

APPENDIX 3

EVANGELINE EQUIVALENT AQUIFER SYSTEM SUMMARY

BASELINE MONITORING PROJECT, EPA FY'00

(July 1999 Through June 2000)

PART III

OF

TRIENNIAL SUMMARY REPORT

FOR THE

ENVIRONMENTAL EVALUATION DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH CWA 106 GRANT

EVANGELINE EQUIVALENT AQUIFER SYSTEM 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 III-1 shows the geographic locations of the Evangeline Equivalent Aquifer System and the associated project wells, whereas Table III-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, February, and in April of 2000, fifteen project wells were sampled which produce from the Evangeline Equivalent Aquifer System. Of these fifteen wells, six are classified as Domestic wells, five are classified as Public Supply wells, three are classified as Industrial wells, and one is classified as an Irrigation well. The wells are located in eleven parishes in southeast and south central Louisiana.

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

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 III-2. Those project inorganic (total metals) parameters analyzed in the laboratory are listed in Table III-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 that include three other categories of compounds (volatiles, semi-volatiles, and pesticides/PCB's) is included. Due to the large number of analytes in 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 III-4, III-5, and III-6 were included in this summary. These 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: Under the Federal Safe Drinking Water Act, EPA has established Primary Maximum Contaminant Levels (MCL) for pollutants that may pose a health risk in public drinking water. A Primary 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.

Laboratory data show that no project well that was sampled during the Fiscal Year 2000 monitoring of the Evangeline Equivalent Aquifer System exceeded a Primary MCL.

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: EPA has set secondary standards which are defined as non-enforceable taste, odor or appearance guidelines. Field and laboratory data contained in Tables III-2 and III-3 show that eight of the wells sampled in the Evangeline Equivalent Aquifer System exceeded the Secondary Maximum Contaminant Level (SMCL) for pH, three of the wells exceeded the SMCL for iron, and one well exceeded the SMCL for color.

pH (SMCL=6.5 – 8.5 standard units (S.U.)):

ST-532 – 9.20 S.U.

ST-6711Z – 9.06 S.U.

TA-286 – 6.31 S.U.

WBR-181 – 9.13 S.U.

PC-325 – 8.62 S.U.

AV-5304Z – 8.61 S.U.

EF-5045Z – 6.40 S.U.

SL-679 – 8.88 S.U.

Iron (SMCL=300 ppm):

WA-241 – 1,586 ppb

WA-5210Z – 574 ppb

SL-679 – 5,580 ppb,
8,517 ppb (duplicate)

Color (SMCL=15 color units (PCU)):

ST-6711Z – 55 PCU

VOLATILE ORGANICS WHICH HAVE NO ESTABLISHED MCL: The following values were exhibited in project well WBR-181. The listed volatile organic compounds do not have MCLs established for them.

Chloroform – 2.6 ppb

Bromodichloromethane – 3.4 ppb

Dibromochloromethane – 4.5 ppb

Bromoform – 1.5 ppb

Since this well is an industrial well and since there are no primary MCLs established for these compounds, and that these compounds were detected in the low ppb range, the well was not resampled to confirm the presence of these compounds.

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 III-2 through III-5.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that this aquifer is of good quality when considering short-term or long-term health risk guidelines. Laboratory data show that no project well that was sampled during the Fiscal Year 2000 monitoring of the Evangeline Equivalent Aquifer System exceeded a Primary MCL. The data show that this aquifer is also of good quality when considering taste, odor, or appearance guidelines.

It is recommended that the several project wells assigned to the Evangeline Equivalent Aquifer be resampled 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 III-1 List of Project Wells Sampled

