



October 25, 2018

Mr. Leo Hellested, P.E.
Office of Waste Management
Solid Waste Section
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908-5767

Attn: Mr. Robert Schmidt

Re: **Quarterly Monitoring Report
3rd Quarter (September) 2018, Groundwater Monitoring, Sampling, and Analysis
Tiverton Municipal Sanitary Landfill**
Pare Project No.: 94139.24

Dear Mr. Hellested:

Enclosed herewith are results of the statistical analysis of groundwater monitoring data for the third quarterly monitoring round of Year 2018 from the Tiverton Landfill (Landfill). Pare Corporation (Pare) has prepared this report on behalf of the Town of Tiverton (Town). In the 2017 Annual Groundwater Monitoring Report, Pare recommended that overburden well OW-7 and bedrock well OW-16 be included in the groundwater monitoring program. As such, Pare conducted the groundwater sampling on September 27, 2018 at the compliance wells OW-7, OW-12, OW-13, OW-15, and OW-16. Pare was unable to retrieve groundwater samples at the background well OW-9 and compliance well OW-14 due to dry conditions.

Groundwater samples were analyzed by New England Testing Laboratory (NETLAB) of West Warwick, Rhode Island for the constituents listed in Appendix A (Detection Monitoring) of the State Solid Waste Regulations. Certified laboratory results data are enclosed and are summarized on attached Tables 1-3.

Groundwater field parameters consisting of temperature, pH, and specific conductivity were measured at each monitoring well, in accordance with the RIDEM-approved Groundwater Monitoring Plan for the Landfill. Field parameters were collected until three successive measurements stabilized within $\pm 3\%$ for temperature, ± 0.1 standard unit for pH, and $\pm 3\%$ for specific conductivity, in accordance with US EPA's Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. Field parameters are documented on Field Sampling Data Sheets, which are enclosed. pH was unable to be monitored at the Landfill in September 2018 due to a malfunction of the equipment at the time of sampling.

Combustible gases are monitored at each well and at the top of the Landfill. Combustible gases were unable to be monitored at the Landfill in September 2018 due to a malfunction of the gas monitoring equipment at the time of sampling.

Recent sampling rounds have been during periods of dry conditions; as such, samples collected contained a high amount of silt and suspended particles. Reported concentrations of heavy metals were higher than usual, and the degree of suspended particles observed in the samples may have impacted heavy metal concentrations.

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Pare believes these results were an anomaly and not indicative of typical groundwater quality. Therefore, Pare updated the groundwater monitoring program in the 2016 Annual Groundwater Monitoring Report to include a 10-15 settling minute period for turbidity to drop out of suspension, before the sample is decanted and then stored in laboratory glassware with preservative. Additionally, during the March 2017 monitoring round, accumulated sediment in the bottom of wells at the Landfill was removed prior to sampling.

HUMAN HEALTH THRESHOLD EVALUATION

Compliance Well OW-7 – Nine (9) target metals were reported in the groundwater sample collected from OW-7. No (0) target metals were reported above their corresponding MCLs or human health thresholds at OW-7. One (1) target VOC, MTBE, was reported above laboratory detection limits. No (0) target VOCs were reported above their corresponding MCLs or human health thresholds at OW-7.

Compliance Well OW-12 – Six (6) target metals were reported in the groundwater sample collected from OW-12. No (0) target metals were reported above their corresponding MCLs or human health thresholds at OW-12. No (0) target VOCs were reported above laboratory detection limits at OW-12.

Compliance Well OW-13 – Nine (9) target metals were reported in the groundwater sample collected from OW-13. One (1) reported metal, arsenic (0.01 mg/L), was reported at its MCL (0.01 mg/L). No (0) target VOCs were reported above laboratory detection limits at OW-13.

Compliance Well OW-14 – No samples were collected from OW-14 due to dry conditions.

Compliance Well OW-15 – Nine (9) target metals were reported in the groundwater sample collected from OW-15. Two (2) reported metals; arsenic (0.03 mg/L) and cadmium (0.007 mg/L); exceeded their MCLs (0.01 mg/L and 0.005 mg/L, respectively). Two (2) target VOCs; chlorobenzene and MTBE; were reported above their laboratory detection limits. No (0) target VOCs were reported above their corresponding MCLs or human health thresholds at OW-15.

Compliance Well OW-16 (new bedrock well) – Six (6) target metals were reported in the groundwater sample collected from OW-16. No (0) target metals were reported above their corresponding MCLs or human health thresholds at OW-16. One (1) target VOC, MTBE, was reported above laboratory detection limits. No (0) target VOCs were reported above their corresponding MCLs or human health thresholds at OW-16.

Background Well OW-9 – No samples were collected from OW-9 due to dry conditions.



TOLERANCE INTERVAL STATISTICAL EVALUATION

The Tolerance Interval (TI) approach was used to develop Tolerance Limits (TLs) for each target inorganic constituent (i.e., metals) using the background well analytical results from the eight preceding rounds for which analytical results are available. The background well, OW-9, could not be sampled in this monitoring round along with several previous monitoring rounds including in the June 2016, September 2016, June 2017, and September 2017 monitoring rounds due to dry conditions. Therefore, analytical results of the eight most recent rounds in which samples could be collected were utilized to generate the TLs for this monitoring round, dating back to March 2015. The TI approach is considered inappropriate for analysis of organic constituents and was therefore not performed to evaluate the results of reported VOCs. Table 2 summarizes historical results data from OW-9 used in the calculation of the TLs.

Four (4) of the metals concentration reported in September 2018; arsenic, barium, cobalt, and vanadium; exceeded their corresponding TLs calculated during this monitoring round in at least one compliance well. In total, there were eight (8) TL exceedances of these metals in this monitoring round. The TLs and the corresponding compliance well data from this monitoring round are presented in Table 3. Each of these metals is routinely detected in groundwater beneath the landfill.

CUSUM METHOD STATISTICAL EVALUATION

The Shewhart-CUSUM Method, a supplemental statistical analysis method used in addition to the TI Method, was performed in accordance with the US EPA documents titled "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Interim Final Guidance, April 1989" and "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Addendum to Interim Final Guidance, July, 1992".

Barium and nickel at OW-12 exceeded both of their respective Shewhart-CUSUM thresholds during the September 2018 monitoring round.

The dry conditions present during the September 2016 monitoring round were believed by Pare to have resulted in higher than usual suspended solids in samples collected, which are believed to have also resulted in atypical metals concentrations. As a result, the results of the Shewhart-CUSUM analysis for September 2016 were believed to be an anomaly. In many cases these deviations are outside of the statistical range expected. With the inception of the updated groundwater monitoring program, Pare has reset the Shewhart-CUSUM levels for several metals at multiple wells in order to have an accurate representation of cumulative statistical analysis of these constituents. The metals that have had their Shewhart-CUSUM thresholds reset include: chromium, lead, nickel, vanadium, and zinc at OW-12; barium, cadmium, cobalt, copper, lead, and vanadium at OW-13; zinc at OW-14; and arsenic, cadmium, chromium, cobalt, lead, nickel, vanadium, and zinc at OW-15. It should be noted that the reset of zinc at OW-14 is due to a statistical spike in the Shewhart-CUSUM limit during the September 2015 monitoring round (which was also sampled during dry conditions). These Shewhart-CUSUM parameters were reset prior to the March 2017 sampling round; therefore, data recorded from the March 2017 monitoring round is present in the analysis.



ASSESSMENT MONITORING

The Shewhart-CUSUM analysis is utilized, along with the Tolerance Limits, to identify when Assessment Monitoring should be performed.

Pare performed Assessment Monitoring at OW-14 in the December 2017 monitoring round due to an exceedance of the Shewhart-CUSUM threshold of antimony in the June 2017 monitoring period. This Assessment Monitoring was delayed from September 2017 to December 2017 due to dry conditions in September, rendering a sample unattainable. One Appendix B parameter, sulfides (0.04 mg/L), was detected in the December 2017 monitoring round. In the 2017 Annual Groundwater Monitoring report, Pare recommended that groundwater samples from OW-14 in the March 2018 monitoring round be tested again for sulfides. Again, the Appendix B parameter sulfides (0.04 mg/L) was detected in the samples collected from OW-14 in March 2018.

Pare performed Assessment Monitoring at OW-13 in the June 2018 monitoring round due to an exceedance of both the TL and the Shewhart-CUSUM threshold of barium in the March 2018 monitoring round. No (0) Appendix B parameters were reported in samples collected from OW-13. Sulfides were not detected at OW-13 in the June 2018 monitoring round.

Pare attempted to sample OW-14 in the September 2018 monitoring round to test for sulfides; however, a sample was unobtainable due to dry conditions.

MTBE ANALYSIS

Many of the most recent Assessment Monitoring rounds have been conducted due to MTBE concentrations in groundwater. Reported MTBE concentrations have generally risen since September 2006, as depicted in the attached figure titled Reported Concentrations of MTBE. The figure compares the recent increases in reported MTBE concentrations at OW-13, OW-14 and OW-15 to historical concentrations and drinking water advisories defined in the US EPA document titled “2011 Edition of the Drinking Water Standards and Health Advisories”. Although reported MTBE concentrations appear to be trending slowly upward, MTBE has never been reported above its odor threshold (0.020 mg/L) or its taste threshold (0.040 mg/L). The US EPA has not established a human health advisory concentration for MTBE.

Because the elevated concentrations of MTBE have recently triggered Assessment Monitoring at OW-13, OW-14, and OW-15, and that no Appendix B parameters were reported to a significant degree at these wells, it is Pare’s opinion that the increasing trend in MTBE concentrations beneath the Landfill is an isolated phenomenon and not the result of a significant change in groundwater quality beneath the Landfill.

Despite CUSUM values of MTBE at OW-13, OW-14, and OW-15 remaining above their threshold during the September 2017 monitoring round, Pare does not recommend assessment monitoring due to the aforementioned MTBE trend. The lack of Appendix B parameters in the past, in conjunction with the lack of Appendix B parameters at OW-13 and OW-15 during the December 2016 monitoring round, and the lack of Appendix B parameters at OW-14 during the June 2016 monitoring round, suggests that the presence of MTBE trend does not indicate an increased likelihood that Appendix B parameters would be present beneath the Landfill.



CONCLUSIONS AND RECOMMENDATIONS

Currently, the Landfill conducts Detection Monitoring for the parameters listed in Appendix A of the State Solid Waste Regulations, as well as mercury and tin. During this monitoring round, four (4) metals; arsenic, barium, cobalt and vanadium; exceeded their tolerance limits (TLs) in at least one well. Arsenic, barium and cobalt also exceeded their TLs during the previous monitoring round at OW-13 and OW-15. TL exceedances in two consecutive monitoring rounds is one of the criteria used to consider introducing Assessment Monitoring in subsequent monitoring rounds.

Pare does not recommend Assessment Monitoring at the Landfill during the upcoming December 2018 monitoring round as the criteria to warrant Assessment Monitoring were not met in the September 2018 monitoring round.

During the 2016 and 2017 monitoring periods, a rising trend in detections of antimony at the compliance wells became apparent. Antimony was detected at the background well above its MCL during the December 2017 monitoring round. Previously, antimony had not been detected at the background well since the September 2011 monitoring round. The detection of antimony at compliance well OW-14 in the June 2017 monitoring round triggered Assessment Monitoring, which was performed in the December 2017 monitoring round. The Assessment Monitoring resulted in detection of one Appendix B parameter, sulfides (0.04 mg/L). However, antimony was not detected at any groundwater well during the December 2017 monitoring period. Analysis of the samples collected from OW-14 during the March 2018 monitoring round indicated another detection of sulfides (0.04 mg/L). Assessment Monitoring was not performed at OW-14 in June but was performed at OW-13. Sulfides were not detected in the Assessment Monitoring performed at OW-13 during the June 2018 monitoring round.

The EPA has no MCL for sulfides in groundwater. Water with dissolved hydrogen sulfide will smell musty or swampy around 0.5-1.0 mg/L and Pare did not identify a noticeable smell emanating from the groundwater sample in either round during which the constituent was detected. Hydrogen sulfide gas can occur naturally in groundwater from plant materials rotting underground in anaerobic conditions. Hydrogen sulfide gas could also be resulting from gypsum buried at the Landfill. Pare recommends that sulfides be again tested for at OW-14 in the December 2018 monitoring round as a sample was unobtainable in the September 2018 monitoring round due to dry conditions. Additionally, Pare recommends that the Town consider adding regular analysis of sulfides to the groundwater monitoring program.

Pare recommended that wells OW-7 and OW-16 be incorporated into the compliance monitoring regimen in the 2017 Annual Groundwater Monitoring Report. Despite OW-7 having several years of sampling data, the sampling rounds were selected on a rotating basis with wells OW-6 and OW-8 for alternate monitoring. Pare recommends that wells OW-7 and OW-16 be sampled for two years, or eight consecutive monitoring rounds, prior to initiating statistical analysis. The June 2018 monitoring period marks the second monitoring round that these wells are to be sampled consistently; therefore, it is estimated that statistical analysis for the bedrock and overburden wells will begin in the March 2020 monitoring round.



Mr. Leo Hellested, P.E.

(6)

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Samples have been unable to be collected at the background well OW-9 in recent monitoring rounds. Dating back to June 2016, five out of the last ten monitoring rounds have resulted in a dry well. The tolerance interval analysis is dependent on data collected from the background well; therefore, uncharacteristic TL exceedances may be a result of the lack of recent historical data from this well. Pare will be able to more accurately assess this potential changing trend in groundwater quality with more data collection from the background well.

Recent monitoring rounds also indicate there is an increasing trend of barium and cadmium in groundwater at the Landfill. However, Assessment Monitoring triggered by exceedances of barium and cadmium have resulted in no (0) detections of Appendix B parameters. Pare will continue to evaluate antimony, barium, cadmium, and sulfides trends at the Landfill in subsequent monitoring rounds.

Should the RIDEM have any questions regarding this letter or the attached data, please feel free to contact the undersigned at (401) 334-4100, thank you.

Very truly yours,

Timothy P. Thies, P.E.
Vice President

TPT/TCJ/abv

Attachments

cc: Richard Rogers, Tiverton Public Works Director (w/encl.)
Jay Lambert, Tiverton Landfill Subcommittee (w/encl.)
Jan Reitsma, Tiverton Town Administrator (w/encl.)
Travis C. Johnson, Pare Corporation (w/o encl.)
George G. Palmisciano, P.E. Pare Corporation (w/o encl.)

ATTACHMENT NO. 1
LABORATORY ANALYTICAL DATA REPORT



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 8128041
Client Project: 94139 - Tiverton Landfill

Report Date: 05-October-2018

Prepared for:

Travis Johnson
Pare Corporation
8 Blackstone Valley Place
Lincoln, RI 02865

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted:

The samples listed below were submitted to New England Testing Laboratory on 09/28/18. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 8I28041. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
8I28041-01	OW-12	Water	09/27/2018	09/28/2018
8I28041-02	OW-7	Water	09/27/2018	09/28/2018
8I28041-03	OW-16	Water	09/27/2018	09/28/2018
8I28041-04	OW-15	Water	09/27/2018	09/28/2018
8I28041-05	OW-13	Water	09/27/2018	09/28/2018
8I28041-06	SW-1	Water	09/27/2018	09/28/2018
8I28041-07	SW-2	Water	09/27/2018	09/28/2018
8I28041-08	SW-3	Water	09/27/2018	09/28/2018

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

OW-12 (Lab Number: 8I28041-01)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Volatile Organic Compounds
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 8260C
EPA 6010C

OW-13 (Lab Number: 8I28041-05)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Volatile Organic Compounds
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 8260C
EPA 6010C

OW-15 (Lab Number: 8I28041-04)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper

Method

EPA 6010C
EPA 6010C

Request for Analysis (continued)

OW-15 (Lab Number: 8I28041-04) (continued)

Analysis

Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Volatile Organic Compounds
Zinc

Method

EPA 6010C
EPA 6010C
EPA 6010C
EPA 6010C
EPA 7010
EPA 6010C
EPA 8260C
EPA 6010C

OW-16 (Lab Number: 8I28041-03)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Volatile Organic Compounds
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 8260C
EPA 6010C

OW-7 (Lab Number: 8I28041-02)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Volatile Organic Compounds
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 8260C
EPA 6010C

Request for Analysis (continued)

SW-1 (Lab Number: 8I28041-06)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 6010C

SW-2 (Lab Number: 8I28041-07)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 6010C

SW-3 (Lab Number: 8I28041-08)

Analysis

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Method

EPA 6010C
EPA 7010
EPA 6010C
EPA 6010C

Method References

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

CASE NARRATIVE:

Sample Receipt

The samples were all appropriately cooled and preserved upon receipt. The samples were received in the appropriate containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Metals

All analyses were performed according to NETLAB's documented Standard Operating Procedures, within all required holding times, and with appropriate quality control measures. All QC was within laboratory established acceptance criteria. The samples were received, processed, and reported with no anomalies.

Volatile Organic Compounds

All samples were analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control criteria. Those compounds in italics were qualitatively screened via reconstructed ion chromatography and no detections were identified to the listed PQLs.

Sample: OW-12

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	ND	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.023	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	ND	0.001
7440-47-3	Chromium	6010C	0.002	0.001
7440-48-4	Cobalt	6010C	0.002	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.025	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.001	0.001
7440-66-6	Zinc	6010C	0.026	0.004

Sample: OW-7

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	ND	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.054	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	0.004	0.001
7440-47-3	Chromium	6010C	0.018	0.001
7440-48-4	Cobalt	6010C	0.022	0.001
7440-50-8	Copper	6010C	0.03	0.004
7439-92-1	Lead	6010C	0.006	0.001
7440-02-0	Nickel	6010C	0.032	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.016	0.001
7440-66-6	Zinc	6010C	0.085	0.004

Sample: OW-16

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	ND	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.027	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	ND	0.001
7440-47-3	Chromium	6010C	0.003	0.001
7440-48-4	Cobalt	6010C	0.004	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.010	0.001
7782-49-2	Selenium	6010C	0.003	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	ND	0.001
7440-66-6	Zinc	6010C	0.019	0.004

Sample: OW-15

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	0.004	0.001
7440-38-2	Arsenic	6010C	0.03	0.002
7440-39-3	Barium	6010C	0.084	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	0.007	0.001
7440-47-3	Chromium	6010C	ND	0.001
7440-48-4	Cobalt	6010C	0.014	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	0.002	0.001
7440-02-0	Nickel	6010C	0.029	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.011	0.001
7440-66-6	Zinc	6010C	0.015	0.004

Sample: OW-13

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	0.002	0.001
7440-38-2	Arsenic	6010C	0.01	0.002
7440-39-3	Barium	6010C	0.089	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	0.003	0.001
7440-47-3	Chromium	6010C	0.002	0.001
7440-48-4	Cobalt	6010C	0.010	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.012	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.004	0.001
7440-66-6	Zinc	6010C	0.010	0.004

Sample: SW-1

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	ND	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.036	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	ND	0.001
7440-47-3	Chromium	6010C	ND	0.001
7440-48-4	Cobalt	6010C	ND	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.003	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.001	0.001
7440-66-6	Zinc	6010C	0.005	0.004

Sample: SW-2

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	0.003	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.017	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	ND	0.001
7440-47-3	Chromium	6010C	ND	0.001
7440-48-4	Cobalt	6010C	0.002	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.002	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.001	0.001
7440-66-6	Zinc	6010C	0.006	0.004

Sample: SW-3

Case Number: 8128041

Total Metals

CAS RN	Common Name	Method	Result, mg/l	PQL, mg/l
7440-36-0	Antimony	6010C	0.003	0.001
7440-38-2	Arsenic	6010C	ND	0.002
7440-39-3	Barium	6010C	0.018	0.001
7440-41-7	Beryllium	6010C	ND	0.001
7440-43-9	Cadmium	6010C	ND	0.001
7440-47-3	Chromium	6010C	ND	0.001
7440-48-4	Cobalt	6010C	0.004	0.001
7440-50-8	Copper	6010C	ND	0.004
7439-92-1	Lead	6010C	ND	0.001
7440-02-0	Nickel	6010C	0.006	0.001
7782-49-2	Selenium	6010C	ND	0.002
7440-22-44	Silver	6010C	ND	0.001
7440-28-0	Thallium	7010	ND	0.0002
7440-62-2	Vanadium	6010C	0.003	0.001
7440-66-6	Zinc	6010C	0.011	0.004

Sample: OW-12
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0
71-55-6	1,1,1-Trichloroethane	ND	1.0
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0
79-00-5	1,1,2-Trichloroethane	ND	1.0
75-34-3	1,1-Dichloroethane	ND	1.0
75-35-4	1,1-Dichloroethylene	ND	1.0
563-58-6	1,1-Dichloropropene	ND	1.0
96-18-4	1,2,3-Trichloropropane	ND	1.0
96-12-8	1,2-Dibromo-3-chloropropane(DBCP)	ND	1.0
106-93-4	1,2-Dibromoethane	ND	1.0
107-06-2	1,2-Dichloroethane	ND	1.0
78-87-5	1,2-Dichloropropane	ND	1.0
142-28-9	1,3-Dichloropropane	ND	1.0
594-20-7	2,2-Dichloropropane	ND	1.0
591-78-6	2-Hexanone (Methyl butyl ketone)	ND	5.0
108-10-1	4-Methyl-2-pentanone	ND	5.0
67-64-1	Acetone	ND	5.0
75-05-8	<i>Acetonitrile (Methyl cyanide)</i>	ND	5.0
107-02-8	Acrolein	ND	5.0
107-13-1	Acrylonitrile	ND	5.0
107-05-1	<i>Allyl chloride</i>	ND	5.0
71-43-2	Benzene	ND	1.0
74-97-5	Bromochloromethane	ND	1.0
75-27-4	Bromodichloromethane	ND	1.0
75-25-2	Bromoform (Tribromomethane)	ND	1.0
75-15-0	Carbon disulfide	ND	1.0
56-23-5	Carbon tetrachloride	ND	1.0
108-90-7	Chlorobenzene	ND	1.0
75-00-3	Chloroethane (Ethyl chloride)	ND	1.0
67-66-3	Chloroform (Trichloromethane)	ND	1.0
126-99-8	<i>Chloroprene</i>	ND	5.0
156-59-2	cis-1,2-Dichloroethylene	ND	1.0
10061-01-5	cis-1,3-Dichloropropene	ND	1.0
124-48-1	Dibromochloromethane	ND	1.0
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.0
97-63-2	<i>Ethyl methacrylate</i>	ND	5.0
100-41-4	Ethylbenzene	ND	1.0
78-83-1	<i>Isobutyl alcohol</i>	ND	20.0
465-73-6	<i>Isodrin</i>	ND	5.0
541-73-1	m-Dichlorobenzene	ND	1.0
126-98-7	<i>Methacrylonitrile</i>	ND	10.0
74-83-9	Methyl bromide (Bromomethane)	ND	1.0

Sample: OW-12
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
74-87-3	Methyl chloride (Chloromethane)	ND	1.0
78-93-3	Methyl ethyl ketone (MEK)	ND	5.0
74-88-4	<i>Methyl iodide (Iodomethane)</i>	ND	5.0
80-62-6	<i>Methyl methacrylate</i>	ND	10.0
74-95-3	Methylene bromide (Dibromomethane)	ND	1.0
75-09-2	Methylene chloride (Dichloromethane)	ND	1.0
95-50-1	o-Dichlorobenzene	ND	1.0
106-46-7	p-Dichlorobenzene	ND	1.0
107-12-0	<i>Propionitrile (Ethyl cyanide)</i>	ND	20.0
100-42-5	Styrene	ND	1.0
127-18-4	Tetrachloroethylene	ND	1.0
1634-04-4	tert-Butylmethylether	ND	1.0
108-88-3	Toluene	ND	1.0
156-60-5	trans-1,2-Dichloroethylene	ND	1.0
10061-02-6	trans-1,3-Dichloropropene	ND	1.0
110-57-6	<i>trans-1,4-Dichloro-2-butene</i>	ND	5.0
79-01-6	Trichloroethylene	ND	1.0
75-69-4	Trichlorofluoromethane (CFC-11)	ND	1.0
108-05-4	<i>Vinyl acetate</i>	ND	5.0
75-01-4	Vinyl chloride (Chloroethene)	ND	1.0
1330-20-7	Xylene (total)	ND	1.0

Surrogates:

Compound	% Recovery	Limits
Toluene d8	98.18	70-130
1,2-Dichloroethane d4	111.32	70-130
4 BFB	91.30	70-130

ND = Not Detected

Sample: OW-7
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0
71-55-6	1,1,1-Trichloroethane	ND	1.0
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0
79-00-5	1,1,2-Trichloroethane	ND	1.0
75-34-3	1,1-Dichloroethane	ND	1.0
75-35-4	1,1-Dichloroethylene	ND	1.0
563-58-6	1,1-Dichloropropene	ND	1.0
96-18-4	1,2,3-Trichloropropane	ND	1.0
96-12-8	1,2-Dibromo-3-chloropropane(DBCP)	ND	1.0
106-93-4	1,2-Dibromoethane	ND	1.0
107-06-2	1,2-Dichloroethane	ND	1.0
78-87-5	1,2-Dichloropropane	ND	1.0
142-28-9	1,3-Dichloropropane	ND	1.0
594-20-7	2,2-Dichloropropane	ND	1.0
591-78-6	2-Hexanone (Methyl butyl ketone)	ND	5.0
108-10-1	4-Methyl-2-pentanone	ND	5.0
67-64-1	Acetone	ND	5.0
75-05-8	<i>Acetonitrile (Methyl cyanide)</i>	ND	5.0
107-02-8	Acrolein	ND	5.0
107-13-1	Acrylonitrile	ND	5.0
107-05-1	<i>Allyl chloride</i>	ND	5.0
71-43-2	Benzene	ND	1.0
74-97-5	Bromochloromethane	ND	1.0
75-27-4	Bromodichloromethane	ND	1.0
75-25-2	Bromoform (Tribromomethane)	ND	1.0
75-15-0	Carbon disulfide	ND	1.0
56-23-5	Carbon tetrachloride	ND	1.0
108-90-7	Chlorobenzene	ND	1.0
75-00-3	Chloroethane (Ethyl chloride)	ND	1.0
67-66-3	Chloroform (Trichloromethane)	ND	1.0
126-99-8	<i>Chloroprene</i>	ND	5.0
156-59-2	cis-1,2-Dichloroethylene	ND	1.0
10061-01-5	cis-1,3-Dichloropropene	ND	1.0
124-48-1	Dibromochloromethane	ND	1.0
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.0
97-63-2	<i>Ethyl methacrylate</i>	ND	5.0
100-41-4	Ethylbenzene	ND	1.0
78-83-1	<i>Isobutyl alcohol</i>	ND	20.0
465-73-6	<i>Isodrin</i>	ND	5.0
541-73-1	m-Dichlorobenzene	ND	1.0
126-98-7	<i>Methacrylonitrile</i>	ND	10.0
74-83-9	Methyl bromide (Bromomethane)	ND	1.0

Sample: OW-7
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
74-87-3	Methyl chloride (Chloromethane)	ND	1.0
78-93-3	Methyl ethyl ketone (MEK)	ND	5.0
74-88-4	<i>Methyl iodide (Iodomethane)</i>	ND	5.0
80-62-6	<i>Methyl methacrylate</i>	ND	10.0
74-95-3	Methylene bromide (Dibromomethane)	ND	1.0
75-09-2	Methylene chloride (Dichloromethane)	ND	1.0
95-50-1	o-Dichlorobenzene	ND	1.0
106-46-7	p-Dichlorobenzene	ND	1.0
107-12-0	<i>Propionitrile (Ethyl cyanide)</i>	ND	20.0
100-42-5	Styrene	ND	1.0
127-18-4	Tetrachloroethylene	ND	1.0
1634-04-4	tert-Butylmethylether	4.87	1.0
108-88-3	Toluene	ND	1.0
156-60-5	trans-1,2-Dichloroethylene	ND	1.0
10061-02-6	trans-1,3-Dichloropropene	ND	1.0
110-57-6	<i>trans-1,4-Dichloro-2-butene</i>	ND	5.0
79-01-6	Trichloroethylene	ND	1.0
75-69-4	Trichlorofluoromethane (CFC-11)	ND	1.0
108-05-4	<i>Vinyl acetate</i>	ND	5.0
75-01-4	Vinyl chloride (Chloroethene)	ND	1.0
1330-20-7	Xylene (total)	ND	1.0

Surrogates:

Compound	% Recovery	Limits
Toluene d8	107.54	70-130
1,2-Dichloroethane d4	129.52	70-130
4 BFB	105.38	70-130

ND = Not Detected

Sample: OW-16
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0
71-55-6	1,1,1-Trichloroethane	ND	1.0
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0
79-00-5	1,1,2-Trichloroethane	ND	1.0
75-34-3	1,1-Dichloroethane	ND	1.0
75-35-4	1,1-Dichloroethylene	ND	1.0
563-58-6	1,1-Dichloropropene	ND	1.0
96-18-4	1,2,3-Trichloropropane	ND	1.0
96-12-8	1,2-Dibromo-3-chloropropane(DBCP)	ND	1.0
106-93-4	1,2-Dibromoethane	ND	1.0
107-06-2	1,2-Dichloroethane	ND	1.0
78-87-5	1,2-Dichloropropane	ND	1.0
142-28-9	1,3-Dichloropropane	ND	1.0
594-20-7	2,2-Dichloropropane	ND	1.0
591-78-6	2-Hexanone (Methyl butyl ketone)	ND	5.0
108-10-1	4-Methyl-2-pentanone	ND	5.0
67-64-1	Acetone	ND	5.0
75-05-8	<i>Acetonitrile (Methyl cyanide)</i>	ND	5.0
107-02-8	Acrolein	ND	5.0
107-13-1	Acrylonitrile	ND	5.0
107-05-1	<i>Allyl chloride</i>	ND	5.0
71-43-2	Benzene	ND	1.0
74-97-5	Bromochloromethane	ND	1.0
75-27-4	Bromodichloromethane	ND	1.0
75-25-2	Bromoform (Tribromomethane)	ND	1.0
75-15-0	Carbon disulfide	ND	1.0
56-23-5	Carbon tetrachloride	ND	1.0
108-90-7	Chlorobenzene	ND	1.0
75-00-3	Chloroethane (Ethyl chloride)	ND	1.0
67-66-3	Chloroform (Trichloromethane)	ND	1.0
126-99-8	<i>Chloroprene</i>	ND	5.0
156-59-2	cis-1,2-Dichloroethylene	ND	1.0
10061-01-5	cis-1,3-Dichloropropene	ND	1.0
124-48-1	Dibromochloromethane	ND	1.0
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.0
97-63-2	<i>Ethyl methacrylate</i>	ND	5.0
100-41-4	Ethylbenzene	ND	1.0
78-83-1	<i>Isobutyl alcohol</i>	ND	20.0
465-73-6	<i>Isodrin</i>	ND	5.0
541-73-1	m-Dichlorobenzene	ND	1.0
126-98-7	<i>Methacrylonitrile</i>	ND	10.0
74-83-9	Methyl bromide (Bromomethane)	ND	1.0

Sample: OW-16
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
74-87-3	Methyl chloride (Chloromethane)	ND	1.0
78-93-3	Methyl ethyl ketone (MEK)	ND	5.0
74-88-4	<i>Methyl iodide (Iodomethane)</i>	ND	5.0
80-62-6	<i>Methyl methacrylate</i>	ND	10.0
74-95-3	Methylene bromide (Dibromomethane)	ND	1.0
75-09-2	Methylene chloride (Dichloromethane)	ND	1.0
95-50-1	o-Dichlorobenzene	ND	1.0
106-46-7	p-Dichlorobenzene	ND	1.0
107-12-0	<i>Propionitrile (Ethyl cyanide)</i>	ND	20.0
100-42-5	Styrene	ND	1.0
127-18-4	Tetrachloroethylene	ND	1.0
1634-04-4	tert-Butylmethylether	3.42	1.0
108-88-3	Toluene	ND	1.0
156-60-5	trans-1,2-Dichloroethylene	ND	1.0
10061-02-6	trans-1,3-Dichloropropene	ND	1.0
110-57-6	<i>trans-1,4-Dichloro-2-butene</i>	ND	5.0
79-01-6	Trichloroethylene	ND	1.0
75-69-4	Trichlorofluoromethane (CFC-11)	ND	1.0
108-05-4	<i>Vinyl acetate</i>	ND	5.0
75-01-4	Vinyl chloride (Chloroethene)	ND	1.0
1330-20-7	Xylene (total)	ND	1.0

Surrogates:

Compound	% Recovery	Limits
Toluene d8	108.90	70-130
1,2-Dichloroethane d4	117.76	70-130
4 BFB	105.42	70-130

ND = Not Detected

Sample: OW-15
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0
71-55-6	1,1,1-Trichloroethane	ND	5.0
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0
79-00-5	1,1,2-Trichloroethane	ND	5.0
75-34-3	1,1-Dichloroethane	ND	5.0
75-35-4	1,1-Dichloroethylene	ND	5.0
563-58-6	1,1-Dichloropropene	ND	5.0
96-18-4	1,2,3-Trichloropropane	ND	5.0
96-12-8	1,2-Dibromo-3-chloropropane(DBCP)	ND	5.0
106-93-4	1,2-Dibromoethane	ND	5.0
107-06-2	1,2-Dichloroethane	ND	5.0
78-87-5	1,2-Dichloropropane	ND	5.0
142-28-9	1,3-Dichloropropane	ND	5.0
594-20-7	2,2-Dichloropropane	ND	5.0
591-78-6	2-Hexanone (Methyl butyl ketone)	ND	25.0
108-10-1	4-Methyl-2-pentanone	ND	25.0
67-64-1	Acetone	ND	25.0
75-05-8	<i>Acetonitrile (Methyl cyanide)</i>	ND	25.0
107-02-8	Acrolein	ND	25.0
107-13-1	Acrylonitrile	ND	25.0
107-05-1	<i>Allyl chloride</i>	ND	25.0
71-43-2	Benzene	ND	5.0
74-97-5	Bromochloromethane	ND	5.0
75-27-4	Bromodichloromethane	ND	5.0
75-25-2	Bromoform (Tribromomethane)	ND	5.0
75-15-0	Carbon disulfide	ND	5.0
56-23-5	Carbon tetrachloride	ND	5.0
108-90-7	Chlorobenzene	14	5.0
75-00-3	Chloroethane (Ethyl chloride)	ND	5.0
67-66-3	Chloroform (Trichloromethane)	ND	5.0
126-99-8	<i>Chloroprene</i>	ND	25.0
156-59-2	cis-1,2-Dichloroethylene	ND	5.0
10061-01-5	cis-1,3-Dichloropropene	ND	5.0
124-48-1	Dibromochloromethane	ND	5.0
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	5.0
97-63-2	<i>Ethyl methacrylate</i>	ND	25.0
100-41-4	Ethylbenzene	ND	5.0
78-83-1	<i>Isobutyl alcohol</i>	ND	100.0
465-73-6	<i>Isodrin</i>	ND	25.0
541-73-1	m-Dichlorobenzene	ND	5.0
126-98-7	<i>Methacrylonitrile</i>	ND	50.0
74-83-9	Methyl bromide (Bromomethane)	ND	5.0

Sample: OW-15
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
74-87-3	Methyl chloride (Chloromethane)	ND	5.0
78-93-3	Methyl ethyl ketone (MEK)	ND	25.0
74-88-4	<i>Methyl iodide (Iodomethane)</i>	ND	25.0
80-62-6	<i>Methyl methacrylate</i>	ND	50.0
74-95-3	Methylene bromide (Dibromomethane)	ND	5.0
75-09-2	Methylene chloride (Dichloromethane)	ND	5.0
95-50-1	o-Dichlorobenzene	ND	5.0
106-46-7	p-Dichlorobenzene	ND	5.0
107-12-0	<i>Propionitrile (Ethyl cyanide)</i>	ND	100.0
100-42-5	Styrene	ND	5.0
127-18-4	Tetrachloroethylene	ND	5.0
1634-04-4	tert-Butylmethylether	7.0	5.0
108-88-3	Toluene	ND	5.0
156-60-5	trans-1,2-Dichloroethylene	ND	5.0
10061-02-6	trans-1,3-Dichloropropene	ND	5.0
110-57-6	<i>trans-1,4-Dichloro-2-butene</i>	ND	25.0
79-01-6	Trichloroethylene	ND	5.0
75-69-4	Trichlorofluoromethane (CFC-11)	ND	5.0
108-05-4	<i>Vinyl acetate</i>	ND	25.0
75-01-4	Vinyl chloride (Chloroethene)	ND	5.0
1330-20-7	Xylene (total)	ND	5.0

Surrogates:

Compound	% Recovery	Limits
Toluene d8	105.18	70-130
1,2-Dichloroethane d4	115.80	70-130
4 BFB	99.12	70-130

ND = Not Detected

Sample: OW-13
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0
71-55-6	1,1,1-Trichloroethane	ND	1.0
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0
79-00-5	1,1,2-Trichloroethane	ND	1.0
75-34-3	1,1-Dichloroethane	ND	1.0
75-35-4	1,1-Dichloroethylene	ND	1.0
563-58-6	1,1-Dichloropropene	ND	1.0
96-18-4	1,2,3-Trichloropropane	ND	1.0
96-12-8	1,2-Dibromo-3-chloropropane(DBCP)	ND	1.0
106-93-4	1,2-Dibromoethane	ND	1.0
107-06-2	1,2-Dichloroethane	ND	1.0
78-87-5	1,2-Dichloropropane	ND	1.0
142-28-9	1,3-Dichloropropane	ND	1.0
594-20-7	2,2-Dichloropropane	ND	1.0
591-78-6	2-Hexanone (Methyl butyl ketone)	ND	5.0
108-10-1	4-Methyl-2-pentanone	ND	5.0
67-64-1	Acetone	ND	5.0
75-05-8	<i>Acetonitrile (Methyl cyanide)</i>	ND	5.0
107-02-8	Acrolein	ND	5.0
107-13-1	Acrylonitrile	ND	5.0
107-05-1	<i>Allyl chloride</i>	ND	5.0
71-43-2	Benzene	ND	1.0
74-97-5	Bromochloromethane	ND	1.0
75-27-4	Bromodichloromethane	ND	1.0
75-25-2	Bromoform (Tribromomethane)	ND	1.0
75-15-0	Carbon disulfide	ND	1.0
56-23-5	Carbon tetrachloride	ND	1.0
108-90-7	Chlorobenzene	ND	1.0
75-00-3	Chloroethane (Ethyl chloride)	ND	1.0
67-66-3	Chloroform (Trichloromethane)	ND	1.0
126-99-8	<i>Chloroprene</i>	ND	5.0
156-59-2	cis-1,2-Dichloroethylene	ND	1.0
10061-01-5	cis-1,3-Dichloropropene	ND	1.0
124-48-1	Dibromochloromethane	ND	1.0
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	1.0
97-63-2	<i>Ethyl methacrylate</i>	ND	5.0
100-41-4	Ethylbenzene	ND	1.0
78-83-1	<i>Isobutyl alcohol</i>	ND	20.0
465-73-6	<i>Isodrin</i>	ND	5.0
541-73-1	m-Dichlorobenzene	ND	1.0
126-98-7	<i>Methacrylonitrile</i>	ND	10.0
74-83-9	Methyl bromide (Bromomethane)	ND	1.0

Sample: OW-13
Method: 8260C

Case Number: 8128041

CAS RN	Common Name	Result, ppb	PQL (ppb)
74-87-3	Methyl chloride (Chloromethane)	ND	1.0
78-93-3	Methyl ethyl ketone (MEK)	ND	5.0
74-88-4	<i>Methyl iodide (Iodomethane)</i>	ND	5.0
80-62-6	<i>Methyl methacrylate</i>	ND	10.0
74-95-3	Methylene bromide (Dibromomethane)	ND	1.0
75-09-2	Methylene chloride (Dichloromethane)	ND	1.0
95-50-1	o-Dichlorobenzene	ND	1.0
106-46-7	p-Dichlorobenzene	ND	1.0
107-12-0	<i>Propionitrile (Ethyl cyanide)</i>	ND	20.0
100-42-5	Styrene	ND	1.0
127-18-4	Tetrachloroethylene	ND	1.0
1634-04-4	tert-Butylmethylether	ND	1.0
108-88-3	Toluene	ND	1.0
156-60-5	trans-1,2-Dichloroethylene	ND	1.0
10061-02-6	trans-1,3-Dichloropropene	ND	1.0
110-57-6	<i>trans-1,4-Dichloro-2-butene</i>	ND	5.0
79-01-6	Trichloroethylene	ND	1.0
75-69-4	Trichlorofluoromethane (CFC-11)	ND	1.0
108-05-4	<i>Vinyl acetate</i>	ND	5.0
75-01-4	Vinyl chloride (Chloroethene)	ND	1.0
1330-20-7	Xylene (total)	ND	1.0

Surrogates:

Compound	% Recovery	Limits
Toluene d8	104.40	70-130
1,2-Dichloroethane d4	117.50	70-130
4 BFB	100.04	70-130

ND = Not Detected

ATTACHMENT NO. 2
ANALYTICAL SUMMARY TABLES

**TABLE 1 (CONT.)
SUMMARY OF GROUNDWATER MONITORING RESULTS
APPENDIX A - CONSTITUENTS FOR DETECTION MONITORING
MONITORING WELL OW-14
Concentration (Expressed in same units as Threshold Value)**

Parameter	Threshold Value	SEP-17	JUN-18	MAR-19	DEC-17	SEP-17	JUN-17	MAR-17	DEC-16	SEP-16	JUN-16	MAR-16	DEC-14	SEP-14	JUN-14	MAR-14	DEC-13	SEP-13	JUN-13	MAR-13	DEC-12	SEP-12	JUN-12	MAR-12	DEC-11	SEP-11	JUN-11	MAR-11	DEC-10	SEP-10	JUN-10				
Arsimony	0.006 mg/L	NT	ND	ND	0.0390	NT	0.0050	0.0410	ND	NT	ND	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	0.0060	ND	ND	0.0110	0.0170	ND	ND	NT	ND			
Arsenic	0.010 mg/L	NT	0.0030	ND	0.0200	NT	0.0200	0.0330	ND	NT	ND	0.0070	0.0050	0.0050	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	0.0050	ND	0.0070	ND	NT	0.0070	0.0070	0.0070		
Barium	2 mg/L	NT	0.155	0.2240	0.1990	NT	0.2400	0.2490	0.2290	NT	0.1380	0.1750	0.1980	0.1140	NT	0.2020	0.0910	NT	0.1570	0.1840	0.0790	NT	0.1440	0.1760	0.1370	NT	0.1750	0.1770	0.1470	0.1610	0.2100	0.2700	0.2030	0.1900	
Beryllium	0.004 mg/L	NT	ND	ND	ND	NT	0.0030	ND	ND	NT	0.0010	0.0010	ND	0.0010	NT	ND	ND	NT	ND	ND	0.0010	NT	ND	ND	ND	NT	ND	ND	ND	ND	0.0010	NT	ND	0.0010	
Cadmium	0.005 mg/L	NT	0.0060	0.0060	ND	NT	0.0060	0.0060	ND	NT	ND	ND	0.0060	0.0060	NT	ND	ND	NT	ND	ND	0.0060	NT	ND	0.0060	0.0060	0.0060	NT	ND	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	
Chromium	0.1 mg/L	NT	0.001	0.0060	0.0020	NT	0.0010	0.0020	ND	NT	0.0110	0.0030	0.0030	0.0170	NT	0.0050	0.0050	NT	0.0040	0.0010	0.0080	NT	ND	ND	ND	NT	ND	ND	ND	ND	0.0050	NT	0.0018		
Cobalt	0.73 mg/L	NT	0.006	0.0140	0.0090	NT	0.0140	0.0130	0.0360	NT	0.0100	0.0100	0.0100	0.0120	NT	0.0170	0.0120	NT	0.0080	0.0150	0.0120	NT	0.0080	0.0160	0.0370	NT	0.0140	0.0100	0.0160	0.0090	0.0457	0.0261	NT	0.0130	
Copper	1.3 mg/L	NT	ND	0.0090	ND	NT	0.0100	ND	0.0200	NT	0.0210	0.0010	ND	0.0170	NT	0.0100	0.0090	NT	0.0070	0.0050	0.0200	NT	0.0030	0.0090	0.0100	NT	ND	ND	0.0010	0.0090	ND	0.0049	0.0140	NT	0.0050
Lead	0.015 mg/L	NT	ND	0.0060	ND	NT	0.0170	ND	ND	NT	0.0160	0.0070	ND	0.0090	NT	0.0050	0.0050	NT	0.0040	0.0040	0.0070	NT	0.0020	0.0050	0.0030	NT	0.0020	ND	0.0090	0.0020	ND	0.0039	NT	0.0011	
Mercury	0.002 mg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Nickel	0.1 mg/L	NT	0.012	0.0220	0.0220	NT	0.0220	0.0470	0.0490	NT	0.0160	0.0160	0.0170	0.0200	NT	0.0270	0.0160	NT	0.0150	0.0220	0.0200	NT	0.0120	0.0200	0.0260	NT	0.0190	0.0170	0.0160	0.0180	0.0490	0.0407	NT	0.0170	
Selenium	0.05 mg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	0.0050	0.0140	NT	ND	ND	0.0050	NT	ND	ND	ND	NT	ND	0.0020	0.0100	0.0240	0.0090	0.0090	0.0090	0.0090	0.0090
Silver	0.1 mg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	0.0040	NT	0.0020	ND	NT	0.0020	0.0020	ND	NT	ND	0.0020	ND	NT	ND	0.0040	ND	0.0050	ND	ND	NT	ND	
Thallium	0.002 mg/L	NT	ND	0.0003	0.0003	NT	ND	ND	ND	NT	ND	ND	ND	0.0010	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	0.0010	ND	ND	ND	NT	ND	
Tin	22 mg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	0.0050	ND	0.0070	0.0010	NT	ND	ND	NT	ND	0.0220	0.0180	NT	0.0010	ND	ND	NT	ND	ND	ND	ND	ND	0.0070	0.0070	0.0070	
Vanadium	0.26 mg/L	NT	ND	0.0070	0.0030	NT	0.0070	ND	ND	NT	0.0170	ND	0.0140	NT	0.0080	0.0050	NT	0.0050	0.0020	0.0080	NT	0.0030	0.0060	NT	ND	ND	NT	ND	ND	0.0030	0.0060	0.0060	0.0060	0.0060	
Zinc	2 mg/L	NT	0.031	0.0480	0.0160	NT	0.0600	0.0230	0.0300	NT	0.0280	0.0170	0.0140	0.0680	NT	0.0240	0.0190	NT	0.0070	0.0100	0.0310	NT	0.0120	0.0310	0.0210	NT	0.0160	0.0070	0.0070	0.0270	0.0453	0.0070	NT	0.0094	
Acesone	610 µg/L	NT	ND	ND	ND	NT	ND	6.9	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	6.4	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Acrylonitrile	0.039 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Benzene	5 µg/L	NT	2.77	ND	ND	NT	3.2	4.1	ND	NT	2.7	3.1	3.9	2.0	NT	3.5	ND	NT	3.3	3.6	ND	NT	2.9	4.3	1.9	NT	1.8	3.5	3.6	4.1	2.1	3.7	1.7	NT	3.6
Bromochloromethane	80 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Bromodichloromethane (THM)	90 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Bromofrom	80 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Carbon disulfide	1000 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Carbon tetrachloride	5 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Chlorobenzene	100 µg/L	NT	13.3	10.8	ND	NT	13.42	15.6	ND	NT	12.5	13.5	15.4	10.7	NT	16.7	5.3	NT	15.7	15.7	3.2	NT	11.3	19.1	8.0	NT	7.0	14.3	14.6	16.5	7.1	15.3	6.1	NT	14.0
Chloroethane	4.6 µg/L	NT	ND	ND	ND	NT	2.27	ND	ND	NT	3.3	ND	2.0	1.5	NT	ND	ND	NT	ND	ND	ND	NT	ND	2.5	ND	NT	ND	1.4	2.4	ND	1.6	1.3	ND	NT	2.0
Chloroform	80 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
Chlorobromomethane (THM)	80 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
1,2-Dichlorobenzene (DCBP)	1.2 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
1,2-Dichloroethane (EDB)	0.05 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
1,2-Dichloropropane	600 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	NT	ND	
1,4-Dichlorobenzene	75 µg/L	NT	2.68	ND	ND	NT	ND	ND	ND	NT	1.8	ND	2.2	NT	3.3	ND	NT	3.4	ND	NT	2.2	2.9	1.8	NT	1.4	2.7	2.2	3.2	1.8	2.7	1.9	NT	3.0		
trans-1,4-Dichloro-2-butene	µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
1,1-Dichloroethane	5 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
1,2-Dichloroethane	5 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
1,1-Dichloroethylene	7 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
cis-1,2-Dichloroethane	70 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
trans-1,2-Dichloroethane	100 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
1,2-Dichloropropane	5 µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	ND	NT	ND		
cis-1,3-Dichloropropene	µg/L	NT	ND	ND	ND	NT	ND	ND	ND	NT	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND															

TABLE 1 (CONT.)
SUMMARY OF GROUNDWATER MONITORING RESULTS
APPENDIX A - CONSTITUENTS FOR DETECTION MONITORING
MONITORING WELL OW-16
Concentration (Expressed in same units as Threshold Value)

