### Evaluation of proposed move for Water Right No. 18349

Proposed: Move water right no. 18349 to a new well location, located 2,273 ft to the southeast.



Wells within 1 mile: 2656, 30648, a domestic well in section 20-30-36, and a domestic well in section 21-30-36.

The saturated thickness at the proposed well location is estimated to be 190 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:

$$S = 0.09251$$
,  $T = 2348.2$  ft<sup>2</sup>/day, tp<sub>current</sub> = 63 days, Q<sub>current</sub> = 300 gpm, tp<sub>proposed</sub> = 73 days, Q<sub>proposed</sub> = 1305 gpm

Theis drawdowns were calculated as follows:

2656: Drawdown from current location = 1.43 ft

Drawdown from proposed location = 7.08 ft

Net drawdown = 5.6 ft

30648: Drawdown from current location = 1.24 ft

Drawdown from proposed location = 6.77 ft

Net drawdown = 5.5 ft

Domestic 20-30-36: Drawdown from current location = 1.39 ft

Drawdown from proposed location = 6.73 ft

Net drawdown = 5.3 ft

Domestic 21-30-36: Drawdown from current location = 1.08 ft

Drawdown from proposed location = 6.83 ft

Net drawdown = 5.7 ft

Net drawdown exceeds the drawdown allowance of 3.5 ft for all wells within 1 mile of the proposed location. Critical well analysis is necessary on those wells.

#### **Critical Well Evaluation:**

#### 2656:

Water Column = 191 ft

DP = 5.6 ft (Net drawdown from the proposal indicated above)

DE = 46.8 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 22.1 ft (S = 0.09985, T = 41,893 gpd/ft, Q = 325 gpm, tp = 306 days, efficiency = 70%)

DT = 74.5 ft

Economic Drawdown Constraint (EDC) = 0.4 \* 191 ft = 76.4 ft

Physical Drawdown Constraint (PDC) = 191 ft - 60 ft = 131 ft

Total drawdown of 74.5 ft is less than the EDC and PDC, so this well is not critical.

#### 30648:

Water Column = 191 ft

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

DE = 46.8 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 12.3 ft (S = 0.09985, T = 41,893 gpd/ft, Q = 190 gpm, tp = 141 days, efficiency = 70%)

DT = 64.6 ft

Economic Drawdown Constraint (EDC) = 0.4 \* 191 ft = 76.4 ft

Physical Drawdown Constraint (PDC) = 191 ft - 60 ft = 131 ft

Total drawdown of 64.6 ft is less than the EDC and PDC, so this well is not critical.

#### Domestic 20-30-36:

Water Column = 199 ft

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

DE = 31.0 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DT = 36.3 ft

Economic Drawdown Constraint (EDC) = 0.4 \* 199 ft = 79.6 ft

Physical Drawdown Constraint (PDC) = 199 ft - 20 ft = 179 ft

Total drawdown of 36.3 ft is less than the EDC and PDC, so this well is not critical.

#### Domestic 21-30-36:

Water Column = 190 ft

DP = 5.7 ft (Net drawdown from the proposal indicated above)

DE = 36.7 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DT = 42.4 ft

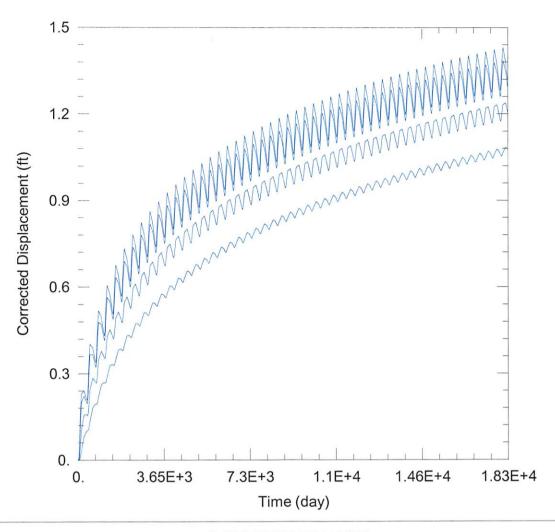
Economic Drawdown Constraint (EDC) = 0.4 \* 190 ft = 76.0 ft

Physical Drawdown Constraint (PDC) = 190 ft - 20 ft = 170 ft

Total drawdown of 42.4 ft is less than the EDC and PDC, so this well is not critical.

#### **Conclusion:**

If the proposed well is operated at its full rate and quantity, drawdown effects on neighboring wells may be noticeable. However, the remaining saturated thickness and aquifer conditions suggest that it is unlikely neighboring wells will lose the capability to maintain their current production as a result of this move in the near term. All neighboring wells are operated by the applicant. GMD3 staff recommends approval of this application.



# WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021\_Moves\18349\18349 Current.aqt

Date: 08/30/21

Time: 16:26:02

# PROJECT INFORMATION

Company: GMD 3 Project: 18349

Location: Grant County

# **WELL DATA**

 Pumping Wells

 Well Name
 X (ft)
 Y (ft)

 18349
 -137210
 204205

Well Name	X (ft)	Y (ft)
О	-137210	204205
<b>2656</b>	-133081	205390
<b>30648</b>	-131838	204168
<ul> <li>Domestic 20-30-36</li> </ul>	-140883	201580
<ul> <li>Domestic 21-30-36</li> </ul>	-132047	199961

Observation Wells

# SOLUTION

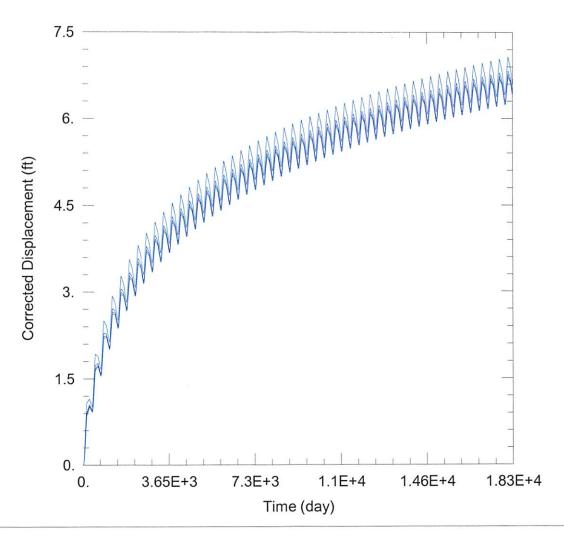
Aguifer Model: Unconfined

 $T = 2348.2 \text{ ft}^2/\text{day}$ 

Kz/Kr = 1.

Solution Method: Theis

S = 0.09251b = 190. ft



# WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021 Moves\18349\18349 Proposed.aqt

Date: 08/30/21 Time: 16:25:54

# PROJECT INFORMATION

Company: GMD 3 Project: 18349

Location: Grant County

### **WELL DATA**

Pumping Wells		
Well Name	X (ft)	Y (ft)
18349	-136145	202197

Observation Wells			
Well Name	X (ft)	Y (ft)	
	-136145	202197	
<b>2656</b>	-133081	205390	
<b>30648</b>	-131838	204168	
<ul> <li>Domestic 20-30-36</li> </ul>	-140883	201580	
<ul> <li>Domestic 21-30-36</li> </ul>	-132047	199961	

# SOLUTION

Aquifer Model: Unconfined

 $T = 2348.2 \text{ ft}^2/\text{day}$ 

Kz/Kr = 1.

Solution Method: Theis

S = 0.09251b = 190. ft