CHICOT EQUIVALENT AQUIFER SYSTEM SUMMARY, 2012
AQUIFER SAMPLING AND ASSESSMENT PROGRAM

DEQ
LOUISIANA

APPENDIX 12 TO THE 2012 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 and aquifer systems across the state. The sampling process is designed so that all 14 aquifers and aquifer systems 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 for 2012.

Analytical and field data contained in this summary were collected from wells producing from the Chicot Equivalent aquifer system during the 2012 state fiscal year (July 1, 2011 - June 30, 2012). This summary will become Appendix 12 of the ASSET Program Triennial Summary Report for 2012.

These data show that between August and November of 2012, 25 wells were sampled which produce from the Chicot Equivalent aquifer system. Nine wells are classified as domestic, nine are classified as industrial, five are classified as public supply, one irrigation well, 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 system 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 and 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 system 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 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 is 50 to 1,100 feet. The depths of the Chicot Equivalent 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 (total metals) 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-266, AN-6297Z, SH-226, and TA-520.

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 detections (if any), from any of these three categories, 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 system, listing the minimum, maximum, and average results for these parameters collected in the FY 2012 sampling. Tables 12-6 and 12-7 compare these same parameter averages to historical ASSET-derived data for the Chicot Equivalent aquifer system, from fiscal years 1997, 2000, 2003, 2006, and 2009.

The average values listed in the above referenced tables are determined using all valid, reported results, including non-detects. Per Departmental policy concerning statistical analysis, one-half of the detection limit (DL) is used in place of zero when non-detects are encountered. However, the minimum value is reported as less than the DL, not one-half the DL. If all results for a particular analyte are reported as non-detect, then the minimum, maximum, and average values are all reported as less than the DL. One-half the DL is also used for contouring purposes, and in the figures and charts referenced below.

Figures 12-2, 12-3, 12-4, and 12-5, respectively, represent the contoured data for pH, total dissolved solids, chloride, and iron. Charts 12-1 through 12-16 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 does use MCLs as a benchmark for further evaluation. Data contained in Tables 12-2 and 12-3 show that no MCL was exceeded in any of the 25 wells sampled in the Chicot Equivalent aquifer system.

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 16 of the 25 wells sampled in the Chicot Equivalent aquifer system.

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 system, including the five 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.

Federal Secondary Drinking Water Standards: A review of the data listed in Table 12-2 shows that eight wells exceeded the SMCL for pH, three wells exceeded the SMCL for chloride, four wells exceeded the SMCL for color, and six wells exceeded the SMCL for total dissolved solids. Following is a list of SMCL parameter exceedances with well number and results:

pH (SMCL = 6.5 – 8.5 Standard Units):

AN-500 – 8.58 SU
SH-5333Z – 6.03 SU
ST-5245Z – 5.24 SU
WA-5295Z – 5.70 SU
EF-5329Z – 5.50 SU
SH-77 – 5.68 SU
TA-520 – 5.02 SU (Original and Duplicate)
WA5311Z – 5.44 SU

Chloride (SMCL = 250 mg/L):

AN-6297Z – 657.0 mg/L, Duplicate – 724.0 mg/L
SJB-173 – 344 mg/L
SC-179 – 368.0 mg/L

Color (SMCL = 15 PCU):

AN-500 – 18 PCU
AN-6297Z – 18 PCU, Duplicate – 15 PCU
JF-224 – 75 PCU
SC-179 – 25 PCU

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

	LAB RESULTS (in mg/L)	FIELD MEASUSRES (in g/L)
AN-316	605 mg/L	0.658 g/L
AN-6297Z	1,320 mg/L (Original and Duplicate)	(Data not recorded)
JF-224	802 mg/L	0.881 g/L
SC-179	1,150 mg/L	1.227 g/L
SJ-226	610 mg/L, Duplicate – 608 mg/L	0.603 g/L (Original and Duplicate)
SJB-173	1,260 mg/L	1.119 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 system, including the five previous sampling event averages.

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

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

Iron (SMCL = 300 µg/L):

AN-6297Z – 353 µg/L, Duplicate – 383 µg/L
EB-34 – 7,220 µg/L
EB-8599Z – 363 µg/L
SJ-226 – 908 µg/L, Duplicate – 756 µg/L
SJB-173 - 569 µg/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.

The volatile organic compound, chloroform (a disinfection by-product and common laboratory contaminant, and has no MCL established for it), was detected in industrial well AN-500 at 2.07 µg/L. There were no other confirmed detections of VOCs at or above their respective detection limits during the FY 2012 sampling of the Chicot Equivalent aquifer system.

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.

There were no confirmed SVOC detections at or above its detection limit during the FY 2012 sampling of the Chicot Equivalent aquifer system.

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 2012 sampling of the Chicot Equivalent aquifer system.

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 system exhibit some changes when comparing current data to that of the five previous sampling rotations (three, six, nine, twelve, and fifteen years prior). These comparisons can be found in Tables 12-6 and 12-7, and in Charts 12-1 to 12-16 of this summary. Over the fifteen-year period, six analytes have shown a general increase in average concentration, (barium, hardness, iron, nitrite-nitrate, pH and total phosphorus), while eight analytes have shown a general decrease in average concentration, (alkalinity, chloride, color, salinity, specific conductance (lab and field), sulfate, TDS, and TKN). All other analyte averages have remained consistent or have been non-detect for this time period. The number of secondary exceedances in the Chicot Equivalent aquifer system has increased from the previous sampling in FY 2009 of 20 SMCL exceedances, to 26 in FY 2012.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the groundwater produced from this aquifer is moderately hard[1] and that no primary MCL was exceeded in any of the wells sampled in FY 2012. The data also show that this aquifer is of fair quality when considering taste, odor, or appearance guidelines, with 26 Secondary MCLs exceeded in 16 wells.

Comparison to historical ASSET-derived data shows some change in the quality or characteristics of the Chicot Equivalent aquifer system, with six parameters showing consistent increases in average concentrations and eight parameters decreasing in average concentration with the remainder of the analyte averages staying consistent over the previous 15 year period.

It is recommended that the wells assigned to the Chicot Equivalent aquifer system be re-sampled as planned, in approximately three years. In addition, several wells should be added to the 25 currently in place to increase the well density for this aquifer.

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[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 System – FY 2012

Well ID	Parish	Date	Owner	Depth (Feet)	Well Use
AN-9183Z	Ascension	9/15/2011	Private Owner	630	Domestic
AN-321	Ascension	11/16/2011	Rubicon, Inc.	523	Industrial
AN-316	Ascension	11/17/2011	Westlake Vinyls	478	Industrial
AN-500	Ascension	11/17/2011	Lion Copolymer	480	Industrial
AN-6297Z	Ascension	11/17/2011	Oxy Chemical	294	Monitor
AN-266	Ascension	9/15/2011	City of Gonzales	548	Public Supply
AN-337	Ascension	11/16/2011	BASF Corp.	459	Public Supply
EB-8599Z	East Baton Rouge	8/17/2011	Private Owner	180	Domestic
EB-34	East Baton Rouge	8/15/2011	ExxonMobil USA	453	Industrial
EB-1231	East Baton Rouge	8/15/2011	Georgia Pacific Corp.	280	Industrial
EB-991B	East Baton Rouge	9/15/2011	Baton Rouge Water Works	565	Public Supply
EF-5329Z	East Feliciana	8/15/2011	Private Owner	97	Domestic
JF-224	Jefferson	10/13/2011	Entergy	775	Industrial
LI-5477Z	Livingston	9/15/2011	Private Owner	106	Domestic
LI-85	Livingston	9/15/2011	Frenchsettlement Water System	405	Public Supply
SC-179	St Charles	10/11/2011	Union Carbide	460	Industrial
SH-5333Z	St Helena	8/17/2011	Private Owner	230	Domestic
SH-77	St Helena	8/17/2011	Transco	170	Public Supply
SJ-226	St James	10/11/2011	Noranda Alumina LLC	248	Industrial
SJB-173	St John the Baptist	10/13/2011	Dupont	425	Industrial
ST-5245Z	St Tammany	9/14/2011	Premier Pastures	90	Domestic
ST-11516Z	St Tammany	9/14/2011	Louisiana State Parks	340	Domestic
TA-520	Tangipahoa	8/17/2011	Private Owner	135	Irrigation
WA-5311Z	Washington	9/14/2011	Private Owner	90	Domestic
WA-5295Z	Washington	9/14/2011	Private Owner	100	Domestic

Table 12-2: Summary of Field and Conventional Data – FY 2012
Chicot Equivalent Aquifer System

Well ID	Temp Deg. C	pH SU	Sp. Cond. mmhos/cm	Sal. ppt	TDS g/L	Alk mg/L	Cl mg/L	Color PCU	Sp. Cond. µmhos/cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb. NTU	NH3 mg/L	Hard. mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L
LABORATORY DETECTION LIMITS →						2	1.25	5	10	1	10	4	0.1	0.1	5	0.05	0.5	0.05
	FIELD PARAMETERS					LABORATORY PARAMETERS												
AN-266	22.73	8.01	0.325	0.15	0.211	137	14.4	< 5	316	2.02	218	< 4	0.2	0.31	42	< 0.05	< 0.5	0.46
AN-266*	22.73	8.01	0.325	0.15	0.211	137	13.9	< 5	313	2.00	215	< 4	4.5	0.52	48	< 0.05	< 0.5	0.44
AN-316	21.24	8.11	1.012	0.50	0.658	148	197.0	12	816	< 1	605	< 4	0.7	0.27	300	< 0.05	< 0.5	0.54
AN-321	21.00	8.24	0.636	0.31	0.413	146	91.2	< 5	628	1.59	358	< 4	< 0.1	0.35	30	< 0.05	< 0.5	0.65
AN-337	21.19	8.18	0.413	0.20	0.269	166	30.1	< 5	425	3.71	252	< 4	< 0.1	0.44	28	< 0.05	< 0.5	0.74
AN-500	20.65	8.58	0.435	0.21	0.283	146	43.0	18	342	< 1	305	< 4	0.7	0.31	180	< 0.05	< 0.5	0.65
AN-6297Z	22.70	8.01	0.259	DATA NOT RECORDED		196	657.0	18	2,020	< 1	1,320	< 4	2.0	1.69	320	< 0.05	2.05	0.41
AN-6297Z*	22.70	8.01	0.259			198	724.0	15	1,980	< 1	1,320	< 4	1.7	1.72	300	< 0.05	2.03	0.52
AN-9183Z	21.70	8.26	0.418	0.20	0.272	165	32.7	< 5	409	1.52	262	< 4	0.5	0.21	18	< 0.05	< 0.5	0.36
EB-1231	19.19	6.96	0.241	0.11	0.157	63	31.1	12	244	3.21	152	< 4	0.7	< 0.1	68	0.077	< 0.5	0.25
EB-34	21.46	6.92	0.397	0.19	0.258	177	22.8	10	396	< 10	275	< 4	41.6	0.35	200	0.070	1.06	0.41
EB-8599Z	19.63	6.90	0.179	0.08	0.116	69	11.0	< 5	180	3.34	140	< 4	2.0	0.21	56	< 0.05	0.88	0.30
EB-991B	21.09	7.72	0.264	0.13	0.171	124	3.8	< 5	253	8.11	232	< 4	< 0.1	0.35	24	< 0.05	< 0.5	0.35
EF-5329Z	18.79	5.50	0.049	0.02	0.032	8	5.3	5	50	< 1	47	< 4	0.3	< 0.1	22	0.281	0.67	0.18
JF-224	23.33	8.33	1.356	0.68	0.881	338	231.0	75	1,250	< 1	802	< 4	0.1	0.96	26	< 0.05	0.78	0.81
LI-5477Z	22.08	7.90	0.406	0.19	0.264	198	9.0	< 5	401	< 1	340	< 4	0.1	0.32	58	< 0.05	0.85	0.44
LI-85	22.04	8.14	0.620	0.30	0.403	129	102.0	< 5	599	1.6	442	5.5	< 0.1	0.32	60	< 0.05	< 0.5	0.59
SC-179	20.93	8.25	1.888	0.96	1.227	426	368.0	25	1,740	< 1	1,150	< 4	0.5	1.89	220	< 0.05	2.24	0.64
SH-5333Z	20.72	6.03	0.069	0.03	0.045	19	8.2	< 5	69	< 1	40	< 4	2.6	0.23	26	0.074	< 0.5	0.23
SH-77	19.23	5.68	0.029	0.01	0.019	6	3.7	< 5	28	< 1	< 10	< 4	3.2	< 0.1	20	0.259	< 0.5	0.19

