



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
SAM NUNN ATLANTA
FEDERAL CENTER 61
FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

July 12, 2023

Carrie A. Hunt
Manager, Environmental Remediation
Olin Corporation
490 Stuart Road, N.E.
Cleveland, Tennessee 37312

Re: Olin Corp. (McIntosh Plant) OU1 Superfund Site
McIntosh, Washington County, Alabama
Site/Spill ID Number 04B6
Consent Decree Civil Action No.95-0526-BH-S

Dear Ms. Hunt:

The U.S. Environmental Protection Agency (EPA), in consultation with the Alabama Department of Environmental Management (ADEM), completed the Optimization Review Report in 2020 and the Fifth Five-Year Review in 2021 for the Olin Corp. (McIntosh Plant) Superfund site Operable Unit 1 (OU1). Olin has submitted the 2020-2021 Annual Effectiveness Report that includes the most recent groundwater monitoring data for OU1, and EPA/ADEM have reviewed the report. This letter hereby notifies Olin that EPA and ADEM disapprove of the progress being made by the 1994 Record of Decision (ROD) remedy and the requirements of the Statement of Work (SOW) incorporated in the 1995 RD/RA Consent Decree. The SOW identified seven remedial action objectives and four related to groundwater are listed below.

1. "Prevent or mitigate the continued release of hazardous substances, pollutants and contaminants to the aquifers"
2. "Eliminate or reduce the threat posed to human health and the environment from current and potential migration of hazardous substances in the ground water, and subsurface and surface soil at the Site"
3. "Reduce concentrations of hazardous substances, pollutants and contaminants in ground water, surface and subsurface soil within the Site to levels specified by the Performance Standard

4. “Reduce the volume, toxicity, and mobility of hazardous substances, pollutants and contaminants at the Site”

The OU1 remedy included source control requirements that were completed in 2000. The source control included upgrading and extending caps, monitoring, and maintenance. Areas targeted for source control included the Weak Brine Pond, the Former CPC Plant Area, the Old CPC Plant Landfill, the Sanitary Landfill, and the Former Mercury Cell Plant. Improvements to the groundwater extraction system were also completed under OU1 in accordance with the ROD in 2001. Olin began to phase out groundwater extraction in 2015 and had ceased groundwater extraction altogether by 2017.

EPA recommended that statistical evaluations be completed for contaminants of concern (COCs) in groundwater in the 2020 Optimization Review Report. EPA has completed statistical evaluations for COCs in groundwater and concluded that the OU1 remedy is not making satisfactory progress toward achieving the Maximum Contaminant Levels (MCLs) and/or Groundwater Protection Standards (GWPSs). Table 1 includes a summary of the statistical evaluation results. EPA identified six COCs in groundwater that exceeded the MCLs/GWPSs in one or more of the last three semiannual monitoring events and have enough COC detections to support statistical evaluation. Select wells having the COC exceedances are listed in Table 1. Two time periods were considered for the statistical evaluation: 1) COC trends since completion of the OU1 source control and groundwater remedies in 2001, and 2) COC trends since the phase-out of groundwater extraction in 2017. The statistical methodology and representative data plots are in Attachment 1.

Groundwater monitoring wells having COC concentrations that are statistically stable or increasing over time and exceed the MCLs/GWPSs are concluded to be caused by ongoing COC mass addition to groundwater. This implies that an active source or sources are continuing to release COCs at rates that are unacceptable to the source control objectives and the groundwater remedy objectives. The EPA is instructing Olin to take the following actions in response these conditions.

In addition to the statistical analyses, EPA prepared maps of the potential COC distributions in groundwater for the alluvial aquifer and the upper Miocene aquifer for the COCs exceeding the MCLs/GWPSs from 2020-2022. The distribution maps and preparation methods are in Attachment 2. The distribution plots in Attachment 2 are not intended to represent location-specific COC concentrations but should be considered in envisioning the potential magnitude of the MCL/GWPS exceedances and show data gaps that should be filled.

EPA and ADEM request that Olin develop and implement detailed characterization plans for potential source areas to specifically identify the sources of COC addition to groundwater. The source areas to be addressed include the Weak Brine Pond, the Former CPC Plant Area, the Old CPC Plant Landfill, the Sanitary Landfill, and the Former Mercury Cell Plant. The

characterization techniques should consider the approach discussed in Section 5.1.1 of the 2020 Optimization Review. Assuming that COC sources are identified, this work will progress to improving the source control measures or implementing alternative remedies, as appropriate.

EPA has developed a list of target contaminants to be reported for the laboratory analyses described above. The Investigation Target List is shown in Table 2. This list includes all contaminants identified in the OUI ROD with cleanup goals plus contaminants requiring semiannual monitoring under the RCRA Corrective Action permit.

Olin OUI Source Characterization Schedule	
Submit Draft SAP/QAPP	60 days from receipt of this EPA letter
Submit Final SAP/QAPP	60 days from receiving EPA/ADEM SAP/QAPP comments
Field Mobilization	30 days from EPA approval of QAPP/SAP (in consultation with ADEM)
Draft Source Characterization Report	120 days from final sample collection

The EPA and ADEM look forward to continuing to work with the Olin team to discuss and resolve outstanding issues in a timely manner and to continue making progress on this important site.

Please feel free to give me a call at 404-909-0835 if you have any questions.

Sincerely,



Beth Walden
Project Manager
Superfund & Emergency Management Division

cc:

Lisa Ellis, EPA – ellis.lisa@epa.gov

Ben King, ADEM – ben.king@adem.alabama.gov

Well	a-BHC		b-BHC		d-BHC		Carbon Tetrachloride		Chlorobenzene		Chloroform		Mercury	
	2002+	2017+	2002+	2017+	2002+	2017+	2002+	2017+	2002+	2017+	2002+	2017+	2002+	2017+
BR-4R	NC	NC	--	--	--	--	--	--	--	--	--	--	--	--
BR-7	D	D	NC	NC	S	D	--	--	--	--	S	D	I	I
BR-8	D	S	NC	NC	D	D	--	--	--	--	--	--	S	I
BR-8D	S	S	NC	NC	S	S	--	--	--	--	--	--	D	S
BR-10	S	I	NC	NC	S	S	--	--	--	--	S	S	I	S
E-4	I	I	NC	NC	S	S	--	--	--	--	--	--	--	--
E-5	--	--	NC	NC	--	--	--	--	--	--	--	--	--	--
E-6	S	I	NC	NC	S	S	--	--	--	--	S	S	D	D
MGW-3	NC	S	--	--	--	--	--	--	--	--	--	--	--	--
MP-14	D	NC	NC	NC	--	--	--	--	--	--	--	--	--	--
MP-15	D	S	NC	NC	--	--	--	--	--	--	--	--	D	S
MP-9	D	S	NC	NC	D	S	--	--	--	--	D	S	S	I
PE-3D	--	--	--	--	--	--	D	D	--	--	--	--	S	S
PH-1	--	--	--	--	--	--	NC	S	--	--	--	--	--	--
PH-3D	--	--	--	--	--	--	--	--	--	--	--	--	D	S
PL-10D	NC	S	--	--	--	--	--	--	--	--	I	S	I	S
SL-5	--	--	NC	NC	--	--	D	I	--	--	--	--	S	I
SL-6	--	--	--	--	--	--	D	I	S	I	--	--	--	--
SL-7	--	--	--	--	--	--	D	D	S	S	--	--	--	--
WE-3	S	D	NC	D	S	S	--	--	--	--	--	--	I	S
WP-3	--	--	--	--	--	--	--	--	--	--	--	--	D	S

Upper Miocene Aquifer

Well	1,4-Dichlorobenzene
	2002+
MP-9	S

a-BHC - alpha-Hexachlorocyclohexane b-BHC - beta-Hexachlorocyclohexane

d-BHC - delta-Hexachlorocyclohexane

MCL - Maximum Contaminant Level GWPS - Groundwater Protection Standard

2002+ Trend from 1/1/2002 to present

2017+ Trend from 1/1/2017 to present

Trends in bold font have accompanying plots in Attachment 1

Below Since 2020 --

Exceeds MCL or GWPS ¹			
<50% detects	Decreasing	Stable	Increasing
NC	D	S	I

1 - Exceedances based on data from 2020-2022

Table 1: Statistical Evaluation Summary

Olin Corp. (McIntosh Plant) Superfund Site
McIntosh, Alabama

Contaminant	Analytical Class	MCL	ROD	GWPS	Units
Benzene	VOC	5	5	5	µg/L
Carbon tetrachloride	VOC	5	No	5	µg/L
Chlorobenzene	VOC	100	100	100	µg/L
Chloroform	VOC	80	No	80	µg/L
Dichlorobenzene, 1,2-	VOC	600	600	600	µg/L
Dichlorobenzene, 1,3-	VOC	--	75	0.5	µg/L
Dichlorobenzene, 1,4-	VOC	75	75	75	µg/L
Dichloroethane, 1,1-	VOC	--	No	2.8	µg/L
Dichloroethene, 1,1-	VOC	7	No	7	µg/L
Methylene Chloride	VOC	5	No	5	µg/L
Tetrachloroethene	VOC	5	No	5	µg/L
Trichloroethene	VOC	5	No	5	µg/L
Vinyl chloride	VOC	2	No	2	µg/L
Hexachlorobenzene	SVOC	1	No	1	µg/L
Nitrobenzene	SVOC	--	No	No	µg/L
Pentachlorobenzene	SVOC	--	29	0.5	µg/L
Pentachloronitrobenzene	SVOC	--	0.29	No	µg/L
4,4'-DDD	Organochlorine Pest.	--	No	No	ng/L
4,4'-DDE	Organochlorine Pest.	--	No	No	ng/L
4,4'-DDT	Organochlorine Pest.	--	No	No	ng/L
2,4'-DDD	Organochlorine Pest.	--	No	No	ng/L
2,4'-DDE	Organochlorine Pest.	--	No	No	ng/L
2,4'-DDT	Organochlorine Pest.	--	No	No	ng/L
alpha-BHC	Organochlorine Pest.	--	13	7.2	ng/L
beta-BHC	Organochlorine Pest.	--	No	25	ng/L
delta-BHC	Organochlorine Pest.	--	No	25	ng/L
gamma-BHC (Lindane)	Organochlorine Pest.	200	No	200	ng/L
Arsenic	Metals	10	No	10	µg/L
Beryllium	Metals	4	No	4	µg/L
Cadmium	Metals	5	No	5	µg/L
Chromium	Metals	100	No	100	µg/L
Lead	Metals	15	No	15	µg/L
Manganese	Metals	--	No	43	µg/L
Mercury	Metals	2	2	2	µg/L
Nickel	Metals	--	No	1	µg/L
Selenium	Metals	50	No	50	µg/L
Strontium	Metals	--	No	1,200	µg/L

GWPS - Groundwater Protection Standard
MCL - Federal Maximum Contaminant Level
MDL - Method Detection Limit
ROD - Record of Decision
SVOC - Semivolatile organic compound
VOC - Volatile organic compound
-- No MCL Established

Table 2
Investigation Target Contaminants

Olin Corp. (McIntosh Plant) Superfund Site
McIntosh, Alabama

Attachment 1

Mann-Kendall / Theil-Sen

Groundwater Statistics

The Mann-Kendall and Theil-Sen methods are non-parametric statistical methods for regression analyses and can be used to assess time trends for environmental data. These methods are described by the U.S. Environmental Protection Agency (EPA) in Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA 2009).

Mann-Kendall Statistic (S)

To calculate the Mann-Kendall statistic (S), each time-based measurement is compared to the others to produce data pairs and the data pairs are individually scored as follows:

- If the earlier data value is less than the later data value a score of 1 is assigned
- If the earlier data value is more than the later data value a score of -1 is assigned
- If the earlier and later data values are equal a score of 0 is assigned
- S is calculated as the sum of the scores and interpreted as follows
 - A positive S indicates an increasing trend
 - A negative S indicates a decreasing trend
 - Small S values near 0 can indicate a stable trend but the method does not calculate a metric to establish a stable trend

The S value is not indicative of the line slope magnitude and does not allow a determination as to the rate of decrease or rate of increase in data values over time. The Theil-Sen method described below can be used to estimate a quantified slope and provide an additional line of evidence as to whether an increasing or decreasing trend exists.

Theil-Sen Slope

The Theil-Sen method is like the Mann-Kendall S calculation in that it evaluates all possible data pairs. However, the Theil-Sen method determines the simple two-point slope magnitude for each data pair to develop the overall trend direction and slope magnitude. Rather than averaging the data-pair slopes, the median slope value is used, and using the median rather than the average makes the Theil-Sen slope non-parametric. Selecting the median value also minimizes the undesirable effects from extraneous slope measurements from data outliers and errors. The Theil-Sen trend line is constructed by combining the median slope with the median concentration and median date resulting in the Theil-Sen plot

representing the median concentration changes over time rather than the average that is estimated by a linear regression.

Theil-Sen p Value

The Theil-Sen p value is a measure of the probability of the trend slope being zero, meaning the time-based data values are stable. The numerical p values range from zero to one. A high p value indicates that the probability of the trend slope being zero is high. Low p values indicate a high probability that the calculated slope direction is valid. The metrics used for the p values are summarized below.

Theil-Sen p Metrics:

- <0.1 VALID: high probability that the trend is valid, 90 percent or greater
- 0.1 - 0.2 LIKELY VALID: moderate probability that the trend is valid, 90-80 percent
- 0.2 - 0.75 LIKEY STABLE: low probability that the trend is valid, 25-80 percent
- or
- 0.2 - 0.75 STABLE: if Theil-Sen and Man-Kendall slope directions disagree
- >0.75 STABLE: very low probability that the trend is valid, less than 25 percent

Data plots can have a high probability of an increasing or a decreasing trend according to the statistical calculations, but the rate of increase or decrease can be so low that the changes over time are essentially ineffectual and the trend should be considered stable for all practical purposes.

Kendall Tau-b

Kendall Tau-b is Kendall S divided by the total number of data pairs. The Kendall tau-b values range from 0 to 1. A greater magnitude Kendall tau-b value represents a better fit between the actual data and the regression results. Lower magnitude Kendall tau-b values do not necessarily indicate that the time-trend slope and p values are invalid, but rather the regression results may not be meaningful for predicting future results. Experience shows that environmental data rarely present trends that are useful for making accurate future predictions but can be useful for semiquantitative purposes. The Kendal Tau-b metric are listed below.

Kendall Tau-b Metrics:

- >0.65 Slope possibly meaningful for making future projections
- <0.65 Slope not meaningful for making future projections

Data Handling

Eight data points at a minimum are recommended by EPA to support the statistical analyses. For non-detect results, the method detection limit was used and, if not available, the reporting limit was used at the reported values. Estimated concentrations reported with a "J" flag were also used the reported values.

Summary

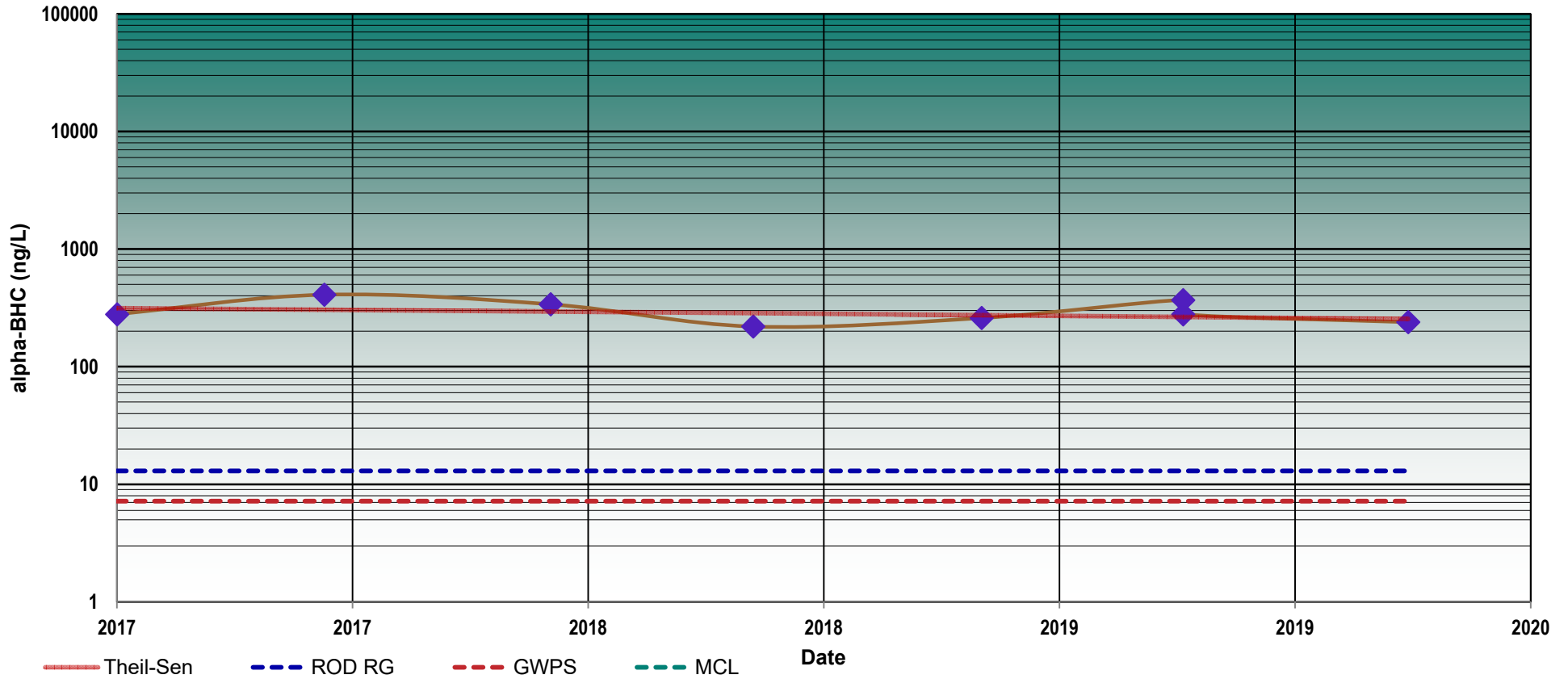
The metrics assigned to the statistics described above are based on professional judgement and strict rules dictating the statistic metrics have not been established. While the data analysis methods described above are highly quantitative and reliably produce consistent and comparable computational results, non-statistical professional judgement must be used, as is the case for most statistical methods. This can be accomplished through visual inspections of the data plots in comparison to the numerical results.

References

EPA. March 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. EPA 530/R-09-007. Office of Resource Conservation and Recovery.

Alluvial Aquifer Plots

BR-008: alpha-BHC, ng/L



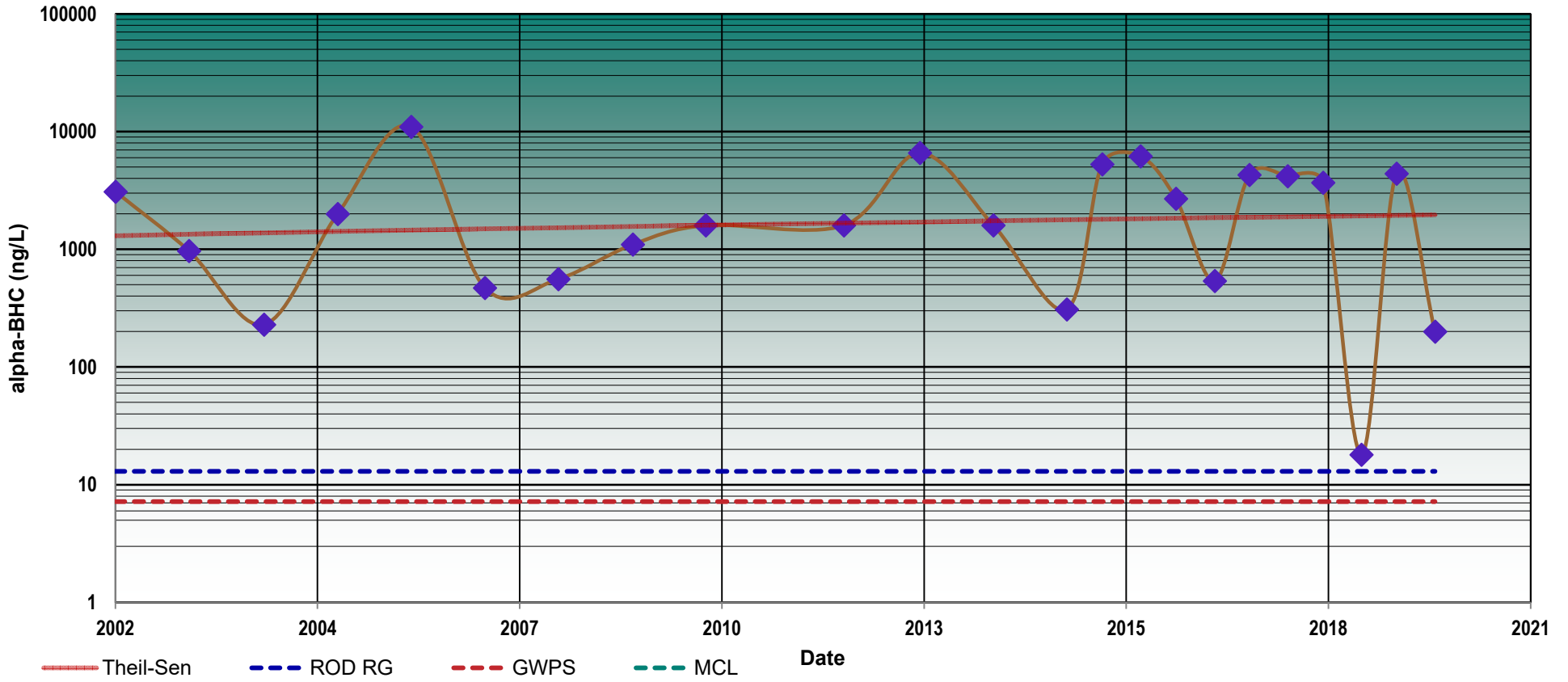
No. Data Pairs = 28	Theil-Sen Slope = -0.05487 ng/L/day	Kendall S = -6	p-Value = 0.5299	Kendall Tau-b = 0.222	
	Most Recent Result (ng/L): 240	Most Recent Date: 1/26/20	Average (ng/L): 300		
Theil-Sen and Kendall AGREE that trend is DECREASING			alpha-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)			GWPS	ROD RG	MCL
			7.2	13	--
			Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008D: alpha-BHC, ng/L



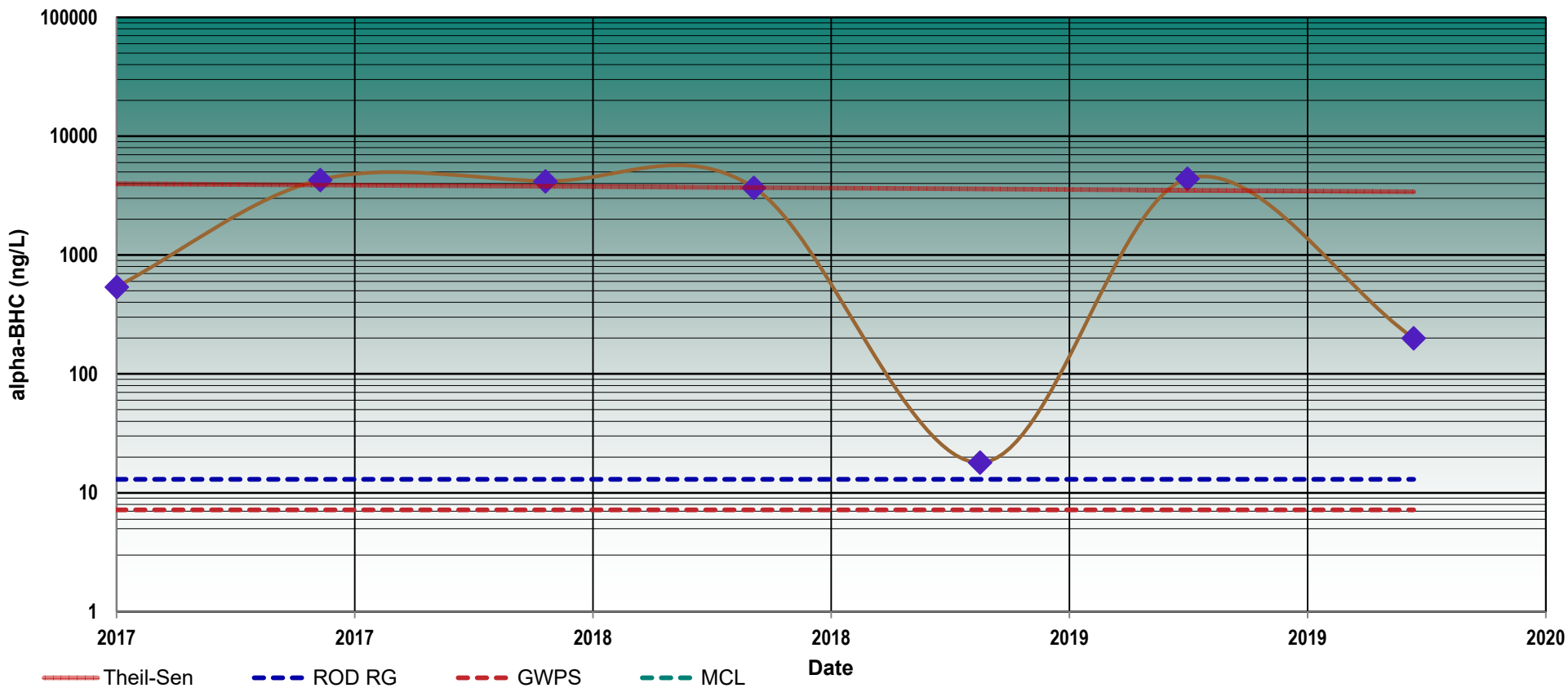
No. Data Pairs = 253	Theil-Sen Slope = 0.10045 ng/L/day	Kendall S = 12	p-Value = 0.7711	Kendall Tau-b = 0.048		
Most Recent Result (ng/L): 200		Most Recent Date: 1/23/20		Average (ng/L): 2726		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				7.2	13	--
				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008D: alpha-BHC, ng/L



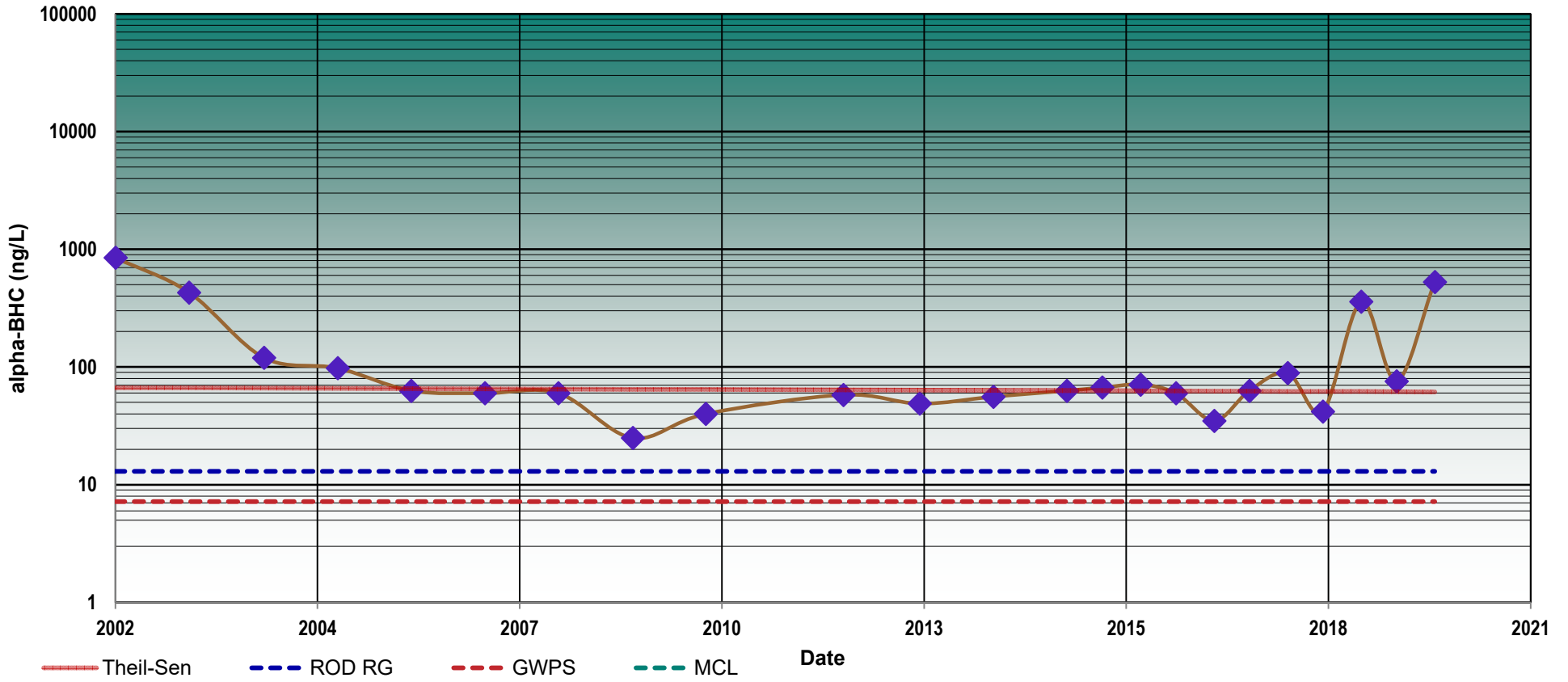
No. Data Pairs = 21	Theil-Sen Slope = -0.5291 ng/L/day	Kendall S = -3	p-Value = 0.7639	Kendall Tau-b = 0.143		
Most Recent Result (ng/L): 200		Most Recent Date: 1/23/20		Average (ng/L): 2480		
Theil-Sen and Kendall AGREE that trend is DECREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: alpha-BHC, ng/L



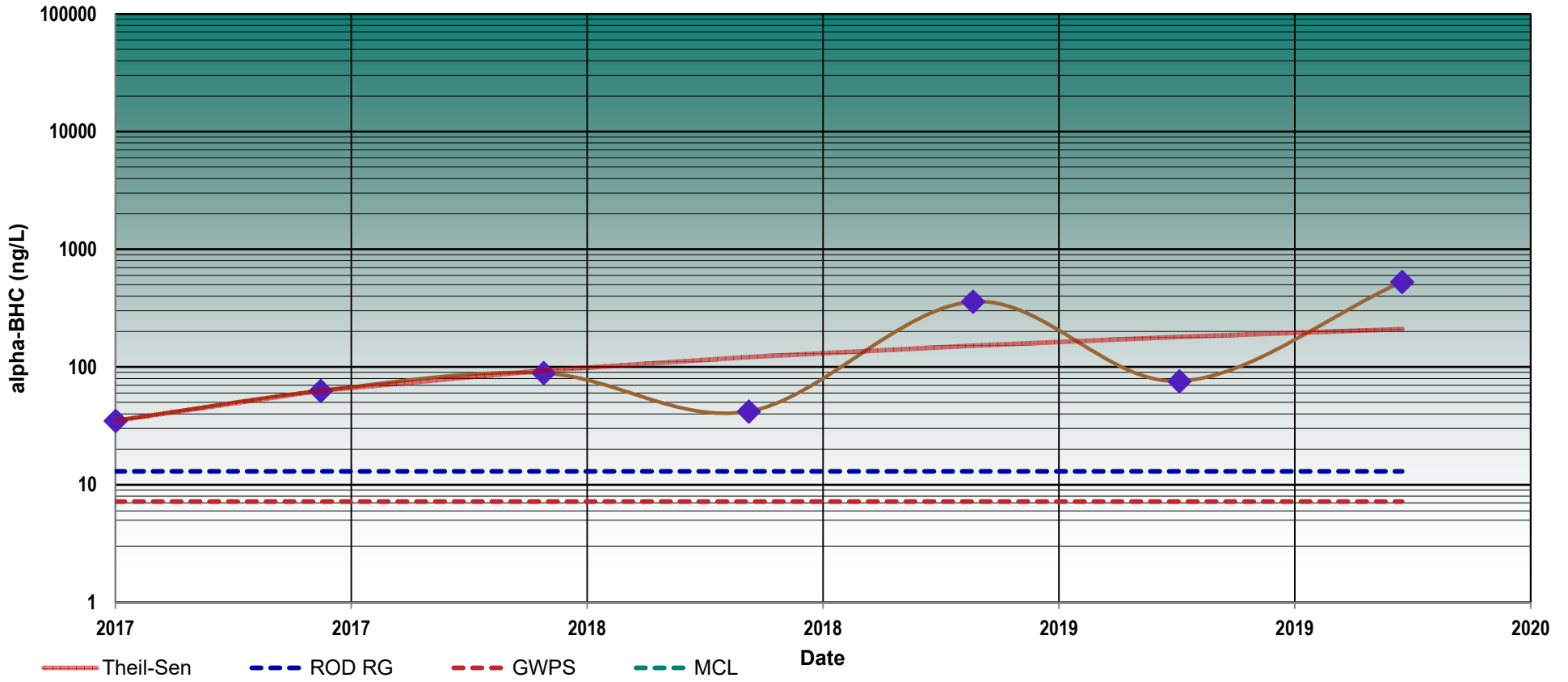
No. Data Pairs = 253	Theil-Sen Slope = -0.00079 ng/L/day	Kendall S = -7	p-Value = 0.8738	Kendall Tau-b = 0.028		
Most Recent Result (ng/L): 530		Most Recent Date: 1/22/20		Average (ng/L): 146		
Theil-Sen and Kendall AGREE that trend is DECREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: alpha-BHC, ng/L



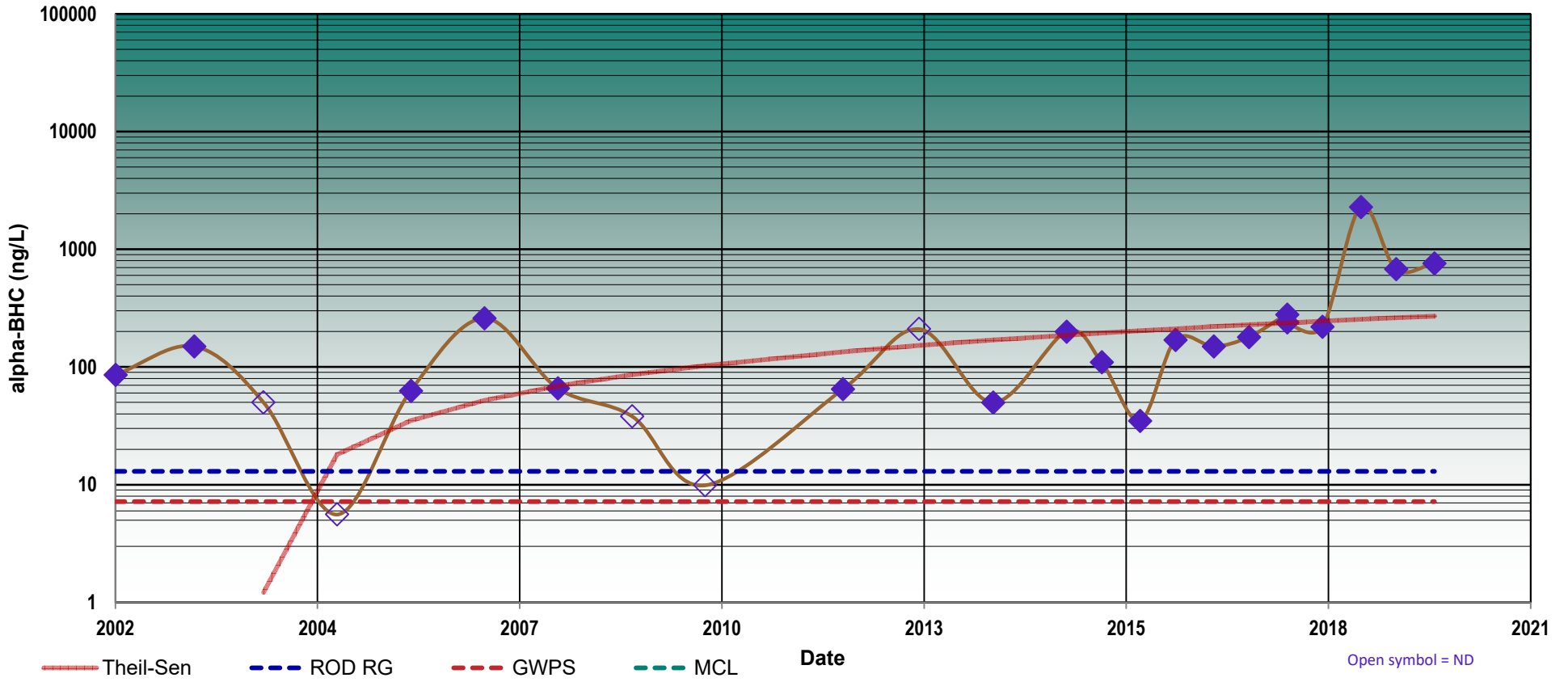
No. Data Pairs = 21	Theil-Sen Slope = 0.16092 ng/L/day	Kendall S = 13	p-Value = 0.0715	Kendall Tau-b = 0.619		
Most Recent Result (ng/L): 530		Most Recent Date: 1/22/20		Average (ng/L): 171		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				7.2	13	--
				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-004: alpha-BHC, ng/L



