# GROUNDWATER MONITORING REPORT ANNUAL REPORT CALANDER YEAR 2016

# DANSKAMMER POINT GENERATING STATION HISTORIC ASH CELL

Prepared for

Danskammer Energy, LLC
Newburgh, New York

February 2017

Prepared by




Synapse Risk Management, LLC
360 Erie Blvd. East
Syracuse, New York 13202

Project DANSK 01.15.04

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## EXECUTIVE SUMMARY

Dynegy Northeast Generation, Inc. formerly operated the Danskammer Generating Station located in Newburgh, New York. The Danskammer Generating Station has been offline since October 2012 after sustaining damage during Hurricane Sandy. Prior to October 2012 coal combustion wastes generated by the coal-fired generating units were transported off site for beneficial reuse, or alternatively placed within the on-site Solid Waste Management Facility (SWMF) Phase III cell. The Danskammer Generating Station was sold in November 2013 to Danskammer Energy, LLC with the intent to repowering the facility with fuels other than coal.

Prior to the construction of the permitted Danskammer SWMF, an earthen-lined cell was reportedly used to receive combustion ash from the Danskammer Generating Station. This cell is referred to as the Historic Ash Cell (HAC). Currently the HAC is more than fifty percent (50%) capped with various SWMF structures and features including pavement and lined sedimentation basins. Vegetative cover is in place over the remainder of the HAC surface.

At the request of the New York State Department of Environmental Conservation (NYSDEC), IT Corporation prepared a Corrective Measures Assessment (CMA) for the HAC (IT Corporation, August 2000) In a response letter dated December 7, 2004, NYSDEC requested that the CMA be updated to reflect current site conditions and that a public informational meeting be conducted to summarize the key elements of the CMA, as well as to address public concerns.

In response to the NYSDEC request, an updated CMA was submitted by Dynegy in association with its consultant Shaw EMCON/OWT, Inc. (January 2005). The CMA summarized historical monitoring and engineering work performed in the HAC area, assessed the feasibility of various corrective measures alternatives that might be pursued, and recommended a specific corrective measure to be implemented. A public informational meeting was held in March 2005. Following that meeting Dynegy received NYSDEC approval of the CMA, including approval of the recommended alternative which focused on long term monitoring of ash-related constituents down gradient of the HAC and continued monitoring of the bedrock water-bearing unit underlying the HAC.

The purpose of this annual report is to summarize HAC groundwater quality in the overburden and the bedrock units during the calendar year 2016 and present results in accordance with the requirements of the HAC Monitoring Plan. The key findings are summarized as follows:

- The review of the time trend plots prepared for ash indicator parameters indicate that the majority of the indicator parameters are stable with some seasonal fluctuation and variation identified in some parameters;

- Groundwater quality data collected during 2016 indicate some exceedances of New York State Groundwater Quality Standards (GWQS) for three parameters (sulfate, TDS and turbidity); and

- The evaluations performed on the data collected during 2016 continue to indicate no impact to groundwater quality attributable to the HAC.

# 1 INTRODUCTION

## 1.1 General

This report presents an annual summary of the results for the Historic Ash Cell (HAC) groundwater monitoring program at the Danskammer Generating Station in Newburgh, New York. This document has been prepared to satisfy the annual reporting requirements set forth in the NYSDEC - approved HAC Monitoring Plan (Synapse, 2005) and includes discussions of groundwater quality results and trends since the inception of the program in January 2007 through December 2016.

Beginning with the completion of the fourth quarter 2009 sampling event, three years of representative analytical data from each monitoring well was compiled into a database for the development of Operation Trigger Values (OTV). The Existing water quality or OTV was calculated as the arithmetic mean of three prior years of data on an individual monitoring well basis. The Statistical Trigger Value (STV) is defined as three standard deviations above the average existing water quality of each parameter at each well. This methodology establishes a STV, the exceedance of which would initiate implementation of the contingency water quality monitoring plan if the owner/operator determines there was a significant increase relative to existing water quality. This HAC report, therefore presents a summary of the groundwater quality associated with the HAC monitoring well network for calendar year 2016 utilizing the 2009-developed OTV and STV.

The HAC monitoring program provides for routine monitoring of wells downgradient of the HAC to identify changes in concentrations of key parameters in groundwater including: arsenic, bicarbonate, boron, calcium, carbonate, chlorides, iron, potassium, sodium, sulfur, and total dissolved solids (TDS). Analytical results are tracked using time-trend comparisons, OTV and STV relative to individual monitoring wells.

## 1.2 Monitoring Network

Four monitoring wells (three overburden wells and one bedrock well) comprise the groundwater monitoring network at the Danskammer HAC. The network includes wells screened in the overburden units and in the underlying bedrock as summarized on Figure 1-1 – HAC Groundwater Monitoring Plan and in Table 1-1 – Monitoring Well Network. The following summarizes the groundwater monitoring network relative to the screened unit location, and vertical and horizontal position of each well relative to the HAC.

Overburden Monitoring Wells

- HAC – 1 Crossgradient - Southeast
- HAC – 2 Downgradient - South
- NW – 1 Downgradient - South

Bedrock Monitoring Wells

- DW – 3R Vertical

## 1.3 Water Quality Monitoring Program

Water quality sampling is performed on a quarterly frequency, occurring during the months of March, June, September, and December of 2016. The HAC sampling and analysis is scheduled to coincide with the sampling activities associated with other Danskammer groundwater monitoring programs.

Beginning with the 2010 Annual HAC Monitoring Report, operational water quality values were formulated from historical water quality results utilizing time trend analysis, OTV and STV intrawell methodologies.

Evaluation Methodology

The existing water quality was calculated for selected parameters as the mean of five years of data (2007 through 2012) on an individual monitoring well basis. STVs will be calculated as three standard deviations of the existing water quality of each parameter per well. This methodology will establish intra-well STV thresholds which, if exceeded, may invoke the contingency monitoring.

## 1.4 2016 Monitoring Status

Table 1-1 summarizes groundwater elevations (as field measured) for the monitored HAC locations and their associated sampling status during calendar year 2016. Each quarterly event included accessing the four groundwater monitoring wells for sampling. Samples for the 2016 monitoring period were obtained from the groundwater monitoring wells at the HAC that containing sufficient volume for water sampling.

Based on a review of field conditions observed during the 2016 sampling events, certain HAC monitoring wells demonstrated variability in groundwater elevation. All HAC monitoring wells contained sufficient water volume for sampling during 2016, with the exception of HAC-1 and HAC-2 during the September and December 2016 sampling event, respectively.

## 1.5 Tables

1-1 2016 Monitoring Status

TABLE 1-1
2016 MONITORING STATUS
DANSKAMMER ENERGY, L.L.C.
HISTORIC ASH CELL

| Quarter 1 through Quarter 4 | | | March-16 | | June-16 | | September-16 | | December-16 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID** | **TOC** | **Total Well Depth** | **Depth to Water** | **Water Level Elevation (ft-amsl)** | **Depth to Water** | **Water Level Elevation (ft-amsl)** | **Depth to Water** | **Water Level Elevation (ft-amsl)** | **Depth to Water** | **Water Level Elevation (ft-amsl)** |
| **HAC-1** | 57.78 | 28.70 | 20.84 | 36.94 | 20.30 | 37.48 | 16.10 | 41.68 | 18.55 | 39.23 |
| **HAC-2** | 69.18 | 20.65 | 8.15 | 61.03 | 10.70 | 58.48 | 21.80 | 47.38 | 17.25 | 51.93 |
| **NW-1** | 71.13 | 35.75 | 28.15 | 42.98 | 30.40 | 40.73 | 32.20 | 38.93 | 28.54 | 42.59 |
| **W-3R** | 90.50 | 106.25 | 55.74 | 34.76 | 55.30 | 35.20 | 58.12 | 32.38 | 57.26 | 33.24 |

**NOTES:**

* = Denotes upgradient well
R = Bedrock Well
S = Perched Overburden Well
D = Deep Overburden Well
NA - not applicable
ft-amsl - feet above mean sea level

## 1.6 Figures

1-1 HAC Groundwater Monitoring Plan




LEGEND:

- 70 TOPOGRAPHIC CONTOUR
- ACCESS ROADWAY
- DRAINAGE CHANNEL
- GUIDERAIL
- FENCE
- PROPERTY BOUNDARY
- CULVERT
- STRUCTURES/TANKS
- POWER POLE
- NW-1 OVERBURDEN MONITORING WELL
- W-3R BEDROCK MONITORING WELL

NOTES:

1. BASE MAP MODIFIED FROM ELECTRONIC FILE BY SHAW EMCON/OWT, INC. DRAWING ENTITLED "GROUNDWATER MONITORING SYSTEM", 2003.

0 300' 600'

GRAPHIC SCALE

X: DYNX05.DWG
1/24/17
SYNAPSE/WIP/DANSK 01-13/DANSK-0113-B30.DWG

synapse
connect. advise. insure.

SYNAPSE RISK MANAGEMENT, LLC
360 ERIE BLVD. EAST
SYRACUSE, NEW YORK 13202

HAC MONITORING PROGRAM

DANSKAMMER GENERATING STATION
DANSKAMMER ENERGY, LLC
NEWBURGH, NEW YORK

# HAC GROUNDWATER MONITORING PLAN

PROJECT NO.: DANSK 01.15.01
DATE: DECEMBER 2016
FIGURE NO.: 1-1

## 1.7 Tables

2-1 Overburden/Bedrock Groundwater Quality Data December 2016

TABLE 2-1

OVERBURDEN/BEDROCK GROUNDWATER QUALITY DATA
DECEMBER 2016
HISTORIC ASH CELL
DANSKAMMER ENERGY, LLC
NEWBURGH, NEW YORK

| **Monitoring Well ID** | | **HAC-1** | | | **HAC-2** | | | **NW-1** | | | **W-3R** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HAC Parameters** | **NYSDEC Standard** | **Operational** | **STV** | **12/12/2016** | **Operational** | **STV** | **12/12/2016** | **Operational** | **STV** | **12/12/2016** | **Operational** | **STV** | **12/12/2016** |
| Arsenic | 0.025 | 0.005 | 0.006 | 0.008 | 0.005 | 0.009 | NA | 0.005 | 0.01 | <0.005 | 0.005 | 0.01 | <0.005 |
| Boron | 1 | 0.479 | 2.83 | 4.66 | 0.639 | 1.37 | NA | 0.11 | 0.530 | 0.125 | 0.65 | 0.89 | **0.743** |
| Calcium | - | 177 | 509 | 319 | 251 | 610 | NA | 121 | 646 | 78.7 | 95 | 191 | **181** |
| Iron | 0.3 | 1.74 | 9.05 | 0.27 | 0.67 | 2.6 | NA | 2.27 | 13 | 0.104 | 0.69 | 2.8 | <0.050 |
| Potassium | - | 1.66 | 6.18 | **1.89** | 6 | 14 | NA | 4 | 12 | 1.06 | 2 | 4 | 0.97 |
| Alkalinity | - | 257 | 712 | 368 | 318 | 665 | NA | 254 | 620 | **333** | 232 | 404 | **318** |
| Chloride | 250 | 17 | 54 | **43.7** | 12 | 38 | NA | 4 | 17 | **2.96** | 22 | 38 | 21 |
| Hardness | - | 577 | 1505 | **1040** | 717 | 1538 | NA | 352 | 928 | **385** | 428 | 588 | **632** |
| Sodium | 20 | 14 | 43 | **29.3** | 9 | 28 | NA | 4 | 24 | 1.18 | 11 | 17 | **11.7** |
| Sulfate | 250 | 334 | 949 | **544** | 391 | 896 | NA | 35 | 147 | **39.3** | 178 | 290 | 163 |
| Sulfur | - | 103 | 273 | **182** | 129 | 298 | NA | 102 | 299 | 13.1 | 63 | 86 | 54.4 |
| Total Dissolved Solids | 500 | 711 | 1824 | **1230** | 869 | 1952 | NA | 399 | 1064 | 325 | 552 | 783 | 500 |
| Carbonate | - | 0.83 | 2 | <1 | 0.92 | 1.78 | NA | 0.83 | 2 | <1 | 0.83 | 2 | <1 |
| Bicarbonate | - | 286 | 725 | **368** | 340 | 689 | NA | 305 | 758 | **333** | 230 | 397 | **318** |
| Conductivity | - | 920 | 2350 | **1730** | 1161 | 2509 | NA | 1042 | 2638 | 742 | 759 | 1177 | **916** |
| Turbidity | 5 | 27 | 123 | <1 | 29 | 186 | NA | 29 | 186 | 18* | 36 | 85 | <1 |

Notes:
1. Operational = Existing Water Quality, the mean of prior three years (2007-2009) of analytical data, where available.
2. STV = Statistical Trigger Values: Calculated value of three standard deviations above the average analytical value.
3. NYSDEC Standard = Groundwater Quality Standards per NYCRR Part 703.
4. Overburden and bedrock monitoring wells to be accessed utilizing Intrawell comparison.
5. Bolded cells indicate that the concentration is above the Operational Trigger Value.
6. Shaded cells indicate that the concentration is above the Statistical Trigger Value.
7. Concentrations reported in milligrams per liter (mg/L), approximately equivalent to parts per million.
8. NA = Not Available, due to limited data from dry monitoring wells, or incomplete historical data.
* - Exceedance of the GWQS.

# 2 TREND ANALYSIS

As set forth in the HAC Monitoring Plan, trend plots of concentration versus time for boron, sulfate, sulfur, iron, calcium, potassium, sodium, chloride, bicarbonate and TDS concentrations were prepared for each HAC monitoring well. Those trends are described and presented in Appendix C.

Overburden and Bedrock Monitoring Wells

An analysis of the concentration versus time plots for the three overburden monitoring wells HAC-1, HAC-2 and NW-1, and one bedrock monitoring well W-3R, yielded the following observations for each intrawell location:

| Monitoring Well | Constituent | Overburden Trend Observation |
|---|---|---|
| HAC-1 | Arsenic | Arsenic is considered stable with concentrations below the method detection limit (MDL). |
| | Sulfur | No apparent trend is associated with sulfur. Sulfur concentrations range between 90 and 180 mg/L, just above the OTV. |
| | TDS | No apparent trend is associated with TDS. TDS concentrations range between 600 and 1200 mg/L. |
| | Sulfate | Sulfate is considered stable with concentrations ranging from 270 mg/L to 550 mg/L. |
| | Boron | No apparent trend is associated with boron. Boron was below the method detection limit during all quarterly events, with the exception of October 2007. |
| | Iron | No apparent trend is associated with iron. Iron was elevated above the OTV during the third quarter 2008 and the first quarter 2009. |
| | Calcium | Calcium exhibits seasonal fluctuation above the OTV with the highest concentrations typically observed during the third quarter. |
| | Potassium | The July 2007 sampling result was elevated in comparison to the OTV, otherwise potassium is considered stable, with no apparent trend. . |
| | Sodium | Sodium is considered stable, with concentrations fluctuating above the OTV. |
| | Chloride | No apparent trend is associated with chloride. Chloride is considered stable with concentrations ranging from 10 mg/L to 35 mg/L. |
| | Bicarbonate | Bicarbonate is elevated above the OTV. Bicarbonate concentrations have increased during the prior three quarters. |

| Monitoring Well | Constituent | Overburden Trend Observation |
|---|---|---|
| HAC-2 | Arsenic | Arsenic is considered stable with concentrations below the MDL. |
| | Sulfur | Sulfur exhibits seasonal fluctuation with the highest concentrations typically observed in the first quarter. |
| | TDS | No apparent trend is associated with TDS. TDS concentrations range between 900 and 1200 mg/L. |
| | Sulfate | Sulfate is considered stable with concentrations ranging from 375 mg/L to 650 mg/L. |
| | Boron | Boron was above the OTV during 2016. |
| | Iron | No apparent trend is associated with iron. Iron remained below the OTV during all four quarters of 2016. |
| | Calcium | Calcium exhibits seasonal fluctuation with the highest concentrations typically observed in the second quarter. |
| | Potassium | No apparent trend is associated with potassium. Potassium is considered stable with concentrations within the OTV range. |
| | Sodium | Sodium demonstrates a seasonal trend during with some OTV exceedances. The highest sodium concentrations were observed during the third quarter. |
| | Chloride | No apparent trend is associated with chloride. The highest chloride concentration was observed during the third quarter of 2010. |
| | Bicarbonate | Bicarbonate is considered stable with concentrations around the OTV. |

| Monitoring Well | Constituent | Overburden Trend Observation |
|---|---|---|
| NW-1 | Arsenic | Arsenic is considered stable with concentrations below the MDL. |
| | Sulfur | Sulfur is considered stable, with concentrations below the OTV during 2016. |
| | TDS | No apparent trend is associated with TDS. TDS had OTV exceedances during the second and fourth quarter of 2016. |
| | Sulfate | Sulfate is considered stable with concentrations ranging from 20 mg/L to 30 mg/L. The highest concentration was measured in July 2007 at 196 mg/L. |
| | Boron | No apparent trend is associated with boron. Boron was below the OTV during 2016. |
| | Iron | No apparent trend is associated with iron. Iron remained below the OTV during 2016. . |
| | Calcium | No apparent trend is associated with calcium. Calcium is considered stable with concentrations near the OTV. |
| | Potassium | Potassium remained below the OTV during 2016. |
| | Sodium | Sodium is considered stable, with one OTV exceedance observed during the fourth quarter 2016. |
| | Chloride | No apparent trend is associated with chloride. Chloride concentrations were above the OTV during the second quarter of 2016. |
| | Bicarbonate | No apparent trend is associated with bicarbonate. Bicarbonate is considered stable with concentrations above the OTV during the first, second and third quarter 2016. |

| Monitoring Well | Constituent | Bedrock Trend Observation |
|---|---|---|
| W-3R | Arsenic | Arsenic is considered stable with concentrations below the MDL during 2016. |
| | Sulfur | Sulfur is considered stable with a downward trend since January 2007. |
| | TDS | TDS demonstrates a seasonal fluctuation with the highest concentrations typically observed during the fourth quarter. |
| | Sulfate | Sulfate is considered stable with concentrations ranging from 55 mg/L to 200 mg/L. |
| | Boron | No apparent trend is associated with boron. Boron was at or above the OTV during 2016. |
| | Iron | No apparent trend is associated with iron. Iron was below the OTV during 2015. |
| | Calcium | Calcium exhibits seasonal fluctuation with the highest concentrations typically observed in the third quarter. |
| | Potassium | Potassium demonstrates a seasonal fluctuation with concentrations below the OTV during 2016. |
| | Sodium | Sodium exhibits seasonal fluctuation with the highest concentrations typically observed in the fourth quarter. Sodium is considered stable with concentrations near the OTV. |
| | Chloride | No apparent trend is associated with chloride. Chloride concentrations were below the OTV during 2016. |
| | Bicarbonate | Bicarbonate exhibits seasonal fluctuation with the highest concentrations typically observed in the fourth quarter. |

# 3 CONCLUSIONS

Groundwater Quality

Based on the evaluation of the HAC groundwater data collected during 2016, no impact to groundwater quality as a result of the HAC was identified. The data evaluation included the comparison of groundwater analytical results, time trend analysis, as well as NYSDEC Groundwater Quality Standards and Guidance Values. The review of the time trend plots prepared for ash indicator parameters indicate that the majority of the parameters are stable with some seasonal fluctuation and variation identified in some parameters.

The key findings are summarized as follows:

- The review of the time trend plots prepared for ash indicator parameters indicate that the majority of the parameters are stable with some seasonal fluctuation and variation identified in some parameters.

- Groundwater quality data collected during 2016 indicate some exceedances of New York State Groundwater Quality Standards for three parameters (sulfate, TDS and turbidity).

- The evaluations performed on the data collected during 2016 continue to indicate no impact to groundwater quality attributable to the HAC.

# 4 REFERENCES

New York State Department of Environmental Conservation, Division of Solid Waste. 6 NYCRR Part 360.

Synapse Risk Management, LLC. March 2005. HAC Monitoring Plan, Danskammer Point Solid Waste Management Facility.

# APPENDIX A
# LABORATORY ANALYSIS & FIELD DATA REPORTS FOURTH QUARTER 2016

# 2016 ANNUAL REPORT
# HISTORIC ASH CELL

# DANSKAMMER ENERGY, LLC
# NEWBURGH, NEW YORK

# FEBRUARY 2017

**Experience is the solution**
314 North Pearl Street ♦ Albany, New York 12207
(800) 848-4983 ♦ (518) 434-4546 ♦ Fax (518) 434-0891

December 27, 2016

Roger Creighton
Synapse Risk Management, LLC
360 Erie Blvd East
Syracuse, NY 13202

TEL: (315) 475-3700
FAX: (315) 475-3780

Work Order No: 161212037

RE: Quarterly GW
Historic Ash Cell

Dear Roger Creighton:

Adirondack Environmental Services, Inc received 4 samples on 12/12/2016 for the analyses presented in the following report.

Please see case narrative for specifics on analysis.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

ELAP#: 10709

Krzysztof Trafalski
Laboratory Manager

## Adirondack Environmental Services, Inc — CASE NARRATIVE

| | | | |
|---|---|---|---|
| **CLIENT:** | Synapse Risk Management, LLC | **Date:** | *27-Dec-16* |
| **Project:** | Quarterly GW | | |
| **Lab Order:** | 161212037 | | |

The sampling was performed in accordance with the AES field sampling procedures and/or the client specified sampling procedures. Sample containers were supplied by Adirondack Environmental Services.

