091 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| Molybdenum, Total | mg/L | N/A | 0.057 | 0.059 | 0.050 | 0.032 |
| pH, Field | S.U. | 6.5 - 9.0 | 9.74 | 8.24 | 7.87 | 7.49 |
| Radium-226 | pCi/L | 3.75 | 0.140 | 0.143 | 0.147 | -- |
| Radium-228 | pCi/L | 3.75 | 0.438 | 0.470 | 0.446 | 0.505 |
| Selenium, Dissolved | mg/L | 5 | 0.0193 | 0.0071 | 0.0099 | 0.0093 |
| Selenium, Total | mg/L | 5 | 0.0048 | 0.0051 | 0.0054 | 0.0110 |
| Sulfate | mg/L | 500 | 286 | 256 | 219 | 254 |
| Thallium, Dissolved | mg/L | N/A | <0.002 | <0.002 | <0.002 | <0.002 |
| Thallium, Total | mg/L | N/A | <0.002 | <0.002 | <0.002 | <0.002 |
| Total Dissolved Solids | mg/L | 1000 | 562 | 551 | 505 | 595 |

Exceeds Surface Water Standard

Average concentrations between October 2010 and November 2020 as calculated by Sanitas™ Software

"<" = Constituent non-detect in 75% or more samples; reporting limit presented as average.

"--" = Constituent not analyzed

N/A = Standard not established for this constituent

[1]Constituents analyzed are coal-combustion residual (CCR) constituents as identified in Appendices III and IV to 40 CFR Part 257.

[2] Surface Water Standard values obtained from the Illinois General Use Water Quality Standards (WQS) as defined in 35 IAC 302, Subpart B or, in the absence of Illinois WQS, the Illinois Water Quality Criteria (WQC) as shown in **Table 1**.

# Appendix E

# HELP Model

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******************************************************************************
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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**               FOR USEPA RISK REDUCTION ENGINEERING LABORATORY            **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:    C:Waukegan\PREC30.D4
TEMPERATURE DATA FILE:      C:Waukegan\TEMP30.D7
SOLAR RADIATION DATA FILE:  C:Waukegan\SOLAR30.D13
EVAPOTRANSPIRATION DATA:    C:Waukegan\EVAP30.D11
SOIL AND DESIGN DATA FILE:  C:Waukegan\BASE_3.D10
OUTPUT DATA FILE:           C:Waukegan\BASE_3.OUT


TIME:  10:57     DATE:   4/ 6/2021


******************************************************************************

     TITLE:  Midwest Generation (Waukegan) - Base Cond. - 1"/1" Soil

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                   LAYER  1
                                   --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   9
           THICKNESS                 =     1.00   INCHES
           POROSITY                  =     0.5010 VOL/VOL
           FIELD CAPACITY            =     0.2840 VOL/VOL
           WILTING POINT             =     0.1350 VOL/VOL
           INITIAL SOIL WATER CONTENT  =     0.4648 VOL/VOL
           EFFECTIVE SAT. HYD. COND.   =  0.190000006000E-03 CM/SEC
         NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

```
                    LAYER  2
                    --------

          TYPE 3 - BARRIER SOIL LINER
          MATERIAL TEXTURE NUMBER   9
THICKNESS                  =     1.00   INCHES
POROSITY                   =     0.5010 VOL/VOL
FIELD CAPACITY             =     0.2840 VOL/VOL
WILTING POINT              =     0.1350 VOL/VOL
INITIAL SOIL WATER CONTENT =     0.5010 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC


                    LAYER  3
                    --------

      TYPE 1 - VERTICAL PERCOLATION LAYER
          MATERIAL TEXTURE NUMBER  31
THICKNESS                  =   120.00   INCHES
POROSITY                   =     0.5780 VOL/VOL
FIELD CAPACITY             =     0.0760 VOL/VOL
WILTING POINT              =     0.0250 VOL/VOL
INITIAL SOIL WATER CONTENT =     0.1966 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.410000002000E-02 CM/SEC


          GENERAL DESIGN AND EVAPORATIVE ZONE DATA
          ----------------------------------------

 NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
          SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
          GOOD STAND OF GRASS, A SURFACE SLOPE OF  1.%
          AND A SLOPE LENGTH OF  500. FEET.

SCS RUNOFF CURVE NUMBER            =     74.30
FRACTION OF AREA ALLOWING RUNOFF   =    100.0    PERCENT
AREA PROJECTED ON HORIZONTAL PLANE =      1.000  ACRES
EVAPORATIVE ZONE DEPTH             =      1.0    INCHES
INITIAL WATER IN EVAPORATIVE ZONE  =      0.465  INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE =      0.501  INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE =      0.135  INCHES
INITIAL SNOW WATER                 =      0.000  INCHES
INITIAL WATER IN LAYER MATERIALS   =     24.555  INCHES
TOTAL INITIAL WATER                =     24.555  INCHES
TOTAL SUBSURFACE INFLOW            =      0.00   INCHES/YEAR
```

EVAPOTRANSPIRATION AND WEATHER DATA
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NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
CHICAGO ILLINOIS

| | | |
|---|---|---|
| STATION LATITUDE | = | 41.78 DEGREES |
| MAXIMUM LEAF AREA INDEX | = | 3.50 |
| START OF GROWING SEASON (JULIAN DATE) | = | 117 |
| END OF GROWING SEASON (JULIAN DATE) | = | 290 |
| EVAPORATIVE ZONE DEPTH | = | 1.0 INCHES |
| AVERAGE ANNUAL WIND SPEED | = | 10.30 MPH |
| AVERAGE 1ST QUARTER RELATIVE HUMIDITY | = | 71.00 % |
| AVERAGE 2ND QUARTER RELATIVE HUMIDITY | = | 65.00 % |
| AVERAGE 3RD QUARTER RELATIVE HUMIDITY | = | 70.00 % |
| AVERAGE 4TH QUARTER RELATIVE HUMIDITY | = | 72.00 % |

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHICAGO ILLINOIS

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 1.60 | 1.31 | 2.59 | 3.66 | 3.15 | 4.08 |
| 3.63 | 3.53 | 3.35 | 2.28 | 2.06 | 2.10 |

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHICAGO ILLINOIS

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 21.40 | 26.00 | 36.00 | 48.80 | 59.10 | 68.60 |
| 73.00 | 71.90 | 64.70 | 53.50 | 39.80 | 27.70 |

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR CHICAGO ILLINOIS
AND STATION LATITUDE = 41.78 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