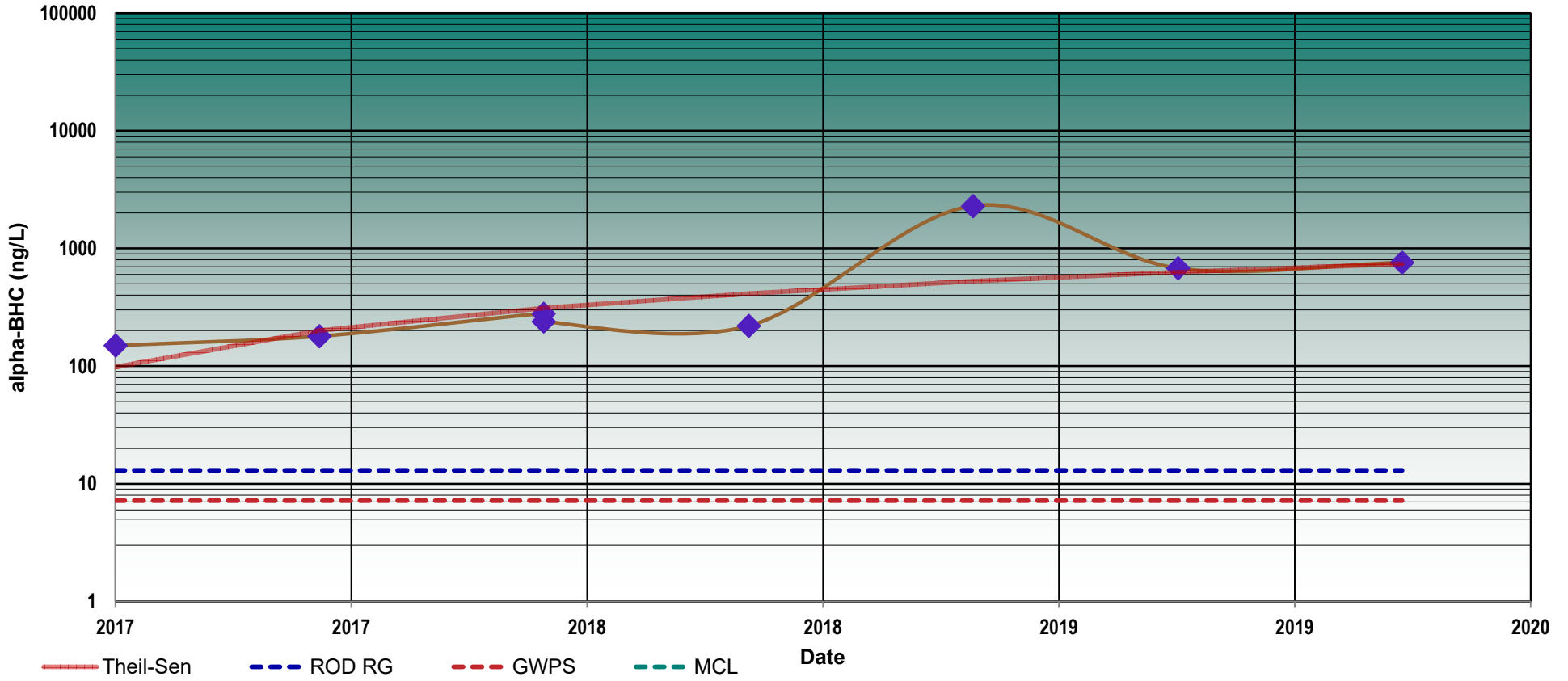
No. Data Pairs = 276	Theil-Sen Slope = 0.04657 ng/L/day	Kendall S = 135	p-Value = 0.0009	Kendall Tau-b = 0.492		
Most Recent Result (ng/L): 760		Most Recent Date: 1/23/20		Average (ng/L): 266		
<p style="text-align: center; color: blue;">Theil-Sen and Kendall AGREE that trend is INCREASING</p> <p style="text-align: center; color: blue;">p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)</p>				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
		Exceeds	Exceeds	OK		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-004: alpha-BHC, ng/L



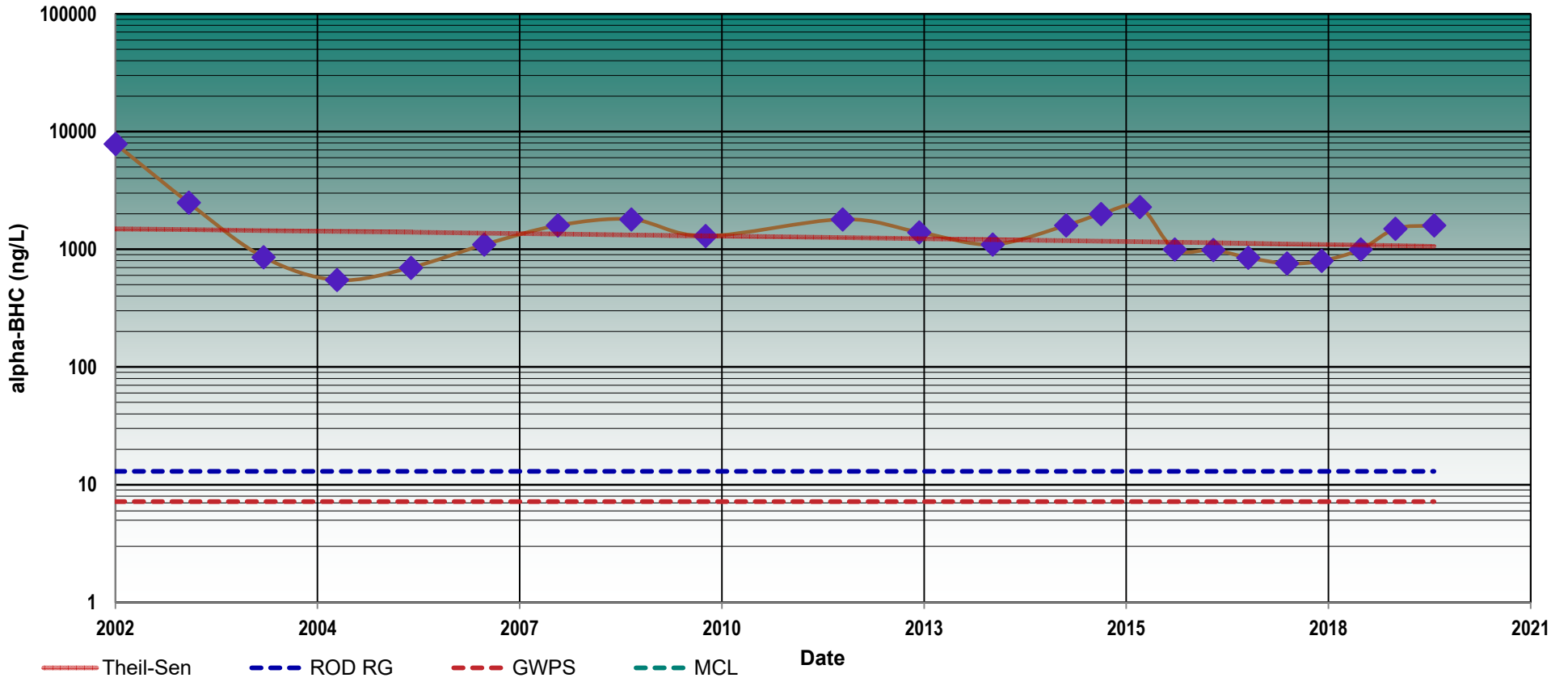
No. Data Pairs = 28	Theil-Sen Slope = 0.58824 ng/L/day	Kendall S = 19	p-Value = 0.0248	Kendall Tau-b = 0.691		
Most Recent Result (ng/L): 760		Most Recent Date: 1/23/20		Average (ng/L): 601		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				7.2	13	--
				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: alpha-BHC, ng/L



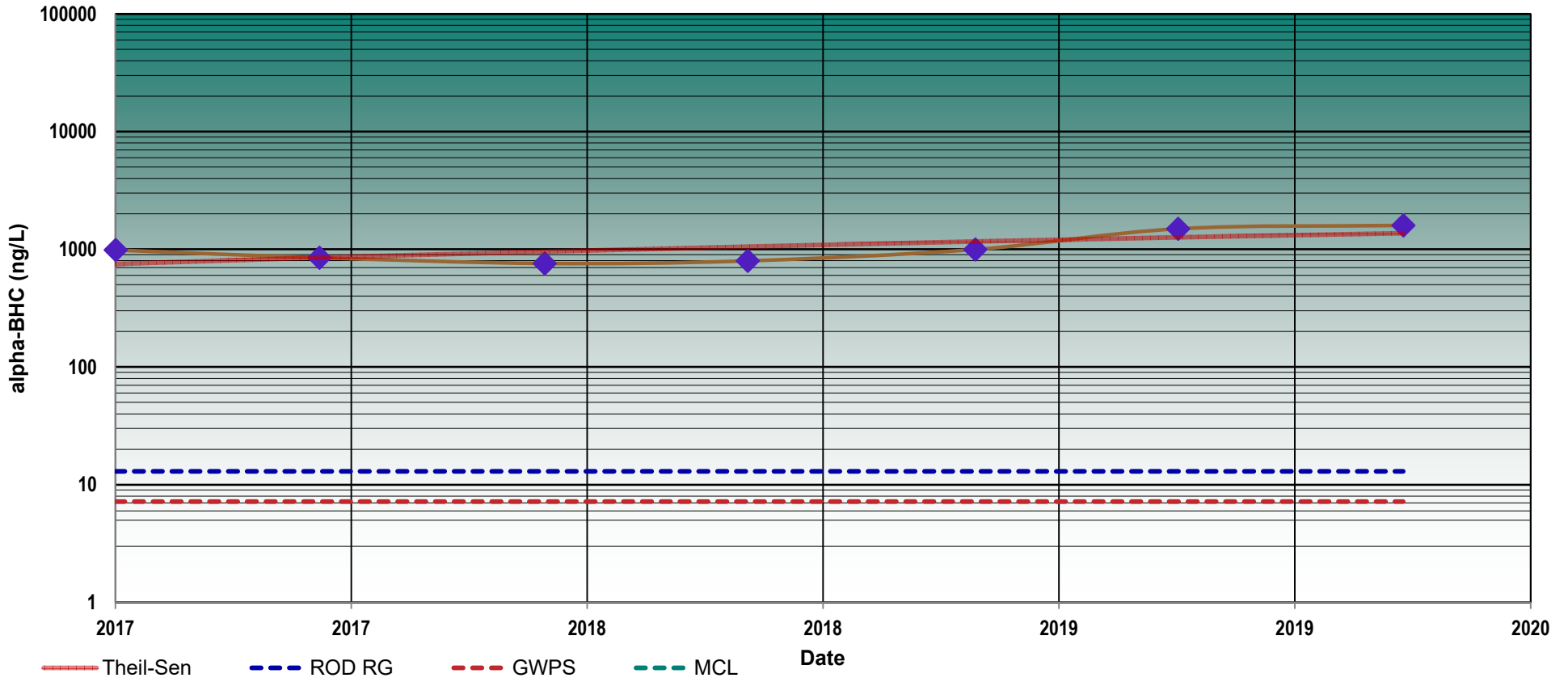
No. Data Pairs = 253	Theil-Sen Slope = -0.06616 ng/L/day	Kendall S = -31	p-Value = 0.4271	Kendall Tau-b = 0.124		
Most Recent Result (ng/L): 1600		Most Recent Date: 1/26/20		Average (ng/L): 1609		
Theil-Sen and Kendall AGREE that trend is DECREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: alpha-BHC, ng/L



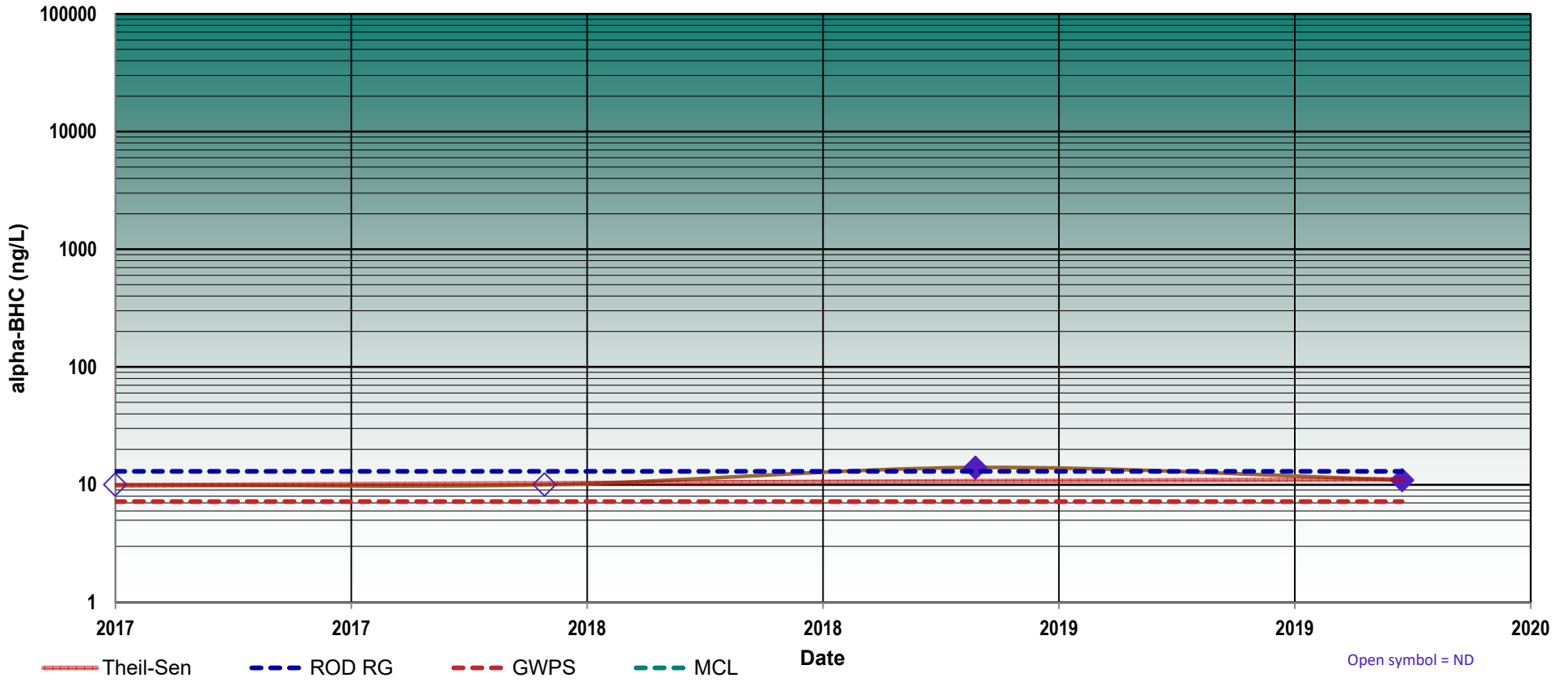
No. Data Pairs = 21	Theil-Sen Slope = 0.56604 ng/L/day	Kendall S = 11	p-Value = 0.1331	Kendall Tau-b = 0.524		
Most Recent Result (ng/L): 1600		Most Recent Date: 1/26/20		Average (ng/L): 1071		
<p style="text-align: center; color: blue;">Theil-Sen and Kendall AGREE that trend is INCREASING</p> <p style="text-align: center; color: blue;">p-Value: LIKELY VALID STATISTICAL TREND (p = 0.1 to 0.2 probability from 90% to 80%)</p>				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
		Exceeds	Exceeds	OK		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MGW-003: alpha-BHC, ng/L



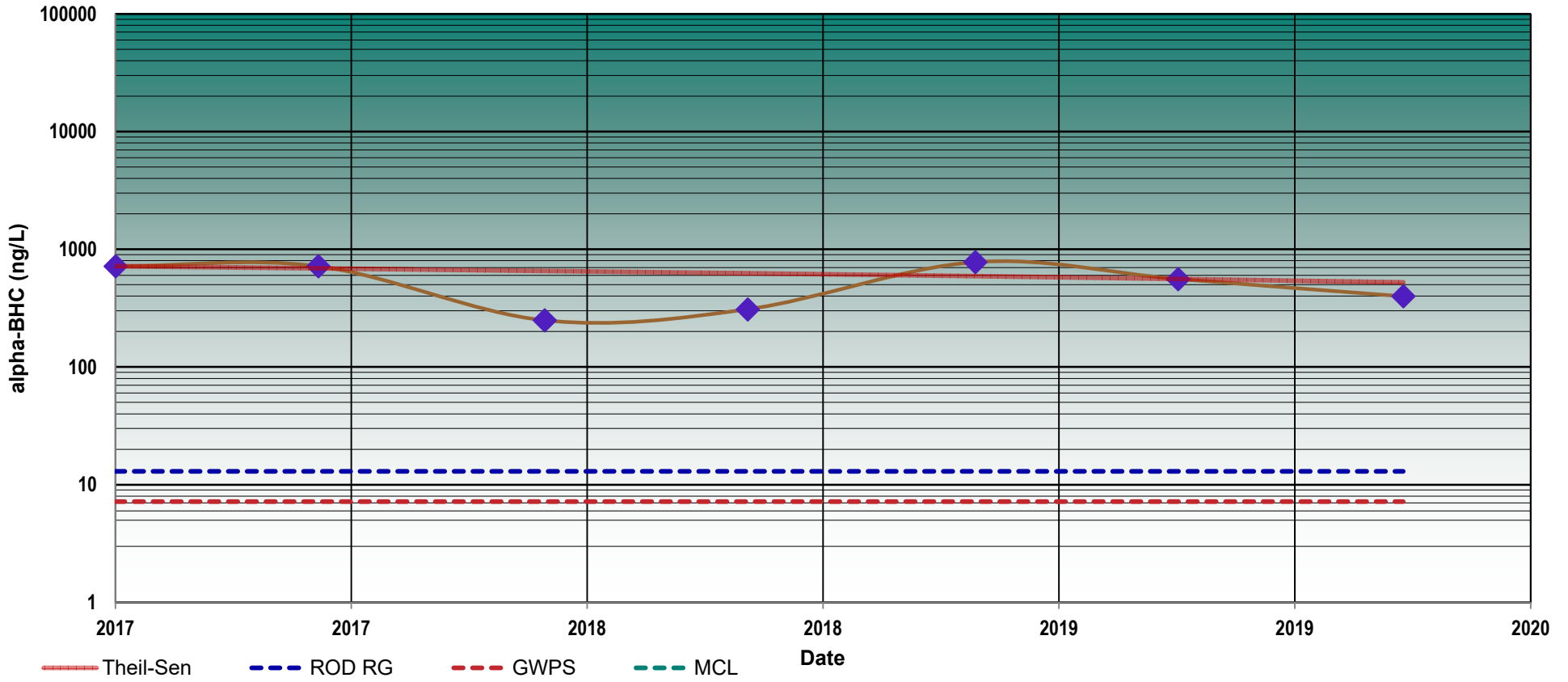
No. Data Pairs = 6	Theil-Sen Slope = 0.00115 ng/L/day	Kendall S = 3	p-Value = 0.4701	Kendall Tau-b = 0.548		
Most Recent Result (ng/L): 11		Most Recent Date: 1/26/20		Average (ng/L): 11		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-009: alpha-BHC, ng/L



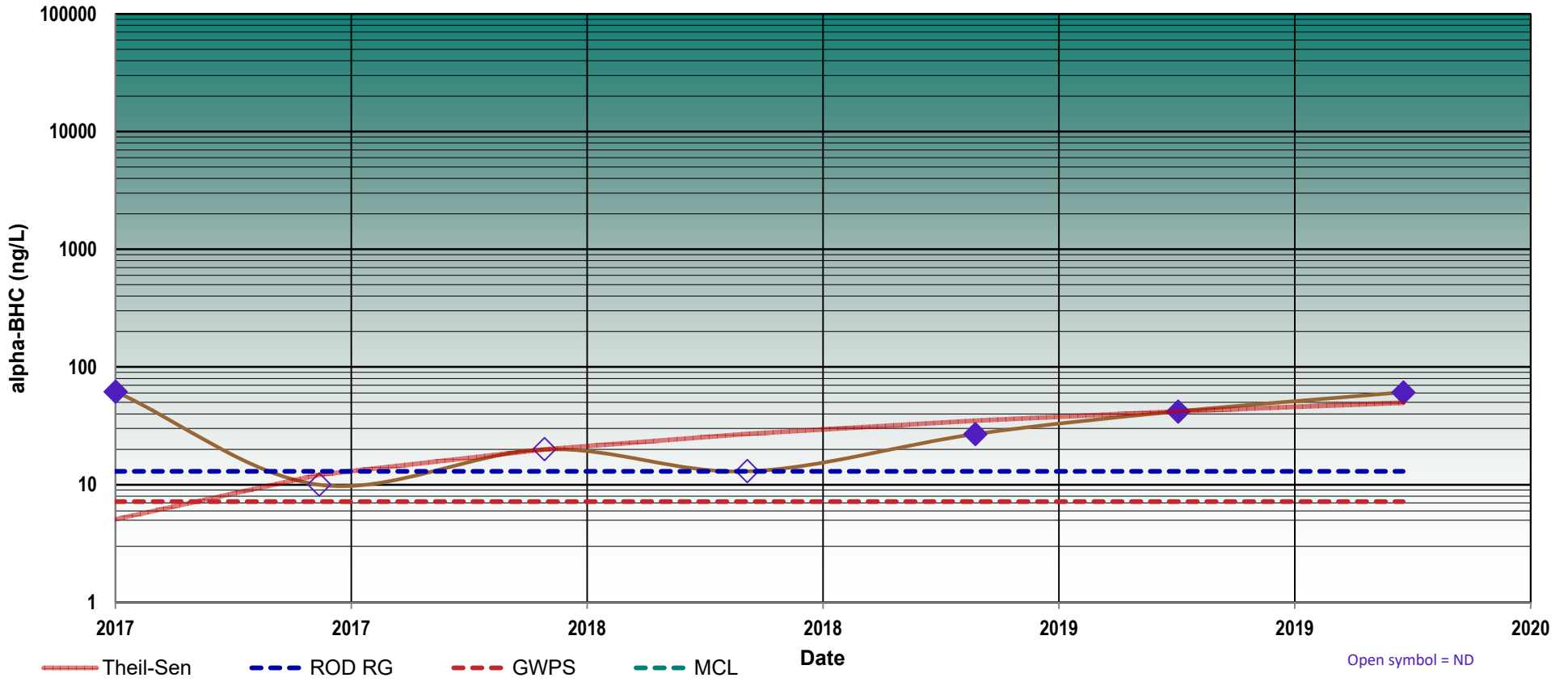
No. Data Pairs = 21	Theil-Sen Slope = -0.17758 ng/L/day	Kendall S = -2	p-Value = 0.8793	Kendall Tau-b = 0.098		
Most Recent Result (ng/L): 400		Most Recent Date: 1/26/20		Average (ng/L): 534		
Theil-Sen and Kendall AGREE that trend is DECREASING				alpha-BHC ng/L		
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				GWPS	ROD RG	MCL
				7.2	13	--
				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-015: alpha-BHC, ng/L



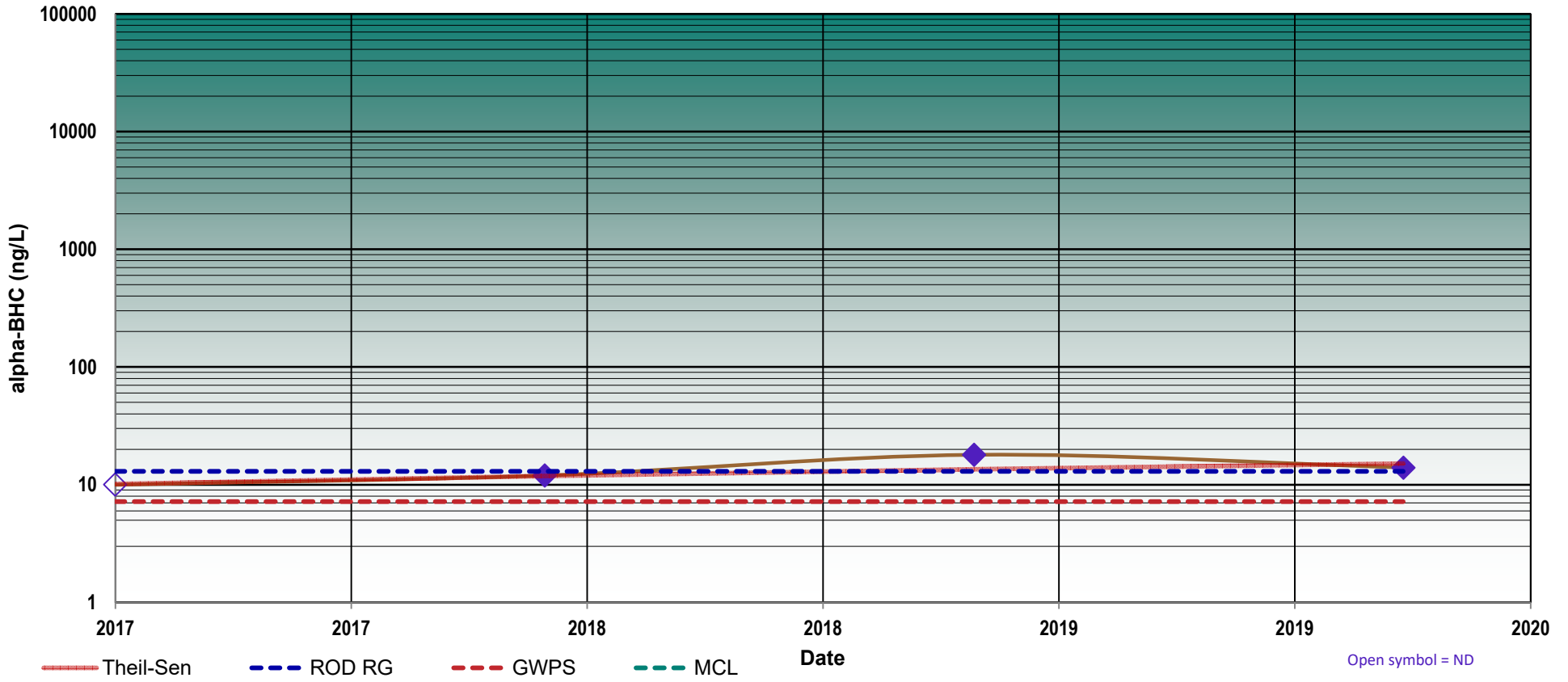
No. Data Pairs = 21	Theil-Sen Slope = 0.04097 ng/L/day	Kendall S = 7	p-Value = 0.3675	Kendall Tau-b = 0.333		
Most Recent Result (ng/L): 61		Most Recent Date: 1/26/20		Average (ng/L): 34		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PL010D: alpha-BHC, ng/L



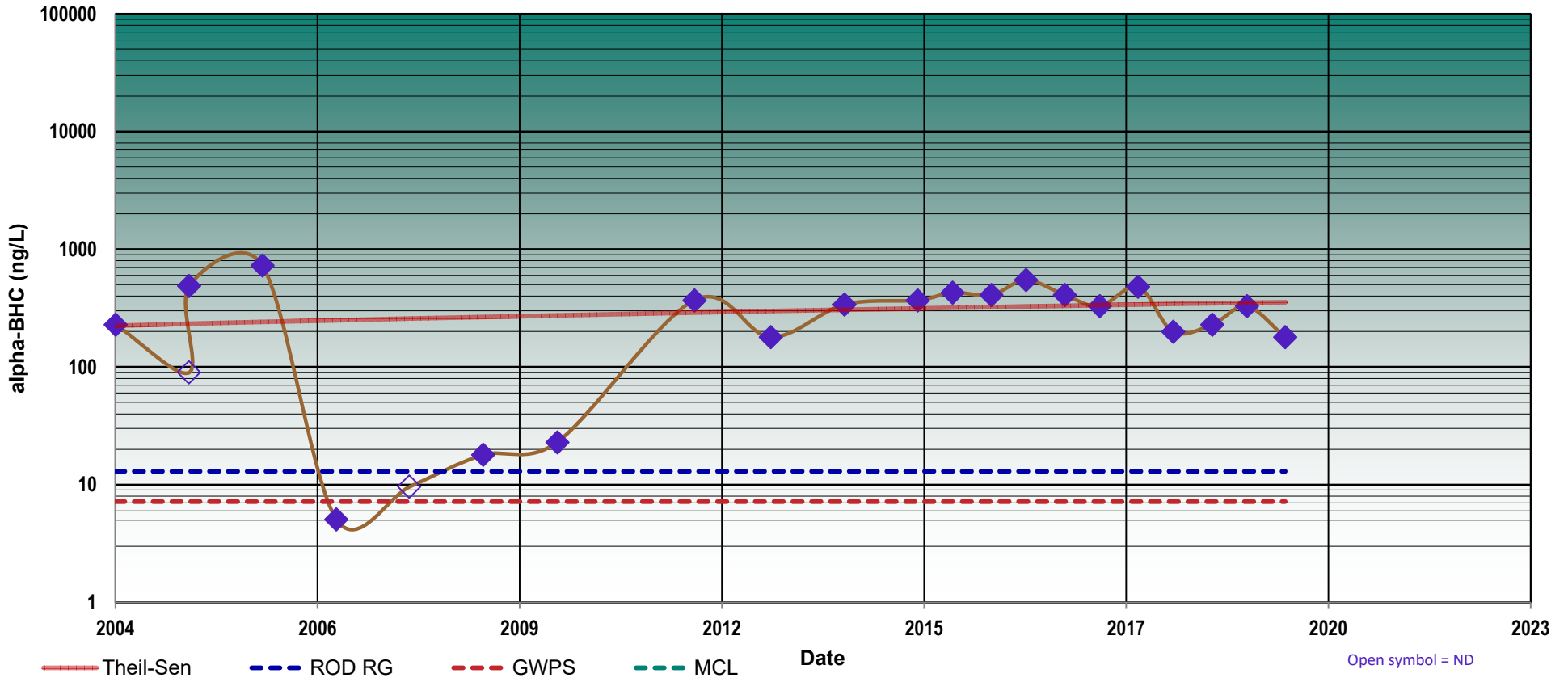
No. Data Pairs = 6	Theil-Sen Slope = 0.00458 ng/L/day	Kendall S = 4	p-Value = 0.3082	Kendall Tau-b = 0.667	
	Most Recent Result (ng/L): 14	Most Recent Date: 1/24/20	Average (ng/L): 14		
Theil-Sen and Kendall AGREE that trend is INCREASING			alpha-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)			GWPS	ROD RG	MCL
			7.2	13	--
			Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WE-003: alpha-BHC, ng/L



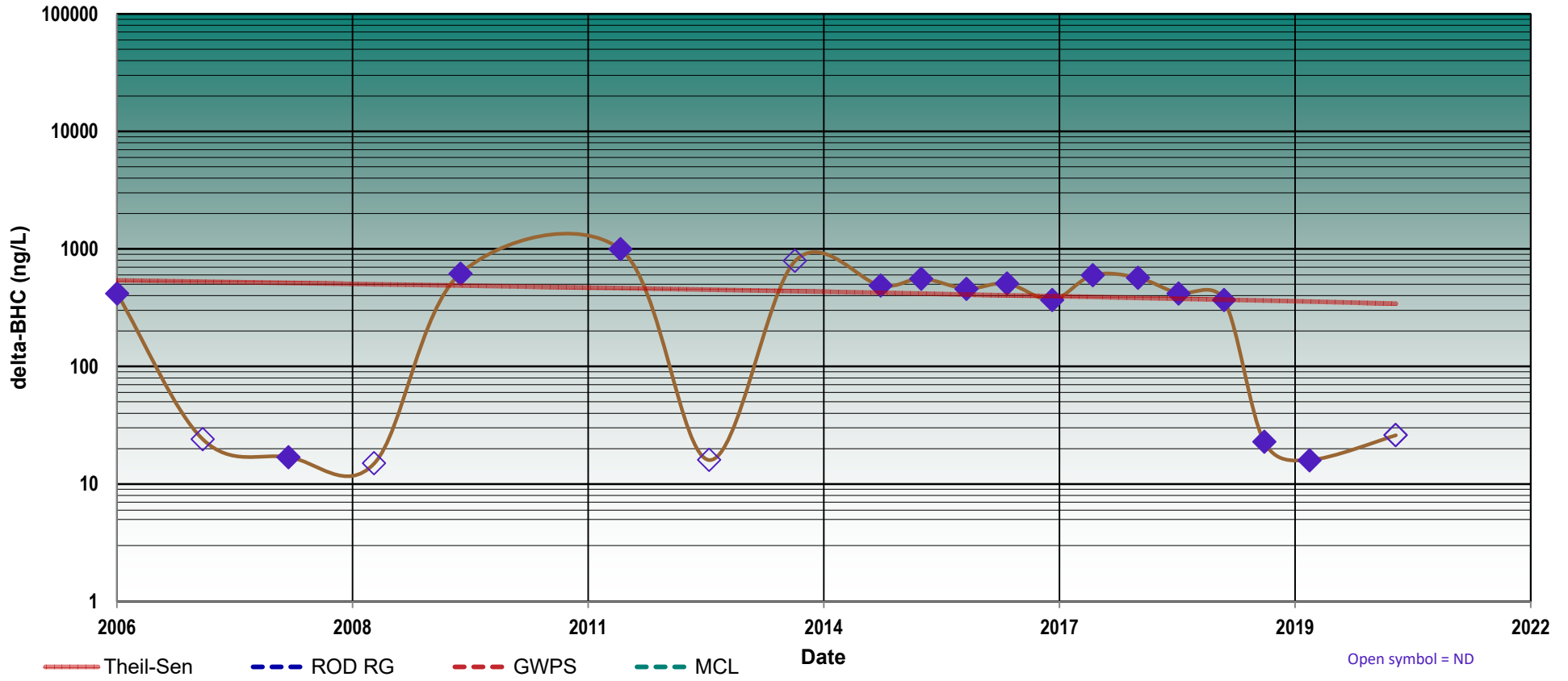
No. Data Pairs = 231	Theil-Sen Slope = 0.02275 ng/L/day	Kendall S = 29	p-Value = 0.4287	Kendall Tau-b = 0.127		
Most Recent Result (ng/L): 180		Most Recent Date: 1/25/20		Average (ng/L): 291		
Theil-Sen and Kendall AGREE that trend is INCREASING				alpha-BHC ng/L		
				GWPS	ROD RG	MCL
				7.2	13	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

Mann-Kendall / Theil-Sen
Groundwater Trend Analysis
 Olin Corporation (McIntosh Plant) OU1
 McIntosh, Alabama