PROJECT NUMBER	PARISH	WELL NUMBER	DATE SAMPLED	OWNER	DEPTH (Feet)	WELL USE
200007	AVOYELLES	AV-5304Z	02/07/2000	PRIVATE OWNER	547	DOMESTIC
198608	EAST BATON ROUGE	EB-1003	02/08/2000	BATON ROUGE WATER WORKS	1430	PUBLIC SUPPLY
200011	EAST FELICIANA	EF-5045Z	02/08/2000	PRIVATE OWNER	160	DOMESTIC
200010	LIVINGSTON	LI-299	02/08/2000	WARD 2 WATER DISTRICT	1417	PUBLIC SUPPLY
200006	POINTE COUPEE	PC-325	02/07/2000	ALMA PLANTATION LTD	1252	INDUSTRIAL
200008	ST LANDRY	SL-679	04/19/2000	VALERO ENERGY	1152	INDUSTRIAL
198819	ST TAMMANY	ST-532	01/11/2000	SE LOUISIANA STATE HOSPITAL	1520	PUBLIC SUPPLY
200001	ST TAMMANY	ST-6711Z	01/11/2000	PRIVATE OWNER	860	DOMESTIC
199403	TANGIPAHOA	TA-284	01/11/2000	CITY OF PONCHATOULA	608	PUBLIC SUPPLY
198618	TANGIPAHOA	TA-286	01/12/2000	TOWN OF KENTWOOD	640	PUBLIC SUPPLY
200003	TANGIPAHOA	TA-6677Z	01/11/2000	PRIVATE OWNER	495	DOMESTIC
199705	WASHINGTON	WA-241	01/12/2000	PRIVATE OWNER	400	IRRIGATION
200002	WASHINGTON	WA-5210Z	01/12/2000	PRIVATE OWNER	752	DOMESTIC
200004	WEST BATON ROUGE	WBR-181	02/07/2000	PORT OF GREATER BATON	1900	INDUSTRIAL
200009	WEST FELICIANA	WF-DELEE	02/08/2000	PRIVATE OWNER	240	DOMESTIC

Table III-2 Summary of Water Quality Data

WELL NUMBER	TEMP. °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	SO4 ppm	TOT. P ppm	TKN ppm	NH3 (as N) ppm	NITRITE-NITRATE (as N) ppm
AV-5304Z	18.91	8.61	0.613	0.30	<4.0	364.0	227.0	20.6	<1.0	648.0	12.0	63.90	2.10	0.11	0.32	0.29	0.06
EB-1003	27.47	8.76	0.276	0.13	<4.0	190.0	134.0	6.0	<1.0	286.0	1.0	3.10	9.20	0.21	0.21	0.18	0.02
EF-5045Z	17.60	6.4	0.044	0.02	<4.0	32.0	17.3	9.4	<1.0	46.3	<1.0	3.60	<1.25	0.12	0.16	<0.10	0.04
LI-299	25.61	8.71	0.252	0.12	<4.0	174.0	122.0	<5.0	1.0	264.0	2.0	9.40	11.70	0.53	0.48	0.16	0.02
PC-325	24.94	8.62	0.271	0.13	<4.0	196.0	133.0	<5.0	1.1	282.0	<1.0	3.10	8.40	0.43	0.14	0.14	0.02
SL-679	26.54	8.88	0.349	0.17	4.5	220.0	173.0	6.4	10.4	350.0	10.0	4.10	3.10	0.30	0.22	<0.10	<0.02
SL-679*	26.54	8.88	0.349	0.17	16.3	222.0	163.0	8.2	8.6	348.0	11.0	3.80	9.80	0.27	0.19	<0.10	<0.02
ST-532	27.83	9.2	0.338	0.16	<4.0	184.0	162.0	<5.0	<1.0	341.0	10.0	2.80	11.30	0.35	0.07	<0.10	0.02
ST-6711Z	20.79	9.06	0.657	0.32	<4.0	392.0	336.0	<5.0	<1.0	672.0	55.0	16.00	3.30	0.51	0.85	0.23	0.03
TA-284	23.42	8.82	0.275	0.13	<4.0	162.0	132.0	<5.0	<1.0	277.0	13.0	2.90	9.30	0.40	0.13	0.11	0.02
TA-286	21.35	6.31	0.049	0.02	<4.0	50.0	16.7	9.3	1.7	56.2	1.0	2.90	2.90	0.24	0.59	<0.10	0.03
TA-6677Z	20.29	7.37	0.101	0.05	<4.0	89.0	44.2	18.0	1.3	100.0	13.0	3.60	3.70	0.14	<0.05	<0.10	0.05
WA-241	19.67	6.58	0.083	0.04	<4.0	81.0	25.0	17.9	<1.0	79.5	2.0	2.70	10.00	0.16	0.33	<0.10	0.02
WA-5210Z	21.90	7.21	0.150	0.07	<4.0	149.0	60.8	35.8	<1.0	150.0	2.0	3.20	9.40	0.25	0.54	0.15	0.04
WA-5210Z*	21.90	7.21	0.150	0.07	<4.0	144.0	60.7	35.6	<1.0	150.0	1.0	3.30	9.40	0.25	0.31	0.16	0.02
WBR-181	26.26	9.13	0.289	0.14	<4.0	182.0	137.0	<5.0	<1.0	294.0	<1.0	3.70	8.70	0.30	<0.05	<0.10	0.02
WF-DELEE	19.04	7.33	0.072	0.03	<4.0	38.0	21.3	16.2	1.2	75.5	<1.0	8.30	<1.25	0.10	<0.05	<0.10	0.64
WF-DELEE*	19.04	7.33	0.072	0.03	<4.0	58.0	21.2	16.0	<1.0	75.7	1.0	8.30	<1.25	0.14	0.09	<0.10	0.63