**Qualifiers:**

- C - Details are above in Case Narrative
- ND - Not Detected at reporting limit
- S - LCS Spike recovery outside acceptable limits(+ is over - is under)
- J - Analyte detected below quantitation limit
- R - Duplication outside acceptable limits
- B - Analyte detected in Blank
- T - Tentatively Identified Compound-Estimated
- X - Exceeds maximum contamination limit
- E -Above quantitation range-Estimated
- H - Hold time exceeded
- M - Matrix Spike outside acceptable limits(+ is over - is under)

**Note : All Results are reported as wet weight unless noted**

**The results relate only to the items tested. Information supplied by the client is assumed to be correct.**

# Adirondack Environmental Services, Inc

**Date:** *27-Dec-16*

| | | | |
|---|---|---|---|
| **CLIENT:** | Synapse Risk Management, LLC | **Client Sample ID:** | NW-1 |
| **Work Order:** | **161212037** | **Collection Date:** | 12/12/2016 1:20:00 PM |
| **Reference:** | Quarterly GW / Historic Ash Cell | **Lab Sample ID:** | 161212037-001 |
| **PO#:** | | **Matrix:** | GROUNDWATER |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **FIELD-PH, RES CL2, AND TEMP ARE NOT ELAP CERTIFIABLE** | | | | | | Analyst: **FLD** |
| Conductivity (E120.1) | **742** | 1.0 | | umhos/cm | | 12/12/2016 1:20:00 PM |
| Dissolved Oxygen (E360.1) | **6.52** | 0.10 | | mg/L | | 12/12/2016 1:20:00 PM |
| eH (Orion) | **85.4** | | | mV | | 12/12/2016 1:20:00 PM |
| pH (E150.1) | **6.9** | | | S.U. | | 12/12/2016 1:20:00 PM |
| Temperature (E170.1) | **11** | | | deg C | | 12/12/2016 1:20:00 PM |
| Turbidity (E180.1) | **18** | 1.0 | | NTU | | 12/12/2016 1:20:00 PM |
| **HARDNESS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Total Hardness (As CaCO3) | **385** | 5 | | mg/L CaCO3 | 1 | 12/19/2016 |
| **ICP METALS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Arsenic | **< 0.005** | 0.005 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Boron | **0.125** | 0.050 | B | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Calcium | **78.7** | 0.050 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Iron | **0.104** | 0.050 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Magnesium | **45.8** | 0.050 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Manganese | **< 0.020** | 0.020 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Potassium | **1.06** | 0.050 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| Sodium | **1.18** | 0.050 | | mg/L | 1 | 12/19/2016 10:56:20 PM |
| **ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1** | | | | | | Analyst: **CS** |
| Chloride | **2.96** | 2.00 | | mg/L | 2 | 12/23/2016 4:29:10 PM |
| Sulfate | **39.3** | 4.00 | | mg/L | 2 | 12/23/2016 4:29:10 PM |
| **ALKALINITY - SM 2320B-97,-11** | | | | | | Analyst: **AS** |
| Alkalinity, Bicarbonate (As CaCO3) | **333** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Carbonate (As CaCO3) | **< 1.0** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Total (As CaCO3) | **333** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| **SULFUR IN WATER CALCULATION** | | | | | | Analyst: **CMH** |
| Sulfur | **13.1** | 0.6 | | mg/L | 1 | 12/27/2016 |
| **TOTAL DISSOLVED SOLIDS - SM 2540C-97,-11** | | | | | | Analyst: **CS** |
| TDS (Residue, Filterable) | **325** | 5 | | mg/L | 1 | 12/16/2016 |

# Adirondack Environmental Services, Inc

**Date:** *27-Dec-16*

| | | | |
|---|---|---|---|
| **CLIENT:** | Synapse Risk Management, LLC | **Client Sample ID:** | HAC-1 |
| **Work Order:** | **161212037** | **Collection Date:** | 12/12/2016 12:05:00 PM |
| **Reference:** | Quarterly GW / Historic Ash Cell | **Lab Sample ID:** | 161212037-002 |
| **PO#:** | | **Matrix:** | GROUNDWATER |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **FIELD-PH, RES CL2, AND TEMP ARE NOT ELAP CERTIFIABLE** | | | | | | Analyst: **FLD** |
| Conductivity (E120.1) | **1730** | 1.0 | | umhos/cm | | 12/12/2016 12:05:00 PM |
| Dissolved Oxygen (E360.1) | **1.28** | 0.10 | | mg/L | | 12/12/2016 12:05:00 PM |
| eH (Orion) | **19.8** | | | mV | | 12/12/2016 12:05:00 PM |
| pH (E150.1) | **6.7** | | | S.U. | | 12/12/2016 12:05:00 PM |
| Temperature (E170.1) | **10** | | | deg C | | 12/12/2016 12:05:00 PM |
| Turbidity (E180.1) | **< 1** | 1.0 | | NTU | | 12/12/2016 12:05:00 PM |
| **HARDNESS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Total Hardness (As CaCO3) | **1040** | 5 | | mg/L CaCO3 | 1 | 12/19/2016 |
| **ICP METALS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Arsenic | **0.008** | 0.005 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Boron | **4.66** | 0.050 | B | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Calcium | **319** | 0.500 | | mg/L | 10 | 12/19/2016 11:27:37 PM |
| Iron | **0.270** | 0.050 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Magnesium | **59.0** | 0.050 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Manganese | **1.21** | 0.020 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Potassium | **1.89** | 0.050 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| Sodium | **29.3** | 0.050 | | mg/L | 1 | 12/19/2016 11:22:18 PM |
| **ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1** | | | | | | Analyst: **CS** |
| Chloride | **43.7** | 10.0 | | mg/L | 10 | 12/23/2016 4:40:45 PM |
| Sulfate | **544** | 20.0 | | mg/L | 10 | 12/23/2016 4:40:45 PM |
| **ALKALINITY - SM 2320B-97,-11** | | | | | | Analyst: **AS** |
| Alkalinity, Bicarbonate (As CaCO3) | **368** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Carbonate (As CaCO3) | **< 1.0** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Total (As CaCO3) | **368** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| **SULFUR IN WATER CALCULATION** | | | | | | Analyst: **CMH** |
| Sulfur | **182** | 0.6 | | mg/L | 1 | 12/27/2016 |
| **TOTAL DISSOLVED SOLIDS - SM 2540C-97,-11** | | | | | | Analyst: **CS** |
| TDS (Residue, Filterable) | **1230** | 5 | | mg/L | 1 | 12/16/2016 |

## Adirondack Environmental Services, Inc

**Date:** *27-Dec-16*

| | | | |
|---|---|---|---|
| **CLIENT:** | Synapse Risk Management, LLC | **Client Sample ID:** | HAC-2 |
| **Work Order:** | **161212037** | **Collection Date:** | 12/12/2016 |
| **Reference:** | Quarterly GW / Historic Ash Cell | **Lab Sample ID:** | 161212037-003 |
| **PO#:** | | **Matrix:** | GROUNDWATER |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **FIELD-PH, RES CL2, AND TEMP ARE NOT ELAP CERTIFIABLE** | | | | | | Analyst: **FLD** |
| Observation | **Dry** | | | NA | | 12/12/2016 |

# Adirondack Environmental Services, Inc

**Date:** *27-Dec-16*

| | | | |
|---|---|---|---|
| **CLIENT:** | Synapse Risk Management, LLC | **Client Sample ID:** | W-3R |
| **Work Order:** | **161212037** | **Collection Date:** | 12/12/2016 11:15:00 AM |
| **Reference:** | Quarterly GW / Historic Ash Cell | **Lab Sample ID:** | 161212037-004 |
| **PO#:** | | **Matrix:** | GROUNDWATER |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **FIELD-PH, RES CL2, AND TEMP ARE NOT ELAP CERTIFIABLE** | | | | | | Analyst: **FLD** |
| Conductivity (E120.1) | **982** | 1.0 | | umhos/cm | | 12/12/2016 11:15:00 AM |
| Dissolved Oxygen (E360.1) | **0.12** | 0.10 | | mg/L | | 12/12/2016 11:15:00 AM |
| eH (Orion) | **24.7** | | | mV | | 12/12/2016 11:15:00 AM |
| pH (E150.1) | **6.8** | | | S.U. | | 12/12/2016 11:15:00 AM |
| Temperature (E170.1) | **13** | | | deg C | | 12/12/2016 11:15:00 AM |
| Turbidity (E180.1) | **< 1** | 1.0 | | NTU | | 12/12/2016 11:15:00 AM |
| **HARDNESS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Total Hardness (As CaCO3) | **450** | 5 | | mg/L CaCO3 | 1 | 12/19/2016 |
| **ICP METALS - EPA 200.7 REV 4.4 ( Prep: E200.7 - 12/13/2016 )** | | | | | | Analyst: **SM** |
| Arsenic | **< 0.005** | 0.005 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Boron | **0.812** | 0.050 | B | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Calcium | **102** | 0.050 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Iron | **0.051** | 0.050 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Magnesium | **47.3** | 0.050 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Manganese | **0.058** | 0.020 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Potassium | **1.18** | 0.050 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| Sodium | **10.8** | 0.050 | | mg/L | 1 | 12/19/2016 11:32:51 PM |
| **ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1** | | | | | | Analyst: **CS** |
| Chloride | **17.6** | 2.00 | | mg/L | 2 | 12/23/2016 4:52:21 PM |
| Sulfate | **141** | 4.00 | | mg/L | 2 | 12/23/2016 4:52:21 PM |
| **ALKALINITY - SM 2320B-97,-11** | | | | | | Analyst: **AS** |
| Alkalinity, Bicarbonate (As CaCO3) | **320** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Carbonate (As CaCO3) | **< 1.0** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| Alkalinity, Total (As CaCO3) | **320** | 1.0 | | mg/L CaCO3 | 1 | 12/20/2016 |
| **SULFUR IN WATER CALCULATION** | | | | | | Analyst: **CMH** |
| Sulfur | **47.1** | 0.6 | | mg/L | 1 | 12/27/2016 |
| **TOTAL DISSOLVED SOLIDS - SM 2540C-97,-11** | | | | | | Analyst: **CS** |
| TDS (Residue, Filterable) | **480** | 5 | | mg/L | 1 | 12/16/2016 |

Adirondack Environmental Services, Inc.®
314 North Pearl Street
Albany, New York 12207
518-434-4546 ♦ Fax: 518-434-0891

**EXPERIENCE IS THE SOLUTION**

# CHAIN OF CUSTODY RECORD

**AES Work Order#:** 161212037

A full service analytical research laboratory offering solutions to environmental concerns

| Client Name: Synapse | Address: | |
|---|---|---|
| Send Report to: | Project Name (Location): Historic Ash Cell | Samplers Name: Paul Bast |
| Client Phone No: | PO #: | Samplers Signature: Paul Bast |
| Client Fax No: | | |

| AES Sample ID | Client Sample ID: | Date Sampled | Time A=am P=pm | | Sample Type Matrix | C | G | # of Cont's | Analysis |
|---|---|---|---|---|---|---|---|---|---|
| 001 | NW-1 | 12/12/16 | 1:20 | A (P) | GW | | G | 3 | As,B,Ca,Fe,Mg,Mn,K,Na |
| | | | | A P | | | | | Carbonate, Bicarbonate, |
| | | | | A P | | | | | Chlorides,Sulfate,Sulfur,TDS |
| | | | | A P | | | | | Hardness |
| | | | | A P | | | | | Field: pH,Temp,sCond, DO, |
| | | | | A P | | | | | EH, Turbidity |
| 002 | HAC-1 | 12/12/16 | 12:05 | A (P) | GW | | G | 3 | " |
| 003 | HAC-2 | 12/12/16 | — | A P | GW | | G (pb) | 3 | Observation Only " |
| 004 | W-3R | 12/12/16 | 11:15 | (A) P | GW | | G | 3 | " |
| | | | | A P | | | | | |
| | | | | A P | | | | | |
| | | | | A P | | | | | |

**Shipment Arrived Via:**
FedEx UPS Client (AES) Other:_____

Special Instructions/Remarks:

**Turnaround Time Requested:**
1 Day 3 Day Normal
2 -Day 5 Day

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Date | Time |
|---|---|---|---|---|---|
| Paul Bast | 12/12/16 | 4:55 | | | |
| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Date | Time |
| | | | | | |
| Relinquished by: (Signature) | Date | Time | **Received for Laboratory by:** | Date | Time |
| | | | [signature] | 12/12/16 | 5:01 PM |

**Sample Temperature**
Ambient (Chilled)
Chilling Process begun
Notes: 4°C

**Properly Preserved**
(Y) N
Notes:

**Received Within Holding Times**
(Y) N
Notes:



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# TERMS, CONDITIONS & LIMITATIONS

All service rendered by the **Adirondack Environmental Services, Inc.** are undertaken and all rates are based upon the following terms:

(a) Neither **Adirondack Environmental Services, Inc.,** nor any of its employees, agents or sub-contractors shall be liable for any loss or damage arising out of **Adirondack Environmental Services, Inc.'s** performance or nonperformance, whether by way of negligence or breach of contract, or otherwise, in any amount greater than twice the amount billed to the customer for the work leading to the claim of the customer. Said remedy shall be the sole and exclusive remedy against **Adirondack Environmental Services, Inc.** arising out of its work.

(b) All claims made must be in writing within forty-five (45) days after delivery of the **Adirondack Environmental Services, Inc.** report regarding said work or such claim shall be deemed or irrevocably waived.

(c) **Adirondack Environmental Services, Inc.** reports are submitted in writing and are for our customers only. Our customers are considered to be only those entities being billed for our services. Acquisition of an **Adirondack Environmental Services, Inc.** report by other than our customer does not constitute a representation of **Adirondack Environmental Services, Inc.** as to the accuracy of the contents thereof.

(d) In no event shall **Adirondack Environmental Services, Inc.,** its employees, agents or sub-contractors be responsible for consequential or special damages of any kind or in any amount.

(e) No deviation from the terms set forth herein shall bind **Adirondack Environmental Services, Inc.** unless in writing and signed by a Director of **Adirondack Environmental Services, Inc.**

(f) Results pertain only to items analyzed. Information supplied by client is assumed to be correct. This information may be used on reports and in calculations and **Adirondack Environmental Services, Inc.** is not responsible for the accuracy of this information.

(g) Payments by Credit Card/Purchase Cards are subject to a 3% additional charge.

# LOW FLOW GROUNDWATER SAMPLING FIELD FORM

| | | | |
|---|---|---|---|
| Site: | Historic Ash Cell | Well ID: | HAC-1 |
| Project No. | DYNE 01.07.04 | Sample ID: | HAC-1 |
| Date: | 12/12/2016 | Sampler: | Mike Wilsey |
| Weather: | Overcast 30 F | Signature: | |

| Well Condition Observations | |
|---|---|
| Protective Casing: | Good |
| Lock: | Yes |
| Label: | Yes |
| Surface Seal: | Good |
| PVC Well Casing: | Good |

| Well Volume Calculations | |
|---|---|
| Well Diameter (in): | 2 |
| Depth to Water (ft): | 22.6 |
| Total Depth (ft): | |
| Well Volume (gal): | |

| TIME | PUMP SETTING (feet of $H_2O$) | DISCHARGE TIME (seconds) | REFILL TIME (seconds) | FLOW RATE (ml/min) | DEPTH TO WATER (feet) | pH (SU) | TEMP (°C) | SPECIFIC CONDUCTANCE (mS/cm) | DISSOLVED OXYGEN (mg/l) | ORP (mv) | TURBIDITY (NTU) | PURGE VOLUME (liters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11:19 | 25 | 3 | 12 | 150 | 23.5 | 6.5 | 10 | 1723 | 3.23 | 16.5 | 3 | |
| 11:20 | 25 | 3 | 12 | 150 | 23.5 | 6.5 | 10 | 1722 | 3.56 | 16 | 2 | |
| 11:26 | 25 | 3 | 12 | 150 | 23.6 | 6.1 | 11 | 1725 | 3 | 15 | 2 | |
| 11:30 | 25 | 3 | 12 | 150 | 23.6 | 6.5 | 11 | 1729 | 2 | 17 | 2 | |
| 11:38 | 25 | 3 | 12 | 150 | 24 | 6.7 | 10 | 1730 | 1.28 | 19.8 | <1 | |
| | | | | | | | | | | | | |
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| | | | | | | | | | | | | |
| **Stabilization Criteria** | | | | 100-400 ml/min | Drawdown <0.3' | ± 0.1 units | 3% | 3% | 10% | ± 10 mv | 10% (>1 NTU) | Total Purge |
| **Stabilization Achieved (Y/N)** | | | | y | y | y | y | y | y | y | n | |

| **Sampling/Purge Equipment** | |
|---|---|
| Water Level Meter: | Solinst Model 101 |
| pH/S.C./Dissolved Oxygen/ORP/Turbidity: | Horbia Model |
| Pump: | QED Bladder Pump Model |
| Intake Depth (feet below PVC): | |
| Tubing: | QED Bonded Poly Sample Tubing |

| **Laboratory Analyses/Containers** | | | |
|---|---|---|---|
| Container | Preservative | # | Analysis |
| 8-OZ P | HNO3 | 1 | Metals/Hardness |
| 4-OZ P/G | None | 1 | Alk/Bicard/Card |
| 32-OZ P | None | 1 | Br, Cl, SO4, TDS, SU, Turbidity |
| | | | |
| | | | |

| Sample Collection Time | Start | End |
|---|---|---|
| | 12:05 | |

**Comments:**

Synapse Risk Management, LLC

# LOW FLOW GROUNDWATER SAMPLING FIELD FORM

| | | | |
|---|---|---|---|
| Site: | Historic Ash Cell | Well ID: | HAC-2 |
| Project No. | DYNE 01.07.04 | Sample ID: | HAC-2 |
| Date: | 12/12/2016 | Sampler: | Mike Wisley |
| Weather: | Overcast, 30 F | Signature: | |

| Well Condition Observations | |
|---|---|
| Protective Casing: | Good |
| Lock: | Yes |
| Label: | Yes |
| Surface Seal: | Good |
| PVC Well Casing: | Good |

| Well Volume Calculations | |
|---|---|
| Well Diameter (in): | 2 |
| Depth to Water (ft): | 20.35 |
| Total Depth (ft): | |
| Well Volume (gal): | |

| TIME | PUMP SETTING (feet of $H_2O$) | DISCHARGE TIME (seconds) | REFILL TIME (seconds) | FLOW RATE (ml/min) | DEPTH TO WATER (feet) | pH (SU) | TEMP (°C) | SPECIFIC CONDUCTANCE (mS/cm) | DISSOLVED OXYGEN (mg/l) | ORP (mv) | TURBIDITY (NTU) | PURGE VOLUME (liters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2:05 | 15 | 5 | 10 | 300 | 21 | 6.5 | 12 | 1129 | 6.3 | 102 | 20 | |
| 2:17 | 15 | 5 | 10 | 300 | 21 | 6.5 | 13 | 1130 | 6.2 | 102 | 20 | |
| 2:19 | 15 | 5 | 10 | 300 | 21 | 6.5 | 13 | 1135 | 6 | 103 | 20 | |
| 2:22 | 15 | 5 | 10 | 300 | 21 | 6.9 | 13 | 1140 | 5 | 103 | 17 | |
| 2:25 | 15 | 5 | 10 | 300 | 21 | 6.9 | 12 | 1149 | 6.74 | 104.3 | 16 | |
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| **Stabilization Criteria** | | | | 100-400 ml/min | Drawdown <0.3' | ± 0.1 units | 3% | 3% | 10% | ± 10 mv | 10% (>1 NTU) | Total Purge |
| **Stabilization Achieved (Y/N)** | | | | y | y | y | y | y | y | y | n | |

| Sampling/Purge Equipment | |
|---|---|
| Water Level Meter: | Solinst Model 101 |
| pH/S.C./Dissolved Oxygen/ORP/Turbidity: | Horbia Model |
| Pump: | QED Bladder Pump Model |
| Intake Depth (feet below PVC): | |
| Tubing: | QED Bonded Poly Sample Tubing |

| Laboratory Analyses/Containers | | | |
|---|---|---|---|
| Container | Preservative | # | Analysis |
| 8-OZ P | HNO3 | 1 | Metals/Hardness |
| 4-OZ P/G | None | 1 | Alk/Bicard/Card |
| 32-OZ P | None | 1 | Br, Cl, SO4, TDS, SU, Turbidity |
| | | | |
| | | | |

| Sample Collection Time | Start | End |
|---|---|---|
| | 2:35 | |

**Comments:**

Synapse Risk Management, LLC

# LOW FLOW GROUNDWATER SAMPLING FIELD FORM

| | | | |
|---|---|---|---|
| Site: | Historic Ash Cell | Well ID: | NW-1 |
| Project No. | DYNE 01.07.04 | Sample ID: | NW-1 |
| Date: | 12/12/2016 | Sampler: | Mike Wisley |
| Weather: | Overcast, 30 F | Signature: | |

| Well Condition Observations | |
|---|---|
| Protective Casing: | Good |
| Lock: | Good |
| Label: | Yes |
| Surface Seal: | Good |
| PVC Well Casing: | Good |

| Well Volume Calculations | |
|---|---|
| Well Diameter (in): | 2 |
| Depth to Water (ft): | 55.26 |
| Total Depth (ft): | |
| Well Volume (gal): | |

| TIME | PUMP SETTING (feet of $H_2O$) | DISCHARGE TIME (seconds) | REFILL TIME (seconds) | FLOW RATE (ml/min) | DEPTH TO WATER (feet) | pH (SU) | TEMP (°C) | SPECIFIC CONDUCTANCE (mS/cm) | DISSOLVED OXYGEN (mg/l) | ORP (mv) | TURBIDITY (NTU) | PURGE VOLUME (liters) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:17 | 30 | 5 | 10 | 200 | 17.6 | 6.7 | 8 | 738 | 7.5 | 83 | 29 | |
| 12:23 | 30 | 5 | 10 | 200 | 17.8 | 6.8 | 9 | 738 | 7.3 | 82 | 25 | |
| 12:47 | 30 | 5 | 10 | 200 | 17.9 | 6.8 | 11 | 739 | 7.1 | 81 | 20 | |
| 1:02 | 30 | 5 | 10 | 200 | 18 | 6.8 | 11 | 741 | 7 | 80 | 20 | |
| 1:14 | 30 | 5 | 10 | 200 | 18 | 6.9 | 11 | 742 | 6.52 | 85.4 | 17 | |
| | | | | | | | | | | | | |
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| | | | | | | | | | | | | |
| **Stabilization Criteria** | | | | 100-400 ml/min | Drawdown <0.3' | ± 0.1 units | 3% | 3% | 10% | ± 10 mv | 10% (>1 NTU) | Total Purge |
| **Stabilization Achieved (Y/N)** | | | | y | y | y | y | y | y | y | n | |