Well ID	Temp Deg. C	pH SU	Sp. Cond. mmhos/cm	Sal. ppt	TDS g/L	Alk mg/L	Cl mg/L	Color PCU	Sp. Cond. µmhos/cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb. NTU	NH3 mg/L	Hard. mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L
LABORATORY DETECTION LIMITS →						2	1.25	5	10	1	10	4	0.1	0.1	5	0.05	0.5	0.05
	FIELD PARAMETERS					LABORATORY PARAMETERS												
SJ-226	18.73	7.88	0.928	0.46	0.603	193	148.0	5	860	17.80	610	< 4	1.5	0.70	340	< 0.05	1.03	0.79
SJ-226*	18.73	7.88	0.928	0.46	0.603	193	146.0	5	870	18.30	608	< 4	1.6	0.68	260	< 0.05	0.83	0.91
SJB-173	20.39	7.65	1.722	0.87	1.119	366	344.0	15	1,740	< 1	1,260	< 4	1.4	1.38	340	< 0.05	1.45	0.47
ST-11516Z	21.40	7.42	0.291	0.14	0.189	131	9.2	< 5	284	< 1	198	< 4	0.3	0.25	24	0.17	< 0.5	0.54
ST-5245Z	22.81	5.24	0.033	0.01	0.021	4	5.4	< 5	32	< 1	15	< 4	0.4	0.31	20	0.51	< 0.5	0.24
TA-520	21.67	5.02	0.045	0.02	0.029	2	5.8	< 5	44	< 1	20	< 4	0.4	< 0.1	26	1.49	0.52	0.21
TA-520*	21.67	5.02	0.045	0.02	0.029	2	5.7	< 5	44	< 1	< 10	< 4	0.4	< 0.1	20	1.50	0.62	0.21
WA-5295Z	22.87	5.70	0.031	0.01	0.020	8	3.5	< 5	31	< 1	43	< 4	0.8	< 0.1	14	< 0.05	< 0.5	0.24
WA-5311Z	19.93	5.44	0.028	0.01	0.018	2	3.9	< 5	27	< 1	27	< 4	0.8	0.16	12	0.676	< 0.5	0.21

*Denotes Duplicate Sample Shaded cells exceed EPA Secondary Standards

Table 12-3: Summary of Inorganic Data – FY 2012
Chicot Equivalent Aquifer System

Well ID	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Cadmium µg/L	Chromium µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Mercury µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Thallium µg/L	Zinc µg/L
Laboratory Detection Limits	0.5	0.5	200	5	0.08	0.5	0.5	100	0.1	0.2	0.5	0.5	0.5	0.1	5
AN-266	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	‡	153	0.86	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	9.7
AN-266*	< 0.5	< 0.5	< 200	< 5	< 0.08	1.50	‡	300	3.30	< 0.2	0.56	< 0.5	< 0.5	< 0.1	28.4
AN-316	< 0.5	< 0.5	370	< 5	< 0.08	< 0.5	< 0.5	190	< 0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
AN-321	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	0.52	113	0.17	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	11.8
AN-337	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	0.62	< 100	< 0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
AN-500	< 0.5	< 0.5	< 200	< 5	< 0.08	0.68	1.50	178	8.20	< 0.2	0.71	< 0.5	< 0.5	< 0.1	488.0
AN-6297Z	< 0.5	0.54	489	< 5	< 0.08	< 0.5	0.61	353	0.18	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
AN-6297Z*	< 0.5	0.61	516	< 5	< 0.08	< 0.5	< 0.5	383	0.12	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
AN-9183Z	< 0.5	< 0.5	< 200	< 5	< 0.08	0.63	‡	< 100	3.40	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	7.6
EB-1231	< 0.5	< 0.5	< 200	< 5	< 0.08	0.88	0.59	< 100	0.15	< 0.2	1.00	0.78	< 0.5	< 0.1	< 5
EB-34	< 0.5	0.64	210	< 5	< 0.08	0.70	3.80	7,220	0.36	< 0.2	1.00	< 0.5	< 0.5	< 0.1	9
EB-8599Z	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	< 0.5	363	0.21	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
EB-991B	< 0.5	0.58	< 200	< 5	< 0.08	0.73	‡	< 100	0.28	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
EF-5329Z	< 0.5	< 0.5	< 200	< 5	< 0.08	0.63	7.30	< 100	0.62	< 0.2	0.77	< 0.5	< 0.5	< 0.1	22.1
JF-224	< 0.5	< 0.5	< 200	< 5	< 0.08	0.92	0.59	< 100	0.31	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
LI-5477Z	< 0.5	0.86	< 200	< 5	< 0.08	1.30	‡	< 100	< 0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
LI-85	< 0.5	< 0.5	< 200	< 5	< 0.08	2.30	‡	< 100	< 0.1	< 0.2	0.93	< 0.5	< 0.5	< 0.1	< 5
SC-179	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	< 0.5	232	< 0.1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	< 5
SH-5333Z	< 0.5	< 0.5	< 200	< 5	< 0.08	0.64	77.80	< 100	5.40	< 0.2	0.92	< 0.5	< 0.5	< 0.1	13.5
SH-77	< 0.5	< 0.5	< 200	< 5	< 0.08	0.88	19.70	234	0.94	< 0.2	0.98	< 0.5	< 0.5	< 0.1	57.7
SJ-226	< 0.5	9.80	302	< 5	< 0.08	0.72	3.10	908	0.70	< 0.2	0.97	< 0.5	< 0.5	< 0.1	40.9
SJ-226*	< 0.5	9.50	302	< 5	< 0.08	0.55	5.80	756	1.30	< 0.2	1.30	< 0.5	< 0.5	< 0.1	72.7
SJB-173	< 0.5	< 0.5	338	< 5	< 0.08	0.66	6.00	569	1.20	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	93.6

Well ID	Antimony µg/L	Arsenic µg/L	Barium µg/L	Beryllium µg/L	Cadmium µg/L	Chromium µg/L	Copper µg/L	Iron µg/L	Lead µg/L	Mercury µg/L	Nickel µg/L	Selenium µg/L	Silver µg/L	Thallium µg/L	Zinc µg/L
Laboratory Detection Limits	**0.5**	**0.5**	**200**	**5**	**0.08**	**0.5**	**0.5**	**100**	**0.1**	**0.2**	**0.5**	**0.5**	**0.5**	**0.1**	**5**
ST-11516Z	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	‡	128	0.24	< 0.2	< 0.5	< 0.5	< 0.5	< 0.1	6.8
ST-5245Z	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	‡	126	3	< 0.2	0.95	< 0.5	< 0.5	< 0.1	8.6
TA-520	< 0.5	< 0.5	< 200	< 5	< 0.08	< 0.5	103.00	< 100	2.10	< 0.2	1.90	< 0.5	< 0.5	< 0.1	80.4
TA-520*	< 0.5	< 0.5	< 200	< 5	< 0.08	0.80	102.00	< 100	2.00	< 0.2	2.20	< 0.5	< 0.5	< 0.1	80.1
WA-5295Z	< 0.5	< 0.5	< 200	< 5	< 0.08	1.10	‡	< 100	3.90	< 0.2	0.74	< 0.5	< 0.5	< 0.1	18.3
WA-5311Z	< 0.5	< 0.5	< 200	< 5	< 0.08	2.00	‡	< 100	2.80	< 0.2	0.68	< 0.5	< 0.5	< 0.1	7.1

*Denotes Duplicate Sample. Shaded cells exceed EPA Secondary Standards ‡ Data not reported from Lab

Table 12-4: FY 2012 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature (^{O}C)	18.73	23.33	21.15
	pH (SU)	5.02	8.58	7.21
	Specific Conductance (mmhos/cm)	0.028	1.888	0.470
	Salinity (ppt)	0.01	0.96	0.24
	TDS (g/L)	0.019	1.227	0.320
LABORATORY	Alkalinity (mg/L)	2.1	426.0	134.5
	Chloride (mg/L)	3.5	724.0	112.8
	Color (PCU)	2.5	75.0	8.9
	Specific Conductance (µmhos/cm)	26.7	2,020.0	565.2
	Sulfate (mg/L)	0.50	18.30	2.65
	TDS (mg/L)	< 10	1,320.0	387.5
	TSS (mg/L)	< 4	5.5	< 4
	Turbidity (NTU)	< 0.1	41.6	2.4
	Ammonia, as N (mg/L)	< 0.1	1.89	0.56
	Hardness (mg/L)	12	340	107
	Nitrite - Nitrate, as N (mg/L)	< 0.05	1.50	0.19
	TKN (mg/L)	< 0.5	2.50	0.78
	Total Phosphorus (mg/L)	0.19	0.91	0.45

Table 12-5: FY 2012 Inorganic Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (µg/L)	< 0.5	< 0.5	< 0.5
Arsenic (µg//L)	< 0.5	9.8	0.97
Barium (µg//L)	< 200	516	< 200
Beryllium (µg//L)	< 5	< 5	< 5
Cadmium (µg//L)	< 0.08	< 0.08	< 0.08
Chromium (µg//L)	< 0.5	2.30	0.70
Copper (µg//L)	< 0.5	103.00	17.58
Iron (µg//L)	< 100	7,220	443
Lead (µg//L)	< 0.1	8.20	1.45
Mercury (µg//L)	< 0.2	0.13	< 0.2
Nickel (µg//L)	< 0.5	2.20	0.66
Selenium (µg//L)	< 0.5	0.78	< 0.5
Silver (µg//L)	< 0.5	< 0.5	< 0.5
Thallium (µg//L)	< 0.1	< 0.1	< 0.1
Zinc (µg//L)	< 5	488.0	37.4

