# EVANGELINE AQUIFER SUMMARY

# BASELINE MONITORING PROGRAM, FY 2004

APPENDIX 4

OF THE

TRIENNIAL SUMMARY REPORT, 2006

FOR THE

WATER QUALITY ASSESSMENT DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH CWA

# EVANGELINE AQUIFER SUMMARY

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## BACKGROUND

In order to better assess the water quality of a particular aquifer at a given point in time, an attempt was made during the current sampling cycle to sample all assigned wells producing from a common aquifer in a narrow time frame. Also, to more conveniently and economically promulgate those data collected from a particular aquifer, a summary report on each aquifer sampled was prepared separately. Collectively, these aquifer summaries will make up part of the Baseline Monitoring Program Triennial Summary Report for 2006.

Figure 4-1 shows the geographic locations of the Evangeline aquifer and the associated wells, whereas Table 4-1 lists the wells in the aquifer along with their total depths and the use made of produced waters and date sampled.

In January of 2004, eleven wells were sampled which produce from the Evangeline aquifer. Seven of the wells are classified as public supply wells; one well is classified as domestic, one as industrial, and one as an irrigation well. The remaining well is classified as "other" by the Louisiana Department of Transportation and Development (LDOTD), however it is used as a public supply well. The wells are located in seven parishes from the central to the southwest part of the state.

Well data for registered water wells were obtained from the Louisiana Department of Transportation and Development's Water Well Registration Data file.

## GEOLOGY

The Evangeline aquifer is comprised of unnamed Pliocene sands and the Pliocene-Miocene Blounts Creek member of the Fleming formation. The Blounts Creek consists of sands, silts, and silty clays, with some gravel and lignite. The sands of the aquifer are moderately well to well sorted and fine to medium grained with interbedded coarse sand, silt, and clay. The mapped outcrop corresponds to the outcrop of the Blounts Creek member, but downdip, the aquifer thickens and includes Pliocene sand beds that do not outcrop. The confining clays of the Castor Creek member (Burkeville aquiclude) retard the movement of water between the Evangeline and the underlying Miocene aquifer systems. The Evangeline is separated in most areas from the overlying Chicot aquifer by clay beds; in some areas the clays are missing and the upper sands of the Evangeline are in direct contact with the lower sands and gravels of the Chicot.

## HYDROGEOLOGY

Recharge to the Evangeline aquifer occurs by the direct infiltration of rainfall in interstream, upland outcrop areas and the movement of water through overlying terrace deposits, as well as leakage from other aquifers. Fresh water in the Evangeline is separated from water in stratigraphically equivalent deposits in southeast Louisiana by a saltwater ridge in the Mississippi River valley. The hydraulic conductivity of the Evangeline varies between 20-100 feet/day.

The maximum depths of occurrence of freshwater in the Evangeline range from 150 feet above sea level, to 2,250 feet below sea level. The range of thickness of the fresh water interval in the Evangeline is 50 to 1,900 feet. The depths of the Evangeline wells that were monitored in conjunction with the BMP range from 170 to 1,715 feet.

## PROGRAM PARAMETERS

The field parameters checked at each sampling site and the list of water quality analytical parameters are shown in Table 4-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 4-3. These tables also show the field and analytical results determined for each analyte.

In addition to the above mentioned water quality and inorganic analytical parameters, a list of target analytical parameters include three other categories of compounds: volatiles, semi-volatiles, and pesticides/PCB's. Due to the large number of analytes in these categories, tables were not prepared. A discussion of any detections from these three categories can be found in the following section. Also, in order for the reader to be aware of the total list of analytes, Tables 4-8, 4-9 and 4-10 were included in this report.

Tables 4-4 and 4-5 provide an overview of water quality and inorganic data for the Evangeline aquifer, listing the minimum, maximum, and average results for these parameters. Tables 4-6 and 4-7 compare these same parameter averages to historical Baseline Program-derived data for the Evangeline aquifer, from fiscal years 1995, 1998 and 2001.

Figures 4-2, 4-3, 4-4, and 4-5 respectively, represent the contoured data for pH, TDS, chloride, and iron.

## INTERPRETATION OF DATA

*FIELD, WATER QUALITY, AND NUTRIENTS PARAMETERS*

Federal Primary Drinking Water Standards: Under the Federal Safe Drinking Water Act, EPA has established 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, this Office does use the MCLs as a benchmark for further evaluation.

A review of the analyses listed on Table 4-2 shows that no primary MCL was exceeded for field, water quality, or nutrients parameters.

Those BMP wells reporting turbidity levels greater than 1.0 NTU do not exceed the Primary MCL of 1.0, as this standard applies to surface water systems only.

Federal Secondary Drinking Water Standards: EPA has set secondary standards that are defined as non-enforceable taste, odor, or appearance guidelines.

Field and laboratory data contained in Table 4-2 show that the following secondary MCLs (SMCLs) were exceeded.

pH – SMCL = 6.5 – 8.5 SU

AL-120 – 8.77 SU
AL-363 – 8.96 SU
BE-512 – 8.70 SU
R-1350 – 6.46 SU

Color – SMCL = 15 PCU

AL-363 – 29 PCU EV-858 – 23 PCU

Total Dissolved Solids (TDS) – SMCL = 500 ppm

AV-441 – 661 ppm EV-858 – 614 ppm

*INORGANIC PARAMETERS*

Table 4-3 shows the inorganic (total metals) parameters that are sampled for and the analytical results for those parameters for each well. Table 4-5 provides an overview of inorganic data for the Evangeline aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 4-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 4-3 show that the following secondary MCL (SMCL) was exceeded.

Iron – SMCL = 300 ppb

CU-1362 – 444 ppb R-1350 – 2,290 ppb

*VOLATILE ORGANIC COMPOUNDS*

Table 4-8 shows the volatile organic compound (VOC) parameters that are sampled for. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a VOC would be discussed in this section.

Trichloroethylene was detected in well V-5065Z at 5 ppb on the January 27 sampling of 2004. This domestic well was resampled for VOCs in February of 2005. Results from this resample show that trichloroethylene was not detected in the resample or its duplicate. Therefore, it is the opinion of this Office that the original detection of trichloroethylene in 2004 was due to field or lab contamination and not due to contamination of well V-5065Z. Taking this resample result into consideration, laboratory data show that no MCLs were exceeded for this category of compounds.

*SEMIVOLATILE ORGANIC COMPOUNDS*

Table 4-9 shows the semivolatile organic compound (SVOC) parameters that are sampled for. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of an SVOC would be discussed in this section.