-------------------------------------------------------------------------------

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| **PRECIPITATION** | | | | | | |
| TOTALS | 1.47 | 1.46 | 2.39 | 3.26 | 3.34 | 4.22 |
| | 3.43 | 3.42 | 3.11 | 2.19 | 2.10 | 2.22 |
| STD. DEVIATIONS | 0.68 | 0.71 | 1.18 | 1.52 | 1.65 | 2.14 |
| | 1.83 | 1.76 | 1.76 | 1.22 | 1.06 | 0.97 |
| **RUNOFF** | | | | | | |
| TOTALS | 0.413 | 1.356 | 2.098 | 0.305 | 0.062 | 0.105 |
| | 0.096 | 0.111 | 0.062 | 0.036 | 0.023 | 0.239 |
| STD. DEVIATIONS | 0.596 | 0.974 | 1.675 | 0.517 | 0.181 | 0.199 |
| | 0.111 | 0.179 | 0.097 | 0.063 | 0.051 | 0.385 |
| **EVAPOTRANSPIRATION** | | | | | | |
| TOTALS | 0.534 | 0.453 | 0.547 | 1.427 | 1.502 | 1.721 |
| | 1.554 | 1.347 | 1.072 | 0.747 | 0.704 | 0.521 |
| STD. DEVIATIONS | 0.111 | 0.085 | 0.208 | 0.556 | 0.610 | 0.730 |
| | 0.645 | 0.604 | 0.482 | 0.345 | 0.230 | 0.144 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 2** | | | | | | |
| TOTALS | 0.0621 | 0.1168 | 0.4469 | 1.6497 | 1.7830 | 2.3693 |
| | 1.8055 | 1.9666 | 1.9958 | 1.3610 | 1.3568 | 0.6368 |
| STD. DEVIATIONS | 0.0597 | 0.0709 | 0.3026 | 1.0458 | 1.1514 | 1.3195 |
| | 1.3224 | 1.1766 | 1.3682 | 0.9273 | 0.9174 | 0.5390 |
| **PERCOLATION/LEAKAGE THROUGH LAYER 3** | | | | | | |
| TOTALS | 1.3450 | 0.9033 | 0.7227 | 0.4399 | 0.5618 | 1.0476 |
| | 1.9459 | 1.8423 | 1.8643 | 1.9094 | 1.5873 | 1.4743 |
| STD. DEVIATIONS | 0.4007 | 0.1882 | 0.1180 | 0.0877 | 0.3700 | 0.7246 |
| | 1.4347 | 0.8598 | 0.7849 | 0.6882 | 0.5740 | 0.5352 |

---

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

---

| DAILY AVERAGE HEAD ON TOP OF LAYER 2 | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0020 | 0.0028 | 0.0100 | 0.0325 | 0.0335 | 0.0437 |
| | 0.0293 | 0.0315 | 0.0359 | 0.0266 | 0.0259 | 0.0134 |
| STD. DEVIATIONS | 0.0034 | 0.0026 | 0.0062 | 0.0207 | 0.0216 | 0.0204 |
| | 0.0187 | 0.0186 | 0.0238 | 0.0182 | 0.0168 | 0.0095 |

***********************************************************************************

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 30

| | INCHES | | CU. FEET | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 32.60 | ( 5.565) | 118325.9 | 100.00 |
| RUNOFF | 4.906 | ( 2.0599) | 17809.38 | 15.051 |
| EVAPOTRANSPIRATION | 12.130 | ( 2.0324) | 44030.22 | 37.211 |
| PERCOLATION/LEAKAGE THROUGH LAYER 2 | 15.55042 | ( 3.57521) | 56448.012 | 47.70554 |
| AVERAGE HEAD ON TOP OF LAYER 2 | 0.024 | ( 0.005) | | |
| PERCOLATION/LEAKAGE THROUGH LAYER 3 | 15.64379 | ( 3.64652) | 56786.945 | 47.99198 |
| CHANGE IN WATER STORAGE | -0.083 | ( 1.3175) | -300.65 | -0.254 |

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 4.09 | 14846.700 |
| RUNOFF | 1.681 | 6103.1455 |
| PERCOLATION/LEAKAGE THROUGH LAYER 2 | 3.152224 | 11442.57130 |
| AVERAGE HEAD ON TOP OF LAYER 2 | 0.500 | |
| PERCOLATION/LEAKAGE THROUGH LAYER 3 | 0.405263 | 1471.10535 |
| SNOW WATER | 4.86 | 17649.8242 |

| | |
|---|---|
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.5010 |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.1350 |

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FINAL WATER STORAGE AT END OF YEAR 30

| LAYER | (INCHES) | (VOL/VOL) |
| --- | --- | --- |
| 1 | 0.4648 | 0.4648 |
| 2 | 0.5010 | 0.5010 |
| 3 | 20.7881 | 0.1732 |
| SNOW WATER | 0.316 | |

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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:    C:Waukegan\PREC30.D4
TEMPERATURE DATA FILE:      C:Waukegan\TEMP30.D7
SOLAR RADIATION DATA FILE:  C:Waukegan\SOLAR30.D13
EVAPOTRANSPIRATION DATA:    C:Waukegan\EVAP30.D11
SOIL AND DESIGN DATA FILE:  C:Waukegan\CAP_3A.D10
OUTPUT DATA FILE:           C:Waukegan\CAP_3A.OUT


TIME:  13:47     DATE:   4/ 7/2021


******************************************************************************

     TITLE:  Midwest Generation (Waukegan) - Cap Cond. - w/ Geomembrane

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                   LAYER  1
                                   --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   9
           THICKNESS                    =      6.00   INCHES
           POROSITY                     =      0.5010 VOL/VOL
           FIELD CAPACITY               =      0.2840 VOL/VOL
           WILTING POINT                =      0.1350 VOL/VOL
           INITIAL SOIL WATER CONTENT   =      0.3427 VOL/VOL
           EFFECTIVE SAT. HYD. COND.    =  0.190000006000E-03 CM/SEC
         NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
```

FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2
--------

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 12

| | | | |
|---|---|---|---|
| THICKNESS | = | 12.00 | INCHES |
| POROSITY | = | 0.4710 | VOL/VOL |
| FIELD CAPACITY | = | 0.3420 | VOL/VOL |
| WILTING POINT | = | 0.2100 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.3583 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.419999997000E-04 | CM/SEC |

LAYER 3
--------

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 20

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.20 | INCHES |
| POROSITY | = | 0.8500 | VOL/VOL |
| FIELD CAPACITY | = | 0.0100 | VOL/VOL |
| WILTING POINT | = | 0.0050 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0189 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 10.0000000000 | CM/SEC |
| SLOPE | = | 5.00 | PERCENT |
| DRAINAGE LENGTH | = | 250.0 | FEET |

LAYER 4
--------

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 36

| | | | |
|---|---|---|---|
| THICKNESS | = | 0.40 | INCHES |
| POROSITY | = | 0.0000 | VOL/VOL |
| FIELD CAPACITY | = | 0.0000 | VOL/VOL |
| WILTING POINT | = | 0.0000 | VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0000 | VOL/VOL |
| EFFECTIVE SAT. HYD. COND. | = | 0.399999993000E-12 | CM/SEC |
| FML PINHOLE DENSITY | = | 0.75 | HOLES/ACRE |
| FML INSTALLATION DEFECTS | = | 2.50 | HOLES/ACRE |
| FML PLACEMENT QUALITY | = | 3 - GOOD | |

LAYER 5
--------

```
              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER   9
   THICKNESS                  =      1.00   INCHES
   POROSITY                   =      0.5010 VOL/VOL
   FIELD CAPACITY             =      0.2840 VOL/VOL
   WILTING POINT              =      0.1350 VOL/VOL
   INITIAL SOIL WATER CONTENT =      0.5010 VOL/VOL
   EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC


                          LAYER  6
                          --------

            TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER  31
   THICKNESS                  =    120.00   INCHES
   POROSITY                   =      0.5780 VOL/VOL
   FIELD CAPACITY             =      0.0760 VOL/VOL
   WILTING POINT              =      0.0250 VOL/VOL
   INITIAL SOIL WATER CONTENT =      0.0760 VOL/VOL
   EFFECTIVE SAT. HYD. COND.  =  0.410000002000E-02 CM/SEC


           GENERAL DESIGN AND EVAPORATIVE ZONE DATA
           ----------------------------------------

  NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
           SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
           GOOD STAND OF GRASS, A SURFACE SLOPE OF  5.%
           AND A SLOPE LENGTH OF  250. FEET.

