

TECHNICAL MEMORANDUM

Project No. US0047497.6343

DATE May 29, 2026
TO Mr. Tim Andruss
Victoria County Groundwater Conservation District
FROM WSP USA Inc. (WSP)

EVALUATION OF SERENE DRIVE AREA DOMESTIC-USE WATER QUALITY

1.0 INTRODUCTION

WSP USA Inc. (WSP) (previously Pastor, Behling & Wheeler, LLC (PBW)) has reviewed the additional groundwater quality data collected since June 2017 from domestic-use water wells in the Serene Drive area of Victoria County, Texas. This technical memorandum summarizes the updated geochemical analyses completed to evaluate and interpret elevated salinity in groundwater at the Serene Drive area. In addition, recommendations for additional sampling and research are included.

2.0 BACKGROUND

In 2014, the Victoria County Groundwater Conservation District (VCGCD), in response to reports from water well drillers of potential groundwater contamination, requested that PBW conduct a preliminary evaluation of groundwater conditions in the Serene Drive area of Victoria County, Texas. The conclusions of PBW's review and research were the following (PBW, 2014):

- Total dissolved solids (TDS), chloride (Cl), and other constituents measured in groundwater samples from domestic-use water wells in the Serene Drive area were reported at elevated concentrations relative to the naturally occurring (background) concentrations of those constituents in the Victoria County region of the Gulf Coast Aquifer.
- The data were not available to either confirm the presence of significantly elevated salinity or indicate the source of the elevated salinity, if present.
- PBW recommended a preliminary groundwater investigation be performed to form a scientific basis for the presence and/or source of the salinity. This included additional groundwater sampling from a subset of wells at the Serene Drive area for a wider range of constituents.

In 2017, PBW conducted an additional review of the groundwater quality data collected as part of the preliminary groundwater investigation conducted by the VCGCD. The conclusions of PBW's review and research were the following (PBW, 2017):

- TDS, chloride, and other constituents measured in groundwater samples continued to be reported at elevated concentrations relative to the naturally occurring (background) concentrations of those constituents in the Victoria County region of the Gulf Coast Aquifer.
- Mercury (Hg), arsenic (As), and selenium (Se) were also measured in groundwater samples from the Serene Drive area at concentrations that exceeded the maximum contaminant levels (MCLs) promulgated by the Environmental Protection Agency (EPA).

- The source of these elevated concentrations was not known, and the existing data were not sufficient to rule out the potential that historic oil and gas exploration and production activities have impacted groundwater quality in the Serene Drive area.
- Additional sampling and research were recommended to continue to evaluate the locations and depths of the elevated salinity in groundwater and the source of elevated salinity.

3.0 GEOCHEMICAL ANALYSIS

As discussed in PBW's 2014 Report for the VCGCD, groundwater salinization can arise from multiple natural and anthropogenic sources, including natural saline groundwater, halite dissolution, seawater intrusion, and oilfield/deep-basin brines (PBW, 2014). Distinguishing among sources after mixing has occurred requires combining conservative tracers, diagnostic ratios, and graphical and statistical tools. WSP followed similar methodologies summarized in Richter and Kreitler's 1991 Report, which emphasizes the analysis of conservative ions (notably chloride and bromide (Br)), diagnostic constituent ratios (e.g., Br/Cl, sodium (Na)/Cl, iodide (I)/Cl, calcium (Ca)/Cl), and graphical methods (e.g., Piper/Stiff diagrams and bivariate ratio plots) to evaluate salinity sources and mixing trends (Richter and Kreitler, 1991).

Table 1 provides a summary of the groundwater data collected to date from domestic-use water wells in the Serene Drive area. Figure 1 displays the domestic-use water well locations, oil/gas/injection wells within a 0.5-mile radius of the Serene Drive area, and the approximate locations of historic impoundments observed in a 1958 aerial of the area.

TDS concentrations for groundwater samples collected from water wells at the Serene Drive area have ranged from 420 mg/L to 25,580 mg/L, and chloride concentrations have ranged from 41 mg/L to 16,000 mg/L. Figures showing the lateral distribution of TDS and chloride concentrations for groundwater samples collected from water wells at the Serene Drive area are provided as Figures 2 and 3, respectively.

The Environmental Protection Agency's (EPA) Secondary Maximum Contaminant Level (SMCL) is 1,000 mg/L for TDS and 300 mg/L for chloride. The SMCLs are not enforceable and are established only as a guideline to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at or below the SMCL. The wells with the highest concentrations of TDS and chloride in the Serene Drive area are summarized in the table below (Table 3.1), along with their TDS and chloride data.

Table 3.1

Property/Well Owner	Well ID	Property Address	Total Depth of Well (ft bgs) ¹	Screened Interval (ft bgs)	Sample ID	Sample Date	Total Dissolved Solids (mg/L) ²	Chloride (mg/L)
Olguin (Duplicate)	NW-000444	3551 FM 616	280	259-269	NW-000444-20140321-2	3/21/2014	2430	738
Gonzales	UW-000032	313 Serene Dr.	164	100-160	UW-000032-20161014	10/14/2016	2444	953
Garrett	GW-000969	3139 FM 616	160	Unknown	GW-000969-20170606	6/6/2017	2112	1051
Gonzales	UW-000032	313 Serene Dr.	164	100-160	UW-000032-20160915	9/15/2016	3350	1225
Gonzales	NW-001006 (UW-000032)	313 Serene Dr.	160	100-160	NW-001006-20160620	6/20/2016	6715	4752
Garrett	GW-000970	3139 FM 616	150	Unknown	GW-000970-20170606	6/6/2017	11994	6022
Duran	UW-000034	258 Serene Dr.	~150	Unknown	UW-000034-20161215	12/15/2016	25580	16000

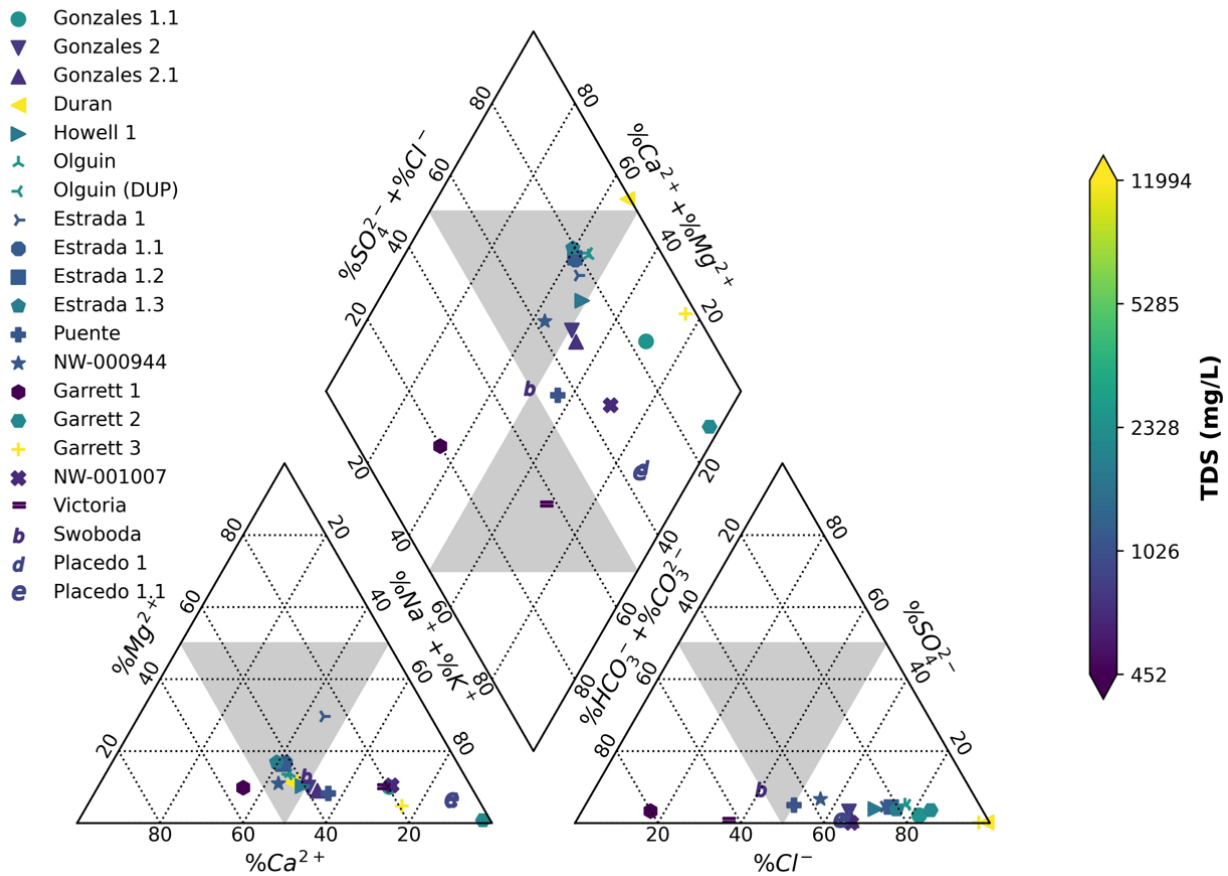
Notes:

- 1) ft bgs – feet below ground surface
- 2) mg/L – milligrams per liter

3.1 Hydrogeochemical Facies

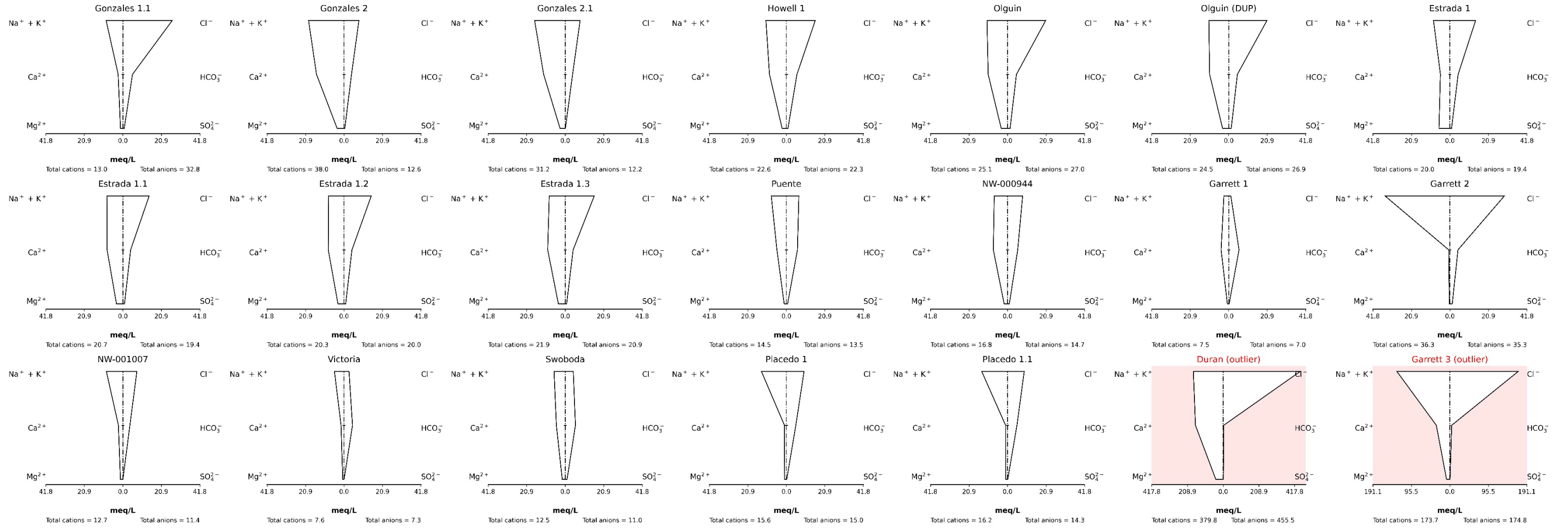
Piper diagrams were reevaluated with the additional groundwater sample data collected since June 2017. The Piper diagrams continued to indicate that many Serene Drive area groundwater samples are chloride-dominated and plot within or trend toward Na/Cl enriched water. Higher TDS samples cluster closer to the Na/Cl endmember, consistent with increased mixing with a saline source (see below diagram; Figure 3.1).

Figure 3.1



Stiff diagrams were also reevaluated with the additional groundwater data collected since June 2017. The Stiff diagrams presented below in Figure 3.2 indicate that groundwater samples from the Serene Drive area continue to exhibit chloride-dominated anion composition with cation chemistry ranging from Na/Cl to mixed Na/Ca/Cl signatures. Several samples share ionic distributions (i.e. shape) but differ in magnitude, consistent with mixing/dilution of a chloride-rich saline endmember with lower-salinity groundwater. The most saline groundwater samples exhibit large Na/Cl to Na/Ca/Cl polygons, while deeper wells show comparatively lower magnitude and, in some cases, greater bicarbonate contribution. This indicates an interval-specific salinity impact rather than a uniform regional depth-to-salinity trend.

Figure 3.2



Note:

1. Stiff diagrams are interpreted qualitatively. If major anions/cation data were not collected for certain samples, polygon shape may not fully represent total ionic composition.

3.2 Bivariate Plots

Ion concentrations alone (e.g., TDS or chloride) indicate the magnitude of salinity but do not reliably identify its source, particularly where waters have undergone mixing. Multiple salinity sources can produce elevated TDS and chloride. As documented by Richter and Kreitler (1991), bivariate plots of major ions and tracer ratios can provide a means of distinguishing among salinity sources, as they preserve relative chemical signatures during mixing. Accordingly, bivariate plots were prepared to evaluate salinity patterns and assess salinity signatures with depth.

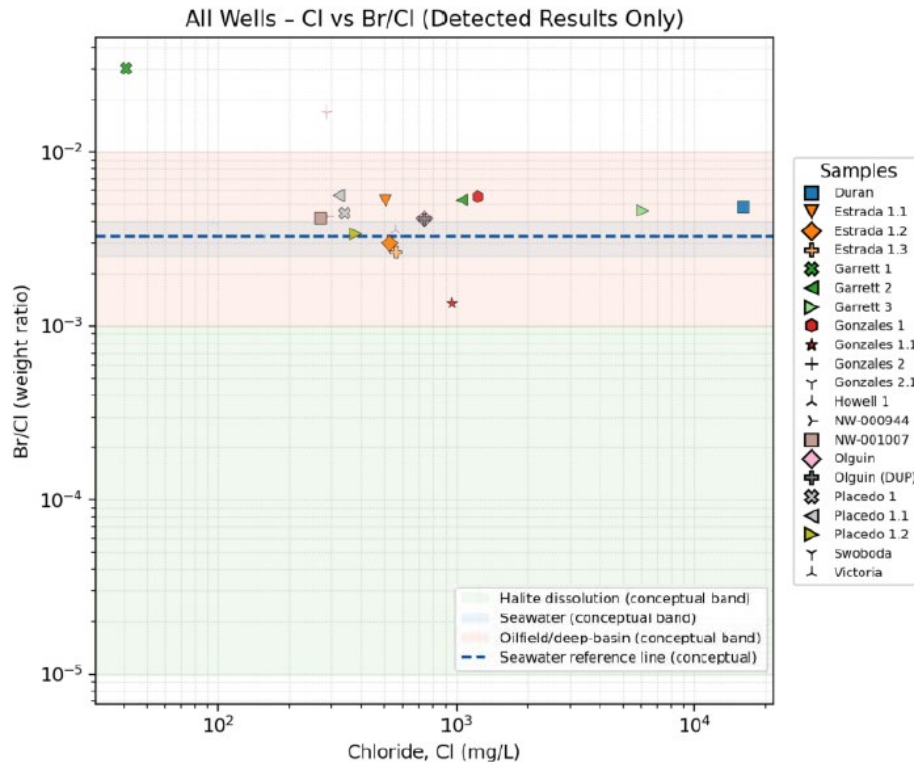
The following weighted ratios were evaluated based on the available dataset:

- Br/Cl: Bromide and chloride are typically conservative tracers. Br/Cl is a primary discriminator between halite dissolution (low Br/Cl) and oilfield/deep-basin brines (elevated Br/Cl).
- Na/Cl: To evaluate NaCl behavior. In oilfield/deep-basin brines, Na may be depleted relative to Cl due to ion exchange and interaction with bounding units.
- I/Cl: Iodide can be enriched in oilfield/deep-basin brines. I/Cl can provide supplementary discrimination, particularly at higher chloride concentrations.
- Ca/Cl: To assesses calcium enrichment relative to chloride, which can indicate Ca-Cl enriched oilfield/deep-basin brines and/or ion-exchange processes.

The weighted ratios were plotted against chloride concentration to evaluate mixing trends as salinity increases. For Br/Cl and I/Cl ratio evaluation, only detected bromide and iodide results were plotted.

3.2.1 Br/Cl vs Chloride Plots

Figure 3.3



As shown above, many samples, including the most saline wells, cluster at Br/Cl ratios in the $\times 10^{-2}$ to $\times 10^{-3}$ range across a broad range of chloride concentrations. This behavior is characteristic of oilfield/deep-basin brines mixing with fresher groundwater and is most clearly expressed in the chloride vs Br/Cl plot displaying data from wells between 100-400 feet total depth (see below plots separated by various depth intervals).

