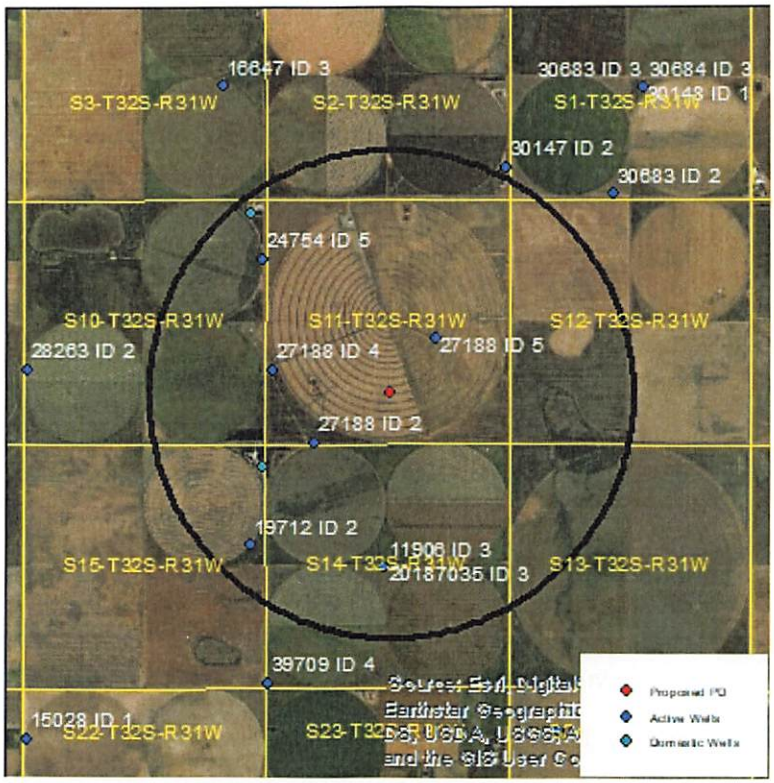
Evaluation of proposed move for Water Right No. 27188 ID5

Proposed: Move water right no. 27188 ID5 a distance of 1,550 ft to the southwest.



Wells within 1 mile: 27188 ID2, 27188 ID4, 24754, 19712, 11906, a domestic well in section 10-32-31, and a domestic well in section 15-32-31.

The saturated thickness at the proposed well location is estimated to be 196 ft, based upon the driller's log and an observation well in section 1-32-31. 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 = 0.02664, T = 3681 ft^2/day,

$tp_{current}$ = 48 days (based on average use and assumed rate), $Q_{current}$ = 300 gpm (assumed), $tp_{proposed}$ = 56 days, $Q_{proposed}$ = 690 gpm

Theis drawdowns were calculated as follows:

27188 ID2: Drawdown from current location = 1.56 ft

Drawdown from proposed location = 6.53 ft

Net drawdown = **5.0 ft**

27188 ID4:	Drawdown from current location = 1.51 ft
	Drawdown from proposed location = 5.17 ft
	Net drawdown = **3.7 ft**
24754:	Drawdown from current location = 1.34 ft
	Drawdown from proposed location = 3.66 ft
	Net drawdown = **2.3 ft**
19712:	Drawdown from current location = 0.98 ft
	Drawdown from proposed location = 3.30 ft
	Net drawdown = **2.3 ft**
11906:	Drawdown from current location = 1.11 ft
	Drawdown from proposed location = 3.86 ft
	Net drawdown = **2.8 ft**
Domestic 10-32-31:	Drawdown from current location = 1.14 ft
	Drawdown from proposed location = 3.02 ft
	Net drawdown = **1.9 ft**
Domestic 15-32-31:	Drawdown from current location = 1.19 ft
	Drawdown from proposed location = 4.35 ft
	Net drawdown = **3.2 ft**

Net drawdown exceeds the drawdown allowance of 3.5 ft for water right numbers 27188 ID2 and 27188 ID4. Critical well analysis was performed for those wells.

