CHICOT EQUIVALENT AQUIFER SUMMARY, FY 2021

AQUIFER SAMPLING AND ASSESSMENT PROGRAM

APPENDIX 12 TO THE 2021 TRIENNIAL SUMMARY REPORT

PARTIAL FUNDING PROVIDED BY THE CWA

Contents

BACKGROUND

The Louisiana Department of Environmental Quality's (LDEQ) Aquifer Sampling and Assessment (ASSET) Program is an ambient monitoring program established to determine and monitor the quality of groundwater produced from Louisiana's major freshwater aquifers. The ASSET Program samples approximately 200 water wells located in 14 aquifers across the state. The sampling process is designed so that all 14 aquifers and associated wells are monitored every three years.

In order to better assess the water quality of a particular aquifer, an attempt is made to sample all ASSET Program wells producing from it in a narrow time frame. To more conveniently and economically promulgate those data collected, a summary report on each aquifer is prepared separately. Collectively, these aquifer summaries will make up, in part, the ASSET Program's Triennial Summary Report.

Analytical and field data contained in this summary were collected from wells producing from the Chicot Equivalent aquifer during the 2021 state fiscal year (July 1, 2020 - June 30, 2021). This summary will become Appendix 12 of the ASSET Program Triennial Summary Report for 2021.

These data show that between July 2020 and June 2021, 24 wells were sampled which produce from the Chicot Equivalent aquifer. Nine wells are classified as domestic, eight are classified as industrial, six are classified as public supply, and one monitoring well. The wells are located in 12 parishes in southeast Louisiana.

Figure 12-1 shows the geographic locations of the Chicot Equivalent aquifer and the associated wells, whereas Table 12-1 lists the wells monitored along with their total depths, use made of produced waters and date sampled.

Well data, including well location, aquifer assignment, and well use classification for registered water wells were obtained from the Louisiana Department of Natural Resources' water well registration data file.

GEOLOGY

The Chicot Equivalent aquifer is composed of the Pleistocene aged aquifers of the New Orleans area, the Baton Rouge area, and St. Tammany, Tangipahoa, and Washington Parishes. The aquifers are in Pleistocene aged alluvial and terrace deposits. The sedimentary sequences that make up the aquifer system are subdivided into several aquifer units separated by confining beds. Northward within southeast Louisiana, fewer units are recognized because some younger units pinch out updip and some clay layers present to the south disappear. Where clay layers are discontinuous or disappear, aquifer units coalesce. The aquifers are moderately well, to well sorted, and consist of fine sand near the top, grading to coarse sand and gravel in lower parts and are generally confined by silt and clay layers.

HYDROGEOLOGY

The deposits that constitute the individual aquifers are not readily differentiated at the surface and act as one hydraulic system that can be subdivided into several hydrologic zones in the subsurface. The Mississippi River Valley is entrenched into the Pleistocene strata in the western part of the system, resulting in water movement between the river, the shallow sands, and the Pleistocene aquifers. Recharge occurs primarily by the direct infiltration of rainfall in interstream, upland outcrop areas, by the movement of water between aquifers, and between the aquifers and the Mississippi River. The hydraulic conductivity varies between 10-200 feet/day.

The maximum depths of occurrence of freshwater in the Chicot Equivalent aquifer range from 350 feet above sea level, to 1,100 feet below sea level. The range of thickness of the fresh water interval in the Chicot Equivalent aquifer is 50 to 1,100 feet. The depths of the Chicot Equivalent aquifer wells that were monitored in conjunction with ASSET range from 90 to 775 feet.

PROGRAM PARAMETERS

The field parameters checked at each ASSET well sampling site and the list of conventional parameters analyzed in the laboratory are shown in Table 12-2. The inorganic parameters analyzed in the laboratory are listed in Table 12-3. These tables also show the field and analytical results determined for each analyte. For quality control, duplicate samples were taken for each parameter from wells AN-321 and AN-266.

In addition to the field, conventional and inorganic analytical parameters, the target analyte list includes three other categories of compounds: volatiles, semi-volatiles, and pesticides/PCBs. Due to the large number of analytes in these categories, tables were not prepared showing the analytical results for these compounds. A discussion of any detections from any of these three categories, if necessary, can be found in their respective sections. Tables 12-8, 12-9 and 12-10 list the target analytes for volatiles, semi-volatiles and pesticides/PCBs, respectively.

Tables 12-4 and 12-5 provide a statistical overview of field and conventional data, and inorganic data for the Chicot Equivalent aquifer, listing the minimum, maximum, and average results for these parameters collected in the FY 2021 sampling. Tables 12-6 and 12-7 compare these same parameter averages to historical ASSET-derived data for the Chicot Equivalent aquifer, from previous fiscal years.

The average values listed in the above referenced tables are determined using all valid, reported results, including those reported as non-detect, or less than the detection limit (< DL). The average values listed in the above referenced tables are determined using all valid, reported results, including those reported as non-detect, or less than the detection limit (< DL). The method used to generate the descriptive statistics varies, depending on the dataset and the proportion of values that are <DL. When estimating a dataset with more than 50 observations, the Maximum Likelihood Estimation (MLE) method is used. This is used to describe Upper and Lower confidence intervals or historical descriptive statistics. For datasets of less than 50 observations, the Kapan-Meier method is used. This is used to calculate descriptive statistics of

a single sampling round. If all values for a particular analyte are reported as < DL, then the minimum, maximum, and average values are all reported as < DL.

Charts 12-1 through 12-18 represent the trend of the graphed parameter, based on the averaged value of that parameter for each three-year reporting period. Discussion of historical data and related trends is found in the **Water Quality Trends and Comparison to Historical ASSET Data** section.

INTERPRETATION OF DATA

Under the Federal Safe Drinking Water Act, EPA has established primary maximum contaminant levels (MCLs) for pollutants that may pose a health risk in public drinking water. An MCL is the highest level of a contaminant that EPA allows in public drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. While not all wells sampled were public supply wells, the ASSET Program uses MCLs as a benchmark for further evaluation.

EPA has also set secondary standards, which are defined as non-enforceable taste, odor, or appearance guidelines. Field and laboratory data contained in Tables 12-2 and 12-3 show that five parameters exceeded secondary MCLs (SMCL) in 15 of the 24 wells sampled in the Chicot Equivalent aquifer.

Field and Conventional Parameters

Table 12-2 shows the field and conventional parameters for which samples are collected at each well and the analytical results for those parameters. Table 12-6 provides an overview of field and conventional parameter data averages for the Chicot Equivalent aquifer, including the eight previous sampling event averages.

Federal Primary Drinking Water Standards: A review of the data listed in Table 12-2 shows that no primary MCL was exceeded for field or conventional parameters for this reporting period. Wells reporting turbidity levels greater than 1.0 NTU do not exceed the Primary MCL of 1.0, as this standard applies to public supply water wells that are under the direct influence of surface water. The Louisiana Department of Health has determined that no public water supply well in Louisiana was in this category.

Federal Secondary Drinking Water Standards: A review of the data listed in Table 12-2 shows that seven wells exceeded the SMCL for pH, three wells exceeded the SMCL for chloride, one well exceeded the SMCL for color, and five wells exceeded the SMCL for total dissolved solids. Laboratory results override field results in exceedance determination, thus only laboratory results are counted in determining SMCL exceedance numbers. Following is a list of SMCL parameter exceedances with well number and results:

pH (SMCL = 6.5 – 8.5 Standard Units):

AN-6297Z	8.52 SU
EB-5329Z	5.64 SU
LI-7965Z	6.46 SU
SH-5333Z	6.16 SU
TA-7627Z	5.77 SU

WA-5295Z	5.90 SU
WA-5311Z	5.23 SU

Chloride (SMCL = 250 mg/L):

AN-6297Z	629.0 mg/L
SC-179	347.0 mg/L
SJB-173	297.0 mg/L

Color (SMCL = 15 PCU):

JF-224	30 PCU

Total Dissolved Solids (SMCL = 500 mg/L or 0.5 g/L):

	LAB RESULTS (in mg/L)	FIELD MEASUSRES (in g/L)
AN-321	595 mg/L (Duplicate – 555 mg/L)	0.75 g/L (Original and Duplicate)
AN-6297Z	1200 mg/L	1.61 g/L
JF-224	695 mg/L	0.81 g/L
SC-179	1060 mg/L	1.33 g/L
SJB-173	1000 mg/L	1.18 g/L

Inorganic Parameters

Table 12-3 shows the inorganic (total metals) parameters for which samples are collected at each well and the analytical results for those parameters. Table 12-7 provides an overview of inorganic parameter data averages for the Chicot Equivalent aquifer, including the eight previous sampling event averages.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 10-3 shows that no MCL was exceeded for inorganics.

Federal Secondary Drinking Water Standards: A review of the analysis listed in Table 12-3 shows that seven wells exceeded the secondary MCL for iron:

Iron (SMCL = 300 µg/L):

AN-6297Z	2440 µg/L
EB-34	434 µg/L
EB-1231	1490 µg/L
SH-77	331µg/L
SJ-226	786 µg/L
SJB-173	527µg/L

Volatile Organic Compounds

Table 12-8 shows the volatile organic compound (VOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however, any detection of a VOC would be discussed in this section.

No VOC was detected at or above its detection limit during the FY 2021 sampling of the Chicot Equivalent aquifer.

Semi-Volatile Organic Compounds

Table 12-9 shows the semi-volatile organic compound (SVOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however any detection of a SVOC would be discussed in this section.

No SVOC was detected at or above its detection limit during the FY 2021 sampling of the Chicot Equivalent aquifer.

Pesticides and PCBs

Table 12-10 shows the pesticide and PCB parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however any detection of a pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected at or above its detection limit during the FY 2021 sampling of the Chicot Equivalent aquifer.

WATER QUALITY TRENDS AND COMPARISON TO HISTORICAL ASSET DATA

Analytical and field data show that the quality and characteristics of groundwater produced from the Chicot Equivalent aquifer exhibit some changes when comparing current data to that of the six previous sampling rotations. These comparisons can be found in Tables 12-6 and 12-7, and in Charts 12-1 to 12-18 of this summary. Increasing or decreasing trend statements made here are based on an R-square value (slope) of 0.03 or greater. An R-square value of less than 0.03 is considered to have only a slight or no change. Increasing or decreasing trend statements made here are based on an R-square value of 0.03 or greater and a p-value of 0.05.

Over the 24-year period specific conductance trends upwards at a rate of 7.882 per month. The only analyte that exhibits a downward trend is alkalinity. This decreases at a rate of 3.59 per month. All other analyte averages have remained consistent or have been non-detect for this period.

The number of secondary exceedances in the Chicot Equivalent aquifer has decreased since the previous sampling in FY 2018. In FY 2018 there were 30 SMCL exceedances, whereas in FY 2021 there were 25 SMCL exceedances. Industrial well, SJ-266, continues to report similar concentrations of arsenic for FY 2021, at 8.6 µg/L. Previously arsenic was reported at 7.8 µg/L.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the groundwater produced from this aquifer is soft[1] and is of good quality given that no primary MCL was exceeded in any of the wells sampled in FY 2021. The data also show that this aquifer is of fair quality when considering taste, odor, or appearance guidelines, with 25 SMCLs exceeded in 15 wells.

Comparison to historical ASSET-derived data shows some change in the quality or characteristics of the Chicot Equivalent aquifer, with specific conductivity showing an increasing trend in average concentrations and alkalinity with a decreasing trend in average concentration. The remainder of the analyte averages staying consistent over the 24-year period.

Close attention will continue to be given to the occurrence of arsenic in well SJ-226. It is recommended that the wells assigned to the Chicot Equivalent aquifer be re-sampled as planned, in approximately three years. In addition, several wells should be added to the 24 currently in place to increase the well density for this aquifer.

[1] Classification based on hardness scale from: Peavy, H. S. et al. *Environmental Engineering*. New York: McGraw-Hill, 1985.

