APPENDIX 1

EVANGELINE AQUIFER SUMMARY

BASELINE MONITORING PROJECT, EPA FY'98

(July 1997 Through June 1998)

PART IV

OF

TRIENNIAL SUMMARY REPORT

FOR THE

WATER QUALITY MANAGEMENT DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH CWA 106 GRANT

EVANGELINE AQUIFER SUMMARY

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BACKGROUND

To better assess the water quality of a particular aquifer at a given point in time, an attempt was made during the project year to sample all project wells producing from a common aquifer in a narrow time frame. Also, to more conveniently and economically promulgate those data collected, these aquifer summaries will make up the project Triennial Summary Report.

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

These data show that in January 1998, eight project wells were sampled which produce from the Evangeline Aquifer. Of these eight wells, five are classified as Public Supply, one is classified as Industrial, one is classified as Irrigation, and one is classified as Domestic. The wells are located in six parishes in the southwest and central part of the state.

PROJECT FIELD AND ANALYTICAL PARAMETERS

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

In addition to the analytical parameters mentioned above, a list of project analytical parameters include three other categories of compounds: Volatiles, Semi-volatiles, and Pesticides/PCB's. Due to the large number of analytes of these three categories, tables were not prepared for each well. However, in order for the reader to be aware of the total list of analytes, Tables IV-4, IV-5, and IV-6 were included in this summary. The tables list the project analytes along with their Practical Quantitation Limits (PQLs) used during processing.

DISCUSSION OF WATER QUALITY DATA

FEDERAL PRIMARY DRINKING WATER STANDARDS: Laboratory data show that one project water well of the Evangeline Aquifer which is used as a public supply well exceeded the Federal Maximum Contaminant Level for Beryllium. Avoyelles parish well number AV-441 reported 52.1 ppb of Beryllium (MCL for Beryllium = 4 ppb). Typical sources of Beryllium contamination in drinking water are the electrical, aerospace, and defense industries. Plans are being made to re-sample this well to make a final determination as to the occurrence of this compound.

Laboratory data also show that seven project wells exceeded the Federal Maximum Contaminant Level for Antimony (MCL for Antimony = 6 ppb). However, the concentration for Antimony found in the Field Blank was 13.6 ppb, which was well above every concentration for Antimony that was found in the wells. Therefore, the Antimony concentrations that were found in the project wells are considered false positives due to field or lab contamination and are not considered a result of contamination of the waters of the Evangeline Aquifer.

Those project wells reporting Turbidity levels of >1 NTU, do not exceed the MCL of 1.0, as this primary standard applies to surface water systems only.

FEDERAL SECONDARY DRINKING WATER STANDARDS: Secondary standards are defined as non-enforceable taste, odor or appearance guidelines. Field and laboratory data contained in Tables IV-2 and IV-3 show that three of the wells sampled in the Evangeline Aquifer exceeded the Secondary Maximum Contaminant Levels (SMCL) for two separate analytes in this category.

TDS (SMCL=500 ppm) Wells AV-441 and EV-858 exceeded this secondary standard with the following reported concentrations: AV-441, 704 ppm; EV-858, 626 ppm.

IRON (SMCL=300 ppb) R-1350 exceeded this secondary standard with a reported concentration of 318 ppb.

SELECTED WATER QUALITY MAPS

For the reader's convenience, maps showing the contoured values for pH, TDS, Chloride, and Iron are included in this summary report in Figures IV-2 through IV-5.

SUMMARY AND RECOMMENDATIONS

In summary, the analytical data show the ground water from this aquifer to be of good quality. The concentration of Beryllium at well number AV-441 has yet to be confirmed, however, plans are being made to re-sample this well to make a final determination as to the occurrence of this compound. Data received from this re-sampling will be appended to this summary report.

It is recommended that the eight project wells assigned to the Evangeline Aquifer be re-sampled as planned, in approximately three years. In addition, several wells should be added to those currently sampled to increase the well density for this aquifer.

