SPARTA AQUFIER SUMMARY

BASELINE MONITORING PROGRAM, FY 2004

APPENDIX 1

OF THE

TRIENNIAL SUMMARY REPORT, 2006

FOR THE

WATER QUALITY ASSESSMENT DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH CWA

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

These data show that in July and October, 2003, fourteen wells were sampled which produce from the Sparta aquifer. Eleven of the fourteen are classified as public supply; the remaining three are classified as industrial wells. The wells are located in ten parishes in the north-central area 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 Sparta aquifer system is within the Eocene Sparta formation of the Claiborne group. The aquifer units consist of fine to medium sand with interbedded coarse sand, silty clay and lignite. Interconnected sands become more massive and coarsen slightly with depth and are laterally discontinuous. The Sparta aquifer is confined downdip by the clays of the overlying Cook Mountain formation and the clays and silty clays of the Cane river formation.

HYDROGEOLOGY

The Sparta aquifer is recharged through direct infiltration of rainfall, the movement of water through overlying terrace and alluvial deposits, and leakage from the Cockfield and Carrizo-Wilcox aquifers. The Sparta is pumped in a large area of north central Louisiana and in a narrow band through Natchitoches and Sabine parishes. The two areas are separated by a saltwater ridge below the Red River valley. Ground water movement is eastward toward the Mississippi River Valley and southward toward the Gulf of Mexico, except when altered by heavy pumping, and the hydraulic conductivity varies between 25 to 100 feet/day.

The maximum depths of occurrence of freshwater in the Sparta range from 200 feet above sea level, to 1,700 feet below sea level. The range of thickness of the fresh water interval in the Sparta is 50 to 700 feet. The depths of the Sparta wells that were monitored in conjunction with the Baseline Monitoring Program range from 153 to 773 feet.

PROGRAM PARAMETERS

The field parameters checked at each sampling site and the list of water quality analytical parameters are shown in Table 1-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 1-3. 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 1-8, 1-9 and 1-10 were included in this report.

Tables 1-4 and 1-5 provide an overview of water quality and inorganic data for the Sparta aquifer, listing the minimum, maximum, and average results for these parameters. Tables 1-6 and 1-7 compare these same parameter averages to historical Baseline Program-derived data for the Sparta aquifer, from fiscal years 1995, 1998 and 2001.

Figures 1-2, 1-3, 1-4, and 1-5 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.

Laboratory data show that no BMP well that was sampled during the Fiscal Year 2003 monitoring of the Sparta aquifer exceeded a Primary MCL.

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, which are defined as non-enforceable taste, odor, or appearance guidelines. Field and laboratory data contained in Tables 1-2 and 1-3 show that six of the fourteen wells sampled in the Sparta aquifer exceeded the secondary MCL (SMCL) for pH, five of the wells exceeded the SMCL for total dissolved solids, six exceeded the SMCL for color, three exceeded the SMCL for chloride, and two exceeded the SMCL for iron.

pH (SMCL = 6.5 – 8.5 standard units):

BI-192 – 5.74 SU
BI-212 – 6.36 SU
CA-105 – 8.57 SU
MO-253 –8.55 SU
OU-506 – 8.72 SU
SA-534 – 6.44 SU (Original and Duplicate)

Total Dissolved Solids (SMCL = 500 ppm):

CA-105 – 686.0 ppm
MO-253 – 1,128.0 ppm
OU-506 – 526.0 ppm
OU-597 – 1,072.0 ppm
UN-205 – 792.0 ppm

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

BI-212 – 20.0 PCU
CA-105 – 60.0 PCU
MO-253 – 25.0 PCU
OU-506 – 25.0 PCU
OU-597 – 34.0 PCU
W-165 – 55.0 PCU

Chloride (SMCL = 250 ppm):

MO-253 – 387 ppm
OU-464 – 360 ppm
UN-205 – 315 ppm

INORGANIC PARAMETERS

Table 1-3 shows the inorganic (total metals) parameters that are sampled for and the analytical results for those parameters for each well. Table 1-5 provides an overview of inorganic data for the Sparta aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 1-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 1-3 show the following secondary MCL (SMCL) was exceeded.

Iron (SMCL = 300 ppb):

SA-534 – 1600 ppb (original)
BI-212 – 2,290 ppb
SA-534 – 1600 ppb (duplicate)

VOLATILE ORGANIC COMPOUNDS

The only volatile organic compounds (VOCs) detected in this sampling of wells assigned to the Sparta aquifer, were those compounds typically associated with chlorination by-products. Dibromochloromethane, bromodichloromethane, chloroform, and bromoform were detected at very low ppb levels in wells L-31 and L-32. It is the opinion of this Office that detection of these VOCs is a result of the chlorination process and is not due to contamination of the aquifer.

SEMIVOLATILE ORGANIC COMPOUNDS

Table 1-9 shows the semivolatile (SVOC) organic compound 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 SVOC would be discussed in this section.

No SVOC was detected at or above its detection limit during the FY2004 sampling of the Sparta aquifer.

PESTICIDES AND PCBS

Table 1-10 shows the pesticide and PCB 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 pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected at or above its detection limit during the FY2004 sampling of the Sparta aquifer.