Table 12-1: List of Wells Sampled, Chicot Equivalent Aquifer – FY 2021

Well ID	Parish	Date	Owner	Depth (Feet)	Well Use
AN-266	Ascension	04/14/2021	City of Gonzales	548	Public Supply
AN-321	Ascension	05/042021	Rubicon, Inc.	523	Industrial
AN-337	Ascension	05/05/2021	BASF Corp.	459	Public Supply
AN-500	Ascension	05/04/2021	Lion Copolymer	480	Industrial
AN-6297Z	Ascension	05/05/2021	Oxy Chemical	294	Monitor
AN-9183Z	Ascension	04/14/2021	Private Owner	630	Domestic
EB-1231	East Baton Rouge	09/10/2020	Georgia Pacific Corp.	280	Industrial
EB-34	East Baton Rouge	11/17/2020	ExxonMobil USA	453	Industrial
EB-8599Z	East Baton Rouge	09/10/2020	Private Owner	180	Domestic
EB-991B	East Baton Rouge	11/17/2020	Baton Rouge Water Works	565	Public Supply
EF-5329Z	East Feliciana	09/09/2020	Private Owner	97	Domestic
JF-224	Jefferson	03/30/2021	Entergy	775	Industrial
LI-5477Z	Livingston	04/14/2021	Private Owner	106	Domestic
LI-7945Z	Livingston	05/06/2021	French Settlement Water System	455	Public Supply
LI-7965Z	Livingston	06/25/2021	LIGO	205	Public Supply
SC-179	St. Charles	04/15/2021	Union Carbide	460	Industrial
SH-5333Z	St. Helena	10/21/2020	Private Owner	230	Domestic
SH-77	St. Helena	10/21/2020	Transco	170	Public Supply
SJ-226	St. James	04/15/2021	Noranda Alumina, LLC	248	Industrial
SJB-173	St. John the Baptist	06/23/2021	DuPont	425	Industrial
ST-11516Z	St. Tammany	03/22/2021	Louisiana State Parks	340	Domestic
TA-7627Z	Tangipahoa	03/08/2021	Global Wildlife Center	120	Domestic
WA-5295Z	Washington	03/09/2021	Private Owner	100	Domestic
WA-5311Z	Washington	03/10/2021	Private Owner	90	Domestic

Table 12-2: Summary of Field and Conventional Data –FY 2021 Chicot Equivalent Aquifer

Well ID	pH SU	Sal ppt	Sp Cond µmhos/cm	Temp Deg C	TDS g/L	Alk mg/L	Cl mg/L	Color PCU	Hard mg/L	Nitrite-Nitrate (as N) mg/L	NH3 mg/L	Tot P mg/L	Sp Cond µmhos/cm	SO4 mg/L	TDS mg/L	TKN mg/L	TSS mg/L	Turb NTU
	Laboratory Reporting Limits →					2	1	5	5	0.05	0.1	0.05	1	1	10	0.1	4	0.1
	Field Parameters					Laboratory Parameters												
AN-266	8.02	0.18	0.37	22.69	0.24	136	21.20	10	26	< DL	< DL	0.15	0.43	3.50	190	0.59	< DL	0.34
AN-266*	8.02	0.18	0.37	22.73	0.24	118	20.90	10	44	< DL	< DL	0.22	0.37	3.50	180	0.43	< DL	0.53
AN-321	8.07	0.57	1.15	25.03	0.75	141	221	< DL	42	< DL	1.00	0.58	1.10	< DL	595	0.65	< DL	0.94
AN-321*	8.07	0.57	1.16	25.97	0.75	141	214	< DL	46	< DL	1.30	0.62	1.07	< DL	555	0.63	< DL	0.36
AN-337	8.20	0.24	0.49	23.51	0.32	159	45.30	< DL	34	< DL	1.80	0.48	0.54	< DL	250	1.00	< DL	0.56
AN-500	8.34	0.19	0.39	23.71	0.25	141	26.50	< DL	30	< DL	0.92	0.53	0.40	2.70	170	0.77	< DL	1.20
AN-6297Z	8.52	1.28	2.48	21.78	1.61	178	629	< DL	166	< DL	4.90	0.57	2.88	< DL	1200	1.40	5.00	10.30
AN-9183Z	8.34	0.22	0.16	20.21	0.30	145	39.20	10	8	< DL	< DL	0.20	0.55	3.20	270	0.42	< DL	0.24
EB-1231	6.63	0.13	0.28	23.28	0.18	80	25.30	< DL	76	0.05	< DL	< DL	0.35	10.40	150	< DL	< DL	12.50
EB-34	6.84	0.18	0.38	20.59	0.24	166	14.40	10	156	< DL	0.39	0.11	0.48	2.80	265	0.55	< DL	0.79
EB-8599Z	6.51	0.10	0.21	23.78	0.13	72	16.50	< DL	56	< DL	< DL	0.08	0.27	4.10	130	0.50	6.00	2.30
EB-991B	7.54	0.13	0.27	22.09	0.17	122	3.50	< DL	70	< DL	0.15	0.13	0.31	8.00	240	0.43	< DL	0.15
EF-5329Z	5.64	0.03	0.06	23.79	0.04	23	4.60	< DL	14	0.17	< DL	< DL	0.07	2.10	10	< DL	< DL	1.70
JF-224	8.35	0.62	1.24	24.72	0.81	281	217	30	24	< DL	0.90	0.73	1.73	< DL	695	1.30	< DL	0.46
LI-5477Z	7.97	0.21	0.44	20.96	0.28	181	8.30	10	54	< DL	< DL	0.25	0.50	< DL	230	0.81	< DL	0.29
LI-7945Z	8.23	0.34	0.69	23.42	0.45	131	114	< DL	54	< DL	0.39	0.50	0.75	2.10	360	1.10	< DL	0.17
LI-7965Z	6.46	0.07	1.55	22.02	0.10	42	10.10	< DL	46	< DL	< DL	0.07	0.15	3.20	90	0.52	< DL	0.24
SC-179	8.12	1.04	2.04	21.99	1.33	363	347	10	82	< DL	2.00	0.49	2.49	< DL	1060	2.60	< DL	0.56
SH-5333Z	6.16	0.04	0.09	21.07	60.98	18	9.10	< DL	26	0.06	< DL	< DL	0.08	< DL	10	0.35	6.00	1.20
SH-77	7.08	0.06	1.21	23.11	78.51	28	2.90	< DL	40	< DL	0.23	< DL	0.09	< DL	35	1.00	< DL	5.70
SJ-226	7.73	0.44	0.89	19.85	0.58	181	124	< DL	178	< DL	0.81	0.65	1.06	14.50	460	1.40	< DL	3.90
SJB-173	7.76	0.91	0.00	26.32	1.18	339	297	< DL	174	< DL	1.90	0.30	1.86	< DL	1000	1.70	< DL	0.90
ST-11516Z	8.10	0.13	2.84	23.00	0.18	146	9.60	10	34	< DL	< DL	0.36	0.33	3.00	160	0.43	< DL	0.30
TA-7627Z	5.77	0.02	0.04	20.66	0.02	8	3.80	< DL	14	< DL	< DL	< DL	0.03	< DL	30	0.17	< DL	0.35
WA-5295Z	5.90	0.02	0.04	20.84	0.02	10	2.60	10	14	< DL	< DL	0.05	0.04	< DL	40	0.18	< DL	0.45
WA-5311Z	5.23	0.01	0.03	21.38	0.02	6	3.30	10	10	0.26	< DL	< DL	0.02	< DL	10	0.13	< DL	0.14

* Duplicate Sample NR – Field Measure Not Recorded Exceed EPA Secondary Standards

Table 12-3: Summary of Inorganic Data – FY 2021 Chicot Equivalent Aquifer

Well ID	Antimony ug/L	Arsenic ug/L	Barium ug/L	Beryllium ug/L	Cadmium ug/L	Chromium ug/L	Copper ug/L	Iron ug/L	Lead ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Silver ug/L	Thallium ug/L	Zinc ug/L
Laboratory Reporting Limits	1	1	1	0.5	1	1	3	50	1	0.2	1	1	0.5	0.5	5
AN-266	< DL	< DL	115	< DL	< DL	< DL	< DL	168	< DL	< DL	< DL	< DL	< DL	< DL	< DL
AN-316	< DL	< DL	116	< DL	< DL	< DL	< DL	158	< DL	< DL	< DL	< DL	< DL	< DL	< DL
AN-321	< DL	< DL	200	< DL	< DL	< DL	< DL	173	< DL	< DL	< DL	< DL	< DL	< DL	< DL
AN-321*	< DL	< DL	198	< DL	< DL	< DL	< DL	124	< DL	< DL	< DL	< DL	< DL	< DL	10.20
AN-337	< DL	< DL	75.90	< DL	< DL	< DL	4.1	70.70	< DL	< DL	< DL	< DL	< DL	< DL	< DL
AN-500	< DL	< DL	100	< DL	< DL	< DL	< DL	251	1.90	< DL	< DL	< DL	< DL	< DL	223
AN-6297Z	< DL	< DL	543	< DL	< DL	< DL	< DL	2440	< DL	< DL	< DL	< DL	< DL	< DL	< DL
AN-9183Z	< DL	< DL	35.20	< DL	< DL	< DL	7.20	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
EB-1231	< DL	0.59	203	< DL	< DL	3.50	9.60	1490	1.60	< DL	2.30	1.80L	< DL	< DL	1.30
EB-34	< DL	1.0	159	< DL	< DL	< DL	9.70	434	< DL	< DL	< DL	< DL	< DL	< DL	10.60
EB-8599Z	< DL	< DL	225	< DL	< DL	0.52	< DL	283	< DL	< DL	< DL	< DL	< DL	< DL	10.80
EB-991B	< DL	0.82	29.20	< DL	< DL	< DL	< DL	72.30	< DL	< DL	< DL	< DL	< DL	< DL	< DL
EF-5329Z	< DL	< DL	26.80	< DL	< DL	< DL	165	72.50	8.70	< DL	0.98	< DL	< DL	< DL	45.60
JF-224	< DL	< DL	123	< DL	< DL	< DL	< DL	88.40	2.00	< DL	< DL	< DL	< DL	< DL	< DL
LI-5477Z	< DL	1.10	87.80	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
LI-7945Z	< DL	< DL	177	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	70.20
LI-7965Z	< DL	< DL	144	< DL	< DL	1.60	14.50	< DL	1.30	< DL	3.00	< DL	< DL	< DL	7.30
SC-179	< DL	< DL	102	< DL	< DL	< DL	11.00	388	< DL	< DL	< DL	< DL	< DL	< DL	< DL
SH-5333Z	< DL	< DL	74.30	< DL	< DL	< DL	133.00	< DL	8.50	< DL	1.30	< DL	< DL	< DL	28.80
SH-77	< DL	< DL	11.80	< DL	< DL	10.00	< DL	331	< DL	< DL	< DL	< DL	< DL	< DL	561
SJ-226	< DL	8.60	305	< DL	< DL	< DL	< DL	786	< DL	< DL	< DL	< DL	< DL	< DL	< DL
SJB-173	< DL	< DL	409	< DL	< DL	< DL	< DL	527	< DL	< DL	1.6	< DL	< DL	< DL	18.80
ST-11516Z	< DL	< DL	16.90	< DL	< DL	< DL	3.40	90.20	< DL	< DL	< DL	< DL	< DL	< DL	< DL
TA-7627Z	< DL	< DL	12.60	< DL	< DL	< DL	5.10	< DL	< DL	< DL	1.20	< DL	< DL	< DL	< DL
WA-5295Z	< DL	< DL	62.20	< DL	< DL	1.30	5.00	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
WA-5311Z	< DL	< DL	12.90	< DL	< DL	< DL	3.10	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL

* Duplicate Sample   Exceed EPA Secondary Standards

Table 12-4: FY 2021 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	pH (SU)	5.23	8.52	7.37
	Salinity (ppt)	0.01	1.28	0.30
	Specific Conductance (mmhos/cm)	0.02	2.04	0.56
	Temperature (^{O}C)	19.85	25.96	22.62
	Total Dissolved Solids (g/L)	0.01	1.61	0.392
LABORATORY	Alkalinity (mg/L)	5.80	363	129.50
	Chloride (mg/L)	2.60	629	93.47
	Color (PCU)	< DL	30	7.69
	Hardness (mg/L)	8	178	58.38
	Nitrite - Nitrate, as N (mg/L)	< DL	0.17	0.07
	Ammonia, as N (mg/L)	< DL	4.90	0.69
	Total Phosphorus (mg/L)	< DL	0.73	0.28
	Specific Conductance (µmhos/cm)	0.03	2.88	0.63
	Sulfate (mg/L)	< DL	14.50	2.93
	Total Dissolved Solids (mg/L)	10	1260	341
	Total Kjeldahl Nitrogen (mg/L)	< DL	2.60	0.74
	Total Suspended Solids (mg/L)	< DL	6	4.19
	Turbidity (NTU)	0.17	10.30	1.79

Table 12-5: FY 2021 Inorganic Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (µg/L)	< DL	< DL	< DL
Arsenic (µg/L)	< DL	10	1.04
Barium (µg/L)	11.80	543	137.10
Beryllium (µg/L)	< DL	0.57	< DL
Cadmium (µg/L)	< DL	< DL	< DL
Chromium (µg/L)	< DL	3.50	0.71
Copper (µg/L)	< DL	165	15.90
Iron (µg/L)	< DL	786	321.04
Lead (µg/L)	< DL	8.70	1.72
Mercury (µg/L)	< DL	< DL	< DL
Nickel (µg/L)	< DL	3.00	1.14
Selenium (µg/L)	< DL	1.80	< DL
Silver (µg/L)	< DL	< DL	< DL
Thallium (µg/L)	< DL	< DL	< DL
Zinc (µg/L)	< DL	561	40.58

Table 12-6: Triennial Field and Conventional Statistics, ASSET Wells

	PARAMETER	AVERAGE VALUES BY FISCAL YEAR								
		FY 1997	FY 2000	FY 2003	FY 2006	FY 2009	FY 2012	FY 2015	FY 2018	FY 2020
FIELD	pH (SU)	7.09	7.23	7.16	7.16	7.28	7.21	7.18	7.43	7.37
FIELD	Salinity (ppt)	0.32	0.30	0.33	0.27	0.29	0.24	0.27	0.30	0.30
FIELD	Specific Conductance (mmhos/cm)	0.618	0.692	0.669	0.540	0.590	0.470	0.600	0.581	0.56
FIELD	Temperature (^{O}C)	21.17	21.90	21.86	22.40	21.69	21.15	22.24	18.82	22.62
FIELD	Total Dissolved Solids (g/L)	-	-	-	0.350	0.380	0.320	0.391	0.391	0.392
LABORATORY	Alkalinity (mg/L)	161	166	158	151	151	134	146	140	129.50
LABORATORY	Chloride (mg/L)	108.6	125.3	120.2	104.1	99.0	112.8	91.3	120.6	93.47
LABORATORY	Color (PCU)	18	22	18	18	17	9	13	17	7.69
LABORATORY	Hardness (mg/L)	46	49	46	45	47	107	79	47	58.38
LABORATORY	Nitrite - Nitrate, as N (mg/L)	0.15	0.15	0.14	0.16	0.12	0.19	0.14	< DL	0.07
LABORATORY	Ammonia, as N (mg/L)	0.58	0.51	0.70	0.58	0.50	0.56	0.42	0.54	0.69
LABORATORY	Total Phosphorus (mg/L)	0.21	0.22	0.14	0.21	0.21	0.45	0.20	2.21	0.28
LABORATORY	Specific Conductance (µmhos/cm)	624	712	653	630	582	565	550	653	0.63
LABORATORY	Sulfate (mg/L)	3.2	2.7	2.7	2.9	2.5	2.6	2.6	2.4	2.93
LABORATORY	Total Dissolved Solids (mg/L)	394	416	365	372	334	388	347	390	341
LABORATORY	Total Kjeldahl Nitrogen (mg/L)	0.89	0.73	0.94	0.67	0.56	0.78	0.64	0.73	0.74
LABORATORY	Total Suspended Solids (mg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	4.19
LABORATORY	Turbidity (NTU)	< DL	< DL	1.9	2.2	1.6	2.4	2.1	1.5	1.79