Table IV-1 List of Project Wells Sampled

EVANGELINE AQUIFER PROJECT WELLS							
PROJECT NUMBER	PARISH	PARISH WELL NO.	DATE SAMPLED	WELL OWNER	DEPTH (feet)	WELL USE	AQUIFER
8601	ALLEN	AL-120	01/12/1998	CITY OF OAKDALE	910	PUBLIC SUPPLY	EVANGELINE
9504	ALLEN	AL-363	01/12/1998	WEST ALLEN PARISH WATER DIST.	1715	PUBLIC SUPPLY	EVANGELINE
9327	AVOYELLES	AV-441	01/12/1998	TOWN OF EVERGREEN	319	PUBLIC SUPPLY	EVANGELINE
9119	BEAUREGARD	BE-410	01/13/1998	BOISE CASCADE	474	INDUSTRIAL	EVANGELINE
9505	BEAUREGARD	BE-512	01/12/1998	SINGER WATER DISTRICT	918	PUBLIC SUPPLY	EVANGELINE
9503	EVANGELINE	EV-858	01/12/1998	SAVOY SWORDS WATER SYSTEM	472	PUBLIC SUPPLY	EVANGELINE
9313	RAPIDES	R-1350	01/12/1998	COUNTRY PINES NURSERY	180	IRRIGATION	EVANGELINE
9506	VERNON	V-5065Z	01/12/1998	MR. LARRY AFEMAN	170	DOMESTIC	EVANGELINE

Table IV-2 Summary of Water Quality Data

EVANGELINE AQUIFER
WATER QUALITY PARAMETERS

FIELD PARAMETERS

WELL NUMBER	TEMP ^{o}C	pH SU	COND. mmhos/cm	SAL. ppt	TSS ppm	TDS ppm	ALK. ppm	HARD. ppm	TURB. NTU	COND. umhos/cm	COLOR PCU	Cl ppm	SO_4 ppm	NITRITE-NITRATE (as N) ppm	TOT. P ppm	TKN ppm	TOC ppm	NH_3 (as N) ppm
AL-120	22.51	7.44	0.307	0.15	<4.0	238.0	153.0	<5.0	<1.0	319.0	<5.0	6.60	5.80	0.030	0.13	<0.02	<2.00	<0.10
AL-120*	22.51	7.44	0.307	0.15	<4.0	214.0	154.0	<5.0	<1.0	322.0	<5.0	6.60	5.50	0.030	0.14	<0.02	<2.00	<0.10
AL-363	27.60	8.50	0.475	0.23	<4.0	352.0	259.0	<5.0	<1.0	501.0	20.0	3.70	2.10	0.020	0.24	0.14	2.40	0.10
AV-441	20.50	7.42	1.075	0.53	<4.0	704.0	433.0	15.0	1.1	1128.0	5.0	105.00	<0.04	0.020	0.16	0.38	3.10	0.40
BE-410	26.88	7.20	0.319	0.15	<4.0	280.0	161.0	17.2	<1.0	334.0	<5.0	6.30	6.80	0.090	0.11	0.11	<2.00	0.20
BE-512	24.39	8.16	0.320	0.15	<4.0	256.0	163.0	<5.0	<1.0	333.0	<5.0	5.70	5.80	0.020	0.11	0.11	<2.00	0.12
EV-858	21.73	7.23	0.921	0.45	<4.0	626.0	361.0	42.4	<1.0	991.0	20.0	100.00	6.10	<0.020	0.25	0.69	2.00	0.40
R-1350	19.96	5.29	0.700	0.03	<4.0	127.0	24.0	<5.0	1.2	79.9	<5.0	4.20	6.20	0.020	0.09	<0.02	<2.00	<0.10
V-5065Z	19.76	5.08	0.071	0.03	<4.0	126.0	27.3	12.7	<1.0	76.5	<5.0	5.20	1.30	0.050	0.10	<0.02	5.70	<0.10

* Denotes duplicate sample.

Table IV-3 Summary of Inorganic Data

EVANGELINE AQUIFER INORGANIC (TOTAL METALS) PARAMETERS															
WELL NUMBER	ARSENIC ppb	SILVER ppb	BARIUM ppb	BERYLLIUM ppb	CADMIUM ppb	CHROMIUM ppb	COPPER ppb	IRON ppb	MERCURY ppb	NICKEL ppb	ANTIMONY ppb	SELENIUM ppb	LEAD ppb	THALLIUM ppb	ZINC ppb
AL-120	<5.0	<2.0	<10.0	<1.0	<2.0	<5.0	54.0	47.5	<0.05	<5.0	6.6**	<5.0	<10.0	<5.0	23.2
AL-120*	<5.0	<2.0	<10.0	<1.0	<2.0	<5.0	33.4	<20.0	<0.05	<5.0	5.0	<5.0	<10.0	<5.0	43.1
AL-363	<5.0	<2.0	<10.0	<1.0	<2.0	<5.0	33.1	25.9	<0.05	<5.0	9.1**	<5.0	<10.0	<5.0	121.0
AV-441	<5.0	<5.0	<2.0	52.1	<1.0	<5.0	136.0	248.8	<0.05	<5.0	6.6**	<5.0	<10.0	<5.0	36.7
BE-410	<5.0	<2.0	39.6	<1.0	<2.0	<5.0	46.3	34.0	<0.05	<5.0	5.2	<5.0	40.0	<5.0	533.0
BE-512	<5.0	<2.0	12.3	<1.0	<2.0	5.1	33.0	15.5	<0.05	<5.0	11.5**	<5.0	<10.0	<5.0	30.6
EV-858	<5.0	<2.0	232.6	<1.0	<2.0	<5.0	28.3	218.0	<0.05	<5.0	14.7**	<5.0	<10.0	<5.0	33.8
V-5065Z	<5.0	<2.0	60.2	<1.0	<2.0	<5.0	36.8	23.1	<0.05	<5.0	7.3**	<5.0	<10.0	<5.0	116.0