INVALID DATA

Table 1-3 lists five wells where the results for antimony have been determined to be invalid. This determination was made due the irregular occurrence of antimony at levels very near the detection limit, and due to the duplicate sample not confirming the original sample's results. Also, historical data for these same wells show that antimony has not had a confirmed occurrence since Baseline Program testing began. Therefore, considering these findings, the antimony results for the following wells BI-192, BI-212, UN-205, W-165, WB-241, and WB-269 have been determined to be invalid and are not included in this summary.

COMPARISON TO HISTORICAL BASELINE DATA

Analytical and field data show that the quality and characteristics of ground water produced from the Sparta aquifer has not changed significantly when comparing current data to that of the three previous sampling rotations (three, six and nine years prior). These comparisons can be found in Tables 1-6 and 1-7 of this summary. While there are general fluctuations over the nine-year period, five parameters show a consistent change. Color has decreased from an average of 25.9 PCU to a current average of 16.1 PCU, and Hardness has decreased from an average concentration of 21.7 ppm to 15.9 ppm. During this same reporting period, the data show that the average concentration for Barium has increased from 36.5 ppb to 61.8 ppb, and the average concentration for iron has increased from 212.5 ppb to 405.8 ppb and that the average concentration for Chloride has increased from 85.8 ppm to 94.2 ppm.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from this aquifer is soft[1], and is of good quality when considering short-term or long-term health risk guidelines. Laboratory data show that no Baseline well that was sampled during the Fiscal Year 2004 monitoring of the Sparta aquifer exceeded a Primary MCL. The data also show that this aquifer is of fair quality when considering taste, odor, or appearance guidelines. Comparison to historical Baseline-derived data shows only a slight change in the quality or characteristics of the Sparta aquifer, with the consistent decreases in color and hardness average concentrations, and increases in the average concentrations of chloride, barium and iron.

It is recommended that the wells assigned to the Sparta aquifer be re-sampled as planned, in approximately three years. In addition, several wells should be added to the fourteen 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 1-1 List of Wells Sampled

PARISH	DOTD WELL NAME	DATE SAMPLED	OWNER	DEPTH (IN FEET)	WELL USE
BIENVILLE	BI-192	7/29/2003	LUCKY WATER SYSTEM	153	PUBLIC SUPPLY
BIENVILLE	BI-212	7/29/2003	STONE CONTAINER CORP.	490	INDUSTRIAL
CALDWELL	CA-105	7/21/2003	VIXEN WATER SYSTEM	525	PUBLIC SUPPLY
CLAIBORNE	CL-203	7/21/2003	TOWN OF HOMER	460	PUBLIC SUPPLY
LINCOLN	L-31	7/22/2003	CITY OF RUSTON	636	PUBLIC SUPPLY
LINCOLN	L-32	7/22/2003	CITY OF RUSTON	652	PUBLIC SUPPLY
MOREHOUSE	MO-253	7/21/2003	VILLAGE OF COLLINSTON	773	PUBLIC SUPPLY
OUACHITA	OU-506	7/21/2003	ANGUS CHEMICAL	506	INDUSTRIAL
OUACHITA	OU-597	7/21/2003	GRAPHIC PACKAGING INT'L INC.	710	INDUSTRIAL
SABINE	SA-534	10/14/2003	BOISE CASCADE	543	PUBLIC SUPPLY
UNION	UN-205	7/28/2003	D'ARBONNE WATER SYSTEM	725	PUBLIC SUPPLY
WEBSTER	WB-241	7/28/2003	TOWN OF SPRINGHILL	408	PUBLIC SUPPLY
WEBSTER	WB-269	7/28/2003	CITY OF MINDEN	280	PUBLIC SUPPLY
WINN	W-165	7/29/2003	TOWN OF WINNFIELD	456	PUBLIC SUPPLY