Laboratory data from the January 27 sampling of 2004 reported that well AL-391, a public supply well, exceeded the MCL of 6 parts per billion (ppb) for bis(2-ethylhexyl)phthalate (BEHP), with a concentration of 10.6 ppb. However, this well was also resampled in February of 2005 for SVOCs. Results from this resample and its duplicate sample show that BEHP was not detected in this well. Therefore, it is this Office's opinion that the BEHP originally detected in well AL-391, is due to laboratory or field contamination and is not due to contamination of this well.

Taking this resample data into consideration, laboratory data show that no primary MCL was exceeded for this category of compounds.

*PESTICIDES AND PCBS*

Table 4-10 shows the pesticide and PCB parameters that are sampled for. Due to the number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected during the 2004 sampling of the Evangeline aquifer.

## COMPARISON TO HISTORICAL DATA

Tables 4-6 and 4-7 list the current field, water quality, nutrients and inorganic data averages alongside those parameters' data averages for the three previous sampling rotations (three, six and nine years prior). A comparison of these averages show that the following analytes have decreased in their average concentrations over the previous sampling rotations: specific conductance (both field and lab), salinity, alkalinity, color, TDS, copper and zinc. All other analytes have remained fairly consistent since the FY95 sampling.

## SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from this aquifer is generally soft[1], and is of good quality when considering short-term or long-term health risk guidelines. Laboratory data show that no well that was sampled during this sampling rotation of the Evangeline aquifer exceeded a primary MCL. The data also show that this aquifer is of good quality when considering taste, odor, or appearance guidelines. A comparison to historical BMP data show that several analytes have decreased in their average concentrations, while the remainder of the analytes has not changed significantly since the FY 1995 sampling.

It is recommended that the BMP wells assigned to the Evangeline aquifer be re-sampled as planned in approximately three years. In addition, several wells should be added to the eleven 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, 1985.*

## Table 4-1 Wells Sampled

| PARISH | WELL NUMBER | DATE SAMPLED | OWNER | DEPTH (FEET) | WELL USE |
|---|---|---|---|---|---|
| ALLEN | AL-120 | 1/27/2004 | CITY OF OAKDALE | 910 | PUBLIC SUPPLY |
| ALLEN | AL-363 | 1/26/2004 | WEST ALLEN PARISH WATER DIST. | 1,715 | PUBLIC SUPPLY |
| ALLEN | AL-391 | 1/26/2004 | FAIRVIEW WATER SYSTEM | 800 | PUBLIC SUPPLY |
| AVOYELLES | AV-441 | 1/27/2004 | TOWN OF EVERGREEN | 319 | PUBLIC SUPPLY |
| BEAUREGARD | BE-410 | 1/26/2004 | BOISE CASCADE | 474 | INDUSTRIAL |
| BEAUREGARD | BE-512 | 1/26/2004 | SINGER WATER DISTRICT | 918 | PUBLIC SUPPLY |
| CALCASIEU | CU-1362 | 1/26/2004 | LA WATER CO | 635 | PUBLIC SUPPLY |
| EVANGELINE | EV-858 | 1/26/2004 | SAVOY SWORDS WATER SYSTEM | 472 | PUBLIC SUPPLY |
| RAPIDES | R-1350 | 1/27/2004 | PRIVATE OWNER | 180 | IRRIGATION |
| VERNON | V-5065Z | 1/27/2004 | PRIVATE OWNER | 170 | DOMESTIC |
| VERNON | V-668 | 1/27/2004 | LDWF/FORT POLK WMA HQ | 280 | OTHER |

## Table 4-2 Field, Water Quality, and Nutrients Data

| WELL NAME | PH SU | SAL. PPT | SP. COND. MMHOS/CM | TDS G/L | TEMP. DEG. C | ALK. PPM | NH3 PPM | CL PPM | COLOR PCU | HARD PPM | NITRITE-NITRATE (AS N) PPM | TKN PPM | TOT. P PPM | SP. COND. UMHOS/CM | SO4 PPM | TDS PPM | TSS PPM | TURB NTU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LABORATORY DETECTION LIMITS → | | | | | 2.0 | 0.1 | 1.3 | 5.0 | 5.0 | 0.05 | 0.1 | 0.05 | 10 | 1.3 | 4.0 | 4.0 | 1.0 |
| | FIELD PARAMETERS | | | | | LABORATORY PARAMETERS | | | | | | | | | | | | |
| AL-120 | 8.77 | 0.14 | 0.294 | 0.19 | 23.15 | 150 | <0.1 | 3.8 | <5 | <5 | <0.05 | 0.48 | 0.09 | 303 | 6.2 | 175 | <4 | <1 |
| AL-363 | 8.96 | 0.23 | 0.473 | 0.31 | 24.79 | 251 | 0.13 | 3.7 | 29 | <5 | <0.05 | 0.18 | 0.28 | 480 | 2.5 | 295 | <4 | <1 |
| AL-391 | 8.01 | 0.11 | 0.231 | 0.15 | 22.39 | 116 | 0.24 | 4.6 | <5 | 35.1 | <0.05 | 0.37 | <0.05 | 233 | 5.6 | 123 | <4 | <1 |
| AV-441 | 7.83 | 0.54 | 1.091 | 0.71 | 19.83 | 410 | 0.52 | 92.9 | 7 | 14.1 | <0.05 | 0.65 | 0.21 | 1,130 | 34.5 | 661 | <4 | <1 |
| BE-410 | 6.76 | 0.08 | 0.175 | 0.11 | 22.02 | 81.3 | <0.1 | 5.3 | <5 | 59.8 | 0.07 | <0.1 | 0.08 | 179 | 2.7 | 112 | <4 | <1 |
| BE-410* | 6.76 | 0.08 | 0.175 | 0.11 | 22.02 | 81.3 | <0.1 | 5.3 | <5 | 60 | 0.07 | <0.1 | 0.1 | 178 | 2.7 | 120 | <4 | 1.1 |
| BE-512 | 8.70 | 0.15 | 0.316 | 0.21 | 24.69 | 163 | <0.1 | 5 | 8 | <5 | <0.05 | 0.19 | 0.13 | 310 | 5.7 | 197 | <4 | <1 |
| CU-1362 | 7.14 | 0.13 | 0.266 | 0.17 | 23.49 | 118 | 0.13 | 14.7 | 10 | 34.7 | <0.05 | 0.31 | 0.25 | 269 | 2 | 190 | <4 | <1 |
| EV-858 | 7.75 | 0.43 | 0.87 | 0.57 | 21.87 | 342 | 0.49 | 85.7 | 23 | 35.3 | <0.05 | 0.55 | 0.09 | 900 | <1.3 | 614 | <4 | <1 |
| R-1350 | 6.46 | 0.03 | 0.075 | 0.05 | NO DATA | 23.7 | <0.1 | 3.6 | <5 | 10 | <0.05 | 0.22 | <0.05 | 69.8 | 5.3 | 85.3 | <4 | 5.5 |
| V-5065Z | 7.28 | 0.03 | 0.068 | 0.04 | | 27.5 | <0.1 | 4.3 | <5 | 14.8 | 0.07 | 0.16 | <0.05 | 71.7 | 1.5 | 63 | <4 | <1 |
| V-668 | 6.83 | 0.02 | 0.035 | 0.02 | | 9.7 | <0.1 | 2.9 | <5 | 7.9 | <0.05 | 0.14 | <0.05 | 32.8 | <1.3 | 35.3 | <4 | 1.1 |
| V-668* | 6.83 | 0.02 | 0.035 | 0.02 | | 9.9 | <0.1 | 2.9 | <5 | 7.6 | <0.05 | 0.2 | <0.05 | 33.6 | <1.3 | 51.3 | <4 | 1.3 |