* Denotes duplicate sample.

** See discussion of Antimony concentrations under Federal Primary Drinking Water Standards.

Table IV-4 List of VOC Analytical Parameters
BASELINE MONITORING PROJECT

VOLATILE ORGANICS BY EPA METHOD 8260

COMPOUNDS	PQL (ppb)
DICHLOROFLUOROMETHANE	5
CHLOROMETHANE	5
VINYL CHLORIDE	5
BROMOMETHANE	5
CHLOROETHANE	5
TRICHLOROFLUOROMETHANE	5
1,1-DICHLOROETHENE	5
METHYLENE CHLORIDE	5
TRANS-1,2-DICHLOROETHENE	5
1,1-DICHLOROETHANE	5
2,2 DICHLOROPROPANE	5
CIS-1,2 DICHLOROETHENE	5
BROMOCHLOROMETHANE	5
CHLOROFORM	5
1,1,1-TRICHLOROETHANE	5
1,1 DICHLOROPROPENE	5
CARBON TETRACHLORIDE	5
BENZENE	5
1,2-DICHLOROETHANE	5
TRICHLOROETHENE	5
1,2-DICHLOROPROPANE	5
BROMODICHLOROMETHANE	5
DIBROMOMETHANE	5
CIS-1,3-DICHLOROPROPENE	5
TOLUENE	5
TRANS-1,3-DICHLOROPROPENE	5
1,1,2-TRICHLOROETHANE	5
1,3--DICHLOROPROPANE	5
TETRACHLOROETHENE	5
1,2-DIBROMOETHANE	5
DIBROMOCHLOROMETHANE	5
CHLOROBENZENE	5
ETHYLBENZENE	5
1,1,1,2-TETRACHLOROETHANE	5
P&M XYLENE	10
O-XYLENE	5
STYRENE	5
BROMOFORM	5
ISOPROPYLBENZENE	5

Table IV-4 (Cont=d)
Volatile Organic (VOC) Parameters

COMPOUNDS	PQL (ppb)
1,1,2,2-TETRACHLOROMETHANE	5
1,2,3,-TRICHLOROPROPANE	5
BROMOBENZENE	5
n-PROPYLBENZENE	5
2-CHLOROTOLUENE	5
4-CHLOROTOLUENE	5
1,3,5-TRIMETHYLBENZENE	5
TERT-BUTYLBENZENE	5
1,2,4-TRIMETHYLBENZENE	5
SEC-BUTYLBENZENE	5
P-ISOPRPYLTOLUENE	5
1,3-DICHLOROBENZENE	5
1,4-DICHLOROBENZENE	5
n-BUTYLBENZENE	5
1,2-DIBROMO-3-CHLOROPROPANE	5
NAPHTHALENE	5
1,2,4-TRICHLOROBENZENE	5
HEXACHLOROBUTADIENE	5
1,2-DICHLOROBENZENE	5
1,2,3-TRICHLOROBENZENE	5

PQL = Practical Quantitation Limit
ppb = parts per billion

Table IV-5 List of Semi-volatile Analytical Parameters
BASELINE MONITORING PROJECT

