



REVISED Staff Report

TO: Water Resources Commission

FROM: Ivan Gall, Director

DATE: December 11, 2025

SUBJECT: Agenda Item E
Water Resources Commission

DIVISION 512 RULEMAKING PETITION

I. Introduction

On September 12, 2025, the Department and the Commission received a petition for rulemaking (Petition, Attachment 1) to amend Oregon Administrative Rules (OAR) Chapter 690, Division 512. Similar to the rules proposed by the Department as part of the Commission's ongoing Division 512 rulemaking process (Department Proposal), the Petition proposes rules establishing one or more critical groundwater areas within the existing Greater Harney Valley Groundwater Area of Concern (GHVGAC). The Petition was filed by a number of governmental entities, businesses, and individuals in the basin as their preferred alternative to the Department Proposal. The Petition differs from the Department Proposal in significant ways, including the number and boundaries of the proposed critical groundwater areas, the groundwater withdrawal limits within those boundaries, and the timing of groundwater withdrawal reductions. The Commission will be asked to take an action on the Petition.

II. Integrated Water Resources Strategy Recommended Action

Not applicable.

III. Background

Rulemaking petitions are governed by ORS 183.390 and OAR 137-001-0070. A rulemaking petition must contain the information required by OAR 137-001-0070(1), including the full language of the proposed rules or rule amendments and "facts or arguments" showing the reasons for and effects of the proposed rule language. The Department has reviewed the rulemaking petition and concludes that the petition includes the required information.

OAR 137-003-0070(3) requires that, before denying a petition to amend or repeal a rule, the Commission must invite public comment on the rule, including whether options exist for achieving the rule's substantive goals in a way that reduces the negative economic impact on businesses. The Department accepted public comments on the rulemaking petition through 5 p.m. on October 7, 2025. In addition, the Commission held a public hearing on the rulemaking petition on October 3, 2025.

OAR 137-003-0070(4)(a) requires the Commission to either deny the petition or initiate

rulemaking proceedings on the petition within 90 days after receipt of the petition. The deadline for Commission action on this petition is December 11, 2025.

IV. Discussion

A. Comparison of Department Proposal and Petition

Key differences between the management scenarios of the Department Proposal and the Petition include the number and boundaries of proposed critical groundwater areas and the requirements for the timing and magnitude of reduction of groundwater withdrawals.

The Department Proposal includes one critical groundwater area, the boundary of which is consistent with the GHVGAC. The vast majority of groundwater use and areas of known groundwater level decline within the Harney Basin occur within the GHVGAC boundary. The Department Proposal establishes a single critical groundwater area with seven subareas, which each have their own groundwater reduction requirements (referred to as Permissible Total Withdrawals (PTWs)). The evidence indicates that a single groundwater reservoir underlies the entirety of the proposed critical groundwater area. While transmissivity rates of groundwater flow may vary, withdrawals in one subarea will eventually affect the groundwater levels in another.

The Department Proposal requires reductions in groundwater withdrawals in six of the seven subareas. The Department Proposal was based on optimization modeling, using the Harney Basin Groundwater Model (HBGM) to define the minimum pumping reductions in each subarea that would result in no median groundwater level decline after 30 years. Put another way, the Department defined desired hydraulic condition outputs from the model and then used the model to back-calculate the pumping rate inputs for each subarea that would result in those defined outputs.

The Petition would establish five separate critical groundwater areas within the Harney Basin. When combined, the boundaries of the five areas mostly, but not entirely follow the boundaries of the Department Proposal critical groundwater area.

The Petition imposes mandatory groundwater withdrawal reductions in two of its five proposed critical groundwater areas. It establishes targets for reduction via voluntary agreements in the other three proposed areas.

Department Staff used the HBGM to simulate the future hydraulic conditions resulting from the Petition management scenario pumping inputs (Attachment 2). Based on this modeling, and assuming the voluntary agreement reduction targets are achieved, the Petition would reduce rates of median groundwater decline after 30 years, but declines would continue in five of the seven subareas designated by the Department.

B. Comparison of Petition with Spectrum of Available Policy Options

The Petition is one example of an alternative management scenario to the Department Proposal, but the Department has also received other proposed modifications to the Department Proposal. For example, the Division 512 RAC requested evaluation of an

alternative management scenario with a lesser pumping reduction (i.e., more permissible future pumping) in the Lower Blitzen/Voltage subarea during the RAC #14 meeting held on 4/16/2025. Department staff used the HBGM to simulate the best understanding of expected future hydraulic conditions given model input parameters reflecting the RAC-proposed management criteria (Attachment 3).

Department staff have conducted another round of simulation modeling with the HBGM to demonstrate changes in water level outcomes in response to changing model inputs related to timing and quantity of pumping reductions. The starting point for this simulation was the Petition management scenario, with modification to the input parameters regarding the timing of voluntary reductions and the quantity of voluntary reductions in 3 subareas (called “Modified Petition Simulation,” see Attachment 4). The Attachment 4 memo presents model simulation output results for four management scenarios:

- “Full Pumpage” describing the model output water level trends under the baseline scenario of unchanged (2018) pumping volumes into the future
- “OWRD Proposal” describing the water level trends that were defined as success criteria during the Division 512 RAC process, and the minimum reductions in pumping needed to simulate those defined outcome criteria
- “Petition Proposal” describing the model output water level trends under the defined pumping management scenario described in the Petition
- “Modified Petition Simulation” describing the model output water level trends under an additional/alternate defined pumping management scenario intermediate to the Petition and the OWRD Proposal

The Modified Petition Simulation shows that modifying model scenario inputs, including pumping volumes and timing, alters the modeled water level trend outputs. Any number of management scenarios with differing volume and timing of pumping in various subarea configurations are possible. Assuming (as has been the case to date) that alternate proposed management scenarios recommend a reduction in pumping from the 2018 baseline scenario, but more pumping than the OWRD Proposal, the output water level trend simulations will fall somewhere between the Full Pumpage and OWRD Proposal model outputs.

C. Discussion of the Spectrum of Potential Policy Options

Overallocation of the groundwater resource in the Harney Basin has resulted in groundwater levels declining, at variable rates, across the basin, exceeding the definition of excessive declines in acute areas and prompting the Department to propose a critical groundwater area to control, as needed, groundwater pumping. The Commission has been briefed on the management approach recommended by the Department in the proposed rules, as well as the management approach recommended by petitioners in the Petition.

Agency staff have discussed with the Commission over the last several years that managing groundwater sustainably in the Harney Basin groundwater reservoir requires reductions in

groundwater use to stabilize, or slow, declining groundwater levels. It is a policy option as to how reasonably stable groundwater levels are defined. The amount of pumping reductions, and the timeframe over which pumping reductions occur, are also policy options. As a policy, the OWRD Proposal (the proposed Division 512 rules) promote a phased approach to reducing groundwater pumping to achieve groundwater level stability in 30 years.

V. Alternatives

The Commission may consider the following alternatives:

1. Initiate rulemaking proceedings based on the rule language proposed in the Petition
2. Deny the Petition

VI. Recommendation

The Director recommends denial of the Petition. The Department has incorporated some of the rule language proposed in the Petition into the Department Proposal.

Attachments:

1. Petition for Rulemaking to Amend Oregon Administrative Rules Chapter 690, Division 512
2. OWRD Memo dated 9/30/2025 Re: Technical Evaluation of Petition to Amend Division 512
3. OWRD Memo dated 7/30/2025 RE: Corrected: Evaluation of Division 512 RAC Alternate PTW Scenario
4. OWRD Memo dated 12/3/2025 Re: Technical Evaluation of Modified Petition Simulation

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REPRESENTATIVE MARK OWENS

HOUSE DISTRICT 60
900 Court St NE H-475
Salem OR 97301

September 11, 2025

Re: Petition for Rulemaking to Amend Oregon Administrative Rules (OAR) Chapter 690, Division 512

Director Ivan Gall
Oregon Water Resources Department
725 Summer St NE Ste A
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Water Resources Commissioners
725 Summer St NE Ste A
Salem, OR 97301

Dear Director Gall, Chair Smitherman and Commissioners,

Enclosed please find a Petition for rulemaking to amend Division 512 Rules to be filed with the Oregon Water Resources Commission.

We appreciate the extensive work the department has done with and in our community over the last ten years including convening the 512 Rules Advisory Committee, partnering with us for Place-Based Planning to the Groundwater Study Advisory Committee and currently the Division 512 Rulemaking.

Our goal is to arrive at the best policy for the Harney Basin, with consideration of statutes, rules, science, data and public input that will help us solve this complex issue. This is the reason for the petition and what has galvanized our community to bring this forward.

Sincerely,

Mark Owens

House District 60

BEFORE THE OREGON WATER RESOURCES COMMISSION

PETITION TO AMEND OREGON ADMINISTRATIVE RULES

CHAPTER 690, DIVISION 512

**(HARNEY BASIN GROUNDWATER CRITICAL GROUNDWATER AREAS AND
SERIOUS WATER MANAGEMENT PROTECTION AREA)**

This Petition to Amend Oregon Administrative Rules (OAR) Chapter 690, Division 512 (the “Petition”) is made pursuant to ORS 183.390(1), OAR 137-001-0070, and OAR 690-001-0005. For the reasons set forth below, Petitioners request that the Oregon Water Resources Commission initiate rulemaking to amend OAR 690-512.

The Petition is supported and brought by Harney County, the City of Burns, the City of Hines, the Malheur Wildlife Refuge, the Burns Paiute Tribe, irrigators across the basin, local business, and Representative Mark Owens (the “Petitioners”). The individual petitioners are listed by name and address at the close of this Petition.

The Petition seeks to amend Oregon Administrative Rules at Chapter 690, Division 512 as outlined in Exhibit A, the Proposed Rules and Summary. The proposed Division 512 Rules amend existing Chapter 690, Division 512 rules by deleting OAR 690-512-0010 and 690-512-0020 and adding the following new rules: OAR 690-512-0010 to OAR 690-512-00150. In the proposed rule amendments, existing sections OAR 690-512-0090 and OAR 690-512-0100 would remain, but would be renumbered as OAR 690-512-0160 and OAR 690-512-0170, respectively.

It proposes rules that will implement Oregon's groundwater policy goal of achieving reasonably stable groundwater conditions in the Harney Basin and protecting the public health, safety and welfare of the community. Amendments to Division 512 are needed because the existing rule is inadequate to address declining groundwater levels in portions of the basin. The Oregon Water Resources Department (“WRD” or “the Department”) has proposed rules to address declining groundwater levels as well. This Petition is submitted as an alternative to the Department’s proposed rulemaking for the reason that scientific, management, and economic impact concerns raised by the Rule Advisory Committee (“RAC”), Burns Paiute Tribe, the cities, Harney County, and groundwater users in the basin were not adequately addressed in the Department’s proposed rules.

This Petition and the included proposed rule amendments will uphold and implement Oregon’s groundwater policies and substantive goals. Indeed, the rules proposed through this Petition require more immediate reductions in the areas of greatest concern than the Department’s proposal. Importantly, however, these proposed rule amendments do not curtail in areas that are

not experiencing excessive declines and they place a much higher emphasis on voluntary measures, allowing the community to create solutions that make sense for their local area, while retaining a strong regulatory backstop if those solutions do not maintain stable groundwater levels and reservoir conditions.

This Petition includes an overview of the proposed rule amendments, the factual and technical bases for designating groundwater reservoirs and critical groundwater areas, and the corrective control and voluntary measures necessary to maintain and achieve stable groundwater levels, and it outlines the rule amendment impacts on groundwater users and the basin as a whole.

I. Overview of Proposed Rule Amendments

Exhibit A – Proposed Rule and Summary provides a summary of the critical groundwater area rules proposed and sets out the rules proposed to be deleted and rules proposed for addition.

The Oregon legislature has long realized that efficient and equitable management of water is necessary to support the general welfare of the people and ensure their continued prosperity. (ORS 536.220) Recognizing this, the legislature adopted a water policy intended to protect and manage water resources so that water can be beneficially used by the people of the state. (ORS 536.220) Groundwater management is an essential component of Oregon's water policy, and the Oregon legislature expressly recognizes that beneficial use within the capacity of a groundwater resource is a core tenet of effective management. (ORS 537.525(3).) Oregon's groundwater policy also acknowledges the importance of engaging with groundwater users to address existing or anticipated impairment of groundwater resources, and the Water Resources Commission is expected to engage with groundwater users to control those activities contributing to such impairment via voluntary joint action. (ORS 537.525(9).) Further, Oregon policy, statutes and rules support designating critical groundwater areas and implementing regulatory corrective controls and area-wide voluntary agreements to address declines. (*See e.g.* ORS 537.735, 537.745; OAR 690-010-0120.)

The Petitioners developed the rule amendments included herein through a community process that engaged a broad coalition of groundwater users representing many different types of interests and beneficial uses. Crucially, these proposed amendments to the Division 512 rules address conditions in certain groundwater reservoirs where excessive declines are occurring or where reasonably stable conditions are not being met with the current levels of pumpage, while also creating a collaborative and voluntary approach for those users located in reservoirs with reasonably stable conditions, incorporating a regulatory backstop to ensure those voluntary approaches are effective. Further, in drafting the proposed rule amendments contained in this Petition, the stakeholders supporting this petition relied on public comments and best available science—developed by the Department and the USGS—to define groundwater reservoirs and determine appropriate voluntary and regulatory approaches to achieve and maintain reasonably stable groundwater levels.

The rule amendments proposed in this petition identify five groundwater reservoirs within the Harney Basin: Weaver Springs, Silver Creek, Silvies River, Northeast Crane, and Blitzen-Voltage. Each meets the definition of groundwater reservoir at ORS 537.515(6). In brief, these groundwater reservoirs are distinguished by local geology, location in the basin-wide groundwater-flow system, local rate and magnitude of recharge and discharge, hydraulic gradient, groundwater levels, groundwater quality, and groundwater chemistry. (Gingerich et al, 2022).

Each of these five groundwater reservoirs is designated as a separate critical groundwater area in the proposed rule amendments. This approach complies with the critical groundwater area criteria in ORS 537.730 and is supported by the requirement to define the boundaries of the critical groundwater area and indicate which reservoirs are affected as required by ORS 537.735 and OAR 690-010-0130.

Because each critical groundwater area is associated with a distinct reservoir, the proposed rule amendments provide maximum flexibility in managing the Harney Basin's groundwater resources while minimizing impacts to groundwater users in areas experiencing less serious and declines. Said simply, separating subareas of the basin into distinct reservoirs is scientifically defensible and allows tailored responses to the current conditions in as well as the needs of groundwater users in each reservoir. This approach ensures each reservoir achieves reasonably stable groundwater levels and other substantive goals contained in Oregon's groundwater management laws and policy. Identifying each area as a separate reservoir also precludes transfers between reservoirs because they are each treated as separate sources of water. This addresses concerns identified by the Rules Advisory Committee and the community stakeholders and Petitioners, who wish to prevent increased groundwater use in the respective groundwater reservoirs that could potentially result in injury and hamper users ability to reach or maintain reasonably stable groundwater levels.

Although this Petition provides a basis for designating critical groundwater areas within each reservoir within the Harney Basin, some petitioners maintain that there is insufficient evidence to designate critical groundwater areas for the Silver Creek, Silvies River, and Blitzen-Voltage groundwater reservoirs and that these areas are likely to maintain reasonably stable conditions without the necessity of regulatory reductions. Although those Petitioners do not support a critical groundwater area designation in these areas, they are signing on to this Petition because they support the basin-wide approach implemented in this proposal. They sign on with the understanding that voluntary approaches will be utilized and a provision to lift critical groundwater area designations will be included in the proposed rule amendments. They also agree that the proposed corrective controls and voluntary measures in these areas will enhance the likelihood of maintaining reasonably stable groundwater levels in perpetuity.

By differentiating between reservoirs, the proposed rule amendments also include management actions tailored to address the unique characteristics and groundwater levels in each reservoir.

For example, for those reservoirs in excessive decline or where dynamically stable groundwater levels will not likely be attained with current rates of pumpage, the proposed amendments require corrective controls to achieve dynamically stable conditions within a timeframe tailored to the unique conditions of each reservoir (i.e., for Weaver Springs, the timeframe is 100% of the required reductions by 2028 or upon completion of the contested case process). By contrast, those reservoirs that are reasonably stable will implement voluntary agreements to continue to maintain reasonably stable conditions and achieve the other substantive goals in policy. These voluntary measures will be backed by regulatory measures to ensure that the resource is protected long-term if voluntary measures do not maintain reasonably stable groundwater levels as anticipated.

The explanation for identifying each reservoir and designating each critical groundwater area are addressed in detail below.

II. Basis for Proposed Rules

The proposed rule amendments are based off of Scenario B, which was modeled by the Oregon Water Resource Department and presented at the November 13, 2024 Division 512 Rules Advisory Committee meeting and the December 16, 2024 Discussion Group meeting. Scenario B designated 6 subareas and modeled a 22% basin-wide reduction from 2018 pumping levels, with reductions starting in 2030 and phased in every decade for three decades. In its November 2024 presentation, the Department stated that Scenario B would stabilize discharge to surface water and would result in no further losses to storage in 30 years. In presentations at other RAC meetings, the Department indicated that other portions of the basin - Silver Creek, Silvies River, and Blitzen Voltage area - could result in near stability (~0.1 ft year of decline) in 30 years without reductions in use.

The proposed rule amendments in this Petition require greater reductions in rates of groundwater pumpage overall and faster regulatory action in two reservoirs, as outlined in the below table. Petitioners anticipate that the proposed rules amendments will achieve stability in groundwater levels more expeditiously than predicted by the Department's Scenario B.

Area	"Scenario B"	Modifications in Proposed Amendments
Weaver Springs/Dog Mountain (titled Weaver Springs in this proposal)	54% reductions from estimated use phased in over 30 years	54% regulatory reductions from estimated use implemented immediately
Northeast Crane	30% reductions from estimated use phased in over 30 years	30% regulatory reductions phased in over 24 years, with reductions frontloaded

Silver Creek	9% reductions phased in over 30 years	10% voluntary reductions achieved by 2040 via voluntary agreements, with a regulatory backstop
Silvies	0% reductions	10% voluntary reductions achieved by 2040 via voluntary agreements, with a regulatory backstop
Blitzen-Voltage	0% reductions	10% voluntary reductions achieved by 2040 via voluntary agreements, with a regulatory backstop

III. Definitions and Standards

To avoid confusion between existing definitions, the proposed rule amendments included with the Petition provide definitions of new terms. They also provide a definition of reasonably stable groundwater levels¹ that is appropriate for the groundwater reservoirs identified in the proposed rule and for the associated critical groundwater areas. Otherwise, these rules rely on those definitions and standards already existing in the follow statutory and rule provisions: ORS 537.515, OAR 690-008-0001, OAR 690-009-0020, OAR 690-300-0010, OAR 690-400-0010.

IV. Technical Basis for Designating Groundwater Reservoirs and Critical Groundwater Areas

In the USGS Groundwater Study Gingerich et al (2022) states that “groundwater in the Harney Basin occurs within a single groundwater-flow system that includes several distinct yet hydraulically connected areas of interest distinguished by local hydrostratigraphy, location in the basin-wide groundwater flow system, and local rate and magnitude of recharge and discharge.” The distinctions between these “areas of interest” are used to ascertain and reasonably infer exterior boundaries of groundwater reservoirs for management purposes. These distinctions are supported by best available science as well as local knowledge and expertise and will support the development of appropriate, site-specific regulatory controls and voluntary agreements that reflect the self-organization of groundwater users based on different locations and characteristics of these groundwater reservoirs.

Weaver Springs Groundwater Reservoir and Critical Groundwater Area

The USGS Groundwater Study indicates that the Weaver Springs/Dog Mountain area (the Weaver Springs Groundwater Reservoir in the proposed rule amendments) has characteristics that distinguish it from other areas in the Harney Basin, thereby supporting its identification as a

¹ Note that the definition of “reasonably stable groundwater levels” at OAR 690-008-0001(9) does not apply to Critical Groundwater Areas designated under OAR 690-010. See OAR 690-008-0001(9)(e).

separate reservoir with boundaries that can be ascertained and reasonably inferred. The Weaver Springs Groundwater Reservoir is located in the middle of the Harney Basin, north of Harney Lake. Recharge to this area is limited because of its distance from primary sources of recharge in the uplands, minimal direct precipitation, and low-permeability deposits that surround the reservoir.

Some of the characteristics that distinguish the Weaver Springs Groundwater Reservoir include the following: local geology distinct from adjacent groundwater reservoirs; distance from surface water sources that recharge groundwater in the regional system and minimal direct recharge; wells that have historically had a relative high well yield; wells with similar groundwater level trends; high vertical permeability and a hydraulic gradient that flows towards a deepening cone of depression; and generally older or pre-modern groundwater. The saturated thickness of the Weaver Springs Groundwater Reservoir is not known but a significant amount of groundwater storage has been removed. (Gingerich et al, 2022)

Current conditions in the Weaver Springs Reservoir support its designation as a critical groundwater area under ORS 537.730. Groundwater in the Weaver Springs Groundwater Reservoir is over-appropriated and overdrawn and is declining or has declined excessively. The median magnitude of groundwater level declines in this groundwater reservoir is 48.3 feet, with a median rate of decline of -4.3 feet of decline per year. (Boschman, 2024)

Northeast Crane Groundwater Reservoir and Critical Groundwater Area

The USGS Groundwater Study indicates that the floodplains from Prater Creek to Mahon Creek and the Crane area (herein referred to as the Northeast Crane Groundwater Reservoir) have characteristics that distinguish it from other areas in the Harney Basin, thereby supporting its identification as a separate reservoir with boundaries that can be ascertained and reasonably inferred. The Northeast Crane Groundwater Reservoir is located in the northeast portion of the Harney Basin and is primarily recharged from small creeks in the northeast uplands of the Harney Basin.

Some of the characteristics that distinguish the Northeast Crane groundwater reservoir include the following: local geology distinct from adjacent groundwater reservoirs, including a high amount of heterogeneity and a mix of high and low permeability units; distance from significant sources of recharge and proximity to smaller sources of recharge; wells with significant variability in yield; highly variable groundwater level trends; highly variable vertical permeability with differing trends in the shallow and deep groundwater systems; a hydraulic gradient that flows southeast towards Malheur Lake and Virginia Valley; the presence of important geothermal resources; evidence of predominantly pre-modern water, especially in areas farther from recharge areas and deeper in the system. (Gingerich et al, 2022) The saturated thickness of the Northeast Crane Groundwater Reservoir is unknown. Cones of depression have formed in portions of the Northeast Crane Groundwater Reservoir in response to concentrated pumping over time at various depths.

Current conditions in the Northeast Crane reservoir support its designation as a critical groundwater area under ORS 537.730. Groundwater in the Northeast Crane Groundwater Reservoir is over-appropriated and overdrawn and groundwater levels are declining or have declined excessively. The median magnitude of groundwater level declines in this area range from 10.3 to 31.3, depending on how wells are analyzed, with a median rate of decline ranging from -0.9 to -3.3 feet of decline per year. (Boschmann, 2024)

Silver Creek Groundwater Reservoir and Critical Groundwater Area: The USGS Groundwater Study indicates that the Silver Creek Floodplain, Suntime to Harney Lake (herein referred to as the Silver Creek Groundwater Reservoir) has characteristics that distinguish it from other areas in the Harney Basin, thereby supporting its identification as a separate reservoir with boundaries that can be ascertained and reasonably inferred. The Silver Creek Groundwater Reservoir is located in the Western portion of the basin and is primarily recharged from surface water in the Silver Creek floodplain.

Some of the characteristics that distinguish the Silver Creek Groundwater Reservoir include the following: local geology distinct from adjacent groundwater reservoirs; relatively high permeability of local geology; proximity to the Silver Creek floodplain that recharges groundwater; wells with relatively high yield with yields decreasing in the lower part of the groundwater reservoir; relatively consistent groundwater level trends; a hydraulic gradient that predominantly flows south towards Harney Lake; the presence of important geothermal resources in the lower part of the groundwater reservoir; evidence of predominantly modern water in the upper part of the reservoir above Moon Reservoir and pre-modern water in the lower part of the groundwater reservoir in the Warm Springs Valley; spring discharge at Double O Springs and in the Warm Springs Valley. (Gingerich et al, 2022) The saturated thickness of the groundwater resource in the Silver Creek Groundwater Area is unknown. Due to high permeability in this groundwater reservoir, declines are more or less uniform across the area.

The Silver Creek Groundwater Reservoir is proposed to be designated as a critical groundwater area under the proposed rule amendments on the sole ground that the available ground water supply in the area in question is about to be overdrawn. (ORS 537.730). The Department has also asserted that the Silver Creek Groundwater Reservoir meets the above criteria. However, it is important to note that declines are minor, groundwater levels in the area are not in excessive decline and do not meet the other factors under ORS 537.730. The median magnitude of groundwater level declines in this area range from 2.5 to 3.5, depending on how wells are analyzed, with a median rate of decline rate of 0.4 feet of decline per year. Some petitioners disagree with a designation of this area as a critical groundwater area, however, they support the Petition for the reasons explained above.

Silvies River Groundwater Reservoir and Critical Groundwater Area: The USGS Groundwater Study indicates that the Silvies River and Poison Creek Floodplains (herein referred to as the Silvies River Groundwater Reservoir) have characteristics that distinguish it

from other areas in the Harney Basin, thereby supporting its identification as a separate reservoir with boundaries that can be ascertained and reasonably inferred. The Silvies River Groundwater Reservoir is located in the north-central portion of the Harney Basin and is primarily recharged from surface water in the Silvies River drainage and other tributaries to the Silvies River and Malheur Lake.

Some of the characteristics that distinguish the Silvies River Groundwater Reservoir include the following: local geology distinct from adjacent groundwater reservoirs; changing permeability of local geology depending on proximity to uplands and depth; proximity to the Silvies River and Poison Creek floodplains that recharge groundwater; wells with variable yield depending on location and depth; variable groundwater level trends depending on proximity to recharge areas and depth; a hydraulic gradient that predominantly flows southeast towards Malheur Lake; the presence of important geothermal resources in the lower part of the groundwater reservoir; and evidence of predominantly modern water in the shallow part of the system and pre-modern water in the deeper part of the system. (Gingerich et al, 2022) The saturated thickness of the Silvies River Groundwater Reservoir is unknown.

The Silvies River Groundwater Reservoir is proposed to be designated as a critical groundwater area under the proposed rule amendments on the sole ground that available ground water supply in the area in question is about to be overdrawn. (ORS 537.730) The Department has also asserted that the Silver Creek Groundwater Reservoir meets the above criteria. However, it is important to note that declines are minor, and groundwater levels in the area are not in excessive decline and do not meet the other factors under ORS 537.730. The median magnitude of groundwater level decline in this area is 2.6 feet, with a median rate of decline rate of 0.3 feet of decline per year. Some petitioners disagree with a designation of this area as a critical groundwater area, however, they support the Petition for the reasons explained above.

Blitzen-Voltage Groundwater Reservoir and Critical Groundwater Area

The USGS Groundwater Study indicates that the Donner Und Blitzen Floodplain and Virginia Valley area (herein referred to as the Blitzen-Voltage Groundwater Reservoir) have characteristics that distinguish it from other areas in the Harney Basin, thereby supporting its identification as a separate reservoir with boundaries that can be ascertained and reasonably inferred. The Blitzen-Voltage River Groundwater Reservoir is located in the southern portion of the Harney Basin and is primarily recharged from surface water in the Donner Und Blitzen floodplain and precipitation and snowpack from the Steens Mountain and small drainages.

Some of the characteristics that distinguish the Blitzen-Voltage groundwater reservoir include the following: local geology distinct from adjacent groundwater reservoirs; relatively high vertical permeability of local geology, especially in the Voltage basalts; proximity to the Donner Und Blitzen floodplain that recharges groundwater as well as recharge from infiltration around Steens Mountain; wells with relatively high yield; relatively consistent groundwater level trends; a hydraulic gradient that predominantly flows northeast towards Malheur Lake and Virginia

Valley; evidence of modern and pre-modern water mixing; historic spring discharge at Sodhouse Springs and in the Warm Springs Valley. (Gingerich et al, 2022) The saturated thickness of the groundwater resource in the Blitzen-Voltage Groundwater Area is unknown. Due to high permeability in this groundwater reservoir, declines are more or less uniform across the area.

The Blitzen-Voltage River Groundwater Reservoir is proposed to be designated as a critical groundwater area under the proposed rule amendments on the ground that there is a pattern of substantial interference between wells within the area in question and between wells and an appropriator of surface water whose water right has an earlier priority date. (ORS 537.730) The Department has also asserted that the Silver Creek Groundwater Reservoir meets the above criteria. However, it is important to note that declines are minor, and groundwater levels in the area are not in excessive decline and do not meet the other factors under ORS 537.730. The median magnitude of groundwater level declines in this area is 2.9 feet, with a median rate of decline rate of 0.3 feet of decline per year. Some petitioners disagree with a designation of this area as a critical groundwater area, however, they support the Petition for the reasons explained above.

V. Modeled Impacts of Proposed Rules

Available scientific information supports the understanding that the proposed rule amendments would maintain reasonably stable groundwater levels and ensure perpetual use of the groundwater resources in all five groundwater reservoirs. The median change in groundwater level would not exceed decline triggers in 3 groundwater reservoirs and for areas with evidence of excessive declines, dynamic stability, which is a more restrictive target than reasonably stable groundwater levels, would be achieved.

Under the original “Scenario B,” the Department projected that 35 domestic wells would lose access to groundwater at their current depth from 2030-2098 (56 wells from 2018-2098). The modeled impacts to spring discharge under “Scenario B” were expected be highest in the Silver Creek and Blitzen-Voltage areas and would be positive or neutral in all other areas. However, the original “Scenario B” did not account for immediate reductions in Weaver Springs, reductions of 10% in the Silvies and Blitzen-Voltage subareas, or frontloaded reductions in the Northeast Crane area. Consequently, the proposed rule amendments should result in fewer impacts to domestic wells and springs than “Scenario B” anticipated.

The proposed rule amendments also incentivize actions to better understand the source of groundwater to springs as well as the subsurface flow path. Where springs have already been impacted, the rule amendments also encourage voluntary joint action to remedy impacts. Neither of these proposals are part of the Department’s proposed rules.

This Petition’s proposed rule amendments balance social, economic, and environmental impacts and proposes mitigation measures where impacts are projected to occur in a way that exceeds the expected outcomes anticipated with the Department’s proposed rules.

VI. Specific Strategies to Maintain Reasonably Stable Groundwater Levels

As mentioned previously, the proposed rule amendments provide for tailored groundwater management strategies that correspond to current conditions in each reservoir. The proposed rule implements the following reservoir and critical groundwater area-specific management strategies:

Weaver Springs Groundwater Reservoir: Because this reservoir is in excessive decline and overdrawn, the proposed amendments provide for corrective controls that would implement immediate regulatory reductions in groundwater use following a contested case process.

Northeast Crane Groundwater Reservoir: Because this reservoir is in excessive decline and overdrawn with greater variability in declining trends, the proposed amendments provide for corrective controls that would implement phased regulatory reductions in groundwater use following a contested case process.

Silver Creek Groundwater Reservoir: Reasonably stable conditions will be maintained through voluntary agreements, a conservation plan, and a corrective control that precludes further development where wells were not constructed by December 31, 2024. If the decline trigger² is met, corrective controls, including a permissible total withdrawal, will be implemented.

Silvies River Groundwater Reservoir: Reasonably stable conditions will be maintained through voluntary agreements, a conservation plan, and a corrective control that precludes further development where wells were not constructed by December 31, 2024. If the decline trigger is met, corrective controls, including a permissible total withdrawal, will be implemented.

Blitzen-Voltage Groundwater Reservoir: Reasonably stable conditions will be maintained through voluntary agreements, a conservation plan, and a corrective control that precludes further development where wells were not constructed by December 31, 2024. Interference with affected surface water rights will be further assessed, including an assessment of sources and subsurface flow paths, and voluntary joint actions will be pursued to restore spring discharge where it has been depleted below customary quantities. If the decline trigger is met, corrective controls, including a permissible total withdrawal, will be implemented.

VII. Consideration of Economic Impacts

The agency is tasked with the responsibility to maintain “the present level of the economic and general welfare of the people of this state” while also fostering “future growth and development of this state for the increased economic and general welfare of the people.”³ Harney County’s economy relies on agriculture within the county, but is also fairly isolated from other economic

² “Decline Trigger” is defined in the proposed rule amendments.

³ ORS 536.220

outputs. Agriculture employs some 1,020 people and generates some \$186,110,000 annually in the county.⁴ An economic analysis of the management of groundwater in the Harney Basin documented that “groundwater reductions had approximately 1:1 relationship with reductions in alfalfa/hay production.”⁵

The report documents that there will be a concurrent loss of jobs and economic activity for each acre of production lost. Generally speaking, minimizing the number of acres lost to production would minimize economic impacts. If groundwater declines continue, jobs would be lost not only on farms and ranches, but also in businesses that supply goods and services to them. Even local shops, grocery stores, and restaurants could feel the impact as families spend less because of reduced employment and labor income. Loss of economic output would also have a significant impact on the provision of public services.

These proposed rule amendments would impose reasonable economic impacts by targeting and minimizing regulatory reductions and employing voluntary approaches, where appropriate, that allow for greater flexibility and adaptability in achieving substantive policy goals. The proposed rule amendments will seek to keep as many farming operations in business as possible while still achieving stabilized groundwater levels across the basin.

Also, of note, the proposed rules amendments provide exemptions for groundwater users that provide significant economic benefits to the Harney Basin with minimal groundwater use. They also allow for municipalities to continue to facilitate economic development.

Finally, the amended rules provide a pathway for future growth and development by allowing offset water to enable new and temporary uses of water.

Altogether, they provide a pathway to achieve a sustainable groundwater resource on a faster pace than the Department’s rules with less economic and social damage to the community.

VIII. Consideration of Impacts to Water Rights

The agency is tasked with the responsibility to acknowledge and protect rights to appropriate ground water “except when, under certain conditions, the public welfare, safety and health require otherwise.” (ORS 537.525 (2)) In Oregon, “existing rights, established duties of water, and relative priorities concerning the use of the waters of this state and the laws governing the same are to be protected and preserved subject to the principle that all of the waters within this state belong to the public for use by the people for beneficial purposes without waste.” (ORS 536.310). Approximately 670 groundwater rights are used in various ways within the Harney Basin.

⁴ ECONorthwest. The Economic Impacts of Groundwater Management in Harney County, Oregon (May 1, 2025) Prepared for: Oregon Consensus, Oregon Water Resources Department, and Division 512 RAC. 22 p. https://www.oregon.gov/owrd/Documents/ECO_Harney_County_Report_Final.pdf.

⁵ *id.* at 7

The proposed rule amendments protect existing rights by: limiting additional development; targeting regulatory reductions in areas where evidence indicates significant declines and declines that may affect public welfare, safety and health; and proposing data collection, voluntary actions and conservation programs to protect surface water appropriators with senior water rights. In areas where groundwater use will be reduced through regulatory controls, the proposed rule amendments protect existing rights by providing an initial allocation that allows for more groundwater users to exercise their rights and allocating additional water through prior appropriation. The amended rules offer a reasonable and equitable approach to groundwater use reductions that minimize impacts to existing water rights.

Furthermore, where groundwater use is likely to be reduced through corrective controls, the proposed rule amendments encourage compensation for voluntary cancellation of groundwater rights, especially reductions in groundwater use that would benefit senior surface water appropriators or ecologically significant springs. This would continue a strategy that was spearheaded through collaborative efforts and resulted in a federally approved Groundwater Conservation Reserve Enhancement Program for the Harney Basin and could result in voluntary cancellation of groundwater rights on up to 20,000 acres. The Department's proposed rules do not have any corollary to these important concepts and precepts.

IX. Consideration of Impacts to Public Welfare, Safety, and Health

The agency is tasked with the responsibility to “promote and secure the maximum beneficial use and control of such water resources ” and to undertake actions to “best protect and promote the public welfare generally with an impartiality of interest.” Under ORS 537.525 the Department is responsible for acknowledging and protecting rights to appropriate groundwater, except when, under certain conditions, the public welfare, safety and health require otherwise.” Public health, welfare, and safety is a term used broadly in statute and rule, but is not specifically defined.

The proposed rule amendments take a holistic approach to the preservation of public welfare, safety, and health by protecting existing rights, minimizing economic impacts, focusing regulatory reductions in areas where impacts to domestic wells have been clearly identified, and building community awareness and support for further data gathering, voluntary action, collaboration and conservation planning to address suspected interference and achieve substantive groundwater goals. Minimizing economic impacts will prevent job loss and sustain sources of funding for public services like hospitals and local schools. Minimizing job loss will minimize the number of individuals seeking assistance programs or struggling with financial insecurity and the associated challenges stemming from that. Minimizing impacts to domestic wells and offering mitigation funds will minimize housing insecurity that might otherwise be experienced, especially by low-income households. Exempting municipalities will allow cities to continue to be responsive to many interrelated challenges and needs related to housing, economic development, public safety, and quality of life. The proposed rule amendments will achieve the substantive goals while preserving public welfare, safety and health in a holistic manner.

X. Consideration of Impacts to Domestic Wells

Concerns regarding impacts to domestic wells have primarily been raised in and near areas experiencing declines or in areas with low permeability and low yield, namely the Weaver Springs and parts of the Northeast Crane areas. Each domestic well is drilled to different depths and may experience issues related to groundwater level declines as well as other factors, including but not limited to well construction or completion in low-yield units. Oregon water policies do not guarantee access to groundwater at particular depths. Regardless, there has been ongoing and active outreach to better understand and address impacts to domestic wells. A process was developed by the Department to track “dry well” complaints in the Harney Basin beginning in 2019. Since 2022, the Department has received 18 dry well reports in Harney County. A survey was also completed in 2019 by the Place-Based Planning Collaborative to understand impacts to domestic well users.

Information collected through Department outreach and the survey led to creation of the Harney Basin Domestic Well fund that provides financial assistance to wells affected by declining groundwater levels. (ORS 537.743) The Department has been accepting applications since 2024. Seven projects have been funded to-date through this fund. An additional seven projects were funded through the statewide Well Abandonment, Repair, and Replacement Fund. If no changes are made to the Harney Basin Domestic Well fund, and future applicants seek the maximum funding available, funding is currently available to assist approximately 33 well owners.

The proposed rules amendments place an emphasis on continuing these types of programs and continuing to track concerns of domestic and stockwater well owners. This is in line with the substantive policy goal of assuring “adequate and safe supplies of ground water for human consumption [...], while conserving maximum supplies of ground water for agricultural, commercial, industrial, thermal, recreational and other beneficial uses.” (ORS 537.525)

The proposed amended rules would ensure perpetual use of the groundwater users for future residents of the Harney Basin. Impacts to shallow domestic wells will be mitigated through continuation of the Harney Basin Domestic Well fund and other identified funding sources. Further, domestic and stockwater wells are exempt from the corrective controls and other monitoring and management measures contained in the proposed rule amendment.

