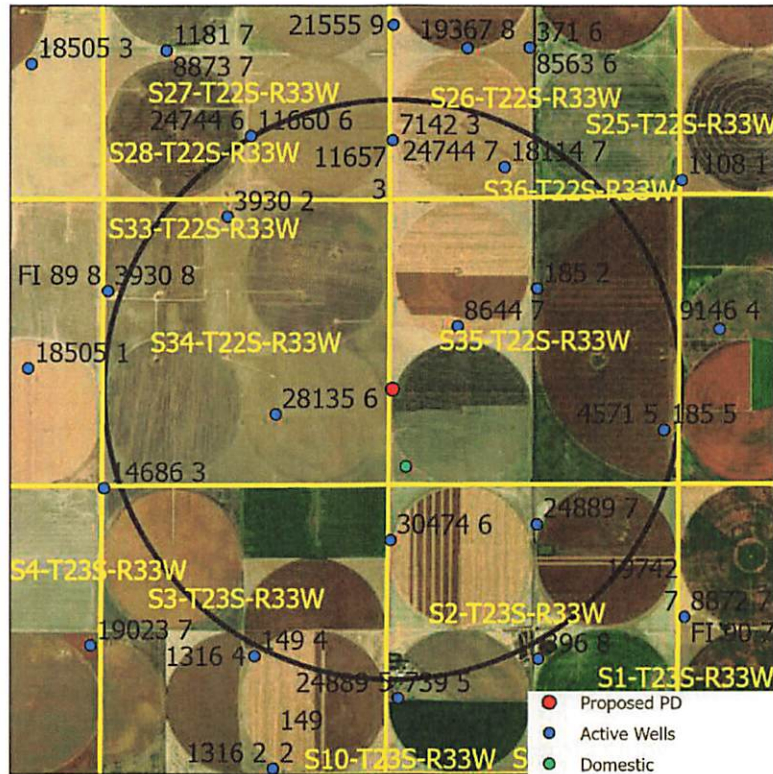## Evaluation of proposed move for Water Right No. 8644

Proposed: Move water right no. 8644 to a new location 2,108 ft to the southwest.

Wells within 1 mile: 3930, 7142, 18114, 185 ID2, 28135, 30474, 24889, 185 ID5, and one domestic well in S35-22-33.

The saturated thickness at the proposed well location is estimated to be 90.5 ft, based upon the GMD3 model. For saturated thickness between than 75 ft and 100 ft, the drawdown allowance is 2.0 ft.

50 year Theis Analysis: The following values were used to run the analysis:

S = 0.094, T = 16,927 ft^2/day, tp$_{current}$ = 126 days, Q$_{current}$ = 400 gpm, tp$_{proposed}$ = 97 days,

Q$_{proposed}$ = 1500 gpm

Theis drawdowns were calculated as follows:

3930:	Drawdown from current location = 0.92 ft
	Drawdown from proposed location = 2.77 ft
	Net drawdown = **1.8 ft**
7142:	Drawdown from current location = 1.07 ft
	Drawdown from proposed location = 3.28 ft
	Net drawdown = **2.2 ft**

18114:   Drawdown from current location = 1.18 ft

                        Drawdown from proposed location = 3.68 ft

                        Net drawdown = **2.5 ft**

185 ID2:   Drawdown from current location = 1.62 ft

                        Drawdown from proposed location = 5.28 ft

                        Net drawdown = **3.7 ft**

28135:   Drawdown from current location = 1.05 ft

                        Drawdown from proposed location = 3.21 ft

                        Net drawdown = **2.2 ft**

30474:   Drawdown from current location = 0.99 ft

                        Drawdown from proposed location = 3.00 ft

                        Net drawdown = **2.0 ft**

24889:   Drawdown from current location = 1.02 ft

                        Drawdown from proposed location = 3.10 ft

                        Net drawdown = **2.08 ft**

185 ID5:   Drawdown from current location = 0.97 ft

                        Drawdown from proposed location = 2.94 ft

                        Net drawdown = **2.0 ft**

Domestic S35-22-33:   Drawdown from current location = 1.25 ft

                        Drawdown from proposed location = 3.94 ft

                        Net drawdown = **2.7 ft**

Net drawdown exceeds the drawdown allowance for the wells authorized under water right nos. 7142, 18114, 185 ID2, 28135, 30474, 24889, and domestic S35-22-33. Critical well analysis was performed for those wells.

