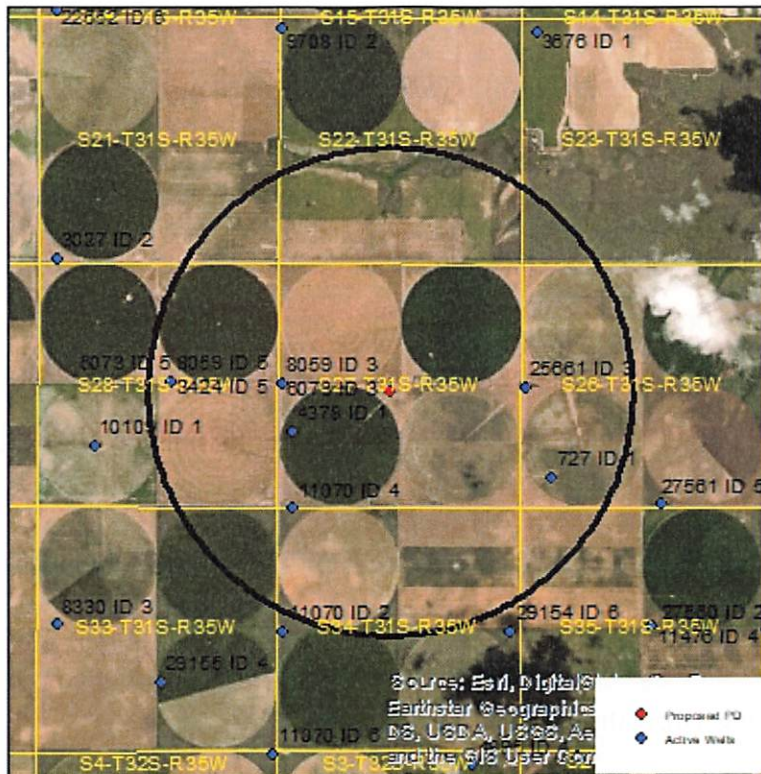


Evaluation of proposed move for Water Right No. 4378

Proposed: Move water right no. 4378 to a new well location a distance of 2,298 ft to the northeast.



Wells within 1 mile: 3424 & 6073 & 8059 ID 3, 11070, 3424 & 6073 & 8059 ID 5, 25661, and 727.

The saturated thickness at the proposed well location is estimated to be 181 ft, based upon the driller’s log and an observation well in section 21-31-35. 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:

$S = 0.2049$, $T = 5513.4 \text{ ft}^2/\text{day}$, $tp_{\text{current}} = 64 \text{ days}$ (based on observed rate and reported use),
 $Q_{\text{current}} = 514 \text{ gpm}$ (based on 2012 inspection), $tp_{\text{proposed}} = 129 \text{ days}$, $Q_{\text{proposed}} = 1125 \text{ gpm}$

Theis drawdowns were calculated as follows:

3424 & 6073 & 8059 ID3: Drawdown from current location = 3.05 ft

Drawdown from proposed location = 6.81 ft

Net drawdown = **3.8 ft**

11070:

Drawdown from current location = 2.15 ft

Drawdown from proposed location = 5.56 ft

Net drawdown = **3.4 ft**

3424 & 6073 & 8059 ID5: Drawdown from current location = 1.42 ft

Drawdown from proposed location = 4.45 ft

Net drawdown = **3.0 ft**

25661: Drawdown from current location = 0.96 ft

Drawdown from proposed location = 5.97 ft

Net drawdown = **5.0 ft**

727: Drawdown from current location = 0.90 ft

Drawdown from proposed location = 4.92 ft

Net drawdown = **4.0 ft**

Net drawdown exceeds the drawdown allowance of 3.5 ft for water right nos. 3424 & 6073 & 8059 ID 3, 25661, and 727. Critical well analysis is necessary for those wells.

Critical Well Evaluation:

3424 & 6073 & 8059 ID 3:

Water Column = 181 ft

DP = 3.8 ft (Net drawdown from the proposal indicated above)

DE = 43.7 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 45.1 ft (S = 0.2049, T = 41,240 gpd/ft, Q = 717 gpm, tp = 129 days, efficiency = 70%)

DT = 92.6 ft

Economic Drawdown Constraint (EDC) = $0.4 * 181 \text{ ft} = 72.4 \text{ ft}$

Physical Drawdown Constraint (PDC) = $181 \text{ ft} - 60 \text{ ft} = 121 \text{ ft}$

Total drawdown of 92.6 ft is greater than the EDC, so this well is **critical**.

25661:

Water Column = 182 ft

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

DE = 40.5 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 20.1 ft (S = 0.1625, T = 122,235 gpd/ft, Q = 894 gpm, tp = 87 days, efficiency = 70%)

DT = 65.6 ft

Economic Drawdown Constraint (EDC) = $0.4 * 182 \text{ ft} = 72.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $182 \text{ ft} - 60 \text{ ft} = 122 \text{ ft}$

Total drawdown of 65.6 ft is less than the EDC and PDC, so this well is **not critical**.