XI. Consideration of Impacts to Springs

There is significant interest in further studying the relationship between groundwater pumping and spring discharge, especially for springs that discharge to the Malheur National Wildlife Refuge. The two groundwater reservoirs with ecologically significant springs are the Silver Creek Groundwater Reservoir and Blitzen-Voltage Groundwater Reservoir.

Within the Silver Creek Groundwater Reservoir groundwater discharges to a number of springs in the Warm Spring Valley, and there is particular interest in the Double O Springs. These springs are managed by the Malheur National Wildlife Refuge, Bureau of Land Management and

private landowners. Barnett (2017) has summarized information on the springs in the Warm Spring Valley by using flow data gathered by WRD in 2017 and comparing it to previous measurements and estimates that date to 1907. The measurements taken over time do not show any consistent pattern. Some springs appear to be relatively stable (neither significant decline or rise) and most appear to have relatively stable flow estimates across time. Garcia et al (2022) report that “in Warm Spring Valley (south of the Weaver Spring/Dog Mountain pumping area) July 2017 springflow measurements totaling 23,500 acre-ft/yr are within 11 percent of the 1931 estimate reported by Piper and others (1939) (26,500 acre-ft/yr), within 20 percent of the 1907–2017 mean, and within the range of early 1900s measurements at 6 of the 7 springs measured. Considering the variability noted by Piper and others (1939) and springflow measurement accuracy of about 15 percent (Oregon Water Resources Department, 2020), differences between 2017 and early 1900s springflow in Warm Springs Valley likely reflect climate variability and (or) management of irrigation diversions rather than nearby groundwater development.” The water temperature and chemistry at springs in the Warm Spring Valley varies, along with the age of water. Observations made by the Refuge and private landowners indicate likely declines in spring discharge since 2017. A monitoring program is being proposed for funding by basin partners to collect spring discharge data and establish an ongoing monitoring program. There are many outstanding questions regarding the source of the various springs as well as the subsurface flow path. Double O Springs has a 2018 priority date and the water rights and associated priority dates of other springs will be identified to inform future management approaches.

Within the Blitzen Voltage Groundwater Reservoir groundwater discharges to Sodhouse Springs, which is a historically significant source of water to the Refuge, specifically the Refuge headquarters. Sodhouse Springs has a 1923 water right. Water stopped flowing from the springs around 2014. Groundwater pumpage proximal to the springs is suspected to be one factor that is affecting spring discharge. Loss of spring discharge has affected groundwater dependent ecosystems around the springs as well as access to water for ongoing operations and maintenance of the Refuge headquarters.

The Malheur National Wildlife Refuge has worked to establish effective working relationships with neighboring landowners built on mutual respect and trust. Management of surface water on the Refuge has improved through ongoing dialogue and cooperative relationships fostered through development and implementation of the Comprehensive Compensation Plan. The Refuge is taking a renewed interest in its springs with the hope of better understanding the springs and, where spring discharge has decreased or ceased, working collaboratively with groundwater users to restore customary quantities. Additional information regarding the source and subsurface flow path of the springs would aid in designing and pursuing targeted actions that would have a high likelihood of benefitting the springs. Partner organizations have recently submitted grant proposals to aid in developing a community led monitoring program for springs that are important to the Refuge, migratory and resident wildlife, and the basin community.

XII. Consideration of Impacts to Streamflow and Lakes

According to Garcia et al (2022) groundwater discharge to streams “is the primary mechanism for the natural discharge of groundwater in the uplands and the second most important mechanism in the lowlands.” However, Gingerich et al (2022) summarized that “groundwater discharge to streams in the lowlands was considered negligible because streams in the northern and western lowland regions are mostly losing water and contributing to groundwater recharge and, in the southern region, base-flow gains between Frenchglen and Diamond Lane were likely offset by streamflow losses farther downstream.” Since there is no documented lowering of groundwater levels in the uplands, groundwater pumping cannot be credited with impacting streams. Stream conditions have more likely been affected by significant riparian habitat changes and drainage efforts that include straightening some 25 miles of the Donner und Blitzen River, draining Silver Swamp to Harney Lake and significant surface water diversion infrastructure (canals, dams, diversions, roadways, etc.). There is no clear evidence of groundwater pumping affecting discharge to streams in the Harney Basin.

Likewise, the groundwater contribution to Malheur and Harney Lakes is relatively insignificant. Garcia et al (2022) estimate that net inflow from groundwater to Malheur Lake is some 50 acre-feet/year to a waterbody that fluctuates from 25,000 to 45,000 acres in surface area. The hydrology of Malheur Lake is dominated by surface water flow from the Donner und Blitzen River with occasional contributions from the Silvies River. Discharge from Sodhouse springs and Double O springs (see above) are important to ecological functions on the Refuge as well as Refuge operations.

As a result of this current scientific understanding, the proposed rule amendments do not directly address the issue of stream and lake discharges.

XIII. Consideration of Impacts to Native Vegetation

The Harney Basin is an endorheic basin, which means that all the surface water that leaves the basin is through evapotranspiration (ET). Surface water ET is greater than groundwater ET. Groundwater ET is dominated by transpiration from phreatophytes (i.e., plants drawing water from the groundwater table). ET is estimated by allocating ET to different plant communities and tying published ET values to each. One of the difficulties of developing an estimate of ET from native plant communities is the significant variability year to year in surface runoff as well as amount and distribution of precipitation. There has not yet been a direct link between groundwater level declines and phreatophyte vegetation changes, though there is expected to be a relationship wherein groundwater declines would result in changes to groundwater dependent vegetation. This link is difficult to identify and track, especially given that the effects of change in ET are often masked by other factors affecting vegetation cover including type of vegetation, land management practices, climatic variation, interactions with wildlife, presence and distribution of invasive species, etc.

Impacts to native vegetation from the proposed approach are not well understood and models likely do not accurately capture the complex dynamics affecting the presence and distribution of groundwater dependent native vegetation at this time. Additionally, there are currently no groundwater rights for native vegetation in the Harney Basin. For these reasons, the proposed rule amendments do not address the possibility of impacts to native vegetation.

XIV. Consideration of Impacts to the Water Resources Department

The amended rules would allow the Department to focus available resources on the areas of greatest decline, sequence actions as capacity and resources allow, expedite action on areas in need of corrective controls, and minimize legal expenses. The Department currently has a backlog of contested cases. Between 2023 and 2025, the Department faced a \$1.6 million shortfall in its legal budget, which led to delays in processing cases. Minimizing the number of participants in a contested case proceeding would likely expedite contested case proceedings, reduce legal spend and allow corrective control measures to be implemented sooner. If the Department were to enter contested case proceedings with all 670 groundwater right holders across the basin, it would strain the backlog further, slow progress on pending cases, and cost anywhere between \$750,000 to \$1,000,000 (or more), contributing further to the Department's budget shortfall and backlog.

Encouraging voluntary joint action in areas with reasonably stable conditions could direct state resources towards cooperative, incentive based actions to achieve reductions. An approach based on partnership and voluntary joint action could lead to greater local investments in data collection, studies, and management actions that benefit groundwater resources and improve the effectiveness of Department actions in the basin.

XV. Consideration of Preference for Voluntary Joint Action and Opportunities for Voluntary Agreements

ORS 537.525 states a preference for “voluntary joint action by the Water Resources Commission and the ground water users concerned whenever possible [...] whenever wasteful use of ground water, impairment of or interference with existing rights to appropriate surface water, declining ground water levels, [...] overdraw of ground water supplies,” or other impairments “exist or impend.” Utilization of “the police power of the state” is understood as a backstop in the event that “voluntary joint action is not taken or is ineffective.”

With funding authorized by the legislature in 2023, groundwater users within two groundwater reservoirs have been able to begin working toward voluntary agreements. Groundwater users in the Silver Creek Groundwater Reservoir and Blitzen-Voltage Groundwater Reservoir expect to have a voluntary agreement before the Commission in December. Groundwater users in the Silvies River Groundwater Reservoir and Northeast Crane have also expressed interest in developing a voluntary agreement. Three of these areas are currently reasonably stable and do not show excessive declines. Nonetheless, all voluntary agreements would seek voluntary

reductions in groundwater use through conservation actions and other actions identified to remedy concerning conditions and improve the collective understanding and management of groundwater resources, including data collection and voluntary remediation of well construction issues. The proposed rules amendments recognize and support voluntary joint action and the development of voluntary agreements.

XVI. Consideration of Integrated and Coordinated Basin Plans and Programs

ORS 536.220 calls for development of a “coordinated, integrated state water resources policy” as well as “plans and programs for the development of such water resources and through other activities designed to encourage, promote and secure the maximum beneficial use and control of such water resources.” ORS 536.310 includes the substantive policy goals for the policy, plans, and programs. OAR 690-400 describes the purpose and authorization for the Oregon Water Management Program, which includes the basin program rules for 18 administrative basins, including the Division 512 rules for the Malheur Lake Basin.

In 2016 the Harney County Watershed Council received a grant from the Water Resources Department to initiate a place-based integrated water resources planning process to develop a community supported integrated water resources plan in consultation and partnership with the state. The integrated plan was developed over 10 years with local, state, and federal funding, significant public and community input and thousands of volunteer hours. The integrated plan is currently before the Water Resources Commission for state recognition.

The proposed rule amendments include numerous actions recommended in the place-based integrated water resources plan. The proposed rule amendments memorialize a truly integrated and coordinated approach. They also encourage basin partners, including the Department, to continue ongoing collaboration and adaptive management of groundwater resources, including with federal land managers whose actions greatly impact groundwater recharge and management. Entities within the Harney Basin have supported numerous collaborative efforts to address complex natural resources issues across all sectors and all levels of government, including wildfire management, wetland management, forest management, and rangeland management, that have demonstrated significant social, economic, and environmental benefits to the community and the state. The proposed collaborative would be modeled off of and learn from decades of effective collaboration in the Harney Basin that delivers results while building a culture of cooperation and strengthening social cohesion, economic vitality, and ecological health. This approach is noticeable absent from the Department’s proposed rules.

XVII. Criteria for a Petition to Amend Rule

This section addresses the requirements of OAR 137-001-0070(2)(a)-(e), which require a petition to amend a rule to include comments on the following five criteria.

- (a) Options for achieving the existing rule's substantive goals while reducing the negative economic impact on businesses;

The proposed rule amendments are designed to more fully address groundwater declines in the Harney Basin which goes beyond the substantive goal of the existing Division 512 rules. These amendments minimize negative economic impacts on businesses by ensuring continued availability of groundwater, which is essential to multiple industries in the basin including agriculture and recreation/tourism.

(b) The continued need for the existing rule;

The existing Division 512 rules recognized that declining groundwater levels represented a threat to the Harney Basin and established the Greater Harney Valley Groundwater Area of Concern to address the issue. Since the passage of OAR 690-512-0020, groundwater levels have continued to decline in some areas of the basin. As such the existing rule is proposed to be expanded to address these declines.

(c) The complexity of the existing rule;

The existing Division 512 rules were intended as preliminary actions to study and slow declining groundwater levels in the Harney Basin. It is insufficient to address declining groundwater levels in the Harney Basin.

(d) The extent to which the existing rule overlaps, duplicates, or conflicts with other state or federal rules and with local government regulations; and

The existing Division 512 rules do not directly overlap, duplicate, or conflict with existing state, federal, or local law. However, they do not adequately implement Oregon's groundwater policy because they have not ceased groundwater declines in some areas of the basin, nor do they incentive voluntary efforts to reduce groundwater use.

(e) The degree to which technology, economic conditions, or other factors have changed in the subject area affected by the existing rule, since the agency adopted the rule.

Multiple factors demonstrate the need for amendments to the Division 512 rules. Technical investigations of the area have increased understanding about its hydrogeology and what measures should be implemented to arrest groundwater declines. Additionally, declines have continued since the passage of the existing Division 512 rules and such declines threaten multiple industries that rely on groundwater. Finally, community engagement on the issue has increased and these proposed rule amendments arise from the community's understanding that the existing rules do not adequately address groundwater declines and do not encourage an integrated, coordinated, adaptive approach to groundwater management.

XVIII. Conclusion

For each of the reasons set forth herein, the Petitioners request that the Oregon Water Resources Commission initiate rulemaking to amend OAR 690-512 as proposed in this Petition.

Dated this 11th day of September, 2025.

[Petitioners' Signature Pages Follow]

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Rexane Worley

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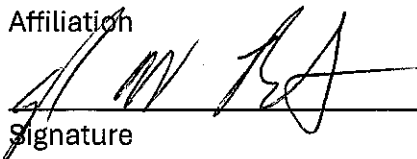
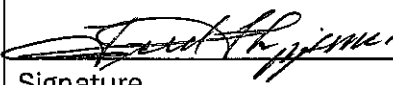
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<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Kenneth W Bentz</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">rancher</div> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 150px; margin-right: 10px;">  </div> <div style="border-bottom: 1px solid black; width: 100px; text-align: center;">9/10/25</div> </div> </div> <div style="width: 50%;"> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">68281 Crane Buchanan Rd</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Burns, OR 92720</div> </div> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> <div>Name</div> <div>Affiliation</div> <div>Signature</div> <div>Date</div> <div>Address</div> </div>		
<div style="border-bottom: 1px solid black; margin-bottom: 5px;">Fred Flippence, General Manager</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Harney Electric Cooperative, Inc</div> <div style="display: flex; align-items: center;"> <div style="border-bottom: 1px solid black; width: 150px; margin-right: 10px;">  </div> <div style="border-bottom: 1px solid black; width: 100px; text-align: center;">9/11/2025</div> </div> </div> <div style="width: 50%;"> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">P.O. Box 587</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">Burns, OR 97720</div> </div> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> <div>Name</div> <div>Affiliation</div> <div>Signature</div> <div>Date</div> <div>Address</div> </div>		
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Princeton OR 97221

Ann I Gilmour
Signature

Ann I Gilmour
Name

Irrigator, Blitzen
Affiliation
Petitioner

33937 Sodhouse Ln
Princeton OR 97221

Jeff L. Gilmour
Signature

Jeff L. Gilmour
Name

Irrigator, Blitzen
Affiliation
Petitioner

33937 Sodhouse Ln
Princeton OR 97221

Petitioner

<u>Martin Thompson</u> Name		<u>53439 Hwy 78</u>
<u>Thompson Truck Inc.</u> Affiliation		<u>Burns, OR 97720</u>
<u>Martin E. Thompson</u> Signature	 Date	 Address
<u>Mike Reila</u> Name		<u>Box 537, Hines OR 97738</u>
<u>Integrated Structures</u> Affiliation		
<u>Mike Reila</u> Signature	 Date	 Address
 Name		
 Affiliation		
 Signature	 Date	 Address
 Name		
 Affiliation		
 Signature	 Date	 Address

Petitioner

Travis Singhue
Signature

Travis Singhue
Name

Farmer - Dog Mountain Sub area
Affiliation
Petitioner

P.O. Box 816
Burns, OR 97720

Kelly Singhue
Signature

Kelly Singhose
Name

Farmer
Affiliation
Petitioner

PO Box 816
Burns, OR 97720

Signature

Name

Affiliation
Petitioner

Signature

Name

Affiliation
Petitioner

Petitioner




<u>Tobias Joyce</u> Name			<u>64352 Harney Ave</u> 		
<u>Business Owner</u> Affiliation			<u>Crane, OR 97732</u> 		
<u>[Signature]</u> Signature	<u>9/11/25</u> Date	<u>Crane, OR 97732</u> Address			

<u>Tod Gahley</u> Name			<u>402 W Monroe St</u> 		
<u>A Parts Store (NAPA)</u> Affiliation			<u>Burns, OR 97720</u> 		
<u>[Signature]</u> Signature	<u>9/11/2025</u> Date	<u>Burns, OR 97720</u> Address			

<u>Craig Neher</u> Name			<u>429 Crane Blvd Burns, OR</u> 		
<u>Ed Staub & Sons</u> Affiliation			<u>Burns, OR</u> 		
<u>[Signature]</u> Signature	<u>9-11-25</u> Date	<u>Burns, OR</u> Address			

_____ Name			_____ 		
_____ Affiliation			_____ 		
_____ Signature	_____ Date	_____ Address			

Petitioner

<p>Stephany Conner</p> <p>Name</p> <p>Ag Business Employee</p> <p>Affiliation</p> <p> 9/11/25</p> <p>Signature Date</p> <p>116 S. Ogden Hines, OR 97738</p> <p>Address</p>		
<p>Christopher Robbins</p> <p>Name</p> <p>Robbins Equipment - Burns Inc.</p> <p>Affiliation</p> <p> 9/11/25</p> <p>Signature Date</p> <p>1160 S. Egan Burns OR 97720</p> <p>Address</p>		
<p>Joe Wright</p> <p>Name</p> <p>Ag Business Employee</p> <p>Affiliation</p> <p> 9/11/25</p> <p>Signature Date</p> <p>889 E. Madison Burns OR 97720</p> <p>Address</p>		
<p>Fauntana Britt</p> <p>Name</p> <p>Ag Business Employee</p> <p>Affiliation</p> <p>Faunter Britt 9/11/25</p> <p>Signature Date</p> <p>628 W. Madison Burns OR 97720</p> <p>Address</p>		

Petitioner

<u>Matt King</u> Name		
<u>Landowner</u> Affiliation		
<u>[Signature]</u> Signature	<u>9-14-25</u> Date	<u>P.O. Box 657 Burns, Or.</u> Address
<u>Matt Nonnenmacher</u> Name		
<u>Business Owner</u> Affiliation		
<u>[Signature]</u> Signature	<u>9/11/25</u> Date	<u>997 Oregon Ave, Burns.</u> Address
 Name		
 Affiliation		
 Signature		
 Date		
 Address		
<u>Curt Bladenburn</u> Name		
<u>Farmer - Business Owner.</u> Affiliation		
<u>[Signature]</u> Signature	<u>9/11/25</u> Date	<u>707 Powderosa Village</u> <u>Burns OR - 97720</u> Address

Exhibit A - Summary and Language for Proposed Division 512 Rules

Summary of Proposed Rules

Groundwater Reservoir	Critical Groundwater Area and Criteria	Proposed Corrective Controls or Voluntary Reductions**
Weaver Springs	Yes (Overdrawn, Excessive Declines)	Set permissible total withdrawal at 45% of estimated pumpage (9200 acre feet) 100% of reductions implemented immediately upon completion of contested case Allocate by priority based on initial allocation and declarations Initial allocation of 2.5 acre feet with annual declarations of proposed duty
Northeast-Crane	Yes (Overdrawn, Excessive Declines)	Set permissible total withdrawal at 70% of estimated pumpage (37,000 acre feet) Reductions of 30% implemented in 6-year intervals Allocate by priority based on initial allocation and declarations Initial allocation of 2.5 acre feet with annual declarations of proposed duty
Silver Creek*	Yes (About to be Overdrawn)	10% reduction by 2040 from 2017-2018 levels through voluntary agreements Regulatory backstop if decline below 25 feet
Blitzen-Voltage*	Yes (Substantial Interference with Senior Appropriator of Surface Water)	10% reduction by 2040 from 2018 levels through voluntary agreements Regulatory backstop if decline below 25 feet
Silvies River*	Yes (About to be Overdrawn)	10% reduction by 2040 from 2017-2018 levels through voluntary agreements Regulatory backstop if decline below 25 feet

*The water users do not agree that they have met the criteria for a critical groundwater area designation in these areas. However, for purposes of proposing a meaningful path forward, they are willing to propose the critical groundwater area designation to facilitate implementation of the corrective and voluntary measures identified in each of these areas.

** All critical groundwater areas are closed to future non-exempt and consumptive appropriations absent offsets. Additionally, all critical groundwater areas include a corrective control providing that permissive total withdrawal be set at zero for individual water rights with wells not constructed by December 31, 2024.

Exhibit A - Summary and Language for Proposed Division 512 Rules

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These Proposed Division 512 Rules propose to amend the existing Chapter 690, Division 512 rules by deleting OAR 690-512-0010 and 690-512-0020 and adding the following new rules (OAR 690-512-0010 to OAR 690-512-00150). Under the proposed rules, existing sections OAR 690-512-0090 and OAR 690-512-0100 would remain, but would be renumbered as OAR 690-512-0160 and OAR 690-512-0170, respectively.

690-512-0010 Classifications

- (1) Except as provided in OAR 690-512-0040 of this rule, the groundwater and surface water of the Malheur Lake Basin are classified for direct appropriation of, or storage of surface water and use of, water for domestic, livestock, irrigation, municipal, quasi-municipal, industrial, mining, agricultural water use, commercial, power development, forest management, public uses, road watering, dust abatement, and wildlife refuge management.
- (2) Except as provided in OAR 690-512-0040 of this rule, groundwater in the Groundwater Classification Boundary, as defined in OAR 690-512-0030(4), is classified for exempt groundwater uses as specified in ORS 537.545 and for nonconsumptive geothermal uses.
- (3) Definitions of classified uses. Except as specified in these rules, and unless the context requires otherwise, the definitions in OAR 690-300-0010 apply except that “public use” is defined in OAR 690-077-0010(27). “Exempt groundwater uses” are those uses specified in ORS 537.545.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0020 Definitions

The following definitions apply to these rules:

- (1) “Annual High Water Level” the highest static water level measurement in calendar year for a well, measured in March of each calendar year.
- (2) “Decline Trigger” means that the critical groundwater area has reached a median decline of 25 feet from the highest known groundwater level. This measurement shall be derived as the median water level from all wells in the area where water levels are collected and reported to the Department. Further, the median decline level shall be a measurement of decline across the entirety of the critical groundwater area.
- (3) “Dynamically Stable Groundwater Levels” means that annual high water levels, based on measured and observed data over time, are at and remaining in a consistent range with a median groundwater level showing 0.5 feet per year variability to allow for natural variability around a central tendency. This measurement shall be derived as the median water level from all wells in the area where water levels are collected and reported to the Department. Dynamically stable groundwater levels must be achieved if the Decline Trigger has been met or exceeded and should be achieved within a reasonable timeframe that ensures the durability of the groundwater resource.
- (4) “Initial Allotment” means the maximum annual volume of water that may be used by each groundwater right, as that term is defined in OAR 690-010-0110(5), upon completion of the contested case.
- (5) “Permissible Total Withdrawal” is the estimated annual volume of groundwater, measured in acre-feet which can be withdrawn in a critical groundwater area and shall be set by the Department for the purpose of achieving the target groundwater level trend. The Department may not reduce groundwater pumping through regulatory orders to a value less than the permissible total withdrawal.
- (6) “Reasonably Stable Groundwater Levels” in any critical groundwater area that has not hit the decline trigger means the median annual high water level for the critical groundwater area has not declined more than 25 feet and does not indicate an average rate of decline of more than 0.6 feet per year. This measurement shall be derived as the median water level from all wells in the area where water levels are collected and reported to the Department. In any critical groundwater area that has hit the decline trigger, reasonably stable groundwater levels means the median annual high water level for the critical groundwater area is not declining by an average rate of decline of more than 0.6 feet per year. This measurement shall be derived as the median water level from all wells in the area where water levels are collected and reported to the Department.

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(7) “Target Groundwater Level Trend” is the goal for the rate of change in groundwater levels for critical groundwater areas where dynamically stable groundwater level conditions have not been met.

(8) “Totalizing flow meter” is an instrument used to measure and display both the instantaneous flow rate and the total volume of groundwater produced from a well.

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690-512-0030 Administrative Boundaries

- (1) The Greater Harney Valley Groundwater Area of Concern (GHVGAC) Boundary is defined for administrative purposes relevant to ORS 537.743 and is described and shown in Exhibit 1.
- (2) The Malheur Lake Basin Boundary is delineated on the agency Map 12.6, dated January 1, 1966, and shown in Exhibit 2.
- (3) The Serious Water Management Problem Area (SWMPA) Boundary is defined as the Harney Basin within the Malheur Lake Basin and within portions of Grant and Harney Counties as shown in Exhibit 3. This designation is limited to groundwater rights (permit, certificate, decree, or groundwater registration) and does not apply to surface water rights or exempt groundwater uses.
- (4) The Groundwater Classification Boundary is defined as the Harney Basin within the Malheur Lake Basin and within portions of Grant and Harney Counties as shown in Exhibit 4.
- (5) The Harney Basin is defined as the closed surface-water basin that drains into Malheur and Harney Lakes including the four National Watershed Boundary Dataset 8-digit hydrologic units Donner und Blitzen 17120003, Silver 17120004, Harney-Malheur Lakes 17120001, and Silvies 17120002 as shown in Exhibit 5.
- (6) The following areas are distinct groundwater reservoirs and groundwater sources in the Harney Basin. Each has distinguishing and unique hydraulic, geologic, water quality, water levels, and groundwater use characteristics.
 - (a) The Weaver Springs Groundwater Reservoir is shown in Exhibit 6;
 - (b) The Silver Creek Groundwater Reservoir is shown in Exhibit 7;
 - (c) The Silvies River Groundwater Reservoir is shown in Exhibit 9;
 - (d) The Northeast Crane Groundwater Reservoir is shown in Exhibit 10; and
 - (e) The Blitzen-Voltage Groundwater Reservoir is shown in Exhibit 11.
- (7) The following groundwater reservoirs are each designated as a critical groundwater area. Each critical groundwater area has unique management considerations, which are addressed through distinctive corrective controls, area-specific voluntary agreements, and area-specific conservation measures. Each critical groundwater area will be managed as a separate source:

Exhibit A - Summary and Language for Proposed Division 512 Rules

- (a) The Weaver Springs Groundwater Reservoir is designated as the Weaver Springs Critical Groundwater Area;
- (b) The Silver Creek Groundwater Reservoir is designated as the Silver Creek Critical Groundwater Area;
- (c) The Silvies River Groundwater Reservoir is designated as the Silvies River Critical Groundwater Area;
- (d) The Northeast Crane Groundwater Reservoir is designated as the Northeast Crane Critical Groundwater Area; and
- (e) The Blitzen-Voltage Groundwater Reservoir is designated as the Blitzen-Voltage Critical Groundwater Area.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0040 New Groundwater Appropriations

- (1) In processing applications to appropriate and use groundwater within the Groundwater Classification Boundary defined in OAR 690-512-0030(4), the Department may find that the proposed use will ensure the preservation of the public welfare, safety and health where the use is classified under OAR 690-512-0010 and water is available for the proposed new use as described in subsections (2) of this section.
- (2) Notwithstanding OAR 690-300-0010(57) and except for exempt groundwater uses and non-consumptive groundwater uses, for the purposes of processing applications pursuant to ORS 537.621 and OAR 690-310-0130 (groundwater permits) and ORS 537.143 to 537.144 and OAR 690-340-0030 (limited licenses), an applicant may request the Department processing an application find that groundwater is available for the proposed use(s) in the Groundwater Classification Boundary consistent with this subsection. In determining whether to accept and in reviewing an application for a permit to appropriate groundwater, the Department may find that groundwater is available if:
 - (a) The total rate and duty of the proposed groundwater use is offset by the contemporaneous and voluntary cancellation or partial cancellation of an existing primary groundwater certificate or primary permit within the Groundwater Classification Boundary as provided in subsection (b) of this section irrespective of limitations on season of use;
 - (b) The primary groundwater certificate or primary groundwater permit that is voluntarily cancelled or partially cancelled is from the same groundwater reservoir and is not subject to forfeiture or cancellation for non-use and is equal or greater in rate, duty and total volume as compared to the rate, duty and total volume of the new appropriation sought.
- (3) Notwithstanding OAR 690-512-0010(2), if groundwater is available for a proposed new use consistent with subsection (2) and if the use is the type of use described in OAR 690-512-0010(1), the proposed use will be considered a classified use for groundwater within the Groundwater Classification Boundary.
- (4) Each groundwater permit issued according to subsections (1) and (2) must be conditioned as follows:
 - (a) Include a requirement for construction of a dedicated observation well at a location determined by the Department, to the same depth as the production well, within 6 months of permit issuance, or the permit may be cancelled. This 6 month deadline shall not be extended. Failure to construct a dedicated observation well

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within 6 months of permit issuance shall cause the watermaster to regulate off any future use under the permit.

(b) All groundwater pumping authorized by this permit is prohibited if March groundwater levels indicate 18 feet or more of decline has occurred, as measured in the observation well or any authorized irrigation well, when compared to the first March measurement. Subsequent groundwater pumping may occur with Department approval during the year(s) a subsequent March groundwater level measurement indicates the groundwater level at the observation well has recovered to less than 18 feet of decline when compared to the first March measurement.

(c) Notwithstanding OAR 690-008-0001(8b and 8c), all permits issued pursuant to this section must include the following condition: Any well authorized under this permit shall be located more than 1,320 feet from any existing senior exempt, permitted or certificated well(s) not owned by the permit holder. Any well authorized on this permit, when located between 1,320 feet and 2,640 feet of any senior exempt, permitted or certificated well not owned by the permit holder, shall immediately cease pumping groundwater if Department staff, during investigation of a complaint, determine 10 feet or more of measured groundwater level interference related to the authorized well use has occurred in the complainant's senior exempt, permitted or certificated well.

(6) Each limited license issued according to subsections (1) and (2) shall be conditioned to provide for a limited duration of 5 years or less.

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690-512-0050 Programs Encouraging Voluntary Cancellation

- (1) The Department shall develop and maintain programs to support voluntary cancellation of groundwater rights in the Harney Basin that evaluate interest and participation in such programs and actively remove barriers to canceling water rights.
- (2) The Department shall, in coordination with the Harney Basin groundwater users, seek funding to provide market-based compensation for voluntary cancellation of groundwater rights. Compensation will be prioritized for groundwater rights that have either the highest potential to substantially interfere with an earlier priority surface water right or to impact ecologically significant groundwater dependent ecosystems or both.
- (3) The Department shall annually report to the Commission on its implementation of any programs developed under this section.

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690-512-0060 HARNEY BASIN CRITICAL GROUNDWATER AREAS

The following rules apply to all critical groundwater areas identified in OAR 690-512-0030(7):

- (1) Groundwater level trends shall be measured annually using all available data collected by and reported to the Department.
- (2) By February 1 of each year, the Department shall produce an estimate of water used in the previous water year in each critical groundwater area using all available data, including satellite imagery.
- (3) By May 1 of each year, the Department shall provide the median groundwater level change for each critical groundwater area using all available data collected by or reported to the Department. The groundwater level change will be calculated as the annual difference between the median high water levels.
- (4) The Department may access any well within a critical groundwater area that is authorized as a point of appropriation on a valid water right for the purpose of implementing these rules, including inspection of flowmeters or measurement of groundwater level data. The Department will provide advance notice verbally or in writing to the groundwater right holder, well owner, or well operator prior to accessing the well and will seek approval prior to entering private property.
- (5) A review of the critical groundwater area rules shall be completed once every 3 years. The review shall be presented at a public meeting held within the basin at which written and oral public comment shall be accepted. The review and a summary of public comments received shall be presented at a Commission meeting which has been publicly noticed and where there is opportunity for public comment.
- (6) A review of the conditions in the critical groundwater areas shall be completed no less frequently than once every 10 years. The review shall be presented at a public meeting held within the basin at which written and oral public comment shall be accepted. The review and a summary of public comments received shall then be presented at a Commission meeting which has been publicly noticed and where there is opportunity for public comment.
- (7) The Department will actively encourage and promote groundwater users to submit groundwater level measurements and shall accept groundwater level measurements taken by authorized professionals using any process established and publicized by the Department.

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- (8) Except as set forth in OAR 690-512-0040, the Department will not accept new applications for groundwater permits or groundwater limited licenses within the critical groundwater areas designated under OAR 690-512-0030(7).
- (9) The Department shall continue to process transfers that are within a single groundwater reservoir. The Department shall use its reimbursement authority to prioritize resources for processing such transfers in an expedited manner in these areas.
- (10) The Department shall not enforce decline conditions in any groundwater rights in the critical groundwater areas.
- (11) The following water rights shall not be subject to corrective controls that result in groundwater use reductions in the critical groundwater areas:
- (a) Exempt groundwater uses as defined in ORS 537.545;
 - (b) Municipal and quasi-municipal groundwater rights;
 - (c) Geothermal uses;
 - (d) Recreational groundwater rights; and
 - (e) Groundwater rights held by a federally recognized Indian tribe.
- (12) By December 31, 2026, and consistent with ORS 540.610 and OAR 690-017, the Department shall initiate cancellation proceedings for groundwater rights where there is evidence to demonstrate non-use for five consecutive years.
- (13) Within the critical groundwater areas, the Department shall regularly monitor for unauthorized groundwater use and timely proceed with regulatory enforcement where it has verified unauthorized use.
- (14) A separate contested case process will be initiated for each critical groundwater area, which will be prioritized as follows and may be sequenced or conducted concurrently as resources and capacity allow:
- (a) Initiation and completion of a contested case process is the high priority for the Weaver Springs Critical Groundwater Area.
 - (b) Initiation and completion of a contested case process is a high priority for the Northeast Crane Critical Groundwater Area.
 - (c) Initiation and completion of a contested case process is a medium priority for the Silver Creek Critical Groundwater Area.

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- (d) Initiation and completion of a contested case process is a medium priority for the Blitzen-Voltage Critical Groundwater Area.
 - (e) Initiation and completion of a contested case process is a low priority for the Silvies River Critical Groundwater Area.
- (15) Corrective control orders will be issued following the completion of the contested case process specified in OAR 690-010-0170 through 230. Only those corrective control measures identified in these Division 512 rules will be implemented in each of the critical groundwater areas.
- (16) One or more groundwater users within a critical groundwater area can petition the Commission to remove the critical groundwater area designation for that area. Consistent with ORS 537.730, the Commission shall remove the designation where:
- (a) 9 years of data showing that conditions in the critical groundwater area are at reasonably stable groundwater levels;
 - (b) The original conditions for designation of the critical groundwater area no longer exist; and
 - (c) A voluntary agreement is in place within the groundwater reservoir.

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690-512-0070 Weaver Springs Critical Groundwater Area

- (1) The target groundwater level trend for the Weaver Springs Critical Groundwater Area is dynamically stable groundwater levels by 2034.
- (2) The following corrective controls described in ORS 537.735 are necessary to achieve reasonably stable groundwater levels and the target groundwater level trend:
 - (a) The permissible total withdrawal shall be set at 9200 acre-feet;
 - (b) Reductions in use to meet 100% of the permissible total withdrawal shall be implemented in 2028 or immediately upon completion of the contested case process specified in OAR 690-010-0170 through 230;
 - (c) Groundwater use will be reduced by relative priority date of the water rights within the groundwater area, with the most junior water rights being curtailed first, until groundwater use equals the permissible total withdrawal or until the target groundwater level trend in subsection (1) is achieved, whichever is less;
 - (d) To establish a schedule for reductions in groundwater use, the Department shall determine an initial allotment for each irrigation groundwater right within the critical groundwater area. The initial allotment shall not exceed the total rate or duty authorized on the water right. In determining the initial allotment, the Department shall:
 - (i) Use a duty of 2.5 acre-feet per acre for primary and supplemental groundwater rights; and
 - (ii) Consider the historic, beneficial use in the five-year period from 2020 to 2024 to identify the number of acres that will be allotted water;
 - (e) In allocating the permissible total withdrawal on an annual basis, the watermaster or another entity authorized by the Department shall request and accept annual declarations from all irrigation groundwater rights holders indicating the intended duty of groundwater to be used. If groundwater users indicate that they do not intend to use 2.5 acre feet, the available duty may go to the groundwater right holder with the next priority date until the permissible total withdrawal is met, however, in no case may a groundwater user receive an allocation greater than 2.5 acre feet. If a groundwater right holder does not submit a declaration, their allocation is assumed to be 2.5 acre feet; and

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- (f) Notwithstanding any of the above, the Department shall reduce the permissible withdrawal of groundwater to zero for any irrigation groundwater right or portion thereof where construction of a permitted well was not initiated by December 31, 2024.
- (3) Any voluntary agreement developed amongst groundwater water users from the Weaver Springs Groundwater Reservoir must contain sufficient conditions to ensure use does not exceed the permissible total withdrawal set for the Weaver Springs Critical Groundwater Area.

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690-512-0080 Silver Creek Critical Groundwater Area

(1) The following corrective controls described in ORS 537.735 will maintain reasonably stable groundwater levels in the Silver Creek Critical Groundwater Area:

(a) The Department shall reduce the permissible withdrawal of groundwater to zero for any irrigation groundwater right or portion thereof where construction of a permitted well was not initiated by December 31, 2024.

(2) To maintain reasonably stable groundwater levels, the Department shall also:

(a) Promote and support a voluntary agreement among groundwater users from the Silver Creek Groundwater Reservoir that reduces groundwater use within the reservoir by 10%, as measured from the 2017 to 2018 mean estimated pumping amounts, by 2040. The 2017 to 2018 mean estimated pumping amounts shall be measured as the mean use from all authorized irrigation groundwater rights that were being put to use within the Silver Creek Groundwater Reservoir in 2017 and 2018.

(b) Promote and support the development of a sub-basin conservation plan consistent with OAR 690-410-0060 to achieve the voluntarily reduction of groundwater use within the Silver Creek Groundwater Reservoir by 10% from 2017 to 2018 mean estimated pumping amounts, and to achieve voluntary actions to be taken in the event of a drought declaration. The conservation plan shall be completed and implementation shall begin by 2028.

(c) Monitor and develop programs to restore and protect spring discharge fed by the Silver Creek Groundwater Reservoir up to customary quantities, including actions to track spring discharge over time and delineate the contributing sources and subsurface flow paths. Customary quantities shall mean the rate or annual amount of water ordinarily available under the terms of existing water rights.

(d) Improve the scientific understanding of the Silver Creek Groundwater Reservoir through the collection of data and additional studies and investigations.

(3) If the Silver Creek Critical Groundwater Area has reached the decline trigger, as that term is defined in OAR 690-512-0010(2), the following additional corrective controls described in ORS 537.735 will be implemented:

(a) The Department shall set a permissible total withdrawal amount necessary to reach dynamically stable groundwater levels within a reasonable amount of time, not to exceed 30 years;

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- (b) The Department shall implement the permissible total withdrawal in six-year increments;
- (c) The Department shall set an initial allocation and reduce uses in the same manner as set out in OAR 690-512-0100(d) to (f); and
- (d) The Department shall adjust permissible total withdrawal and the schedule of curtailment in the same manner as set forth in OAR 690-512-0100(c).