| **Sampling/Purge Equipment** | |
|---|---|
| Water Level Meter: | Solinst Model 101 |
| pH/S.C./Dissolved Oxygen/ORP/Turbidity: | Horbia Model |
| Pump: | QED Bladder Pump Model |
| Intake Depth (feet below PVC): | |
| Tubing: | QED Bonded Poly Sample Tubing |

| **Laboratory Analyses/Containers** | | | |
|---|---|---|---|
| Container | Preservative | # | Analysis |
| 8-OZ P | HNO3 | 1 | Metals/Hardness |
| 4-OZ P/G | None | 1 | Alk/Bicard/Card |
| 32-OZ P | None | 1 | Br, Cl, SO4, TDS, SU, Turbidity |
| | | | |
| | | | |

| Sample Collection Time | Start | End |
|---|---|---|
| | 1:20 | |

**Comments:**

Synapse Risk Management, LLC

# GROUNDWATER SAMPLING FIELD FORM

| | | | |
|---|---|---|---|
| Site: | Historic Ash Cell | Well ID: | W-3R |
| Project No. | DANSK 01.16.04 | Sample ID: | W-3R |
| Date: | 12/12/2016 | Sampler: | Mike Wisley |
| Weather: | Overcast 30 F | Signature: | |

| Well Condition Observations | |
|---|---|
| Protective Casing: | Good |
| Lock: | Yes |
| Label: | Yes |
| Surface Seal: | Good |
| PVC Well Casing: | Good |

| Well Volume Calculations | |
|---|---|
| Well Diameter (in): | 2 |
| Depth to Water (ft): | 56.26 |
| Total Depth (ft): | 105.35 |
| Well Volume (gal): | |

| TIME | DEPTH TO WATER (feet) | pH (SU) | TEMP (°C) | SPECIFIC CONDUCTANCE (mS/cm) | DISSOLVED OXYGEN (mg/l) | ORP (mv) | TURBIDITY (NTU) | PURGE VOLUME (gallons) |
|---|---|---|---|---|---|---|---|---|
| 11:02 | 59.3 | 6.8 | 13 | 982 | 0.12 | 24.7 | <1 | |
| | | | | | | | | |
| | | | | | | | | |
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**Laboratory Analyses/Containers**

| Container | Preservative | # | Analysis |
|---|---|---|---|
| 8-OZ P | HNO3 | 1 | Metals/Hardness |
| 4-OZ P/G | None | 1 | Alk/Bicard/Card |
| 32-OZ P | None | 1 | Br, Cl, SO4, TDS, SU, Turbidity |
| 16-OZ P | NaOH | 1 | Sulfide |
| 8-OZ P | NaOH | 1 | Cyanide |

| Sample Collection Time | Start | End |
|---|---|---|
| | 11:15 | |

**Comments:**

# APPENDIX B
# QUARTERLY WATER QUALITY DATA

## 2016 ANNUAL REPORT
## HISTORIC ASH CELL

## DANSKAMMER ENERGY, LLC
## NEWBURGH, NEW YORK

## FEBRUARY 2017

TABLE 1
OVERBURDEN/BEDROCK GROUNDWATER QUALITY DATA
MARCH 2016
DANSKAMMER EMERGY, LLC
HISTORIC ASH CELL

| **Monitoring Well ID** | | **HAC-1** | **HAC-2** | **NW-1** | **W-3R** |
|---|---|---|---|---|---|
| **Routine Parameters** | **NYSDEC Standard** | **3/21/2016** | **3/21/2016** | **3/21/2016** | **3/21/2016** |
| Arsenic | 0.025 | <0.005 | <0.005 | <0.005 | <0.005 |
| Boron | 1 | **4.51** | 0.584 | <0.050 | 0.779 |
| Calcium | - | 422 | 455 | 67.6 | 116 |
| Iron | 0.3 | 0.202 | 0.131 | <0.050 | 0.204 |
| Potassium | - | 1.62 | 5.04 | 0.702 | 0.976 |
| Alkalinity | - | 350 | 393 | 308 | 313 |
| Chloride | 250 | 40.1 | 4.46 | 2.35 | 20.1 |
| Hardness | - | 1291 | 1225 | 327 | 478 |
| Sodium | 20 | **23.7** | 5.19 | 1.29 | 11.8 |
| Sulfur | - | 199 | 203 | 7.6 | 56.7 |
| Sulfate | - | 596 | 609 | 22.9 | 170 |
| Total Dissolved Solids | 500 | **1320** | **1360** | 345 | **545** |
| Carbonate | - | <1 | <1 | <1 | <1 |
| Bicarbonate | - | 350 | 393 | 308 | 313 |
| Conductivity | - | 1817 | 1738 | 650 | 936 |
| Turbidity | 5 | **11** | <1 | **6** | 3 |

Notes:

1. NYSDEC Standard = Groundwater Quality Standards per NYCRR Part 703.
2. Concentrations reported in milligrams per liter (mg/L), approximately equivalent to parts per million.
3. NA = Not Analyzed

TABLE 1
OVERBURDEN/BEDROCK GROUNDWATER QUALITY DATA
JUNE 2016
DYNEGY DANSKAMMER, LLC
HISTORIC ASH CELL

| **Monitoring Well ID** | | **HAC-1** | **HAC-2** | **NW-1** | **W-3R** |
|---|---|---|---|---|---|
| **Routine Parameters** | **NYSDEC Standard** | **6/27/2016** | **6/27/2016** | **6/27/2016** | **6/27/2016** |
| Arsenic | 0.025 | NA | 0.006 | <0.005 | <0.005 |
| Boron | 1 | NA | 0.681 | 0.224 | 0.791 |
| Calcium | - | NA | 466 | 96.4 | 124 |
| Iron | 0.3 | NA | <0.050 | <0.050 | 0.054 |
| Potassium | - | NA | 4.87 | 0.875 | 0.9 |
| Alkalinity | - | NA | 373 | 345 | 305 |
| Chloride | 250 | NA | 11.4 | 5.42 | 19.4 |
| Hardness | - | NA | 1261 | 434 | 501 |
| Sodium | 20 | NA | 8.19 | 3.8 | 13.3 |
| Sulfur | - | NA | 216 | 20.2 | 49.7 |
| Sulfate | - | NA | 648 | 60.5 | 149 |
| Total Dissolved Solids | 500 | NA | **1400** | 440 | **560** |
| Carbonate | - | NA | <1 | <1 | <1 |
| Bicarbonate | - | NA | 373 | 345 | 305 |
| Conductivity | - | NA | 1949 | 846 | 1022 |
| Turbidity | 5 | NA | 4 | <1 | <1 |

Notes:

1. NYSDEC Standard = Groundwater Quality Standards per NYCRR Part 703.
2. Concentrations reported in milligrams per liter (mg/L), approximately equivalent to parts per million.
3. NA = Not Analyzed

TABLE 1
OVERBURDEN/BEDROCK GROUNDWATER QUALITY DATA
SEPTEMBER 2016
DANSKAMMER ENERGY, LLC
HISTORIC ASH CELL

| **Monitoring Well ID** | | **HAC-1** | **HAC-2** | **NW-1** | **W-3R** |
|---|---|---|---|---|---|
| **Routine Parameters** | **NYSDEC Standard** | **9/26/2016** | **9/21/2015** | **9/26/2016** | **9/26/2016** |
| Arsenic | 0.025 | <0.005 | NA | <0.005 | <0.005 |
| Boron | 1 | **4.04** | NA | 0.063 | 0.662 |
| Calcium | - | 203 | NA | 68 | 92 |
| Iron | 0.3 | 0.775 | NA | 1.33 | <0.050 |
| Potassium | - | 1.67 | NA | 1.14 | 1.06 |
| Alkalinity | - | 340 | NA | 316 | 320 |
| Chloride | 250 | 48.1 | NA | 2.62 | 19 |
| Hardness | - | 718 | NA | 330 | 395 |
| Sodium | 20 | **24** | NA | 2.05 | 10.8 |
| Sulfur | - | 64.6 | NA | 3.8 | 15.8 |
| Sulfate | - | 581 | NA | 34.1 | 142 |
| Total Dissolved Solids | 500 | **1310** | NA | 340 | **555** |
| Carbonate | - | <1 | NA | <1 | <1 |
| Bicarbonate | - | 340 | NA | 316 | 320 |
| Conductivity | - | 1663 | NA | 627 | 912 |
| Turbidity | 5 | **31** | NA | **8** | **9** |

Notes:

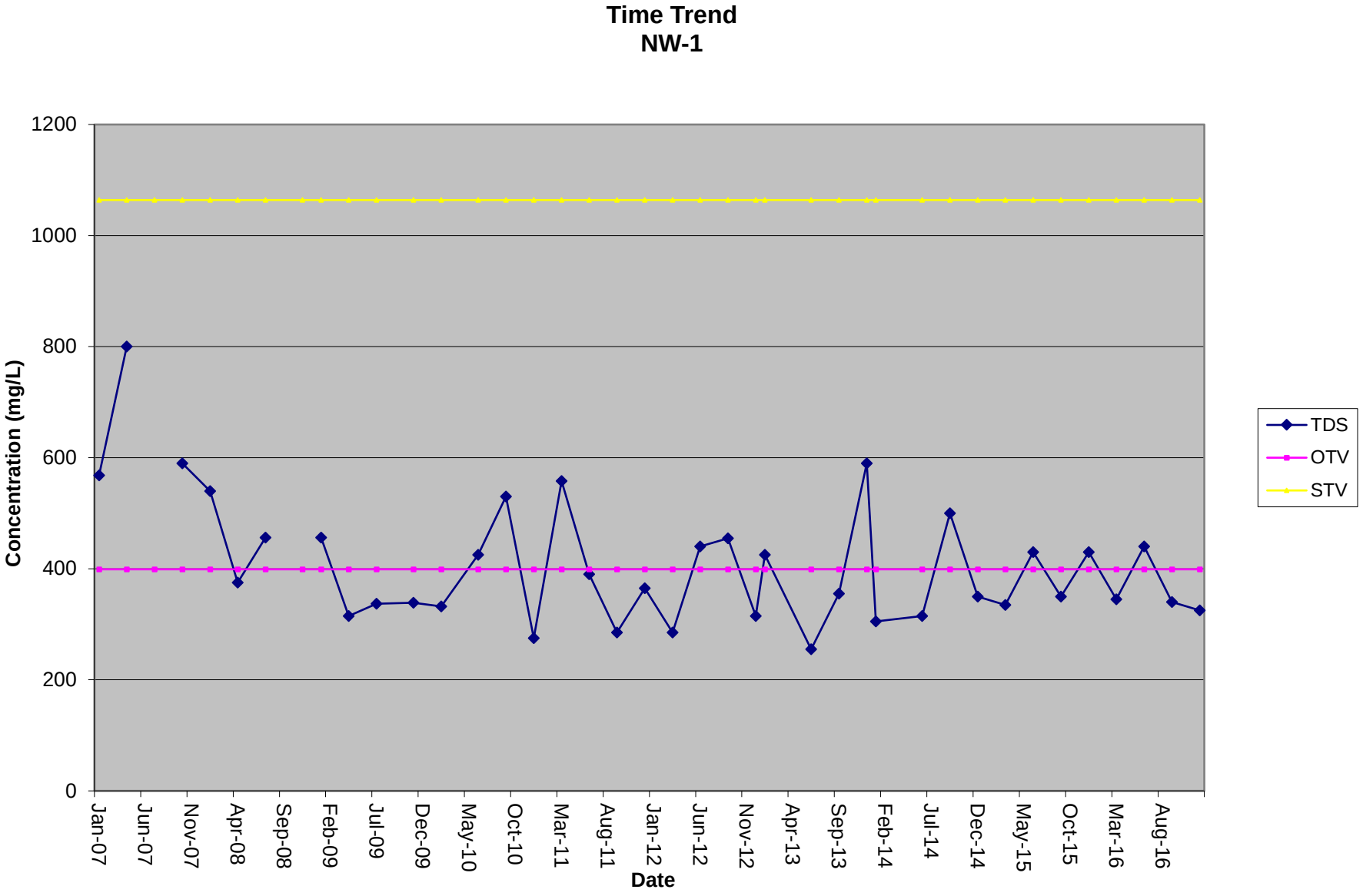
1. NYSDEC Standard = Groundwater Quality Standards per NYCRR Part 703.
2. Concentrations reported in milligrams per liter (mg/L), approximately equivalent to parts per million.
3. NA = Not Analyzed

# APPENDIX C
# INDICATOR PARAMETER TIME TREND PLOTS

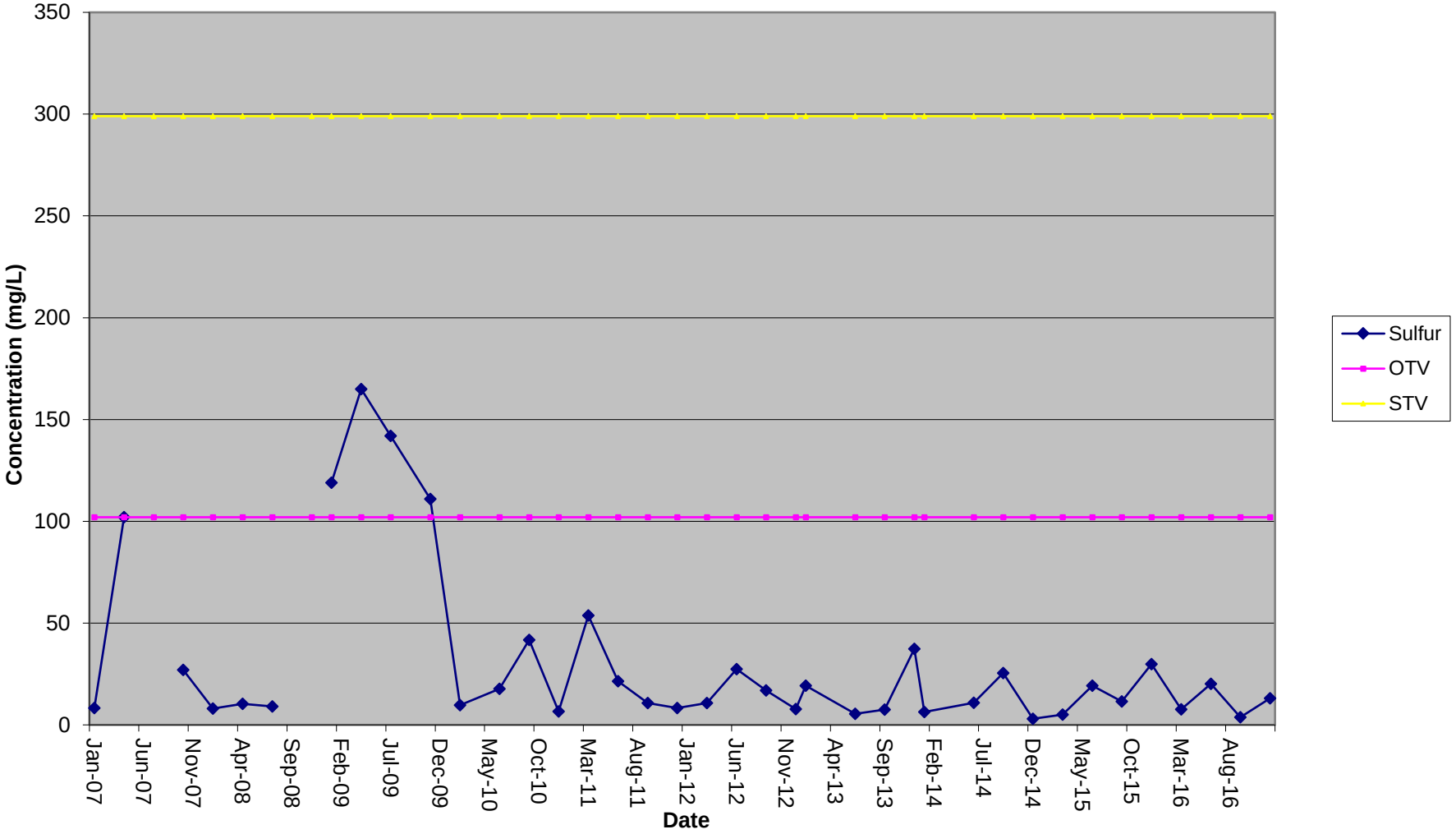
## 2016 ANNUAL REPORT
## HISTORIC ASH CELL

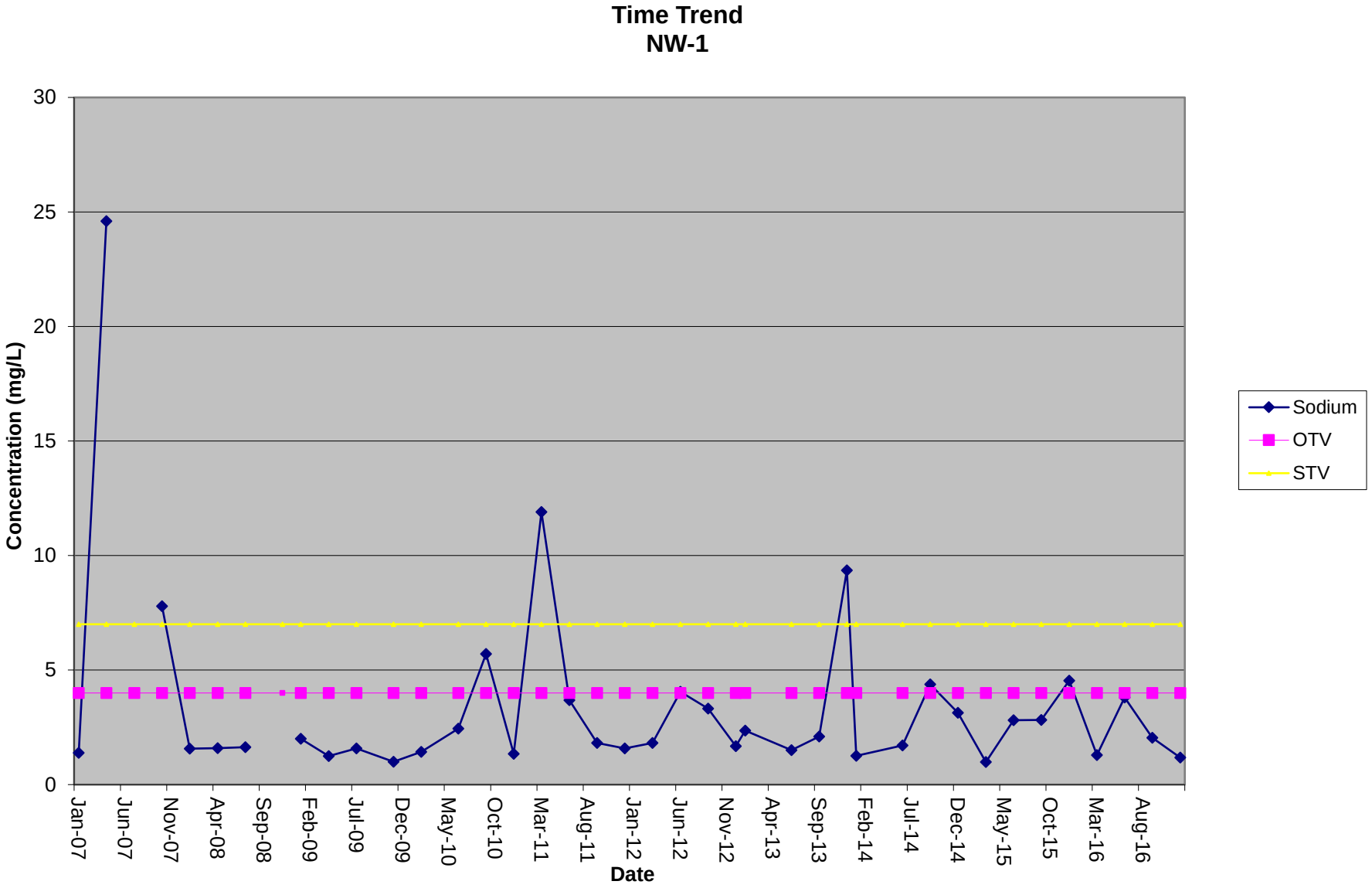
## DANSKAMMER ENERGY, LLC
## NEWBURGH, NEW YORK

