

Bluebonnet Groundwater Conservation District
1903 Dove Crossing Lane Suite A, P.O. Box 269
Navasota, TX 77868
Phone: 936-825-7303 Fax: 936-825-7331
Email: BGCD@bluebonnetgroundwater.org

BGCD Well ID #: _____

NON-EXEMPT WATER WELL REGISTRATION APPLICATION

Please complete all questions. Please print or type information, or place an "x" in the appropriate space.

Drill New Well: X Register an Existing Well: _____ Replace Existing Well: _____ Increase Size of Existing Well: _____
Increase Pump Size of Existing Well: _____ Abandon/Cap/Plug Existing Well: _____ Perform Dye Trace: _____

Well Owner Quadvest, L.P. Phone 281.305.1154

Address 26926 FM 2978 Magnolia TX 77354

Fax: 832.934.8310 Email: mwatson@quadvest.com

Drilling Company Johnston's Water Well Service and Drilling Phone 281.351.5643

Address PO Box 370

Fax: _____ Email: marshwaterman@aol.com

Driller Mitchell Marsh License# 59570

Well Location: County Waller Well Site Address or Location: Joseph Rd. Hockley, TX 77447

Latitude 30°09'13.98" N Longitude 95°48'35.94" W

Proposed Water Use: Public Water Supply: X Industrial: _____ Recreational: _____ Commercial: _____

Hydraulic Fracturing: _____ Transport Outside of District: _____

Proposed depth: 350 ft. Aquifer Gulf Coast Aquifer Date drilling is scheduled to begin 10/28/2024

Proposed casing size: 11 7/8 in. Proposed casing depth: 290 ft. Pump depth: 183 ft. Pump size 25 hp.

Type Pump: Turbine: _____ Submersible: X Windmill: _____ Other (specify): _____

Pump fuel or power source: Electricity: X Natural Gas: _____ Wind: _____ Other (specify): _____

Pump Bowls: Size _____ # of Stages: _____ Pump Column: Inside Diameter: 3 in. Length: 252 ft.

Pump discharge pipe: Size 3 in. Rated pump horsepower: 25 Pump Discharge: 250 gpm

Water bearing formation: Gulf Coast Aquifer

Estimated Annual Water Production: _____ Acre-Feet or 51,000,000 Gallons
(Total Plant Buildout)

If the water produced from this well will be used in whole or in part on property other than the property where the well is located, describe the location where the water will be used. Transportation of water produced and moved to another location may require a District Transportation Permit. See District Rules, Section 10 or contact the District office for information.

This well is being used to serve the Maple Woods development (Total ESFC build out of 510) that will consist of single family residences as part of PWS 2370135.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Permit form approved on: _____

By: _____ Zach Holland, General Manger

(Continued) NON-EXEMPT WATER WELL DRILLING PERMIT FORM (Continued)

The following documentation, attachments and fee payments must accompany this form when it is submitted for consideration by the District.

- a. Plat or map showing location of the property and location on property of well for which form is submitted.
- b. If owner and/or operator of a well is different from property owner, provide written documentation from property owner authorizing construction and operation of this well.
- c. All the information and documentation required for the type and class of well for which authorization is requested by Section 8 of the District Rules and that information and documentation required by Rule 8.5.
- d. Forms for non-exempt well authorizations must be accompanied by the information required by Rule 8.5A1:
 - a. 8.5A1(e) – a statement of the projected effect of the proposed withdrawal on the aquifer or aquifer conditions, depletion, subsidence, or effects on existing permit holders or other groundwater users in the District;
 - b. 8.5A1(f) – the applicant’s water conservation plan or a declaration the applicant and subsequent user will comply with the District’s management plan;
 - c. 8.5A1(g)(2) – well construction diagram;
 - d. 8.5A1(g)(3) – a map showing the location of the proposed well or wells, all existing well, hydrologic features, and geologic features located within half (1/2) mile radius of the proposed well or wells site;
 - e. 8.5A1(h) – the applicant’s well closure plan or a declaration the applicant will comply with well plugging guidelines and report closure to the applicable authorities, including the District.
- e. Payment for applicable fees must accompany the form. Additional fees may apply as documented in the District’s adopted Fee Schedule.