Critical Well Evaluation:

27188 ID2:

Water Column = 196 ft

DP = 5.0 ft

DE = 57 ft

DD = 22.3 ft (S = 0.02664, T = 112,246 gpd/ft, Q = 831 gpm, tp = 73 days, efficiency = 70%)

DT = 84.3 ft

Economic Drawdown Constraint (EDC) = 0.4 * 196 ft = 78.4 ft

Physical Drawdown Constraint (PDC) = 196 ft – 60 ft = 136 ft

Total drawdown of 84.3 ft is greater than the EDC, so this well **is critical.**

27188 ID4:

Water Column = 196 ft

DP = 3.7 ft

DE = 57 ft

DD = 10.9 ft (S = 0.02664, T = 112,246 gpd/ft, Q = 399 gpm, tp = 100 days, efficiency = 70%)

DT = 71.6 ft

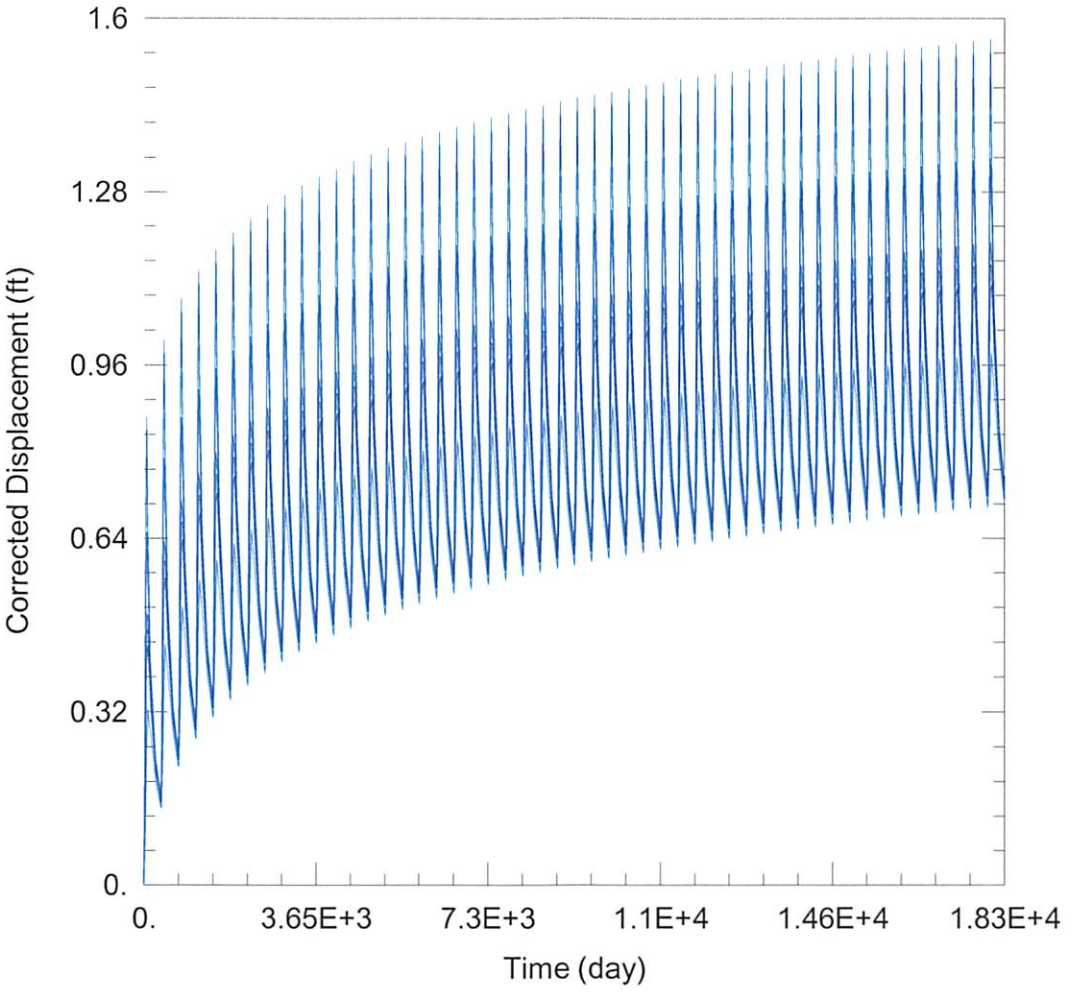
Economic Drawdown Constraint (EDC) = 0.4 * 196 ft = 78.4 ft

Physical Drawdown Constraint (PDC) = 196 ft – 60 ft = 136 ft

Total drawdown of 71.6 ft is less than both the EDC and PDC, so this well **is not critical.**

Conclusion:

The proposed move is likely to create noticeable effects on neighboring wells 27188 ID2 and 27188 ID4. 27188 ID2 was identified as a critical well because it is projected to lose more than 40% of its remaining usable water supply over the next 25 years. Both of these wells are owned and operated by the applicant. GMD3 staff recommends approval of the application.