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690-512-0090 Silvies River Critical Groundwater Area

(1) The following corrective controls described in ORS 537.735 will maintain reasonably stable groundwater levels in the Silvies River Critical Groundwater Area:

(a) The Department shall reduce the permissible withdrawal of groundwater to zero for any irrigation groundwater right or portion thereof where construction of a permitted well was not initiated by December 31, 2024.

(2) In order to maintain reasonably stable groundwater levels, the Department shall also:

(a) Promote and support a voluntary agreement among groundwater users from the Silvies River Groundwater Reservoir that reduces groundwater use within the reservoir by 10%, as measured from the 2017 to 2018 mean estimated pumping amounts, by 2040. The 2017 to 2018 mean estimated pumping amounts shall be measured as the mean use from all authorized irrigation groundwater rights that were being put to use within the Silvies River Groundwater Reservoir in 2017 and 2018.

(b) Promote and support the development of a sub-basin conservation plan consistent with OAR 690-410-0060 to achieve the voluntarily reduction of groundwater use within the Silvies River Groundwater Reservoir by 10% from 2017 to 2018 mean estimated pumping amounts and to achieve voluntary actions to be taken in the event of a drought declaration. The conservation plan shall be completed and implementation shall begin by 2028.

(c) Improve the scientific understanding of the Silvies River Groundwater Reservoir, including by the collection of data and conducting additional studies and investigations.

(3) If the Silvies River Critical Groundwater Area has reached the decline trigger as that term is defined in OAR 690-512-0010(2), the following additional corrective controls described in ORS 537.735 will be implemented:

(a) The Department shall set a permissible total withdrawal amount necessary to reach dynamically stable groundwater levels within a reasonable amount of time, not to exceed 30 years;

(b) The Department shall implement the permissible total withdrawal in six-year increments;

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(c) The Department shall set an initial allocation and reduce uses in the same manner as set out in OAR 690-512-0100(d) to (f); and

(d) The Department shall adjust permissible total withdrawal and the schedule of curtailment in the same manner as set forth in OAR 690-512-0100(c).

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690-512-0100 Northeast Crane Critical Groundwater Area

- (1) The target groundwater level for the Northeast Crane Critical Groundwater Area is dynamically stable groundwater levels by 2058.
- (2) The following corrective controls described in ORS 537.735 will achieve and maintain reasonably stable groundwater levels and the target groundwater levels:
 - (a) The Department shall set the permissible total withdrawal at 37,000 acre feet.
 - (b) Reductions in use to meet the permissible total withdrawal will begin in 2028 or upon completion of a contested case process specified in OAR 690-010-0170 through 230. Reductions in use will be implemented in six-year intervals as follows: 30 percent of total reduction scheduled in 2028, 20 percent of the total reduction in 2034, 20 percent of the total reduction in 2040, 20 percent of the total reduction in 2046, 10 percent of the total reduction in 2052.
 - (c) In the year prior to each six-year interval identified in subsection (e), the Department will evaluate the groundwater level trends in the Northeast Crane Critical Groundwater Area to determine if they meet the target groundwater level trend in subsection (1). If the goal has been met, the Department will not implement the next scheduled set of reductions. If at the following 6 year interval the target groundwater level trend is no longer being met, however, the Department shall resume the scheduled curtailment until the target groundwater level goal is met again.
 - (d) Groundwater use will be reduced by relative priority date of the water rights within the groundwater area, with the most junior water rights being curtailed first, until groundwater use equals the permissible total withdrawal or until the target groundwater level trends described in subsection (1) are achieved.
 - (e) To establish a schedule for reductions in groundwater use, the Department shall determine an initial allotment for each irrigation groundwater right within the critical groundwater area. The initial allotment shall not exceed the total rate or duty authorized on the water right. In determining the initial allotment, the Department shall:
 - (i) Use a duty of 2.5 acre-feet per acre for primary and supplemental groundwater rights; and
 - (ii) Consider the historic, beneficial use in the five-year period from 2020 to 2024 to identify the number of acres that will be allotted water.

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- (f) In allocating the permissible total withdrawal on an annual basis, the watermaster or another entity authorized by the Department shall request and accept annual declarations from all irrigation groundwater rights holders indicating the intended duty of groundwater to be used. If groundwater users indicate that they do not intend to use 2.5 acre feet, the available duty may go to the groundwater right holder with the next priority date until the permissible total withdrawal is met, however, in no case may a groundwater users receive an allocation greater than 2.5 acre feet. If a groundwater right holder does not submit a declaration, their allocation is assumed to be 2.5 acre feet; and
 - (g) Notwithstanding any of the above, the Department shall reduce the permissible withdrawal of groundwater to zero for any irrigation groundwater right or portion thereof where construction of a permitted well was not initiated by December 31, 2024.
- (3) In order to achieve and maintain reasonably stable groundwater levels, the Department shall also:
- (a) Promote and support development of a voluntary agreement among groundwater users in the Northeast Crane Groundwater Reservoir by 2028.
 - (b) Promote and support development of a sub-basin conservation plan consistent with 690-410-0060 to voluntarily reduce groundwater use, including voluntary actions to be taken in the event of a drought declaration. The conservation plan shall be completed and implementation shall begin by 2028.
 - (c) Improve the scientific understanding of the Northeast Crane Groundwater Reservoir, including by the collection of data and conducting additional studies and investigations.
- (4) Any voluntary agreement developed amongst groundwater water users from the Northeast Crane Groundwater Reservoir must contain sufficient conditions to ensure use does not exceed the permissible total withdrawal set for the Northeast-Crane Critical Groundwater Area.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0010 Blitzen-Voltage Critical Groundwater Area

(1) The following corrective controls described in ORS 537.735 will maintain reasonably stable groundwater levels in the Blitzen-Voltage Critical Groundwater Area:

(a) The Department shall reduce the permissible withdrawal of groundwater to zero for any irrigation groundwater right or portion thereof where construction of a permitted well was not initiated by December 31, 2024.

(2) In order to maintain reasonably stable groundwater levels, the Department shall:

(a) Promote and support a voluntary agreement among groundwater users from the Blitzen-Voltage Groundwater Reservoir that reduces groundwater use within the reservoir by 10%, as measured from the 2017 to 2018 mean estimated pumping amounts, by 2040. The 2017 to 2018 mean estimated pumping amounts shall be measured as the mean use from all authorized irrigation groundwater rights that were being put to use within the Blitzen-Voltage River Groundwater Reservoir in 2017 and 2018.

(b) Promote and support the development of a sub-basin conservation plan consistent with OAR 690-410-0060 to achieve the voluntary reduction of groundwater use within the groundwater area by 10% from 2017-2018 mean estimated pumping amounts, and to achieve voluntary actions to be taken in the event of a drought declaration, by 2028.

(c) Monitor and develop programs to restore and protect spring discharge fed by the Blitzen-Voltage Groundwater Reservoir up to customary quantities, including actions to track spring discharge over time and delineate the contributing sources and subsurface flow paths. Customary quantities means the rate or annual amount of water ordinarily available within the terms of existing water rights.

(d) Improve the scientific understanding of the Blitzen-Voltage Groundwater Reservoir, including the collection of data or additional studies or investigations.

(3) If the Blitzen-Voltage Critical Groundwater Area has reached the decline trigger, as that term is defined in OAR 690-512-0010(2), the following additional corrective controls described in ORS 537.735 will be implemented:

(a) The Department shall set a permissible total withdrawal amount necessary to reach dynamically stable groundwater levels within a reasonable amount of time, not to exceed 30 years;

Exhibit A - Summary and Language for Proposed Division 512 Rules

- (b) The Department shall implement the permissible total withdrawal in six-year increments;
- (c) The Department shall set an initial allocation and reduce uses in the same manner as set out in OAR 690-512-0100(d) to (f); and
- (d) The Department shall adjust permissible total withdrawal and the schedule of curtailment in the same manner as set forth in OAR 690-512-0100(c).

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0120 Domestic and Stockwater Wells and Uses

- (1) The Department shall develop, manage and maintain a program and process for accepting, tracking, and responding to groundwater quality and quantity concerns from exempt domestic and stockwater well owners and users located in the Harney Basin. This information will be used to inform adaptive management of the groundwater resources within the basin and to develop mechanisms to address impacts to exempt domestic and stockwater wells and uses within the basin.
- (2) The Department will develop, manage and maintain programs to provide financial and technical assistance to domestic and stock wells and well owners impacted by groundwater level declines in the Harney Basin.
- (3) The Department shall annually report to the Commission on its implementation of any programs developed under this section.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0130 Adaptive Management and Co-Management

(1) The Department shall support creation of an ongoing groundwater management collaborative to support an integrated, coordinated, and adaptive approach to groundwater management in the Harney Basin. Membership in the collaborative shall remain open to all interested organizations and individuals adhering to a governance agreement. Meetings of the collaborative shall be open to the public. The Department will work with the collaborative to encourage the collection and use of relevant data, implementation of conservation measures and voluntary agreements, implementation of actions contained in the state-recognized place-based integrated water resources plan, and other actions necessary to implement these rules. The Department shall regularly participate in the meetings of the collaborative and will strive to provide financial, technical, and planning assistance as authority, capacity, and resources allow. The collaborative can advise on how to increase the effectiveness of groundwater management actions, but are advisory only and are not conferred any authority.

(2) The Department will foster coordinated action by federal, state and local agencies, Indian tribes, and special districts as well as public education to promote the effective management, protection and beneficial use of groundwater consistent with ORS 536.440 to ORS 536.480, and OAR 690-410-0010, with a focus on the following:

- (a) Opportunities to further refine the USGS groundwater model to reflect updated science and data.
- (b) Opportunities to increase data collection activities on federal lands.
- (c) Opportunities to better understand the relationship between upland vegetation management and groundwater recharge.

(3) The Department will, on a biannual basis, develop a work plan that includes the following elements:

- (a) Describes the actions the Department will undertake or support in order to assist with implementation of the state recognized place-based integrated water resources plan and other voluntary actions as authority, capacity and resources allow.
- (b) Summarizes regulatory and non-regulatory actions taken by the Department over the previous biennia.
- (c) Describes policy and budget needs to support voluntary and regulatory actions supported by the agency, including the actions in OAR 690-512-0120

Exhibit A - Summary and Language for Proposed Division 512 Rules

pertaining to impacted domestic and stock wells and OAR 690-512-0050 pertaining to the voluntary cancellation of groundwater rights.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0140 Serious Water Management Problem Area (SWMPA)

(1) Groundwater conditions within the Harney Basin Serious Water Management Problem Area (SWMPA) boundary defined in OAR 690-512-0030(3) meet the criteria defined in OAR 690-085-0020(1)(a) and OAR 690-085-0020(1)(f).

(2) By no later than March 1, 2028, each groundwater right holder, well owner, or well operator shall properly install and thereafter properly maintain a totalizing flow meter on each well listed as a point of appropriation on a non-cancelled groundwater right or use within the Harney Basin SWMPA boundary as defined in OAR 690-512-0030(3). The Department may extend the deadline as needed for a specific groundwater area if a petition to extend the deadline is received. If the deadline is extended, the Department will notify each groundwater right holder, well owner, or well operator at least 60 days before March 1, 2028. Groundwater wells that are regulated off or are no longer in use, and are disconnected from all water use infrastructure do not require a totalizing flow meter to be installed unless or until use is permitted to resume.

(3) Totalizing flow meters shall be properly installed according to manufacturer specifications and must meet the specifications in section 6 of this rule.

(4) Totalizing flow meters and the method of flow meter installation may be subject to approval by Department staff. Once installed, totalizing flow meters must be maintained in good working order. Department staff shall have reasonable access to the totalizing flow meters upon request pursuant to ORS 537.780(1)(e).

(5) The groundwater right holder, well owner, or well operator shall keep a complete record of the volume of water appropriated each month. The groundwater right holder, well owner, or well operator shall submit annually a report that includes water use measurements to the Department by December 31 of each calendar year for water used between November 1st of the preceding year and October 31st of the current year. Reports shall be submitted using a form developed and maintained by the Department.

(a) Groundwater wells regulated off are not required to report until use is permitted to resume.

(b) Any governmental entity required to submit water use reports under OAR 690-085 is exempt from the reporting requirements of this rule.

(6) A totalizing flow meter shall meet the following specifications:

(a) A totalizing flow meter shall have a rated accuracy of plus or minus 2 percent of actual flow for all flow rates for which the meter is expected to measure;

Exhibit A - Summary and Language for Proposed Division 512 Rules

- (b) A totalizing flow meter shall measure the entire discharge from the well;
 - (c) A totalizing flow meter shall have a visual and recording, mechanical or digital totalizer located on or adjacent to the flow meter and shall be equipped with a sweep hand or digital readout so that instantaneous flow rate can be read;
 - (d) The totalizing part of the flow meter shall have sufficient capacity to record, at a minimum, the quantity of water authorized to be pumped over a period of 2 years. Units of water measurement shall be in acre-feet, cubic-feet, or gallons, and the totalizer shall read directly in one of these units. Flow meters recording in acre-feet shall, at a minimum, read to the nearest 1/10th acre-foot, and the decimal multiplier shall be clearly indicated on the face of the register head;
 - (e) Totalizers on each meter shall not be field reset without notice to and written permission from the local watermaster. Prior to resetting the totalizers, the final reading must be recorded and reported;
 - (f) The totalizing flow meter shall be installed in accordance with all manufacturer specifications. There shall be no turnouts or diversions between the well and the flow meter; and
 - (g) The totalizing flow meter shall be installed no more than 100 feet from the well head unless an exception is approved by the watermaster in writing.
- (7) A water user shall report broken flow meters to the local watermaster's office within 48 hours after determining that the flow meter is broken. A water user shall not appropriate water for more than 60 days without an operating flow meter.
- (8) While the flow meter is broken, the water user shall use other methods of reporting as defined under OAR 690-085-0015(5) until the flow meter is replaced or repaired. The water user shall keep the monthly data and provide the data to the local watermaster upon request. The data shall include a statement of the initial reading on the newly installed flow meter, the current power meter reading and the time of operation. The water user shall notify the local watermaster within 48 hours of installing the repaired or replacement flow meter.
- (9) Failure to have and maintain a properly installed, functioning totalizing flow meter by the deadline may result in the local watermaster regulating and controlling the unmetered well such that no groundwater may be pumped or appropriated until a flow meter is installed consistent with these rules.
- (10) If a water user has proof that a totalizing flow meter cannot be maintained for reasons outside of their control and the watermaster attests to this in writing, an alternate

Exhibit A - Summary and Language for Proposed Division 512 Rules

method for measuring and recording water use may be proposed by the groundwater user and shall be authorized by the Department.

(11) Consistent with ORS 536.900, ORS 183.745, and OAR 690-260, the Department may assess civil penalties for violation of these rules.

Exhibit A - Summary and Language for Proposed Division 512 Rules

690-512-0150 Rights of the Burns Paiute Tribe and Harney Basin Co-Stewardship

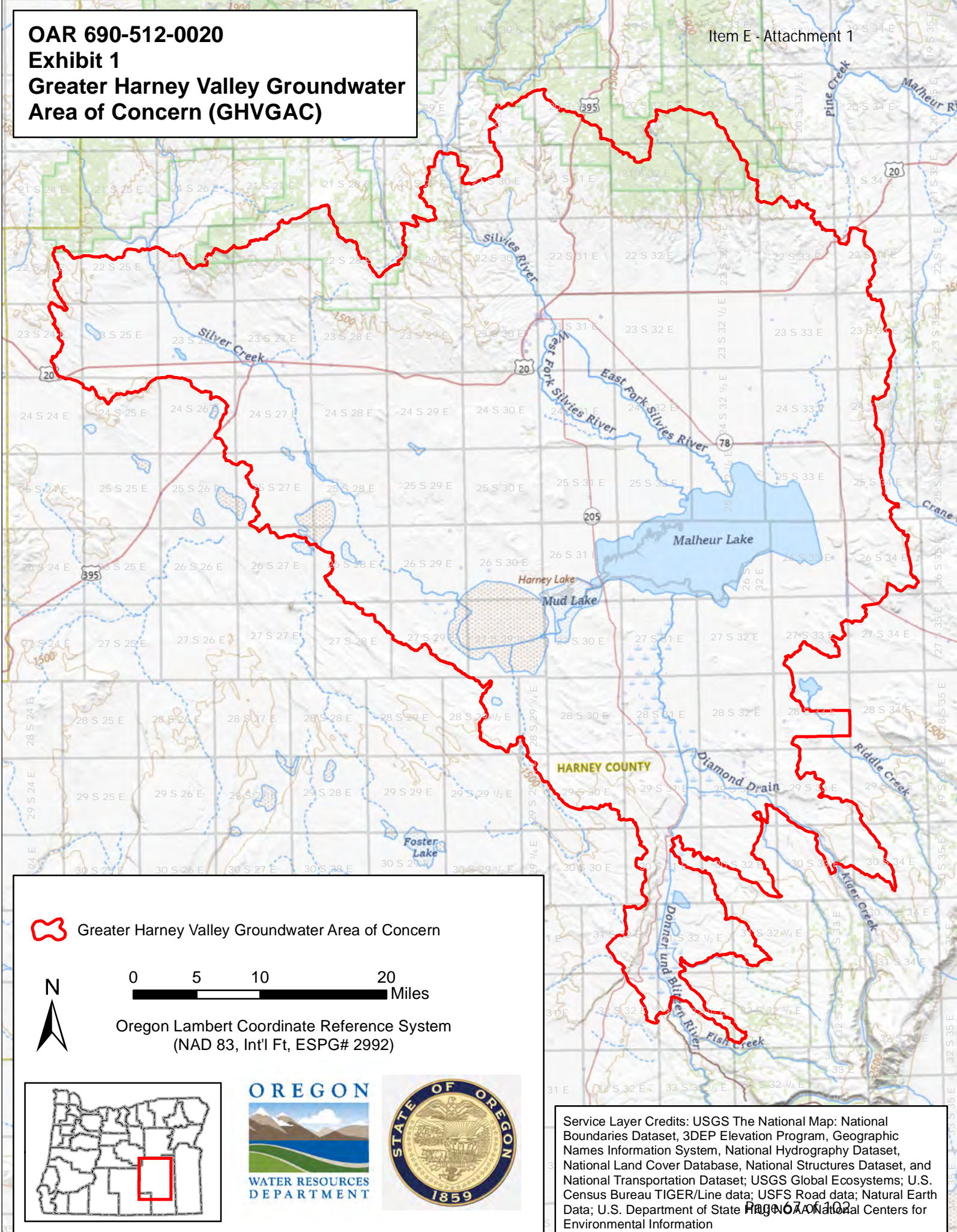
- (1) Nothing in OAR 690-512-0010 to OAR 690-512-0140, nor the implementation thereof, shall be interpreted to impair, curtail, condition, meter, require reporting for, or otherwise limit any water right of the Burns Paiute Tribe. This protection applies to all federally reserved, aboriginal, and state-recognized rights, including but not limited to Certificate 20245 (1940, quasi-municipal, 112.2 acres, T-10100), Certificate 20244 (1947, irrigation, 14.3 acres, T-10100); and Permit G-16405 (1991, irrigation, 21.1 acres).
- (2) OAR 690-512-0010 to OAR 690-512-0140, including the critical groundwater area designations, and any contested case process and regulatory orders associated with the critical groundwater area designation, shall not apply to the Burns Paiute Tribe's water rights or to waters within Tribal lands without the express written consent of the Burns Paiute Tribe. Consent may be conditioned and may be revoked by the Burns Paiute Tribe at any time.
- (3) No monitoring, metering, installation, reporting, inspection, or access obligations shall be imposed on Tribal lands, Tribal systems, or Tribal rights without the express written consent of the Burns Paiute Tribe. Consent may be conditioned and may be revoked by the Burns Paiute Tribe at any time.
- (4) Nothing in OAR 690-512-0010 to OAR 690-512-0140, nor any participation in programs, agreements, or forums, by the Burns Paiute Tribe shall be construed as:
 - (a) a waiver of the Burns Paiute Tribe's sovereign immunity;
 - (b) consent to State or agency jurisdiction;
 - (c) a concession regarding the existence, scope, seniority, quantification, or exercise of Tribal water rights; or
 - (d) evidence of abandonment, forfeiture, or subordination to state-law priority.
- (5) Within twelve (12) months of rule adoption, the Department shall initiate a co-stewardship process with the Burns Paiute Tribe and basin stakeholders to support collaborative management of Harney Basin water resources. The structure and authority of this framework shall be developed jointly, with no presumption of Tribal waiver or subordination.
- (6) Voluntary conservation actions, data sharing, pilot projects, or participation by the Burns Paiute Tribe shall not be used to argue waiver, diminution, quantification, or subordination of Tribal rights.
- (7) If any provision of this section is held invalid, the remainder shall remain in effect. In the event of conflict between this section and other rule text, this section controls.

OAR 690-512-0020

Exhibit 1

Greater Harney Valley Groundwater
Area of Concern (GHVGAC)

Item E - Attachment 1



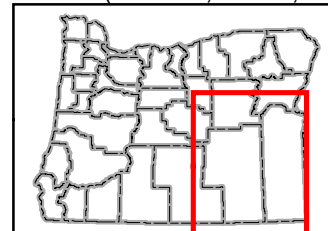
OAR 690-512-0020
Exhibit 2
Malheur Lake Basin



Item E, Attachment 1
Malheur Lake Basin

0 10 20 40 Miles

Oregon Lambert Coordinate Reference System
(NAD 83, Int'l Ft, ESPG# 2992)



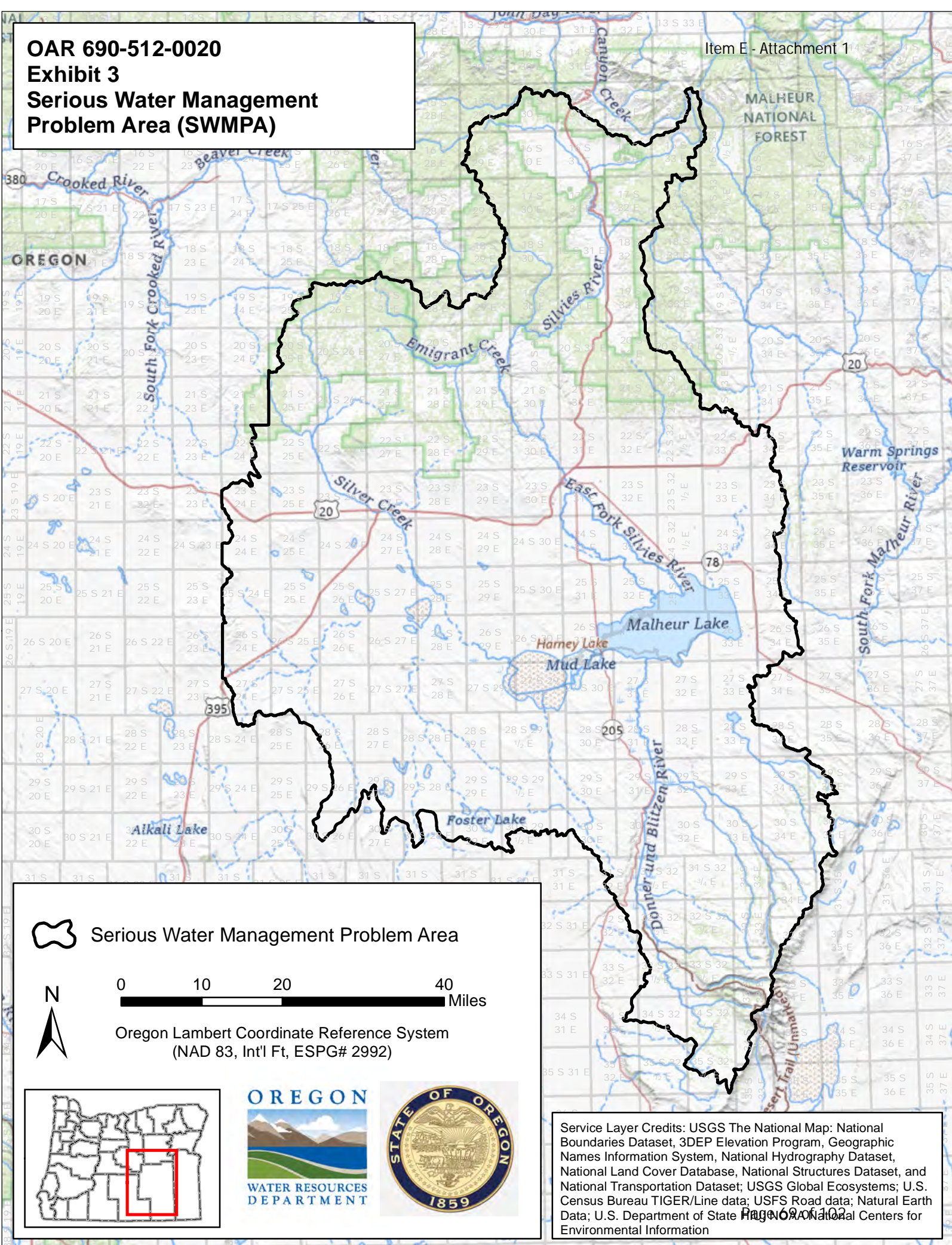
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OAR 690-512-0020

Exhibit 3

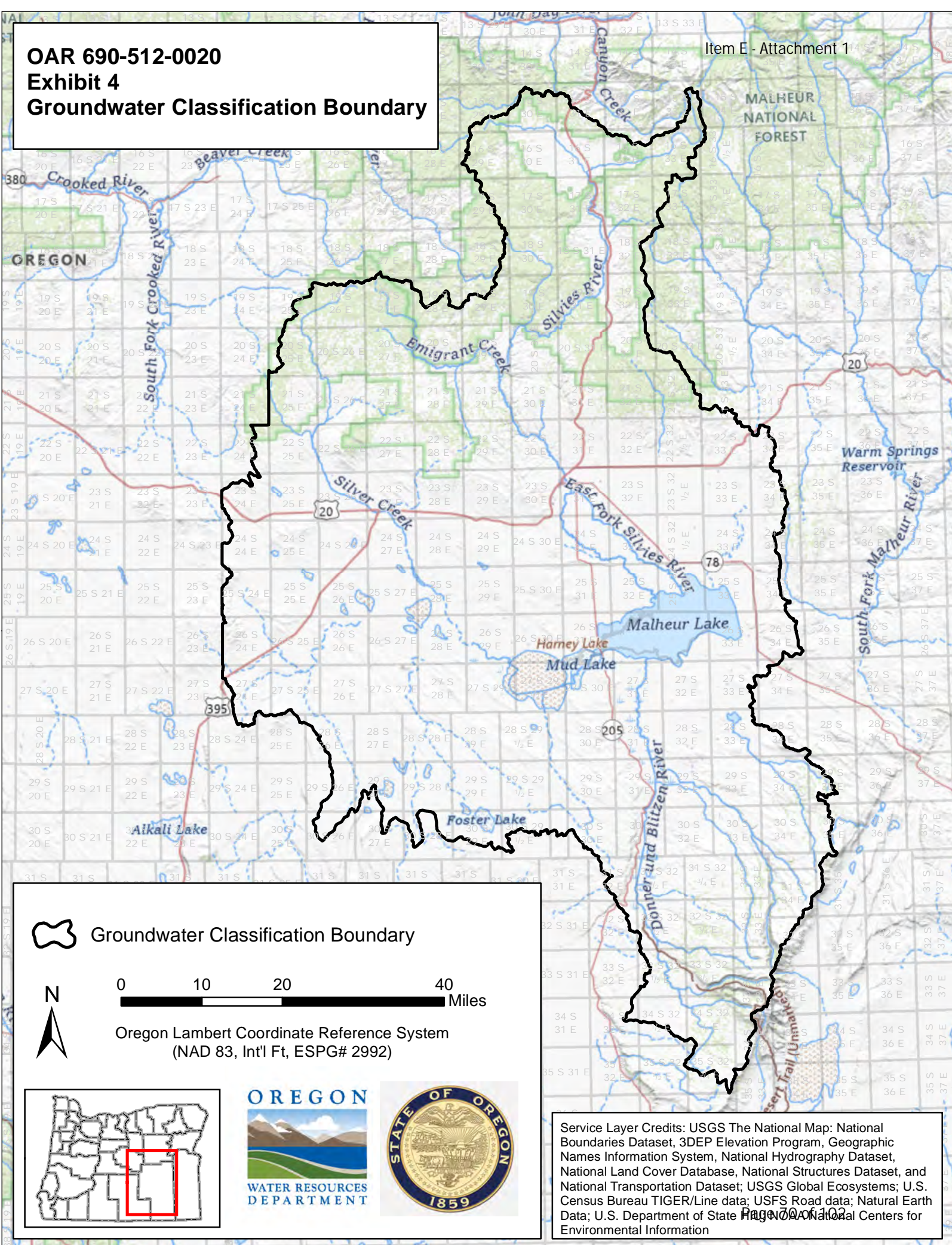
Serious Water Management Problem Area (SWMPA)

Item E - Attachment 1



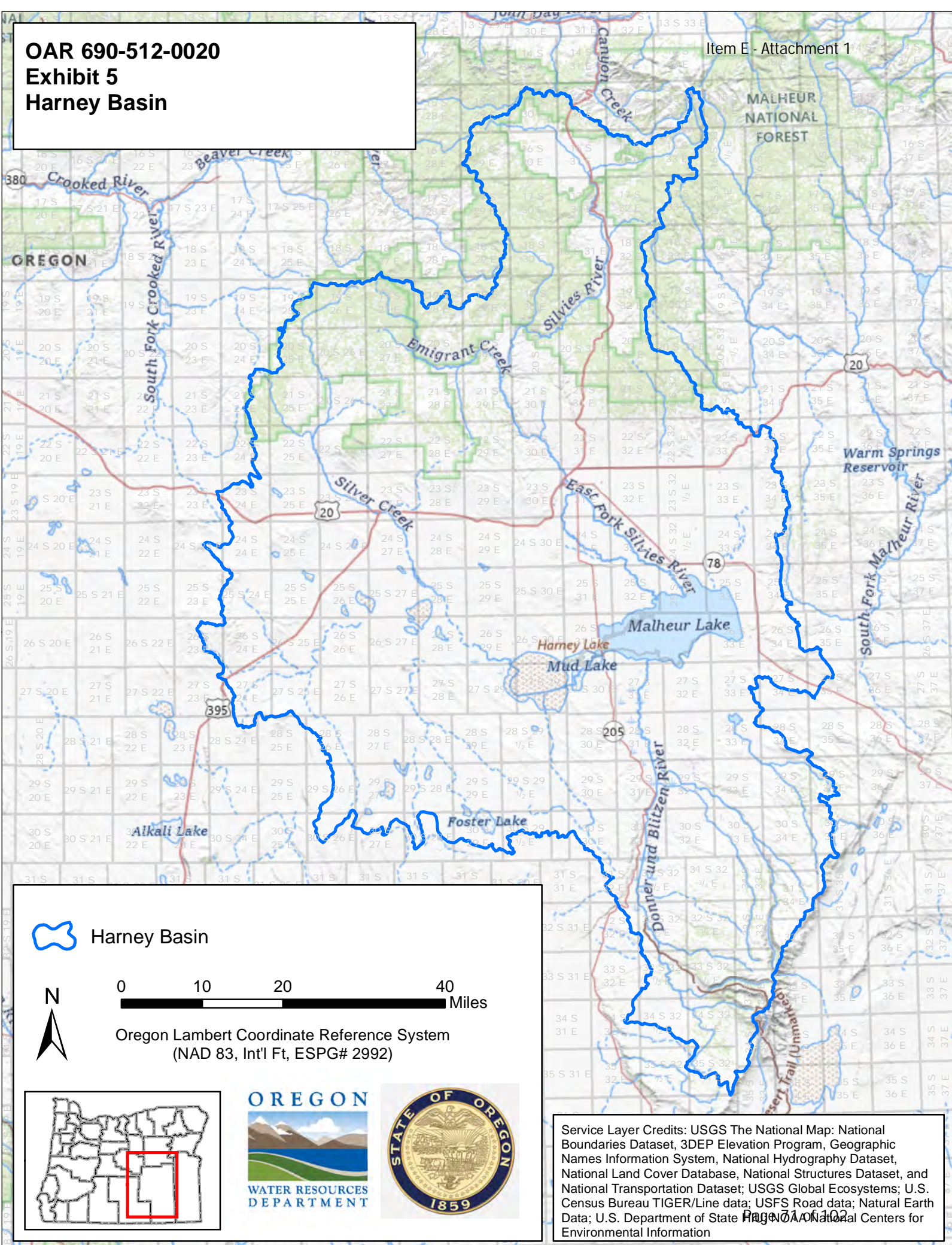
OAR 690-512-0020
Exhibit 4
Groundwater Classification Boundary

Item E - Attachment 1




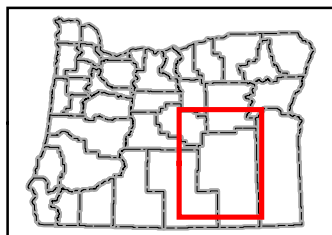
OAR 690-512-0020
Exhibit 5
Harney Basin

Item E - Attachment 1

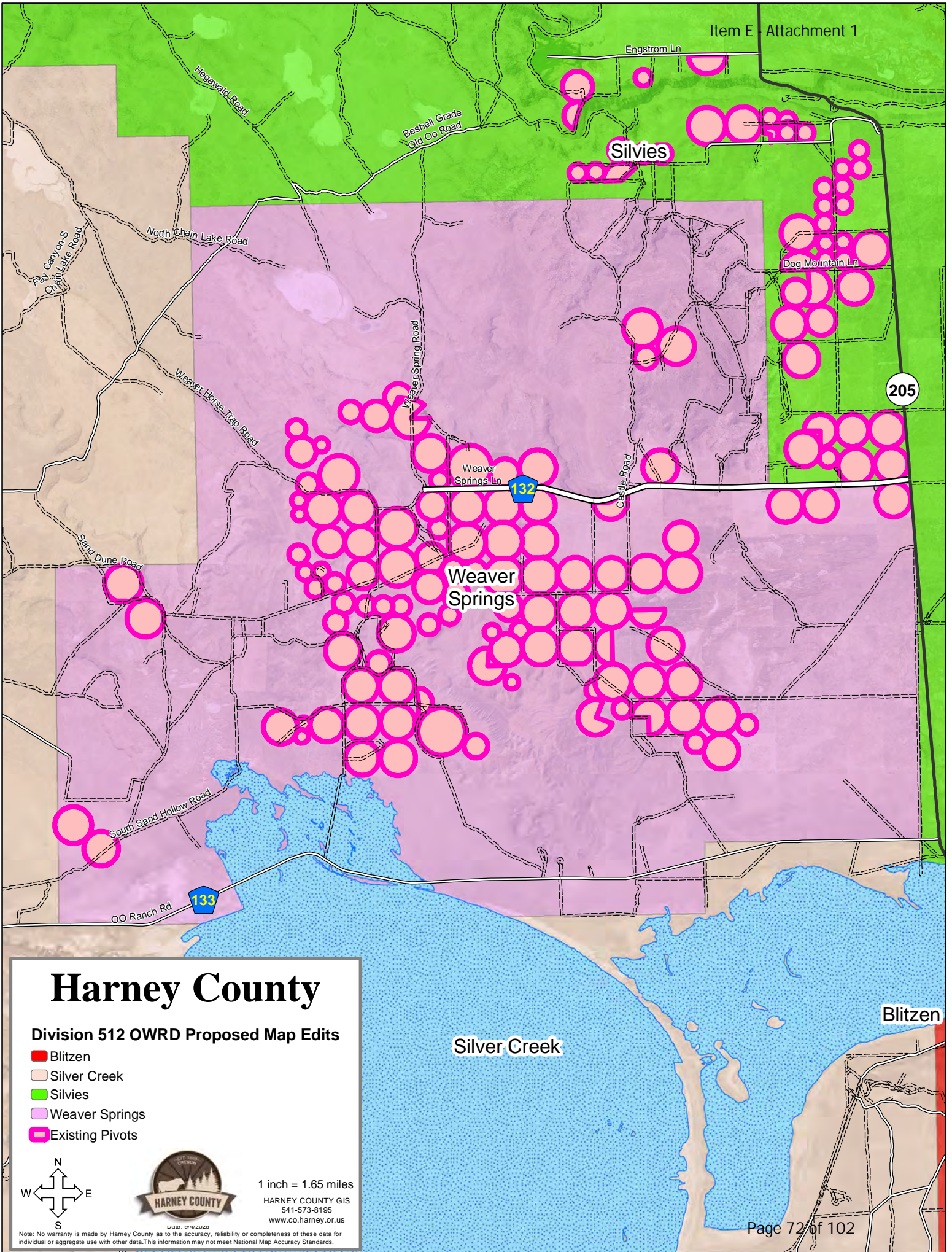


 Harney Basin

 0 10 20 40 Miles
 Oregon Lambert Coordinate Reference System
 (NAD 83, Int'l Ft, ESPG# 2992)



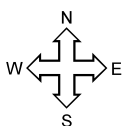
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Harney County