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

	PARAMETER	AVERAGE VALUES BY FISCAL YEAR					
		FY 1997	FY 2003	FY 2002	FY 2006	FY 2009	FY 2012
FIELD	Temperature (^{O}C)	21.17	21.90	21.86	22.40	21.69	21.15
	pH (SU)	7.09	7.23	7.16	7.16	7.28	7.21
	Specific Conductance (mmhos/cm)	0.618	0.692	0.669	0.54	0.59	0.47
	Salinity (Sal.) (ppt)	0.32	0.30	0.33	0.27	0.29	0.24
	TDS (Total dissolved solids) (g/L)	-	-	-	0.35	0.38	0.32
LABORATORY	Alkalinity (Alk.) (mg/L)	160.8	165.8	157.7	151.4	151.33	134.46
	Chloride (Cl) (mg/L)	108.6	125.3	120.2	104.1	99.04	112.78
	Color (PCU)	18.0	21.8	18.0	18.5	17.38	8.88
	Specific Conductance (µmhos/cm)	623.9	711.6	652.8	629.9	581.65	565.19
	Sulfate (SO4) (mg/L)	3.15	2.71	2.74	2.93	2.50	2.65
	TDS (Total dissolved solids) (mg/L)	393.7	415.8	364.8	372.3	334.06	387.47
	TSS (Total suspended solids) (mg/L)	<4	<4	<4	<4	<4	< 4
	Turbidity (Turb.) (NTU)	<1	2.30	1.92	2.15	1.65	2.38
	Ammonia, as N (NH3) (mg/L)	0.58	0.51	0.70	0.58	0.50	0.56
	Hardness (mg/L)	46.5	49.1	46.2	44.6	46.6	107.0
	Nitrite - Nitrate , as N (mg/L)	0.15	0.15	0.14	0.16	0.12	0.19
	TKN (mg/L)	0.89	0.73	0.94	0.67	0.56	0.78
	Total Phosphorus (P) (mg/L)	0.21	0.22	0.14	0.21	0.21	0.45

Table 12-7: Triennial Inorganic Statistics, ASSET Wells

PARAMETER	AVERAGE VALUES BY FISCAL YEAR					
	FY 1997	FY 2003	FY 2002	FY 2006	FY 2009	FY 2012
Antimony (µg/L)	5.3	<5	<5	<10	<1	< 0.5
Arsenic (µg/L)	<5	<5	<5	<10	<3	0.97
Barium (µg/L)	107.1	140.6	146.0	130.9	123.3	< 200
Beryllium (ug/L)	<1	<1	<1	<1	<1	< 5
Cadmium (ug/L)	<1	<1	<1	<1	<0.5	< 0.08
Chromium (µg/L)	<5	<5	<5	<5	<3	0.70
Copper (µg/L)	19.6	10.8	15.4	<10	7.9	17.6
Iron (µg/L)	230.0	370.9	641.3	848.6	888.0	443.0
Lead (µg/L)	<10	<10	<10	<10	<3	1.45
Mercury (µg/L)	<0.05	0.06	<0.05	<0.05	<0.05	< 0.2
Nickel (µg/L)	<5	<5	<5	<5	3.8	0.7
Selenium (µg/L)	<5	<5	<5	<5	<4	< 0.5
Silver (µg/L)	<1	<1	<1	<10	<0.5	< 0.5
Thallium (µg/L)	<5	<5	<5	<5	<1	< 0.1
Zinc (µg/L)	32.2	32.0	37.9	21.3	21.7	37.4

Table 12-8: VOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (µg/L)
TRANS-1,2-DICHLOROETHENE	624	0.5
TERT-BUTYL METHYL ETHER	624	0.5
ETHYL BENZENE	624	0.5
STYRENE	624	1
CIS-1,3-DICHLOROPROPENE	624	0.5
TRANS-1,3-DICHLOROPROPENE	624	0.5
1,4-DICHLOROBENZENE	624	0.5
1,2-DICHLOROETHANE	624	0.5
TOLUENE	624	0.5
CHLOROBENZENE	624	0.5
DIBROMOCHLOROMETHANE	624	0.5
TETRACHLOROETHYLENE	624	0.5
CHLOROFORM	624	0.5
BENZENE	624	0.5
1,1,1-TRICHLOROETHANE	624	0.5
BROMOMETHANE	624	0.5
CHLOROMETHANE	624	0.5
CHLOROETHANE	624	0.5
VINYL CHLORIDE	624	0.5
METHYLENE CHLORIDE	624	0.5
BROMOFORM	624	0.5
BROMODICHLOROMETHANE	624	0.5
1,1-DICHLOROETHANE	624	0.5
1,1-DICHLOROETHENE	624	0.5
TRICHLOROFLUOROMETHANE	624	0.5
1,2-DICHLOROPROPANE	624	0.5
1,1,2-TRICHLOROETHANE	624	0.5
TRICHLOROETHYLENE	624	0.5
1,1,2,2-TETRACHLOROETHANE	624	0.5
1,2,3-TRICHLOROBENZENE	624	1
O-XYLENE	624	1
1,2-DICHLOROBENZENE	624	0.5
1,3-DICHLOROBENZENE	624	0.5
CARBON TETRACHLORIDE	624	0.5
XYLENES, M & P	624	1

Table 12-9: SVOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (µg/L)
1,2,4,5-TETRACHLOROBENZENE	625	10
1,2,4-TRICHLOROBENZENE	625	10
2,4,6-TRICHLOROPHENOL	625	10
2,4-DICHLOROPHENOL	625	10
2,4-DIMETHYLPHENOL	625	10
2,4-DINITROPHENOL	625	10
2,4-DINITROTOLUENE	625	10
2,6-DINITROTOLUENE	625	10
2-CHLORONAPHTHALENE	625	10
2-CHLOROPHENOL	625	10
2-NITROPHENOL	625	10
3,3'-DICHLOROBENZIDINE	625	20
4,6-DINITRO-2-METHYLPHENOL	625	10
4-BROMOPHENYL PHENYL ETHER	625	10
4-CHLORO-3-METHYLPHENOL	625	10
4-CHLOROPHENYL PHENYL ETHER	625	10
4-NITROPHENOL	625	10
ACENAPHTHENE	625	10
ACENAPHTHYLENE	625	10
ANTHRACENE	625	10
BENZIDINE	625	30
BENZO(A)ANTHRACENE	625	10
BENZO(A)PYRENE	625	10
BENZO(B)FLUORANTHENE	625	10
BENZO(G,H,I)PERYLENE	625	10
BENZO(K)FLUORANTHENE	625	10
BENZYL BUTYL PHTHALATE	625	10
BIS(2-CHLOROETHOXY) METHANE	625	10
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	625	10
BIS(2-CHLOROISOPROPYL) ETHER	625	10
BIS(2-ETHYLHEXYL) PHTHALATE	625	10
CHRYSENE	625	10
DIBENZ(A,H)ANTHRACENE	625	10
DIETHYL PHTHALATE	625	10
DIMETHYL PHTHALATE	625	10
DI-N-BUTYL PHTHALATE	625	10

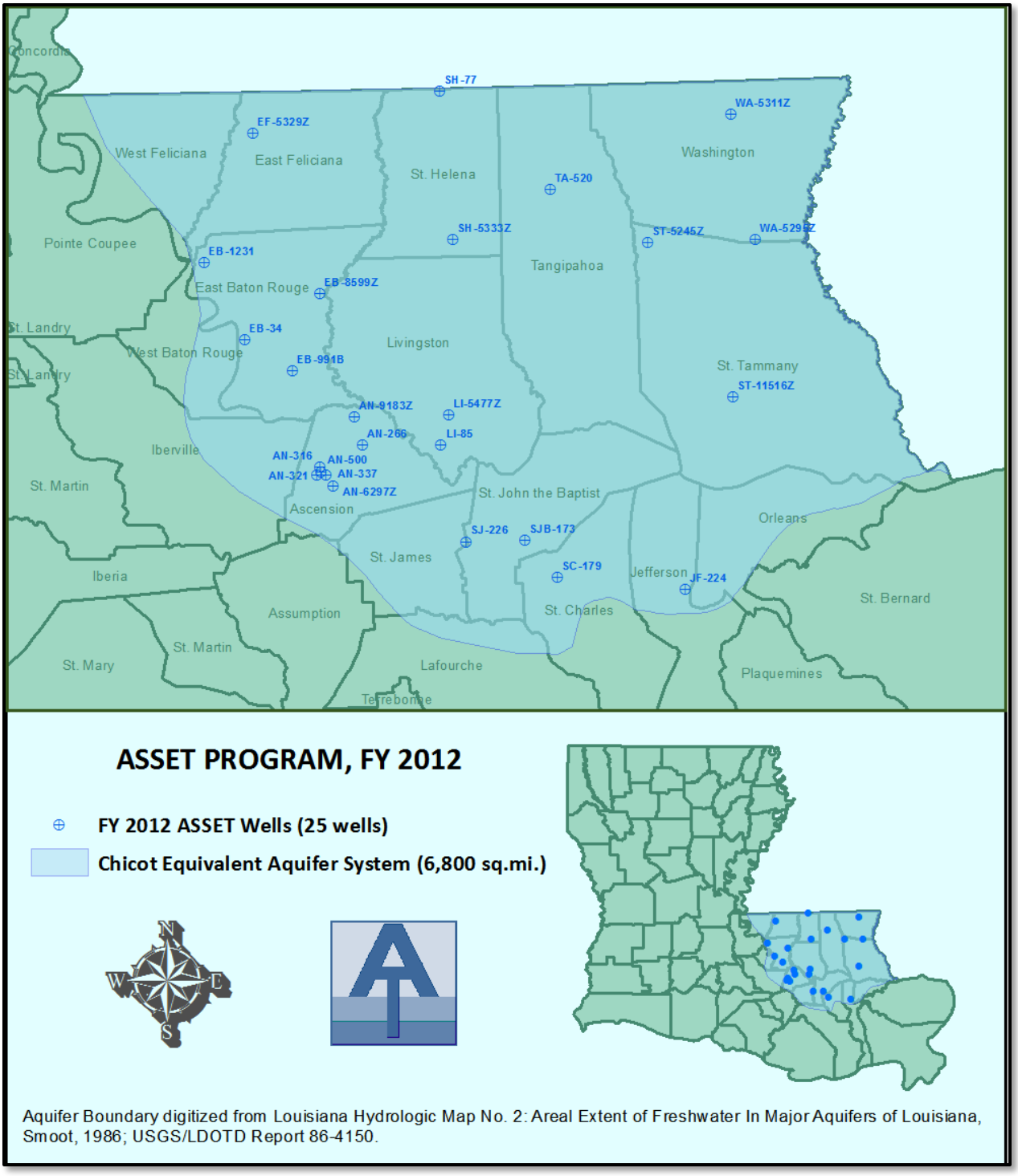
Table 12-9: SVOCs (Continued)