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

COMPOUNDS	PQL (ppb)
N-Nitrosodimethylamine	10
2-Picoline	10
Methyl methanasulfonate	10
Ethyl methanesulfonate	20
Phenol	10
Aniline	10
Bis(2-chloroethyl)ether	10
2-Chlorophenol	10
1,3-Dichlorobenzene	10
1,4-Dichlorobenzene	10
Benzyl alcohol	20
1,2-Dichlorobenzene	10
2-Methylphenol	10
Bis(2-chloroisopropyl)ether	10
4-Methylphenol	10
N-Nitroso-di-n-propylamine	10
Hexachloroethane	10
Acetophenone	10
Nitrobenzene	10
N-Nitrosopiperidine	20
Isophorone	10
2,4-Dimethylphenol	10
2-Nitrophenol	10
Benzoic acid	50
Bis(2-chloroethoxy)methane	10
2,4-Dichlorophenol	10
a,a-Dimethylphenethylamine	10
1,2,4-trichlorobenzene	10
Benzidine	50
Pyrene	10
p-Dimethylaminoazobenzene	10
Butylbenzylphthalate	10
Bis(2-ethylhexyl)phthalate	10

Table IV-5 (Cont=d)
Semivolatile Parameters

COMPOUNDS	PQL (ppb)
3,3'-Dichlorobenzidine	20
Benzo(a)anthracene	10
Chrysene	10
Di-n-octylphthalate	10
7,12-Dimetnylbenz(a)anthracine	10
Benzo(b)fluoranthene	20
Benzo(k)fluoranthene	10
Benzo(a)pyrene	10
3-Methylcholanthrene	10
Dibenz(a,j)acridine	10
Indeno(1,2,3-cd)pyrene	10
Dibenz(a,h)anthracene	10
Benzo(g,h,i)perylene	10
Napthalene	10
4-Chloroaniline	10
2,6-Dichlorophenol	10
Hexachlorobutadiene	10
N-Nitrose-di-n-butylamine	10
4-Chloro-3-methylphenol	20
2-Methylnapthalene	10
Hexachlorocyclopentadiene	10
1,2,4,5-Tetrachlorobenzene	10
2,4,6-Trichlorophenol	10
2,4,5-Trichlorophenol	10
2-Chloronapthalene	10
1-Chloronapthalene	10
2-Nitroaniline	50
Dimethylphthalate	10
2,6-Dinitrotoluene	10
Acenaphthylene	10
3-Nitroaniline	50
4-Nitrophenol	50
2,4-Dinitrophenol	50
Acenaphthene	10

Table IV-5 (Cont=d)
Semivolatile Parameters

COMPOUNDS	PQL (ppb)
2,4-Dinitrotoluene	10
Pentachlorobenzene	10
Dibenzofuran	10
1-Naphthylamine	10
Diethylphthalate	10
2,3,4,6-Tetrachlorophenol	10
2-Naphthylamine	10
4-Chlorophenyl phenyl ether	10
4-Nitroaniline	50
Fluorene	10
4,6-Dinitro-2-methylphenol	50
4-Aminobiphenyl	20
1,2-Diphenylhydrazine	10
Phenacetin	20
4-Bromophenyl phenyl ether	10
Hexachlorobenzene	10
Pronamide	10
N-Nitrosodiphenylamine/Diphenylamine	10
Pentachlorophenol	50
Pentachloronitrobenzene	20
Phenathrene	10
Anthracene	10
Di-n-butylphthalate	10
Fluoranthene	10

Table IV-6 List of Pesticide and PCB Analytical Parameters
BASELINE MONITORING PROJECT