Table 1-2 Summary of 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												
BI-192	5.74	0.01	0.026	0.02	20.19	3	<0.1	1.5	<5	6.4	1.34	<0.1	<0.05	26.1	<1.3	31.3	<4	<1
BI-212	6.36	0.09	0.201	0.13	21.43	84	0.31	6.6	20	25.4	<0.05	0.36	0.17	200	9.3	180	<4	1.9
CA-105	8.57	0.53	1.068	0.69	23.93	585	0.81	18	60	<5.0	0.06	1.01	0.87	1041	<1.3	686	<4	1.3
CL-203	6.50	0.06	0.133	0.09	22.34	59	0.12	7.9	<5	17.3	0.06	0.13	0.07	146	7.6	128	<4	2.5
L-31	8.12	0.16	0.342	0.22	25.19	148	0.18	16.3	<5	<5.0	1.32	0.27	0.38	350	14.8	241	<4	1.4
L-32	7.83	0.20	0.426	0.28	27.00	162	<0.1	32.1	<5	<5.0	0.06	0.14	0.73	427	10.9	282	<4	<1
L-32*	7.83	0.20	0.426	0.28	27.00	162	<0.1	32.4	<5	<5.0	0.06	0.31	0.73	426	10.9	302	<4	<1
MO-253	8.55	1.01	1.986	1.29	23.70	412	1.06	387	25	6.2	0.06	1.16	0.52	1950	<1.25	1128	<4	<1
OU-506	8.72	0.44	0.894	0.58	22.96	293	0.68	114	25	<5.0	0.06	0.94	0.49	885	<1.3	526	<4	<1
OU-597	8.44	0.96	1.892	1.23	25.58	340	0.99	464	34	7.1	0.06	1.07	0.56	1855	<1.3	1072	<4	<1
SA-534	6.44	0.09	0.192	0.13	24.26	53.3	0.2	11.9	<5	18.4	<0.05	0.25	0.06	184	21.6	165	<4	<1
SA-534*	6.44	0.09	0.192	0.13	24.26	52.9	0.2	12	<5	18.4	<0.05	0.13	0.06	185	21.7	167	<4	<1
UN-205	8.48	0.71	1.425	0.93	25.50	161	0.96	315	<5	16.1	<0.05	1.17	0.17	1426	<1.3	792	<4	<1
W-165	8.24	0.31	0.648	0.42	23.00	280	0.45	43.4	55	<5.0	<0.05	0.49	0.78	674	5.4	420	<4	<1
WB-241	7.29	0.36	0.728	0.47	21.51	252	1.55	77.8	<5	70.2	<0.05	1.75	0.12	734	18.5	442	<4	<1
WB-269	6.58	0.12	0.245	0.16	20.80	53.5	0.18	30.9	<5	27.8	0.98	0.52	0.09	245	14.9	166	<4	<1
WB-269*	6.58	0.12	0.245	0.16	20.80	53.4	0.17	30.5	<5	28.0	0.98	0.17	0.09	244	14.8	169	<4	<1

* Denotes duplicate sample.

Table 1-3 Summary of 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
BI-192	Invalid Data	<5	26.3	<1	<1	<5	<5	241	<10	<0.05	<5	<5	<1	<5	14.9
BI-212		<5	77.8	<1	<1	<5	<5	2290	<10	<0.05	<5	<5	<1	<5	19.8
CA-105	<5	<5	16.9	<1	<1	<5	<5	25.6	<10	<0.05	<5	<5	<1	<5	<10
CL-203	<5	<5	66	<1	<1	<5	<5	292	<10	<0.05	<5	<5	<1	<5	<10
L-31	<5	<5	7.1	<1	<1	<5	<5	40.5	<10	<0.05	<5	<5	<1	<5	<10
L-32	<5	<5	9.4	<1	<1	<5	<5	85.1	<10	<0.05	<5	<5	<1	<5	<10
L-32*	<5	<5	9.5	<1	<1	<5	<5	84.4	<10	<0.05	<5	<5	<1	<5	<10
MO-253	<5	<5	26.1	<1	<1	<5	<5	288	<10	<0.05	<5	<5	<1	<5	66.3
OU-506	<5	<5	8.6	<1	<1	<5	9.5	92.8	<10	<0.05	<5	<5	<1	<5	<10
OU-597	<5	<5	51.2	<1	<1	<5	7.4	32.3	<10	<0.05	<5	<5	<1	<5	<10
SA-534	<5	<5	82.2	<1	<1	<5	<5	1600	<10	<0.05	<5	<5	<1	<5	<10
SA-534*	<5	<5	82	<1	<1	<5	<5	1600	<10	<0.05	<5	<5	<1	<5	<10
UN-205	Invalid Data	<5	42	<1	<1	<5	<5	36.7	<10	<0.05	<5	<5	<1	<5	<10
W-165		<5	15.4	<1	<1	<5	<5	23.3	<10	<0.05	<5	<5	<1	<5	<10
WB-241		<5	228	<1	<1	<5	<5	127	<10	<0.05	<5	<5	<1	<5	<10
WB-269		<5	152	<1	<1	<5	8	<20	<10	0.1	8.4	<5	<1	<5	30.4
WB-269*		<5	151	<1	<1	<5	9	<20	<10	0.1	8.4	<5	<1	<5	29.5

* Denotes duplicate sample.

Table 1-4 Field, Water Quality, and Nutrients Statistics

Fiscal Year 2004

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature °C	20.19	27.0	23.50
	pH (SU)	5.74	8.72	7.45
	Sp. Conductance (mmhos/cm)	0.026	1.986	0.65
	Salinity (ppt)	0.01	1.01	0.32
	TDS (g/L)	0.017	1.291	0.42
LABORATORY	Alkalinity (ppm)	3	585	185.54
	Chloride (ppm)	1.5	464	94.19
	Color (PCU)	<5	60	16.12
	Specific Conductance (umhos/cm)	26.1	1950	646.95
	Sulfate (ppm)	<1.25	21.7	9.30
	TDS (ppm)	31.3	1128	405.72
	TSS (ppm)	<4	<4	<4
	Turbidity (NTU)	<1	2.5	1.18
	Ammonia (ppm)	<0.1	1.55	0.48
	Hardness (ppm)	<5	70.2	15.96
	Nitrite-Nitrate, as N (ppm)	<0.05	1.34	0.31
	TKN (ppm)	<0.1	1.75	0.59
	Phosphorous (ppm)	<0.05	0.87	0.35

