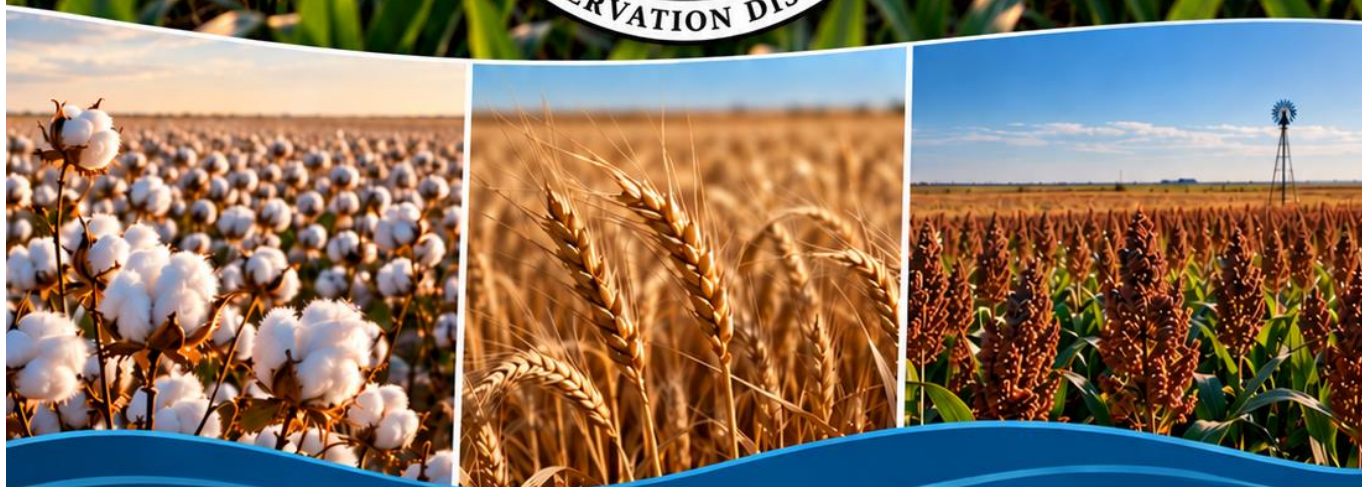


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SANDY LAND UNDERGROUND WATER CONSERVATION DISTRICT

— GROUNDWATER QUALITY SUMMARY REPORT —
— YOAKUM COUNTY, TEXAS —

2026
REPORT





2026 Groundwater Quality Summary Report

Sandy Land Underground Water Conservation District

Yoakum County, Texas

Public Resource | September 2026

Sandy Land Underground Water Conservation District
1012 Avenue F | P.O. Box 130 | Plains, Texas 79355
806-456-2155 | www.sandylandwater.com

About This Report

Sandy Land Underground Water Conservation District (Sandy Land UWCD) prepared this report as a public resource to summarize groundwater-quality conditions and long-term trends in Yoakum County. The report combines the District's 2026 water-quality sampling results with historical monitoring data, descriptive statistics, and geostatistical maps to provide residents, landowners, water users, and local decision-makers with a clearer understanding of groundwater quality across the county.

Since the District's creation in 1990, Sandy Land UWCD has conducted 36 years of groundwater-quality monitoring in Yoakum County. The District performs water-quality analyses on a majority of the wells in its monitoring network each year and has long-term records for many of these wells dating back to the beginning of the monitoring program. Maintaining this historical record allows the District to evaluate changes in groundwater quality over time and identify areas where water-quality conditions may be changing within the Ogallala Aquifer.

Long-term monitoring is an important part of the District's efforts to protect the groundwater resources of Yoakum County. Changes observed in individual wells or across portions of the county may provide an early indication of changing groundwater conditions. When significant changes are identified, the District can evaluate the available information, investigate potential causes, and, where possible, work with landowners, water users, and other appropriate entities to address concerns. As a single-county groundwater conservation district, Sandy Land UWCD remains committed to monitoring, understanding, and protecting the groundwater resources within its jurisdiction.

Each year, the District routinely evaluates seven water-quality parameters: chloride, hardness, total dissolved solids (TDS), fluoride, iron, nitrate, and pH. Bacteriological analysis is not routinely performed on monitoring-network wells but may be conducted upon request. District residents may also request water-quality testing, which allows Sandy Land UWCD to provide additional information about groundwater conditions at individual locations.