BR-007: delta-BHC, ng/L



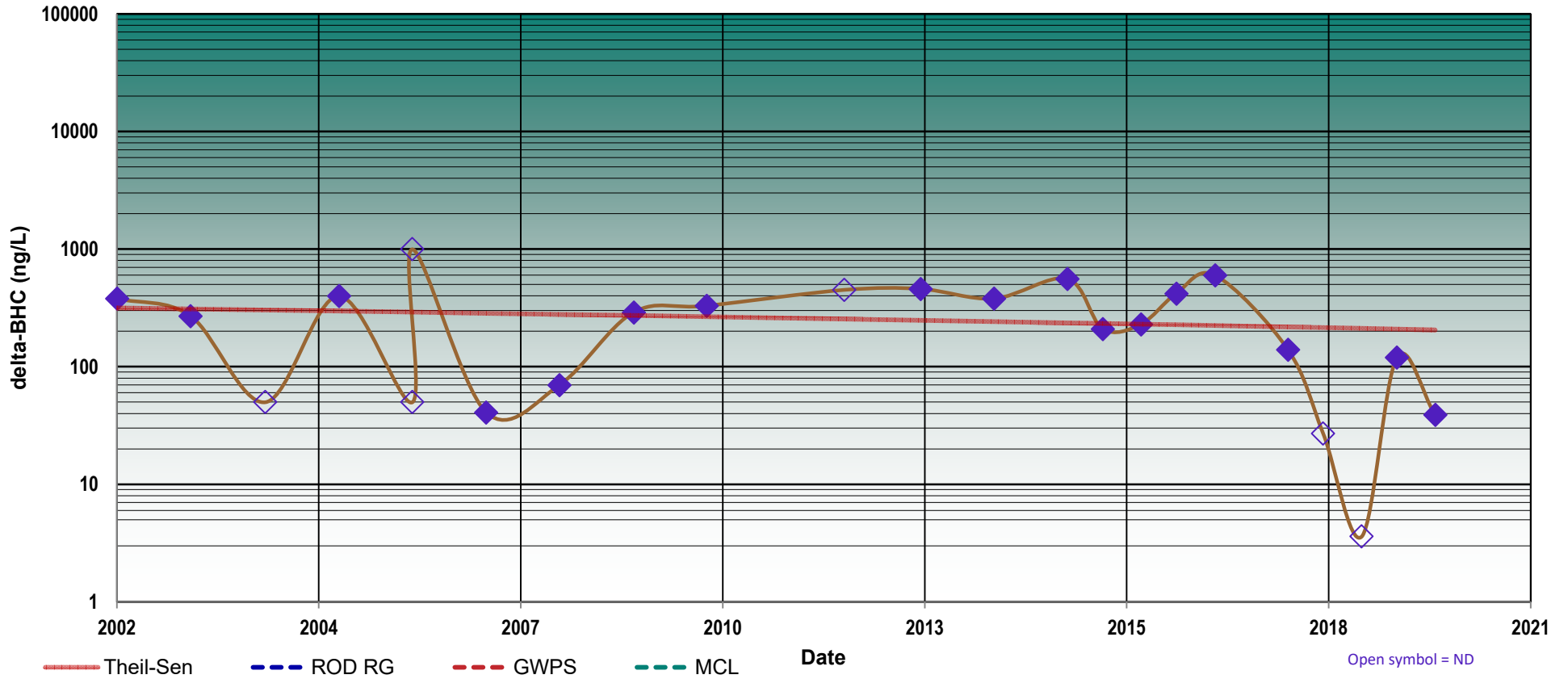
No. Data Pairs = 210	Theil-Sen Slope = -0.03646 ng/L/day	Kendall S = -30	p-Value = 0.3801	Kendall Tau-b = 0.144		
Most Recent Result (ng/L):	Not Detected	Most Recent Date:	1/28/21	Average (ng/L): 350		
Theil-Sen and Kendall AGREE that trend is DECREASING				delta-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				0	--	--
				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008D: delta-BHC, ng/L



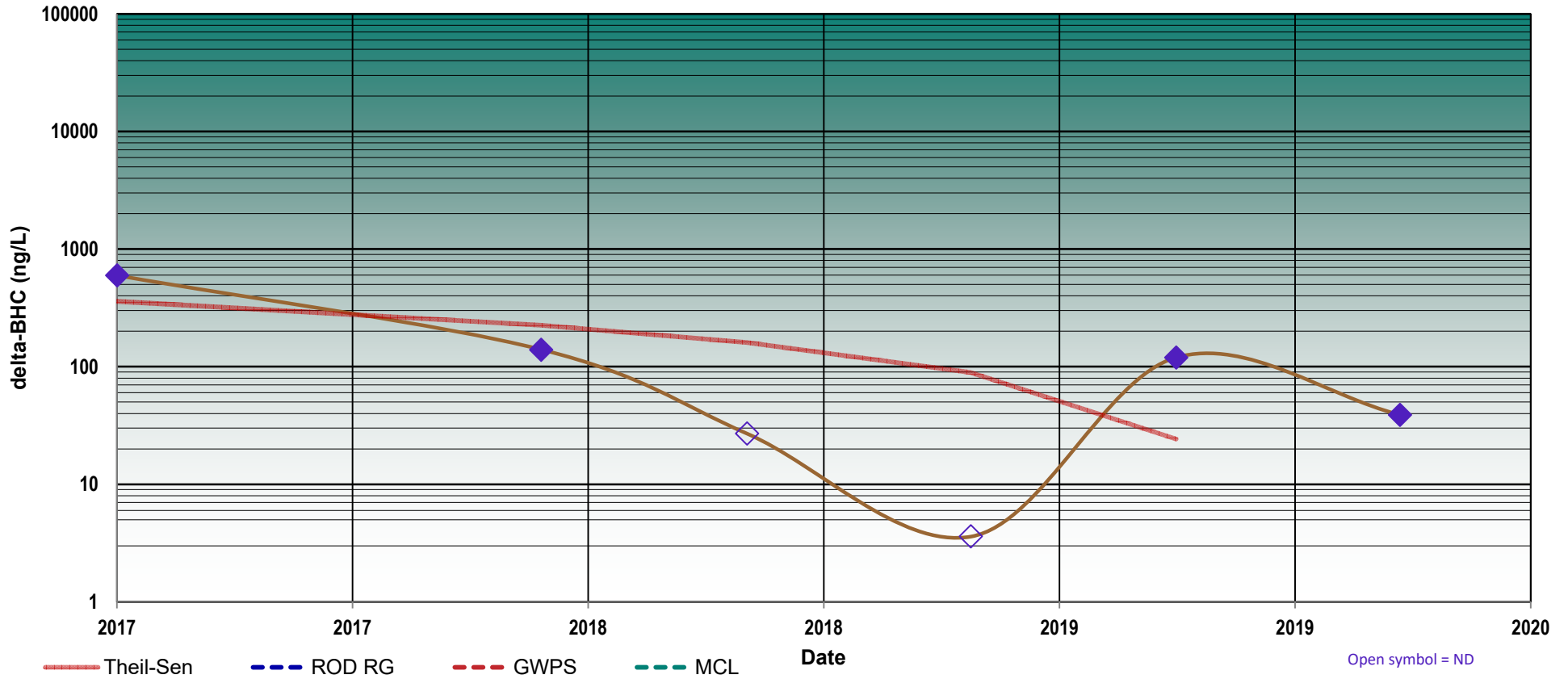
No. Data Pairs = 253	Theil-Sen Slope = -0.01692 ng/L/day	Kendall S = -34	p-Value = 0.383	Kendall Tau-b = 0.135		
Most Recent Result (ng/L): 39		Most Recent Date: 1/23/20		Average (ng/L): 284		
Theil-Sen and Kendall AGREE that trend is DECREASING				delta-BHC ng/L		
				GWPS	ROD RG	MCL
				0	--	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008D: delta-BHC, ng/L



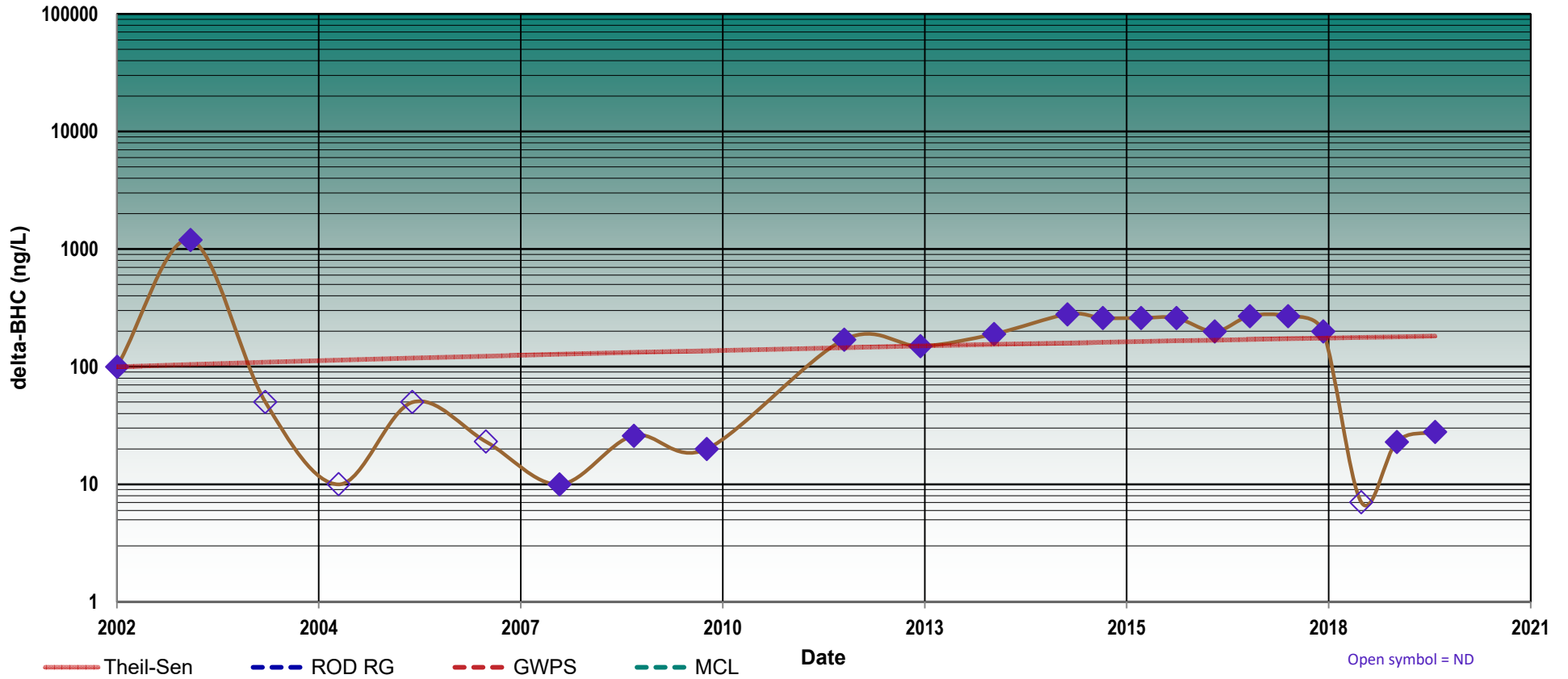
No. Data Pairs = 15	Theil-Sen Slope = -0.3737 ng/L/day	Kendall S = -7	p-Value = 0.2597	Kendall Tau-b = 0.467		
Most Recent Result (ng/L): 39		Most Recent Date: 1/23/20		Average (ng/L): 155		
Theil-Sen and Kendall AGREE that trend is DECREASING				delta-BHC ng/L		
				GWPS	ROD RG	MCL
				0	--	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: delta-BHC, ng/L



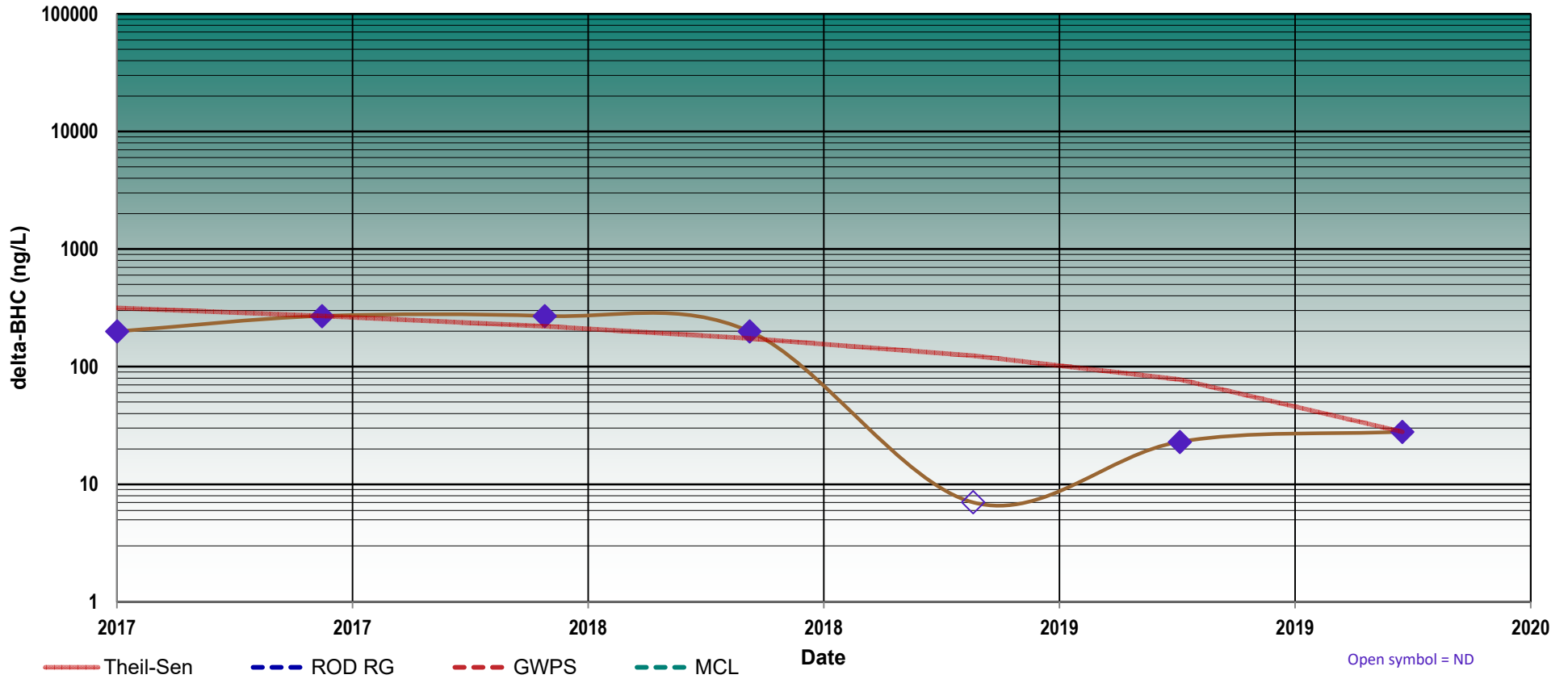
No. Data Pairs = 253	Theil-Sen Slope = 0.01257 ng/L/day	Kendall S = 37	p-Value = 0.3403	Kendall Tau-b = 0.149		
Most Recent Result (ng/L): 28		Most Recent Date: 1/22/20		Average (ng/L): 176		
Theil-Sen and Kendall AGREE that trend is INCREASING				delta-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				0	--	--
				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: delta-BHC, ng/L



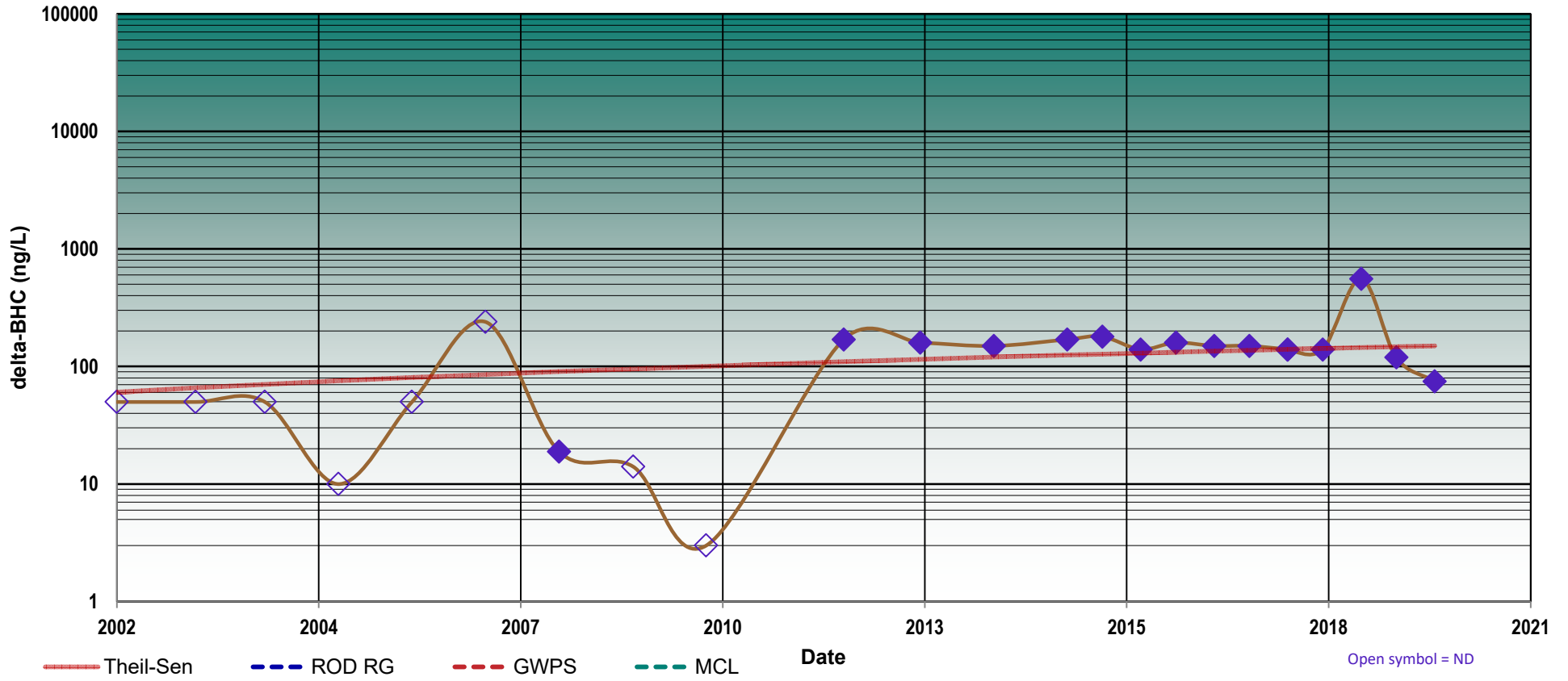
No. Data Pairs = 21	Theil-Sen Slope = -0.2639 ng/L/day	Kendall S = -9	p-Value = 0.2189	Kendall Tau-b = 0.451		
Most Recent Result (ng/L): 28		Most Recent Date: 1/22/20		Average (ng/L): 143		
Theil-Sen and Kendall AGREE that trend is DECREASING				delta-BHC ng/L		
				GWPS	ROD RG	MCL
				0	--	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-004: delta-BHC, ng/L



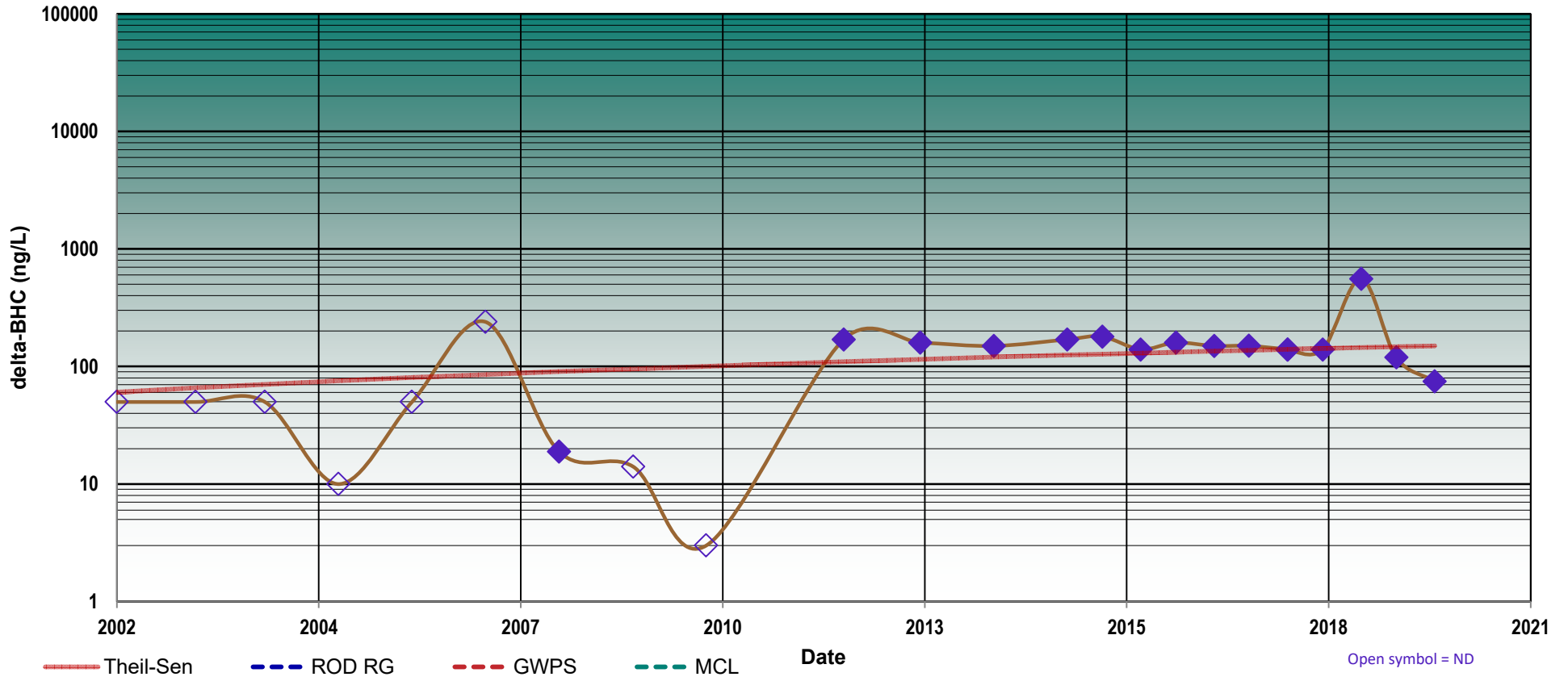
No. Data Pairs = 276	Theil-Sen Slope = 0.01374 ng/L/day	Kendall S = 43	p-Value = 0.2939	Kendall Tau-b = 0.161		
Most Recent Result (ng/L): 75		Most Recent Date: 1/23/20		Average (ng/L): 129		
Theil-Sen and Kendall AGREE that trend is INCREASING				delta-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				0	--	--
				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-004: delta-BHC, ng/L



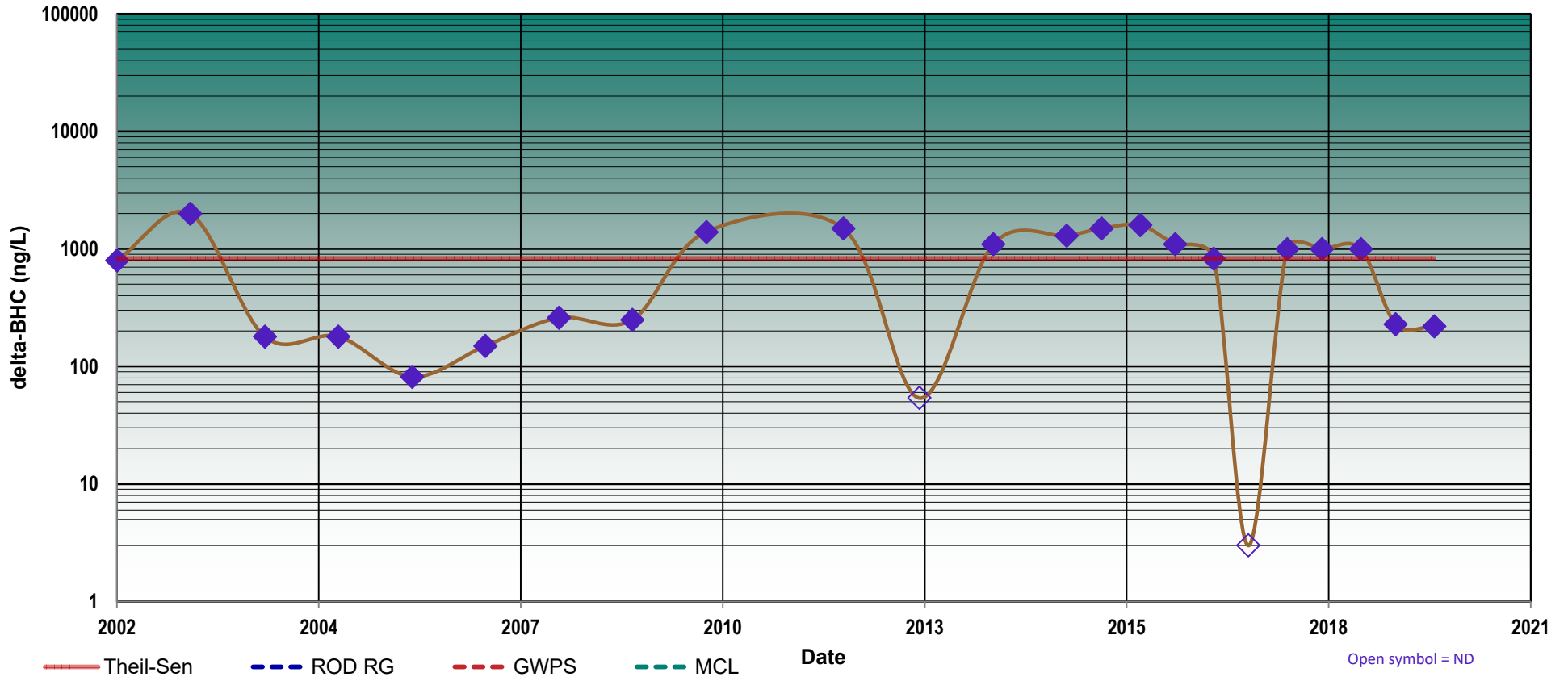
No. Data Pairs = 276	Theil-Sen Slope = 0.01374 ng/L/day	Kendall S = 43	p-Value = 0.2939	Kendall Tau-b = 0.161		
Most Recent Result (ng/L): 75		Most Recent Date: 1/23/20		Average (ng/L): 129		
Theil-Sen and Kendall AGREE that trend is INCREASING				delta-BHC ng/L		
				GWPS	ROD RG	MCL
				0	--	--
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: delta-BHC, ng/L



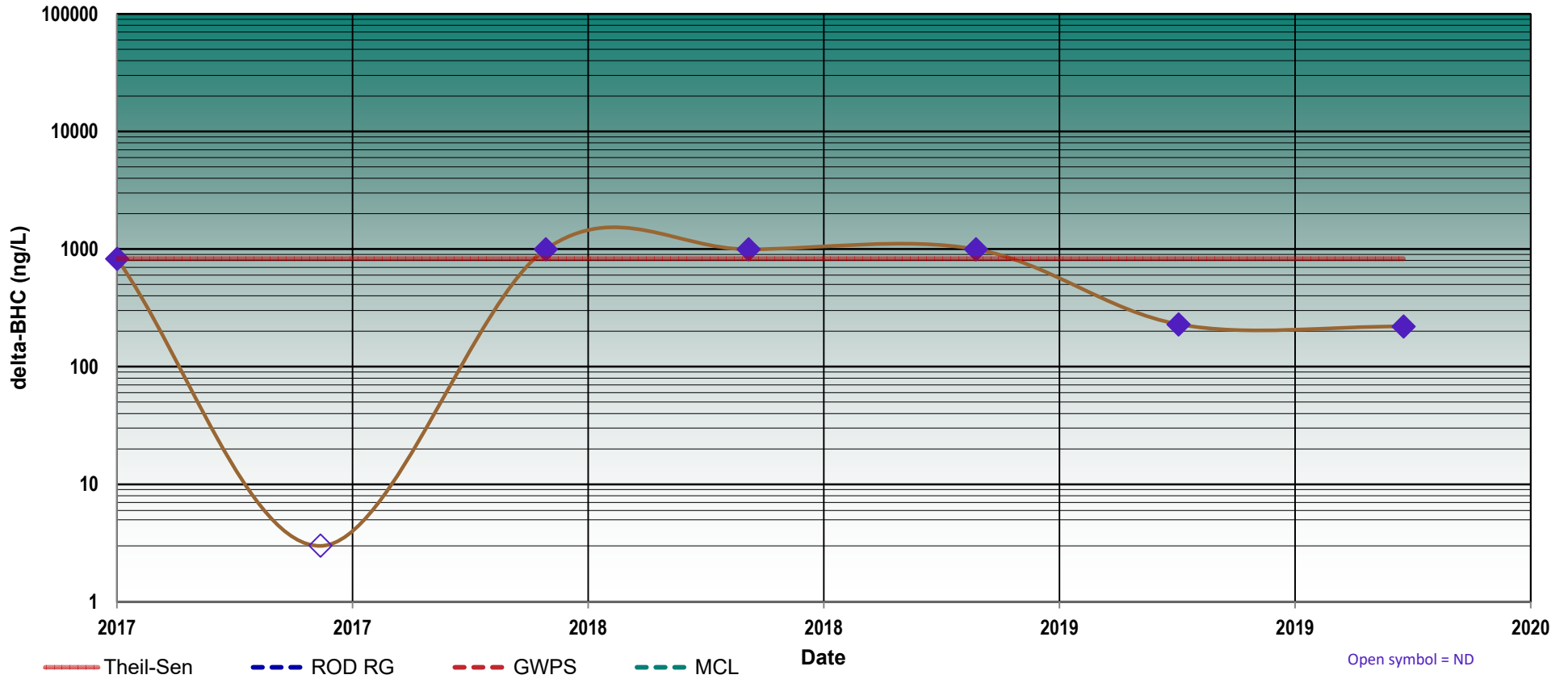
No. Data Pairs = 253	Theil-Sen Slope = 0 ng/L/day	Kendall S = 1	p-Value = 1	Kendall Tau-b = 0.004		
Most Recent Result (ng/L): 220		Most Recent Date: 1/26/20		Average (ng/L): 771		
Theil-Sen and Kendall DISAGREE on trend direction p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				delta-BHC ng/L		
				GWPS	ROD RG	MCL
				0	--	--
				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: delta-BHC, ng/L



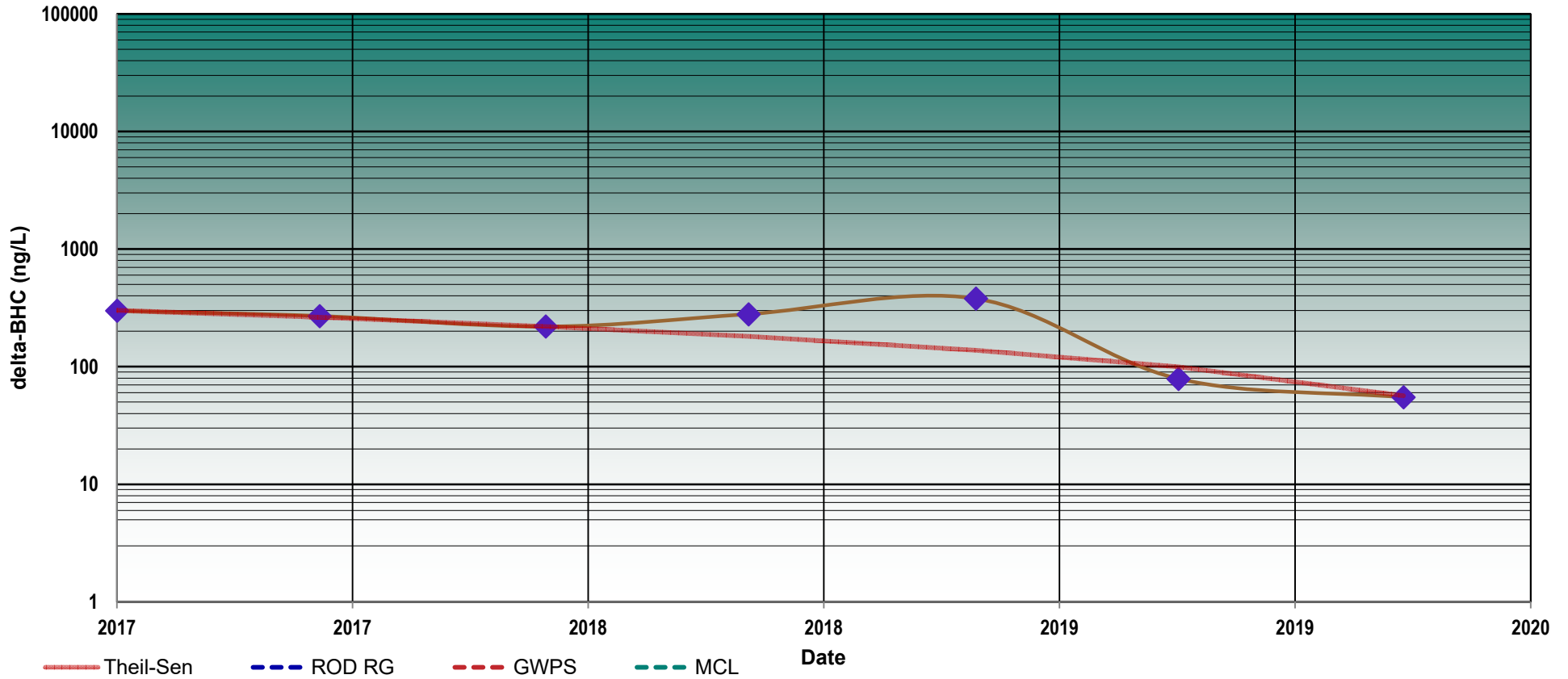
No. Data Pairs = 21	Theil-Sen Slope = 0 ng/L/day	Kendall S = -2	p-Value = 0.8754	Kendall Tau-b = 0.103		
Most Recent Result (ng/L): 220		Most Recent Date: 1/26/20		Average (ng/L): 612		
Theil-Sen and Kendall DISAGREE on trend direction				delta-BHC ng/L		
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				GWPS	ROD RG	MCL
				0	--	--
				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-009: delta-BHC, ng/L



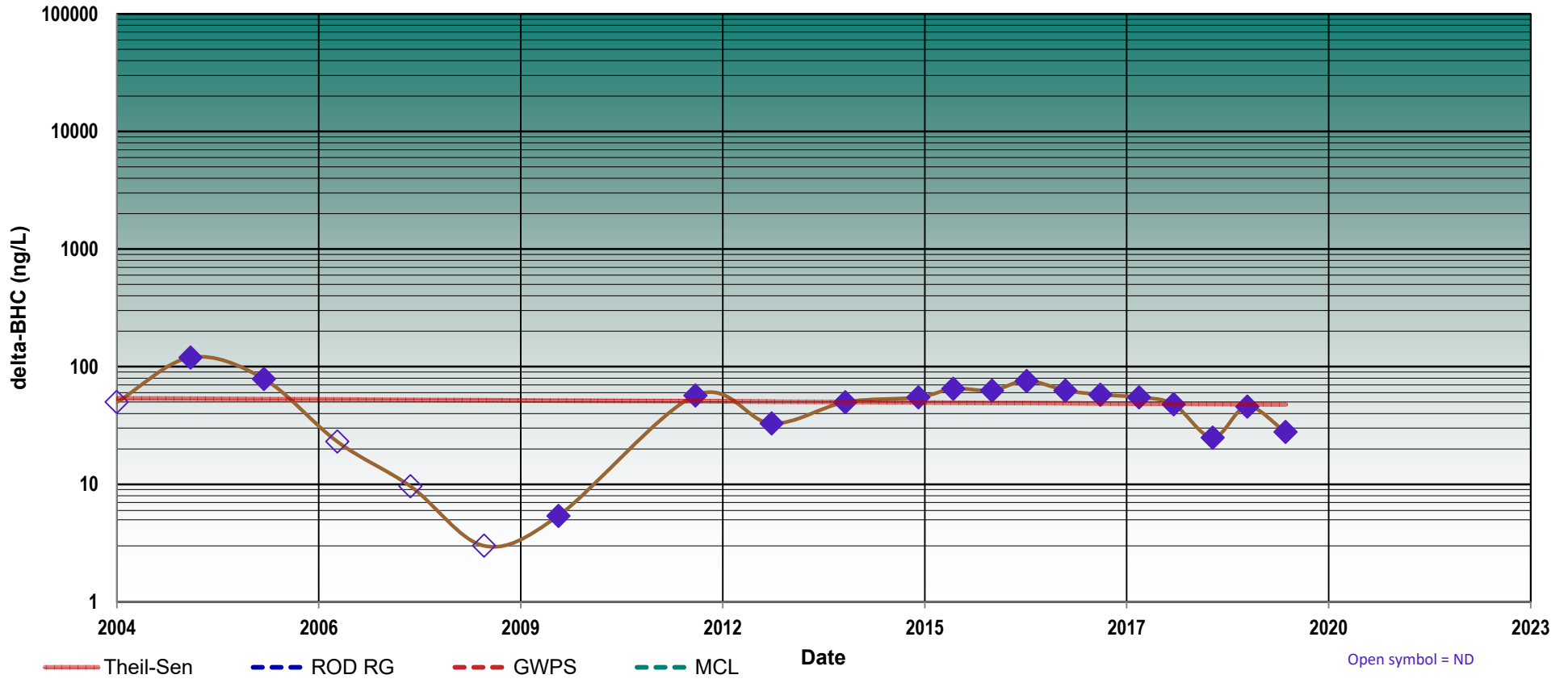
No. Data Pairs = 21	Theil-Sen Slope = -0.22436 ng/L/day	Kendall S = -9	p-Value = 0.2296	Kendall Tau-b = 0.429	
	Most Recent Result (ng/L): 55	Most Recent Date: 1/26/20	Average (ng/L): 226		
Theil-Sen and Kendall AGREE that trend is DECREASING			delta-BHC ng/L		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)			GWPS	ROD RG	MCL
			0	--	--
			Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WE-003: delta-BHC, ng/L