Well Development Fee	\$75.00	
Operating Permit Application Fee	\$375.00	
Hydrogeologic Report Fee – applicable if well completed with eight (8) inches or greater inside casing diameter		
	Phase I-a Report (less than 200MG/yr)	Phase I-b Report (> 200MG/yr)
District Prepared Report	\$1,500.00	\$7,500.00
Applicant Prepared/District Review	\$500.00	\$1,500.00

- f. Forms for new non-exempt wells must be accompanied by an Operating Permit Application and, if appropriate, a Transport Permit Application.

I, the undersigned applicant, hereby agree and certify that:

- a. this well will be drilled within 30 feet of the location specified and not elsewhere;
- b. I will furnish the District with a copy of the completed driller’s log, any electric log, the well completion report, and any water quality test report within 60 days of completion of this well and prior to production of water there from (other than such production as may be necessary to the drilling and testing of such well);
- c. in using this well, I will avoid waste, achieve water conservation, protect groundwater quality and the water produced from this well will be for a beneficial use;
- d. I will comply with all District and State well plugging and capping guidelines in effect at the time of well closure;
- e. I agree to abide by the terms of the District Rules, the District Management Plan, and orders of the District Board of Directors currently in effect and as they may be modified, changed, and amended from time to time;
- f. I hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.

Signature:  Date: 6/13/2024

Printed Name: Taylor Hamilton Title: Staff Engineer

Bluebonnet Groundwater Conservation District

303 E. Washington Ave., P.O. Box 269
Navasota, TX 77868
Phone: 936-825-7303 Fax: 936-825-7331
Email: BGCD@bluebonnetgroundwater.org

BGCD Well ID #: _____

WELL OPERATING PERMIT APPLICATION

Please complete all questions. Please print or type information or place an "x" in the appropriate space.

Drill New Well: Register an Existing Well: _____ Replace Existing Well: _____ Increase Size of Existing Well: _____
Increase Pump Size of Existing Well: _____ Abandon/Cap/Plug Existing Well: _____ Perform Dye Trace: _____

Well Owner Quadvest, L.P. Phone 281.305.1154

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Address PO Box 370

Fax: _____ Email: marshwaterman@aol.com

Driller Mitchell Marsh License# 59570

Well Location: County Waller 911 address of well site Joseph Rd. Hockley, TX 77447

Latitude 30°09'13.98" N Longitude 95°48'35.94" W

Proposed Water Use: Public Water Supply: Industrial: _____ Recreational: _____ Commercial: _____
Hydraulic Fracturing: _____ Transport Outside of District: _____

Status of well as of application date:

- Operating Well (Date drilled _____)
- Well Completed but not operating (Date Drilled _____)
- Well Development permit attached or awaiting approval

Authorization to produce the following quantity of water annually from this well is: 51,000,000 (Total Plant Buildout) Gallons

A well operating permit is normally issued for a period of one year (12 months). If a permit for a longer period of time is requested, attach a statement detailing the reasons for a longer permit period and the period of time requested.

If the water produced from this well will be used in whole or in part on property other than the property where the well is located, **describe the location where the water will be used.** Transportation of water produced and moved to another location may require a District Transportation Permit. See District Rules, Section 10 or contact the District office for information.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Permit application approved on: _____ By: _____ Zach Holland, General Manger

(Continued) WELL OPERATING PERMIT APPLICATION (Continued)

The following documentation, attachments and fee payments must accompany this application when it is submitted for consideration by the District.

