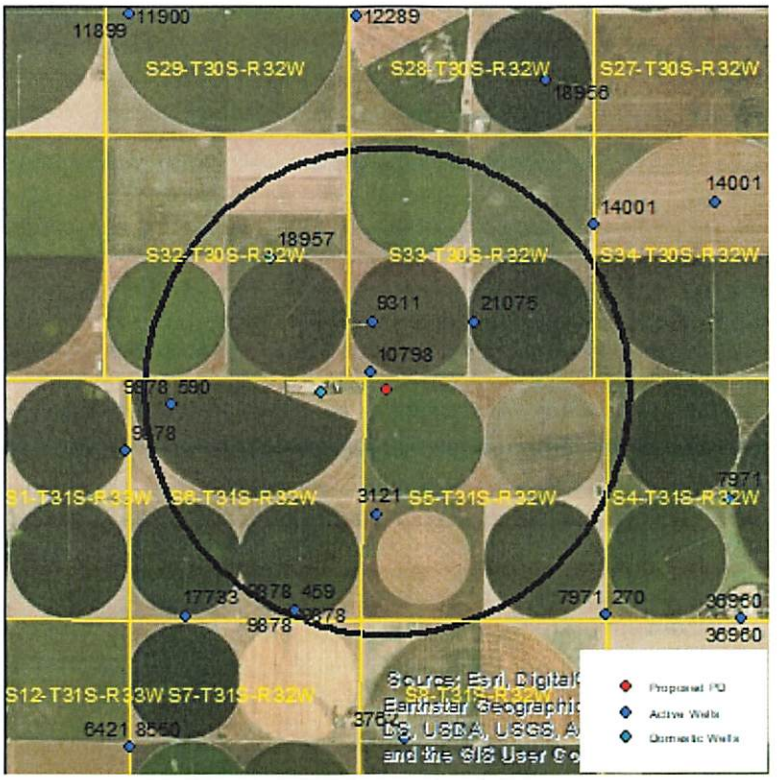
Evaluation of proposed move for Water Right No. 10798

Proposed: Move water right no. 10798 to a new well location, 528 ft to the southeast.



Wells within 1 mile: 18957, 9311, 21075, 590 & 9878, 459 & 9878, 3121, and a domestic well in section 6-31-32.

The saturated thickness at the proposed well location is estimated to be 163 ft, based upon the GMD3 model. For saturated thickness between 150 ft and 200 ft, the drawdown allowance is 3.5 ft.

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

S = 0.1602, T = 8701 ft^2/day, $tp_{current}$ = 105 days, $Q_{current}$ = 525 gpm, $tp_{proposed}$ = 75 days, $Q_{proposed}$ = 1890 gpm

Theis drawdowns were calculated as follows:

18957: Drawdown from current location = 1.70 ft

Drawdown from proposed location = 4.01 ft

Net drawdown = **2.3 ft**

9311: Drawdown from current location = 3.35 ft

Drawdown from proposed location = 7.91 ft

Net drawdown = **4.6 ft**

21075:	Drawdown from current location = 2.05 ft
	Drawdown from proposed location = 5.69 ft
	Net drawdown = **3.6 ft**
590 & 9878:	Drawdown from current location = 1.39 ft
	Drawdown from proposed location = 3.47 ft
	Net drawdown = **2.1 ft**
459 & 9878:	Drawdown from current location = 1.23 ft
	Drawdown from proposed location = 3.28 ft
	Net drawdown = **2.1 ft**
3121:	Drawdown from current location = 1.77 ft
	Drawdown from proposed location = 5.23 ft
	Net drawdown = **3.5 ft**
Domestic 6-31-32:	Drawdown from current location = 3.23 ft
	Drawdown from proposed location = 8.24 ft
	Net drawdown = **5.0 ft**

Net drawdown exceeds the drawdown allowance of 3.5 ft for all wells under water right numbers 9311, 21075, and the domestic well in section 6-31-32. Critical well analysis was conducted for those wells.

Critical Well Evaluation:

9311:

Water Column = 167 ft

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

DE = 59.1 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 18.1 ft (S = 0.1377, T = 12,778 ft^2/day, Q = 625 gpm, tp = 108 days, efficiency = 70%)

DT = 81.8 ft

Economic Drawdown Constraint (EDC) = 0.4 * 167 ft = 66.8 ft

Physical Drawdown Constraint (PDC) = 167 ft – 60 ft = 107 ft

Total drawdown of 81.8 ft is greater than the EDC, so this well **is critical.**

21075:

Water Column = 167 ft

DP = 3.6 ft (Net drawdown from the proposal indicated above)

DE = 59.1 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 11.9 ft (S = 0.1377, T = 12,778 ft^2/day, Q = 405 gpm, tp = 120 days, efficiency = 70%)

