NORTH LOUISIANA TERRACE AQUIFER SUMMARY

BASELINE MONITORING PROGRAM, FY 2004

APPENDIX 6

OF THE

TRIENNIAL SUMMARY REPORT, 2006

FOR THE

WATER QUALITY ASSESSMENT DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH CWA

NORTH LOUISIANA TERRACE 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 6-1 shows the geographic locations of the North Louisiana Terrace aquifer and the associated wells, whereas Table 6-1 lists the wells in the aquifer along with their total depths and the use made of produced waters and date sampled.

In March of 2004, eleven wells were sampled which produce from the North Louisiana Terrace aquifer. Seven of the wells are classified as public supply wells, three are classified as domestic wells, and one is classified as an industrial well. The wells are located in seven parishes in the central and north-central parts 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 Pleistocene terrace aquifers that make up the North Louisiana Terrace aquifer occur as blanket terrace deposits in central Louisiana and as erosional remnants of dissected terraces northward. The Prairie, intermediate, and high terraces typically consist of unconsolidated, fining upward sequences of gravel, sand, silt, and clay and are overlain by Holocene alluvium in the valleys of the larger streams. The older terraces generally have a coarser texture and the fine-grained top stratum is often eroded. The aquifer deposits are typically poorly to well sorted and consist of coarse sand and gravel in the lower parts grading to fine sand toward the top. The North Louisiana Terrace is unconfined in most areas, but may be confined by silt and clay locally.

HYDROGEOLOGY

Recharge is primarily from the direct infiltration of rainfall in interstream, upland outcrop areas and can be relatively rapid where the overlying silts and clays are thin or missing. Water in the terrace aquifers moves downgradient and laterally and is discharged into streams that have eroded valleys into the aquifer units. Water levels typically reflect variations in precipitation and seasonal withdrawals by wells. The hydraulic conductivity of the North Louisiana Terrace varies between 150-270 feet/day.

The maximum depths of occurrence of freshwater in the North Louisiana Terrace range from 100 feet above sea level, to 100 feet below sea level. The range of thickness of the fresh water interval in the North Louisiana Terrace is 50 to 150 feet. The depths of the North Louisiana Terrace wells that were monitored in conjunction with the BMP range from 49 to 158 feet.

PROGRAM PARAMETERS

The field parameters checked at each sampling site and the list of water quality analytical parameters are shown in Table 6-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 6-3. 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 6-8, 6-9 and 6-10 were included in this report.

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

Figures 6-2, 6-3, 6-4, and 6-5 respectively, represent the contoured data for pH, TDS, chloride and iron.

INTERPRETATION OF DATA

FIELD, WATER QUALITY, AND NUTRIENTS PARAMETERS

Table 6-2 lists the field parameters that are checked and the water quality and nutrient parameters that are sampled for at each well. It also shows the field results and the water quality and nutrient analytical results for each well. Table 6-4 provides an overview of field data, water quality data, and nutrient data for the North Louisiana Terrace aquifer, listing the minimum, maximum, and average results for these 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 6-2 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 6-2 show that the following secondary MCLs (SMCLs) were exceeded:

pH (SMCL = 6.5 – 8.5 standard units):

BI-208 – 5.82 SU
G-342 – 5.54 SU
LS-264 – 5.88 SU
MO-364 – 6.47 SU (Duplicate)
BO-434 – 6.45 SU
G-432 – 5.61 SU
MO-364 – 6.47 SU
OU-5524Z – 6.15 SU

Chloride – SMCL = 250 ppm

MO-364 – 263 ppm
MO-364 – 269 ppm (Duplicate)

Total Dissolved Solids (TDS) – SMCL = 500 ppm (0.5 g/L)

BO-340 – 540 ppm (lab); 0.66 g/L (field)
BO-340 (Duplicate) – 532 ppm (lab); 0.66 g/L (field)
MO-364 – 1,020 ppm (lab); 1.06 g/L (field)
MO-364 (Duplicate) –1026 ppm (lab); 1.06 g/L (field)

INORGANIC PARAMETERS

Table 6-3 shows the inorganic (total metals) parameters that are sampled for and the analytical results for the March 2004 sampling. Arsenic was detected in well MO-364 at 10.7 ppb in the original sample and 22.1 ppb in the duplicate sample. Also detected in this well was lead at 16.3 and 6.78 ppb (original and duplicate); and thallium at 20.3 and 39.6 ppb (original and duplicate). Thallium was detected in well BO-5382Z at 11.4 ppb while selenium was detected in the duplicate sample but not in the original sample of well BO-340 at 11.7 ppb. Thallium and arsenic was reported in the field blank for these samples at 11.7 ppb and 11.9 ppb respectively.

Due to occurrence of thallium and arsenic in the field blank, and because the occurrence of selenium in BO-5382Z could not be confirmed, a metals resample was collected from MO-364 and BO-5382Z in March of 2005. Laboratory data from this resample shows that arsenic, lead, and thallium was not detected in well MO-364, as was originally reported in 2004. In addition, thallium was not detected in well BO-5382Z from this resample effort. However, mercury was detected at just above its detection limit of 0.05 ppb, at 0.06 ppb, in well MO-364 in 2005, while it was not detected in 2004 (MCL for mercury = 2.0 ppb).

