



Harney Groundwater Rules Advisory Committee: Discussion Groups

Model Scenario Options

Last updated 9/11/2024

The tables below describe the various scenarios that have been previously tested in the model or that are currently under consideration. A brief description of the model can be found [here](#), including an overview of the model design, inputs, calibration, outputs, and limitations. The discussion group will be discussing and generating options and considerations for use by the RAC at their October meeting to develop 2-3 additional scenarios to run through the USGS groundwater study model. These discussions will be supported by the Department's [guidance document](#) describing how to develop management scenarios for evaluation by the USGS groundwater study model. The model scenarios developed will be most usable when they are consistent with Oregon law and policy, can be justified with science and sound information, and can inform realistic management actions. Each model scenario should contemplate:

- The purpose of the scenario with relation to the model (what question are we asking or are we testing for?);
- The geographic locations of potential reductions (e.g., subareas);
- Groundwater management goal(s) (e.g., target water level trends and/or levels) and considerations;
- Proposed amount of reductions; and
- Timing of reductions.

And check out Appendix A below – Try thinking about building your own scenario before the meeting on September 16.

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Table 1. Previous Scenarios or Scenarios Currently Under Consideration

Scenario	A	B	C	D
Developed By	US Geological Survey (USGS)	USGS	Oregon Water Resources Department (OWRD)	OWRD – <i>Running this scenario is contingent upon OWRD capacity</i>
Scenario Title	No Change <i>*For comparison purposes only, not under consideration for management</i>	100% Curtailment, No GW Pumping <i>*For comparison purposes only, not under consideration for management</i>	Permissible Total Withdrawal (PTW) in 15 Subareas	Return to 1990 Pumping Levels
Scenario Description	Groundwater pumping is not reduced, and groundwater pumping levels remain at 2018 levels	There is no groundwater pumping for any uses starting in 2019	Permissible Total Withdrawal (PTW) is set for each of 15 subareas.	Groundwater pumping in the Harney basin is curtailed to 1990 pumping levels.
Purpose of Model Run	Educational - understand groundwater response	Educational - understand groundwater response	Understand groundwater response to OWRD’s proposed scenario	Educational - understand groundwater response
Subareas (Locations for Reductions)	Entire model extent, no subareas.	Entire model extent, no subareas.	Reductions limited to the Greater Harney Valley Groundwater Area of Concern (GHVGAC). GHVGAC divided into 15 subareas – 6 high priority subareas, 9 lower priority subareas.	Entire model extent, no subareas.
Groundwater Goal(s)	None articulated	None articulated	Target water level trend of zero (no decline) achieved in all subareas.	Target water level trend of zero (no decline) achieved in the Harney Basin.
Proposed Amount of Reductions	None	100% reduction in pumping.	PTW established for each subarea. For the 6 high priority subareas the PTW was based on the hydrograph method. For the 9 priority lower priority subareas the PTW was set to the 2018 estimated pumpage.	PTW set to basin wide 1990 modeled total pumping volumes.
Timing of Reductions / Goal Achievement	NA	Pumping ceases immediately starting in 2019.	2018-2025 pumping is set to 2018 pumpage levels. PTW fully implemented starting in 2026.	2018-2025 pumping is set to 2018 pumpage levels. PTW is fully implemented starting in 2026.
Duration of Simulation	82 Years (to Year 2100)	82 Years (to Year 2100)	82 Years (to Year 2100)	82 Years (to Year 2100)
Allocation of Reductions	NA	Zero pumping is allowed.	PTW is allocated by priority not to exceed 2018 modeled pumpage for each well.	PTW (total volume pumped in the model in 1990) is allocated by priority with no well being allocated more water than what was modeled to be pumped in 2018.