* Denotes duplicate sample.

## Table 4-3 Inorganic Data

| WELL NAME | Antimony PPB | Arsenic PPB | Barium PPB | Beryllium PPB | Cadmium PPB | Chromium PPB | Copper PPB | Iron PPB | Lead PPB | Mercury PPB | Nickel PPB | Selenium PPB | Silver PPB | Thallium PPB | Zinc PPB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Detection Limits | 5 | 5 | 1 | 1 | 1 | 5 | 5 | 20 | 10 | 0.05 | 5 | 5 | 1 | 5 | 10 |
| AL-120 | <5 | <5 | 9.9 | <1 | <1 | <5 | <5 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| AL-363 | <5 | <5 | 9 | <1 | <1 | <5 | <5 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| AL-391 | <5 | <5 | 127 | <1 | <1 | <5 | <5 | 72.8 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| AV-441 | 5.2 | <5 | 76.9 | <1 | <1 | <5 | <5 | 241 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| BE-410 | <5 | <5 | 154 | <1 | <1 | <5 | <5 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| BE-410* | <5 | <5 | 152 | <1 | <1 | <5 | <5 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| BE-512 | <5 | <5 | 6 | <1 | <1 | <5 | <5 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| CU-1362 | <5 | <5 | 201 | <1 | <1 | <5 | <5 | 444 | <10 | <0.05 | <5 | <5 | <1 | <5 | 21.3 |
| EV-858 | 5.3 | <5 | 201 | <1 | <1 | <5 | <5 | 63.2 | <10 | <0.05 | <5 | <5 | <1 | <5 | <10 |
| R-1350 | <5 | <5 | 15.7 | <1 | <1 | <5 | <5 | 2,290 | <10 | <0.05 | <5 | <5 | <1 | <5 | 173 |
| V-5065Z | <5 | <5 | 73.4 | <1 | <1 | <5 | 15.3 | <20 | <10 | <0.05 | <5 | <5 | <1 | <5 | 17.9 |
| V-668 | <5 | <5 | 43 | <1 | <1 | <5 | 11.5 | 67.5 | <10 | <0.05 | <5 | <5 | <1 | <5 | 23.3 |
| V-668* | <5 | <5 | 40.9 | <1 | <1 | <5 | 33.7 | 238 | <10 | <0.05 | <5 | <5 | <1 | <5 | 72.2 |

* Denotes duplicate sample.

## Table 4-4 Field, Water Quality, and Nutrients Statistics

Fiscal Year 2004

| | PARAMETER | MINIMUM | MAXIMUM | AVERAGE |
|---|---|---|---|---|
| FIELD | Temperature °C | 19.83 | 24.79 | 22.69 |
| | pH (SU) | 6.46 | 8.96 | 7.54 |
| | Sp. Conductance (mmhos/cm) | 0.035 | 1.091 | 0.32 |
| | Salinity (ppt) | 0.02 | 0.54 | 0.15 |
| | TDS (g/L) | 0.023 | 0.709 | 0.21 |
| LABORATORY | Alkalinity (ppm) | 9.7 | 410 | 137.2 |
| | Chloride (ppm) | 2.9 | 92.9 | 18.1 |
| | Color (PCU) | <5 | 29 | 7.5 |
| | Specific Conductance (umhos/cm) | 32.8 | 1,130 | 322.3 |
| | Sulfate (ppm) | <1.3 | 34.5 | 5.4 |
| | TDS (ppm) | 35.3 | 661 | 209.4 |
| | TSS (ppm) | <4 | <4 | <4 |
| | Turbidity (NTU) | <1 | 5.5 | 1.04 |
| | Ammonia (ppm) | <0.1 | 0.52 | 0.15 |
| | Hardness (ppm) | <5 | 60 | 22.1 |
| | Nitrite-Nitrate, as N (ppm) | <0.05 | 0.07 | <0.05 |
| | TKN (ppm) | <0.1 | 0.65 | 0.27 |
| | Phosphorous (ppm) | <0.05 | 0.28 | 0.10 |

## Table 4-5 Inorganic Statistics

Fiscal Year 2004

| PARAMETER | MINIMUM | MAXIMUM | AVERAGE |
|---|---|---|---|
| Antimony (ppb) | <5 | 5.3 | <5 |
| Arsenic (ppb) | <5 | <5 | <5 |
| Barium (ppb) | 6 | 201 | 85.4 |
| Beryllium (ppb) | <1 | <1 | <1 |
| Cadmium (ppb) | <1 | <1 | <1 |
| Chromium (ppb) | <5 | <5 | <5 |
| Copper (ppb) | <5 | 33.7 | 6.6 |
| Iron (ppb) | <20 | 2,290 | 267.4 |
| Lead (ppb) | <10 | <10 | <10 |
| Mercury (ppb) | <0.05 | <0.05 | <0.05 |
| Nickel (ppb) | <5 | <5 | <5 |
| Selenium (ppb) | <5 | <5 | <5 |
| Silver (ppb) | <1 | <1 | <1 |
| Thallium (ppb) | <5 | <5 | <5 |
| Zinc (ppb) | <10 | 173 | 26.8 |