It should also be noted that the metals analysis of the original sampling in 2004 of the North Louisiana Terrace aquifer was performed by a contract lab, whereas the resamples collected in 2005 were analyzed by the Department's lab. For every parameter except lead, the department's detection limits are significantly lower than the contract lab's detection limits.

Taking all of this information and data into consideration, the reliability of the 2004 total metals data is questionable at best. Due to the resample data not confirming the presence of arsenic, lead and thallium, and due to the presence of arsenic and selenium in the field blank, it is the opinion of this Office that the occurrences of these metals are invalid and are therefore rejected and will not be used for assessing the quality of this aquifer.

Federal Primary Drinking Water Standards: Taking the above into account, a review of the analytical data listed in Table 6-3 show that it appears that no primary MCL was exceeded for total metals. Also, the resample data listed in Table 6-3A from the March 2005 sampling show that no primary MCL was exceeded for wells BO-5283Z or BO-364.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 6-3 show that six wells exceeded the secondary MCL (SMCL) for iron (Iron SMCL = 300 ppb). However, due to the

questionable reliability of the metals data, as previously discussed, the FY2004 iron values may be unreliable as well.

March 2004 sample:

BO-340 – 1,890 ppb
BO-5382Z – 1,380 ppb
MO-364 – 2,450 ppb
OU-5524Z – 307 ppb
BO-340 – 1,940 ppb (Duplicate)
MO-124 – 34,800 ppb
MO-364 – 3,130 ppb (Duplicate)
RR-254 – 961 ppb

March 2005 resample:

BO-5382Z – 239 ppb [< SMCL]
MO-364 – 3,640 ppb
BO-5382Z – 239 ppb (Duplicate) [< SMCL]
MO-364 – 3,640 ppb (Duplicate)

VOLATILE ORGANIC COMPOUNDS

Table 6-8 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 well is not provided, however any detection of a VOC would be discussed in this section.

No VOC was detected during the FY 2004 sampling of the North Louisiana Terrace Aquifer.

SEMIVOLATILE ORGANIC COMPOUNDS

Table 6-9 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 well is not provided, however any detection of an SVOC would be discussed in this section.

No SVOC was detected during the FY 2004 sampling of the North Louisiana Terrace Aquifer.

PESTICIDES AND PCBS

Table 6-10 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 well is not provided, however any detection of a pesticide or PCB would be discussed in this section.

The pesticide Endrin was not detected in the original sample of well BO-340, but was detected in the duplicate sample of this well, at 0.478 ppb, taken immediately following the original (detection limit for Endrin = 0.1 ppb; MCL = 2.0 ppb). Because the original sample did not confirm the presence of this pesticide in the well, it is the opinion of this Office that the Endrin detection is invalid and is rejected.

Considering the above, there were no valid detections of a pesticide or PCB during the 2004 sampling of the North Louisiana Terrace aquifer.

COMPARISON TO HISTORICAL DATA

Tables 6-6 and 6-7 lists the current field, water quality, nutrients, and inorganics 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 a constant increase in specific conductance (field and lab), alkalinity, sulfate, hardness and total dissolved solids, while color, nitrite-nitrate, and TKN have steadily decreased. From FY 1995 to FY 2001, chloride, turbidity and salinity remained constant, but have now shown an increase for FY 2004. Phosphorus decreased after FY 1995 but has remained constant since then.

Iron has shown a consistent decrease from FY 1995 to FY 2001, but then in FY 2004, the average iron concentration increased to more than the original amount in FY 1995. Copper and zinc have had general fluctuations over the past nine years, while the remaining parameters have fluctuated only slightly or have remained constant since the FY 1995 sampling.

SUMMARY AND RECOMMENDATIONS

The data derived from the Baseline Monitoring Program sampling of the North Louisiana Terrace aquifer show that the ground water produced from this aquifer is moderately hard[1]. It is of good quality when considering short-term or long-term health risk guidelines in that it appears no BMP well that was sampled during the Fiscal Year 2004 monitoring had a confirmed exceedance of a primary MCL. It should be noted that due to the higher detection limits returned by the contract lab, and that the results from this lab are questionable for inorganics, a definitive statement regarding MCL exceedances cannot be made. However, the data does show that this aquifer is of good quality when considering taste, odor, or appearance guidelines. A comparison to historical BMP data shows an increase in the average concentrations of several water quality and nutrient parameters, while the average concentrations for color, nitrite-nitrate and TKN have declined.

As previously discussed in the Inorganics section of this summary, several metals were detected in the original sampling of the North Louisiana Terrace aquifer for FY 2004. However, some of the data was determined to be invalid and was rejected due to the occurrence of various metals in the field blank and due to the inability to confirm their presence either by duplicate samples or by resamples.