Table 1-5 Inorganic Statistics

Fiscal Year 2004

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Arsenic (ppb)	<5	<5	<5
Barium (ppb)	7.1	228	61.9
Beryllium (ppb)	<1	<1	<1
Cadmium (ppb)	<1	<1	<1
Chromium (ppb)	<5	<5	<5
Copper (ppb)	<5	9.5	5.8
Iron (ppb)	<20.0	2,290	405.8
Lead (ppb)	<10.0	<10.0	<10.0
Mercury (ppb)	<0.05	0.1	0.06
Nickel (ppb)	<5	8.4	5.4
Selenium (ppb)	<5	<5	<5
Silver (ppb)	<1	<1	<1
Thallium (ppb)	<5	<5	<5
Zinc (ppb)	<10	66.3	16.5

Table 1-6 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	23.10	23.65	23.49	23.50
	PH (SU)	7.23	7.76	7.86	7.45
	Sp. Conductance (mmhos/cm)	0.646	0.654	0.654	0.65
	Salinity (ppt)	0.30	0.32	0.32	0.32
	TDS	-	-	-	0.42
LABORATORY	Alkalinity (ppm)	185.5	203.2	178.3	185.54
	Chloride (ppm)	85.8	89.0	90.0	94.2
	Color (PCU)	25.9	21.7	17.7	16.1
	Sp. Conductance (umhos/cm)	619.1	687.7	660.0	646.9
	Sulfate (ppm)	6.55	8.21	7.42	9.30
	TDS (ppm)	356.5	442.7	391.1	405.7
	TSS (ppm)	<4	<4	<4	<4
	Turbidity (NTU)	1.32	2.21	1.45	1.18
	Ammonia (ppm)	0.34	0.46	0.33	0.48
	Hardness (ppm)	21.7	10.0	13.6	15.9
	Nitrite-Nitrate, as N (ppm)	0.28	0.32	0.30	0.31
	TKN (ppm)	0.58	0.52	0.45	0.59
	Phosphorus (ppm)	0.36	0.31	0.31	0.35

Table 1-7 Three-year Inorganic Averages

PARAMETER	FY 1995 AVERAGE	FY 1998 AVERAGE	FY 2001 AVERAGE	FY 2004 AVERAGE
Antimony (ppb)	<5	<5	<5	Invalid Data
Arsenic (ppb)	<5	<5	<5	<5
Barium (ppb)	36.5	30.7	50.4	61.8
Beryllium (ppb)	<1	<1	<1	<1
Cadmium (ppb)	<1	1.00	<1	<1
Chromium (ppb)	<5	<5	<5	<5
Copper (ppb)	10.2	10.2	<5	5.82
Iron (ppb)	212.5	283.7	517.4	405.8
Lead (ppb)	<10	<10	<10	<10
Mercury (ppb)	<0.05	<0.05	<0.05	0.06
Nickel (ppb)	5.1	<5	<5	5.40
Selenium (ppb)	<5	<5	<5	<5, <30
Silver (ppb)	<1	1.2	<1	<1
Thallium (ppb)	<5	<5	<5	<5, <30
Zinc (ppb)	16.2	20.8	14.2	16.5

Table 1-8 List of 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 1-9 List of 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	20
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 1-9 (Cont'd)
Semivolatile Parameters