Division 512 OWRD Proposed Map Edits

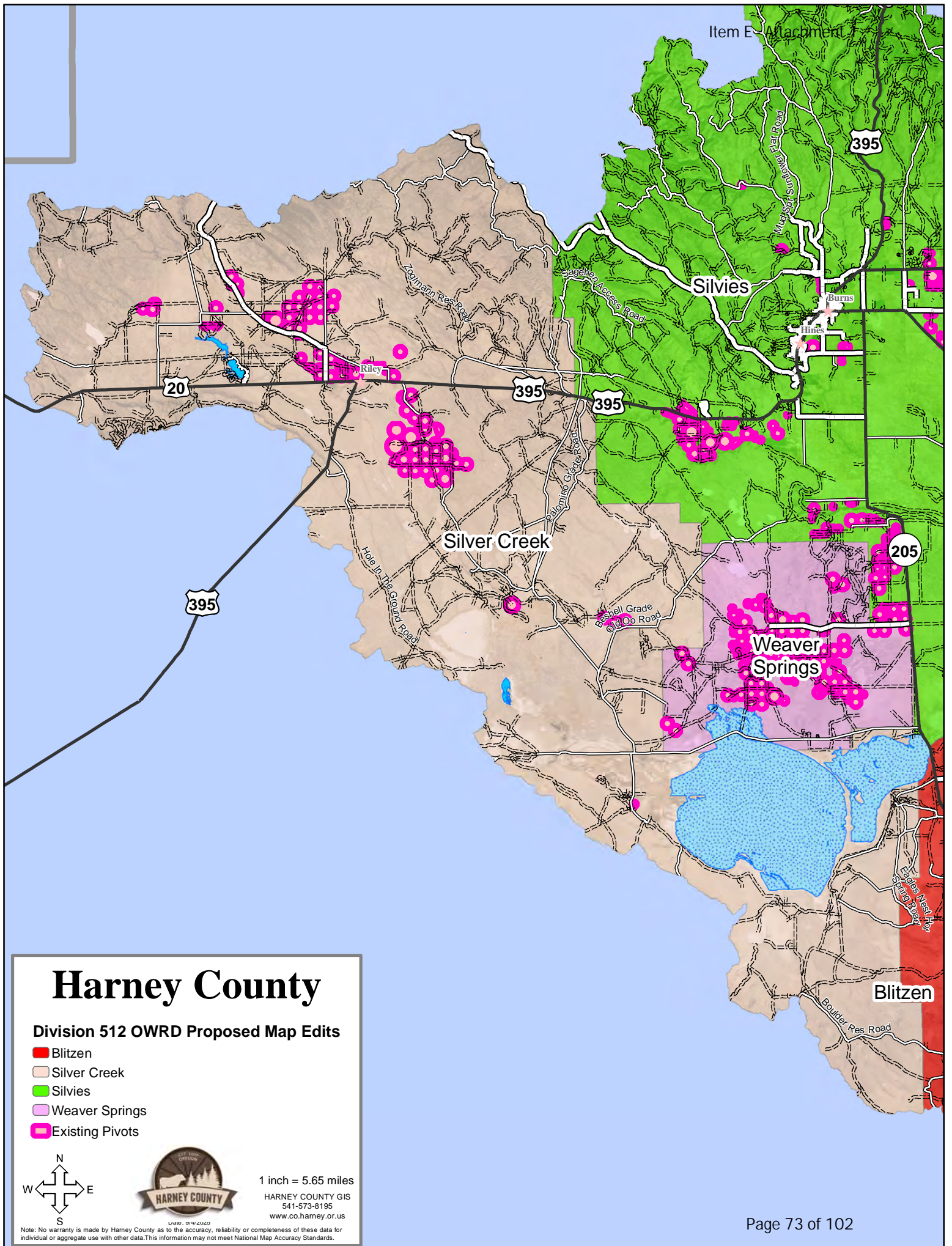
- Blitzen
- Silver Creek
- Silvies
- Weaver Springs
- Existing Pivots

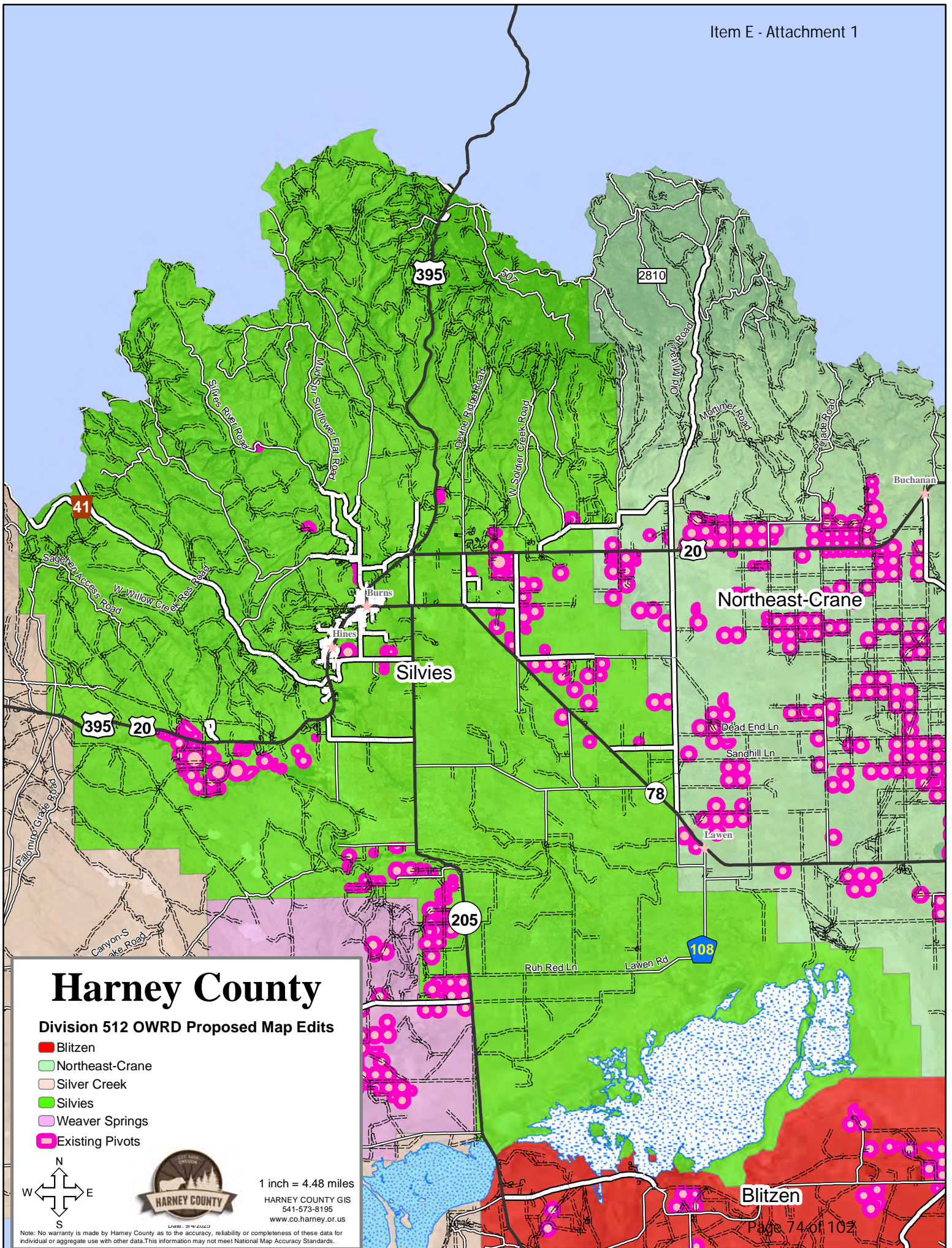


1 inch = 1.65 miles

HARNEY COUNTY GIS
541-573-8195
www.co.harney.or.us

Note: No warranty is made by Harney County as to the accuracy, reliability or completeness of these data for individual or aggregate use with other data. This information may not meet National Map Accuracy Standards.

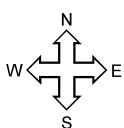




Harney County

Division 512 OWRD Proposed Map Edits

- Blitzen
- Northeast-Crane
- Silver Creek
- Silvies
- Weaver Springs
- Existing Pivots



1 inch = 4.48 miles

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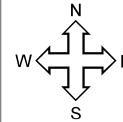
Blitzen

Item E - Attachment 1

Harney County

Division 512 OWRD Proposed Map Edits

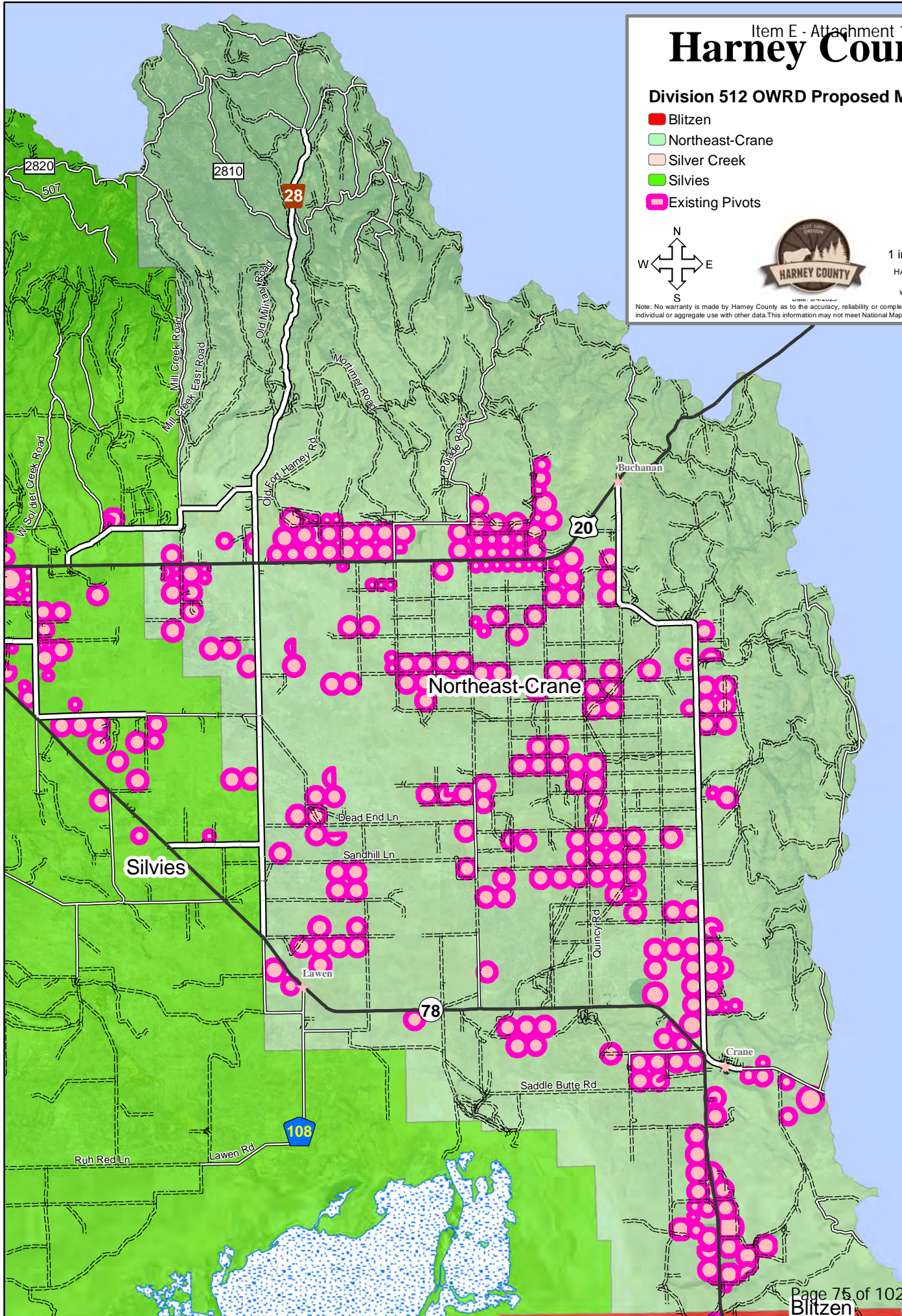
-  Blitzen
-  Northeast-Crane
-  Silver Creek
-  Silvies
-  Existing Pivots



1 inch = 3.32 miles

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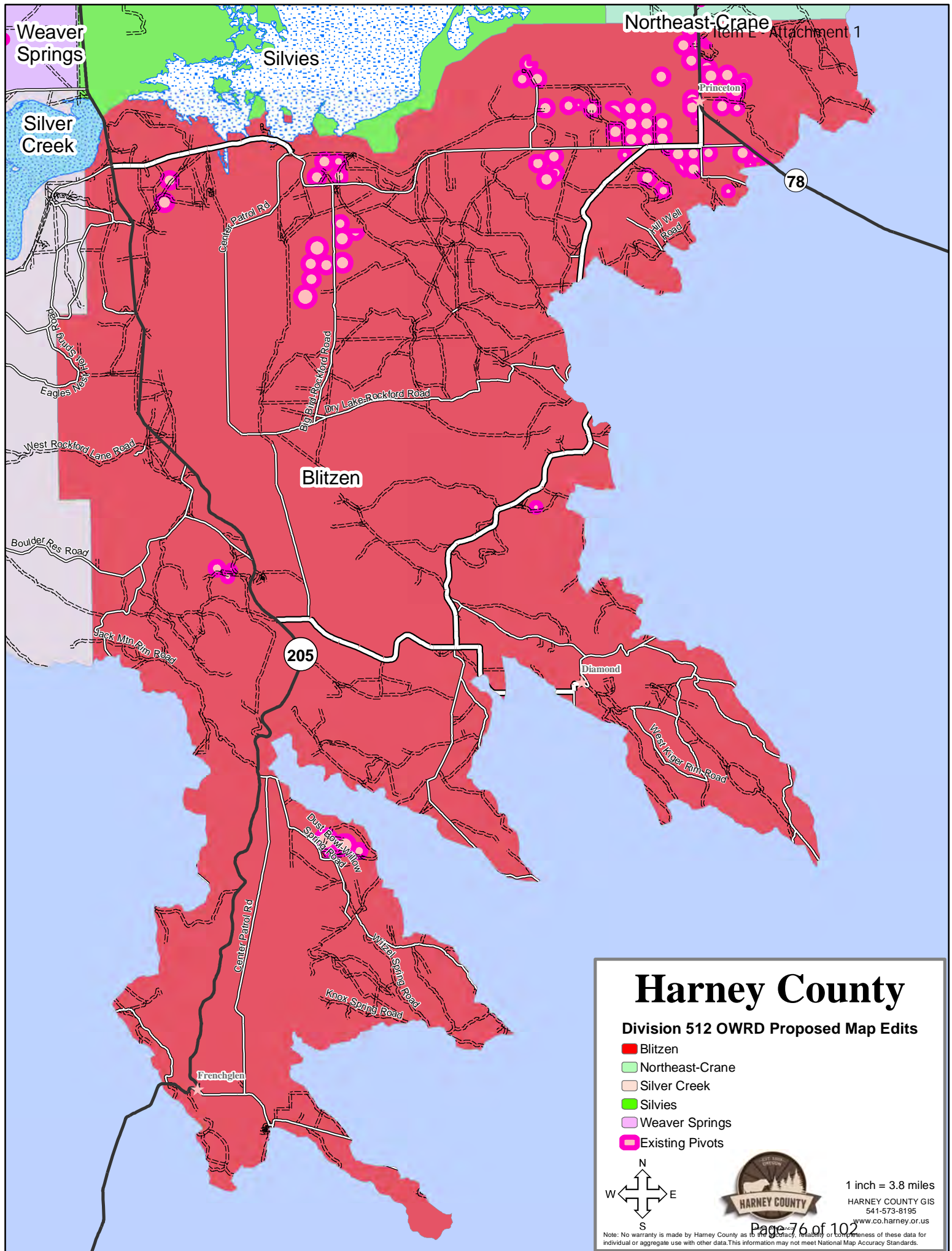


Exhibit B Harney Basin Water Policy and Management Background

Harney Basin Water Policy and Management Background

I. Overview of relevant actions and events

The following provides an overview of relevant actions taken pertaining to development of integrated and coordinated policies, plans and programs for water resources generally and groundwater resources specifically in the Harney Basin. This timeline of actions and events shows the activities that have been undertaken by the state to inform allocation policies as well as efforts by the community and legislature to work towards an integrated and coordinated approach to water management with the state.

- **1967** The Oregon Water Resources Department publishes the Malheur Lake Basin Report, which includes descriptions of current groundwater use, potential for further development.
- **1985** Basin Program Rules (Division 512) adopted for the Malheur Lake Administrative Basin. No rules specific to appropriation of groundwater resources included.
- **1990** Division 512 rules updated. No rules specific to appropriation of groundwater resources included.
- **1990** 22 wells dropped from the groundwater monitoring network in the Malheur Lake Basin due to agency budget cuts.
- **1990** Water Resources Department begins to include measurement and reporting, groundwater level measurements, and decline conditions on some new groundwater permits.
- **2000** Harney County Watershed Council publishes the Silver Creek Sub-Basin Assessment and Silvies River Sub-Basin Assessment.
- **2001** Harney County Watershed Council publishes the Harney-Malheur Lake Sub-Basin Assessment.
- **2002** Water Resources Department includes measurement, reporting, and decline conditions on most new, large groundwater permits.
- **2003** Harney County Watershed Council publishes the Donner Und Blitzen Sub-Basin Assessment.
- **2004** OWRD includes measurement, reporting, and decline conditions placed on almost all new groundwater permits.
- **2006** OWRD installs HARN 1245 recorder in response to local concern noted in the Crane area in 2004.

Exhibit B Harney Basin Water Policy and Management Background

- **2006** Water Resources Department Groundwater Section Manager presents to the Harney County Watershed Council about groundwater concepts and policies.
- **2008** OWRD begins quarterly monitoring of additional wells in the Crane area.
- **2008** Oregon Water Resources Department Groundwater Section Manager presents to the Harney County community about groundwater concepts and policies and highlights initial concerns about groundwater declines North of Harney and Malheur Lakes.
- **2009** ~2 ft/yr decline in HARN 1245 recorder well (Crane area) and additional wells with declines noted by the Water Resources Department.
- **2009** The Oregon Water Resources Commission adopts and amends the Division 512 rules to reserve 4,550 acre feet of unappropriated water on Home Creek, tributary to the Catlow Valley in the Malheur Lakes Basin, for multipurpose storage for future economic development. No rules specific to appropriation of groundwater resources included.
- **2009** OWRD begins quarterly monitoring at Weaver Springs to monitor impacts of rapid groundwater development.
- **2010** The Harney County Watershed Council obtains grant funds to gather data on groundwater conditions in the Harney Basin.
- **2012** The Harney County Watershed Council received a final Harney Basin Groundwater Study report completed with grant funding.
- **2012** Declines in the Weaver Springs area are well documented by the Water Resources Department.
- **2013** Water Resources Department issues first “propose to deny” due to groundwater availability/capacity concerns in the Crane-Buchanan area.
- **2014** Water Resources Department issues first “propose to deny” due to groundwater availability/capacity concerns in the Weaver Springs area.
- **2014** WaterWatch files a protest on 5 groundwater permitting decisions where groundwater reviews show that groundwater availability “cannot be determined.”
- **2014** Expansion of Water Resources Department monitoring across the basin begins.
- **2014** Harney County Watershed Council receives a grant to support community groundwater level monitoring efforts.

Exhibit B Harney Basin Water Policy and Management Background

- **2015** Water Resources Department issues first “propose to deny” due to groundwater availability/capacity concerns for the entire basin.
- **2015** Water Resources Department Groundwater Section Manager presents to the community the findings of an internal memo showing the basin is over appropriated.
- **2015** The Water Resources Department initiates a rulemaking effort to update the Division 512 rules to limit additional groundwater development based on the findings of an internal memo.
- **2016** Updated Division 512 rules are adopted by the Water Resources Commission, followed by extensive outreach to groundwater users and community members.
- **2016** A cooperative groundwater investigation between the USGS and Oregon Water Resources Department is initiated and a Study Advisory Committee is first convened by the Department and Harney County Court.
- **2016** Place-based integrated water resources planning initiated in the basin after a grant was awarded by the Commission.
- **2017** Two eddy covariance stations placed in the Harney Basin to improve satellite-based estimates of evapotranspiration from crops and native vegetation.
- **2017** The Nature Conservancy obtains a grant to map groundwater-dependent ecosystems and develop a report assessing their current condition, and an analysis of how their condition has changed over time as compared to increased pumping and/or climatic changes.
- **2018** Grant received from OWEB to assist with use of satellite-based imagery to improve groundwater use estimates.
- **2018** Water Resources Department and community leaders support outreach for a groundwater quality study performed by the Department of Environmental Quality.
- **2019** Two Agrimet stations placed in the Harney Basin in partnership with the Bureau of Reclamation to improve track local weather conditions, improve estimates of evapotranspiration from crops and inform irrigation management.
- **2019** Final meeting of the Groundwater Study Advisory Committee while the report goes through peer review (report initially anticipated at the end of 2020).

Exhibit B Harney Basin Water Policy and Management Background

- **2019** The Department initiates a more proactive approach to identifying and regulating unauthorized uses at the request of groundwater users and community members.
- **2019** The Department prioritizes issuance of outstanding claims of beneficial use at the request of groundwater users and community members.
- **2019** The Department evaluates and adjusts internal practices related to granting extensions for undeveloped water rights in the Harney Basin at the request of groundwater users and community members.
- **2019** The Department creates an internal process to receive and respond to “dry well complaints” in the Harney Basin at the request of groundwater users and community members that becomes the prototype for a statewide system.
- **2019** The Harney County Watershed Council partners with Oregon State University to survey impacts from changes in groundwater quality and quantity to domestic well users.
- **2020** The Water Resources Department publicly warns against additional groundwater development in the Harney Basin through letters to groundwater users and media coverage.
- **2021** The Department of Environmental Quality publishes the groundwater quality study for the Harney Basin.
- **2021** HB 2018 directs the Water Resources Department to develop updated groundwater recharge estimates across Oregon and involve the public (Harney Basin was the primary catalyst for this action). Three new positions authorized and funded by the Legislature to assist with community engagement along with other new positions for the Groundwater and Surface Water sections.
- **2021** HB 3092 creates the Greater Harney Valley Well Fund for the purpose of replacing, repairing or deepening domestic personal use wells that are affected by declining groundwater levels. HB 2145 also creates the Statewide Water Well Abandonment, Repair, and Replacement Fund.
- **2021** Funding provided by the Oregon State Legislature to support voluntary cancellation of groundwater rights in the Harney Basin through a newly established Groundwater Conservation Reserve Enhancement Program.

Exhibit B Harney Basin Water Policy and Management Background

- **2021** A feasibility study assessing the potential for a groundwater market in the Harney Basin is finalized (funded by the Water Resources Department's Feasibility Study grant program).
- **2022** The Harney Basin Groundwater Conservation Reserve Enhancement Program receives federal approval.
- **2022** An independent analysis of voluntary agreement and the factors enabling and constraining voluntary agreements is finalized with support from the collaborative.
- **2022** The groundwater portion of the place-based integrated water resources plan is completed.
- **2022** USGS Harney Basin Groundwater Study and Groundwater Budget Reports are published.
- **2023** Funding provided by the Oregon State Legislature to assist in the development of voluntary groundwater agreements among groundwater users (HB 2010). A position is authorized and funded to assist with complex issues in the Harney Basin and Eastern Oregon.
- **2023** Agricultural Water Management Technical Assistance Program created at OSU through legislative action, including funding for ongoing improvements to and use of satellite imagery to understand crop water use (Harney Basin was a primary catalyst for this action).
- **2023** Division 512 rulemaking advisory committee convened.
- **2023** The Commission adopts updated Division 10 rules regarding the designation of critical groundwater areas in Oregon.
- **2024** USGS Harney Basin Groundwater Model published.
- **2024** Statewide groundwater allocation rulemaking concludes and updated rules adopted by the Commission to guide future groundwater allocation decisions.
- **2025** The Water Resources Department develops guidance for the development of voluntary agreements.
- **2025** The Water Resources Commission set to recognize the Harney Basin place-based integrated water resources plan.
- **2025** The Water Resources Commission set to adopt updated Division 512 rules.

Exhibit B Harney Basin Water Policy and Management Background

II. Malheur Lake Basin Program

The Malheur Lake Basin report was published by the Department in 1967. This report and the initial set of basin program rules guided allocation decisions for the Department until the rules were updated in 2016 limiting additional development in the Harney Basin portion of the Malheur Lakes Basin. The 1967 report states that “the basin has practically no unappropriated surface water during the irrigation season and summer flows have been over appropriated for many years.”¹ At that time, groundwater rights totaled 173 cubic feet per second.² The report also states that “detailed studies of ground-water location and yield capabilities are needed.”³

The 1967 report characterizes the groundwater system as follows: “The water-bearing beds are discontinuous and irregularly distributed and their water yielding capacity varies from place to place.”⁴ The estimated recharge of groundwater to the Silvies drainage area was 40,000 acre feet. The report noted that groundwater feeds springs as well as “the deep rooted desert-type and marsh-type vegetation around the lakes and marshes.”⁵ At that time 5,000 acre feet were being consumed by all known groundwater rights. The report notes that the interrelationships between surface and groundwater could adversely affect surface flows and “conversely, lowering of the water table below the reach of dense marsh vegetation in the central and lower portion of the valley could materially increase the quantity of water available for beneficial crop production.”⁶

At that time, data were largely lacking for the Silver Creek and Donner Und Blitzen areas to ascertain the “water-yielding capacity [...] nor the safe yield.”⁷ Groundwater quantity and quality data for the basin indicate variability throughout the basin depending largely on the recharge areas and underlying geology. The total amount of irrigated acres using groundwater 8,731 (excluding Catlow-Alvord) and the total “legal annual groundwater depletion” was 38,675 for all uses across the three major drainages (excluding Catlow-Alvord).⁸

¹ Oregon Water Resources Department, Malheur Lake Basin Report (1967), xiv. Link:

https://www.oregon.gov/owrd/wrdreports/Malheur_Lake_Basin_1967.pdf

² *id.* at xiv

³ *id.* at xvi

⁴ *id.* at 36

⁵ *id.* at 38

⁶ *id.* at 41

⁷ *id.* at 41

⁸ *id.* at 45

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Groundwater was noted in the report as the primary source of drinking water for cities and rural homes as well as commercial developments. Groundwater was also noted as the source of water for ecologically significant springs in the Malheur National Wildlife Refuge. The report indicated an interest from the Harney County Water Resources Committee in “determining the ground-water potential for more irrigation development.”⁹ For the Silvies area, the Committee “recommended that final adjudication of water rights be made by the State Engineer and that a study be made to update the present ground-water information. The survey is needed due to the increased use of irrigation wells and the attendant problems, which are developing on ground-water quantity and quality.”¹⁰ In the Donner Und Blitzen area, “ground water [is] the only appreciable source for expansion” with a need to determine both quantity and quality.¹¹ The second most serious problem for this area was noted as the “lack of knowledge about ground water as related to future development.”¹²

The report concludes that “the development potential from ground-water sources is appreciable, but the limits of this potential cannot be determined without further detailed studies.”¹³ At that time, “determining the location and extent of large ground-water bodies in the basin” was considered a high-priority need.¹⁴ It continues that “although detailed studies are needed in order to locate more ground-water aquifers and identify their characteristics, analysis of available data and evaluation of the relationship between precipitation, runoff, and consumptive use by existing ground cover lends weight to the conclusion that there is sufficient ground water, when used in conjunction with surface water, to provide some new development and provide supplemental supplies [and] the economic and physical feasibility of developing both ground and surface water should be determined concurrently in each area.”¹⁵ For the Silvies area specifically, the report recommends managing surface and ground water jointly and suggest that “ground water yield [...and...] pumping facilities could provide about 90 percent assurance of a full supply of irrigation water for all appropriators, [with only] a fraction of this potential [...] currently realized.”¹⁶

The report indicates that at the time of the report “water wells are being installed at an accelerated rate” but that the “perennial demand for total groundwater requirements

⁹ *id.* at 54

¹⁰ *id.* at 54

¹¹ *id.* at 55

¹² *id.* at 55

¹³ *id.* at 67

¹⁴ *id.* at 67

¹⁵ *id.* at 69

¹⁶ *id.* at 77

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probably will not exceed the recharge.¹⁷ It notes however, that the perennial yield often depends on the placement of wells and advises proceeding thoughtfully with the location and spacing of wells so as to “avoid excessive localized drawdown.”¹⁸ The report continually stresses the need for studies and investigations, as well as the potential for further development, indicating that groundwater is the most likely source for additional development: “to those lands at a distance from any unappropriated surface water, either groundwater or imported surface water provides the only hope of irrigation in dry basin areas.”¹⁹

The Oregon Water Resources Department has not updated the Malheur Lake Basin Plan since 1967, but has undertaken additional studies, supported the development of a Place-Based Integrated Water Resources Plan and updated the basin program rules for the Harney Basin portion of the Malheur Lakes Basin.

III. Groundwater appropriation and use in the Harney Basin

Appropriation and use of groundwater in the Harney Basin accelerated as mentioned in the 1967 report, especially with the availability of two-phase electricity to rural areas that enabled pumping of groundwater. Reports and presentations from the Water Resources Department describe the Department’s approach to groundwater appropriation, but a full record of decisions has not been assembled or maintained.

Prior to 2016, when new basin program rules for groundwater allocation were adopted, the Department followed existing statutes and rules to process groundwater right applications in the Harney Basin. Under ORS 537.612(2) there is a rebuttable presumption that new groundwater uses will ensure the public welfare, safety, and health if water is available for the proposed use, will not injure other water rights, is allowed in applicable basin program rules, and complies with rules of the Water Resources Commission. At that time, “water is available” meant that “the requested source is not over appropriated under OAR 690-400-0010 and 690-410-0070 during any period of the proposed use”²⁰ where over-appropriated is defined as “the appropriation of groundwater resources by all water resources by all water rights exceeds the average annual recharge to a groundwater source over the period of record or results in the further depletion of already over-appropriated surface waters.”²¹

¹⁷ *id.* at 77

¹⁸ *id.* at 77

¹⁹ *id.* at 83

²⁰ Language amended in 2024 through the groundwater allocation rulemaking to include specific criteria for determining if groundwater is available. The new definition is included in OAR 690-300-0010(57) and includes the following language for determining if groundwater is available: (d)

²¹ OAR 690-400-0010(11)(a)(B).

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Under the Department's policies, water was determined to be available for a new groundwater use if the appropriation of groundwater resources by all water rights did not exceed "the average annual recharge to a groundwater source or result in the further depletion of already-over appropriated surface waters."²² The presumption could be overcome if one or more criteria for establishing the presumption were not satisfied, or the proposed use would not ensure preservation of the public welfare, safety and health as demonstrated in comments, a protest, or a finding of OWRD.²³ The Department appears to have maintained its standard process for processing groundwater rights until legal action and public concern prompted an internal analysis of levels of appropriation.

The Department received numerous calls for regulation from groundwater users and complaints from domestic well users, primarily, in the vicinity of Weaver Springs and in portions of the Northeast-Crane beginning as early as 2006 and 2009 respectively, which led to additional monitoring efforts. In 2014 WaterWatch of Oregon (WaterWatch) filed protests to propose issuance of 5 groundwater irrigation permits in the Harney Basin because the groundwater reviews performed by OWRD indicated that water availability "cannot be determined" and data showed concerning groundwater level trends in nearby wells. This was following a "propose to deny" determinations made by the Department for portions of the basin in 2013 and 2014. In their protest, WaterWatch asserted that the lack of affirmative findings that water is available, not over-appropriated, and available within the capacity of the resource means OWRD should not issue the permit.²⁴ This prompted the OWRD to conduct an initial assessment with available data regarding the appropriation and use of groundwater resources in the Harney Basin in 2015, which led the Department to issue its first "propose to deny" determination based on overall capacity of groundwater resources and to initiate a rulemaking process in 2015. Water rights transactions under the effective Division 512 rules (Adopted April 2016) and future consideration for permits and transfers

OAR 690-512-0020 states that "the Greater Harney Valley Groundwater Area of Concern (GHVGAC) is established to ensure that groundwater in the GHVGAC is appropriated within the capacity of the resource and that new appropriations of groundwater assure the maintenance of reasonably stable groundwater levels and prevent depletion of the groundwater resource."²⁵ The effective Division 512 rules provided a pathway for permits

²² Language amended in 2024 through the groundwater allocation rulemaking.

²³ ORS 537.621(2).

²⁴ Lisa Brown, WaterWatch of Oregon, Harney Basin Case Study: How the State Severely Over-appropriated Groundwater and Potential Tools and Challenges for Fixing it After the Fact (June 8, 2018). Link: https://enr.osbar.org/files/2018/06/2018_WW-GW-CLE.pdf.

²⁵ [OAR 690-512-0020](#). Updated Division 512 rules were last updated by the Commission in April 2016.

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that were pending at the time the rule was adopted through the identification of “offset water” from voluntarily cancelled groundwater rights or under certain conditions in either the South or Northwest Subareas where there was limited groundwater level trend information (see Figure 2).

Within the South and Northwest Subareas (which generally coincide with portions of the proposed Blitzen-Voltage and Upper Silver Creek areas respectively), the Department issued permits that required that a dedicated observation well be drilled,²⁶ contained a decline condition of 18 feet of decline,²⁷ and stipulated that water use will be allowed so long as the Department continued to find through the groundwater study that groundwater use is within the capacity of the resource and is not over appropriated within those areas. According to the rules, these determinations must include site-specific substantial evidence.²⁸

²⁶ OAR 690-512-0020(7)(a). (7) Each permit issued according to subsections (4) and (6) must be conditioned as follows: (a) Include a requirement for construction of a dedicated observation well at a location determined by the Department, to the same depth as the production well, within 6 months of permit issuance, or the permit may be cancelled. This 6 month deadline shall not be extended. Failure to construct a dedicated observation well within 6 months of permit issuance shall cause the watermaster to regulate off any future use under the permit.

²⁷ OAR 690-512-0020(7)(b). (7) Each permit issued according to subsections (4) and (6) must be conditioned as follows: (b) All groundwater pumping authorized by this permit is prohibited if March groundwater levels indicate 18 feet or more of decline has occurred, as measured in the observation well or any authorized irrigation well, when compared to the first March measurement. Subsequent groundwater pumping may occur with Department approval during the year(s) a subsequent March groundwater level measurement indicates the groundwater level at the observation well has recovered to less than 18 feet of decline when compared to the first March measurement.

²⁸ OAR 690-512-0020(6)(c). (6) For the purposes of this subsection and processing applications pursuant to ORS 537.621 and OAR 690-310-0130, and notwithstanding OAR 690-300-0010(57), groundwater is available for appropriation to new proposed uses on pending applications in these sub-areas in the GHVGAC, if: (c) Permits issued according to this subsection shall be conditioned to prohibit use of water if, based on the Department’s Harney Basin groundwater study, the Department cannot make a finding that the groundwater use is within the capacity of the resource, is not over appropriated, or will not cause injury to senior water users. The permit holder may provide offset water in the manner described in subsection (4) within three years of the final report being issued. *The Department shall make the findings described in this subsection for each permit issued under Section 6 within one year of completing the Harney Basin groundwater study. The Department’s findings described in this subsection shall include site-specific substantial evidence.*

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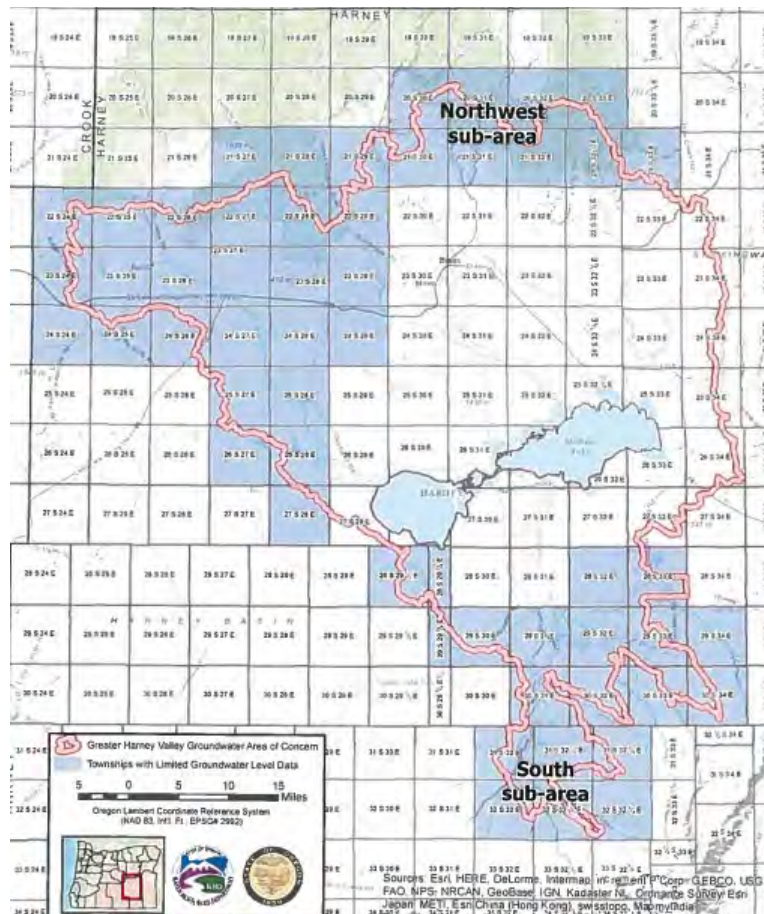


Figure 1. Northwest and South subareas in current Division 512 rules where pending permits were allowed to develop with the drilling of a dedicated observation well and inclusion of a 18' decline trigger.

Along with the approval of a limited number of pending permits, transfers also continued after the adoption of the updated Division 512 rules. Figure 2 shows the transfers that occurred in the basin, including the transfers that occurred from one “subarea” of the basin to another part of the basin. During this time, the Department allowed transfers out of Weaver Springs, the area with known excessive declines, into areas where groundwater was reasonably stable. The transfer review process requires the Department to find that the groundwater is from the same source and will not result in injury to existing groundwater rights or enlargement of the underlying right. Transferred groundwater rights maintain their original priority date. According to Department staff, if water is determined to no longer be available at the original source, then the transferred right cannot withdraw water at its new location.²⁹ Department staff communicated with neighboring users in parts of the basin

²⁹ RAC Meeting #12 Summary (Link: <https://www.oregon.gov/owrd/Documents/RAC%202012%20Meeting%20Summary.pdf>) includes the following: “The transfer of water into the Upper Blitzen has impacted that subarea (potentially). How will the

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that the Department made a determination that they would not be impacted by the transfers.

Transfers and extensions continue to be a topic of interest and concern in the basin, particularly how they have been handled in the past and how they might be handled in the future. At the request of the planning collaborative, the Department examined its policies on extensions in 2020 and limited approvals to a narrow set of circumstances.³⁰ There have been approximately 69 transfers in the basin since April 2016.³¹ As seen in Figure 3 and as described above, some of these transfers moved water from the cone of depression in Weaver Springs to the Lower Blitzen area within proximity of Sodhouse Springs. Groundwater users have long recognized these as different sources of groundwater, but they were approved based on the Department's finding that all groundwater in the Harney Basin is the "same source." Department staff have repeatedly informed community members and leaders that the Department does not consult basin program rules when deciding upon transfers, which leads to questions and concerns about how they will be handled in the future. These amended rules present the opportunity to recognize different groundwater reservoirs as different sources of groundwater for transfer purposes.

In presentations to the RAC, including in a memo on subareas,³² the Department discussed the purpose and function of subareas. According to the Department a "subarea is a portion of a groundwater reservoir that shares similar hydrogeologic properties and similar groundwater conditions including groundwater level elevations, seasonal and annual water level trends, and response to natural and human stresses."³³ The intent of the subareas is "to group wells that similarly impact the local portion of the groundwater reservoir and where reductions in groundwater pumpage, through voluntary or regulatory action, will have a timely, measurable, efficient, and similar groundwater response within that sub area."³⁴ The Department suggested that subarea boundaries could be used to inform voluntary agreements, target regulatory reductions to areas with the most severe declines,

Department address the lands that have been transferred into the subarea? Particularly with regards to senior rights that were transferred into the subarea? OWRD response: Transfers should have language that states water must be available at the old point of diversion for use to be available at the new point of diversion.

³⁰ Email correspondence with Representative Mark Owens.