## FEBRUARY 2017

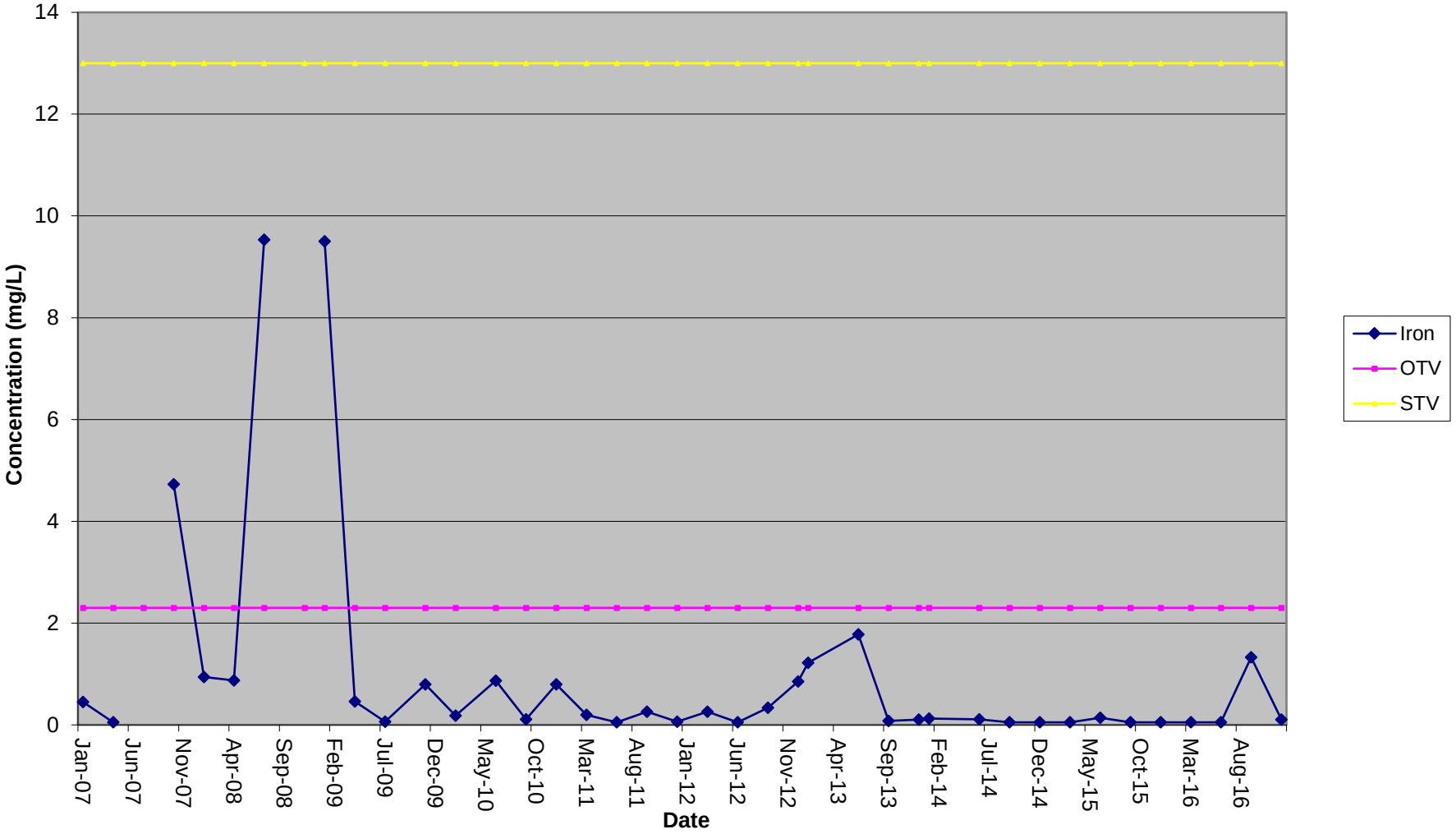

Time Trend
NW-1
Concentration (mg/L)
1200
1000
800
600
400
200
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
TDS
OTV
STV

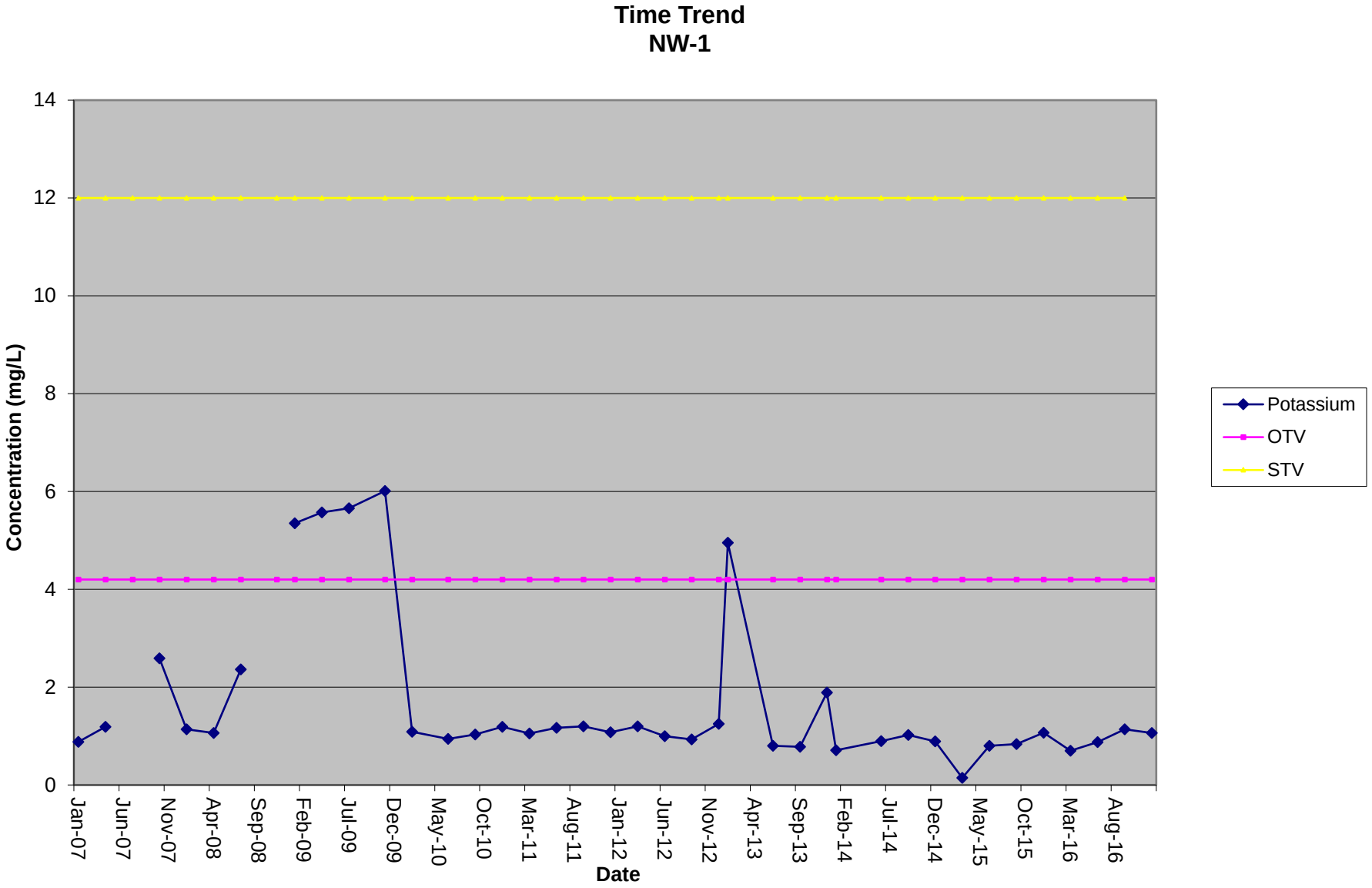
# Time Trend
## NW-1



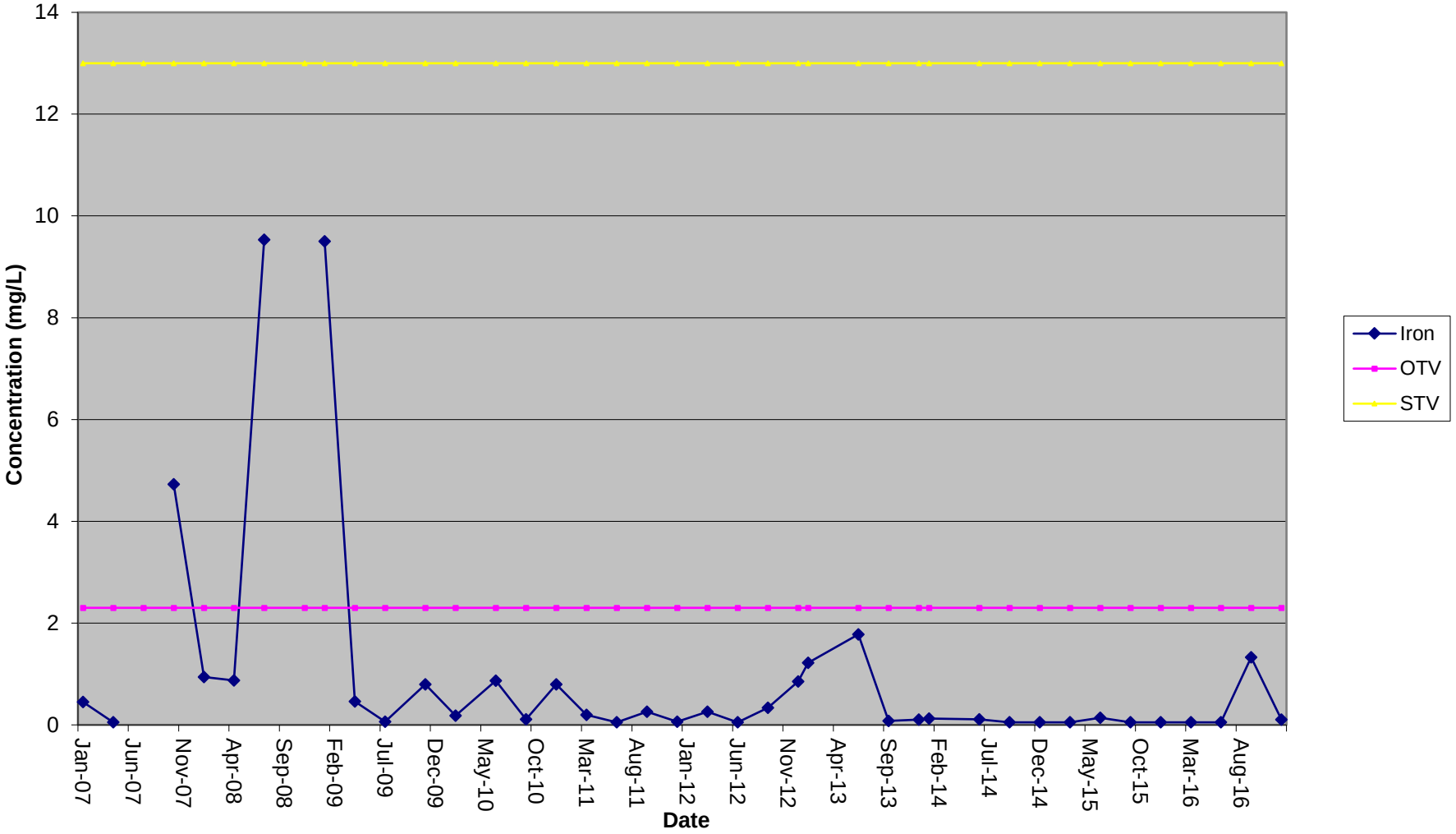

Time Trend
NW-1
Concentration (mg/L)
30
25
20
15
10
5
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
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Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Sodium
OTV
STV

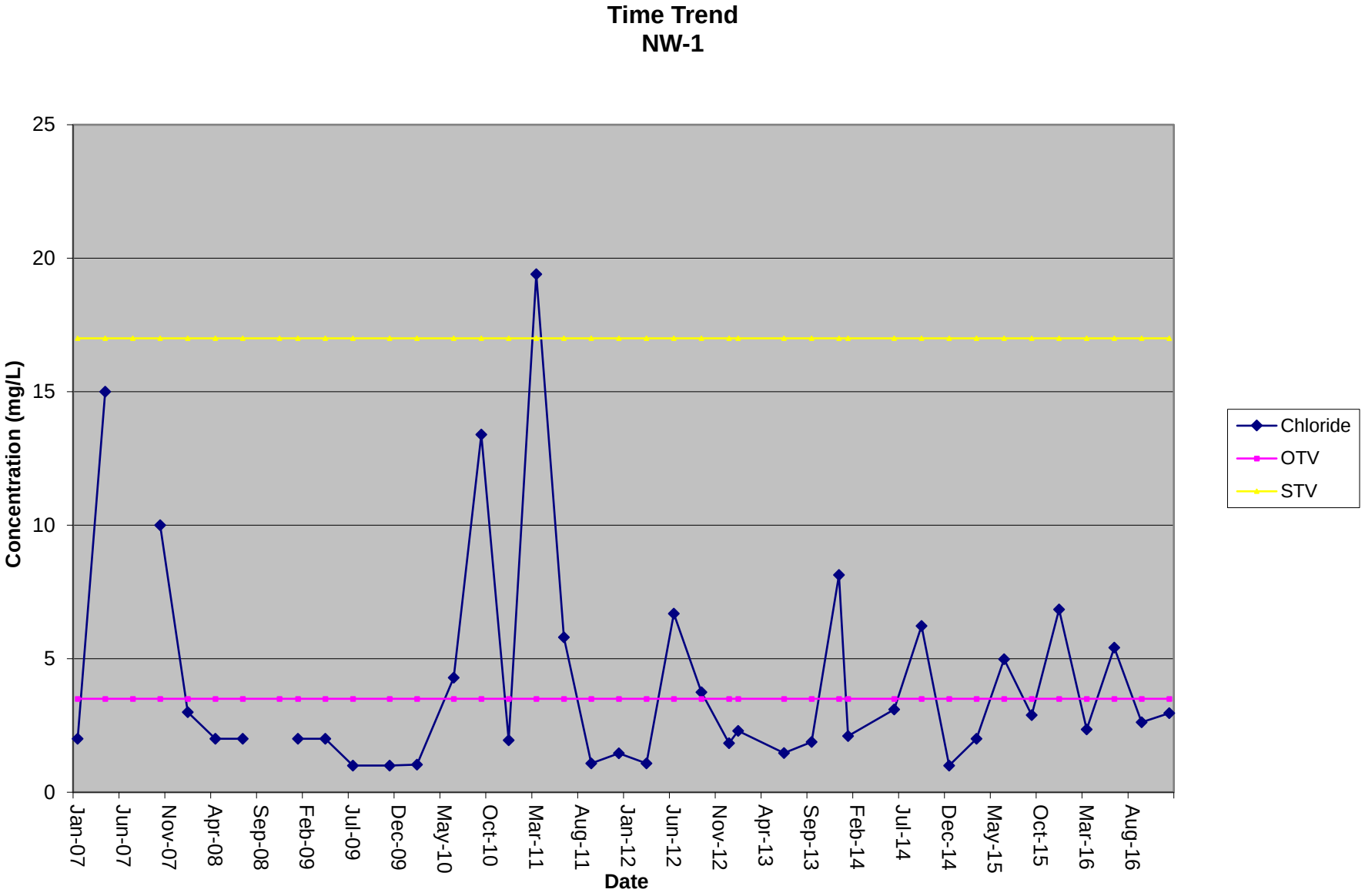
**Time Trend**
**NW-1**

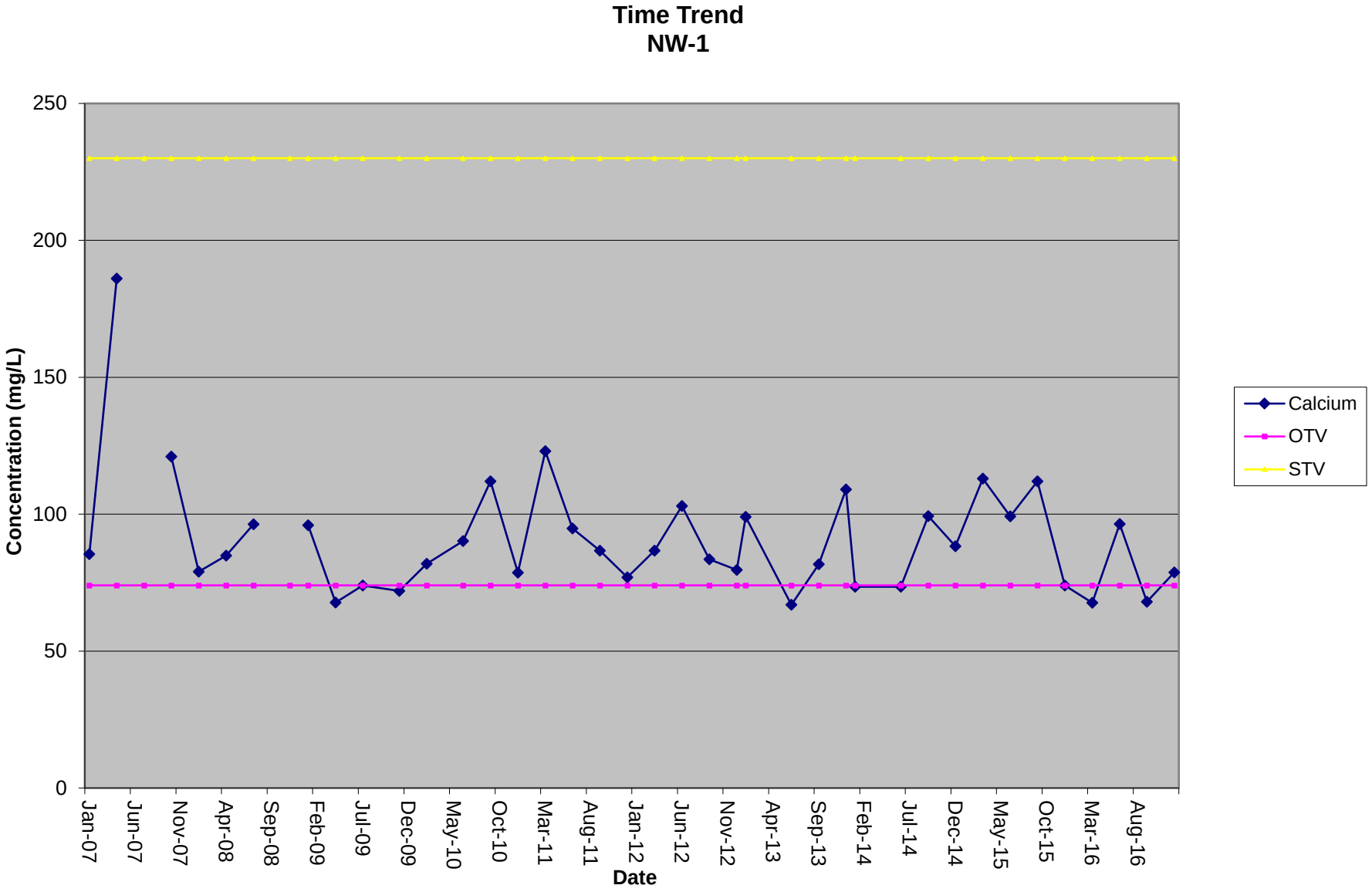


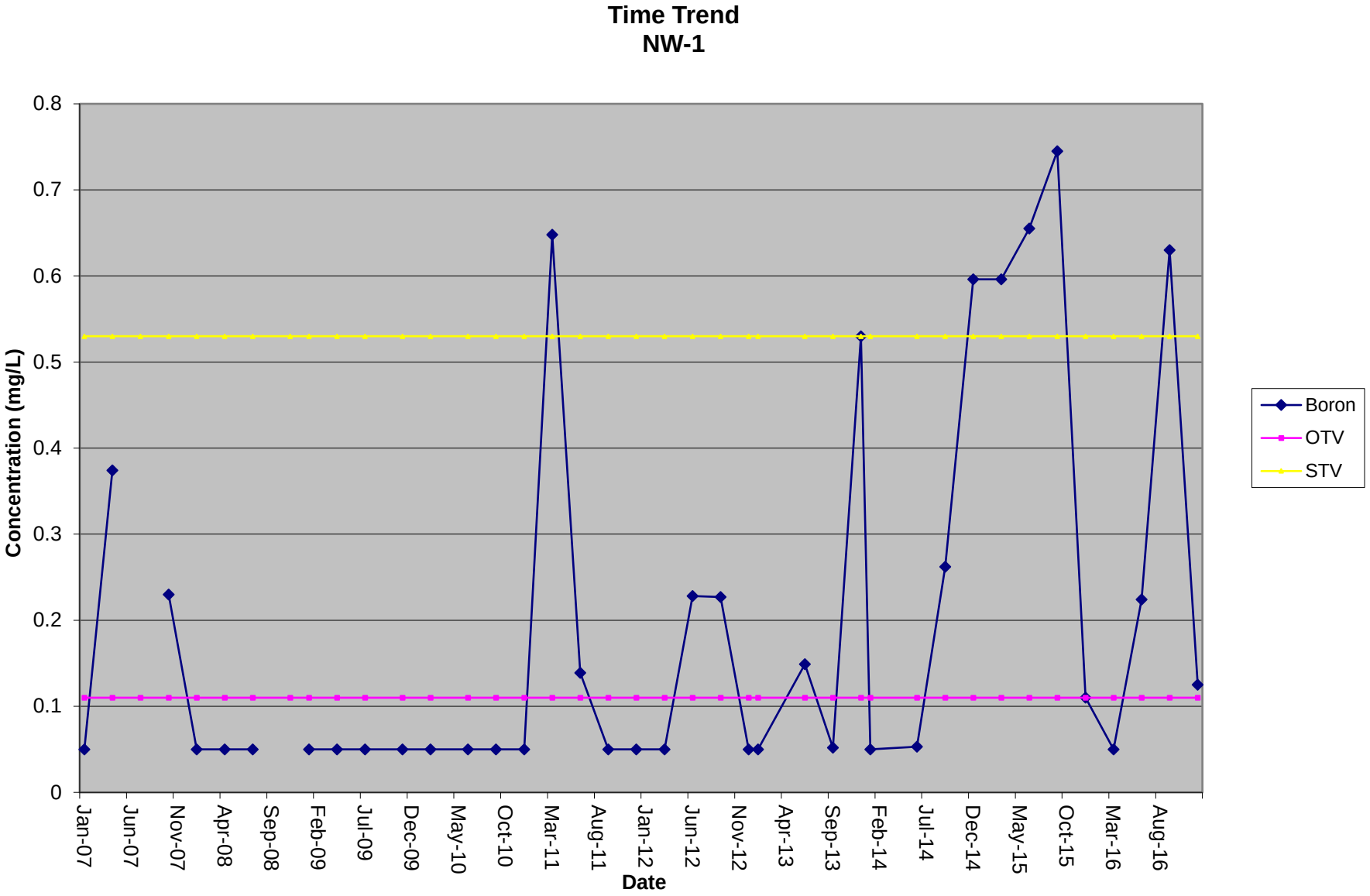

Time Trend
NW-1
Concentration (mg/L)
14
12
10
8
6
4
2
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Potassium
OTV
STV