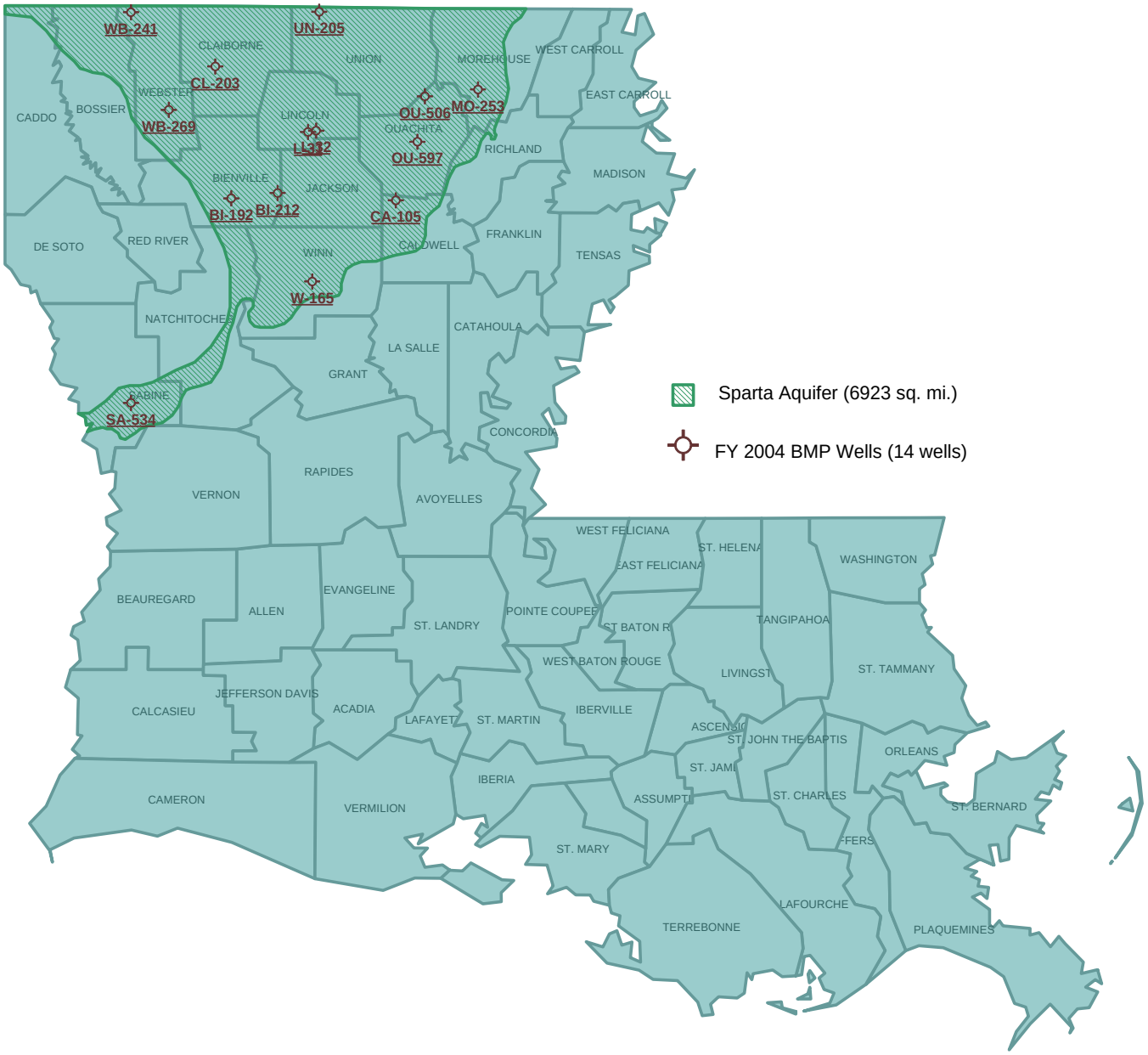
COMPOUND	ANALYTICAL METHOD	CAS NUMBER	PQL (ppb)
Benzo[g,h,i]perylene	625	191242	10
bis (2-Chloroethoxy) methane	625	111911	10
bis (2-Ethylhexyl) phthalate	625	117817	10
bis (2-Chloroethyl) ether	625	111444	10
bis (2-Chloroethyl) ether	625	111444	10
bis (2-Chloroisopropyl) ether	625	108601	10
Butyl benzyl 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
Di-n-octyl phthalate	625	117840	10
Fluoranthene	625	206440	10
Fluorene	625	86737	10
Hexachlorobenzene	625	118741	10
Hexachlorobutadiene	625	87683	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-Nitrosodi-n-propylamine	625	621647	10
Pentachlorophenol	625	87865	50
Phenanthrene	625	85018	10
Phenol	625	108952	10
Pyrene	625	129000	10

Table 1-10 List of Pesticide and PCB Analytical Parameters

BASELINE MONITORING PROGRAM

COMPOUND	ANALYTICAL METHOD	CAS NUMBER	PQL (ppb)
4,4'-DDD	625	72548	2
4,4'-DDE	625	72559	2
4,4'-DDT	625	50293	2
Aldrin	625	309002	2
alpha-BHC	625	319846	2
beta-BHC	625	319857	2
delta-BHC	625	319868	2
gamma-BHC	625	58899	2
Chlordane	625	57749	2
Dieldrin	625	60571	2
Endosulfan I	625	959988	2
Endosulfan II	625	33213659	2
Endosulfan Sulfate	625	1031078	2
Endrin	625	72208	2
Endrin aldehyde	625	7421934	2
Heptachlor	625	76448	2
Heptachlor epoxide	625	1024573	2
Toxaphene	625	8001352	75
Aroclor-1016	625	12674112	10
Aroclor-1221	625	11104282	10
Aroclor-1232	625	11141165	10
Aroclor-1242	625	53469219	10
Aroclor-1248	625	12672296	10
Aroclor-1254	625	11097691	10
Aroclor-1260	625	11096825	10

BASELINE MONITORING PROGRAM WELLS OF THE SPARTA 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 1-1 Location Plat, Sparta Aquifer