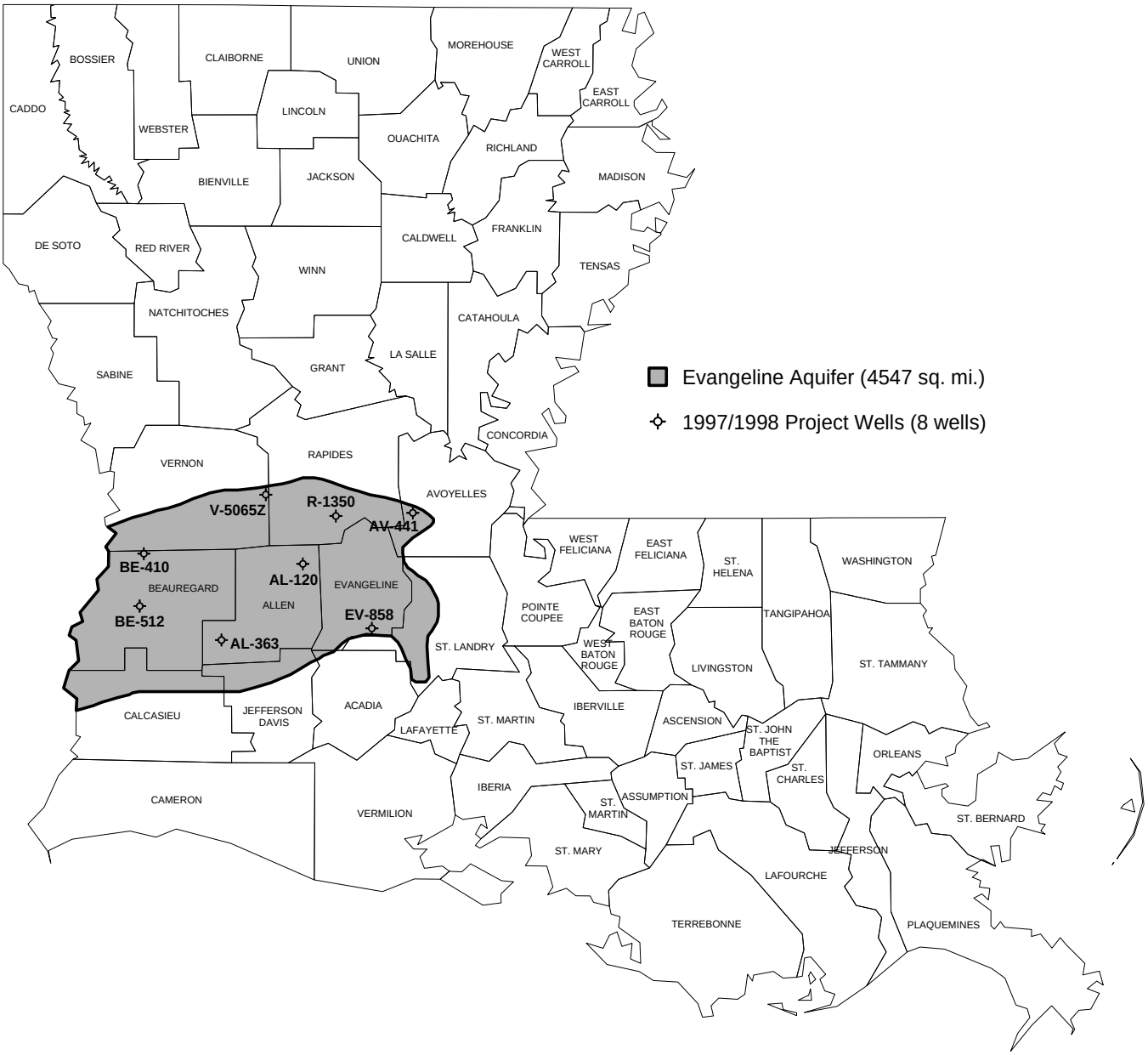
SEMIVOLATILE ORGANICS BY EPA METHOD 8270

COMPOUNDS	PQL (ppb)
Alpha BHC	2
Beta BHC	2
Gamma BHC	2
Delta BHC	2
Heptachlor	2
Aldrin	2
Heptachlor epoxide	2
Chlordane	2
Endosulfan I	2
4,4'-DDE	2
Dieldrin	2
4,4'DDD	2
Endrin	2
Toxaphene	75
Endosulfan II	2
Endrin Aldehyde	2
4,4'DDT	2
Endosulfan Sulfate	2
Methoxychlor	2
Endrin Ketone	2

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

COMPOUNDS	PQL (ppb)
PCB 1221/ PCB 1232	10
PCB 1016/ PCB1242	10
PCB 1254	10
PCB 1248	10
PCB 1260	10

BASELINE MONITORING PROJECT 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.

06/12/1998

Figure IV-1 Location Plat, Evangeline Aquifer

EVANGELINE AQUIFER - pH (SU)