Figure 3.4

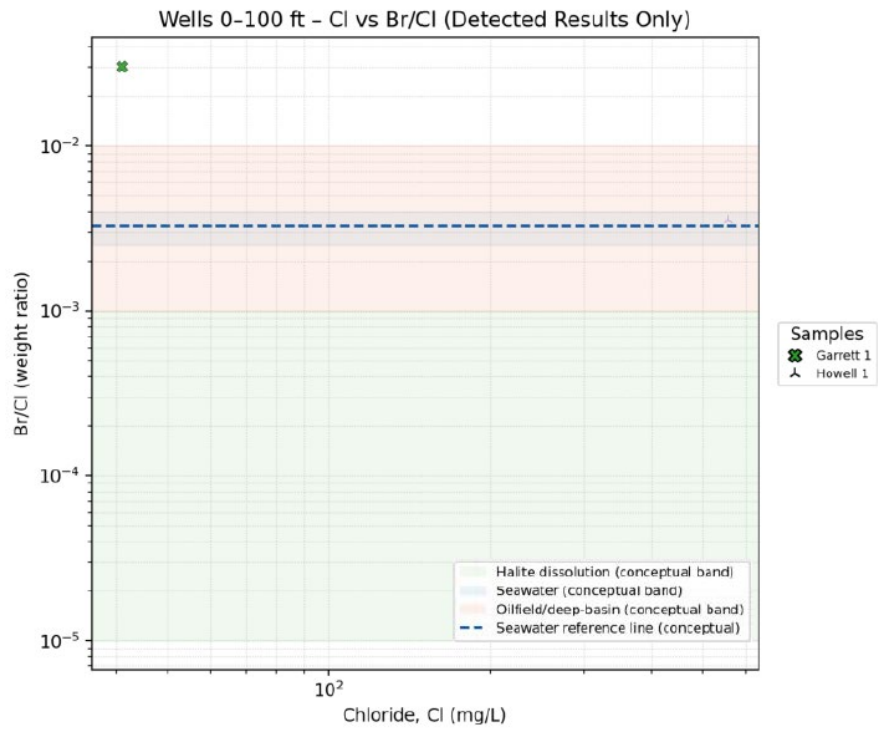


Figure 3.5

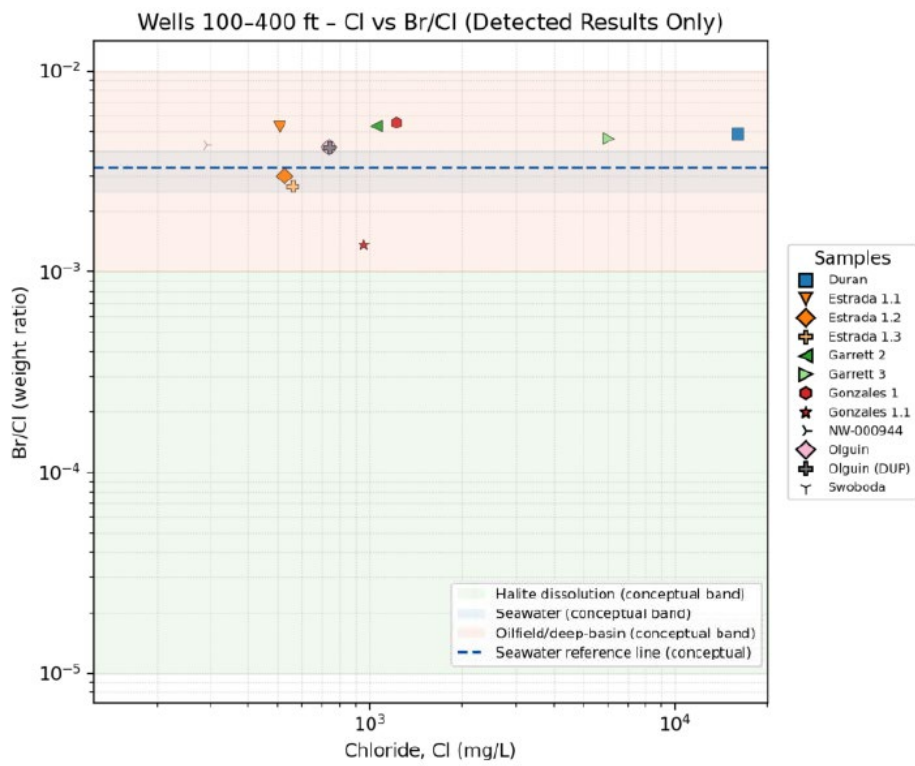
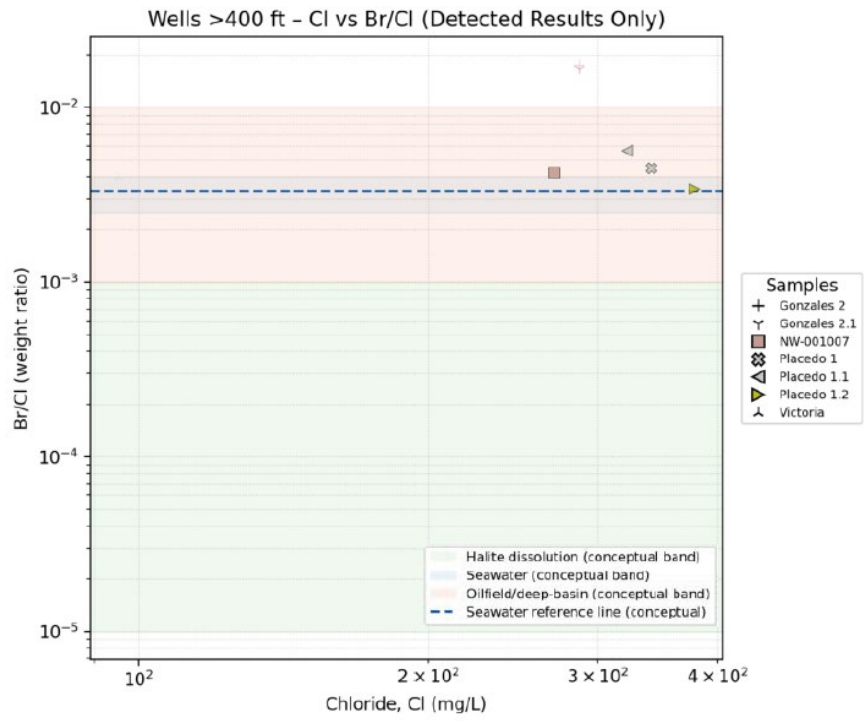
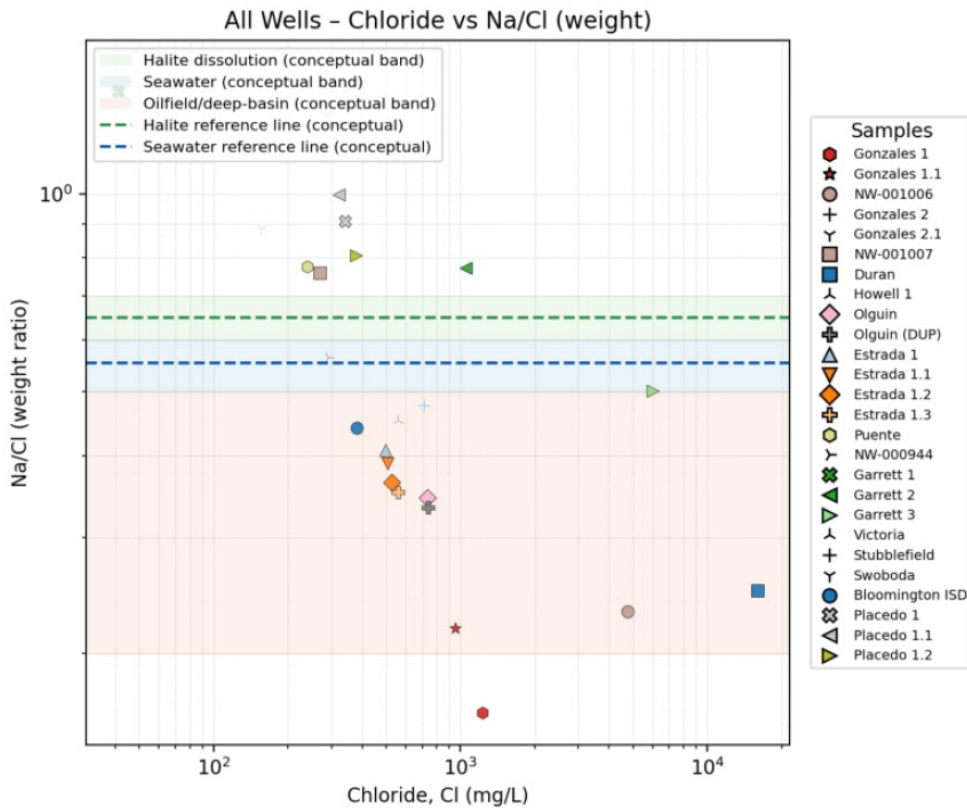


Figure 3.6



3.2.2 Na/Cl vs Chloride Plots

Figure 3.7



As shown above, samples with higher chloride concentrations exhibited depressed Na/Cl ratios relative to the stoichiometric NaCl expectation. This finding further reinforces the interpretation of oilfield/deep-basin brine mixing. Again, this pattern is most clearly expressed in the chloride vs Na/Cl plot displaying data from wells between 100-400 feet total depth.