 SCS RUNOFF CURVE NUMBER            =     76.10
 FRACTION OF AREA ALLOWING RUNOFF   =    100.0    PERCENT
 AREA PROJECTED ON HORIZONTAL PLANE =      1.000  ACRES
 EVAPORATIVE ZONE DEPTH             =      2.0    INCHES
 INITIAL WATER IN EVAPORATIVE ZONE  =      0.920  INCHES
 UPPER LIMIT OF EVAPORATIVE STORAGE =      1.002  INCHES
 LOWER LIMIT OF EVAPORATIVE STORAGE =      0.270  INCHES
 INITIAL SNOW WATER                 =      0.000  INCHES
 INITIAL WATER IN LAYER MATERIALS   =     15.980  INCHES
 TOTAL INITIAL WATER                =     15.980  INCHES
 TOTAL SUBSURFACE INFLOW            =      0.00   INCHES/YEAR


            EVAPOTRANSPIRATION AND WEATHER DATA
            -----------------------------------

  NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
           CHICAGO               ILLINOIS
```

```
STATION LATITUDE                        =  41.78 DEGREES
MAXIMUM LEAF AREA INDEX                 =   3.50
START OF GROWING SEASON (JULIAN DATE)   =    117
END OF GROWING SEASON (JULIAN DATE)     =    290
EVAPORATIVE ZONE DEPTH                  =   2.0  INCHES
AVERAGE ANNUAL WIND SPEED               =  10.30 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY   =  71.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY   =  65.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY   =  70.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY   =  72.00 %
```

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR CHICAGO ILLINOIS

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 1.60 | 1.31 | 2.59 | 3.66 | 3.15 | 4.08 |
| 3.63 | 3.53 | 3.35 | 2.28 | 2.06 | 2.10 |

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR CHICAGO ILLINOIS

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 21.40 | 26.00 | 36.00 | 48.80 | 59.10 | 68.60 |
| 73.00 | 71.90 | 64.70 | 53.50 | 39.80 | 27.70 |

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR CHICAGO ILLINOIS AND STATION LATITUDE = 41.78 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 30

-------------------------------------------------------------------------------

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION | | | | | | |
| TOTALS | 1.47 | 1.46 | 2.39 | 3.26 | 3.34 | 4.22 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3.43 | 3.42 | 3.11 | 2.19 | 2.10 | 2.22 |
| STD. DEVIATIONS | 0.68 | 0.71 | 1.18 | 1.52 | 1.65 | 2.14 |
| | 1.83 | 1.76 | 1.76 | 1.22 | 1.06 | 0.97 |

RUNOFF

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.400 | 1.390 | 2.266 | 0.318 | 0.008 | 0.060 |
| | 0.053 | 0.033 | 0.016 | 0.002 | 0.000 | 0.205 |
| STD. DEVIATIONS | 0.630 | 1.041 | 1.753 | 0.590 | 0.034 | 0.231 |
| | 0.161 | 0.082 | 0.074 | 0.009 | 0.001 | 0.354 |

EVAPOTRANSPIRATION

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.539 | 0.453 | 0.630 | 1.820 | 1.965 | 2.240 |
| | 2.014 | 1.821 | 1.442 | 1.011 | 0.912 | 0.573 |
| STD. DEVIATIONS | 0.117 | 0.084 | 0.286 | 0.681 | 0.759 | 0.786 |
| | 0.807 | 0.780 | 0.628 | 0.465 | 0.248 | 0.161 |

LATERAL DRAINAGE COLLECTED FROM LAYER 3

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.1163 | 0.0012 | 0.1514 | 1.1998 | 1.4708 | 1.7004 |
| | 1.6026 | 1.5145 | 1.5676 | 1.2379 | 1.1522 | 0.7157 |
| STD. DEVIATIONS | 0.1641 | 0.0064 | 0.2024 | 0.9201 | 1.1226 | 1.1022 |
| | 1.2231 | 1.0275 | 1.1934 | 0.7596 | 0.7969 | 0.5451 |

PERCOLATION/LEAKAGE THROUGH LAYER 5

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0000 | 0.0000 | 0.0000 |

PERCOLATION/LEAKAGE THROUGH LAYER 6

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0000 | 0.0000 | 0.0000 |

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

| | | | | | | |
|---|---|---|---|---|---|---|
| AVERAGES | 0.0003 | 0.0000 | 0.0004 | 0.0035 | 0.0042 | 0.0050 |
| | 0.0046 | 0.0043 | 0.0046 | 0.0035 | 0.0034 | 0.0020 |
| STD. DEVIATIONS | 0.0005 | 0.0000 | 0.0006 | 0.0027 | 0.0032 | 0.0032 |

| | | | | | |
|---|---|---|---|---|---|
| 0.0035 | 0.0029 | 0.0035 | 0.0022 | 0.0023 | 0.0016 |

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 30

| | INCHES | | CU. FEET | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 32.60 | ( 5.565) | 118325.9 | 100.00 |
| RUNOFF | 4.750 | ( 2.1588) | 17244.21 | 14.573 |
| EVAPOTRANSPIRATION | 15.419 | ( 2.4608) | 55972.44 | 47.304 |
| LATERAL DRAINAGE COLLECTED FROM LAYER 3 | 12.43034 | ( 3.12447) | 45122.129 | 38.13377 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.00081 | ( 0.00018) | 2.924 | 0.00247 |
| AVERAGE HEAD ON TOP OF LAYER 4 | 0.003 | ( 0.001) | | |
| PERCOLATION/LEAKAGE THROUGH LAYER 6 | 0.00081 | ( 0.00018) | 2.925 | 0.00247 |
| CHANGE IN WATER STORAGE | -0.004 | ( 1.3462) | -15.80 | -0.013 |

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 30

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 4.09 | 14846.700 |
| RUNOFF | 1.715 | 6224.0708 |
| DRAINAGE COLLECTED FROM LAYER 3 | 1.40194 | 5089.04932 |
| PERCOLATION/LEAKAGE THROUGH LAYER 5 | 0.000070 | 0.25589 |
| AVERAGE HEAD ON TOP OF LAYER 4 | 0.124 | |
| MAXIMUM HEAD ON TOP OF LAYER 4 | 0.245 | |
| LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN) | 2.0 FEET | |
| PERCOLATION/LEAKAGE THROUGH LAYER 6 | 0.000030 | 0.10777 |
| SNOW WATER | 4.86 | 17649.8242 |
| MAXIMUM VEG. SOIL WATER (VOL/VOL) | 0.5010 | |
| MINIMUM VEG. SOIL WATER (VOL/VOL) | 0.1350 | |

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 30

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 1.8061 | 0.3010 |
| 2 | 4.1040 | 0.3420 |
| 3 | 0.0020 | 0.0100 |
| 4 | 0.0000 | 0.0000 |
| 5 | 0.5010 | 0.5010 |
| 6 | 9.1200 | 0.0760 |
| SNOW WATER | 0.316 | |

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# EXHIBIT 2*

*Exhibit 2 is an excerpt of Jonathan S. Shefftz' Opinion on Economic Benefit of Noncompliance and Economic Impact of Penalty Payment and Compliance Costs Report, which is marked as Non-Disclosable Information. The two pages in Exhibit 2 are not Non-Disclosable Information.

# EXPERT OPINION

***on***

# Economic Benefit of Noncompliance

***and***

# Economic Impact of Penalty Payment and Compliance Costs

***In:***

**Sierra Club,**
**Environmental Law and Policy Center,**
**Prairie Rivers Network, and**
**Citizens Against Ruining the Environment**
**v.**
**Midwest Generation, LLC**

Pollution Control Board of the State of Illinois
PCB No-2013-015

*Submitted on:*
January 25, 2021

*Expert Report of:*
Jonathan S. Shefftz

d/b/a JShefftz Consulting