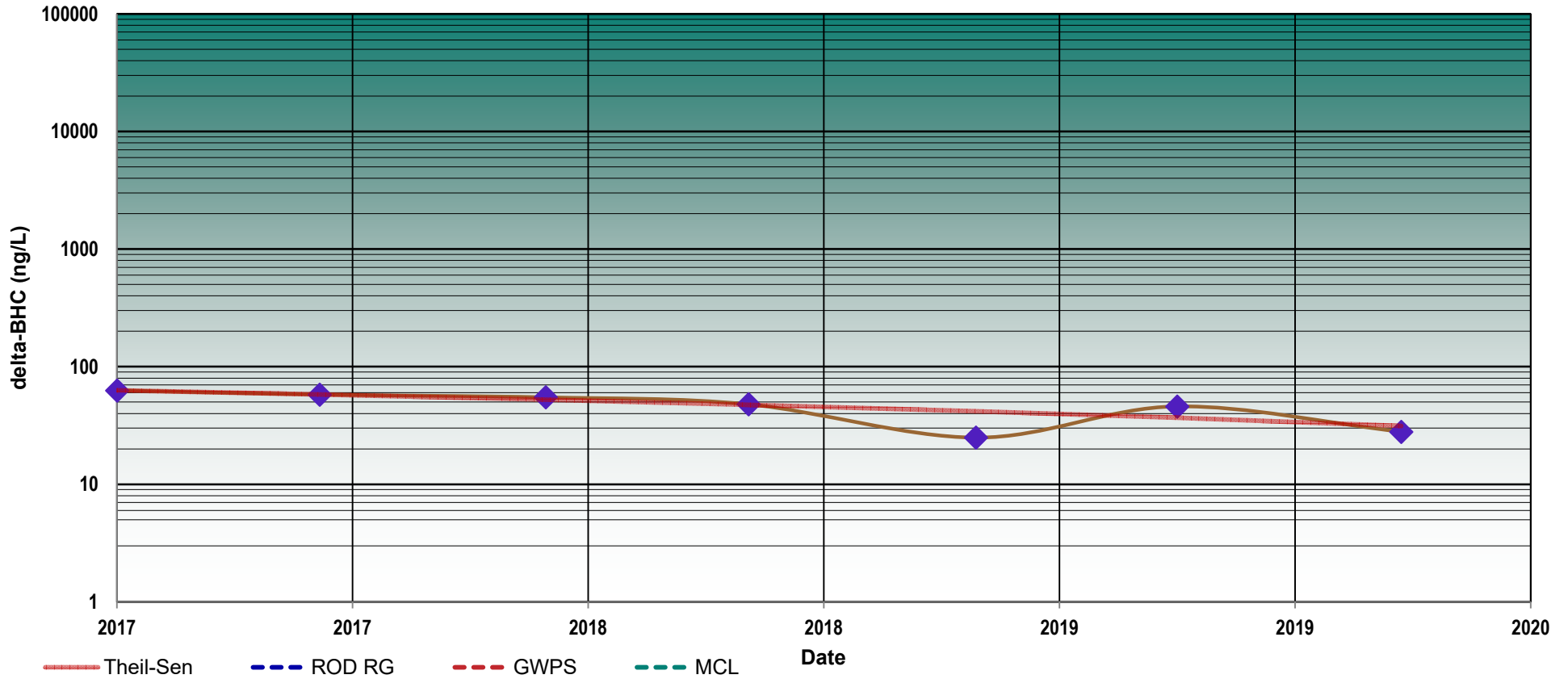
No. Data Pairs = 210	Theil-Sen Slope = -0.00107 ng/L/day	Kendall S = -11	p-Value = 0.7624	Kendall Tau-b = 0.053		
Most Recent Result (ng/L): 28		Most Recent Date: 1/25/20		Average (ng/L): 48		
Theil-Sen and Kendall AGREE that trend is DECREASING				delta-BHC ng/L		
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				GWPS	ROD RG	MCL
				0	--	--
				Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WE-003: delta-BHC, ng/L



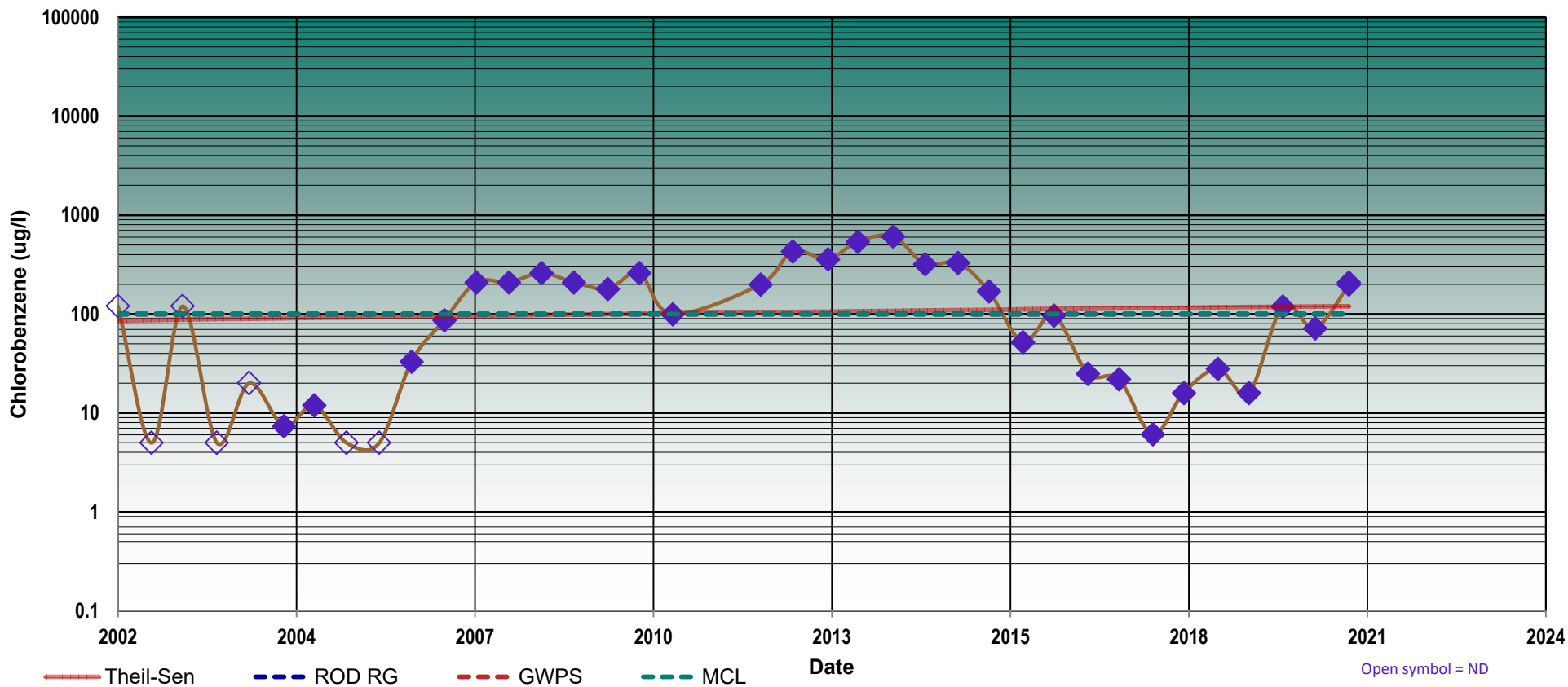
No. Data Pairs = 21	Theil-Sen Slope = -0.02907 ng/L/day	Kendall S = -17	p-Value = 0.0163	Kendall Tau-b = 0.81	
	Most Recent Result (ng/L): 28	Most Recent Date: 1/25/20	Average (ng/L): 46		
Theil-Sen and Kendall AGREE that trend is DECREASING			delta-BHC ng/L		
<p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>			GWPS	ROD RG	MCL
			0	--	--
			Exceeds	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-006: Chlorobenzene, ug/l



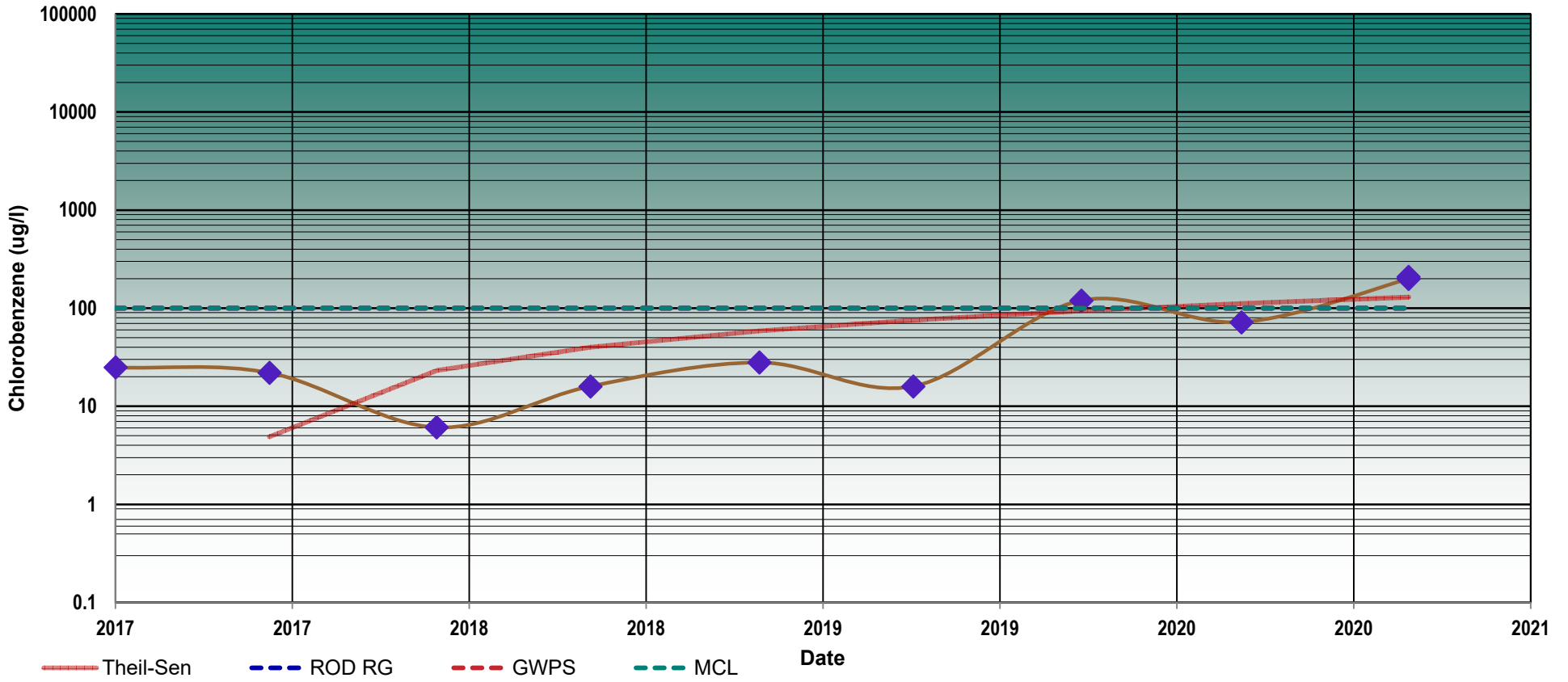
No. Data Pairs = 703	Theil-Sen Slope = 0.00497 ug/l/day	Kendall S = 100	p-Value = 0.2124	Kendall Tau-b = 0.144		
Most Recent Result (ug/l): 210		Most Recent Date: 1/28/21		Average (ug/l): 149		
Theil-Sen and Kendall AGREE that trend is INCREASING				Chlorobenzene ug/l		
				GWPS	ROD RG	MCL
				100	100	100
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-006: Chlorobenzene, ug/l



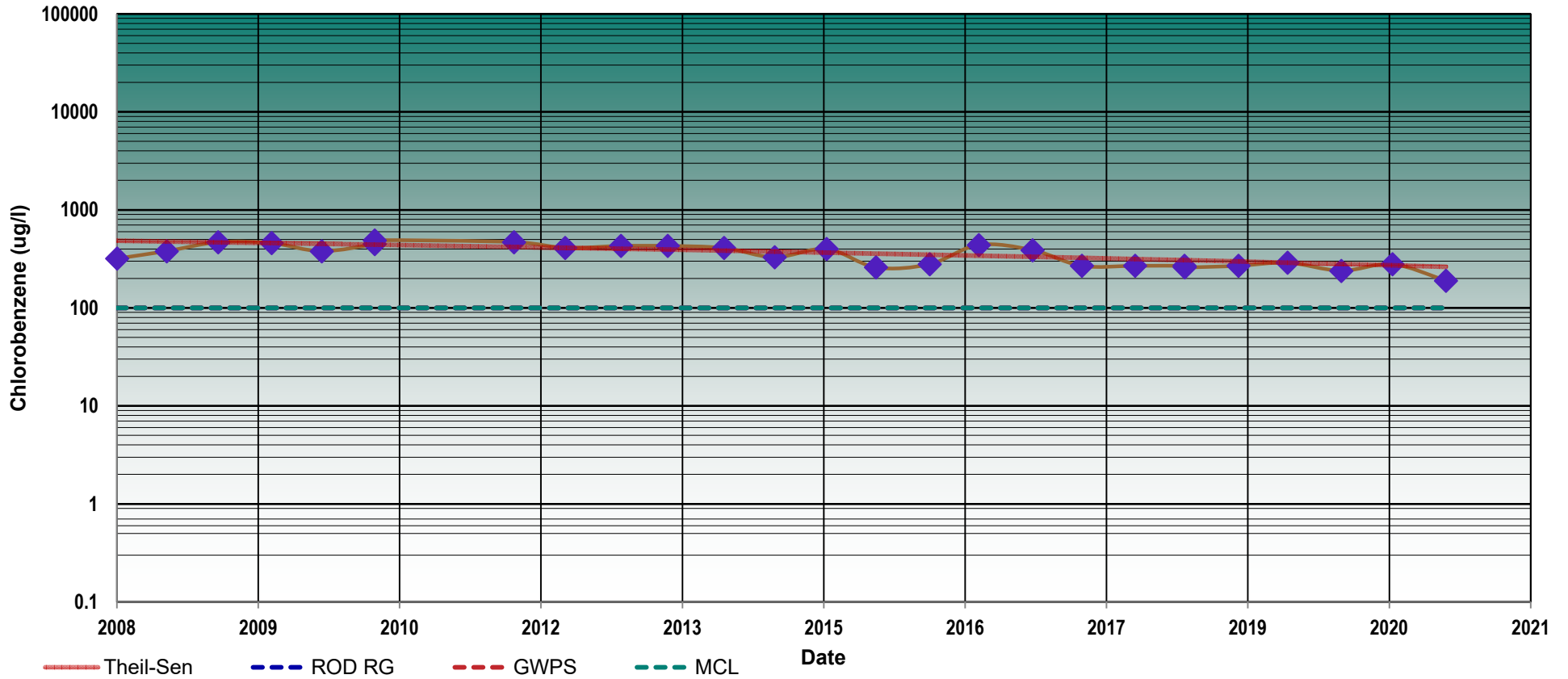
No. Data Pairs = 45	Theil-Sen Slope = 0.09688 ug/l/day	Kendall S = 25	p-Value = 0.0305	Kendall Tau-b = 0.568		
Most Recent Result (ug/l): 210		Most Recent Date: 1/28/21		Average (ug/l): 72		
Theil-Sen and Kendall AGREE that trend is INCREASING				Chlorobenzene ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				100	100	100
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-007: Chlorobenzene, ug/l



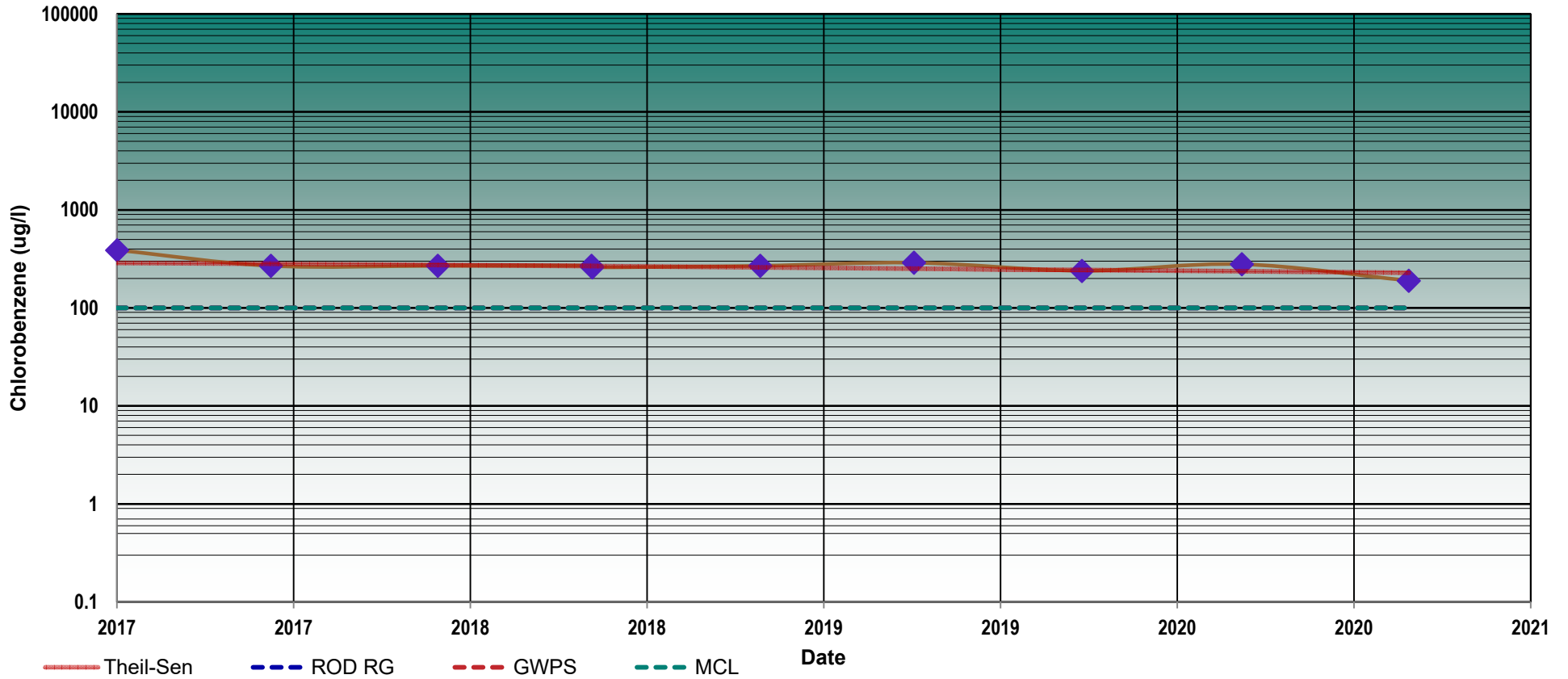
No. Data Pairs = 351	Theil-Sen Slope = -0.04714 ug/l/day	Kendall S = -188	p-Value = 0.0001	Kendall Tau-b = 0.546		
Most Recent Result (ug/l): 190		Most Recent Date: 1/28/21		Average (ug/l): 353		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Chlorobenzene ug/l		
				GWPS	ROD RG	MCL
				100	100	100
		Exceeds	Exceeds	Exceeds		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-007: Chlorobenzene, ug/l



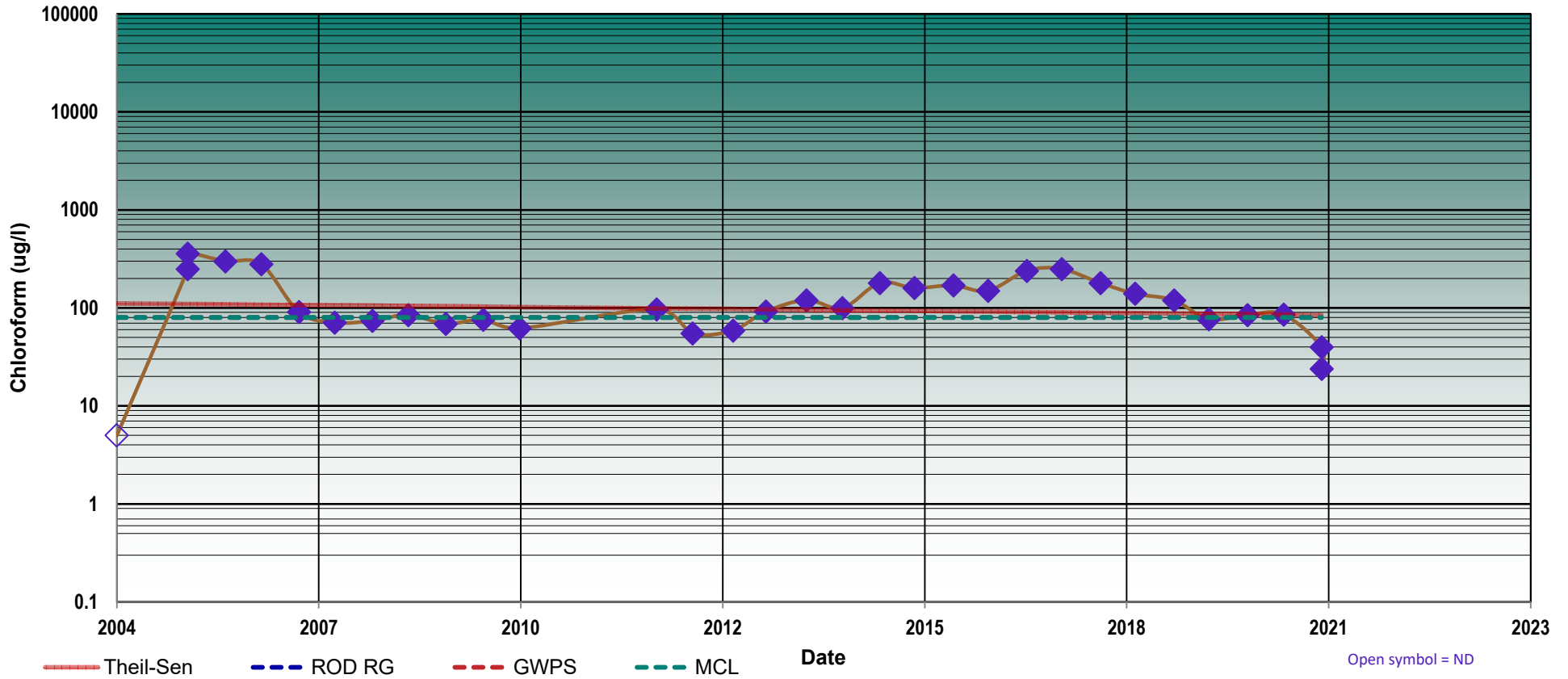
No. Data Pairs = 45	Theil-Sen Slope = -0.04115 ug/l/day	Kendall S = -15	p-Value = 0.1943	Kendall Tau-b = 0.358	
	Most Recent Result (ug/l): 190	Most Recent Date: 1/28/21	Average (ug/l): 273		
Theil-Sen and Kendall AGREE that trend is DECREASING			Chlorobenzene ug/l		
<p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>			GWPS	ROD RG	MCL
			100	100	100
			Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

Mann-Kendall / Theil-Sen
Groundwater Trend Analysis
 Olin Corporation (McIntosh Plant) OU1
 McIntosh, Alabama



BR-007: Chloroform, ug/l



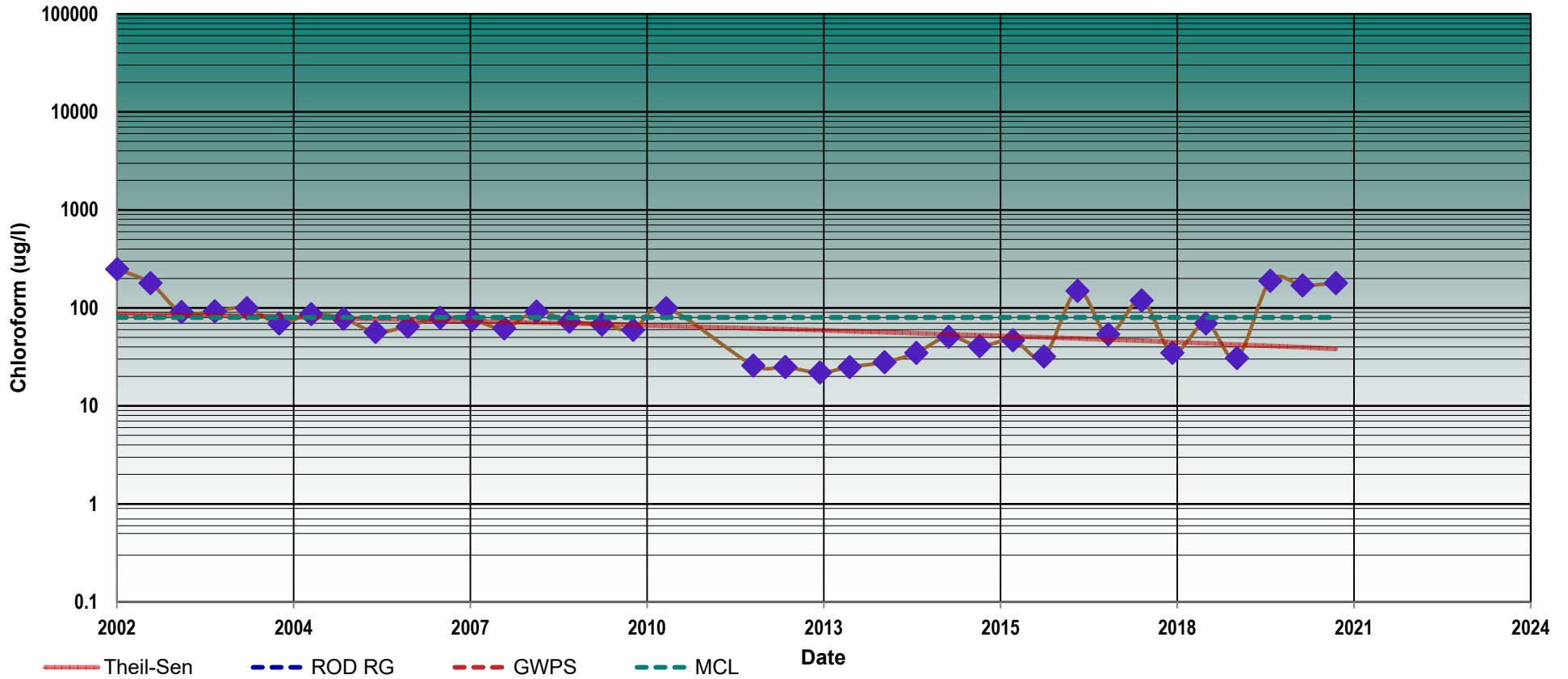
No. Data Pairs = 496	Theil-Sen Slope = -0.00446 ug/l/day	Kendall S = -26	p-Value = 0.6849	Kendall Tau-b = 0.053		
Most Recent Result (ug/l): 24		Most Recent Date: 1/28/21		Average (ug/l): 130		
Theil-Sen and Kendall AGREE that trend is DECREASING				Chloroform ug/l		
				GWPS	ROD RG	MCL
				80	--	80
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: Chloroform, ug/l



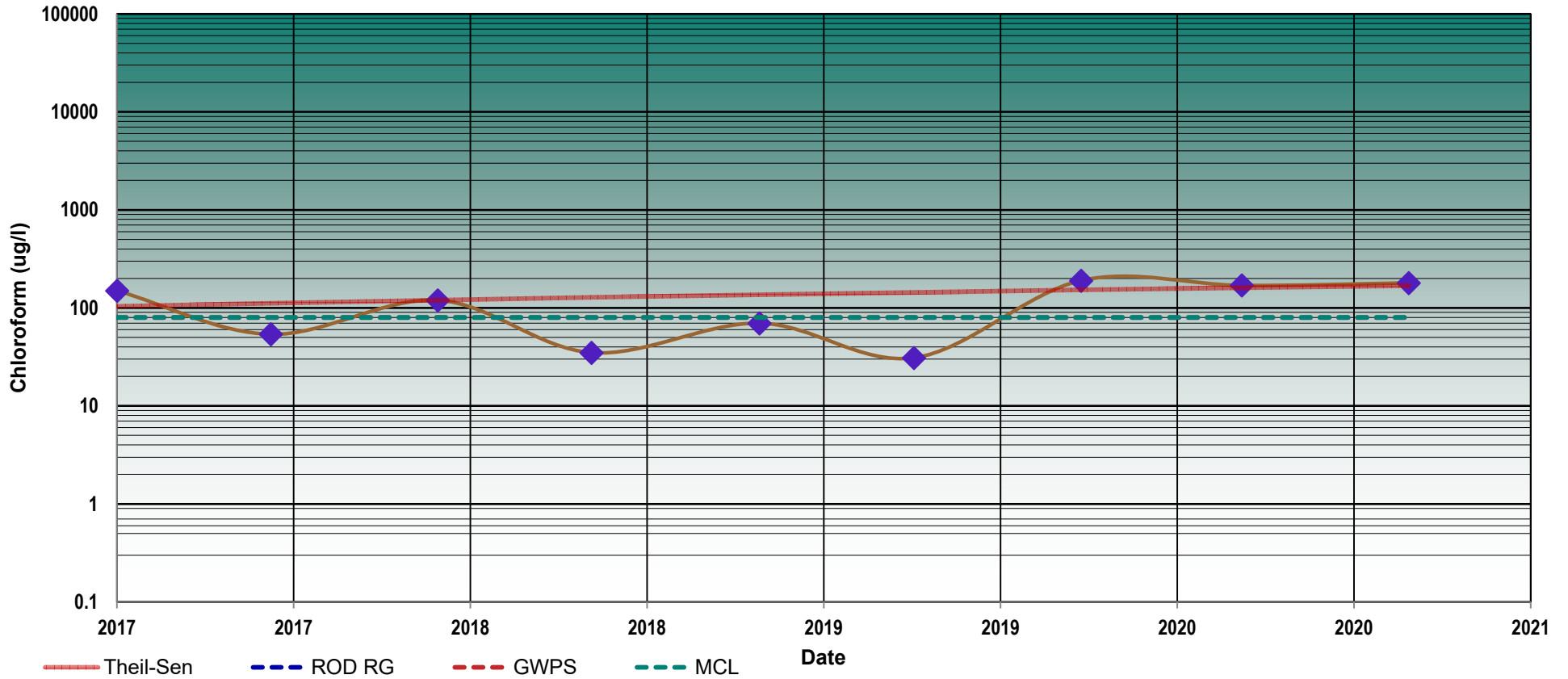
No. Data Pairs = 666	Theil-Sen Slope = -0.00717 ug/l/day	Kendall S = -125	p-Value = 0.1047	Kendall Tau-b = 0.188		
Most Recent Result (ug/l): 180		Most Recent Date: 1/27/21		Average (ug/l): 81		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Chloroform ug/l		
				GWPS	ROD RG	MCL
				80	--	80
		Exceeds	OK	Exceeds		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: Chloroform, ug/l



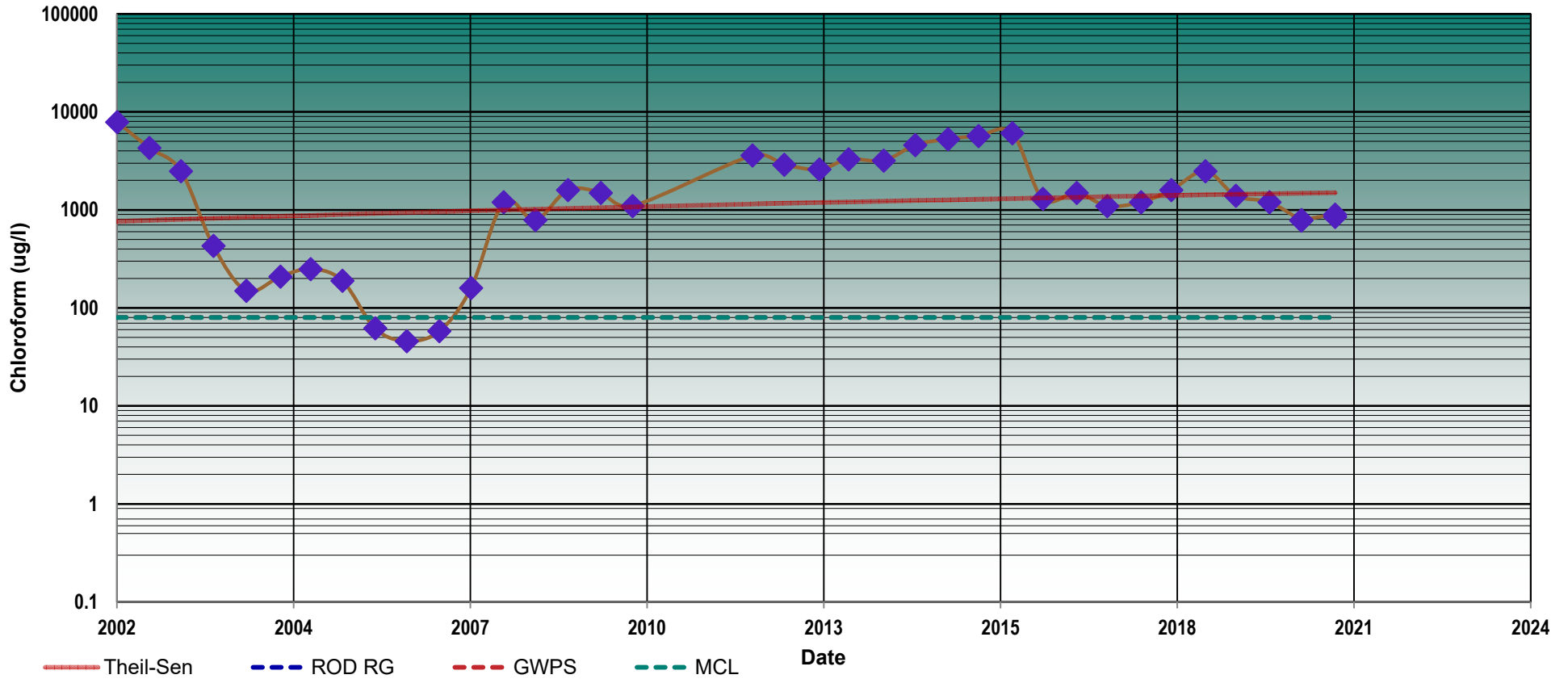
No. Data Pairs = 36	Theil-Sen Slope = 0.04479 ug/l/day	Kendall S = 8	p-Value = 0.4655	Kendall Tau-b = 0.222		
Most Recent Result (ug/l): 180		Most Recent Date: 1/27/21		Average (ug/l): 111		
Theil-Sen and Kendall AGREE that trend is INCREASING p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Chloroform ug/l		
				GWPS	ROD RG	MCL
				80	--	80
				Exceeds	OK	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: Chloroform, ug/l



