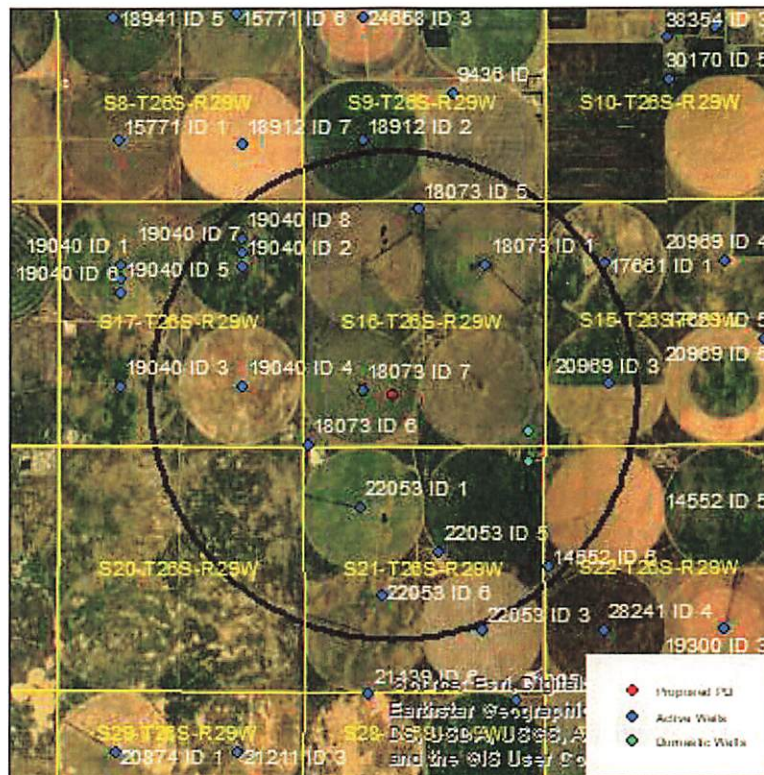


Evaluation of proposed move for Water Right No. 18073 ID7

Proposed: Move water right no. 18073 ID7 to a new well location, 671 ft to the southeast.



Wells within 1 mile: 19040 ID7, 19040 ID4, 18073 ID1, 18073 ID5, 18073 ID6, 20969, 22053 ID1, 22053 ID5, 22053 ID6, 14552, a domestic well in section 16-26-29, and a domestic well in section 21-26-29.

The saturated thickness at the proposed well location is estimated to be 74 ft, based upon the GMD3 model. For saturated thickness between than 50 ft and 75 ft, the drawdown allowance is 1.5 ft.

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

$$S = 0.1676, T = 1936 \text{ ft}^2/\text{day}, t_{p\text{proposed}} = 61 \text{ days}, Q_{\text{proposed}} = 1011 \text{ gpm}$$

Theis drawdowns were calculated as follows:

19040 ID7:	Net drawdown = 4.3 ft
19040 ID4:	Net drawdown = 5.3 ft
18073 ID1:	Net drawdown = 5.1 ft
18073 ID5:	Net drawdown = 4.6 ft
18073 ID6:	Net drawdown = 6.9 ft
20969:	Net drawdown = 4.2 ft
22053 ID1:	Net drawdown = 6.1 ft

22053 ID5: Net drawdown = 5.0 ft

22053 ID6: Net drawdown = 4.4 ft

Domestic 16-26-29: Net drawdown = 5.5 ft

Domestic 21-26-29: Net drawdown = 5.2 ft

Net drawdown exceeds the drawdown allowance for all wells within 1 mile of the proposed location. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

19040 ID7:

Water Column = 77 ft

DP = 4.3 ft (Net drawdown from the proposal indicated above)

DE = 32.1 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 12.5 ft (S = 0.2756, T = 8426 ft²/day, Q = 300 gpm, tp = 133 days, efficiency = 70%)

DT = 48.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 77 ft = 30.8 ft

Physical Drawdown Constraint (PDC) = 77 ft – 60 ft = 17.0 ft

Total drawdown of 48.9 ft is greater than the EDC and the PDC, so this well is **critical**.

19040 ID4:

Water Column = 77 ft

DP = 5.3 ft (Net drawdown from the proposal indicated above)

DE = 32.1 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 0 ft (Well has not operated in the last 10 years.)