It is recommended that the wells assigned to the North Louisiana Terrace aquifer be resampled as planned in approximately three years, with close attention given to the inorganic data derived from that sampling. In addition, several wells should be added to those 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 6-1 Wells Sampled

WELL NUMBER	PARISH	DATE SAMPLED	OWNER	DEPTH (FEET)	WELL USE
BI-208	BIENVILLE	3/22/2004	PRIVATE OWNER	100	DOMESTIC
BO-340	BOSSIER	3/23/2004	VILLAGE WATER SYSTEM	91	PUBLIC SUPPLY
BO-434	BOSSIER	3/22/2004	RED CHUTE UTILITIES	94	PUBLIC SUPPLY
BO-5382Z	BOSSIER	3/22/2004	PRIVATE OWNER	95	DOMESTIC
G-342	GRANT	3/16/2004	VANGAURD SYNFUELS, LLC	49	INDUSTRIAL
G-432	GRANT	3/16/2004	CENTRAL GRANT WATER SYSTEM	158	PUBLIC SUPPLY
LS-264	LA SALLE	3/16/2004	CITY OF JENA	105	PUBLIC SUPPLY
MO-124	MOREHOUSE	3/15/2004	TEXAS GAS	133	PUBLIC SUPPLY
MO-364	MOREHOUSE	3/15/2004	PEOPLES WATER SERVICE	154	PUBLIC SUPPLY
OU-5524Z	OUACHITA	3/15/2004	PRIVATE OWNER	95	DOMESTIC
RR-254	RED RIVER	3/22/2004	EAST CROSS WATER SYSTEM	93	PUBLIC SUPPLY

Table 6-2 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												
BI-208	5.82	0.03	0.076	0.05	18.91	12.3	<0.1	9.1	<5	11.8	1.42	<0.1	<0.05	76.9	1.8	76	<4	<1
BO-340	7.47	0.51	1.019	0.66	19.34	247	0.45	178	<5	294	<0.05	0.53	<0.05	1067	<1.3	540	<4	23
BO-340*	7.47	0.51	1.019	0.66	19.34	247	0.46	175	<5	292	<0.05	0.36	<0.05	1,060	<1.3	532	<4	23
BO-434	6.45	0.10	0.202	0.13	18.71	84.7	<0.1	10	<5	70.8	0.38	<0.1	0.33	204	4.3	131	<4	<1
BO-5382Z	7.12	0.33	0.683	0.44	18.46	231	0.89	46.5	<5	186	<0.05	0.91	<0.05	705	58.9	364	6.5	11
G-342	5.54	0.06	0.119	0.08	19.33	6.1	<0.1	20.8	<5	11.8	1.89	0.25	<0.05	120	5.7	82	<4	<1
G-432	5.61	0.02	0.048	0.03	19.08	10.3	<0.1	3.5	<5	7.3	0.54	0.34	<0.05	44.2	<1.3	41.3	<4	2.1
LS-264	5.88	0.05	0.112	0.07	19.06	23.3	<0.1	14.2	<5	23.1	0.83	0.13	<0.05	113	5.7	91.3	<4	<1
MO-124	7.33	0.13	0.271	0.18	20.60	111	<0.1	18.1	<5	103	<0.05	0.26	1.06	262	<1.3	172	69	380
MO-364	6.47	0.83	1.634	1.06	20.84	205	<0.1	263	<5	462	<0.05	<0.1	<0.05	1,646	202	1020	5	4.3
MO-364*	6.47	0.83	1.634	1.06	20.84	205	<0.1	269	<5	464	<0.05	<0.1	<0.05	1,649	206	1026	<4	5.3
OU-5524Z	6.15	0.06	0.133	0.09	18.82	33.8	<0.1	21.4	<5	30.7	0.21	0.23	0.25	133	1.5	113	<4	4.5
RR-254	6.84	0.08	0.176	0.12	19.32	45	<0.1	21	<5	22.9	0.11	<0.1	<0.05	177	9.6	119	<4	<1

* Denotes duplicate sample.

Table 6-3 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	Thallium ppb	Zinc ppb
Laboratory Detection Limits	60	10	200	5	5	10	10	100	3	0.2	40	10	10	20
BI-208	<60	<10	<200	<5	<5	<10	31.3	<100	<3	<0.2	<40	<10	<10	<20
BO-340	<60	<10	464	<5	<5	<10	<10	1,890	<3	<0.2	<40	<10	<10	<20
BO-340*	<60	<10	467	<5	<5	<10	<10	1,940	<3	<0.2	<40	11.7(R)	<10	<20
BO-434	<60	<10	<200	<5	<5	<10	<10	<100	<3	<0.2	<40	<10	<10	<20
BO-5382Z	<60	<10	<200	<5	<5	<10	<10	1,380	4.59	<0.2	<40	<10	11.4(R)	<20
G-342	<60	<10	<200	<5	<5	<10	<10	<100	<3	<0.2	<40	<10	<10	<20
G-432	<60	<10	<200	<5	<5	<10	10.2	<100	7.75	<0.2	<40	<10	<10	284
LS-264	<60	<10	<200	<5	<5	<10	<10	<100	<3	<0.2	<40	<10	<10	<20
MO-124	<60	<10	248	<5	<5	<10	45.5	34,800	<3	<0.2	<40	<10	<10	<20
MO-364	<60	10.7(R)	259	<5	<5	<10	34.1	2,450	16.3(R)	<0.2	<40	<10	20.3(R)	20.7
MO-364*	<60	22.1(R)	391	<5	<5	<10	22.7	3,130	6.78(R)	<0.2	<40	<10	39.6(R)	34.4
OU-5524Z	<60	<10	<200	<5	<5	<10	179	307	3.71	<0.2	<40	<10	<10	<20
RR-254	<60	<10	<200	<5	<5	<10	<10	961	<3	<0.2	<40	<10	<10	<20

(R) – Data rejected, see discussion on page 5

Table 6-3A Inorganic Resample Data (2005)

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
BO-5382Z	<10	<10	98.1	<1	<1	<5	11.9	239	<10	<0.05	<5	<5	<10	<5	<20
BO-5382Z*	<10	<10	87.5	<1	<1	<5	<10	205	<10	<0.05	<5	<5	<10	<5	<20
MO-364	<10	<10	217	<1	<1	<5	38.8	3640	<10	0.06	6.9	<5	<10	<5	34.6
MO-364*	<10	<10	313	<1	<1	<5	38.1	4130	<10	0.06	8.9	<5	<10	<5	31.8

* Denotes duplicate sample.