## Table 4-6 Three-year Field, Water Quality, and Nutrients Averages

| | PARAMETER | FY 1995 AVERAGE | FY 1998 AVERAGE | FY 2001 AVERAGE | FY 2004 AVERAGE |
|---|---|---|---|---|---|
| FIELD | Temperature $^{O}$C | 23.71 | 22.87 | 21.33 | 22.69 |
| | pH (SU) | 7.14 | 7.08 | 7.05 | 7.54 |
| | Sp. Conductivity (mmhos/cm) | 0.50 | 0.50 | 0.30 | 0.32 |
| | Salinity (ppt) | 0.22 | 0.21 | 0.14 | 0.15 |
| | TDS (g/L) | - | - | - | 0.21 |
| LABORATORY | Alkalinity (ppm) | 205.8 | 192.8 | 176.7 | 137.2 |
| | Chloride (ppm) | 15.2 | 27.0 | 38.3 | 18.1 |
| | Color (PCU) | 23.3 | 6.7 | 8.2 | 7.5 |
| | Sp. Conductivity (umhos/cm) | 489.6 | 453.8 | 446.1 | 322.3 |
| | Sulfate (ppm) | 4.71 | 4.40 | 5.73 | 5.43 |
| | TDS (ppm) | 308.4 | 324.8 | 263.7 | 209.4 |
| | TSS (ppm) | <4 | <4 | <4 | <4 |
| | Turbidity (NTU) | <1 | <1 | <1 | 1.04 |
| | Ammonia (ppm) | 0.20 | 0.16 | 0.22 | 0.15 |
| | Hardness (ppm) | 16.1 | 11.1 | 31.9 | 22.6 |
| | Nitrite-Nitrate, as N (ppm) | <0.05 | <0.05 | <0.05 | <0.05 |
| | TKN (ppm) | 0.72 | 0.16 | 0.69 | 0.28 |
| | Phosphorus (ppm) | 0.16 | 0.15 | 0.17 | 0.10 |

## Table 4-7 Three-year Inorganic Averages

| PARAMETER | FY 1995 AVERAGE | FY 1998 AVERAGE | FY 2001 AVERAGE | FY 2004 AVERAGE |
|---|---|---|---|---|
| Antimony (ppb) | <5 | - | <5 | <5 |
| Arsenic (ppb) | <5 | <5 | <5 | <5 |
| Barium (ppb) | 62.7 | 41.4 | 127.0 | 85.4 |
| Beryllium (ppb) | <2 | <2 | <2 | <1 |
| Cadmium (ppb) | <2 | <2 | <2 | <1 |
| Chromium (ppb) | <5 | <5 | <5 | <5 |
| Copper (ppb) | 25.1 | 48.6 | 7.9 | 6.6 |
| Iron (ppb) | 203.1 | 104.5 | 160.7 | 267.4 |
| Lead (ppb) | <10 | <10 | <10 | <10 |
| Mercury (ppb) | <0.05 | <0.05 | <0.05 | <0.05 |
| Nickel (ppb) | 8.1 | <5 | <5 | <5 |
| Selenium (ppb) | <5 | <5 | <5 | <5 |
| Silver (ppb) | <1 | 1.19 | <1 | <1 |
| Thallium (ppb) | <5 | <5 | <5 | <5 |
| Zinc (ppb) | 134.2 | 106.6 | 15.2 | 26.8 |

## Table 4-8 VOC Analytical Parameters

BASELINE MONITORING PROGRAM

| COMPOUND | ANALYTICAL METHOD | CAS NUMBER | PQL (ppb) |
|---|---|---|---|
| 1,1-Dichloroethane | 624 | 75343 | 2 |
| 1,1-Dichloroethene | 624 | 75354 | 2 |
| 1,1,1-Trichloroethane | 624 | 71556 | 2 |
| 1,1,2-Trichloroethane | 624 | 79005 | 2 |
| 1,1,2,2-Tetrachloroethane | 624 | 79345 | 2 |
| 1,2-Dichlorobenzene | 624 | 95501 | 2 |
| 1,2-Dichloroethane | 624 | 107062 | 2 |
| 1,2-Dichloropropane | 624 | 78875 | 2 |
| 1,3-Dichlorobenzene | 624 | 541731 | 2 |
| 1,4-Dichlorobenzene | 624 | 106467 | 2 |
| BENZENE | 624 | 71432 | 2 |
| BROMOFORM | 624 | 75252 | 2 |
| CARBON TETRACHLORIDE | 624 | 56235 | 2 |
| CHLOROBENZENE | 624 | 108907 | 2 |
| DIBROMOCHLOROMETHANE | 624 | 124481 | 2 |
| CHLOROETHANE | 624 | 75003 | 2 |
| cis-1,3-Dichloropropene | 624 | 10061015 | 2 |
| Bromodichloromethane | 624 | 75274 | 2 |
| Methylene Chloride | 624 | 75092 | 2 |
| Ethyl Benzene | 624 | 100414 | 2 |
| Methyl Bromide | 624 | 74839 | 2 |
| Methyl Chloride | 624 | 74873 | 2 |
| Methylene Chloride | 624 | 75092 | 2 |
| o-Xylene | 624 | 95476 | 2 |
| Styrene | 624 | 100425 | 2 |
| METHYL-t-BUTYL ETHER | 624 | 1634044 | 2 |
| Tetrachloroethylene | 624 | 127184 | 2 |
| Toluene | 624 | 108883 | 2 |
| TRANS-1,2-DICHLOROETHENE | 624 | 156605 | 2 |
| trans-1,3-Dichloropropene | 624 | 10061026 | 2 |
| Trichloroethylene | 624 | 79016 | 2 |
| TRICHLOROFLUOROMETHANE | 624 | 75694 | 2 |
| CHLOROFORM | 624 | 67663 | 2 |
| Vinyl Chloride | 624 | 75014 | 2 |