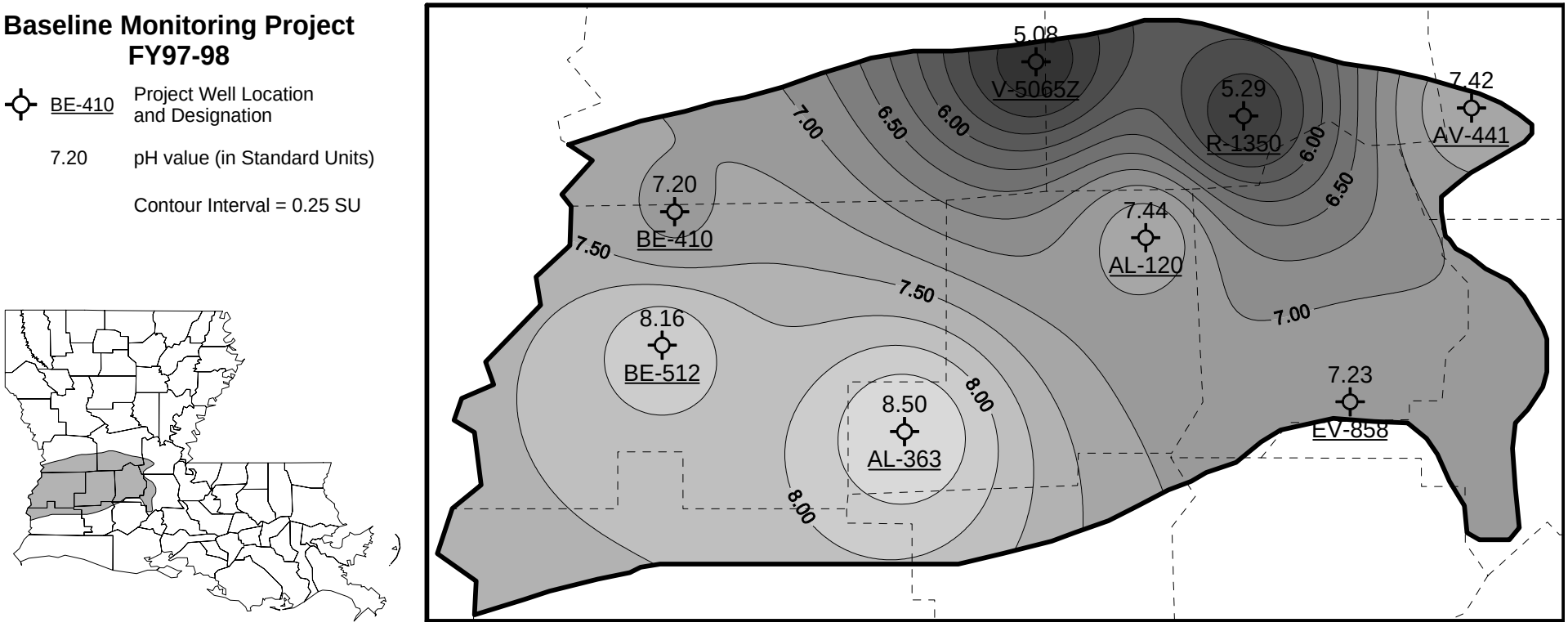


Figure IV-2 Map of pH Data

EVANGELINE AQUIFER - TDS (PPM)