COMPOUND	METHOD	DETECTION LIMIT (µg/L)
DI-N-OCTYLPHTHALATE	625	10
FLUORANTHENE	625	10
FLUORENE	625	10
HEXACHLOROBENZENE	625	10
HEXACHLOROBUTADIENE	625	10
HEXACHLOROCYCLOPENTADIENE	625	10
HEXACHLOROETHANE	625	10
INDENO(1,2,3-C,D)PYRENE	625	10
ISOPHORONE	625	10
NAPHTHALENE	625	10
NITROBENZENE	625	10
N-NITROSODIMETHYLAMINE	625	10
N-NITROSODI-N-PROPYLAMINE	625	10
N-NITROSODIPHENYLAMINE	625	10
PENTACHLOROBENZENE	625	10
PENTACHLOROPHENOL	625	10
PHENANTHRENE	625	10
PHENOL	625	10
PYRENE	625	10

Table 12-10: Pesticides and PCBs

COMPOUND	METHOD	DETECTION LIMITS (µg/L)
ALDRIN	608	0.05
ALPHA BHC	608	0.05
ALPHA ENDOSULFAN	608	0.05
ALPHA-CHLORDANE	608	0.05
BETA BHC	608	0.05
BETA ENDOSULFAN	608	0.1
CHLORDANE	608	0.5
DELTA BHC	608	0.05
DIELDRIN	608	0.1
ENDOSULFAN SULFATE	608	0.1
ENDRIN	608	0.1
ENDRIN ALDEHYDE	608	0.1
ENDRIN KETONE	608	0.1
GAMMA BHC (LINDANE)	608	0.05
GAMMA-CHLORDANE	608	0.05
HEPTACHLOR	608	0.05
HEPTACHLOR EPOXIDE	608	0.05
METHOXYCHLOR	608	0.5
P,P'-DDD	608	0.1
P,P'-DDE	608	0.1
P,P'-DDT	608	0.1
PCB-1016 (AROCHLOR 1016)	608	1
PCB-1221 (AROCHLOR 1221)	608	1
PCB-1232 (AROCHLOR 1232)	608	1
PCB-1242 (AROCHLOR 1242)	608	1
PCB-1248 (AROCHLOR 1248)	608	1
PCB-1254 (AROCHLOR 1254)	608	1
PCB-1260 (AROCHLOR 1260)	608	1
TOXAPHENE	608	2

Figure 12-1: Location Plat, Chicot Equivalent Aquifer System



Aquifer Boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater In Major Aquifers of Louisiana, Smoot, 1986; USGS/LDOTD Report 86-4150.