Because monitoring wells are distributed throughout Yoakum County, the network provides information about both changes through time at individual wells and differences in groundwater quality among different areas of the county. When evaluated together, the annual sampling program and long-term historical record provide a valuable tool for recognizing trends and documenting the condition of the county's groundwater resources.

For 2026, the dataset evaluated in this report contains 81 mapped sampling locations. Results include chloride, hardness, TDS, fluoride, iron, nitrate, and pH. The following sections summarize these results, examine long-term trends in the District's historical data, and use spatial interpolation to illustrate the geographic distribution of selected water-quality parameters across Yoakum County.

Key Findings at a Glance

- Nitrate: 0.047 to 18.8 mg/L; average 5.07 mg/L.
- Chloride: 30 to 920 mg/L; average 254 mg/L.
- Hardness: 54 to 1590 mg/L; average 698 mg/L.
- TDS: 226 to 910 mg/L; average 515 mg/L.
- pH: 7.00 to 7.73; average 7.45.

2026 Dataset Summary

Concentrations are in mg/L except pH, which is unitless.

Parameter	Samples	Average	Median	Minimum	Maximum
Chloride	81	254	175	30	920
Hardness	81	698	611	54	1590
TDS	81	515	488	226	910
Fluoride	81	2.87	3.15	1.04	3.67
Iron	81	0.05	0.012	0	1.10
Nitrate	81	5.1	3.7	.05	18.80
pH	81	7.45	7.47	7.00	7.73

Understanding the Water-Quality Parameters

Nitrate: Nitrate is a form of nitrogen that can occur naturally and can also be associated with fertilizer, septic systems, and other sources. EPA's primary drinking-water maximum contaminant level is 10 mg/L when nitrate is reported as nitrogen (N).

Chloride: Chloride is a dissolved ion that can influence taste and corrosivity. EPA lists 250 mg/L as a secondary, non-enforceable drinking-water guideline related primarily to aesthetic effects such as taste.

Hardness: Hardness mainly reflects dissolved calcium and magnesium. It is not assigned a federal drinking-water maximum contaminant level. Hard water can contribute to mineral scale and can reduce soap efficiency.

Total Dissolved Solids (TDS): TDS is a broad measure of dissolved minerals and salts. EPA lists 500 mg/L as a secondary, non-enforceable guideline associated with taste, deposits, staining, and other aesthetic concerns.

Fluoride: Fluoride occurs naturally in groundwater in many areas. EPA has a 4.0 mg/L primary drinking-water MCL and a 2.0 mg/L secondary guideline. The primary and secondary values serve different purposes.

Iron: Iron commonly occurs naturally in groundwater. EPA lists 0.3 mg/L as a secondary, non-enforceable guideline because elevated iron can cause staining, color, and taste concerns.

pH: pH indicates how acidic or alkaline water is. EPA's secondary guideline range is 6.5 to 8.5. pH can affect taste, scaling, and corrosion behavior.

Reference Benchmarks

The following federal values are provided as general public-information references. Primary standards are health-based and enforceable for public water systems; secondary standards are non-enforceable federal guidelines addressing aesthetic or nuisance characteristics. Private wells are not regulated in the same manner as public water systems.

Parameter	EPA Reference	Type	2026 Dataset Note
Nitrate	10 mg/L as nitrogen	Primary MCL	14 of 81 results are above 10mg/L
Chloride	250 mg/L	Secondary	27 of 81 results are above 250 mg/L.
TDS	500 mg/L	Secondary	37 of 81 results are above 500 mg/L.
Fluoride	4.0 mg/L primary; 2.0 mg/L secondary	Primary + Secondary	69 of 81 results are above 2.0 mg/L; none exceed 4.0 mg/L.
Iron	0.3 mg/L	Secondary	3 of 81 results are above 0.3 mg/L.
pH	6.5-8.5	Secondary	0 of 81 results fall outside 6.5-8.5.
Hardness	No federal MCL	—	Reported as a water-quality characteristic.

Spatial Mapping Method

Ordinary Kriging was used to estimate spatial patterns for nitrate, chloride, and hardness. Ordinary Kriging uses both measured values and the spatial relationship among sampling locations.

The colored surfaces between wells are estimates, not measurements. The interpolation was extended to the county map boundary for visualization. Predictions outside the outermost sampling locations are extrapolations and should be interpreted with greater uncertainty.