* Denotes duplicate sample.

Table III-3 Summary of Inorganic Data

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
AV-5304Z	<5.0	<1.0	106.0	<1.0	<1.0	<5.0	<5.0	25.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	1268.0
EB-1003	<5.0	<1.0	16.2	<1.0	<1.0	<5.0	<5.0	<10.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	51.1
EF-5045Z	<5.0	<1.0	74.8	<1.0	1.0	<5.0	13.4	11.8	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	24.0
LI-299	<5.0	<1.0	<5.0	<1.0	<1.0	<5.0	6.3	77.8	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	602.3
PC-325	<5.0	<1.0	<5.0	<1.0	<1.0	<5.0	<5.0	30.6	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	111.9
SL-679	<5.0	<1.0	18.2	<1.0	1.41	<5.0	26.6	5,580.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	144.0
SL-679*	<5.0	<1.0	25.0	<1.0	3.6	<5.0	35.7	8,517.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	153.7
ST-532	<5.0	<1.0	3.8	<1.0	<5.0	<5.0	<5.0	13.4	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	165.0
ST-6711Z	<5.0	<1.0	10.7	<1.0	<1.0	<5.0	<5.0	39.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	107.7
TA-284	<5.0	<1.0	<5.0	<1.0	<1.0	<5.0	<5.0	10.6	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	56.9
TA-286	<5.0	<1.0	62.0	<1.0	<1.0	<5.0	7.7	<10.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	133.4
TA-6677Z	<5.0	<1.0	107.9	<1.0	<1.0	<5.0	8.7	74.8	<0.05	<5.0	<5.0	<5.0	<5.0	<5.0	56.6
WA-241	<5.0	<1.0	78.9	<1.0	<1.0	<5.0	<5.0	1,586.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	62.1
WA-5210Z	<5.0	<1.0	62.0	<1.0	<1.0	<5.0	7.7	7.8	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	133.4
WA-5210Z*	<5.0	<1.0	62.5	<1.0	<1.0	<5.0	<5.0	574.0	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	28.1
WBR-181	<5.0	<1.0	6.1	<1.0	<1.0	<5.0	<5.0	11.8	0.05	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
WF-DELEE	<5.0	<1.0	45.9	<1.0	1.3	<5.0	<5.0	215.9	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	<10.0
WF-DELEE*	<5.0	<1.0	43.0	<1.0	<1.0	<5.0	5.7	177.2	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	85.2

* Denotes duplicate sample.