Parameter	Threshold Value	SEP '18	JUN '18	MAR '18	NOV '17
Antimony	0.006 mg/L ¹	ND	0.002	ND	ND
Arsenic	0.010 mg/L ¹	ND	0.001	ND	ND
Barium	2 mg/L ¹	0.027	0.011	0.0190	0.1000
Beryllium	0.004 mg/L ¹	ND	ND	ND	ND
Cadmium	0.005 mg/L ¹	ND	ND	ND	ND
Chromium	0.1 mg/L ¹	0.003	0.004	0.0060	0.0050
Cobalt	0.73 mg/L ¹	0.004	0.002	0.0050	0.0050
Copper	1.3 mg/L ¹	ND	ND	ND	ND
Lead	0.015 mg/L ¹	ND	ND	ND	ND
Mercury	0.002 mg/L ¹	ND	ND	ND	ND
Nickel	0.1 mg/L ²	0.01	0.009	0.0100	0.0100
Selenium	0.05 mg/L ¹	0.003	ND	0.0100	0.0050
Silver	0.1 mg/L ^{2,3}	ND	ND	ND	ND
Thallium	0.002 mg/L ¹	ND	ND	0.0003	ND
Tin	22 mg/L ⁴	ND	ND	ND	ND
Vanadium	0.26 mg/L ¹	ND	ND	ND	ND
Zinc	2 mg/L ^{2,3}	0.019	0.022	0.024	0.0210
Acetone	610 µg/L ⁵	ND	ND	ND	ND
Acrylonitrile	0.039 µg/L ⁵	ND	ND	ND	ND
Benzene	5 µg/L ⁵	ND	ND	ND	ND
Bromochloromethane	80 µg/L ⁵	ND	ND	ND	ND
Bromodichloromethane (THM)	90 µg/L ⁵	ND	ND	ND	ND
Bromoform	80 µg/L ⁵	ND	ND	ND	ND
Carbon disulfide	1000 µg/L ⁵	ND	ND	ND	ND
Carbon tetrachloride	5 µg/L ⁵	ND	ND	ND	ND
Chlorobenzene	100 µg/L ⁵	ND	ND	ND	ND
Chloroethane	4.6 µg/L ⁵	ND	ND	ND	ND
Chloroform	80 µg/L ⁵	ND	ND	ND	ND
Chlorodibromomethane (THM)	80 µg/L ⁵	ND	ND	ND	ND
1,2-Dibromo-3-chloroethane (DBCP)	0.2 µg/L ⁵	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	0.05 µg/L ⁵	ND	ND	ND	ND
1,2-Dichlorobenzene	600 µg/L ⁵	ND	ND	ND	ND
1,4-Dichlorobenzene	75 µg/L ⁵	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	µg/L ⁵	ND	ND	ND	ND
1,1-Dichloroethane	5 µg/L ⁵	ND	ND	ND	ND
1,2-Dichloroethane	5 µg/L ⁵	ND	ND	ND	ND
1,1-Dichloroethylene	7 µg/L ⁵	ND	ND	ND	ND
cis-1,2-Dichloroethane	70 µg/L ⁵	ND	ND	ND	ND
trans-1,2-Dichloroethane	100 µg/L ⁵	ND	ND	ND	ND
1,2-Dichloropropane	5 µg/L ⁵	ND	ND	ND	ND
cis-1,3-Dichloropropene	µg/L ⁵	ND	ND	ND	ND
trans-1,3-Dichloropropene	µg/L ⁵	ND	ND	ND	ND
Ethylbenzene	700 µg/L ⁵	ND	ND	ND	ND
Methyl butyl ketone(2-Hexanone)	160 µg/L ⁵	ND	ND	ND	ND
Bromomethane	10 µg/L ⁵	ND	ND	ND	ND
Chloromethane	30 µg/L ⁵	ND	ND	ND	ND
Dibromomethane	61 µg/L ⁵	ND	ND	ND	ND
Methylene chloride	5 µg/L ⁵	ND	ND	ND	ND
Methyl ethyl ketone(2-Butanone)	4000 µg/L ⁵	ND	ND	ND	ND
Methyl iodide	µg/L ⁵	ND	ND	ND	ND
4-Methyl-2-pentanone	µg/L ⁵	ND	ND	ND	ND
Styrene	100 µg/L ⁵	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	70 µg/L ⁵	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.3 µg/L ⁵	ND	ND	ND	ND
Tetrachloroethylene(PCE)	5 µg/L ⁵	ND	ND	ND	ND
Toluene	1000 µg/L ⁵	ND	ND	ND	ND
1,1,1-Trichloroethane	200 µg/L ⁵	ND	ND	ND	ND
1,1,2-Trichloroethane	5 µg/L ⁵	ND	ND	ND	ND
Trichloroethylene(TCE)	5 µg/L ⁵	ND	ND	ND	ND
Trichlorofluoromethane	2000 µg/L ⁵	ND	ND	ND	ND
1,2,3-Trichloropropane	40 µg/L ⁵	ND	ND	ND	ND
Vinyl acetate	410 µg/L ⁵	ND	ND	ND	ND
Vinyl chloride	2 µg/L ⁵	ND	ND	ND	ND
Xylenes	10000 µg/L ⁵	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	20-40 µg/L ⁵	2.42	6.53	7.8	4.6

ND = Exceeded MCL

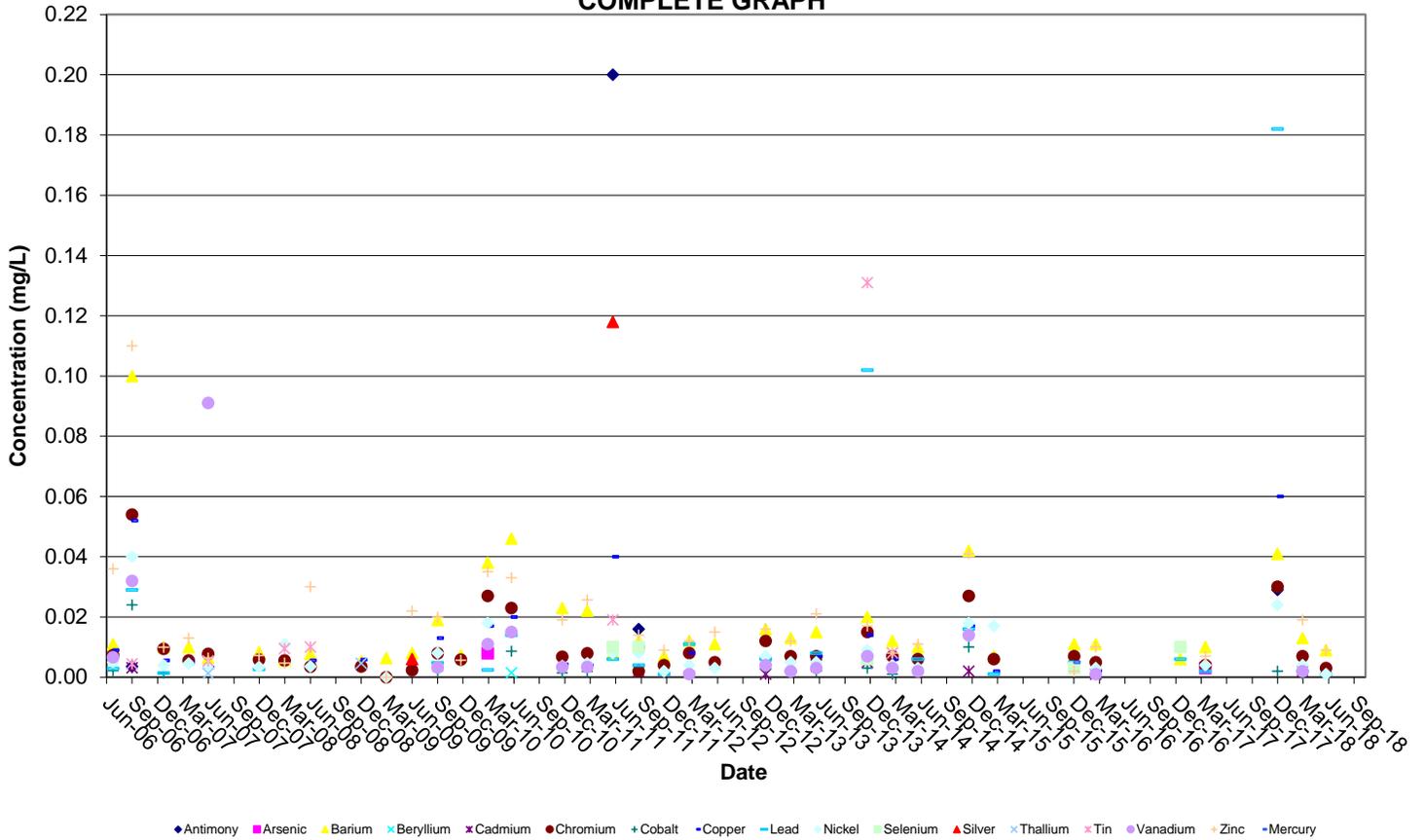
1. Threshold value given is the Maximum Contaminant Level (MCL) as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
2. Threshold value given is the Lifetime health advisory as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
3. Threshold value given is the Secondary Drinking Water Regulation (SDWR) as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
4. Threshold value given is the Drinking Water Advisory as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
5. Threshold value given is the Preliminary Remedial Goal (PRG) for tap water, as provided in the October 2002 USEPA Region 9 PRGs Table 2002 Update
6. Constituent concentration was reported above its laboratory method detection limit, but lower than its laboratory reporting limit and historical reporting limit. However, the reporting limit this round was significantly higher than previous reporting limits. Therefore, to be consistent with historical data, only those constituents with concentrations lower than historical reporting limits were reported as non-detect.

No threshold value has been provided for parameters not identified in the sources listed above

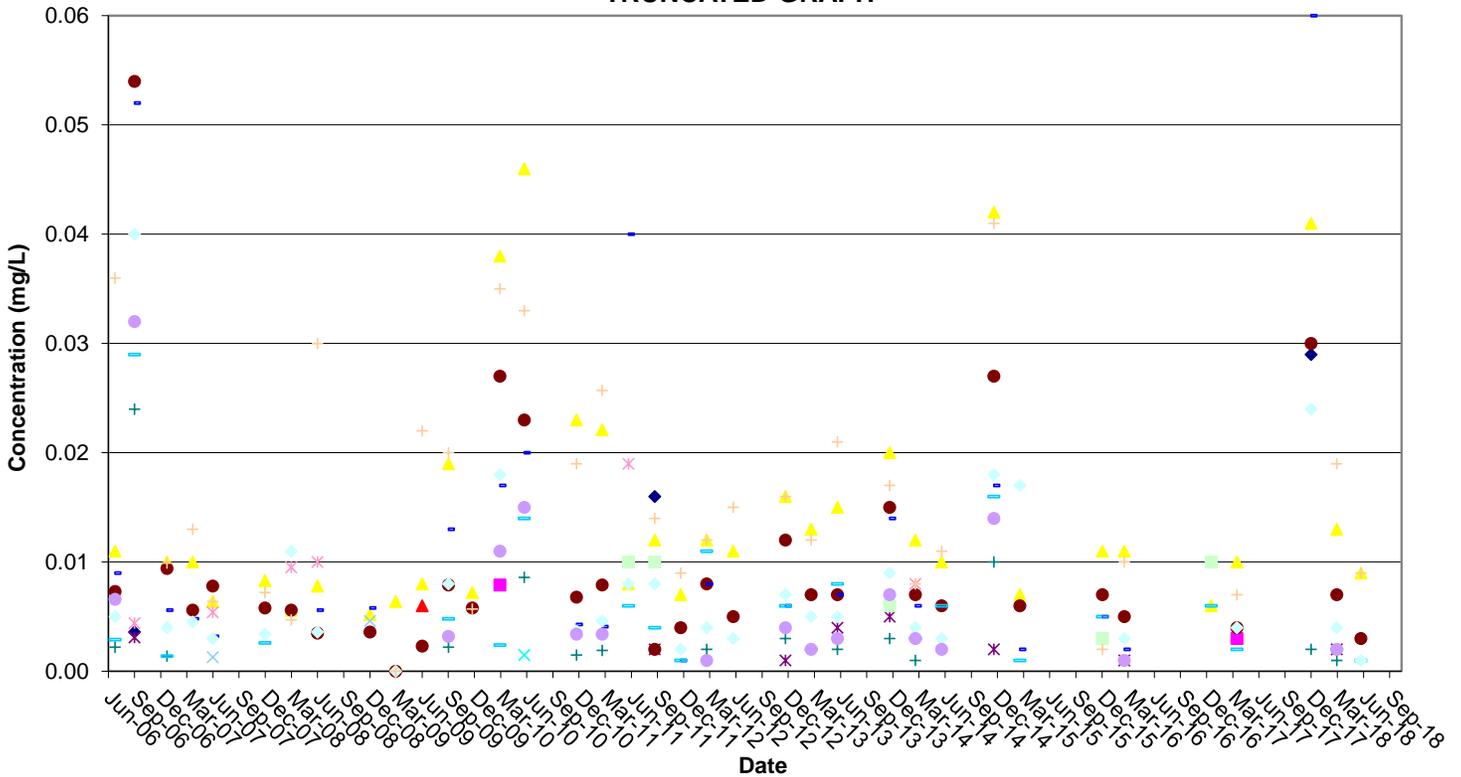
ATTACHMENT NO. 3
HISTORICAL DETECTED METALS GRAPHS

Detected Appendix A Metals in OW-9
Tiverton Landfill

COMPLETE GRAPH

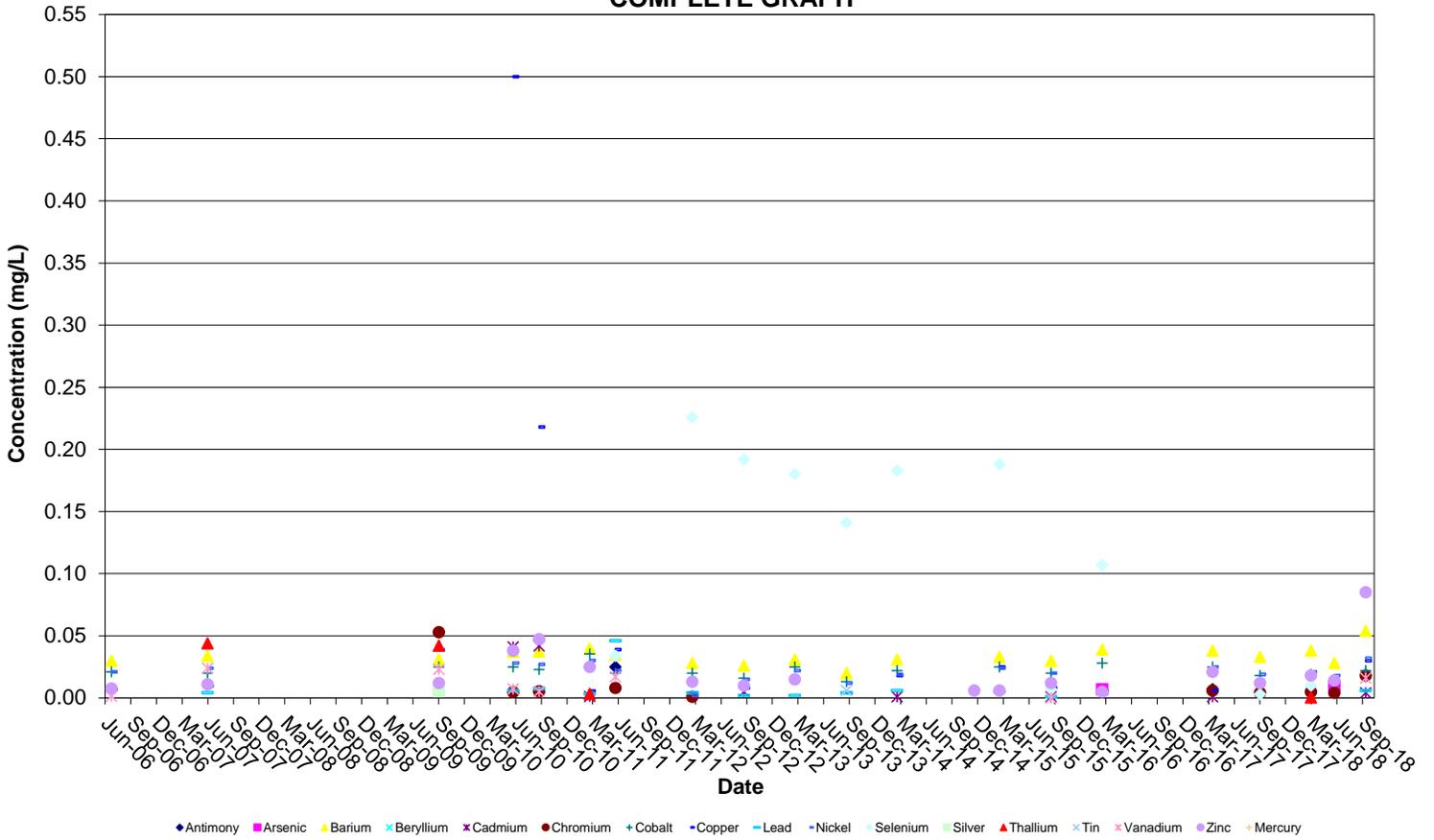


TRUNCATED GRAPH

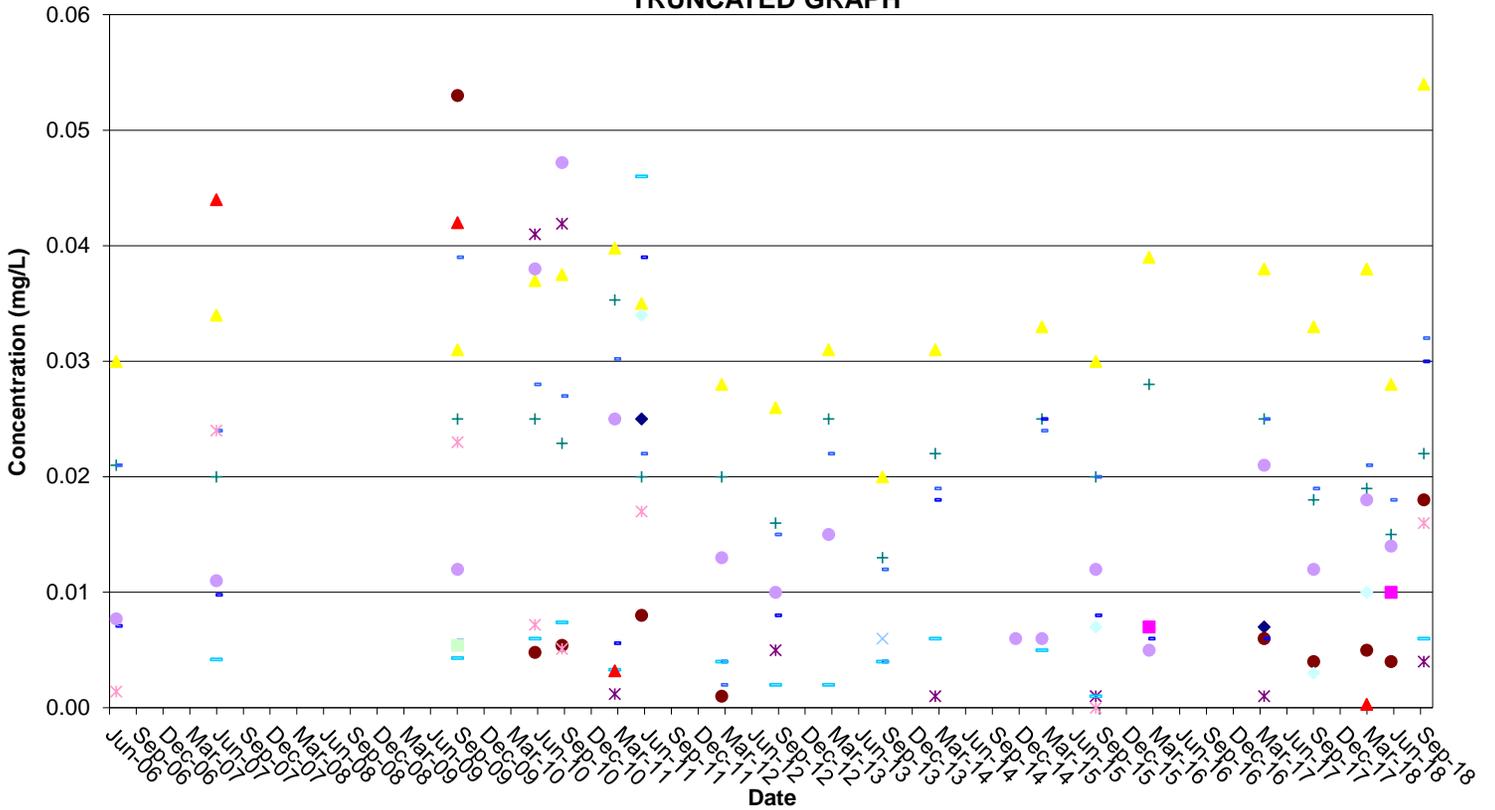


Detected Appendix A Metals in OW-7 Tiverton Landfill

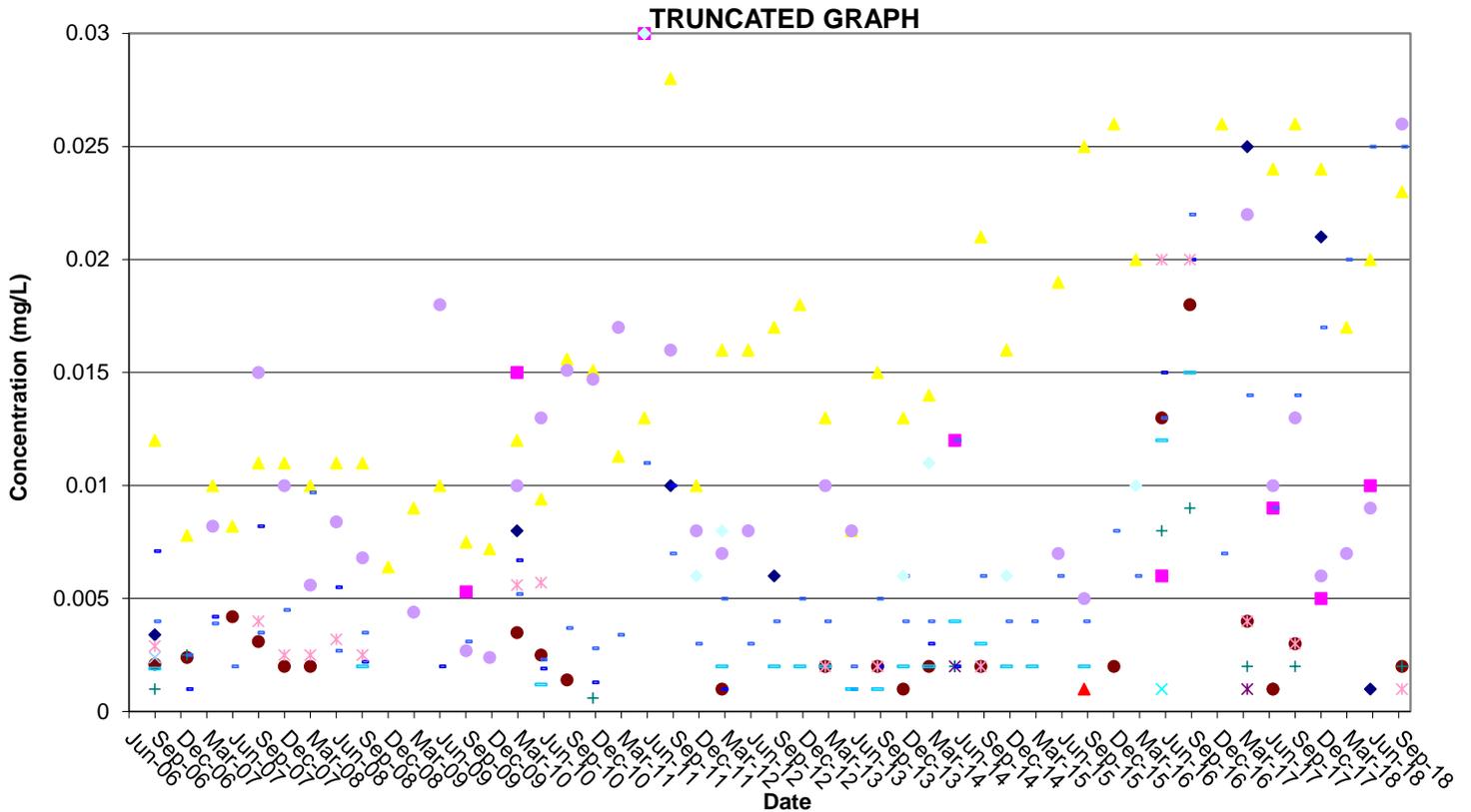
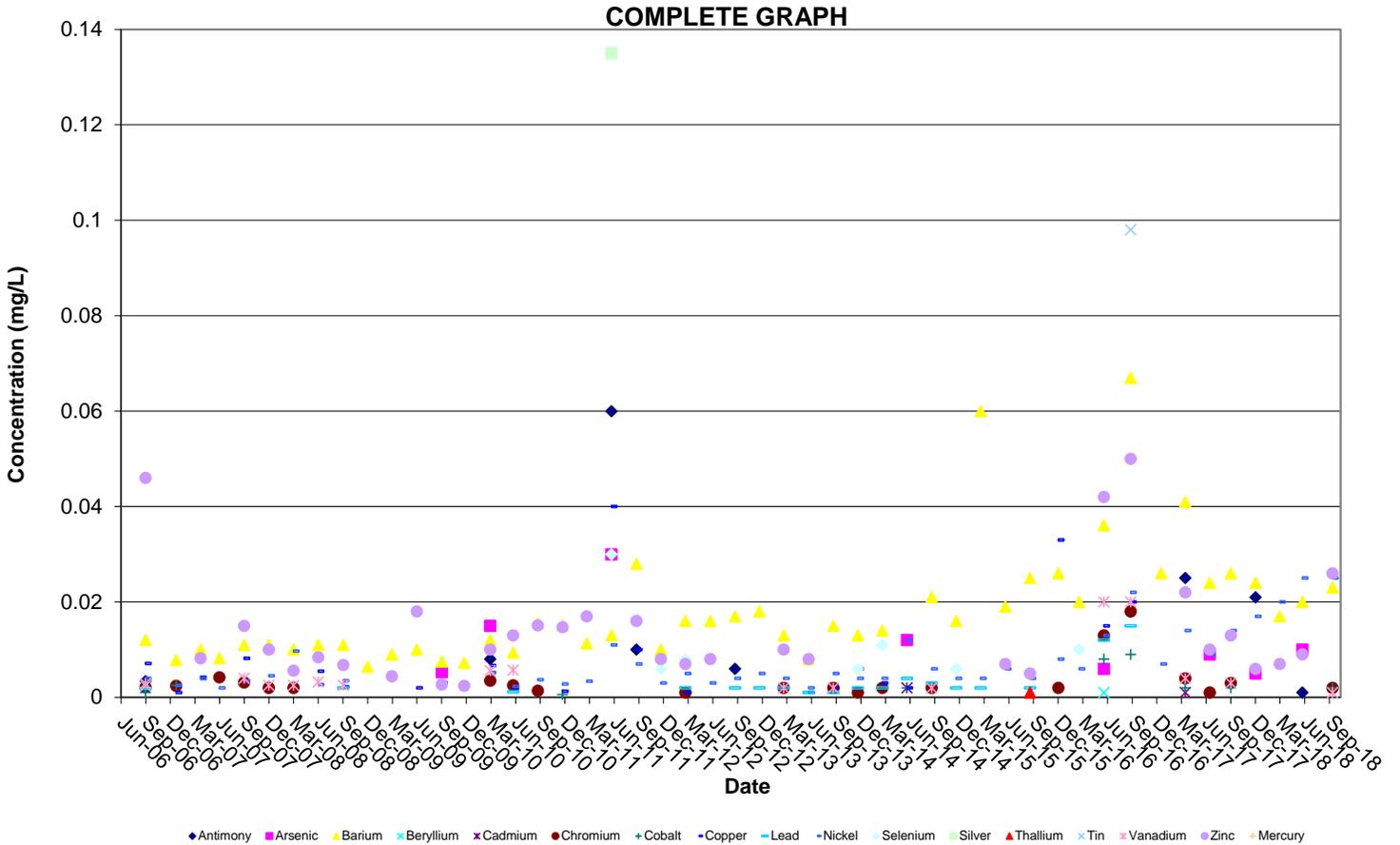
COMPLETE GRAPH



TRUNCATED GRAPH

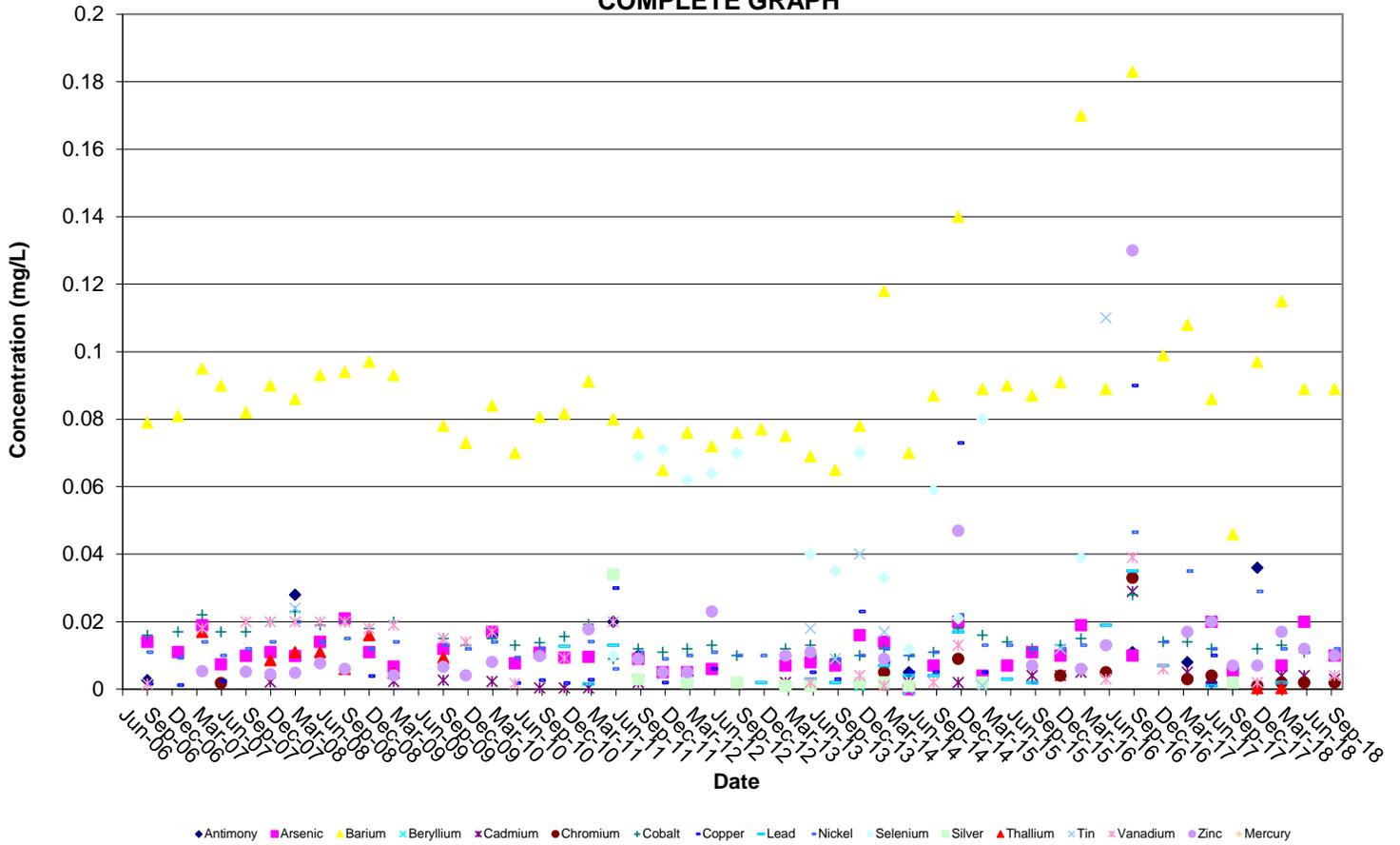


Detected Appendix A Metals in OW-12
Tiverton Landfill

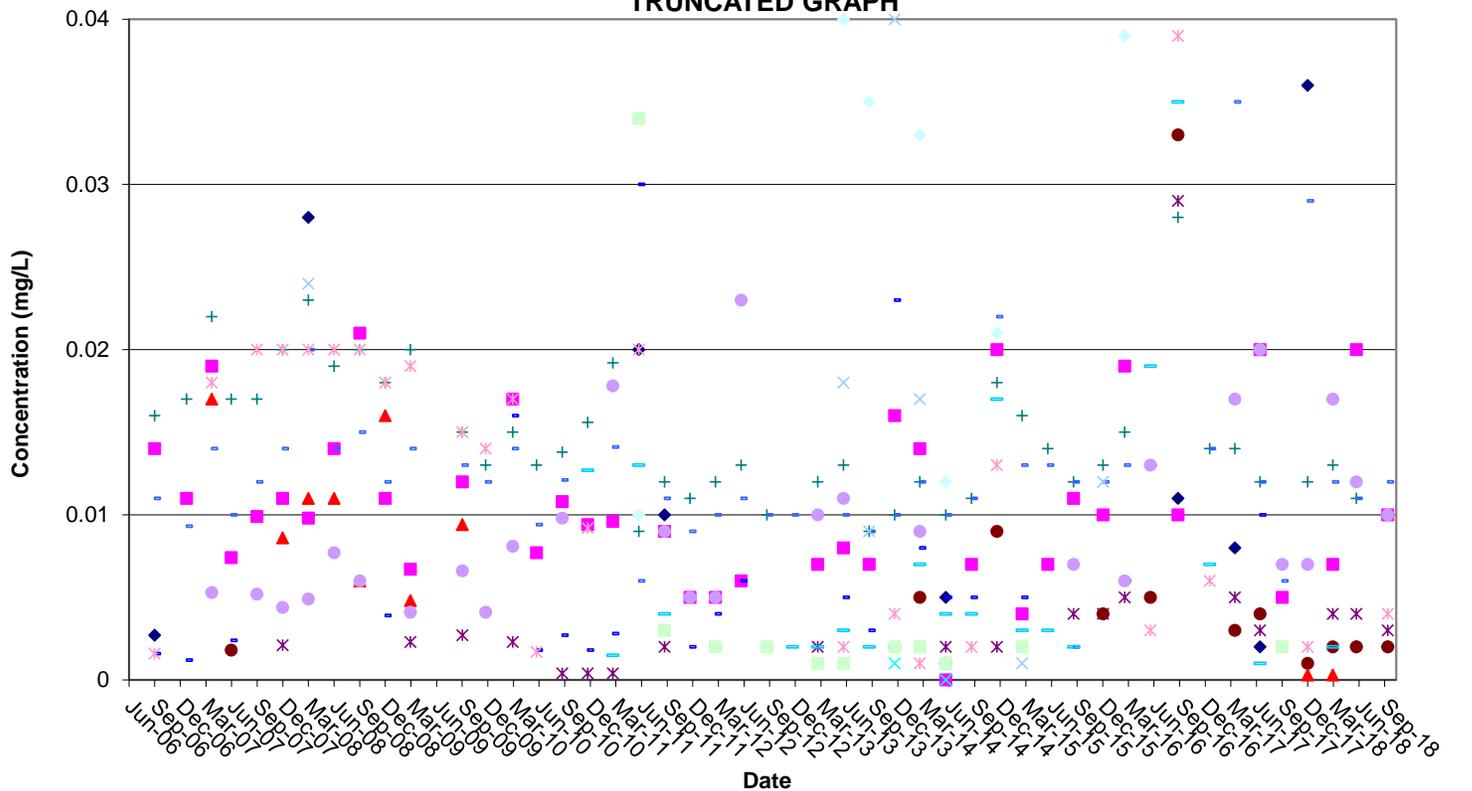


Detected Appendix A Metals in OW-13 Tiverton Landfill

COMPLETE GRAPH

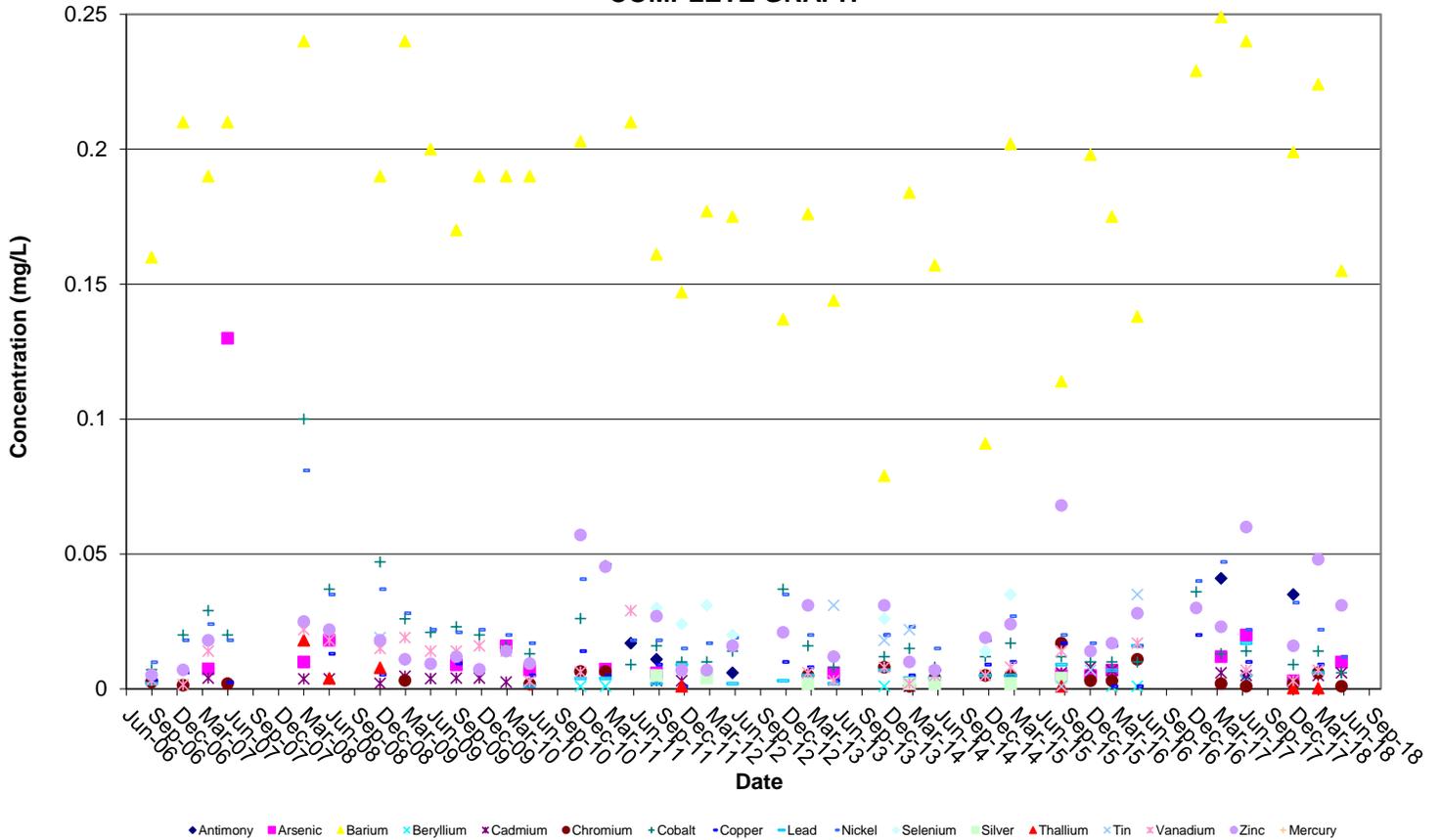


TRUNCATED GRAPH

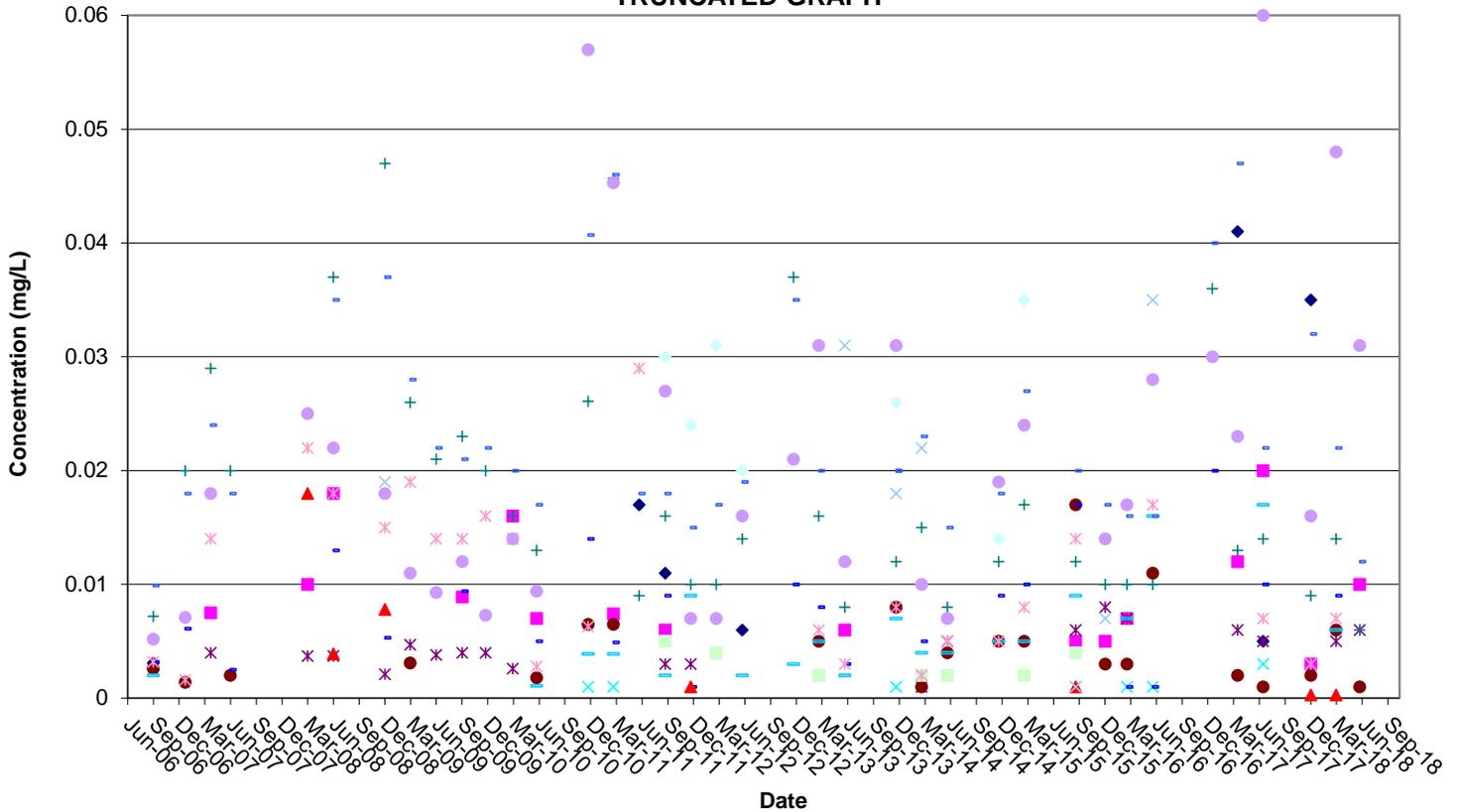


Detected Appendix A Metals in OW-14
Tiverton Landfill

COMPLETE GRAPH

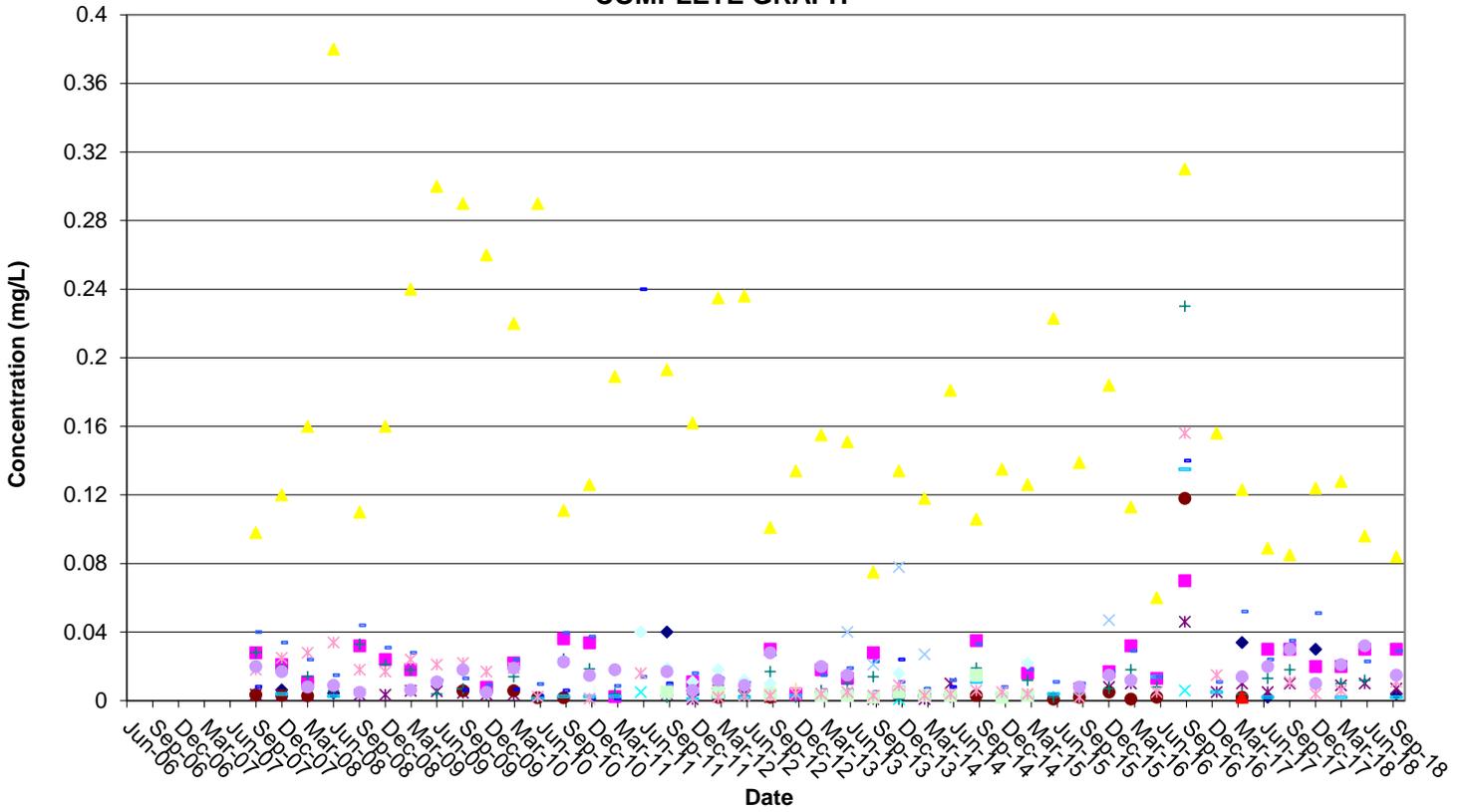


TRUNCATED GRAPH

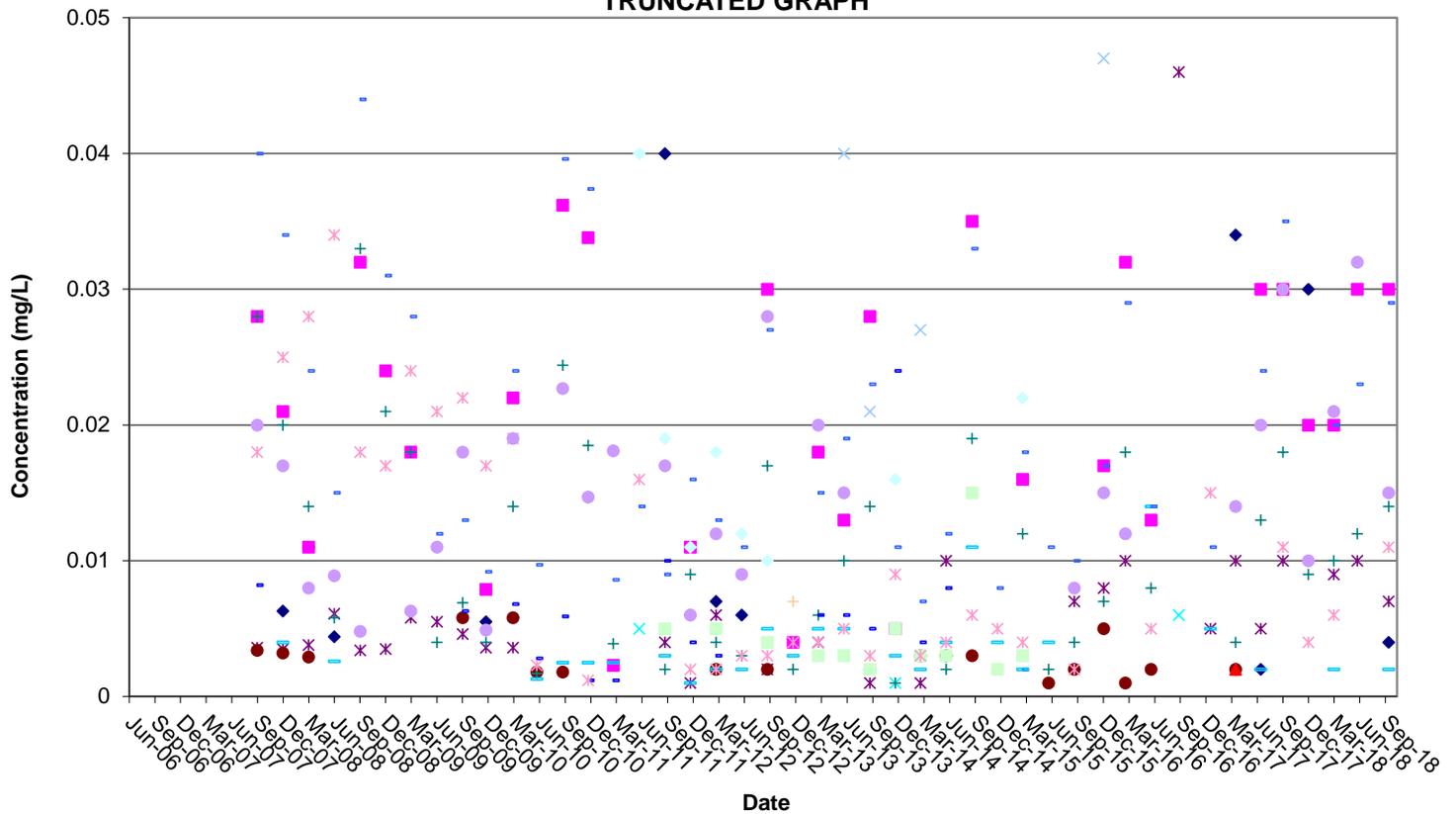


Detected Appendix A Metals in OW-15
Tiverton Landfill

COMPLETE GRAPH

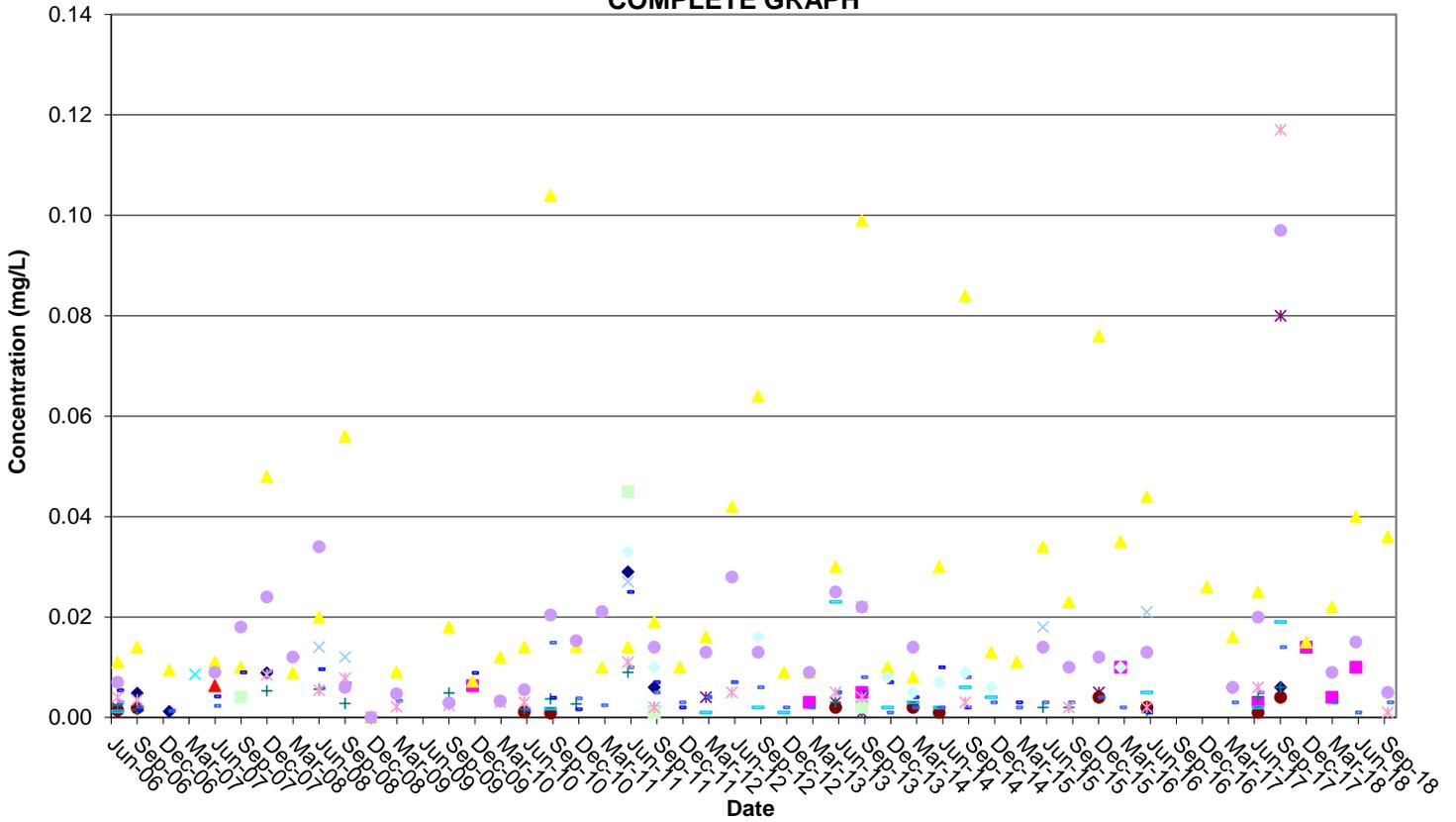


TRUNCATED GRAPH

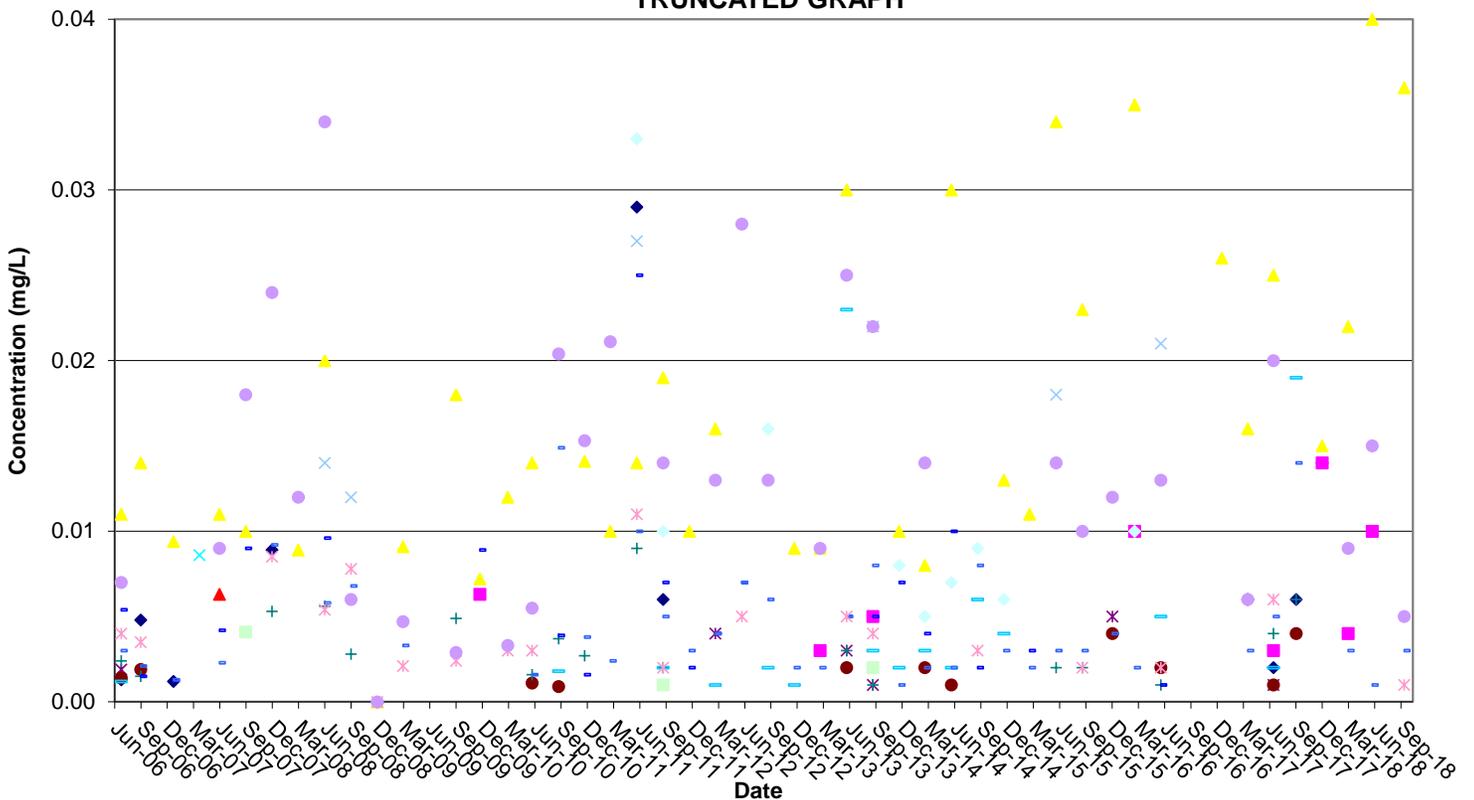


Detected Appendix A Metals at Surface Water Sampling Location SW-1 Tiverton Landfill