Table 6-4 Field, Water Quality, and Nutrients Statistics

Fiscal Year 2004

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature °C	18.46	20.84	19.43
	pH (SU)	5.54	7.47	6.51
	Sp. Conductance (mmhos/cm)	0.048	1.634	0.55
	Salinity (ppt)	0.02	0.83	0.27
	TDS (g/L)	0.031	1.062	0.36
LABORATORY	Alkalinity (ppm)	6.1	247	112.42
	Chloride (ppm)	3.5	269	80.74
	Color (PCU)	<5	<5	<5
	Specific Conductance (umhos/cm)	44.2	1,649	558.24
	Sulfate (ppm)	<1.3	206	38.32
	TDS (ppm)	41.3	1,026	331.35
	TSS (ppm)	<4	69	7.73
	Turbidity (NTU)	<1	380	35.05
	Ammonia (ppm)	<0.1	0.89	0.18
	Hardness (ppm)	7.3	464	152.26
	Nitrite-Nitrate, as N (ppm)	<0.05	1.89	0.43
	TKN (ppm)	<0.1	0.91	0.25
	Phosphorous (ppm)	<0.05	1.06	0.15

Table 6-5 Inorganic Statistics

Fiscal Year 2004

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (ppb)	<60	<60	<60
Arsenic* (ppb)	<10	<10	<10
Barium (ppb)	<200	467	202.23
Beryllium (ppb)	<5	<5	<5
Cadmium (ppb)	<5	<5	<5
Chromium (ppb)	<10	<10	<10
Copper (ppb)	<10	179	27.52
Iron (ppb)	<100	34,800	3,623.7
Lead* (ppb)	<3	7.75	3.64
Mercury (ppb)	<0.2	<0.2	<0.2
Nickel (ppb)	<40	<40	<40
Selenium* (ppb)	<10	<10	<10
Thallium* (ppb)	<10	<10	<10
Zinc (ppb)	<20	284	33.8

* Rejected data not used for statistical analysis.

Table 6-6 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	20.18	19.79	18.97	19.43
	PH (SU)	6.27	5.88	6.81	6.51
	Sp. Conductance (mmhos/cm)	0.28	0.26	0.32	0.55
	Salinity (ppt)	0.12	0.13	0.15	0.27
	TDS	-	-	-	0.36
LABORATORY	Alkalinity (ppm)	81.70	69.60	97.68	112.42
	Chloride (ppm)	22.68	20.99	25.03	80.74
	Color (PCU)	17.69	6.43	8.75	<5
	Sp. Conductance (umhos/cm)	278.00	268.06	352.94	558.24
	Sulfate (ppm)	25.95	32.62	41.53	38.32
	TDS (ppm)	219.54	192.43	239.04	331.35
	TSS (ppm)	6.62	<4	<4	7.73
	Turbidity (NTU)	11.08	9.49	3.09	35.05
	Ammonia (ppm)	0.19	0.25	0.18	0.18
	Hardness (ppm)	48.57	64.02	89.65	152.26
	Nitrite-Nitrate, as N (ppm)	0.67	1.27	0.68	0.43
	TKN (ppm)	0.69	0.36	0.24	0.25
	Phosphorus (ppm)	0.24	0.14	0.15	0.15

Table 6-7 Three-year Inorganic Averages

PARAMETER	FY 1995 AVERAGE	FY 1998 AVERAGE	FY 2001 AVERAGE	FY 2004 AVERAGE
Antimony (ppb)	<5	<5	<5	<60
Arsenic (ppb)	<5	<5	<5	<10
Barium (ppb)	117.25	90.54	93.86	202.23
Beryllium (ppb)	<5	<5	<1	<5
Cadmium (ppb)	<5	<5	<1	<5
Chromium (ppb)	<5	<5	<5	<10
Copper (ppb)	6.57	55.75	11.77	27.52
Iron (ppb)	2,243.92	1,077.02	522.23	3,623.7
Lead (ppb)	<10	<10	<10	3.64
Mercury (ppb)	0.07	<0.05	<0.05	<0.2
Nickel (ppb)	7.18	3.44	6.89	<40
Selenium (ppb)	<5	<5	<5	<10
Silver (ppb)	<5	<5	<1	-
Thallium (ppb)	<5	<5	<5	<10
Zinc (ppb)	25.03	46.36	119.17	33.8

Table 6-8 VOC Analytical Parameters

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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
ETHYLBENZENE	624	100414	2
BROMOMETHANE	624	74839	2
CHLOROMETHANE	624	74873	2
METHYLENE CHLORIDE	624	75092	2
O-XYLENE	624	95476	2
STYRENE	624	100425	2
METHYL-t-BUTYL ETHER	624	1634044	2
TETRACHLOROETHENE	624	127184	2
TOLUENE	624	108883	2
TRANS-1,2-DICHLOROETHENE	624	156605	2
TRANS-1,3-DICHLOROPROPENE	624	10061026	2
TRICHLOROETHENE	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 6-9 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
Benzo[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
Butylbenzylphthalate	625	85687	10
Chrysene	625	218019	10
Diethylphthalate	625	84662	10
Dimethylphthalate	625	131113	10
Di-n-butylphthalate	625	84742	10
Di-n-octylphthalate	625	117840	10