Table 12-7: Triennial Inorganic Statistics, ASSET Wells

PARAMETER	AVERAGE VALUES BY FISCAL YEAR								
	FY 1997	FY 2000	FY 2003	FY 2006	FY 2009	FY 2012	FY 2015	FY 2018	FY 2020
Antimony (µg/L)	5.3	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Arsenic (µg/L)	< DL	< DL	< DL	< DL	< DL	0.97	< DL	< DL	1.04
Barium (µg/L)	107	141	146	131	123	< DL	146	140.4	137.10
Beryllium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Cadmium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Chromium (µg/L)	< DL	< DL	< DL	< DL	< DL	0.7	0.6	< DL	0.71
Copper (µg/L)	19.6	10.8	15.4	< DL	7.9	17.6	25.5	12.9	15.90
Iron (µg/L)	230	371	641	849	888	443	478	516	321.04
Lead (µg/L)	< DL	< DL	< DL	< DL	< DL	1.45	0.80	1.32	1.72
Mercury (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Nickel (µg/L)	< DL	< DL	< DL	< DL	3.8	0.7	0.79	< DL	1.14
Selenium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Silver (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Thallium (µg/L)	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL	< DL
Zinc (µg/L)	32.2	32.0	37.9	21.3	21.7	37.4	30.9	34.0	40.58

Table 12-8: Volatile Organic Compound List

VOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
1,1,1-TRICHLOROETHANE	624	0.50
1,1,2,2-TETRACHLOROETHANE	624	0.50
1,1,2-TRICHLOROETHANE	624	0.50
1,1-DICHLOROETHANE	624	0.50
1,1-DICHLOROETHENE	624	0.50
1,2-DICHLOROBENZENE	624	0.50
1,2-DICHLOROETHANE	624	0.50
1,2-DICHLOROPROPANE	624	0.50
1,3-DICHLOROBENZENE	624	0.50
1,4-DICHLOROBENZENE	624	0.50
BENZENE	624	0.50
BROMODICHLOROMETHANE	624	0.50
BROMOFORM	624	0.50
BROMOMETHANE	624	1.0
CARBON TETRACHLORIDE	624	0.50
CHLOROBENZENE	624	0.50
CHLOROETHANE	624	0.50
CHLOROFORM	624	0.50
CHLOROMETHANE	624	0.50
CIS-1,3-DICHLOROPROPENE	624	1.0
DIBROMOCHLOROMETHANE	624	0.50
ETHYL BENZENE	624	0.50
METHYLENE CHLORIDE	624	1.0
O-XYLENE (1,2-DIMETHYLBENZENE)	624	0.50
STYRENE	624	0.50
TERT-BUTYL METHYL ETHER	624	0.50
TETRACHLOROETHYLENE (PCE)	624	0.50
TOLUENE	624	0.50
TRANS-1,2-DICHLOROETHENE	624	0.50
TRANS-1,3-DICHLOROPROPENE	624	0.50
TRICHLOROETHYLENE (TCE)	624	0.50
TRICHLOROFLUOROMETHANE (FREON-11)	624	0.50
VINYL CHLORIDE	624	0.50
XYLENES, M & P	624	1.0

Table 12-9: Semi-Volatile Organic Compound List

SVOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
1,2,4-TRICHLOROBENZENE	625	5.0
2,4,6-TRICHLOROPHENOL	625	5.0
2,4-DICHLOROPHENOL	625	5.0
2,4-DIMETHYLPHENOL	625	5.0
2,4-DINITROPHENOL	625	20.0
2,4-DINITROTOLUENE	625	5.0
2,6-DINITROTOLUENE	625	5.0
2-CHLORONAPHTHALENE	625	5.0
2-CHLOROPHENOL	625	5.0
2-NITROPHENOL	625	5.0
3,3'-DICHLOROBENZIDINE	625	5.0
4,6-DINITRO-2-METHYLPHENOL	625	10.0
4-BROMOPHENYL PHENYL ETHER	625	5.0
4-CHLORO-3-METHYLPHENOL	625	5.0
4-CHLOROPHENYL PHENYL ETHER	625	5.0
4-NITROPHENOL	625	20.0
ACENAPHTHENE	625	0.20
ACENAPHTHYLENE	625	0.20
ANTHRACENE	625	0.20
BENZIDINE	625	20.0
BENZO(A)ANTHRACENE	625	0.20
BENZO(A)PYRENE	625	0.20
BENZO(B)FLUORANTHENE	625	0.20
BENZO(G,H,I)PERYLENE	625	0.20
BENZO(K)FLUORANTHENE	625	0.20
BENZYL BUTYL PHTHALATE	625	5.0
BIS(2-CHLOROETHOXY) METHANE	625	5.0
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	625	5.0
BIS(2-ETHYLHEXYL) PHTHALATE	625	5.0
CHRYSENE	625	0.20
DIBENZ(A,H)ANTHRACENE	625	0.20
DIETHYL PHTHALATE	625	5.0
DIMETHYL PHTHALATE	625	5.0
DI-N-BUTYL PHTHALATE	625	5.0
DI-N-OCTYLPHTHALATE	625	5.0
FLUORANTHENE	625	0.20
FLUORENE	625	0.20
HEXACHLOROBENZENE	625	5.0

SVOC ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
HEXACHLOROBUTADIENE	625	5.0
HEXACHLOROCYCLOPENTADIENE	625	10.0
HEXACHLOROETHANE	625	5.0
INDENO(1,2,3-C,D)PYRENE	625	0.20
ISOPHORONE	625	5.0
NAPHTHALENE	625	0.20
NITROBENZENE	625	5.0
N-NITROSODIMETHYLAMINE	625	5.0
N-NITROSODI-N-PROPYLAMINE	625	5.0
N-NITROSODIPHENYLAMINE	625	5.0
PENTACHLOROPHENOL	625	5.00
PHENANTHRENE	625	0.20
PHENOL	625	5.0
PYRENE	625	0.20

Table 12-10: Pesticide and PCB List

PESTICIDE/PCB ANAYTICAL PARAMETERS	METHOD	REPORTING LIMIT (µg/L)
ALDRIN	608	0.025
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	608	0.025
ALPHA ENDOSULFAN	608	0.025
ALPHA-CHLORDANE	608	0.025
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	608	0.025
BETA ENDOSULFAN	608	0.025
CHLORDANE	608	0.20
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	608	0.025
DIELDRIN	608	0.025
ENDOSULFAN SULFATE	608	0.025
ENDRIN	608	0.025
ENDRIN ALDEHYDE	608	0.025
ENDRIN KETONE	608	0.025
GAMMA-CHLORDANE	608	0.025
HEPTACHLOR	608	0.025
HEPTACHLOR EPOXIDE	608	0.025
METHOXYCHLOR	608	0.25
P,P'-DDD	608	0.025
P,P'-DDE	608	0.025
P,P'-DDT	608	0.025
PCB-1016 (AROCHLOR 1016)	608	0.80
PCB-1221 (AROCHLOR 1221)	608	0.80
PCB-1232 (AROCHLOR 1232)	608	0.80
PCB-1242 (AROCHLOR 1242)	608	0.80
PCB-1248 (AROCHLOR 1248)	608	0.80
PCB-1254 (AROCHLOR 1254)	608	0.80
PCB-1260 (AROCHLOR 1260)	608	0.80
TOXAPHENE	608	1.0

Figure 12-1: Location Plat, Chicot Equivalent Aquifer

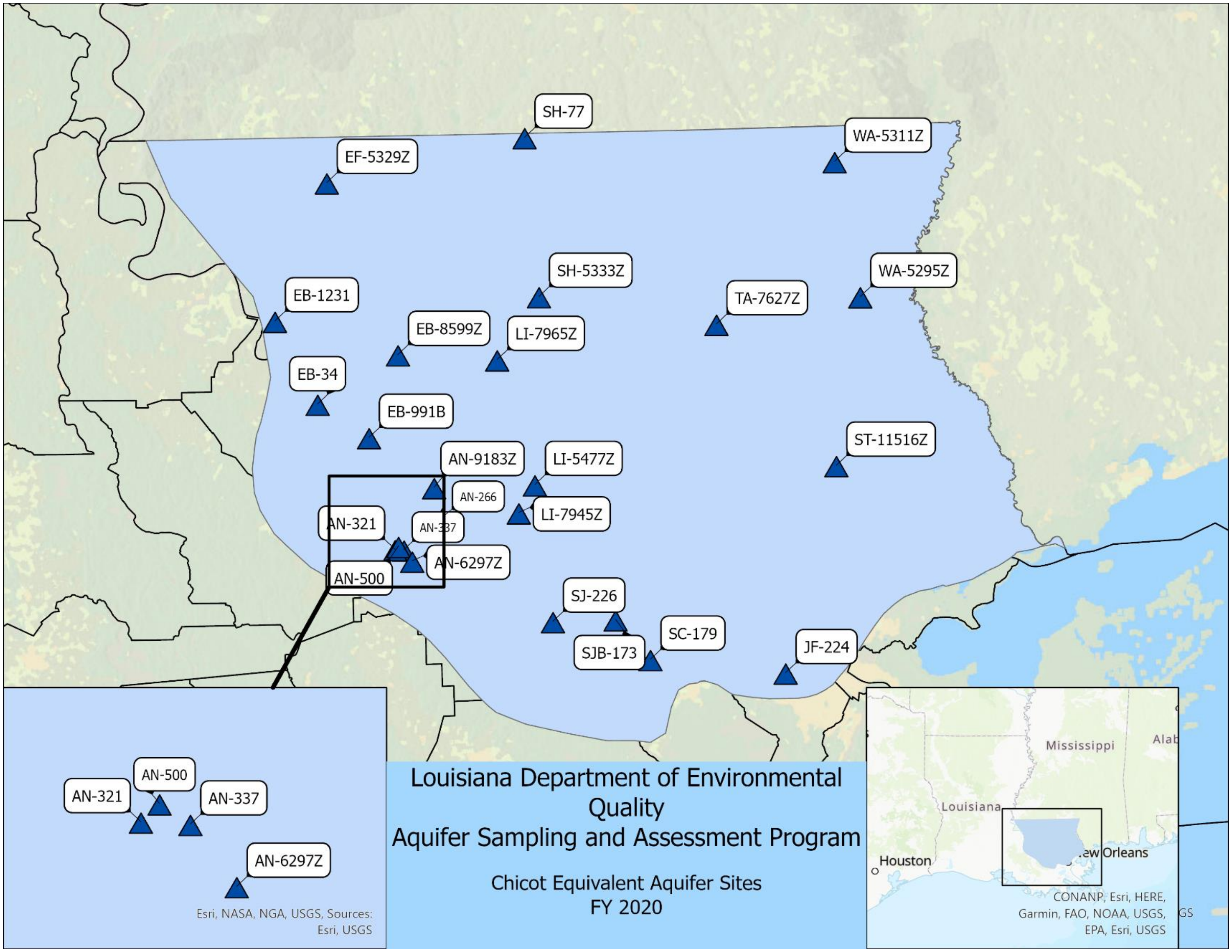
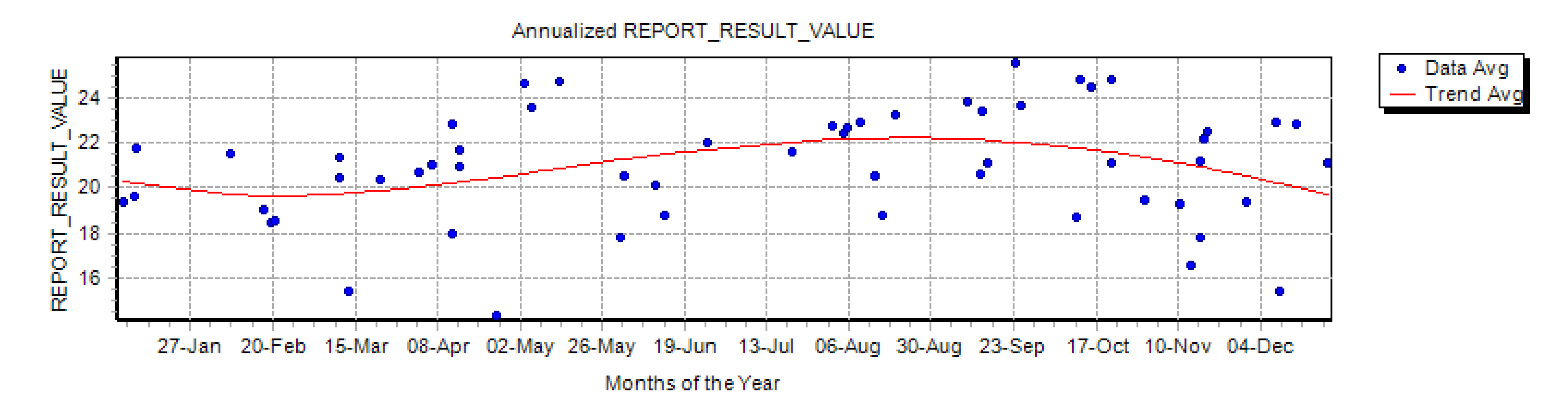