COMPLETE GRAPH

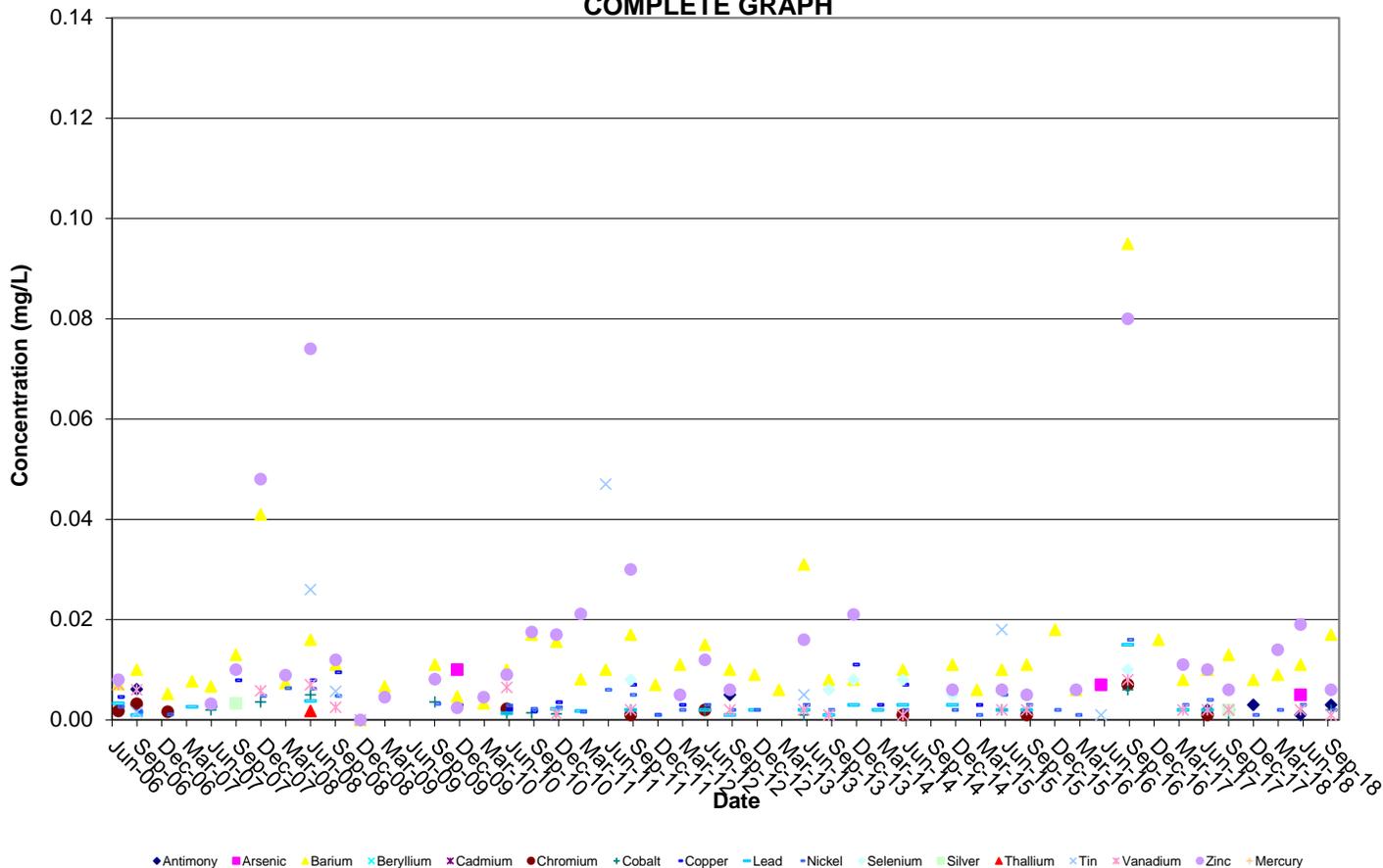


TRUNCATED GRAPH

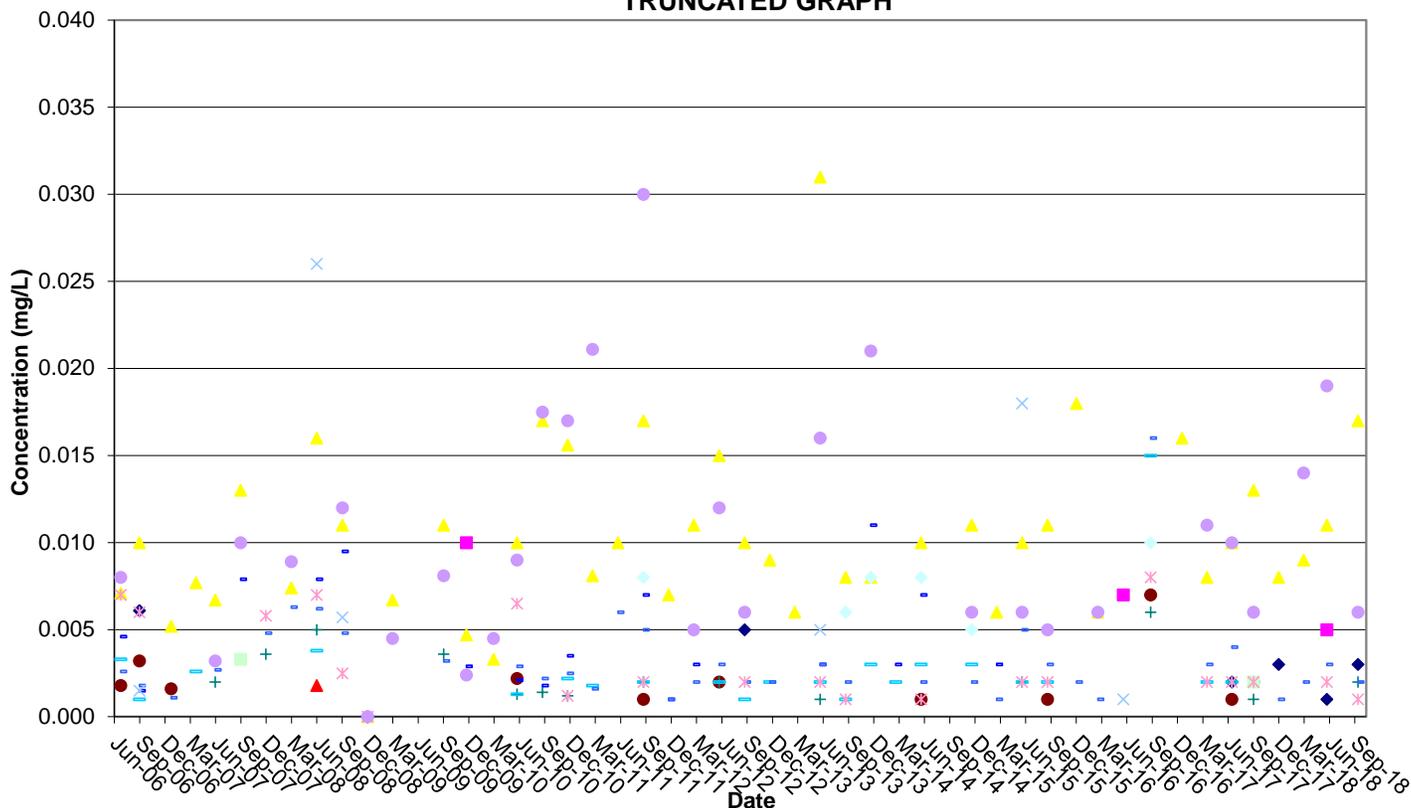


**Detected Appendix A Metals at Surface Water Sampling Location SW-2
Tiverton Landfill**

COMPLETE GRAPH

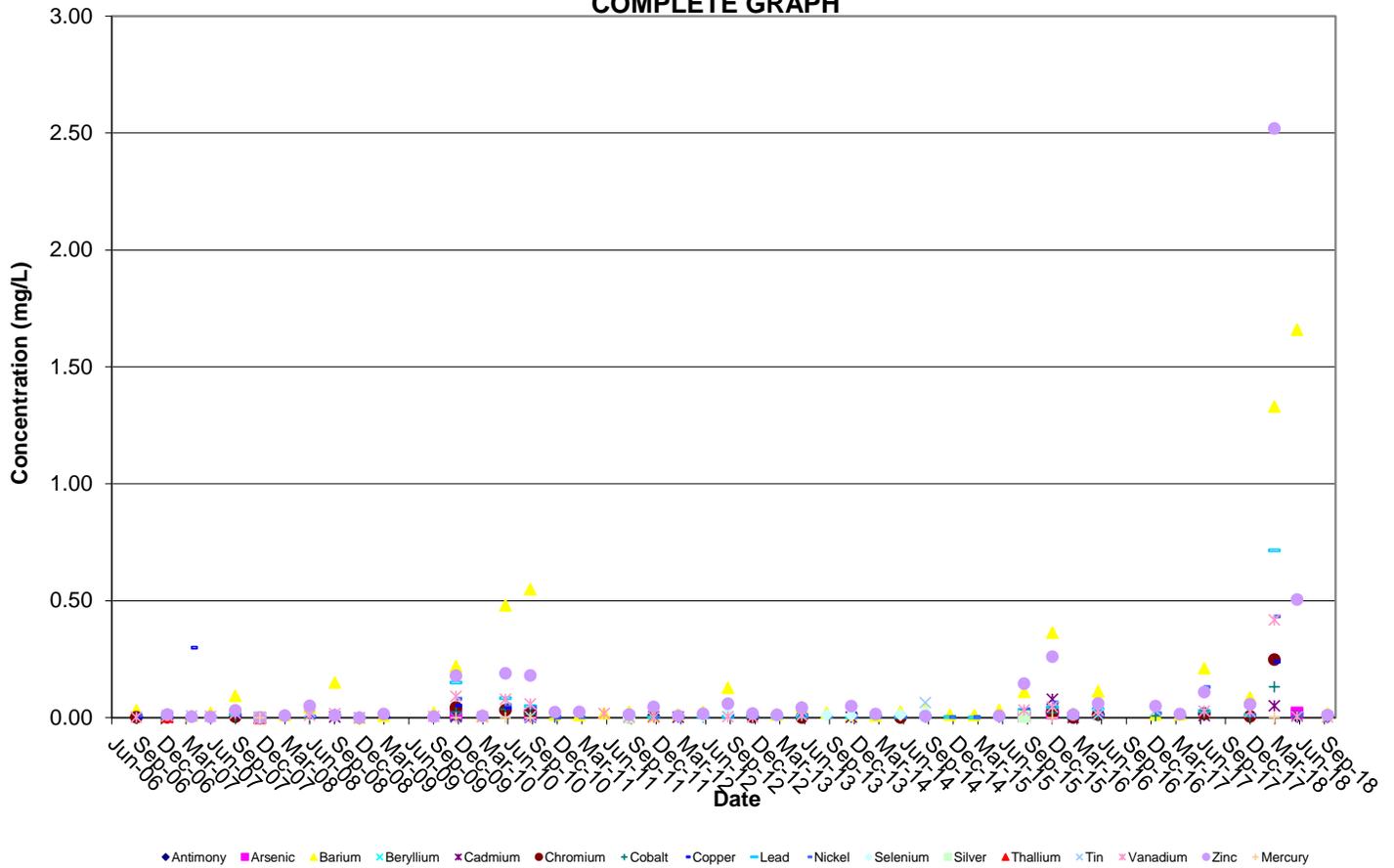


TRUNCATED GRAPH

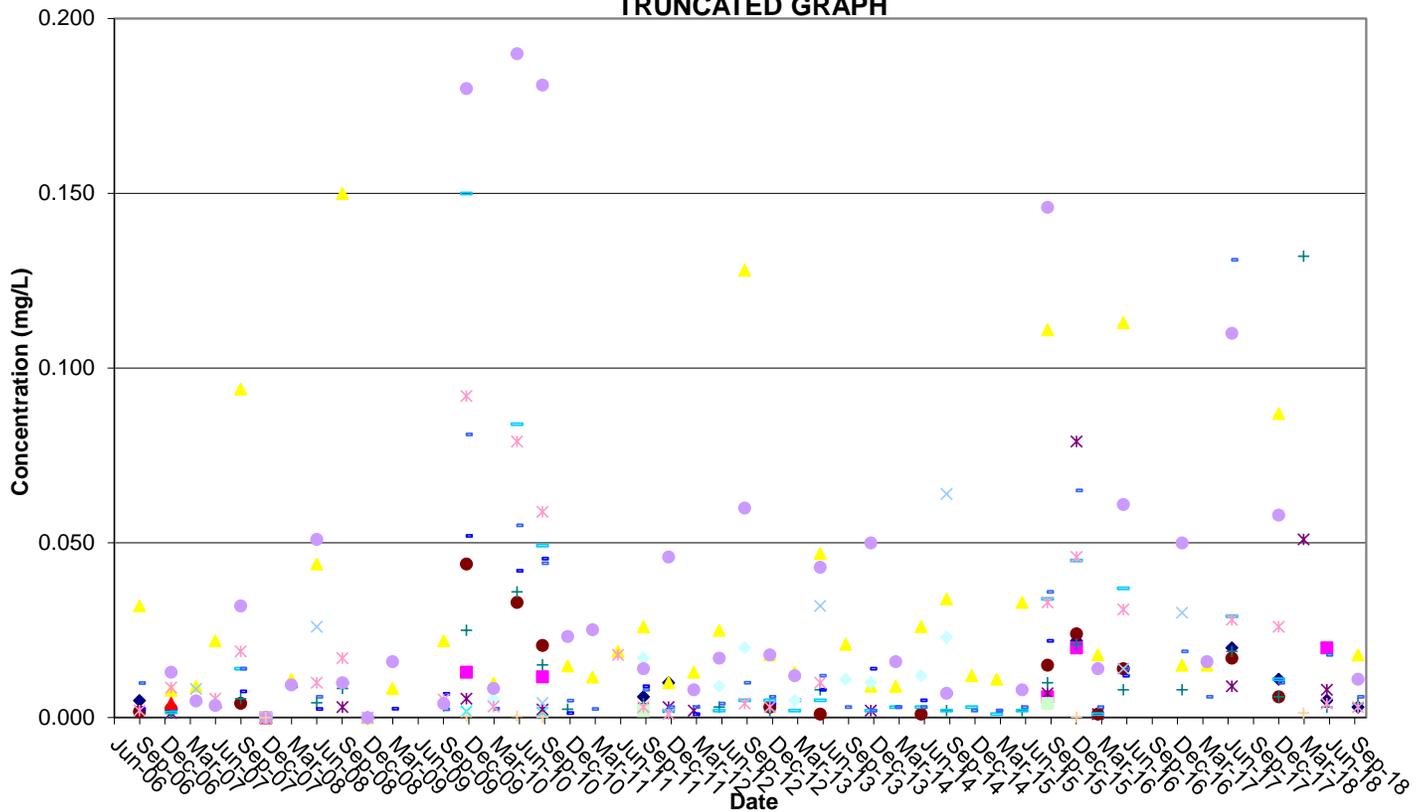


Detected Appendix A Metals at Surface Water Sampling Location SW-3 Tiverton Landfill

COMPLETE GRAPH



TRUNCATED GRAPH



ATTACHMENT NO. 4
TOLERANCE INTERVAL STATISTICAL EVALUATION

TABLE 3
SUMMARY OF GROUNDWATER MONITORING RESULTS - TOLERANCE INTERVAL COMPARISON
SEPT 2018 - SAMPLE ROUND
 Concentration (units as specified for Threshold Value)

Parameter	OW-9		Background Well	Compliance wells				
	Tolerance Limit * TL=AVG+K*S	Threshold Value		OW-9	OW-12	OW-13	OW-14	OW-15
METALS								
Antimony	0.0290 mg/L	0.006 mg/L ¹	NT	ND	0.002	NT	0.004	
Arsenic	0.0030 mg/L	0.010 mg/L ¹	NT	ND	0.010	NT	0.030	
Barium	0.0491 mg/L	2 mg/L ¹	NT	0.023	0.089	NT	0.084	
Beryllium	0.0005 mg/L	0.004 mg/L ¹	NT	ND	ND	NT	ND	
Cadmium	0.3650 mg/L	0.005 mg/L ¹	NT	ND	0.003	NT	0.007	
Chromium	0.0364 mg/L	0.1 mg/L ¹	NT	0.002	0.002	NT	ND	
Cobalt	0.0020 mg/L	0.73 mg/L ²	NT	0.002	0.010	NT	0.014	
Copper	0.0600 mg/L	1.3 mg/L ¹	NT	ND	ND	NT	ND	
Lead	0.2245 mg/L	0.015 mg/L ¹	NT	ND	ND	NT	0.0020	
Mercury	0.0001 mg/L	0.002 mg/L ¹	NT	ND	ND	NT	ND	
Nickel	0.0337 mg/L	0.1 mg/L ⁴	NT	0.025	0.012	NT	0.029	
Selenium	0.0100 mg/L	0.05 mg/L ¹	NT	ND	ND	NT	ND	
Silver	0.0005 mg/L	0.1 mg/L ^{2,3}	NT	ND	ND	NT	ND	
Thallium	0.0005 mg/L	0.002 mg/L ¹	NT	ND	ND	NT	ND	
Tin	0.0025 mg/L	22 mg/L ⁵	NT	ND	ND	NT	ND	
Vanadium	0.0020 mg/L	0.26 mg/L ²	NT	0.001	0.004	NT	0.0110	
Zinc	13.7203 mg/L	2 - 5 mg/L ^{2,3}	NT	0.026	0.01	NT	0.015	
VOCS								
Acetone		610 µg/L ²						
Acrylonitrile		0.039 µg/L ²						
Benzene		5 µg/L ¹						
Bromochloromethane		80 µg/L ⁴						
Bromodichloromethane (THM)		90 µg/L ¹						
Bromoform		80 µg/L ¹						
Carbon disulfide		1000 µg/L ²						
Carbon tetrachloride		5 µg/L ¹						
Chlorobenzene		100 µg/L ¹						
Chloroethane		4.6 µg/L ²						
Chloroform		80 µg/L ¹						
Chlorodibromomethane (THM)		80 µg/L ¹						
1,2-Dibromo-3-chloropropane (DBCP)		0.2 µg/L ¹						
1,2-Dibromoethane (EDB)		0.05 µg/L ¹						
1,2-Dichlorobenzene		600 µg/L ¹						
1,4-Dichlorobenzene		75 µg/L ¹						
trans-1,4-Dichloro-2-butene		µg/L						
1,1 -Dichloroethane		5 µg/L						
1,2-Dichloroethane		5 µg/L ¹						
1,1-Dichloroethylene		7 µg/L ¹						
cis-1,2-Dichloroethene		70 µg/L ¹						
trans-1,2-Dichloroethene		100 µg/L ¹						
1,2-Dichloropropane		5 µg/L ¹						
cis-1,3-Dichloropropene		µg/L						
trans-1,3-Dichloropropene		µg/L						
Ethylbenzene		700 µg/L ¹						
Methyl butyl ketone(2-Hexanone)		160 µg/L ²						
Bromomethane		10 µg/L ⁴						
Chloromethane		30 µg/L ⁴						
Dibromomethane		61 µg/L ²						
Methylene chloride		5 µg/L ¹						
Methyl ethyl ketone(2-Butanone)		4000 µg/L ⁴						
Methyl iodide		µg/L						
4-Methyl-2-pentanone		µg/L						
Styrene		100 µg/L ¹						
1,1,1,2-Tetrachloroethane		70 µg/L ⁴						
1,1,2,2-Tetrachloroethane		0.3 µg/L ⁴						
Tetrachloroethylene(PCE)		5 µg/L ¹						
Toluene		1000 µg/L ¹						
1,1,1-Trichloroethane		200 µg/L ¹						
1,1,2-Trichloroethane		5 µg/L ¹						
Trichloroethylene(TCE)		5 µg/L ¹						
Trichlorofluoromethane		2000 µg/L ⁴						
1,2,3-Trichloropropane		40 µg/L ⁴						
Vinyl acetate		410 µg/L ²						
Vinyl chloride		2 µg/L ¹						
Xylenes		10000 µg/L ¹						
Methyl tert-butyl ether (MTBE)		20 - 40 µg/L ⁴						

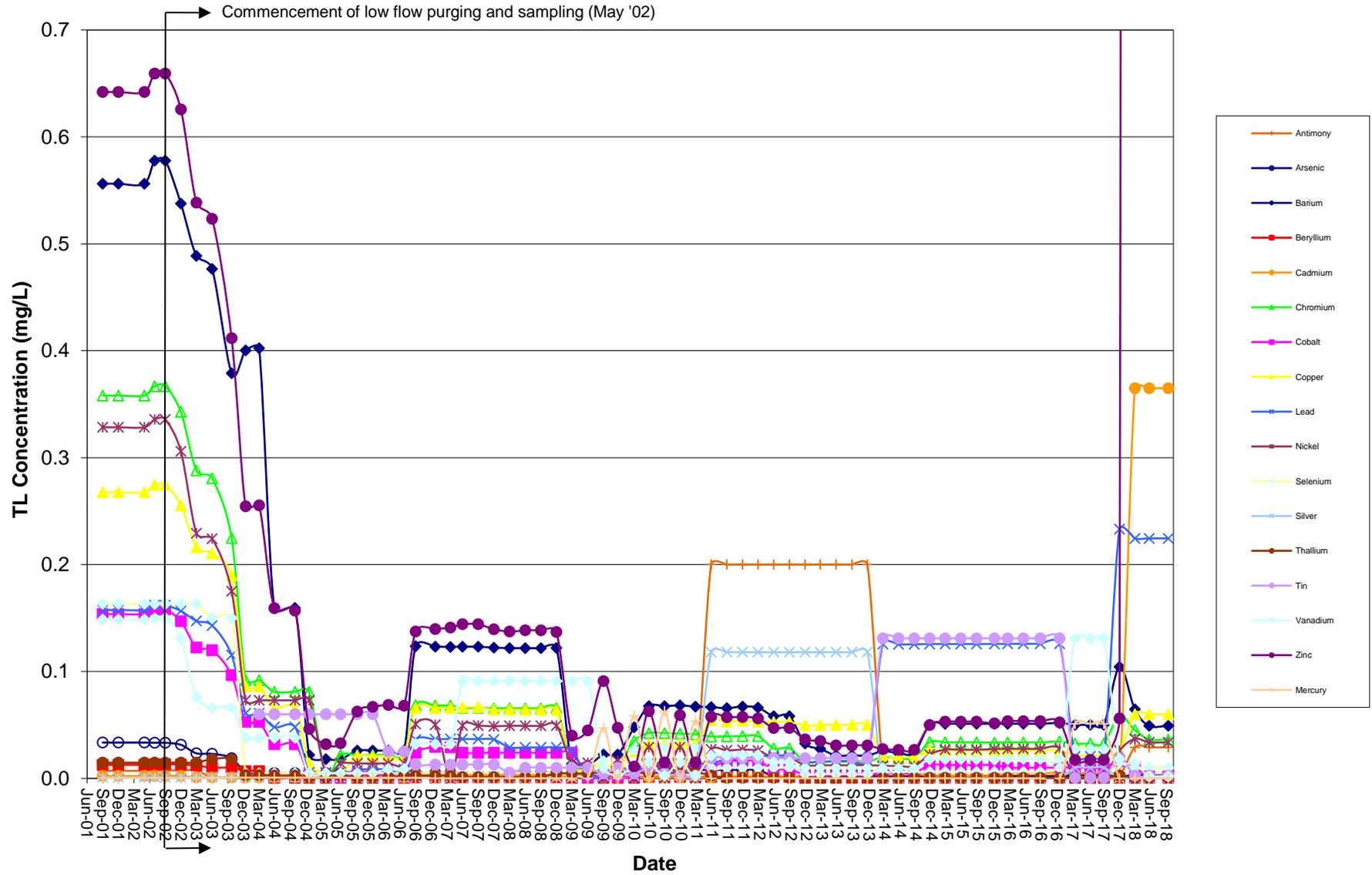
1. Threshold value given is the Maximum Contaminant Level (MCL) as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
 2. Threshold value given is the lifetime health advisory as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
 3. Threshold value given is the Secondary Drinking Water Regulation (SDWR) as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
 4. Threshold value given is the Drinking Water Advisory as provided in the USEPA 2004 Edition of the Drinking Water Standards and Health Advisories
 5. Threshold value given is the Preliminary Remedial Goal (PRG) for tap water, as provided in the October 2002 USEPA Region 9 PRGs Table 2002 Update
 6. Constituent concentration was reported above its laboratory method detection limit, but lower than its laboratory reporting limit and historical reporting limit.
 However, the reporting limit this round was significantly higher than previous reporting limits. Therefore, to be consistent with historical data, only those constituents with concentrations lower than historical reporting limits were reported as non-detect.

No threshold value has been provided for parameters not identified in the sources listed above

" " = Exceedance of TL
 ND = Not Detected

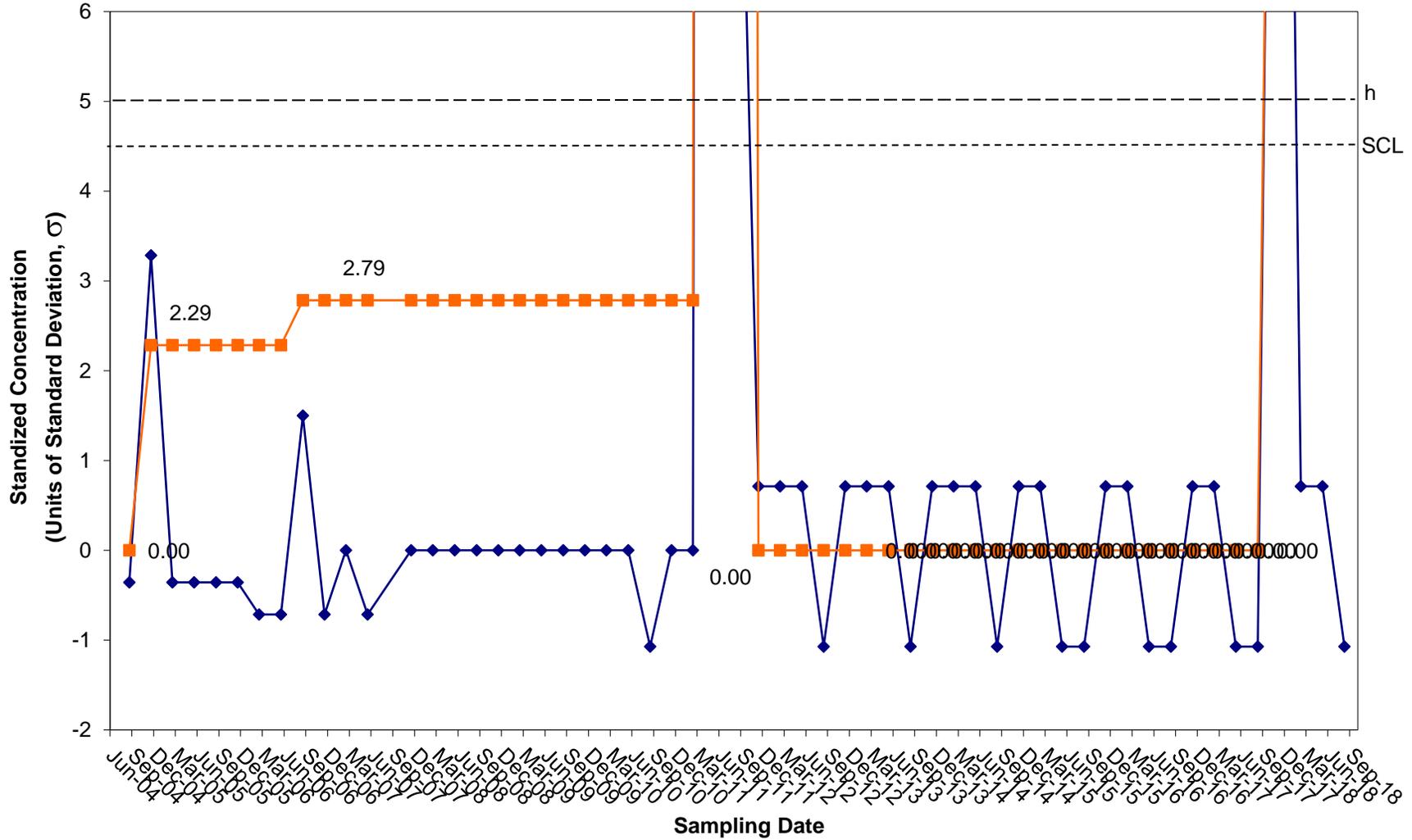
* Tolerance Limit (TL) constructed from background (upgradient) well data from OW-9.

Historical Tolerance Limit Concentrations from Background Well Tiverton Landfill Compliance Sampling

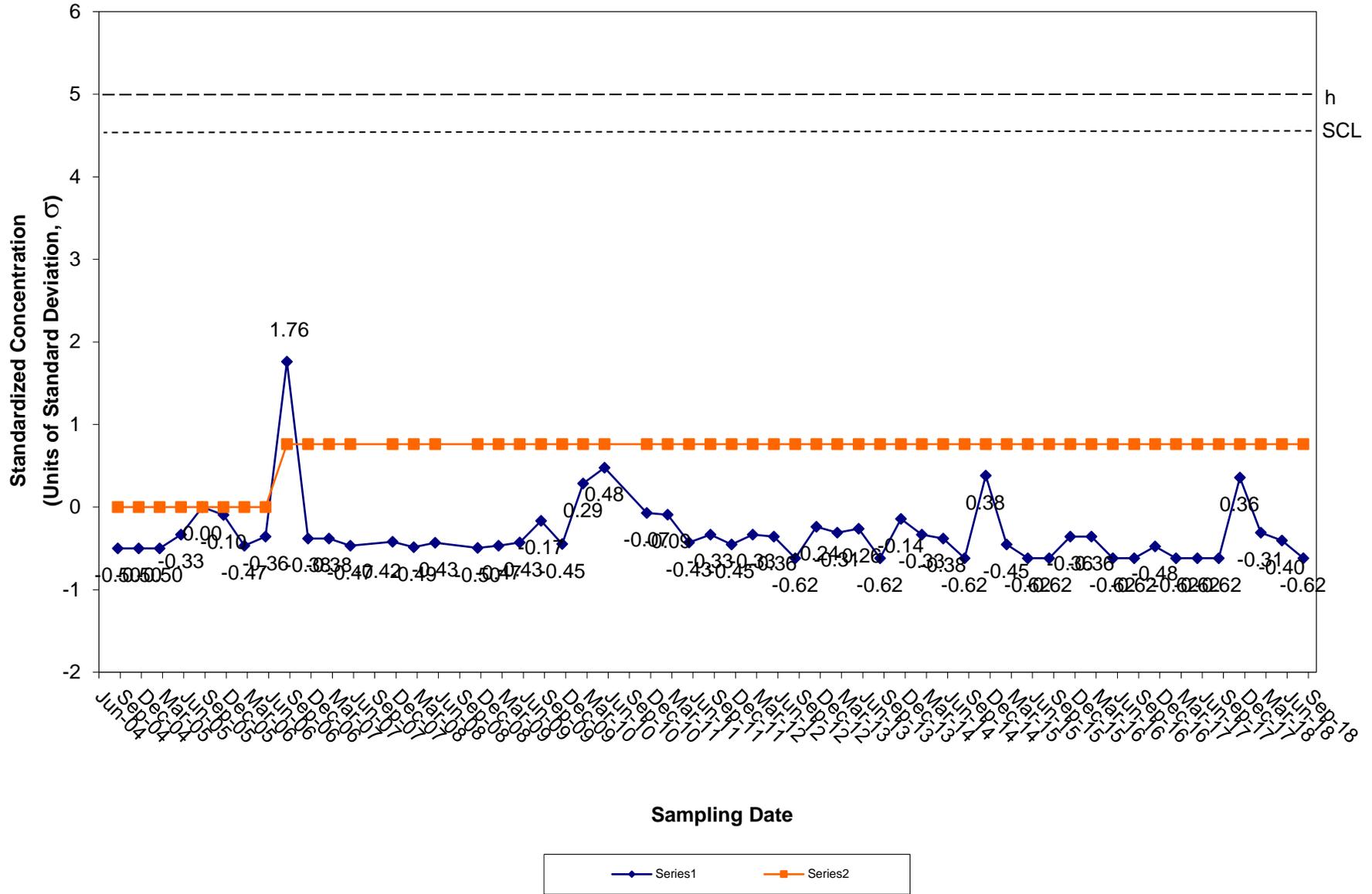


ATTACHMENT NO. 5
CUSUM METHOD STATISTICAL EVALUATION

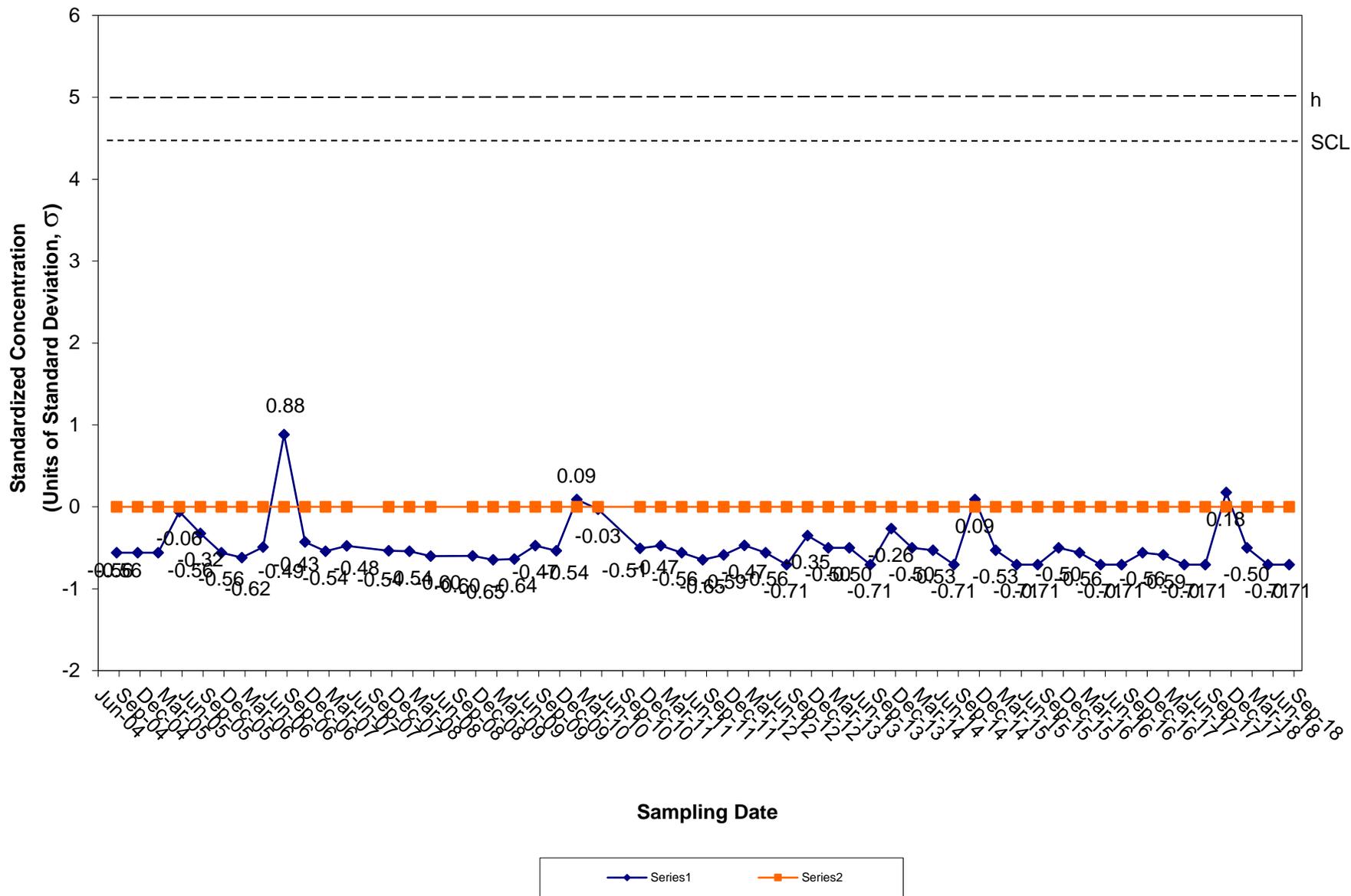
CUSUM Control Chart for Antimony Tiverton Landfill Groundwater Compliance Well OW-9



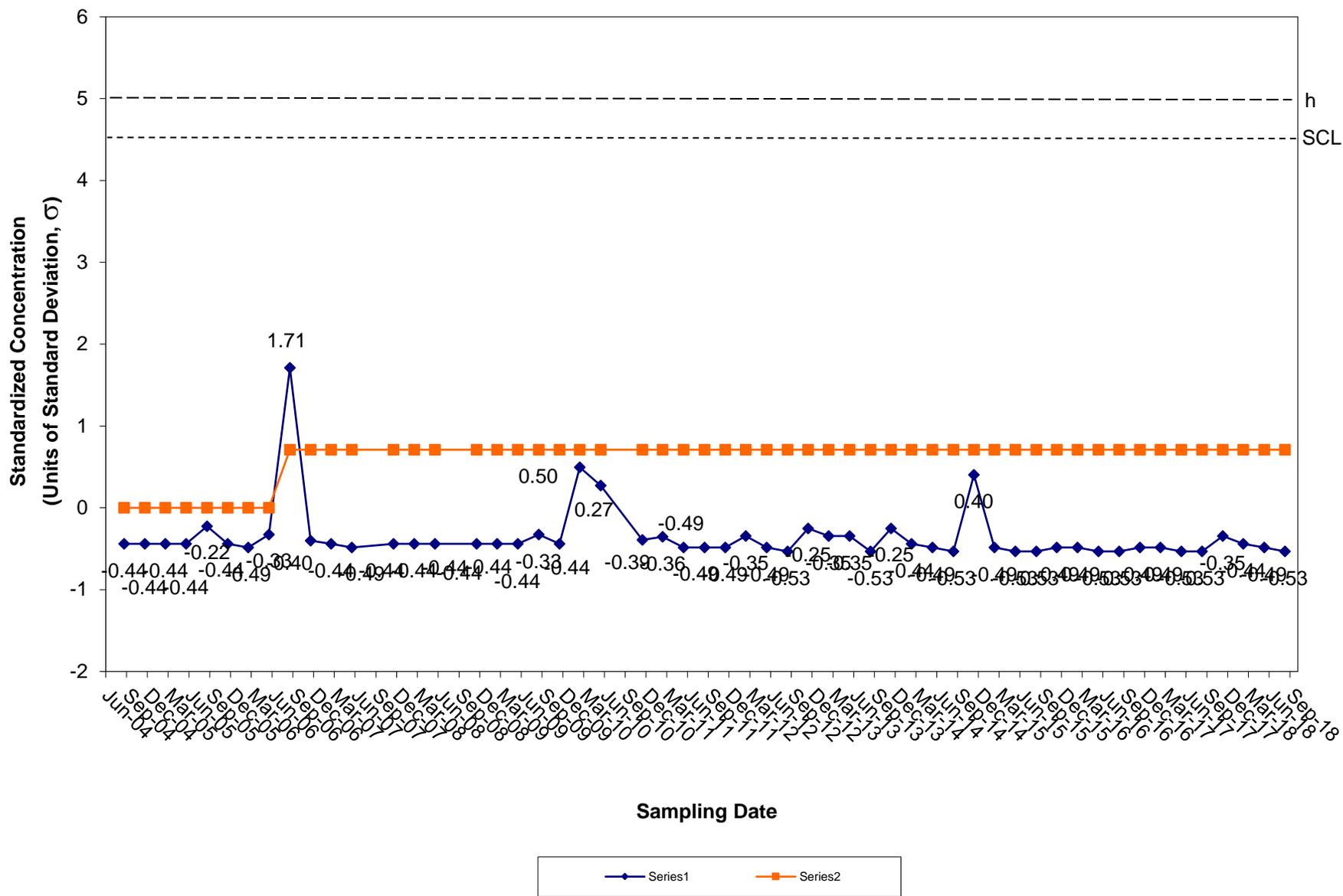
CUSUM Control Chart for Barium Tiverton Landfill Groundwater Background Well OW-9



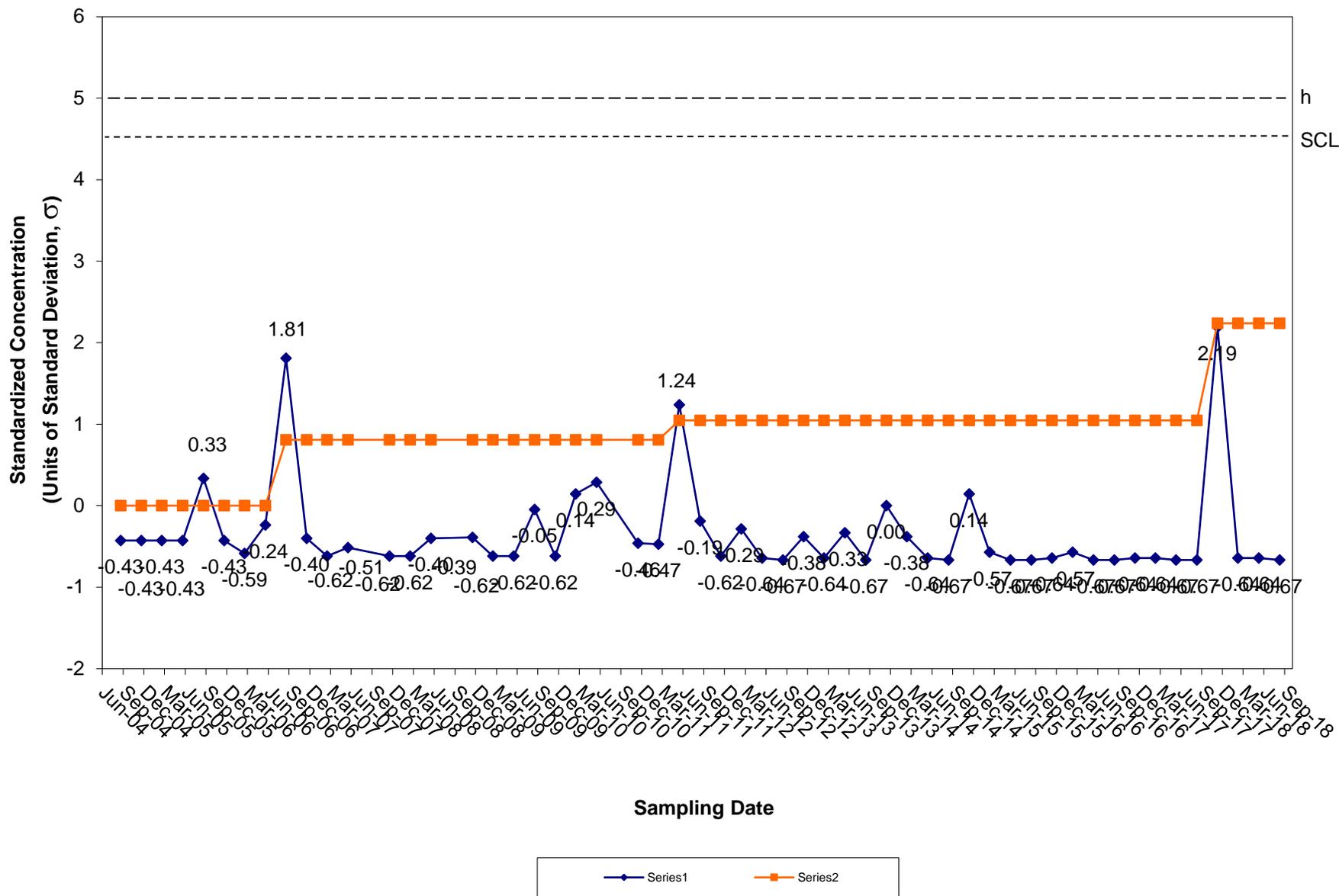
CUSUM Control Chart for Chromium Tiverton Landfill Groundwater Background Well OW-9