- a. Plat or map showing location of the property and location on property of well for which application is submitted.
- b. If the owner and/or the operator of well is different from the property owner, provide written documentation from the property owner authorizing construction and operation of this well.
- c. All the information and documentation required for the type and class of well for which authorization is requested by Section 8 of the District Rules and in particular that information and documentation required by Rule 8.5.
- d. If this permit application is for a well completed with an inside casing diameter of eight (8) inches or greater, or for any of the conditions enumerated in District Rule 8.5 F, a current hydrogeological report (a report completed within 18 months of the date of this application is considered current) shall be submitted with this application.
- e. Payment for applicable fees must accompany application. For a non-exempt well the appropriate Operating Permit Application Fee (\$375.00 + \$750.00 if inside casing diameter is eight (8) inches or greater) must be included.
- f. The applicant's water conservation plan and if any subsequent user of the water is a municipality or entity providing retail water services, the water conservation plan of that municipality or entity shall also be provided. In lieu of a water conservation plan, a declaration that the applicant and/or a subsequent user if any subsequent user is a municipality or entity providing retail water services will comply with the District Management Plan.
- g. The applicant's Drought Contingency Plan and a copy of any subsequent user's Drought Contingency Plan or a declaration that the applicant or a subsequent user will comply with District rules, policies and Board actions in drought conditions.

I, the undersigned applicant, hereby agree and certify that:

- a. in using this well, I will avoid waste, achieve water conservation, protect groundwater quality and the water produced from this well will be for a beneficial use;
- b. I will comply with all District and State well plugging and capping guidelines in effect at the time of well closure;
- c. I agree to abide by the terms of the District Rules, the District Management Plan and orders of the District Board of Directors currently in effect and as they may be modified, changed and amended from time to time;
- d. I hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.

Signature:  Date: 6/13/2024

Printed Name: Taylor Hamilton Title: Staff Engineer

William R. Hutchison, Ph.D., P.E., P.G.

Independent Groundwater Consultant

909 Davy St.

Brenham, TX 77833

512-745-0599

billhutch@texasgw.com

www.texasgw.com

June 21, 2024

Mr. Zach Holland
General Manager
Bluebonnet Groundwater Conservation District
PO Box 269
Navasota, TX 77868-0269

RE: Phase I-a Report: Quadvest Maple Woods Well

Dear Mr. Holland,

This letter represents the Phase I-a report for the Quadvest Maple Woods Well permit application that I received from you via email on June 20, 2024.

“Estimated Annual Water Production” is 51 million gallons per year, which is below the 200 million gallon per year threshold. Therefore, the application requires the preparation of a Phase I-a analysis of potential drawdown.

Well Locations on HAGM Grid

The latitude and longitude data on the application were used to convert the location data to x- and y-coordinates in the GAM coordinate system using Surfer, a commercial gridding program. The FORTRAN program *PointRC.exe* was used to find the HAGM cell for those x- and y-coordinates. The results of this effort yielded that the well is in HAGM row 36, column 95.

The applications noted that the well depth of 350 feet and casing depth of 290 feet, which would place the bottom of the well and casing in the Evangeline Aquifer (HAGM layer 2).

Grid Parameters, HAGM Parameters, HAGM Results, Theis Parameters

The Excel spreadsheet named *BGCD Parameters.xlsx* contains the data needed for the review and Phase I-a calculations for cells designated in the four counties of the Bluebonnet Groundwater Conservation District. The data for row 36, column 95 were copied and transposed into the spreadsheet *QVMaple Woods Phase I-a Tables.xlsx*. Results for layer 1 (Chicot) and layer 2 (Evangeline Aquifer) are summarized into four tables as follows:

- Table 1: Grid Parameters
- Table 2: HAGM Parameters
- Table 3: HAGM Results
- Table 4: Theis Parameters (layer 2 only)

Table 1. Grid Parameters for Quadvest Maple Woods Well

County Name	Waller	Waller
County Code	237	237
Outcrop Layer	1	1
Layer	1	2
Row	36	36
Column	95	95
x-coordinate (GAM-ft)	6243249	6243249
y-coordinate (GAM-ft)	19311038	19311038
Surface Elevation (ft MSL)	247	247
Cell Top Elevation (ft MSL)	247	109
Cell Bottom Elevation (ft MSL)	109	-788
Cell Thickness (ft)	138	897
Clay Thickness (ft)	54	400
Clay Thickness (% of Cell Thickness)	39.13	44.59

