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MEMORANDUM

TO: Water Resources Commission

FROM: Jason Spriet, East Region Manager
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SUBJECT: Agenda Item A, March 13, 2025
Water Resources Commission

DIVISION 512 RULEMAKING UPDATE

I. Introduction

During this agenda item, staff will brief the Commission on the latest developments in the Division 512 Rulemaking. Discussions will include updates on additional insights gained through modeling, the process to refine groundwater management scenarios, the proposed adaptive management plan, and initial fiscal impact results. *This is an informational report.*

II. Integrated Water Resources Strategy Recommended Action

- 1. A-C – Understanding water resources today
- 9. C – Partner with federal agencies, Tribes, and neighboring states in long-term water resources management
- 10. F – Provide an adequate presence in the field
- 11. E – Develop additional groundwater protections

III. Background

The Department continues to use the Harney Basin Groundwater Model (HBGM) to test management scenario outcomes on groundwater levels within the Harney Basin. This modeling work provides insight for the Division 512 Rules Advisory Committee (RAC) on the impacts of different groundwater management scenarios on water users and groundwater levels. Conversations with the RAC have made clear that more work is needed to quantify and make transparent the impacts of groundwater management scenarios on natural discharge to streams and springs, groundwater dependent ecosystems (GDE) in the form of evapotranspiration (ET), and domestic wells. Department staff continue to use the HBGM to quantify and communicate modeled outcomes in specific areas and basin wide. The Department has also updated its

proposal for groundwater management based on the information learned through modeling and RAC and public feedback.

In conjunction with the ongoing modeling work, the Department has engaged with ECOnorthwest to evaluate the economic impacts of different groundwater management scenarios and reductions in pumpage across the basin. Initial results have been presented to the RAC and feedback has been received.

IV. Discussion

After the HBGM released in March of 2024, the Department received input from the RAC that the model should be used to inform the process. Based on this feedback, the Department focused on running the model and collaborating with the RAC on designing management scenarios. The work resulted in five management scenarios agreed upon with the RAC during the October RAC meeting. The Department ran these scenarios and presented results to the RAC in November. At the same time, Department staff developed optimization software to run the model and identify the maximum amount of pumping that could occur within a management scenario while achieving the goal of a minimum target water level trend of no decline. Since that time, Department staff have further expanded the optimization software to accept additional parameters. This work is responsive to the RAC's concerns about impacts to the economy, spring and stream flow, ET, and domestic wells. In conjunction with this software development work, the Department has been engaging with the RAC to frame the conversation around the goal for groundwater levels while also understanding impacts to those areas of concern and possibly constraining results.

At the November 2024 RAC meeting, the Department went through a values exercise with the RAC to attempt to capture individual RAC member values related to the criteria being considered when proposing a management scenario. These criteria included impacts to domestic wells, impacts to small business and the economy, timeliness of achieving the groundwater level trend goal, strictly following prior appropriation, creating room for voluntary agreements, and adaptive management. A key takeaway from this exercise was that every individual criterion was ranked as the most important or the least important by at least one member of the RAC. Using statistical methods for analysis, Department staff identified two primary profiles and formulated a management scenario for each profile based on the responses to the values exercise, past RAC member feedback, and the objectives expressed in the three RAC proposed management scenarios. These two scenarios were then run through the model to identify the maximum amount of pumpage that could occur within each subarea and still achieve the goal of a minimum target water level trend of no decline.

During the January 2025 RAC meeting, the Department presented the outcomes of the two profile-based management scenarios. The Department also proposed an updated management scenario for the RAC to consider and provide feedback. The Department's proposed management scenario inputs and detailed results can be seen in Attachment A. The modeling results show that basin wide pumpage will need to be reduced by 38% from 2018 levels to

achieve the goal of a minimum target water level trend of no decline in 30 years. More discussion is planned internally and with the RAC to gather feedback for the existing management scenarios and if the Department should consider additional management scenarios.

Proposal for Adaptive Management

Members of the RAC have advocated that the Department implement an adaptive management strategy that will guide adjustments to curtailment based on measured groundwater conditions. At the January 2025 RAC meeting Department staff presented the policy and technical challenges to implementing adaptive management and discussed an initial proposal for an adaptive management strategy in the Harney Basin.

Department staff proposed using the HBGM to develop target trajectories for groundwater levels in each subarea which can be compared against measured groundwater level changes at future adaptive management checkpoints as groundwater use reductions are phased in. A provisional schedule for phasing in curtailment will be defined, and based on measured conditions at each checkpoint, the scheduled curtailment may be adjusted up or down. The initial proposed timeline is based on a 24-year phase-in period with adaptive management checkpoints every 6 years.