Table 6-9 (Cont'd)
Semivolatile Parameters

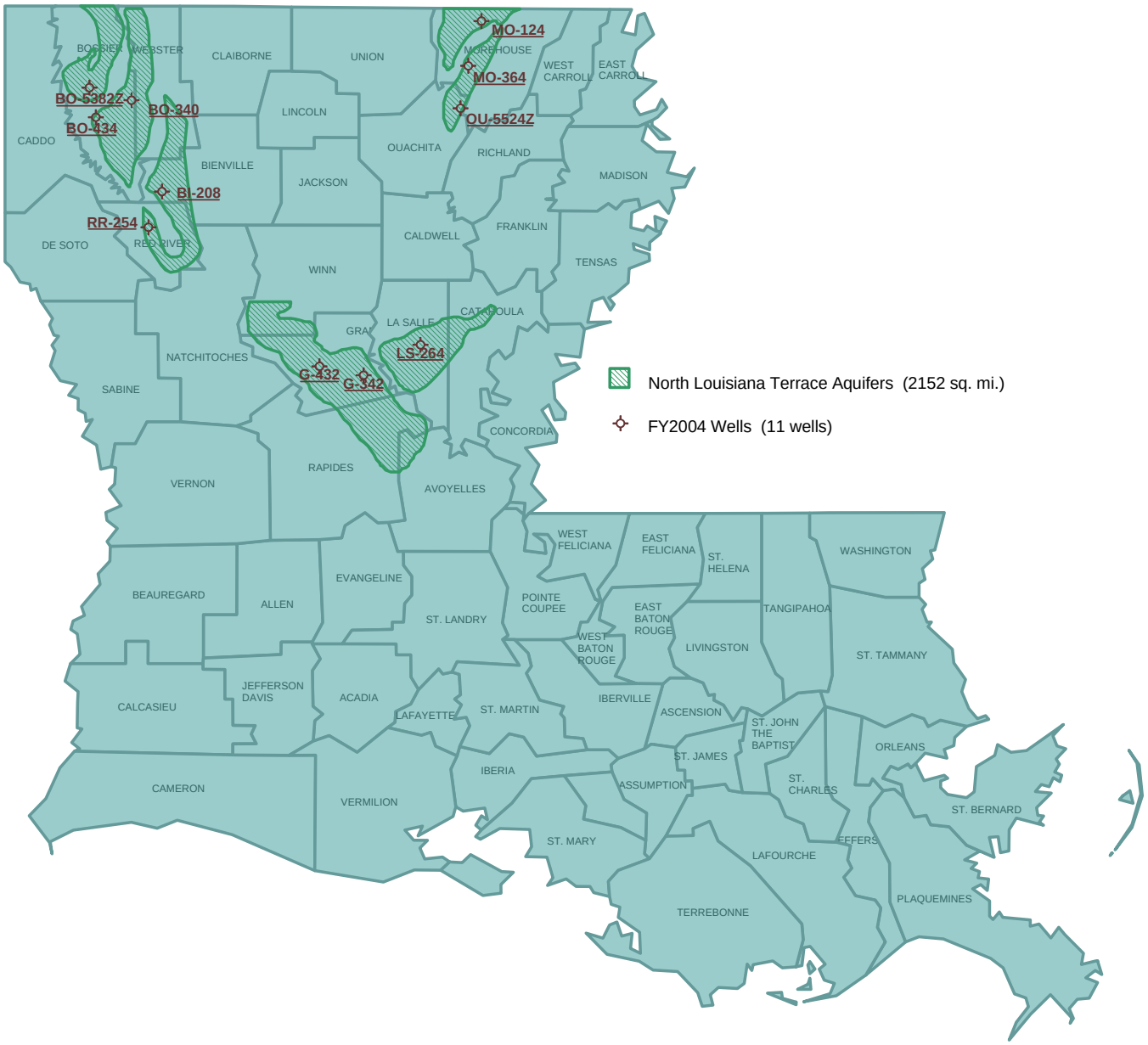
COMPOUND	ANALYTICAL METHOD	CAS NUMBER	PQL (ppb)
Fluoranthene	625	206440	10
Fluorene	625	86737	10
Hexachlorobenzene	625	118741	10
Hexachlorobutadiene	625	87683	10
Hexachlorocyclopentadiene	625	77474	10
Hexachloroethane	625	67721	10
Indeno[1,2,3-cd]pyrene	625	193395	10
Isophorone	625	78591	10
Naphthalene	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 6-10 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
Methoxychlor	8081	72435	0.5
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 NORTH LOUISIANA TERRACE 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 6-1 Location Plat, North Louisiana Terrace Aquifer