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

VOLATILE ORGANICS BY EPA METHOD 8260

COMPOUNDS	PQL (ppb)
DICHLOROFLUOROMETHANE	5
CHLOROMETHANE	2
VINYL CHLORIDE	2
BROMOMETHANE	2
CHLOROETHANE	2
TRICHLOROFLUOROMETHANE	5
1,1-DICHLOROETHENE	2
METHYLENE CHLORIDE	2
TRANS-1,2-DICHLOROETHENE	2
METHYL-t-BUTYL ETHER	2
1,1-DICHLOROETHANE	2
2,2 DICHLOROPROPANE	2
CIS-1,2 DICHLOROETHENE	2
BROMOCHLOROMETHANE	2
CHLOROFORM	2
1,1,1-TRICHLOROETHANE	2
1,1 DICHLOROPROPENE	2
CARBON TETRACHLORIDE	2
BENZENE	2
1,2-DICHLOROETHANE	2
TRICHLOROETHENE	2
1,2-DICHLOROPROPANE	2
BROMODICHLOROMETHANE	2
DIBROMOMETHANE	2
CIS-1,3-DICHLOROPROPENE	2
TOLUENE	2
TRANS-1,3-DICHLOROPROPENE	2
1,1,2-TRICHLOROETHANE	2
1,3--DICHLOROPROPANE	2
TETRACHLOROETHENE	2
1,2-DIBROMOETHANE	2
DIBROMOCHLOROMETHANE	2
CHLOROBENZENE	2
ETHYLBENZENE	2
1,1,1,2-TETRACHLOROETHANE	2
P&M XYLENE	4
O-XYLENE	2
STYRENE	2
BROMOFORM	2

Table III-4 (Cont'd)
Volatile Organic (VOC) Parameters

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

PQL = Practical Quantitation Limit
 ppb = parts per billion

**Table III-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 methanesulfonate	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	10
1,2-Dichlorobenzene	10
2-Methylphenol	10
Bis(2-chloroisopropyl)ether	10
4-Methylphenol	10
N-Nitroso-di-n-propylamine	10
Hexachloroethane	20
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 III-5 (Cont'd)
Semivolatile Parameters

COMPOUNDS	PQL (ppb)
3,3'-Dichlorobenzidine	20
Benzo(a)anthracene	10
Chrysene	10
Di-n-octylphthalate	10
7,12-Dimethylbenz(a)anthracene	10
Benzo(b)fluoranthene	10
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 III-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 III-6 List of Pesticide and PCB Analytical Parameters
BASELINE MONITORING PROJECT**

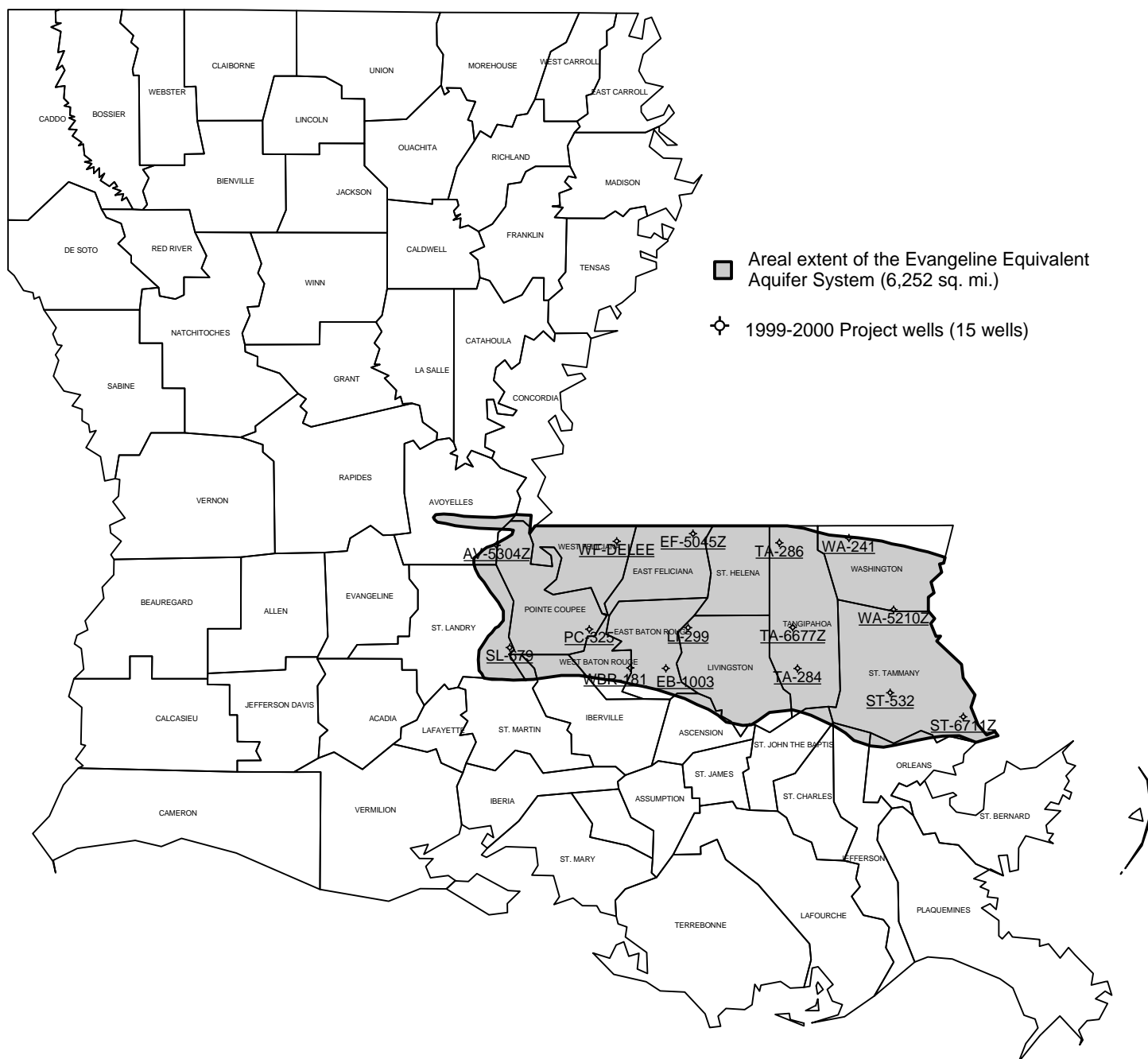
SEMIVOLATILE ORGANICS BY EPA METHOD 8270