Figure 12-2: Map of pH Data

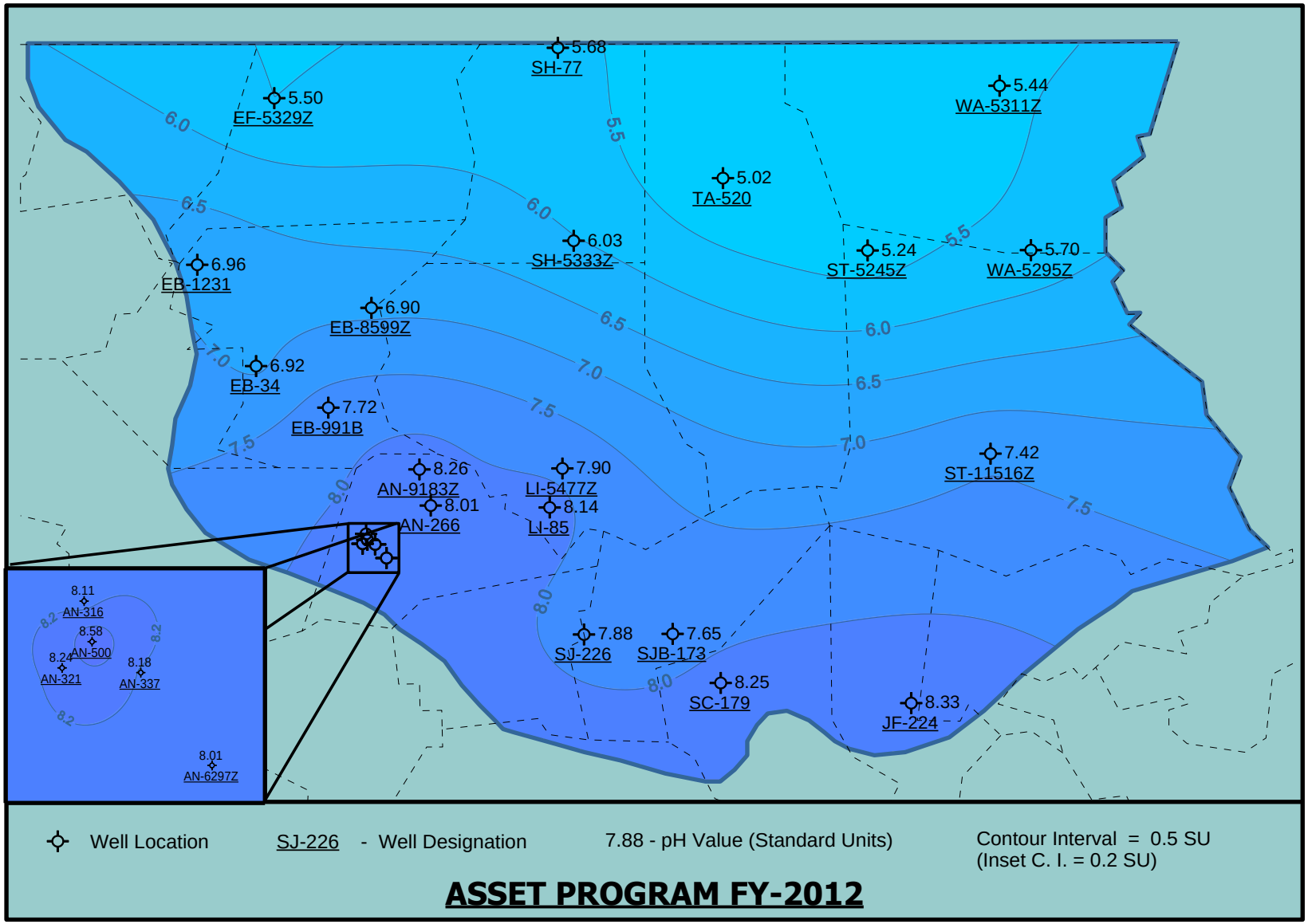


Figure 12-3: Map of TDS Lab Data

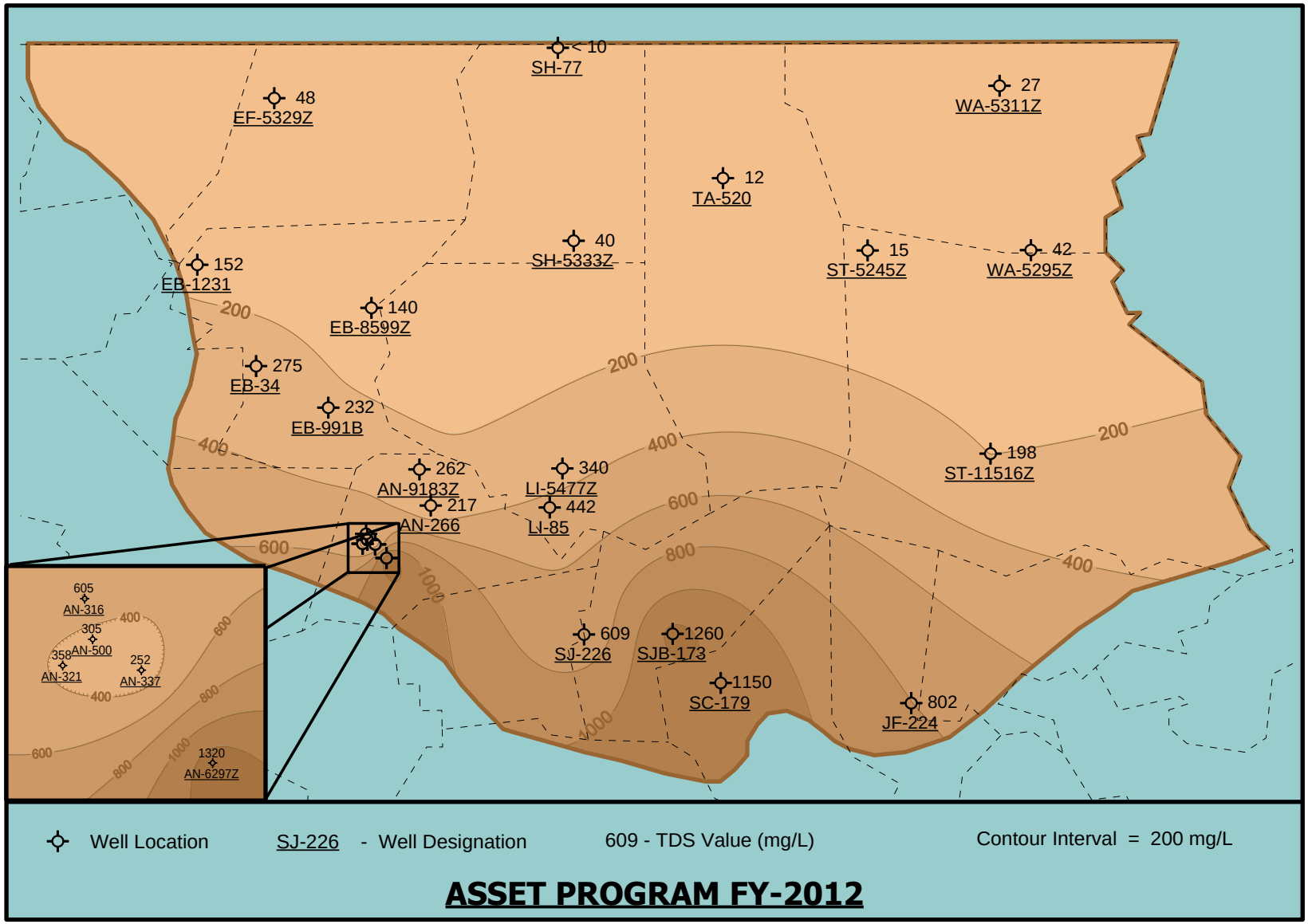


Figure 12-4: Map of Chloride Data

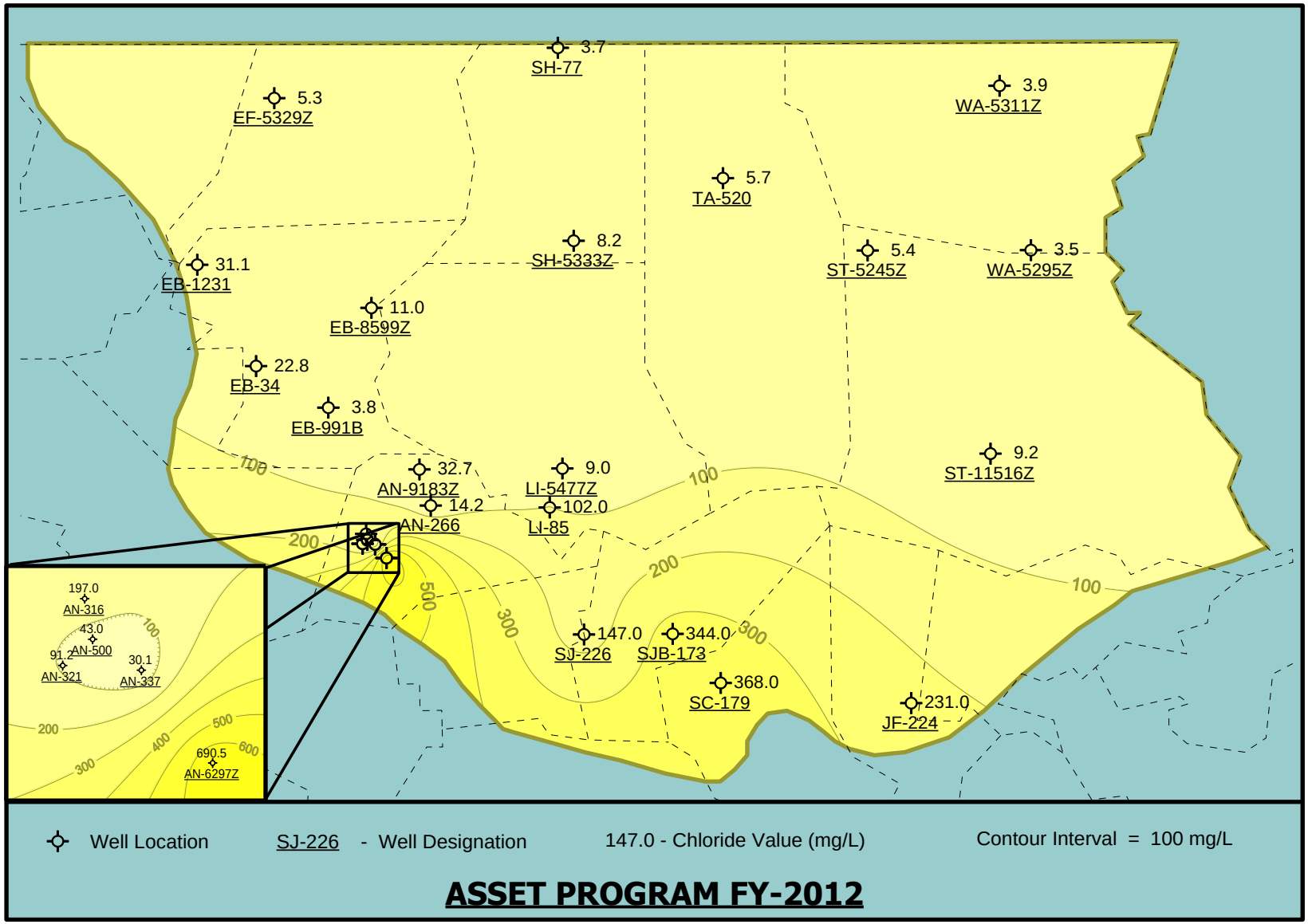


Figure 12-5: Map of Iron Data

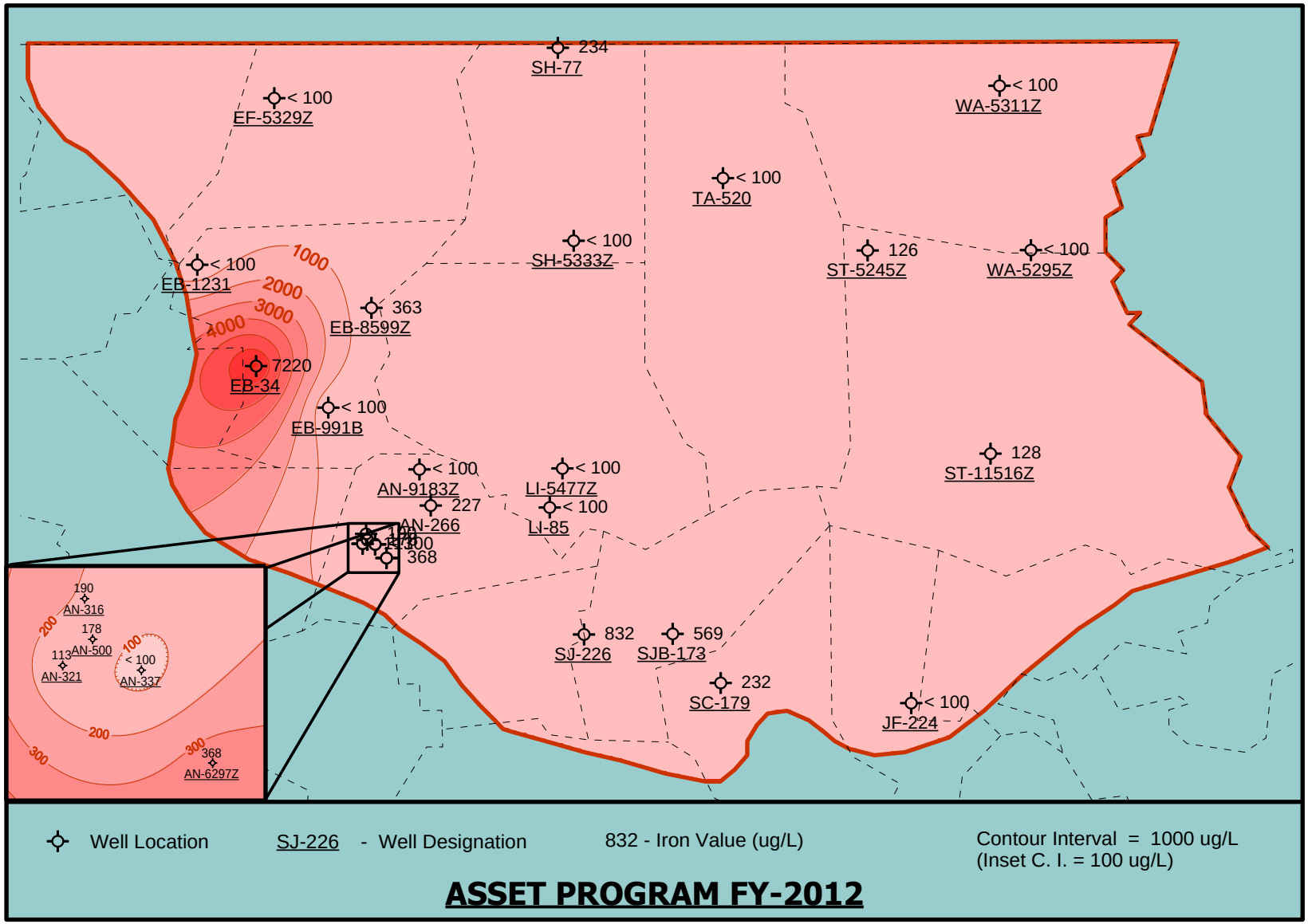


Chart 12-1: Temperature Trend

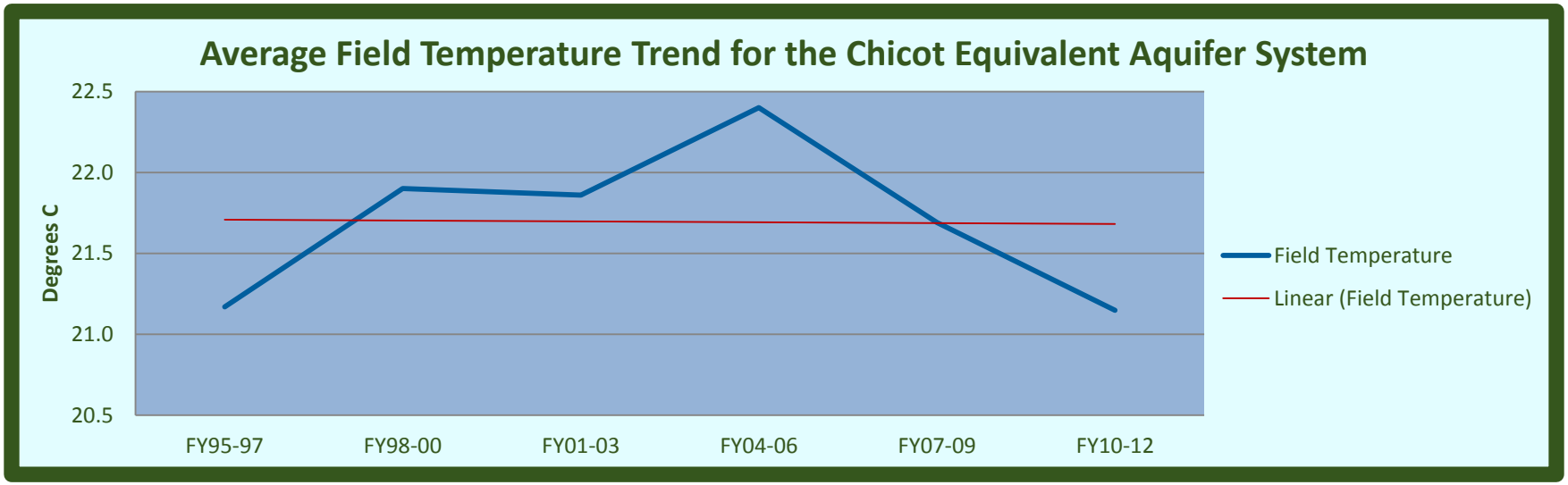