14 Moody Field Road
Amherst MA 01002

Table 3: **ECONOMIC BENEFIT FROM DELAYED AND/OR AVOIDED COMPLIANCE MEASURES**

| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | (q) | (r) | (s) | (t) | **(u)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Site Name and Total Remedy Costs | Per-Year Cost Estimate: Amount | Date | Cost Index: Choice | Value | Depreciate? | Recurring? | **On-Time Compliance Scenario:** Date | Cost Index Value | Adjusted Cost for Inflation | After-Tax Value | PV Factor at: 25-Jan-21 | After-Tax PV | **Delayed Compliance Scenario:** Date | Cost Index Value | Adjusted Cost for Inflation | After-Tax Value | PV Factor at: 25-Jan-21 | After-Tax PV | **Economic Benefit** |
| (1) | Joliet: | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-11 | 181.1 | $3,099,354 | $1,823,040 | 1.5966 | $2,910,730 | 1-Jan-22 | 200.1 | $3,423,880 | $2,447,732 | 0.9515 | $2,329,083 | $581,647 |
| (2) | Site-Wide = | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-12 | 191.1 | $3,270,494 | $1,923,705 | 1.5252 | $2,933,992 | 1-Jan-23 | 204.9 | $3,506,054 | $2,506,478 | 0.9022 | $2,261,452 | $672,540 |
| (3) | $20,742,381 | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-13 | 192.6 | $3,296,165 | $1,938,804 | 1.4626 | $2,835,644 | 1-Jan-24 | 209.8 | $3,590,053 | $2,566,529 | 0.8555 | $2,195,695 | $639,948 |
| (4) | NE Landfill = | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-14 | 194.2 | $3,323,548 | $1,954,911 | 1.3997 | $2,736,294 | 1-Jan-25 | 214.7 | $3,674,269 | $2,626,735 | 0.8111 | $2,130,499 | $605,794 |
| (5) | $10,278,011 | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-15 | 185.0 | $3,166,099 | $1,898,393 | 1.3364 | $2,536,989 | 1-Jan-26 | 219.6 | $3,758,778 | $2,687,150 | 0.7691 | $2,066,614 | $470,375 |
| (6) | Pond Areas = | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-16 | 179.7 | $3,075,394 | $1,844,006 | 1.2814 | $2,362,937 | 1-Jan-27 | 224.7 | $3,845,229 | $2,748,955 | 0.7292 | $2,004,645 | $358,292 |
| (7) | $1,239,585 | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-17 | 185.6 | $3,176,367 | $1,886,444 | 1.2306 | $2,321,539 | 1-Jan-28 | 229.9 | $3,933,670 | $2,812,180 | 0.6915 | $1,944,534 | $377,005 |
| (8) | Total = | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-18 | 192.6 | $3,296,165 | $2,356,429 | 1.1753 | $2,769,436 | 1-Jan-29 | 235.1 | $4,024,308 | $2,876,978 | 0.6556 | $1,886,027 | $883,408 |
| (9) | **$32,259,977** | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-19 | 194.3 | $3,325,259 | $2,377,228 | 1.1076 | $2,633,102 | 1-Jan-30 | 240.7 | $4,118,879 | $2,944,587 | 0.6216 | $1,830,367 | $802,735 |
| (10) | | $3,225,998 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-20 | 196.6 | $3,364,621 | $2,405,368 | 1.0555 | $2,538,977 | 1-Jan-31 | 246.3 | $4,215,673 | $3,013,785 | 0.5894 | $1,776,350 | $762,627 |
| (11) | Powerton: | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-11 | 181.1 | $16,871,392 | $9,923,753 | 1.5966 | $15,844,615 | 1-Jan-22 | 200.1 | $18,637,959 | $13,324,277 | 0.9515 | $12,678,410 | $3,166,205 |
| (12) | Site-Wide = | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-12 | 191.1 | $17,802,998 | $10,471,723 | 1.5252 | $15,971,243 | 1-Jan-23 | 204.9 | $19,085,270 | $13,644,060 | 0.9022 | $12,310,259 | $3,660,985 |
| (13) | $135,964,711 | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-13 | 192.6 | $17,942,739 | $10,553,919 | 1.4626 | $15,435,881 | 1-Jan-24 | 209.8 | $19,542,521 | $13,970,948 | 0.8555 | $11,952,310 | $3,483,570 |
| (14) | Pond Areas = | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-14 | 194.2 | $18,091,796 | $10,641,594 | 1.3997 | $14,895,068 | 1-Jan-25 | 214.7 | $20,000,956 | $14,298,683 | 0.8111 | $11,597,414 | $3,297,654 |
| (15) | $39,643,093 | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-15 | 185.0 | $17,234,718 | $10,333,937 | 1.3364 | $13,810,150 | 1-Jan-26 | 219.6 | $20,460,978 | $14,627,553 | 0.7691 | $11,249,655 | $2,560,495 |
| (16) | Total = | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-16 | 179.7 | $16,740,967 | $10,037,884 | 1.2814 | $12,862,693 | 1-Jan-27 | 224.7 | $20,931,580 | $14,963,987 | 0.7292 | $10,912,324 | $1,950,369 |
| (17) | **$175,607,804** | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-17 | 185.6 | $17,290,615 | $10,268,896 | 1.2306 | $12,637,340 | 1-Jan-28 | 229.9 | $21,413,007 | $15,308,159 | 0.6915 | $10,585,108 | $2,052,232 |
| (18) | | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-18 | 192.6 | $17,942,739 | $12,827,264 | 1.1753 | $15,075,476 | 1-Jan-29 | 235.1 | $21,906,398 | $15,660,884 | 0.6556 | $10,266,626 | $4,808,850 |
| (19) | | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-19 | 194.3 | $18,101,112 | $12,940,485 | 1.1076 | $14,333,342 | 1-Jan-30 | 240.7 | $22,421,198 | $16,028,915 | 0.6216 | $9,963,639 | $4,369,703 |
| (20) | | $17,560,780 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-20 | 196.6 | $18,315,382 | $13,093,666 | 1.0555 | $13,820,971 | 1-Jan-31 | 246.3 | $22,948,096 | $16,405,594 | 0.5894 | $9,669,594 | $4,151,376 |
| (21) | Waukegan: | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-11 | 181.1 | $10,203,931 | $6,001,952 | 1.5966 | $9,582,930 | 1-Jan-22 | 200.1 | $11,272,363 | $8,058,612 | 0.9515 | $7,667,988 | $1,914,942 |
| (22) | Site-Wide = | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-12 | 191.1 | $10,767,373 | $6,333,369 | 1.5252 | $9,659,515 | 1-Jan-23 | 204.9 | $11,542,900 | $8,252,019 | 0.9022 | $7,445,327 | $2,214,188 |
| (23) | $77,899,032 | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-13 | 192.6 | $10,851,889 | $6,383,081 | 1.4626 | $9,335,724 | 1-Jan-24 | 209.8 | $11,819,448 | $8,449,724 | 0.8555 | $7,228,838 | $2,106,887 |
| (24) | Pond Areas = | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-14 | 194.2 | $10,942,040 | $6,436,108 | 1.3997 | $9,008,637 | 1-Jan-25 | 214.7 | $12,096,713 | $8,647,940 | 0.8111 | $7,014,194 | $1,994,443 |
| (25) | $28,309,749 | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-15 | 185.0 | $10,423,673 | $6,250,035 | 1.3364 | $8,352,472 | 1-Jan-26 | 219.6 | $12,374,937 | $8,846,842 | 0.7691 | $6,803,867 | $1,548,605 |
| (26) | Total = | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-16 | 179.7 | $10,125,049 | $6,070,980 | 1.2814 | $7,779,443 | 1-Jan-27 | 224.7 | $12,659,561 | $9,050,320 | 0.7292 | $6,599,847 | $1,179,596 |