DT = 37.4 ft

Economic Drawdown Constraint (EDC) = 0.4 * 77 ft = 30.8 ft

Physical Drawdown Constraint (PDC) = 77 ft – 60 ft = 17.0 ft

Total drawdown of 37.4 ft exceeds the EDC and the PDC, so this well is **critical**.

18073 ID1:

Water Column = 74 ft

DP = 5.1 ft (Net drawdown from the proposal indicated above)

DE = 28.0 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 77.2 ft ($S = 0.1676$, $T = 1936 \text{ ft}^2/\text{day}$, $Q = 461 \text{ gpm}$, $tp = 106 \text{ days}$, efficiency = 70%)

DT = 110.3 ft

Total drawdown exceeds remaining saturated thickness, so this well is **critical**.

18073 ID5:

Water Column = 74 ft

DP = 4.6 ft (Net drawdown from the proposal indicated above)

DE = 28.0 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 65.1 ft ($S = 0.1676$, $T = 1936 \text{ ft}^2/\text{day}$, $Q = 386 \text{ gpm}$, $tp = 118 \text{ days}$, efficiency = 70%)

DT = 97.7 ft

Total drawdown exceeds remaining saturated thickness, so this well is **critical**.

18073 ID6:

Water Column = 74 ft

DP = 6.9 ft (Net drawdown from the proposal indicated above)

DE = 28.0 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 63.6 ft ($S = 0.1676$, $T = 1936 \text{ ft}^2/\text{day}$, $Q = 375 \text{ gpm}$, $tp = 126 \text{ days}$, efficiency = 70%)

DT = 98.5 ft

Total drawdown exceeds remaining saturated thickness, so this well is **critical**.

20969:

Water Column = 66 ft

DP = 4.2 ft (Net drawdown from the proposal indicated above)

DE = 29.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 0 ft (Well has not operated in the last 10 years.)

DT = 33.4 ft

Economic Drawdown Constraint (EDC) = $0.4 * 66 \text{ ft} = 26.4 \text{ ft}$

Physical Drawdown Constraint (PDC) = $66 \text{ ft} - 60 \text{ ft} = 6.0 \text{ ft}$

Total drawdown of 33.4 ft is greater than the EDC, so this well is **critical**.

22053 ID1:

Water Column = 58 ft

Remaining saturated thickness is less than 60 ft, so this well is **critical**.

22053 ID5:

Water Column = 58 ft

Remaining saturated thickness is less than 60 ft, so this well is **critical**.

22053 ID6:

Water Column = 58 ft

Remaining saturated thickness is less than 60 ft, so this well is **critical**.

Domestic 16-26-92:

Water Column = 74 ft

DP = 5.5 ft (Net drawdown from the proposal indicated above)

DE = 28.0 ft (Water level decline from 2022 through 2048 based upon GMD3 model)

DT = 33.5 ft

Economic Drawdown Constraint (EDC) = $0.4 * 74 \text{ ft} = 29.6 \text{ ft}$

Physical Drawdown Constraint (PDC) = $74 \text{ ft} - 20 \text{ ft} = 54.0 \text{ ft}$

Total drawdown of 33.5 ft is greater than the EDC, so this well is **critical**.

Domestic 21-26-29:

Water Column = 58 ft

DP = 5.2 ft (Net drawdown from the proposal indicated above)

DE = 28.4 ft (Water level decline from 2022 through 2048 based upon GMD3 model)