Chart 12-1: Temperature Trend



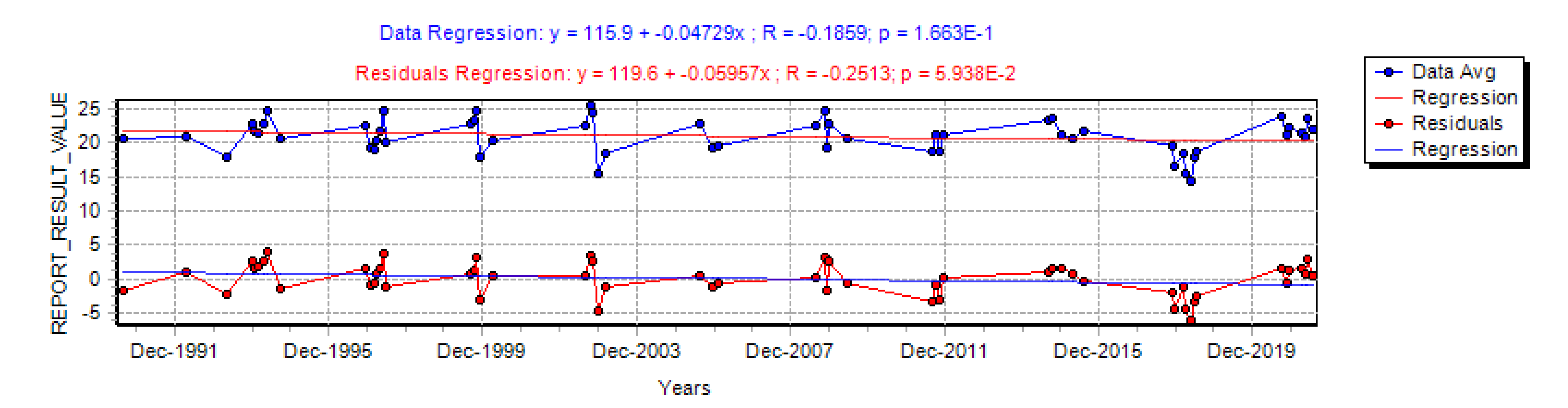
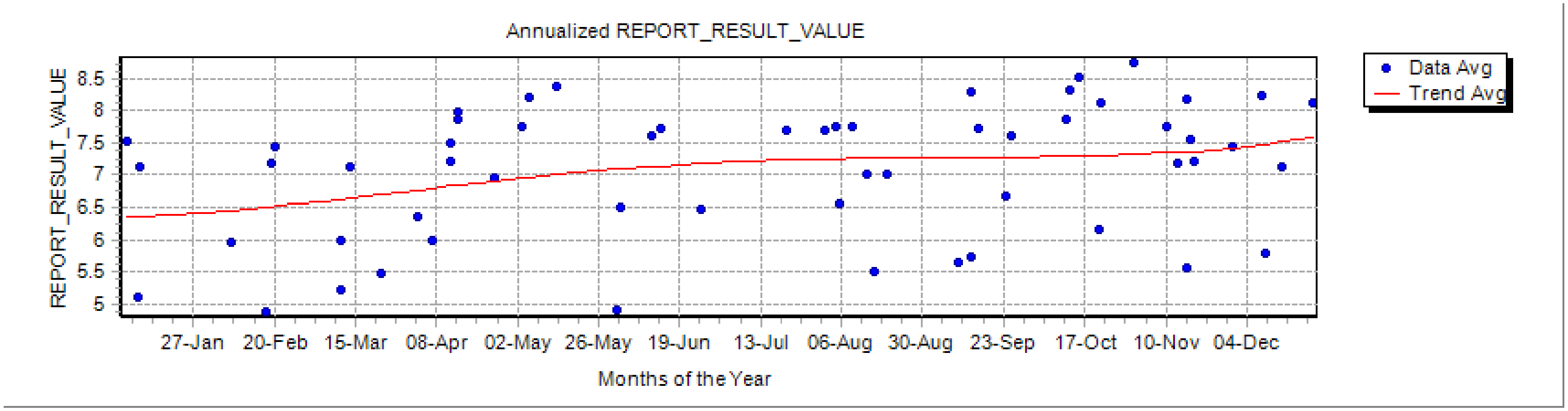


Chart 12-2: pH Trend



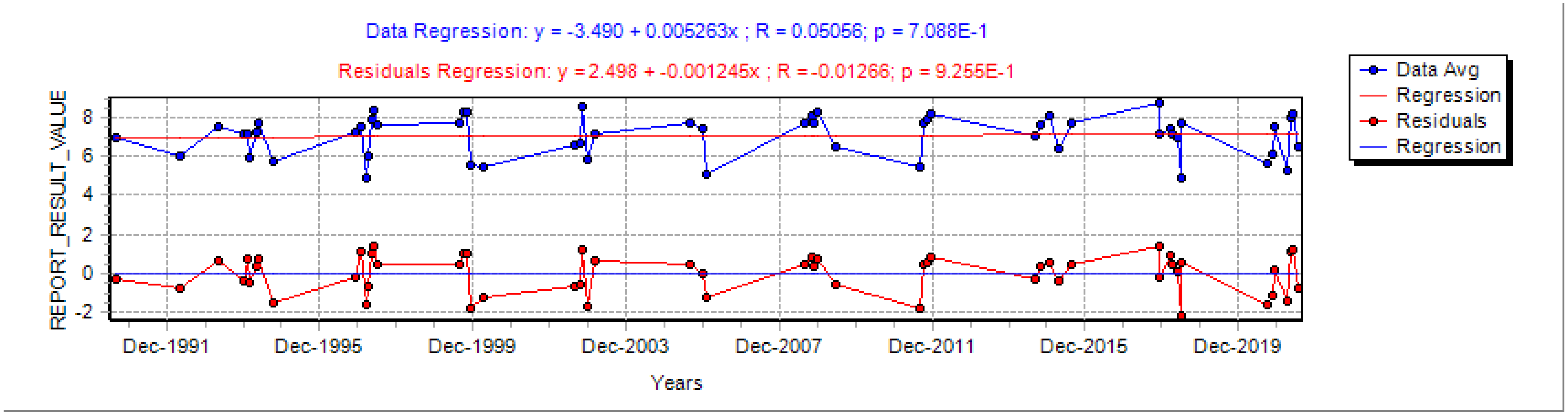
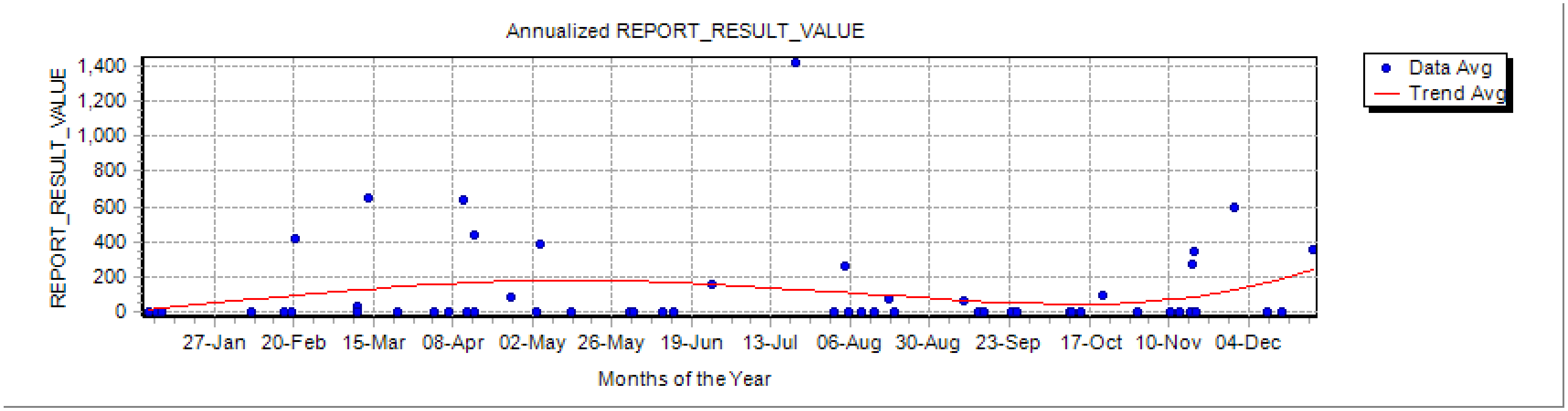


Chart 12-3: Specific Conductance Trend



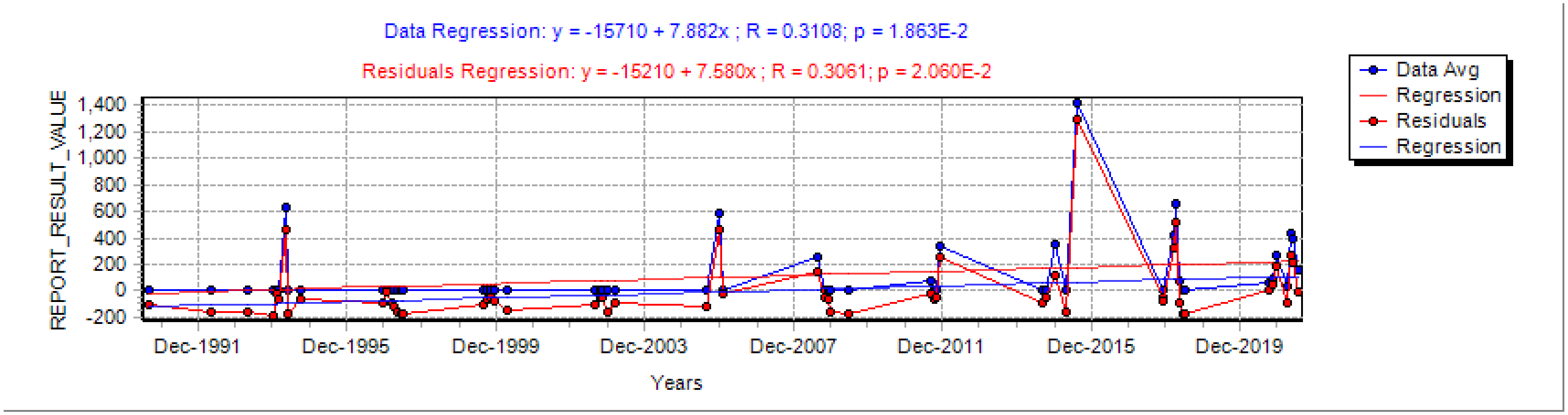
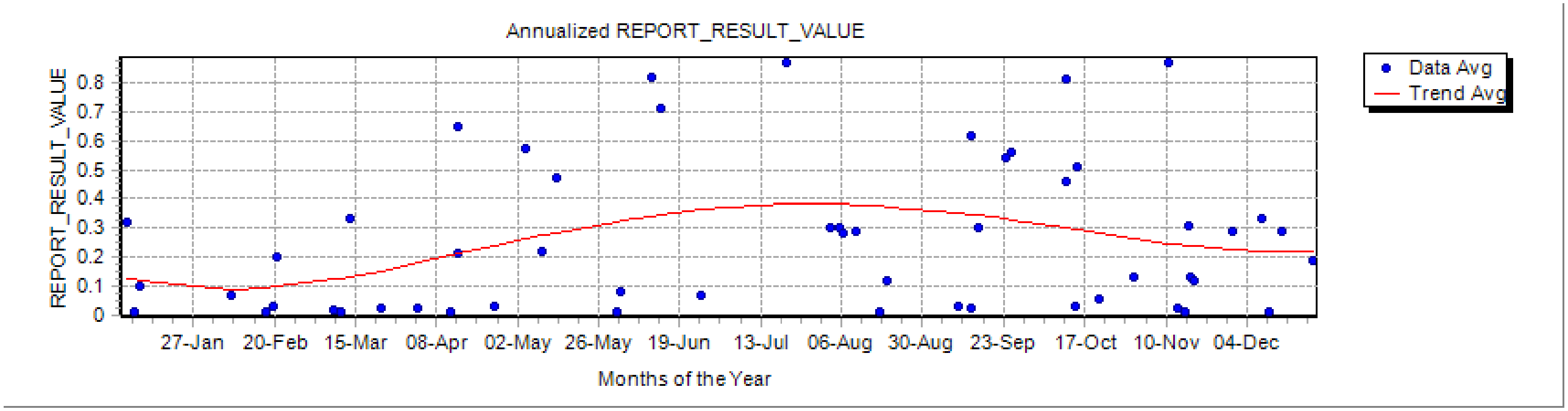