PQL = Practical Quantitation Limit
ppb = parts per billion

## Table 4-9 Semi-volatile Analytical Parameters

BASELINE MONITORING PROGRAM

| COMPOUND | ANALYTICAL METHOD | CAS NUMBER | PQL (ppb) |
|---|---|---|---|
| 1,2-Dichlorobenzene | 625 | 95501 | 10 |
| 1,2,3-Trichlorobenzene | 625 | 87616 | 10 |
| 1,2,3,4-Tetrachlorobenzene | 625 | 634662 | 10 |
| 1,2,4-Trichlorobenzene | 625 | 120821 | 10 |
| 1,2,4,5-Tetrachlorobenzene | 625 | 95943 | 10 |
| 1,3-Dichlorobenzene | 625 | 541731 | 10 |
| 1,3,5-Trichlorobenzene | 625 | 108703 | 10 |
| 1,4-Dichlorobenzene | 625 | 106467 | 10 |
| 2-Chloronaphthalene | 625 | 91587 | 10 |
| 2-Chlorophenol | 625 | 95578 | 20 |
| 2-Methyl-4,6-dinitrophenol | 625 | 534521 | 20 |
| 2-Nitrophenol | 625 | 88755 | 20 |
| 2,4-Dichlorophenol | 625 | 120832 | 20 |
| 2,4-Dimethylphenol | 625 | 105679 | 20 |
| 2,4-Dinitrophenol | 625 | 51285 | 20 |
| 2,4-Dinitrotoluene | 625 | 121142 | 10 |
| 2,4,6-Trichlorophenol | 625 | 88062 | 20 |
| 2,6-Dinitrotoluene | 625 | 606202 | 10 |
| 3,3'-Dichlorobenzidine | 625 | 91941 | 10 |
| 4-Bromophenyl phenyl ether | 625 | 101553 | 10 |
| 4-Chloro-3-methylphenol | 625 | 59507 | 20 |
| 4-Chlorophenyl phenyl ether | 625 | 7005723 | 10 |
| 4-Nitrophenol | 625 | 100027 | 20 |
| Acenaphthene | 625 | 83329 | 10 |
| Acenaphthylene | 625 | 208968 | 10 |
| Anthracene | 625 | 120127 | 10 |
| Benzidine | 625 | 92875 | 20 |
| Benzo[a]pyrene | 625 | 50328 | 10 |
| Benzo[k]fluoranthene | 625 | 207089 | 10 |
| Benz[a]anthracene | 625 | 56553 | 10 |
| Benzo[b]fluoranthene | 625 | 205992 | 10 |
| Benzo[g,h,i]perylene | 625 | 191242 | 10 |
| bis (2-Chloroethoxy) methane | 625 | 111911 | 10 |
| bis (2-Ethylhexyl) phthalate | 625 | 117817 | 10 |
| bis (2-Chloroethyl) ether | 625 | 111444 | 10 |
| bis (2-Chloroethyl) ether | 625 | 111444 | 10 |
| bis (2-Chloroisopropyl) ether | 625 | 108601 | 10 |
| Butyl benzyl phthalate | 625 | 85687 | 10 |
| Chrysene | 625 | 218019 | 10 |
| Diethyl phthalate | 625 | 84662 | 10 |
| Dimethyl phthalate | 625 | 131113 | 10 |
| Di-n-butyl phthalate | 625 | 84742 | 10 |

**Table 4-9 (Cont'd)**
Semivolatile Parameters

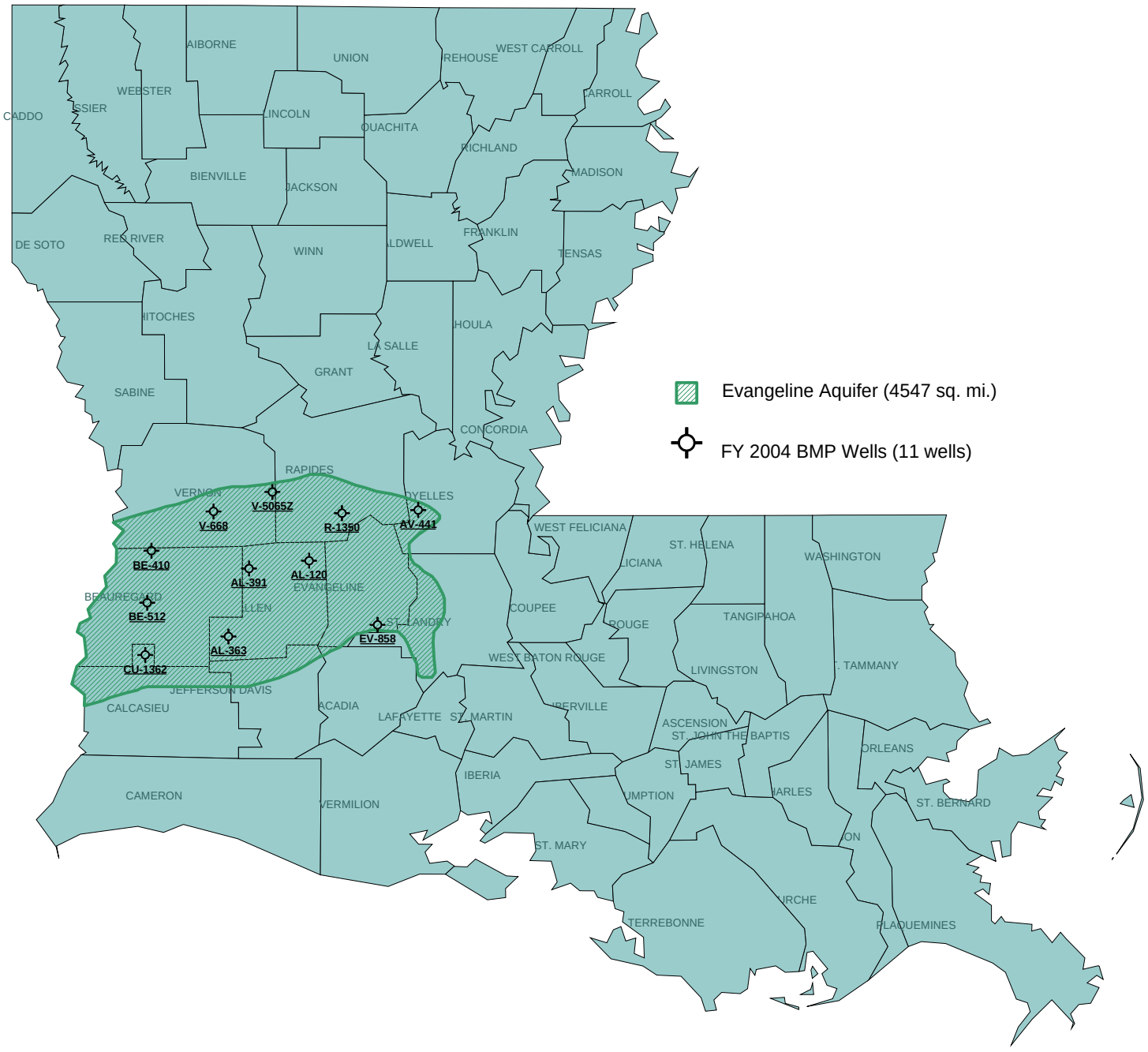
| COMPOUND | ANALYTICAL METHOD | CAS NUMBER | PQL (ppb) |
|---|---|---|---|
| Di-n-octyl phthalate | 625 | 117840 | 10 |
| Fluoranthene | 625 | 206440 | 10 |
| Fluorene | 625 | 86737 | 10 |
| Hexachlorobenzene | 625 | 118741 | 10 |
| Hexachlorobutadiene | 625 | 87683 | 10 |
| Hexachlorocyclopentadiene | 625 | 77474 | 10 |
| Hexachloroethane | 625 | 67721 | 10 |
| Indeno[1,2,3-cd]pyrene | 625 | 193395 | 10 |
| Isophorone | 625 | 78591 | 10 |
| Naphthalene | 625 | 91203 | 10 |
| Nitrobenzene | 625 | 98953 | 10 |
| N-Nitrosodimethylamine | 625 | 62759 | 10 |
| N-Nitrosodiphenylamine | 625 | 86306 | 10 |
| N-nitroso-di-n-propylamine | 625 | 621647 | 10 |
| Pentachlorobenzene | 625 | 608935 | 10 |
| Pentachlorophenol | 625 | 87865 | 20 |
| Phenanthrene | 625 | 85018 | 10 |
| Phenol | 625 | 108952 | 20 |
| Pyrene | 625 | 129000 | 10 |