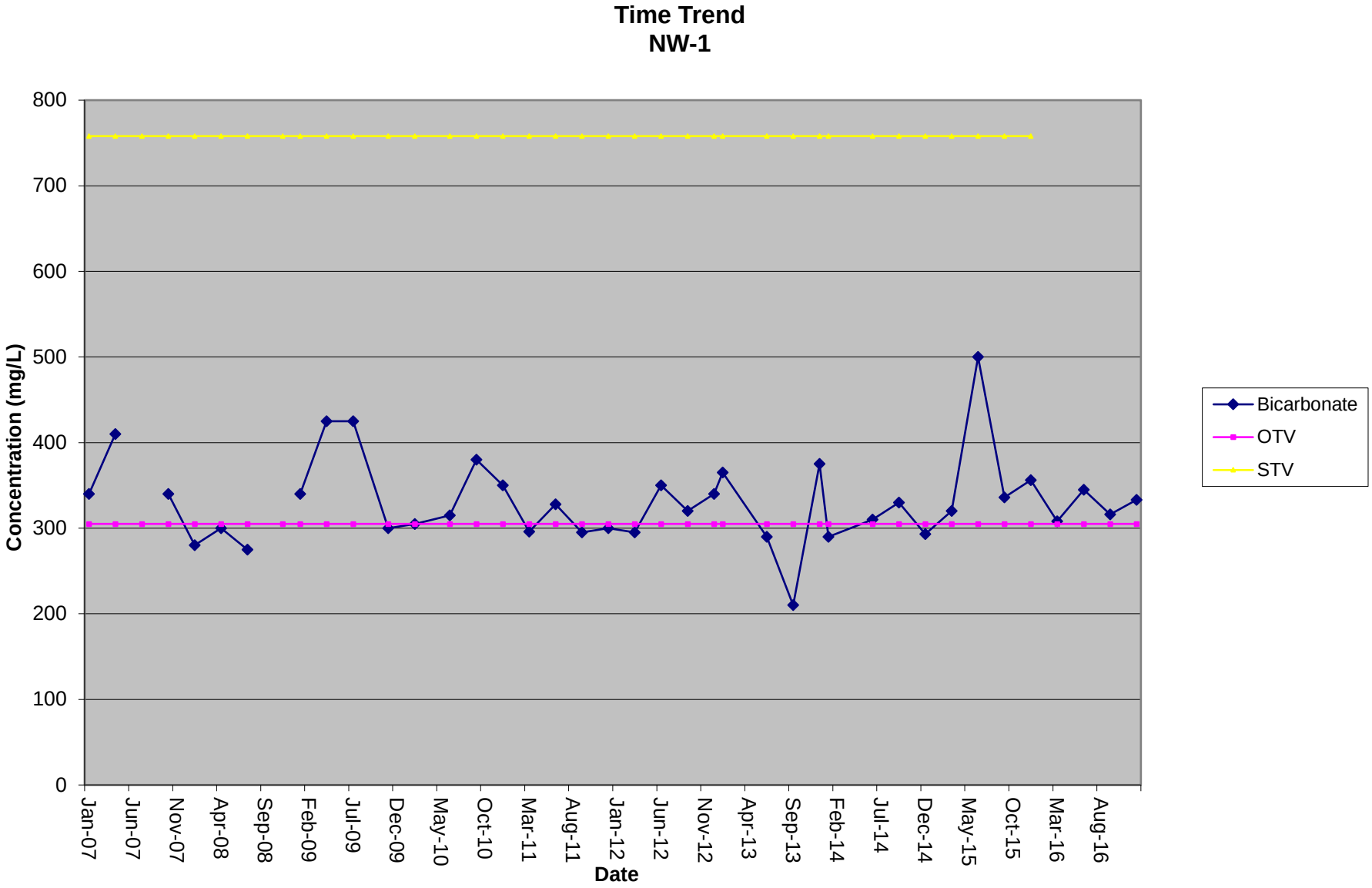
**Time Trend**
**NW-1**

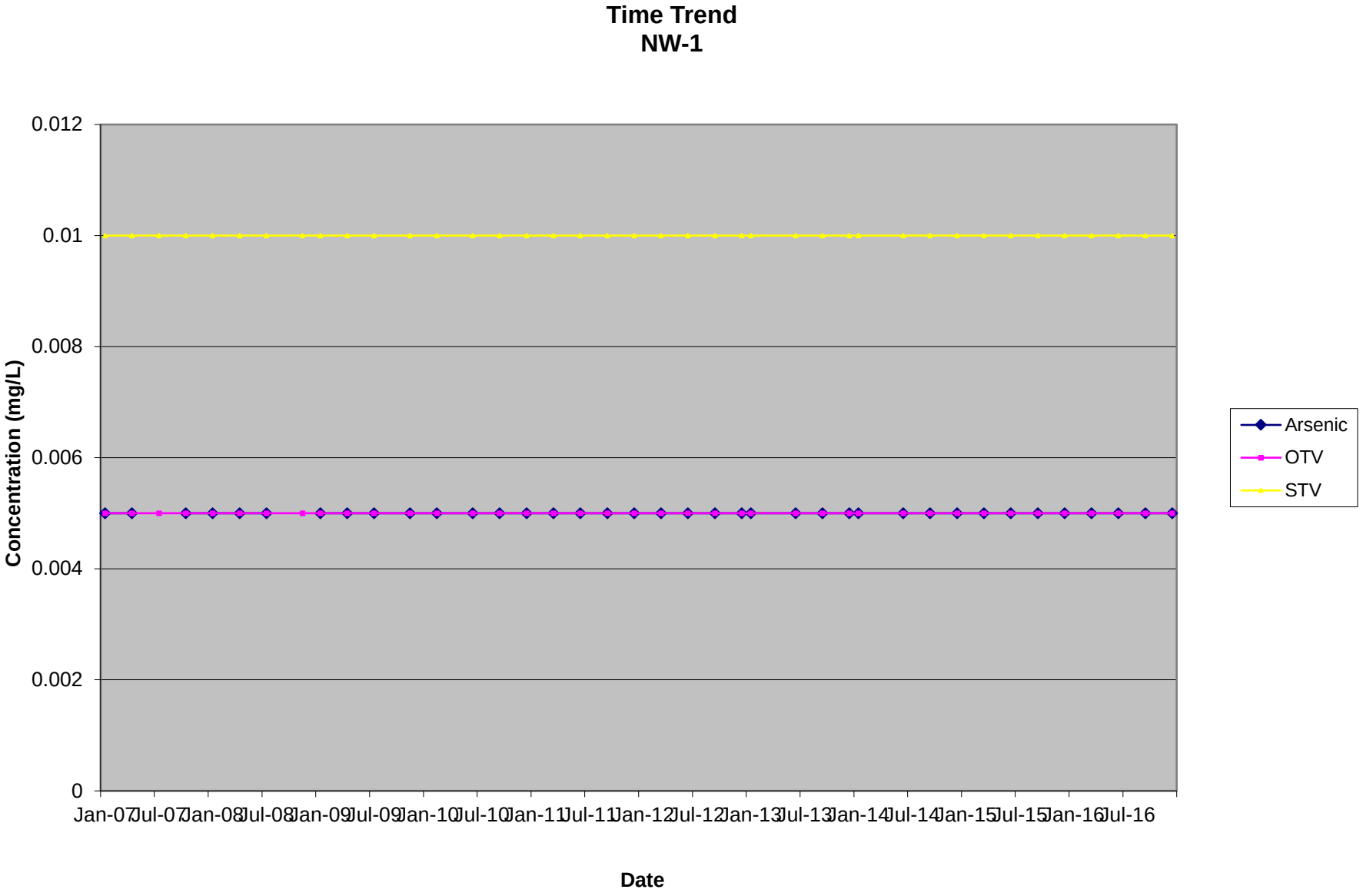


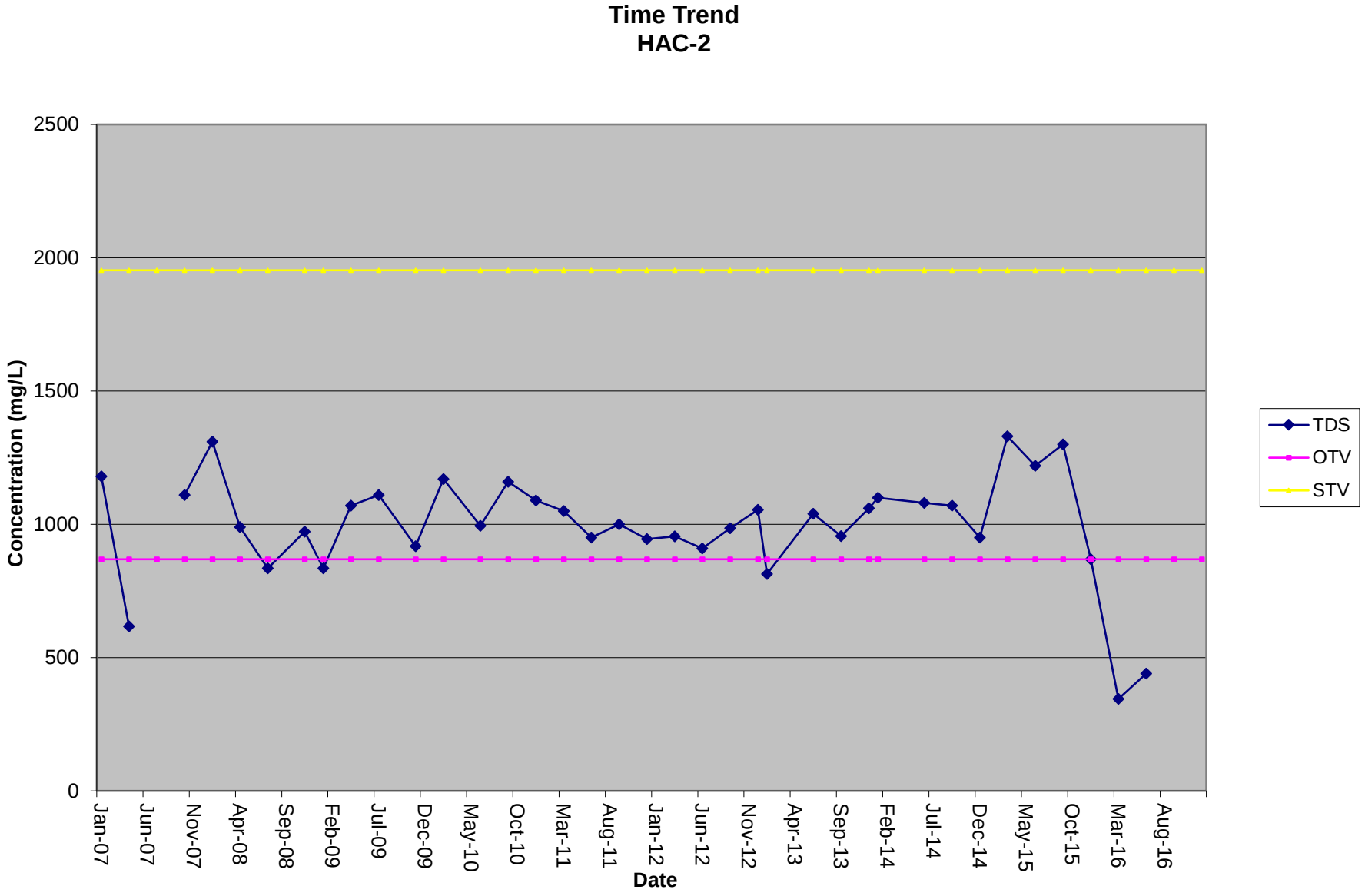

Time Trend
NW-1
Concentration (mg/L)
25
20
15
10
5
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Chloride
OTV
STV

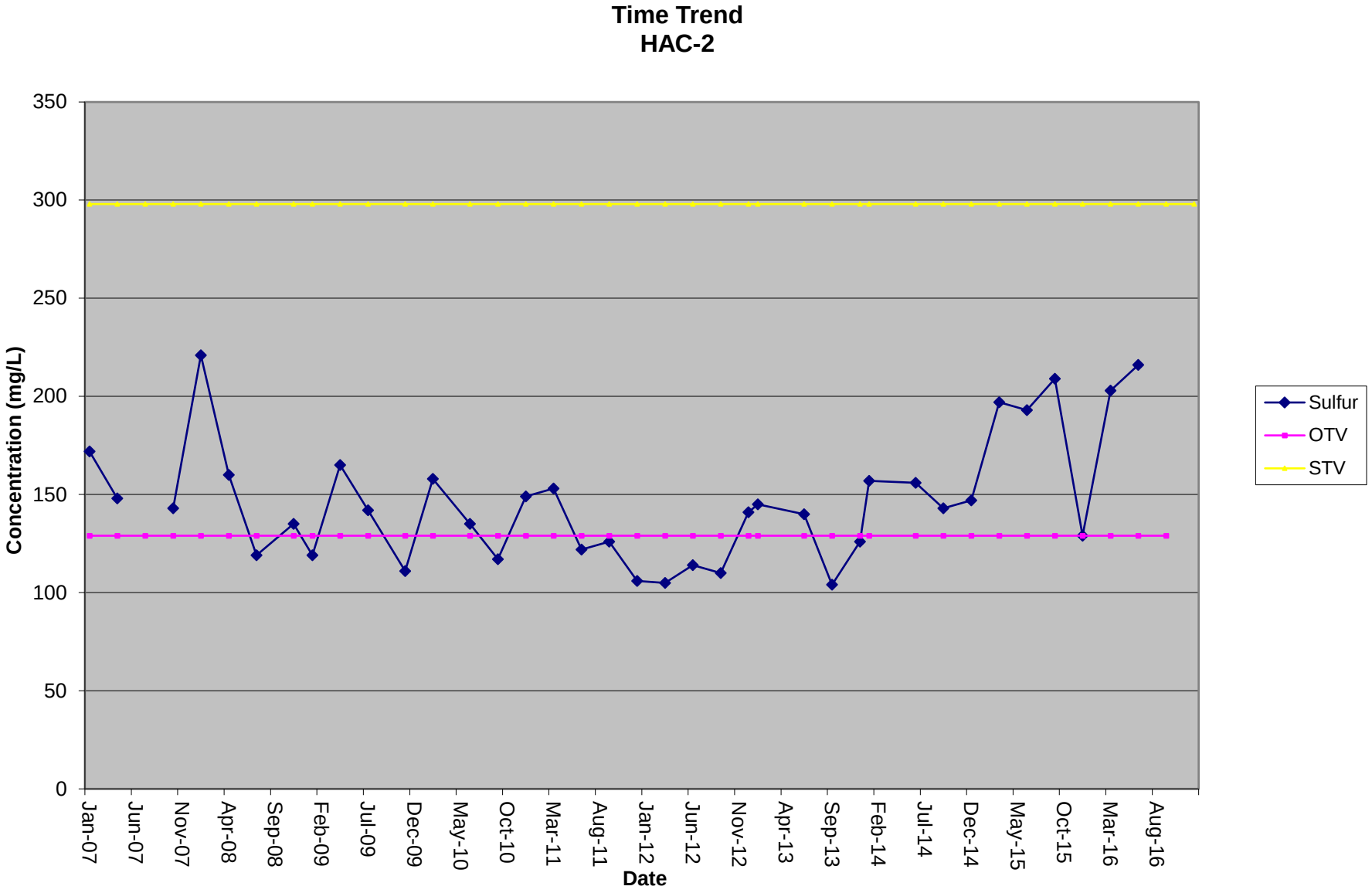

Time Trend
NW-1
Concentration (mg/L)
250
200
150
100
50
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Calcium
OTV
STV

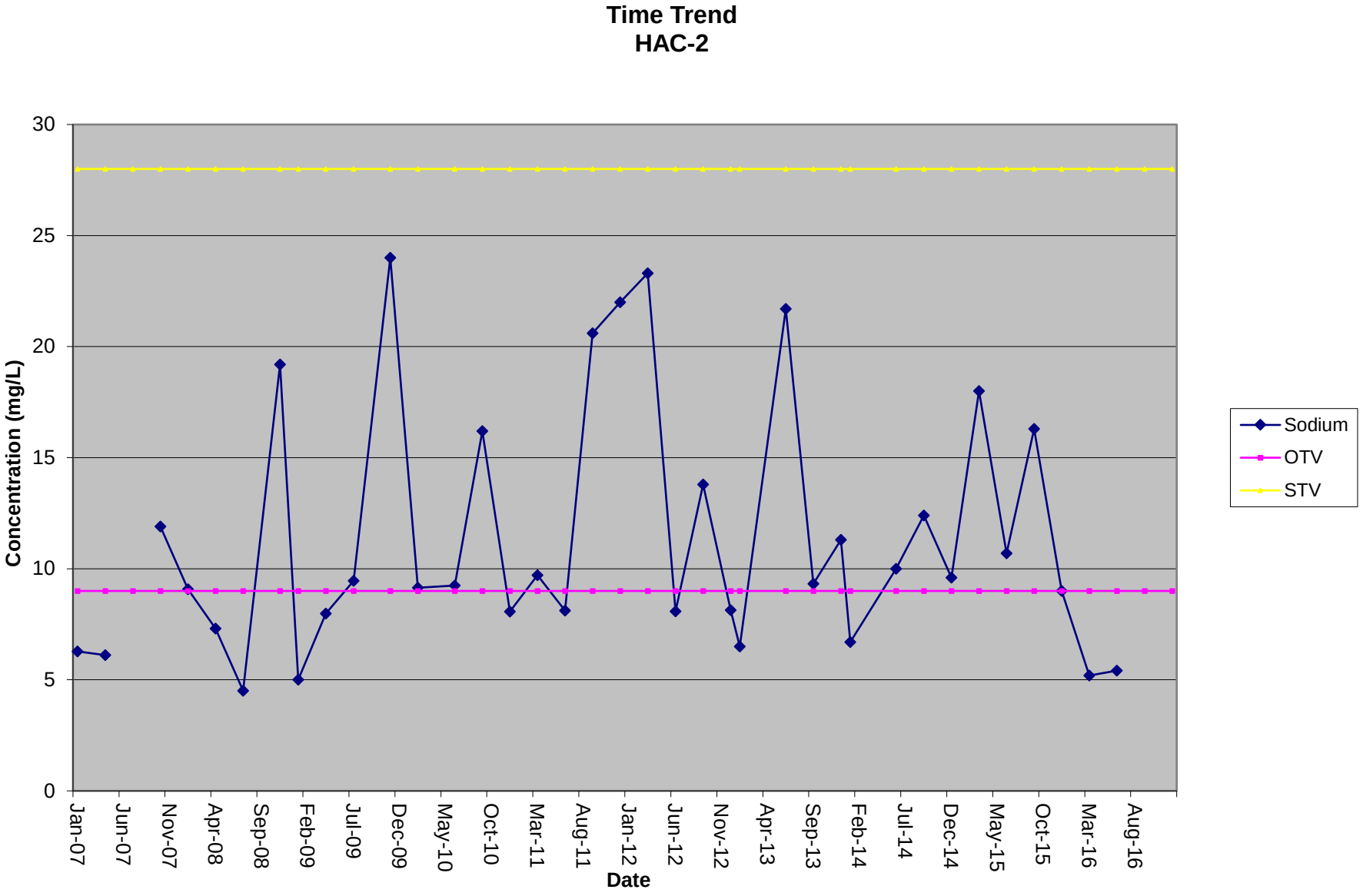

Time Trend
NW-1
Concentration (mg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Boron
OTV
STV


Time Trend
NW-1
Concentration (mg/L)
800
700
600
500
400
300
200
100
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Bicarbonate
OTV
STV