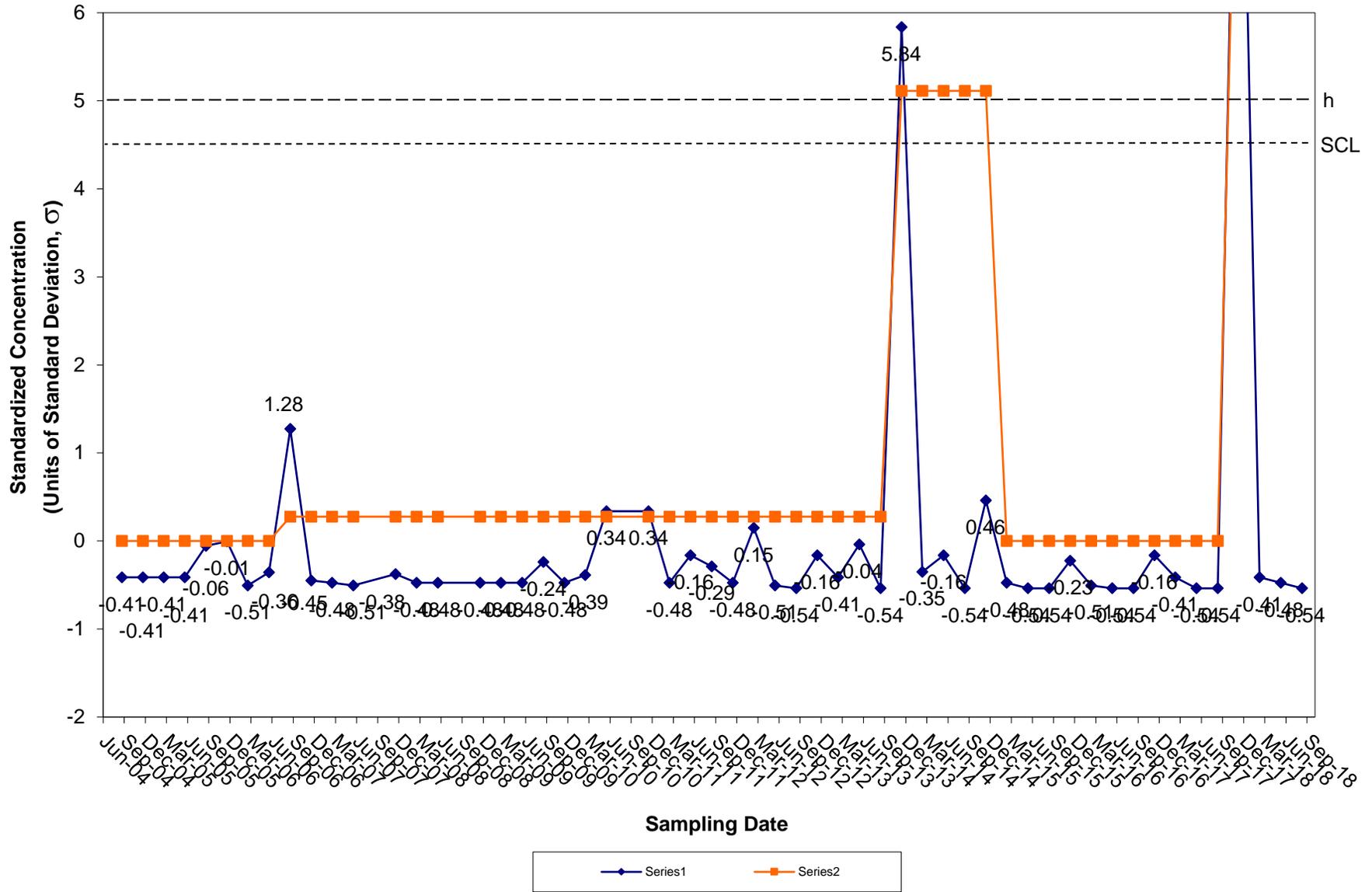
CUSUM Control Chart for Cobalt Tiverton Landfill Groundwater Background Well OW-9



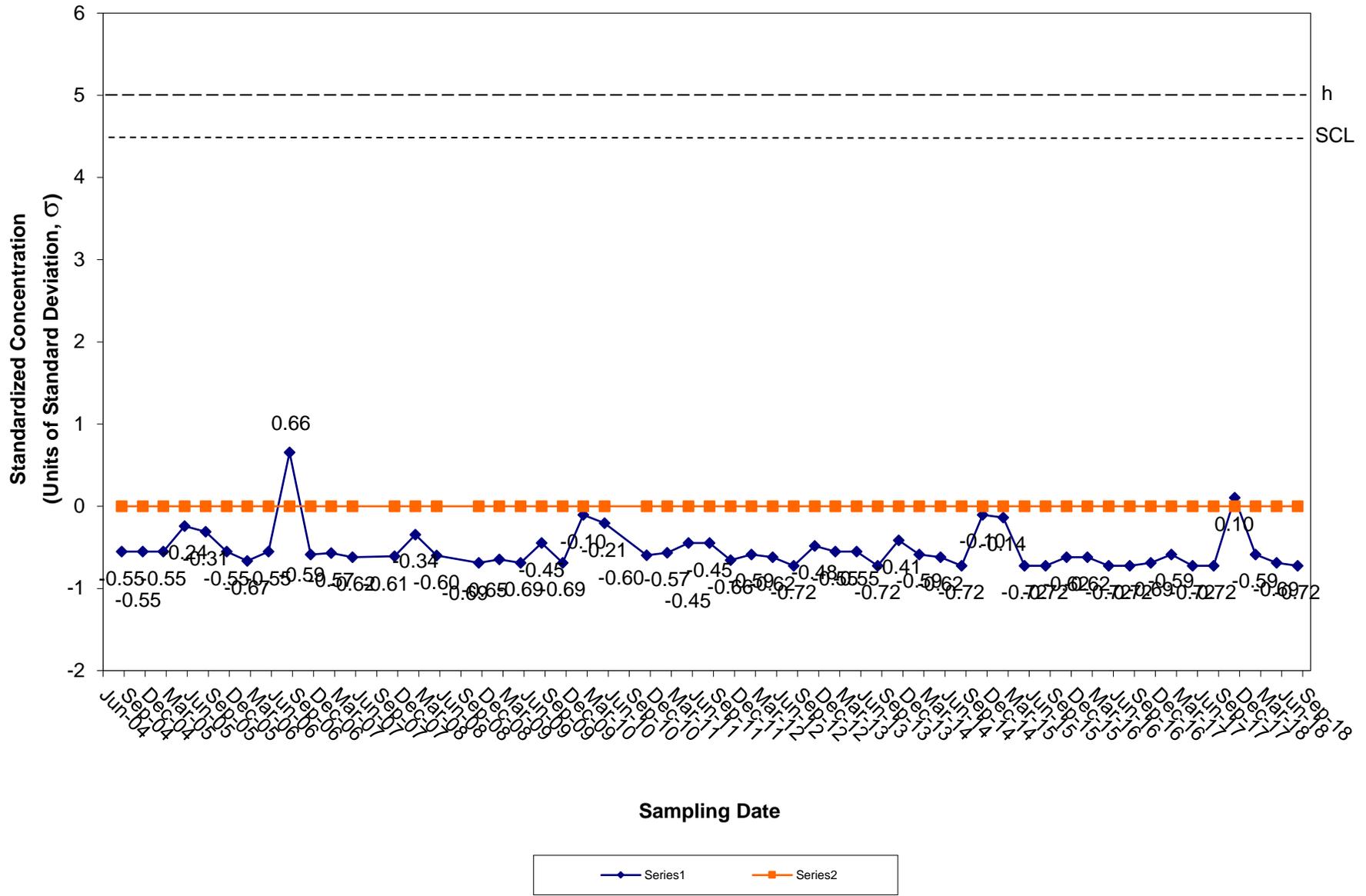
CUSUM Control Chart for Copper Tiverton Landfill Groundwater Background Well OW-9



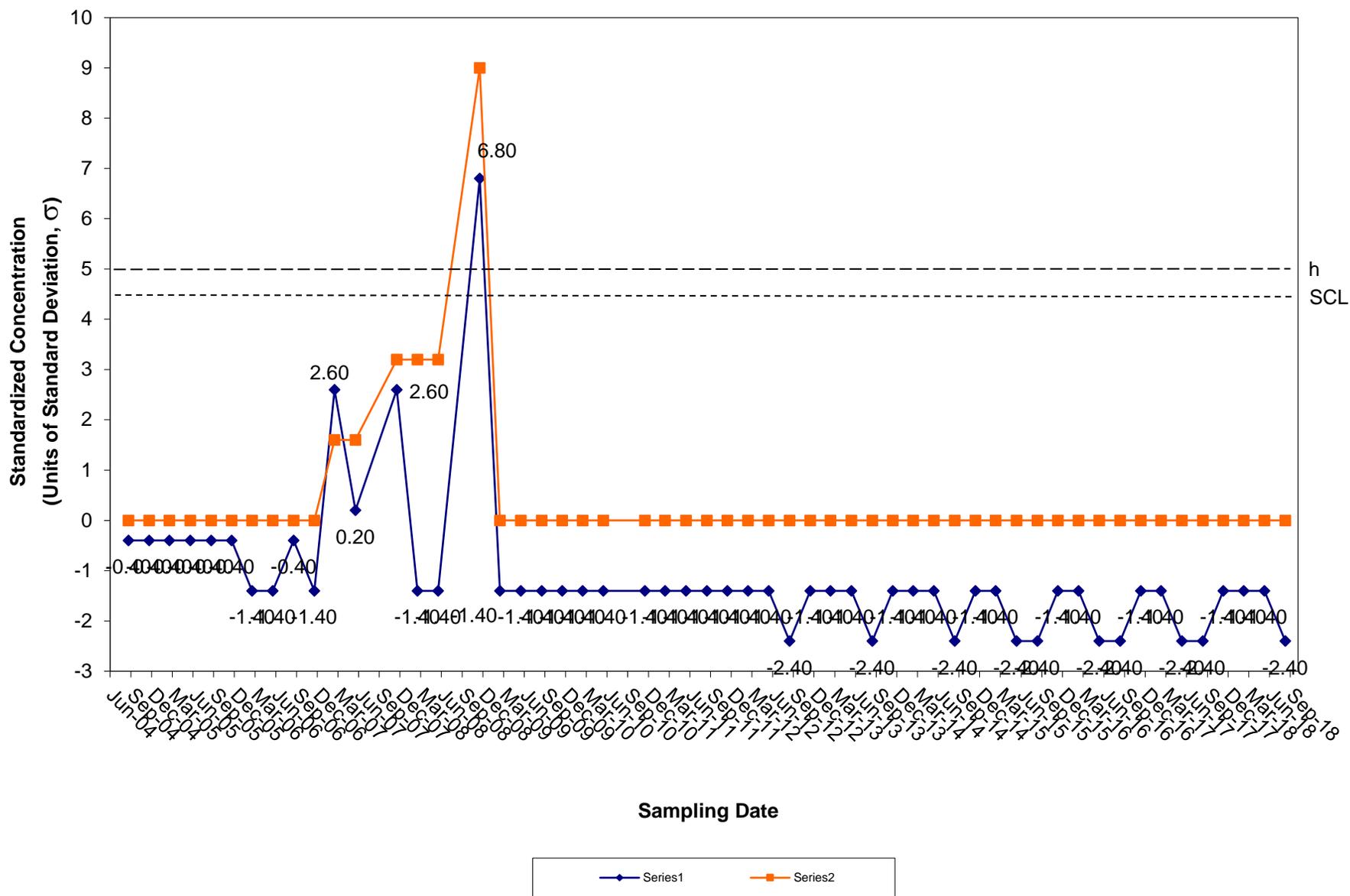
CUSUM Control Chart for Lead Tiverton Landfill Groundwater Background Well OW-9



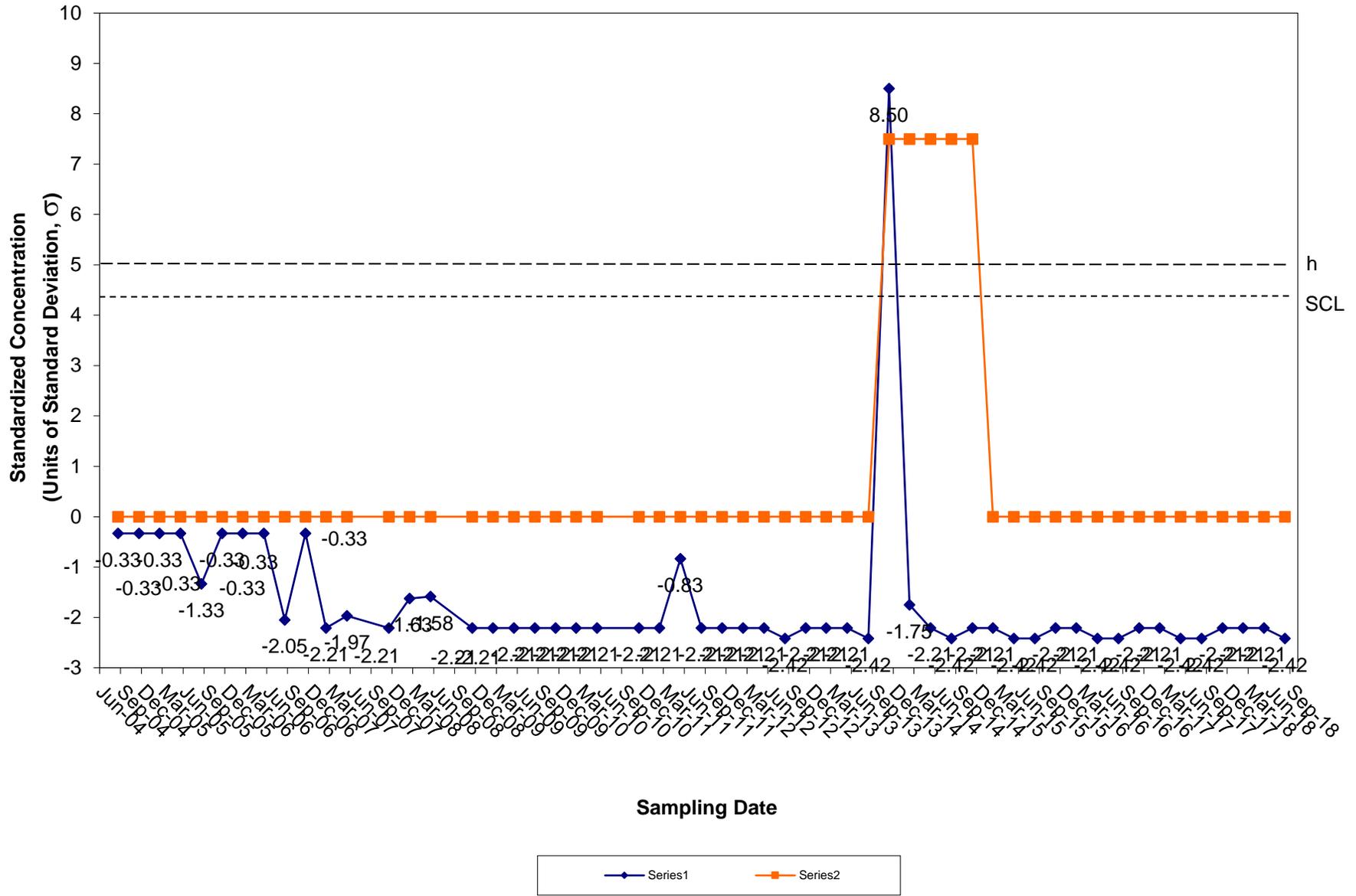
CUSUM Control Chart for Nickel Tiverton Landfill Groundwater Background Well OW-9



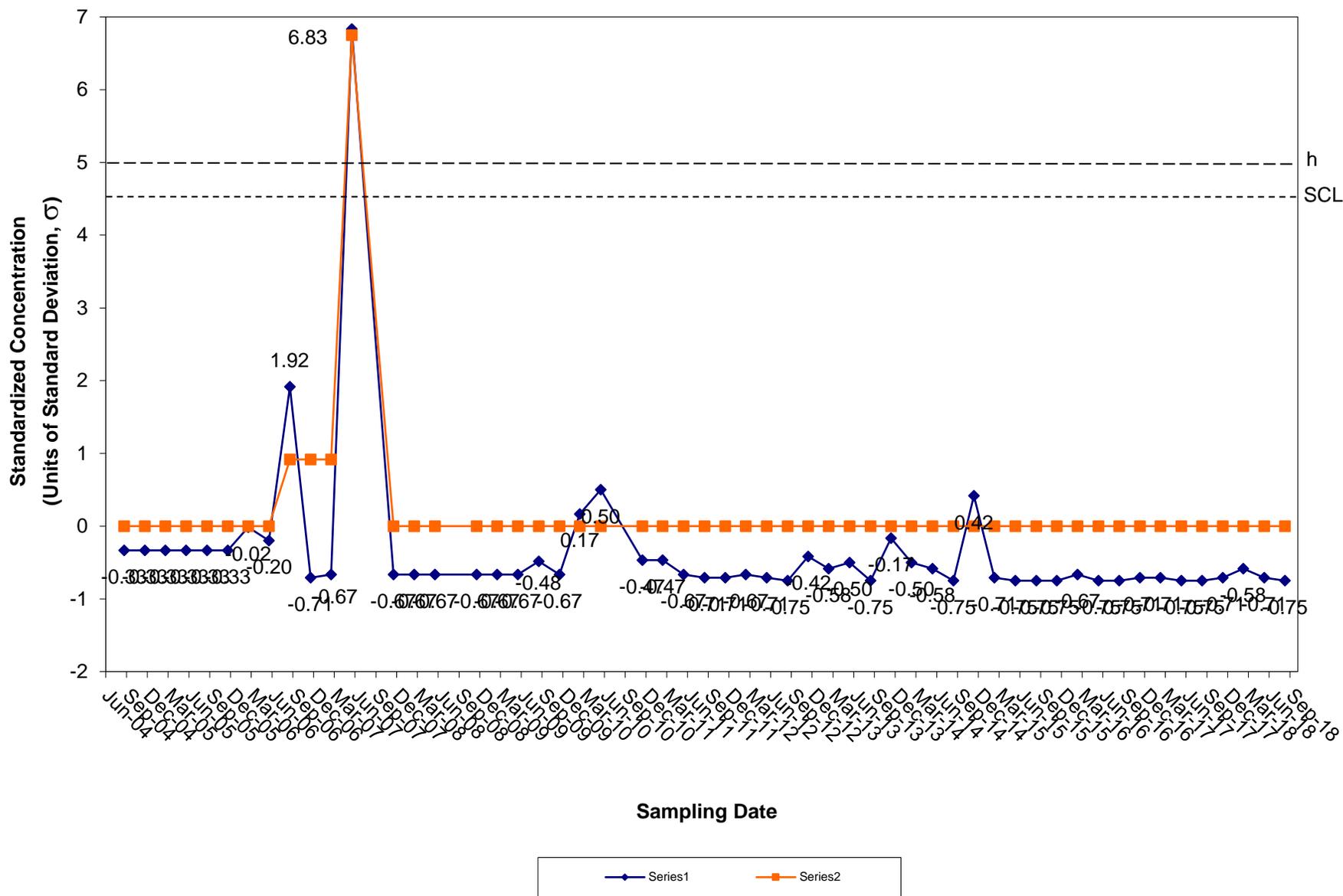
CUSUM Control Chart for Thallium Tiverton Landfill Groundwater Background Well OW-9



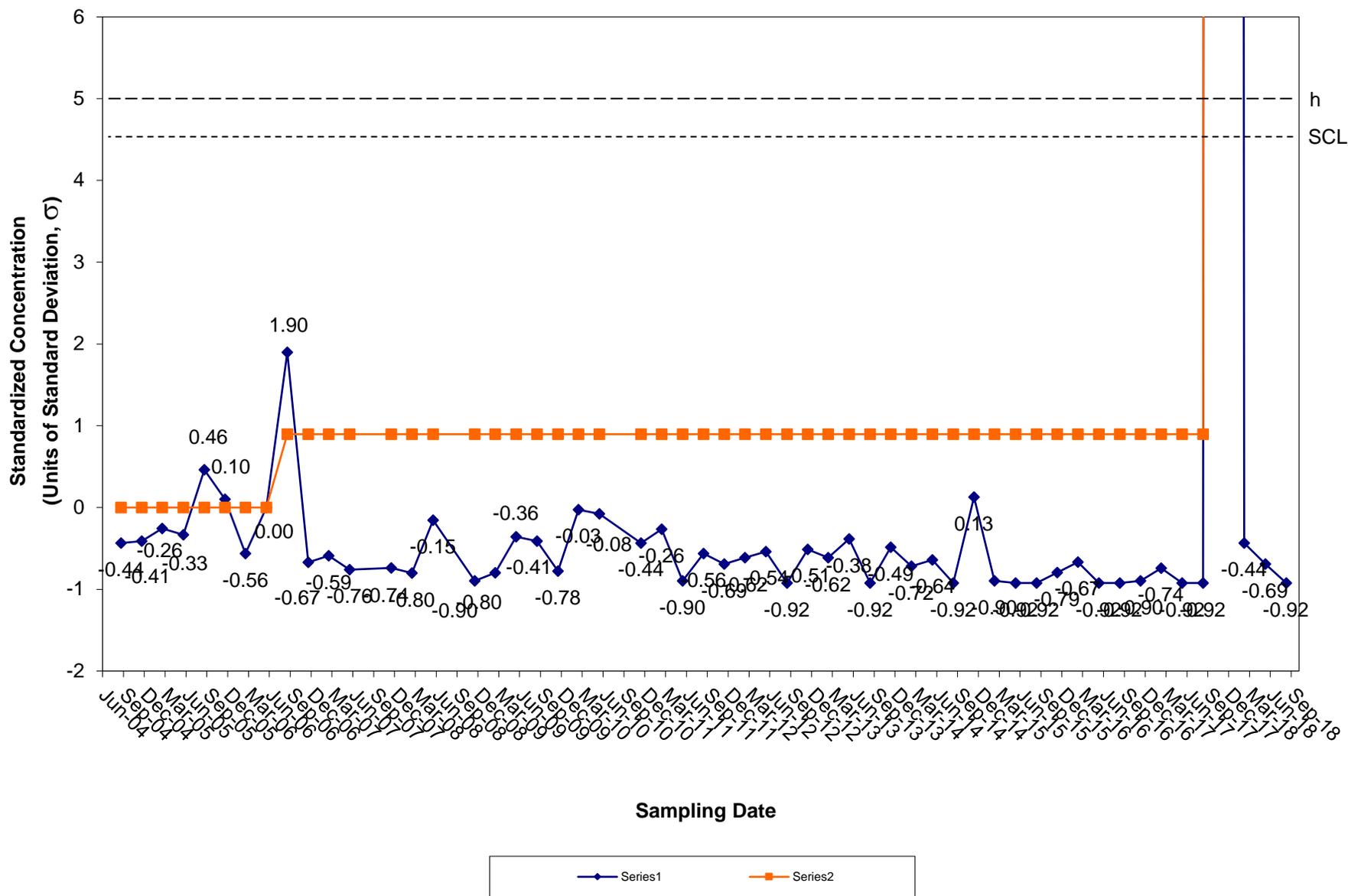
CUSUM Control Chart for Tin Tiverton Landfill Groundwater Background Well OW-9



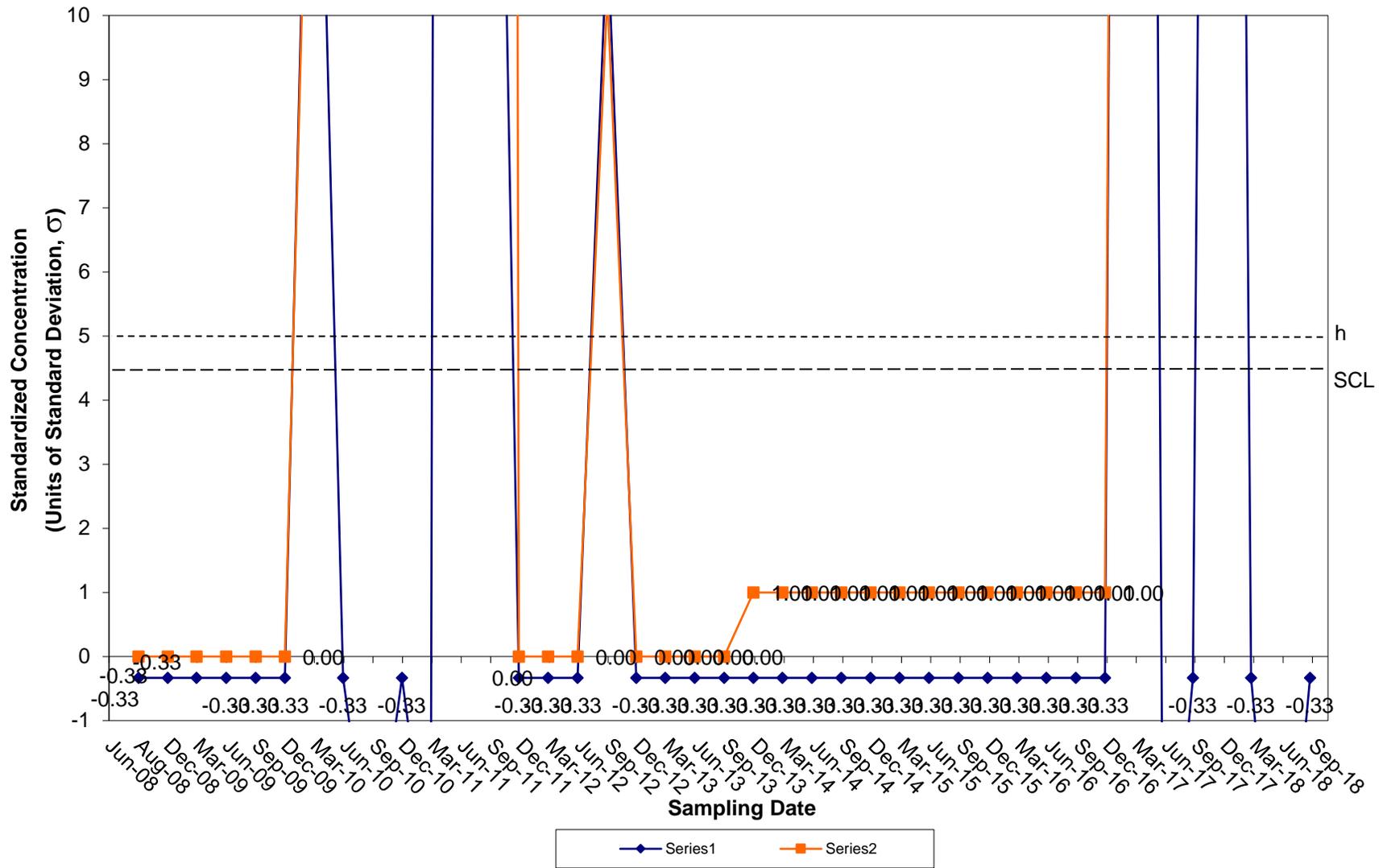
CUSUM Control Chart for Vanadium Tiverton Landfill Groundwater Background Well OW-9



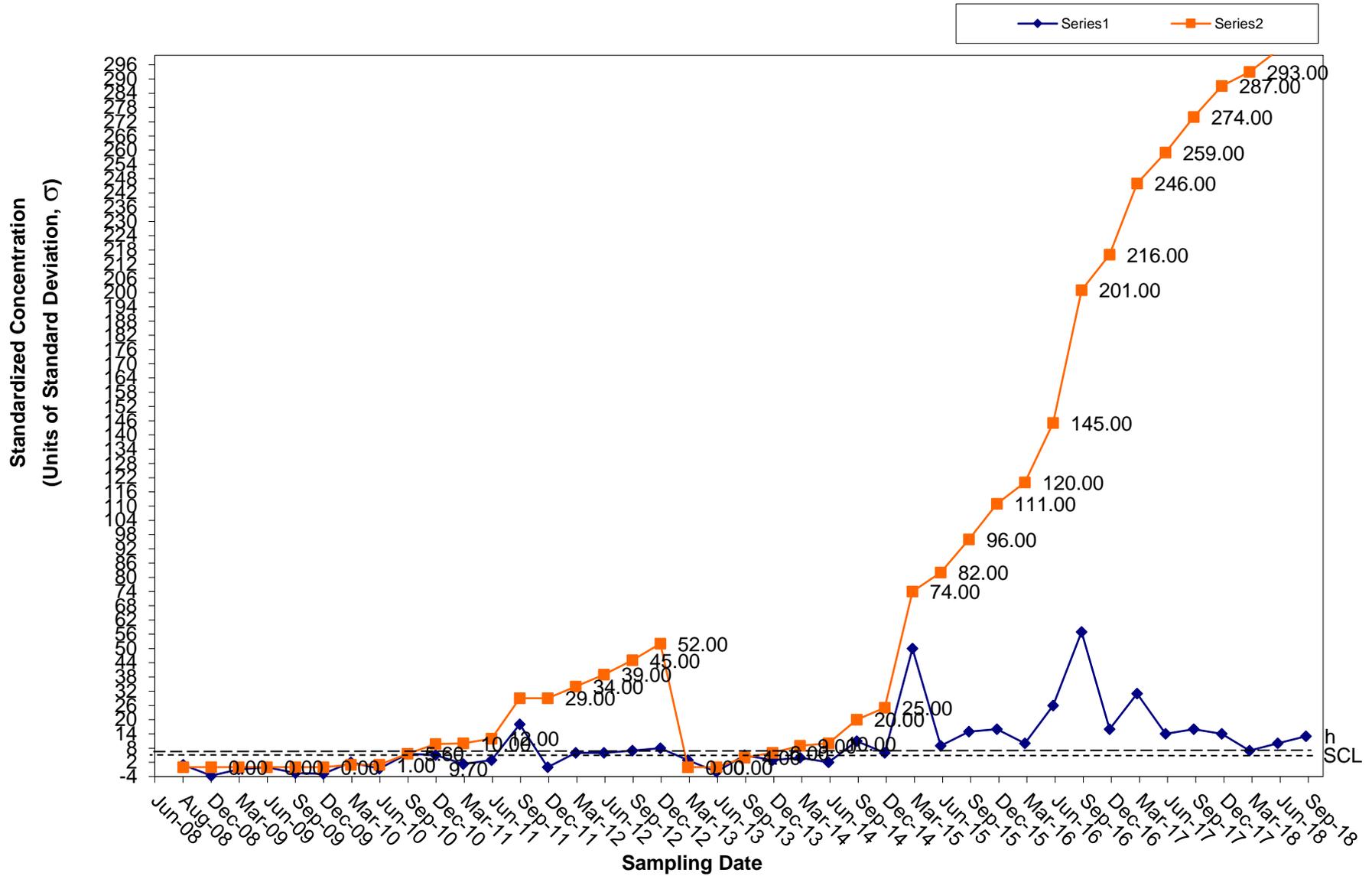
CUSUM Control Chart for Zinc Tiverton Landfill Groundwater Background Well OW-9



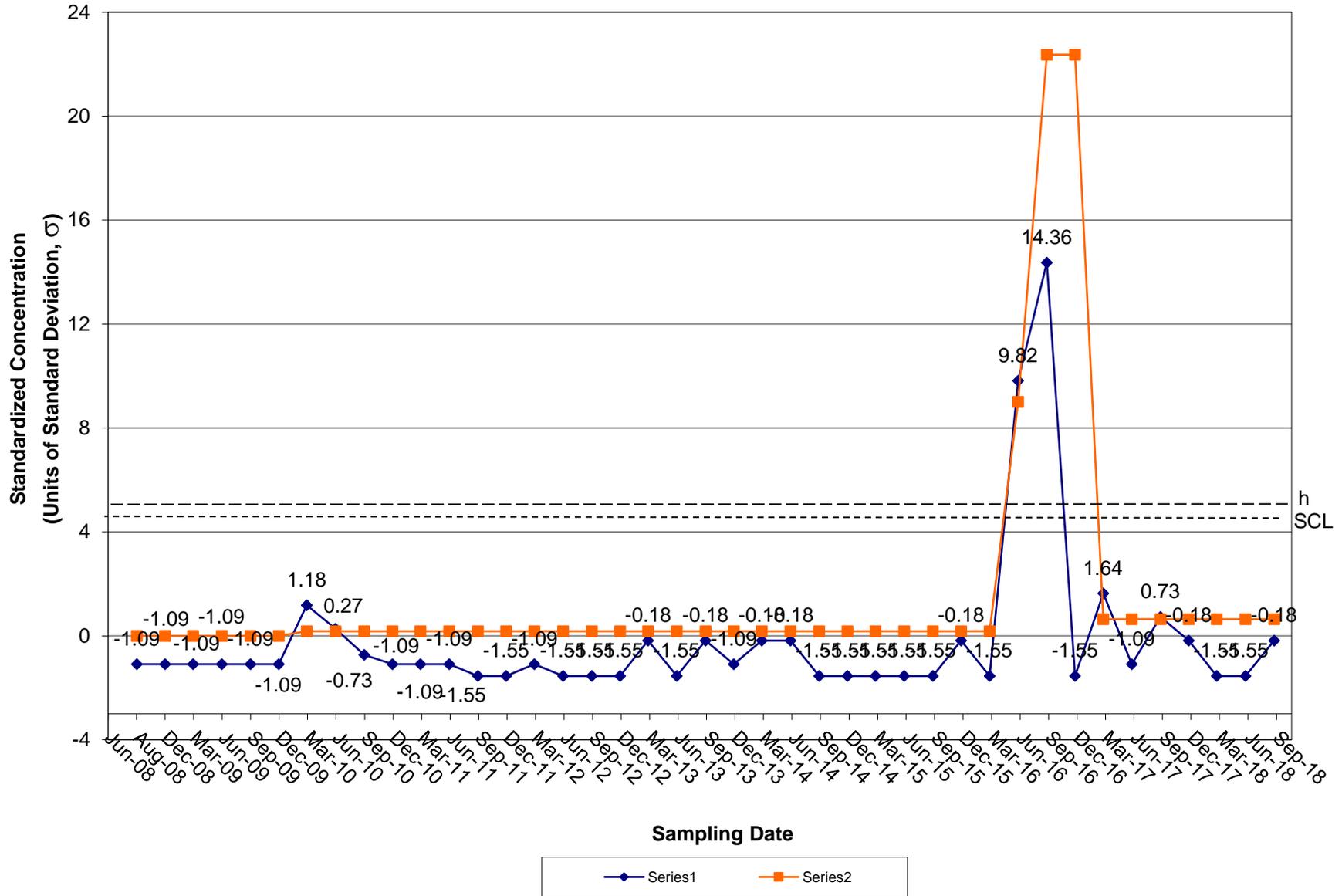
CUSUM Control Chart for Antimony Tiverton Landfill Groundwater Compliance Well OW-12



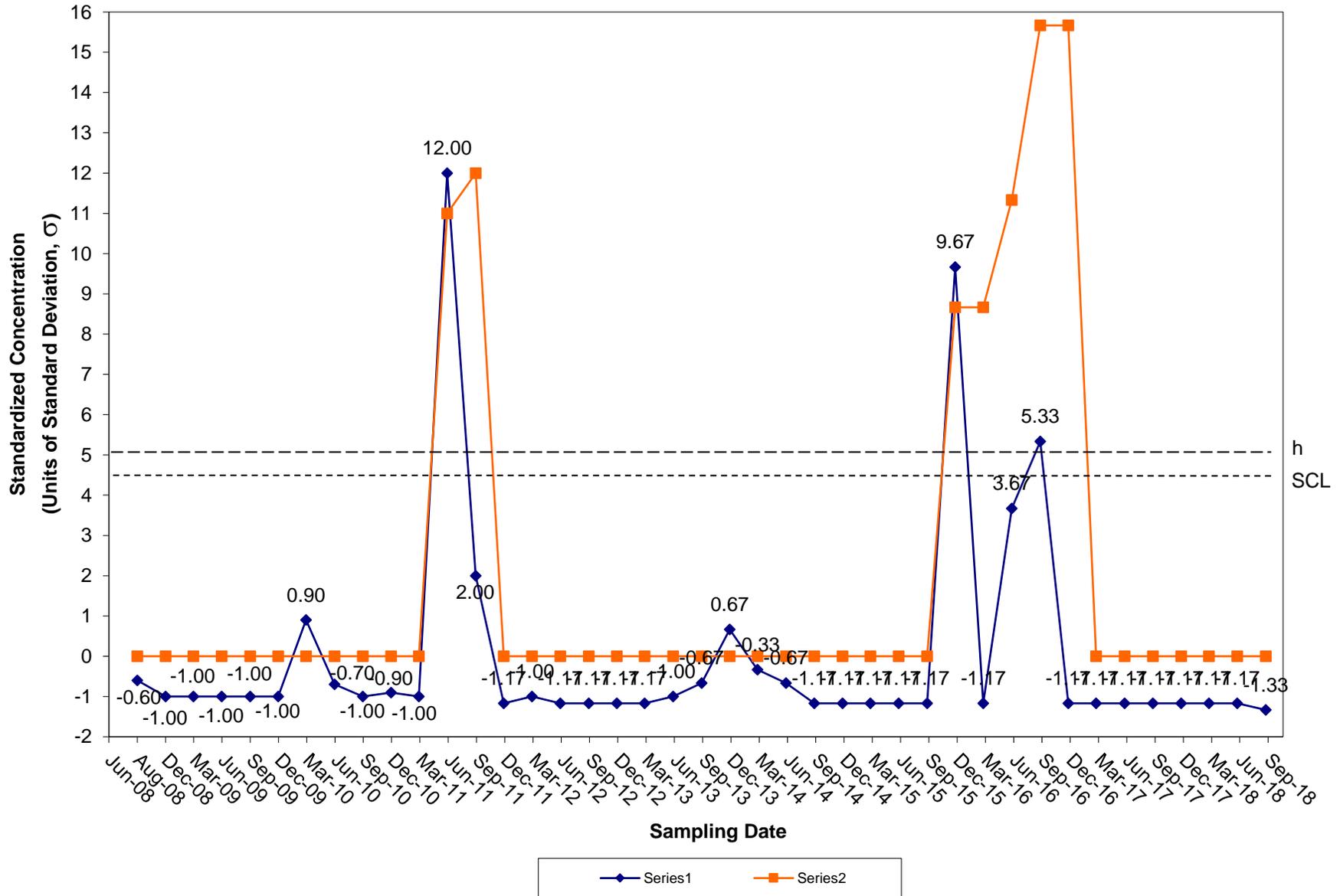
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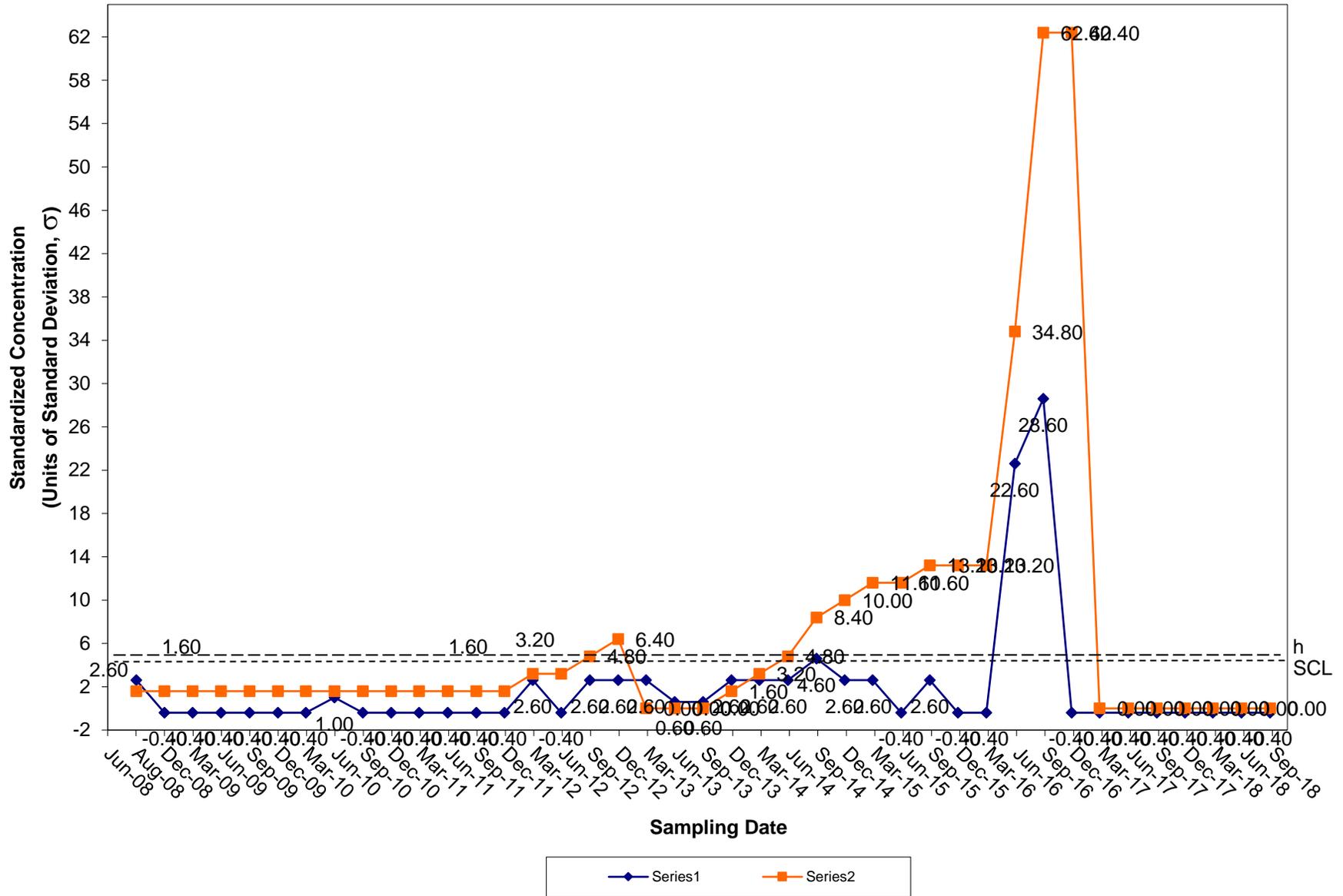
CUSUM Control Chart for Chromium Tiverton Landfill Groundwater Compliance Well OW-12



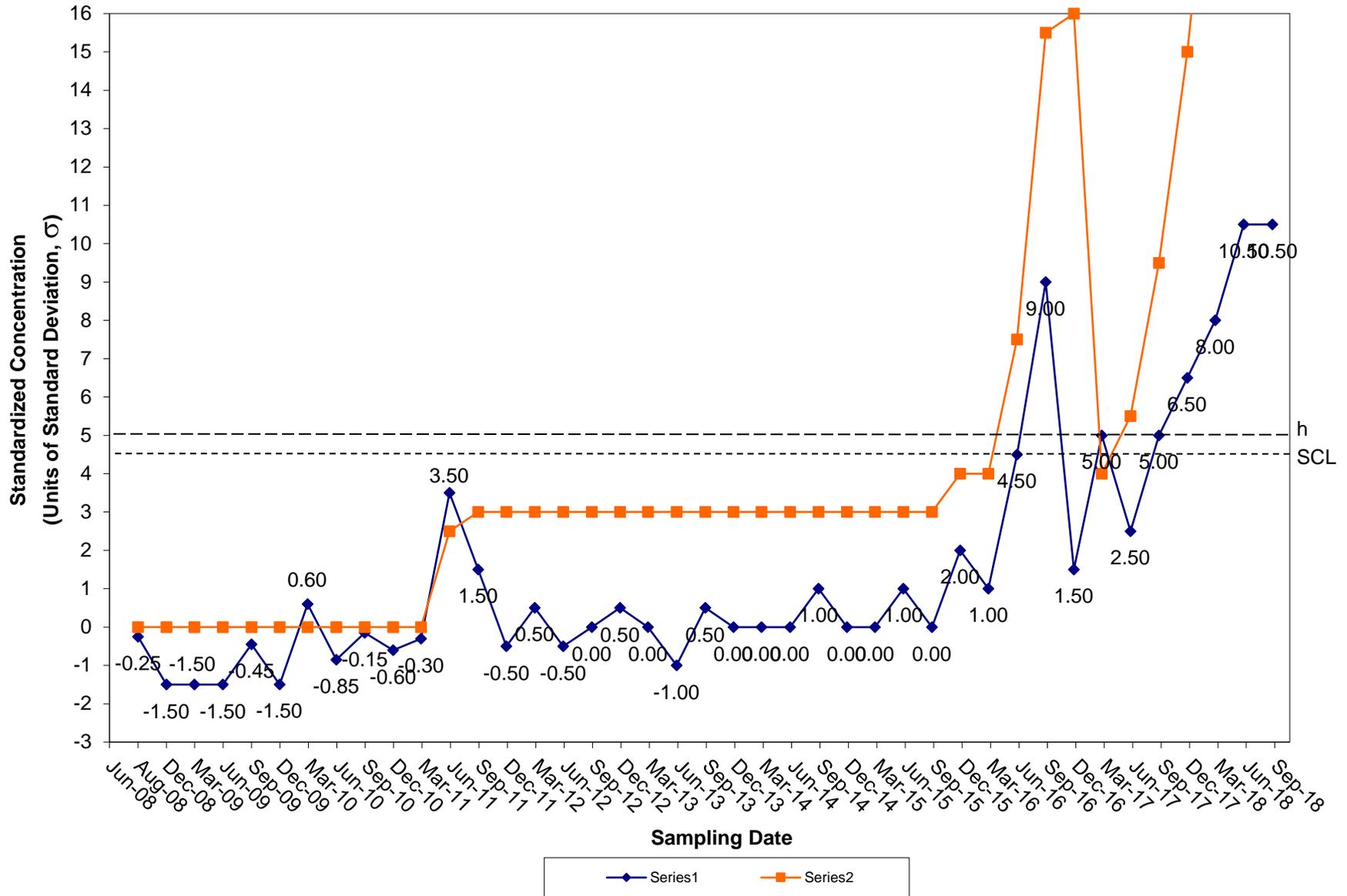
CUSUM Control Chart for Copper Tiverton Landfill Groundwater Compliance Well OW-12



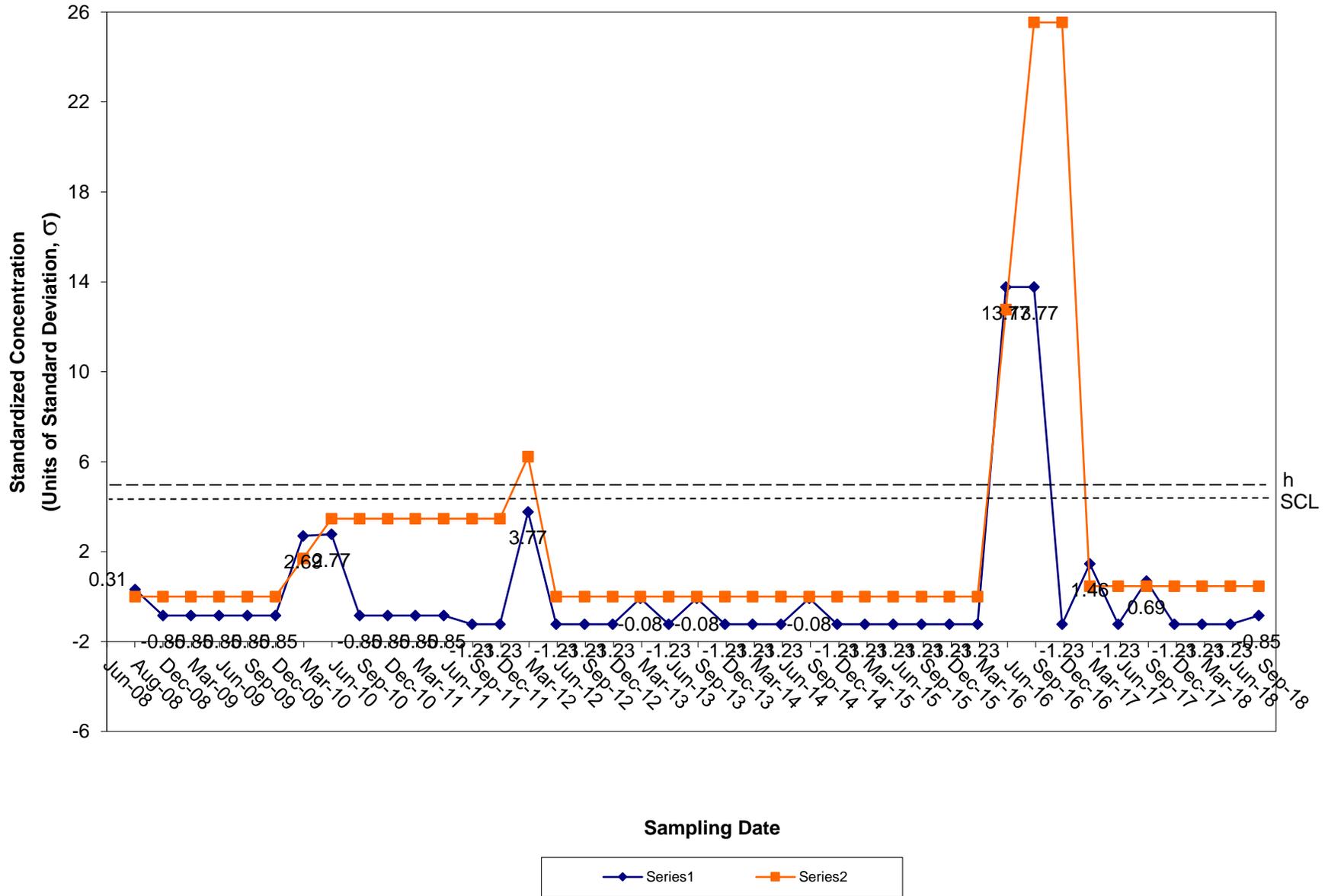
CUSUM Control Chart for Lead Tiverton Landfill Groundwater Compliance Well OW-12