Chart 12-4: Field Salinity Trend



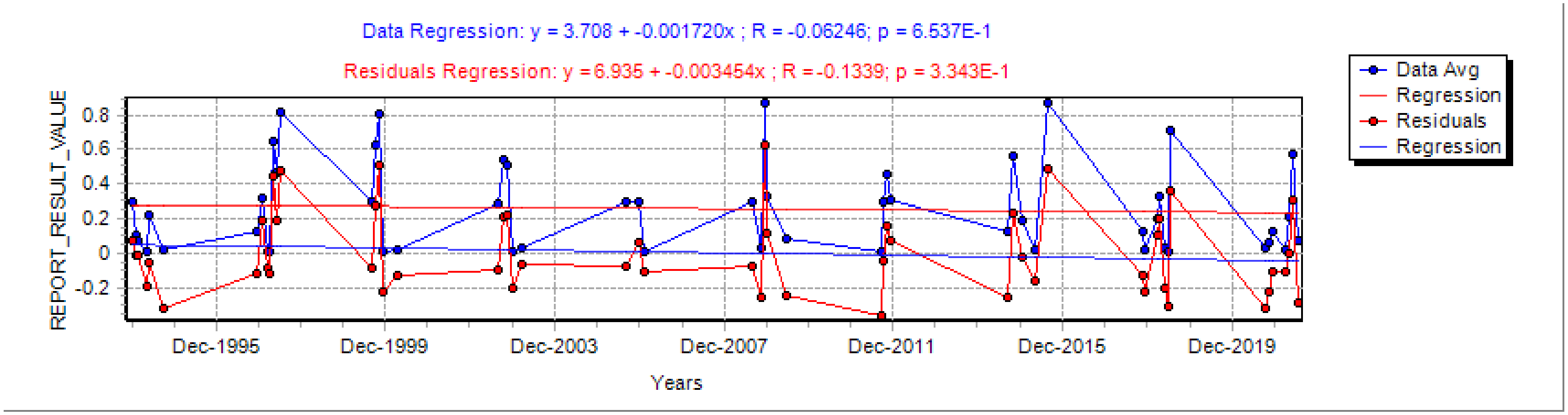
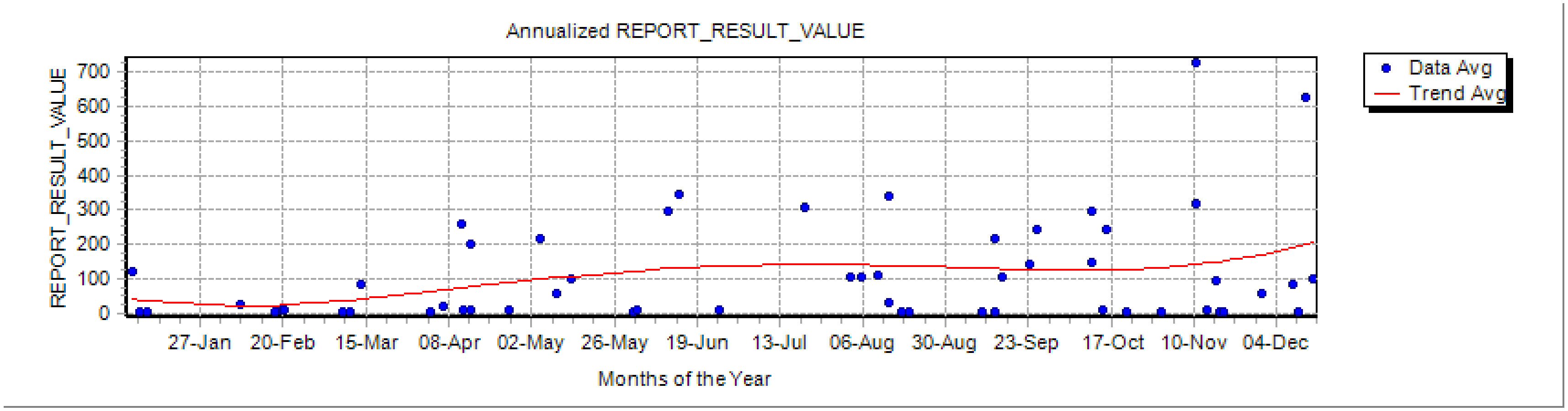


Chart 12-5: Chloride Trend



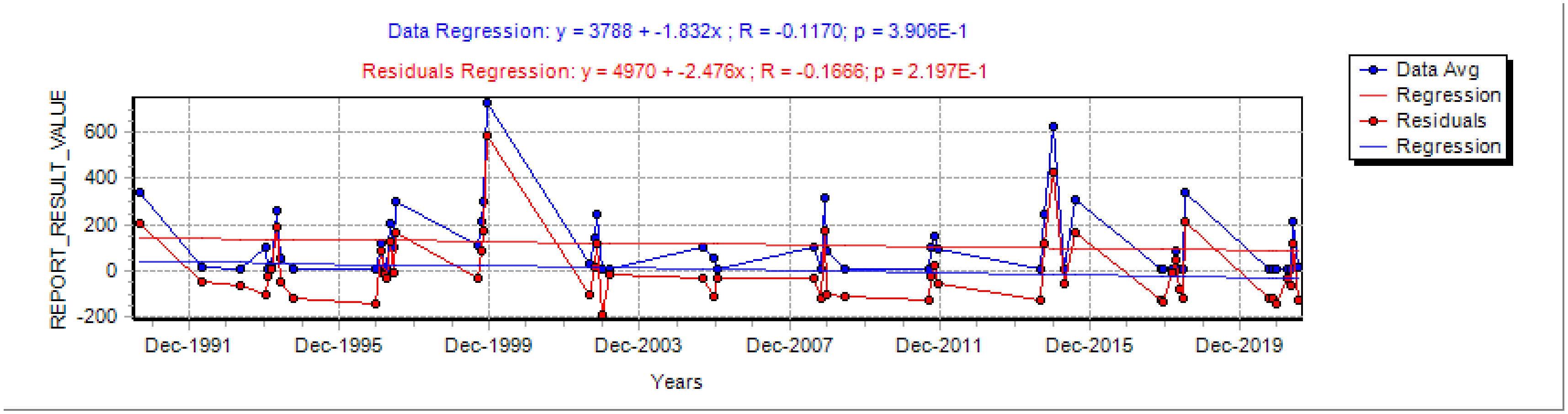
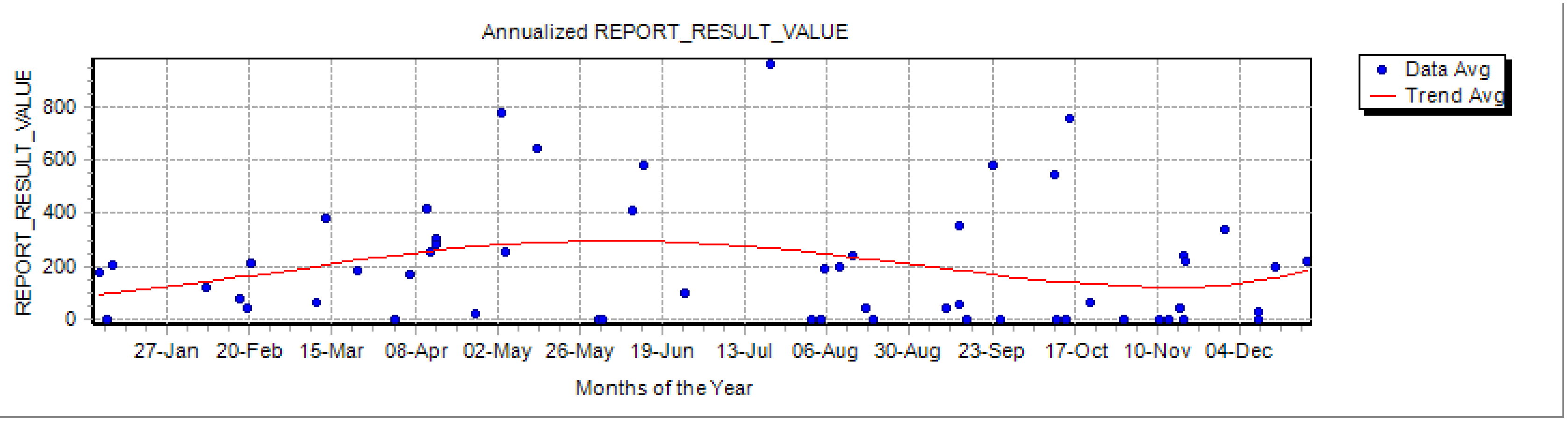


Chart 12-6: Total Dissolved Solids Trend



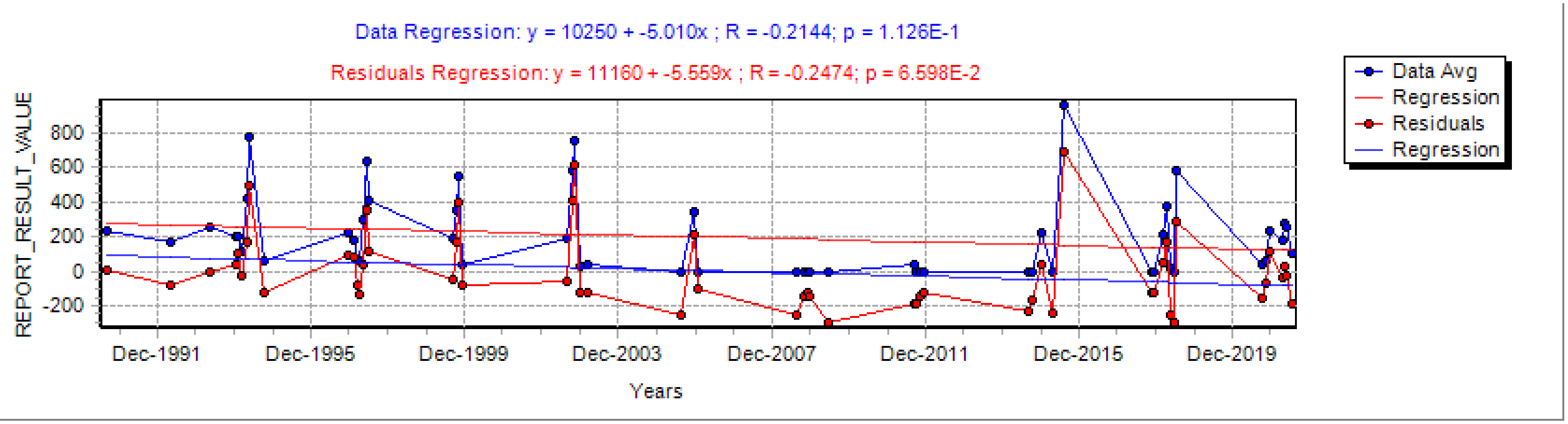


Chart 12-7: Alkalinity Trend

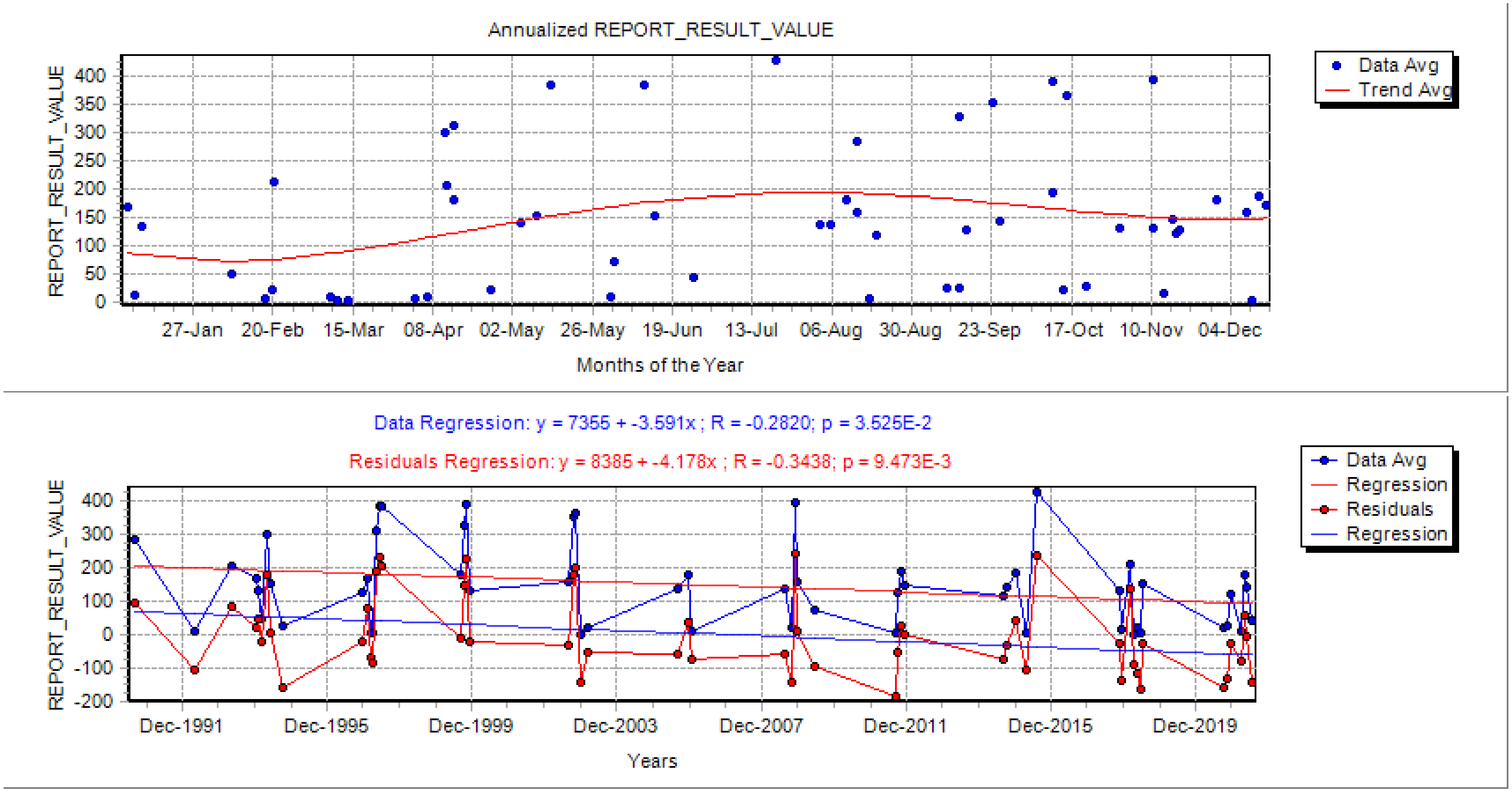
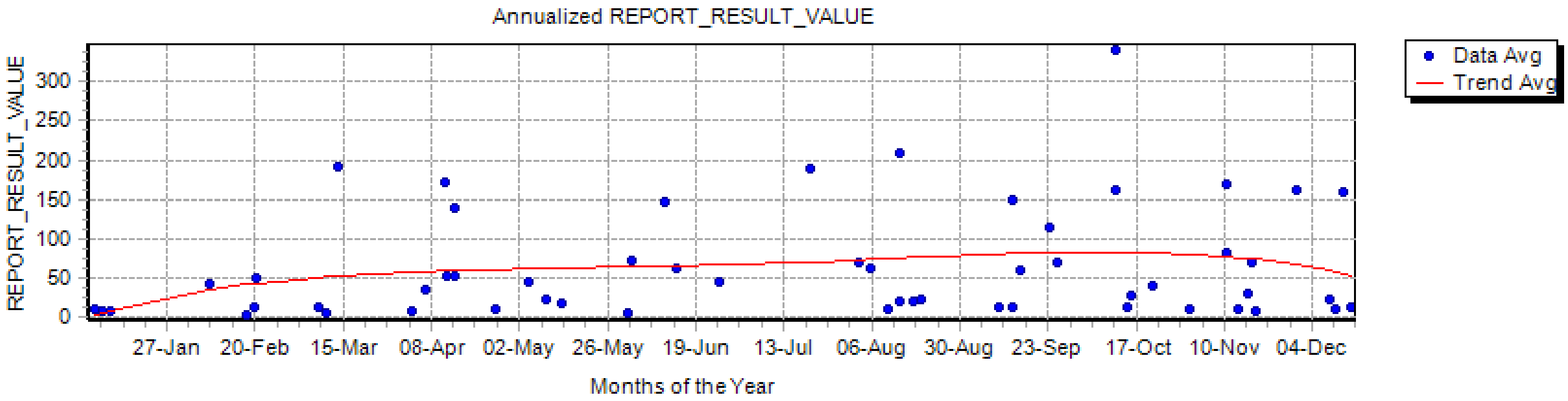