³¹ Email correspondence with Representative Mark Owens.

³² RAC Meeting #3 Explanation of Draft Harney Basin Critical Groundwater Area Map. Link: <https://www.oregon.gov/owrd/Documents/Explanation%20of%20Subareas%20Map.pdf>

³³ *id.* at 1

³⁴ *id.* at 1

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determine “same source” for transfer decisions, and to target water use measurement and reporting to areas where there is the highest need.³⁵

Under the effective Division 512 rules the Department was required to provide an annual update to the Commission, including recommendations to amend or repeal the rules.³⁶ Staff did not make any recommendations to the Commission to amend the rules despite continued concerns in portions of the basin, including declining groundwater level trends and concerns voiced by members of the public.

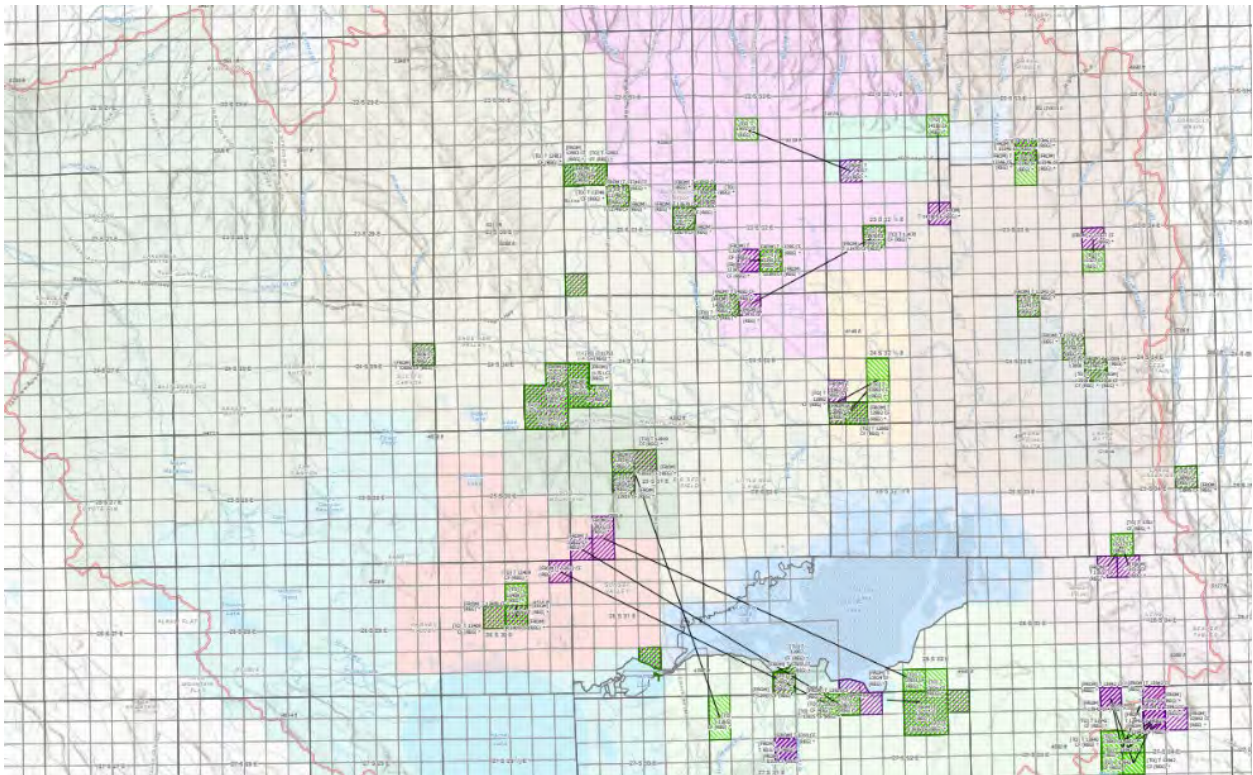


Figure 2. Map showing transfers within the Harney Basin, including from lands (in purple) and to lands (in green).

IV. USGS Harney Basin Groundwater Study and Model and Groundwater Study Advisory Committee

The Oregon Water Resources Department formally initiated a cooperative groundwater study with the US Geological Survey in 2016 and worked with the Harney County Court to co-convene a Groundwater Study Advisory Committee in 2016, as required by the Division

³⁵ *id.* at 1

³⁶ OAR 690-512-0020(9).

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512 rules, to ensure that there would be local input and consideration of local knowledge in the groundwater study. The Water Resources Department and US Geological Survey took great care and effort to listen to Groundwater Study Advisory Committee members and take community input into account.

All meetings of the Groundwater Study Advisory Committee from 2016 to 2019 were open to the public. Meetings of the Groundwater Study Advisory Committee concluded in 2019 when the groundwater study team focused their attention on finalizing reports and going through the US Geological Survey's peer review process. The groundwater study reports were initially expected to be released in late 2020 but were released in April 2022. Two community-wide presentations on the groundwater study findings were held, one in late 2018 and one in late 2022. There was no public process associated with the development of the US Geological Survey's numerical model. The peer reviewed model was released in June 2024 about half-way through the Division 512 rulemaking process.

The two reports (Harney Basin Groundwater Resources³⁷ and Harney Basin Groundwater Budget³⁸) and Harney Basin Groundwater Model³⁹ developed in cooperation with the US Geological Survey comprise the best available science along with supporting documents developed jointly by OWRD and USGS. Additional information was generated for the community-based planning effort on groundwater dependent ecosystems, domestic wells and other aspects of groundwater. Each USGS document identifies sources of uncertainty and lack of data that limit the ability to make precise conclusions. There are many questions raised by the community that were determined to be relevant to groundwater management, but outside of the scope of a particular study, planning, or rulemaking effort.

The previous process to declare a critical groundwater area was by an order of the State Engineer. This process was used to designate 7 critical groundwater areas across Oregon. A

³⁷ Gingerich, S.B., Johnson, H.M., Boschmann, D.E., Grondin, G.H., and Garcia, C.A., 2022, Groundwater resources of the Harney Basin, southeastern Oregon: U.S. Geological Survey Scientific Investigations Report 2021–5103, 118 p., <https://doi.org/10.3133/sir20215103>.

³⁸ Garcia, C.A., Corson-Dosch, N.T., Beamer, J.P., Gingerich, S.B., Grondin, G.H., Overstreet, B.T., Haynes, J.V., and Hoskinson, M.D., 2021, Hydrologic budget of the Harney Basin groundwater system, southeastern Oregon (ver. 1.1, November 2022): U.S. Geological Survey Scientific Investigations Report 2021–5128, 144 p., <https://doi.org/10.3133/sir20215128>.

³⁹ Gingerich, S.B., Boschmann, D.E., Grondin, G.H., and Schibel, H., 2024, Groundwater model of the Harney Basin, southeastern Oregon: U.S. Geological Survey Scientific Investigations Report 2024–5017, 120 p., <https://doi.org/10.3133/sir20215103>.

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review of current critical groundwater area basis and standards is included in Table 1 below. All information is available on the Water Resources Department webpage.⁴⁰

Table 1. Overview of critical groundwater orders pre-dating updated critical groundwater area statutes.

Name/Area	Year	Basis	Standards for Allocation
Cow Valley ⁴¹ 33 sq. mi.	1959	Unreasonable and excessive groundwater level declines documented. Allocation in exceedance of estimated recharge. Corrective controls deemed necessary to: preserve public welfare, safety, and health; prevent continuation of excessively declining ground water levels; and, further protect existing rights to appropriate groundwater.	Reductions in use. Allocation limited to estimated natural recharge to maintain reasonably stable groundwater levels. Continued collection of data “could be used as a basis for further reductions or enlargement of the ground water withdrawals from the Cow Valley Ground Water Reservoir.”
The Dalles ⁴² 21 sq. mi.	1959	Unreasonable and excessive groundwater level declines documented in groundwater reservoirs. Documented concern with well construction issues. Corrective controls deemed necessary to: preserve the public welfare, safety, and health; acknowledge and protect rights to appropriate ground water and associated priority; determine and maintain reasonably stable ground water levels.	No reductions in use. Pending rights allowed contingent upon source of groundwater and well construction. Restriction of new appropriations from certain groundwater reservoirs overlying one another. Stipulations regarding well construction to limit comingling between groundwater reservoirs.
Cooper-Bull Mountain ⁴³ 41 sq. mi.	1974	Unreasonable and excessive groundwater level declines documented in groundwater. Corrective controls deemed necessary to: preserve the public welfare, safety, and health; acknowledge and protect rights to appropriate ground water and associated priority; determine and maintain reasonably stable ground water levels. reservoirs (6-8 feet per year in basalt wells).	Balance pumpage with estimated recharge. Annual determinations of allowed usage determined by watermaster based on estimated recharge. Limitations of use in particular wells within or proximal to cones of depression. Future adjustments may be needed as the effects of reduced pumpage are measured. “If groundwater withdrawals are limited to the amount of annual average recharge, then no further water level declines would occur within the critical area after pumping cones are stabilized.” Limitations on future

⁴⁰ Accessible at:

<https://www.oregon.gov/owrd/programs/gwwl/gw/pages/adminareasandcriticalgwareas.aspx>.

⁴¹ [Special Order Vol.10 Pg 216](#)

⁴² [Special Order Vol.10 Pg 247](#)

⁴³ [Special Order Vol. 24 Pg 370](#)

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Name/Area	Year	Basis	Standards for Allocation
			development. Active encouragement of voluntary reductions for largest users.
Ordnance Basalt ⁴⁴ 175 sq. mi.	1976	Water levels in wells developing water from deep basalt zones within the Ordnance basalt ground water area have shown an annual decline of 5 to 7 feet per annum over the past several years. Pumping lifts in these wells are relatively high. These conditions do not justify a reduction in diversion rights from the deep basalt wells in the area at this time. There is no evidence to indicate the present water level declines in deep basalt wells have substantially harmed existing rights or have unduly affected pumping yields of wells in the area. Some curtailment of withdrawals of water, may become necessary in the future.	To properly provide for the public welfare, safety, and health, the rights to appropriate ground water from the deep and shallow ground water zones within the basalt formation within the Ordnance basalt ground water area as delineated in Plate 1 must be acknowledged and protected and reasonably stable ground water levels must be determined and maintained. To accomplish this further development of the shallow or deep aquifer system must be prohibited within the basalts of the delineated area by additional wells which are not exempt from filing for water rights in accordance with ORS 537.545.
Ordnance Gravel ⁴⁵ 82 sq. mi.	1976	Water levels in wells developing water from the alluvial sediments overlying the basalts in the Ordnance gravel ground water area have declined at an average rate of approximately 1.6 feet per year. The decline of water levels in shallow gravel -wells in the area has developed into a serious decline problem. The long term decline of water levels clearly indicates that artificial discharge from the alluvial aquifer system by withdrawals of ground water by wells is greatly exceeding natural recharge to the aquifer	To properly provide for the public welfare, safety, and health, the rights to appropriate ground water and priority therefrom must be acknowledged and protected and reasonably stable ground water levels must be determined and maintained. To accomplish this, further development of the alluvial aquifer system must be prohibited within the Ordnance gravel ground water area by additional wells except for those which are exempt from filing for water rights in accordance with ORS 537.545:
Butter Creek ⁴⁶ 274 sq. mi.	1986	The record of testimony and evidence clearly establishes that the water levels in the basalt ground water reservoir in the proposed Butter Creek Critical Ground Water Area have declined excessively. The record of testimony and evidence also clearly establishes that the available ground water supply in the basalt ground water reservoir in the proposed Butter Creek Critical	In the interest of the public welfare, health and safety as set forth in ORS 537.525, it is necessary that adequate and safe supplies of ground water be maintained in the basalt ground water reservoir in the proposed Butter Creek Critical Ground Water Area for domestic and livestock and other beneficial uses of water, within the capacity of the resource. Therefore, it is necessary that corrective controls be

⁴⁴ [Special Order Vol. 27 Pg 40](#)⁴⁵ [Special Order Vol. 27 Pg 40](#)⁴⁶ [Special Order Vol. 40 Pg 1](#)

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Name/Area	Year	Basis	Standards for Allocation
		Ground Water Area has been overdrawn. The overdrafting of the ground water supply available in the basalt ground water reservoir in the proposed Butter Creek Critical Ground Area has been cumulative over the past fifteen and more years of record.	adopted and enforced to obtain stable water levels in the subject ground water reservoir by limiting withdrawal of water to the sustained yield capacity of the resource. Appropriation of water from the basalt ground water reservoir within the Butter Creek Critical Ground Water Area for any use not set forth in ORS 537.545 shall be pursuant to the provisions of existing permits, certificates of water rights and/or ground water registration certificates, only. No new application for a permit to appropriate water from the basalt ground water reservoir within the Butter Creek Critical Ground Water Area be accepted for filing. Pending applications are denied and Permissible Total Withdrawal is established for each of six subareas.
Stage Gulch ⁴⁷ 183 sq. mi.	1986	As regards previously proposed subareas 1, 2, 4 and 12, the circumstances described in ORS 537.730 requiring designation of a critical groundwater area have not been demonstrated, and these areas should not be included in this designation. As regards the remainder of the area described in the Order and shown in Figure 1, the circumstances described in ORS 537. 730 regarding overdraft or water levels which are declining or have declined excessively have been clearly established.	In the interest of the public welfare, health and safety, it is necessary that the Stage Gulch critical groundwater area be closed to any further appropriation and that careful monitoring of water use occur. With the exception of the City of Hermiston's application, all pending applications for permits to appropriate water from the basalt groundwater reservoir in the Stage Gulch area should be rejected on the ground that they represent an unacceptable additional burden on the resource and a substantial potential for interfering with existing rights. Sets sustained annual yield for various subareas.

For the majority of the designated critical groundwater areas the Water Resources Department has closed the basin to further appropriation. In some cases the Water Resources Department disposed of pending applications and set permissible total withdrawals for particular appropriators or for the area as a whole. In each case, the Water Resources Department has been selective about the corrective controls and makes designations only where there is sufficient data to do so. The Stage Gulch designation is a clear case where some subareas are identified where “circumstances described in ORS

⁴⁷ [Special Order Vol. 45 Pg 278](#)

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537.730 requiring designation of a critical groundwater area have not been demonstrated, and these areas should not be included in this designation.”⁴⁸ The Department has discretion to set the boundaries of a critical groundwater area to the groundwater reservoir “in whole or in part.”⁴⁹ The Department has used this discretion in the past to focus corrective controls. The largest critical groundwater area to-date is Butter Creek at 274 square miles. By comparison, the Harney Basin covers 5,240 square miles.

Where the Water Resources Department has set a permissible total withdrawal for a larger area, the past policy was to set the permissible total withdrawal at the estimated natural recharge. Within the Columbia-Umatilla Plateau Subbasin, Willow Creek Subbasin, and Butter Creek Subbasins in the Umatilla Basin Program, the Commission adopted the following objective in rule: “achieve a balance between groundwater pumpage and natural recharge in designated critical groundwater areas and groundwater study areas.”⁵⁰ Within the Stage Gulch CGWA and Butter Creek CGWA the areas “shall be managed according to the sustainable annual yield within that subarea. The Department shall refine the sustainable annual yield over time through the use of pumpage data and the response of ground-water levels.”⁵¹ Sustainable annual yield is defined in the basin program rules as “the volume of water that can be pumped on an annual basis while maintaining reasonably stable water levels. This is a measurement of the capacity of the available source.”⁵² Reasonably stable was defined as “an annual static water level decline of less than one foot over the entire subarea as determined by averaging the annual water level change of the representative wells in the subarea, and the water level change for the subarea averaged over five consecutive years displays no decline.”⁵³ The purpose of these rules in both areas was to “stabilize water levels in the basalt groundwater reservoir” given that groundwater levels had already shown evidence of excessive declines (groundwater declines had met or exceeded the quantitative thresholds).⁵⁴ Where permissible total withdrawal has been set in the past, it appears that these amounts have not been set at amount less than the estimated natural recharge.

Several of the previous critical groundwater area designations calls for an adaptive approach, with some areas requiring an annual assessment of “sustained yield” or “natural recharge” and allocation in accordance with those estimates. The critical groundwater area

⁴⁸ *id.* at 10

⁴⁹ ORS 537.735(1)(a).

⁵⁰ OAR 690-507-0070((1)(d), OAR 690-507-0080(1)(d), and OAR 690-507-0090(1)(d).

⁵¹ OAR 690-507-0750(1) and OAR 690-507-0650(1)

⁵² OAR 690-507-0620(5) and OAR 690-507-0760(5)

⁵³ OAR 690-507-0620(6) and OAR 690-507-0760(6)

⁵⁴ OAR 690-507-0750(3) and OAR 690-507-0650(3)

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rules are also required to be assessed on a regular basis, though the Water Resources Department or Commission have not made any updates to the original orders and have not lifted any critical groundwater area designations. ORS 537.735 requires the Commission to periodically review conditions to “evaluate the continuing need for the critical groundwater area designation,” which indicates that there should be a goal of the Commission to support actions that eventually may lead to the designation being lifted.⁵⁵

V. Groundwater level trends and criteria for designation in the Harney Basin

The Department has produced multiple memos and reports describing the groundwater level trends in the Harney Basin, with an updated analysis performed in 2024 with available data.⁵⁶ The Department alone has determined what constitutes “representative” wells despite repeated interest expressed from groundwater professionals and groundwater users to jointly determine this and openly discuss data that does not appear to track with nearby trends. There is continued interest in ensuring an ongoing dialogue about groundwater level trends and what data is used to calculate groundwater level trends to ensure that it uses all available data and remains defensible. Available data clearly shows that two areas, the Weaver Springs and Northeast Crane areas, have evidence of excessive declines, while the remaining areas would likely meet the current definition of reasonably stable depending on how you apply the definition in context. See Table 2 for current groundwater level trends organized by area and colored by level of concern.

The Groundwater Report for the Harney Basin Critical Groundwater Area (Division 10 report) provides additional information compiled by the Department, which outlines the technical basis for critical groundwater area designations.⁵⁷ Table 3 below shows the percent authorized use and percent estimated use of the current estimated natural recharge for the three regions described in the USGS groundwater budget report and the report developed by the Department for the critical groundwater area designation process. Available data clearly show that only one groundwater budget region, the Northern region, is both over appropriated and overdrawn. This region is overdrawn by -2,700 acre feet based on estimates of current use but could be significantly overdrawn based on current levels of appropriation (total amount of use authorized by the Water Resources Department).⁵⁸ One groundwater budget region, the Western Region, is over appropriated

⁵⁵ ORS 537.735(1)(b)

⁵⁶ Darrick Boschmann, Groundwater Level Trends in the Proposed Harney Basin Critical Groundwater Area – Summary Statistics by Subarea (July 23, 2024). Link: <https://www.oregon.gov/owrd/Documents/Groundwater%20Level%20Trends%20in%20the%20Proposed%20Harney%20Basin%20Critical%20Groundwater%20Area%2020240723.pdf>.

⁵⁷ Boschmann, Groundwater Report (2024).

⁵⁸ *id.* at 12

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but not overdrawn⁵⁹ and regulatory reductions in use in the Weaver Springs area may prevent this region from becoming overdrawn. The Southern region is neither over appropriated nor overdrawn.⁶⁰

Each area can has evidence that at least one of the following criteria for designation of a critical groundwater area in ORS 537.730 have been met: there is evidence of excessive declines, groundwater is overdrawn or about to be overdrawn, or there is a pattern of substantial interference between wells with a senior appropriator of surface water.

⁵⁹ *id.* at 12

⁶⁰ *id.* at 14

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Table 2. Groundwater level trends in each area showing areas where the median show excessive declines (red), the median shows concerning trends that could result in excessive declines at current pumping levels if no action is taken (yellow), and declines that are reasonably stable as per existing definition (green).

OWRD 5 Subareas (n=5)	RAC Model Scenarios (n=6)	OWRD 15 Subareas (n=15)	Max Magnitude (feet)	Min Magnitude (feet)	Average Magnitude (feet)	Median Magnitude (feet)	Max Rate (ft/yr)	Min Rate (ft/yr)	Average Rate (ft/yr)	Median Rate (ft/yr)
Weaver Springs	Weaver Springs/ Dog Mountain Area	Weaver Springs Magnitude (n= 68) Rate (n= 34)	-116.9	0.0	-47.0	-48.6	-10.5	-0.5	-4.7	-4.3
North “Sub-Basin”	Weaver Springs / Dog Mountain Area	Dog Mountain Magnitude (n= 21) Rate (n= 19)	-31.8	0.0	-15.4	-11.5	-5.5	-0.4	-1.9	-1.6
North “Sub-Basin”	Northeast / Crane Area	Lawen Magnitude (n= 23) Rate (n= 16)	-51.7	-0.1	-18.5	-18.3	-7.0	+0.4	-2.1	-2.2
North “Sub-Basin”	Northeast / Crane Area	Poison Creek-Rattlesnake Creek Magnitude (n= 35) Rate (n= 20)	-45.3	0.0	-10.9	-10.6	-3.0	+0.7	-0.9	-0.8
North “Sub-Basin”	Northeast / Crane Area	Crane-Buchanan Magnitude (n= 58) Rate (n= 40)	-52.0	0.0	-14.7	-10.3	-3.8	+4.9	-1.3	-1.4
North “Sub-Basin”	Northeast / Crane Area	North Harney Magnitude (n= 9) Rate (n= 7)	-66.8	-9.1	-35.9	-31.3	-4.0	-0.9	-2.3	-2.2
North “Sub-Basin”	Northeast / Crane Area	Rock Creek Magnitude (n= 16) Rate (n= 12)	-69.8	-0.5	-21.5	-19.1	-5.0	-0.6	-3.1	-3.3
North “Sub-Basin”	Northeast / Crane Area	Crane Magnitude (n= 26) Rate (n= 20)	-68.8	-1.7	-22.5	-20.1	-4.7	+1.3	-1.2	-0.9
North “Sub-Basin”	Northeast / Crane Area	Windy Point Magnitude (n= 15) Rate (n= 6)	-26.0	0.0	-13.4	-14.2	-2.2	-0.7	-1.1	-0.9
West “Sub-Basin”	Silver Creek Area	Upper Silver Creek Magnitude (n= 32) Rate (n= 23)	-23.1	0.0	-5.4	-3.5	-4.4	-0.1	-0.5	-0.4

Exhibit B Harney Basin Water Policy and Management Background

<u>OWRD 5 Subareas (n=5)</u>	RAC Model Scenarios (n=6)	<u>OWRD 15 Subareas (n=15)</u>	Max Magnitude (feet)	Min Magnitude (feet)	Average Magnitude (feet)	Median Magnitude (feet)	Max Rate (ft/yr)	Min Rate (ft/yr)	Average Rate (ft/yr)	Median Rate (ft/yr)
West “Sub-Basin”	Silver Creek Area	Harney Lake Magnitude (n= 18) Rate (n= 11)	-9.3	0.0	-2.9	-2.5	-0.9	-0.1	-0.4	-0.4
North “Sub-Basin”	Silvies / Malheur Lake Area	Silvies Magnitude (n= 37) Rate (n= 26)	-29.3	0.0	-4.9	-2.6	-1.1	0.6	-0.3	-0.3
Malheur Lake	Silvies / Malheur Lake Area	Malheur Lake Magnitude (n= 2) Rate (n= 1)	-1.0	-0.5	-0.8	-0.8	+0.3	+0.3	+0.3	+0.3
South “Sub-Basin”	Upper Blitzen	Upper Blitzen Magnitude (n= 10) Rate (n= 4)	-10.4	0.0	-1.6	-0.7	-0.2	+0.1	0.0	+0.1
South “Sub-Basin”	Lower Blitzen-Voltage	Lower Blitzen-Voltage Magnitude (n= 54) Rate (n= 27)	-39.8	0.0	-4.9	-2.9	-1.1	+0.4	-0.3	-0.3

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Table 3. Assessment of overappropriation and overdraw and percent of natural recharge appropriated and pumped per groundwater budget region.

Water Budget Region	Mean annual lowland recharge (acre-feet) – 2022 USGS Estimates <i>(Source: Groundwater Report)</i>	Overappropriated (Authorized Use>Recharge in acre feet per year) See definition in OAR 690-300-0010 <i>(Source: Groundwater Report)</i>	Overdrawn (Actual Pumping>Recharge in acre feet per year) See definition in OAR 690-008-0010 <i>(Source: Groundwater Report)</i>	Wells Declining Excessively or Excessively Declined? See definitions in OAR 690-008-0010 <i>(Source: Groundwater Report)</i>	% of recharge appropriated % of recharge pumped
Northern region <i>(Silvies Subarea, Northeast-Crane Subarea, Parts of Dog Mountain Subarea)</i>	78,000 (+/- 23%)	YES 174,454>78,000 -96,454	YES 80,700>78,000 -2,700	YES, in Northeast-Crane Subarea	223% of recharge appropriated 103% of recharge pumped
Western region <i>(Silver Creek Subarea, Weaver Springs Subarea, Parts of Dog Mountain Subarea)</i>	47,000 (+/- 23%)	YES 65,204>47,000 -18,204	NO 42,500<47,000 +4,500	YES, in Weaver Springs Subarea	138% of recharge appropriated 90% of recharge pumped
Southern region <i>(Lower Blitzen-Voltage Subarea, Upper Blitzen Subarea)</i>	48,000 (+/- 23%) acre feet	NO 37,443<48,000 +10,557	NO 21,600<48,000 +26,400	NO	78% of recharge appropriated 45% of recharge pumped
Total	173,000 (+/- 23%)	YES 277,101>173,000 -104,101	NO 144,800<173,000 +28,200 84% of recharge	YES, in Weaver Springs and Northeast-Crane subarea	160% of recharge appropriated 66% of recharge pumped

Exhibit B Harney Basin Water Policy and Management Background

VI. Process to Update Division 512 Rules

The previous RAC requested the Department initiate a rulemaking process within one year of the Groundwater Study being published in order to “explore whether there is a need for updates or changes to these rules.”⁶¹ At the time the rules were adopted in 2023, RAC members expressed concern that the Department would delay rulemaking and therefore de facto prevent continued development of groundwater resources in areas where there was not concerning data. RAC members advocated for inclusion of this language to ensure that there would be ongoing conversations regarding groundwater appropriation and use in the Harney Basin based on the findings of the groundwater study.⁶²

The groundwater study was published in April 2022 and the first meeting of the Rulemaking Advisory Committee was held in April 2023. Between the first meeting and the second meeting, the Department hosted a number of informational sessions to improve foundational understanding of key concepts. The Division 10 groundwater report required at the onset of a process to designate a critical groundwater area was provided in June 2024. The Department held meetings from April 2023 to May 2025.

Early in the process community leaders suggested that the Department procure the services of a neutral facilitator, which the Department did prior to the second meeting of the RAC. In March 2024 a letter to the Commission from individuals leading and supporting water efforts in the County encouraged broader community engagement, use of the newly published groundwater model to aid in evaluating scenarios, and increased consideration of the place-based plan.⁶³ In May 2024, Harney County Court raised concerns about the Division 10 process, namely the fact that the groundwater report had not yet been released and no formal coordination had been initiated with the County.⁶⁴ During this time the County also requested and recommended consideration of an alternative dispute resolution process for the rulemaking as detailed in ORS 183.502 and OAR 137-005. In May 2024 Representative Owens raised questions regarding the process by which the Department was soliciting and considering input from the RAC on various decisions and how the level of support from RAC members individually or the RAC collectively was being determined and documented.⁶⁵

⁶¹ OAR 690-512-0020.

⁶² Personal communication with RAC members.

⁶³ March 2024 Letter to the Water Resources Commission regarding Division 512 Rules. Letter available upon request.

⁶⁴ May 2024 Letter to the Water Resources Department from the Harney County Court regarding Division 512 rules. Letter available upon request.

⁶⁵ May 2024 Letter to the Interim Director Doug Woodcock from Representative Owens regarding Division 512 rules. Letter available upon request.

Exhibit B Harney Basin Water Policy and Management Background

The Department delivered a presentation on the Division 10 groundwater report to the RAC in June 2024 and revisited the proposed milestones for the RAC process. At the first seven meetings the Department identified its role as fostering collaboration and building consensus in the RAC process. At meeting 8 in June 2024, however, the Department indicated that it had been a “mistake” to suggest that the RAC process would be collaborative or consensus based.⁶⁶ The Department instead suggested that they would inform, consult, and selectively involve the RAC in aspects of the rulemaking. A process by which the RAC members could discuss and deliberate on topics amongst themselves and collectively formulate, agree upon, and deliver advice or recommendations to the Department was never determined or utilized.

Under ORS 183.333 agencies are encouraged to “seek public input to the maximum extent possible.”⁶⁷ The discussion groups were formed in support of this substantive goal of the Administrative Procedures Act, with the first meeting in September 2024. The discussion group meetings were open to the broader public and the process was more informal, discussion oriented, and intended to provide opportunities for discussion and deliberation between RAC meetings as well as to generate ideas and proposals for consideration by the RAC. The discussion group had 10 virtual discussions and 3 in-person/hybrid discussions between September 2024 and April 2025. The discussion groups generated ideas regarding potential scenarios to be modeled and discussed the results of those scenarios in December 2024. Following that meeting, the Department made the decision to “optimize” the model based on internally derived parameters.

In total 15 RAC meetings were held. Proposed boundaries and reductions by subarea were not presented to the RAC for review, discussion, and input until April 16, 2025. Full rule language was provided to the RAC for review for the first time on April 16, 2025. The RAC

⁶⁶ RAC Meeting #8 at 00:24:45 – Jason Spriet: “And then I’ll touch on also, I think everybody on the RAC received a copy of the letter that was sent from 12 RAC members earlier this week on the 27th. There were some questions in there that I wanted to touch on. We don’t have those questions up on the screen but I think there was a comment there about the Department stating that this rulemaking will seek consensus or work collaboratively and used “work collaboratively” in some of the language that we used. And I think especially early on in the process, because this process is new and different and very complex, we probably did. We may have used that language. If we did that was a mistake and we should own that. This process is different than the place planning collaborative process wherein while we do want to collaborate on some of the things we can make...wee have some latitude on decision making. It’s generally not fully collaborative. So we made a mistake. We used that language. Then there was another question around what the process is and that’s something we want to work through as part of the meeting and we will continue forward. I don’t have a direct answer to that question but we’ll definitely talk about how we can create a clear process to get feedback from the RAC in the future.”

⁶⁷ ORS 183.333.

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was given until April 28, 2025 to provide feedback on the draft rules, which were discussed further at two days of meetings on May 15 and May 16, 2025.

The Department accepted public comments on draft rules from June to August 2025, which are available online.⁶⁸ The proposed rules in this petition draw from all available information provided by the Department and RAC.

⁶⁸ Public comments can be found at:

<https://www.oregon.gov/owrd/programs/policylawandrules/oars/pages/division-512-rulemaking.aspx>.



Memorandum

TO: Ivan Gall, Director
FROM: Ben Scandella, Darrick Boschmann; Groundwater Section
DATE: September 30, 2025
SUBJECT: Technical Evaluation of Petition to Amend Division 512

Introduction

On September 12, 2025, the Water Resources Commission received a rulemaking petition for OAR 690-512 (The Malheur Lake Basin Program rules). The petition included proposed rule language submitted as an alternative to the Oregon Water Resources Department (OWRD) proposed rules that had been developed through the Division 512 Rules Advisory Committee process. The proposed rules included in the petition contain numerous substantive differences from OWRD's proposed rules with respect to groundwater management in the Harney Basin (Figure 1).

This memo outlines the Department's process for modeling the petitioner's groundwater management scenario and describes the modeled outcomes in terms of various hydrologic factors using the Harney Basin Groundwater Model (HBGM; [Gingerich and others, 2024](#)). For comparison, this memo also outlines the outcomes from the OWRD proposed groundwater management scenario. Note that there are many aspects of the proposed rule language both in the petition and in the OWRD proposed rules that are outside the scope of this modeling exercise.

The modeling results presented here provide a sound basis for evaluating groundwater system response under different groundwater management scenarios. However, all groundwater flow models are a mathematical simplification of complex natural systems. As such they are subject to uncertainty and limitations arising from assumptions in conceptualizations, the availability of data, and the approximations inherent in numerical simulation. Therefore, model results should be interpreted as one possible representation of system behavior rather than a precise prediction of future conditions. For a full discussion of model development, calibration, uncertainty and limitations, see [Gingerich and others, 2024](#).

Model Inputs

The petitioner's proposed rules [hereinafter 'Petition Proposal'] and OWRD's proposed rules [hereinafter 'OWRD Proposal'] are structured around several parameters defined to specify how groundwater management will occur in the basin. These management parameters are used as model inputs and constraints in the HBGM to define how the model scenarios will proceed over the model period, and include:

- Spatial extent
- Permissible total withdrawal (PTW, the amount of pumping that can occur in an area)

- Frequency of adaptive management
- Timeline for pumping reductions

The Petition Proposal and the OWRD Proposal are simulated with the HBGM from 2018 to 2098 using mean 1982-2016 recharge for annual recharge in the forward-looking simulations. Pumping is simulated using 2018 values until the onset of pumpage reductions. The exemption of specific types of water rights and the proposed reduction in duty to 2.5 acre-feet per acre was not implemented in any of the simulations presented here, for consistency with results presented previously to the Rules Advisory Committee.

Petition Proposal

The Petition Proposal designates 5 separate CGWAs covering the Greater Harney Valley Groundwater Area of Concern as shown in Figure 2. There are four notable differences between the boundaries of the OWRD Proposal subareas and the Petition Proposal CGWAs:

- Portions of the OWRD Proposal Dog Mountain subarea are combined into the Petition Proposal Weaver Springs and Silvies CGWAs.
- The OWRD Proposal Lower Blitzen-Voltage and Upper Blitzen subareas are combined into the Blitzen-Voltage CGWA.
- The boundary between the Lower Blitzen-Voltage subarea and the Northeast-Crane subarea is shifted northward.
- The six PLSS-section projection of the GHVGAC on the southeast margin is removed.

For two CGWAs (Weaver Springs and Northeast-Crane) permissible total withdrawal (PTW) is specified and a schedule for reductions defined. For the remaining 3 CGWAs (Silver Creek, Silvies, Blitzen-Voltage) 10% voluntary reductions from 2017/2018 mean pumping are required by 2040. The Petition Proposal also includes decline triggers which, if met, would allow for implementation of additional regulatory controls through subsequent rulemaking and contested case proceedings. These decline triggers and additional regulatory controls are not considered or implemented in the model scenario here, as any additional regulatory controls implemented through subsequent rulemaking are not specified.

For the Weaver Springs CGWA the model scenario for the Petition Proposal assumed 2018 pumpage continues from 2019-2027, and reductions down to the PTW are implemented in full in 2028. Pumpage reductions are applied to permitted wells based on prior appropriation. Management parameters for the Weaver Springs CGWA are described in Table 1.

For the Northeast-Crane CGWA the model scenario for the Petition Proposal assumed 2018 pumpage continues from 2019-2027, and reductions down to the PTW are implemented starting in 2028 at six-year intervals as described in Table 2. Pumpage reductions are applied to permitted wells based on prior appropriation. Management parameters for the Northeast-Crane CGWA are described in Table 2.

For the Silver Creek, Silvies, and Blitzen-Voltage CGWAs the model scenario for the Petition Proposal assumed 2018 pumpage continues from 2019-2039, and a 10% reduction from 2017/2018 mean pumpage is implemented in 2040. Pumpage reductions are distributed equally across all permitted wells. Management parameters for the Silver Creek, Silvies, and Blitzen-Voltage CGWAs are described in

Table 3. The values supporting determination of Permissible Total Withdrawal (PTW) in these subareas are shown in Table 4.

Table 1: Management parameters for Petition Proposal Weaver Springs Critical Groundwater Area (CGWA)

Parameter	Petition Proposal
Spatial extent	Weaver Springs CGWA
Permissible total withdrawal	9.2 thousand acre-feet
Frequency of adaptation	N/A
Timeline for reductions	PTW implemented fully in 2028

Table 2: Management parameters for Petition Proposal Northeast-Crane Critical Groundwater Area (CGWA)

Parameter	Petition Proposal
Spatial extent	Northeast-Crane CGWA
Permissible total withdrawal	37.0 thousand acre-feet
Frequency of adaptation	6 years
Timeline for reductions	24-year adjustment period starting in 2028 with a curtailment breakdown of 30-20-20-20-10 percent at the 6-year checkpoints

Table 3: Management parameters for Petition Proposal Silver Creek, Silvies, and Blitzen-Voltage Critical Groundwater Areas (CGWAs)

Parameter	Petition Proposal
Spatial extent	Silver Creek CGWA; Silvies CGWA; Blitzen-Voltage CGWA
Permissible total withdrawal	10% voluntary reductions from 2017/2018 mean pumping
Frequency of adaptation	6 years (if necessary)
Timeline for reductions	Reductions implemented in 2040

Table 4: Values supporting determination of modeled pumpage beginning in year 2040 in subareas where a voluntary 10% reduction from the average 2017-2018 pumpage was proposed in the Petition. All values are specified in TAF/yr (thousand acre-feet per year). PTWs were specified directly in the petition rule language for the Northeast-Crane (37.0 TAF/yr) and Weaver Springs Subareas (9.2 TAF/yr).