Chart 12-2: pH Trend

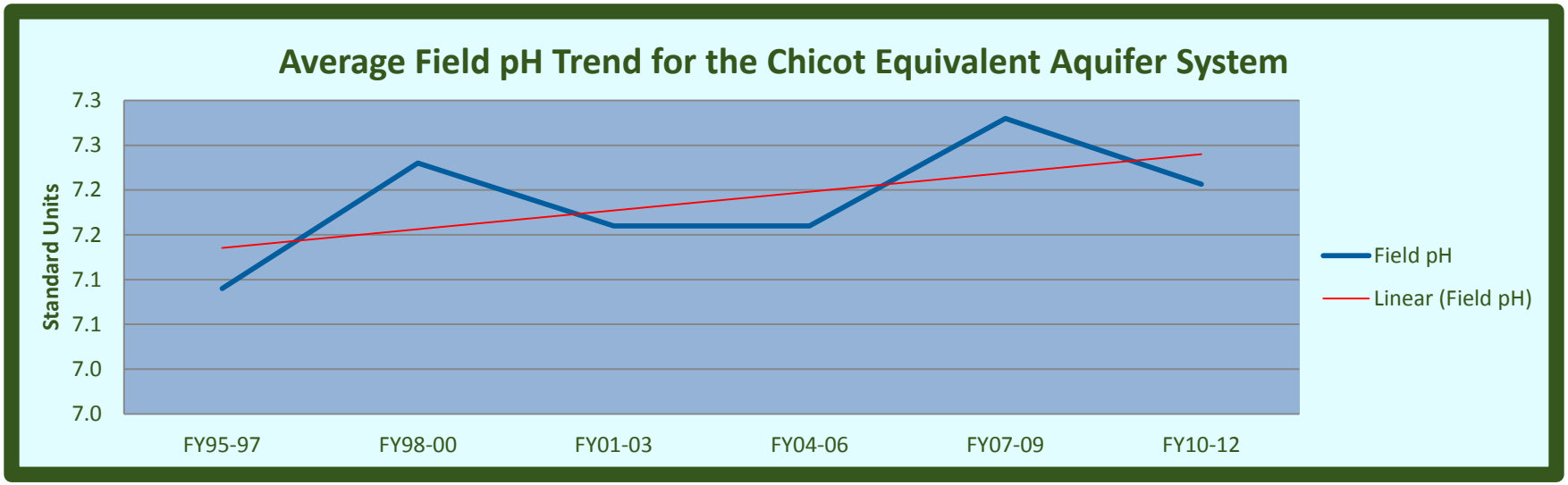


Chart 12-3: Field Specific Conductance Trend

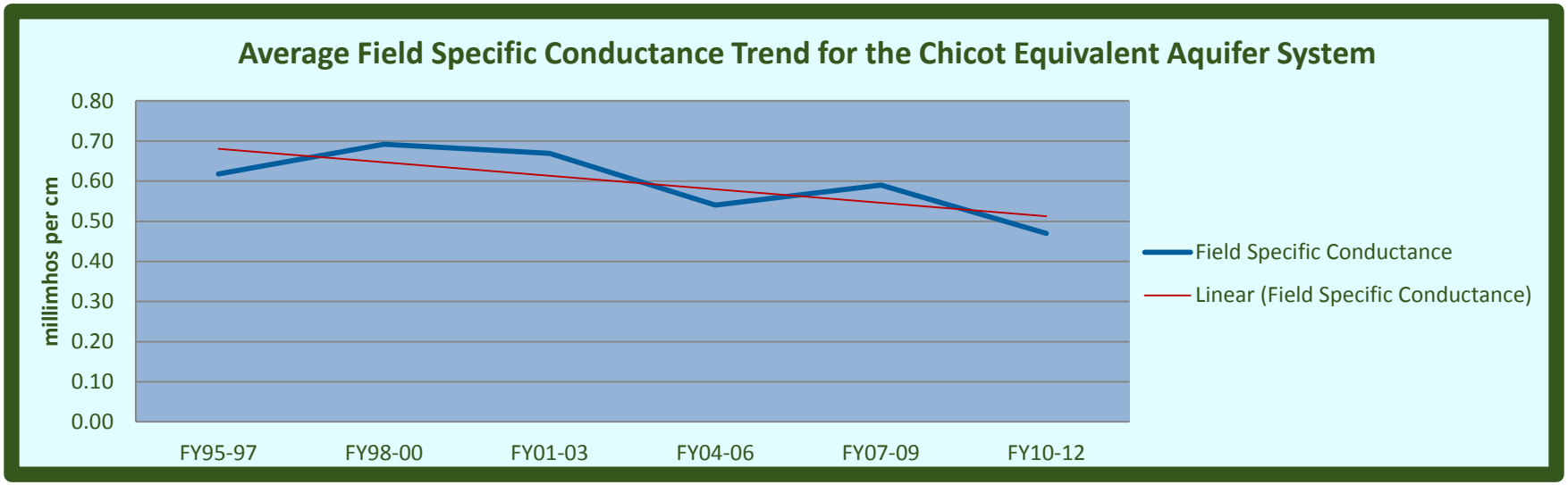


Chart 12-4: Lab Specific Conductance Trend

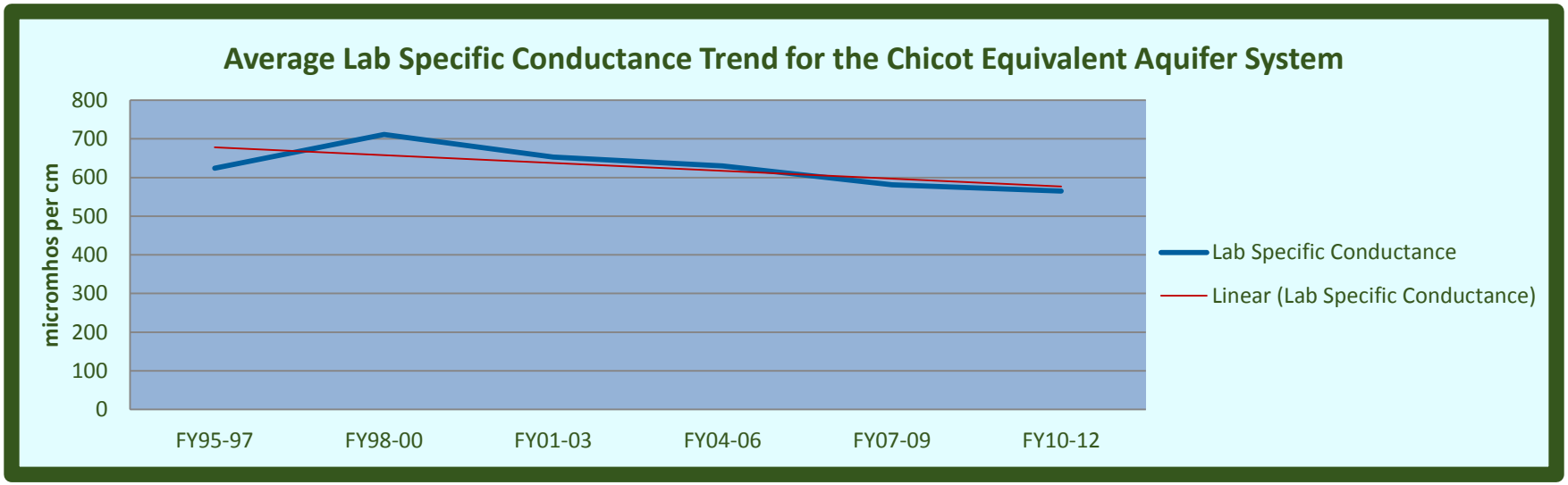


Chart 12-5: Field Salinity Trend

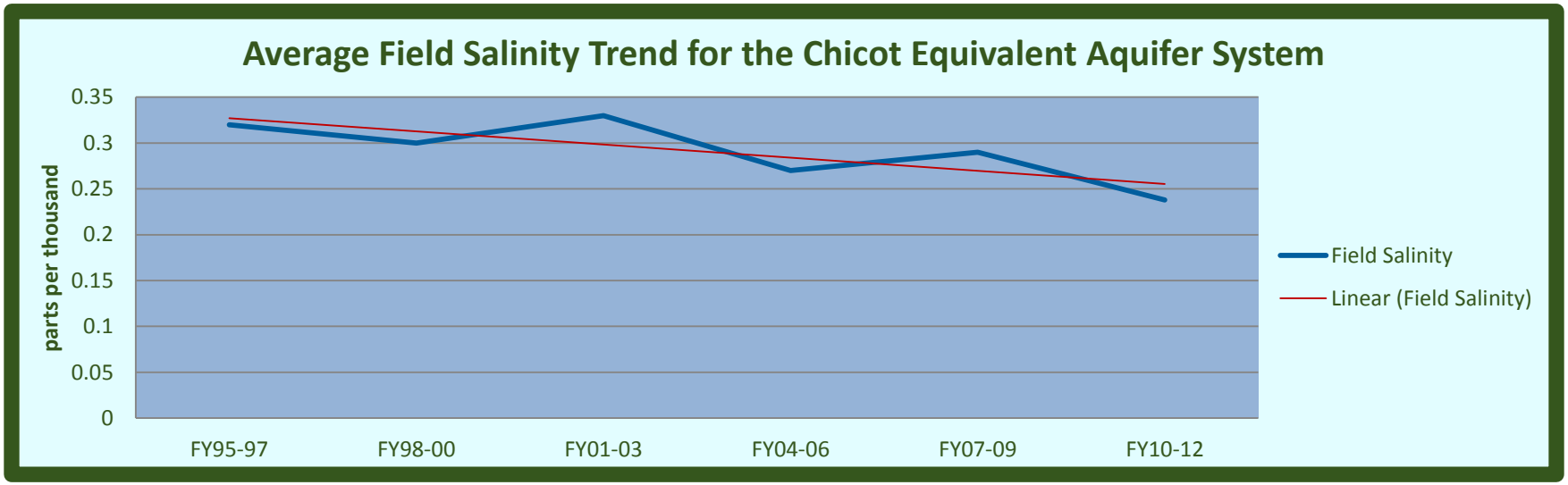


Chart 12-6: Chloride Trend