Table 2. HAGM Parameters for Quadvest Maple Woods Well

County Name	Waller	Waller
County Code	237	237
Outcrop Layer	1	1
Layer	1	2
Row	36	36
Column	95	95
Hydraulic Conductivity (ft/day)	12.11	2.30
Transmissivity (gpd/ft)	12,496	15,432
Leakage (1/day)	2.10E-05	8.20E-06
Storativity (dimensionless)	1.00E-01	3.60E-04
Elastic Storativity (dimensionless)	6.10E-05	8.10E-05
Inelastic Storativity (dimensionless)	6.10E-03	8.10E-03

Table 3. HAGM Results for Quadvest Maple Woods Well

County Name	Waller	Waller
County Code	237	237
Outcrop Layer	1	1
Layer	1	2
Row	36	36
Column	95	95
Groundwater Elevation in 2009 (ft MSL)	176	165
Groundwater Elevation in 2080 (ft MSL)	114	88
DFC Drawdown (ft)	62	77
Artesian Head (ft)	-71	56
Subsidence in 2009 (ft)	0.02	0.02
Subsidence in 2080 (ft)	0.74	0.74
Subsidence from 2009 to 2080 (ft)	0.72	0.72
Cell Pumping in 2009 (AF/yr)	0	50.69
Cell Pumping in 2080 (AF/yr)	0	38.63

Table 4. Theis Parameters for Quadvest Maple Woods Well

County Name	Waller
County Code	237
Outcrop Layer	1
Layer	2
Row	36
Column	95
Drawdown in Production Well at 100 gpm for 36 hours	13.49
Drawdown 1/2 mile from Production Well at 100 gpm for 36 hours	0.90
Drawdown 1/2 miles from Production Well at 100 gpm for 1 year	4.84
Drawdown-Pumping Ratio for Production Well for 36 hours	0.13488
Drawdown-Pumping Ratio for 1/2 mile from Production Well for 36 hours	0.00903
Drawdown-Pumping Ratio for 1/2 mile from Production Well for 1 yr	0.04837

Theis Equation Calculations

Groundwater production data from the permit applications were used along with the drawdown-pumping ratios contained in Table 4 to develop three estimates of drawdown for each well:

- Scenario 1: drawdown in the production well after 36-hours of pumping at three times the average annual pumping rate
- Scenario 2: drawdown in a well ½ mile from the production well after 36 hours of pumping at three times the annual pumping rate

- Scenario 3: drawdown in a well ½ mile from the production well after one year at the average pumping rate.

Results of these calculations for are presented in Table 5.

Table 5. This Results for Quadvest Maple Woods Well

Production Summary	Value
Annual Permit Production Limit (gallons)	51,000,000
Annual Permit Production Limit (acre-feet)	157
Average Pumping Rate (gpm)	97
3X Average Pumping Rate (gpm)	291

Evangeline		
Drawdown Calculations	Drawdown-Pumping Ratios	Calculated Drawdown (ft)
Production Well - 36 hours (3X avg pumping)	0.13488	39.26
1/2 mile from Production Well - 36 hours (3X avg pumping)	0.00903	2.63
1/2 mile from Production Well - one year (avg pumping)	0.04837	4.69

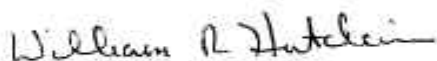
These data represent the best integrated data of the area from a regional perspective. The local-scale data will be developed as part of the Phase II investigation. This will include more site-specific information and data on aquifer depth, clay content, and aquifer parameters calculated from the 36-hour pumping test.

Recommendation

Based on the results of the Phase I-a report, the application should be approved, and the Phase II investigation should proceed to verify the Phase I-a estimates related to the aquifer (e.g. depth to top of Evangeline and clay content) and related to aquifer performance (e.g. drawdown at the end of the 36-hour pumping test and aquifer transmissivity).

I appreciate the opportunity to work with you on this effort. Please call me at 512-745-0599 or email me at billhutch@texasgw.com if you have any questions.

Sincerely,



William R. Hutchison, Ph.D., P.E., P.G.