CGWA	Modeled 2017 Nonexempt Pumpage	Modeled 2018 Nonexempt Pumpage	Modeled 2017-2018 Mean Nonexempt Pumpage	Modeled Pumpage Beginning 2040
Blitzen	16.7	16.6	16.6	15.0
Silver Creek	22.6	21.0	21.8	19.6
Silvies	34.6	28.9	31.8	28.6

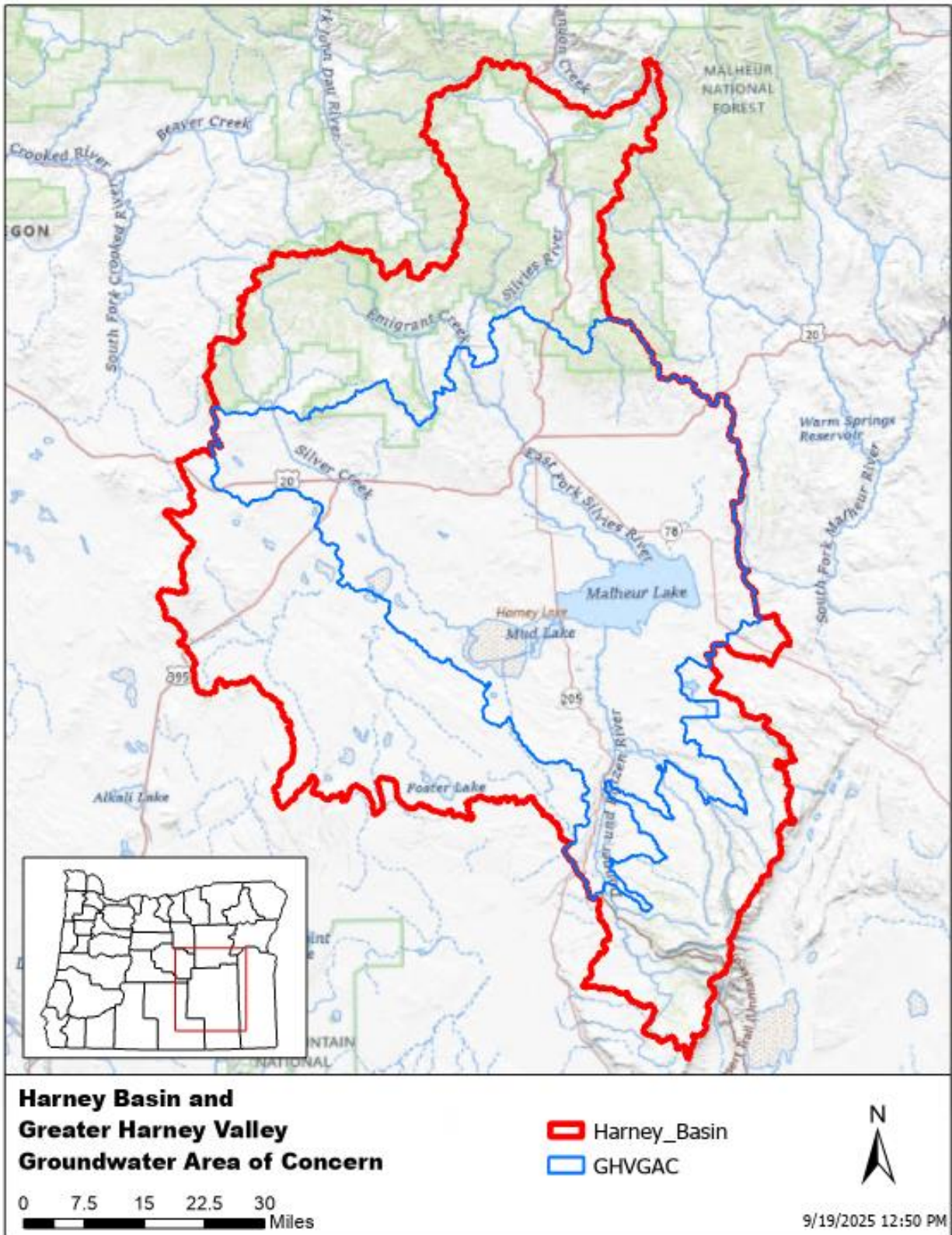


Figure 1: Map showing the extent of the Harney Basin and Greater Harney Valley Groundwater Area of Concern (GHVGAC).

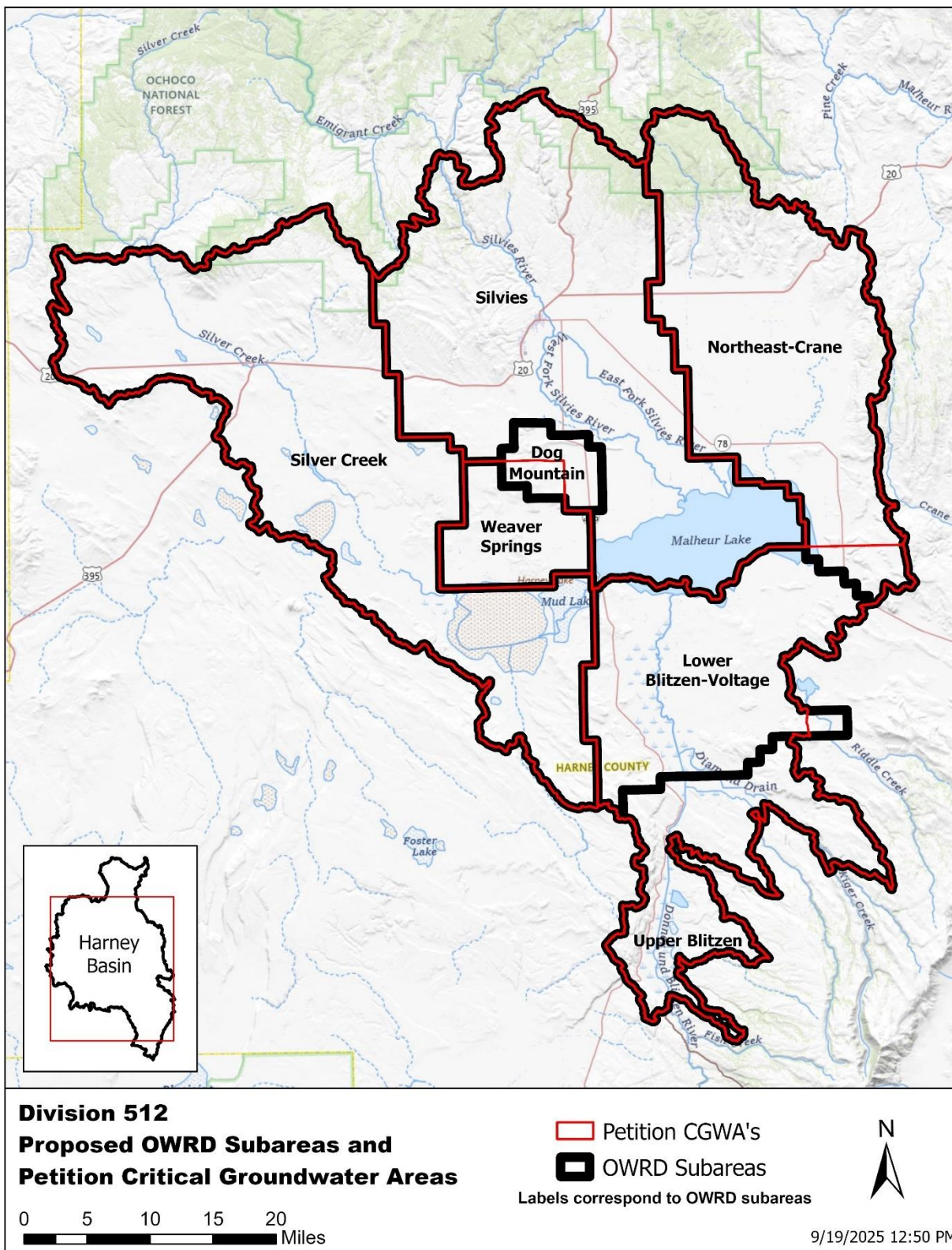


Figure 2: Map showing comparison of OWRD Proposal and Petition Proposal Critical Groundwater Area and Subarea Boundaries.

OWRD Proposal

The OWRD Proposal designates the Greater Harney Valley Groundwater Area of Concern (GHVGAC; Figure 1) as a single Critical Groundwater Area (CGWA) with 7 subareas as shown in Figure 2. For each subarea permissible total withdrawal (PTW) is specified and a schedule for reductions defined. The PTW for each subarea (Table 5) was determined through an iterative modeling optimization process constrained by the management parameters described in Table 6.

The goal of the OWRD Proposal was to achieve durable stability by 2058 for 50th percentile (median) of model cells with wells (“well-cells”) in each subarea after 30 years, except in Weaver Springs and Upper Blitzen. As used to constrain the model, durable stability by 2058 means that by 2058 and for every model-year thereafter, the interannual rate of groundwater level change in a model cell is zero feet per year or rising. Durable stability by 2058 in the median for a subarea means that the median (among well-cells in that subarea) interannual rate of change (minimum from 2058 through the end of the model run) is zero feet per year or rising. In Weaver Springs, reductions from modeled 2018 pumpage were fixed at a 75% reduction. Pumpage was not reduced in Upper Blitzen. In all other subareas, the PTW value was optimized to be the largest amount of nonexempt pumpage that achieved durable stability for 50th percentile of wells cells in that subarea by 2058. The pumpage reductions from 2018 values to the PTW were phased in incrementally, with 40%, 30%, 15%, 10%, and 5% of the total implemented at 6-year intervals beginning in 2028.

For all subareas the model scenario assumed 2018 pumpage continues from 2019-2027, and reductions down to the PTW are implemented starting in 2028 at six-year intervals as described in Table 6. Pumpage reductions are applied to permitted wells based on prior appropriation.

Table 5: Permissible Total Withdrawal (PTW) for subareas in the OWRD Proposal.

Subarea	PTW (thousand acre-ft per year)
Dog Mountain	4.2
Lower Blitzen-Voltage	8.3
Northeast-Crane	35.0
Silver Creek	15.2
Silvies	21.2
Weaver Springs	4.8

Table 6: Management parameters for the OWRD Proposal.

Parameter	OWRD Proposal
Spatial extent	GHVGAC with 7 subareas
Permissible total withdrawal	See Table 5
Frequency of adaptation	Every 6 years
Timeline for reductions	Weaver Springs: 75% in year 1, 25% in year 6 Upper Blitzen: no reductions All others: 24-year adjustment period starting in 2028 with a curtailment breakdown of 40-30-15-10-5 percent at the 6-year checkpoints

Model Results

The following hydrologic factors are used to evaluate the outcomes of the Petition Proposal on various aspects of the groundwater-flow system:

- Groundwater level change magnitude
- Groundwater level change rate
- Groundwater levels
- Impacts to dry domestic wells
- Impacts to springs and streams
- Impacts to natural evapotranspiration (ET)

The figures and tables presented here compare the modelled outcomes of the Petition Proposal and OWRD Proposal. In some instances, Scenario 1 from Gingerich and others (2024) is included for comparison purposes. In Scenario 1 from Gingerich and others (2024) [hereinafter 'Full Pumpage'], the model assumes average recharge and 2018 pumpage remain constant throughout the model period, representing the outcomes of continuing current pumping levels on the groundwater-flow system. To allow for direct comparison of model outcomes across equivalent spatial extents, in some cases the model results in the figures and tables presented here are aggregated over the 7 subareas from the OWRD proposal.

A time-series plot of groundwater pumpage for non-exempt uses from 2018-2098 used to model the OWRD Proposal and Petition Proposal is shown in Figure 3. Pumpage is shown both in thousand acre-feet per year and as a percentage reduction from 2018 pumpage. The Full Pumpage scenario is included for comparison. Pumpage under both proposals steps down at 6-year intervals starting in 2028 as described in Tables 2-5, with the final reduction in pumping implemented in 2052.

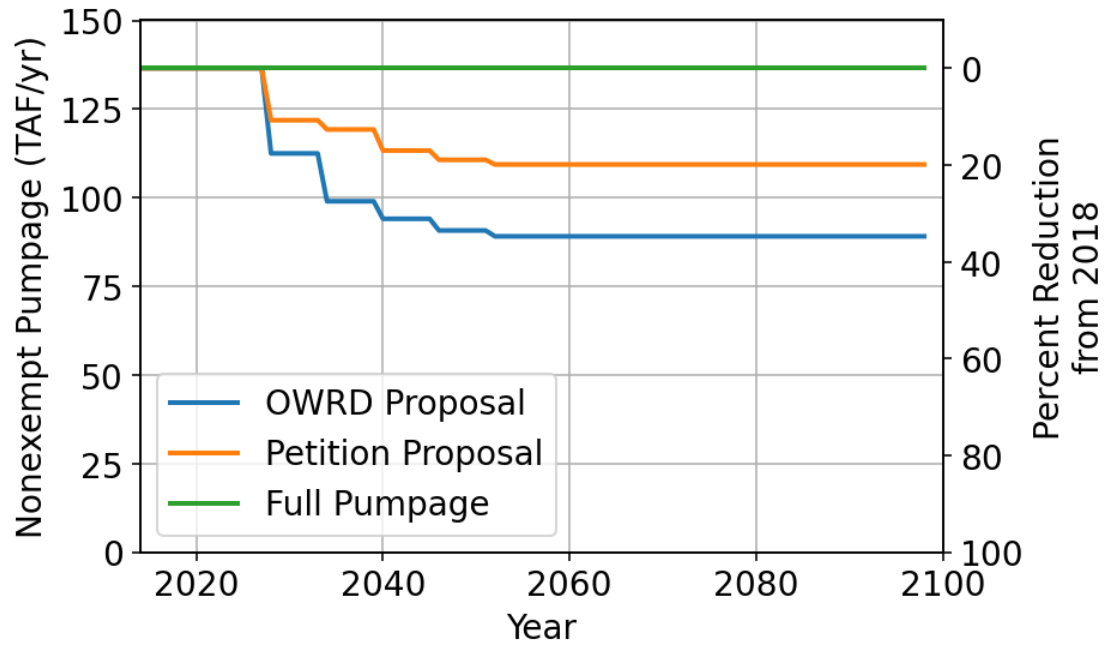


Figure 3: Time series of groundwater pumpage for non-exempt uses over the model period for the OWRD Proposal and Petition Proposal within the GHVGAC boundary. USGS full pumpage scenario included for comparison.

Groundwater Level Change Magnitude

Time-series plots of modeled median groundwater level change magnitude since 2018 under the OWRD Proposal and the Petition Proposal are shown in Figure 4-Figure 10. The Full Pumpage scenario is included for comparison. Values are plotted relative to 2018 modeled groundwater levels and therefore do not account for the groundwater level declines that had already occurred prior to 2018, which were significant in some parts of the basin.

Under the Petition Proposal median groundwater level changes in the Dog Mountain subarea (Figure 4) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline, and the median groundwater level change since 2018 is a decline of 9.7 feet.

Under the OWRD Proposal median groundwater level changes in the Dog Mountain subarea continue to decline until 2046, after which they stabilize and begin a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is a decline of 4.1 feet.

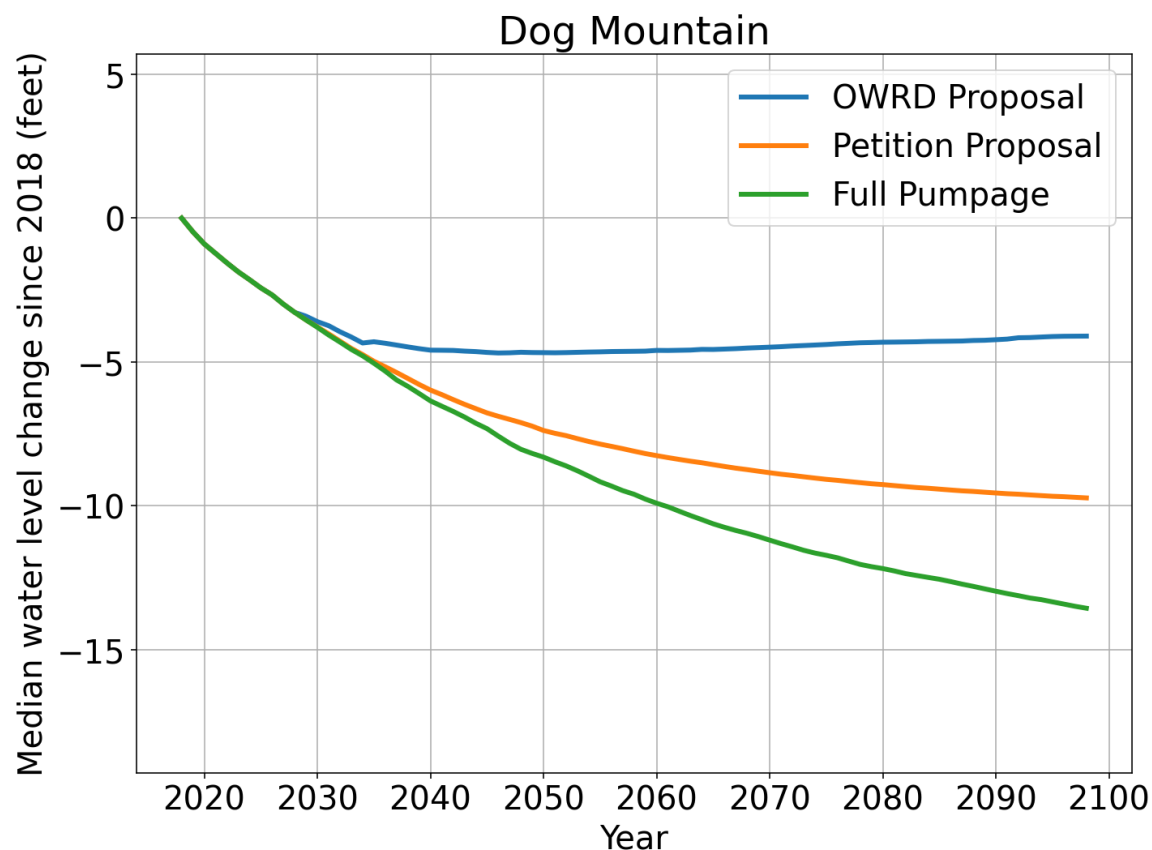


Figure 4: Time-series of median water level change since 2018 in the OWRD Proposal Dog Mountain Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Lower Blitzen-Voltage subarea (Figure 5) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline, and the median groundwater level change since 2018 is a decline of 11.6 feet.

Under the OWRD Proposal median groundwater level changes in the Lower Blitzen-Voltage subarea continue to decline until 2040, after which they stabilize and begin a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is a decline of 5.0 feet.

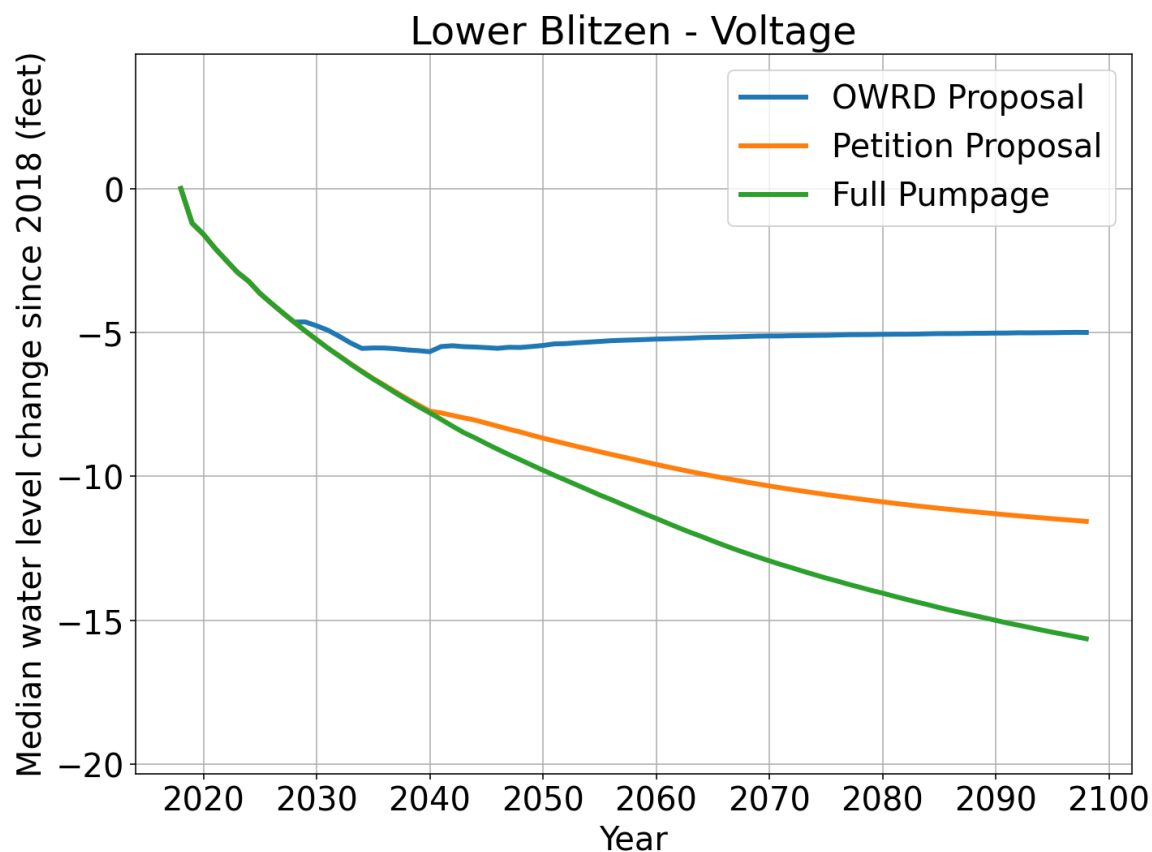


Figure 5: Time-series of median water level change since 2018 in the OWRD Proposal Lower Blitzen-Voltage Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Northeast-Crane subarea (Figure 6) continue to decline through the entire model period. At the end of the model period median groundwater level changes remain in a state of decline, and the median groundwater level change since 2018 is a decline of 24.8 feet.

Under the OWRD Proposal median groundwater level changes in the Northeast-Crane subarea continue to decline until 2054, after which they stabilize and begin a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is a decline of 15.6 feet.

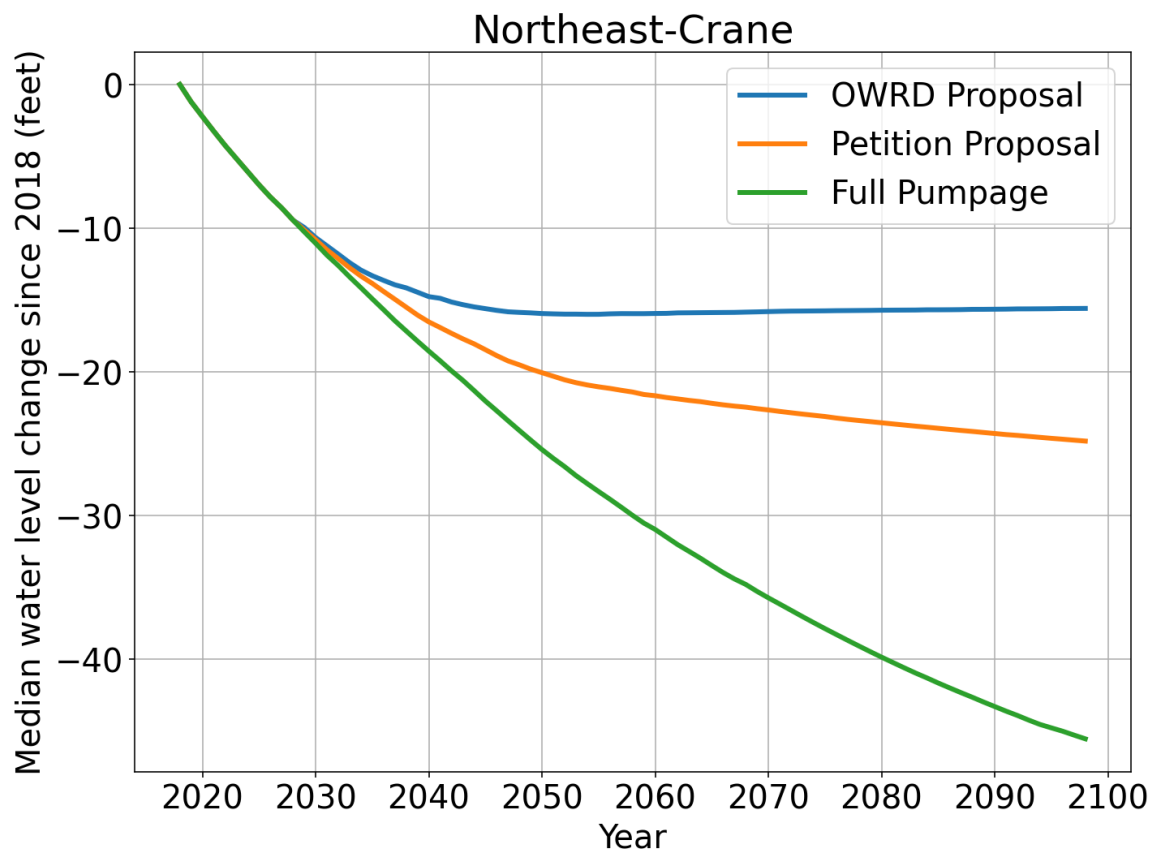


Figure 6: Time-series of median water level change since 2018 in the OWRD Proposal Northeast-Crane Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Silver Creek subarea (Figure 7) continue to decline through the entire model period. At the end of the model period, they remain in a state of decline, and the median groundwater level change since 2018 is a decline of 10.3 feet.

Under the OWRD Proposal median groundwater level changes in the Silver Creek subarea continue to decline until 2052, after which they stabilize and begin a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is a decline of 5.3 feet.

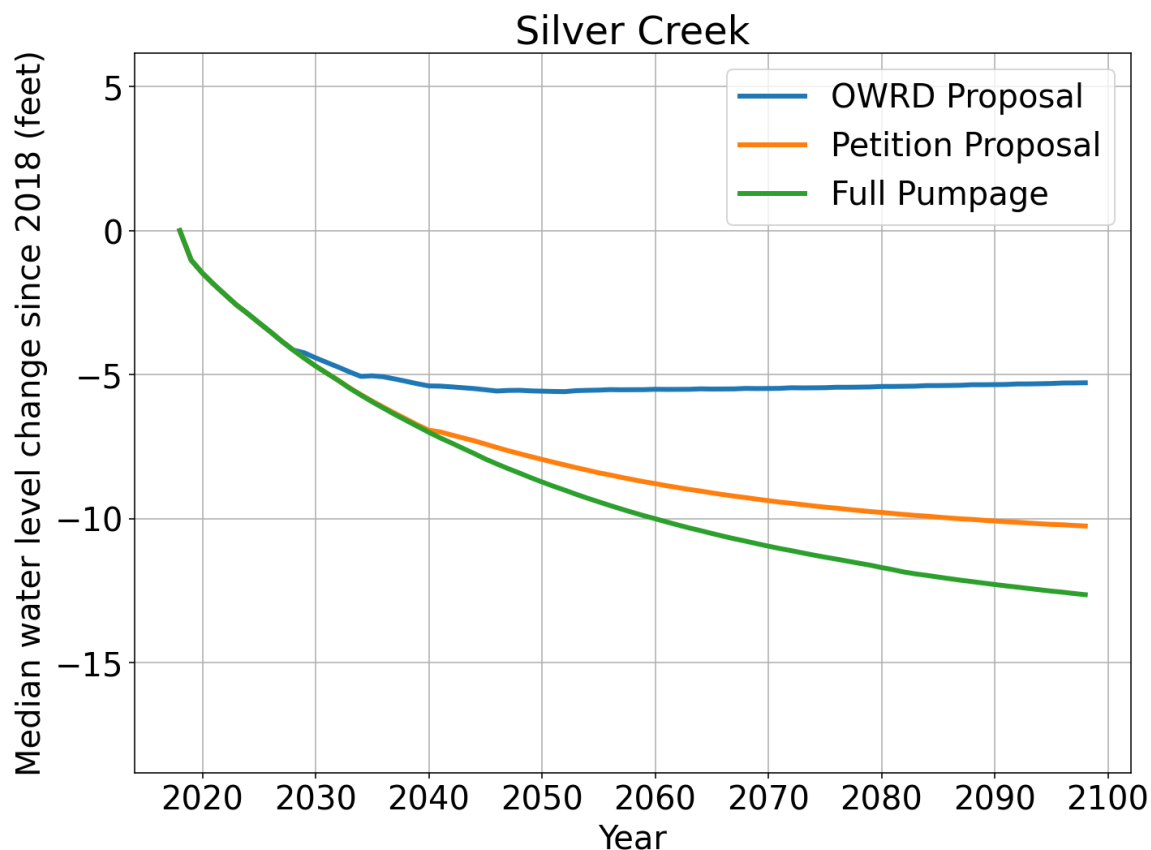


Figure 7: Time-series of median water level change since 2018 in the OWRD Proposal Silver Creek Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Silvies subarea (Figure 8) continue to decline through the entire model period. At the end of the model period, they remain in a state of decline, and the median groundwater level change since 2018 is a decline of 2.8 feet.

Under the OWRD Proposal median groundwater level changes in the Silvies subarea continue to decline until 2028, after which they stabilize and begin a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is an increase of 0.1 feet.

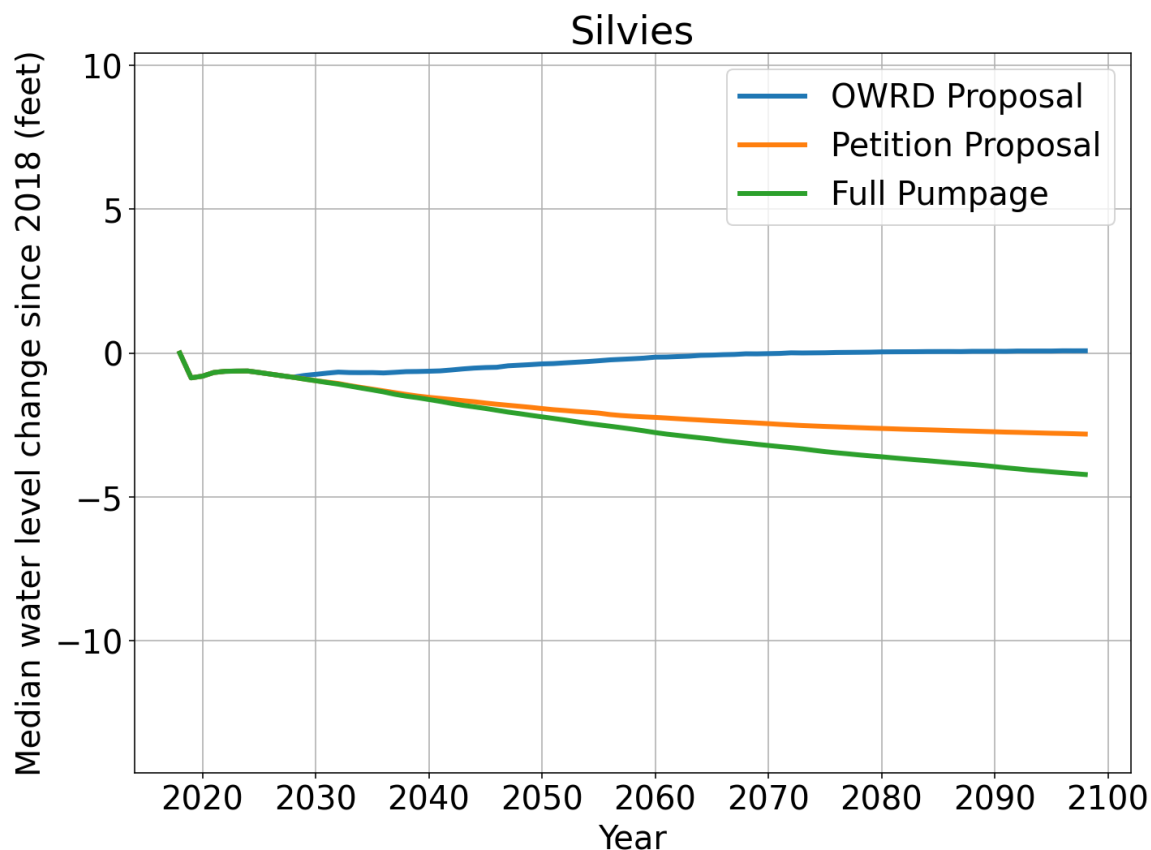


Figure 8: Time-series of median water level change since 2018 in the OWRD Proposal Silvies Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Upper Blitzen subarea (Figure 9) undergo a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is an increase of 0.2 feet.

Under the OWRD Proposal median groundwater level changes in the Upper Blitzen subarea undergo a slow recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is an increase of 0.2 feet.

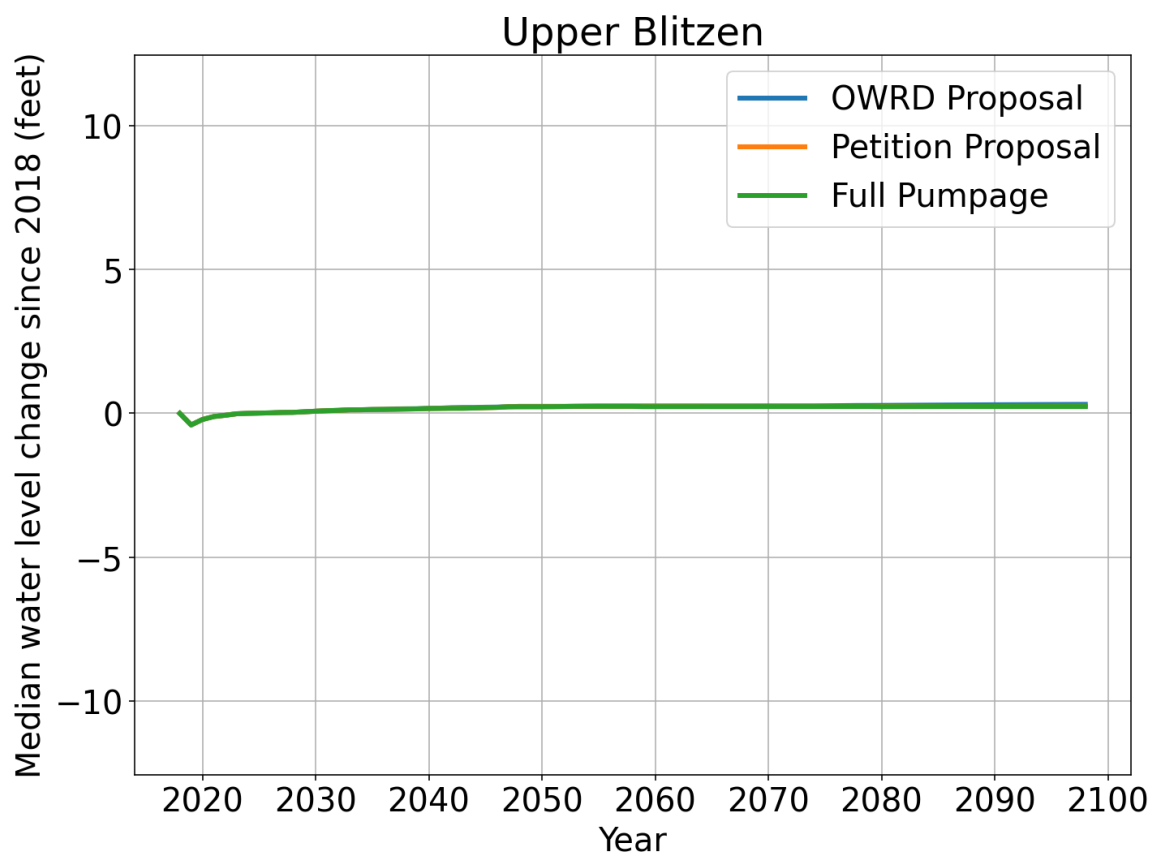


Figure 9: Time-series of median water level change since 2018 in the OWRD Proposal Upper Blitzen Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Under the Petition Proposal median groundwater level changes in the Weaver Springs subarea (Figure 10) continue to decline until 2028, after which they transition to a steady recovery until 2080 and then stabilize through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is a decrease of 6.6 feet.

Under the OWRD Proposal median groundwater level changes in the Weaver Springs subarea continue to decline until 2028, after which they begin a rapid recovery through the end of the model period. At the end of the model period, the median groundwater level change since 2018 is an increase of 18.5 feet.

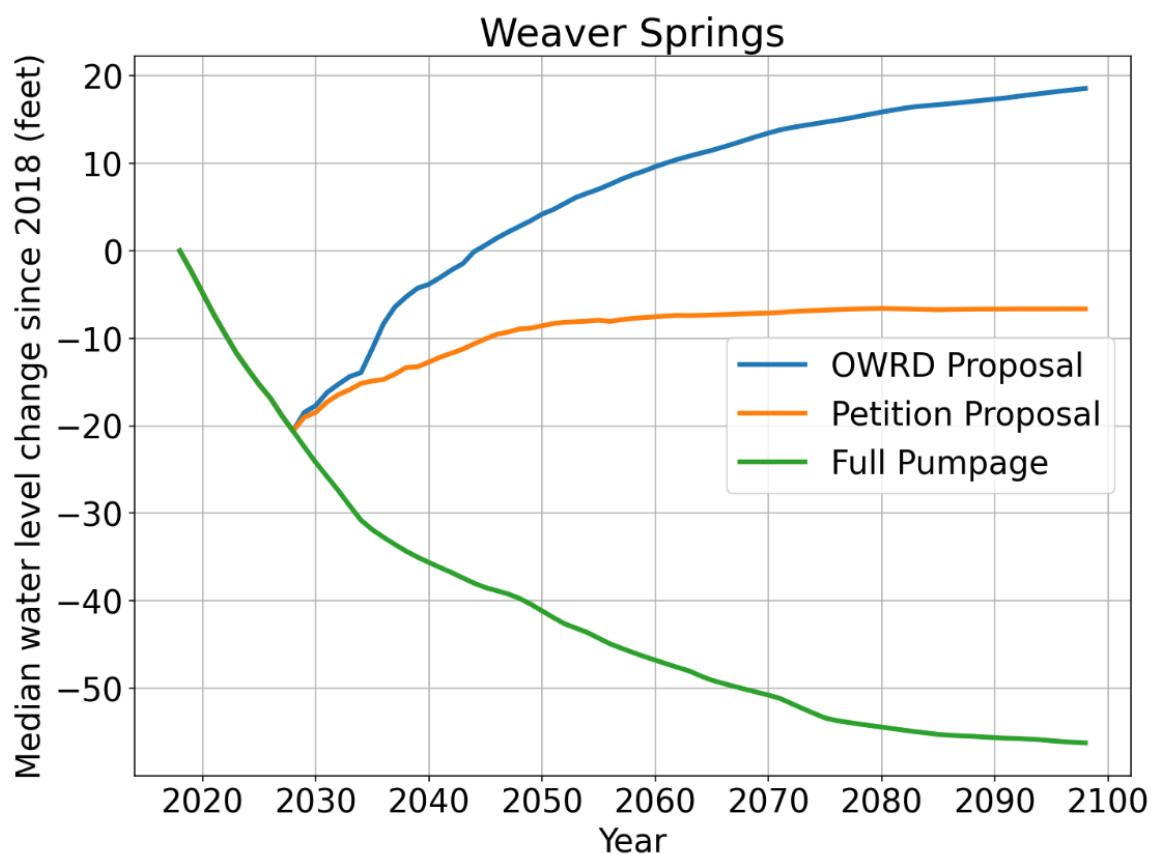


Figure 10: Time-series of median water level change since 2018 in the OWRD Proposal Weaver Springs Subarea under the OWRD Proposal, Petition Proposal, and Full Pumpage scenario. The results of the petition proposal are aggregated over the OWRD Proposal subarea for comparison.