727:

Water Column = 181 ft

DP = 4.0 ft (Net drawdown from the proposal indicated above)

DE = 40.5 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 15.9 ft (S = 0.1625, T = 122,235 gpd/ft, Q = 689 gpm, tp = 140 days, efficiency = 70%)

DT = 60.4 ft

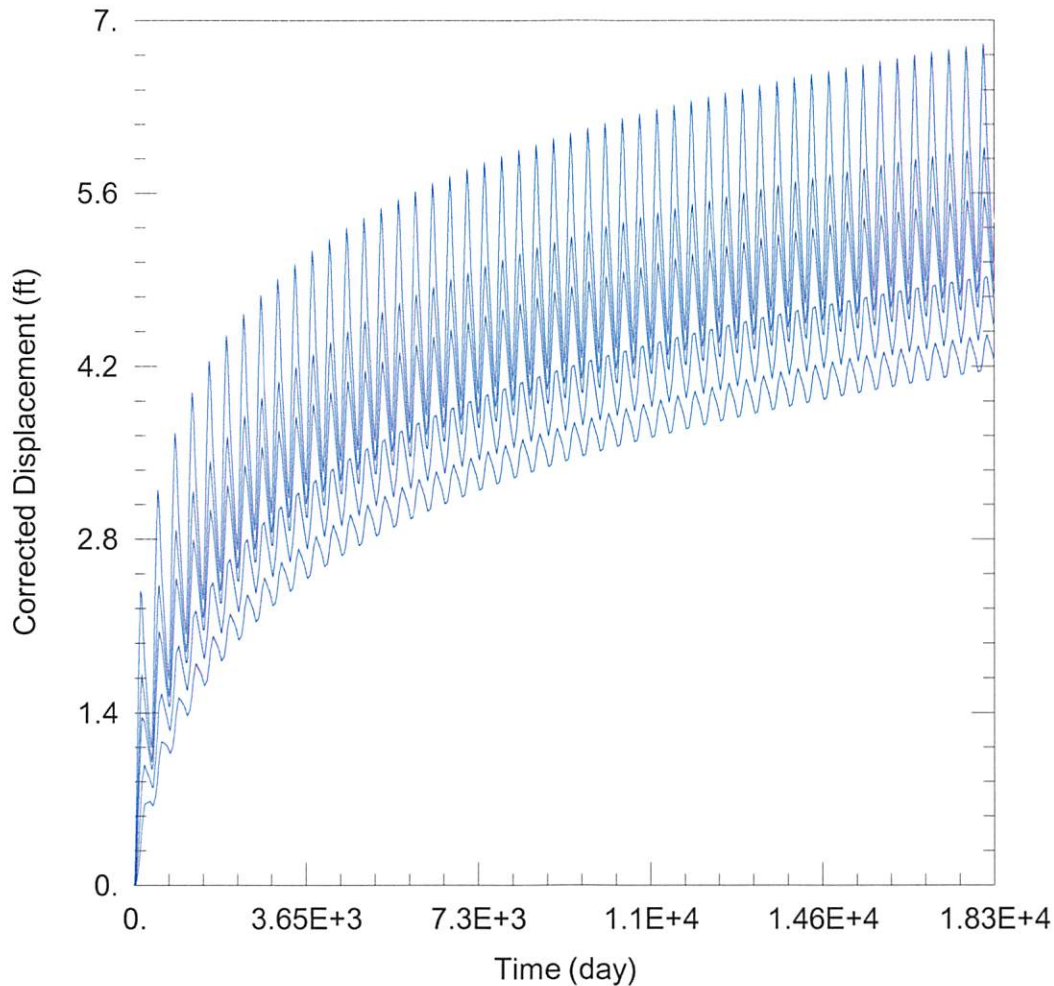
Economic Drawdown Constraint (EDC) = $0.4 * 181 \text{ ft} = 72.4 \text{ ft}$

Physical Drawdown Constraint (PDC) = $181 \text{ ft} - 60 \text{ ft} = 121 \text{ ft}$

Total drawdown of 60.4 ft is less than both the EDC and PDC, so this well is **not critical**.

Conclusion:

The proposed move is located near a critical well and if operated as proposed is likely to create a noticeable effect. GMD3 recommends mitigating this well to well effect by limiting the proposed well to a rate of 815 gpm. This would reduce the effect on the well authorized under water right nos. 3424 & 6073 & 8059 ID 3 to 3.5 ft.