Figure 3.8

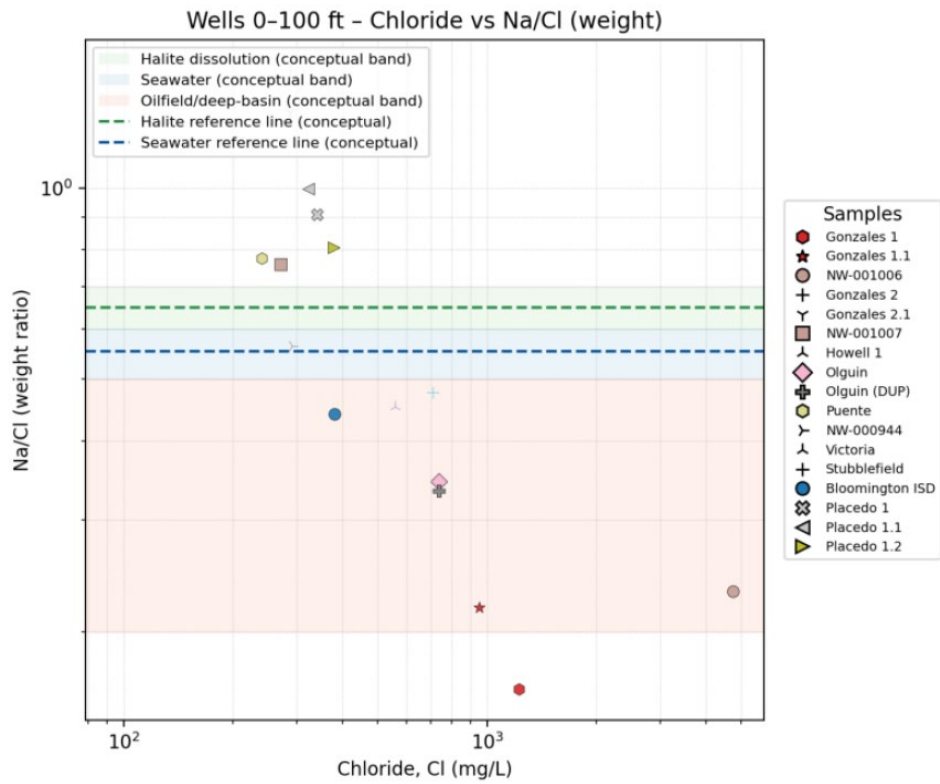
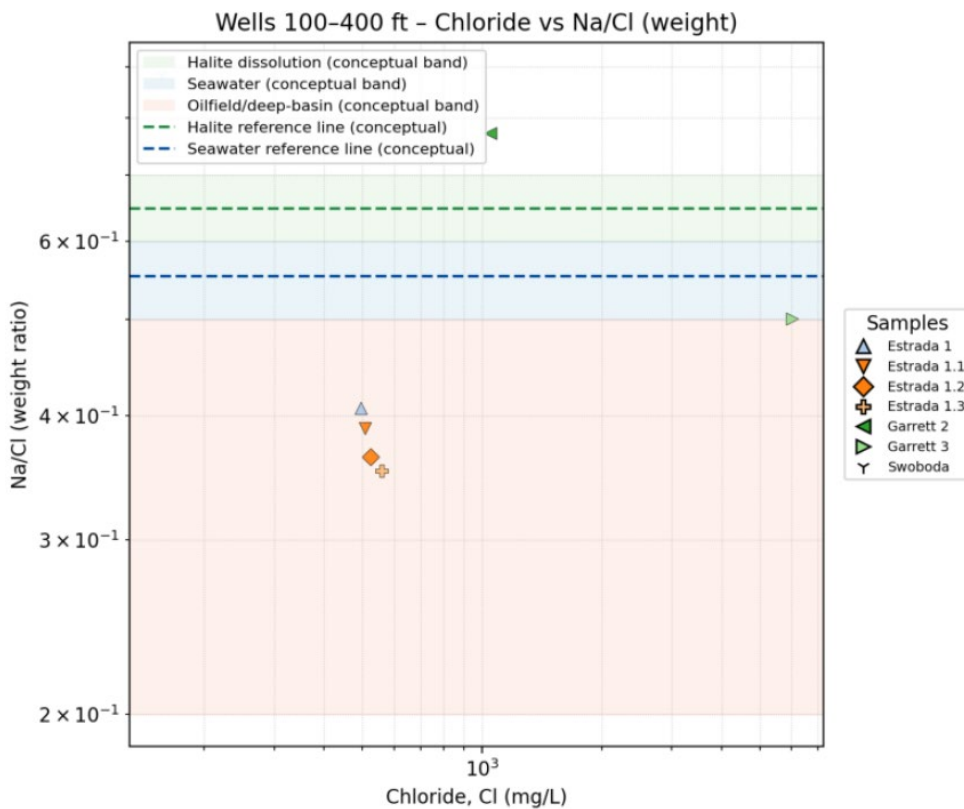
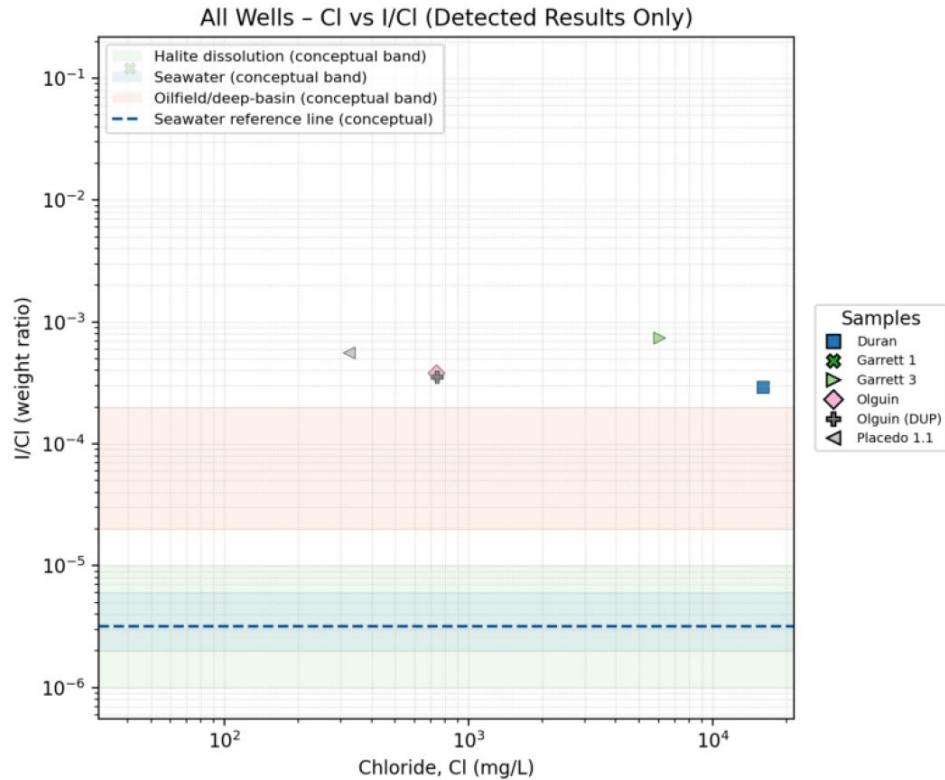


Figure 3.9



3.2.3 I/Cl vs Chloride Plot

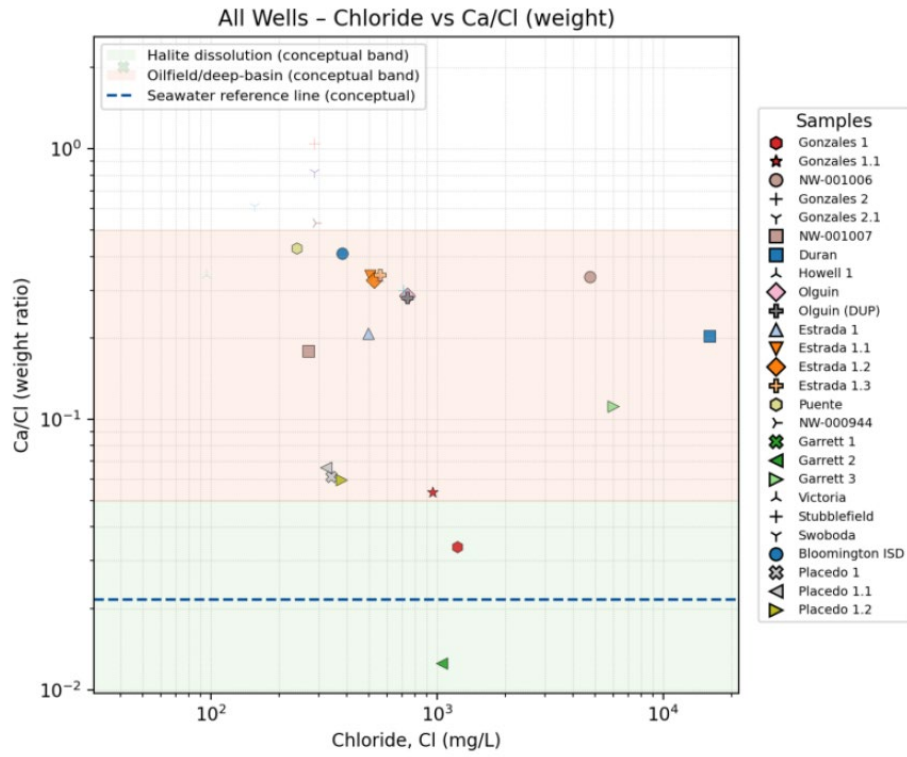
Figure 3.10



Where iodide data are available and were detected, they are reported higher than expected for oilfield/deep-basin brines. However, given the I/Cl values are generally consistent across the range of chloride concentrations, this data cannot be relied upon as a primary discriminator. In addition, iodide data was not collected at wells outside of the 100-400 feet depth range.