Groundwater Level Change Rate

The violin plot in Figure 11 shows the distribution of minimum groundwater level rates of change after 2058 for the Petition Proposal aggregated over the 5 Petition Proposal CGWAs. With the exception of the Weaver Springs CGWA the median value (red dashed lines) is less than zero (declining) for all CGWAs, meaning that the median groundwater level change rate is not stable or rising in 2058 and does not reach stability in any model year thereafter. The 90th percentile rate (green dashed lines) is declining in Northeast-Crane, Silver Creek, and Silvies subareas, and is effectively zero in the Blitzen subarea, meaning that at least 90% of well-cells in each of these subareas are declining in year 2058 or later. Over the GHVGAC combined, 91% of well-cells continue to decline through in 2058 or later.

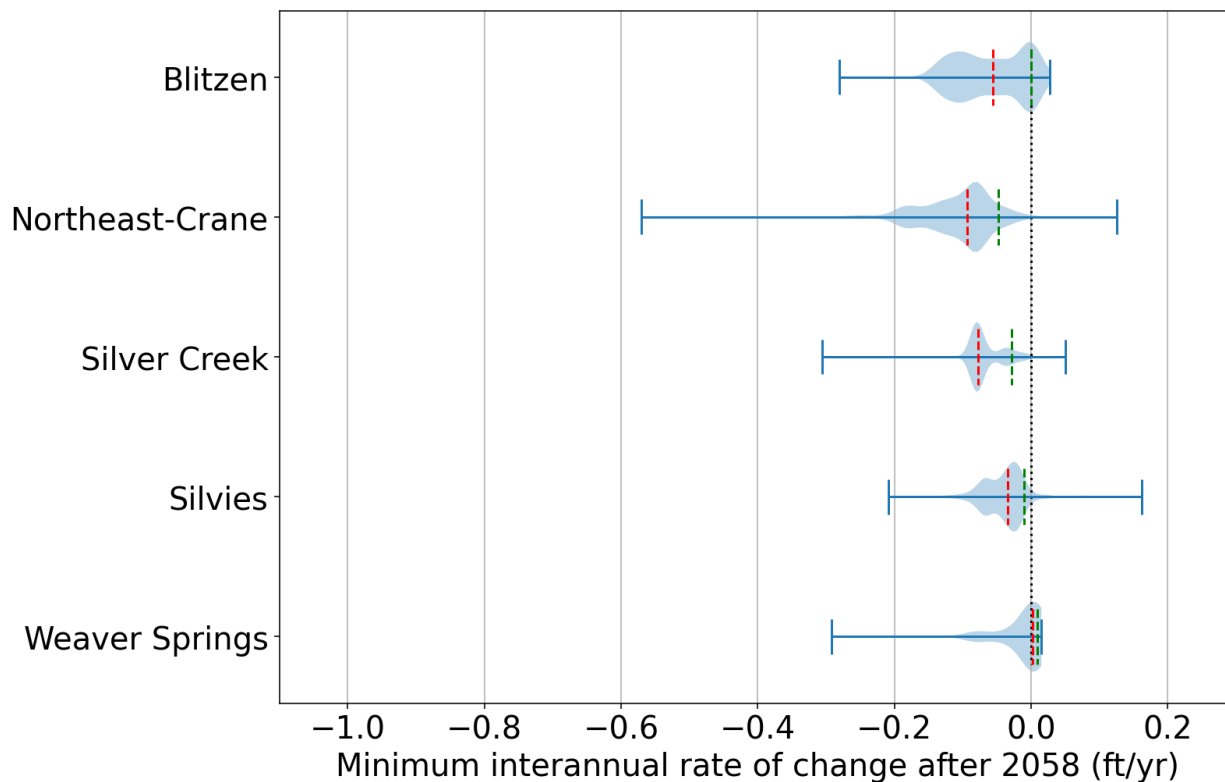


Figure 11: Violin plot showing the distribution of minimum interannual rates of change after 2058 for the Petition Proposal aggregated over the 5 Petition Proposal Critical Groundwater Areas. Red dashed line = median rate. Green dashed line 90th percentile rate. Black dotted line = 0.0 ft/yr.

The violin plot in Figure 12 shows the distribution of minimum groundwater level rates of change after 2058 for the Petition Proposal aggregated over the 7 OWRD Proposal subareas. With the exception of the Weaver Springs and Upper Blitzen subareas both the median value (red dashed lines) and 90th percentile rate (green dashed lines) is less than zero (declining) for all subareas. This means that more than 90% of well-cells are declining in 2058 or later in each of those 5 subareas.

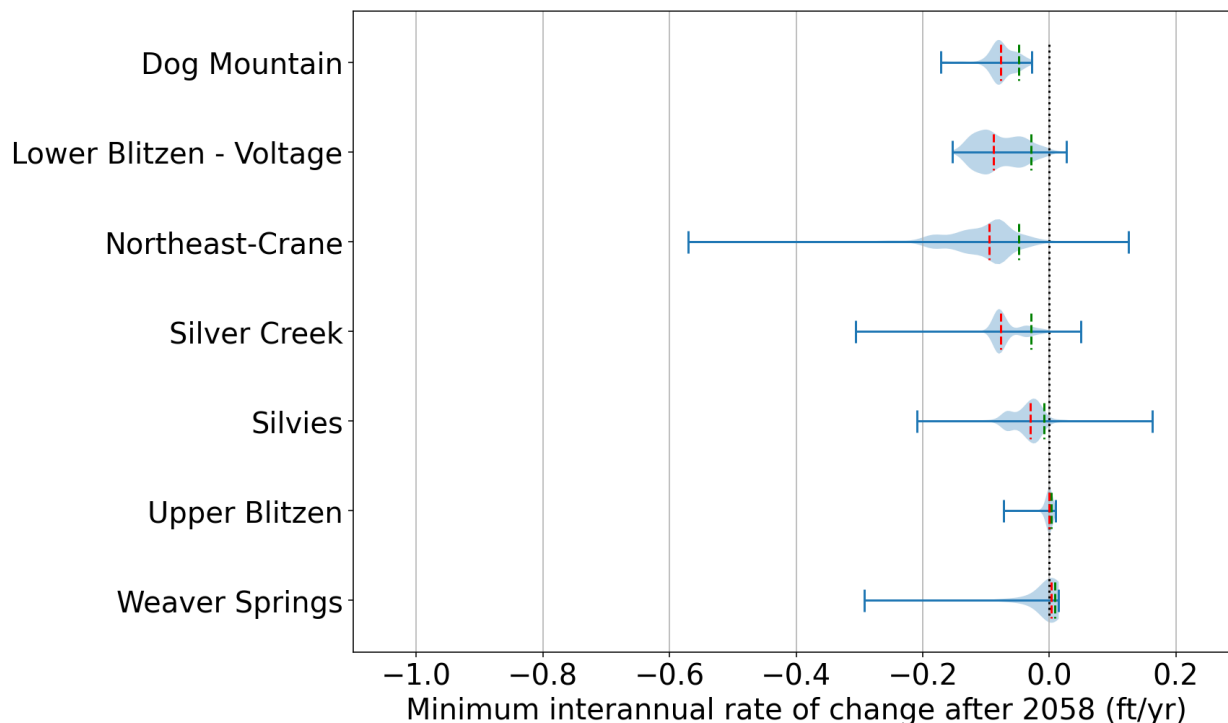


Figure 12: Violin plot showing the distribution of minimum interannual rates of change after 2058 for the Petition Proposal aggregated over the 7 OWRD Proposal subareas. Red dashed line = median rate. Green dashed line 90th percentile rate. Black dotted line = 0.0 ft/yr.

The violin plot in Figure 13 shows the distribution of minimum groundwater level rates of change after 2058 for the OWRD Proposal aggregated over the 7 OWRD Proposal subareas. With the exception of the Weaver Springs subarea, the median value (red dashed lines) is equal to zero (stable), meaning that the median groundwater level change rate is not declining in 2058 or any model year thereafter. In the Weaver Springs subarea the median value is greater than zero (rising groundwater levels) in 2058 and every model year thereafter. Over the entire GHVGAC, 44% of well cells do not achieve durable stability by 2058.

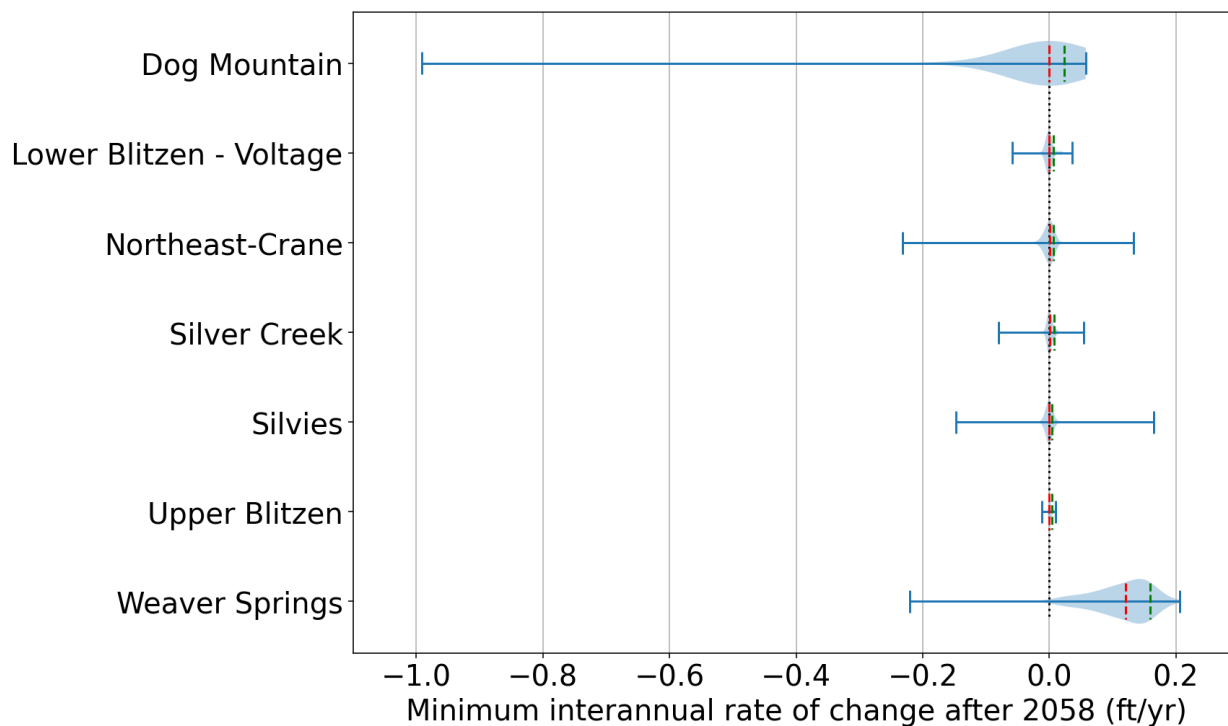


Figure 13: Violin plot showing the distribution of minimum interannual rates of change after 2058 for the OWRD Proposal aggregated over the 7 OWRD Proposal subareas. Red dashed line = median rate. Green dashed line 90th percentile rate. Black dotted line = 0.0 ft/yr.

The checkerboard plot in Figure 14 shows the median groundwater level rate of change after 30 years (2058) under the OWRD Proposal and Petition Proposal aggregated over the 7 OWRD Proposal subareas. The Full Pumpage scenario is included for comparison.

Under the OWRD Proposal the median groundwater level rate of change after 30 is stable in six subareas and rising in the Weaver Springs subarea. This is a direct result of optimizing the model to determine PTW in those subareas to meet the goal of stability in 30 years and explicitly setting the PTW in the Weaver Springs subarea.

Under the Petition Proposal the median groundwater level rate of change after 30 years is stable only in the Upper Blitzen and Weaver Springs subareas but remains in a state of decline in all other subareas.

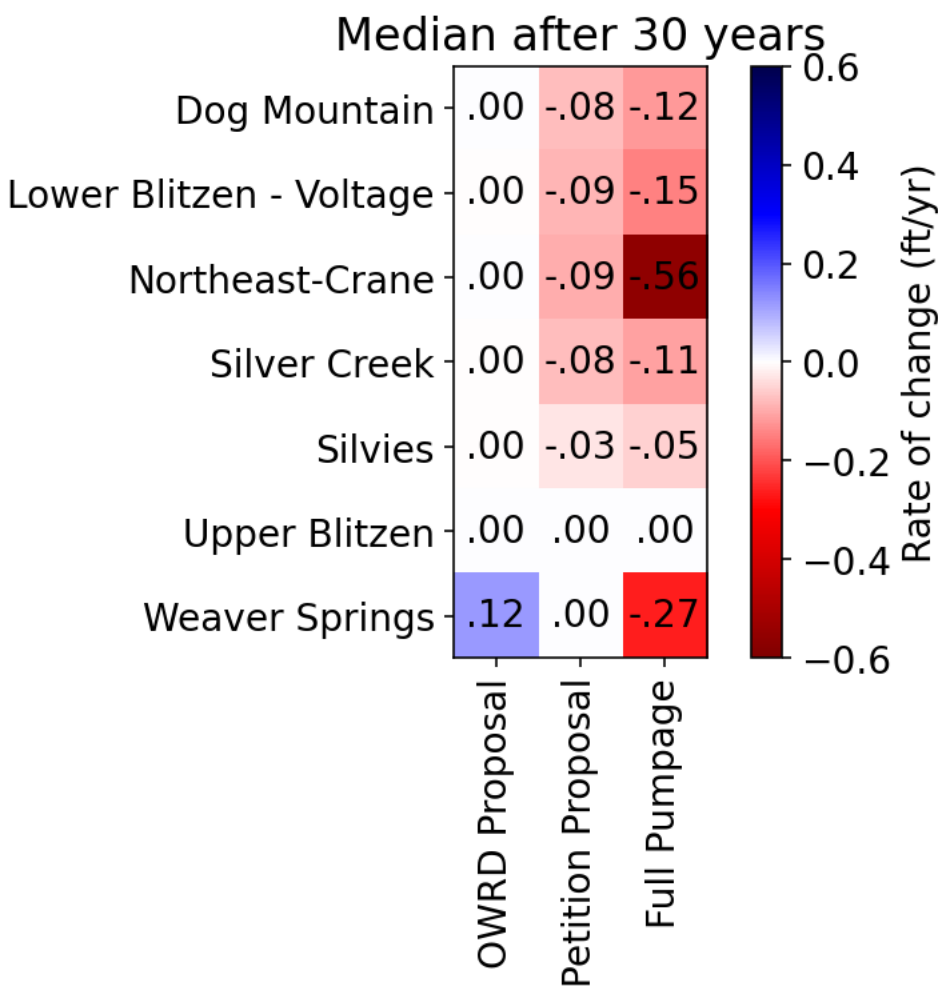


Figure 14: Checkerboard plot showing median rates of change after 30 years for the OWRD Proposal and Petition Proposal aggregated over the 7 OWRD Proposal subareas. Full Pumpage scenario included for comparison. Subareas are presented in alphabetical order from top to bottom. The color bar on the right shows how increasing interannual rates are represented by shades of blue, and decreasing rates by shades of red.

The two maps in Figure 15 show the groundwater level rates of change after 30 years (2058) under the OWRD Proposal (left) and Petition Proposal (right) in layer 2 of the model. Shades of blue on the map indicate rising groundwater levels, shades of red indicate declining groundwater levels, and white indicates approximately stable groundwater levels. The corresponding subarea boundaries and CGWA boundaries are shown for the OWRD Proposal and Petition Proposal for reference. Note that the areas of rising groundwater levels (blue) around the margins of the map area reflect the influence of consistent recharge in those upland areas.

Under the OWRD Proposal (left) groundwater level rates of change after 30 years are stable or rising nearly everywhere. An area of rising groundwater levels is centered around the Weaver Springs subarea as the cone of depression in that area continues to recover. Small, localized areas of groundwater level declines also remain, primarily in the Dog Mountain subarea and in the northern and southern parts of the Crane-Buchanan subarea.

Under the Petition Proposal (right) groundwater level rates of change after 30 years are still declining across most of the GHVGAC. An area of rising groundwater levels is centered around the Weaver Springs subarea as the cone of depression in that area continues to recover.

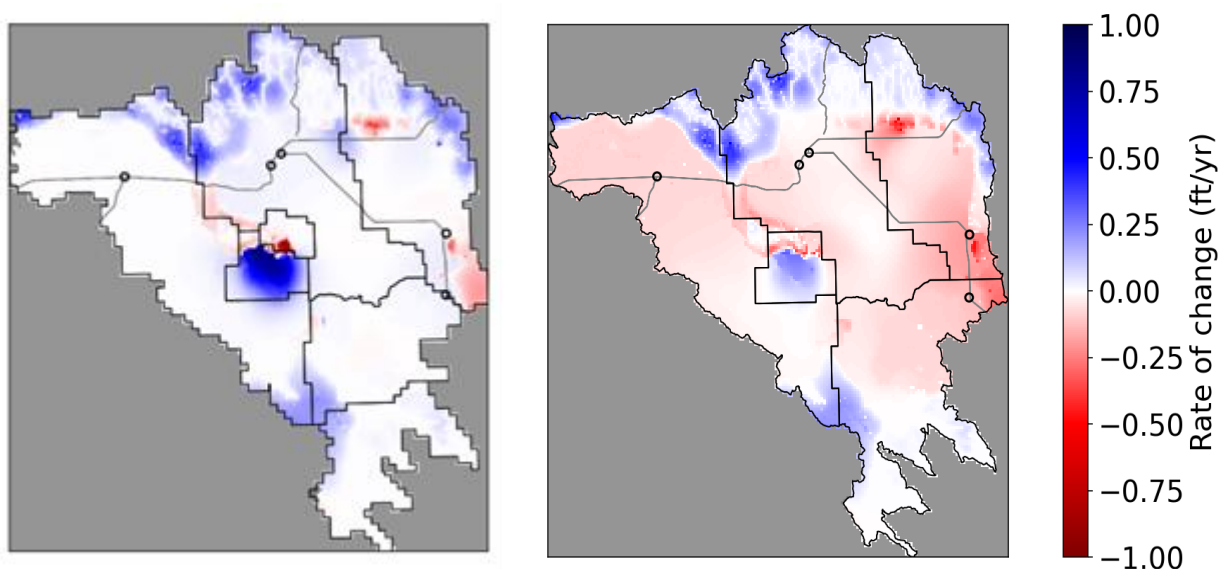


Figure 15: Maps showing the interannual rates of change in groundwater levels under the OWRD Proposal (left) and Petition Proposal (right). Both maps show rates in year 2058, 30 years after the onset of reductions in pumpage, and in layer 2 of the model. The black lines depict the two sets of geographic divisions used to distribute water; the right subfigure shows the 5 CGWAs in the Petition Proposal, and the left subfigure shows the 7 subareas in the OWRD Proposal. Gray lines indicate major roads, and black circles indicate select towns.

Groundwater Levels

The differences in groundwater levels between the OWRD Proposal and Petition Proposal 30 years after reductions begin (2058, left) and at the end of the modeling scenario (2098, right) are shown in Figure 16. Shades of blue indicate areas where groundwater levels in the Petition Proposal are higher than the OWRD Proposal. Shades of red indicate areas where groundwater levels in the OWRD Proposal are higher than the Petition Proposal. White indicates areas where there is no difference in groundwater levels between the two proposals.

In nearly all areas groundwater levels in the Petition Proposal are lower than the OWRD Proposal (red) at 30 years and at the end of the model period. The areas of equal groundwater levels (white) around the margins of the map area reflect the influence of consistent recharge in those upland areas. The small, localized area of higher groundwater levels under the Petition Proposal (blue) near the center of the map area reflects differences in the boundary placement between the two proposals and the scale of pumping reductions in neighboring areas. In the Petition Proposal, this area falls within the Weaver Springs CGWA, which faces greater pumping reductions than the Dog Mountain subarea, where it is located under the OWRD Proposal.

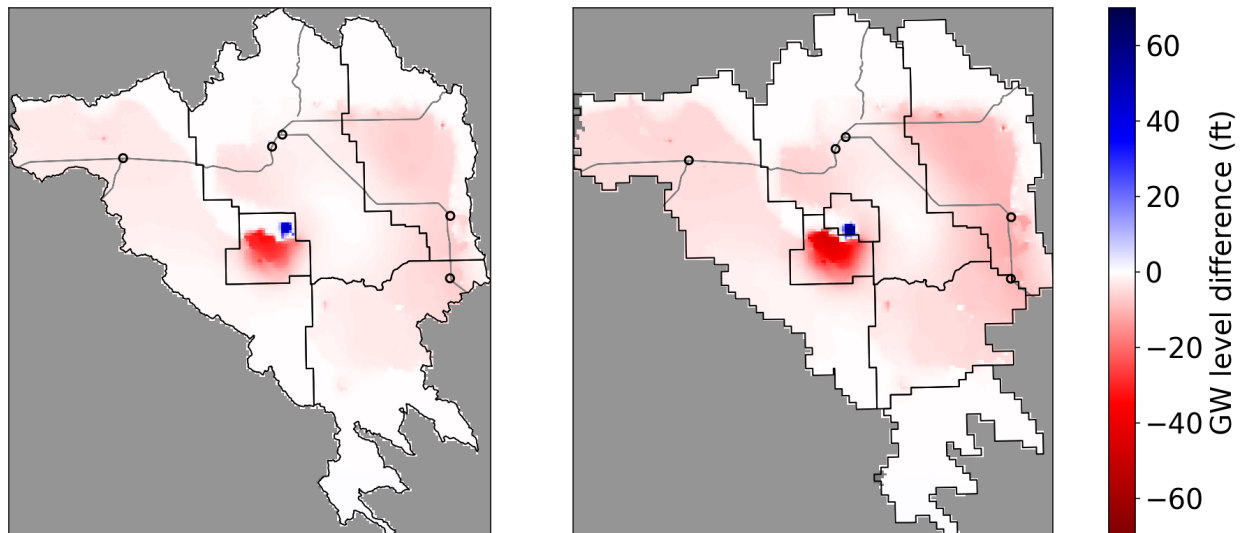


Figure 16: Maps showing the differences in groundwater levels between the Petition Proposal and the OWRD Proposal 30 years after reductions begin (left) and at the end of the modeling scenario (right). Blue colors indicate where water levels in the Petition Proposal are higher, and red colors indicate where the OWRD Proposal is higher. Both maps show differences in layer 2 of the model. The black lines depict the two sets of geographic divisions used to distribute water; the left subfigure shows the 5 CGWAs in the Petition Proposal, and the right subfigure shows the 7 subareas in the OWRD Proposal. Gray lines indicate major roads, and black circles indicate select towns.

Impacts to Dry Domestic Wells

The number of dry domestic wells in 2058 under the OWRD Proposal and the Petition Proposal are presented in Table 7 as aggregated over the 7 OWRD Proposal subareas. The number of dry domestic wells modeled in 2018 is included for comparison. A well is considered dry in the model if the modeled water levels drop below the bottom of the well.

Under both the OWRD Proposal and the Petition Proposal additional domestic wells are modeled to go dry by 2058 as compared to the number of domestic wells modeled to go dry in 2018. The number of dry domestic wells in 2058 under the Petition Proposal is equal to or greater than under the OWRD Proposal in all subareas. Overall, an additional 25 domestic wells are modeled as dry in 2058 under the Petition Proposal as compared to the OWRD Proposal.

Table 7: Counts of number of domestic wells that lose access to water due to modeled water levels dropping below the bottom of the well. The results of the Petition Proposal are aggregated over the 7 OWRD Proposal subareas for comparison.

Subarea	Historic Model	OWRD Proposal	Petition Proposal
Year	2018	2058	2058
Dog Mountain	4	7	7
Lower Blitzen-Voltage	7	9	13
Northeast-Crane	27	46	61
Silver Creek	4	4	4
Silvies	23	25	25
Upper Blitzen	1	1	1
Weaver Springs	11	9	15
All	77	101	126

Impacts to Springs and Streams

Modeled annual groundwater discharge to springs and streams in lowland areas in 2058 under the OWRD Proposal and the Petition Proposal is presented in Table 8 as aggregated over the 7 OWRD Proposal subareas. Modeled values in 1980 from the historic model are included for comparison.

Under both the OWRD Proposal and the Petition Proposal modeled groundwater discharge to springs and streams decreases by 2058 as compared to the modeled 1980 values. Modeled discharge to springs and streams in 2058 under the Petition Proposal is equal to or less than under the OWRD Proposal in all subareas. Overall modeled discharge to springs and streams in 2058 under the Petition Proposal is 2.4 thousand acre-feet per year lower than the OWRD Proposal.

Table 8: Annual groundwater discharge to springs and streams in lowland portions of each subarea, in units of TAF/yr (thousand acre-feet per year). The results of the Petition Proposal are aggregated over the 7 OWRD Proposal subareas for comparison.

Subarea	Historic Model	OWRD Proposal	Petition Proposal
Year	1980	2058	2058
Dog Mountain	0.0	0.0	0.0
Lower Blitzen-Voltage	9.2	3.5 ¹	2.9
Northeast-Crane	4.0	2.0	1.8
Silver Creek	17.8	9.6	8.5
Silvies	8.9	3.4	2.9
Upper Blitzen	11.6	10.6 ¹	10.5
Weaver Springs	0.2	0.0	0.0
All	51.8	29.1	26.7

¹ Values in 2058 under the OWRD Proposal in the Lower Blitzen-Voltage and Upper Blitzen subareas differ from those presented in Scandella (2025), because the values presented in that memorandum were summarized using a restricted portion of the Lower-Blitzen Voltage subarea that was focused on discharge from springs. Lifting that restriction redistributed 0.6 thousand acre-feet per year of discharge from Springs and Streams from Upper Blitzen to Lower Blitzen but did not change the qualitative results presented in that memorandum. All results presented here use the full lowland extents of all subareas.

Impacts to Natural Evapotranspiration (ET)

Modeled annual natural evapotranspiration in lowland areas in 2058 under the OWRD Proposal and the Petition Proposal is presented in Table 9 as aggregated over the 7 OWRD Proposal subareas. Modeled values in 2018 from the historic model are included for comparison.

Under both the OWRD Proposal and the Petition Proposal modeled annual natural evapotranspiration decreases by 2058 as compared to the modeled 2018 values. Modeled annual natural evapotranspiration in 2058 under the Petition Proposal is equal to or less than under the OWRD in all subareas. Overall modeled annual natural evapotranspiration in lowland areas in 2058 is 6,200 acre-feet lower under the Petition Proposal as compared to the OWRD proposal.

Table 9: Annual natural evapotranspiration in lowland portions of each subarea, in units of TAF/yr (thousand acre-feet per year). Results are presented from 2018 under the historical pumpage scenario, as well as in year 2058 from the OWRD Proposal and Petition Proposal. The results of the Petition Proposal are aggregated over the 7 OWRD Proposal subareas for comparison.

Subarea	Historic Model	OWRD Proposal	Petition Proposal
Year	2018	2058	2058
Dog Mountain	0.3	0.2	0.2
Lower Blitzen-Voltage	4.8	4.1	3.1
Northeast-Crane	2.0	0.4	0.3
Silver Creek	17.9	14.7	13.1
Silvies	21.8	17.5	14.0
Upper Blitzen	1.5	1.5	1.5
Weaver Springs	0.7	0.6	0.5
All	49.0	38.9	32.7

Summary and Discussion

The Department evaluated and compared the hydrologic outcomes of the Petition Proposal and the OWRD Proposal for groundwater management in the Harney Basin using the Harney Basin Groundwater Model (Gingerich and others, 2024). Both the Petition Proposal and the OWRD Proposal represent reductions from current groundwater pumping. The differences in the modeled outcomes between the two proposals reflect how each proposal defines the management areas and implements pumping reductions across the basin. Model results show that each proposal influences groundwater levels, rates of decline, and related impacts in different ways over time.

Under the Petition Proposal, the model results indicate that pumping reductions are successful at slowing the rate of groundwater level decline after 30 years as compared to the Full Pumpage scenario. The maximum median rate of decline across all subareas after 30 years was less than 0.1 feet per year. Despite these reductions, the Petition Proposal results in continued long-term groundwater level declines in most areas, lower overall groundwater levels, and greater impacts to domestic wells, springs and streams, and natural evapotranspiration.

Under the OWRD Proposal, the model results indicate long-term groundwater stability at 30 years. This outcome reflects optimized pumping reductions necessary to meet this goal. The OWRD Proposal leads to higher overall groundwater levels across the basin and less impacts on domestic wells, springs and streams, and natural evapotranspiration.

Key model results include:

- In nearly all areas groundwater levels in the Petition Proposal are lower than the OWRD Proposal at 30 years and at the end of the model period. By the end of the model period, median groundwater level changes under the Petition Proposal are between 2.9 to 25.1 feet lower than under the OWRD Proposal in most subareas.
- Under the Petition Proposal, the maximum median rate of decline in 2058 in all subareas was less than 0.1 feet per year. However, more than 90% of wells continue to decline in 2058 or later. Under the OWRD Proposal, median groundwater level rates of change across all subareas stabilize or begin to recover by 2058.
- By 2058, the number of modeled dry domestic wells is higher under the Petition Proposal than under the OWRD Proposal, with an additional 25 domestic wells modeled to go dry.
- Modeled groundwater discharge to springs and streams in 2058 is 2.4 thousand acre-feet lower under the Petition Proposal as compared to the OWRD Proposal.
- Annual natural ET is lower under the Petition Proposal in 2058, with an overall reduction of 6.2 thousand acre-feet per year compared to the OWRD Proposal.

References

Gingerich, S.B., D.E. Boschmann, G.H. Grondin, and H.J. Schibel, 2024. Groundwater Model of the Harney Basin, Southeastern Oregon. U.S. Geological Survey. doi:10.3133/sir20245017.
<https://pubs.usgs.gov/publication/sir20245017>

Scandella, B., 2025. Corrected: Evaluation of Division 512 RAC Alternate PTW Scenario [Memo]. Oregon Water Resources Department. July 30, 2025.
<https://www.oregon.gov/owrd/Documents/Evaluation%20of%20RAC%20Alternate%20PTWs%20Memo%20Corrected.pdf>



Memorandum

TO: Jason Spriet
FROM: Ben Scandella
DATE: July 30, 2025
SUBJECT: Corrected: Evaluation of Division 512 RAC Alternate PTW Scenario

A previous version of this memo, published on May 30, 2025, had an error in the caption of Table 3 that incorrectly identified the basis year as 1980. This version changes that number to the correct year, 2018.

Following the proposal of a set of Permissible Total Withdrawal (PTW) numbers by OWRD in the Division 512 RAC #14 meeting, some members of the RAC expressed concern about the quantity of reductions proposed in the Lower Blitzen-Voltage subarea when compared to the severity of groundwater level declines in that subarea. These RAC members asked the Department to investigate if there was an alternative set of PTW numbers that could achieve the goal with less curtailment in that specific subarea. A RAC member also proposed an alternate set of PTW values that the Department could test with the model. The Department analyzed the WRD Proposal and confirmed that it achieved the goal in the timeline set with the least quantity of basin-wide reductions (~35% of 2018 pumpage). The Department also ran the RAC member proposed alternate scenario and evaluated the results. The alternate scenario achieves the goal by decreasing pumpage reductions in Lower Blitzen-Voltage to 18% of 2018 modeled pumpage, increasing Northeast-Crane reductions to 45%, and increasing basin-wide reductions to ~37%. This document describes the two PTW proposals and presents the major differences between their results.

Inputs

The model was run using PTWs from the WRD Proposal and the RAC Alternate scenario, shown in Table 1. The schedule for pumpage reductions in both scenarios followed the same timing as the WRD Proposal.

Table 1: Summary of pumpage input values used for simulating the PTWs proposed by WRD and an alternate from a member of the RAC following meeting #14.

Subarea	Historic Model	WRD Proposal	RAC Alternate	WRD Proposal	RAC Alternate
Units	kaf/yr			% Reduction from 2018	
Dog Mountain	4.6	4.2	4.2	9%	9%
Lower Blitzen-Voltage	13.7	8.3	11.2	39%	18%
Northeast-Crane	53.1	35.0	29.1	34%	45%
Silver Creek	21.0	15.2	15.2	28%	28%
Silvies	24.8	21.2	21.2	15%	15%
Upper Blitzen	0.1	0.1	0.1	0%	0%
Weaver Springs	19.2	4.8	4.8	75%	75%
All	136.5	88.8	86.0	35%	37%

Results

Water Levels

Increased pumpage in Lower Blitzen-Voltage caused water levels there to decrease in the RAC Alternate scenario compared with the WRD Proposal, with the median among well-cells reaching about 2 feet lower by the end of the century (Figure 1). By the same token, reduced pumpage in the Northeast-Crane subarea caused water levels there to decline less than the WRD Proposal (Figure 2). The increasing water levels following 2040 in the RAC Alternate scenario brought median water levels about 11 feet higher than the WRD Proposal by the end of the century in Northeast-Crane. The changes in pumpage had a minor impact on water levels in the Silvies subarea, raising the median water level by about 0.3 feet by the end of the century (Figure 3).

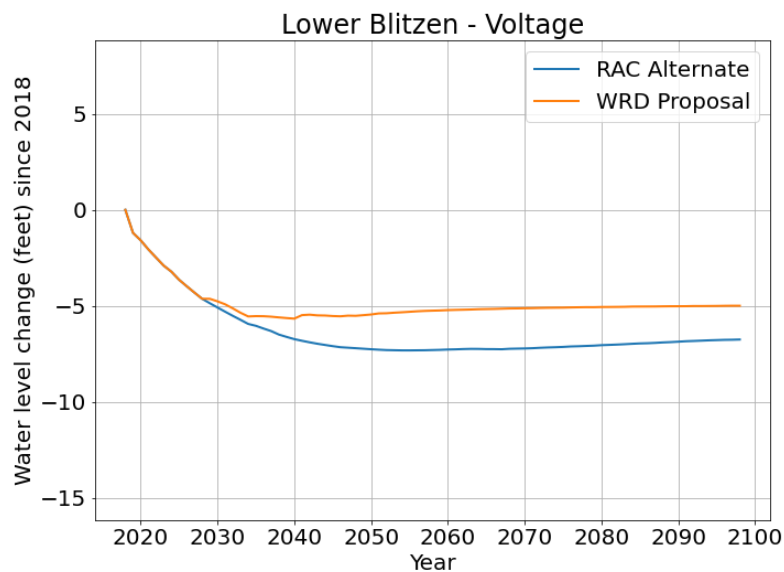


Figure 1: Median water level trajectories in the Lower Blitzen-Voltage Subarea beginning in 2018. The RAC Alternate scenario (blue) causes water levels to decline more than the WRD Proposal (orange), by about 2 feet at the end of the century.

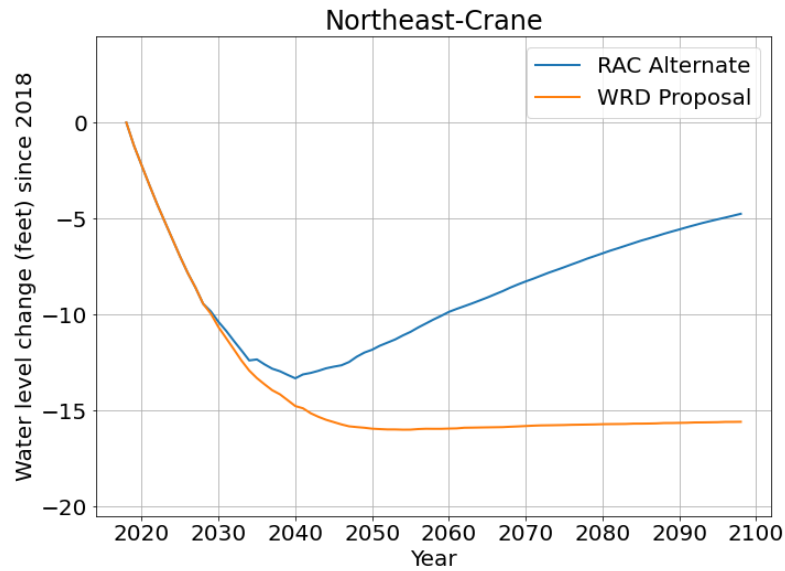


Figure 2: Median water level trajectories in the Northeast-Crane Subarea beginning in 2018. The RAC Alternate scenario (blue) causes water levels to decline less than the WRD Proposal (orange). The increasing water levels following 2040 in the RAC Alternate scenario bring water levels about 11 feet higher than the WRD Proposal by the end of the century.

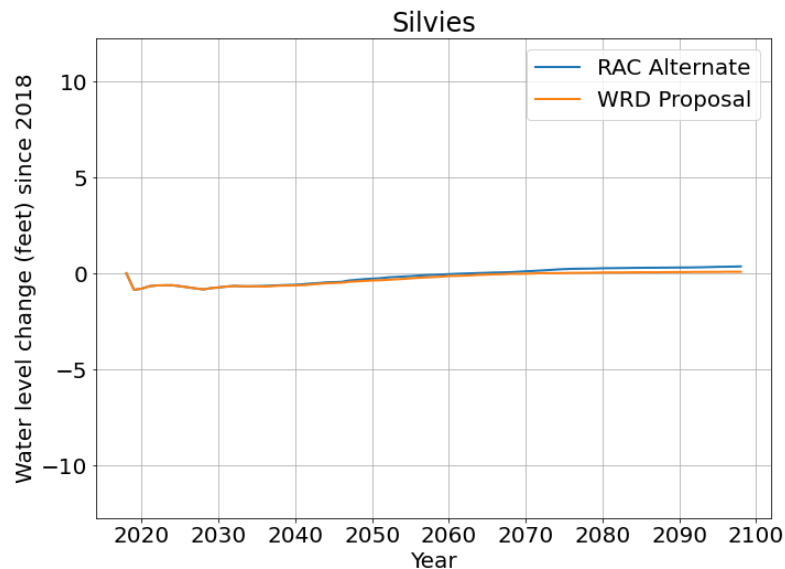


Figure 3: Median water level trajectories in the Silvies Subarea beginning in 2018. The RAC Alternate scenario (blue) causes water levels to recover compared with the WRD Proposal (orange), by about 0.3 feet at the end of the century.

Groundwater Discharge to Springs & Streams

Annual groundwater discharge to springs and streams was summarized in the lowland portions of each subarea, as shown in Table 2. The modeled discharge estimates in the year 2058 (30 years after the start of reductions) are shown alongside values in the same subareas in 1980 and 2022. Discharge numbers from 1980 presented in Table 2 are slightly larger than those presented in slide 181 of the presentation for RAC meeting #14 due to an accounting error used in development of that presentation.

Table 2: Annual groundwater discharge to springs and streams in lowland portions of each subarea, in units of kaf/yr (thousand acre-feet per year). Results are presented from 1980 under the historical pumpage scenario and 2022 under the full-pumpage (constant beginning in 2018) scenarios developed by Gingerich and others (2024), as well as in year 2058 from the WRD Proposal and RAC Alternate scenarios.