| (27) | **$106,208,781** | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-17 | 185.6 | $10,457,480 | $6,210,697 | 1.2306 | $7,643,148 | 1-Jan-28 | 229.9 | $12,950,730 | $9,258,477 | 0.6915 | $6,401,944 | $1,241,204 |
| (28) | | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-18 | 192.6 | $10,851,889 | $7,758,016 | 1.1753 | $9,117,749 | 1-Jan-29 | 235.1 | $13,249,137 | $9,471,808 | 0.6556 | $6,209,324 | $2,908,425 |
| (29) | | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-19 | 194.3 | $10,947,674 | $7,826,492 | 1.1076 | $8,668,902 | 1-Jan-30 | 240.7 | $13,560,492 | $9,694,395 | 0.6216 | $6,026,076 | $2,642,826 |
| (30) | | $10,620,878 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-20 | 196.6 | $11,077,266 | $7,919,137 | 1.0555 | $8,359,016 | 1-Jan-31 | 246.3 | $13,879,163 | $9,922,214 | 0.5894 | $5,848,236 | $2,510,780 |
| (31) | Will County: | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-11 | 181.1 | $3,082,219 | $1,812,961 | 1.5966 | $2,894,638 | 1-Jan-22 | 200.1 | $3,404,952 | $2,434,200 | 0.9515 | $2,316,207 | $578,431 |
| (32) | Site-Wide = | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-12 | 191.1 | $3,252,413 | $1,913,070 | 1.5252 | $2,917,772 | 1-Jan-23 | 204.9 | $3,486,670 | $2,492,621 | 0.9022 | $2,248,950 | $668,822 |
| (33) | $26,651,067 | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-13 | 192.6 | $3,277,942 | $1,928,086 | 1.4626 | $2,819,967 | 1-Jan-24 | 209.8 | $3,570,205 | $2,552,340 | 0.8555 | $2,183,557 | $636,410 |
| (34) | Pond Areas = | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-14 | 194.2 | $3,305,174 | $1,944,103 | 1.3997 | $2,721,166 | 1-Jan-25 | 214.7 | $3,653,956 | $2,612,213 | 0.8111 | $2,118,721 | $602,445 |
| (35) | $5,430,561 | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-15 | 185.0 | $3,148,595 | $1,887,897 | 1.3364 | $2,522,964 | 1-Jan-26 | 219.6 | $3,737,997 | $2,672,294 | 0.7691 | $2,055,189 | $467,775 |
| (36) | Total = | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-16 | 179.7 | $3,058,392 | $1,833,812 | 1.2814 | $2,349,873 | 1-Jan-27 | 224.7 | $3,823,971 | $2,733,757 | 0.7292 | $1,993,562 | $356,311 |
| (37) | **$32,081,628** | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-17 | 185.6 | $3,158,806 | $1,876,015 | 1.2306 | $2,308,704 | 1-Jan-28 | 229.9 | $3,911,922 | $2,796,633 | 0.6915 | $1,933,784 | $374,920 |
| (38) | | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-18 | 192.6 | $3,277,942 | $2,343,401 | 1.1753 | $2,754,125 | 1-Jan-29 | 235.1 | $4,002,060 | $2,861,072 | 0.6556 | $1,875,600 | $878,524 |
| (39) | | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-19 | 194.3 | $3,306,876 | $2,364,085 | 1.1076 | $2,618,545 | 1-Jan-30 | 240.7 | $4,096,108 | $2,928,308 | 0.6216 | $1,820,248 | $798,297 |
| (40) | | $3,208,163 | Jul-15 | PPI | 188.5 | n | n | 20-Jan-20 | 196.6 | $3,346,020 | $2,392,070 | 1.0555 | $2,524,940 | 1-Jan-31 | 246.3 | $4,192,367 | $2,997,123 | 0.5894 | $1,766,529 | $758,411 |

Notes:

| | | |
|---|---|---|
| (a) | | Line number, for reference only. |
| (b) | | Compliance measure. |
| (c) | | Cost estimate for compliance measure. |
| (d) | | Date for cost estimate. |
| (e) | | CCI= Construction Cost Index (*Engineering News Record*) PCI= Plant Cost Index (*Chemical Engineering* mag.) PPI= Producer Price Index & ECI= Employment Cost Index (U.S. Bureau of Labor Statistics) |
| (f) | | Monthly value for selected cost index used for inflation adjustments. |
| (g) | | Whether measure is a capital investment that is depreciated over time for tax purposes (i.e., as opposed to fully expensed the year in which it is incurred). |
| (h) | | Whether measure is an annually recurring cost (and hence avoided entirely each year over the period of noncompliance). |
| (i) | On-Time Compliance Scenario: | For capital investments, mid-point for each year-long period of On-Time Compliance Scenario; for O&M, date when costs first start. |
| (j) | On-Time Compliance Scenario: | Monthly value for selected cost index used for inflation adjustments. |
| (k) | On-Time Compliance Scenario: | Original cost estimate adjusted for inflation from cost estimate date (i.e., original cost estimate divided by associated cost index value, then multiplied by date-specific value). |
| (l) | On-Time Compliance Scenario: | Inflation-adjusted cost adjusted for tax deductibility (i.e., either tax rate from Table 2 if fully expensed, or tax shield present value from Table 4 if depreciated). |
| (m) | On-Time Compliance Scenario: | Value of a dollar brought to present from scenario start date, calculated as: {1 + Table 2 yr-specific Column "p"} ^ {(pv date - Table 3 Column "i" or "i" & "o" avg for recurring costs}/365.25}. |
| (n) | On-Time Compliance Scenario: | After-tax inflation-adjusted cost multiplied by present value factor. |
| (o) through (t) | | Identical calculations for the Delayed Compliance Scenario except for different start date, and any measures that are avoided entirely are not incorporated here. |
| (u) | | Difference of the after-tax present values in the scenarios for the On-Time Compliance Scenario versus the Delayed Compliance Scenario. |

# EXHIBIT 3

**Expert Opinion of Mark A. Quarles, P.G.**

**January 2021**

**Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment v. Midwest Generation, LLC**

**Prepared for:**

Sierra Club
50 F Street NW
8th Floor
Washington, DC 20001

**Prepared by:**

BBJ GROUP

1616 Westgate Circle
Brentwood, Tennessee 37027

Mark A. Quarles, P.G.
Georgia Professional Geologist No. 2266
New York Professional Geologist No. 779
Tennessee Professional Geologist No. 3834

sources – rather than just concluding that the contamination was not from the active ash basins. MWG, KPRG, and Patrick's lack of assigning possible contaminant blame and completing further investigations are consistent with the Board's prior determination that MWG's monitoring and inspection programs for the CCAs were intended to avoid and detect contamination. That avoidance was carried over to the monitoring programs associated with the CCR Rule and the CCAs.

Although MWG relined ash ponds with HDPE liners at each of the four stations, the HDPE liners were placed on top of the original liners that were prone to leak. The addition of the HDPE liner on top of the old liner may not meet the requirements of the CCR Rule, unless MWG demonstrates that a two-foot layer of soil with a hydraulic conductivity no greater than 1 x $10^{-7}$ centimeters per second also exists beneath the HPDE layer (or an alternate liner that meets the same performance equivalence).