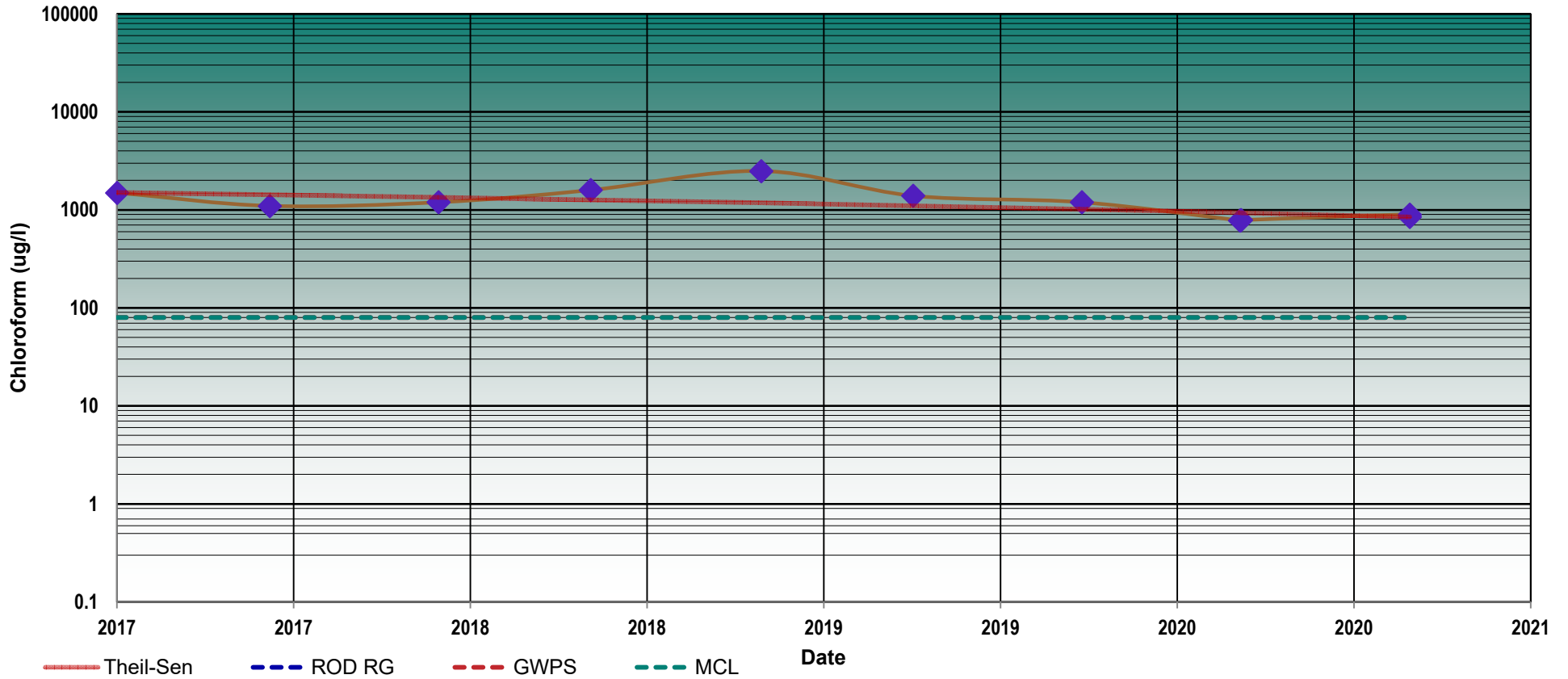
No. Data Pairs = 703	Theil-Sen Slope = 0.10722 ug/l/day	Kendall S = 68	p-Value = 0.3993	Kendall Tau-b = 0.097		
Most Recent Result (ug/l): 850		Most Recent Date: 1/31/21		Average (ug/l): 1970		
Theil-Sen and Kendall AGREE that trend is INCREASING				Chloroform ug/l		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				80	--	80
				Exceeds	OK	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



E-006: Chloroform, ug/l



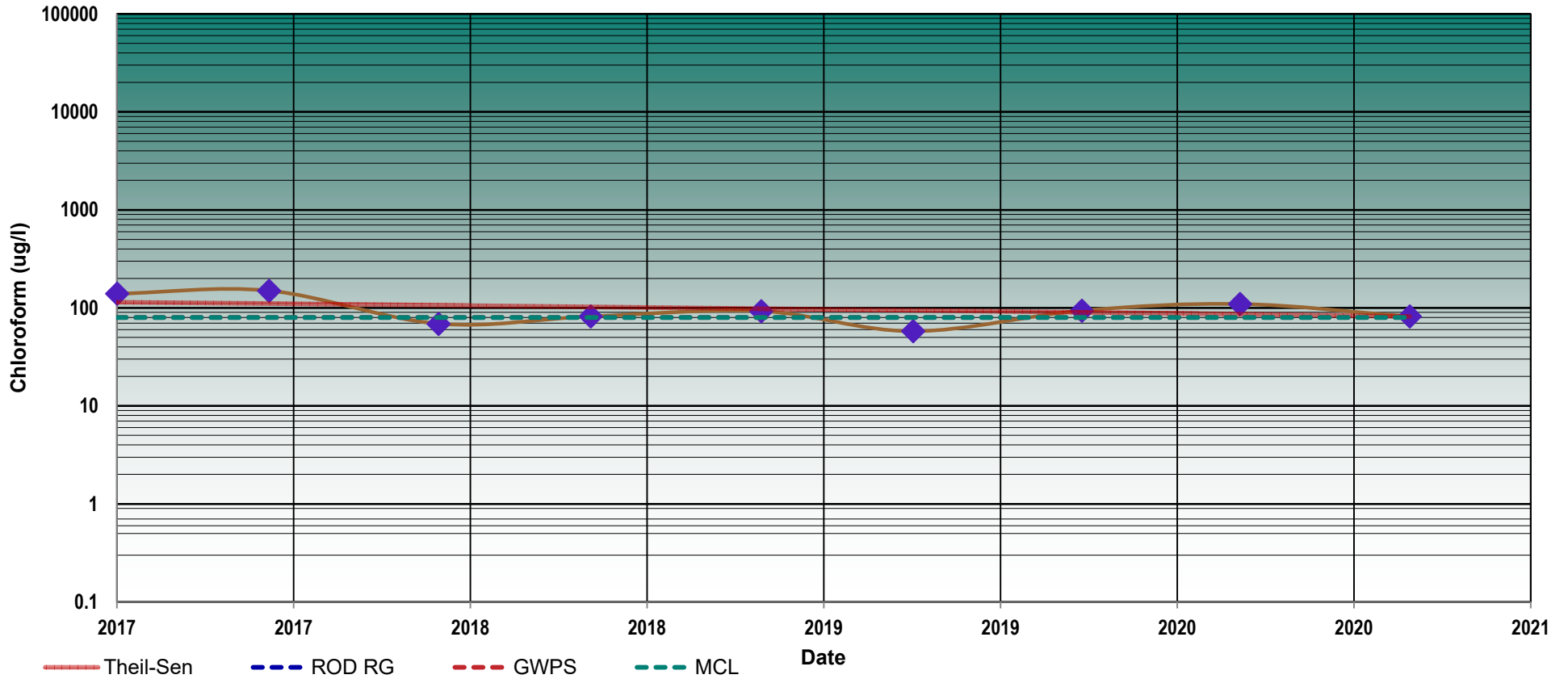
No. Data Pairs = 55	Theil-Sen Slope = -0.44792 ug/l/day	Kendall S = -21	p-Value = 0.1172	Kendall Tau-b = 0.389		
Most Recent Result (ug/l): 850		Most Recent Date: 1/31/21		Average (ug/l): 1256		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Chloroform ug/l		
				GWPS	ROD RG	MCL
				80	--	80
		Exceeds	OK	Exceeds		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-009: Chloroform, ug/l



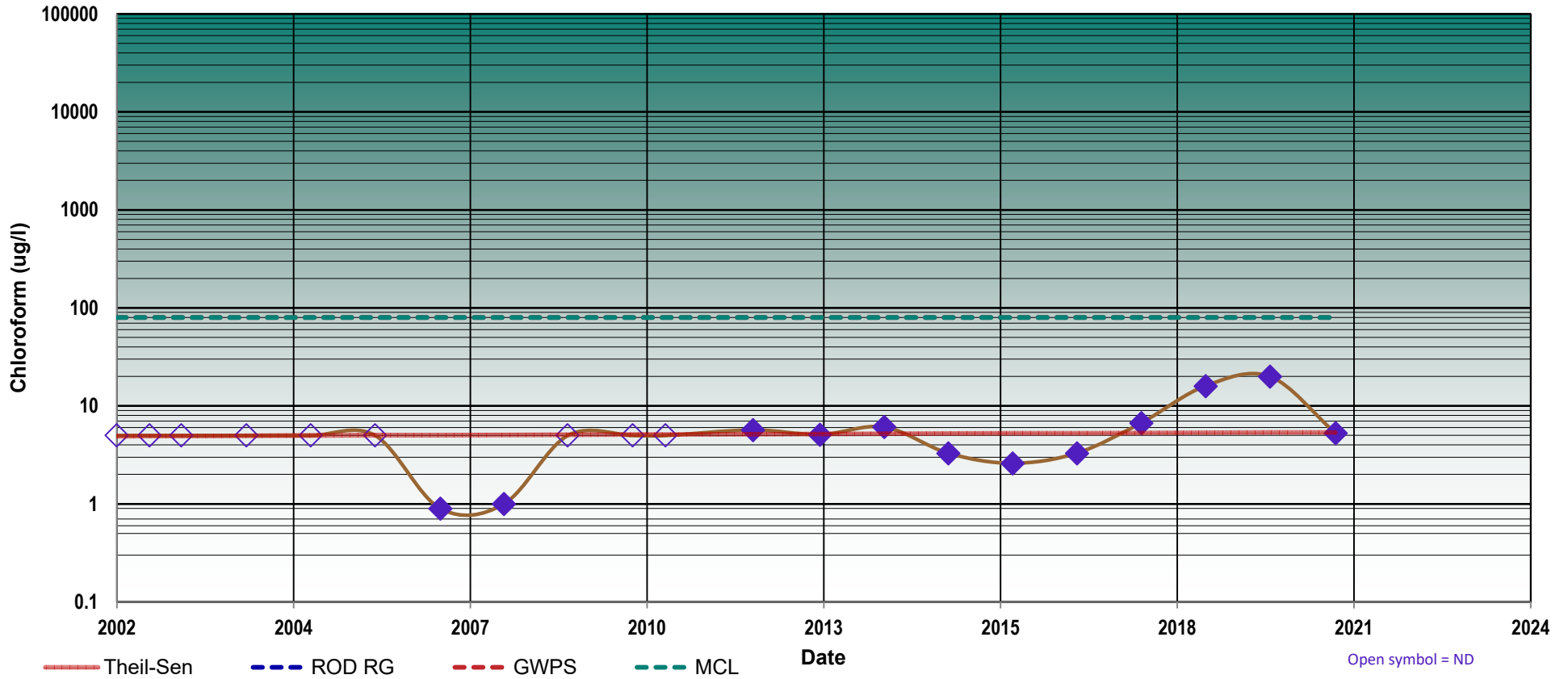
No. Data Pairs = 36	Theil-Sen Slope = -0.02204 ug/l/day	Kendall S = -5	p-Value = 0.675	Kendall Tau-b = 0.141		
Most Recent Result (ug/l): 82		Most Recent Date: 1/31/21		Average (ug/l): 98		
Theil-Sen and Kendall AGREE that trend is DECREASING				Chloroform ug/l		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				80	--	80
				Exceeds	OK	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PL010D: Chloroform, ug/l



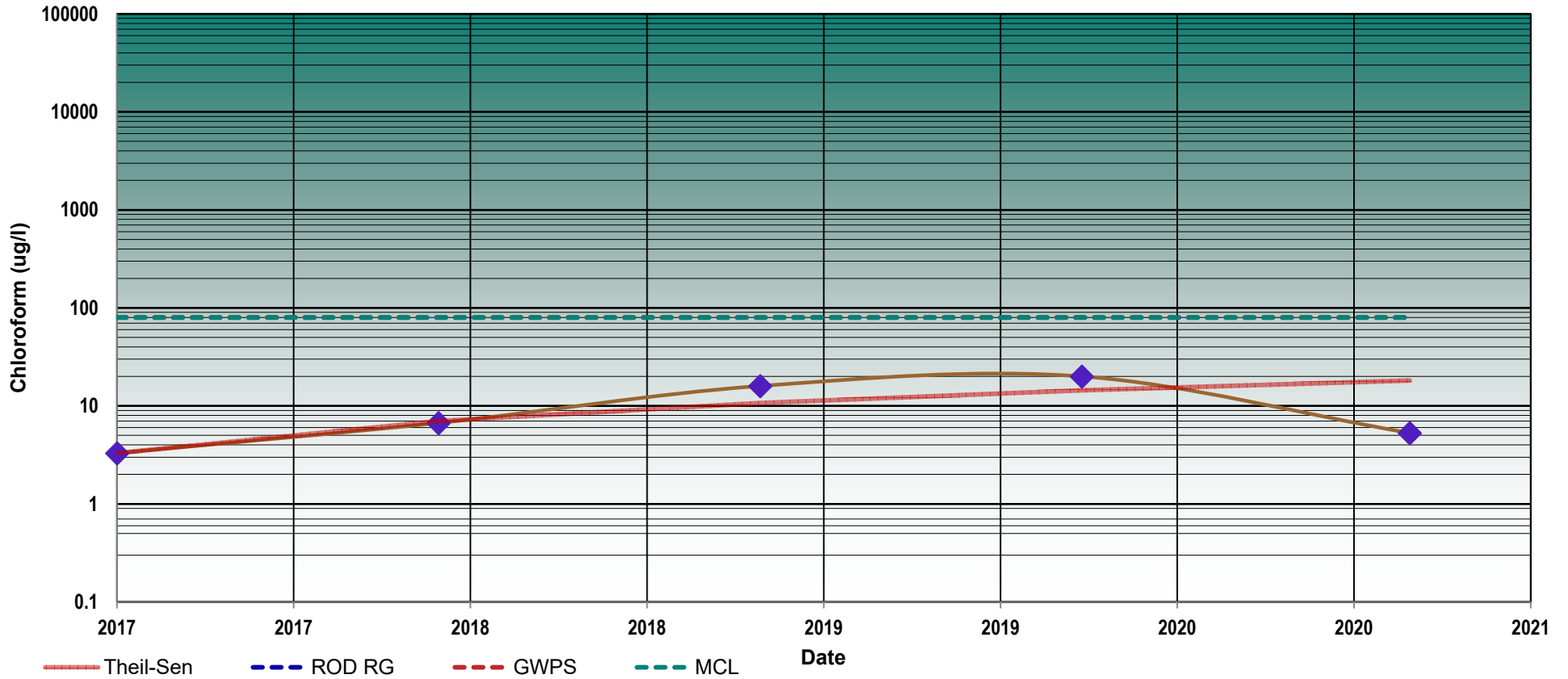
No. Data Pairs = 210	Theil-Sen Slope = 0.00007 ug/l/day	Kendall S = 63	p-Value = 0.0503	Kendall Tau-b = 0.331		
Most Recent Result (ug/l): 5.3		Most Recent Date: 1/29/21		Average (ug/l): 6		
Theil-Sen and Kendall AGREE that trend is INCREASING				Chloroform ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				80	--	80
				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PL010D: Chloroform, ug/l



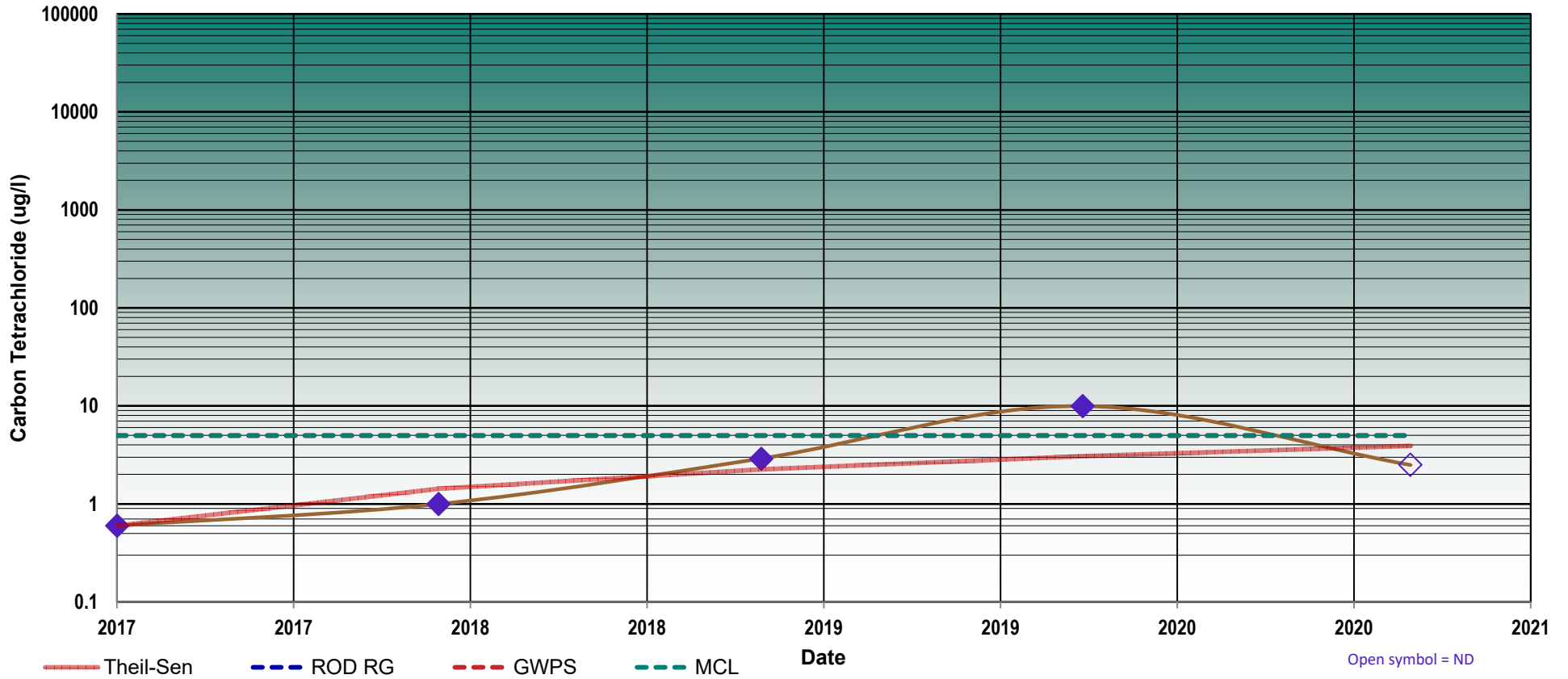
No. Data Pairs = 10	Theil-Sen Slope = 0.01016 ug/l/day	Kendall S = 4	p-Value = 0.4624	Kendall Tau-b = 0.4		
Most Recent Result (ug/l): 5.3		Most Recent Date: 1/29/21		Average (ug/l): 10		
Theil-Sen and Kendall AGREE that trend is INCREASING				Chloroform ug/l		
				GWPS	ROD RG	MCL
				80	--	80
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PH-001: Carbon Tetrachloride, ug/l



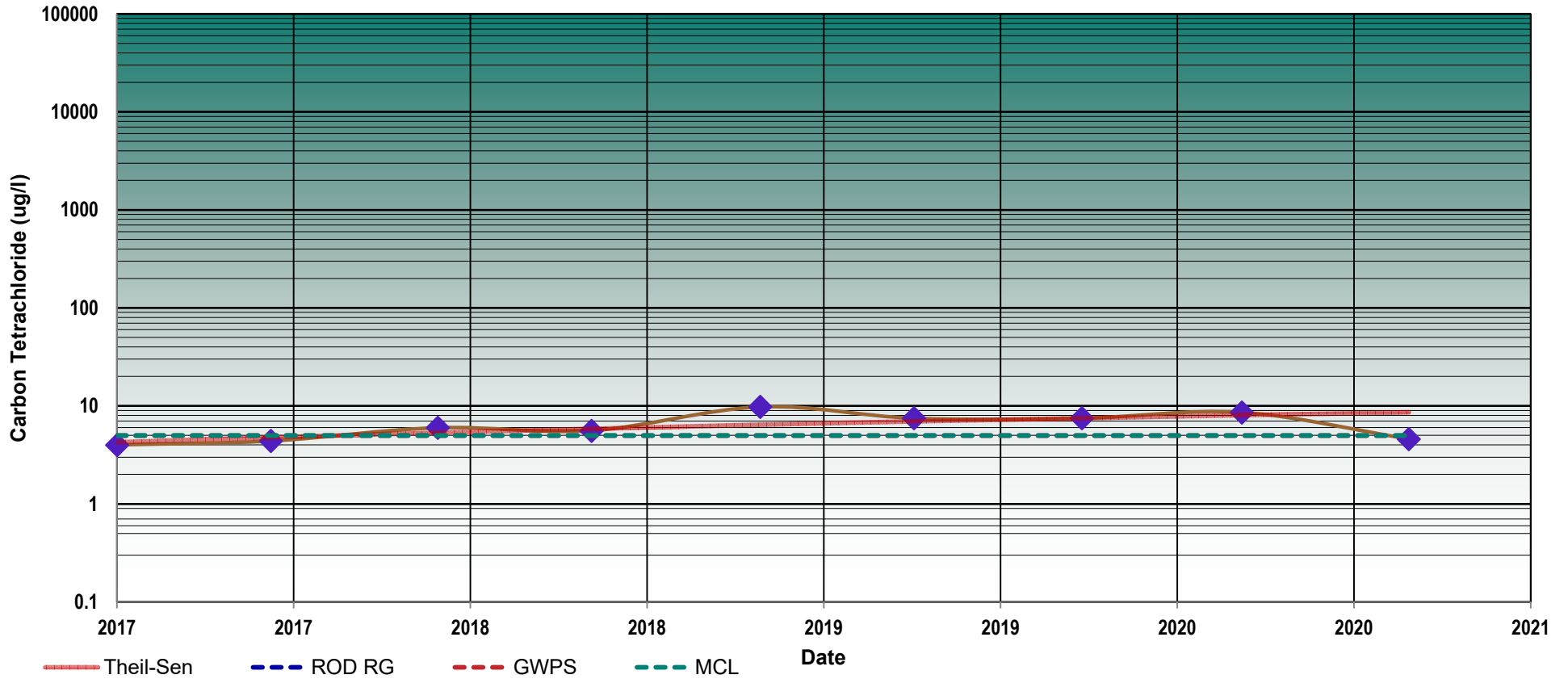
No. Data Pairs = 10	Theil-Sen Slope = 0.00226 ug/l/day	Kendall S = 6	p-Value = 0.2207	Kendall Tau-b = 0.6		
Most Recent Result (ug/l): Not Detected		Most Recent Date: 2/2/21		Average (ug/l): 3		
Theil-Sen and Kendall AGREE that trend is INCREASING				Carbon Tetrachloride ug/l		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				GWPS	ROD RG	MCL
				5	--	5
				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-005: Carbon Tetrachloride, ug/l



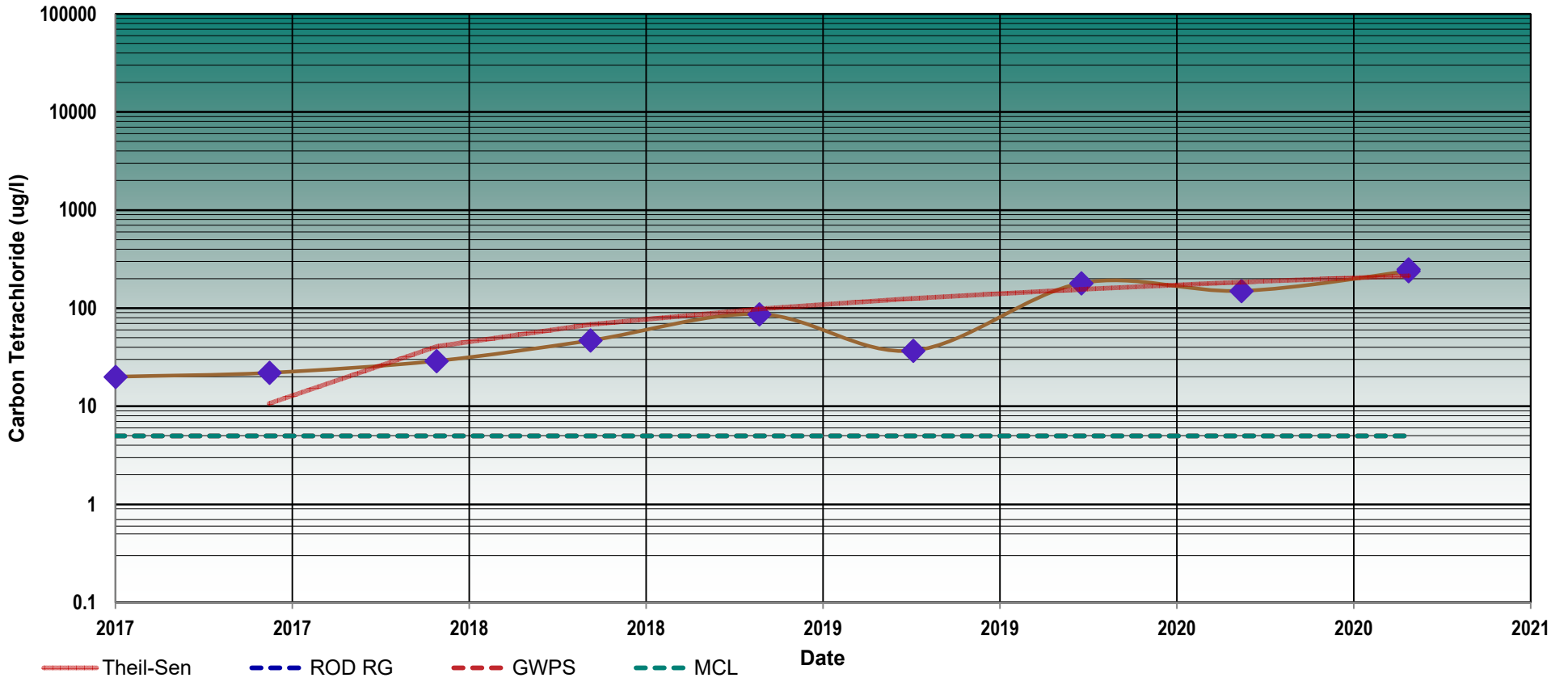
No. Data Pairs = 36	Theil-Sen Slope = 0.00297 ug/l/day	Kendall S = 15	p-Value = 0.1422	Kendall Tau-b = 0.423		
Most Recent Result (ug/l): 4.6		Most Recent Date: 1/28/21		Average (ug/l): 6		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is INCREASING</p> <p style="text-align: center;">p-Value: LIKELY VALID STATISTICAL TREND (p = 0.1 to 0.2 probability from 90% to 80%)</p>				Carbon Tetrachloride ug/l		
				GWPS	ROD RG	MCL
				5	--	5
			OK	OK	OK	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-006: Carbon Tetrachloride, ug/l



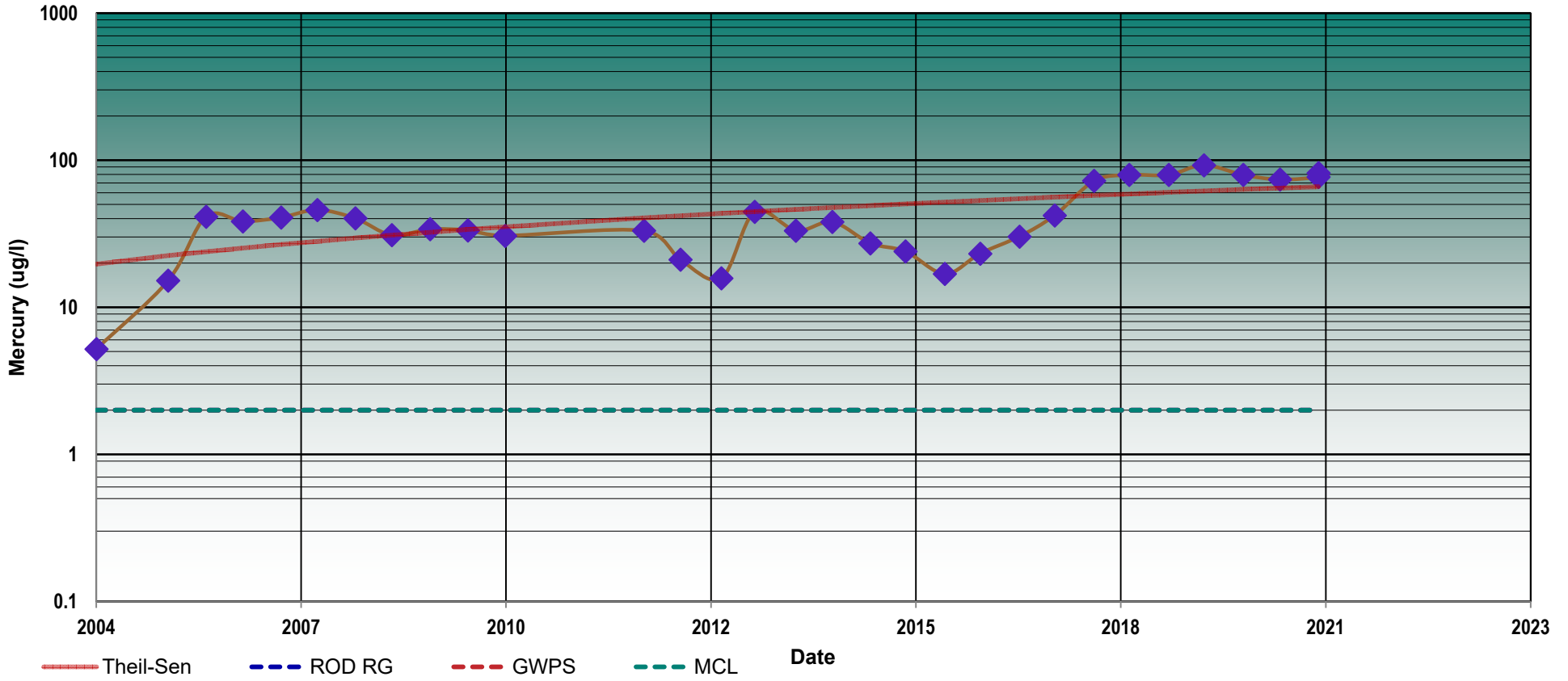
No. Data Pairs = 45	Theil-Sen Slope = 0.15811 ug/l/day	Kendall S = 38	p-Value = 0.0009	Kendall Tau-b = 0.854		
Most Recent Result (ug/l): 250		Most Recent Date: 1/28/21		Average (ug/l): 106		
Theil-Sen and Kendall AGREE that trend is INCREASING				Carbon Tetrachloride ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				5	--	5
				Exceeds	OK	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-007: Mercury, ug/l



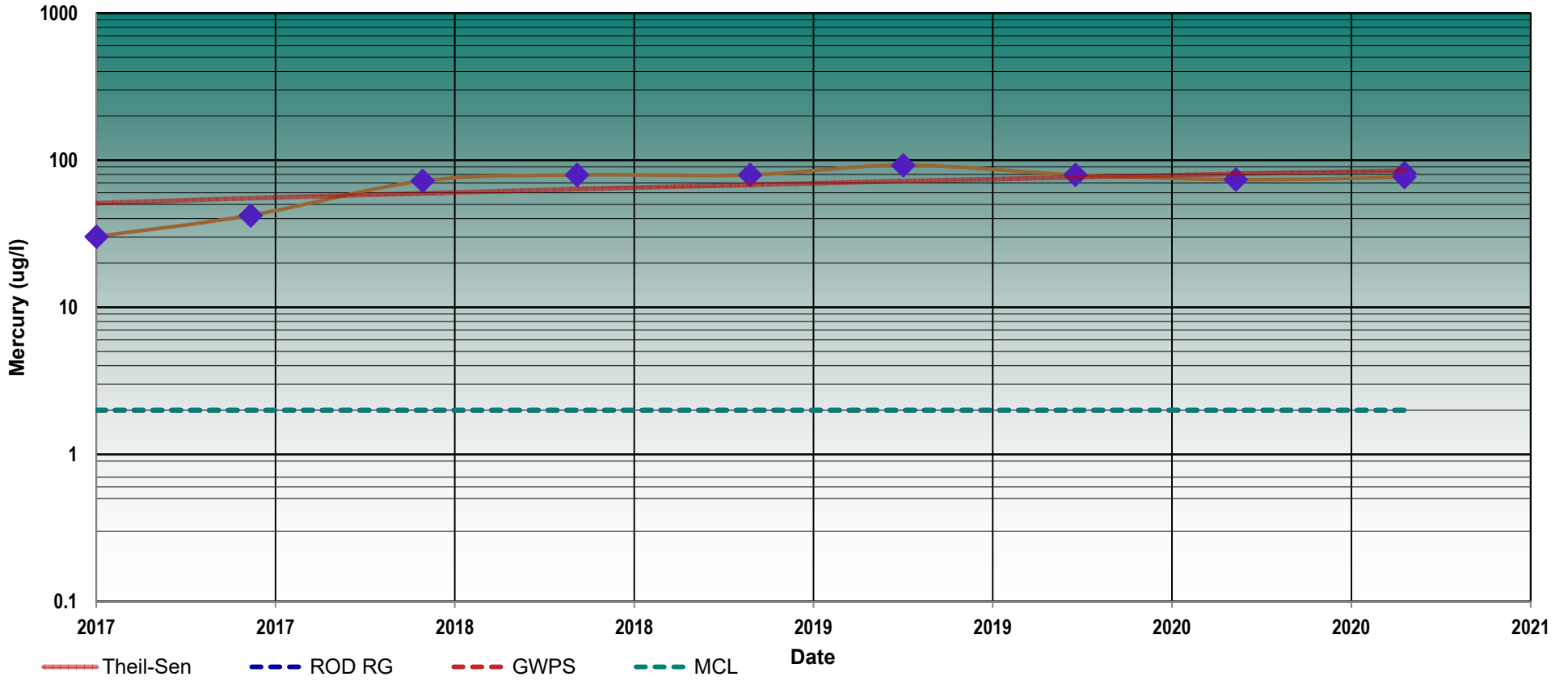
No. Data Pairs = 465	Theil-Sen Slope = 0.00778 ug/l/day	Kendall S = 151	p-Value = 0.0107	Kendall Tau-b = 0.326		
Most Recent Result (ug/l): 82		Most Recent Date: 1/28/21		Average (ug/l): 43		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				2	2	2
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-007: Mercury, ug/l



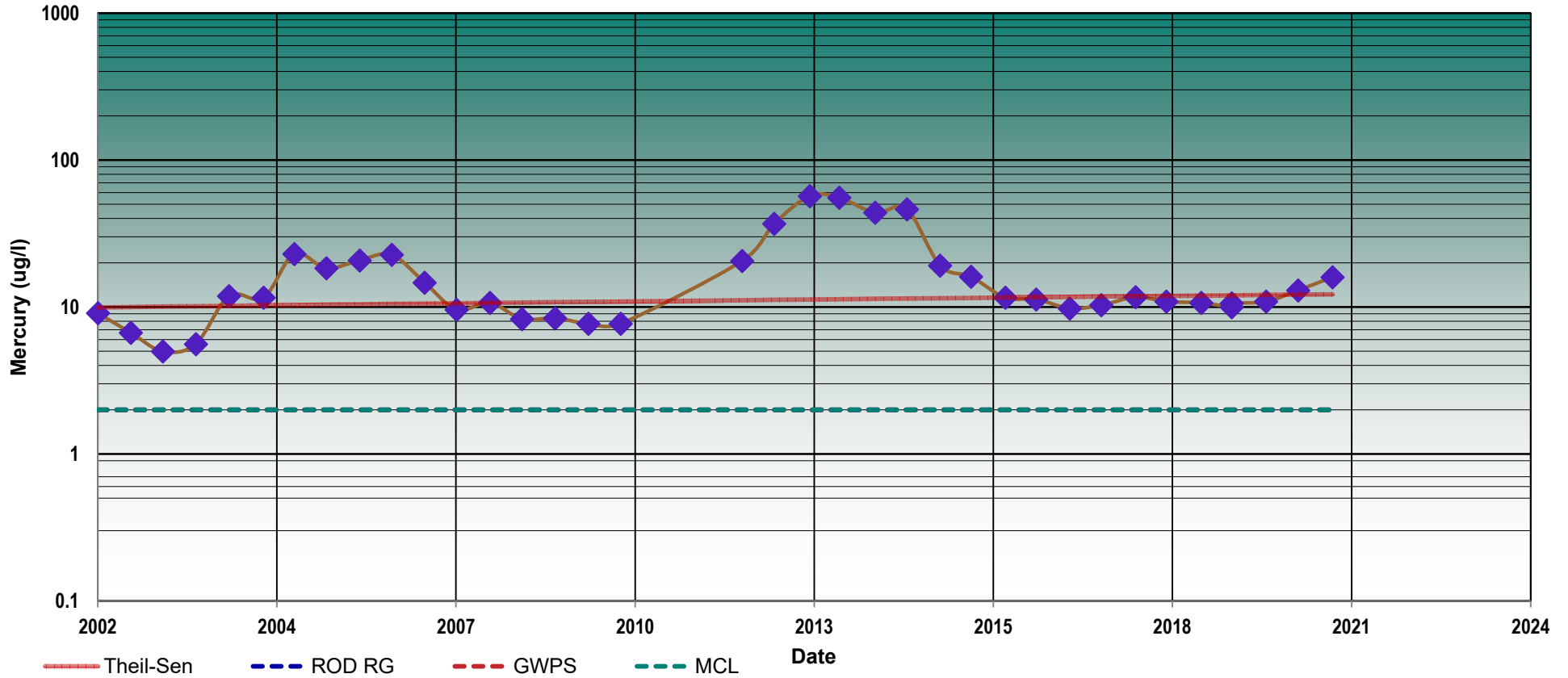
No. Data Pairs = 45	Theil-Sen Slope = 0.02325 ug/l/day	Kendall S = 21	p-Value = 0.0683	Kendall Tau-b = 0.489	
	Most Recent Result (ug/l): 82	Most Recent Date: 1/28/21	Average (ug/l): 71		
Theil-Sen and Kendall AGREE that trend is INCREASING			Mercury ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)			GWPS	ROD RG	MCL
			2	2	2
			Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008: Mercury, ug/l