Chart 12-8: Hardness Trend



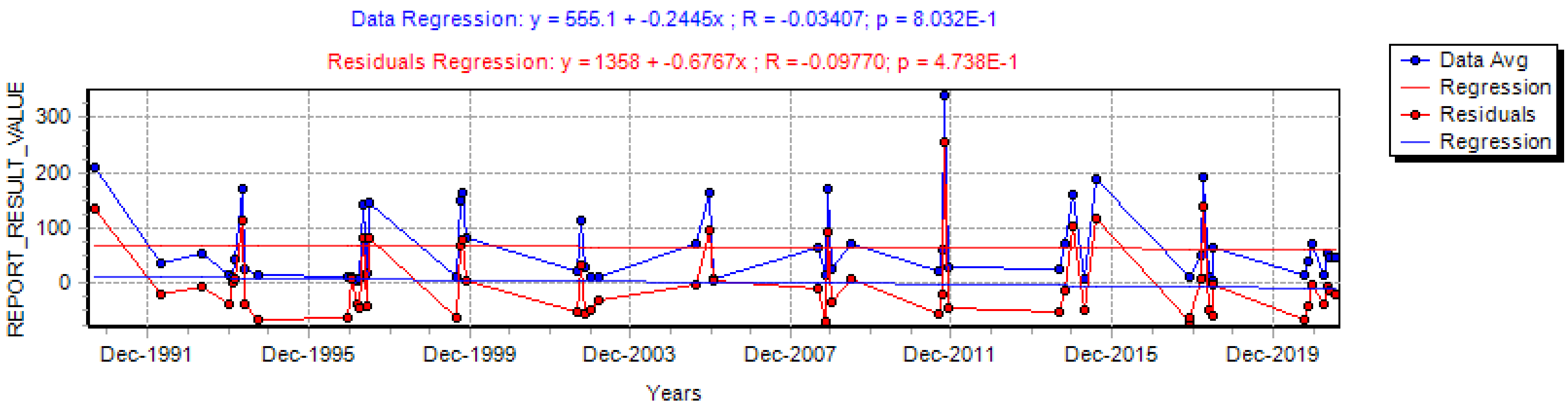
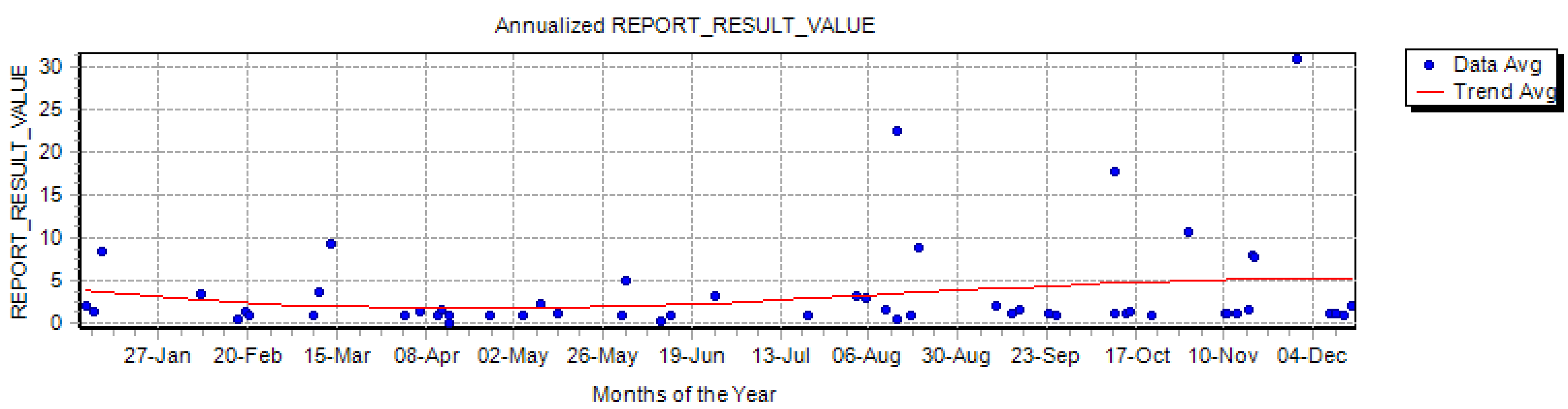


Chart 12-9: Sulfate Trend



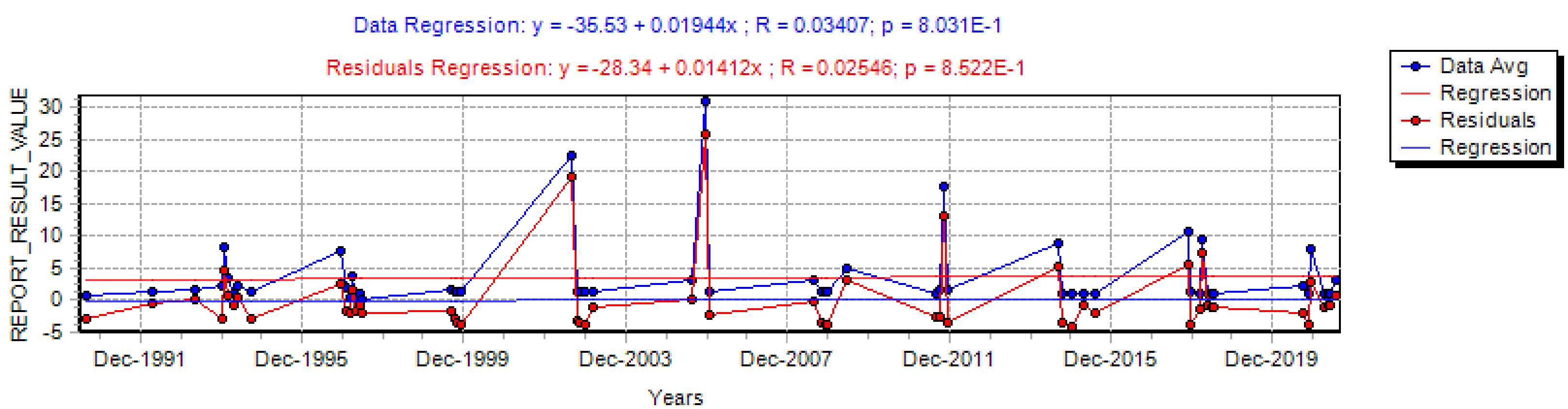
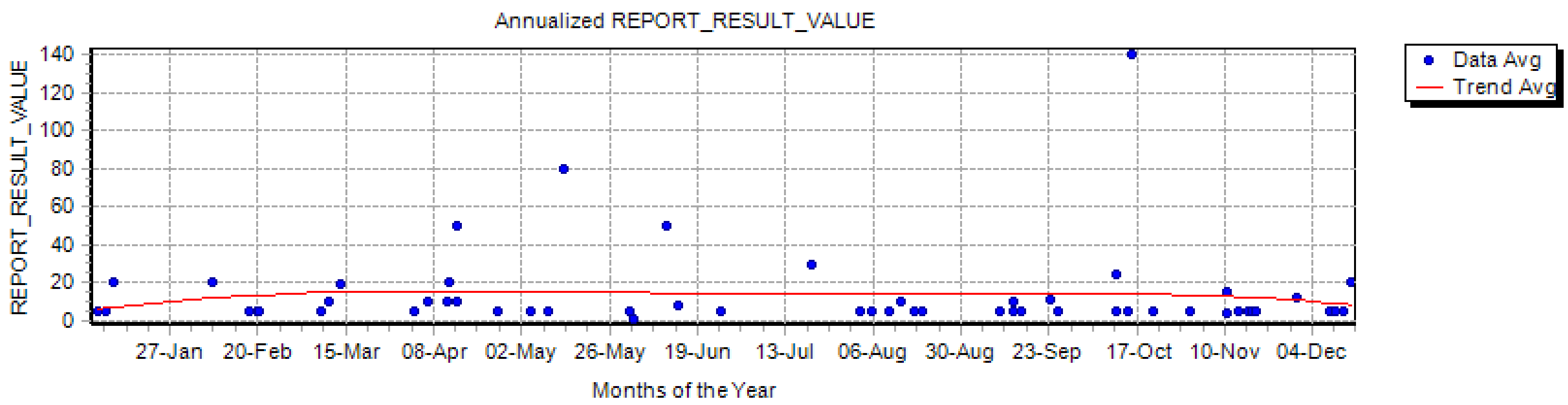


Chart 12-10: Color Trend



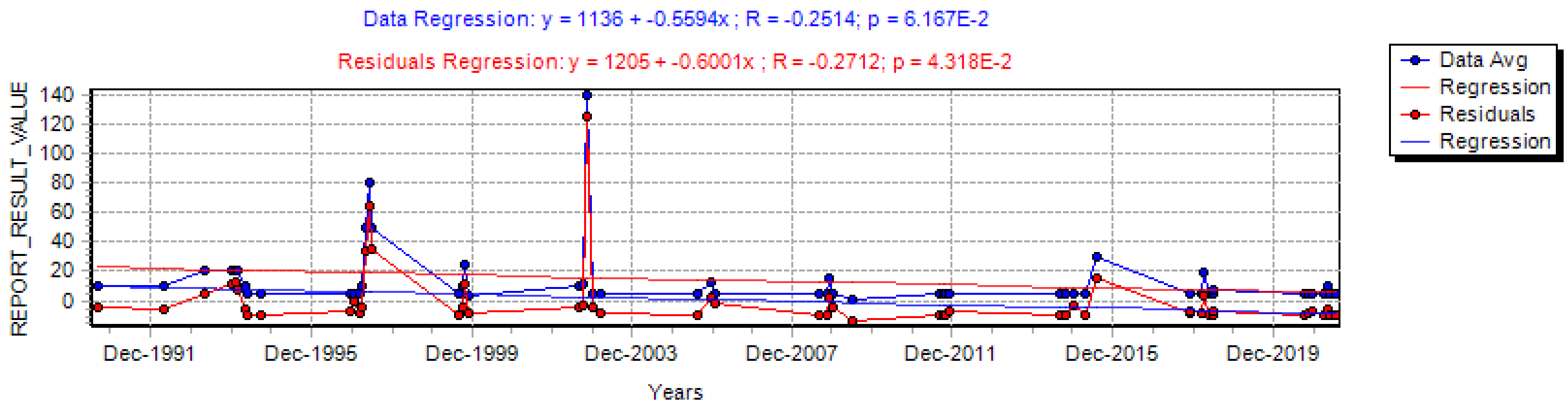
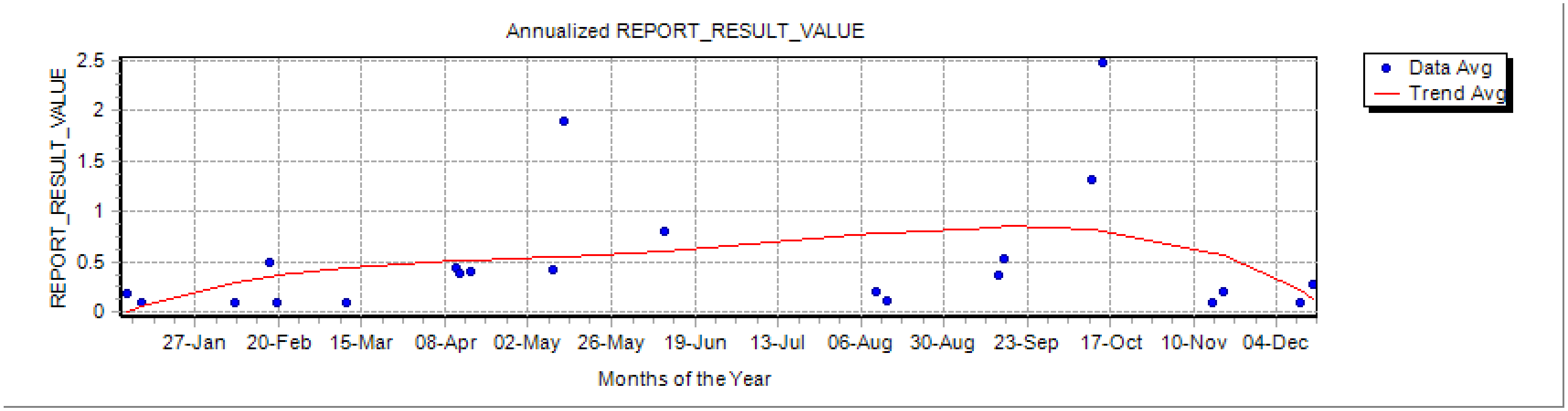