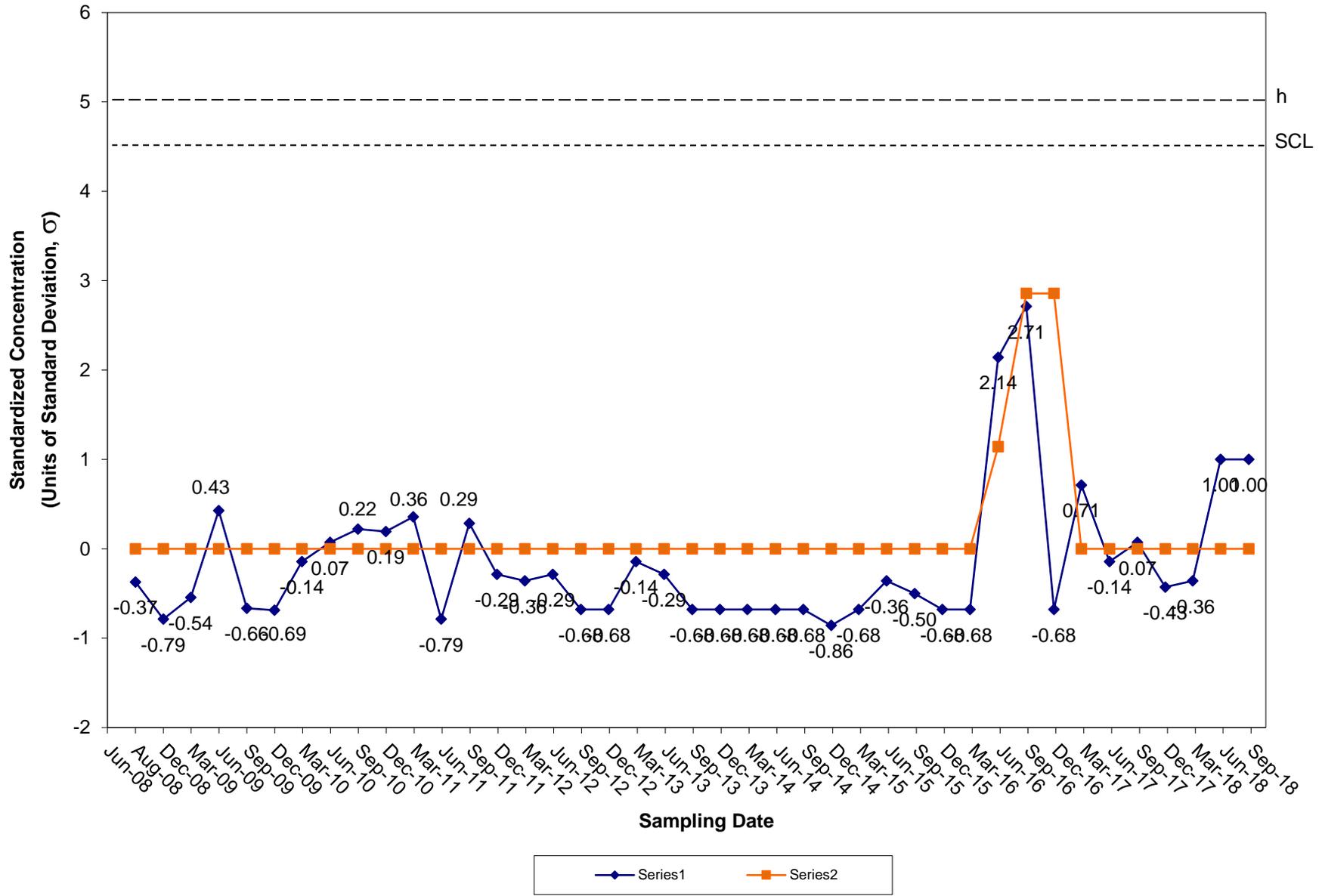
CUSUM Control Chart for Nickel Tiverton Landfill Groundwater Compliance Well OW-12



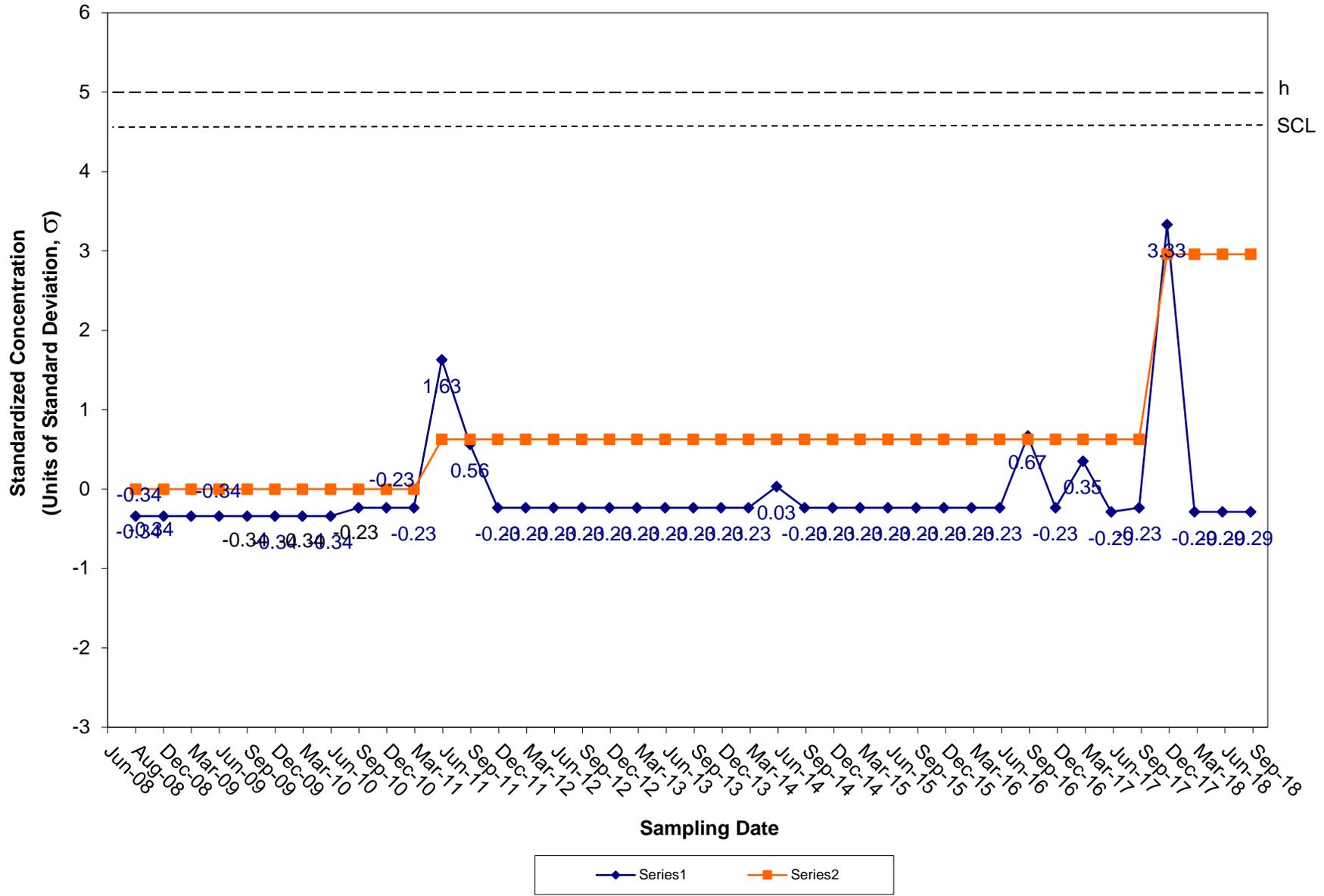
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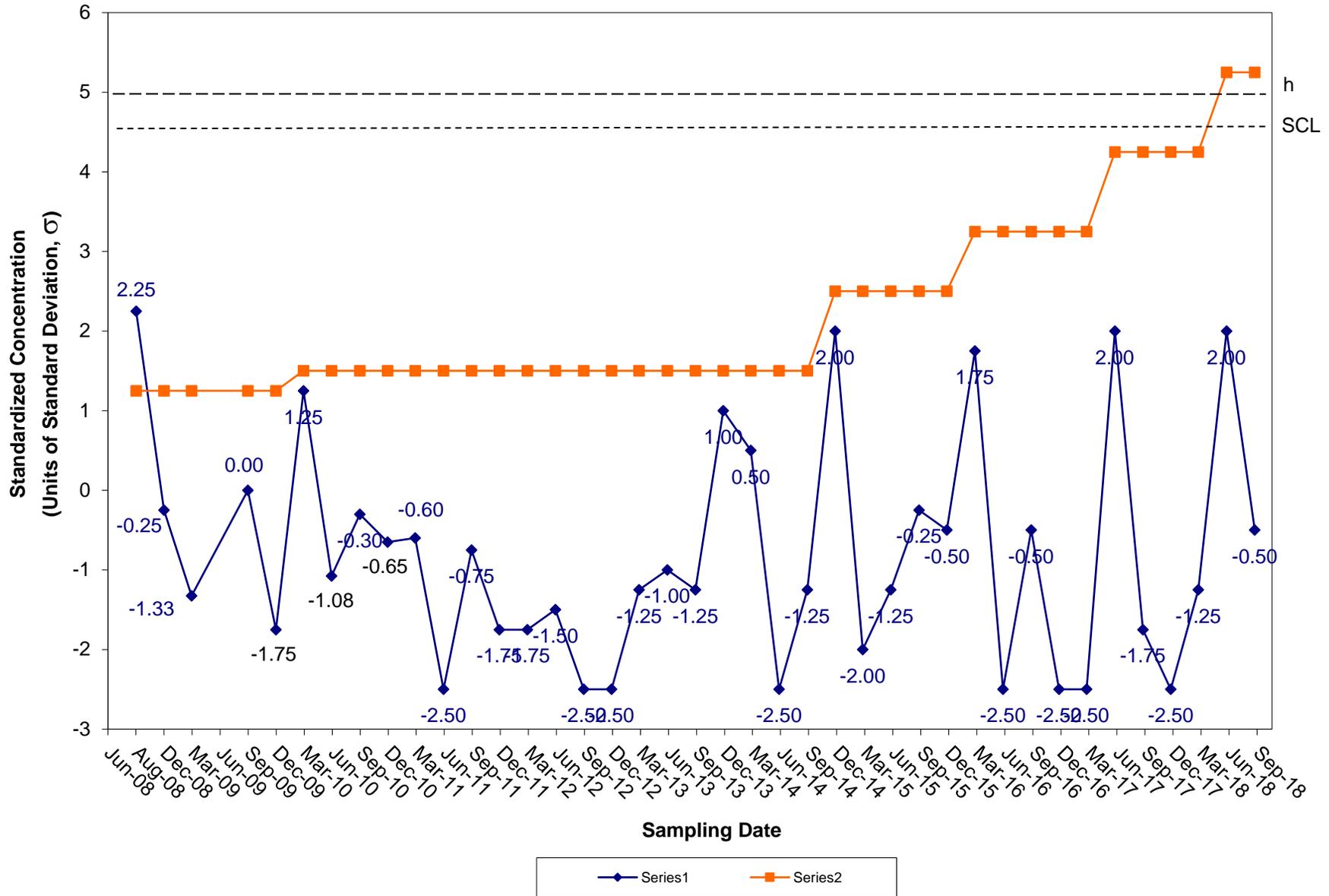
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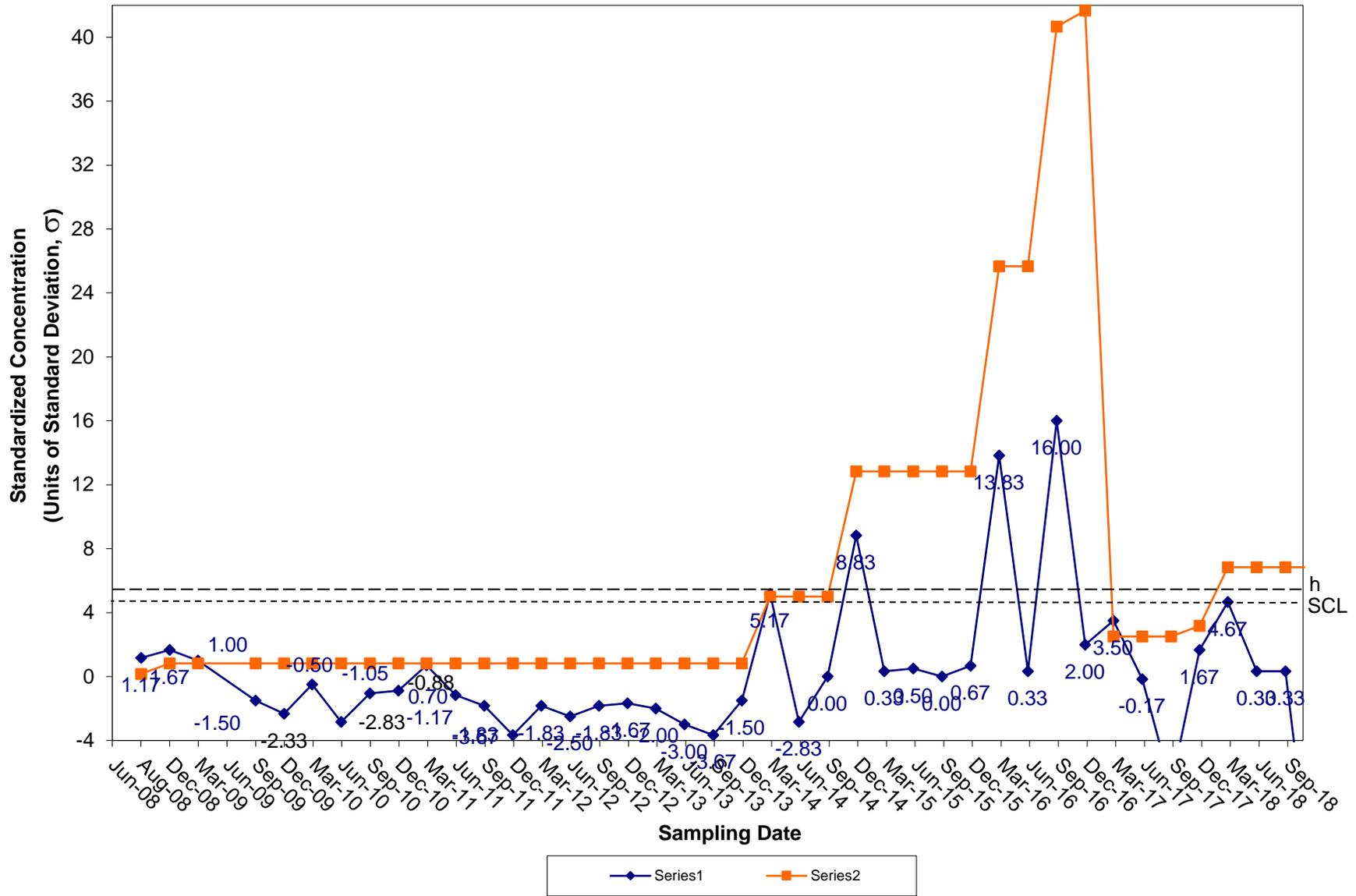
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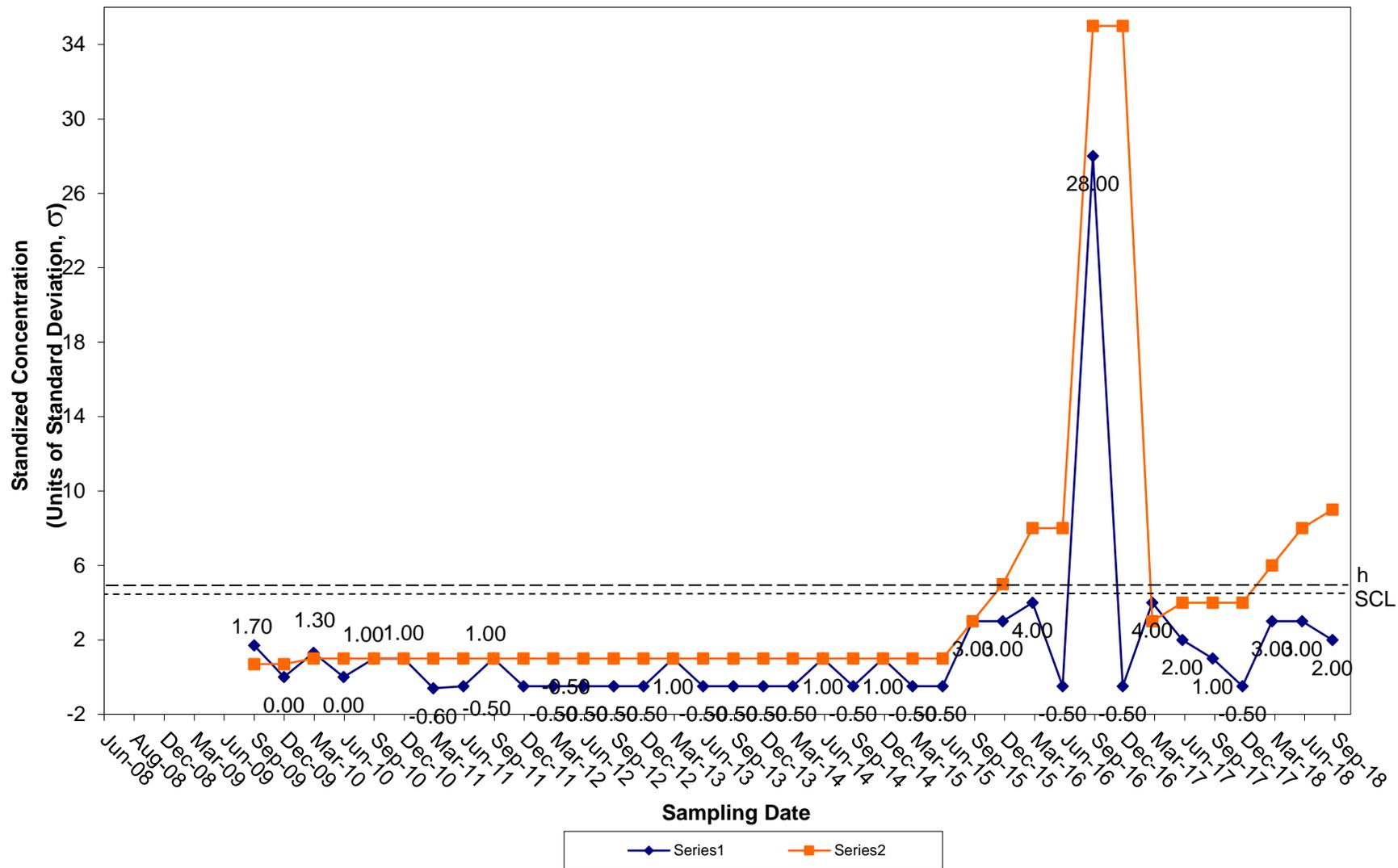
CUSUM Control Chart for Arsenic Tiverton Landfill Groundwater Compliance Well OW-13



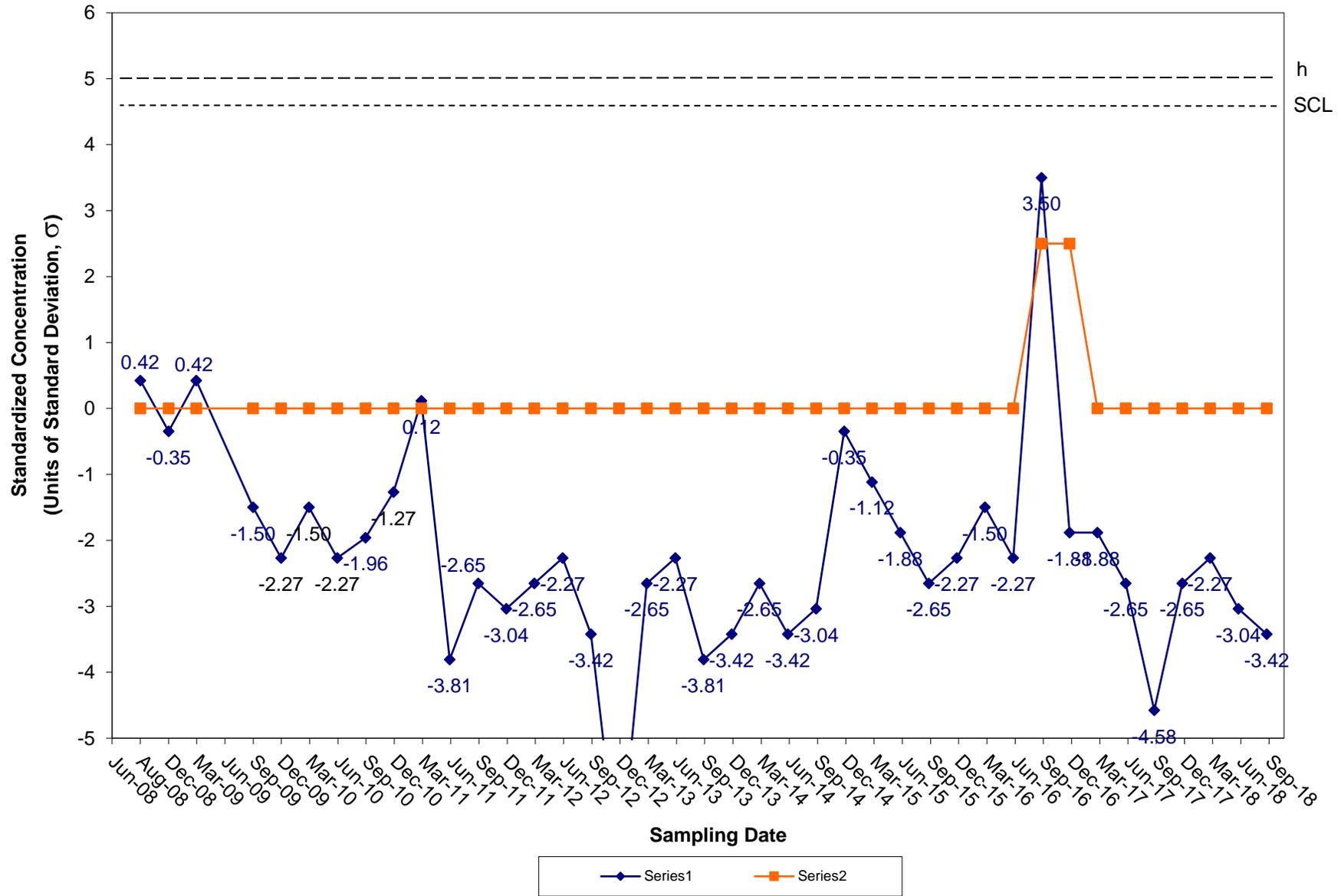
CUSUM Control Chart for Barium Tiverton Landfill Groundwater Compliance Well OW-13



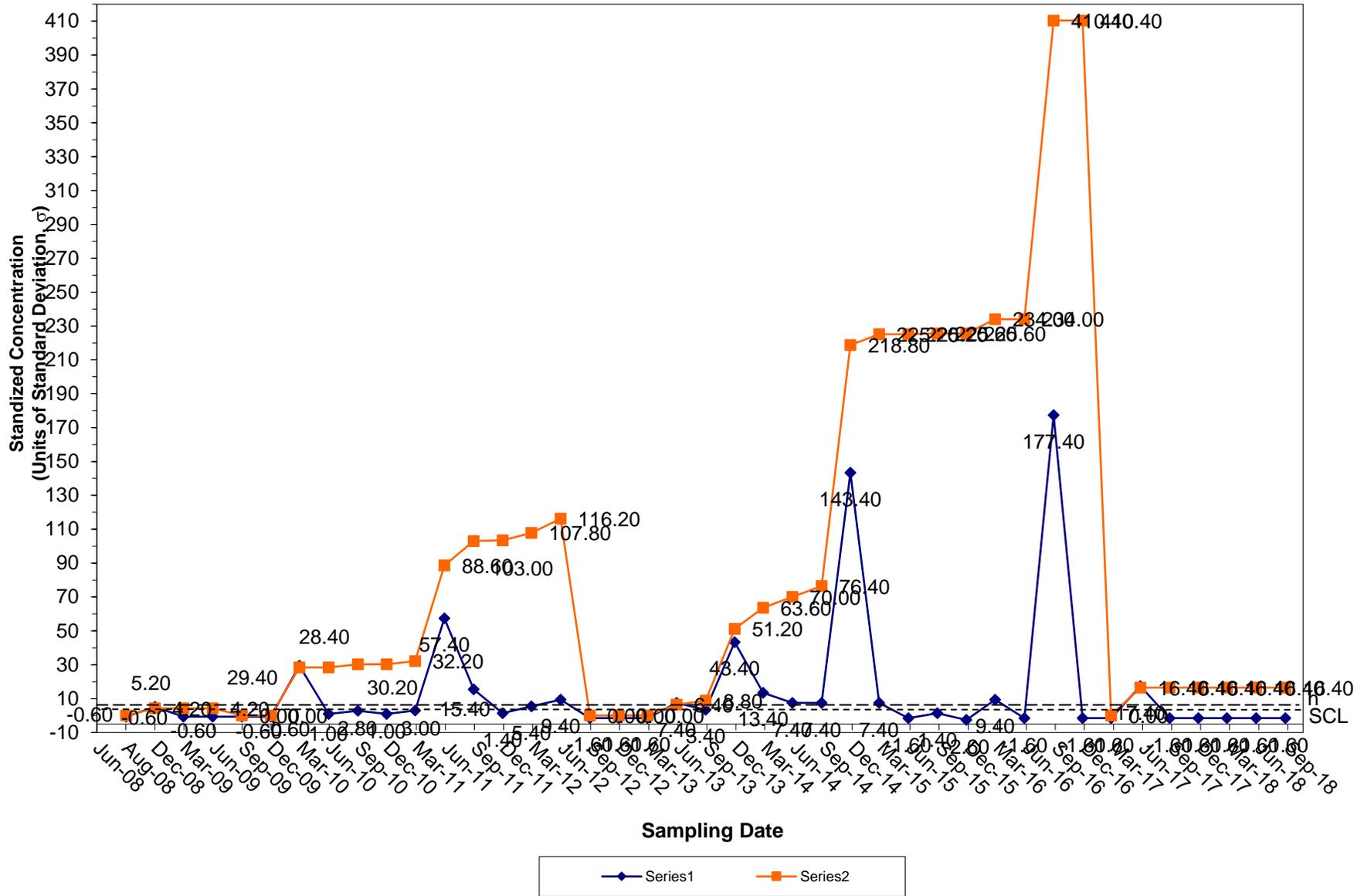
CUSUM Control Chart for Cadmium Tiverton Landfill Groundwater Compliance Well OW-13



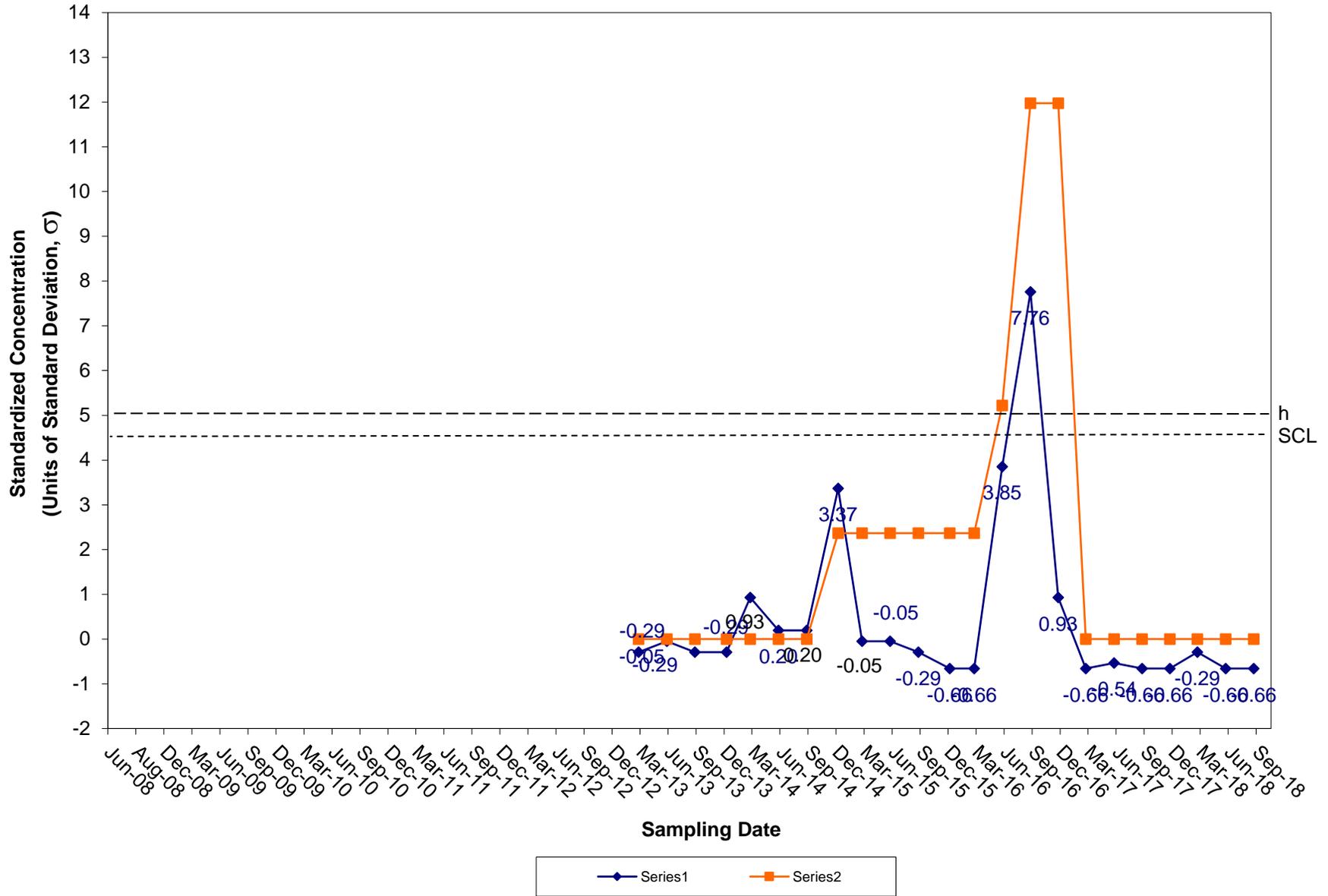
CUSUM Control Chart for Cobalt Tiverton Landfill Groundwater Compliance Well OW-13



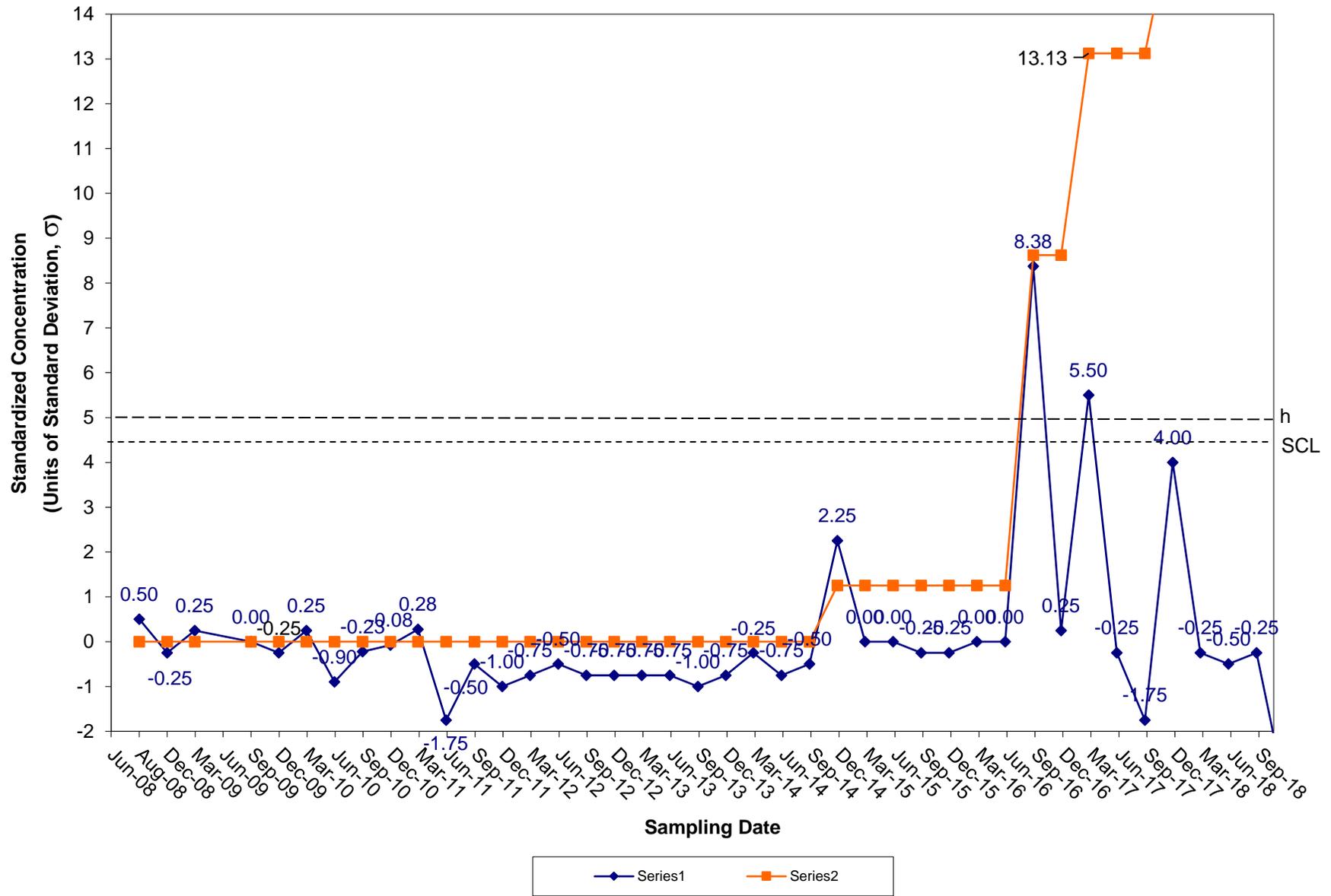
CUSUM Control Chart for Copper Tiverton Landfill Groundwater Compliance Well OW-13



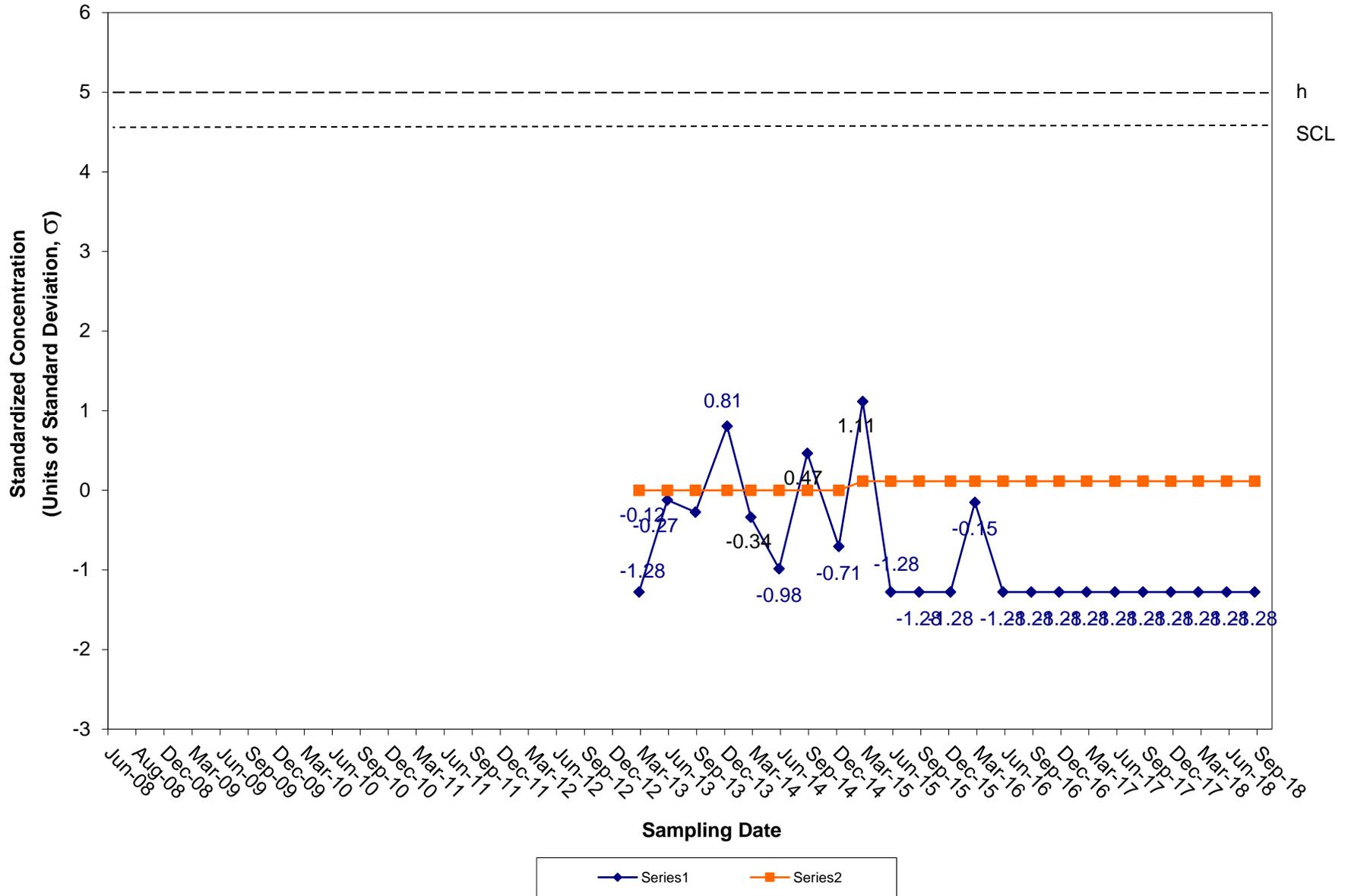
CUSUM Control Chart for Lead Tiverton Landfill Groundwater Compliance Well OW-13



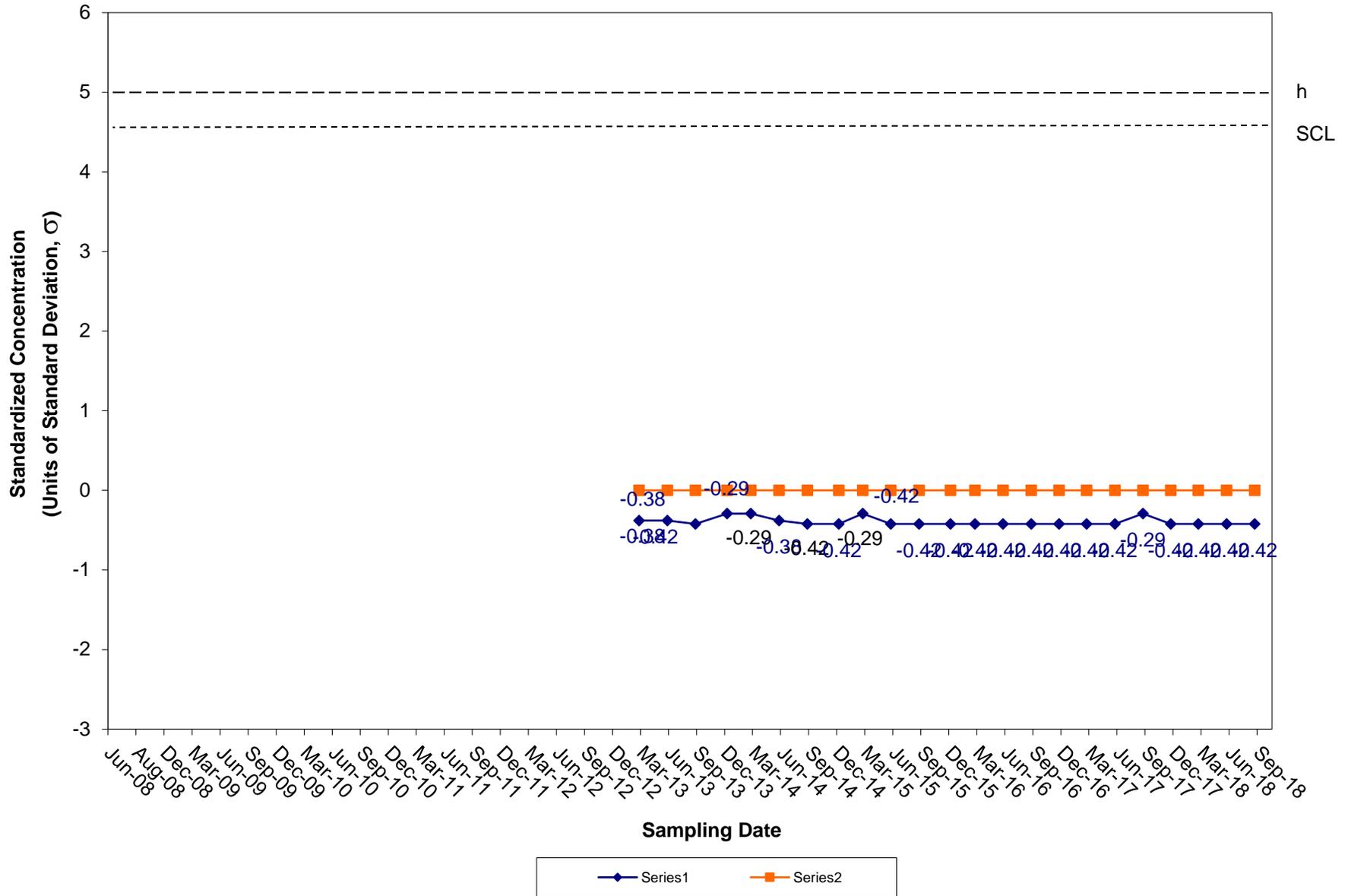
CUSUM Control Chart for Nickel Tiverton Landfill Groundwater Compliance Well OW-13



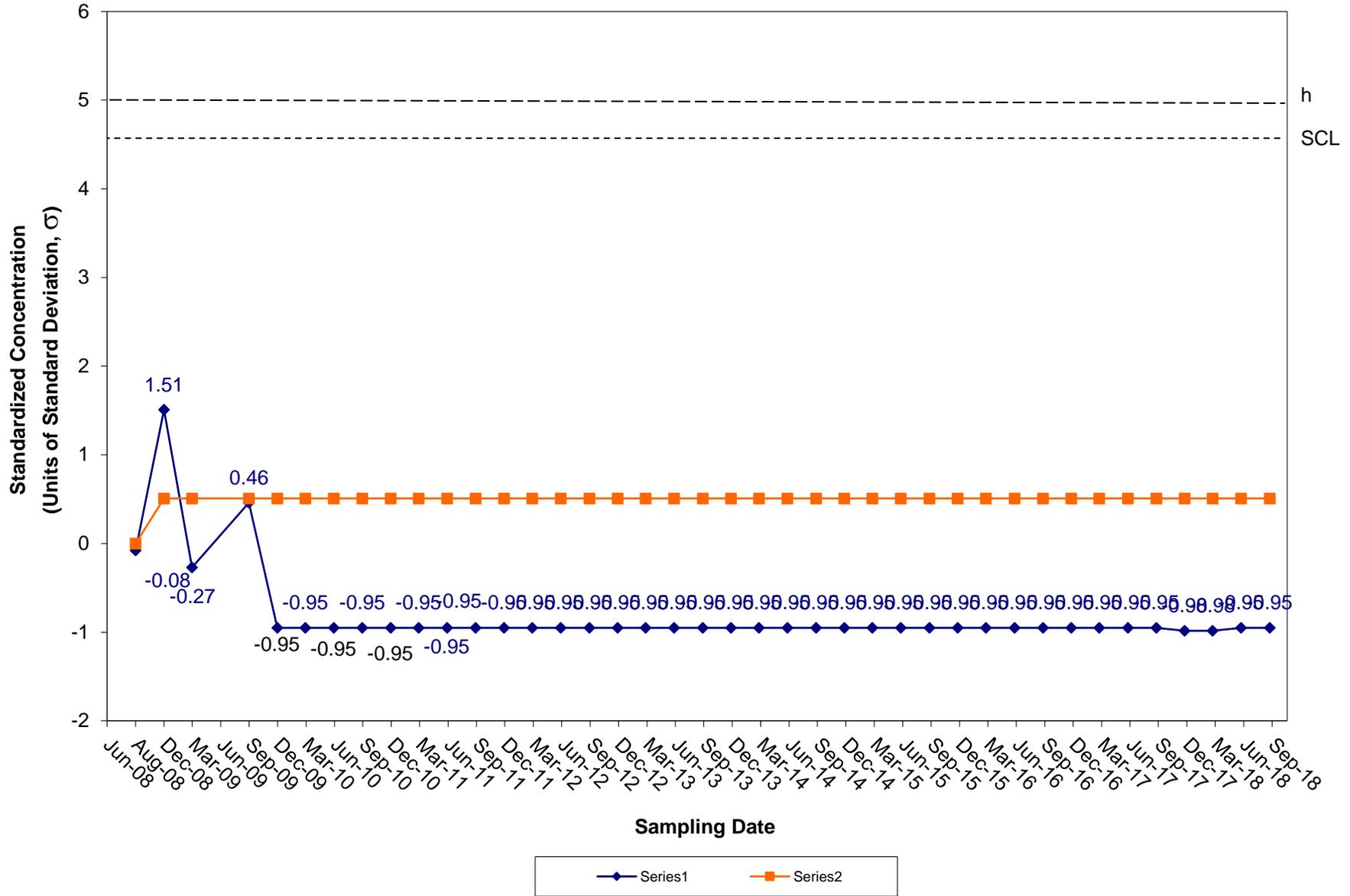
CUSUM Control Chart for Selenium Tiverton Landfill Groundwater Compliance Well OW-13



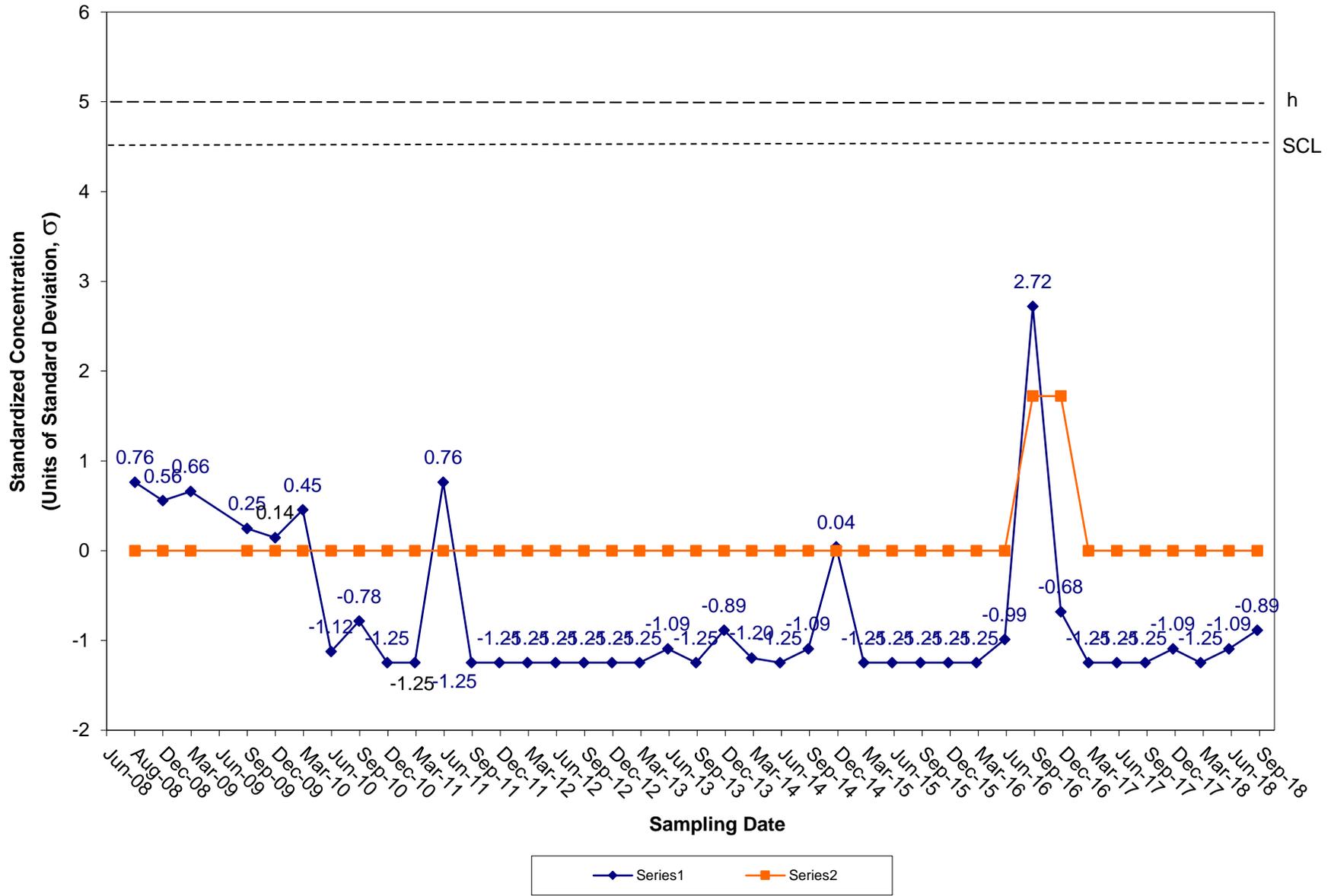
CUSUM Control Chart for Silver Tiverton Landfill Groundwater Compliance Well OW-13



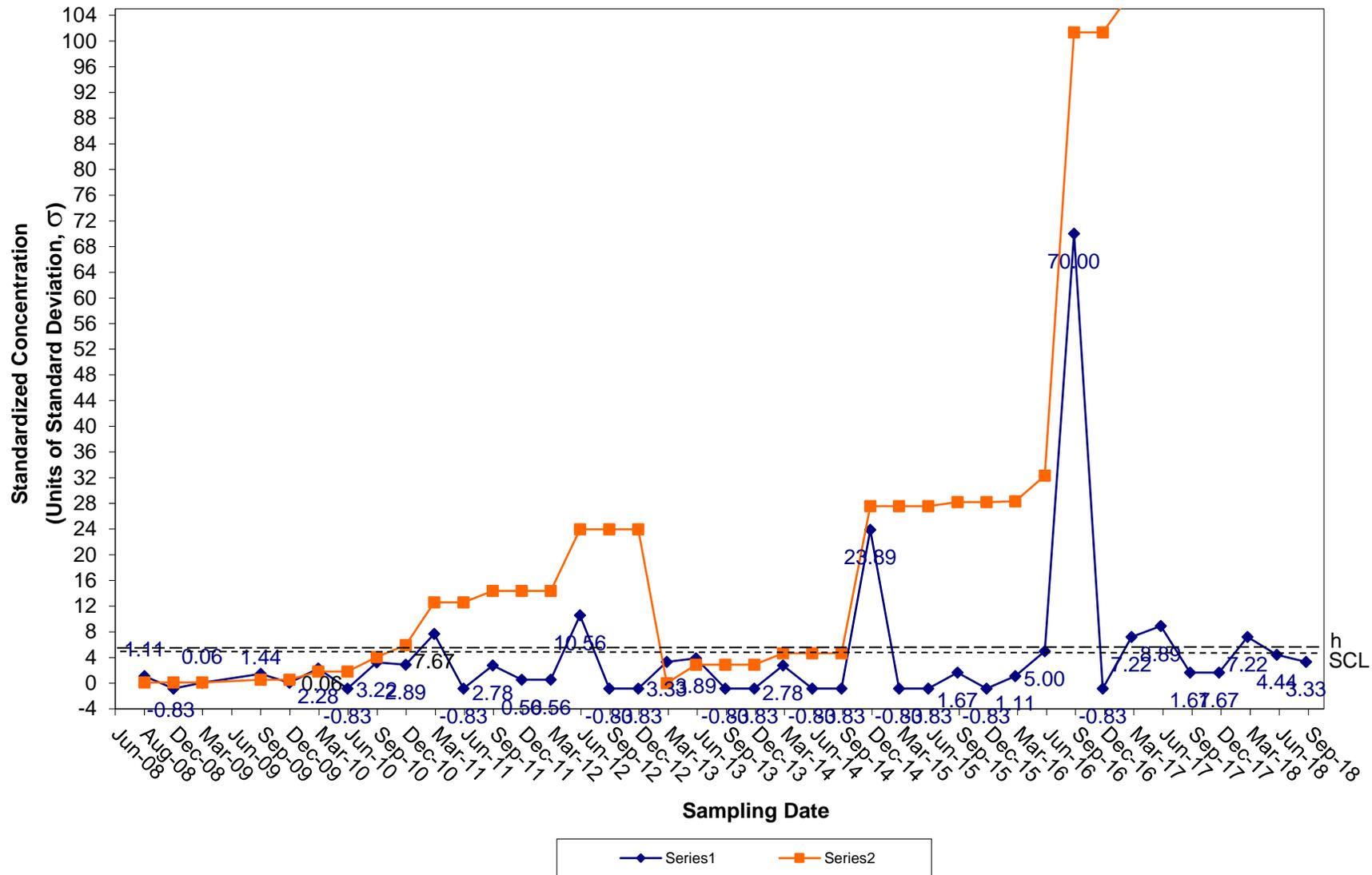
CUSUM Control Chart for Thallium Tiverton Landfill Groundwater Compliance Well OW-13