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\4378\4378 Proposed.aqt

Date: 02/24/21

Time: 15:59:49

PROJECT INFORMATION

Company: GMD 3

Project: 4378

Location: Stevens County

Test Well: 4378

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
4378	-91495	162791

Observation Wells

Well Name	X (ft)	Y (ft)
□	-91495	162791
□ <u>3424 & 6073 & 8059</u>	-93856	162974
□ <u>11070</u>	-93603	160260
□ <u>6073 & 8059</u>	-96249	163015
□ <u>25661</u>	-88563	162872
□ <u>727</u>	-87959	160940

SOLUTION

Aquifer Model: Unconfined

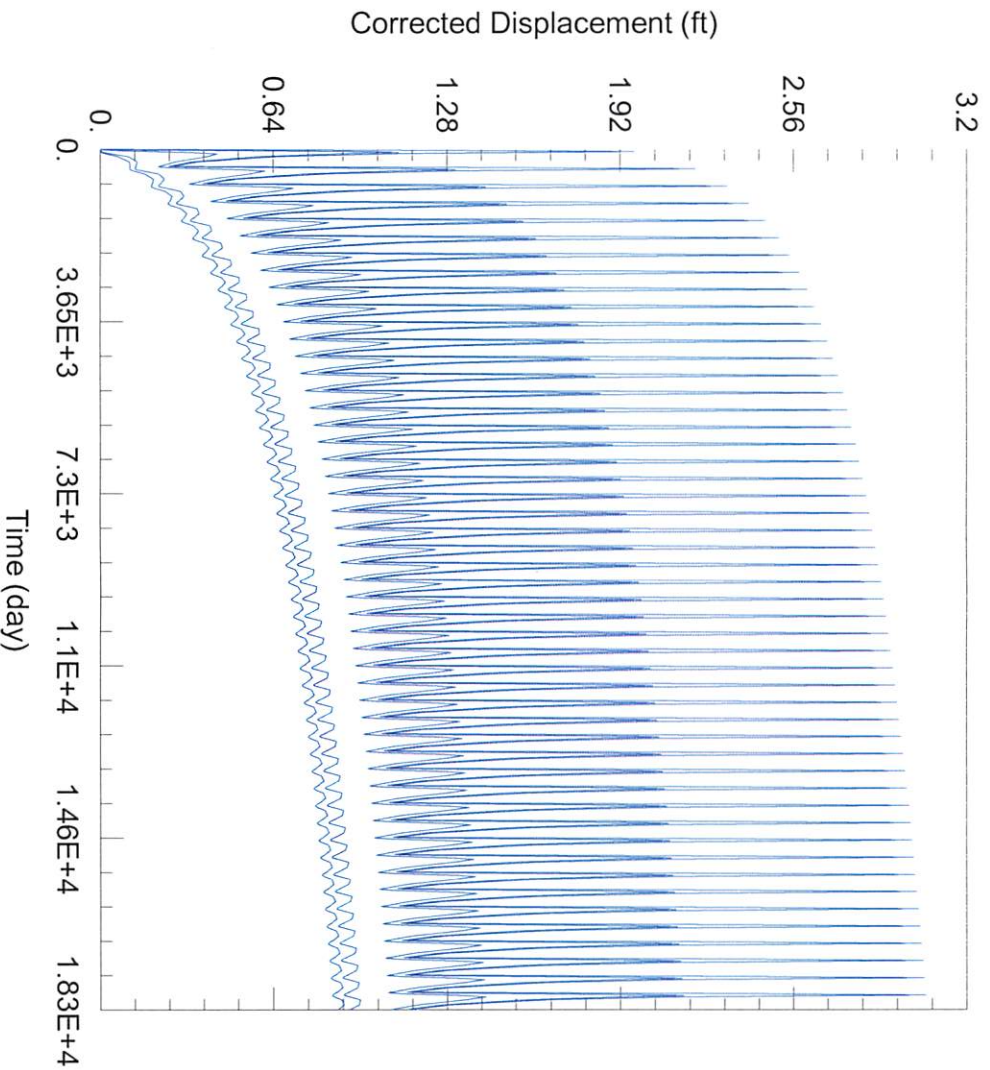
Solution Method: Theis

T = 5513.4 ft²/day

S = 0.2049

Kz/Kr = 1.

b = 181. ft



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\4378\4378_Current.aqt
 Date: 02/24/21 Time: 15:59:55

PROJECT INFORMATION

Company: GMD 3
 Project: 4378
 Location: Stevens County
 Test Well: 4378

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
4378	-93627	161931

Observation Wells

Well Name	X (ft)	Y (ft)
<input type="checkbox"/> 3424 & 6073 & 8059	-93856	162974
<input type="checkbox"/> 11070	-93603	160260
<input type="checkbox"/> 6073 & 8059	-96249	163015
<input type="checkbox"/> 25661	-88563	162872
<input type="checkbox"/> 727	-87959	160940

SOLUTION

Aquifer Model: Unconfined

Solution Method: Theis

T = 5513.4 ft²/day
 Kz/Kr = 1.

S = 0.2049
 b = 181. ft