MWG is required to define *probable and possible* [emphasis supplied] sources of contamination in a nature and extent investigation. MWG cannot possibly complete a groundwater remedy without first knowing the locations of all source areas and the conditions the coal ash exists at those locations.

Historical contamination in wells used for active basin compliance activities not only affects the need to identify source areas, complete a nature and extent investigation, and develop a remedy – but that contamination also adversely affects current CCA and CCR Rule compliance monitoring activities. MWG's use of contaminated background or baseline well data for CCR Rule purposes will only trigger the need to complete required assessments (and corresponding analyses of metals) or corrective actions – if groundwater quality worsens from concentrations possibly already indicative of contamination from historical leakage.

### 5.2 Need for a Nature and Extent Investigation

As discussed above, the first step in determining a suitable remedy at each of the four stations is for MWG to determine the source(s) of contamination, the types of coal ash (e.g. fly ash, bottom ash, cinders, and / or slag), the characteristics of where and how that material exists in the environment, and how much coal ash exists.

The investigation at each station should define the nature and extent of contamination for all active and historical disposal and fill areas. Site-specific factors gathered in an investigation should then be used by MWG to determine possible remedy options and determine how those remedies will be effective in improving groundwater quality over time. The nature and extent study that MWG is required to complete should include these components, at a minimum:

- Sampling, analyses, and field screening activities,
- Characterization of sources and potential sources of contamination,
- A determination of the degree of saturation of coal ash and connectivity to groundwater,
- A three-dimensional analysis (horizontally and vertically) and the nature, direction, and rate of movement of contaminants,
- Characterization of present and post-remediation exposure routes that may potentially threaten human or environmental receptors, and

- Characterization of significant physical features of the remediation site and vicinity that may affect contaminant fate and transport and present a risk to human health, safety, and the environment.

Groundwater elevations can also rise with climate change – possibly submerging even more coal ash in the future. The nature and extent investigations should consider that groundwater elevations might rise in the future and inundate even more coal ash. Precipitation that accumulates in coal ash can mound the groundwater, creating radial, 360-degree groundwater flow from unlined disposal areas. Further, higher hydraulic heads of that mounding can cause increased horizontal seepage velocities and a vertical gradient that can "push" contaminants deeper into the aquifer.

### 5.3 Remedy Selection

The Board concluded that MWG's use of the CCAs, GMZs, and ELUCs have not resulted in improvement in groundwater quality and will not prevent the continued spread of contaminants from source areas. As a result, MWG is required to complete other actions that result in a remedy that meets IEPA groundwater protection standards, in addition to state and Federal standards for other affected media such as wetlands and sediment.

The groundwater remedy should consider that groundwater at each station should be protected for current *and future* [emphasis supplied] uses. Potential current and future human receptors include not only possible drinking water exposures, but also industrial, commercial, or irrigation users that pump groundwater. The study should also recognize that ecological resources possibly remain threatened in the future without a proper remedy.

The remedies associated with each station should be capable of performing satisfactorily, reliably, and within a reasonable amount of time. Each potential remedy should be thoroughly evaluated in an alternatives analysis that is included in a corrective action or remedial action plan. An insufficiently performed nature and extent investigation risks selection of a remedy that will not meet the required groundwater clean-up objectives.

The same shallow, porous, and relatively rapid flow groundwater conditions that exist at each station that create contaminant migration threats, are favorable for a variety of groundwater remedies. Those factors make groundwater remedies more technologically practical and economically reasonable. Such high groundwater flow rates enable groundwater, for example, to be captured by pumping wells and for chemical treatment additives to be injected into the aquifer.

The coal combustion industry and in particular MWG, consider excavation or closure-by-removal to be a technologically practical and economically reasonable closure alternative. Closure of coal ash disposal areas by excavating coal ash and transporting that material to a lined landfill has been common across the United States. Even though MWG plans to close ash ponds at Joliet, Powerton, Waukegan, and Will County by excavation and removal, those closure efforts will be incomplete to remove contaminant sources if historical coal ash remains in adjacent areas or beneath the former active ash ponds. Closure by excavation is expected to improve groundwater quality over time because the source of the contaminants is removed.

# EXHIBIT 4

Electronic Filing: Received, Clerk's Office 01/21/2022



ILLINOIS POLLUTION CONTROL BOARD

| | |
|---|---|
| MIDWEST GENERATION, LLC<br>(Will County Station)<br><br>Petitioner,<br><br>-vs-<br><br>ILLINOIS ENVIRONMENTAL<br>PROTECTION AGENCY,<br><br>Respondent. | PCB No. 21-108<br>(Variance - Land) |

REPORT OF THE PROCEEDINGS held in the above entitled cause before HEARING OFFICER CAROL WEBB, called by the Illinois Pollution Control Board, taken by Pamela L. Cosentino, Certified Shorthand Reporter for the State of Illinois, at the Will County Office Building, County Board Room, 2nd floor, 302 N. Chicago Street, Joliet, Illinois, on the 27th day of July, 2021, commencing at the hour of 9:30 a.m.