## Table 4-10 Pesticide and PCB Analytical Parameters

BASELINE MONITORING PROGRAM

| COMPOUND | ANALYTICAL METHOD | CAS NUMBER | PQL (ppb) |
|---|---|---|---|
| 4,4'-DDD | 8081 | 72548 | 0.1 |
| 4,4'-DDE | 8081 | 72559 | 0.1 |
| 4,4'-DDT | 8081 | 50293 | 0.1 |
| Aldrin | 8081 | 309002 | 0.05 |
| alpha-BHC | 8081 | 319846 | 0.05 |
| beta-BHC | 8081 | 319857 | 0.05 |
| delta-BHC | 8081 | 319868 | 0.05 |
| gamma-BHC | 8081 | 58899 | 0.05 |
| Chlordane | 8081 | 57749 | 0.5 |
| Dieldrin | 8081 | 60571 | 0.1 |
| Endosulfan I | 8081 | 959988 | 0.05 |
| Endosulfan II | 8081 | 33213659 | 0.1 |
| Endosulfan Sulfate | 8081 | 1031078 | 0.1 |
| Endrin | 8081 | 72208 | 0.1 |
| Endrin aldehyde | 8081 | 7421934 | 0.1 |
| Heptachlor | 8081 | 76448 | 0.05 |
| Heptachlor epoxide | 8081 | 1024573 | 0.05 |
| Toxaphene | 8081 | 8001352 | 5 |
| Aroclor-1016 | 8082 | 12674112 | 1 |
| Aroclor-1221 | 8082 | 11104282 | 1 |
| Aroclor-1232 | 8082 | 11141165 | 1 |
| Aroclor-1242 | 8082 | 53469219 | 1 |
| Aroclor-1248 | 8082 | 12672296 | 1 |
| Aroclor-1254 | 8082 | 11097691 | 1 |
| Aroclor-1260 | 8082 | 11096825 | 1 |

# BASELINE MONITORING PROGRAM WELLS OF THE EVANGELINE AQUIFER




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 4-1 Location Plat, Evangeline Aquifer**