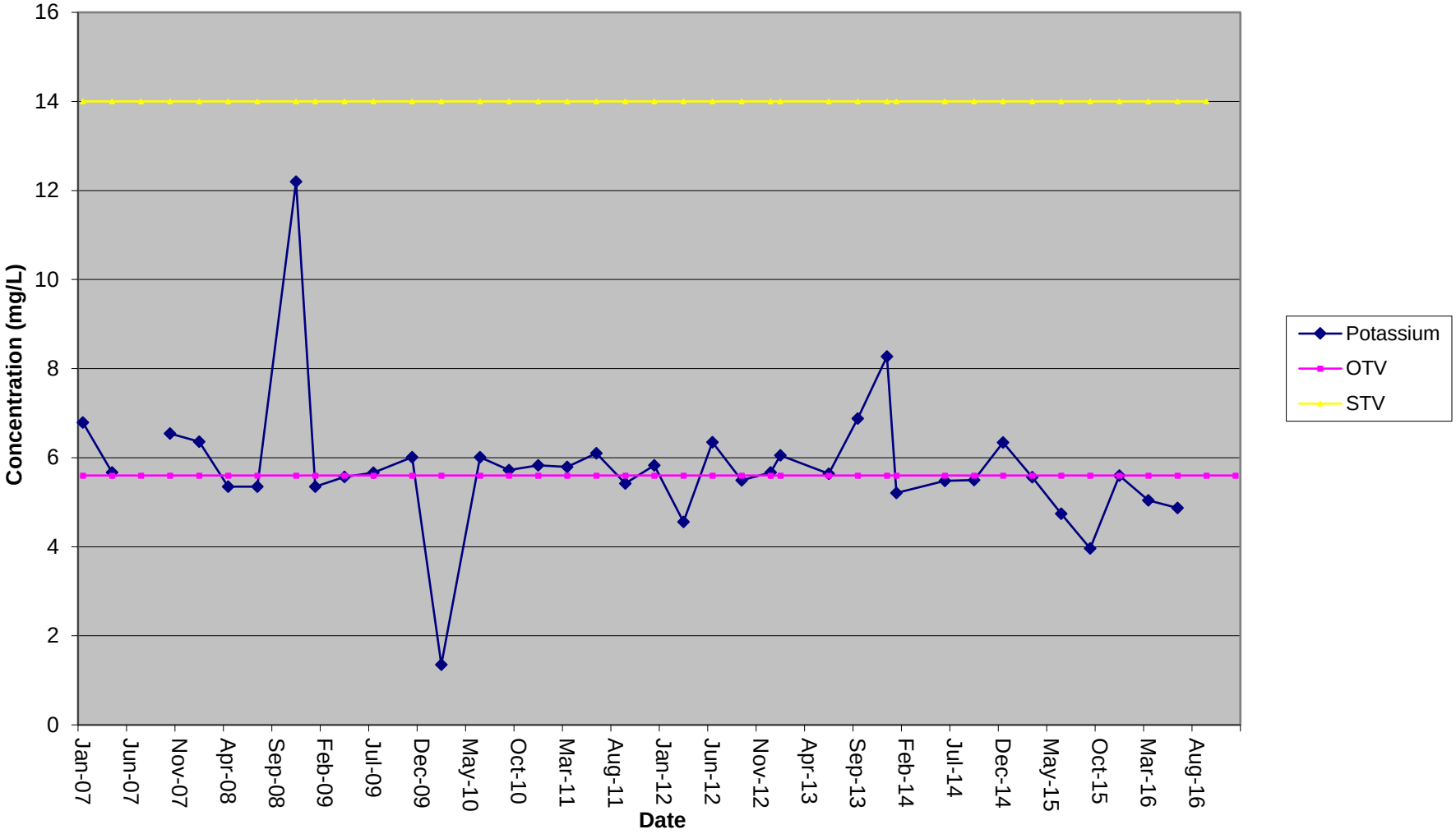

Time Trend
NW-1
0.012
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/L)
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Date
Arsenic
OTV
STV


Time Trend
HAC-2
Concentration (mg/L)
2500
2000
1500
1000
500
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
TDS
OTV
STV

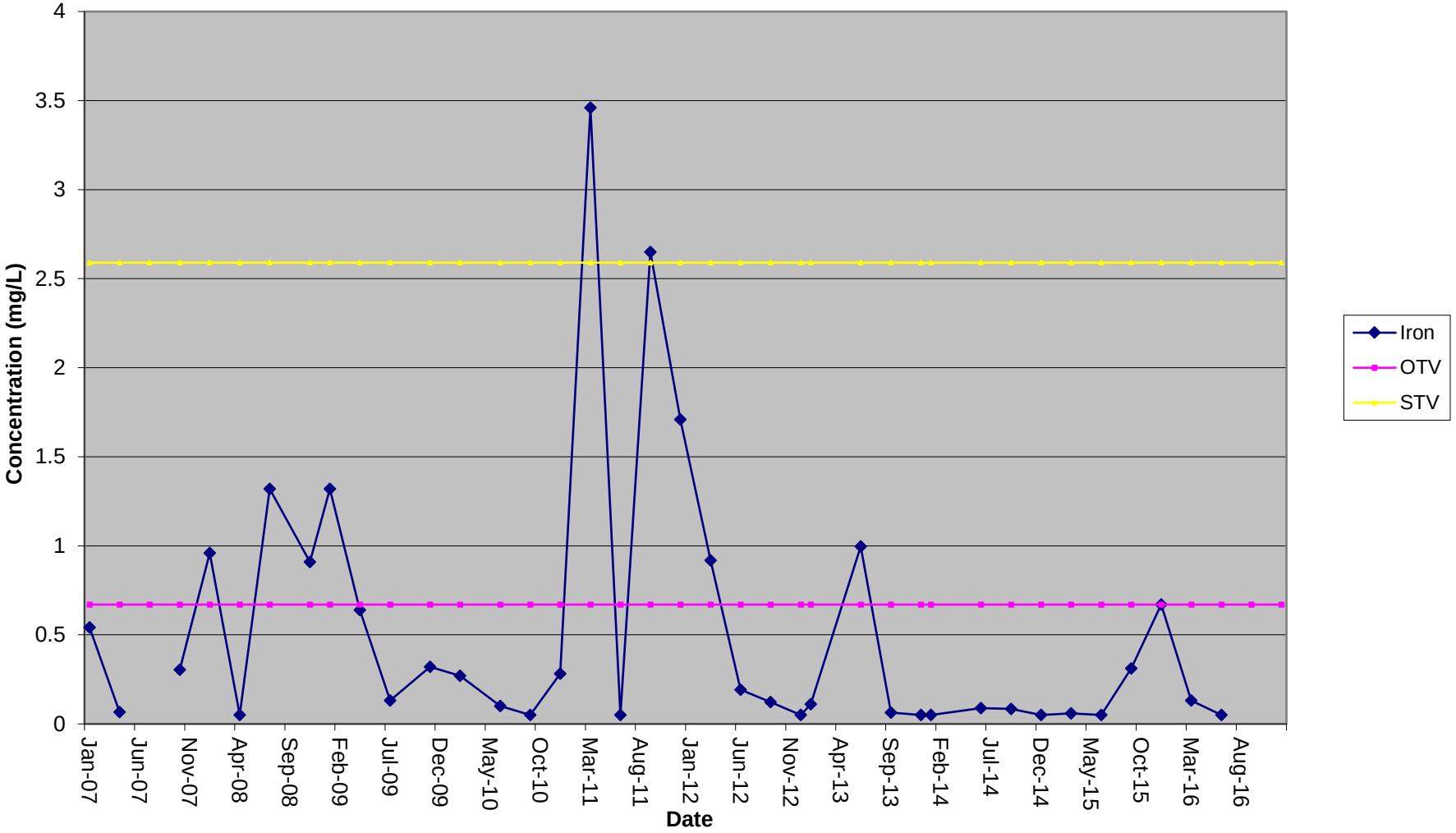

Time Trend
HAC-2
Concentration (mg/L)
350
300
250
200
150
100
50
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Sulfur
OTV
STV


Time Trend
HAC-2
Concentration (mg/L)
30
25
20
15
10
5
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Sodium
OTV
STV