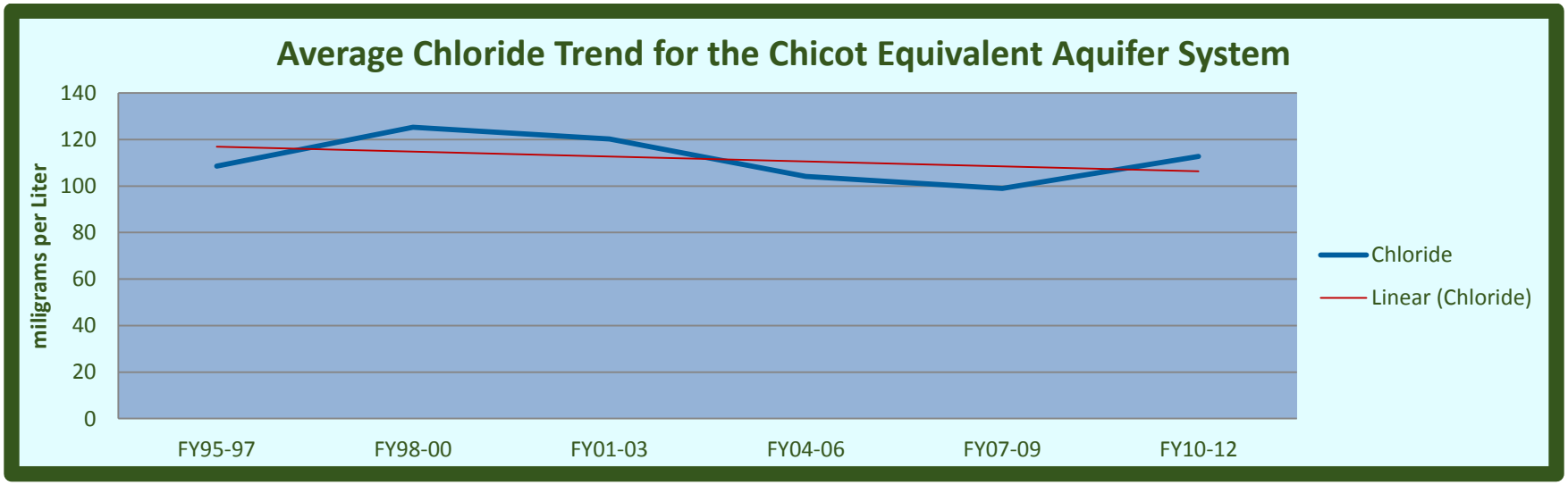


Chart 12-7: Alkalinity Trend

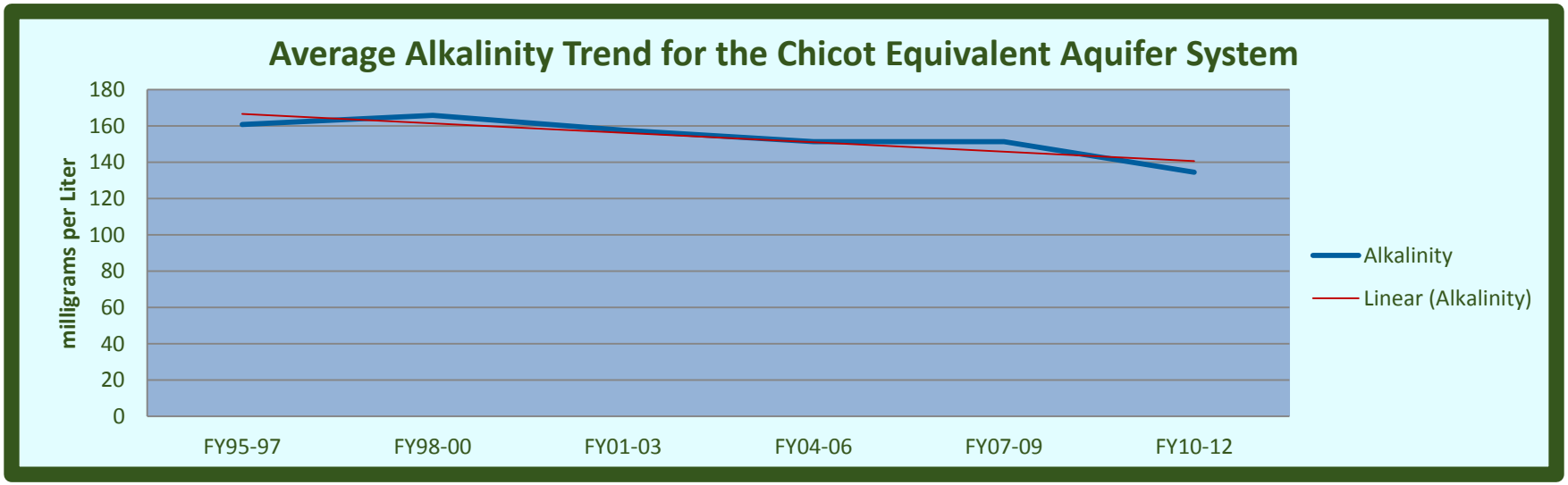


Chart 12-8: Color Trend

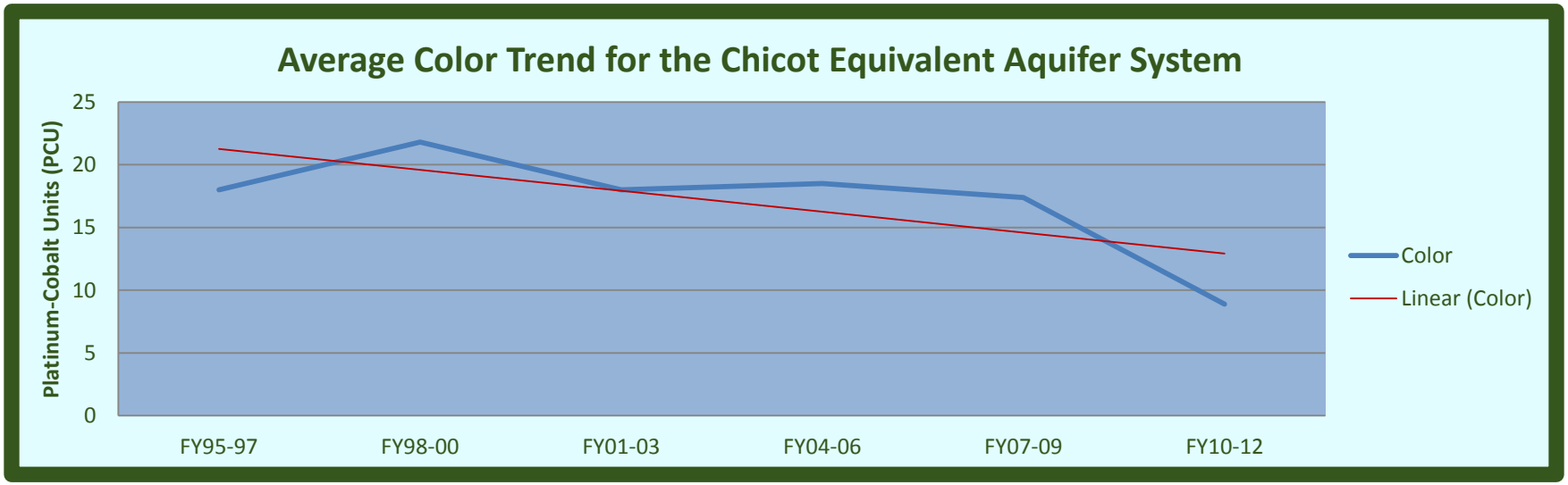


Chart 12-9: Sulfate Trend

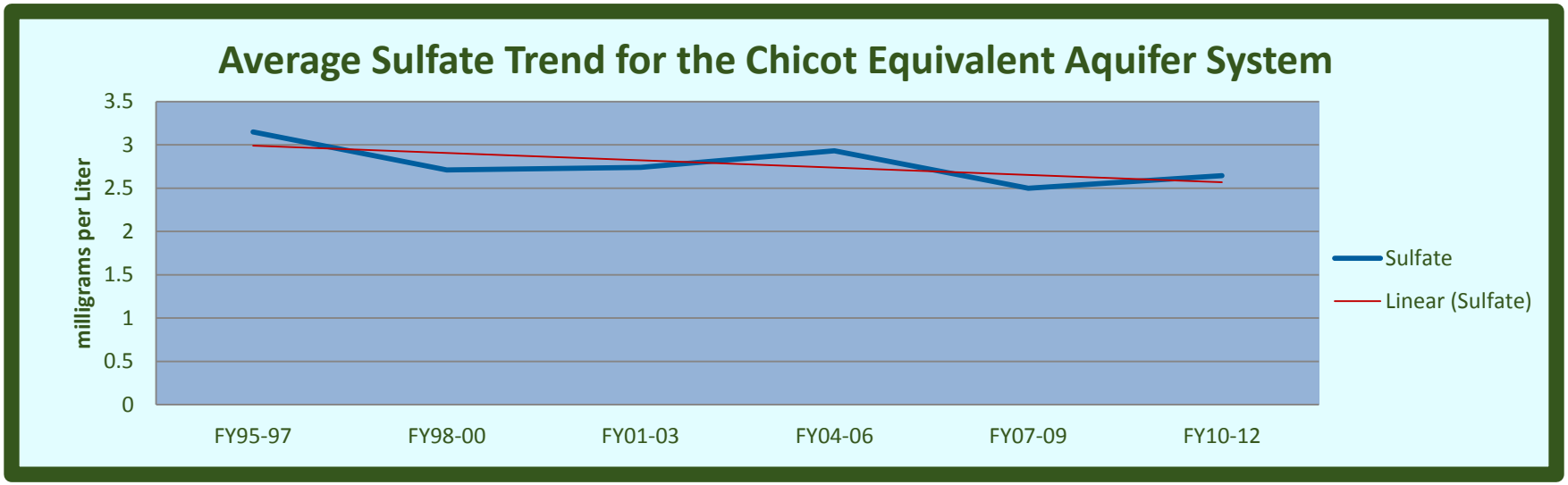


Chart 12-10: Total Dissolved Solids Trend

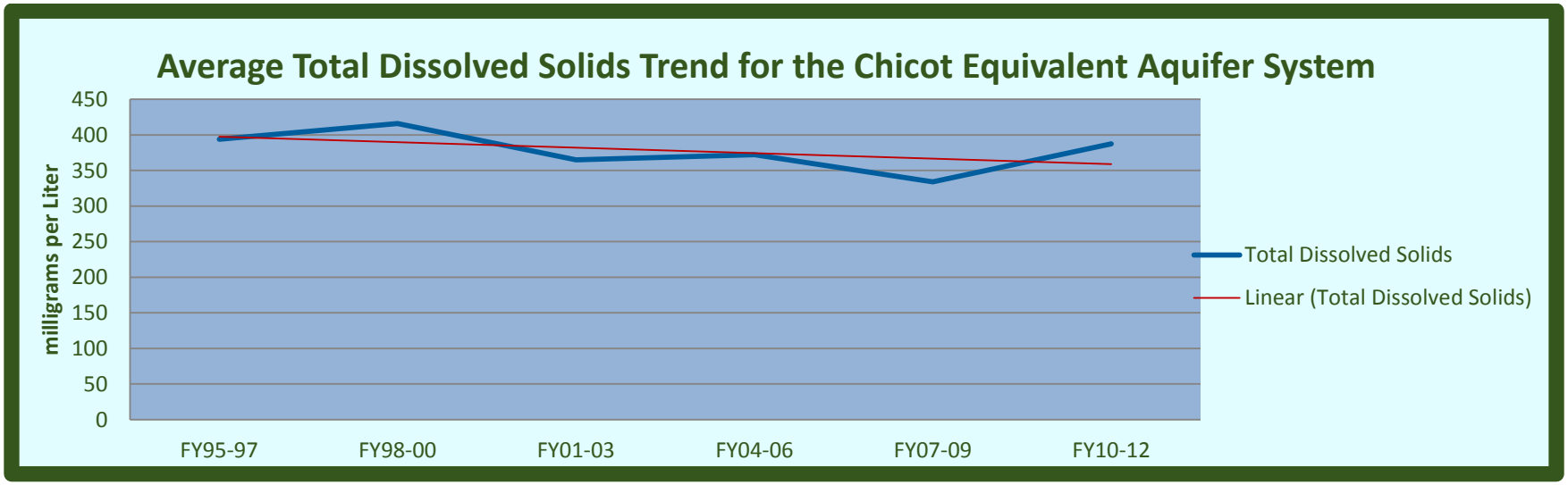


Chart 12-11: Ammonia Trend