Reported by: Pamela L. Cosentino, CSR
License No.: 084-003601

**Q. Including a groundwater monitoring program that establishes, presumably, the background for each of the CCR surface impoundments, right?**

A. Yeah. Groundwater monitoring will be part of the permit application, that's correct.

**Q. And a statistical evaluation, correct?**

A. I believe all that's part of it. My permit staff won't -- they don't review the groundwater information. The groundwater section does. But that's generally part of the applications, correct. There's different divisions of labor once it's all received.

**Q. But your permitting staff is issuing that permit, right?**

A. Correct.

**Q. And the Agency will conduct a detailed review of the information, all the information submitted. Right?**

A. We will, yes.

**Q. And that will take some type, right?**

A. It will.

**Q. And it could involve following up with the applicants for additional questions, right?**

A. Most applications do, yes. There is

Mr. LeCrone.

HEARING OFFICER WEBB: Ms. Gale?

FURTHER RECROSS-EXAMINATION

BY MS. GALE:

**Q. Mr. LeCrone, you assisted in preparing the recommendation submitted by the Agency, correct?**

A. Yes.

**Q. And do you recall in Paragraph 64 of the Agency's recommendation on Page 22, I'll read it: "There is public and environmental benefit to having pollution sources under enforceable operating permits. As stated by the legislature and evidenced by the passage of the Coal Ash Prevention Pollution Act" --**

**And then I'll skip to the end. Final sentence --**

**"Nevertheless, delaying the permitting closure of CCR surface impoundments does have implications to the public and the environment."**

**Do you remember saying that?**

**Or do you have a general understanding that's what the Agency stated?**

A. That's my general understanding, yes. I don't have it in front of me.

**Q. So you just said that it could take years to**

**get a permit application issued, didn't you?**

A. It could.

**Q. And it varies upon complexity, et cetera, and questions that are had. Right?**

A. Correct.

**Q. And in this case, I think we agreed earlier, that these permit applications are pretty complex, didn't we?**

A. They will be, yes.

**Q. So these applications review will take a significant amount of time, won't it?**

A. They will vary from site to site, I'm sure, but it will be a significant undertaking for sure.

**Q. It could take years?**

A. I hope not, but it's possible.

**Q. And we agree Midwest Generation's only asking for a -- let's see -- from October 31st to March 31st, that's five months, right?**

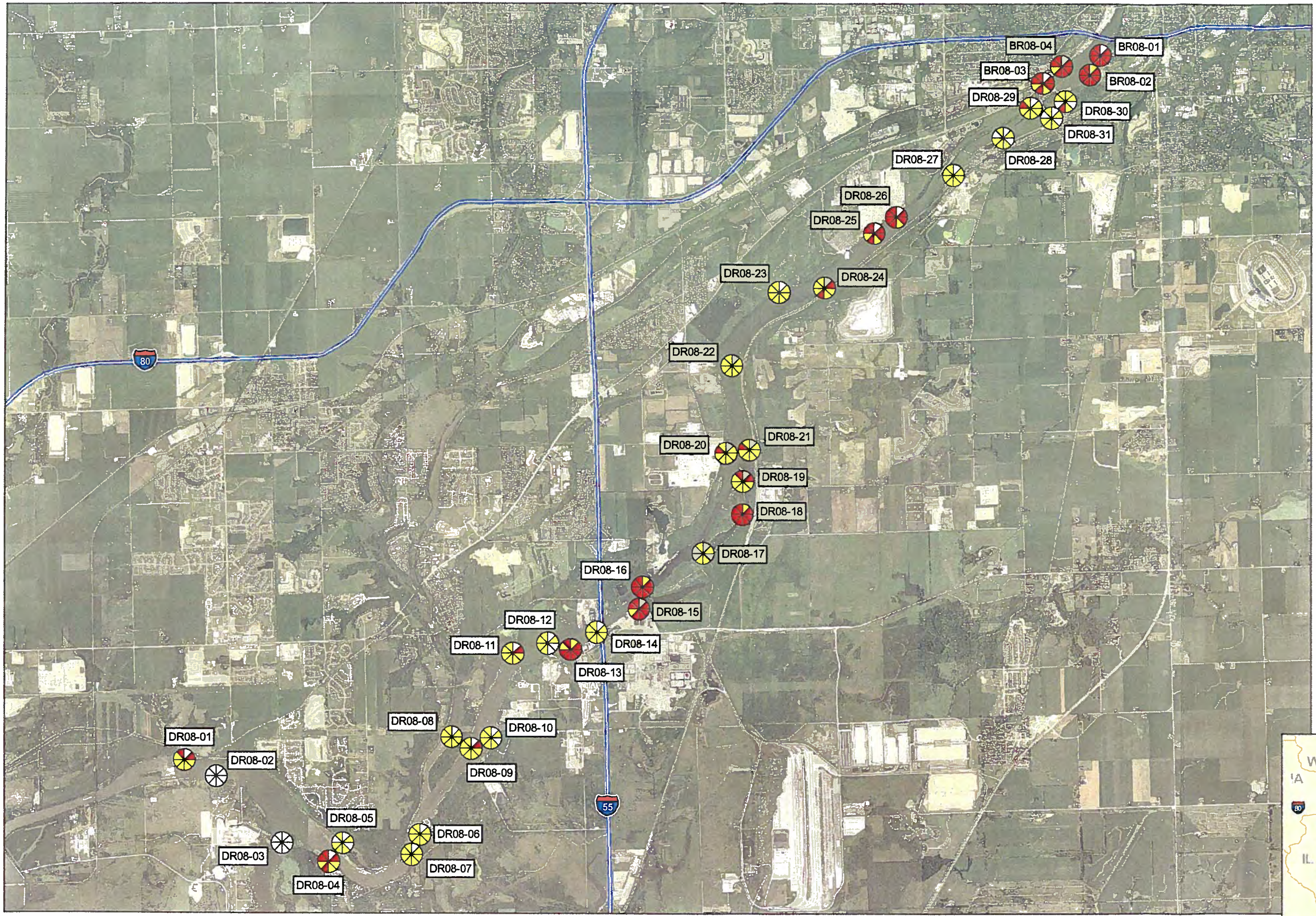
A. That's my understanding, yes.

**Q. For the operating permit application, that's what I'm talking?**

A. Uh-huh.

**Q. And only Midwest Generation is only asking for an additional, I want to say, five months if the**

# EXHIBIT 5




## Legend

Field Sampling Location, May 2008

Zn As Ni Cd Hg Cr Pb Cu

Each segment represents a specific analyte, as shown on the left

As - Arsenic
Cd - Cadmium
Cr - Chromium
Cu - Copper
Hg - Mercury
Ni - Nickel
Pb - Lead
Zn - Zinc

Segments shown in red represent concentrations that exceeded the Probable Effects Concentration (PEC)

Segments shown in yellow represent concentrations that exceeded the Threshold Effects Concentration (TEC)

Segments shown in white represent concentrations that did not exceed sediment quality guidelines

Acronyms
BR - Brandon Reach
DR - Dresden Reach
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyls

Note
Some location's symbols were slightly moved to allow each analyte's exceedence to show. The locations shown on this figure should be considered approximate.

N

0 1 2
Miles

Aerial Photo Source: USDA-FSA-APFO, 2007
Basemap Source: ESRI StreetMap, 2006


Figure 2
Concentrations of Metals that Exceed Sediment Quality Guidelines

Sediment Chemistry Study, Upper Illinois Waterway
Dresden and Lower Brandon Pools

C:\WORK\1458102\MXD\Figure2

MWG13-15_107873

# EXHIBIT 6

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

\- - - - - - - - - - - - - - x

| | | |
|---|---|---|
| In the Matter of: | : | |
| SIERRA CLUB, | : | |
| ENVIRONMENTAL LAW AND | : | PCB No. |
| POLICY CENTER, PRAIRIE | : | 2013-015 |
| RIVERS NETWORK, and | : | |
| CITIZENS AGAINST RUINING | : | |
| THE ENVIRONMENT, | : | |
| Complainants, | : | |
| v. | : | |
| MIDWEST GENERATION, LLC, | : | |
| Respondent. | : | |

\- - - - - - - - - - - - - - x

Deposition of

DOUGLAS G. DORGAN, JR., and MICHAEL B. MAXWELL

Conducted Virtually

Wednesday, October 6, 2021

9:27 a.m. CT

Job No.: 402611

Pages: 1 - 228

Reported By: Courtney Petros, RPR, CSR

MR. MAXWELL: Yeah.

Q My question is, how many were trending downward?

MS. NIJMAN: No. Your question was do you know --

Q I apologize. Thank you. So then my next question is, how many were trending downward?

MR. MAXWELL: According to page 3 of 3 in that table, there's 34 total that were trending downward.

Q And, of those, how many were trending significantly downward?

MR. MAXWELL: There's 11 that are noted that are trending significantly downward.

Q So is it fair to say the majority of the trend tests were not downward?

MS. NIJMAN: Objection. Misstates.

MR. MAXWELL: The majority of the trend tests were no trend. 64 percent of them were no trend. And I would point out that no trend actually indicates the constituent wasn't detected. And so no trend means that, essentially, no constituent was detected. And so that's the majority of the -- the trend test. In

# EXHIBIT 7

# BUREAU OF WATER WAUKEGAN POWER STATION: PART 845 - CCR SURFACE IMPOUNDMENTS

Darin LeCrone, P.E.

Manager, Permit Section

Division of Water Pollution Control

# CCR STATUTE AND REGULATIONS

- On July 30, 2019, Governor Pritzker signed Public Act 101-171 which directed the Illinois Pollution Control Board (IPCB) to adopt rules for a coal combustion residuals (CCR) surface impoundment permitting program. This amendment to the Act requires additional protections and closure requirements for CCR Surface Impoundments (also known as coal ash ponds) at electric utilities and independent power producers.
- Final Rule – 35 Ill. Adm. Code 845 - adopted by the Board in April 2021.