SPARTA AQUIFER - pH

Baseline Monitoring Program, FY 2004

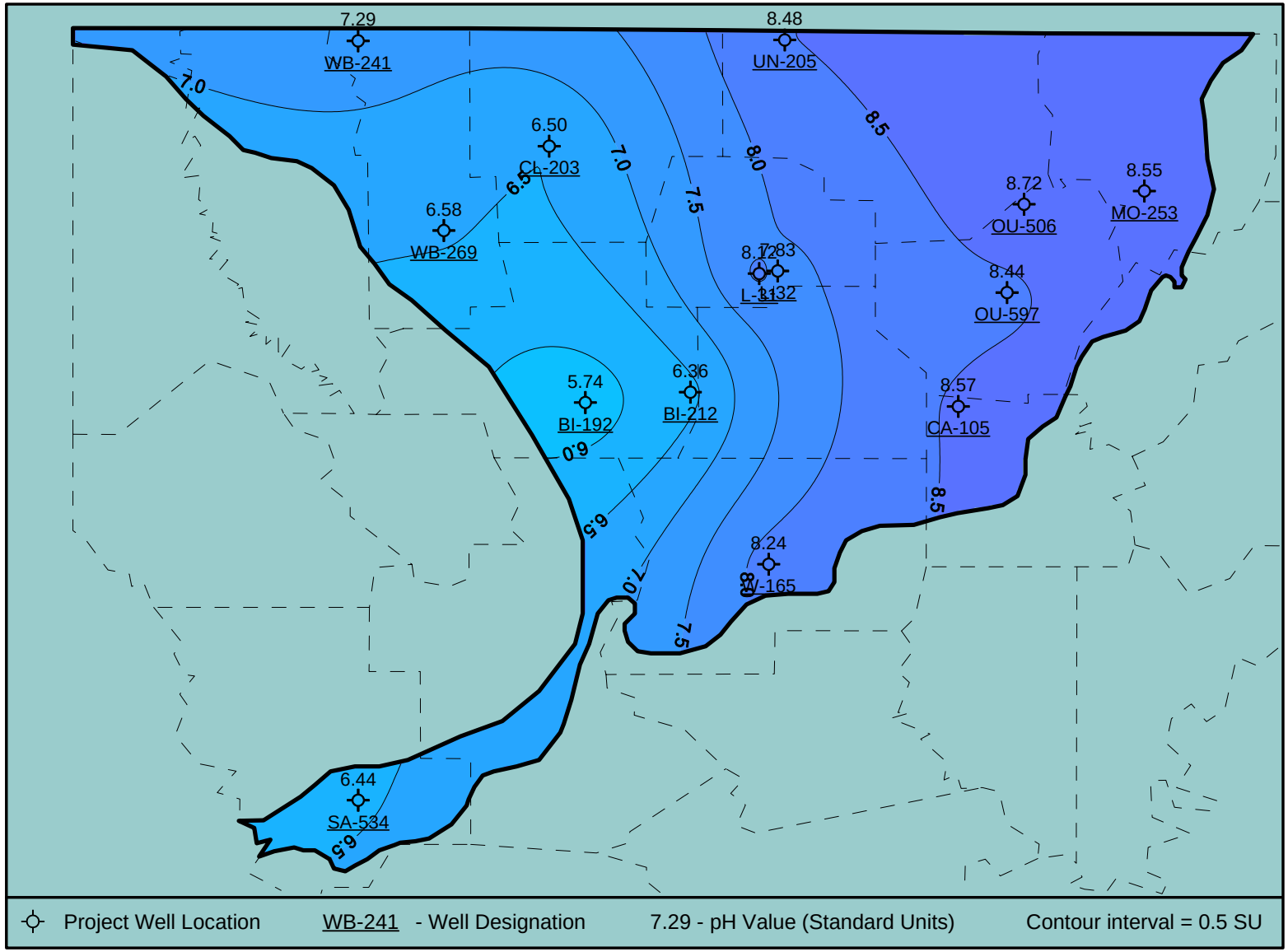


Figure 1-2 Map of pH Data

SPARTA AQUIFER - TDS

Baseline Monitoring Program, FY 2004