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	2
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/ PCB 1242	10
PCB 1254	10
PCB 1248	10
PCB 1260	10

BASELINE MONITORING PROJECT WELLS OF THE EVANGELINE EQUIVALENT AQUIFER SYSTEM



Aquifer boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater in Major Aquifers of Louisiana. Smoot, 1988; USGS/LDOTD Report 86-4150

Figure III-1 Location Plat, Evangeline Equivalent Aquifer System

EVANGELINE EQUIVALENT AQUIFER SYSTEM - pH (SU)

Baseline Monitoring Project, FY1999-2000

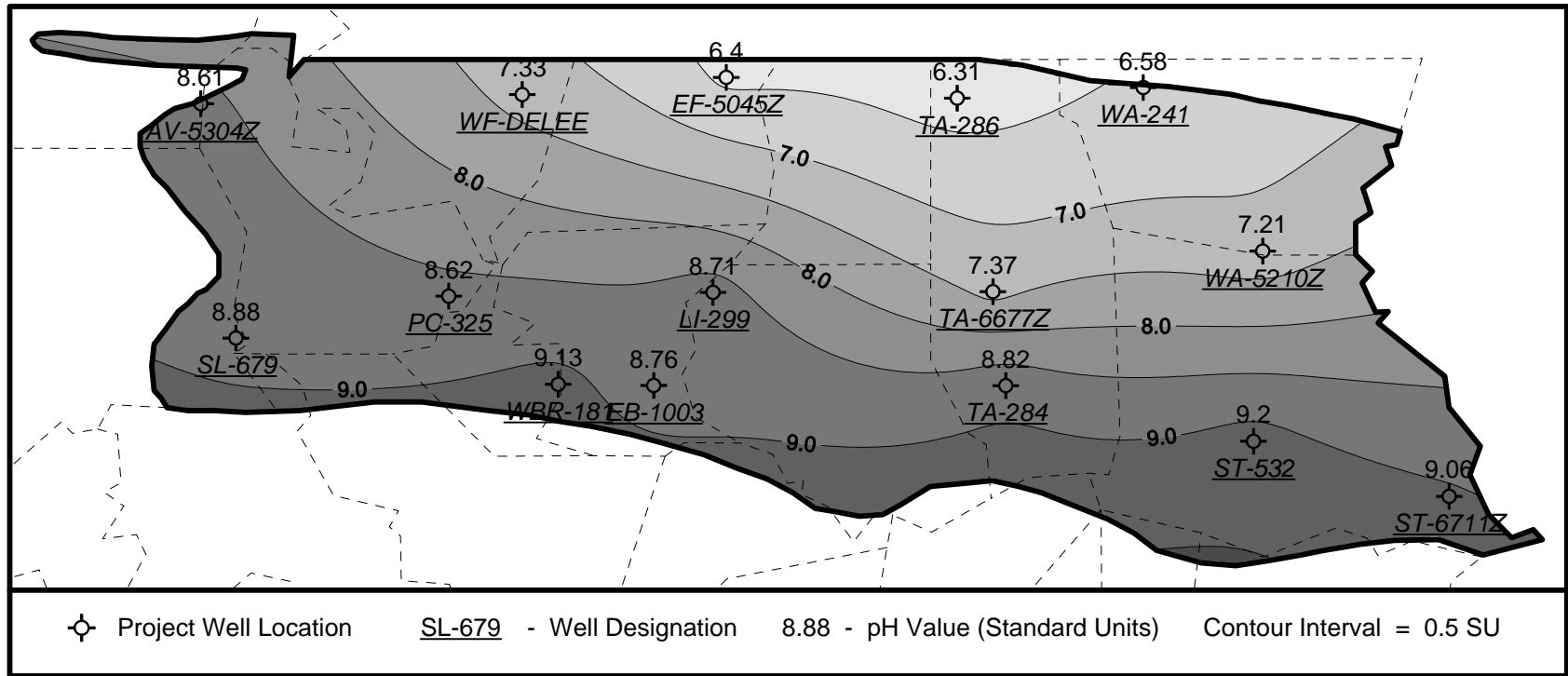


Figure III-2 Map of pH Data

EVANGELINE EQUIVALENT AQUIFER SYSTEM - TDS (ppm)