Chart 12-11: Ammonia Trend



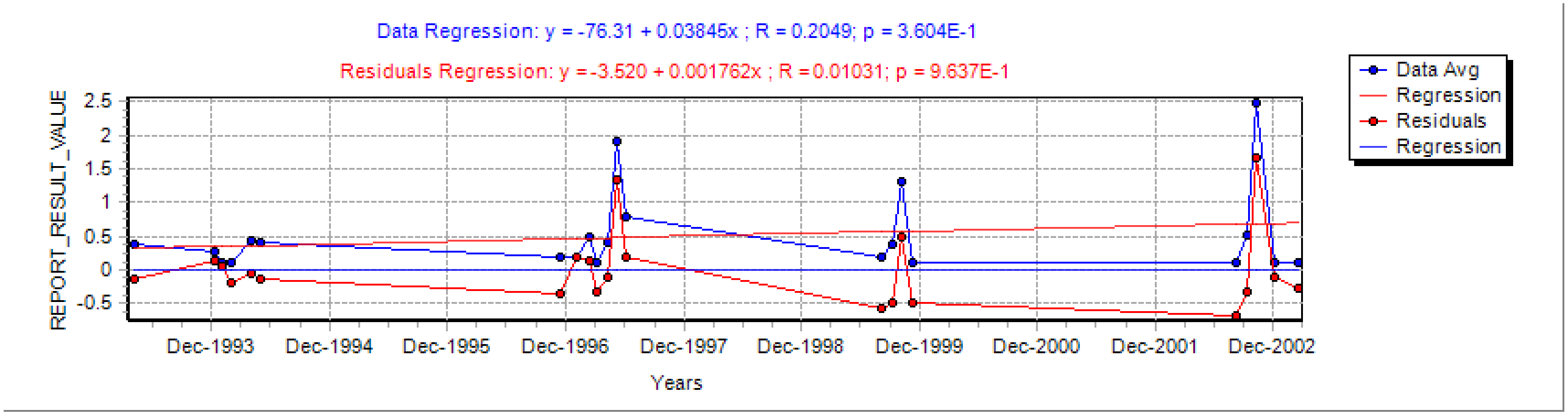
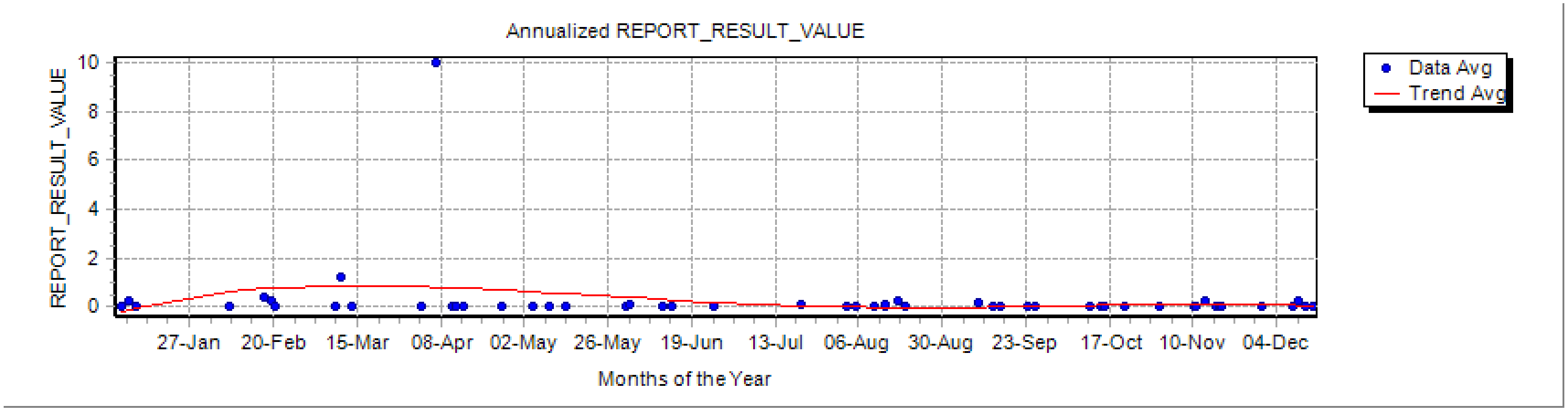


Chart 12-12: Nitrite - Nitrate Trend



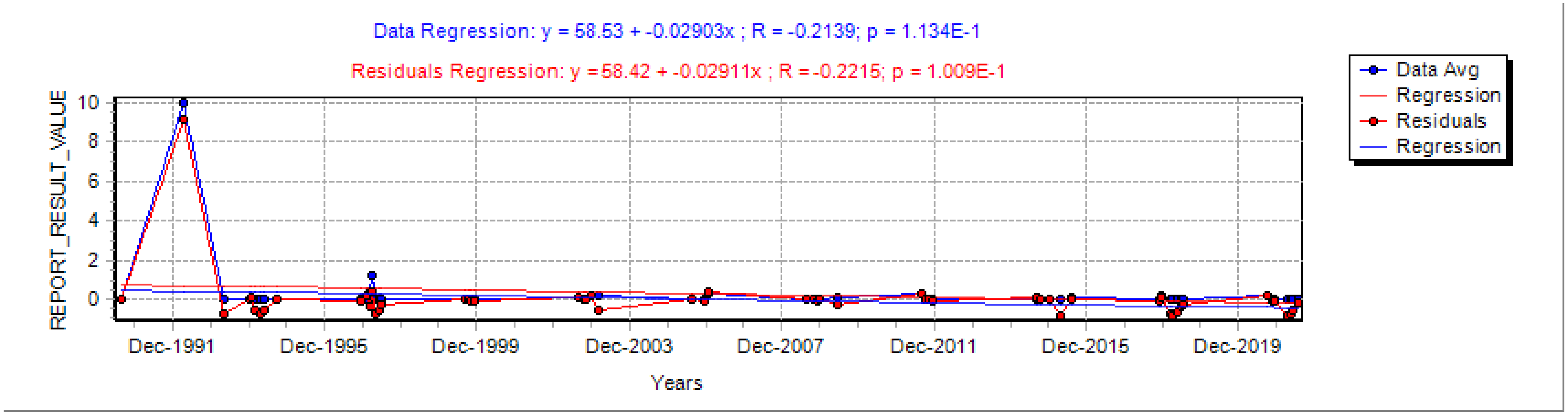
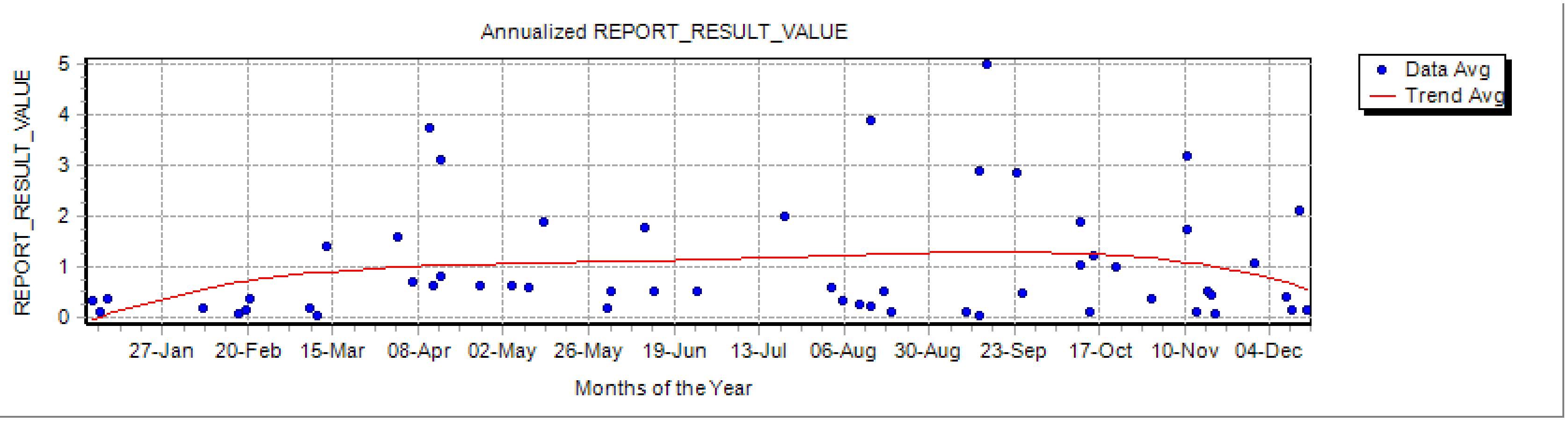


Chart 12-13: Total Kjeldahl Nitrogen Trend



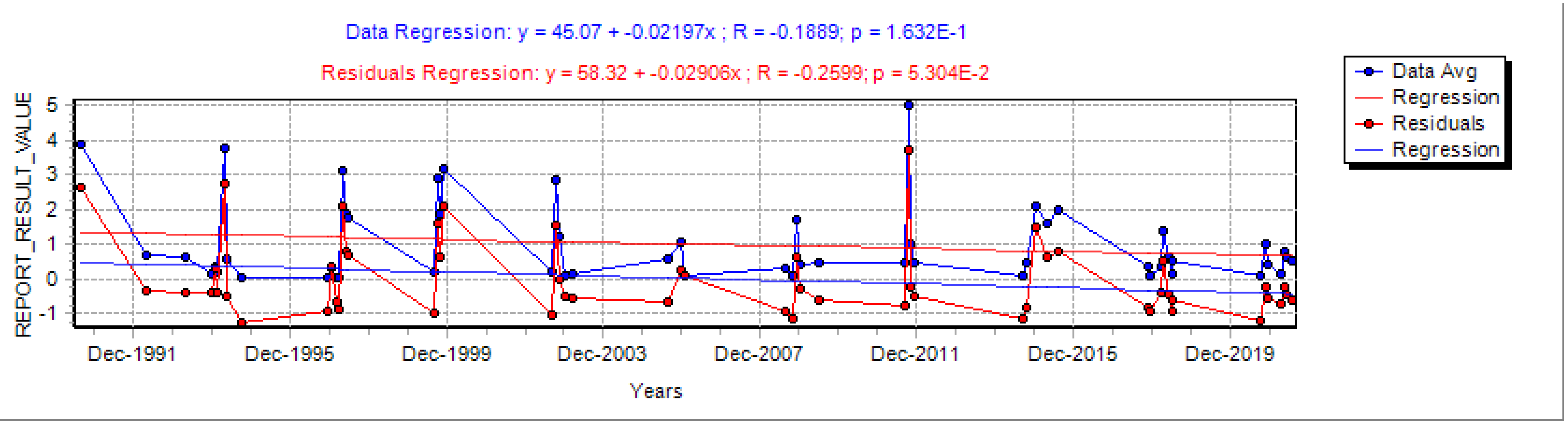
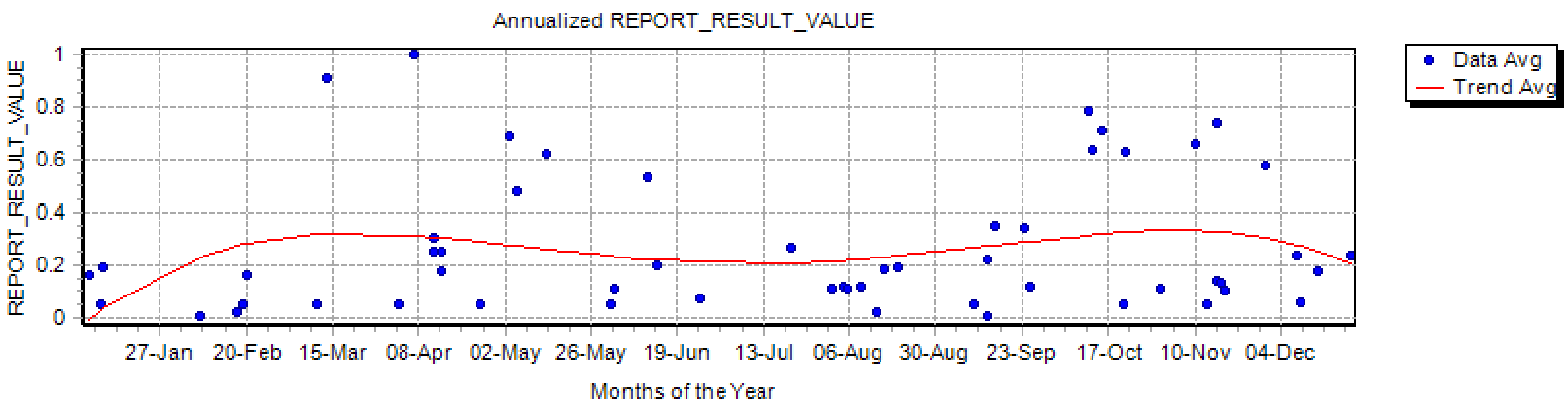