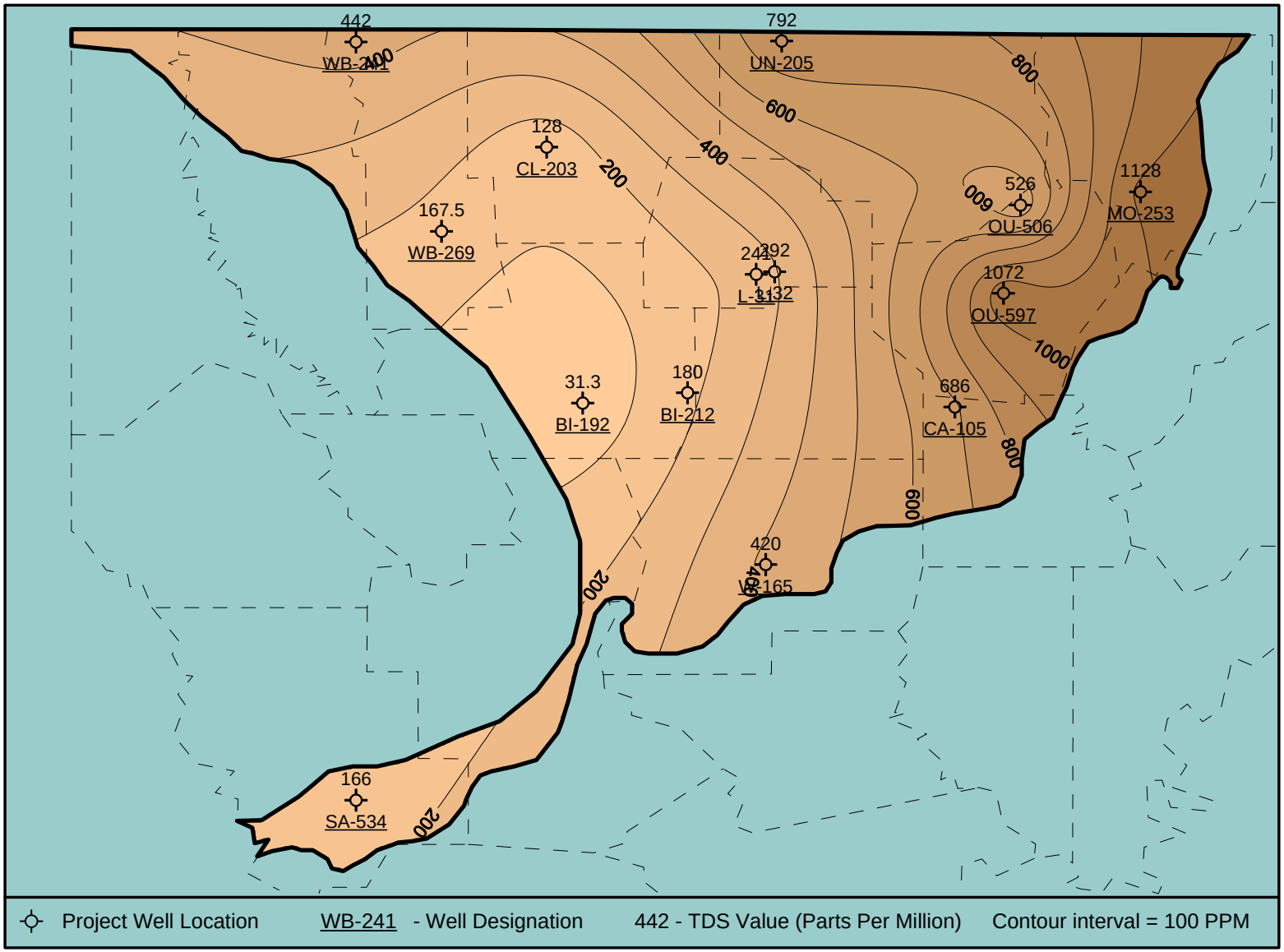


Figure 1-3 Map of TDS Data

SPARTA AQUIFER - Chloride

Baseline Monitoring Program, FY 2004

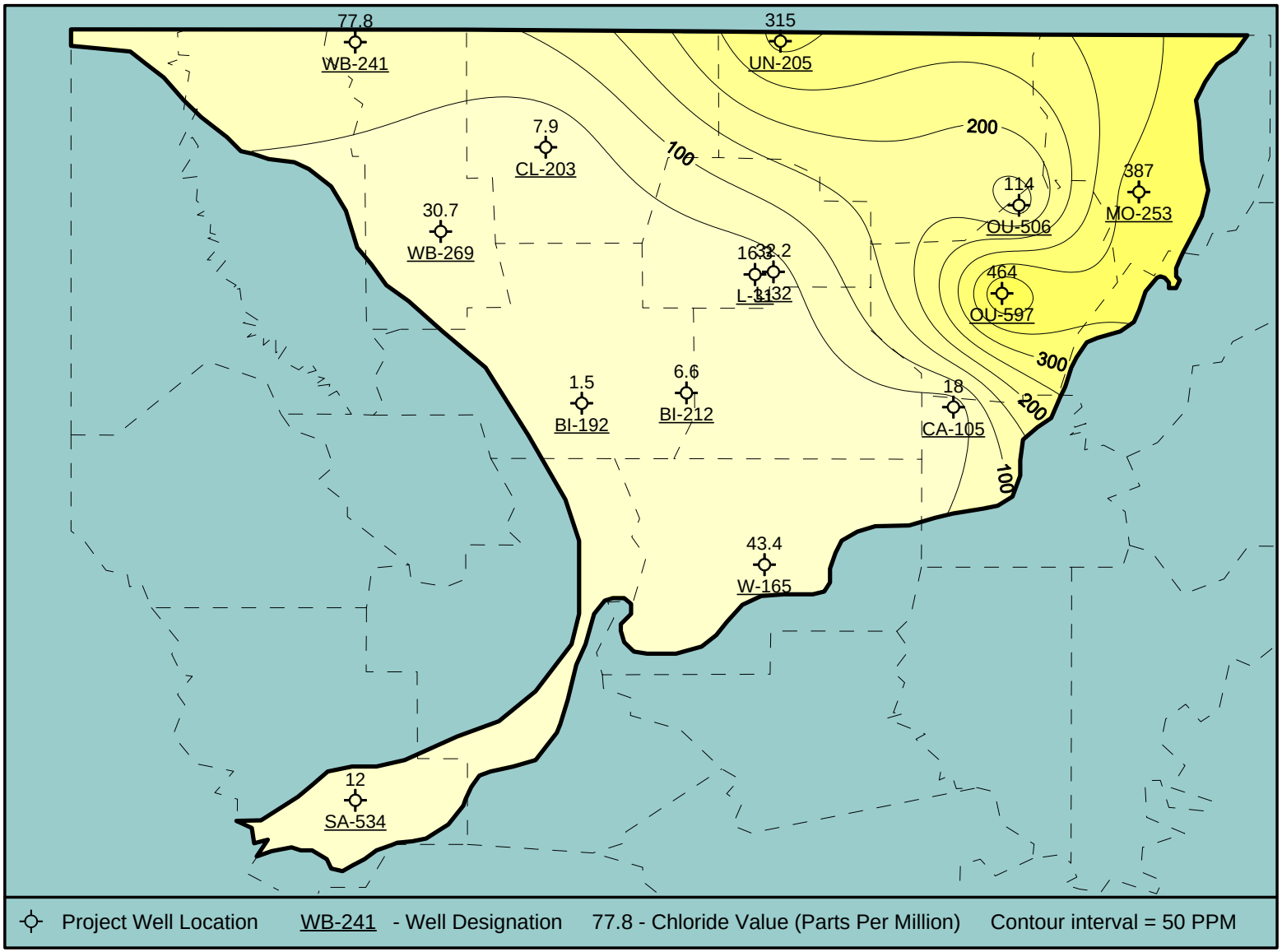