Baseline Monitoring Project, FY1999-2000

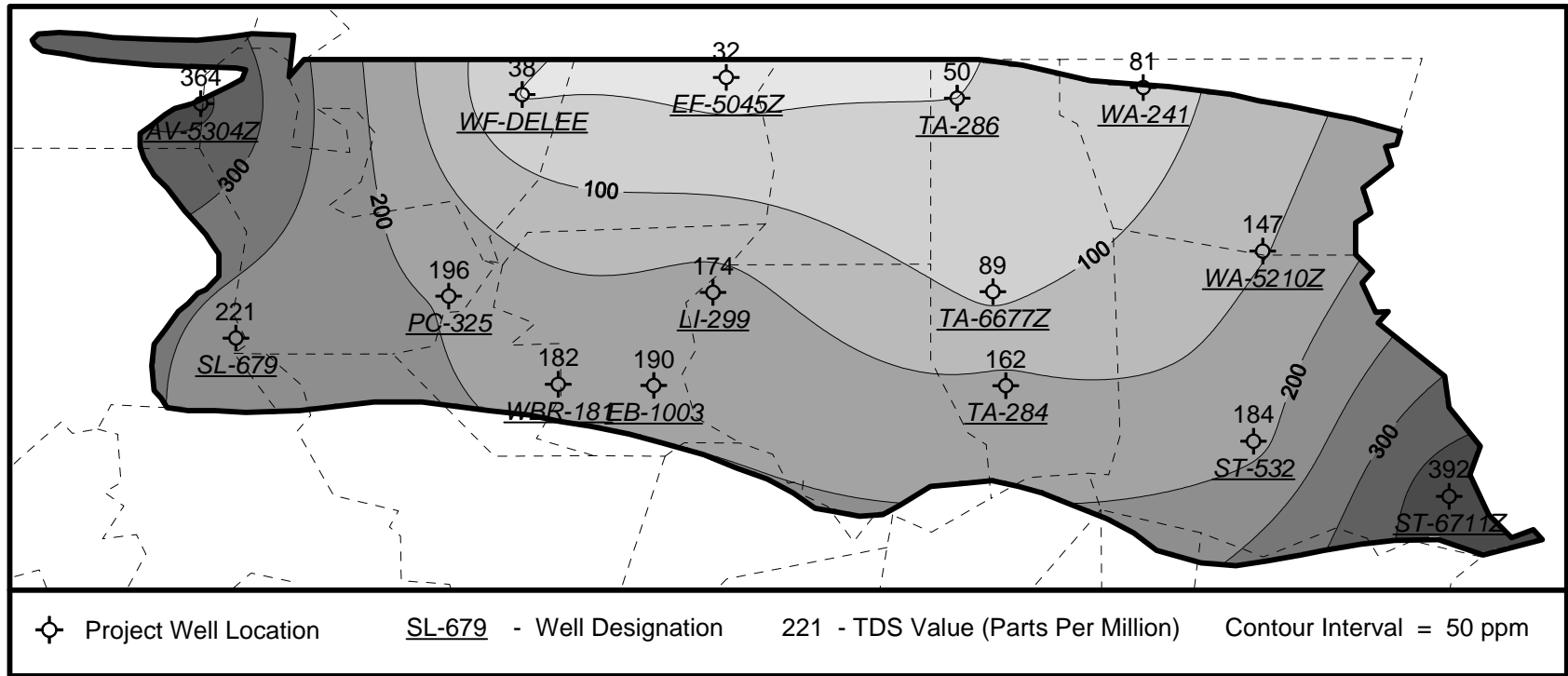


Figure III-3 Map of TDS Data

EVANGELINE EQUIVALENT AQUIFER SYSTEM - CHLORIDE (ppm)