3.2.4 Ca/Cl vs Chloride Plots

Figure 3.11



As shown above, the chloride vs Ca/Cl plot indicates that several saline samples exhibit elevated Ca/Cl relative to the seawater reference line and simple NaCl dissolution conceptual band. Calcium enrichment relative to chloride is common in oilfield/deep-basin brines due to ion exchange. The Ca/Cl behavior observed at Serene Drive is consistent with the interpretation derived from Br/Cl and Na/Cl plots and further supports an oilfield/deep-basin brine influence.

4.0 PRELIMINARY CROSS SECTION DEVELOPMENT

A cross section (provided as Appendix 1) was developed across the Serene Drive area to provide a preliminary conceptual framework for evaluating known groundwater-bearing units, screened well intervals, and the vertical distribution of salinity impacts. It was prepared to support interpretation of geochemical results by placing groundwater chemistry in a stratigraphic context rather than to serve as a definitive hydrogeologic model.

The cross section was oriented southwest–northeast to intersect the highest density of wells and span the Serene Drive area. Available water well driller logs, where screened intervals and lithologic descriptions were reported, and well depth information compiled from VCGCD records were utilized. Lithologic units were generalized into sand and clay categories based on driller log descriptions.

Based on the generalized driller log descriptions, the cross section depicts interbedded sands and clays, consistent with Gulf Coast depositional environments. Sand intervals interpreted from the logs are laterally discontinuous, and clay units vary in thickness and continuity. Given the available data, no laterally continuous confining unit can be confidently traced across the entire section. Therefore, hydraulic connectivity between sands at similar depths cannot be assumed, nor can complete vertical isolation between adjacent intervals be ruled out.

Variants of the cross section were prepared to highlight wells that had groundwater samples collected from them with TDS concentrations $>1,000$ mg/L and TDS $>2,000$ mg/L. These variants of the cross section indicate that elevated TDS values are not uniformly distributed with depth, reinforcing the conclusion that salinity is not controlled solely by depth, but likely by a combination of stratigraphy, pathways, and local hydraulic conditions.

The cross section is based on sparse and inconsistent driller log data, incomplete screened-interval information, and variable lithologic descriptions. As such, the cross section is considered conceptual and was used to support the geochemical analysis and conceptual site model development.

5.0 RAILROAD COMMISSION OF TEXAS WELL INVENTORY AND PROXIMITY SCREENING

An inventory of oil and gas (O&G) wells was compiled from the Railroad Commission of Texas (RRC) database to evaluate potential salinity pathways near the Serene Drive area. The inventory was developed to identify the type, density, and proximity of historical and active O&G infrastructure relative to water wells with elevated salinity.

The O&G inventory includes wells located within a 0.5-mile radius of the center of the Serene Drive area, which are plotted on Figure 1. The inventory was derived from publicly available RRC well data and includes wells of varying status and age. Individual O&G wells were classified into the following status classes based on RRC attributes:

- Injection / Disposal
- Plugged
- Open (Producing or Active)
- Historic
- Dry Hole
- Unknown (records with incomplete status information)

The 0.5-mile inventory indicates a moderate to high density of historical and current O&G activity in the vicinity of Serene Drive. The presence of multiple plugged, historic, and open wells, along with at least one injection/disposal well, reflects a long history of subsurface development in the area. A substantial portion of the inventory consists of legacy wells (i.e. plugged, historic, or unknown status), which is typical of mature oil-producing regions.

Distances from each water well with elevated salinity indicators (TDS > 1,000 mg/L and/or chloride >300 mg/L) to the nearest O&G well in each status class were calculated and are provided in Table 5.1 below. The distances are reported as straight-line (planar) distances.

Table 5.1

RRC Status Class	No. of Water Wells with Elevated Salinity Indicators	Minimum Distance from Water Well to Nearest O&G Well (miles)	Median Distance from Water Well to Nearest O&G Well (miles)	Max Distance from Water Well to Nearest O&G Well (miles)
Injection/Disposal	13	0.173	0.317	0.856
Plugged	13	0.026	0.069	0.183
Open	13	0.136	0.266	0.583
Historic	13	0.289	0.366	0.578
Dry hole	13	0.065	0.265	0.479
Unknown	13	0.062	0.114	0.558

The proximity data shows that the water wells with elevated salinity indicators are commonly located within tenths of a mile of multiple O&G well types, with several wells located within approximately 0.1-miles of plugged or unknown-status wells. While the proximity alone does not

reflect causation, this information establishes a plausible pathway context that warrants further records-based evaluation when considered alongside the geochemical analysis.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The integrated evaluation of groundwater geochemistry, development of a preliminary cross section, and an O&G inventory provides a deeper understanding of saline conditions affecting domestic-use water wells in the Serene Drive area. The combined lines of evidence support the following conclusions. Recommendations for further evaluations are also provided.

The geochemical analyses performed indicate that elevated groundwater salinity in the domestic-use water wells at the Serene Drive area is most consistent with mixing with oilfield/deep-basin brines, rather than from halite dissolution or local background conditions. This conclusion is supported by the chloride-dominated chemistry, Na–Cl to Na–Ca–Cl facies on Piper and Stiff diagrams, elevated and stable Br/Cl ratios, depressed Na/Cl ratios at high chloride, and supporting I/Cl behavior where detected.

While the groundwater data collected to date are diagnostic, the existing data set does not allow for trend analysis for any constituent in any well. Insufficient data is available to ascertain whether groundwater quality is improving, stable, or degrading in the Serene Drive area. Development of a groundwater monitoring program to collect consistent general chemistry and additional tracer analyte data (such as bromide, iodide, boron, strontium, or stable isotopes) would strengthen potential source identification and reduce uncertainty from lack of trend data.

The salinity of groundwater in the groundwater-bearing units is not uniformly distributed with depth. Multiple groundwater-bearing units are present in the laterally heterogeneous sands that are screened for water wells, and the water quality varies in these sands. The strongest salinity and brine-like geochemical signatures are concentrated primarily within the 100 to 400 ft bgs depth interval, while deeper wells (>400 ft bgs) do not consistently exhibit the highest chloride or TDS values. In addition, while the preliminary cross section constructed from driller logs provides a useful conceptual framework, the interpretation is limited by sparse, inconsistent, and incomplete well construction and lithologic data. No laterally continuous confining unit can be confidently correlated across the section, and hydraulic connectivity between wells cannot be demonstrated. The mechanism controlling interval-specific impacts (e.g., vertical gradients, localized pathways, or bounding units) cannot be confirmed without direct information on hydraulic gradients and groundwater-bearing unit connectivity.

Implementation of static groundwater level gauging events and/or pumping tests across accessible water wells at the Serene Drive area would allow for evaluation of lateral and vertical hydraulic gradients and groundwater-bearing unit connectivity. Further refinement of the preliminary cross section could be achieved through field verification of total well depths/well screen intervals or geophysical logging.

The 0.5-mile O&G inventory indicates a moderate to high density of historical and current O&G activity near the Serene Drive area. The proximity data shows that saline water wells are commonly located within tenths of a mile of plugged, open, historic, unknown-status, and injection/disposal wells. These relationships establish a plausible pathway context, however, proximity alone does not establish causation. Additional information is required to evaluate whether specific O&G wells represent credible migration pathways, including construction details. A records-based review of the O&G wells nearest to saline water wells should be prioritized to review plugging and completion reports for historic construction details, including dates of

installation/plugging, construction materials, and incomplete plugs or shallow cement tops which could facilitate vertical migration.

A table of recommended next steps to address specific uncertainties identified by each line of evidence is provided below. The recommended next steps will allow refinement of the conceptual site model without an unnecessary expansion of data collection beyond what is required to support defensible conclusions.