Nitrate -

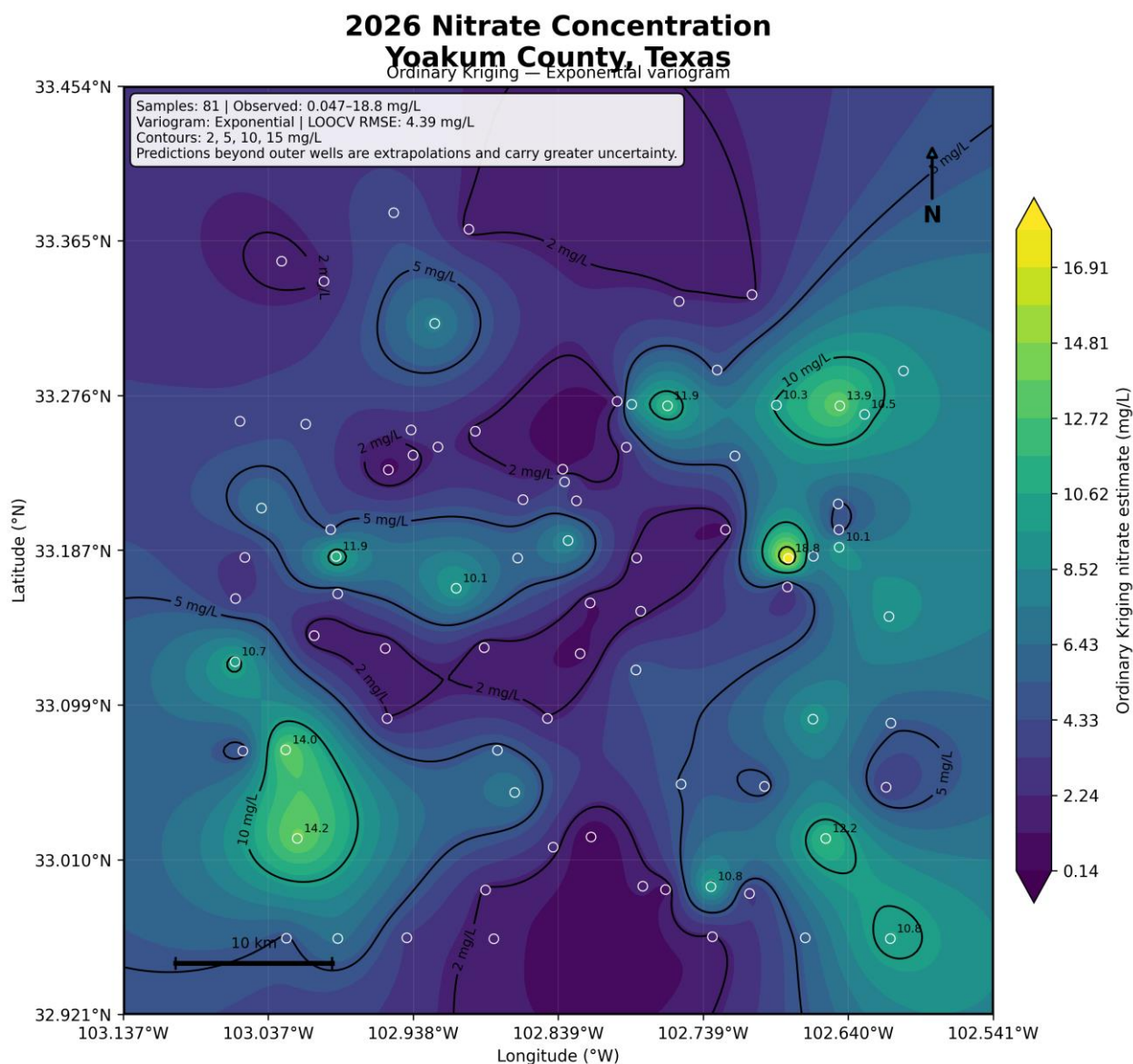


Figure 1. Ordinary Kriging estimate of 2026 nitrate concentrations. The map shows regional estimates between measured sampling locations.