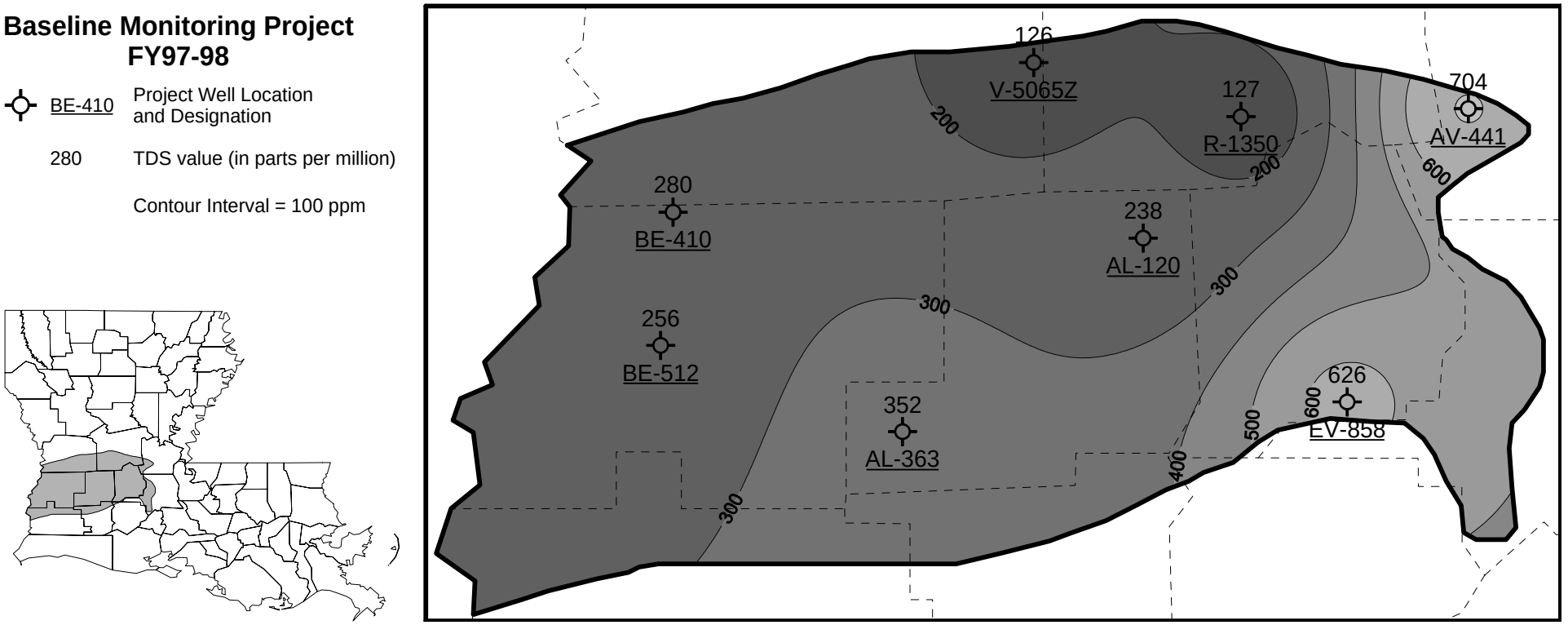


Figure IV-3 Map of TDS Data

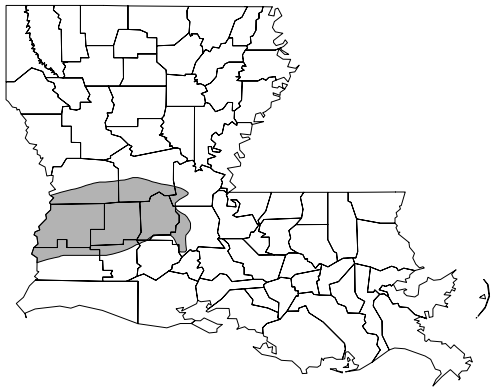
EVANGELINE AQUIFER - CHLORIDE (PPM)