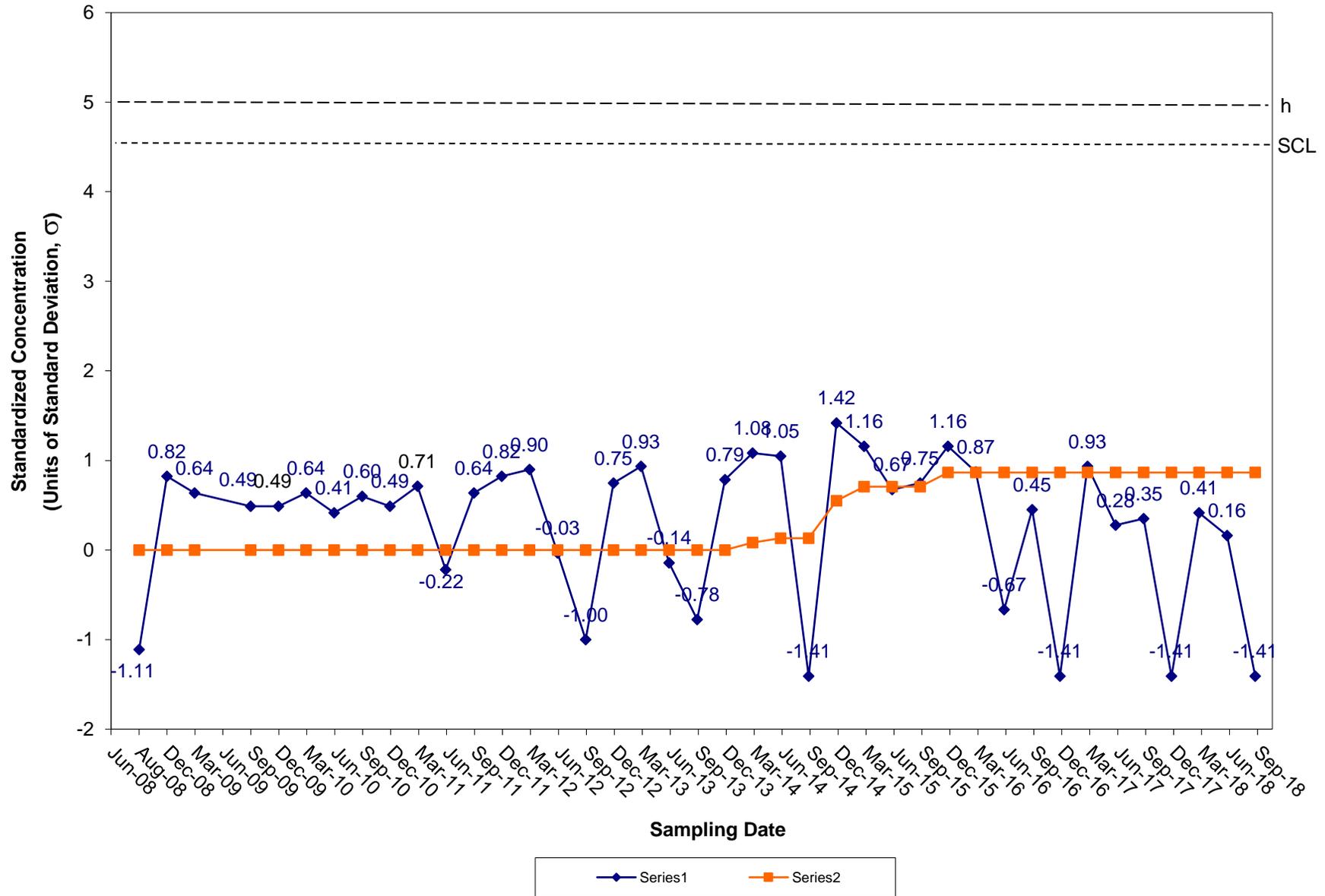
CUSUM Control Chart for Vanadium Tiverton Landfill Groundwater Compliance Well OW-13



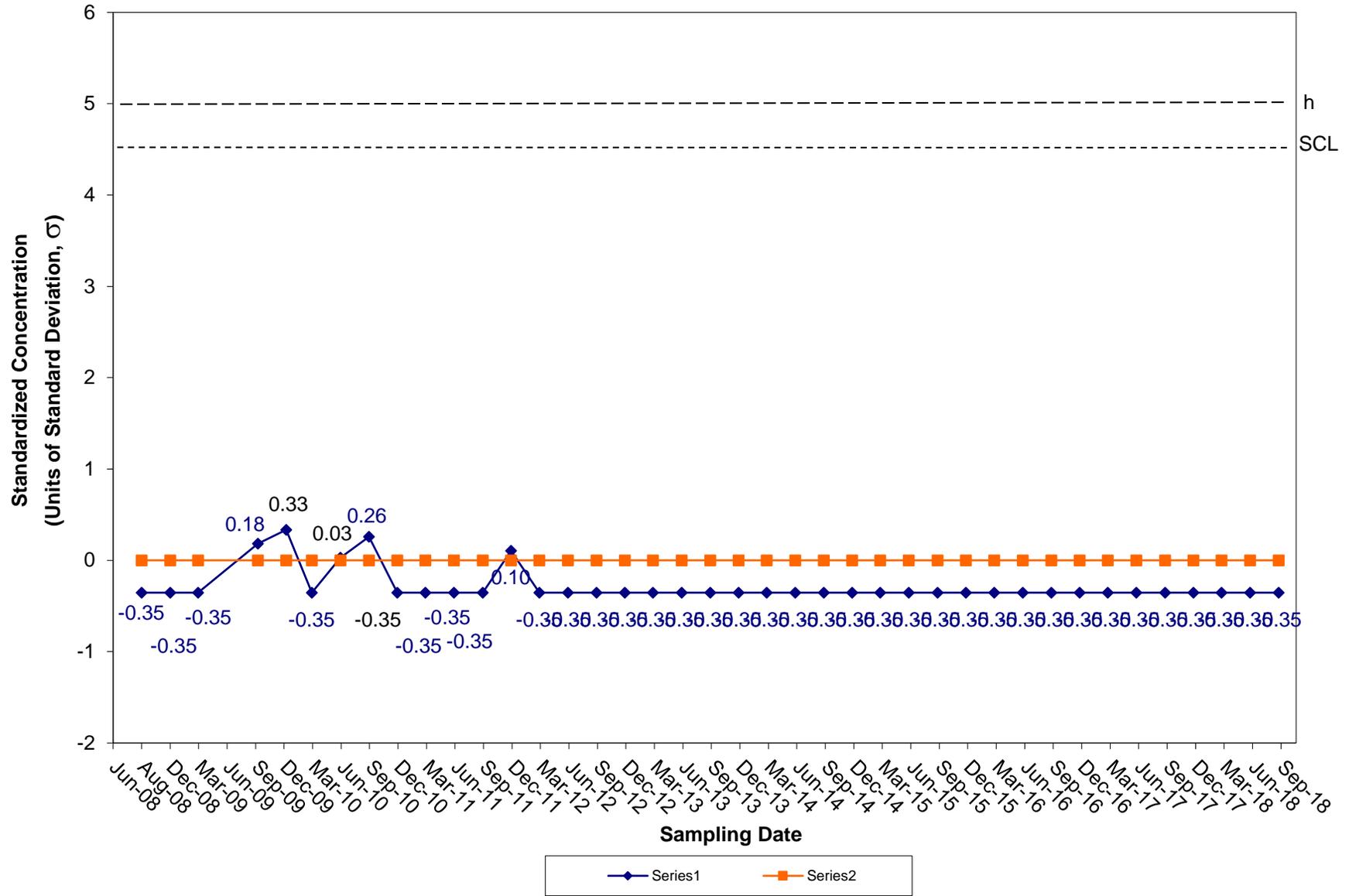
CUSUM Control Chart for Zinc Tiverton Landfill Groundwater Compliance Well OW-13



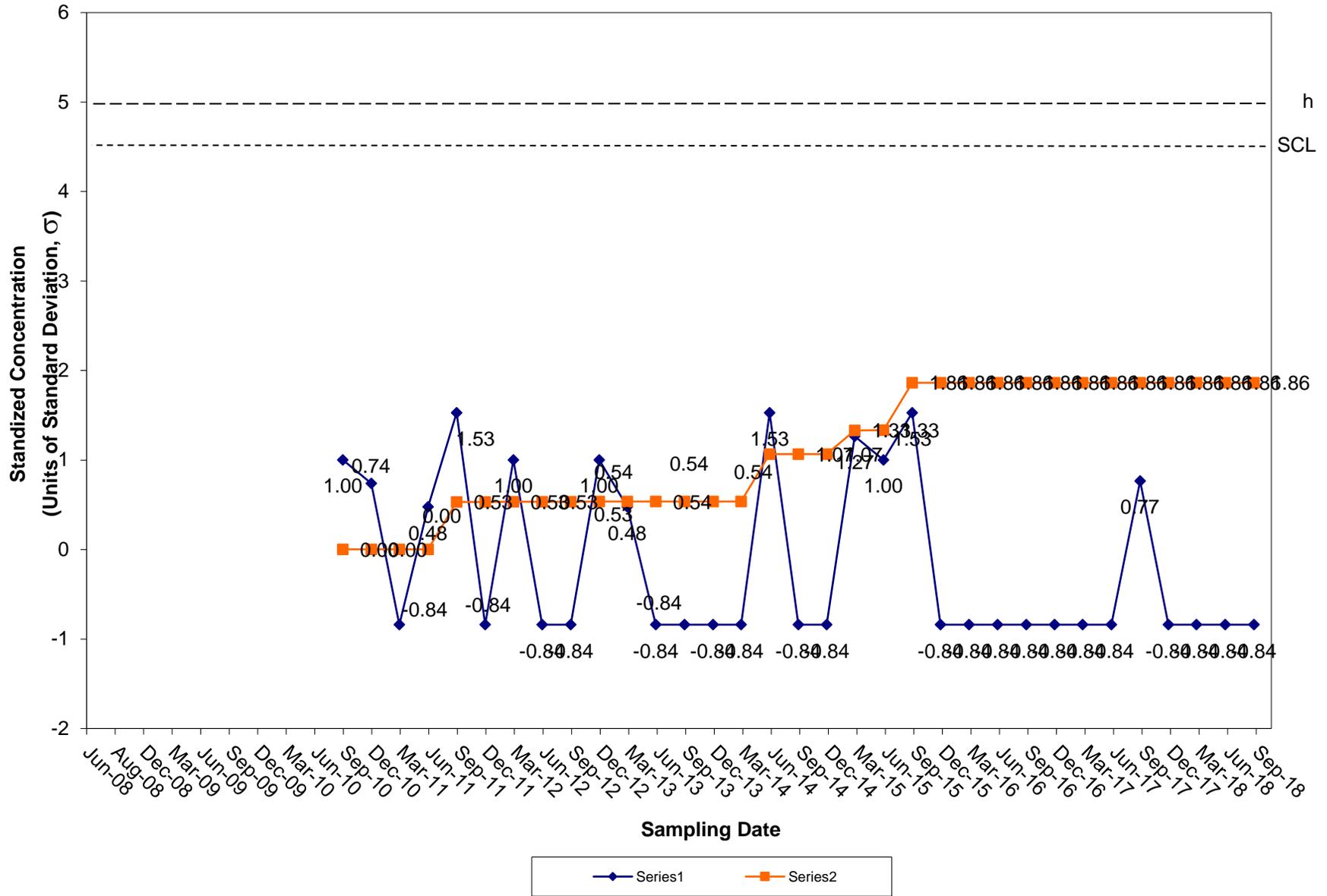
CUSUM Control Chart for Chlorobenzene Tiverton Landfill Groundwater Compliance Well OW-13



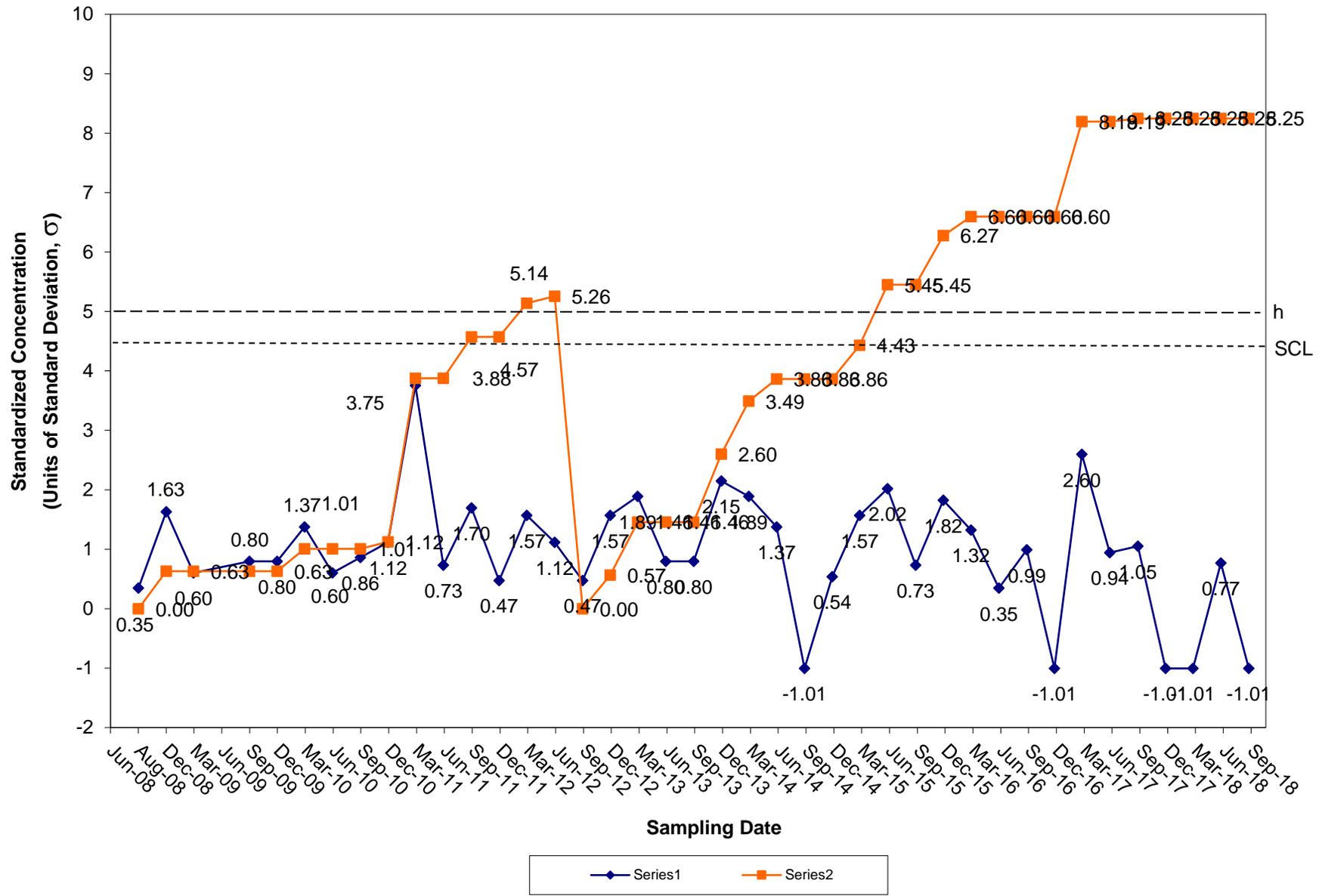
CUSUM Control Chart for Chloroethane Tiverton Landfill Groundwater Compliance Well OW-13



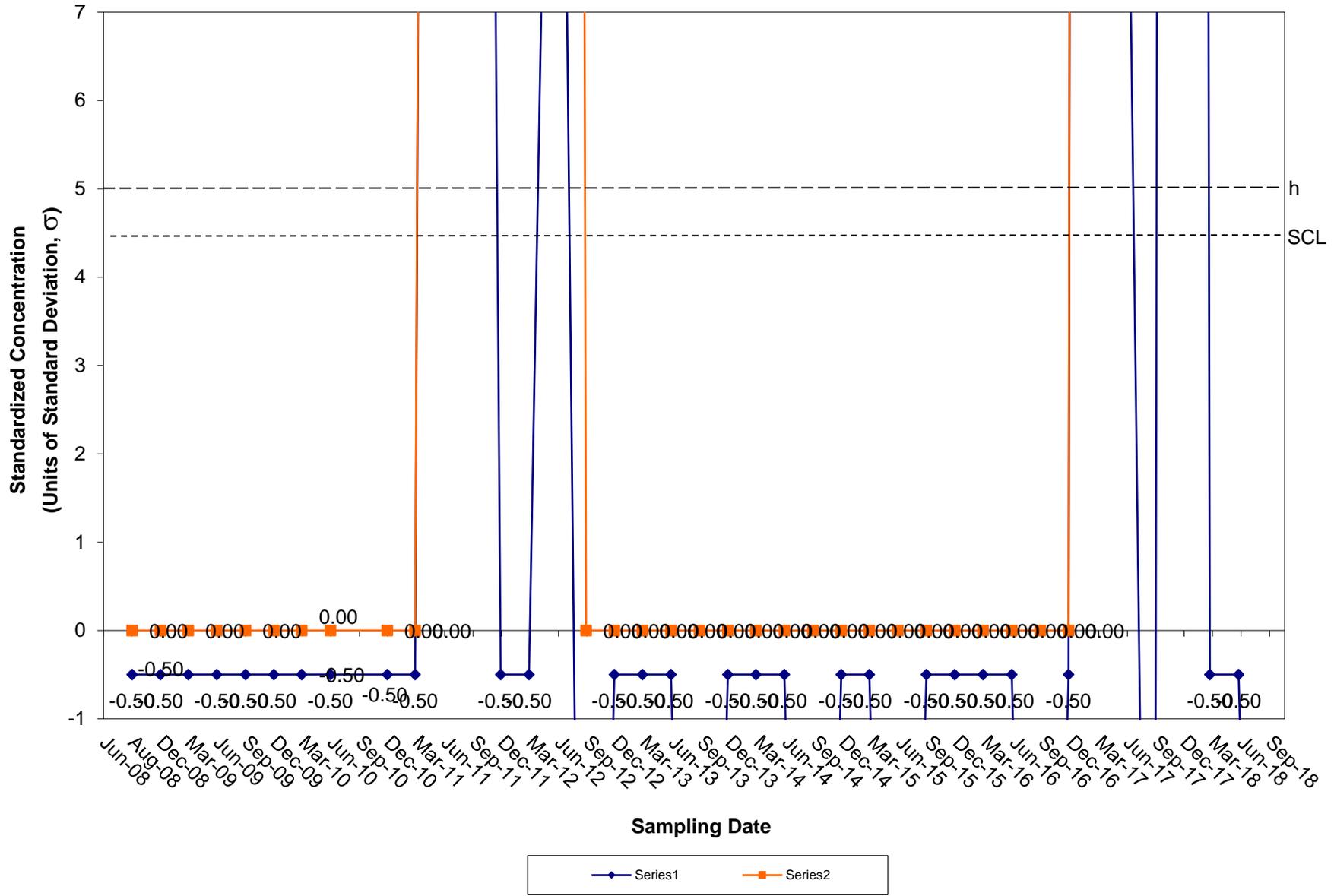
CUSUM Control Chart for 1,4-Dichlorobenzene - Adjusted Baseline Tiverton Landfill Groundwater Compliance Well OW-13



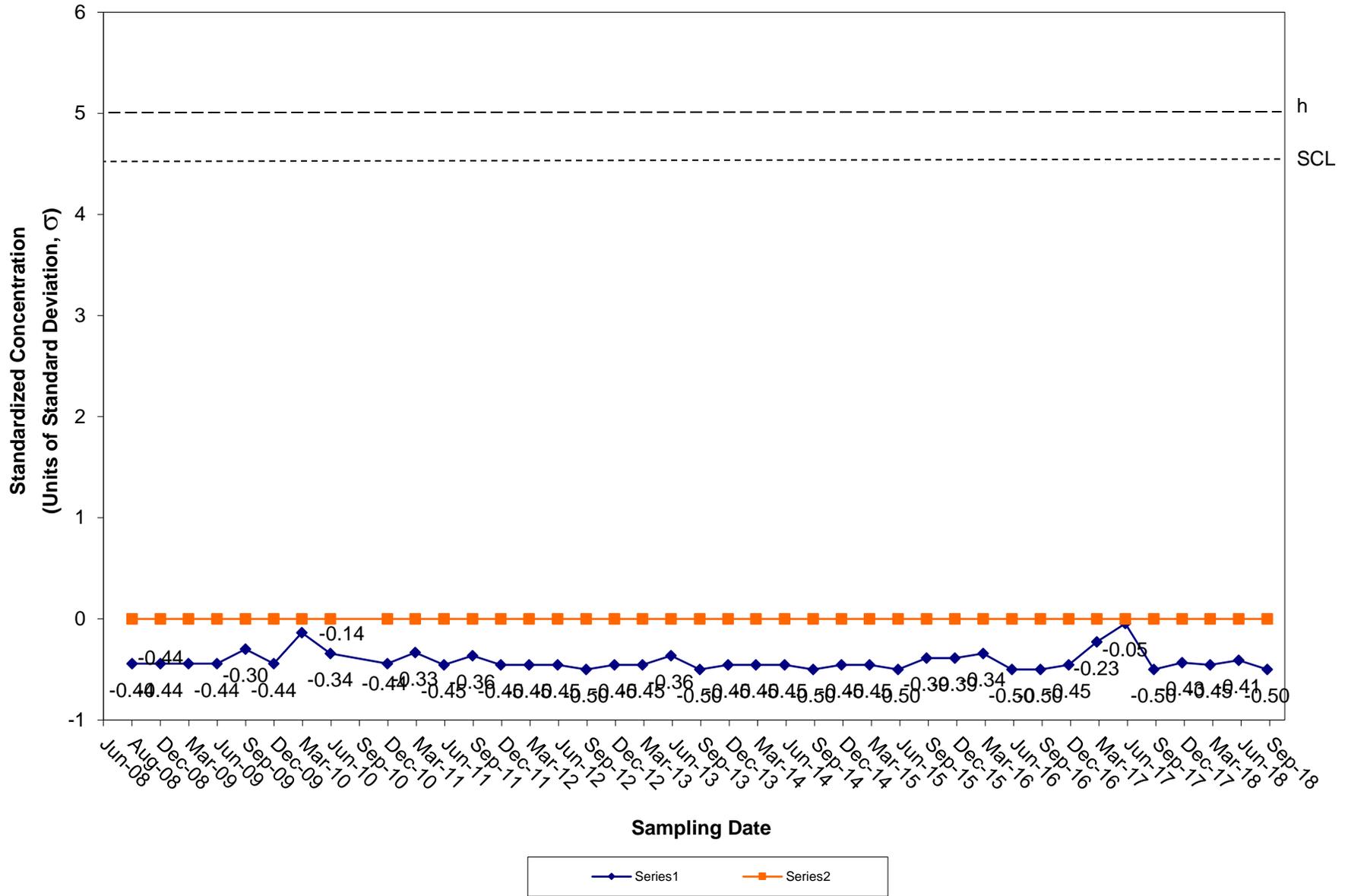
CUSUM Control Chart for MTBE Tiverton Landfill Groundwater Compliance Well OW-13



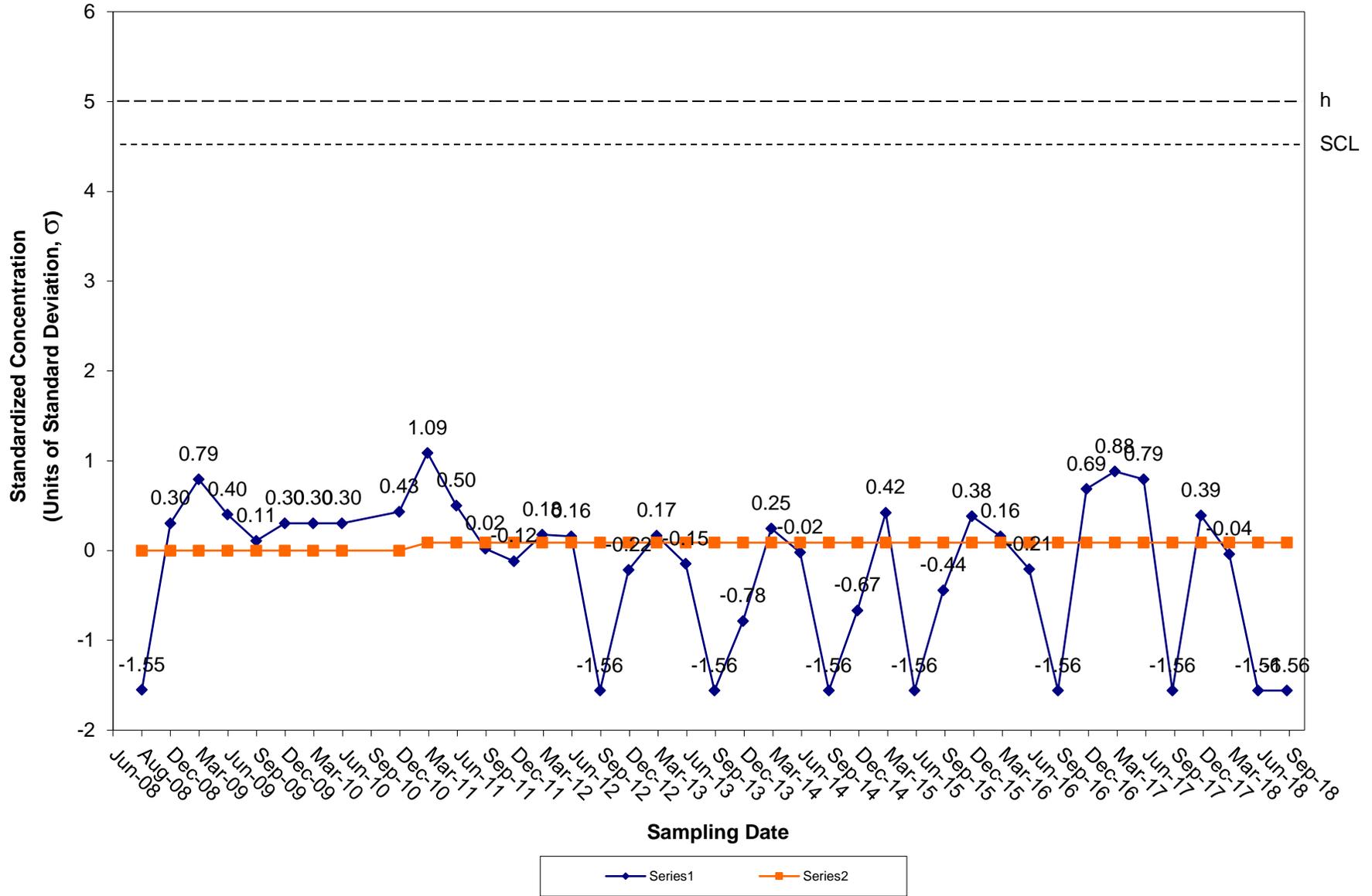
CUSUM Control Chart for Antimony Tiverton Landfill Groundwater Compliance Well OW-14



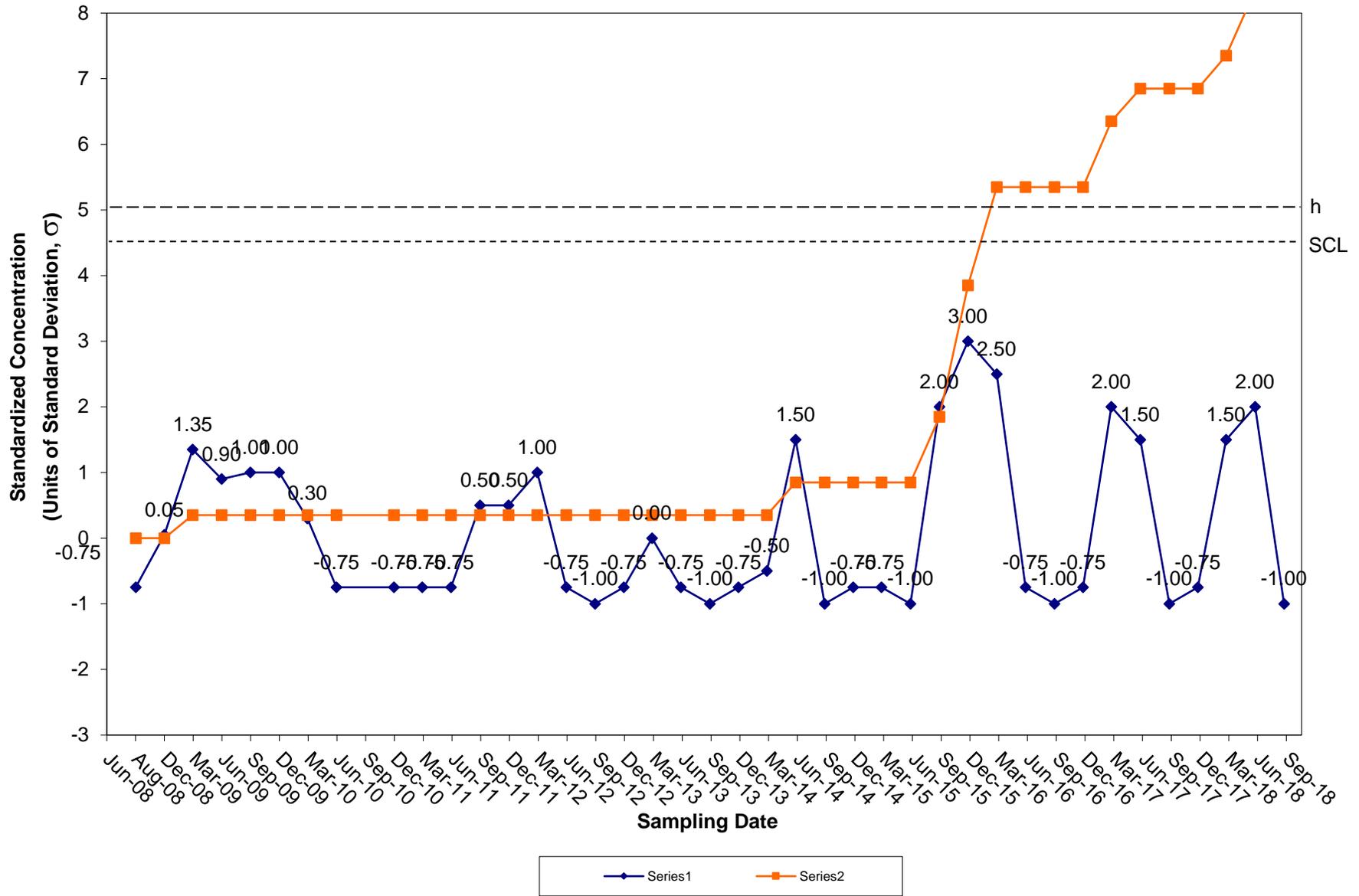
CUSUM Control Chart for Arsenic Tiverton Landfill Groundwater Compliance Well OW-14



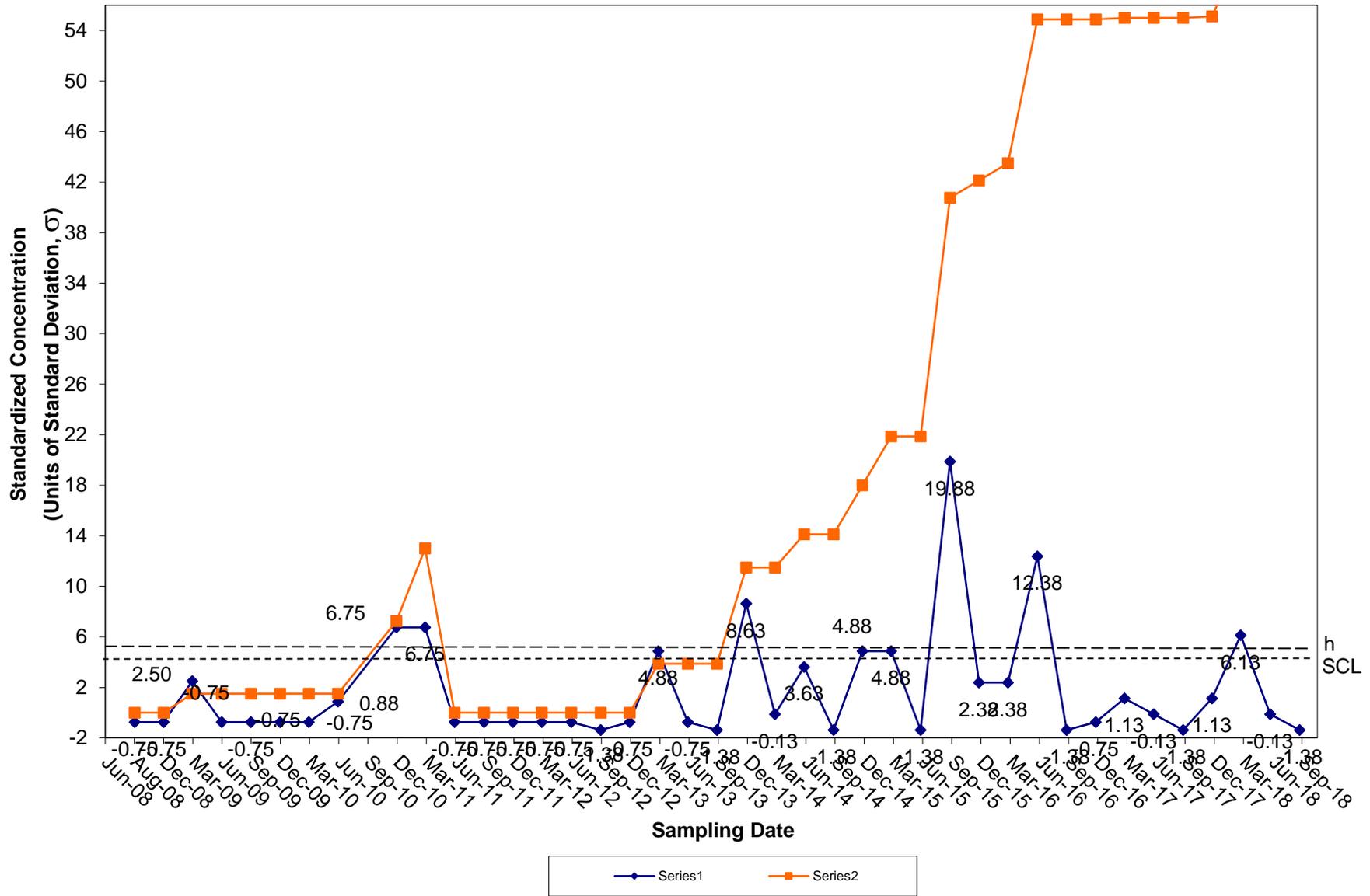
CUSUM Control Chart for Barium Tiverton Landfill Groundwater Compliance Well OW-14



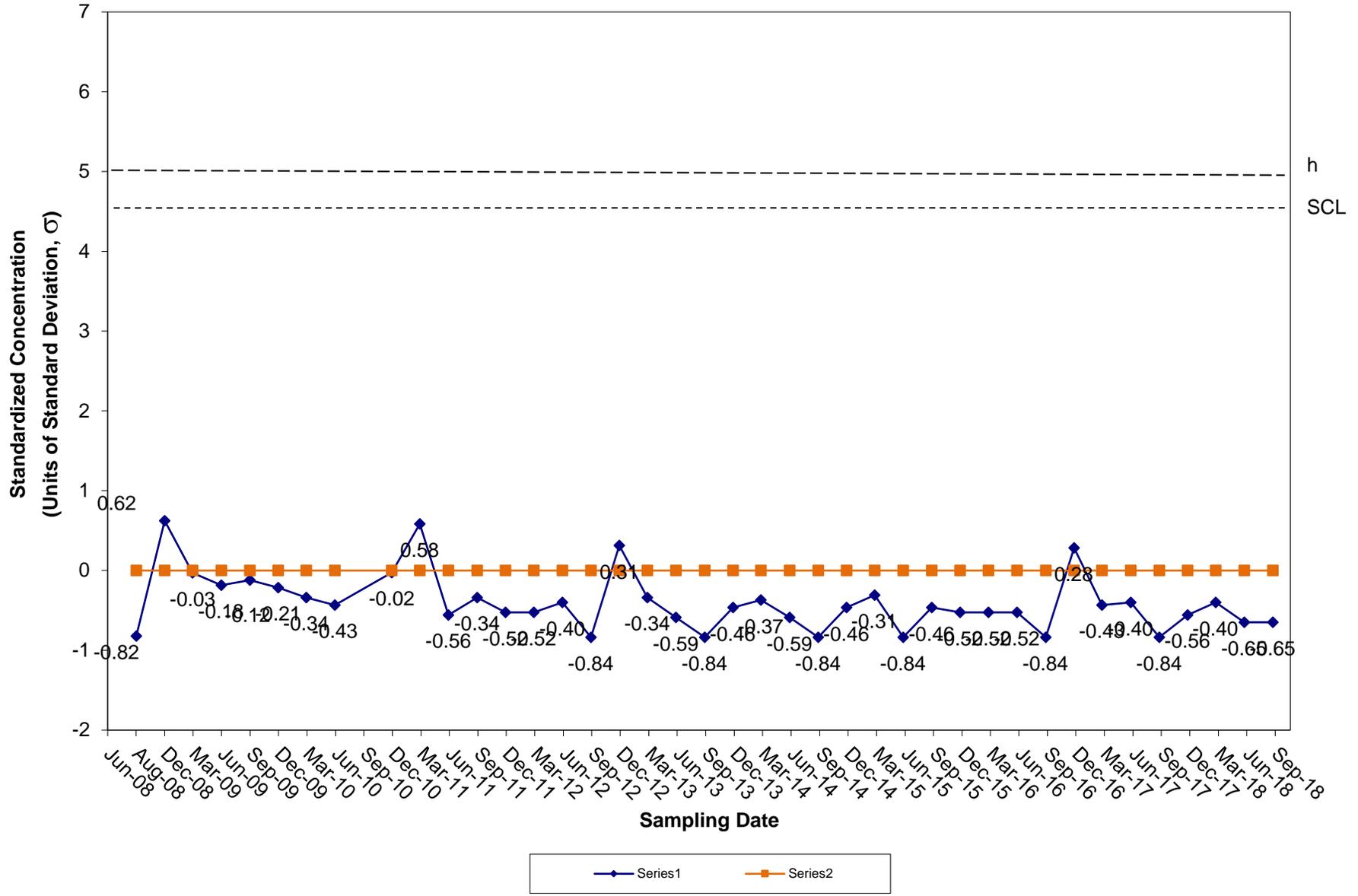
CUSUM Control Chart for Cadmium Tiverton Landfill Groundwater Compliance Well OW-14



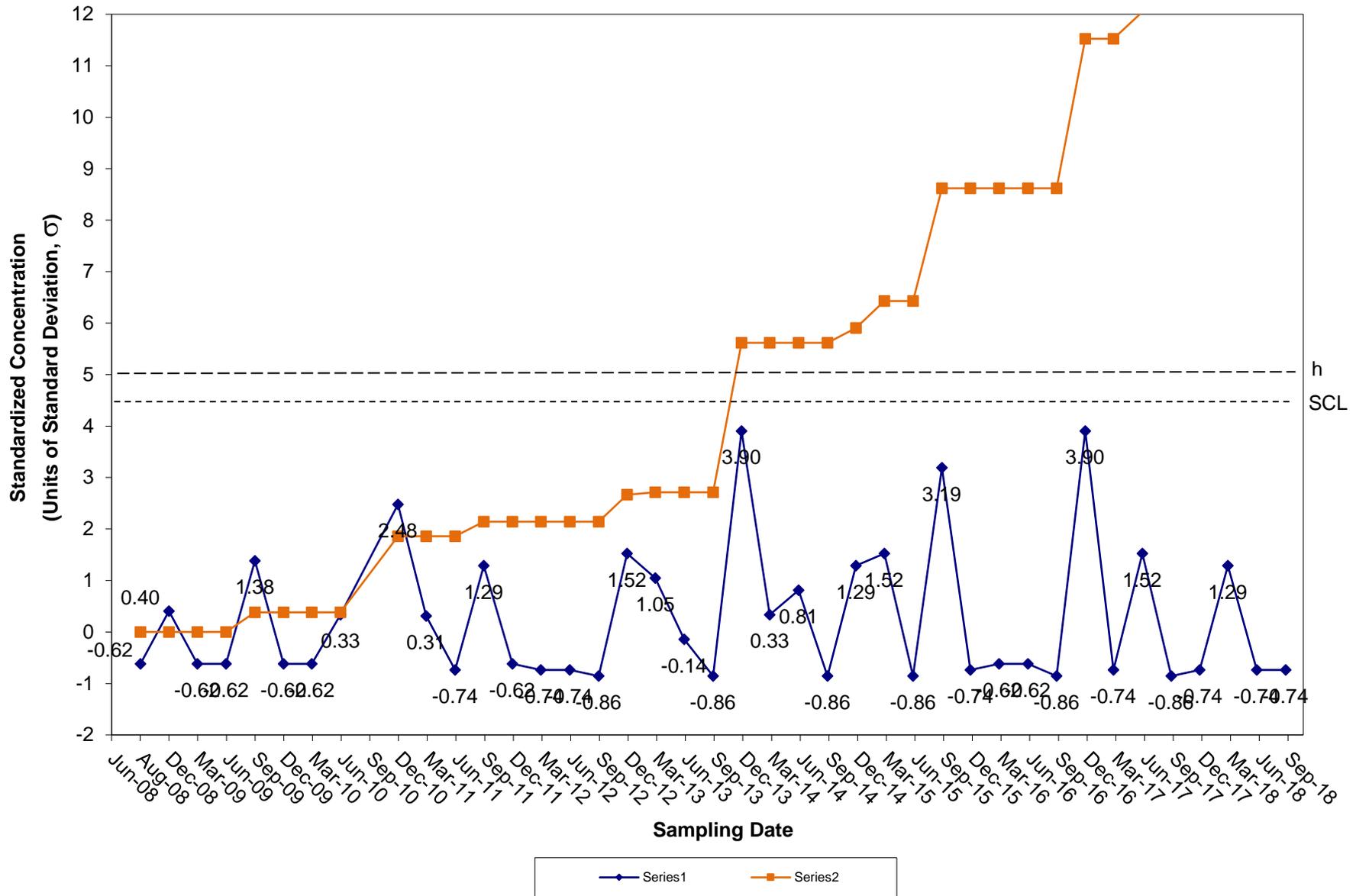
CUSUM Control Chart for Chromium Tiverton Landfill Groundwater Compliance Well OW-14



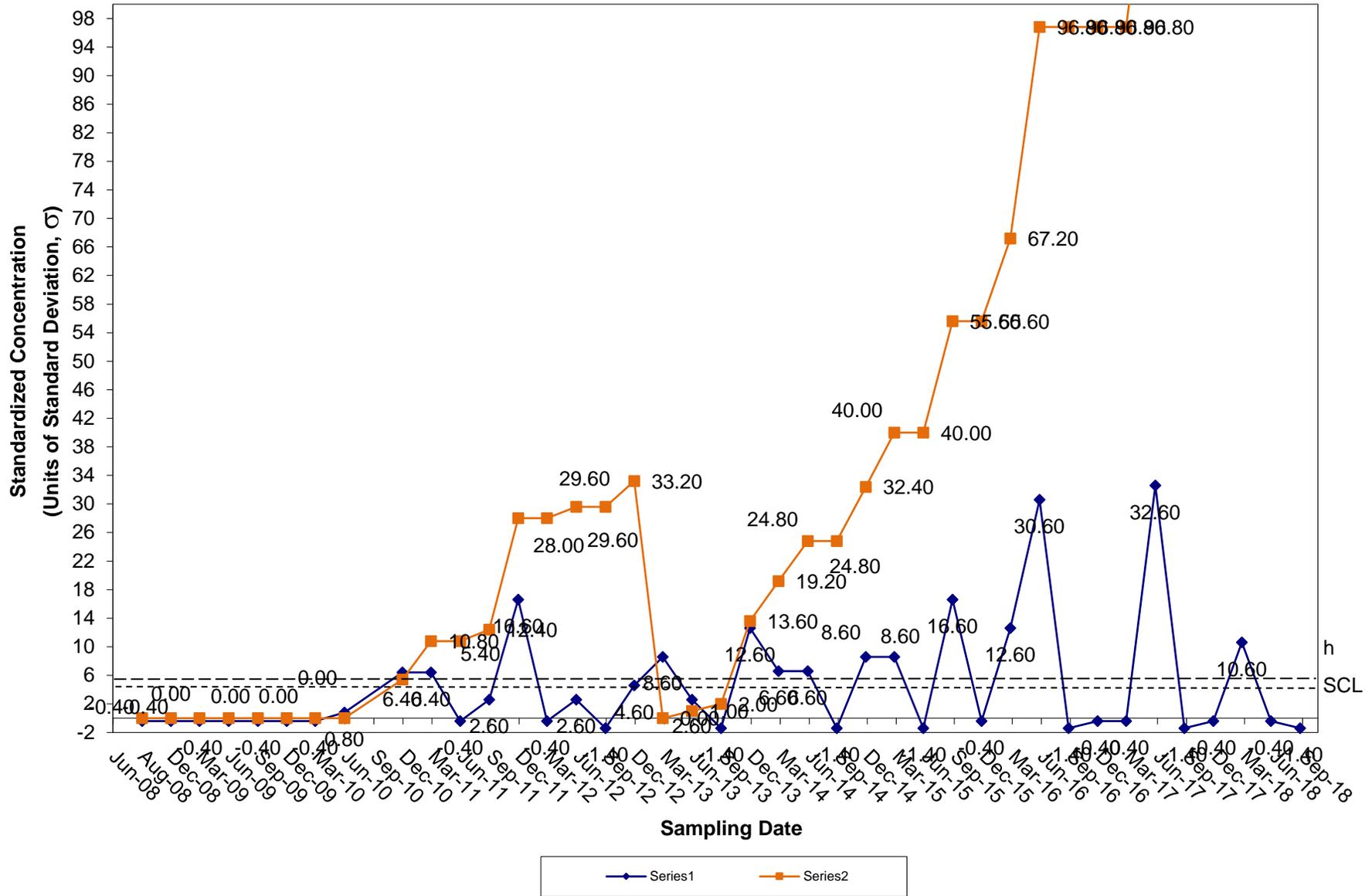
CUSUM Control Chart for Cobalt Tiverton Landfill Groundwater Compliance Well OW-14



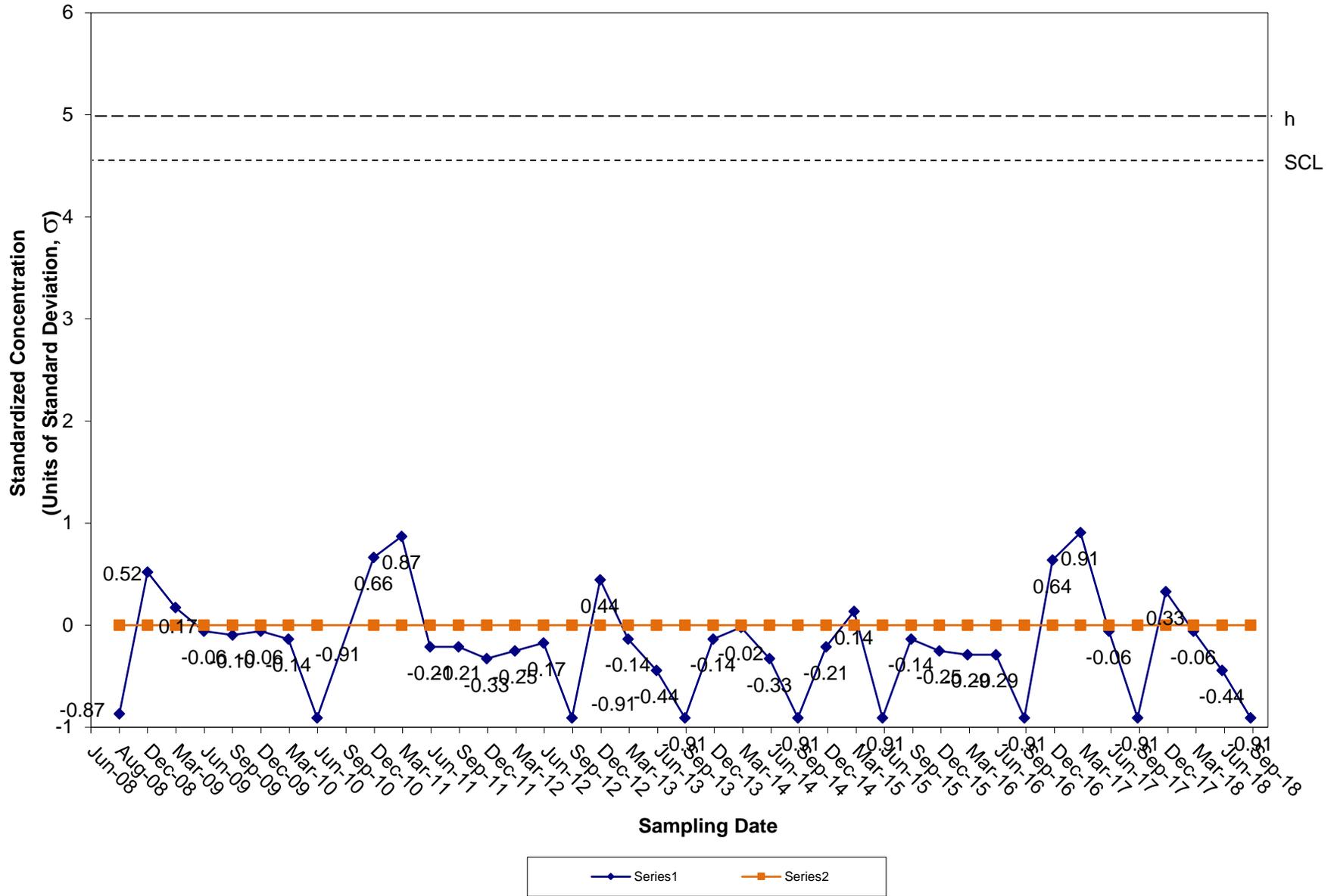
CUSUM Control Chart for Copper Tiverton Landfill Groundwater Compliance Well OW-14