DT = 33.6 ft

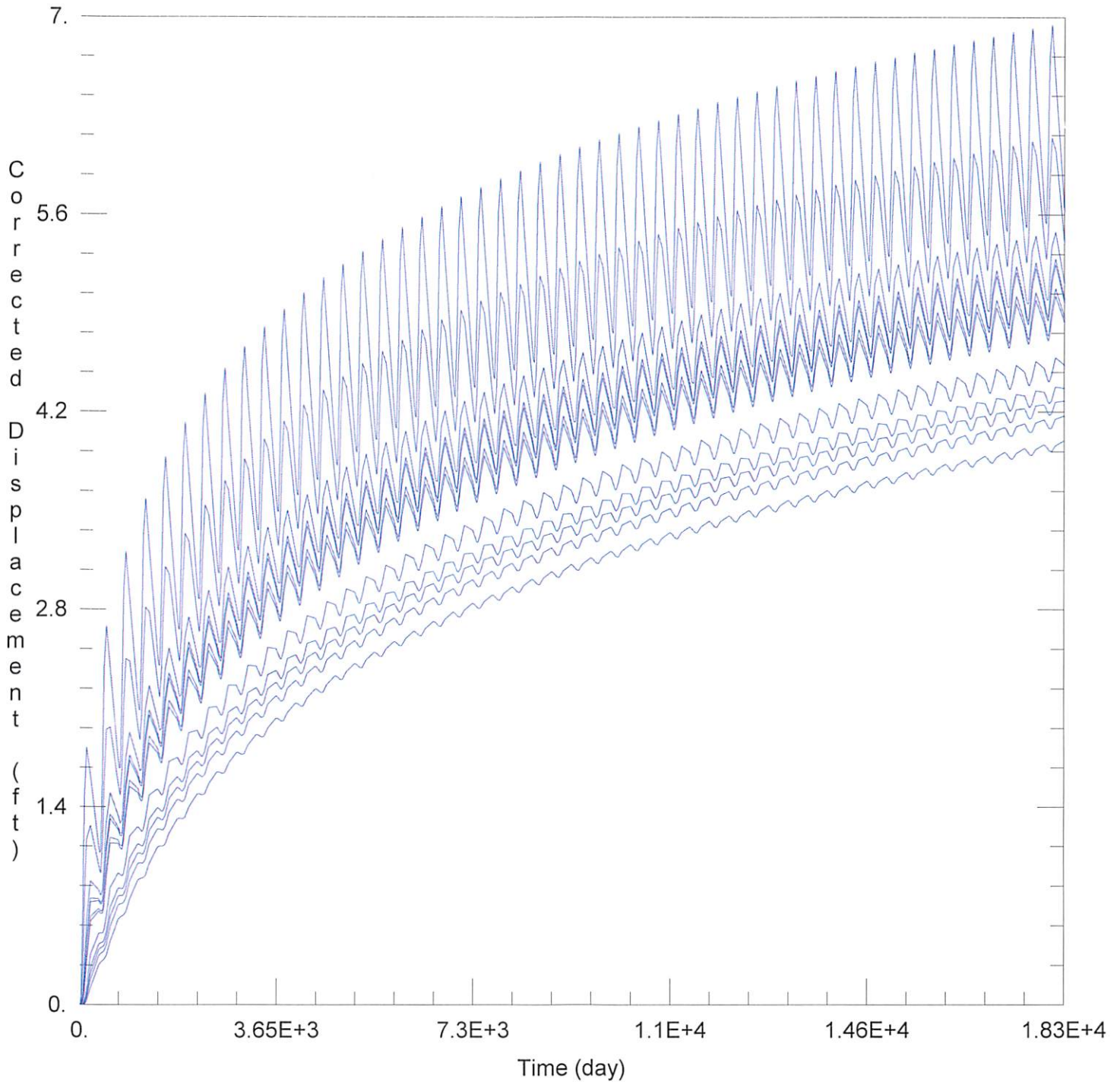
Economic Drawdown Constraint (EDC) = $0.4 * 58 \text{ ft} = 23.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $58 \text{ ft} - 20 \text{ ft} = 38 \text{ ft}$

Total drawdown of 33.6 ft is greater than the EDC, so this well is **critical**.

Conclusion:

The proposed move is in a depleted aquifer area with a little less than 75 ft of remaining saturated thickness. All wells in the area were identified as critical because model projections show that the aquifer is declining at a rate exceeding 40% of the remaining thickness over the next 25 years and given the projected future saturated thickness and aquifer conditions, it is unlikely that area wells will be able to operate very far into the future without significant loss of production. It should be noted that the right that is proposed to be moved has not been operated much over the past 10 years, and had the well been running more frequently, the net effects from the move would be lower. Concerned neighbors should contact GMD3 at (620) 275-7147 or the Division of Water Resources at (620) 276-2901.



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2023_moves\18073\18073 proposed.aqt
 Date: 01/12/24 Time: 15:44:04

PROJECT INFORMATION

Company: GMD 3
 Project: 18073
 Location: Gray County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
18073	86713	331024

Observation Wells

Well Name	X (ft)	Y (ft)
□	86713	331024
□ 19070 ID7	83430	334107