DT = 74.6 ft

Economic Drawdown Constraint (EDC) = 0.4 * 167 ft = 66.8 ft

Physical Drawdown Constraint (PDC) = 167 ft – 60 ft = 107 ft

Total drawdown of 74.6 ft is greater than the EDC, so this well **is critical.**

Domestic 6-31-32:

Water Column = 173 ft

DP = 5.0 ft (Net drawdown from the proposal indicated above)

DE = 56.7 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 61.7 ft

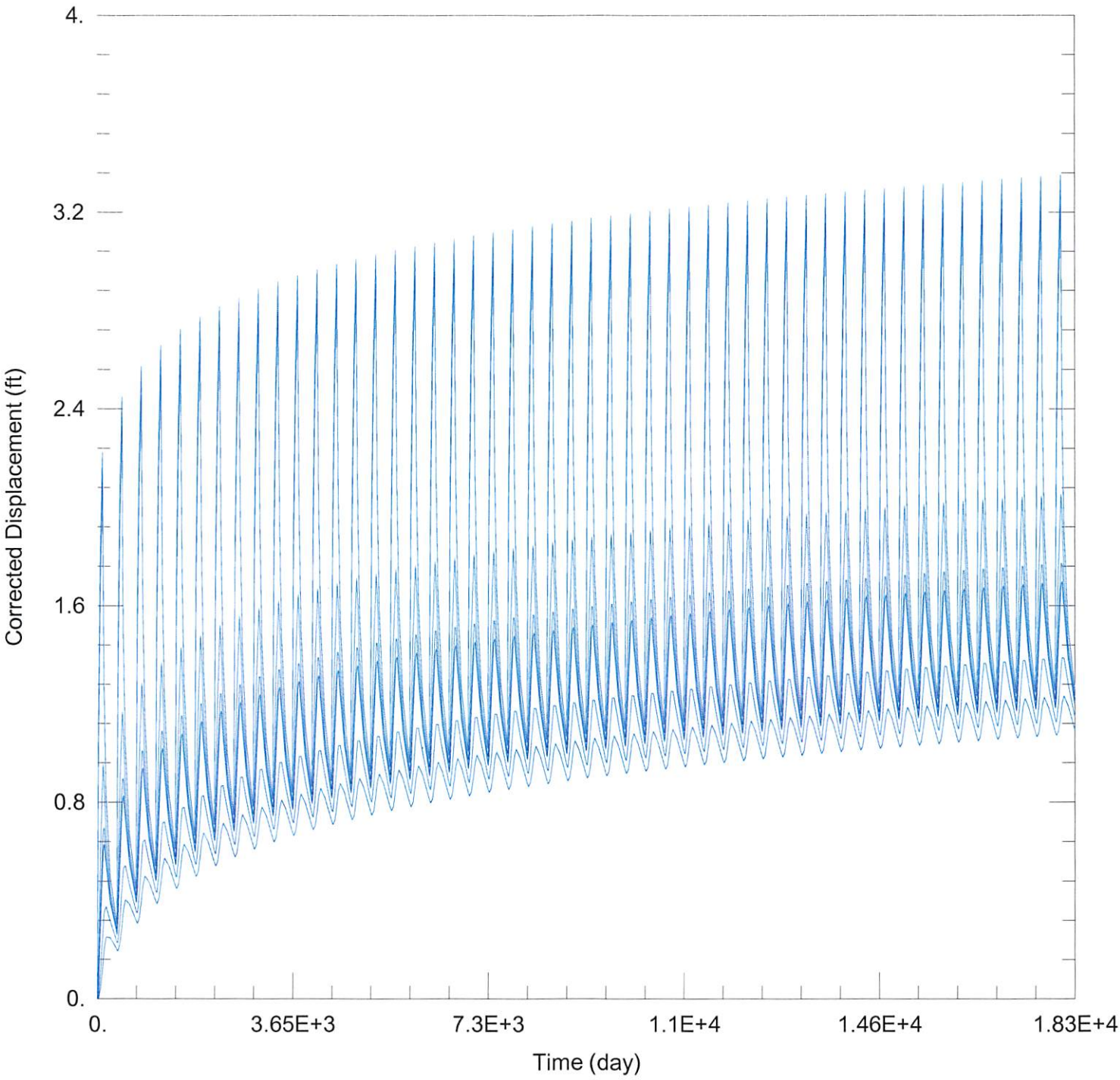
Economic Drawdown Constraint (EDC) = 0.4 * 173 ft = 69.2 ft

Physical Drawdown Constraint (PDC) = 173 ft – 20 ft = 153 ft

Total drawdown of 61.7 ft is less than the EDC and PDC, so this well **is not critical.**

Conclusion:

The proposed move is in an area with declines in saturated thickness exceeding 2 ft per year. Water right numbers 9311 and 21075 were flagged as critical because after accounting for aquifer drawdown at their current level of production, more than 40% of the remaining aquifer will be lost over the next 25 years. If the proposed well were to pump its full authorized authority, there would be an additional well-to-well interaction effect on these wells that may be noticeable. Any 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\2022_moves\10798\10798 Current.aqt
Date: 11/03/22 Time: 15:39:34

PROJECT INFORMATION

Company: GMD 3
Project: 10798
Location: Seward County

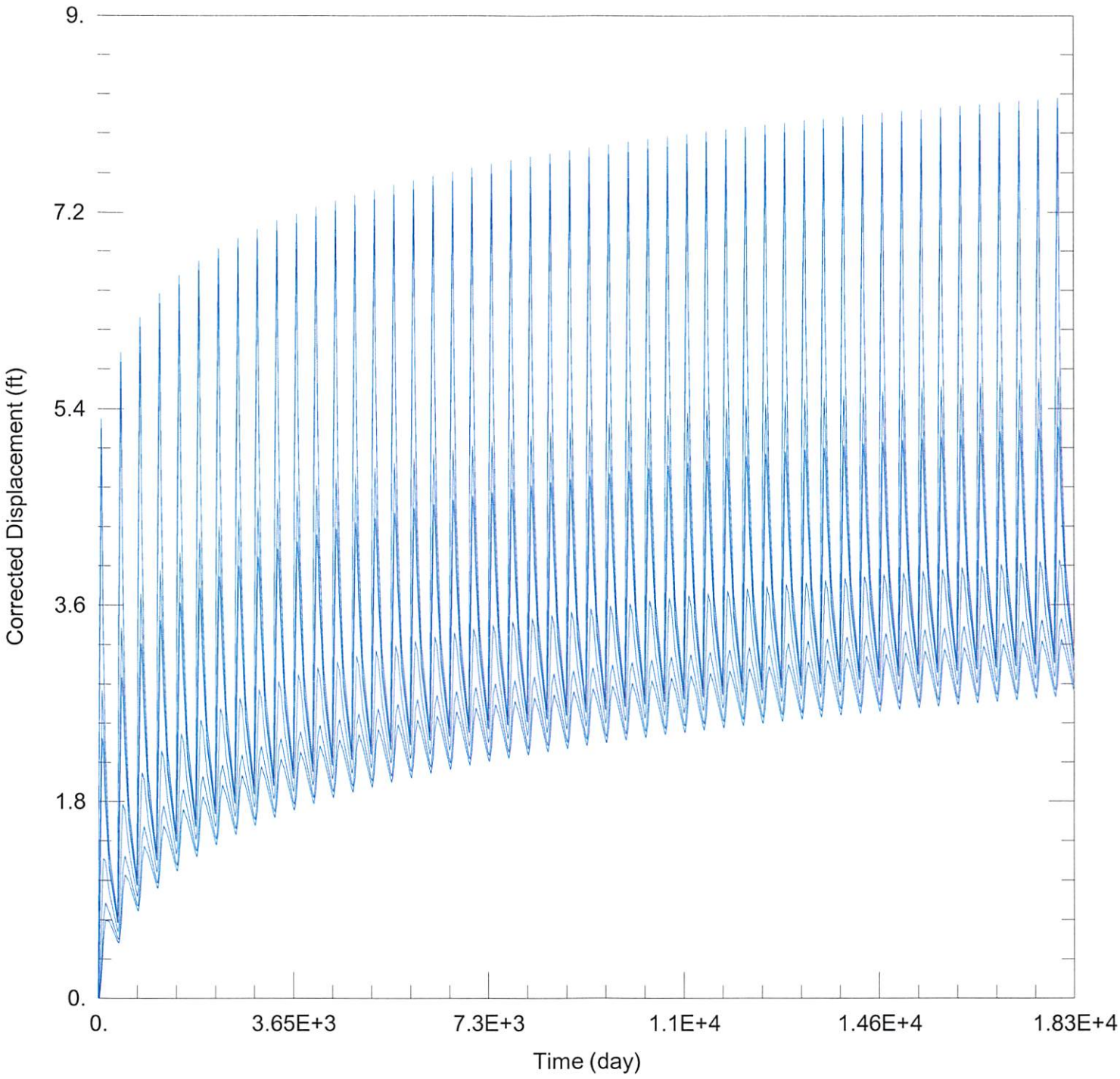
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
10798	-9720	186802

Observation Wells

Well Name	X (ft)	Y (ft)
□	-9720	186802



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2022_moves\10798\10798 Proposed.aqt
Date: 11/03/22 Time: 15:39:28

PROJECT INFORMATION

Company: GMD 3
Project: 10798
Location: Seward County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
10798	-9372	186405

Observation Wells

Well Name	X (ft)	Y (ft)
□	-9372	186405