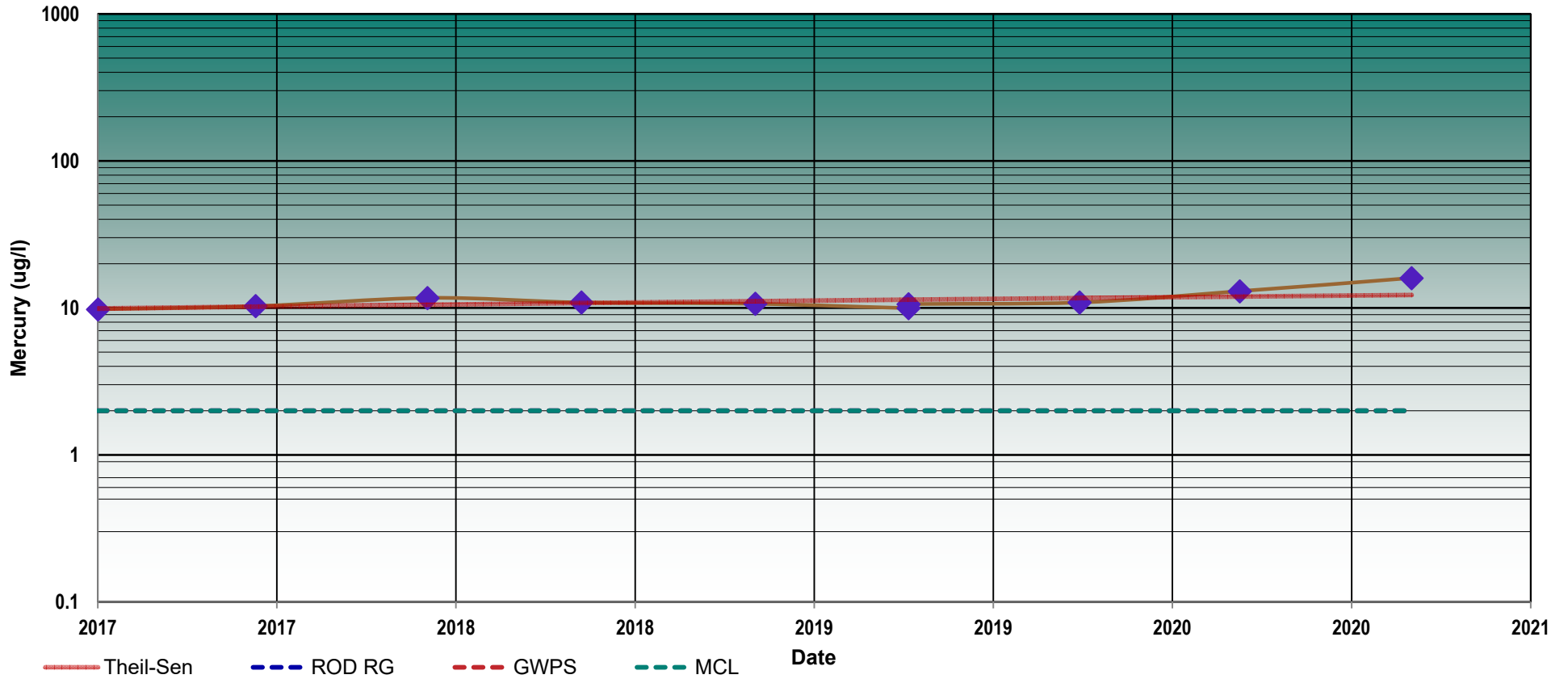
No. Data Pairs = 666	Theil-Sen Slope = 0.00033 ug/l/day	Kendall S = 57	p-Value = 0.4637	Kendall Tau-b = 0.086	
Most Recent Result (ug/l): 16	Most Recent Date: 1/31/21	Average (ug/l): 17			
Theil-Sen and Kendall AGREE that trend is INCREASING			Mercury ug/l		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)			GWPS	ROD RG	MCL
			2	2	2
			Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008: Mercury, ug/l



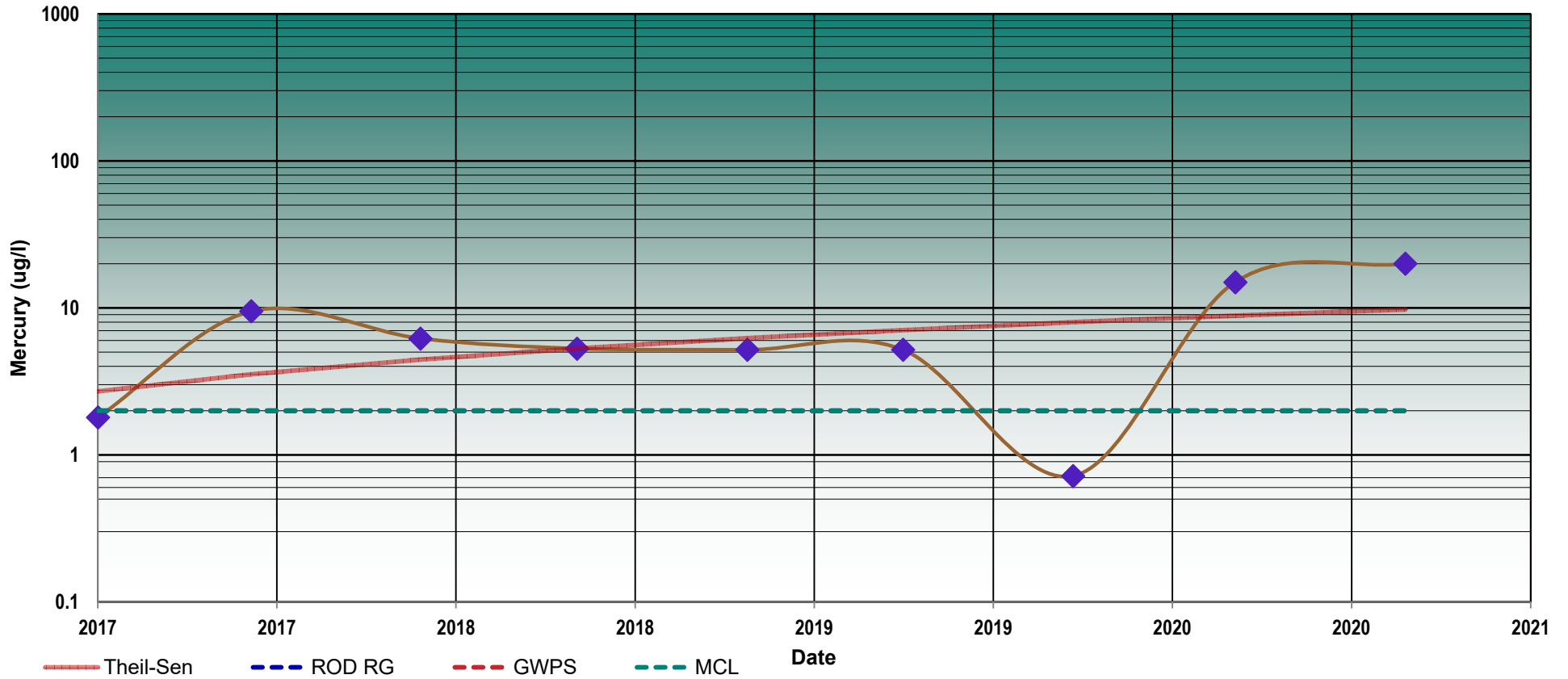
No. Data Pairs = 45	Theil-Sen Slope = 0.00161 ug/l/day	Kendall S = 21	p-Value = 0.0714	Kendall Tau-b = 0.477		
Most Recent Result (ug/l): 16		Most Recent Date: 1/31/21		Average (ug/l): 11		
<p style="text-align: center; color: blue;">Theil-Sen and Kendall AGREE that trend is INCREASING</p> <p style="text-align: center; color: blue;">p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)</p>				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			Exceeds	Exceeds	Exceeds	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-008D: Mercury, ug/l



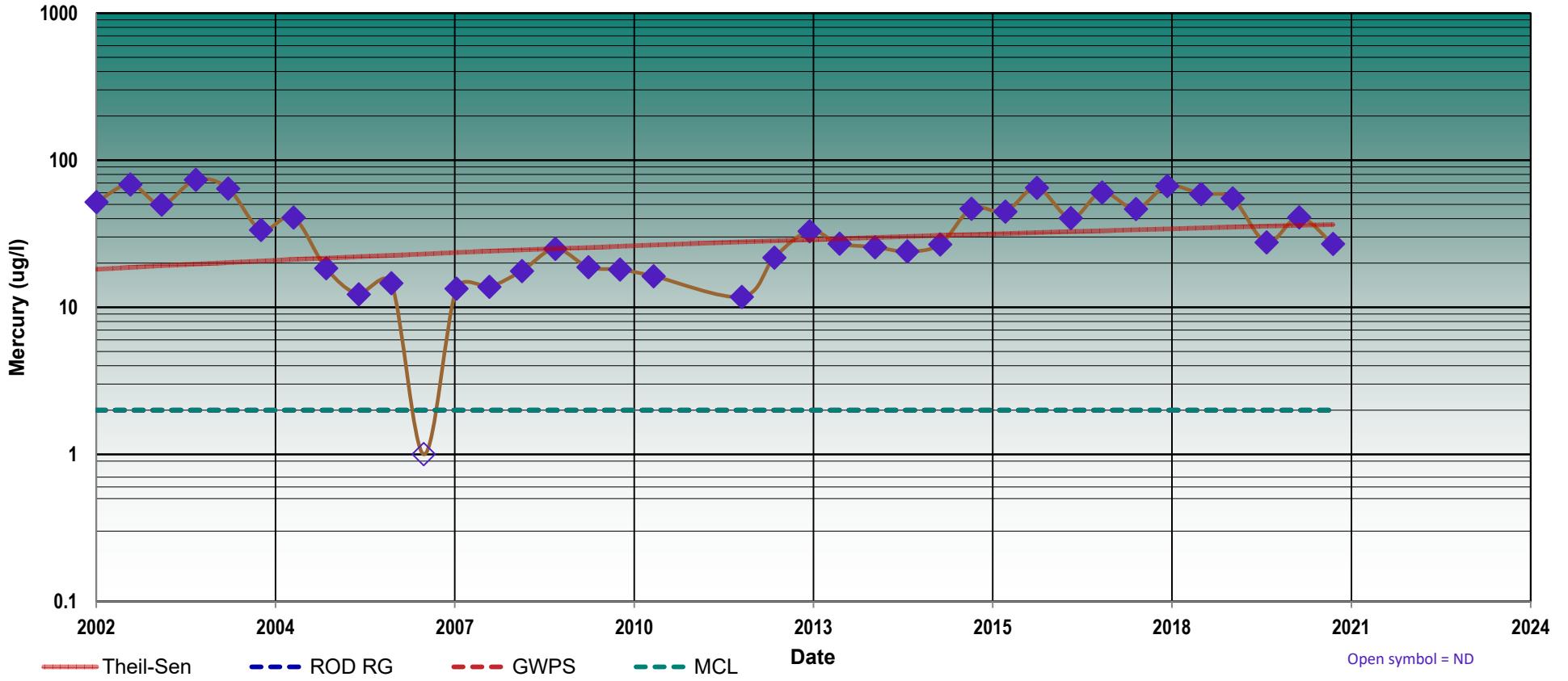
No. Data Pairs = 36	Theil-Sen Slope = 0.00485 ug/l/day	Kendall S = 5	p-Value = 0.675	Kendall Tau-b = 0.141		
Most Recent Result (ug/l): 20		Most Recent Date: 1/28/21		Average (ug/l): 8		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: Mercury, ug/l



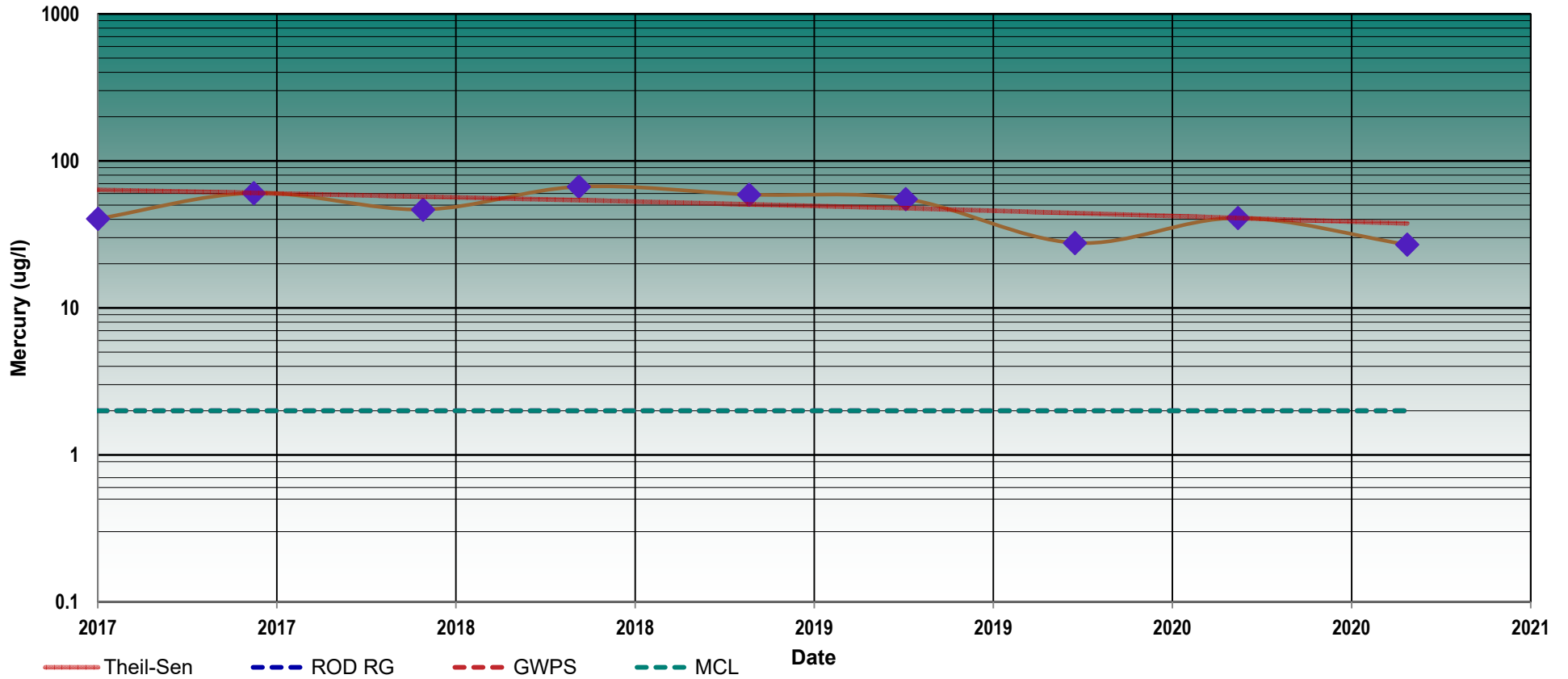
No. Data Pairs = 666	Theil-Sen Slope = 0.00267 ug/l/day	Kendall S = 110	p-Value = 0.154	Kendall Tau-b = 0.165		
Most Recent Result (ug/l): 27		Most Recent Date: 1/27/21		Average (ug/l): 35		
<p style="text-align: center; color: blue;">Theil-Sen and Kendall AGREE that trend is INCREASING</p> <p style="text-align: center; color: blue;">p-Value: LIKELY VALID STATISTICAL TREND (p = 0.1 to 0.2 probability from 90% to 80%)</p>				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
		Exceeds	Exceeds	Exceeds		

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



BR-010: Mercury, ug/l



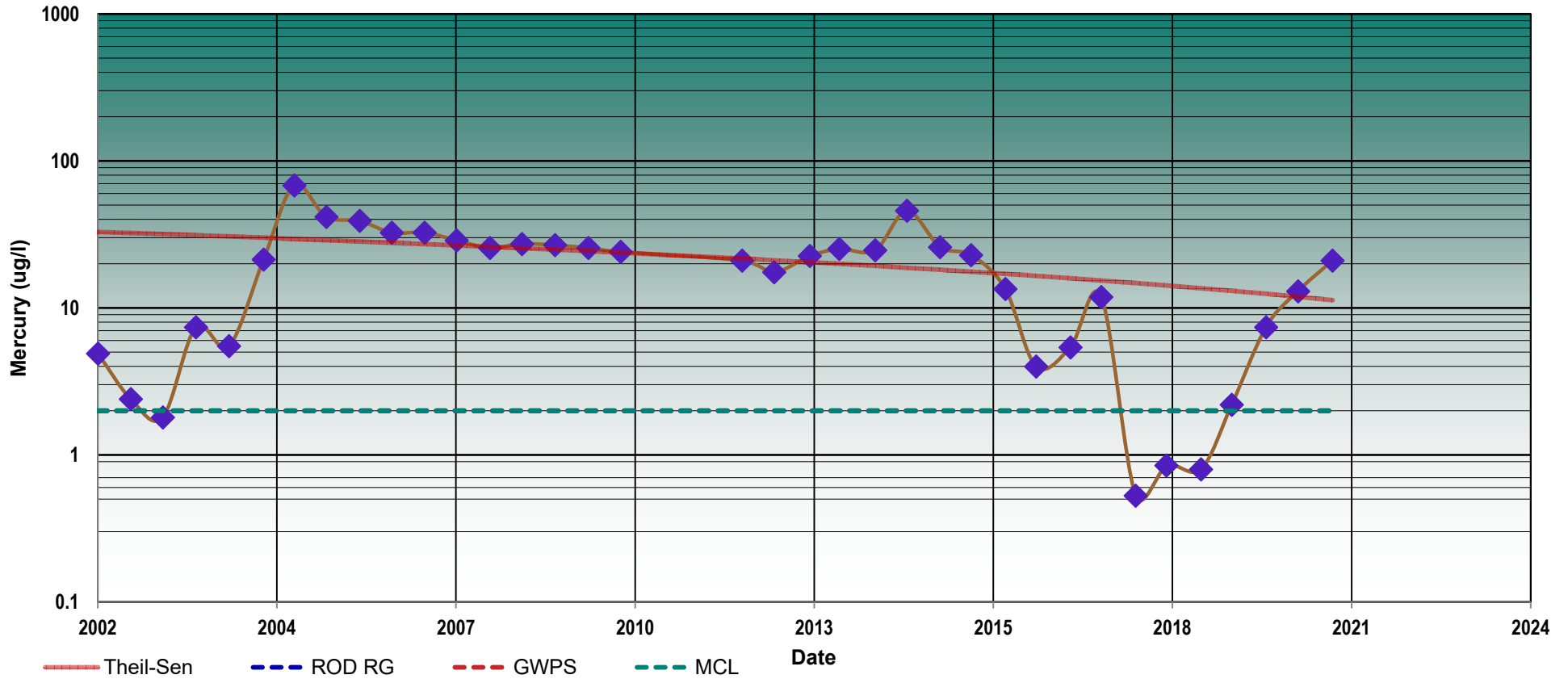
No. Data Pairs = 36	Theil-Sen Slope = -0.01788 ug/l/day	Kendall S = -14	p-Value = 0.1753	Kendall Tau-b = 0.389		
Most Recent Result (ug/l): 27		Most Recent Date: 1/27/21		Average (ug/l): 47		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-009: Mercury, ug/l



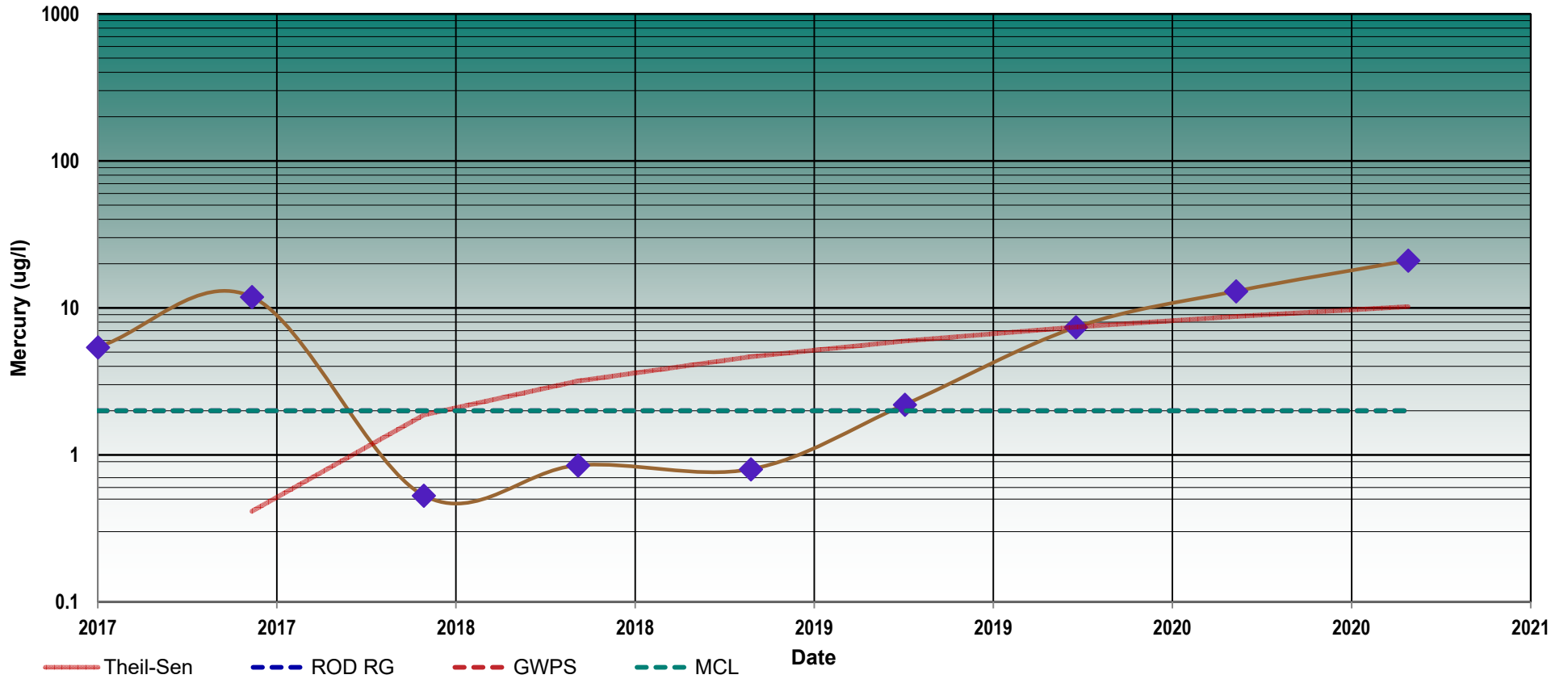
No. Data Pairs = 630	Theil-Sen Slope = -0.00313 ug/l/day	Kendall S = -179	p-Value = 0.0153	Kendall Tau-b = 0.285		
Most Recent Result (ug/l): 21		Most Recent Date: 1/31/21		Average (ug/l): 20		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			Exceeds	Exceeds	Exceeds	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

Mann-Kendall / Theil-Sen
Groundwater Trend Analysis
 Olin Corporation (McIntosh Plant) OU1
 McIntosh, Alabama



MP-009: Mercury, ug/l



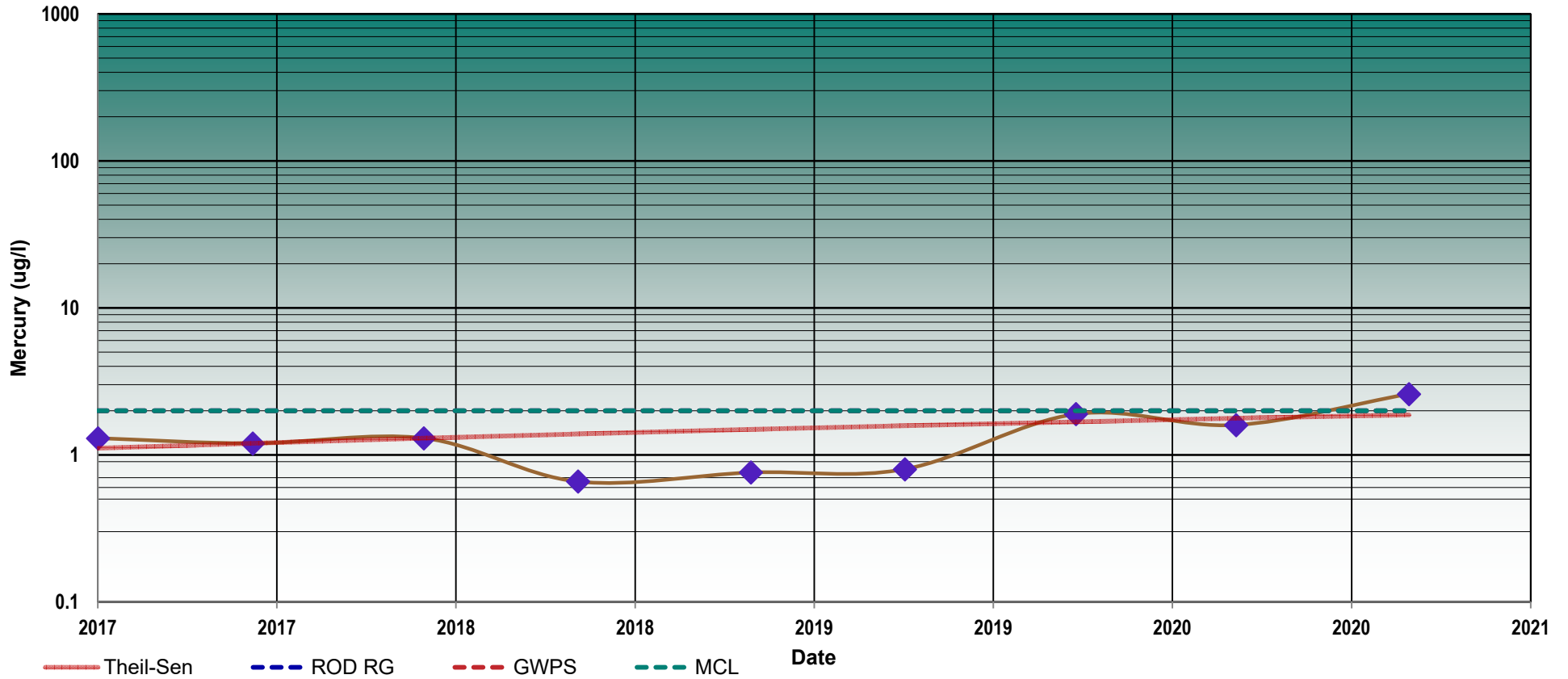
No. Data Pairs = 36	Theil-Sen Slope = 0.00759 ug/l/day	Kendall S = 16	p-Value = 0.1179	Kendall Tau-b = 0.444		
Most Recent Result (ug/l): 21		Most Recent Date: 1/31/21		Average (ug/l): 7		
Theil-Sen and Kendall AGREE that trend is INCREASING p-Value: LIKELY VALID STATISTICAL TREND (p = 0.1 to 0.2 probability from 90% to 80%)				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			Exceeds	Exceeds	Exceeds	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



MP-015: Mercury, ug/l



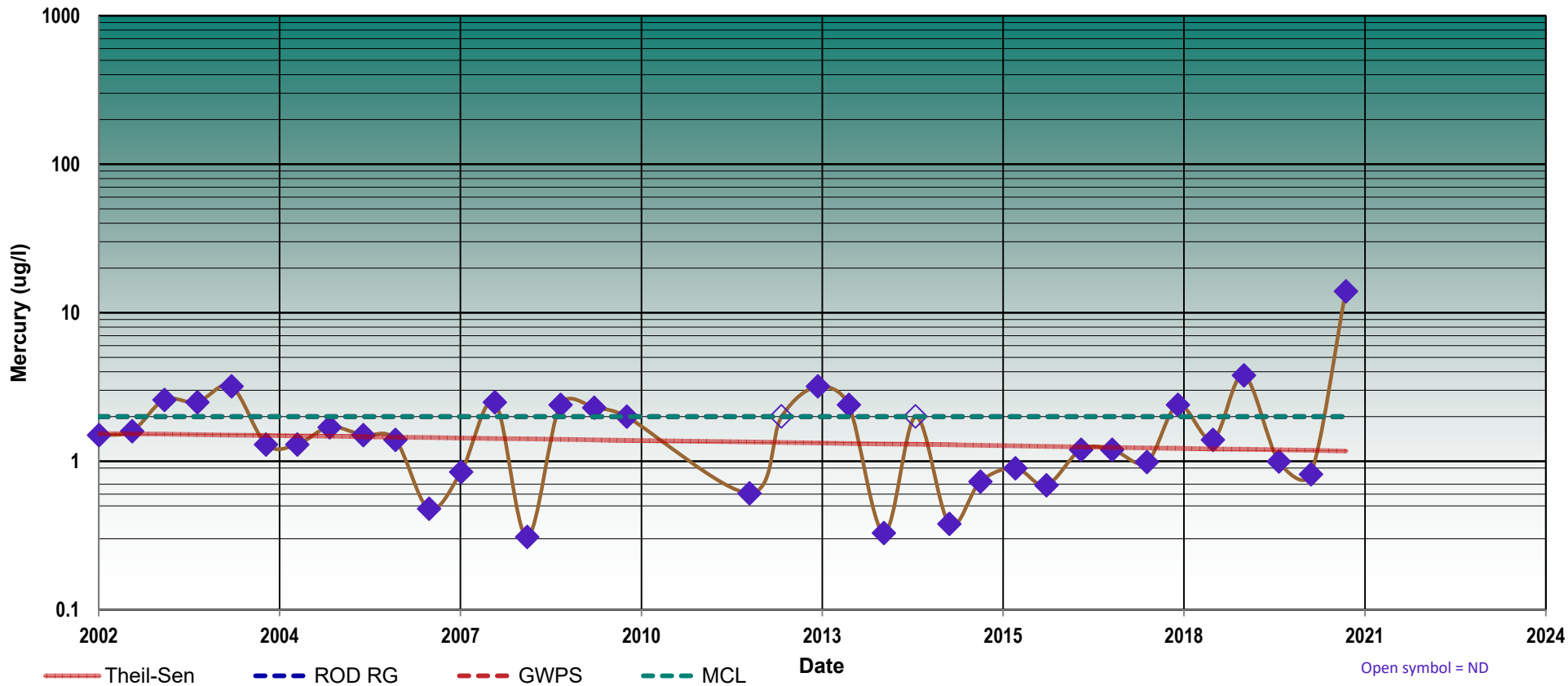
No. Data Pairs = 36	Theil-Sen Slope = 0.00052 ug/l/day	Kendall S = 13	p-Value = 0.2084	Kendall Tau-b = 0.366		
Most Recent Result (ug/l): 2.6		Most Recent Date: 2/1/21		Average (ug/l): 1		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PE-003D: Mercury, ug/l



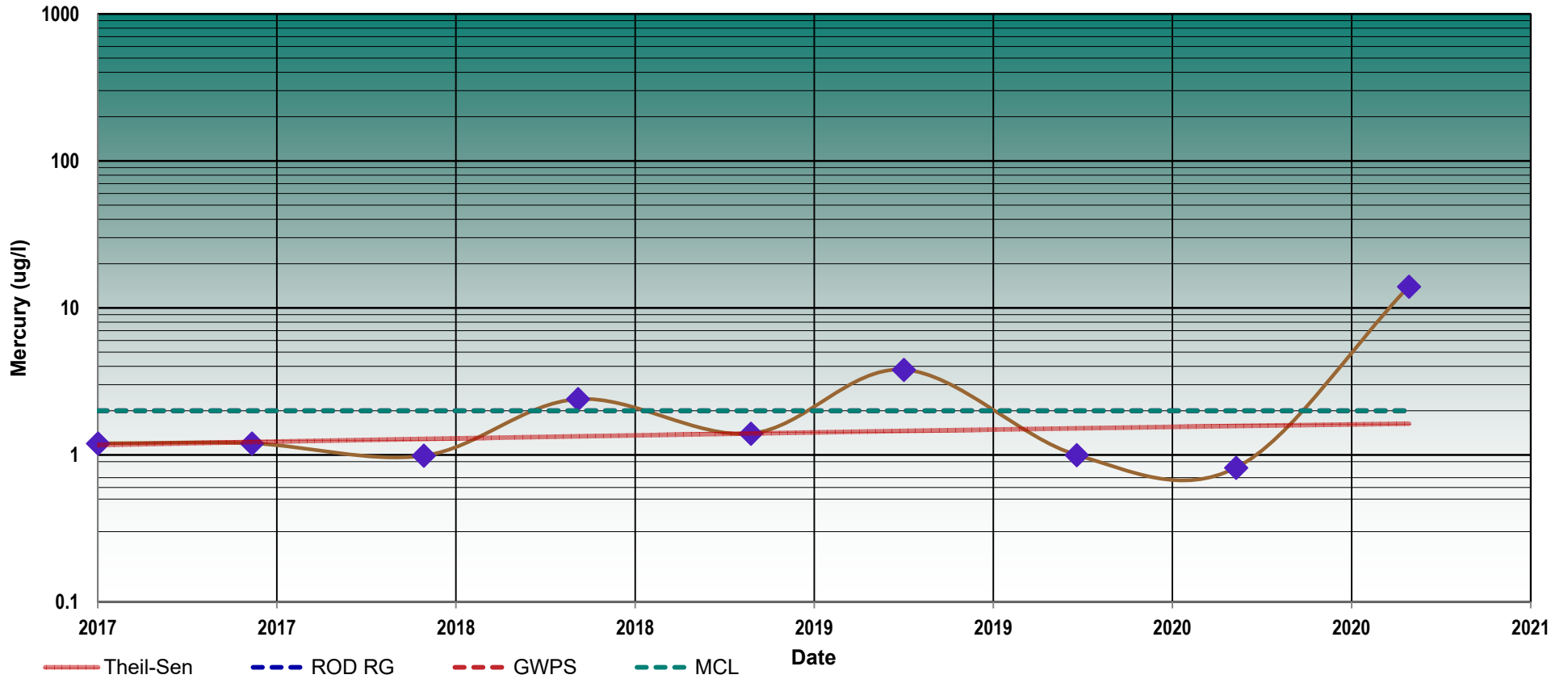
No. Data Pairs = 630	Theil-Sen Slope = -0.00005 ug/l/day	Kendall S = -54	p-Value = 0.4698	Kendall Tau-b = 0.087	
Most Recent Result (ug/l): 14	Most Recent Date: 2/2/21		Average (ug/l): 2		
Theil-Sen and Kendall AGREE that trend is DECREASING			Mercury ug/l		
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)			GWPS	ROD RG	MCL
			2	2	2
			Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PE-003D: Mercury, ug/l