Baseline Monitoring Project, FY1999-2000

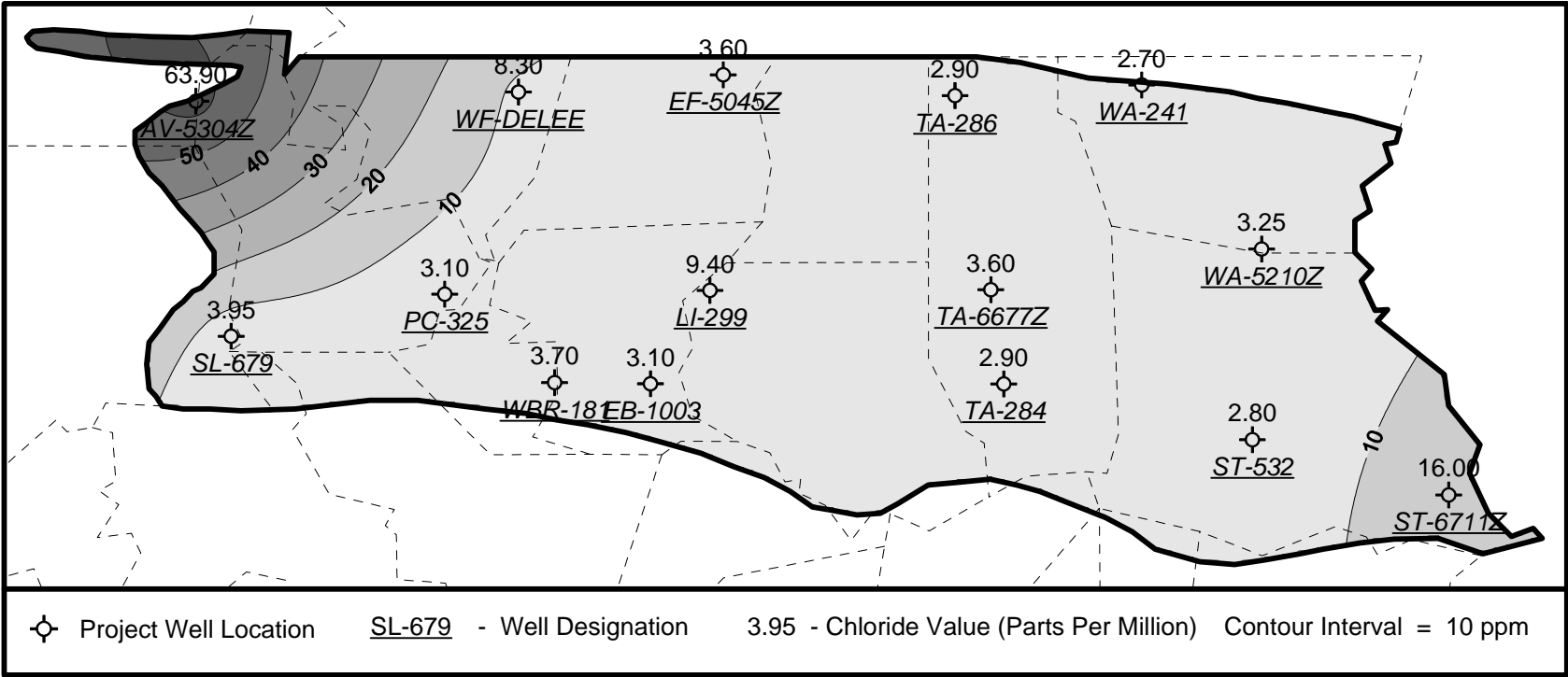


Figure III-4 Map of Chloride Data

EVANGELINE EQUIVALENT AQUIFER SYSTEM - IRON (ppb)