NORTH LOUISIANA TERRACE AQUIFER - pH

Baseline Monitoring Program, FY2004

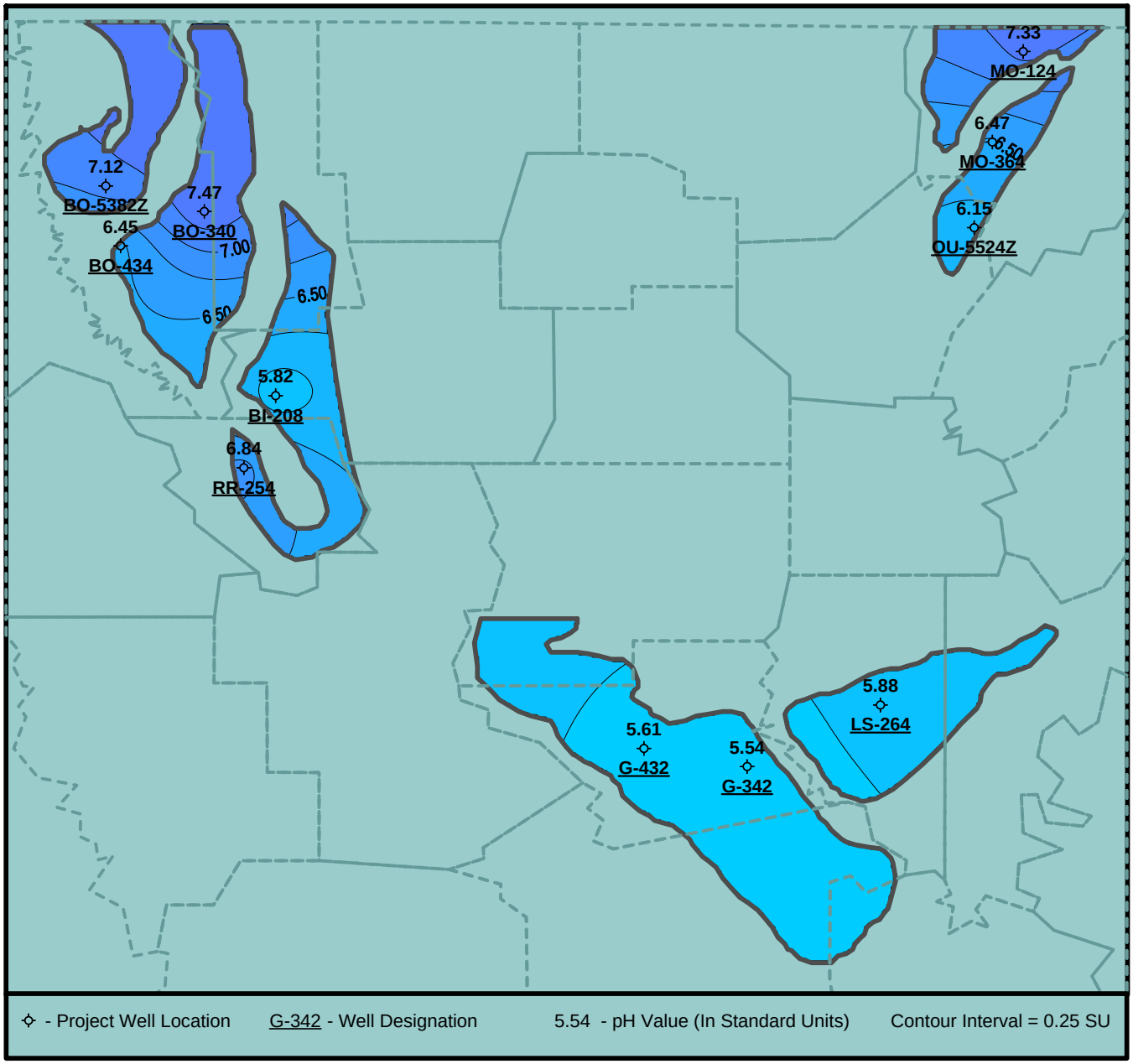


Figure 6-2 Map of pH Data

NORTH LOUISIANA TERRACE AQUIFER - TDS