# EVANGELINE AQUIFER - pH

## Baseline Monitoring Program, FY2004

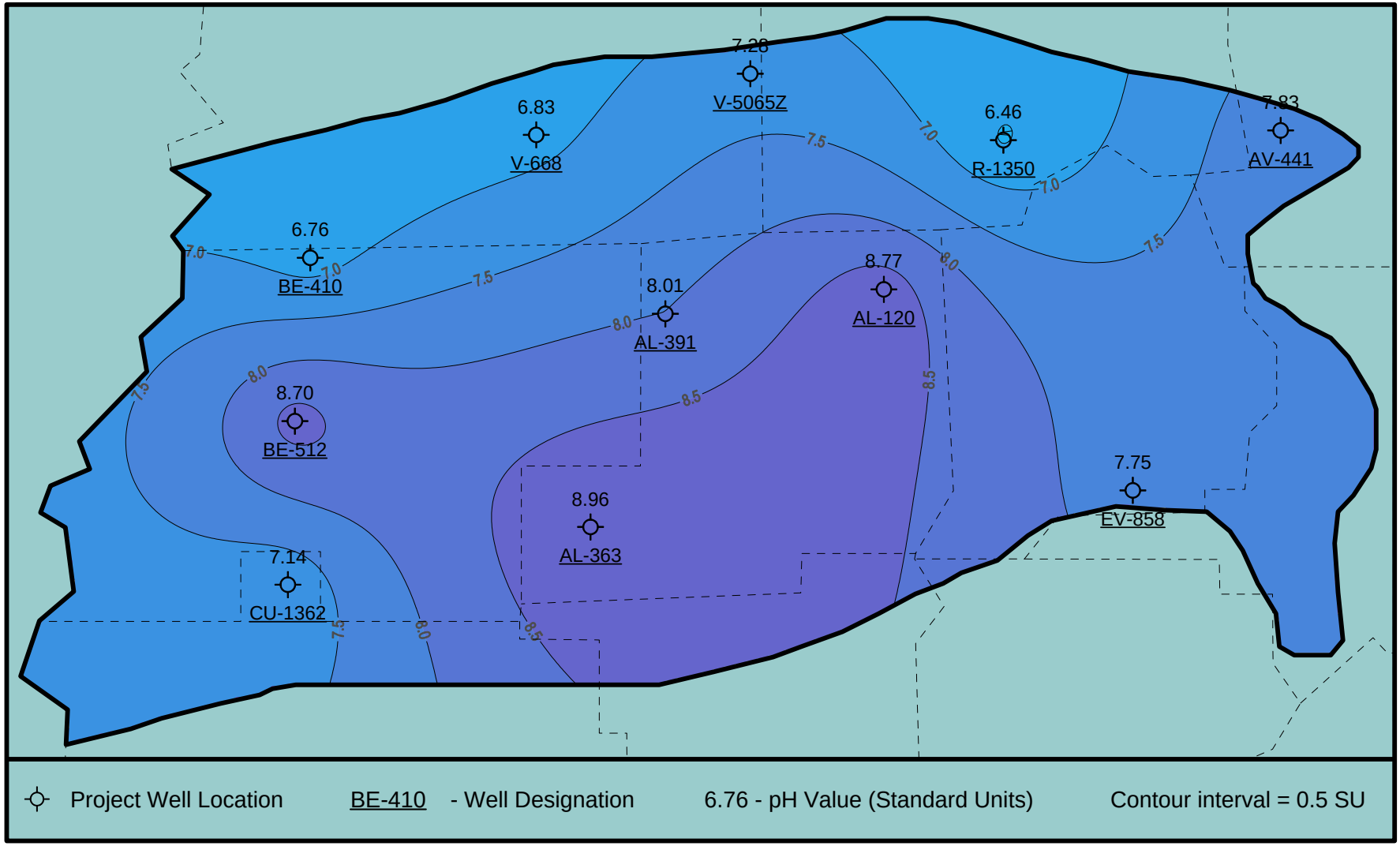



**Figure 4-2 Map of pH Data**

# EVANGELINE AQUIFER - TDS

## Baseline Monitoring Program, FY2004

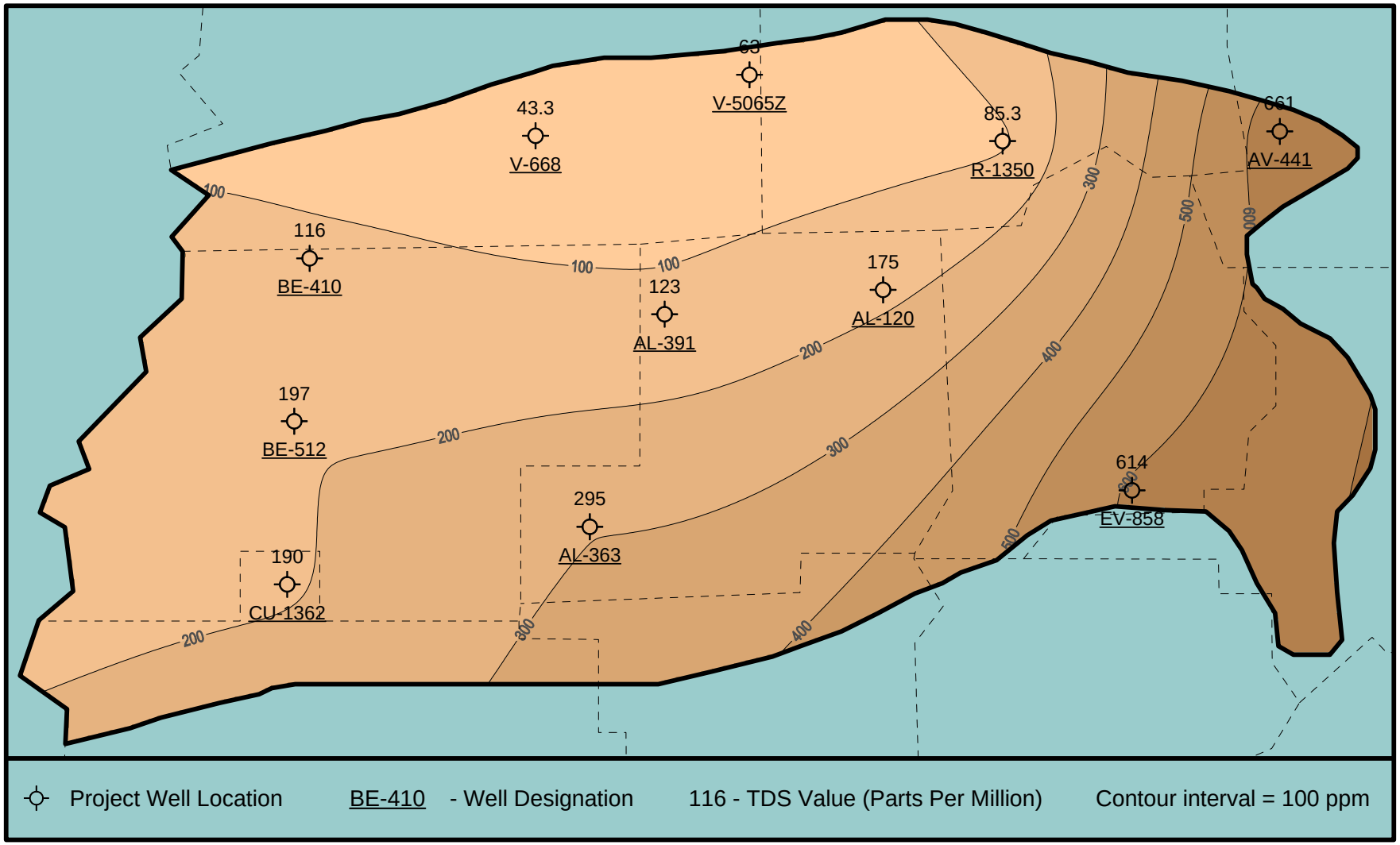