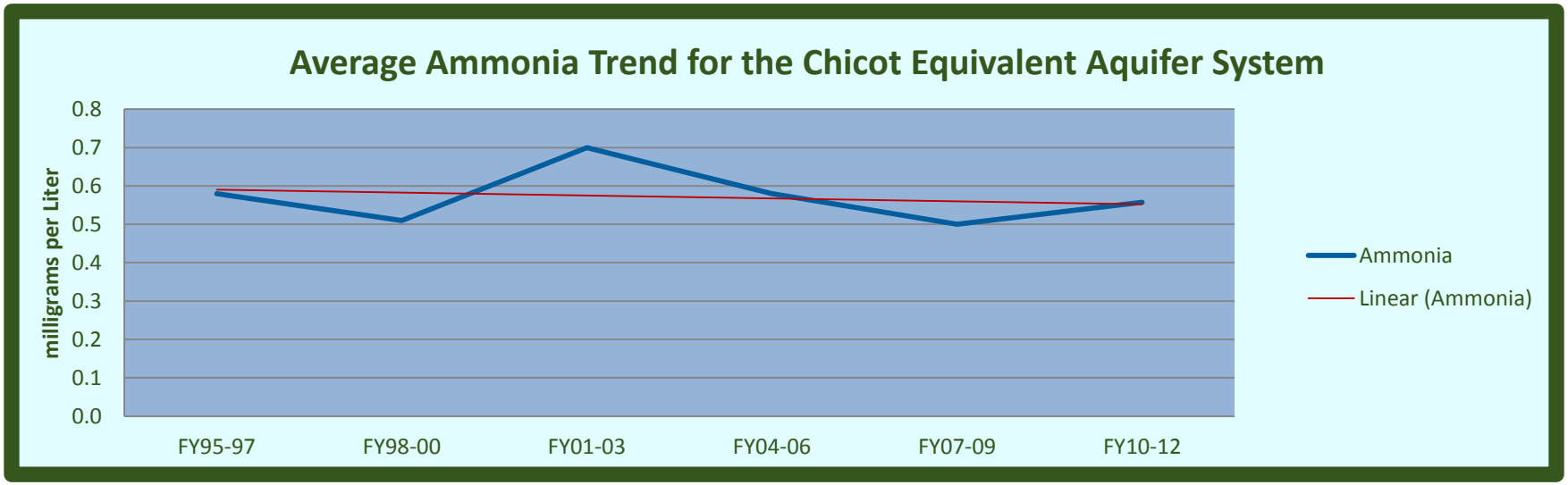


Chart 12-12: Hardness Trend

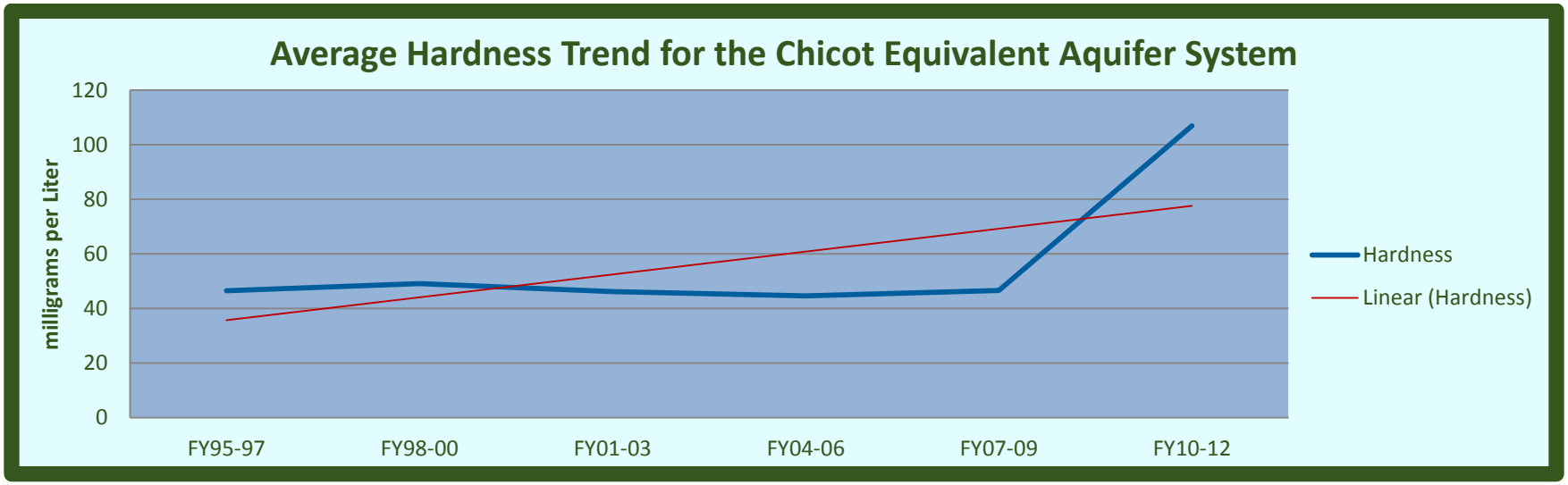


Chart 12-13: Nitrite – Nitrate Trend

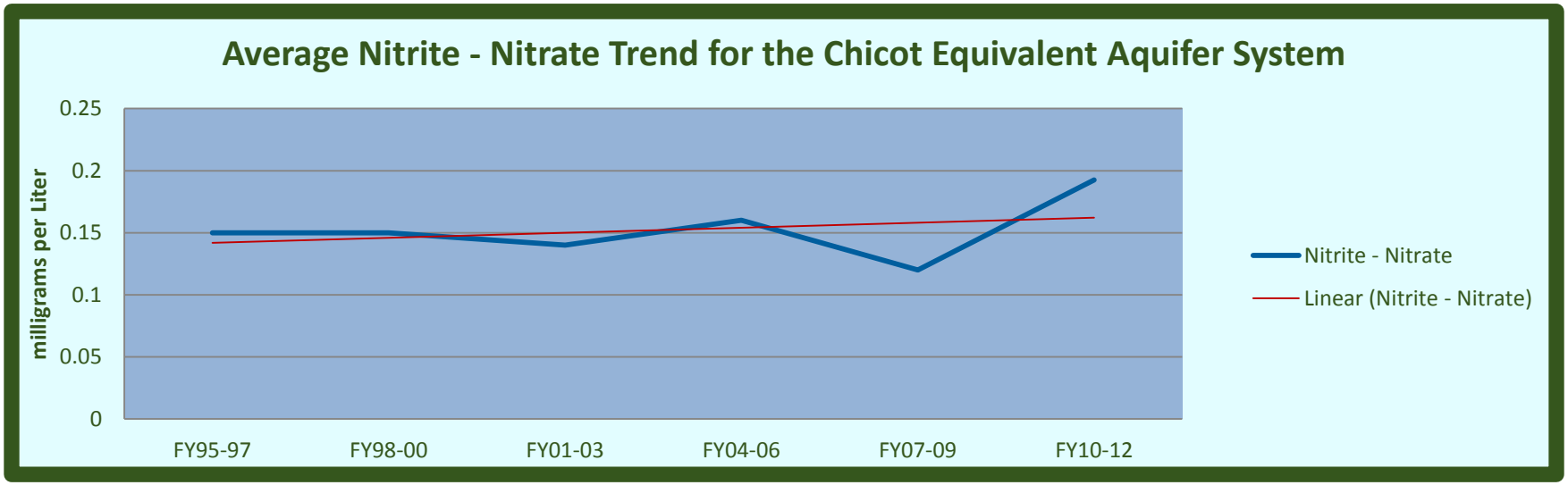


Chart 12-14: TKN Trend

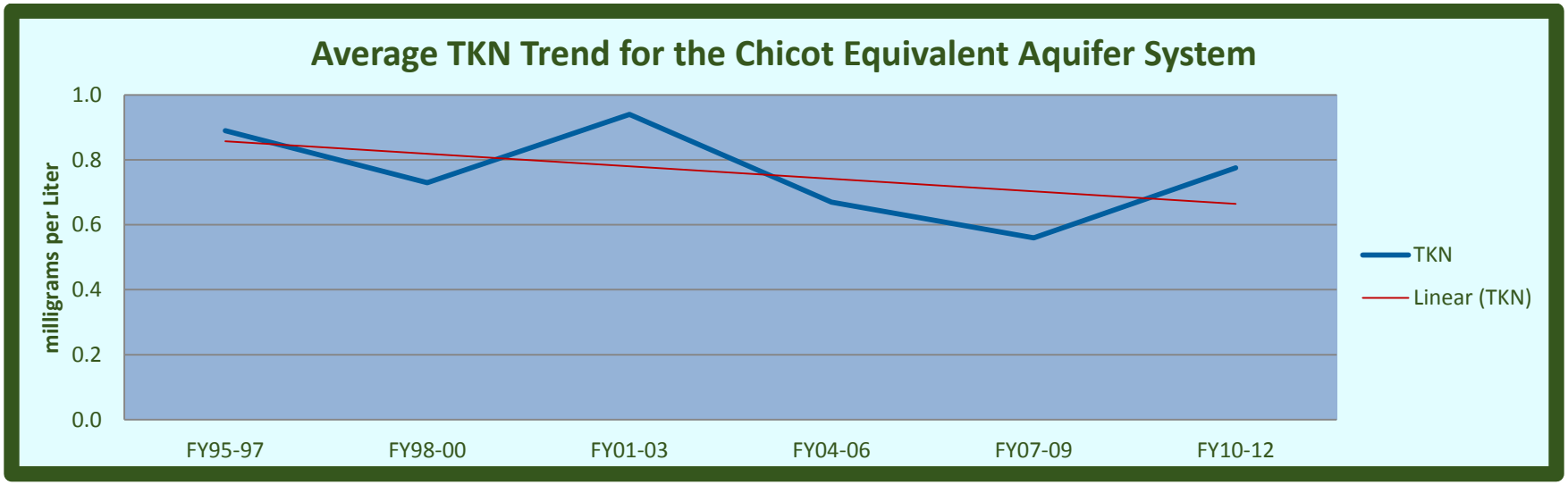


Chart 12-15: Total Phosphorus Trend

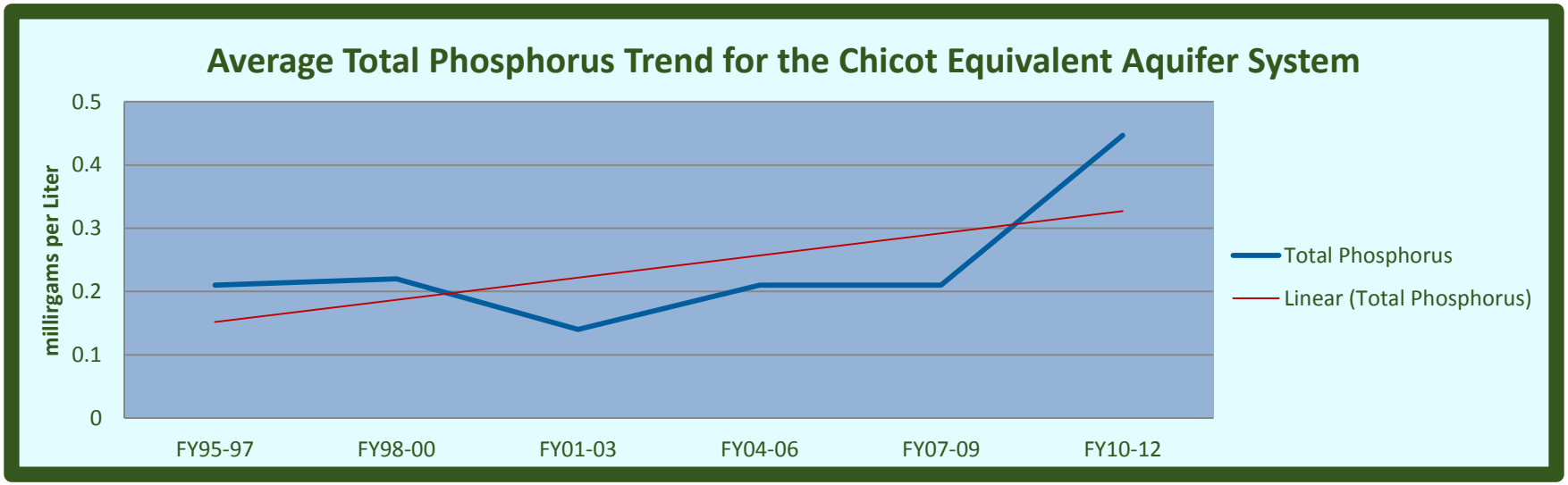


Chart 12-16: Iron Trend