Table 2. RAC Developed Model Scenarios (to be developed at October RAC meeting)

Scenario #	E	F	G
Developed By	RAC (with discussion group input)	RAC (with discussion group input)	RAC (with discussion group input)
Scenario Title	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Scenario Description	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Purpose of Model Run	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Sub-areas (Locations for Reductions)	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Groundwater Management Goal(s)	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Proposed Amount of Reductions	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Timing of Reductions / Goal Achievement	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting
Allocation of Reductions	TBD at October RAC meeting	TBD at October RAC meeting	TBD at October RAC meeting

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Table 3. Other Model Scenarios Examined External to RAC Process

Scenario #	H	I	J	#K-Z OSU Model Runs (Forthcoming)
Developed By	The Nature Conservancy*	The Nature Conservancy*	The Nature Conservancy*	Oregon State University**
Scenario Title	10% Reductions	40% Reductions	65% Reductions	Forthcoming
Scenario Description	Slight reduction in groundwater pumping from 2018 levels	Substantial reduction in groundwater pumping from 2018 levels	Very substantial reduction in groundwater pumping from 2018 levels	Forthcoming
Purpose of Model Run	Educational—understand groundwater response	Educational—understand groundwater response	Educational—understand groundwater response	Forthcoming
Sub-areas (Locations for Reductions)	Basin-wide; output focused on Silver Creek sub-basin	Basin-wide; output focused on Silvies sub-basin	Basin-wide; output focused on Weaver Springs sub-area	Forthcoming
Groundwater Management Goal(s)	None specified or tested - for learning purposes only	None specified or tested - for learning purposes only	None specified or tested - for learning purposes only	Forthcoming
Proposed Amount of Reductions	10% reductions from 2018 pumping levels	40% reductions from 2018 pumping levels	65% reductions from 2018 pumping levels	Forthcoming
Timing of Reductions / Goal Achievement	Phased in linearly over 10 years starting in 2025 (1% reduction per year)	Phased in linearly over 10 years starting in 2025 (4% reduction per year)	Phased in linearly over 10 years starting in 2025 (6.5% reduction per year)	Forthcoming
Duration of Simulation	82 Years (to Year 2100)	82 Years (to Year 2100)	82 Years (to Year 2100)	Forthcoming
Allocation of Reductions	Reductions applied evenly among all model cells / water users regardless of priority date	Reductions applied evenly among all model cells / water users regardless of priority date	Reductions applied evenly among all model cells / water users regardless of priority date	Forthcoming

*These scenarios are shared for learning purposes only. The Nature Conservancy identified these scenarios to better understand model inputs and outputs and explore how groundwater might respond to different hypothetical levels of reduction. The Nature Conservancy is not putting these forward as management scenarios for consideration and offers them only to help inform the development of management scenarios by the RAC.

**Oregon State University worked in partnership with the USGS to develop and test an economic model that can assess economic impacts of various groundwater management scenarios. The results of the study are forthcoming (pending peer review) and a high level overview of the model and approach are summarized in a memo that can be found [here](#). The group will be notified when the model and results are made available to the public.

Appendix A. Build your own scenario(s) before the meeting

Scenario	
Developed By - <i>what is your name?</i>	
Scenario Title - <i>what would you title this scenario?</i>	
Scenario Description - <i>briefly describe the scenario</i>	
Purpose of Model Run - <i>what question are you asking of the model or what parameters are you "testing" for?</i>	
Subareas - <i>how would you divide the basin into subareas? View the subarea discussion guide.</i>	
Groundwater Management Goal(s) - <i>what are the groundwater management goals that should guide scenario development?</i>	
Proposed Amount of Reductions - <i>what amount of reductions are needed to achieve the goal(s)?</i>	
Timing of Reductions and/or Goal Achievement - <i>when should reductions be implemented and/or when would you like the goal(s) be achieved?</i>	
Duration of Simulation - <i>how long should the model run the simulation and what time intervals should we examine?</i>	
Allocation of Reductions - <i>how would you propose that reductions are allocated amongst users?</i>	
Other Ingredients - <i>are there other "ingredients" that might inform scenario development?</i>	
Other Considerations - <i>are there other considerations that should be taken into account?</i>	