Critical Well Evaluation:

7142:

Water Column = 78 ft

DP = 2.4 ft (Net drawdown from the proposal indicated above)

DE = 42.3 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 7.76 ft (S = 0.097, T = 12,428 ft^2/day, Q = 250 gpm, tp = 157 days, efficiency = 70%)

DT = 52.5 ft

Economic Drawdown Constraint (EDC) = 0.4 * 78 ft = 31.2 ft

Physical Drawdown Constraint (PDC) = 78 ft − 60 ft = 18.0 ft

Total drawdown of 52.5 ft is greater than the EDC and the PDC, so this well **is critical.**

18114:

Water Column = 81.6 ft

DP = 2.4 ft (Net drawdown from the proposal indicated above)

DE = 45.7 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 11.6 ft (S = 0.083, T = 11,422 ft^2/day, Q = 380 gpm, tp = 114 days, efficiency = 70%)

DT = 59.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81.6 ft = 32.6 ft

Physical Drawdown Constraint (PDC) = 81.6 ft − 60 ft = 21.6 ft

Total drawdown of 59.7 ft exceeds the EDC and the PDC, so this well **is critical.**

185 ID2:

Water Column = 81.6 ft

DP = 2.4 ft (Net drawdown from the proposal indicated above)

DE = 45.7 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 11.0 ft (S = 0.083, T = 11,422 ft^2/day, Q = 331 gpm, tp = 115 days, efficiency = 70%)

DT = 59.1 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81.6 ft = 32.6 ft

Physical Drawdown Constraint (PDC) = 81.6 ft − 60 ft = 21.6 ft

Total drawdown of 59.1 ft exceeds the EDC and the PDC, so this well **is critical.**

28135:

Water Column = 77.2 ft

DP = 3.0 ft (Net drawdown from the proposal indicated above)

DE = 40.0 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 5.1 ft (S = 0.097, T = 15,160 ft²/day, Q = 200 gpm, tp = 134 days, efficiency = 70%)

DT = 48.1 ft

Economic Drawdown Constraint (EDC) = 0.4 * 77.2 ft = 30.9 ft

Physical Drawdown Constraint (PDC) = 77.2 ft – 60 ft = 17.2 ft

Total drawdown of 48.1 ft is greater than the EDC and the PDC, so this well **is critical.**

30474:

Water Column = 114 ft

DP = 3.0 ft (Net drawdown from the proposal indicated above)

DE = 42.6 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 9.01 ft (S = 0.087, T = 21,357 ft²/day, Q = 498 gpm, tp = 87 days, efficiency = 70%)

DT = 54.6 ft

Economic Drawdown Constraint (EDC) = 0.4 * 114 ft = 45.6 ft

Physical Drawdown Constraint (PDC) = 114 ft – 60 ft = 54.0 ft

Total drawdown of 54.61 ft is greater than the EDC and the PDC, so this well **is critical.**

24889:

Water Column = 120.0 ft

DP = 3.0 ft (Net drawdown from the proposal indicated above)

DE = 37.8 ft (Water level decline from 2024 through 2049 based upon GMD3 model)

DD = 10.1 ft (S = 0.071, T = 19,316 ft²/day, Q = 100 gpm, tp = 204 days, efficiency = 70%)

DT = 50.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 120.0 ft = 48.0 ft

Physical Drawdown Constraint (PDC) = 120.0 ft – 60 ft = 60.0 ft

Total drawdown of 50.9 ft is greater than the EDC, so this well **is critical.**

Domestic S35-22-33:

Water Column = 114 ft

DP = 2.7 ft (Net drawdown from the proposal indicated above)