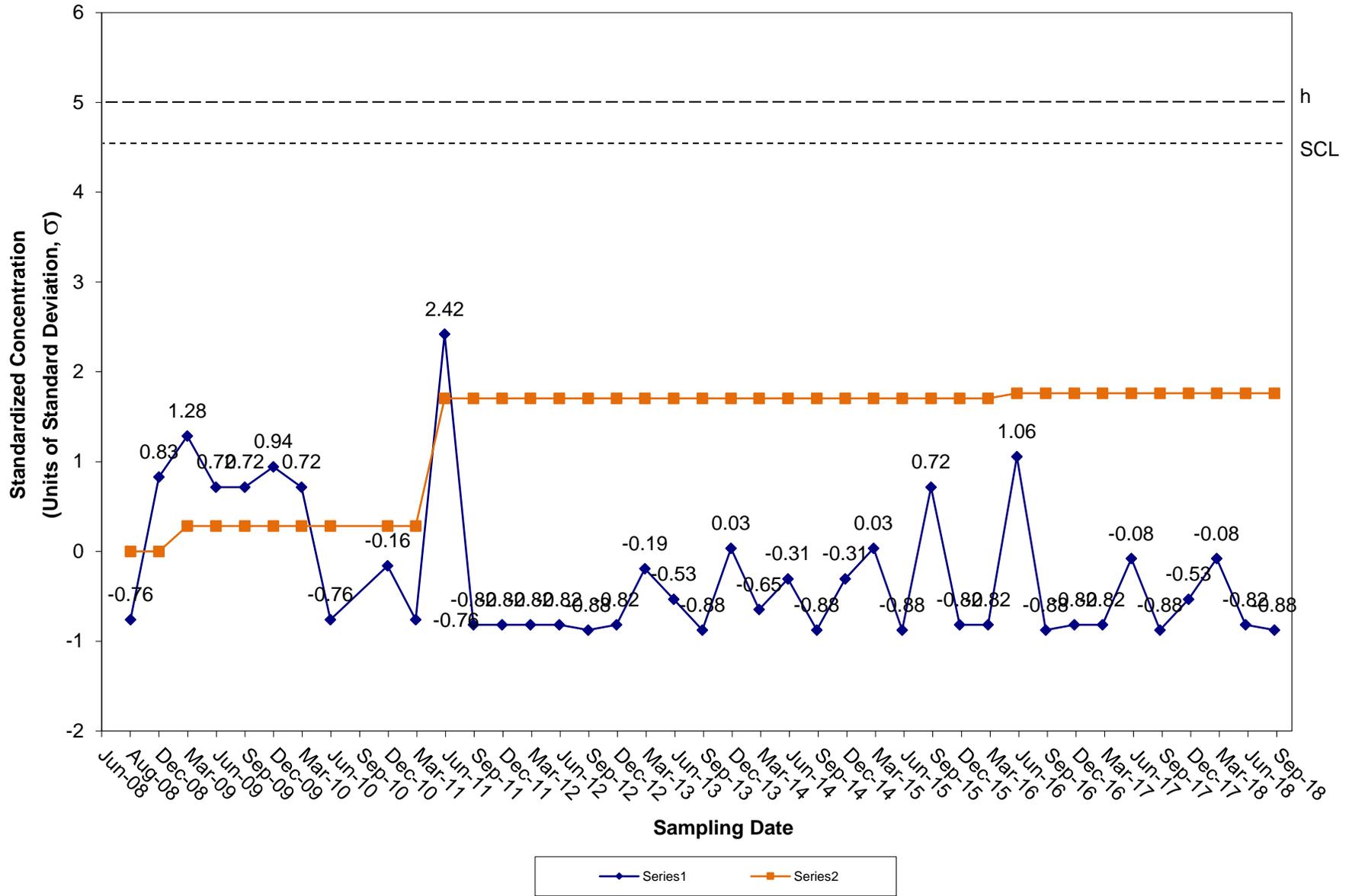
CUSUM Control Chart for Lead Tiverton Landfill Groundwater Compliance Well OW-14



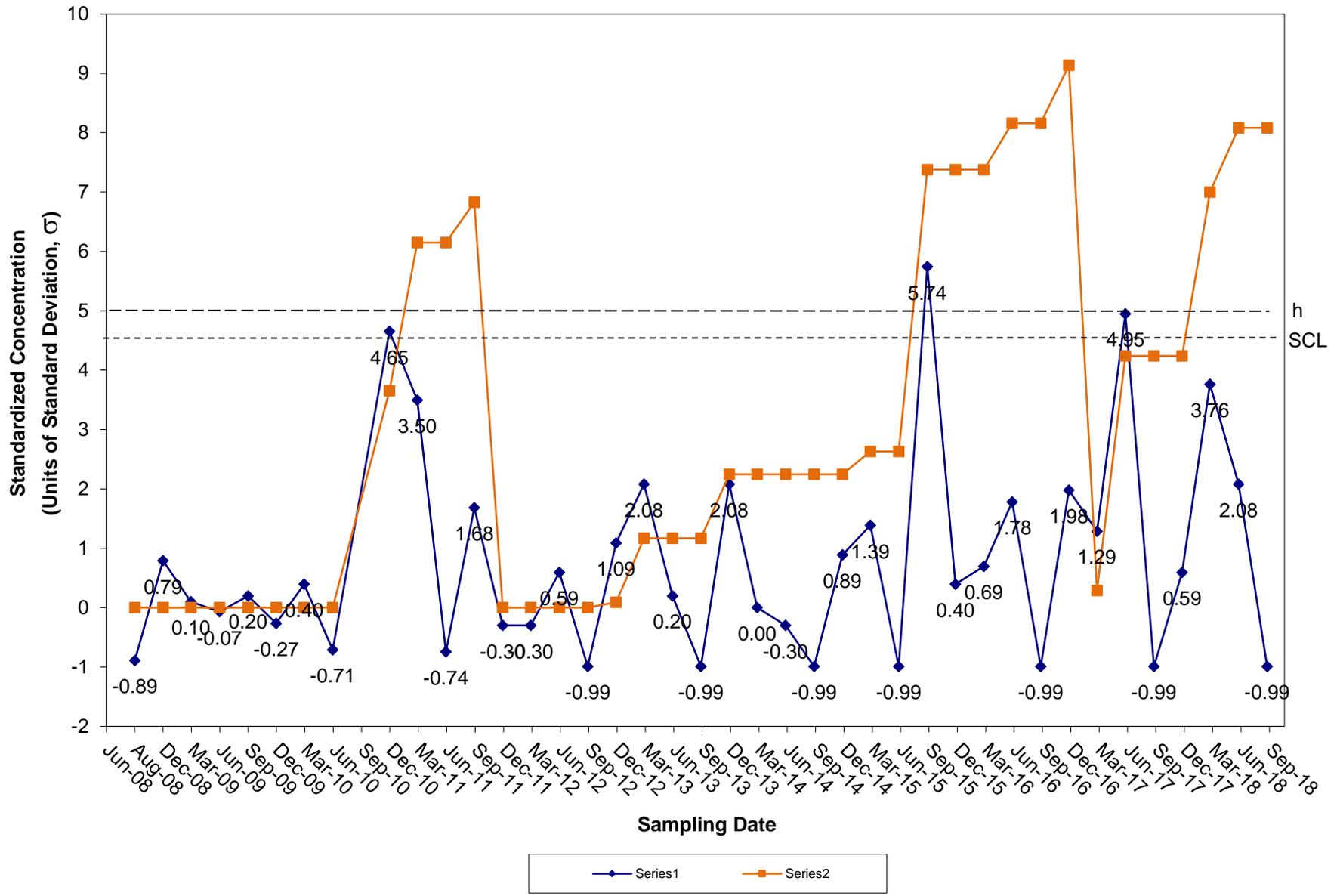
CUSUM Control Chart for Nickel Tiverton Landfill Groundwater Compliance Well OW-14



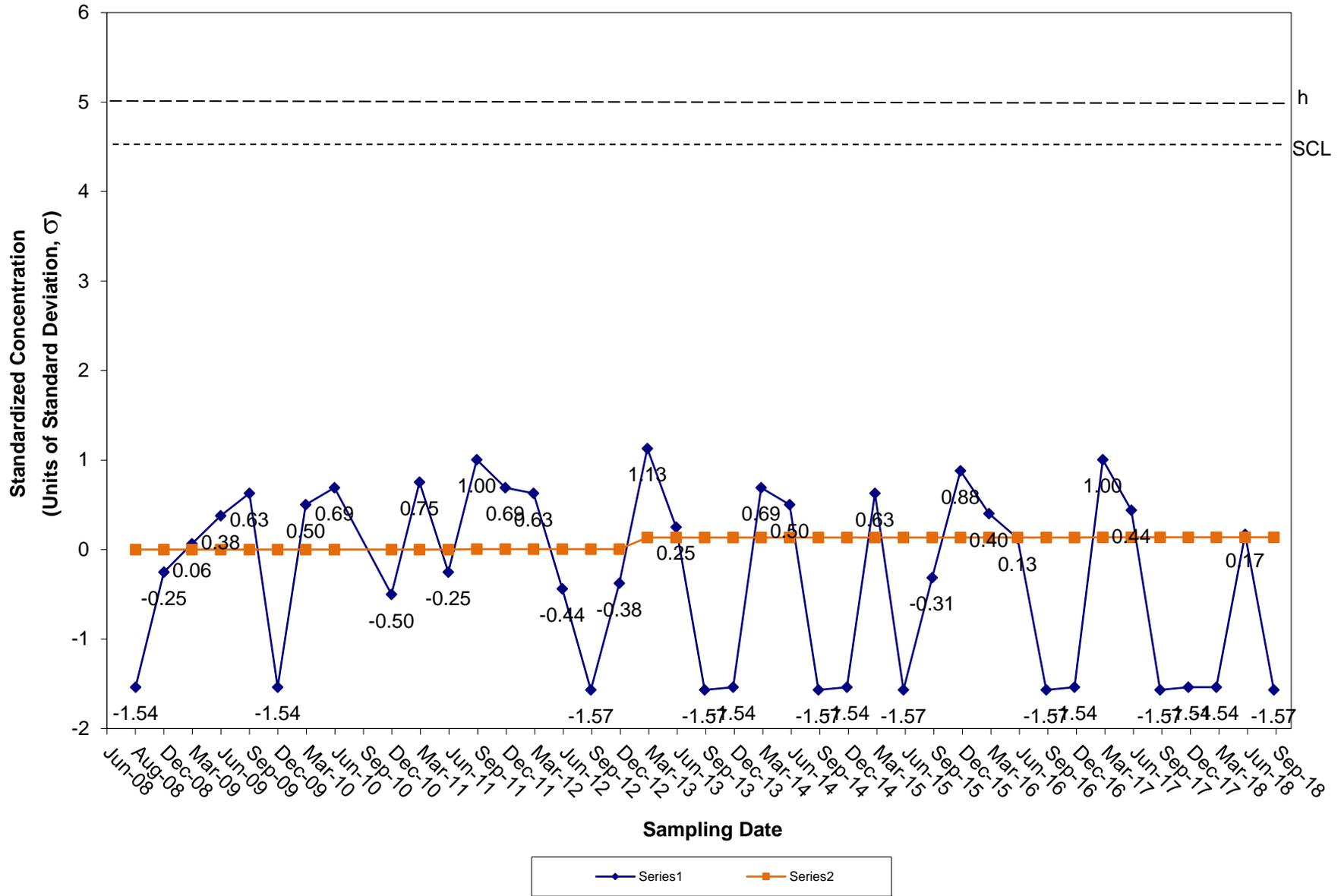
CUSUM Control Chart for Vanadium Tiverton Landfill Groundwater Compliance Well OW-14



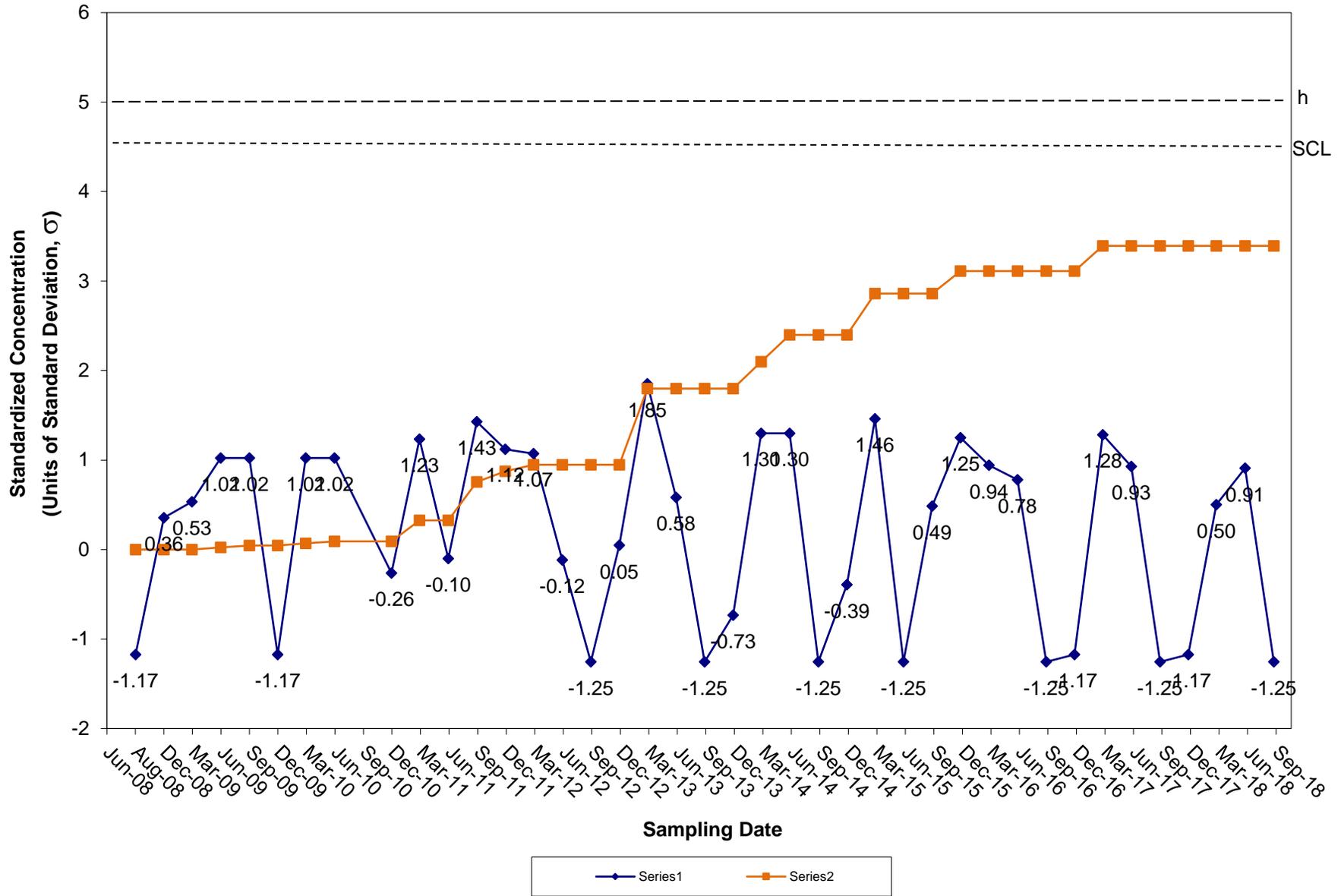
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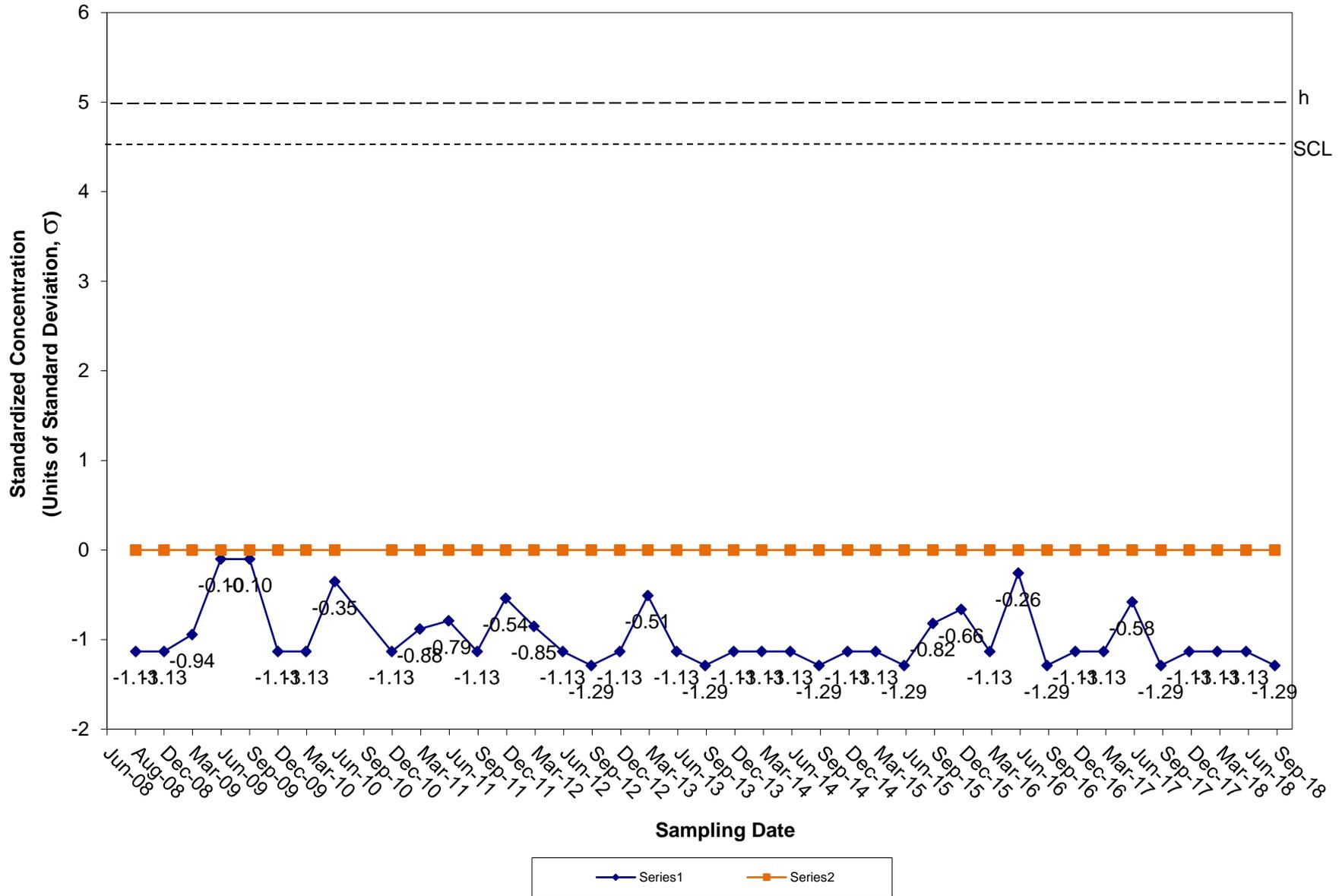
CUSUM Control Chart for Benzene Tiverton Landfill Groundwater Compliance Well OW-14



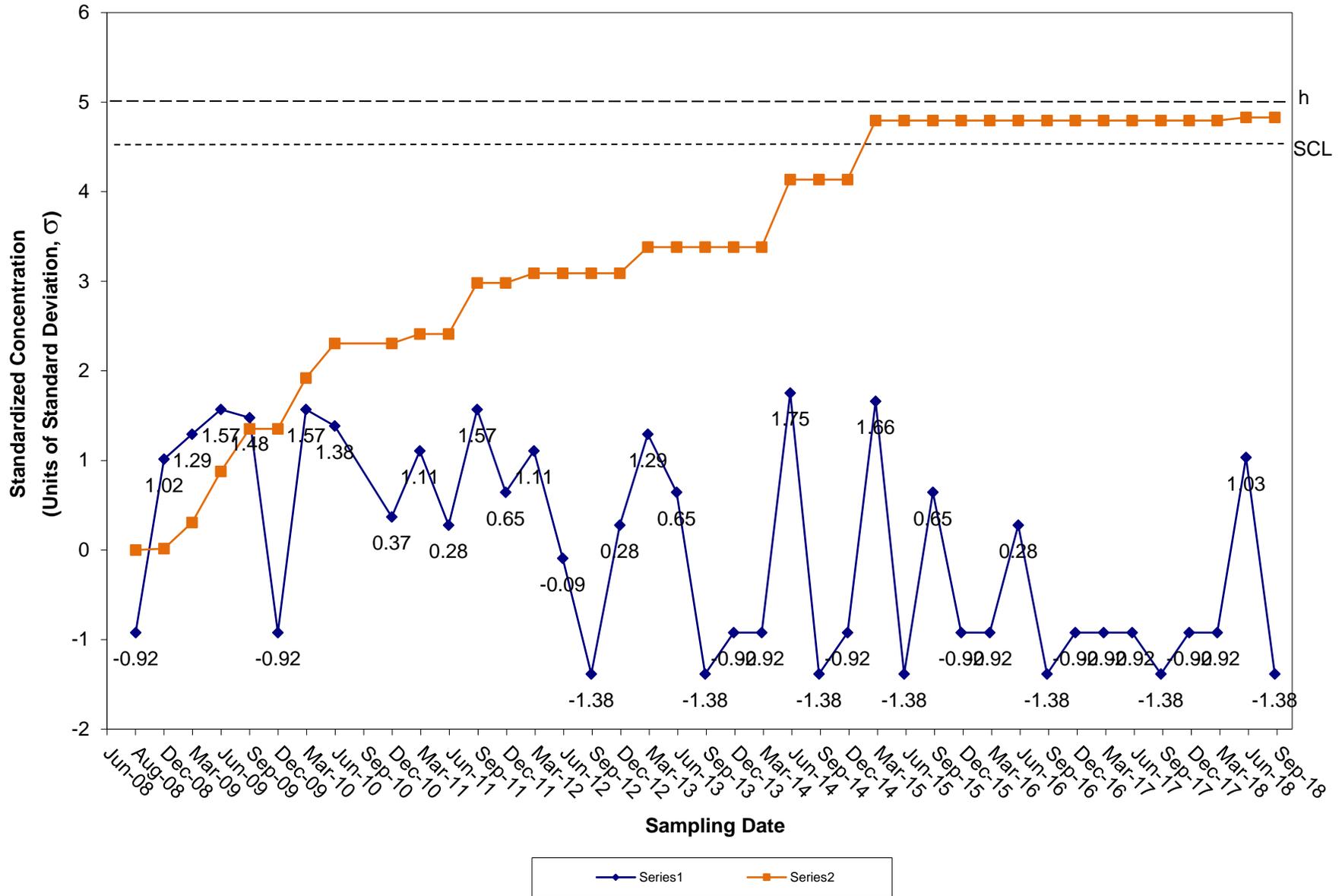
CUSUM Control Chart for Chlorobenzene Tiverton Landfill Groundwater Compliance Well OW-14



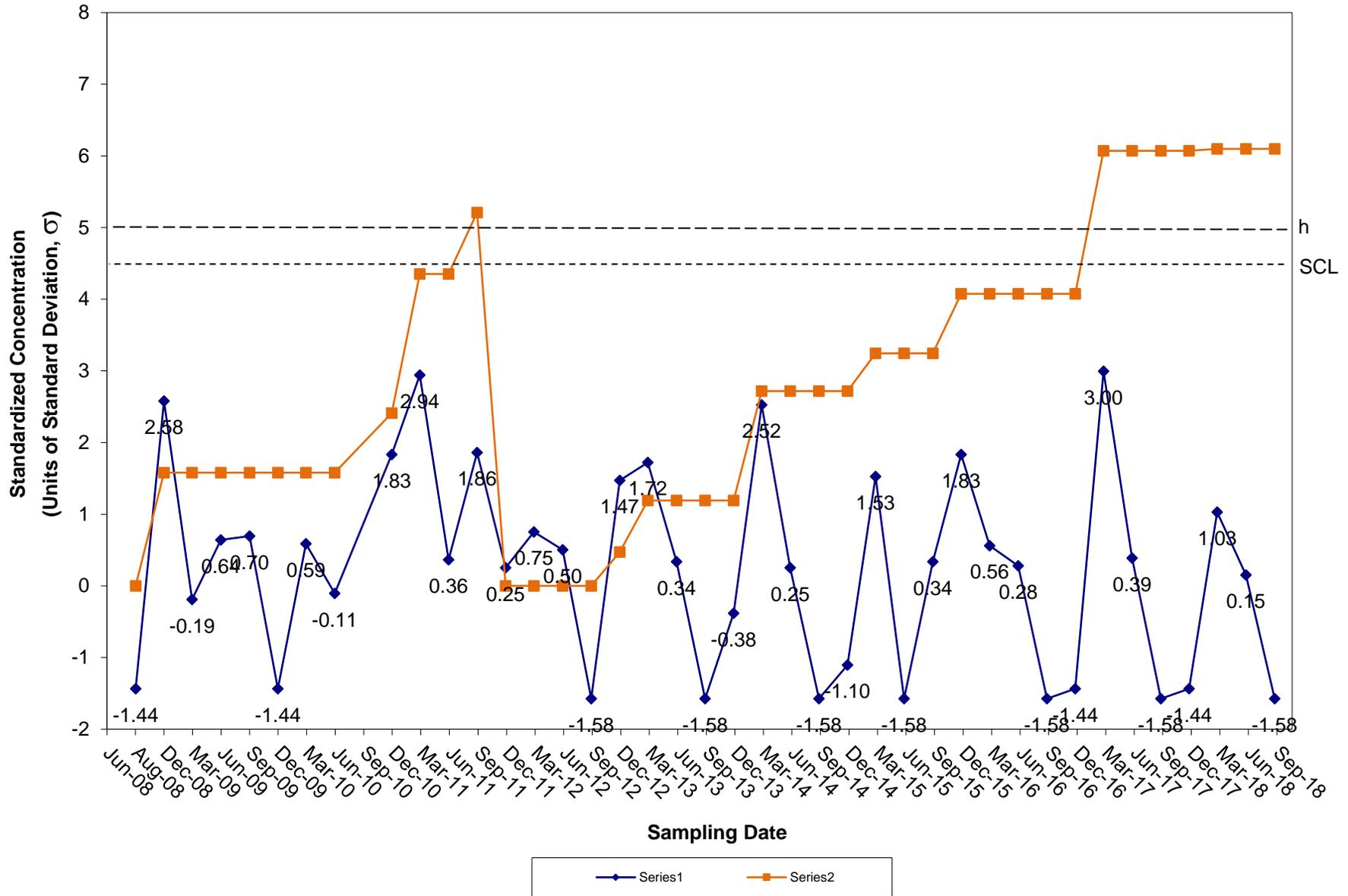
CUSUM Control Chart for Chloroethane Tiverton Landfill Groundwater Compliance Well OW-14



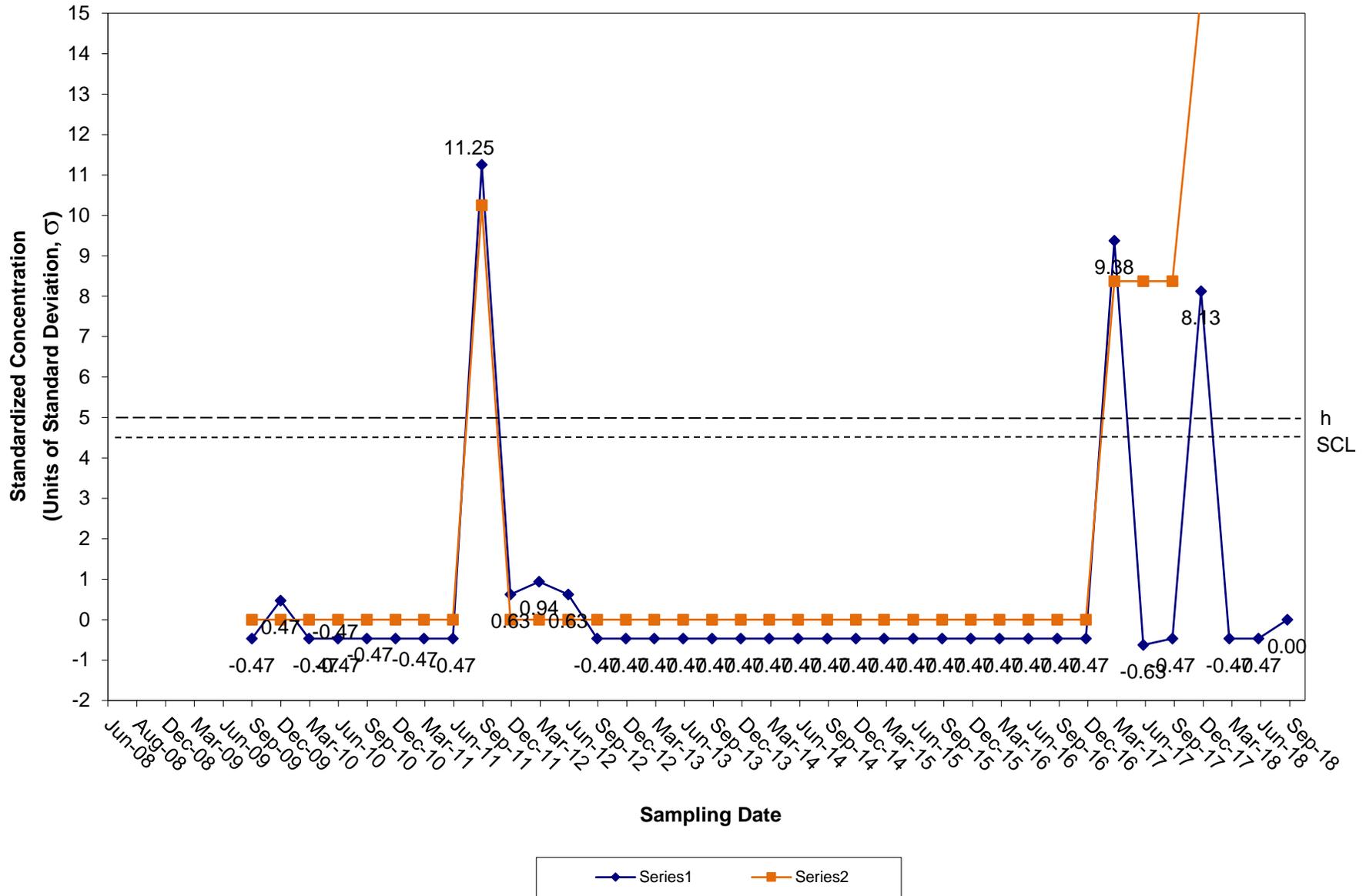
CUSUM Control Chart for 1,4-Dichlorobenzene Tiverton Landfill Groundwater Compliance Well OW-14



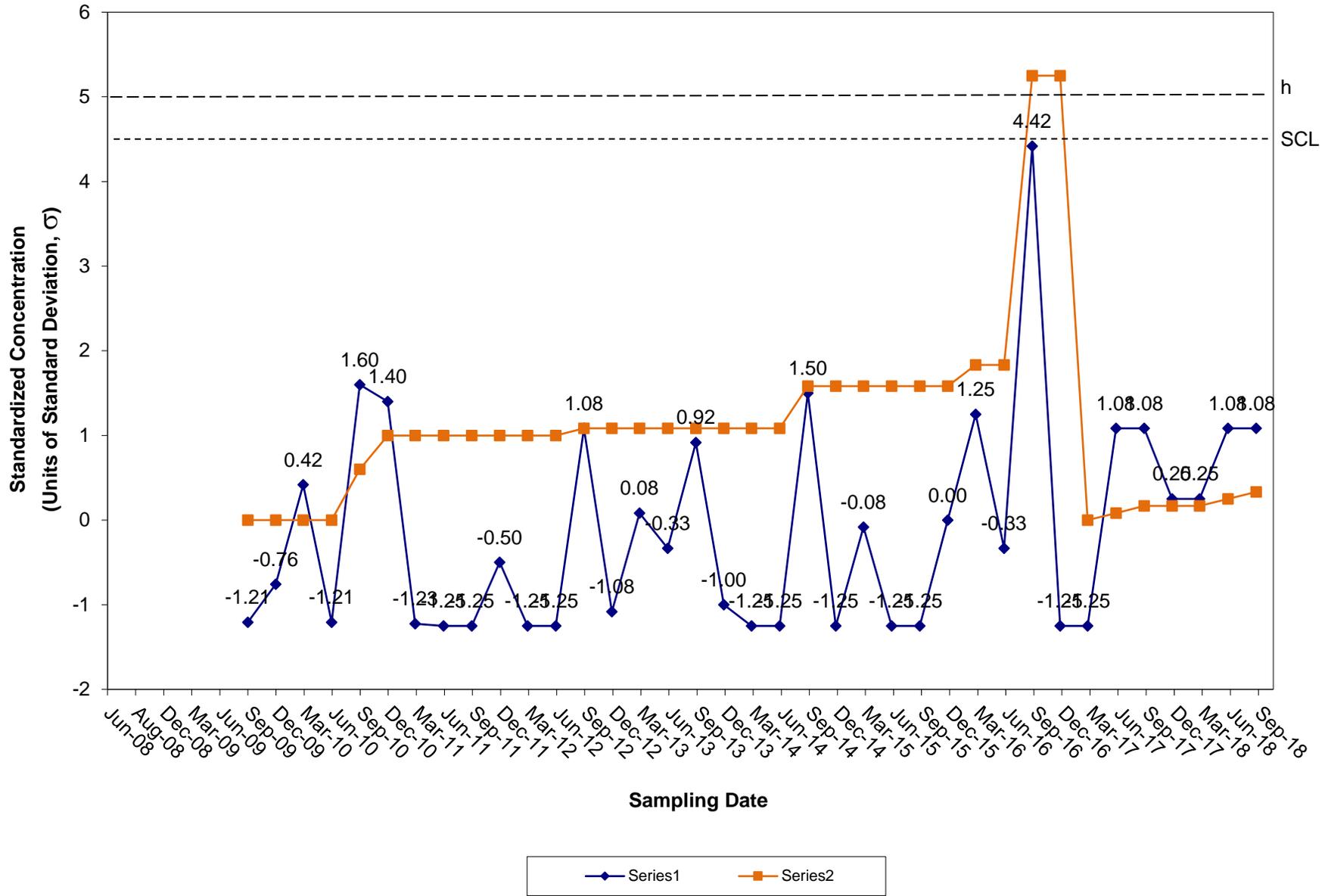
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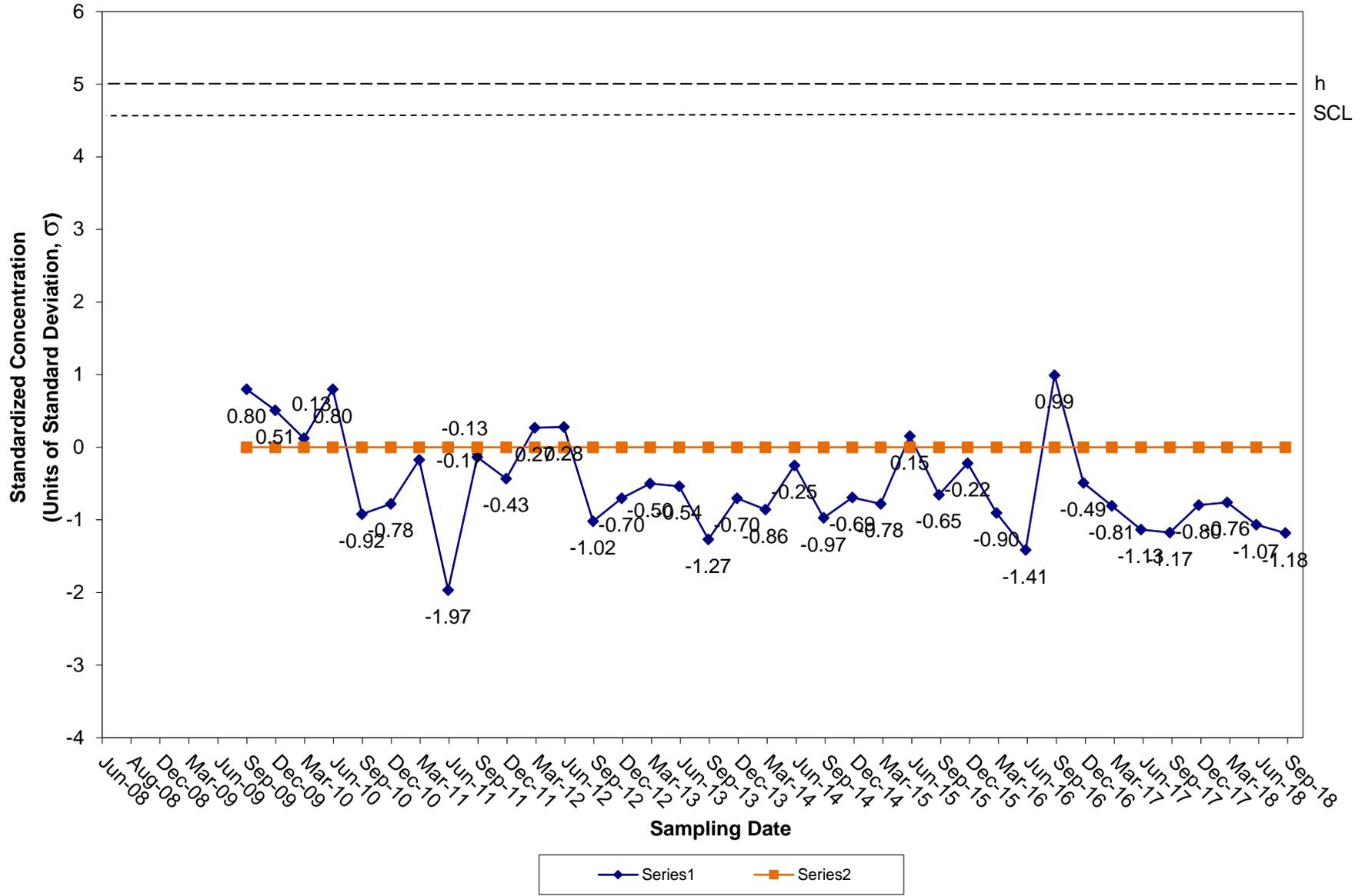
CUSUM Control Chart for Antimony Tiverton Landfill Groundwater Compliance Well OW-15



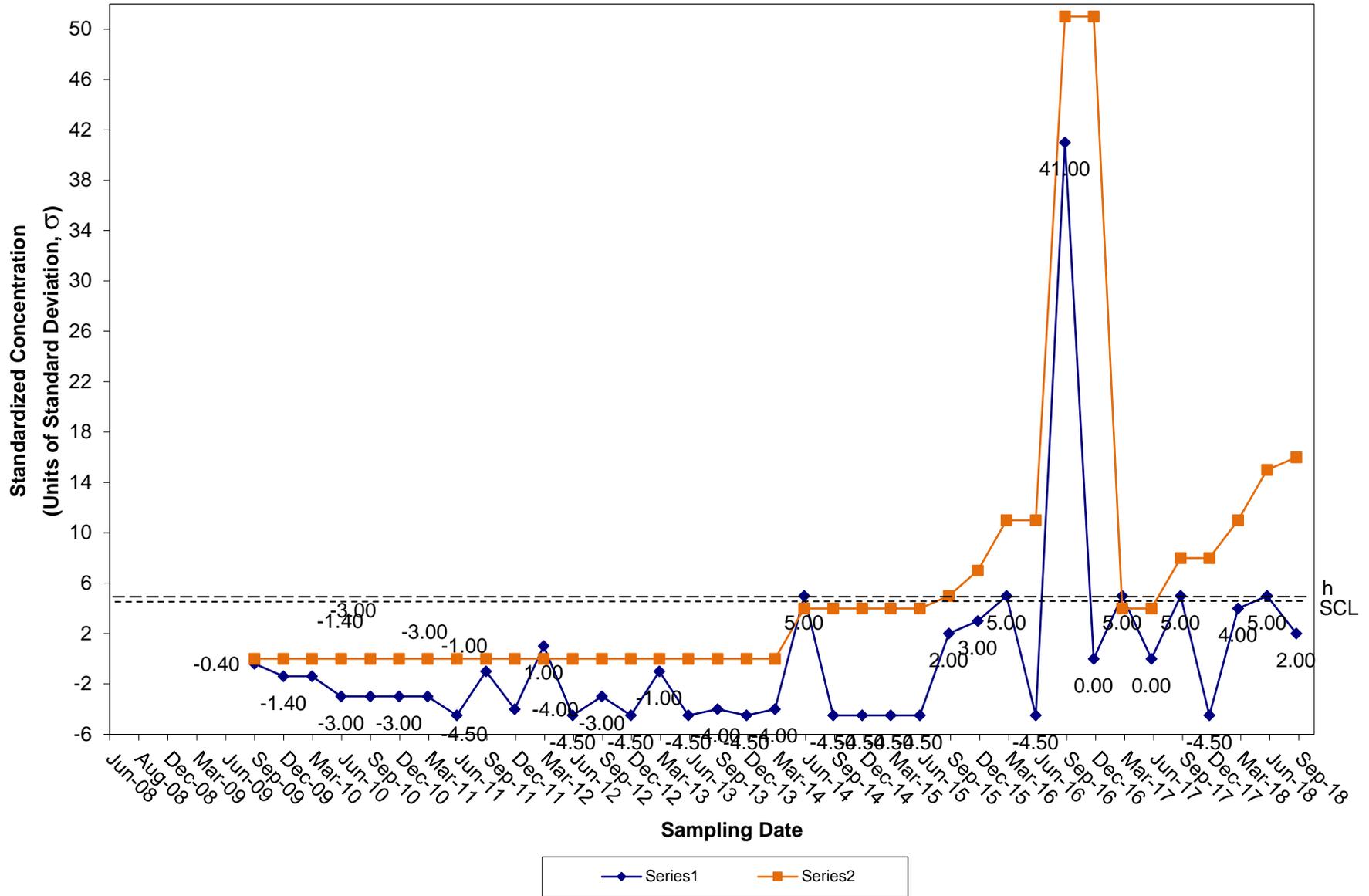
CUSUM Control Chart for Arsenic Tiverton Landfill Groundwater Compliance Well OW-15



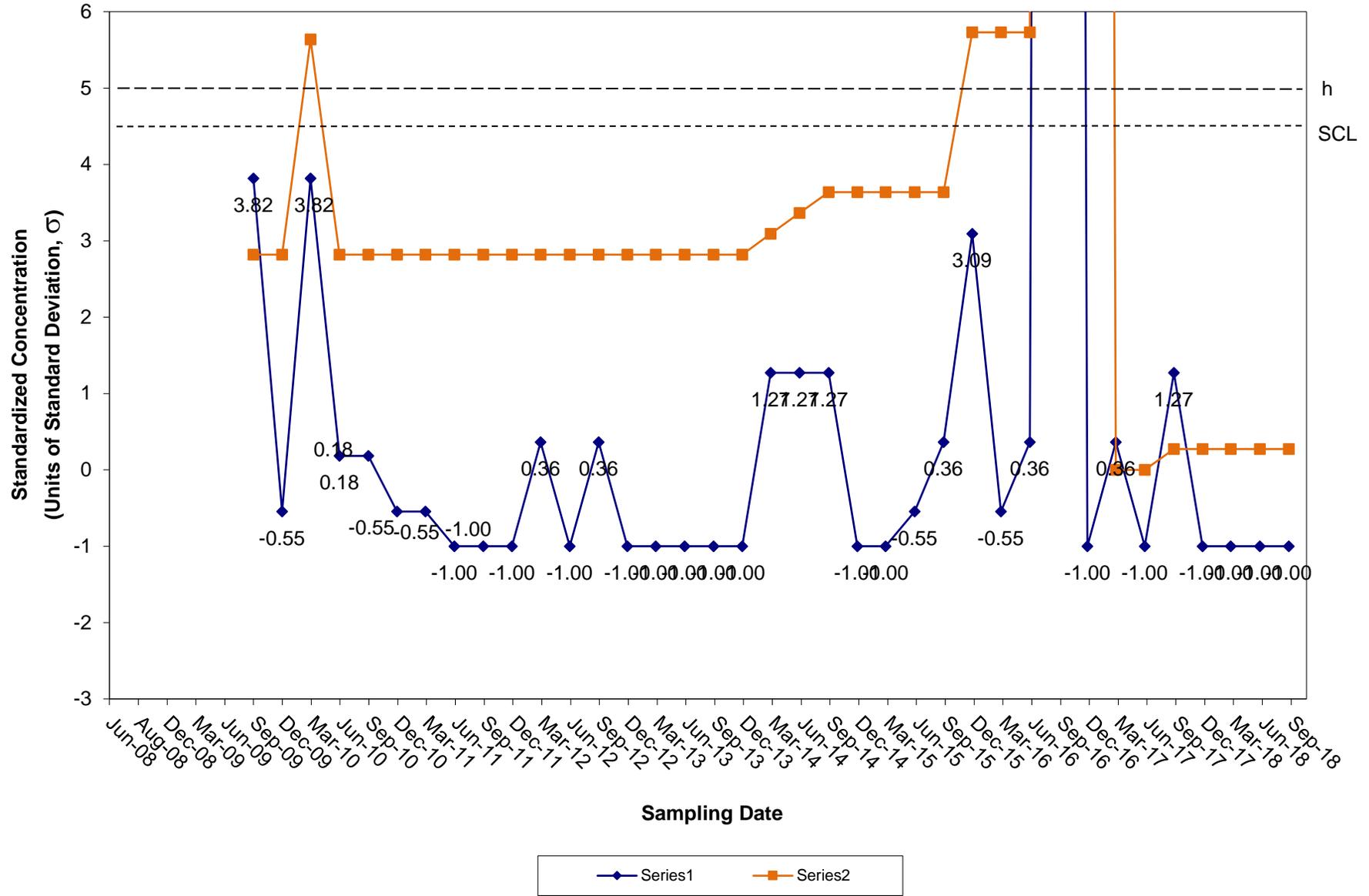
CUSUM Control Chart for Barium Tiverton Landfill Groundwater Compliance Well OW-15



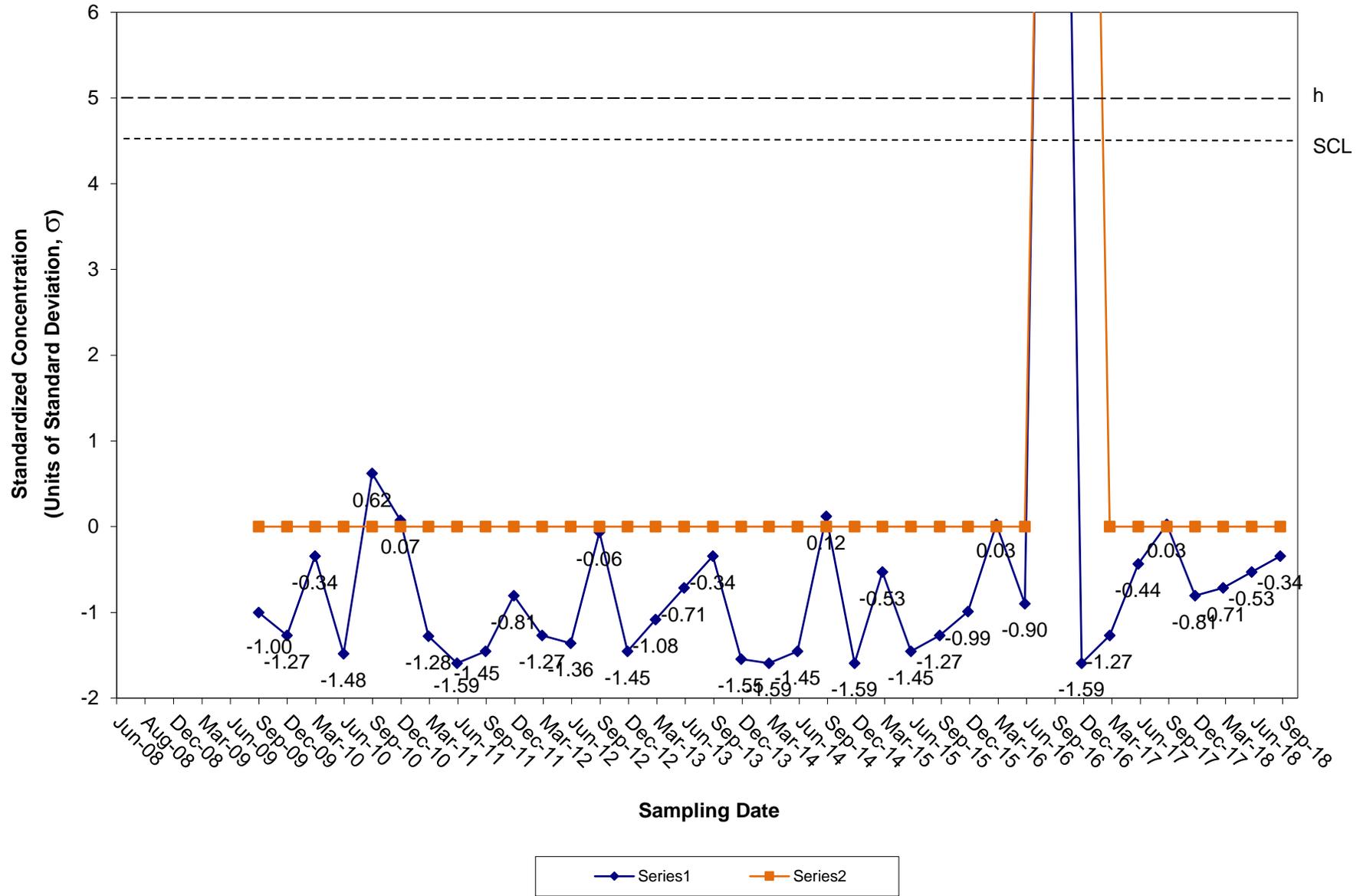
CUSUM Control Chart for Cadmium Tiverton Landfill Groundwater Compliance Well OW-15