Chloride - Ordinary Kriging

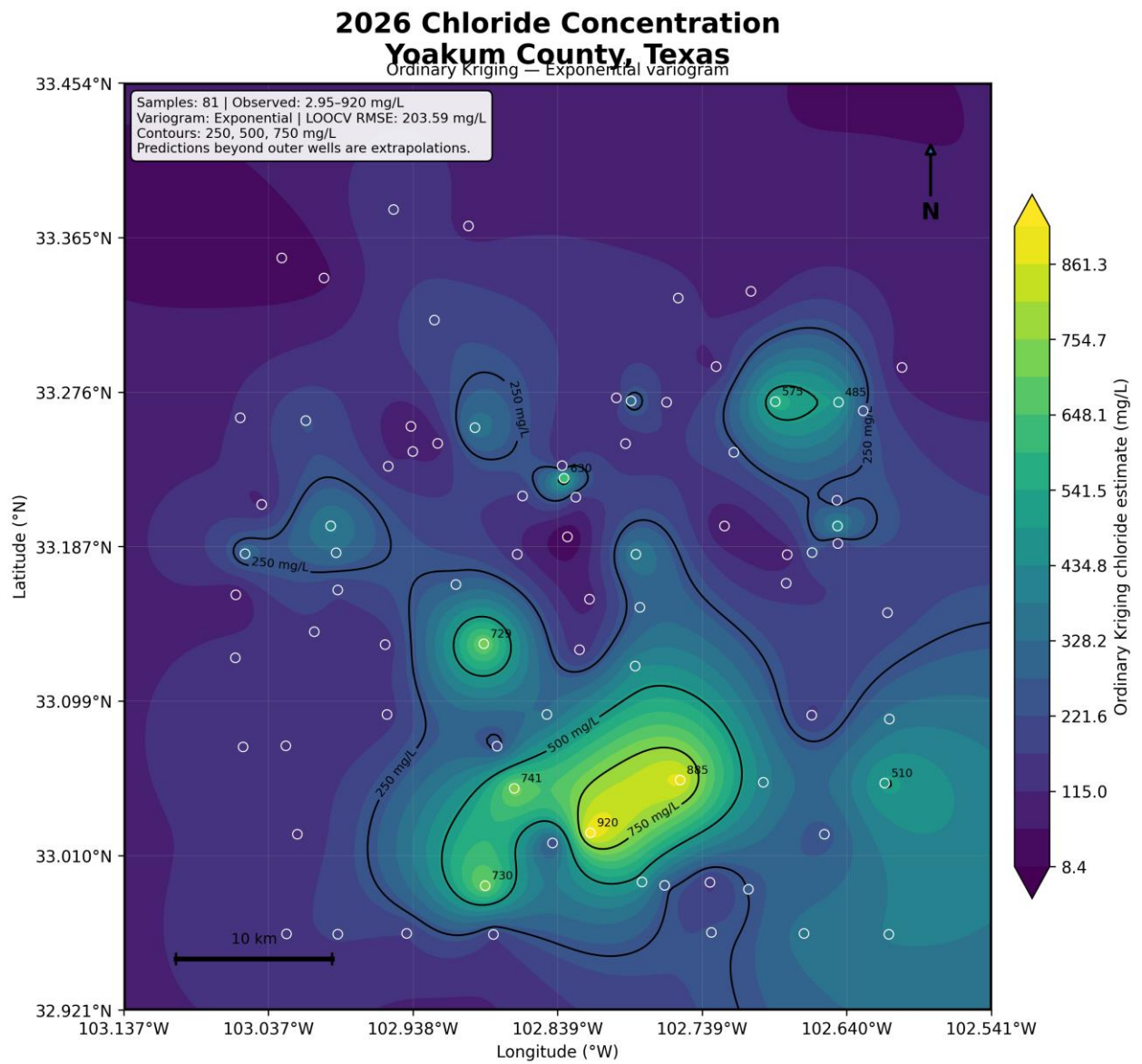


Figure 2. Ordinary Kriging estimate of 2026 chloride concentrations.