DE = 42.6 ft (Water level decline from 2024 through 2049 based upon GMD3 model)
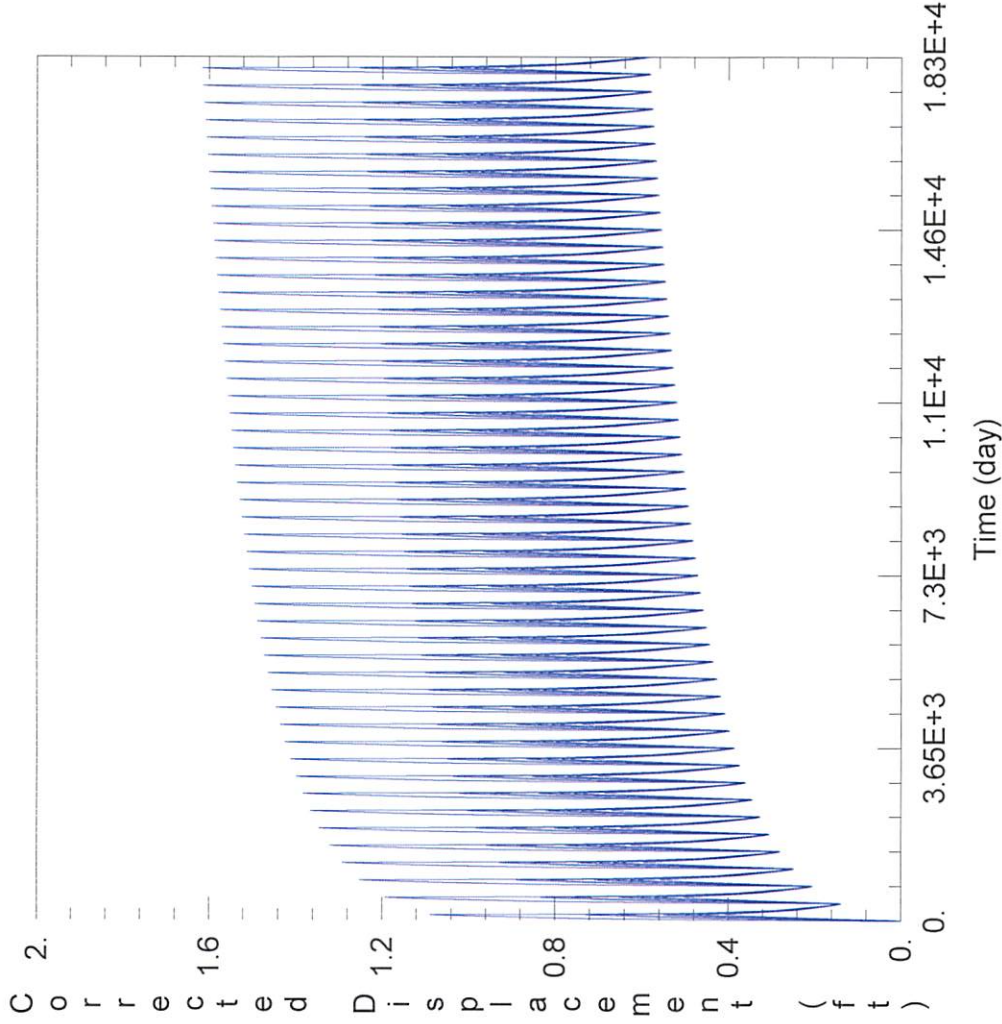
DT = 45.3 ft

Economic Drawdown Constraint (EDC) = 0.4 * 114 ft = 45.6 ft

Physical Drawdown Constraint (PDC) = 114 ft – 20 ft = 94.0 ft

Total drawdown of 45.3 ft is less than the EDC and the PDC, so this well **is not critical.**

Conclusion:

The proposed move is in a depleted aquifer area with about 90 ft of remaining saturated thickness. The analysis shows that net well-to-well effects created by this proposal are likely to be small but noticeable, due to the limited amount of remaining aquifer. Many nearby wells were flagged as critical because projected aquifer declines over the next 25 years amount to more than 40% of the remaining saturated thickness. Concerned neighbors should contact GMD3 at (620) 275-7147 or the Division of Water Resources at (620) 276-2901.

Corrected Displacement (ft)

2.

1.6

1.2

0.8

0.4

0.

Time (day)

0.   3.65E+3   7.3E+3   1.1E+4   1.46E+4   1.83E+4

WELL TEST ANALYSIS

Data Set: C:\Users\scanstation\Documents\move requests\8644\8644 current.aqt
Date: 01/15/25   Time: 12:11:28

PROJECT INFORMATION

Test Well: 8644

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
8644	-33501	445702

Observation Wells

	Well Name	X (ft)	Y (ft)
□		-33501	445702
□	3930	-37713	447702
□	7142	-34689	449082
□	18114	-32646	448602
□	185 ID2.	-32045	446391
□	28135	-36825	444092
□	30474	-34727	441806
□	24889	-32050	442105
□	185 ID5	-29717	443810
□	Domestic	-34442	443148

SOLUTION

Aquifer Model: Unconfined   Solution Method: Theis

T = 1.693E+4 ft^2/day   S = 0.094
Kz/Kr = 1.   b = 90.5 ft

Time (day) — X axis: 0., 3.65E+3, 7.3E+3, 1.1E+4, 1.46E+4, 1.83E+4

Corrected Displacement (ft) — Y axis: 0., 1.2, 2.4, 3.6, 4.8, 6.