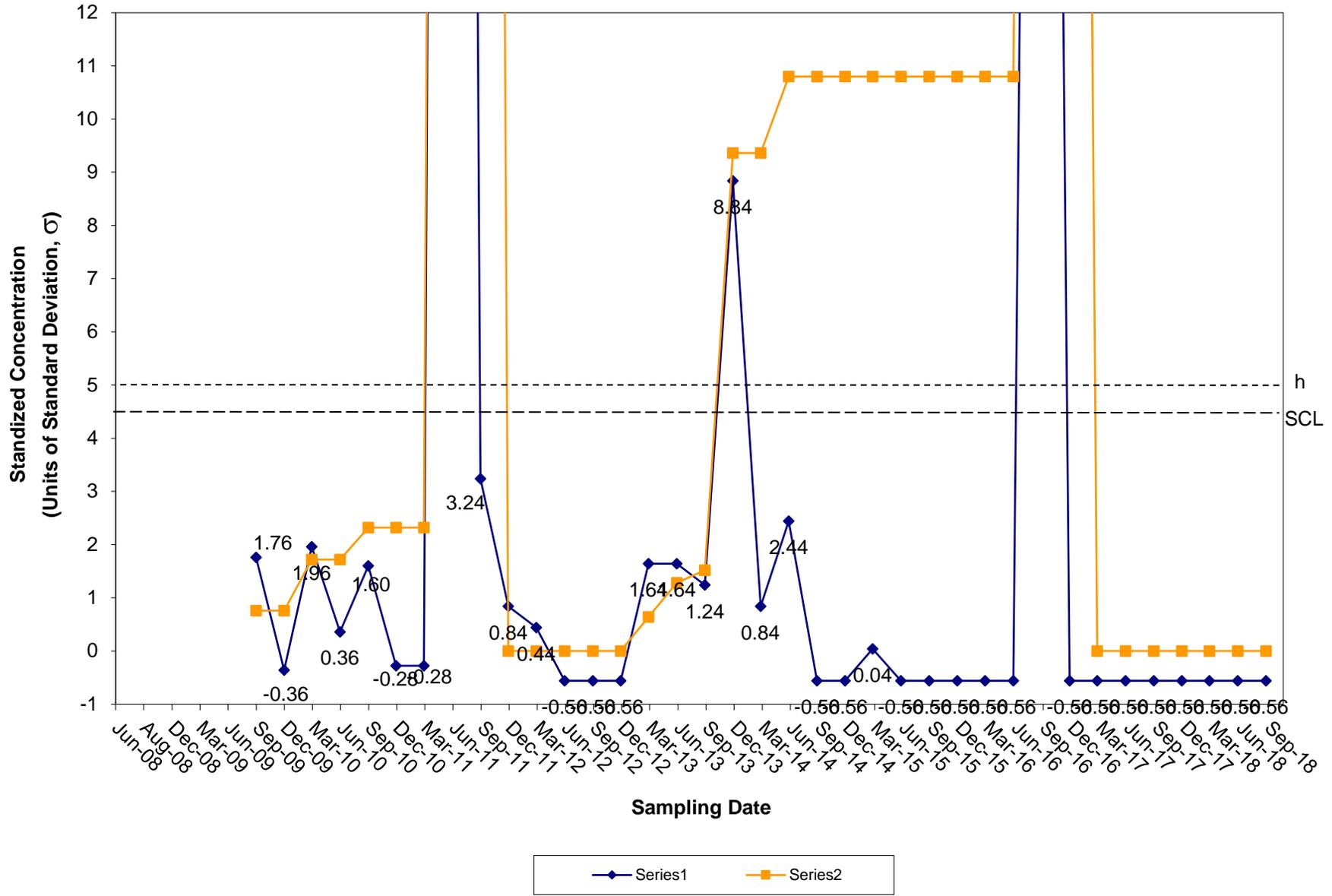
CUSUM Control Chart for Chromium Tiverton Landfill Groundwater Compliance Well OW-15



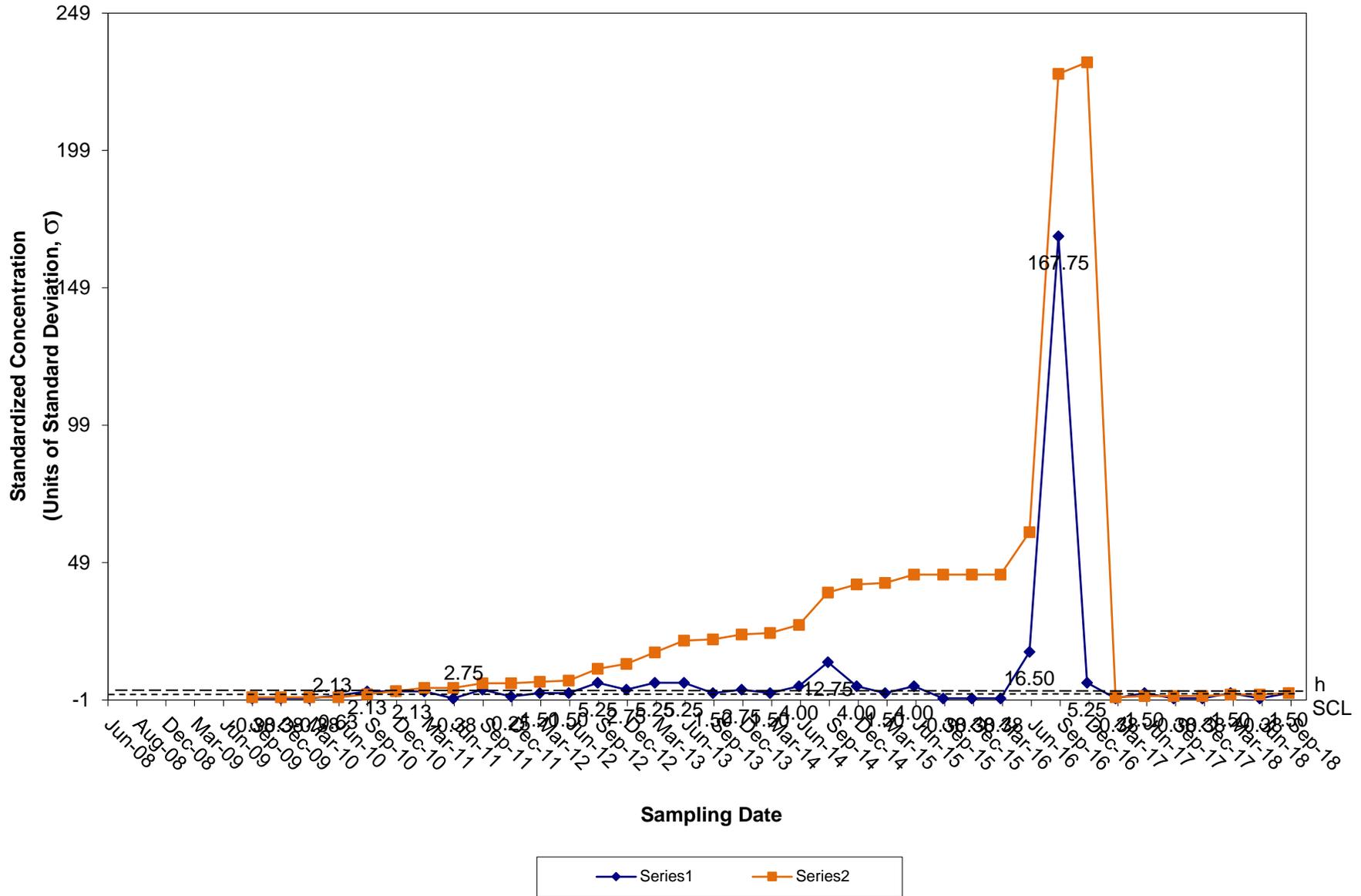
CUSUM Control Chart for Cobalt Tiverton Landfill Groundwater Compliance Well OW-15



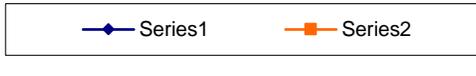
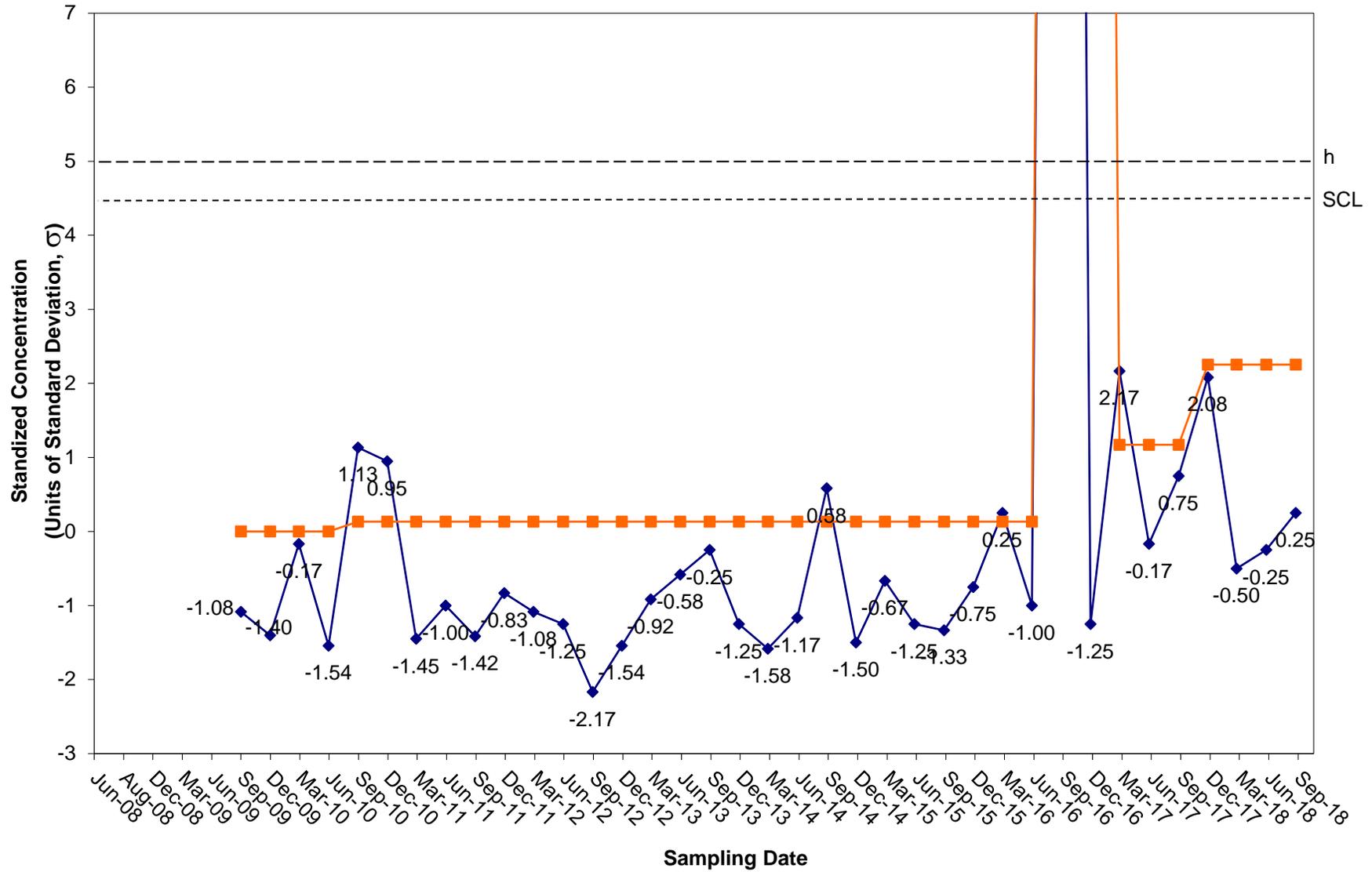
CUSUM Control Chart for Copper Tiverton Landfill Groundwater Compliance Well OW-15



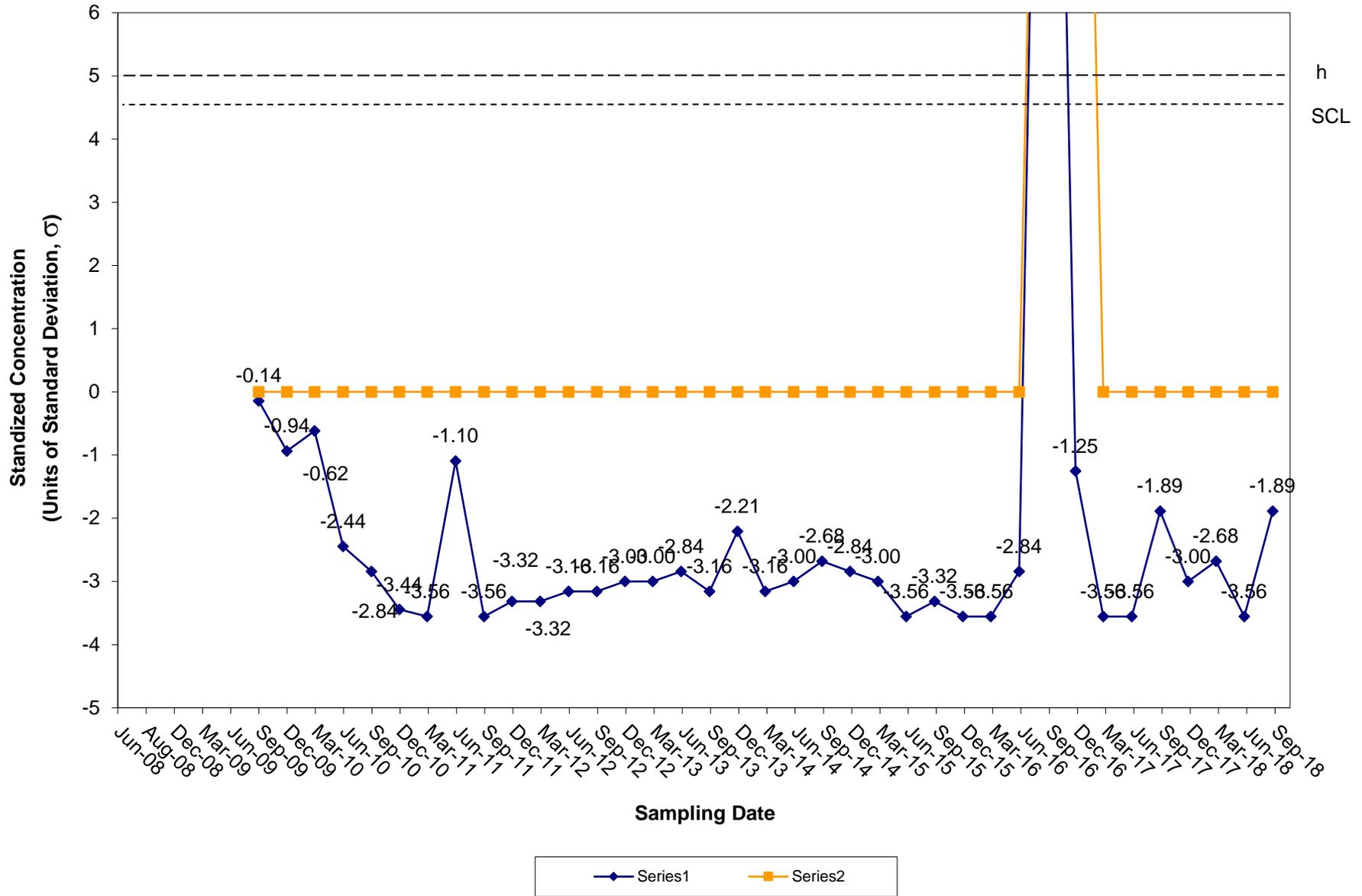
CUSUM Control Chart for Lead Tiverton Landfill Groundwater Compliance Well OW-15



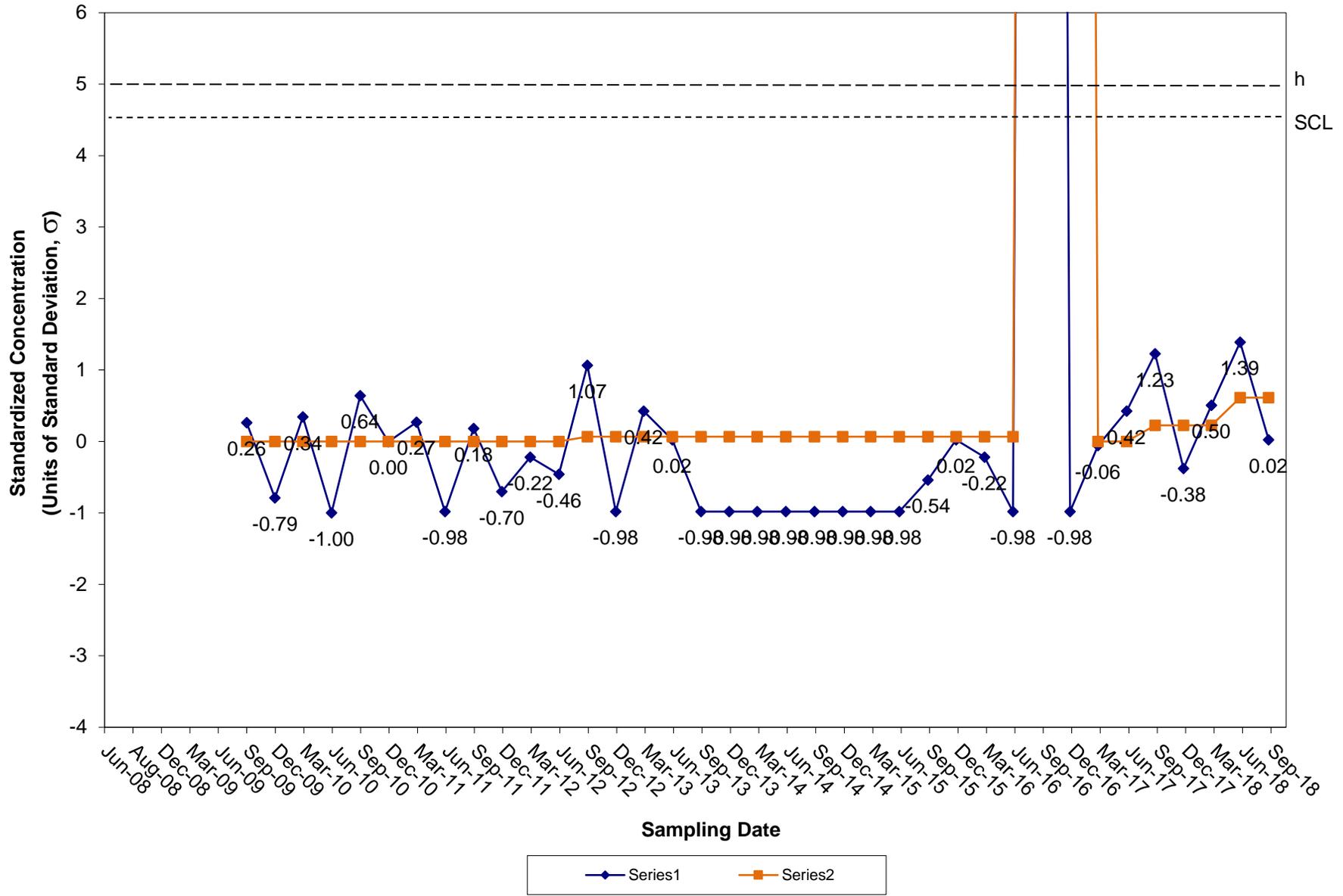
CUSUM Control Chart for Nickel Tiverton Landfill Groundwater Compliance Well OW-15



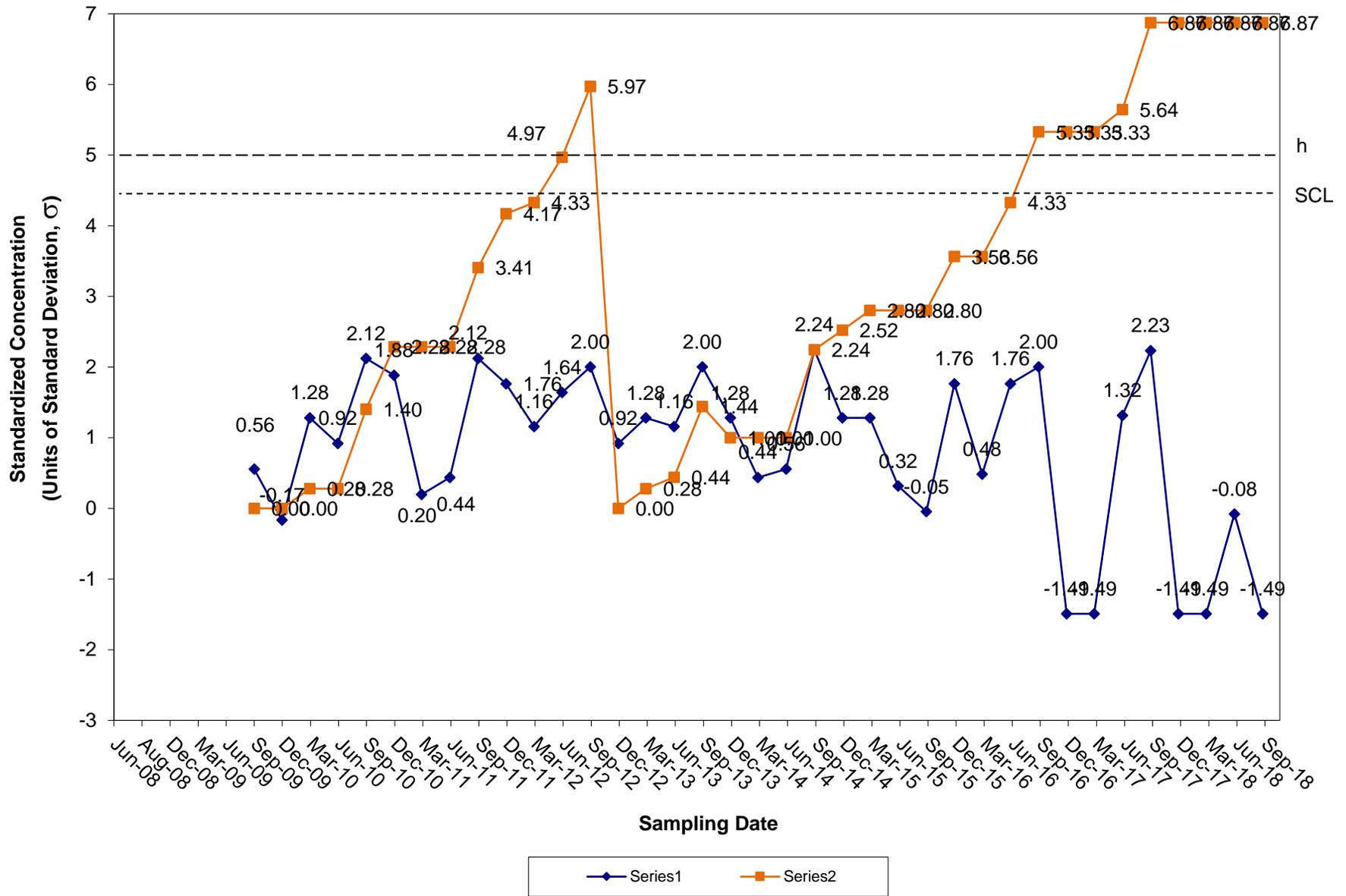
CUSUM Control Chart for Vanadium Tiverton Landfill Groundwater Compliance Well OW-15



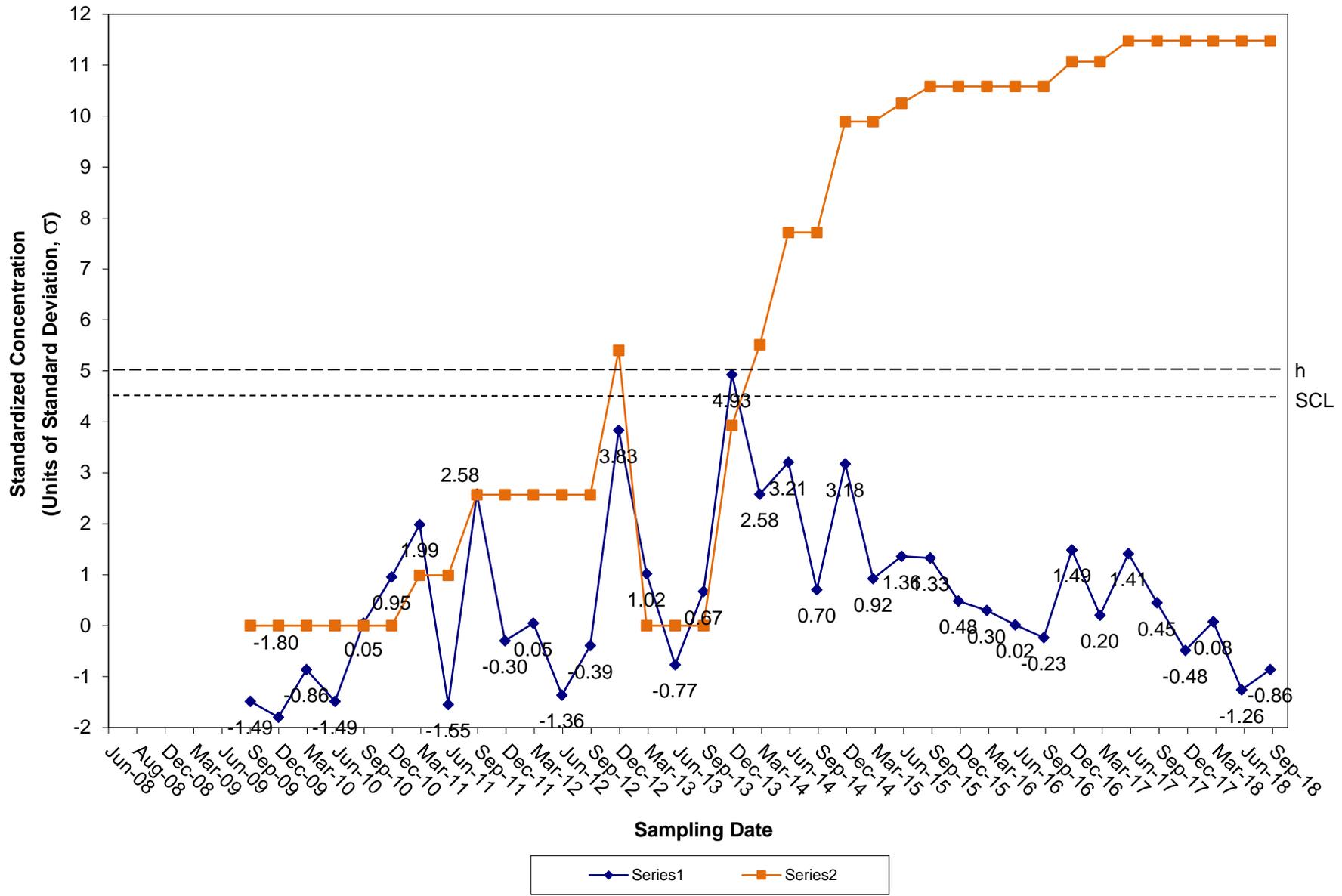
CUSUM Control Chart for Zinc Tiverton Landfill Groundwater Compliance Well OW-15



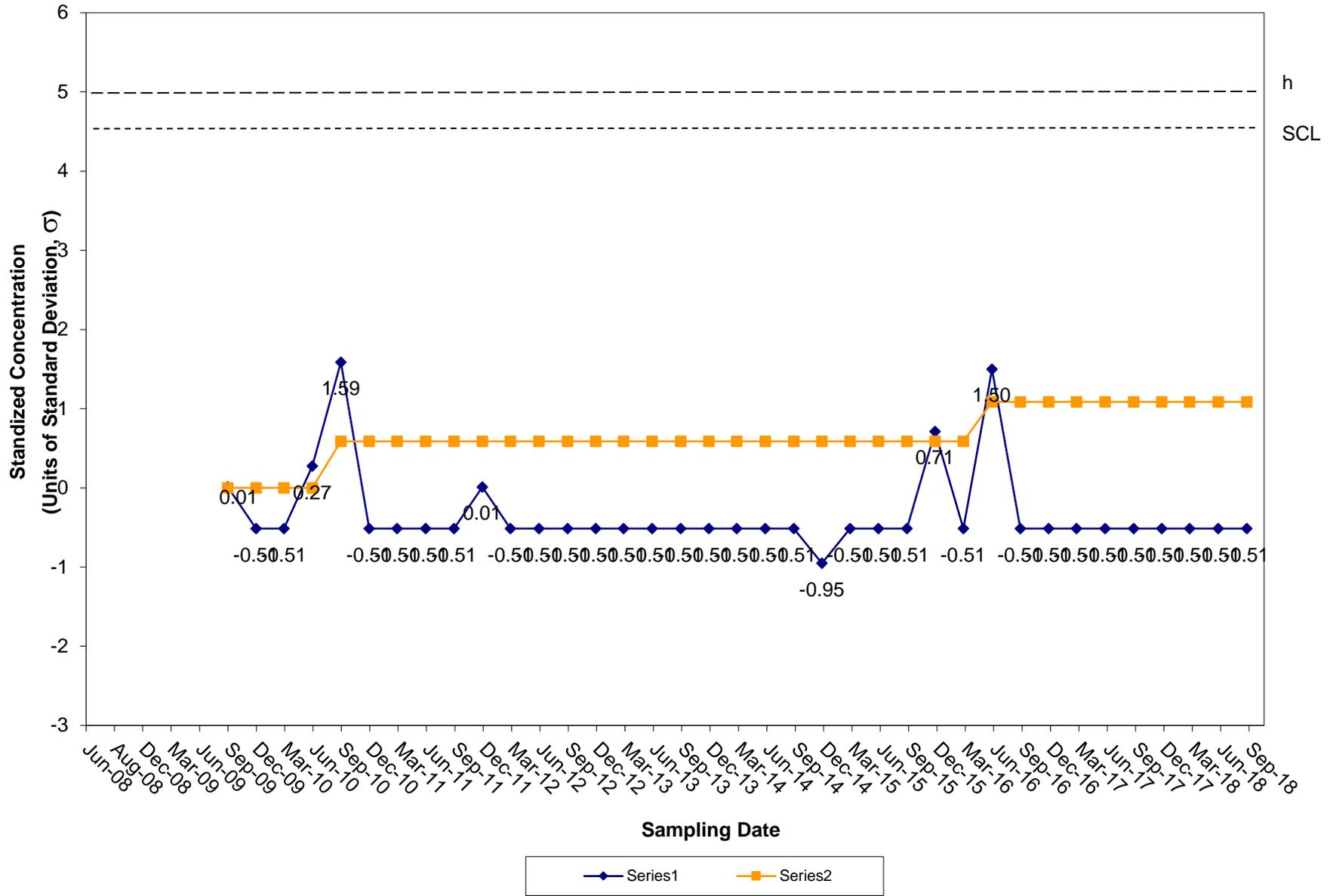
CUSUM Control Chart for Benzene Tiverton Landfill Groundwater Compliance Well OW-15



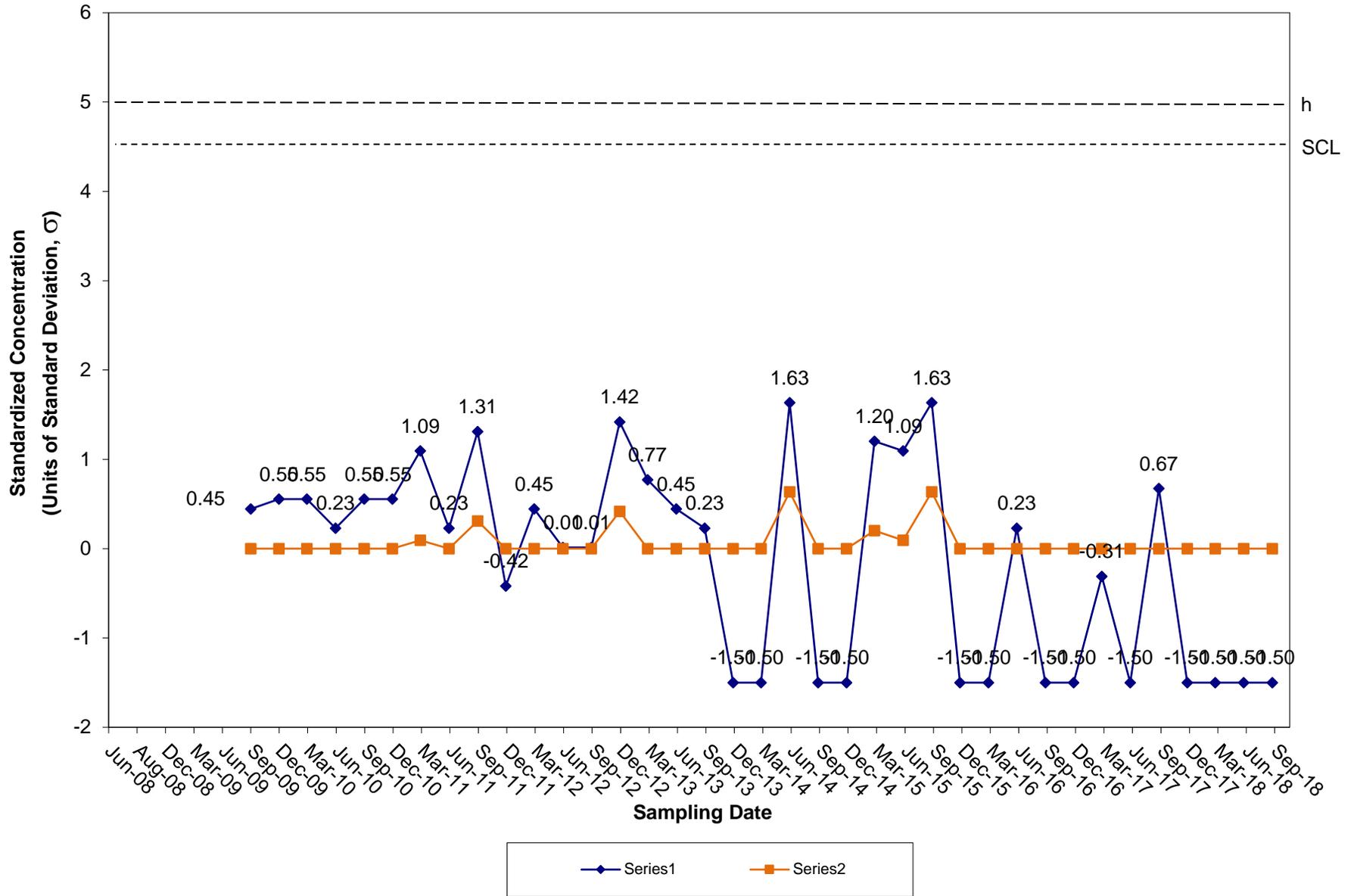
CUSUM Control Chart for Chlorobenzene Tiverton Landfill Groundwater Compliance Well OW-15



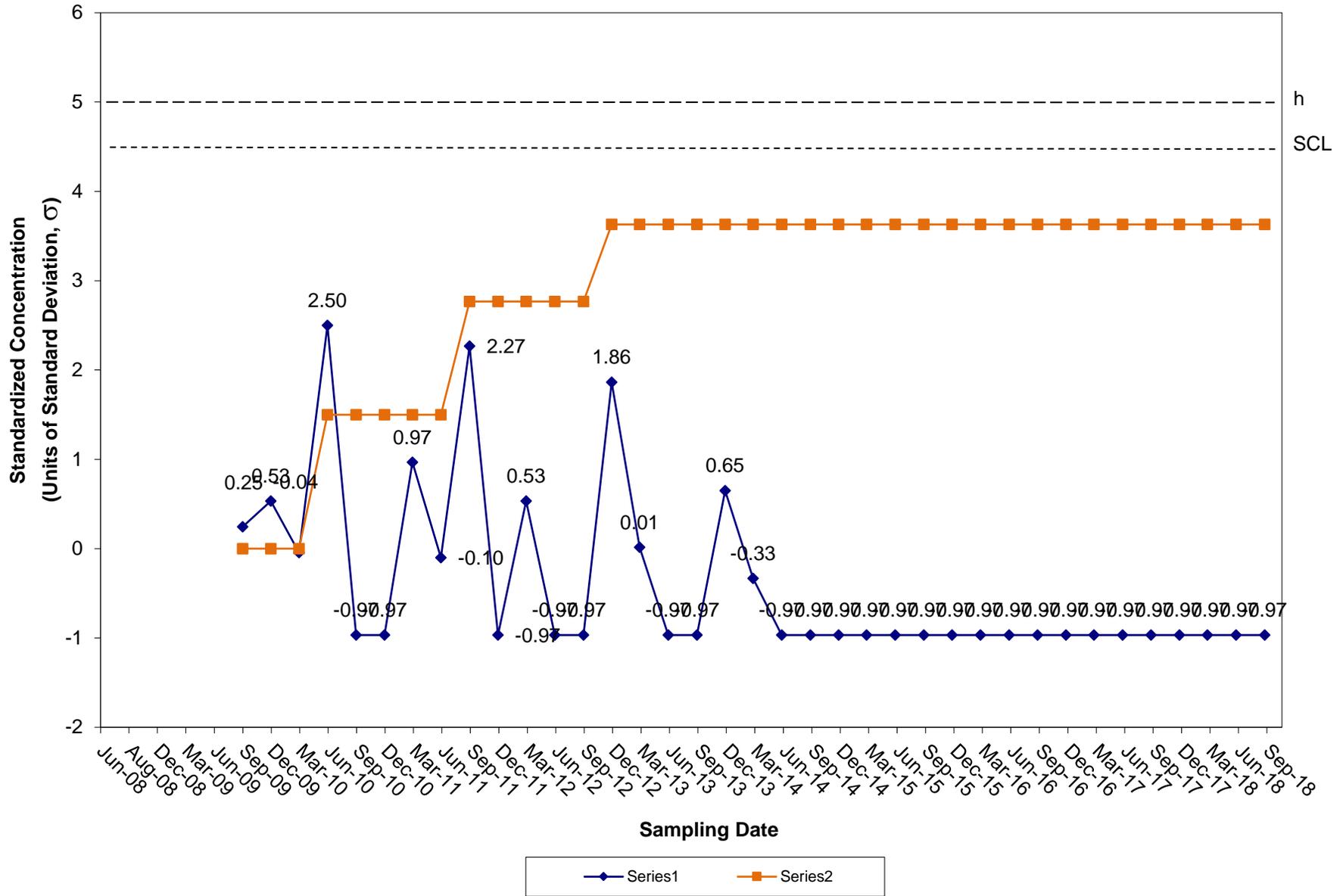
CUSUM Control Chart for Chloroethane Tiverton Landfill Groundwater Compliance Well OW-15



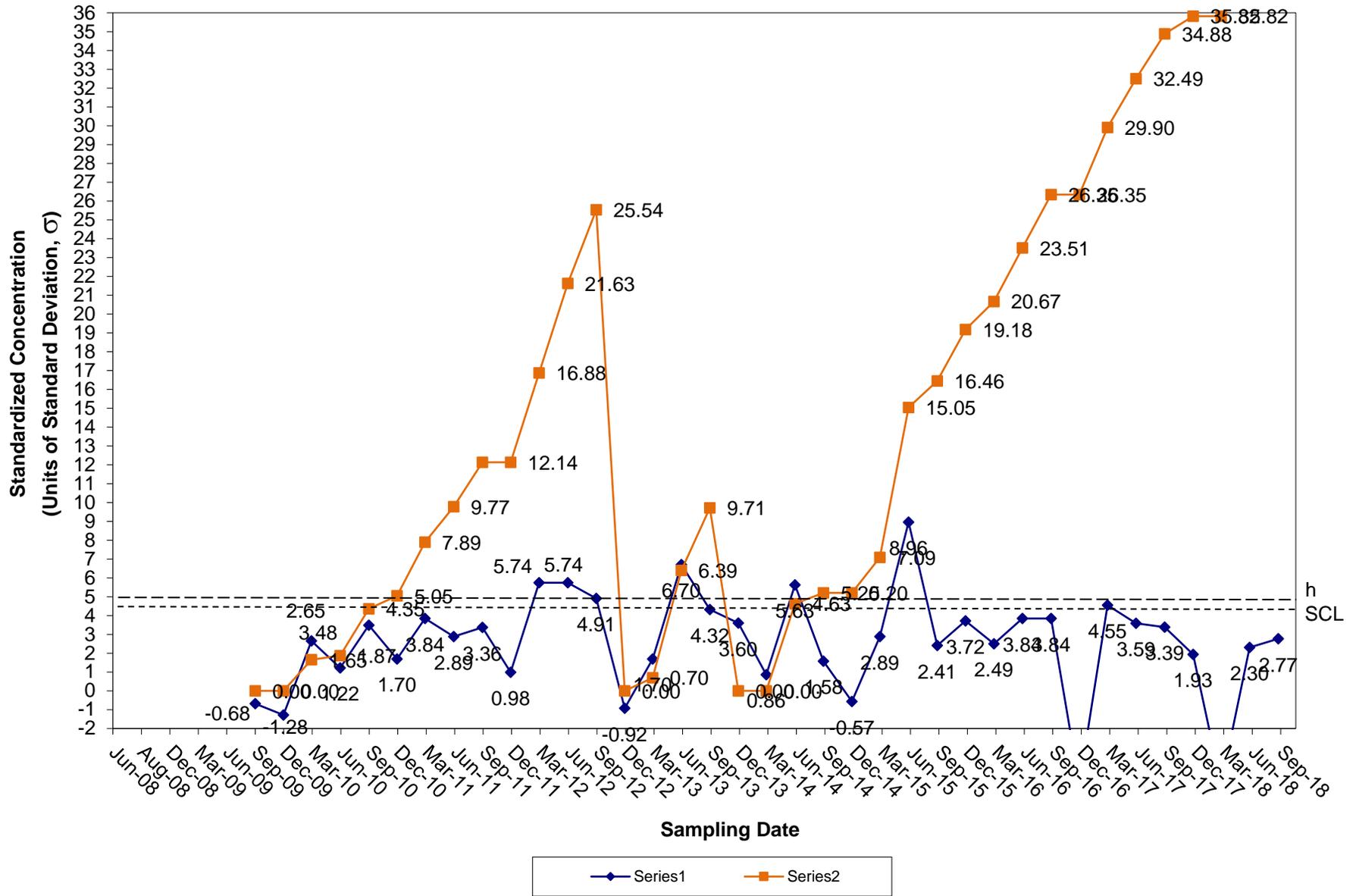
CUSUM Control Chart for 1,4-Dichlorobenzene Tiverton Landfill Groundwater Compliance Well OW-15



CUSUM Control Chart for Xylenes Tiverton Landfill Groundwater Compliance Well OW-15

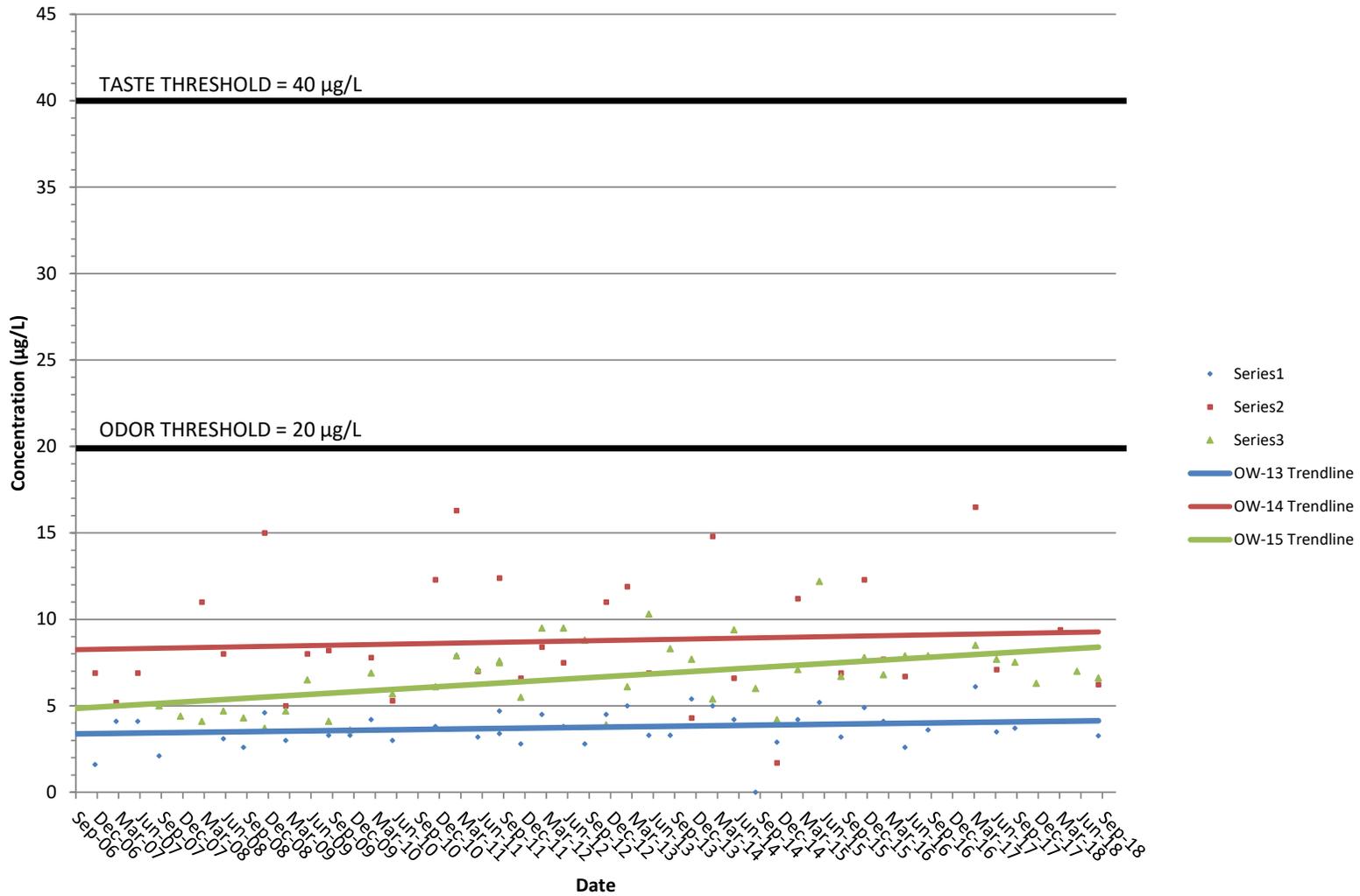


CUSUM Control Chart for MTBE Tiverton Landfill Groundwater Compliance Well OW-15



ATTACHMENT NO. 6
REPORTED CONCENTRATIONS OF MTBE FIGURE

Reported Concentrations of MTBE September 2006 - September 2018



ATTACHMENT NO. 7
FIELD SAMPLING DATA SHEETS

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-9

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 16 feet
PURGE VOLUME (GAL): N/A gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): N/A
ELAPSED TIME (MIN): N/A

WATER LEVEL DATA

DEPTH: N/A feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1
pH:	<u>N/A</u> pH UNITS
SPEC. COND:	<u>N/A</u> mS/cm
TEMPERATURE:	<u>N/A</u> °C

	READING 2
pH:	<u>N/A</u> pH UNITS
SPEC. COND:	<u>N/A</u> mS/cm
TEMPERATURE:	<u>N/A</u> °C

NOTES:

Well was completely dry; therefore no readings or samples were collected.
pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-7

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 11.8 feet
PURGE VOLUME (GAL): 1.6 gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): 0.1 +/-
ELAPSED TIME (MIN): 15 +/-

WATER LEVEL DATA

DEPTH: 2.4 feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.797</u>	mS/cm
TEMPERATURE:	<u>17.4</u>	°C

	READING 2	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.798</u>	mS/cm
TEMPERATURE:	<u>17.4</u>	°C

NOTES:

Samples were noted as generally clear and low in turbidity based on visual inspections of samples.

Samples were collected at 1:00 PM.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-12

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 16.2 feet
PURGE VOLUME (GAL): 0.90 gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): 0.1 +/-
ELAPSED TIME (MIN): 15 +/-

WATER LEVEL DATA

DEPTH: 10.9 feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.608</u>	mS/cm
TEMPERATURE:	<u>14.2</u>	°C

	READING 2	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.601</u>	mS/cm
TEMPERATURE:	<u>14.3</u>	°C

NOTES:

Samples were noted as generally clear and low in turbidity based on visual inspections of samples.

Samples were collected at 11:45 AM.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-13

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 14.5 feet
PURGE VOLUME (GAL): 1.70 gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): 0.1 +/-
ELAPSED TIME (MIN): 15 +/-

WATER LEVEL DATA

DEPTH: 4.1 feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	READING 2
pH:	<u>N/A</u> pH UNITS	<u>N/A</u> pH UNITS
SPEC. COND:	<u>1.215</u> mS/cm	<u>1.216</u> mS/cm
TEMPERATURE:	<u>18.3</u> °C	<u>18.4</u> °C

NOTES:

Samples were noted as generally clear and low in turbidity based on visual inspections of supernatant sample after a 15-minute decanting period.

Samples were collected at 5:30 PM.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-14

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 10.6 feet
PURGE VOLUME (GAL): N/A gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): N/A
ELAPSED TIME (MIN): N/A

WATER LEVEL DATA

DEPTH: N/A feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>N/A</u>	mS/cm
TEMPERATURE:	<u>N/A</u>	°C

	READING 2	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>N/A</u>	mS/cm
TEMPERATURE:	<u>N/A</u>	°C

NOTES:

Well was completely dry; therefore no readings or samples were collected.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-15

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 16.8 feet
PURGE VOLUME (GAL): 1.2 gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): 0.1 +/-
ELAPSED TIME (MIN): 15 +/-

WATER LEVEL DATA

DEPTH: 9.5 feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	READING 2
pH:	<u>N/A</u> pH UNITS	<u>N/A</u> pH UNITS
SPEC. COND:	<u>1.550</u> mS/cm	<u>1.557</u> mS/cm
TEMPERATURE:	<u>14.9</u> °C	<u>14.7</u> °C

NOTES:

Samples were noted as generally clear and low in turbidity based on visual inspections of supernatant sample after a 15-minute decanting period.

Samples were collected at 4:30 PM.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.24

DATE: 9/27/2018
WEATHER: Sunny 70s

WELL ID: OW-16

DIAMETER (INCHES): 2

PURGE DATA

WELL DEPTH: 45.8 feet
PURGE VOLUME (GAL): 6.8 gallons
PURGER TYPE: Peristaltic pump

MEASURE POINT: Top of Casing
PURGE RATE (GPM): 0.3 +/-
ELAPSED TIME (MIN): 20 +/-

WATER LEVEL DATA

DEPTH: 4.5 feet
MEASURE POINT: Top of Casing

ELEVATION: See Site Plan
DEVICE: Water Level Indicator

FIELD TESTING RESULTS

	READING 1	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.739</u>	mS/cm
TEMPERATURE:	<u>14.5</u>	°C

	READING 2	
pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.737</u>	mS/cm
TEMPERATURE:	<u>14.6</u>	°C

NOTES:

Samples were noted as generally clear and low in turbidity based on visual inspections of samples.

Samples were collected at 1:45 PM.

pH sensor was not working for this round of sampling.

FIELD SAMPLING DATA SHEET

PROJECT NAME: TIVERTON LANDFILL
PARE PROJECT NO.: 94139.01 /021

DATE: 9/27/2018
WEATHER: Sunny 70s

FIELD TESTING RESULTS:

SURFACE WATER LOCATION: SW-1

READING 1

pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.62</u>	mS/cm
TEMPERATURE:	<u>18.4</u>	°C

SURFACE WATER LOCATION: SW-2

READING 1

pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.34</u>	mS/cm
TEMPERATURE:	<u>18.9</u>	°C

SURFACE WATER LOCATION: SW-3

READING 1

pH:	<u>N/A</u>	pH UNITS
SPEC. COND:	<u>0.57</u>	mS/cm
TEMPERATURE:	<u>19.4</u>	°C

NOTES:

pH sensor was not working for this round of sampling.