Evaluated	Primary Data Gap	Recommended Next Steps
Geochemical salinity signature	Established trend data	Develop a consistent groundwater monitoring program for select water wells (e.g. monthly, quarterly, or semi-annual basis).
	Tracer data to evaluate field/deep-basin brine source	Collect groundwater samples from select water wells for tracers such as bromide, iodide, boron, strontium, or stable isotopes.
Hydrogeologic and stratigraphic model	Lateral and vertical gradient uncertainty	Collect static water levels in select wells.
	Subsurface stratigraphy uncertainty	Field-verify total well depths and/or screened intervals in select wells.
		Complete soil borings and/or temporary monitoring wells to log stratigraphy and complete pumping tests.
O&G records review	Pathway plausibility	Complete records review of O&G wells within 0.5-mile radius of Serene Drive area.
		Request cement bond logs or pressure tests from operators of O&G wells within 0.5-mile radius of Serene Drive area.

Upon review of this technical memo and the above recommendations with Mr. Tim Andruss, WSP can develop a specific scope of work for ongoing monitoring and sampling once of water wells at the Serene Drive area.

7.0 REFERENCES

Pastor, Behling, and Wheeler, LLC (PBW), 2014. *Report on Potentail Groundwater Contamination Serene Drive Area, Victoria County, Texas*. Prepared for the VCGCD.

PBW, 2017. *Serene Drive Area Technical Memo and Presentation*. Prepared for the VCGCD.

Richter, B. C., & Kreitler, C. W., 1991. *Identification of Sources of Ground-Water Salinization Using Geochemical Techniques*. Bureau of Economic Geology, The University of Texas at Austin. Prepared for the U.S. Environmental Protection Agency under Cooperative Agreement No. CR-815748.

Table 1

TABLE 1
GROUNDWATER DATA SUMMARY
SERENE DRIVE AREA

Owner	Well ID	State Well ID	Address	Total Depth (feet below ground surface)	Screened Interval (feet below ground surface)	Sample ID	Sample Date	Chloride	Total Alkalinity	Bromide	Calcium	Iodide	Magnesium	Potassium	Sodium	Total Dissolved Solids	Hardness (mg/L as CaCO ₃)	Sulfate	Aluminum	Arsenic	Barium	Cadmium	Copper	Chromium	Fluoride	Iron	Lead	Nitrate
Screening Level ¹								300 ²	--	--	--	--	--	--	--	500 ²	--	--	--	0.01 ³	2 ³	0.005 ³	--	0.1 ³	--	--	0.015 ³	--
City of Victoria	7916602	7916602	--	1010	400-990	7916602-20130507	5/7/2013	96	281	0.38	32.6	--	8.9	1.65	119	452	--	<1	--	--	--	--	--	--	--	--	--	--
Stubblefield	8017909	8017909	--	52	--	8017909-19560808	8/8/1956	710	320.4	--	212	--	37	--	338	1612	681.0	83.0	--	--	--	--	--	--	--	--	--	1
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-19920422	4/22/1992	341	313	1.53	21	--	12	4.00	310	906	103	10.0	--	0.012	0.968	<0.01	<0.02	<0.02	0.5	0.037	<0.05	--
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-19970326	3/26/1997	322	312	1.82	21.4	0.18	12.7	3.18	321	892	108	5.9	<0.0015	0.0142	1.06		0.0039		0.3	0.52	<0.001	--
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-20010413	4/13/2001	378	306	1.29	22.6	--	13.7	2.65	305	929	115	--	<0.004	0.01030	1.14	<0.001	<0.002	<0.001	0.52	0.592	<0.001	--
Swoboda	GW-000192	8018103	--	120	--	8018103-20090921	9/21/2009	156	339	0.52	96.1	--	19.8	2.84	138	704	--	49.2	--	--	--	--	--	--	--	--	--	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-19830825	8/25/1983	496	274	--	103	--	72.0	5.00	202	1129	--	43.0	--	--	--	--	--	--	--	--	--	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-19970326	3/26/1997	507	257	2.68	172	--	42.3	4.09	197	1150	--	42.6	--	--	--	--	--	--	--	--	--	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-20050331	3/31/2005	525	263	1.58	172	--	40.3	4.07	191	1164	--	42.8	--	--	--	--	--	--	--	--	--	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-20140318	3/18/2014	560	263	1.49	191	<0.25	45.2	4.29	197	1780	--	37.7	--	--	--	--	--	--	--	--	--	--
Bloomington ISD	GW-000767	8018401	--	450	202-444	8018401-19690516	5/16/1969	381	296	--	156	--	32	--	168	999	--	56	--	--	--	--	--	--	--	--	--	--
Garrett	GW-000967	-	3139 FM 616	~45	-	GW-000967-20170606	6/6/2017	41	342	<1.25	82.7	<5	9.00	3.07	58.7	420	--	11.3	--	<0.00200	0.336	<0.000300	--	<0.00200	--	--	0.00156	--
Garrett	GW-000969	-	3139 FM 616	160	-	GW-000969-20170606	6/6/2017	1051	269	5.6	13	<5	3.64	0.8	811	2112	--	61.9	--	<0.00500	0.00522 J	<0.00100	--	<0.00500	--	--	0.00297	--
Garrett	GW-000970	-	3139 FM 616	150	-	GW-000970-20170606	6/6/2017	6022	278	27.8	674	4.5	101	15.4	3020	11994	--	16.8	--	<0.00200	2.81	<0.000300	--	<0.00200	--	--	0.000351 J	--
Howell	NW-000310	8018404	98 Serene Dr.	65	40-50	NW-000310-20140318	3/18/2014	557	350	1.98	184	<0.25	28.3	6.19	252	1650	--	42.0	--	--	--	--	--	--	--	--	--	--
Howell	NW-000310	8018404	98 Serene Dr.	65	40-50	NW-000310-20150715	7/15/2015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Olguin (Duplicate)	NW-000444	344499	3551 FM 616	280	259-269	NW-000444-20140321-2	3/21/2014	738	287	3.06	208	0.26	40.7	4.19	246	2430	--	66.1	--	--	--	--	--	--	--	--	--	--
Olguin	NW-000444	344499	3551 FM 616	280	259-269	NW-000444-20140321-1	3/21/2014	736	295	3.08	211	0.28	42.0	4.26	254	2460	--	66.2	--	--	--	--	--	--	--	--	--	--
Puente	NW-000493	342978	156 Serene Dr.	183	173-183	NW-000493-20140318	3/18/2014	240	367	<1	103	<0.25	14.6	4.54	186	1070	--	32.2	--	--	--	--	--	--	--	--	--	--
Gonzales	NW-001006 (UW-000032)	-	313 Serene Dr.	160	100-160	NW-001006-20160620	6/20/2016	4752	--	--	1600	--	240	--	1100	6715	5000	34.0	<0.01	<0.01	0.757	<0.005	0.011	<0.005	<1.25	0.213	<0.01	<0.3
Gonzales	NW-001007 (UW-000034)	-	313 Serene Dr.	440	400-440	NW-001007-20250625	6/25/2025	270	233	1.14	48.4	--	16.3	2.45	205	672	--	<0.700		0.0448	0.647	<0.00200	--	<0.0100	0.734 B	--	<0.00600	<0.500
Garcia	NW-001291	-	-	63	53-63	NW-001291-20190712	7/12/2019	--	--	--	--	--	--	--	--	1345	--	--	--	--	--	--	--	--	--	--	--	--
Vasquez	NW-001349	-	-	51	41-51	NW-001349-20190321	3/21/2019	--	--	--	--	--	--	--	--	5310	--	--	--	--	--	--	--	--	--	--	--	--
Rodriguez	NW-002153	-	48 W Serene D	440	404-424	WQFM-20251013.1458	10/13/2025	--	--	--	--	--	--	--	--	1341	--	--	--	--	--	--	--	--	--	--	--	--
Gonzales	UW-000032	-	313 Serene Dr.	164	100-160	UW-000032-20160915	9/15/2016	1225	300	6.80	41.4	<1.0	14.1	2.06	199	3350	--	34.0	--	0.043	0.609	<0.005	--	<0.005	--	--	<0.01	--
Gonzales	UW-000032	-	313 Serene Dr.	164	100-160	UW-000032-20161014	10/14/2016	953	319	1.3	51	<1.0	15.9	2.43	208	2444	--	35	--	0.038	0.105	<0.005	--	0.008	--	--	<0.01	--
Gonzales	UW-000033	-	313 Serene Dr.	440	400-440	UW-000033-20160915	9/15/2016	287	248	5.0	300	<1.0	45.9	6.06	440	800	--	<20	--	<0.01	0.251	<0.005	--	<0.005	--	--	<0.01	--
Gonzales	UW-000033	-	313 Serene Dr.	440	400-440	UW-000033-20161014	10/14/2016	287	245	4.8	235.0	<1.0	34.1	6.12	379	720	--	<5	--	<0.01	0.146	<0.005	--	<0.005	--	--	<0.01	--
Duran	UW-000034	-	258 Serene Dr.	~150	--	UW-000034-20161215	12/15/2016	16000	184	78	3250	4.7	528	25.2	3990	25580	--	55	--	<0.1	1.79	<0.05	--	<0.05	--	--	<0.1	--
Duran	NW-000944	-	-	220	198-208	NW-000944-20170130	1/30/2017	291	337	<1.25	155	<1	22.6	3.91	164	1110	--	47.0	--	<0.01	0.11	<0.005	--	<0.005	--	--	<0.01	--