Baseline Monitoring Program, FY2004

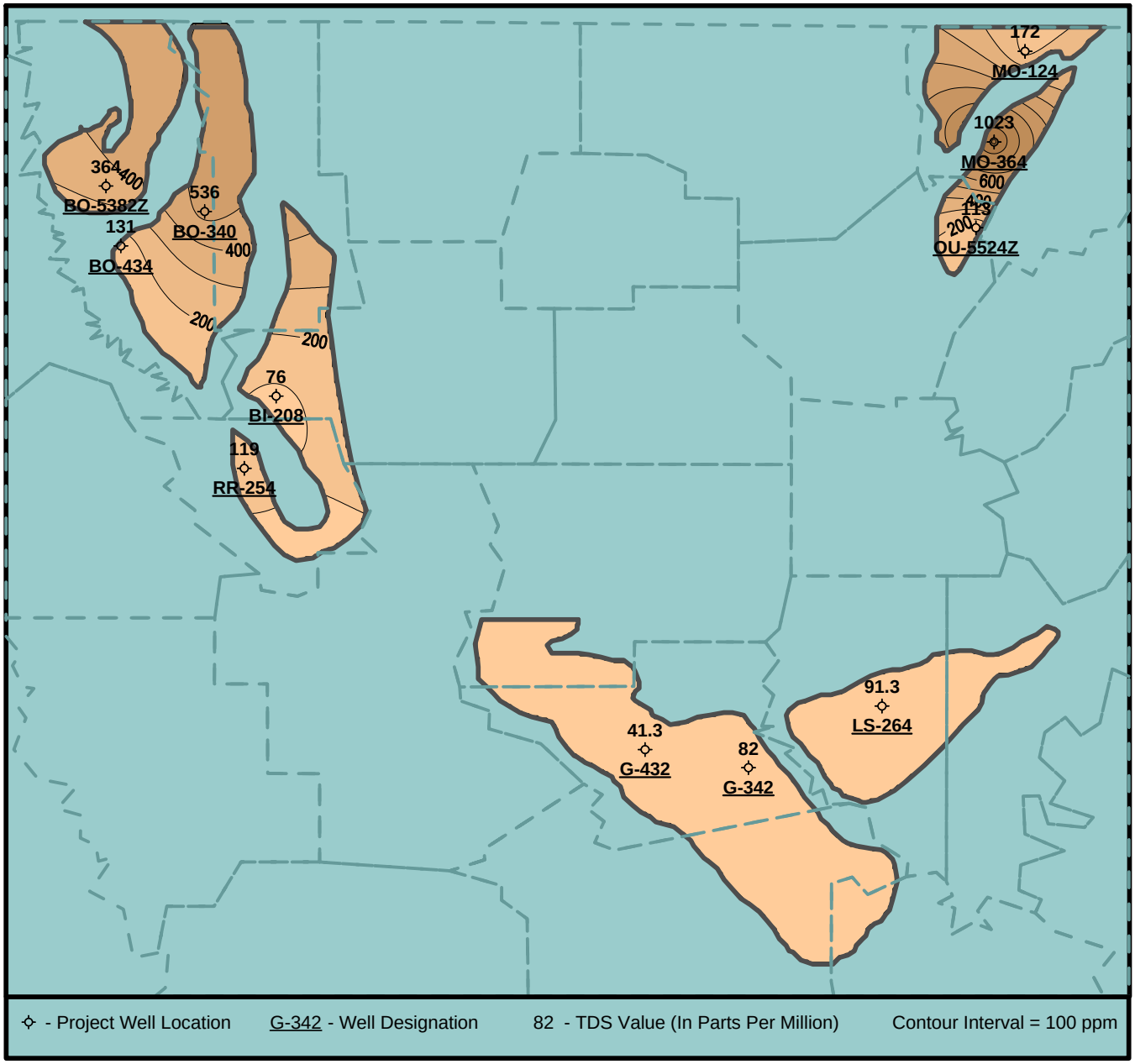


Figure 6-3 Map of TDS Data

NORTH LOUISIANA TERRACE AQUIFER - Chloride

Baseline Monitoring Program, FY2004

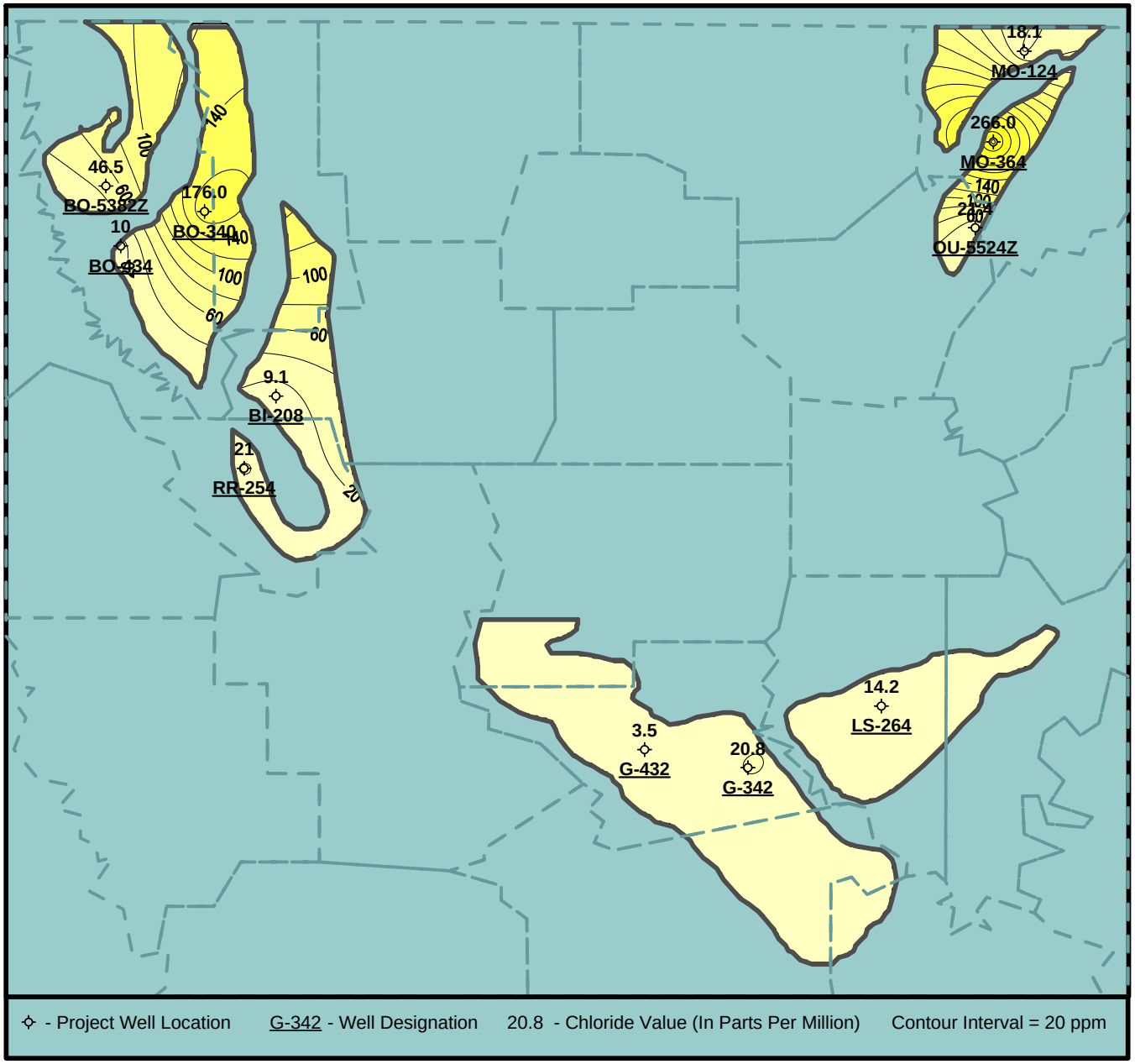