Baseline Monitoring Project
FY97-98

BE-410 Project Well Location and Designation

6 Chloride value (in parts per million)

Contour Interval = 20 ppm



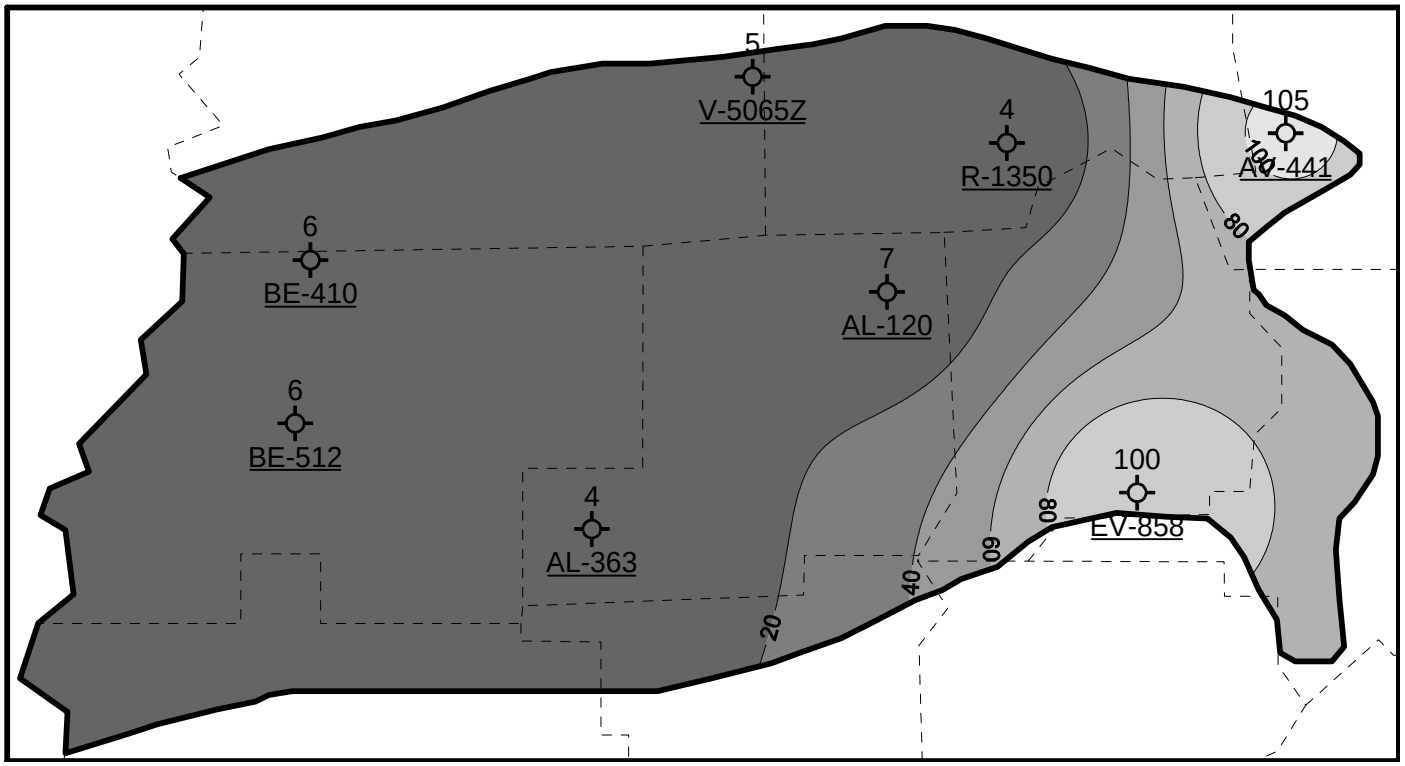


Figure IV-4 Map of Chloride Data

EVANGELINE AQUIFER -IRON (PPB)

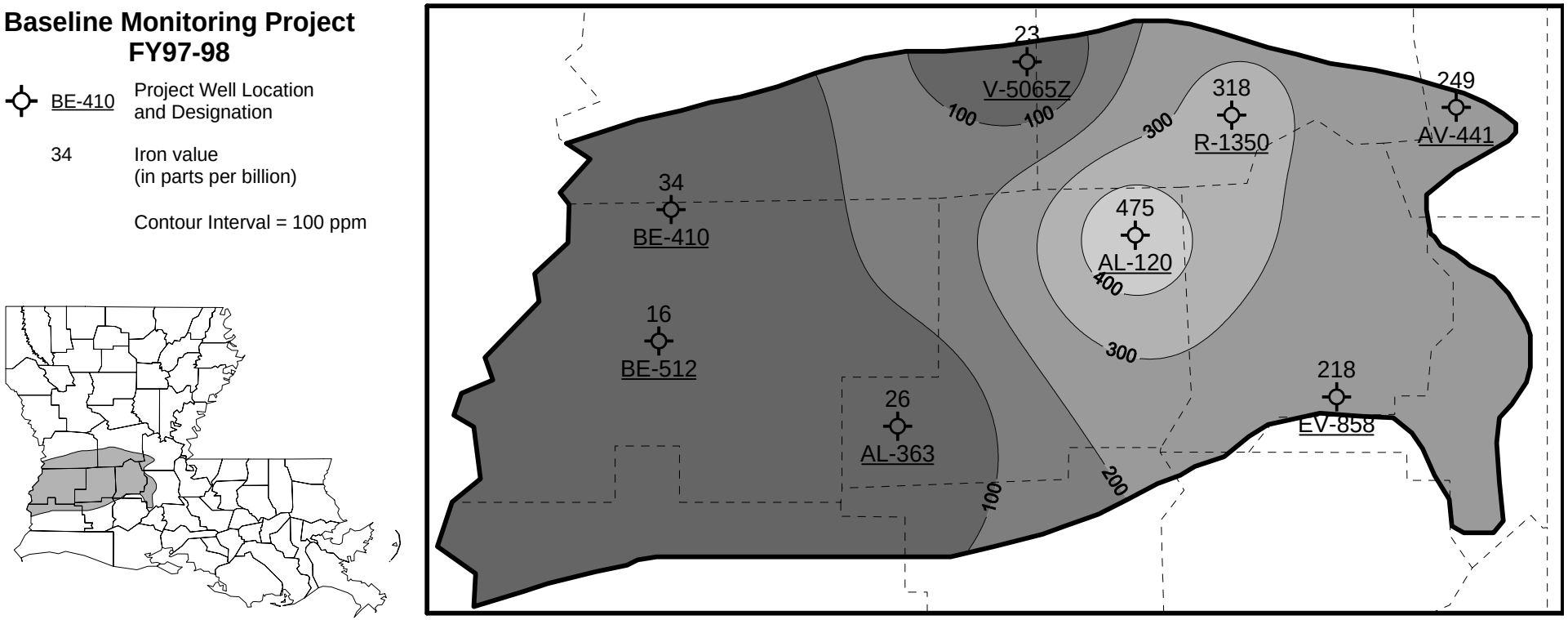


Figure IV-5 Map of Iron Data