WELL TEST ANALYSIS

Data Set: C:\Users\scanstation\Documents\move requests\8644\8644 proposed.aqt
Date: 01/15/25   Time: 12:11:32

PROJECT INFORMATION

Test Well: 8644

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
8644	-33501	445702

Observation Wells

Well Name	X (ft)	Y (ft)
□	-33501	445702
□ 3930	-37713	447702
□ 7142	-34689	449082
□ 18114	-32646	448602
□ 185 ID2.	-32045	446391
□ 28135	-36825	444092
□ 30474	-34727	441806
□ 24889	-32050	442105
□ 185 ID5	-29717	443810
□ Domestic	-34442	443148

SOLUTION
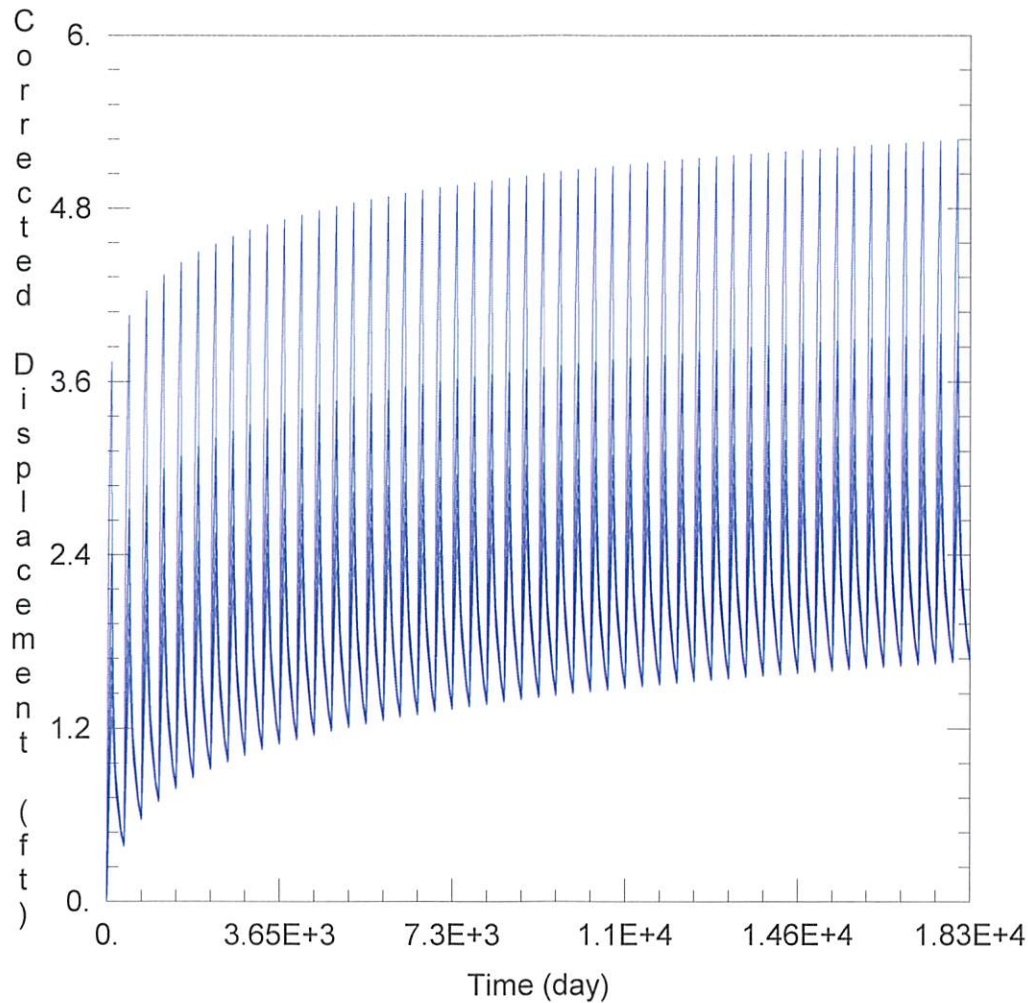
Aquifer Model: Unconfined   Solution Method: Theis

T   = 1.693E+4 ft^2/day   S   = 0.094
Kz/Kr = 1.   b   = 90.5 ft