Figure 6-4 Map of Chloride Data

NORTH LOUISIANA TERRACE AQUIFER - Iron

Baseline Monitoring Program, FY2004

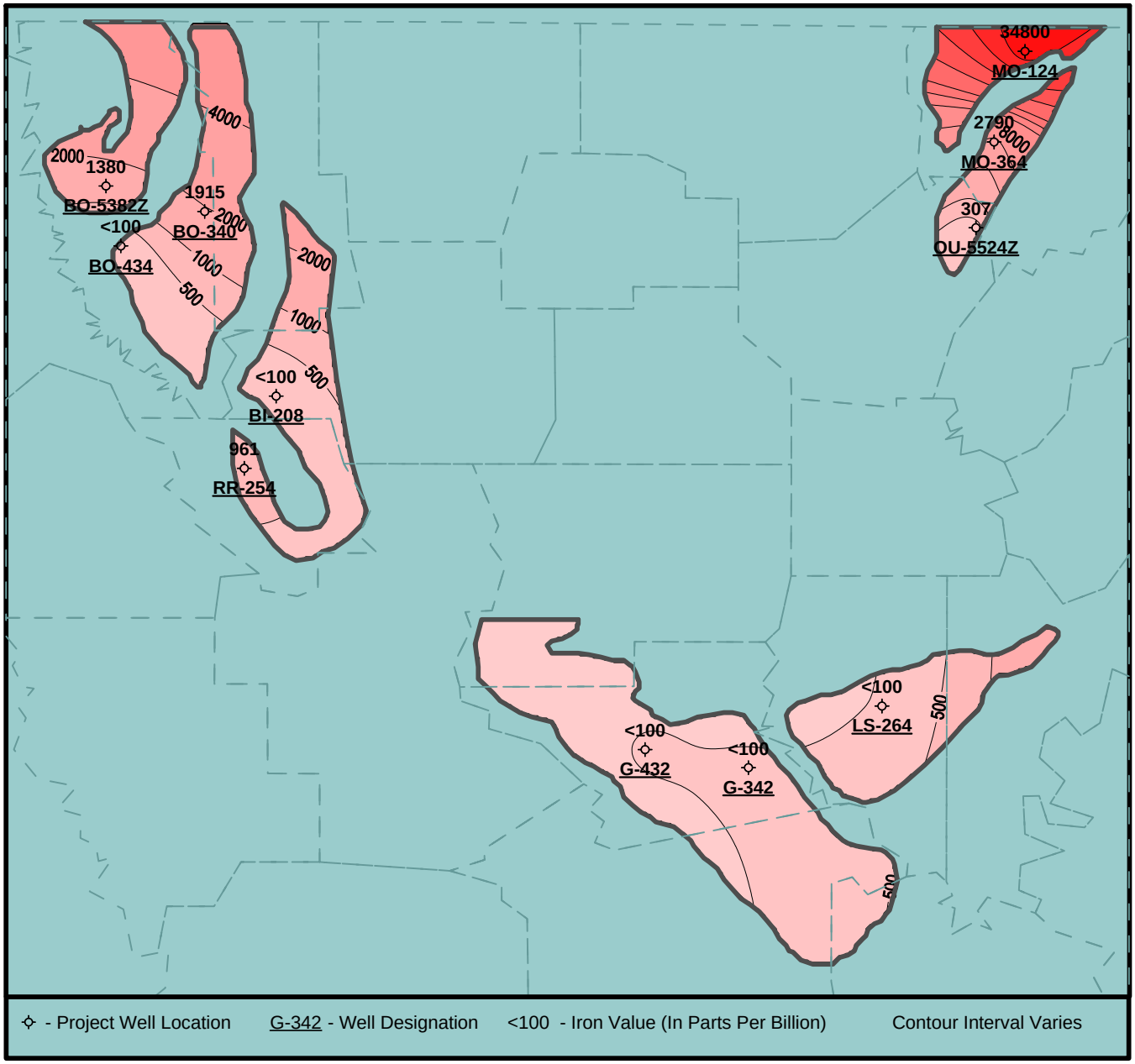


Figure 6-5 Map of Iron Data