- Notes:
- 1) Screening levels are based on EPA's secondary maximum contaminant levels (SMCL) or TCEQ's TRRP Tier 1 residential protective concentration levels (PCLs).
 - 2) Screening level is the EPA SMCL.
 - 3) Screening level is the TRRP Tier 1 residential PCL.
 - 4) All analytical results reported in mg/L.
 - 5) pH, specific conductance, turbidity, dissolved oxygen, and oxidation reduction potential are field measurements obtained during sample collection.
 - 6) pH reported in Standard pH units
 - 7) umhos/cm - micromohs per centimeter, analogous to microSiemens per centimeter (mS/cm)
 - 8) mV - millivolts
 - 9) Yellow highlighted cells indicate an exceedance of the screening level.
 - 10) Lab Qualifiers:
J or B - estimated value – the result falls between the Method Detection Limit (MDL) and the Method Quantitation Limit (MQL) or Reporting Limit (RL)
U or < - indicates the analyte was analyzed but not detected; Sample Quantitation Limit (SQL) or Sample Detection Limit (SDL) listed in the concentration column
 - 11) -- indicates the sample was not analysed for that analyte

TABLE 1
GROUNDWATER DATA SUMMARY
SERENE DRIVE AREA

Owner	Well ID	State Well ID	Address	Total Depth (feet below ground surface)	Screened Interval (feet below ground surface)	Sample ID	Sample Date	Phosphate	Selenium	Silver	Mercury	Bicarbonate	Carbonate	TPH (C6-C12)	TPH (C12-C28)	TPH (C28-C35)	TPH (C6-C35)	pH ^{5,6}	Specific Conductance (umhos/cm) ⁷	Oxidation/Reduction Potential (ORP) (mV) ⁹
Screening Level ¹								--	0.05 ³	0.12 ³	0.002 ³	--	--	--	--	--	--	--	--	--
City of Victoria	7916602	7916602	--	1010	400-990	7916602-20130507	5/7/2013	--	--	--	--	--	--	--	--	--	--	7.27	668	--
Stubblefield	8017909	8017909	--	52	--	8017909-19560808	8/8/1956	--	--	--	--	391	--	--	--	--	--	8.2	2890	--
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-19920422	4/22/1992	--	<0.002	<0.01	<0.0002	381.97	0	--	--	--	--	7.75	1602	-193.1
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-19970326	3/26/1997	--	<0.006	--	--	380.75	0	--	--	--	--	7.59	1507	-139.2
City of Placedo	8018501	8018501	--	1100	960-1100	8018501-20010413	4/13/2001	--	<0.004	--	--	373.4	0	--	--	--	--	7.57	1724	--
Swoboda	GW-000192	8018103	--	120	--	8018103-20090921	9/21/2009	--	--	--	--	--	--	--	--	--	--	7.01	1217	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-19830825	8/25/1983	--	--	--	--	--	--	--	--	--	--	8	2320	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-19970326	3/26/1997	--	--	--	--	--	--	--	--	--	--	6.96	1802	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-20050331	3/31/2005	--	--	--	--	--	--	--	--	--	--	6.72	2120	--
Estrada	GW-000489	8018402	259 Serene Dr.	336	--	GW-000489-20140318	3/18/2014	--	--	--	--	--	--	--	--	--	--	6.73	2493	--
Bloomington ISD	GW-000767	8018401	--	450	202-444	8018401-19690516	5/16/1969	--	--	--	--	--	--	--	--	--	--	7.8	2052	--
Garrett	GW-000967	-	3139 FM 616	~45	-	GW-000967-20170606	6/6/2017	--	<0.00200	<0.00100	<0.0000800	--	--	<1.99	<1.99	<1.99	<1.99	6.85	809	234.4
Garrett	GW-000969	-	3139 FM 616	160	-	GW-000969-20170606	6/6/2017	--	0.00262	<0.00200	<0.000200	--	--	<1.96	<1.96	<1.96	<1.96	--	--	--
Garrett	GW-000970	-	3139 FM 616	150	-	GW-000970-20170606	6/6/2017	--	<0.00200	<0.00100	<0.0000800	--	--	<1.98	<1.98	<1.98	<1.98	6.47	18654	-51.5
Howell	NW-000310	8018404	98 Serene Dr.	65	40-50	NW-000310-20140318	3/18/2014	--	--	--	--	--	--	--	--	--	--	6.55	2605	18.4
Howell	NW-000310	8018404	98 Serene Dr.	65	40-50	NW-000310-20150715	7/15/2015	--	--	--	--	--	--	<2	<2	<2	<2	--	--	--
Olguin (Duplicate)	NW-000444	344499	3551 FM 616	280	259-269	NW-000444-20140321-2	3/21/2014	--	--	--	--	--	--	--	--	--	--	--	--	--
Olguin	NW-000444	344499	3551 FM 616	280	259-269	NW-000444-20140321-1	3/21/2014	--	--	--	--	--	--	--	--	--	--	6.63	3266	-36.2
Puente	NW-000493	342978	156 Serene Dr.	183	173-183	NW-000493-20140318	3/18/2014	--	--	--	--	--	--	--	--	--	--	6.62	1541	141.2
Gonzales	NW-001006 (UW-000032)	-	313 Serene Dr.	160	100-160	NW-001006-20160620	6/20/2016	<1.55	<0.02	<0.01	0.002	--	--	<2	<2	<2	<2	6.58	13880	--
Gonzales	NW-001007 (UW-000034)	-	313 Serene Dr.	440	400-440	NW-001007-20250625	6/25/2025	--	<0.0100	<0.00500	<0.000200	233	<20.0	--	--	--	--	7.81 T8	1380	--
Garcia	NW-001291	-	-	63	53-63	NW-001291-20190712	7/12/2019	--	--	--	--	--	--	--	--	--	--	--	1912	--
Vasquez	NW-001349	-	-	51	41-51	NW-001349-20190321	3/21/2019	--	--	--	--	--	--	--	--	--	--	7.32	8280	--
Rodriguez	NW-002153	-	48 W Serene D	440	404-424	WQFM-20251013.1458	10/13/2025	--	--	--	--	--	--	--	--	--	--	7.34	2064	202.4
Gonzales	UW-000032	-	313 Serene Dr.	164	100-160	UW-000032-20160915	9/15/2016	--	0.012	<0.01	<0.0002	300	<20	<2	<2	<2	<2	6.7	4340	-122
Gonzales	UW-000032	-	313 Serene Dr.	164	100-160	UW-000032-20161014	10/14/2016	--	<0.02	<0.01	<0.0002	319	<20	<2	<2	<2	<2	6.81	3501	-25.2
Gonzales	UW-000033	-	313 Serene Dr.	440	400-440	UW-000033-20160915	9/15/2016	--	0.067	<0.01	<0.0002	248	<20	<2	<2	<2	<2	7.17	1400	-105
Gonzales	UW-000033	-	313 Serene Dr.	440	400-440	UW-000033-20161014	10/14/2016	--	<0.02	<0.01	<0.0002	245	<20	<2	<2	<2	<2	7.47	1369	-133
Duran	UW-000034	-	258 Serene Dr.	~150	--	UW-000034-20161215	12/15/2016	--	<0.2	<0.1	0.00289	184	<20	<2	<2	<2	<2	6.13	33615.7	523.6
Duran	NW-000944	-	-	220	198-208	NW-000944-20170130	1/30/2017	--	<0.02	<0.01	<0.0002	--	--	<2	<2	<2	<2	--	--	--

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or < - indicates the analyte was analyzed but not detected; Sample Quantitation Limit (SQL) or Sample Detectio
- 11) -- indicates the sample was not analysed for that analyte

Figures

Attachment A: Preliminary Cross Section

SW

NE

NW-000221

GW-000773
GW-000767

NW-002153

NW-000310

NW-001006
NW-001007
NW-000227

NW-000509
NW-001291
NW-000944
NW-000493

NW-001349

NW-000444

UTC 000064061
NW-001555

R1GW-000579

100'

200'

300'

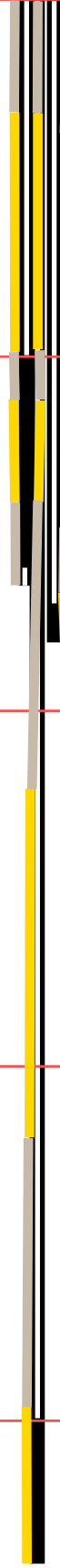
400'