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\27188_ID5\27188 Current.aqt
Date: 11/19/21 Time: 16:34:19

PROJECT INFORMATION

Company: GMD 3
Project: 27188 ID5
Location: Seward County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
27188 ID5	40923	146720

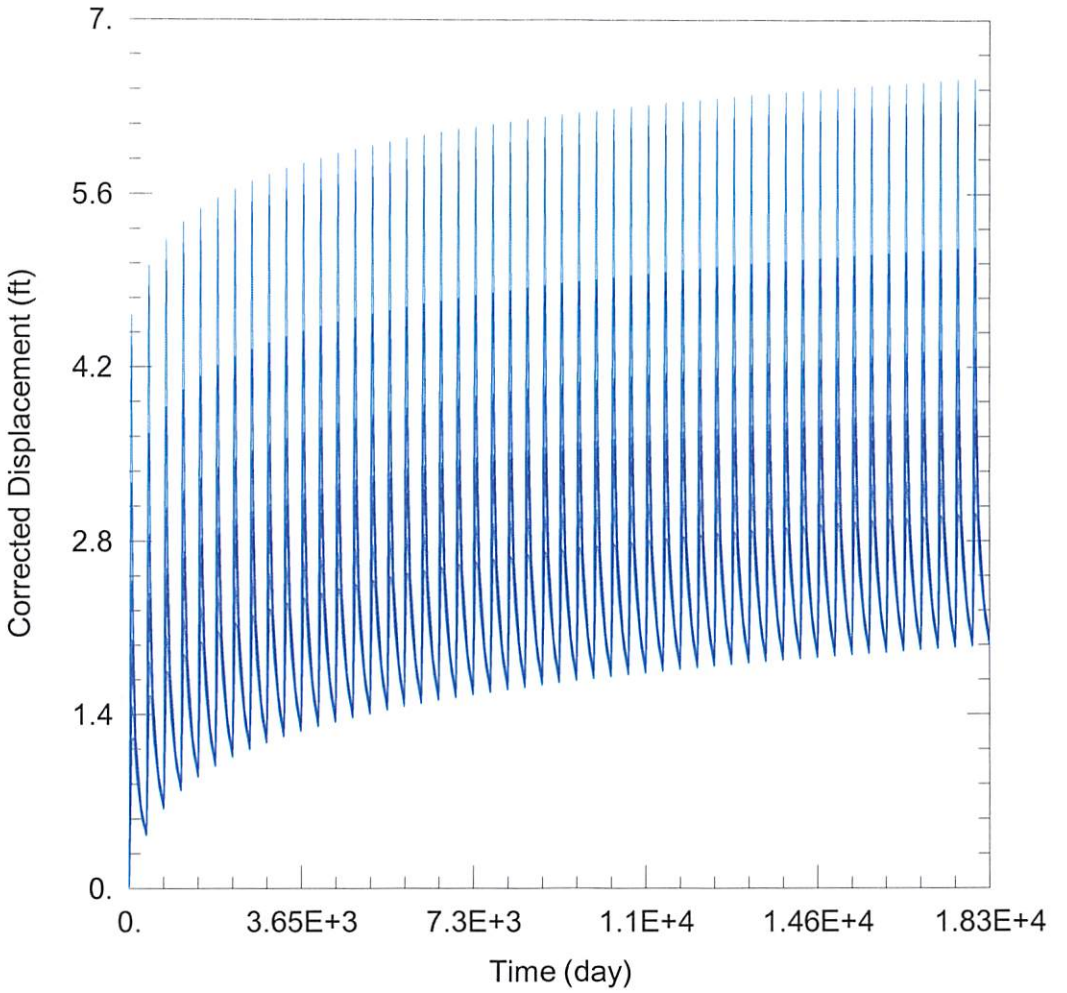
Observation Wells

Well Name	X (ft)	Y (ft)
▫	40923	146720
▫ 27188 ID2	38255	144469
▫ 27188 ID4	37362	146041
▫ 24754	37138	148415
▫ 19712	36856	142239
▫ 11906	39795	141755
▫ Domestic 10-32-31	36875	149412
▫ Domestic 15-32-31	37137	143939

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 3681. ft^2/day
S = 0.02664
Kz/Kr = 1.
b = 196. ft



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\27188_ID5\27188 Proposed.aqt
Date: 11/19/21 Time: 16:34:13

PROJECT INFORMATION

Company: GMD 3
Project: 27188 ID5
Location: Seward County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
27188 ID5	39934	145526

Observation Wells

Well Name	X (ft)	Y (ft)
▫	39934	145526
▫ 27188 ID2	38255	144469
▫ 27188 ID4	37362	146041
▫ 24754	37138	148415
▫ 19712	36856	142239
▫ 11906	39795	141755
▫ Domestic 10-32-31	36875	149412
▫ Domestic 15-32-31	37137	143939

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 3681. ft^2/day
S = 0.02664
Kz/Kr = 1.
b = 196. ft