**Figure 4-3 Map of TDS Data**

# EVANGELINE AQUIFER - Chloride

## Baseline Monitoring Program, FY2004

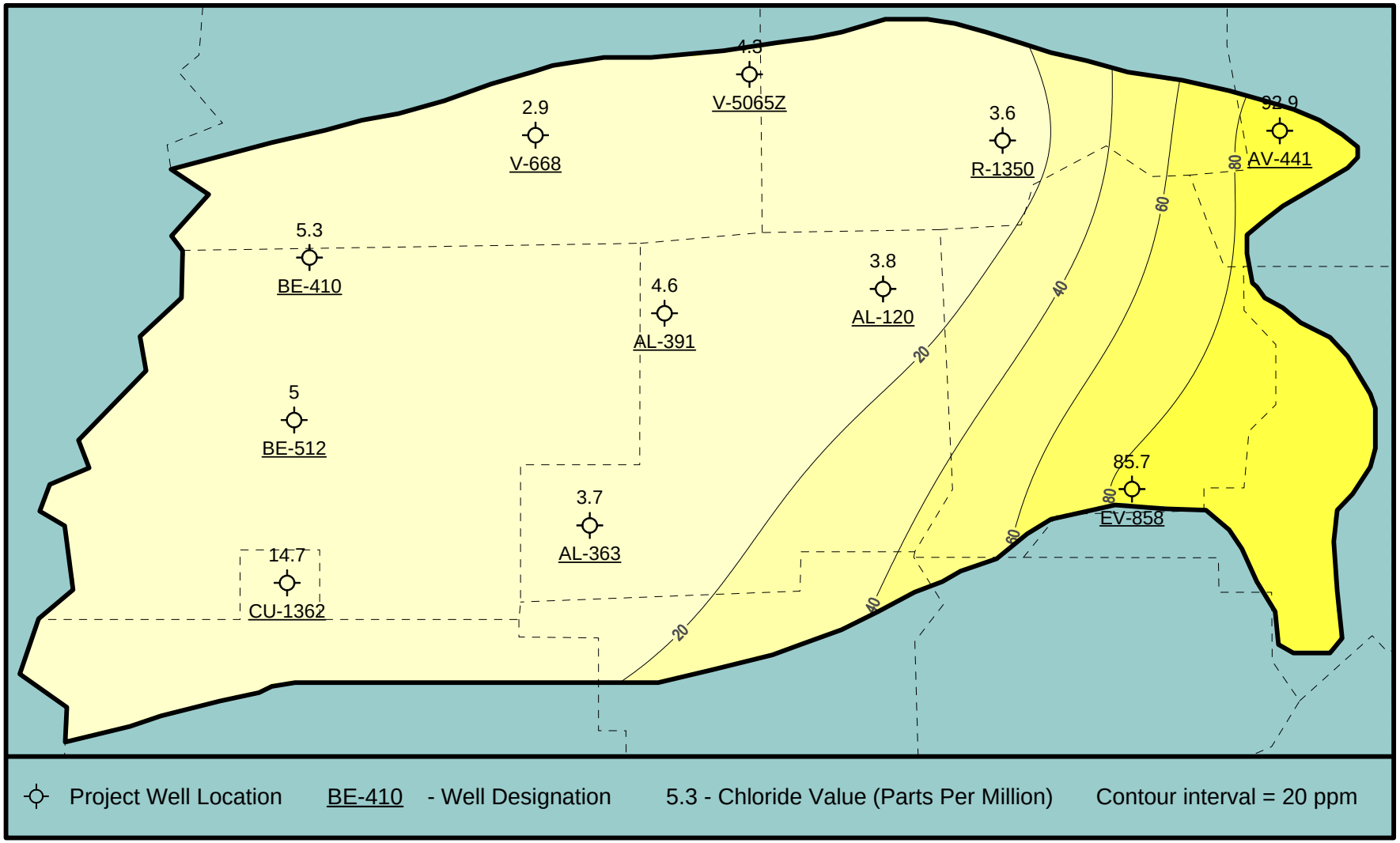



**Figure 4-4 Map of Chloride Data**

# EVANGELINE AQUIFER - Iron

## Baseline Monitoring Program, FY2004

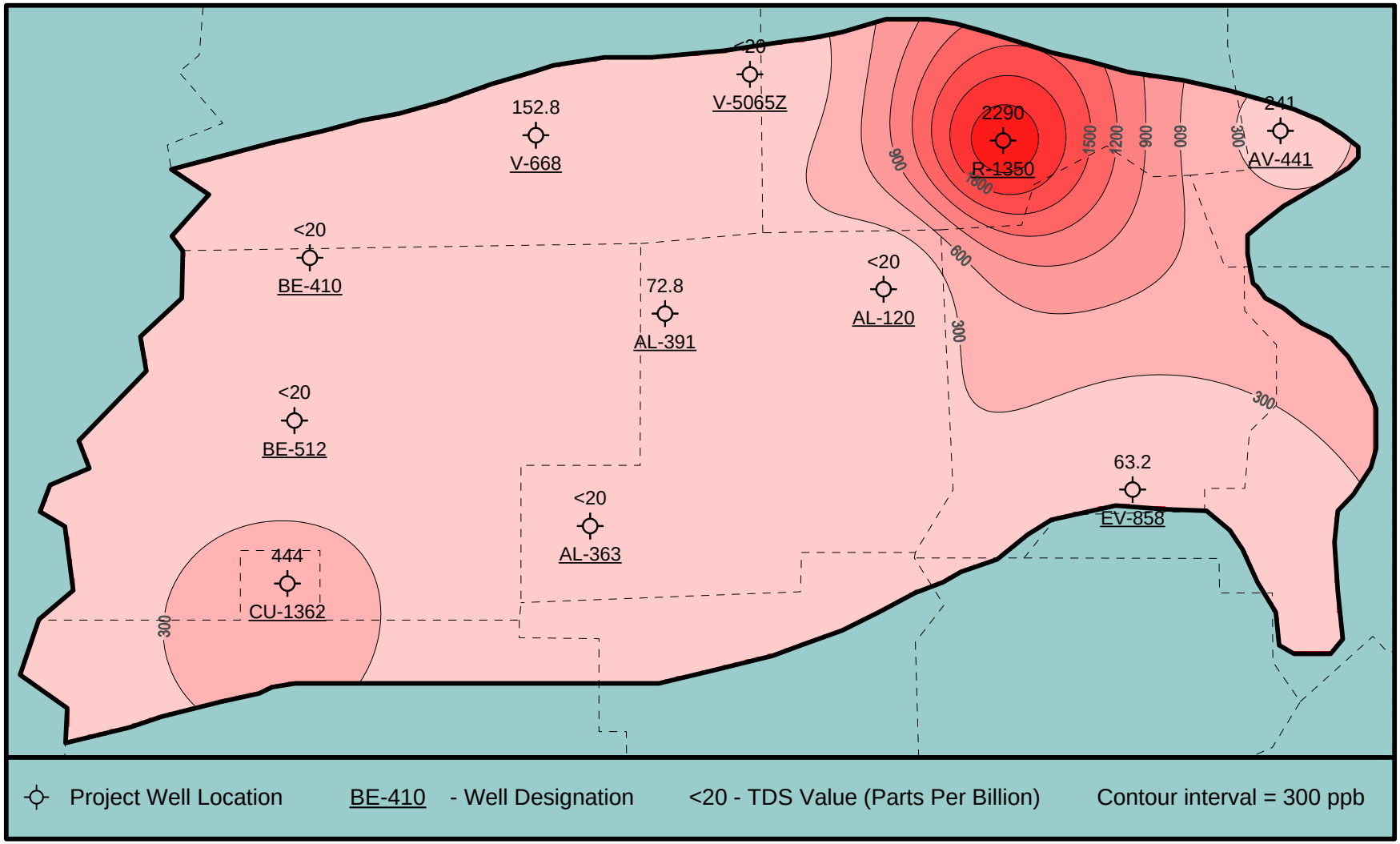



**Figure 4-5 Map of Iron Data**