500'

HZ Scale 0 500

10x VE

- Sand
- Clay
- No Data
- Screened Interval



SW

NE

NW-000221

GW-000773
GW-000767

NW-002153
NW-000310

NW-001096
NW-001907
NW-000227

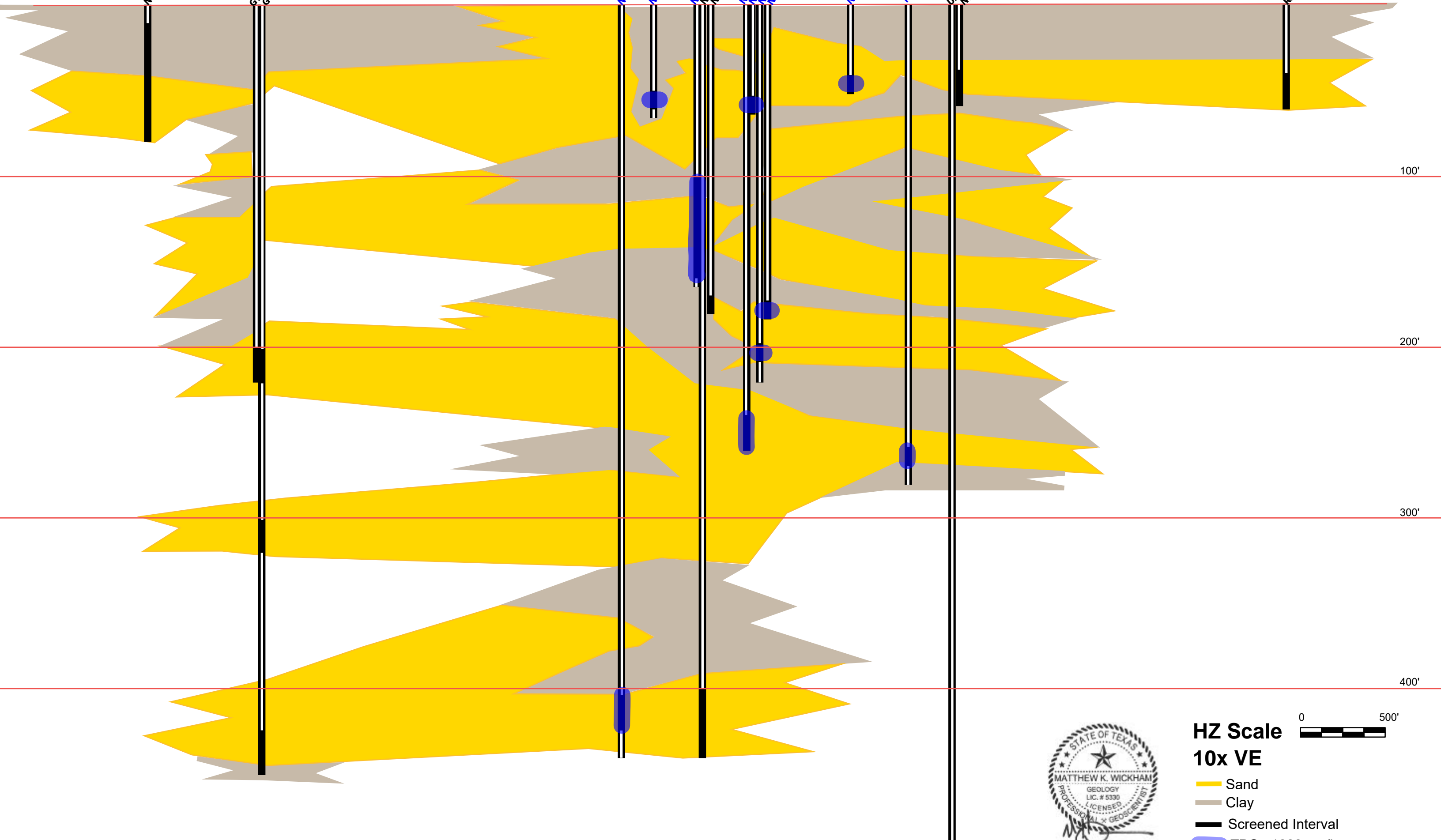
NW-000509
NW-001291
NW-000944
NW-000493

NW-001349

NW-000444

UTC 00064061
NW-001553

R1GW-000579



HZ Scale 0 500'

- 10x VE**
- Sand
 - Clay
 - Screened Interval
 - TDS >1000 mg/L

500'

SW

NE

NW-000221

GW-000773
GW-000767

NW-002153
NW-000310

NW-001006
NW-001007
NW-000227

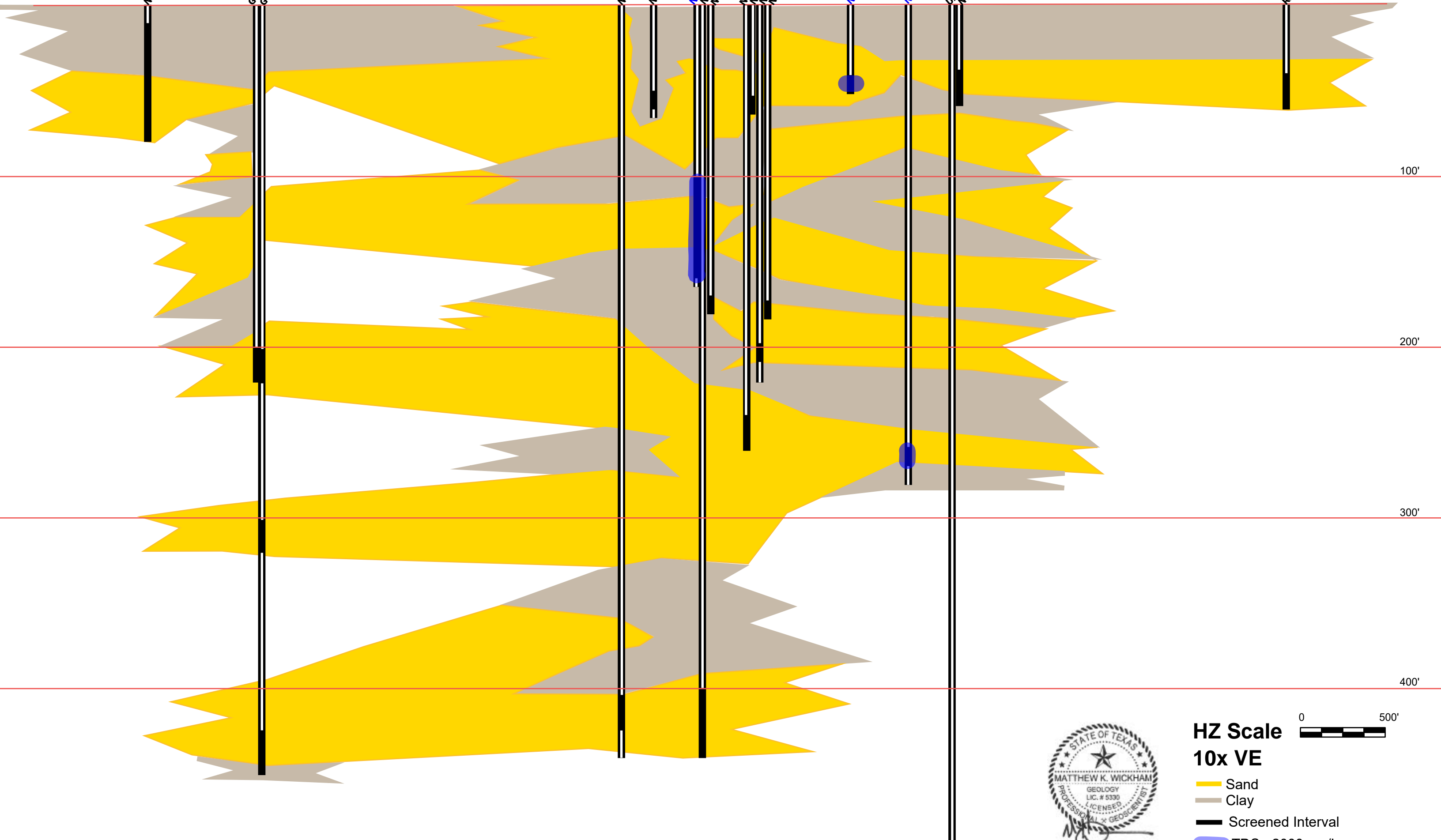
NW-000509
NW-001291
NW-000944
NW-000493

NW-001349

NW-000444

UTC 000064061
NW-001555

R1GW-000579



100'

200'

300'

400'

500'



HZ Scale 0 500'

10x VE

- Sand
- Clay
- Screened Interval
- TDS >2000 mg/L