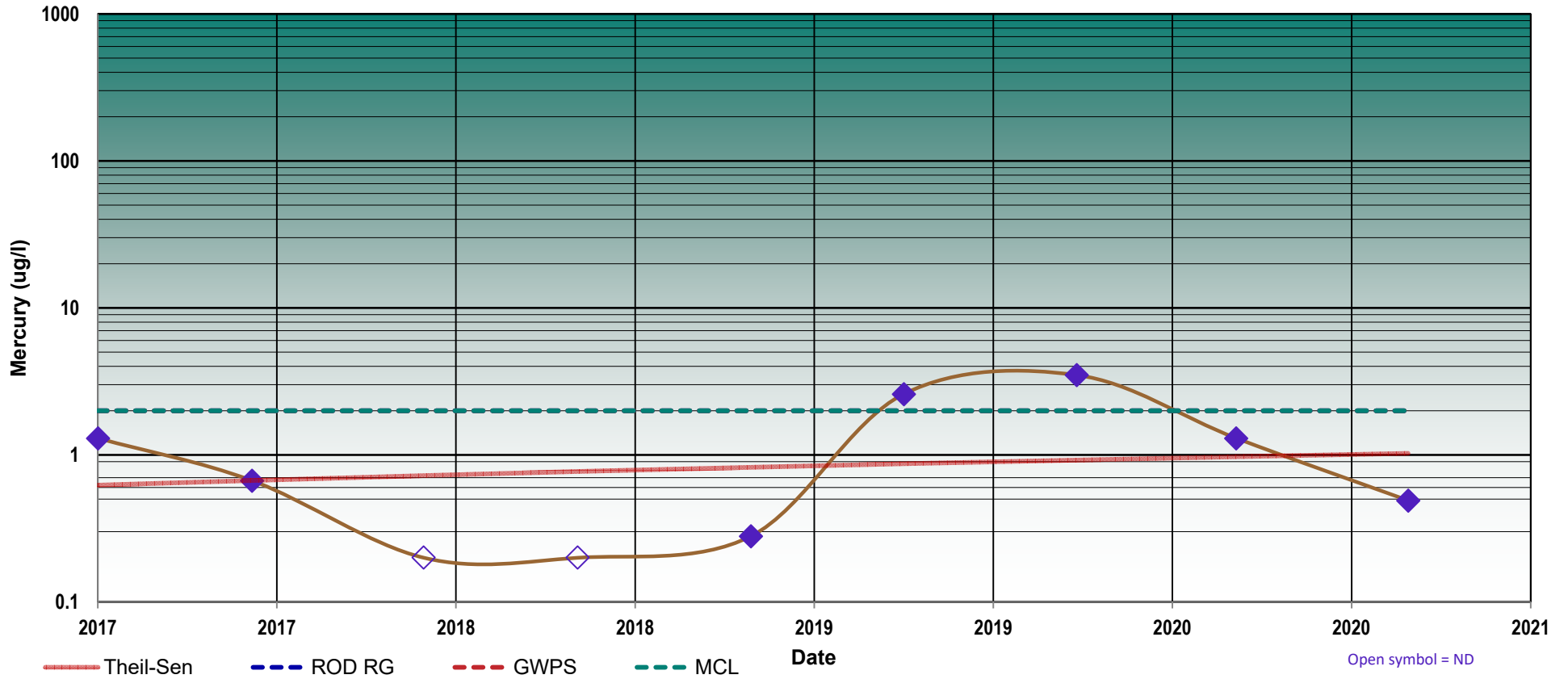
No. Data Pairs = 36	Theil-Sen Slope = 0.00032 ug/l/day	Kendall S = 5	p-Value = 0.675	Kendall Tau-b = 0.141		
Most Recent Result (ug/l): 14		Most Recent Date: 2/2/21		Average (ug/l): 3		
Theil-Sen and Kendall AGREE that trend is INCREASING p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			Exceeds	Exceeds	Exceeds	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PH-003D: Mercury, ug/l



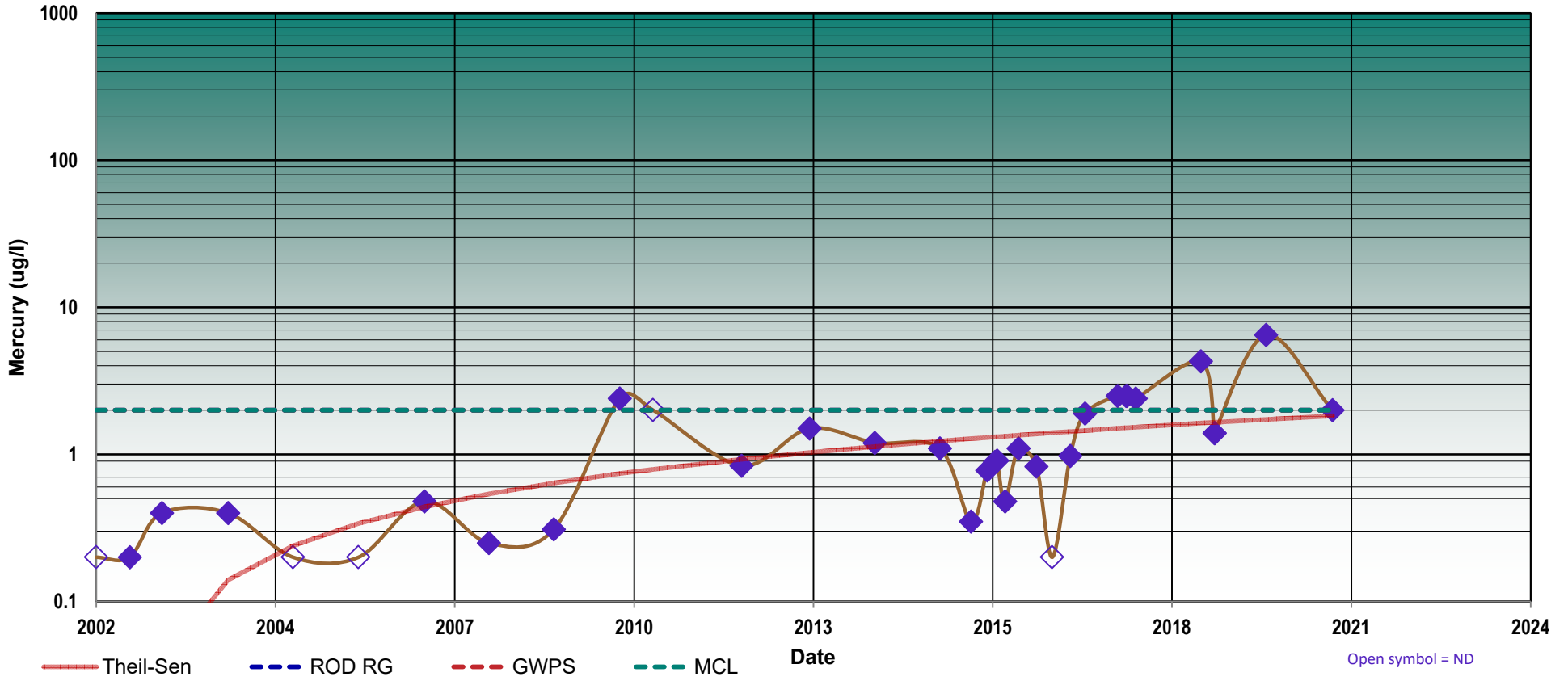
No. Data Pairs = 36	Theil-Sen Slope = 0.00027 ug/l/day	Kendall S = 6	p-Value = 0.5982	Kendall Tau-b = 0.171		
Most Recent Result (ug/l): 0.49		Most Recent Date: 2/1/21		Average (ug/l): 1		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PL010D: Mercury, ug/l



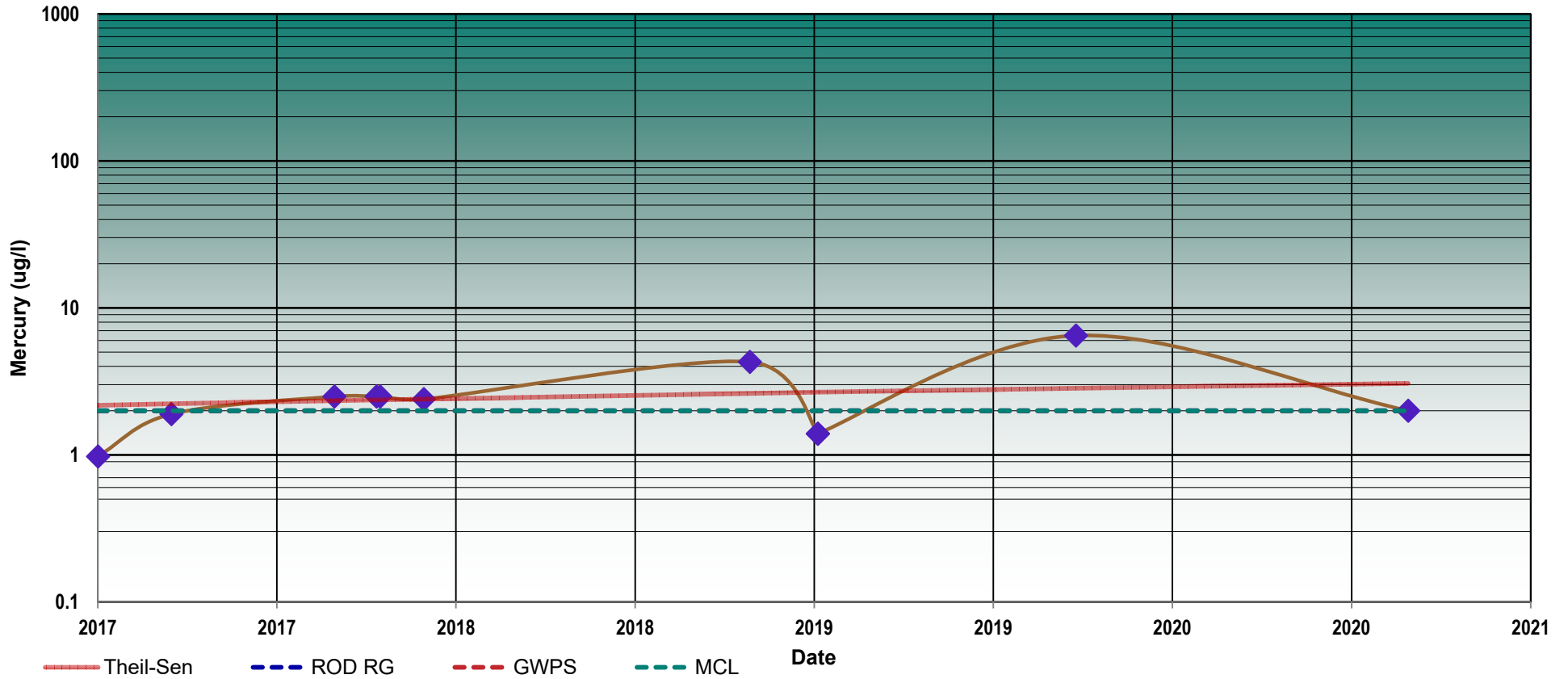
No. Data Pairs = 561	Theil-Sen Slope = 0.00027 ug/l/day	Kendall S = 296	p-Value = 0	Kendall Tau-b = 0.537		
Most Recent Result (ug/l): 2		Most Recent Date: 1/29/21		Average (ug/l): 1		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				2	2	2
				OK	OK	OK

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



PL010D: Mercury, ug/l



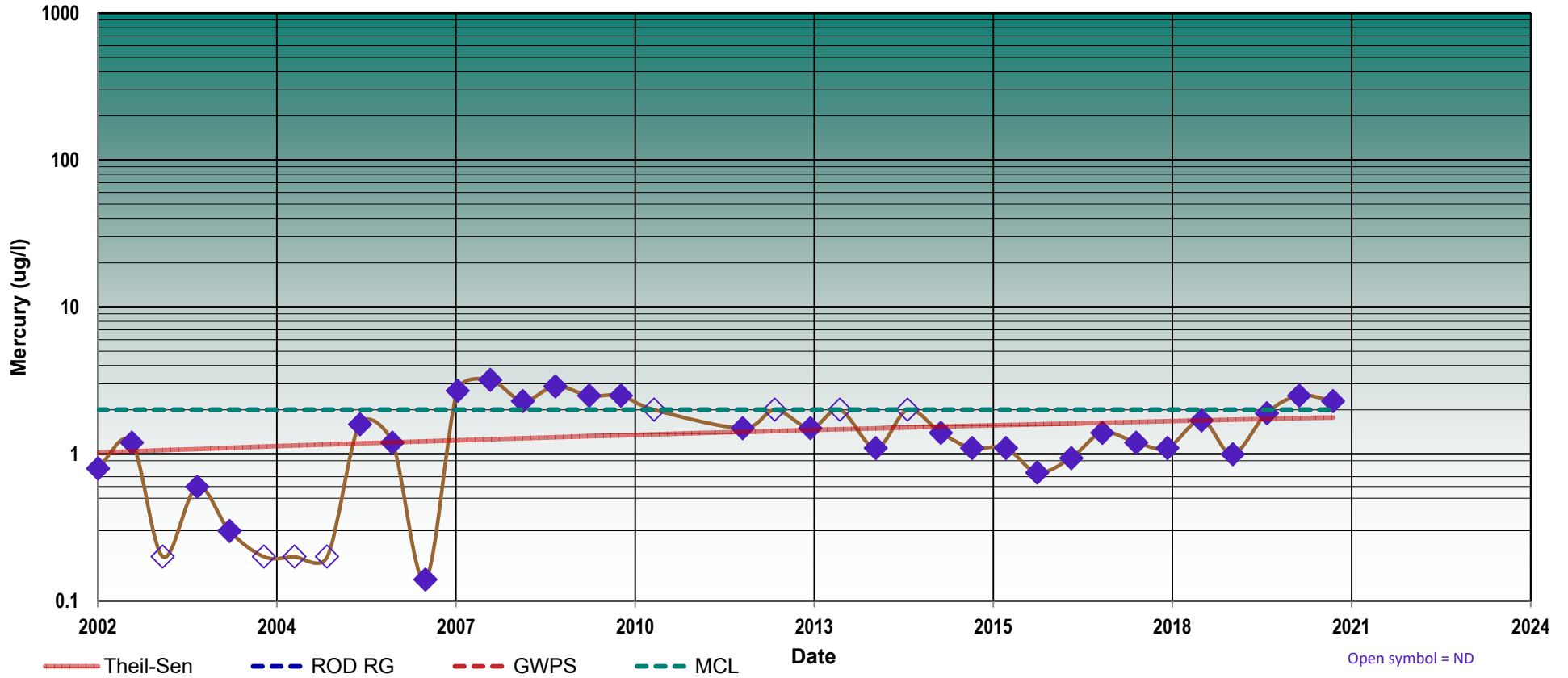
No. Data Pairs = 55	Theil-Sen Slope = 0.00061 ug/l/day	Kendall S = 9	p-Value = 0.5263	Kendall Tau-b = 0.17		
Most Recent Result (ug/l): 2		Most Recent Date: 1/29/21		Average (ug/l): 3		
Theil-Sen and Kendall AGREE that trend is INCREASING p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			OK	OK	OK	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-005: Mercury, ug/l



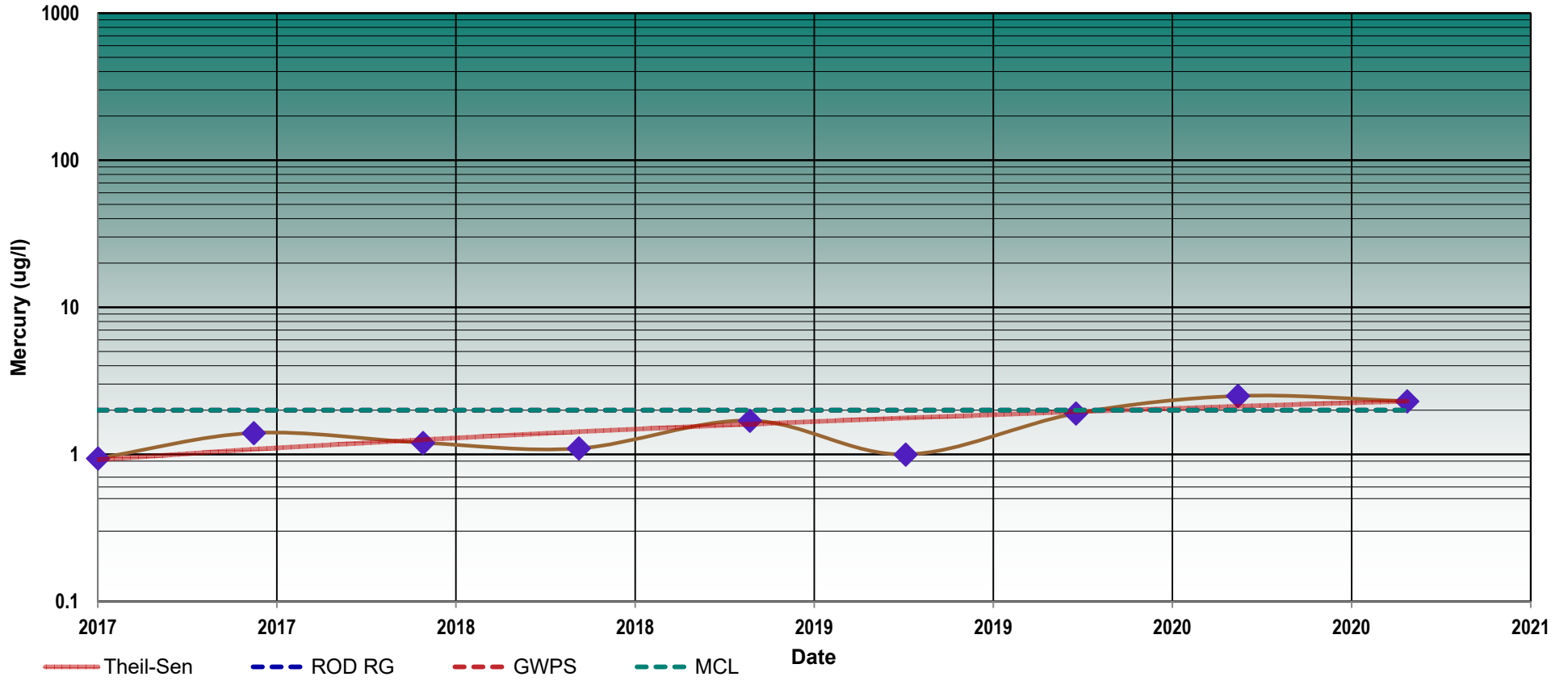
No. Data Pairs = 666	Theil-Sen Slope = 0.00011 ug/l/day	Kendall S = 87	p-Value = 0.2592	Kendall Tau-b = 0.133		
Most Recent Result (ug/l): 2.3		Most Recent Date: 1/28/21		Average (ug/l): 1		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
p-Value: LIKELY STATISTICALLY STABLE (p = 0.2 to 0.75 low probability that the trend is valid)				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



SL-005: Mercury, ug/l



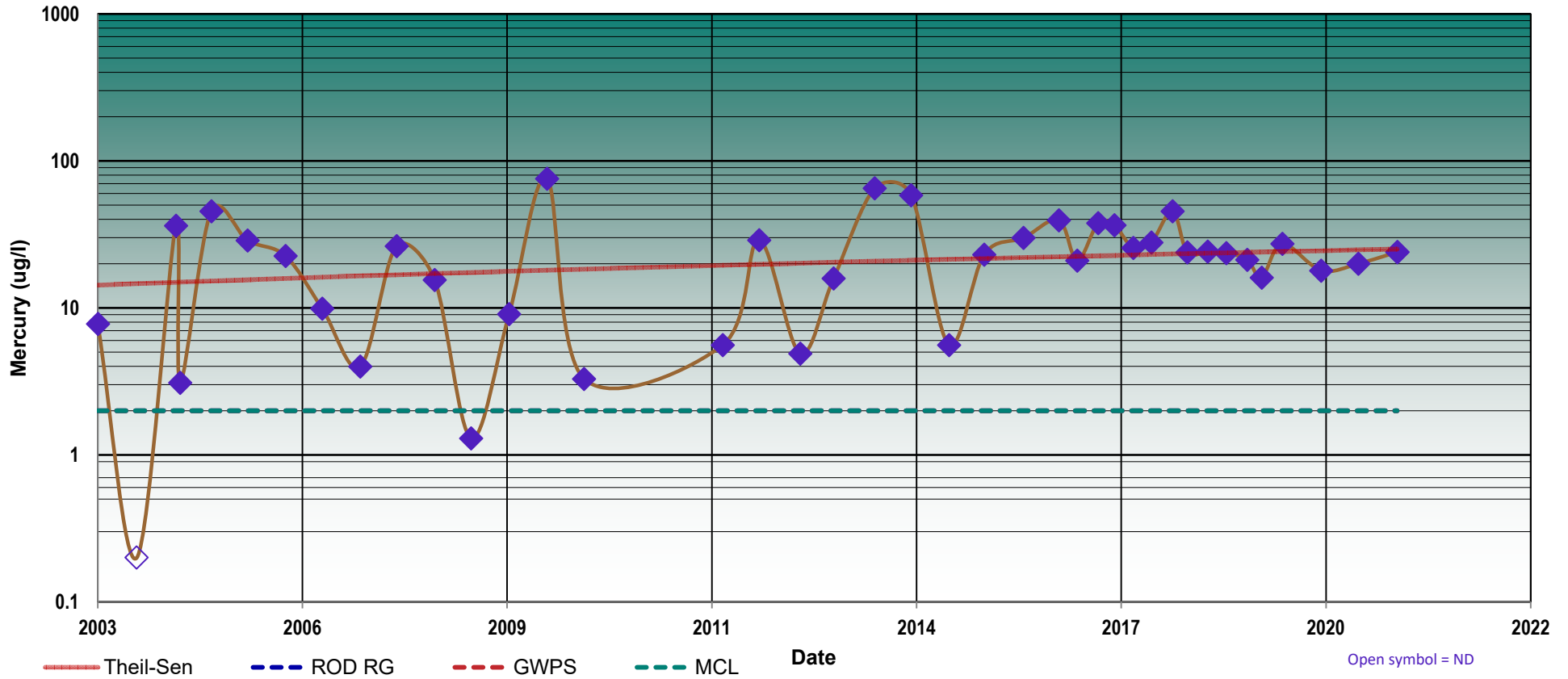
No. Data Pairs = 36	Theil-Sen Slope = 0.00095 ug/l/day	Kendall S = 20	p-Value = 0.0476	Kendall Tau-b = 0.556		
Most Recent Result (ug/l): 2.3		Most Recent Date: 1/28/21		Average (ug/l): 2		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				2	2	2
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WE-003: Mercury, ug/l



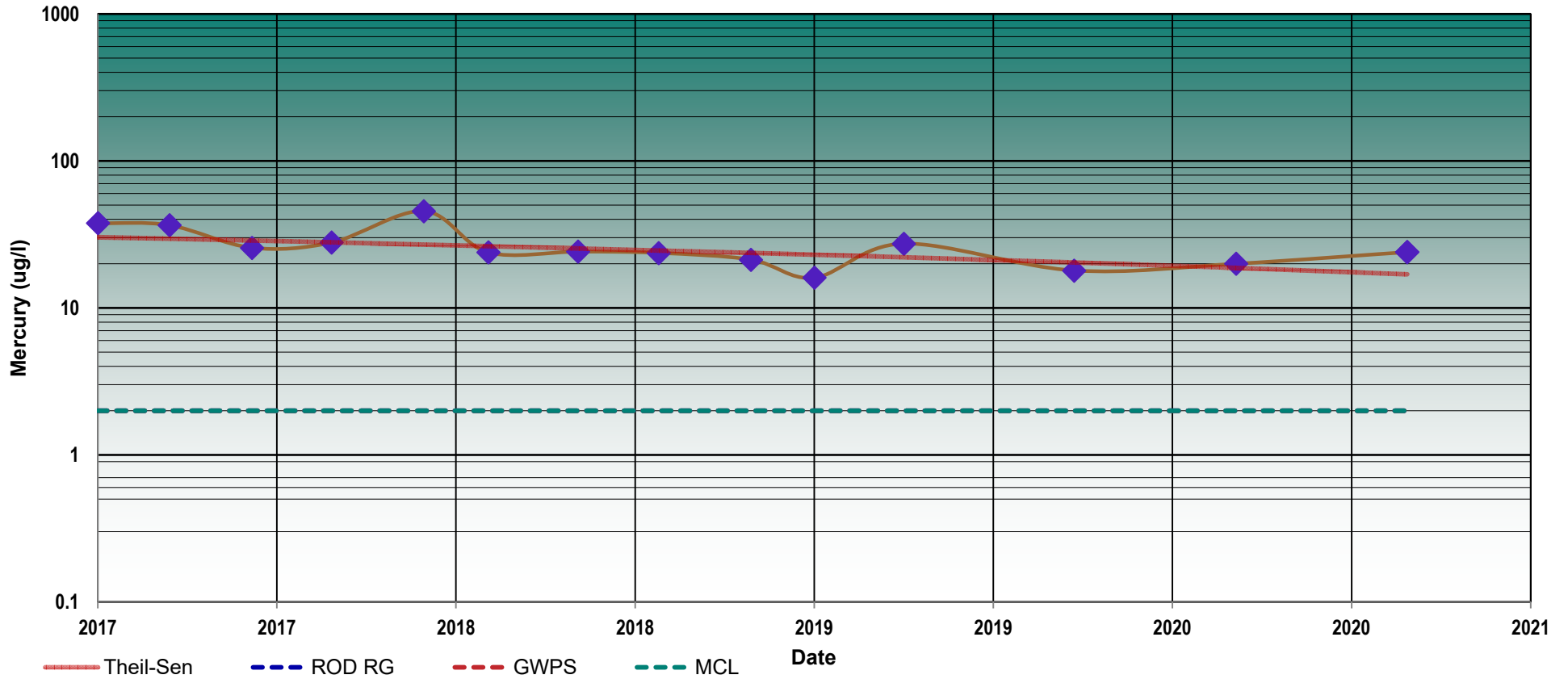
No. Data Pairs = 820	Theil-Sen Slope = 0.00171 ug/l/day	Kendall S = 116	p-Value = 0.1964	Kendall Tau-b = 0.142		
Most Recent Result (ug/l): 24		Most Recent Date: 1/31/21		Average (ug/l): 24		
Theil-Sen and Kendall AGREE that trend is INCREASING				Mercury ug/l		
p-Value: LIKELY VALID STATISTICAL TREND (p = 0.1 to 0.2 probability from 90% to 80%)				GWPS	ROD RG	MCL
				2	2	2
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WE-003: Mercury, ug/l



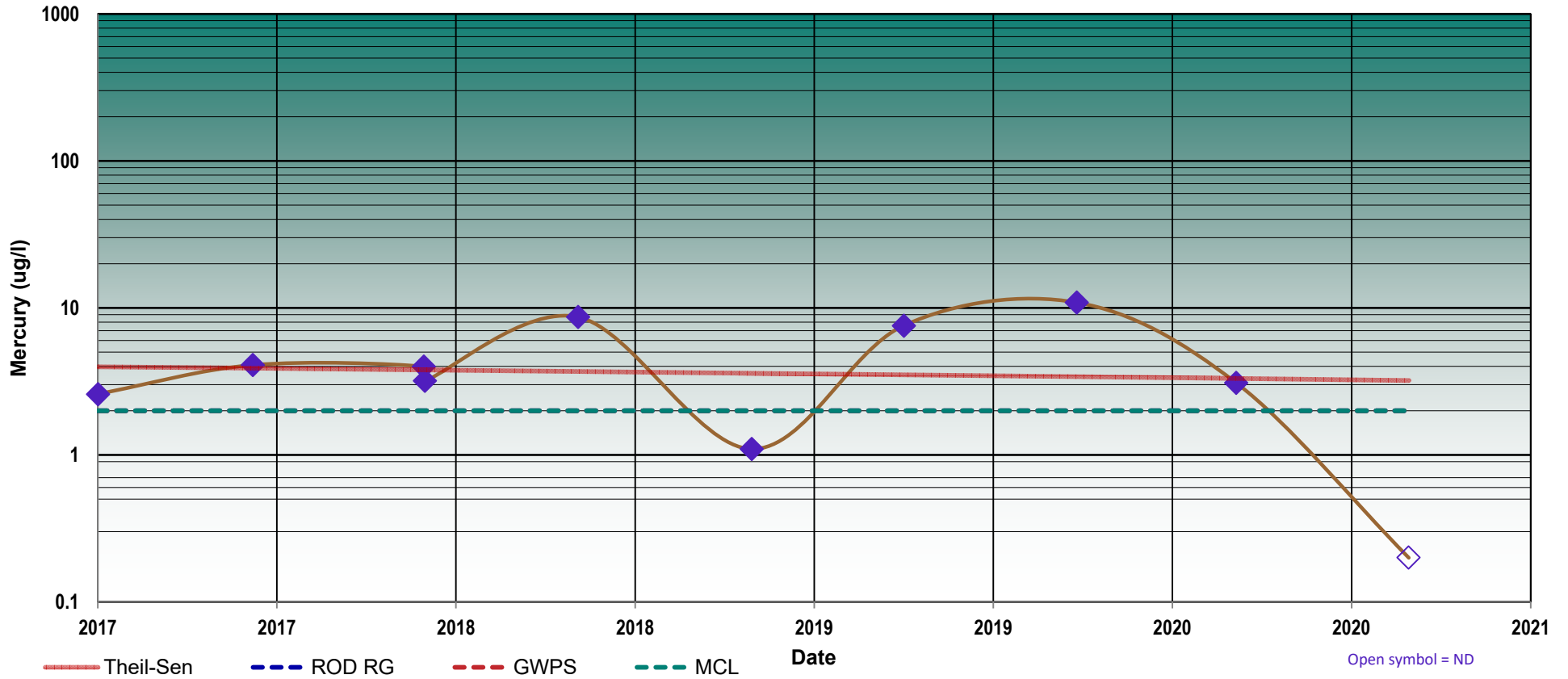
No. Data Pairs = 105	Theil-Sen Slope = -0.00912 ug/l/day	Kendall S = -50	p-Value = 0.0151	Kendall Tau-b = 0.478		
Most Recent Result (ug/l): 24		Most Recent Date: 1/31/21		Average (ug/l): 26		
<p style="text-align: center;">Theil-Sen and Kendall AGREE that trend is DECREASING</p> <p style="text-align: center;">STABLE FOR ALL PRACTICAL PURPOSES</p> <p style="text-align: center;">Statistical slope insufficient to achieve the GWPS in a reasonable timeframe</p>				Mercury ug/l		
				GWPS	ROD RG	MCL
				2	2	2
			Exceeds	Exceeds	Exceeds	

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



WP-003: Mercury, ug/l



No. Data Pairs = 45	Theil-Sen Slope = -0.00052 ug/l/day	Kendall S = -3	p-Value = 0.858	Kendall Tau-b = 0.067		
Most Recent Result (ug/l): Not Detected		Most Recent Date: 2/1/21		Average (ug/l): 5		
Theil-Sen and Kendall AGREE that trend is DECREASING				Mercury ug/l		
p-Value: STATISTICALLY STABLE (p > 0.75 probability greater than 75%)				GWPS	ROD RG	MCL
				2	2	2
				OK	OK	OK

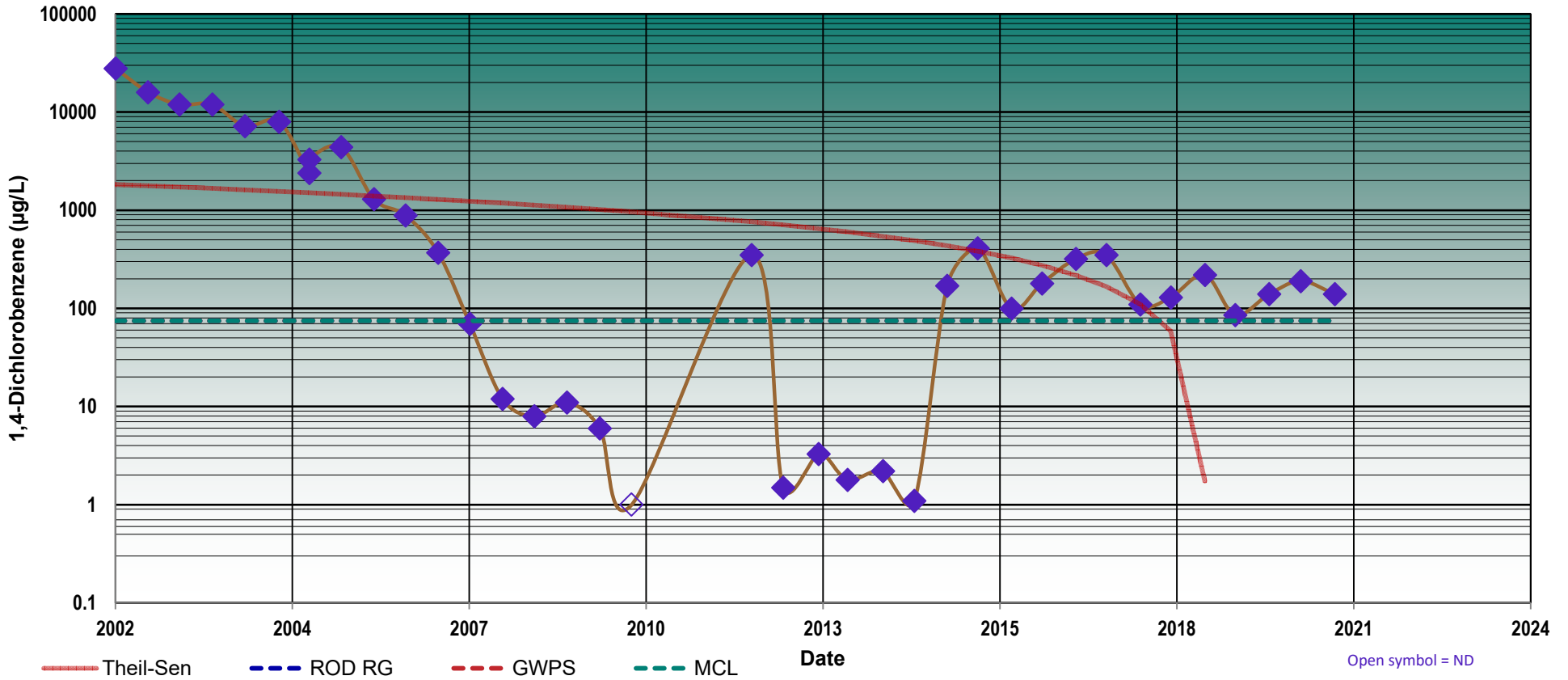
GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



Miocene Aquifer Plots

MP-009: 1,4-Dichlorobenzene, µg/L



No. Data Pairs = 666	Theil-Sen Slope = -0.29655 µg/L/day	Kendall S = -268	p-Value = 0.0005	Kendall Tau-b = 0.404		
Most Recent Result (µg/L): 140		Most Recent Date: 1/31/21		Average (µg/L): 2672		
Theil-Sen and Kendall AGREE that trend is DECREASING				1,4-Dichlorobenzene µg/L		
p-Value: VALID STATISTICAL TREND (p < 0.1 probability greater than 90%)				GWPS	ROD RG	MCL
				75	75	75
				Exceeds	Exceeds	Exceeds

GWPS - Groundwater Protection Standard ROD RG - Record of Decision Remedial Goal MCL - Federal Maximum Contaminant Level -- Value not established

**Mann-Kendall / Theil-Sen
Groundwater Trend Analysis**
Olin Corporation (McIntosh Plant) OU1
McIntosh, Alabama



Attachment 2

Estimated Contaminant Distributions in Groundwater

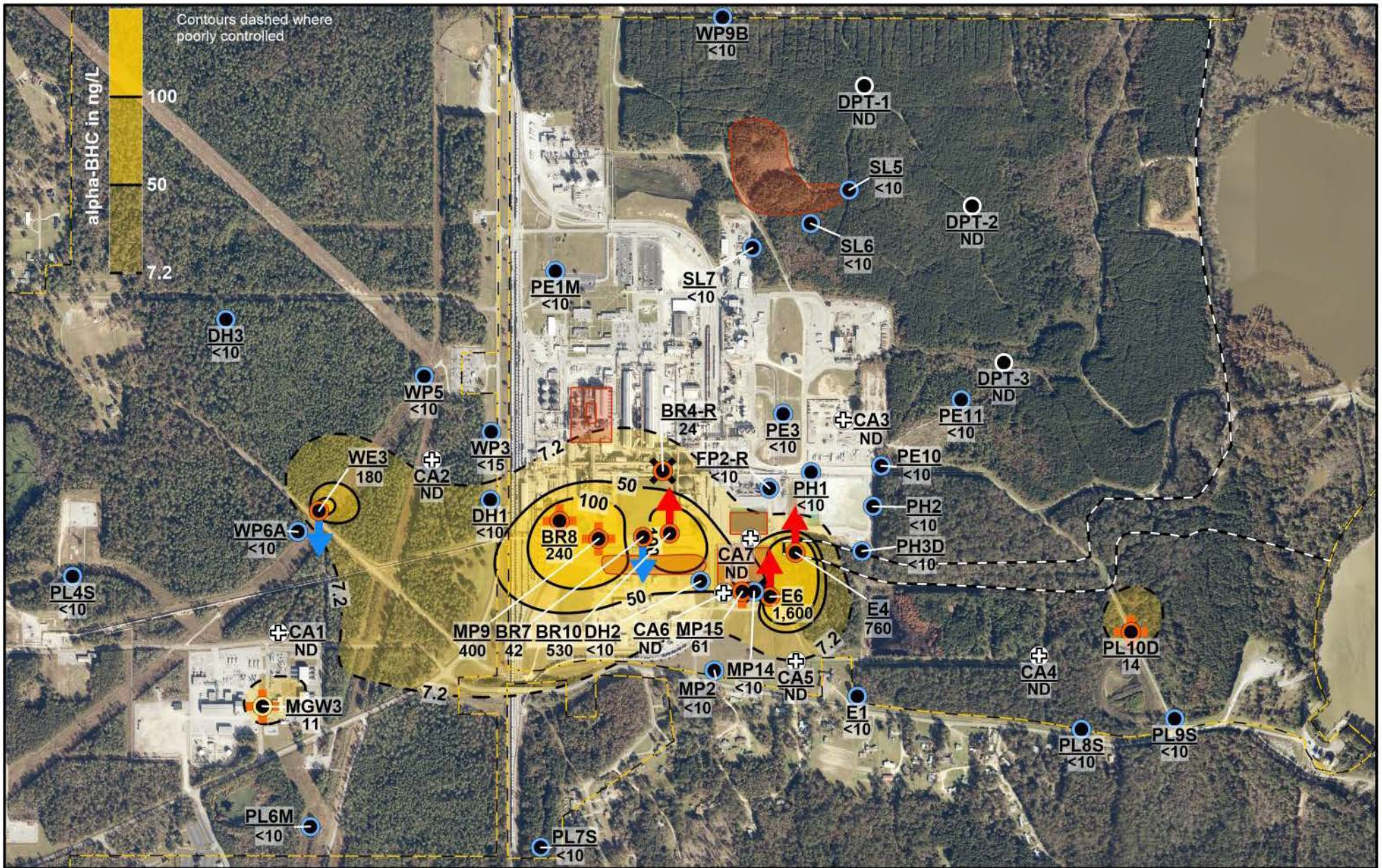
The distributions of contaminants in groundwater were estimated by EPA to provide an indication of the potential spatial coverage of exceedances of the Groundwater Protection Standards (GWPSs). The contaminants selected for these distribution analyses included the following:

- Volatile Organic Compounds (VOCs)
 - Carbon Tetrachloride
 - Chlorobenzene
 - Chloroform
- Hexachlorocyclohexanes (BHCs)
 - a-BHC
 - b-BHC
 - d-BHC
- Mercury

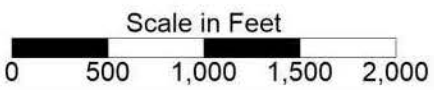
These contaminants include those having some of the highest frequencies of exceeding the GWPSs. The contaminant concentrations used for these analyses are the highest concentrations detected in the current database or provided in the Comprehensive Annual Reports from 2020, 2021, and 2022. For locations that did not have a detection, the lowest detection limit reported was used as the concentration. “J” estimated values were at the estimated concentration. A total of 52 wells were included for the alluvial aquifer. For well locations with wells completed at multiple depths, the well with the highest concentration was used.