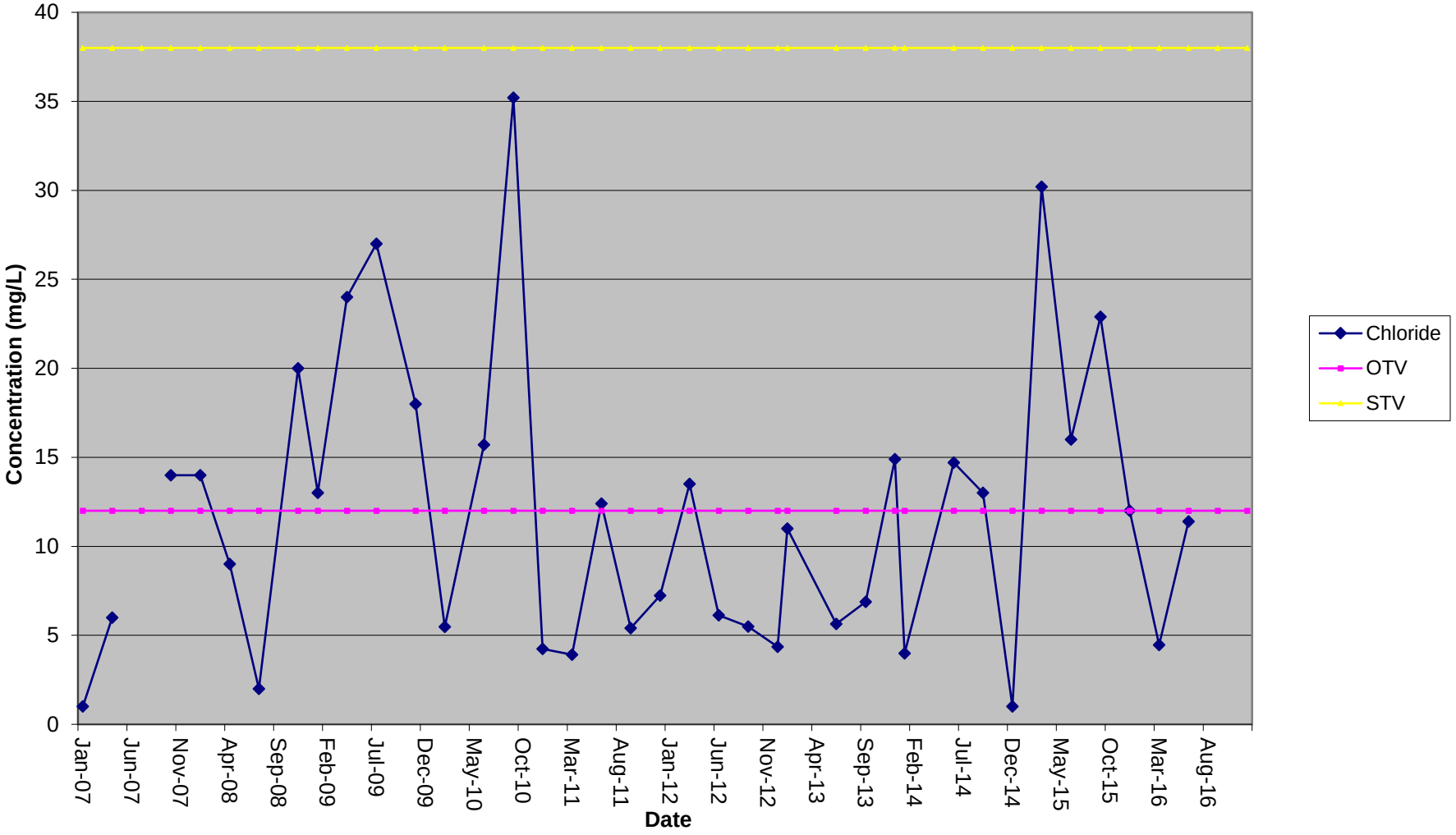
**Time Trend**
**HAC-2**

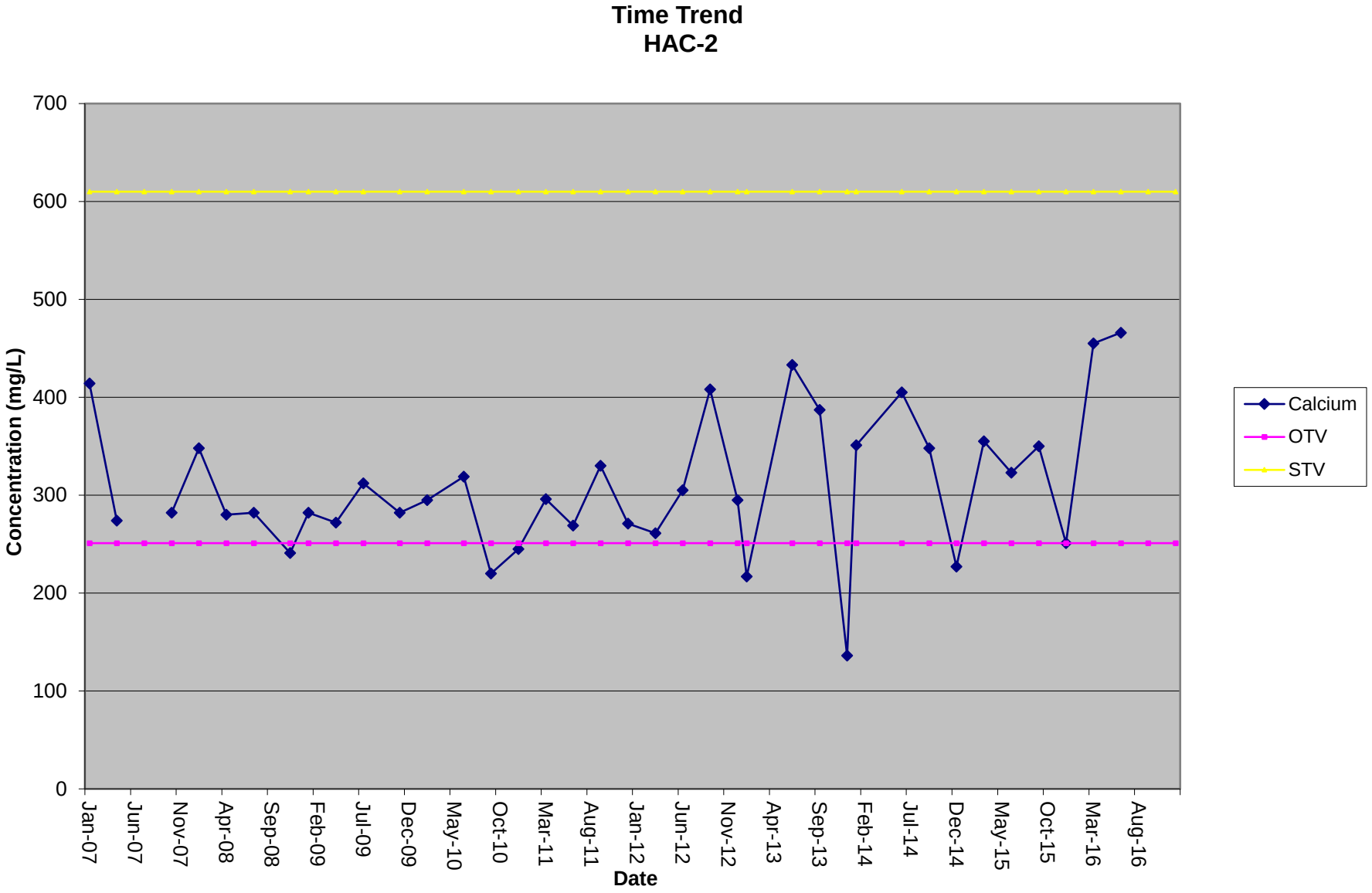


**Time Trend**
**HAC-2**

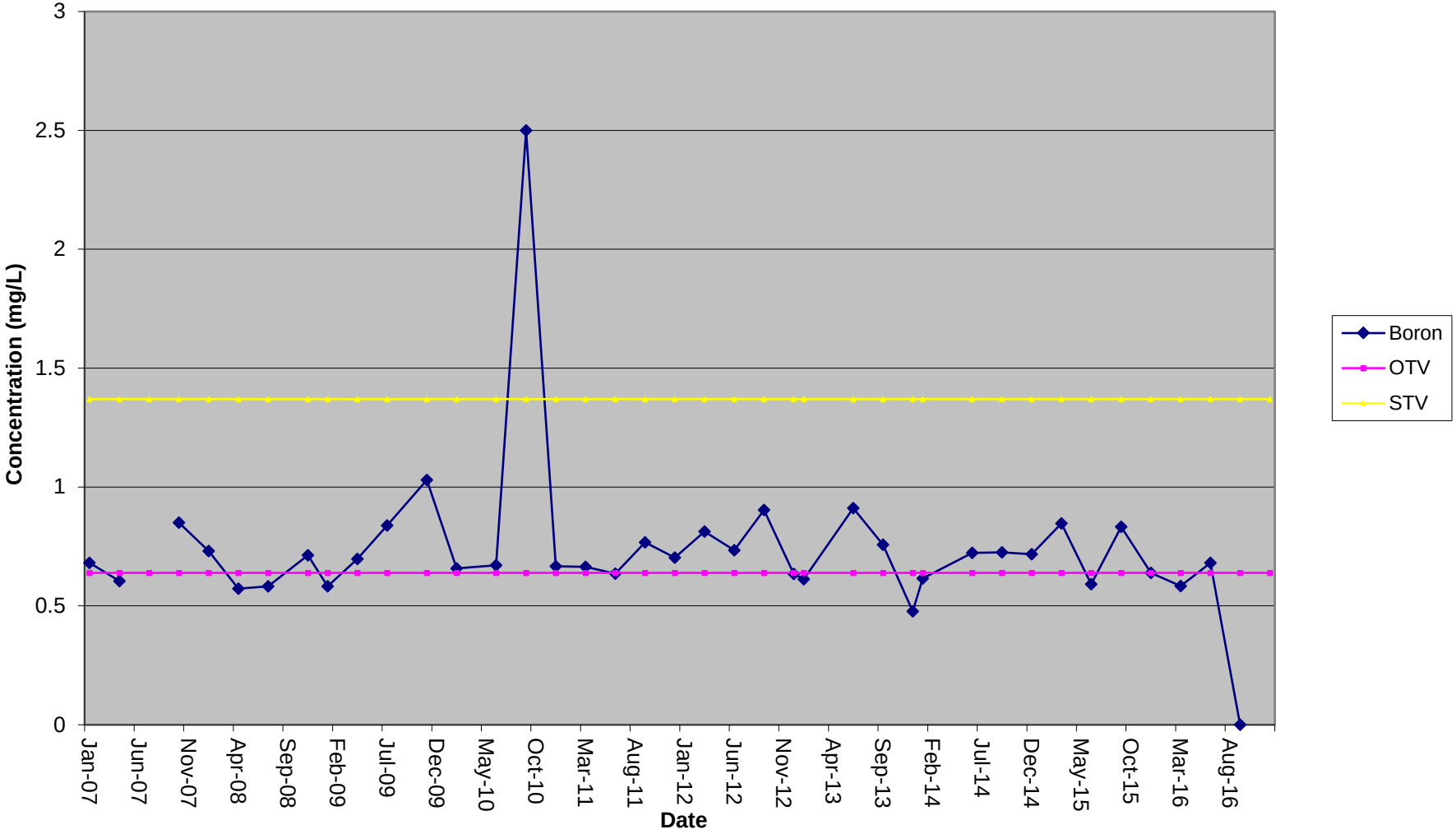


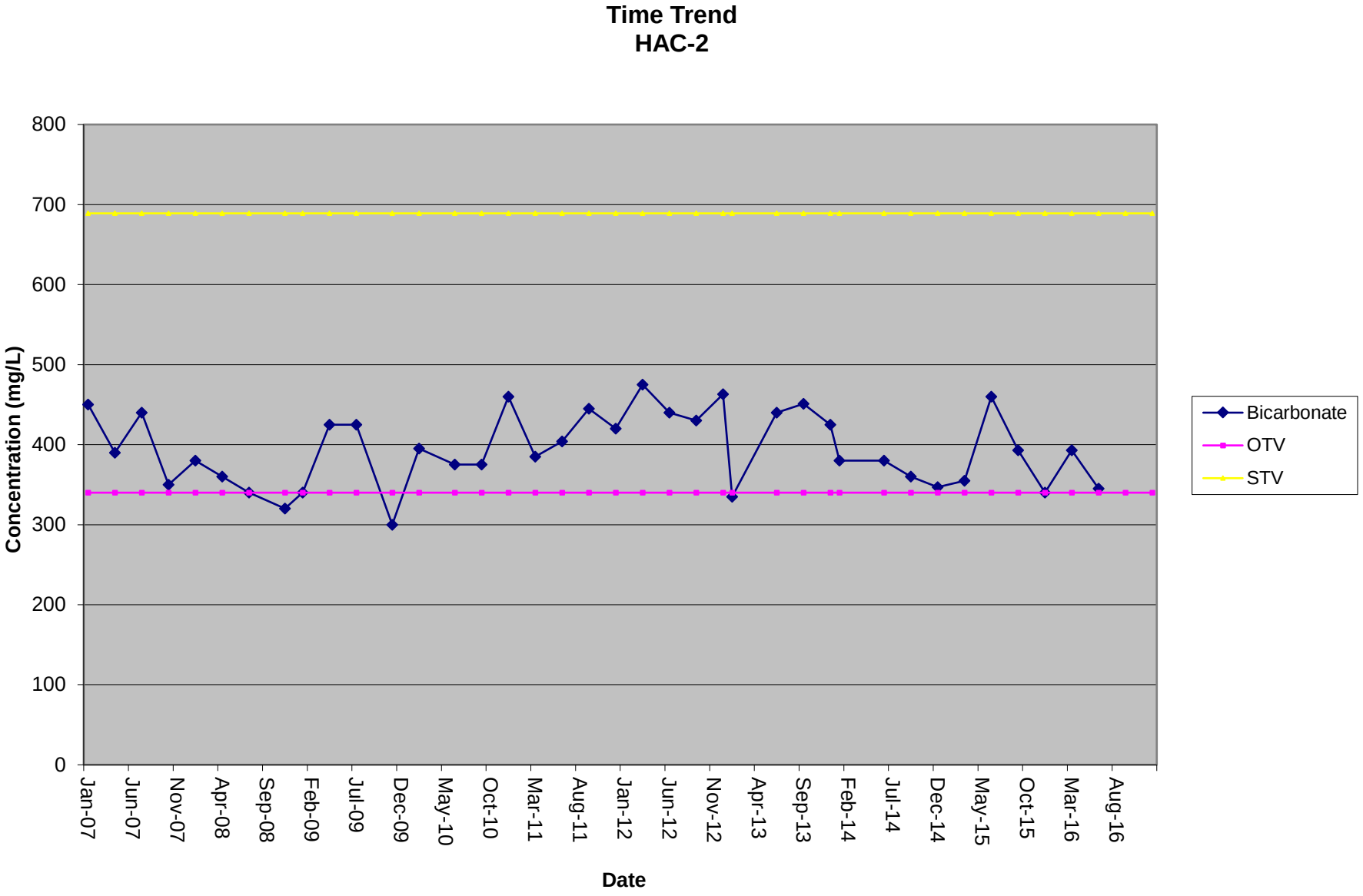
**Time Trend**
**HAC-2**

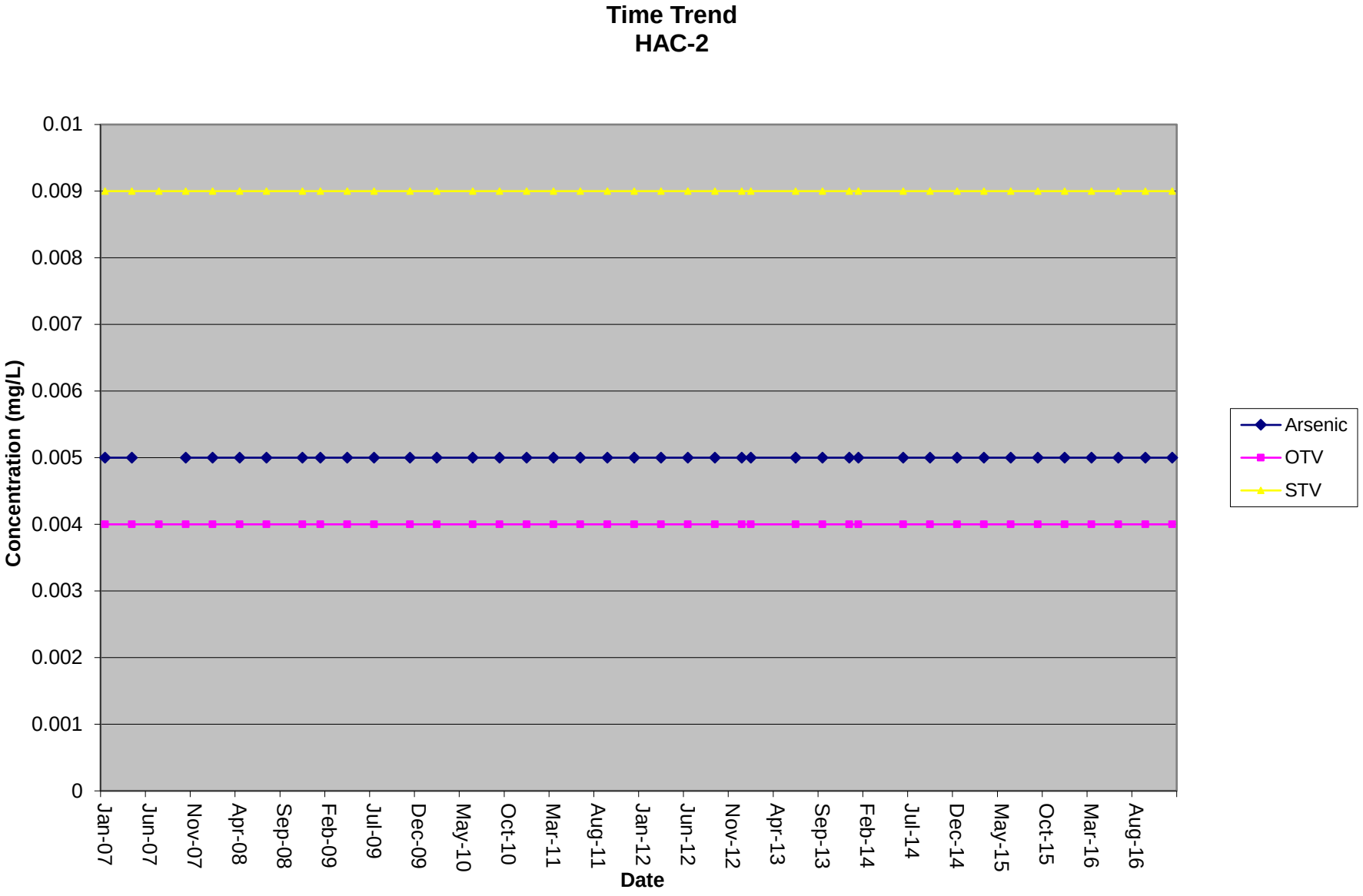



Time Trend
HAC-2
Concentration (mg/L)
700
600
500
400
300
200
100
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Calcium
OTV
STV

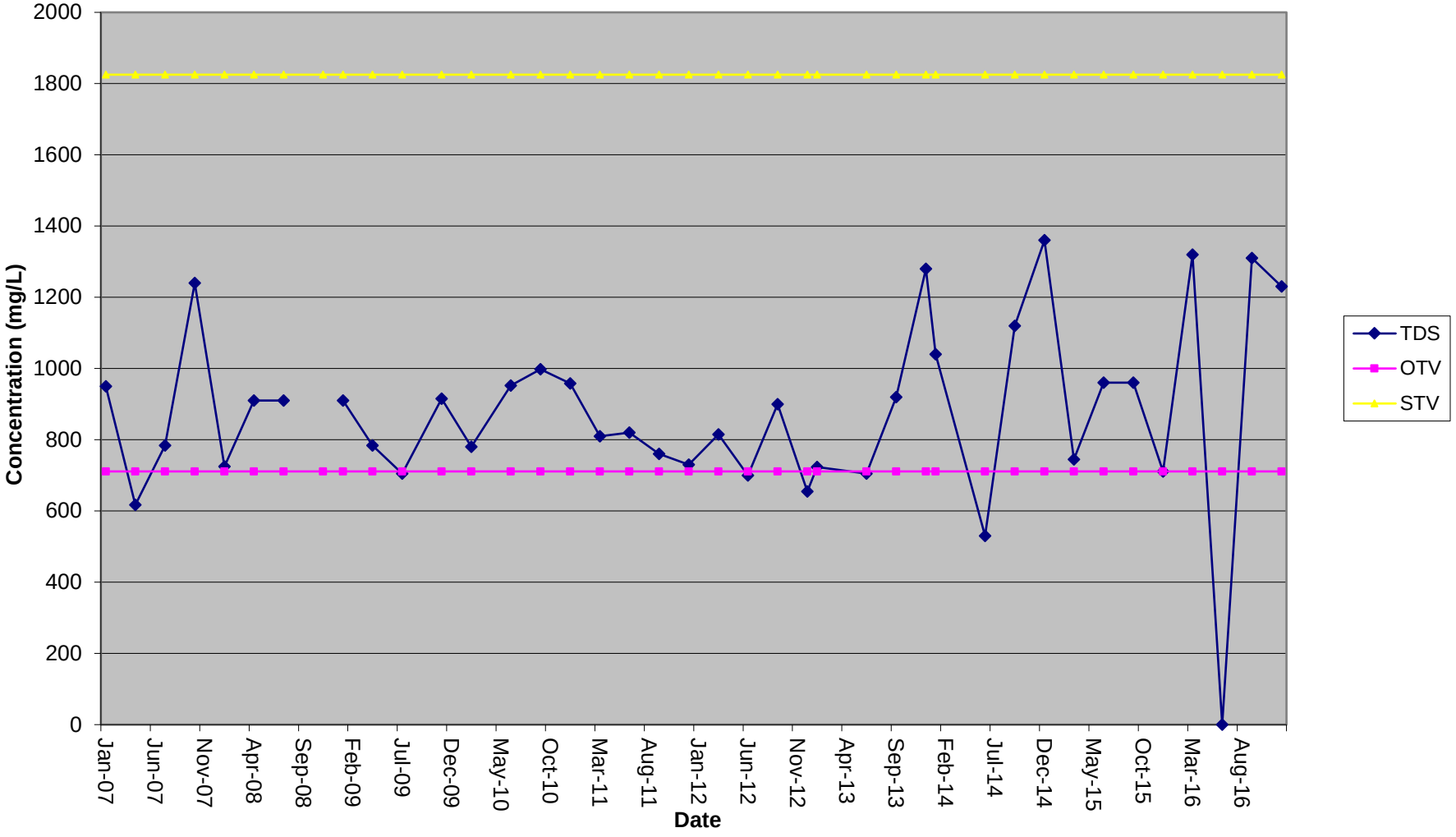
**Time Trend**
**HAC-2**



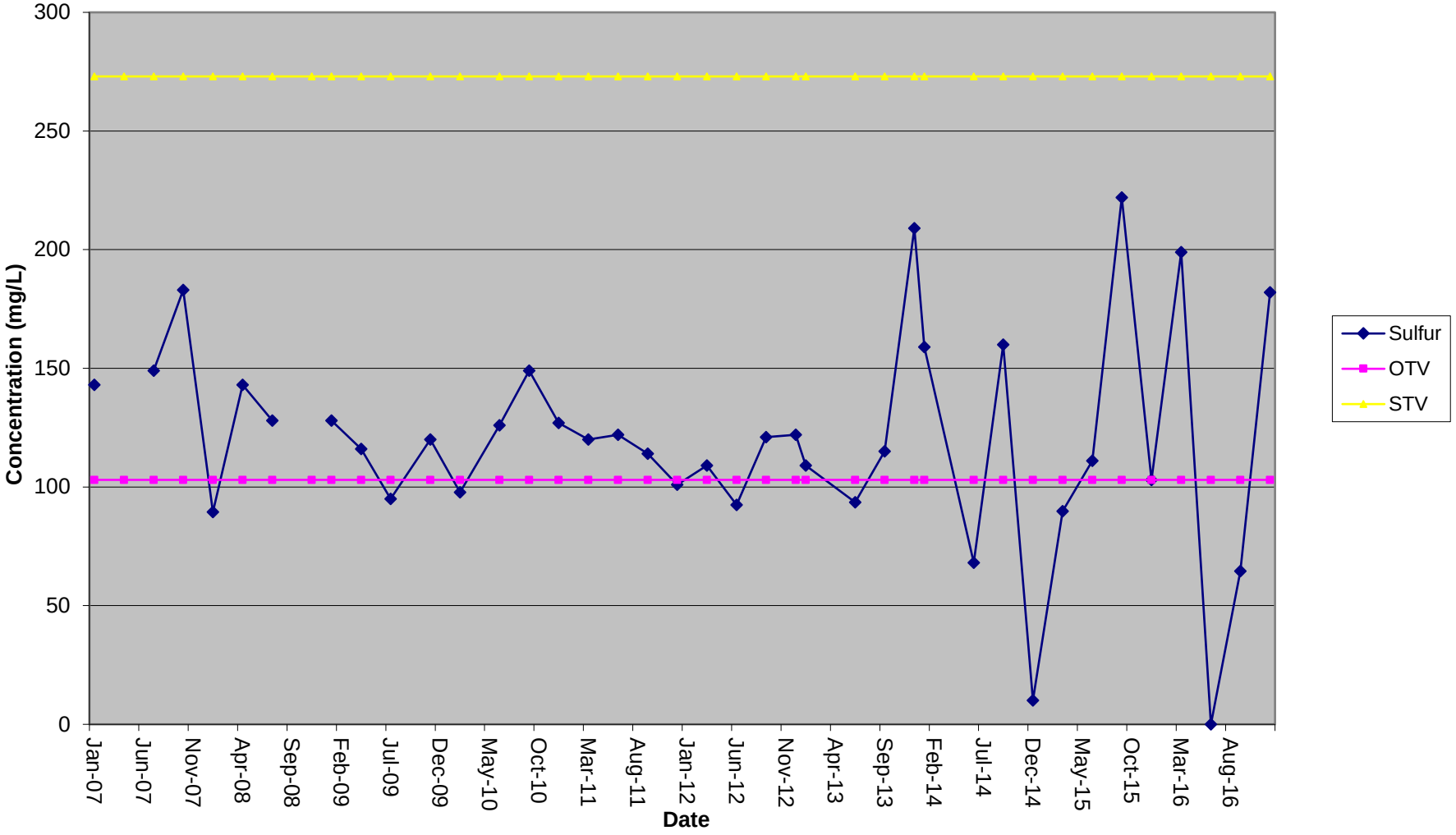

Time Trend
HAC-2
Concentration (mg/L)
800
700
600
500
400
300
200
100
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Bicarbonate
OTV
STV


Time Trend
HAC-2
Concentration (mg/L)
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Arsenic
OTV
STV