Hardness - Ordinary Kriging

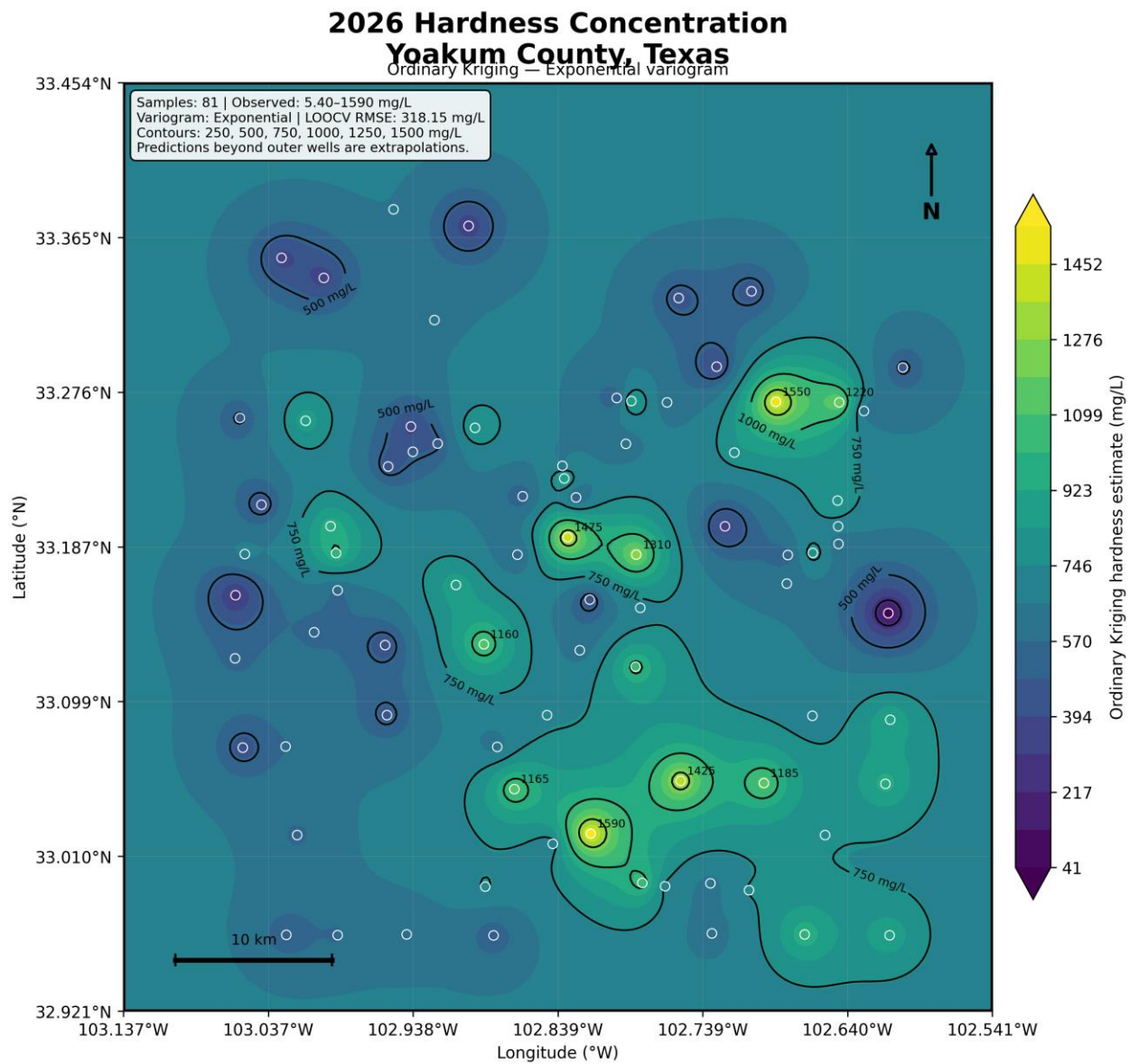


Figure 3. Ordinary Kriging estimate of 2026 hardness concentrations.

Historical Water Quality Data Observations

The District has conducted water quality testing since its formation in 1990. These annual averages provide context for the 2026 sampling results and help show how broad water-quality conditions have changed over time. To further analyze the historical data, the District considers subsets of 5-, 10-, and 20-year averages. These supplied averages are used below as the primary basis for summarizing recent versus longer-term conditions.