The distribution estimates were made using Surfer® 23.4.238, July 30, 2022. Surfer® was used to prepare regular grid files from the irregularly spaced data points using the “Kriging” method with the log value of the concentration used for gridding. The X and Y domain of the grid area was specified to provide sufficient coverage. The grid spacing was set at 5 feet. All other data handling options were set to the Surfer® default values.

Alluvial Aquifer Contaminant Distributions



Federal Maximum Contaminant Level not established
 Record of Decision Remedial Goal = 13 ng/L
 Groundwater Protection Standard = 7.2 ng/L
 Posted values are alpha-BHC in ng/L
 ND - No Data



Potential OU1 Sources

- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS

Exceedance Location Trends (2017-2021)

- Decreasing (Blue arrow pointing down)
- Increasing (Red arrow pointing up)
- Stable (Orange plus sign)
- Not Calculated (Black X)

Trends not calculated for locations with too few samples or less than 50 percent detections

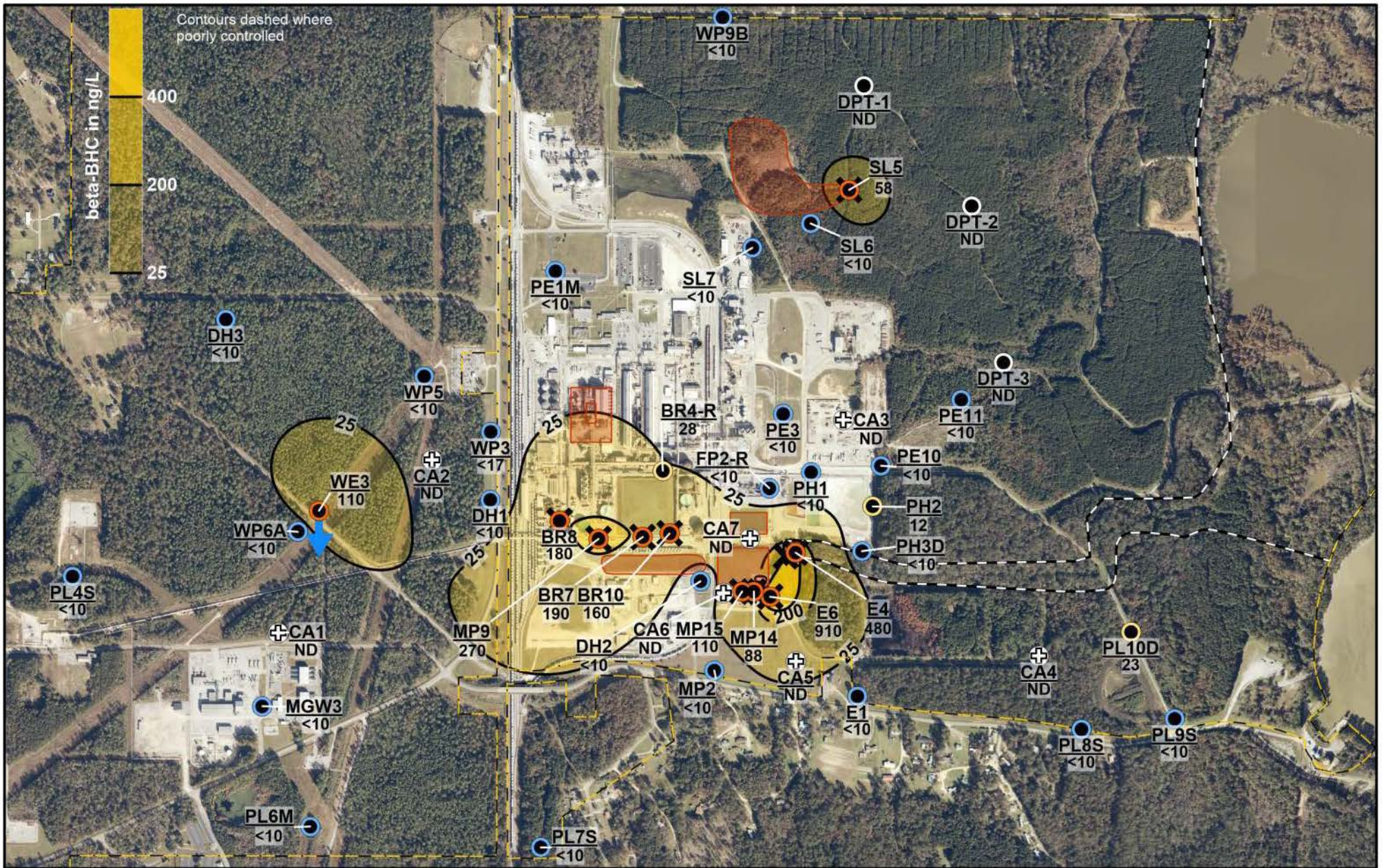


BHC - Hexachlorocyclohexane

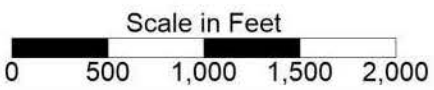
OU2

Alluvial Aquifer alpha-BHC

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



Record of Decision Remedial Goal and Federal Maximum Contaminant Level not established
 Groundwater Protection Standard = 25 ng/L
 Posted values are beta-BHC in ng/L
 ND - No Data



Potential OU1 Sources

- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS

Exceedance Location Trends (2017-2021)

- Decreasing (Blue arrow pointing down)
- Increasing (Red arrow pointing up)
- Stable (Orange plus sign)
- Not Calculated (Black X)

Trends not calculated for locations with too few samples or less than 50 percent detections

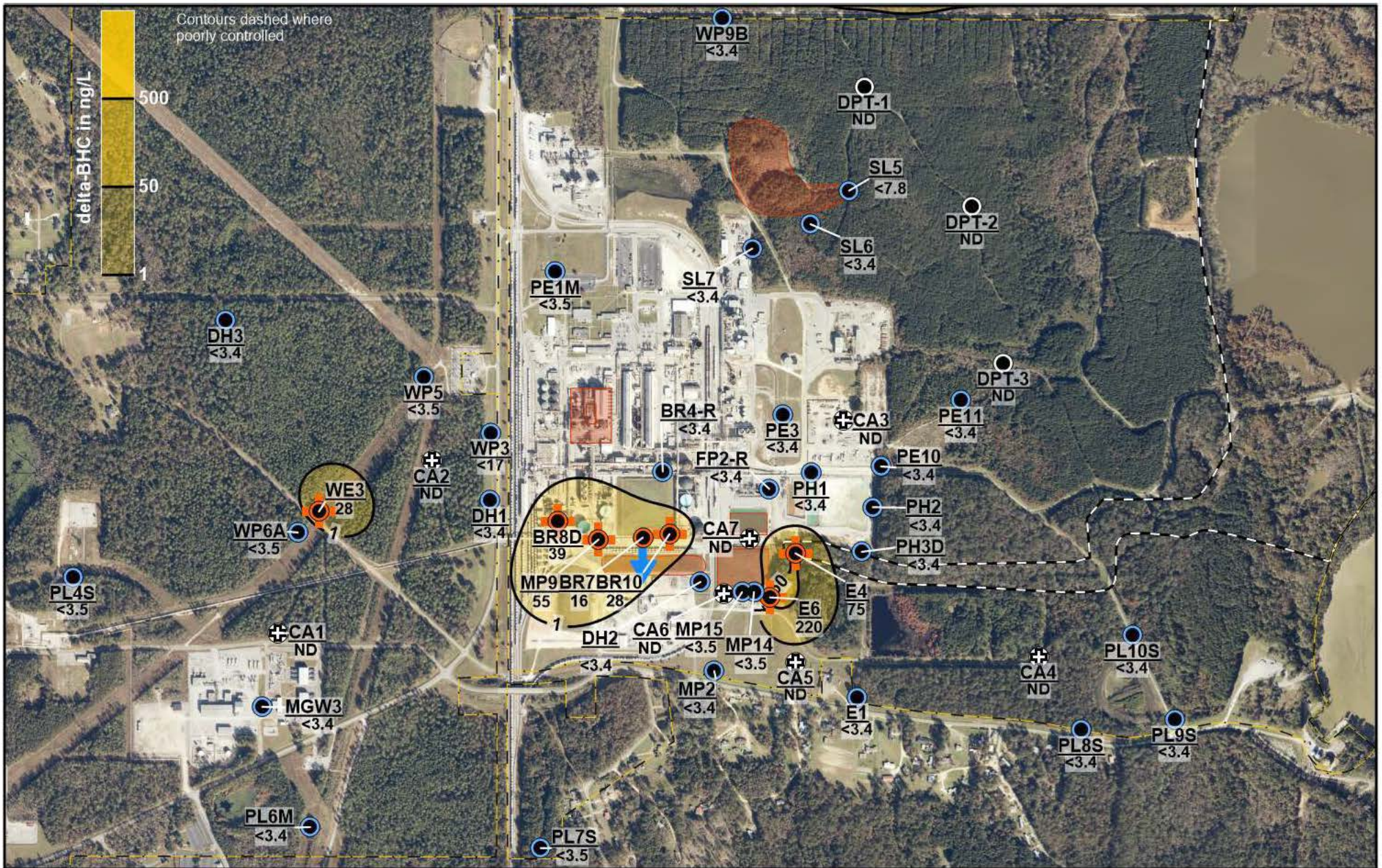


BHC - Hexachlorocyclohexane

OU2

Alluvial Aquifer beta-BHC

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



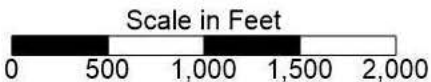
Contours dashed where poorly controlled



Record of Decision Remedial Goal & Federal Maximum Contaminant Level not established
 Groundwater Protection Standard = Detection Limit
 Posted values are delta-BHC in ng/L
 ND - No Data

**Potential
 OU1 Sources**

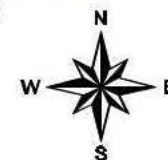
- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS



Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

Trends not calculated for locations with too few samples or less than 50 percent detections

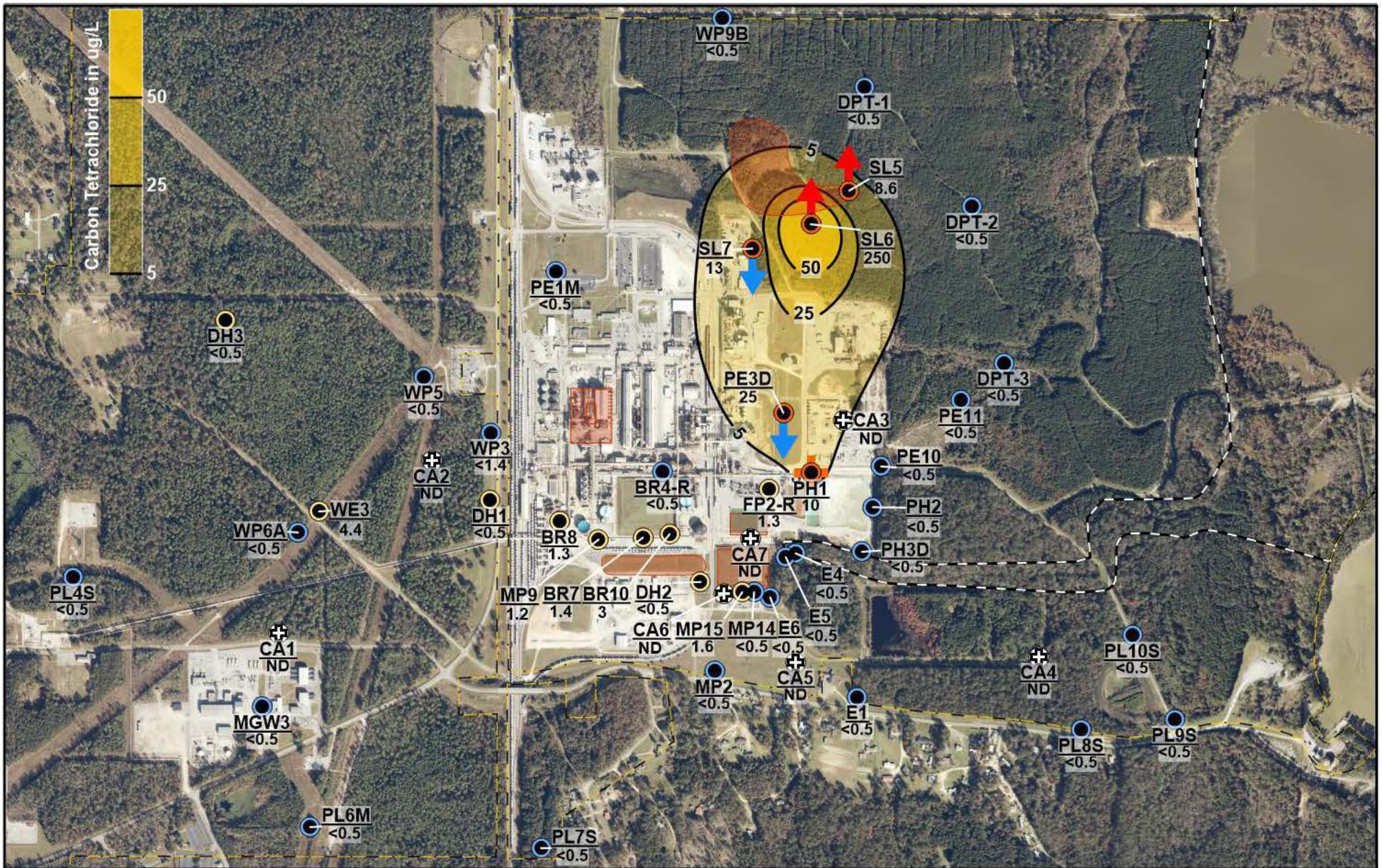


BHC - Hexachlorocyclohexane

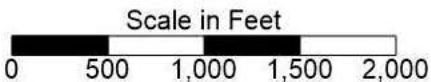
OU2

**Alluvial Aquifer
 delta-BHC**

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



Record of Decision Remedial Goal not established
 Federal Maximum Contaminant Level &
 Groundwater Protection Standard = 5 ug/L
 Posted values are carbon tetrachloride in ug/L



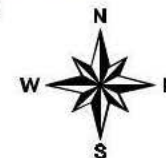
**Potential
OU1 Sources**

- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS

Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

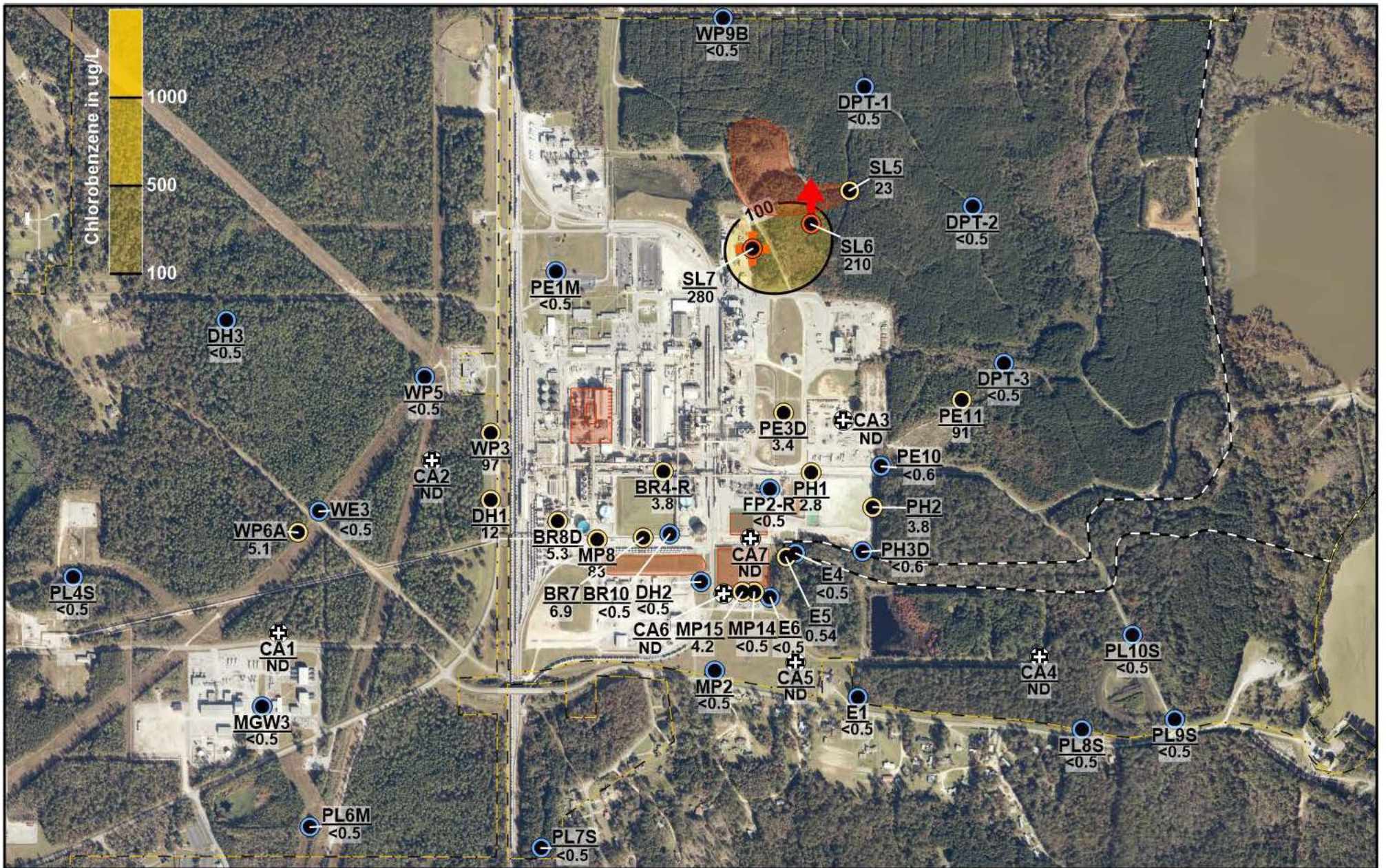
Trends not calculated for locations with too few samples or less than 50 percent detections



OU2

**Alluvial Aquifer
Carbon Tetrachloride**

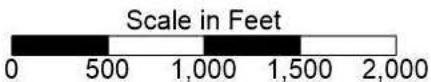
Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



Record of Decision Remedial Goal,
 Federal Maximum Contaminant Level, &
 Groundwater Protection Standard = 100 ug/L
 Posted values are chlorobenzene in ug/L

**Potential
 OU1 Sources**

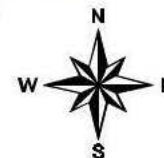
- Alluvium Monitoring Well
- ⊕ Inactive Alluvium Extraction Well
- Not Detected
- Detected Below GWPS
- Exceeds GWPS



Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

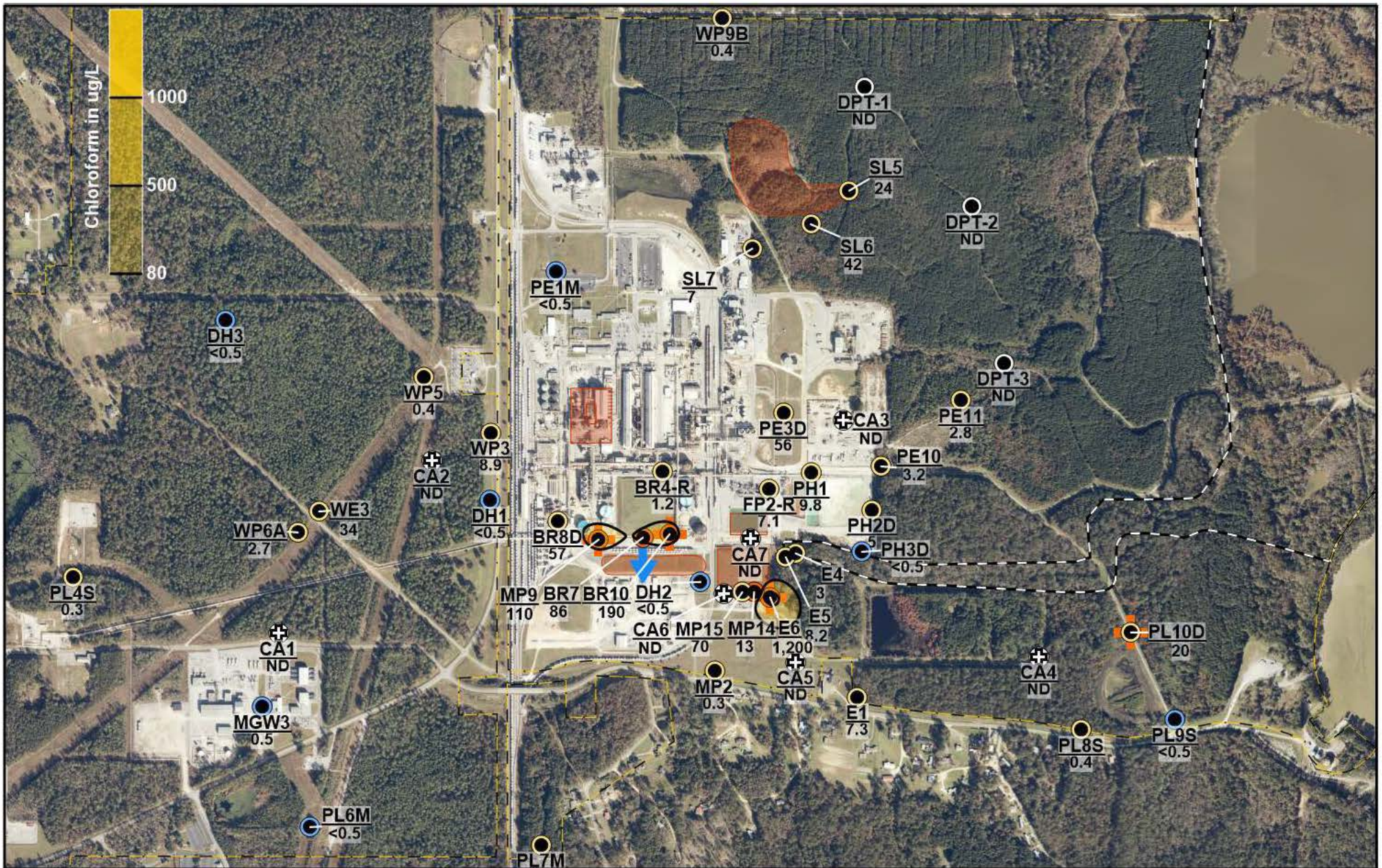
Trends not calculated for locations with too few samples or less than 50 percent detections



OU2

**Alluvial Aquifer
 Chlorobenzene**

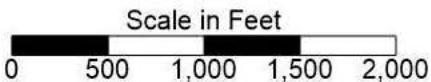
Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



Record of Decision Remedial Goal not established
 Federal Maximum Contaminant Level &
 Groundwater Protection Standard = 80 ug/L
 Posted values are chloroform in ug/L

**Potential
 OU1 Sources**

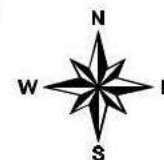
- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS



Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

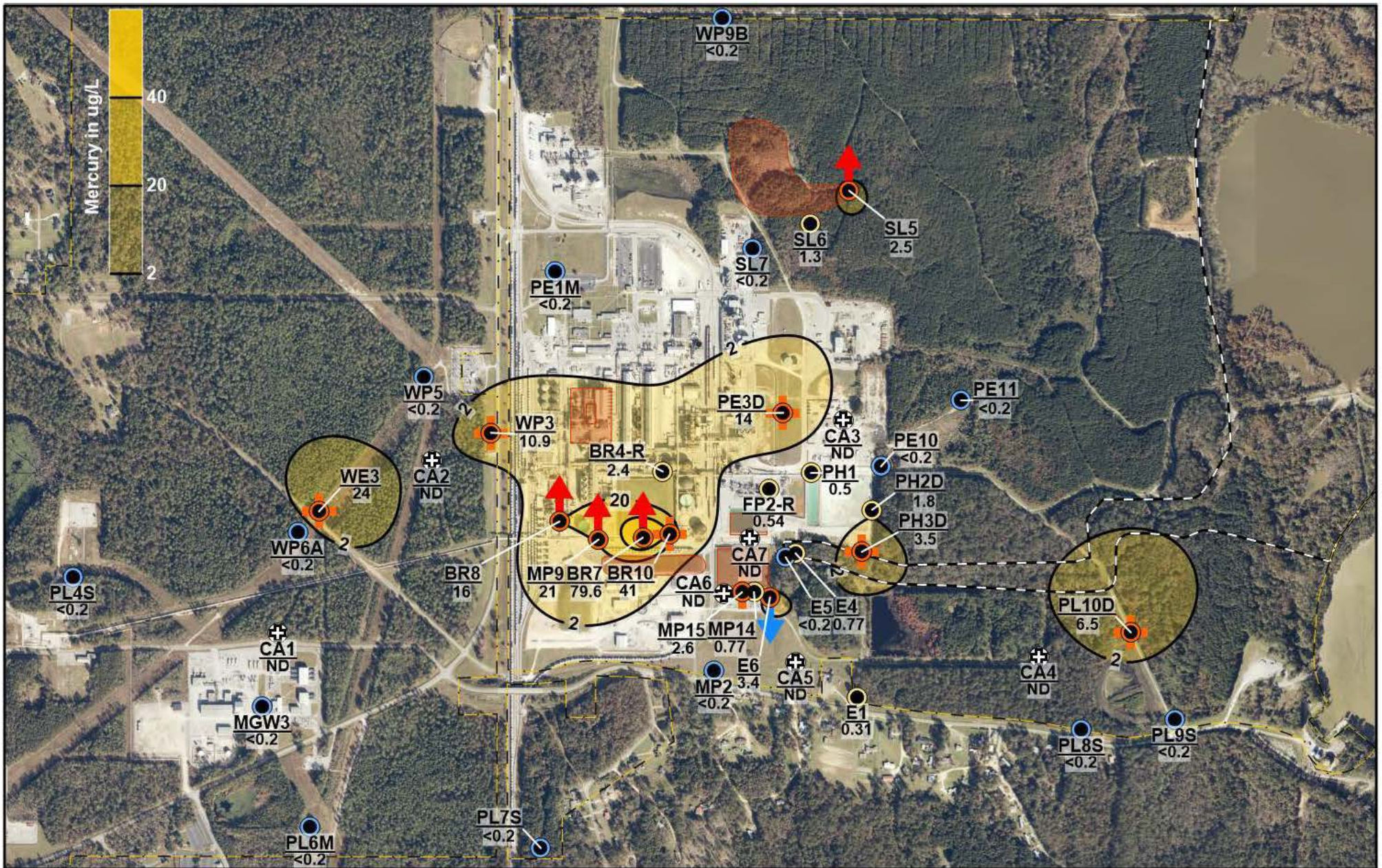
Trends not calculated for locations with too few samples or less than 50 percent detections



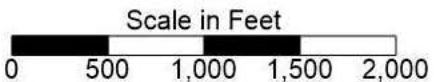
OU2

**Alluvial Aquifer
 Chloroform**

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama



Record of Decision Remedial Goal,
 Federal Maximum Contaminant Level, &
 Groundwater Protection Standard = 2 ug/L
 Posted values are mercury in ug/L
 ND - No Data



**Potential
 OU1 Sources**

- Alluvium Monitoring Well
- ⊕ Abandoned Alluvium Extraction Well
- ND - No Data
- Not Detected
- Detected Below GWPS
- Exceeds GWPS

Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

Trends not calculated for locations with too few samples or less than 50 percent detections

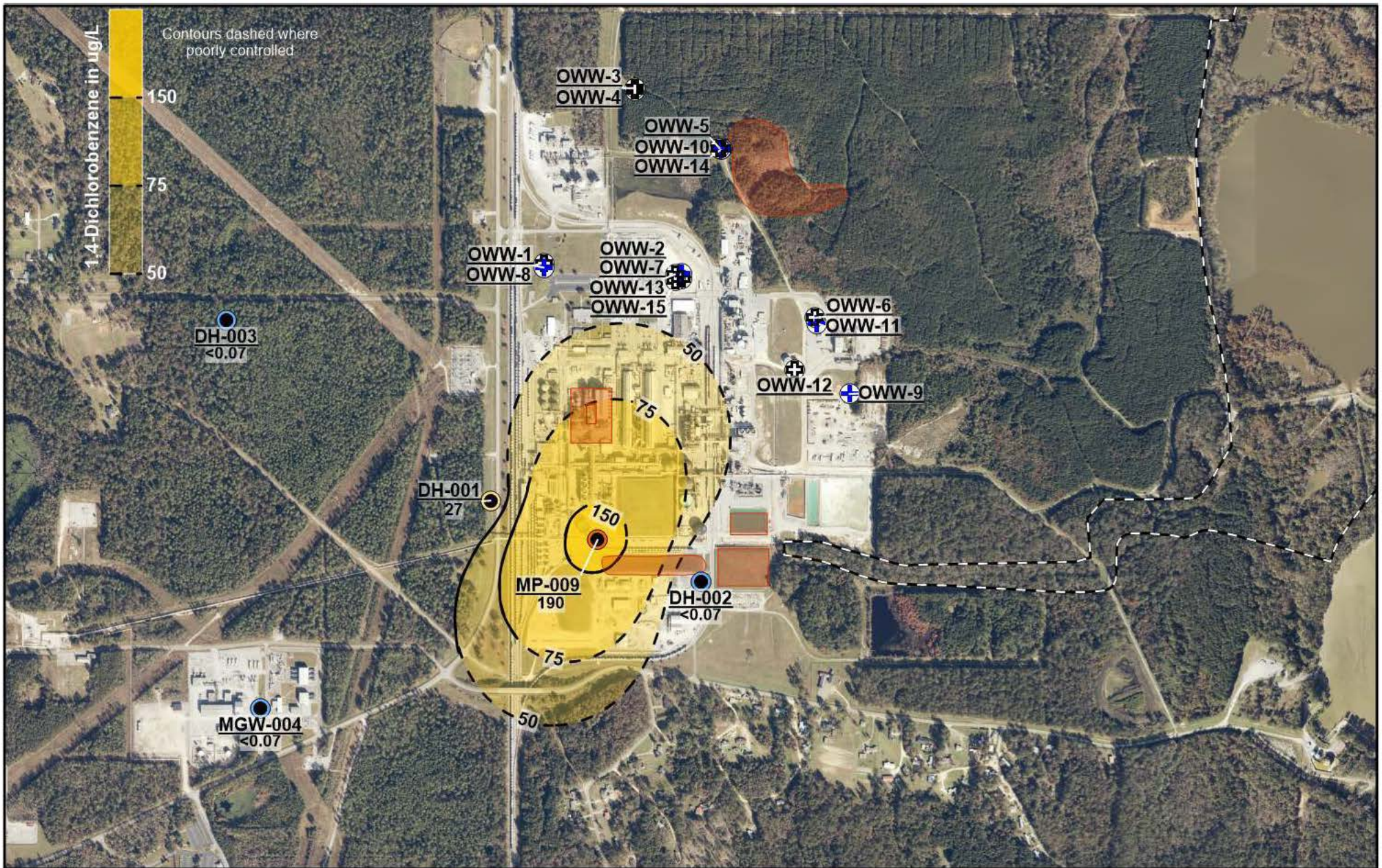


OU2

**Alluvial Aquifer
 Mercury**

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama

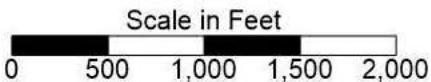
Miocene Aquifer Contaminant Distributions



Record of Decision Remedial Goals,
 Federal Maximum Contaminant Level, &
 Groundwater Protection Standard = 75 ug/L
 Posted values are 1,4-dichlorobenzene in ug/L
 No data for production wells

**Potential
 OU1 Sources**

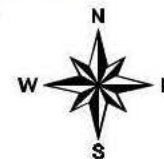
- Upper Miocene Monitoring Well
- ⊕ Inactive Upper Miocene Production Well
- ⊕ Active Upper Miocene Production Well
- Not Detected
- Detected Below GWPS
- Exceeds GWPS



Exceedance Location Trends (2017-2021)

- | | |
|-----------------|---------------------|
| Decreasing
↓ | Stable
+ |
| Increasing
↑ | Not Calculated
X |

Trends not calculated for locations with too few samples or less than 50 percent detections



OU2

**Upper Miocene Aquifer
 1,4-Dichlorobenzene**

Olin Corp. (McIntosh Plant) Superfund Site
 McIntosh, Alabama