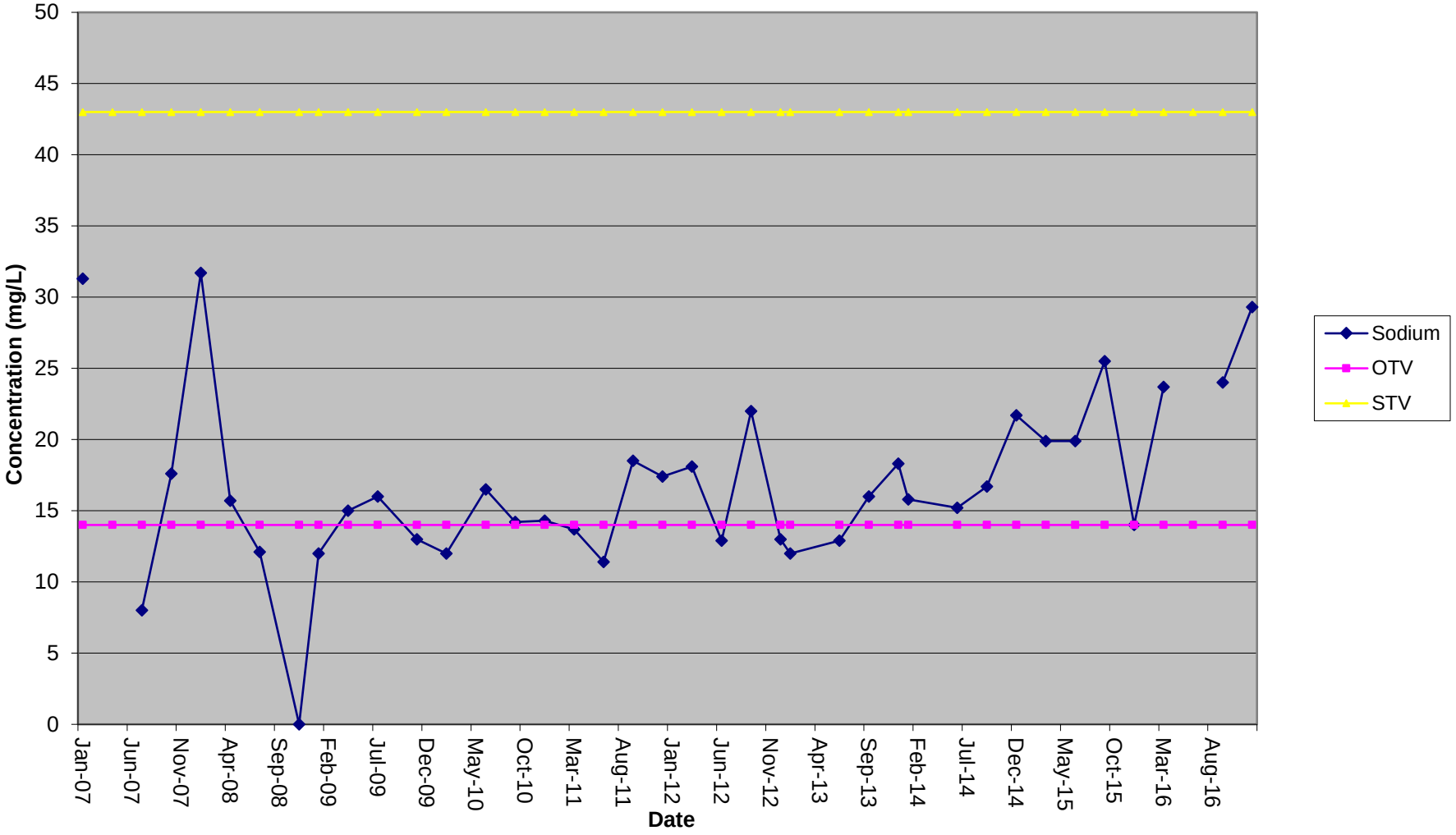
**Time Trend**
**HAC-1**



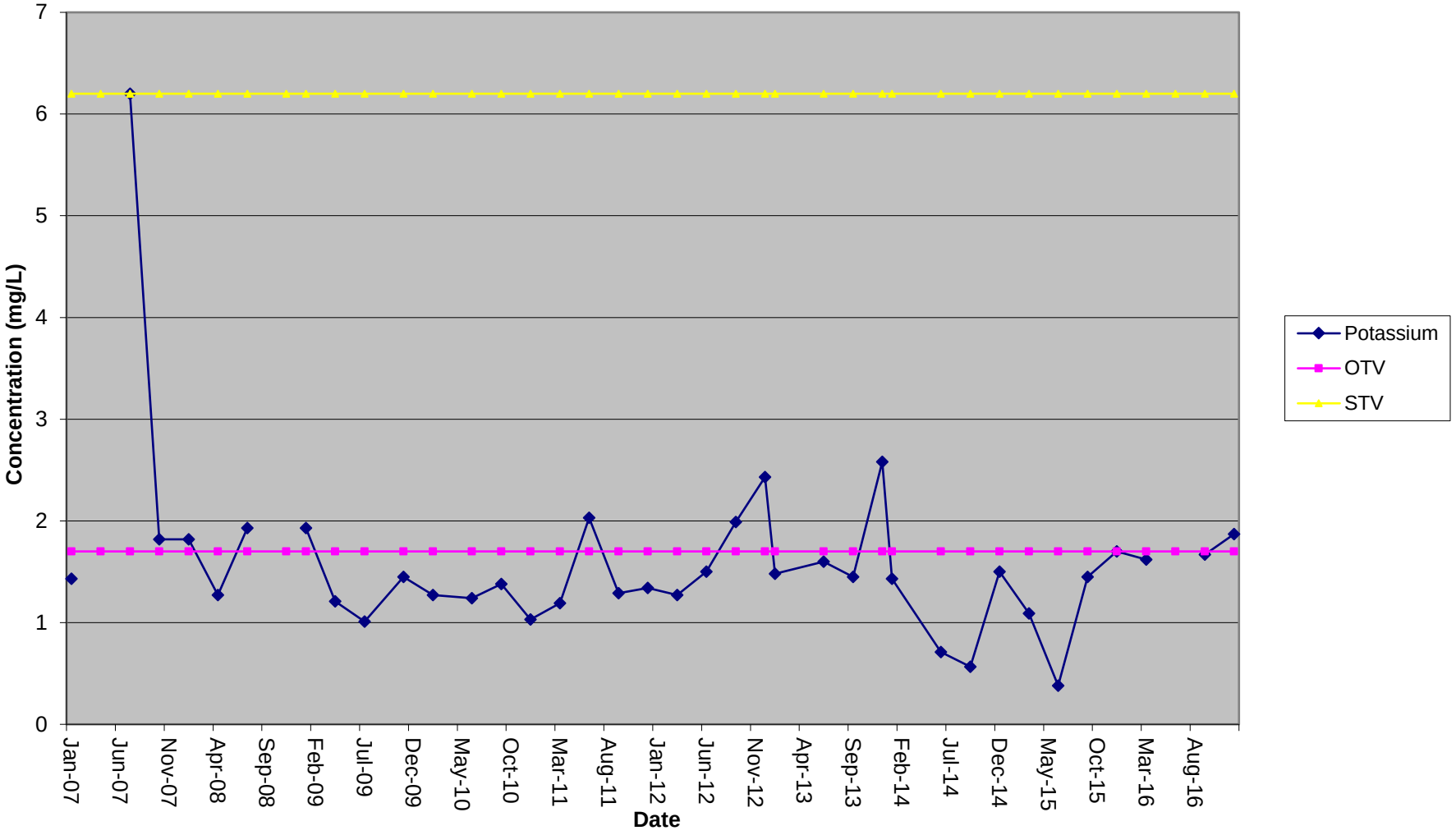
**Time Trend**
**HAC-1**

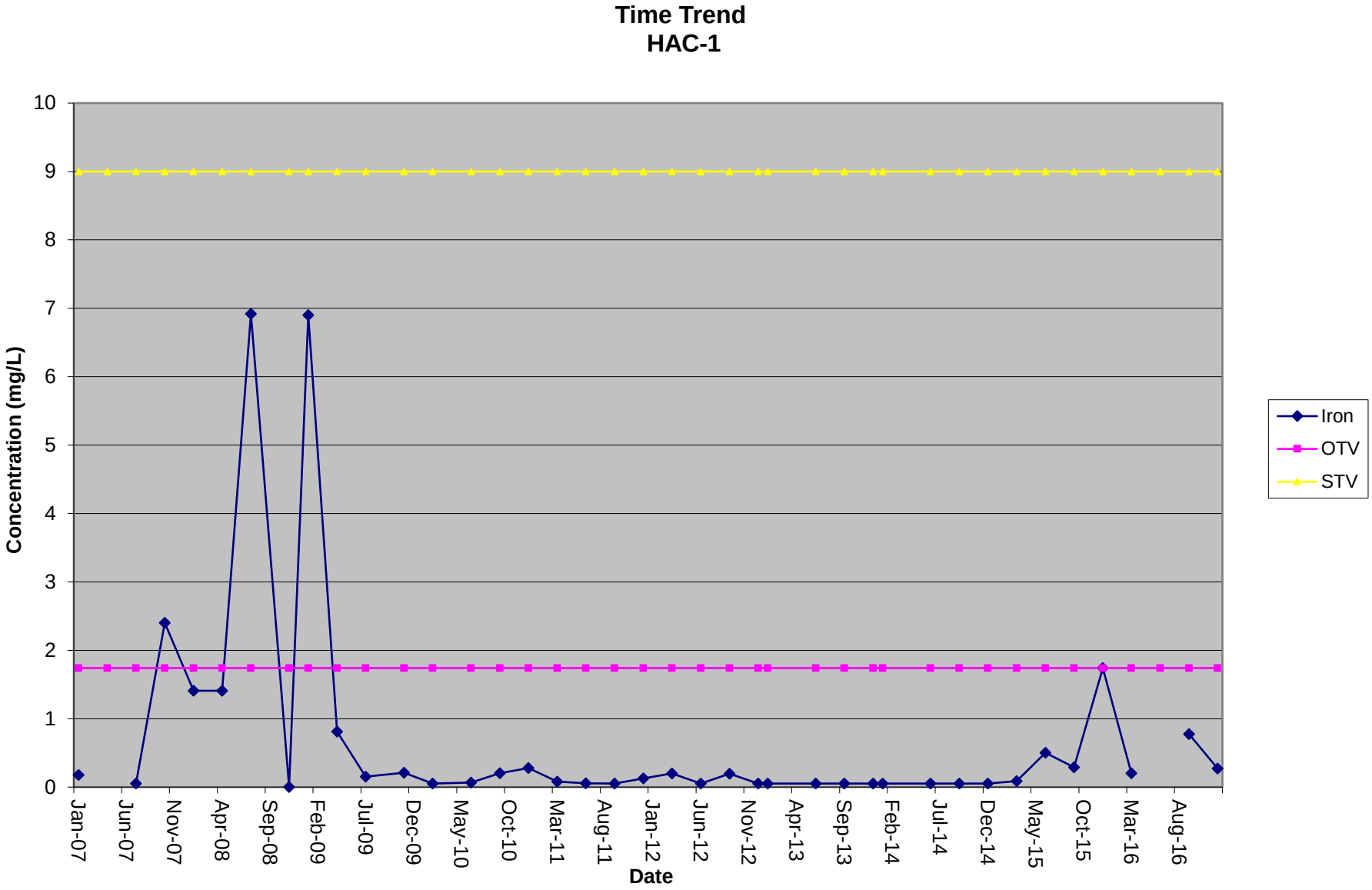


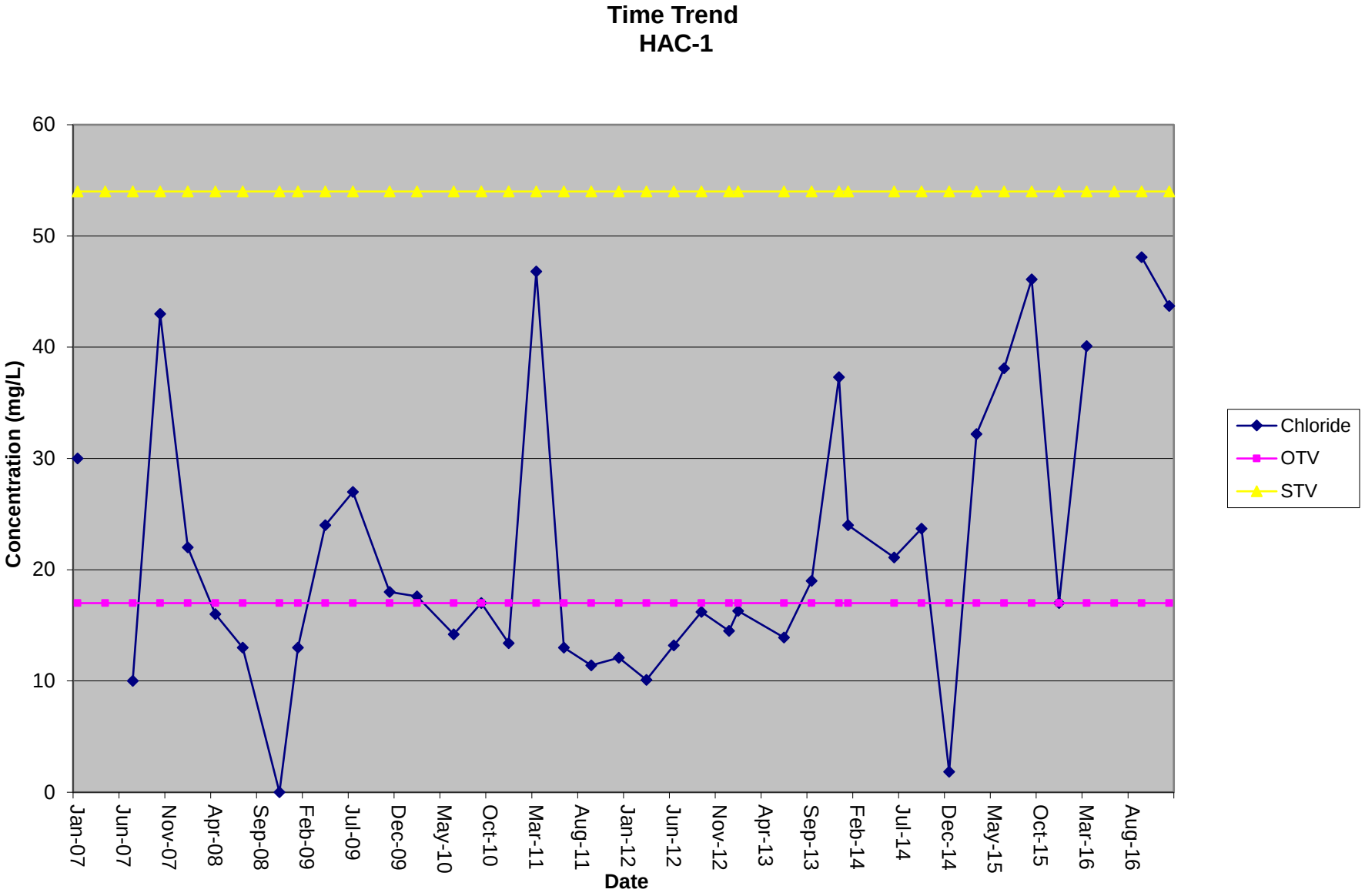
**Time Trend**
**HAC-1**

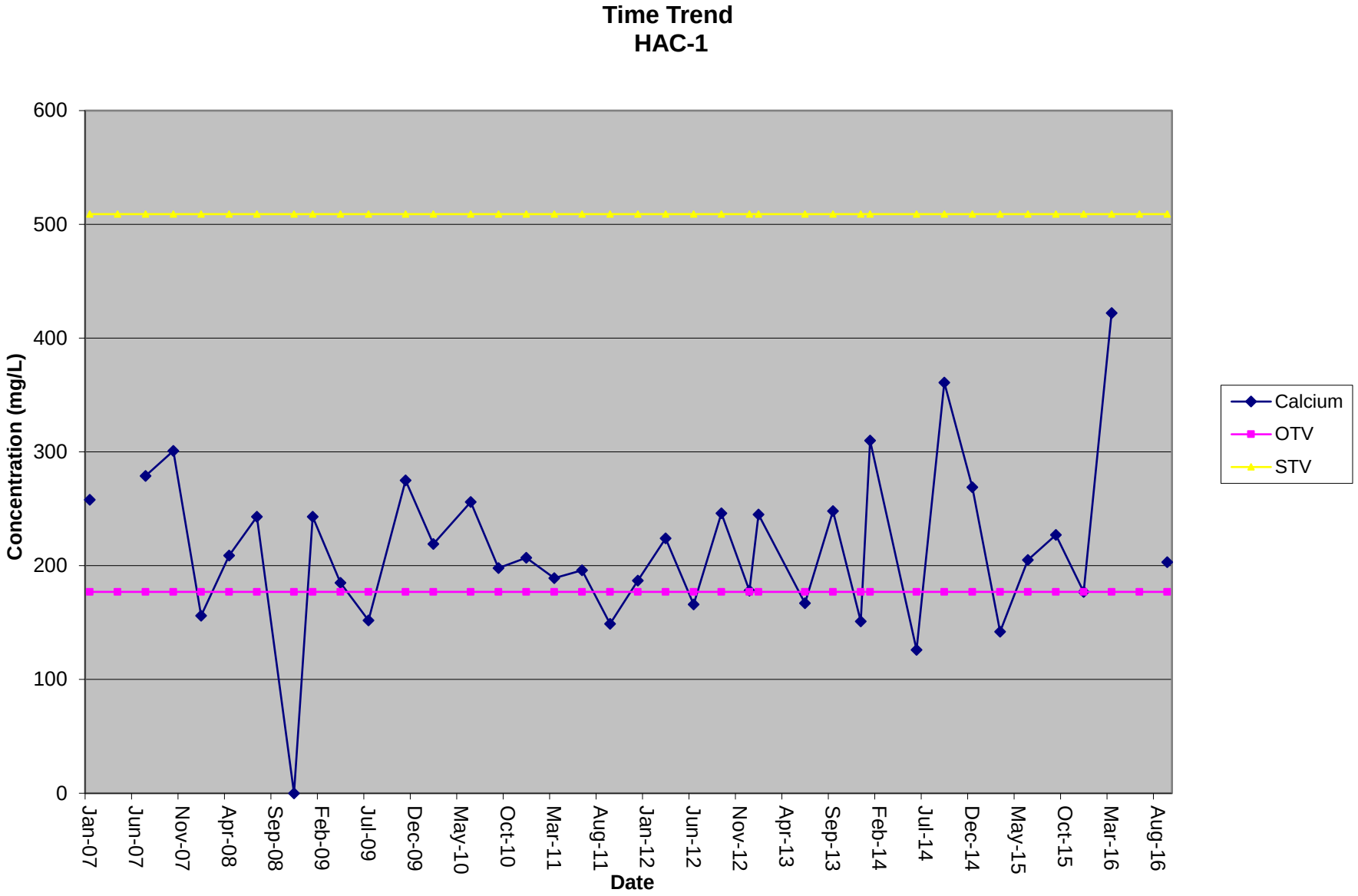


**Time Trend**
**HAC-1**

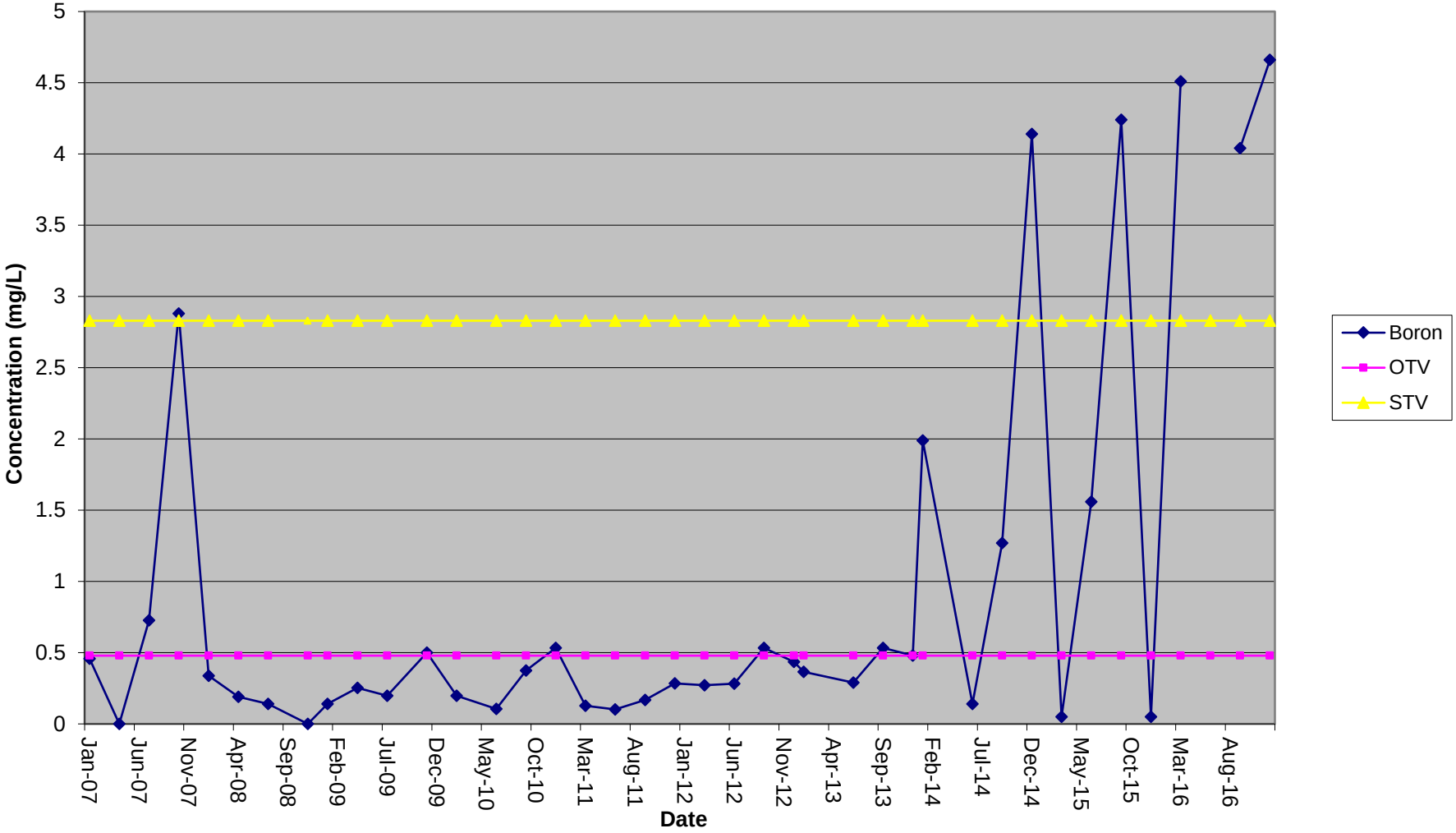



Time Trend
HAC-1
Concentration (mg/L)
10
9
8
7
6
5
4
3
2
1
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Iron
OTV
STV

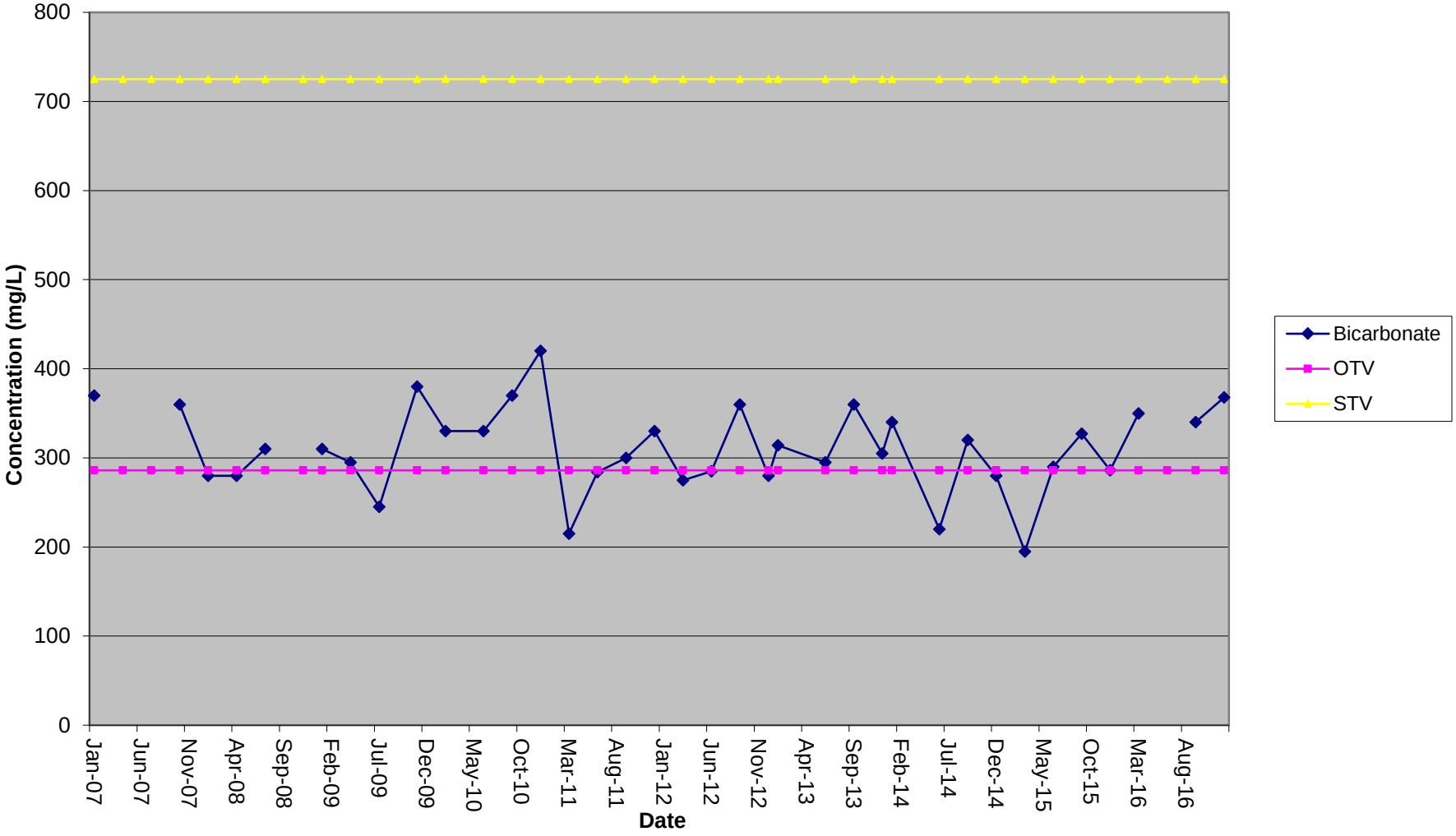

Time Trend
HAC-1
Concentration (mg/L)
60
50
40
30
20
10
0
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Chloride
OTV
STV

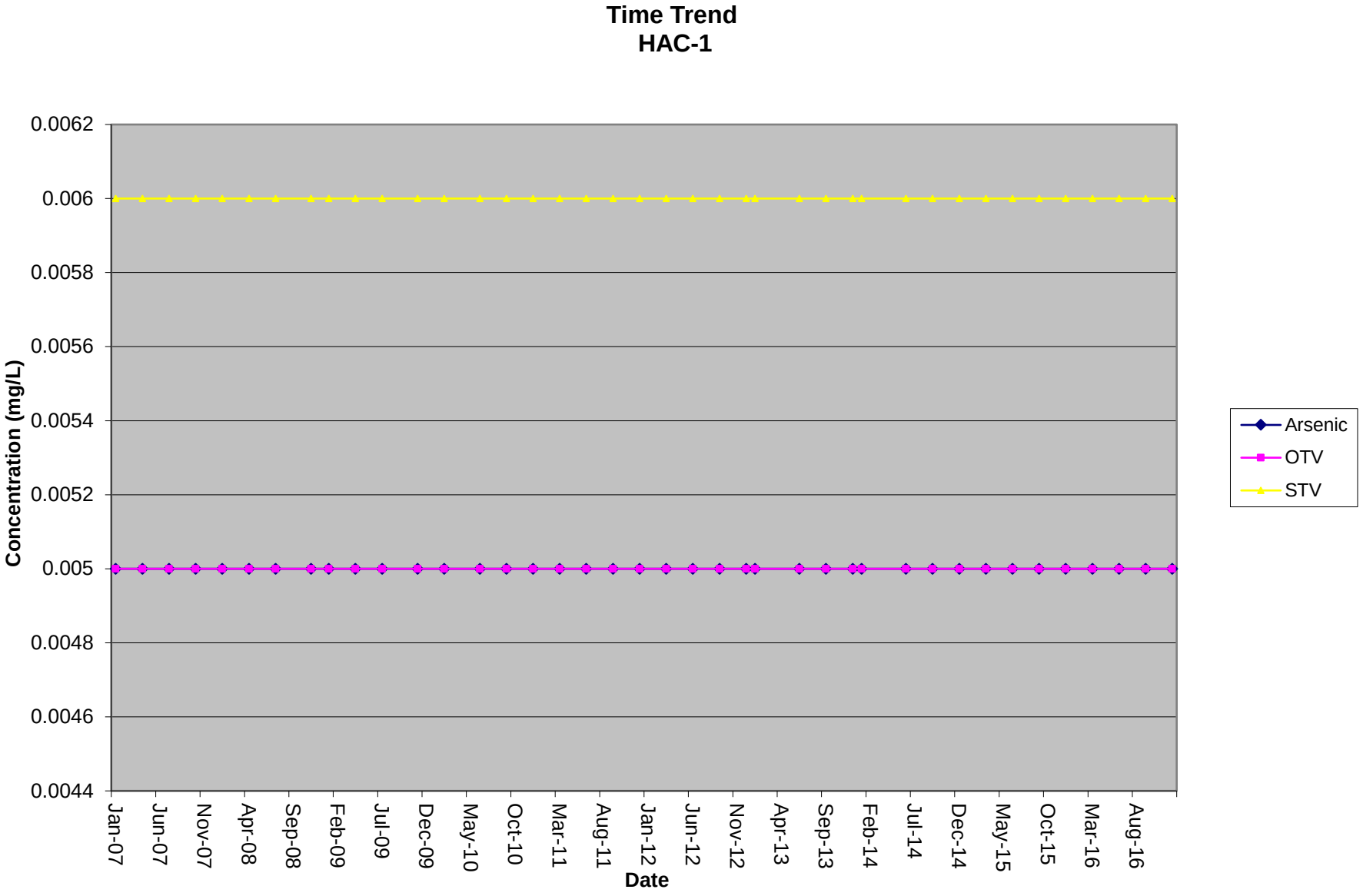

Time Trend
HAC-1
600
500
400
300
200
100
0
Concentration (mg/L)
Jan-07
Jun-07
Nov-07
Apr-08
Sep-08
Feb-09
Jul-09
Dec-09
May-10
Oct-10
Mar-11
Aug-11
Jan-12
Jun-12
Nov-12
Apr-13
Sep-13
Feb-14
Jul-14
Dec-14
May-15
Oct-15
Mar-16
Aug-16
Date
Calcium
OTV
STV

**Time Trend**
**HAC-1**



**Time Trend**
**HAC-1**




Time Trend
HAC-1
Concentration (mg/L)
0.0062
0.006
0.0058
0.0056
0.0054
0.0052
0.005
0.0048
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Jan-07
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Date
Arsenic
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