Figure 1-4 Map of Chloride Data

SPARTA AQUIFER - Iron

Baseline Monitoring Program, FY 2004

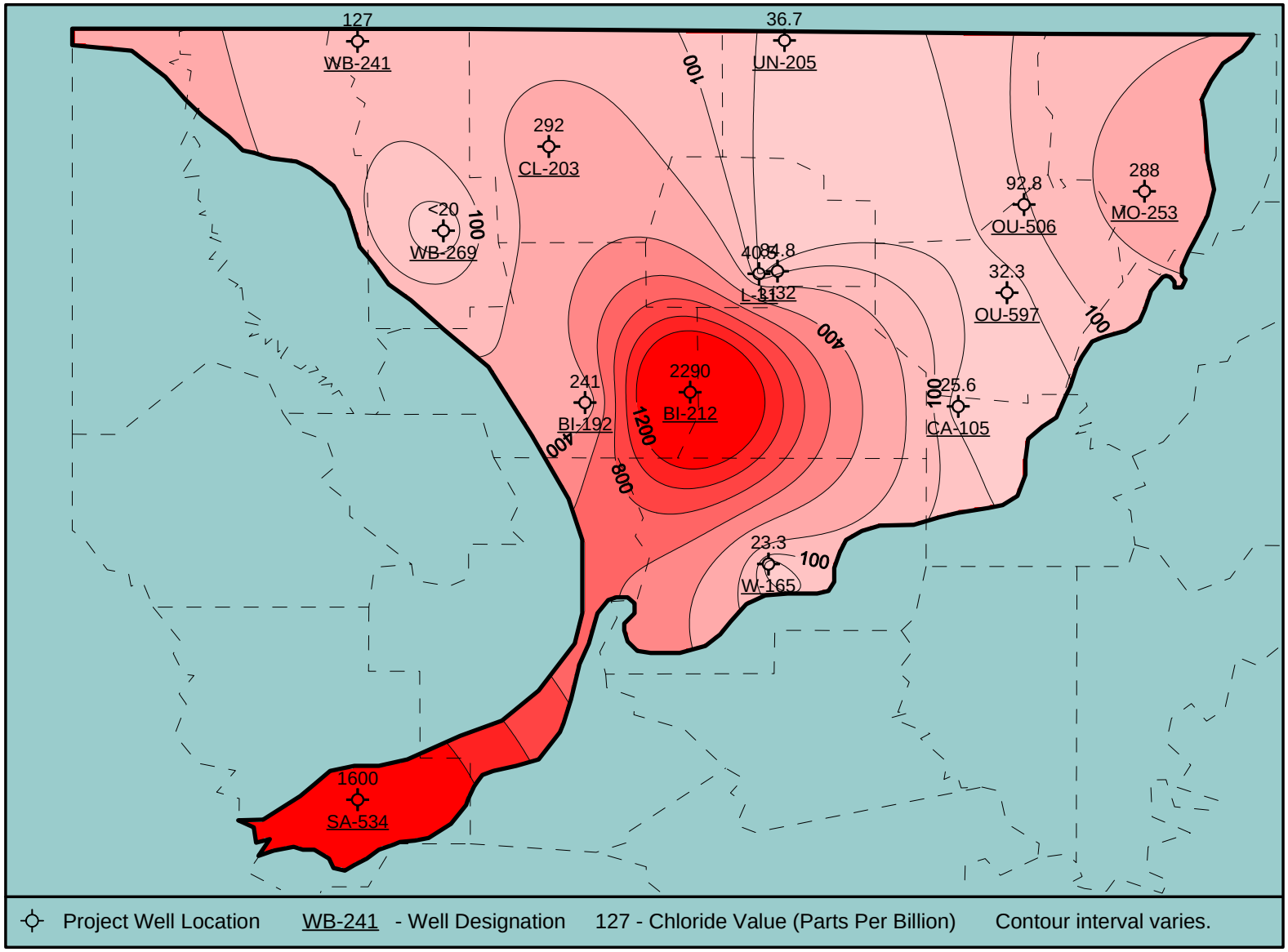


Figure 1-5 Map of Iron Data