- There are 23 site locations - the Illinois EPA recognizes 72 CCR surface impoundments at power generating facilities, based on best available information.

# CCR PERMITTING TIMELINE

- The rule requires all facilities to submit **initial operating permit** applications to the Illinois EPA by **October 31, 2021**.
- **Closure construction permit** applications in EJ areas are due **February 2022**.

# WAUKEGAN POWER STATION – COAL ASH PONDS

- IEPA recognizes 3 CCR Surface Impoundments subject to Part 845: East Pond, West Pond & Old Pond.
- NRG acknowledges East Pond & West Pond are subject to 40 CFR Part 257 and Ill. Adm. Code Part 845.
- NRG disputes that Old Pond is subject to Part 845.

# WAUKEGAN POWER STATION – GROUNDWATER STANDARDS

- In 2012, IEPA issued a violation notice (VN) to NRG Waukegan for exceedances of Class I groundwater standards. Continued groundwater monitoring indicated a source other than East or West Ponds.
- Additional groundwater monitoring conducted indicates exceedances of Groundwater Protection Standards.
- IEPA will evaluate the adequacy of the facility’s groundwater monitoring system and data during the review of the application for the Initial Operating Permit.
- Exceedances of groundwater protection standards under Part 845 requires an Alternative Source Demonstration or corrective action.

# PERMITTING - PUBLIC PARTICIPATION

- **Initial Operating Permit:** Requires a 45-day public notice period with opportunity to submit written comments and request a public hearing.
- **Construction Permit:** Requires a 45-day public notice period with opportunity to submit written comments and request a public hearing. Facility will be required to hold 2 public meetings to outline their chosen closure method and discuss closure alternatives. The meetings must be held at least 30 days prior to submittal of a construction permit application.
- At least 30 days prior to the public meetings, the applicant must post on their publicly available website, all documentation relied upon in making their tentative application.
- If located in an area with significant non-English speaking residents, the notifications must be made in both English and the appropriate non-English language, and translation services must be provided at the meetings.
- Within 14 days after the public meetings, the applicant must distribute a general summary of the issues raised by the public, as well as a response to those issues.

# WAUKEGAN POWER STATION – AGENCY DECISION

- The Agency will provide notice of its final permitting decision, along with responses to comments received during the public notice, and public hearing (if applicable).
- Notice of the final decision will be made to the applicant, to any person who provides comments or an email address to the Agency during the public notice or hearing process, and to any person on the Agency's listserv for the facility.
- Such a notice will briefly describe any significant changes or revisions made to the permit.

# WAUKEGAN POWER STATION – NRG ADJUSTED STANDARD REQUESTS

- NRG filed an adjusted standard (AS) petition with Illinois Pollution Control Board on 5/11/21
- Petition was filed timely resulting in an automatic stay of Part 845 provisions for which relief sought
- NRG seeks inapplicability of Part 845 relative to Old Pond
- Initial petition sought reuse of existing HDPE liner in East Pond for low volume waste streams unrelated to coal ash

Electronic Filing: Received, Clerk's Office 11/18/2022

# WAUKEGAN POWER STATION – NRG ADJUSTED STANDARD REQUESTS CONT.

- NRG filed an amended adjusted standard petition with the Board on 9/17/21
- The amended petition  still seeks inapplicability of Part 845 relative to Old Pond
- Amended petition seeks reuse of existing HDPE liner in West Pond for low volume waste streams (not ash related)
- Amended petition states that East Pond will be closed in place

# WAUKEGAN POWER STATION – NRG ADJUSTED STANDARD REQUESTS CONT.

- The Agency intends to file Adjusted Standard recommendation with the Board for the Old Pond applicability petition by 1/31/22
- The Agency intends to file the Adjusted Standard recommendation with the Board for the West Pond liner petition as a separate recommendation
- The Adjusted Standard petitions will not affect the due date of the initial operating permit application.
- Depending on the Board’s final decisions on the adjusted standard petition, the date of closure construction permit applications may be changed
- Station closure scheduled for June 2022

# EXHIBIT 8

KPRG

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

**2021 INSPECTION SUMMARY LETTER**

November 1, 2021

Mr. DeAndre Cooley
Midwest Generation, LLC
1800 Channahon Road
Joliet, IL 60436

VIA E-MAIL and U.S. MAIL — KPRG Project No. 11306

Re: Joliet #29 Former Ash Burial Area Runoff Inspection 2021

Dear Mr. Cooley:

KPRG and Associates, Inc. (KPRG) completed a walk-over inspection of the former ash burial area on the northeast side of the Joliet #29 property, both inside and outside the fenced boundary of the facility. The inspection was performed on October 27, 2021. The purpose of the inspection was to identify any erosional features. It is our understanding that this area is included within the storm water/discharge permit for the facility and this inspection is part of permit compliance requirements.

During the inspection, KPRG walked and inspected the near bank areas of the covered fill along the river as well as areas away from the bank over the entire length of the former fill area. There was no evidence of erosion or rilling that has occurred over the last year. Areas of previous repair were also closely inspected and the repairs continue to hold up well and do not require any re-dressing. At this time KPRG does not propose or recommend that any repair work is needed for this year.

KPRG appreciates the continued opportunity for providing our technical services to Midwest Generation. If there are any questions, please contact me at 262-781-0475.

Sincerely,
KPRG and Associates, Inc.

Richard R Gnat

Richard R. Gnat, P.G.
Principal

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

ILLINOIS • WISCONSIN • INDIANA


PRIVATE PROPERTY


MWG13-15_108295

Electronic Filing: Received, Clerk's Office 01/21/2022

MWG13-15_108298