Baseline Monitoring Project, FY1999-2000

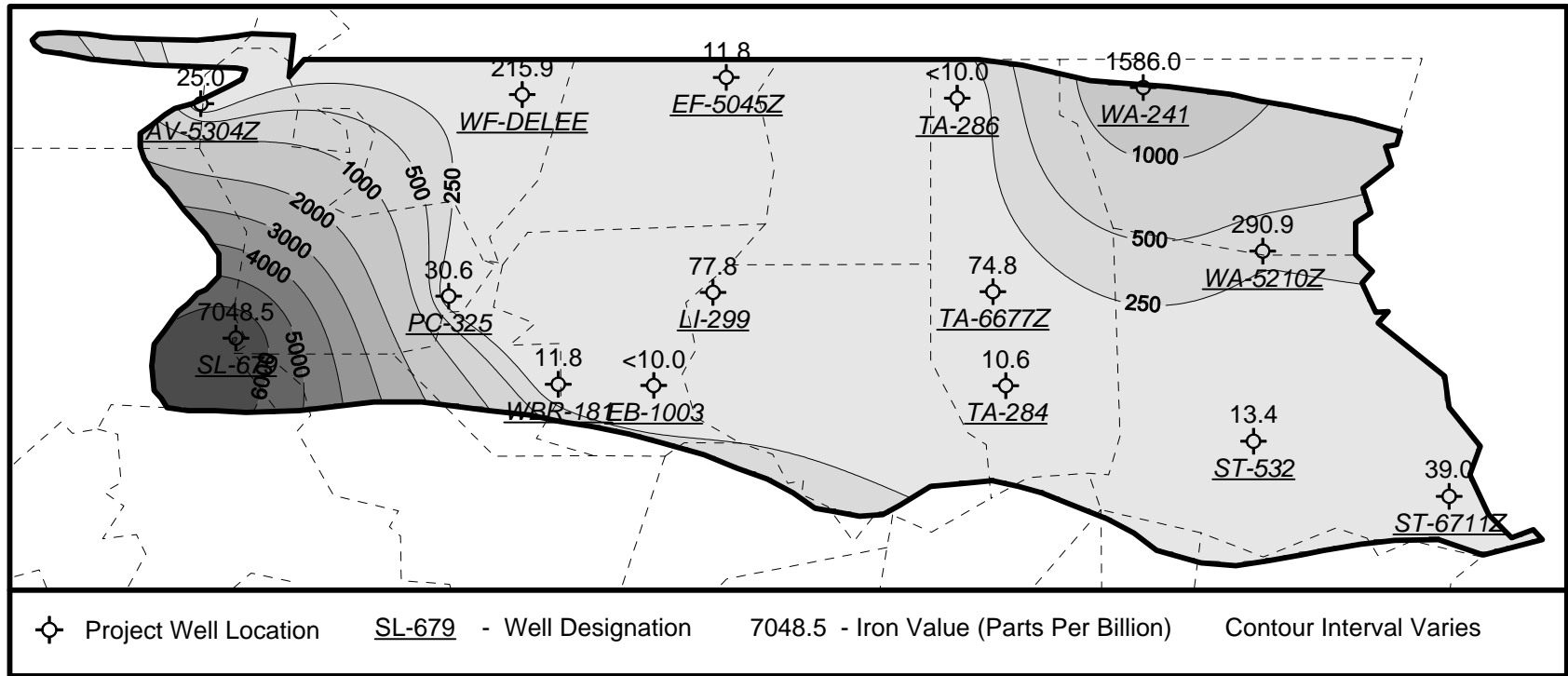


Figure III-5 Map of Iron Data