Chart 12-14: Total Phosphorus Trend



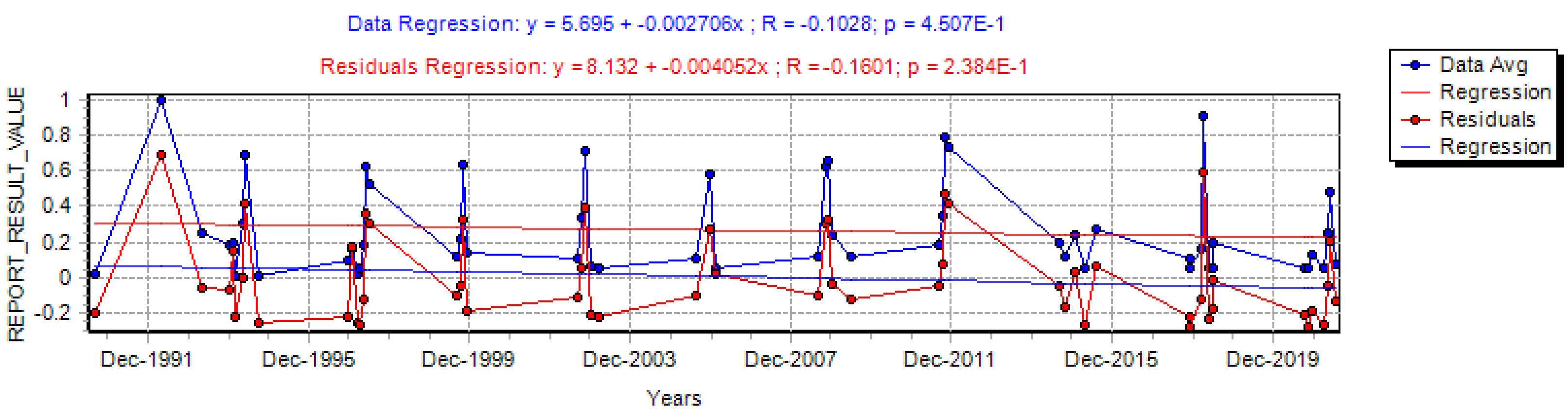
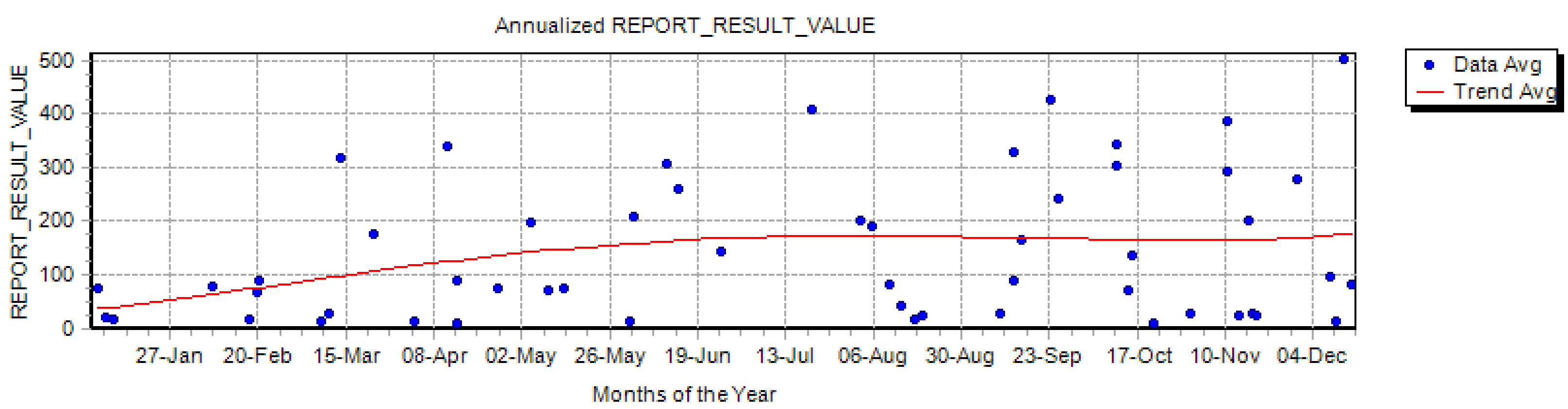


Chart 12-15: Barium Trend



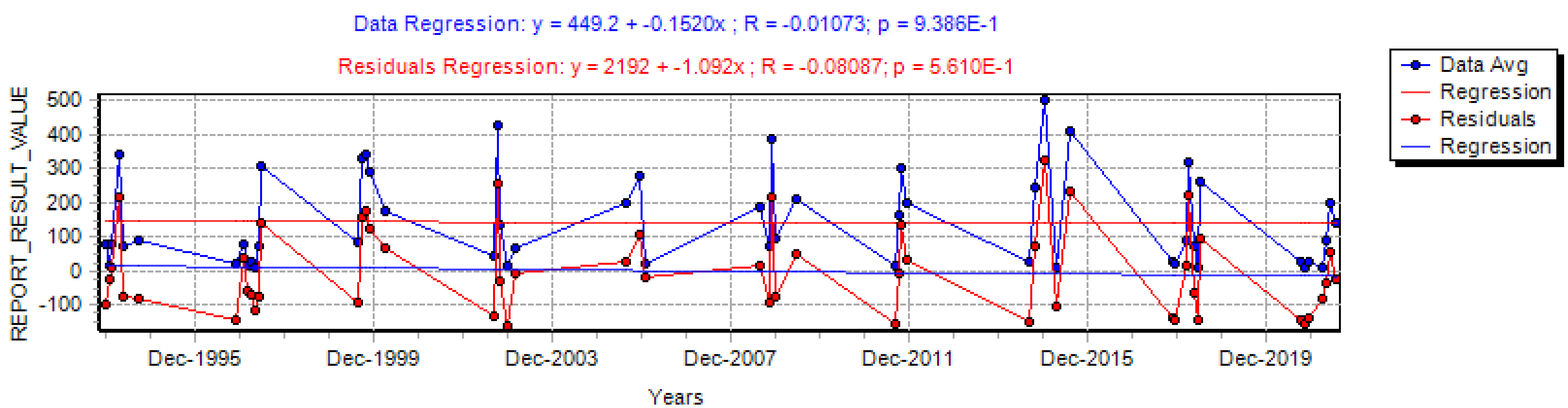
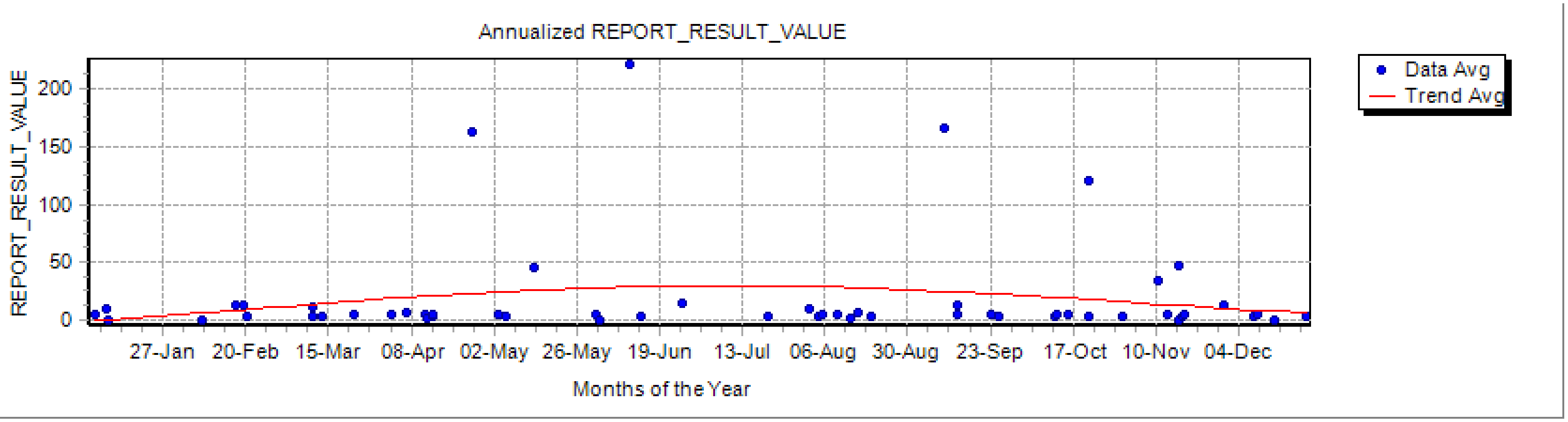


Chart 12-16: Copper Trend



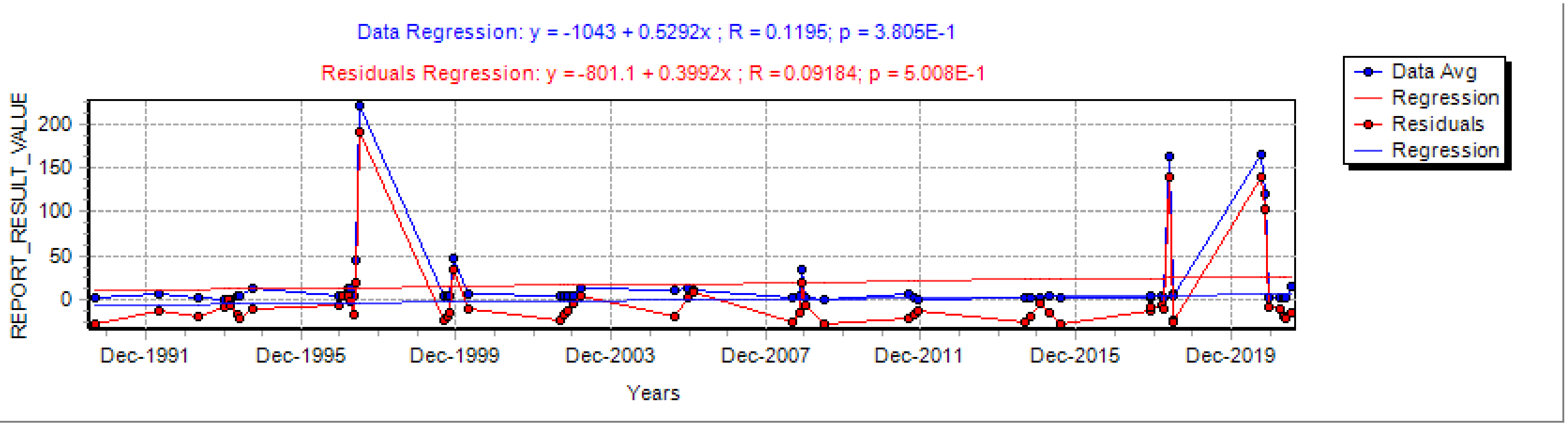
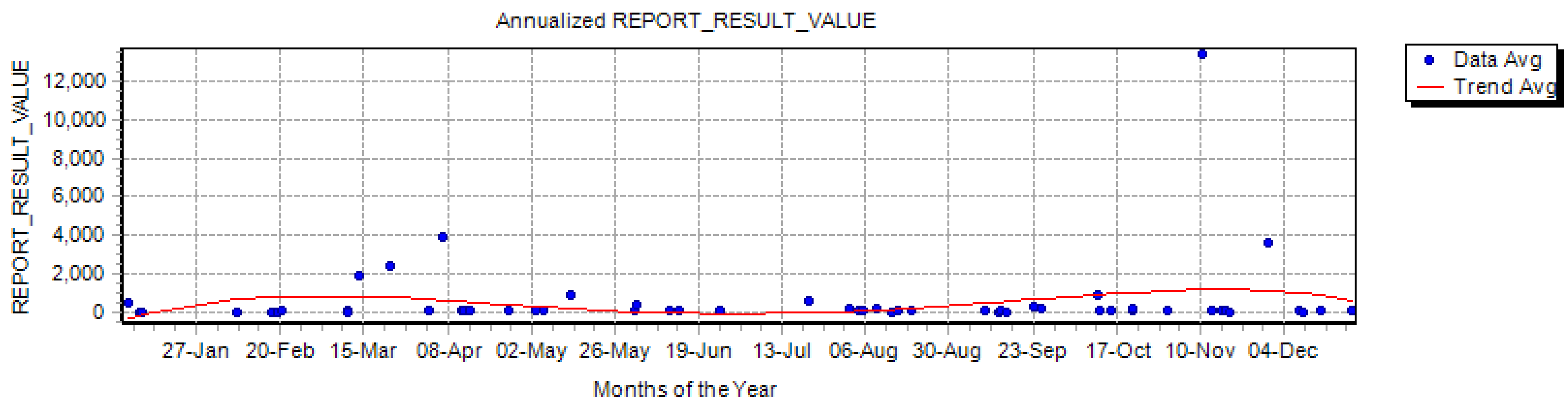


Chart 12-17: Iron Trend



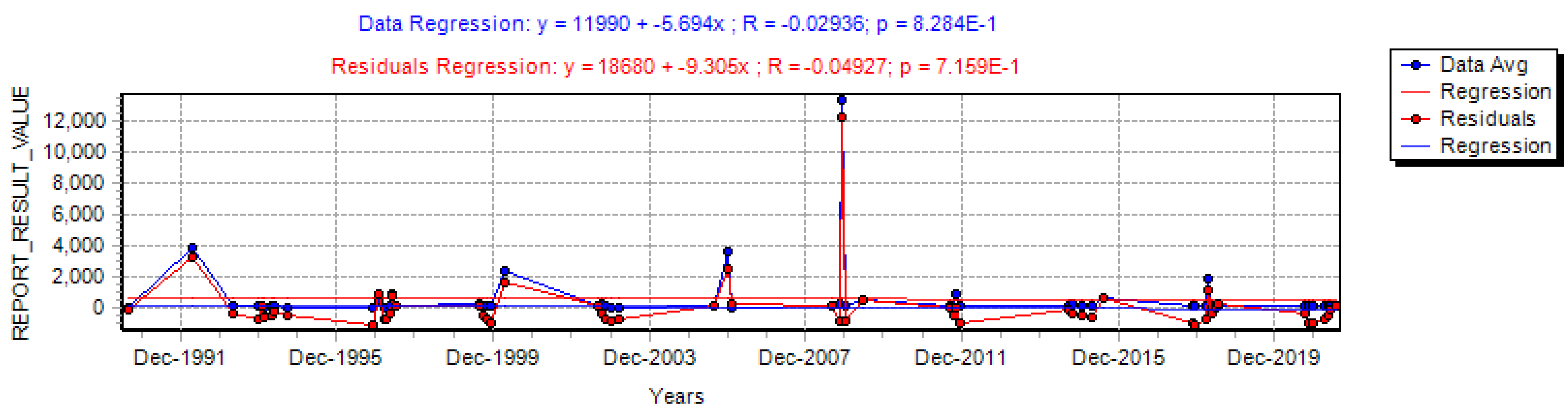


Chart 12-18: Zinc Trend