Long-Term Trend Summary

Parameter	2026	5-Year Avg.	10-Year Avg.	20-Year Avg.	Long-Term Context
Chloride	254	251	259	238	2026 is essentially equal to the 5-year average, below the 10-year average, and above the 20-year average.
Hardness	698	695	701	675	2026 is close to the 5- and 10-year averages and above the 20-year average.
TDS	515	510	569	639	2026 is close to the 5-year average and below both the 10- and 20-year averages.
Fluoride	2.87	2.68	2.64	3.23	2026 is above the 5- and 10-year averages but below the 20-year average.
Iron	0.005	0.159	0.231	0.186	2026 is well below the supplied 5-, 10-, and 20-year averages.
Nitrate	5.10	4.04	3.75	3.67	2026 is above the supplied 5-, 10-, and 20-year averages.
pH	7.45	7.62	7.52	7.52	2026 is slightly below the 5-, 10-, and 20-year averages; historical pH begins in 2005.

Key Observations of Historical Data

- Chloride averaged 181 mg/L in 1990 and 254 mg/L in 2026. The 2026 value is near the supplied 5-year average (251 mg/L) but below the 10-year average (259 mg/L), indicating that recent chloride conditions remain elevated relative to the 20-year average (238 mg/L).
- Hardness averaged 586 mg/L in 1990 and 698 mg/L in 2026. The 2026 average is very close to the supplied 5-year average (695 mg/L) and 10-year average (701 mg/L), while both are above the 20-year average (675 mg/L).
- TDS averaged 570 mg/L in 1990 and 515 mg/L in 2026. The supplied 5-year average (510 mg/L) is lower than the 10-year (569 mg/L) and 20-year (639 mg/L) averages, showing lower recent TDS averages than the longer-term periods in this dataset.
- Nitrate averaged 3.0 mg/L in 1990 and 5.1 mg/L in 2026. The 2026 value is above the supplied 5-year (4.04), 10-year (3.75), and 20-year (3.674) averages. This makes nitrate the clearest parameter in the supplied summary averages showing a higher 2026 district average relative to recent multi-year averages.
- Fluoride averaged 2.87 mg/L in 2026, compared with supplied 5-, 10-, and 20-year averages of 2.68, 2.64, and 3.231 mg/L, respectively. Recent averages are lower than the 20-year average.
- Iron averaged 0.005 mg/L in 2026, substantially below the supplied 5-year (0.159), 10-year (0.2305), and 20-year (0.18575) averages. Annual iron values are variable, so individual years should be interpreted cautiously.
- pH data in the historical file begin in 2005. The 2026 average was 7.45, compared with supplied 5-, 10-, and 20-year averages of 7.62, 7.524, and 7.5165. The available pH series remains relatively stable compared with the concentration parameters.

How the Public Should Use This Report

This report is intended for regional screening, education, and public information. It can help identify broad areas where concentrations appear higher or lower and where additional sampling may be useful. It should not be used to determine the current water quality of an individual well without a representative sample from that well.

If a well is used for drinking water and there is a concern about a result, contact the District or an appropriate water-quality professional for guidance on sampling, laboratory analysis, and interpretation.

Important Limitations

- The report represents the supplied 2026 dataset and does not by itself establish a long-term trend.
- Interpolated surfaces are estimates between sample locations; actual groundwater quality can vary over short distances and with well depth/completion.
- Map areas beyond the outermost sampling wells are extrapolated and have less direct data support.
- The report does not document laboratory methods, detection limits, sample collection procedures, aquifer completion intervals, or QA/QC information. Those records should be consulted separately if available.
- Sandy Land Underground Water Conservation District is not a certified laboratory. All water quality testing results are provided for informational purposes only and should not be considered certified laboratory analyses.

Disclaimer

This report and its maps are for informational and educational purposes only. The water quality data presented herein is modeled or aggregated using AI tools, including ChatGPT, and should not be used as a primary source for regulatory compliance, health and safety decisions, or engineering designs. Environmental conditions change rapidly; always consult official local environmental agencies or certified water testing professionals for actionable safety data and regulatory guidance.

District Contact

Sandy Land Underground Water Conservation District
1012 Avenue F
P.O. Box 130
Plains, Texas 79355
Phone: 806-456-2155
Website: www.sandylandwater.com

Sources and References

- Sandy Land Underground Water Conservation District. 2026 Mapping Data workbook supplied for this report.
- Sandy Land Underground Water Conservation District website, district information and contact details, accessed September 2026: www.sandylandwater.com.
- U.S. Environmental Protection Agency. National Primary Drinking Water Regulations, including nitrate and fluoride standards.
- U.S. Environmental Protection Agency. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals, including chloride, fluoride, iron, pH, and TDS guidelines.