The target trajectories for groundwater levels in each subarea will be defined by the median modeled groundwater level change in well cells through time. Thresholds, or "envelopes" above and below the target trajectory will be defined by specified modeled percentiles of decline in each subarea. If the median of measured groundwater level changes at each checkpoint fall within the specified envelope, the provisional schedule will proceed as defined. If the median of measured groundwater level changes at each checkpoint fall above or below the specified envelope, the scheduled curtailment volume and timing may be adjusted.

Fiscal Impact

At the October 10 RAC meeting, the Department was asked to hire an independent economist for a detailed economic analysis and the Department chose ECOnorthwest. ECOnorthwest was tasked with assessing economic impacts on the economy, local revenue, small businesses, and ecosystems, using existing data, local interviews, and an IMPLAN model.

ECOnorthwest established an economic baseline by running two different management scenarios in IMPLAN: one with six subareas and smaller reductions and another with one large subarea and greater reductions compared to the six subarea management scenarios. These management scenarios established a baseline economic value for the agricultural sector, the economy, and local government revenue.

The IMPLAN model shows a 1-to-1 relationship between groundwater use reduction and farm revenue decline in the Harney Basin, as it is a mono-crop economy reliant on water-intensive crops. However, local tax revenue isn't directly tied to this relationship because different land classes (Classes 2, 3, and 5) generate varying tax amounts. Class 2 generates the most, but land classifications can vary, meaning a partially curtailed irrigation pivot might still be graded

higher. ECOnorthwest's next step is to use the economic baseline to assess the Department's proposed management scenario.

The Department is assessing the economic impact on domestic well users by calculating the average, maximum, and minimum well replacement costs in Harney County, using data from the Well, Abandonment, Repair, and Replacement Fund (WARRF) and Harney Domestic Well Fund (HDWF.) These costs will then be multiplied by the number of wells predicted to dry by the Harney Basin Groundwater Model.

V. Conclusion

Using the HBGM, the Department is engaging with the RAC to identify the pumpage reductions needed to achieve the goal of a minimum target water level trend of no decline. The Department proposed a management scenario based on modeling efforts, RAC feedback, and public comments. This scenario attempts to balance the impacts of further groundwater declines on stream and spring flow, groundwater dependent ecosystems through ET, and domestic wells going dry with the economic impacts of curtailment. There is ongoing discussion if additional management scenarios should be considered.

The Department's proposed management scenario would be implemented along with an adaptive management framework that uses the model to establish trajectories for achieving success. These trajectories can then be compared to measured groundwater level trends over time to evaluate how successful reductions in pumpage (voluntary or regulatory) are. These trajectories provide a clear path to achieve the goal of stabilizing groundwater levels in the basin and provide the opportunity for adjustments to be made to the curtailment schedule as needed.

Attachments:

1. Proposed Management Scenario Inputs and Results

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Proposed Management Scenario Inputs and Results

Division 512 Rulemaking Update

At the January 22nd, 2025, Rules Advisory Committee (RAC) meeting, the Department proposed a management scenario which was then input into the Harney Basin Groundwater Model (HBGM) optimization software to generate results. Table 1 below details the inputs (parameters) that were entered into the optimization software.

Table 1: Optimization parameters used for modeling the Department proposed management scenario

Parameter	**WRD Proposed Management Scenario**
Spatial extent	7 Subareas
Stability success metric	Median (50th percentile) of well-cells
Timeline to achieve goal	30 years
Timeline for phasing curtailment	24 years
Frequency of adaption (checkpoints)	Every 6 years
Discharge to streams and springs	At least 50-70% of 2022 rates
Natural evapotranspiration	At least 60% of 2018 rates
Dry domestic wells	No more than 170% of 2018 modeled counts

Results for the modeled management scenario inputs detailed above in Table 1 are shown in Table 2 below.

Table 2: Modeling results for the Department proposed management scenario

Attribute	**WRD Proposed Management Scenario Result**
Final PTW (AF/yr)	82,800
Percent change in basin-wide pumpage from 2018	-38%
Median water level change from 2018 (ft)	-2.2
Change in lowland spring & streamflow (% of 2022)	-9%
Change in lowland natural ET (% of 2018)	-29%
Change in dry well count (# vs. 2018)	+19
Change in dry well count (% vs. 2018)	+24%