Subarea	Historic Model	Full Pumpage	WRD Proposal	RAC Alternate
Year	1980	2022	2058	2058
Dog Mountain	0.0	0.0	0.0	0.0
Lower Blitzen-Voltage	9.2	2.8	2.9	2.7
Northeast-Crane	4.0	2.0	2.0	2.1
Silver Creek	17.8	11.7	9.6	9.6
Silvies	8.9	3.2	3.4	3.5
Upper Blitzen	11.6	10.4	11.2	11.2
Weaver Springs	0.2	0.0	0.0	0.0
All	51.8	30.1	29.0	29.1

Comparing the discharge between the WRD Proposal and the RAC Alternate scenario, the increased pumpage in Lower Blitzen-Voltage reduced discharge to springs and streams (Table 2), as well as lowering water levels (Figure 1). On the other hand, reduced pumpage in Northeast – Crane caused discharge in springs and streams to increase. The balance of these two effects increased discharge to springs & streams in the Silvies subarea.

Natural Evapotranspiration

Annual lowland natural evapotranspiration (ET) estimates showed reduced ET in Lower-Blitzen Voltage under the RAC Alternate scenario, consistent with more pumpage and lower groundwater levels compared with the WRD Proposal (Table 3). Conversely, further-reduced pumpage in Northeast-Crane caused water levels there to rise and increase natural ET as compared with the WRD Proposal, though the overall magnitude of ET in that subarea remained smaller in 2058 as compared to 2018 values. Despite the slightly higher median water levels at the end of the century in Silvies (Figure 3), Natural ET was lower under the RAC alternate scenario than under the WRD proposal. Basin-wide, lowland natural ET was slightly lower under the RAC Alternate scenario than under the WRD Proposal.

Table 3: Annual natural evapotranspiration in lowland portions of each subarea, in units of kaf/yr. Results are presented from 2018 under the historical pumpage scenario, as well as in year 2058 from the WRD Proposal and RAC Alternate scenarios.

Subarea	Historic Model	WRD Proposal	RAC Alternate
Year	2018	2058	2058
Dog Mountain	0.3	0.2	0.2
Lower Blitzen-Voltage	4.8	4.1	3.6
Northeast-Crane	2.0	0.4	0.8
Silver Creek	17.9	14.7	14.6
Silvies	21.8	17.5	17.1
Upper Blitzen	1.5	1.5	1.6
Weaver Springs	0.7	0.6	0.6
All	49.0	38.9	38.5

Dry Wells

Domestic wells that lost access to water due to modeled water levels falling below the bottom of the well are counted in Table 4. Consistent with the lower groundwater levels in Lower Blitzen-Voltage, 3 additional wells were modeled as going dry there. Conversely, higher water levels in Northeast-Crane reduced the number of wells that went dry there by 10. All other subareas had the same number of dry wells in the year 2058 under both scenarios.

Table 4: Counts of number of domestic wells that lose access to water due to modeled water levels dropping below the bottom of the well.

Subarea	Historic Model	WRD Proposal	RAC Alternate
Year	2018	2058	2058
Dog Mountain	4	7	7
Lower Blitzen-Voltage	7	9	12
Northeast-Crane	27	46	36
Silver Creek	4	4	4
Silvies	23	25	25
Upper Blitzen	1	1	1
Weaver Springs	11	9	9
All	77	101	94

References

Gingerich, S.B., D.E. Boschmann, G.H. Grondin, and H.J. Schibel, 2024. Groundwater Model of the Harney Basin, Southeastern Oregon. U.S. Geological Survey. doi:10.3133/sir20245017.



Memorandum

TO: Ivan Gall, Director
FROM: Darrick Boschmann, Ben Scandella; Groundwater Section
DATE: December 3, 2025
SUBJECT: Technical Evaluation of Modified Petition Simulation

Introduction

To demonstrate changes in modeled outcomes in response to changing model inputs related to timing and quantity of reductions, the Department ran a model simulation using the Harney Basin Groundwater Model (Gingerich and others, 2024). The starting point for this simulation was the proposal submitted by the petitioners in September, with the timing of voluntary reductions and the quantity of voluntary reductions in 3 areas of the model being the only parameters modified. This memo details the changes in modeling parameters tested and provides the simulated outcomes. The model simulation will hereafter be called the Modified Petition Simulation. This memo references the Oregon Water Resources Department memo titled "Technical Evaluation of Petition to Amend Division 512." Unless explicitly stated, all modeling methods and inputs were identical to those documented in the memo "Technical Evaluation of Petition to Amend Division 512."

The figures and tables presented here compare the modelled outcomes of the Modified Petition Simulation, the Petition Proposal, and the OWRD Proposal. In some instances, Scenario 1 from Gingerich and others (2024) is included for comparison purposes. In Scenario 1 from Gingerich and others (2024) [hereinafter 'Full Pumpage'], the model assumes average recharge and 2018 pumpage remain constant throughout the model period, representing the outcomes of continuing current pumping levels on the groundwater-flow system. To allow for direct comparison of model outcomes across equivalent spatial extents, in some cases the model results in the figures and tables presented here are aggregated over the 7 subareas from the OWRD proposal.

Modified Petition Simulation Inputs

For the Silver Creek, Silvies, and Blitzen-Voltage CGWAs the model scenario for the Modified Petition Simulation assumed 2018 pumpage continues from 2019-2033, and a 15% reduction from 2017/2018 mean pumpage is implemented in 2034. Pumpage reductions are distributed equally across all permitted wells. Management parameters for the Silver Creek, Silvies, and Blitzen-Voltage CGWAs are described Table 1. The values supporting determination of Permissible Total Withdrawal (PTW) in these subareas are shown in Table 2.

Table 1: Management parameters for Modified Petition Simulation Silver Creek, Silvies, and Blitzen-Voltage Critical Groundwater Areas (CGWAs). Compare with Table 3 in Technical Evaluation of Petition to Amend Division 512.

Parameter	Modified Petition Simulation
Spatial extent	Silver Creek CGWA; Silvies CGWA; Blitzen-Voltage CGWA
Permissible total withdrawal	15% voluntary reductions from 2017/2018 mean pumping
Frequency of adaptation	6 years (if necessary)
Timeline for reductions	Reductions implemented in 2034

Table 2: Values supporting determination of modeled pumpage beginning in year 2034 in subareas where a voluntary 15% reduction from the average 2017-2018 pumpage is implemented in the Modified Petition Simulation. All values are specified in TAF/yr (thousand acre-feet per year). PTWs were specified directly in the petition rule language for the Northeast-Crane (37.0 TAF/yr) and Weaver Springs Subareas (9.2 TAF/yr). Compare with Table 4 in Technical Evaluation of Petition to Amend Division 512.

CGWA	Modeled 2017 Nonexempt Pumpage	Modeled 2018 Nonexempt Pumpage	Modeled 2017-2018 Mean Nonexempt Pumpage	Modeled Pumpage Beginning 2034 (15% reduction from 2017-2018 Mean)
Blitzen	16.7	16.6	16.6	14.1
Silver Creek	22.6	21.0	21.8	18.5
Silvies	34.6	28.9	31.8	27.0

A time-series plot of groundwater pumpage for non-exempt uses from 2018-2098 used to model the OWRD Proposal, Petition Proposal, and Modified Petition Simulation is shown in Figure 1. Pumpage is shown both in thousand acre-feet per year and as a percentage reduction from 2018 pumpage. The Full Pumpage scenario is included for comparison. Pumpage under all three scenarios steps down at 6-year intervals starting in 2028, with the final reduction in pumping implemented in 2052.

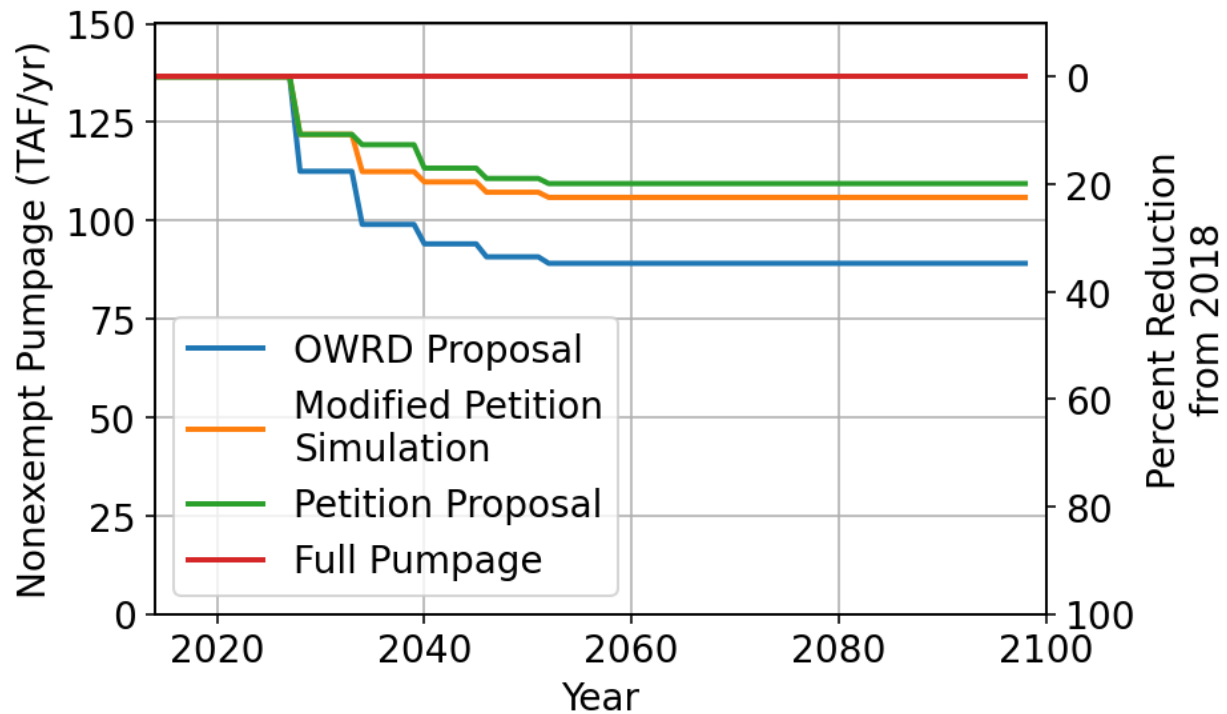


Figure 1: Time series of groundwater pumpage for non-exempt uses over the model period for the OWRD Proposal, Modified Petition Simulation, and Petition Proposal within the GHVGAC boundary. USGS full pumpage scenario included for comparison. Compare with Figure 3 in Technical Evaluation of Petition to Amend Division 512.

Groundwater Level Change Magnitude

Time-series plots of modeled median groundwater level change magnitude since 2018 under the OWRD Proposal, Modified Petition Simulation, and Petition Proposal are shown in Figure 2-Figure 8. The Full Pumpage scenario is included for comparison. Values are plotted relative to 2018 modeled groundwater levels and therefore do not account for the groundwater level declines that had already occurred prior to 2018, which were significant in some parts of the basin.

Under the Modified Petition Simulation groundwater level changes in the Dog Mountain subarea (Figure 2) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline.

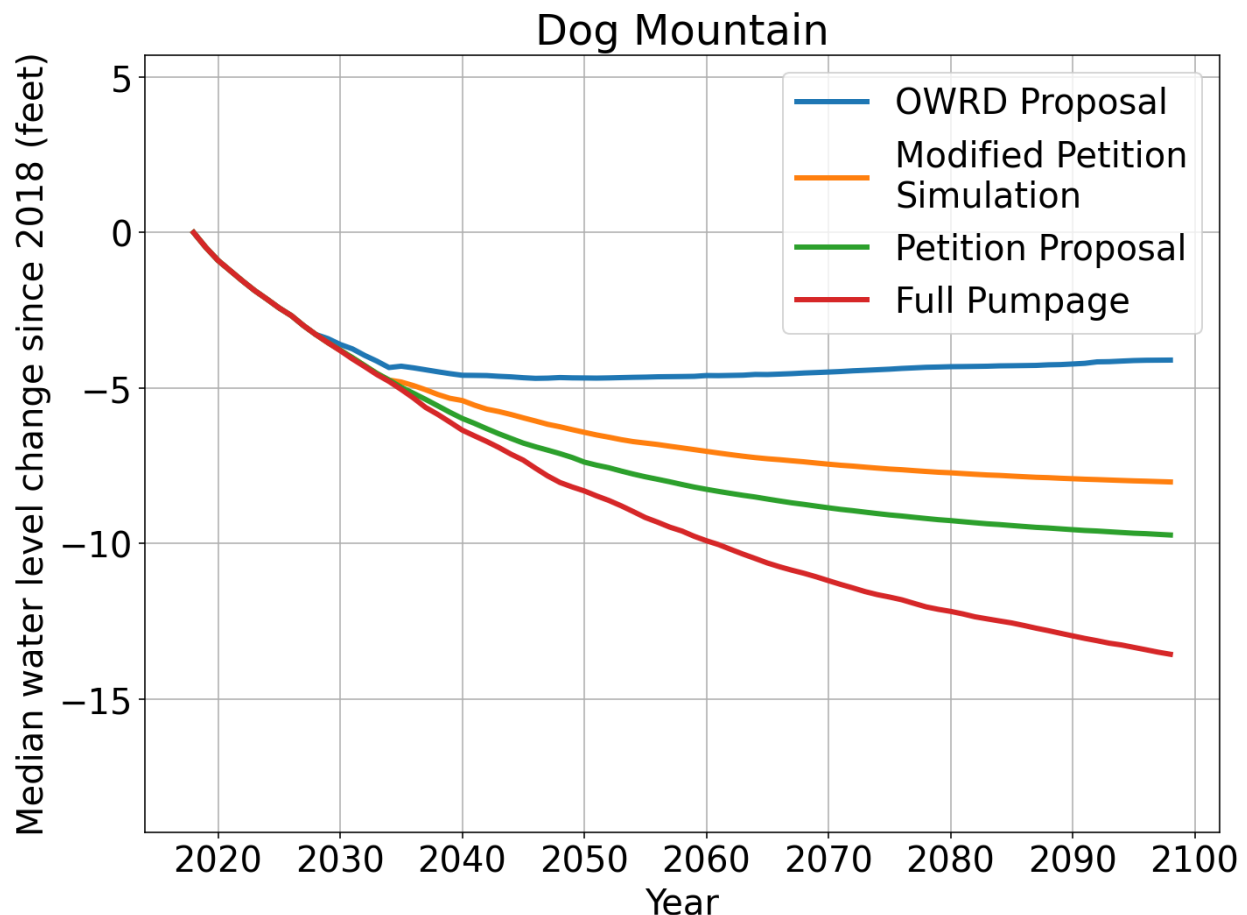


Figure 2: Time-series of median water level change since 2018 in the OWRD Proposal Dog Mountain Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 4 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation groundwater level changes in the Lower Blitzen-Voltage subarea (Figure 3) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline.

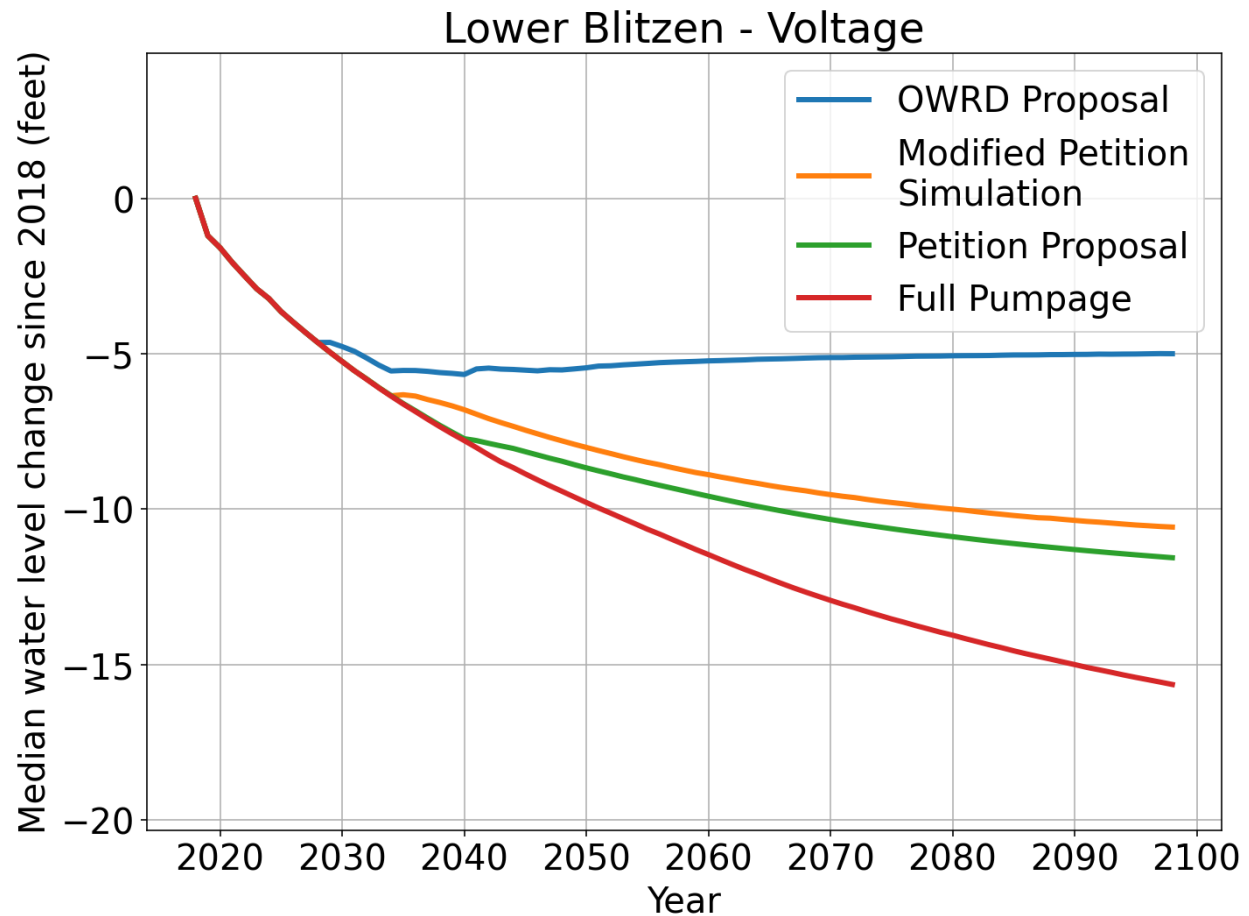


Figure 3: Time-series of median water level change since 2018 in the OWRD Proposal Lower Blitzen-Voltage Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 5 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation groundwater level changes in the Northeast-Crane subarea (Figure 4) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline.

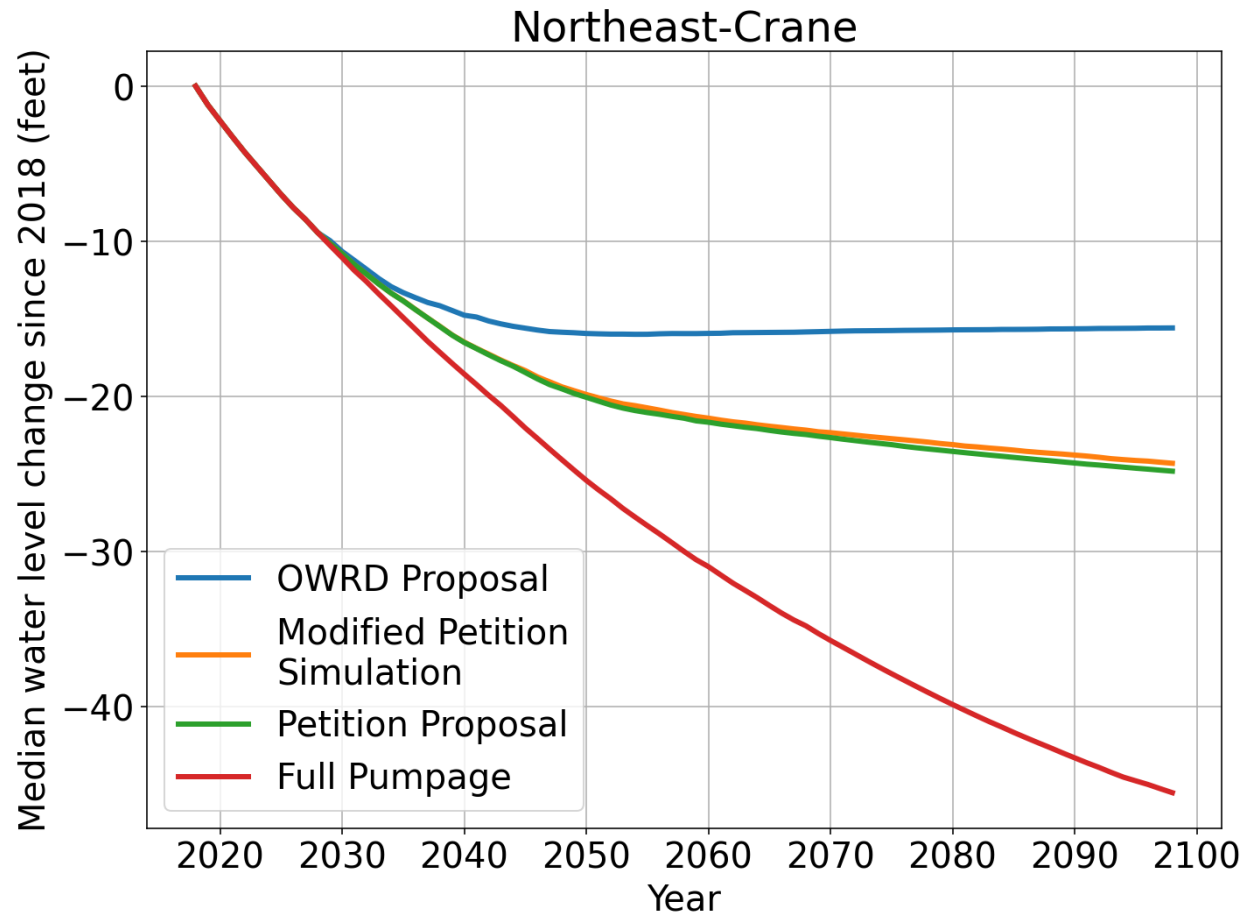


Figure 4: Time-series of median water level change since 2018 in the OWRD Proposal Northeast-Crane Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 6 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation groundwater level changes in the Silver Creek subarea (Figure 5) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline.

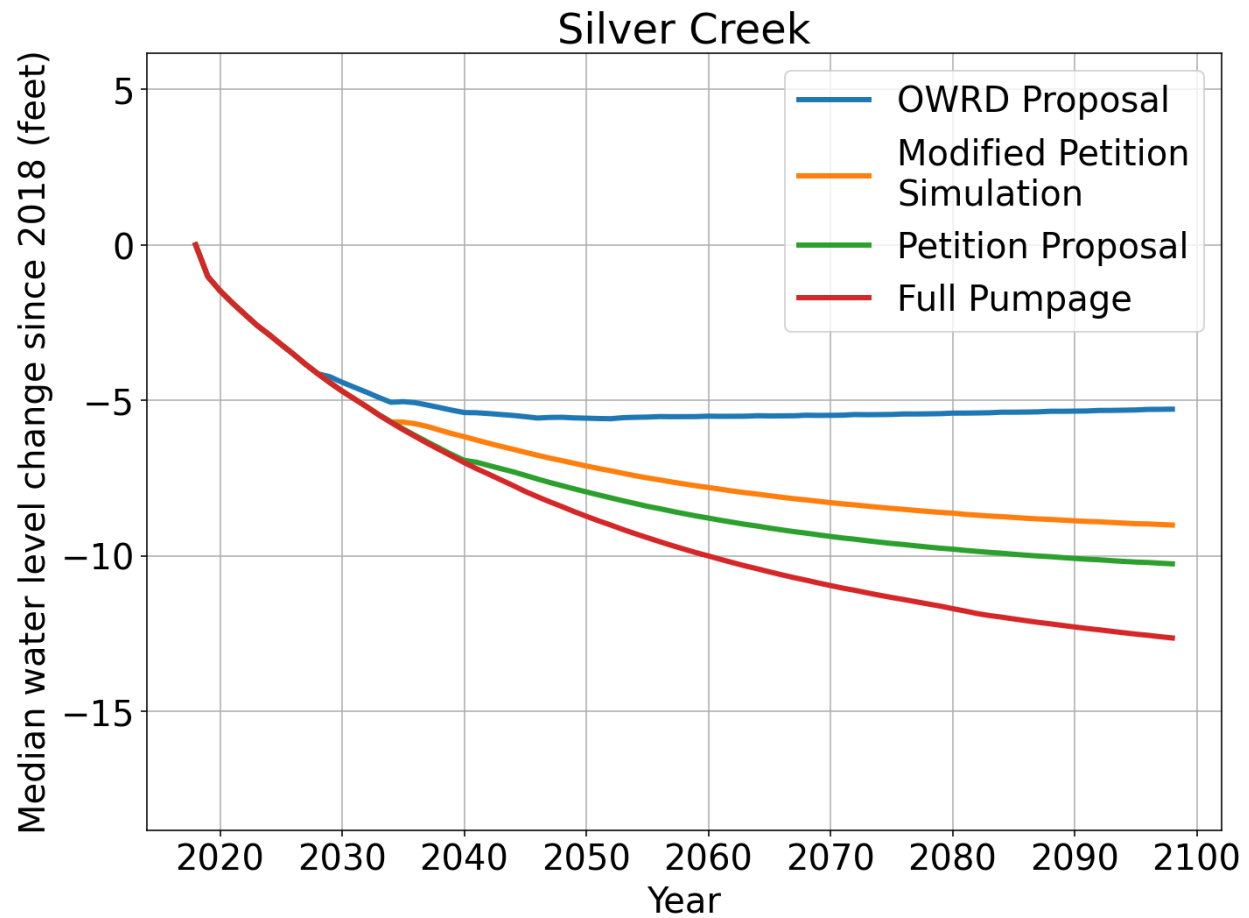


Figure 5: Time-series of median water level change since 2018 in the OWRD Proposal Silver Creek Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 7 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation groundwater level changes in the Silvies subarea (Figure 6) continue to decline through the entire model period. At the end of the model period, the median groundwater level changes remain in a state of decline.

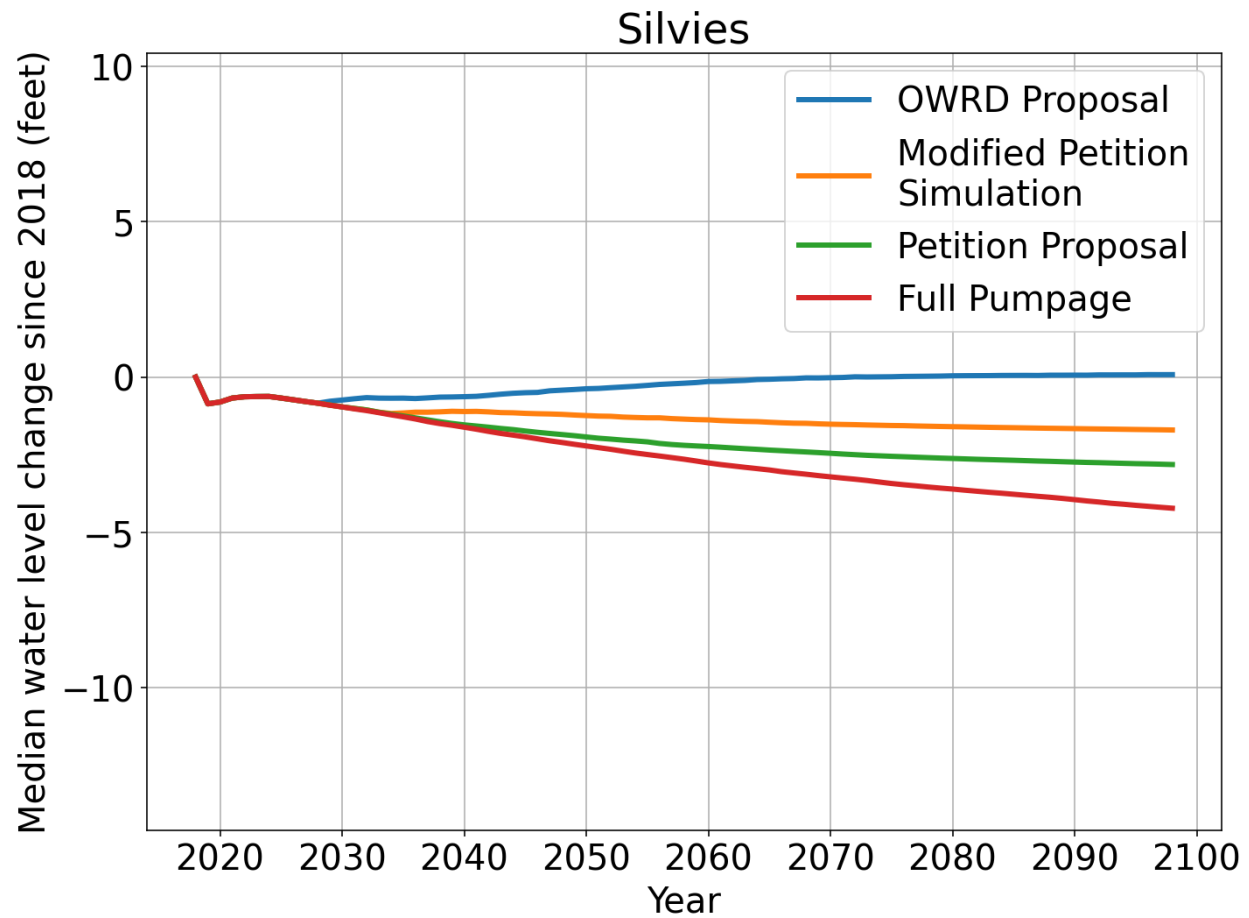


Figure 6: Time-series of median water level change since 2018 in the OWRD Proposal Silvies Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 8 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation groundwater level changes in the Upper Blitzen subarea (Figure 7) undergo a slow recovery through the end of the model period. Water levels under all three scenarios are nearly coincident over the entire model period.

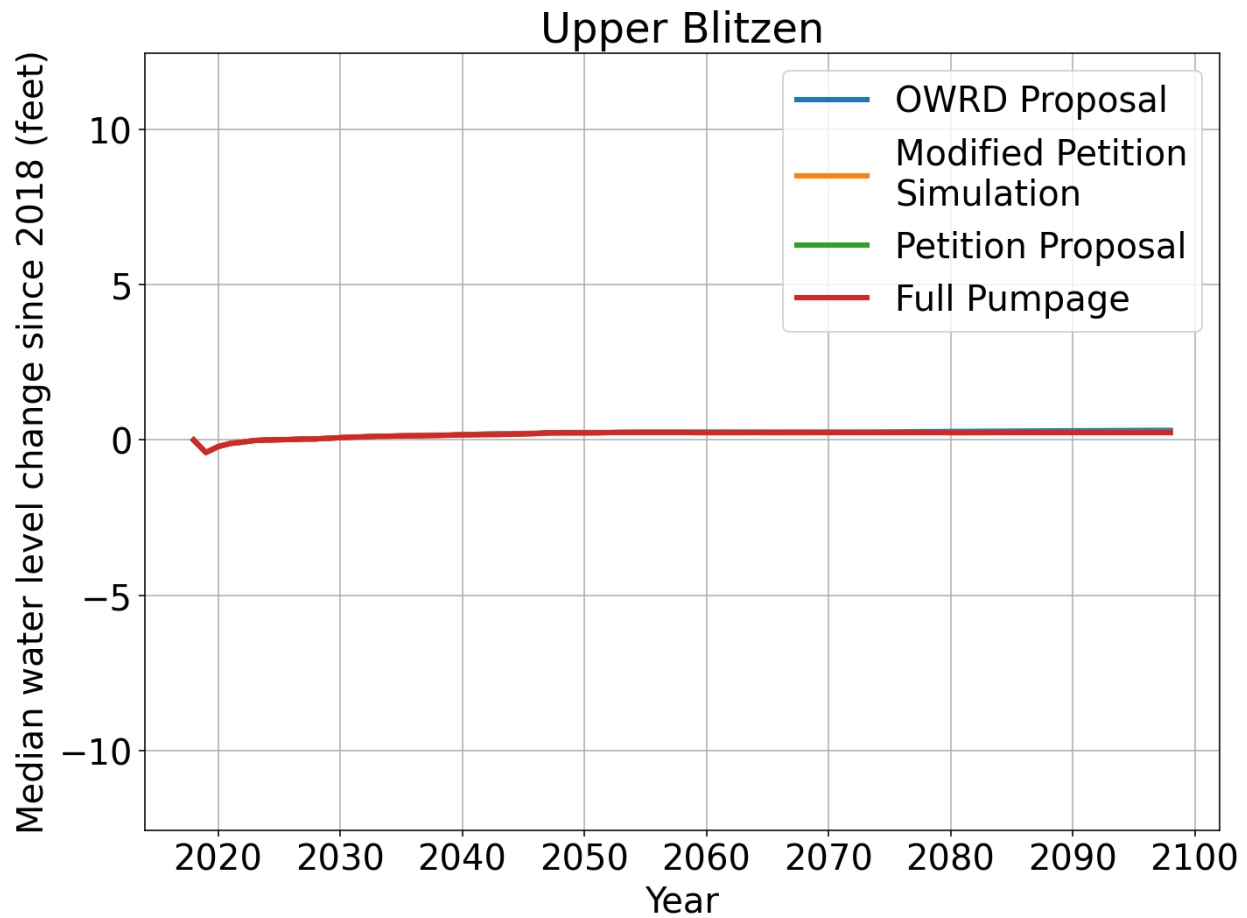


Figure 7: Time-series of median water level change since 2018 in the OWRD Proposal Upper Blitzen Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 9 in Technical Evaluation of Petition to Amend Division 512.

Under the Modified Petition Simulation median groundwater level changes in the Weaver Springs subarea (Figure 8) continue to decline until 2028, after which they transition to a steady recovery until 2080 and then stabilize through the end of the model period. Water levels in the Modified Petition Simulation are mostly covered by those from the Petition Proposal, rising barely higher than the Petition Proposal by the end of the modeling period.

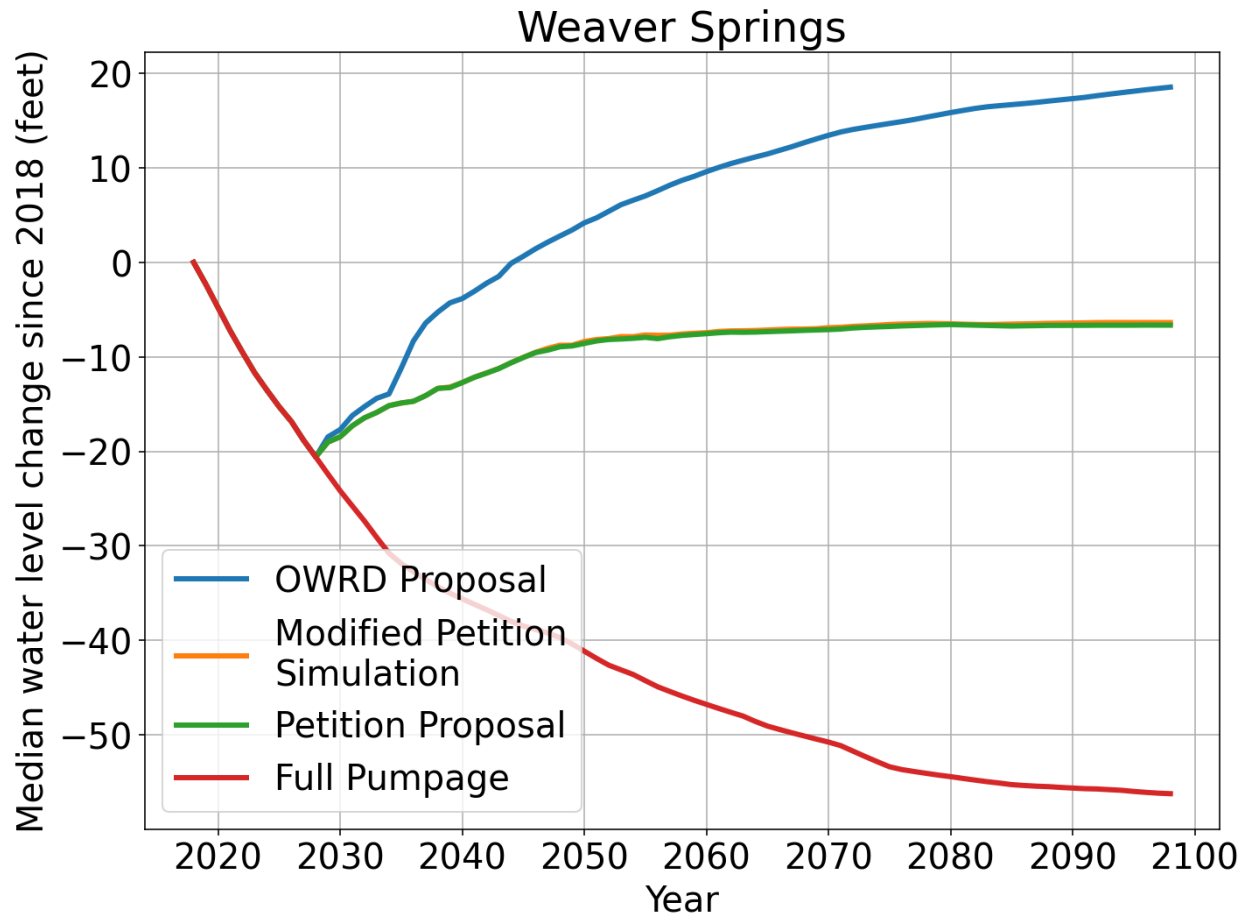


Figure 8: Time-series of median water level change since 2018 in the OWRD Proposal Weaver Springs Subarea under the OWRD Proposal, Modified Petition Simulation, Petition Proposal, and Full Pumpage scenario. The results of the petition proposals are aggregated over the OWRD Proposal subarea for comparison. Compare with Figure 10 in Technical Evaluation of Petition to Amend Division 512.

Groundwater Level Change Rate

The violin plot in Figure 9 shows the distribution of minimum groundwater level rates of change after 2058 for the Modified Petition Simulation aggregated over the 5 Petition Proposal CGWAs. The median rate is represented by the red dashed line, and the 90th percentile rate is represented by the green dashed line. With the exception of the Weaver Springs CGWA, the median value is less than zero (declining) for all CGWAs, meaning that the median groundwater level change rate is not stable or rising in 2058 and does not reach stability in any model year thereafter. The 90th percentile is declining in Northeast-Crane, Silver Creek, and Silvies CGWA's, and is effectively zero in the Blitzen CGWA, meaning that at least 90% of well-cells in each of these areas are declining in year 2058 or later.

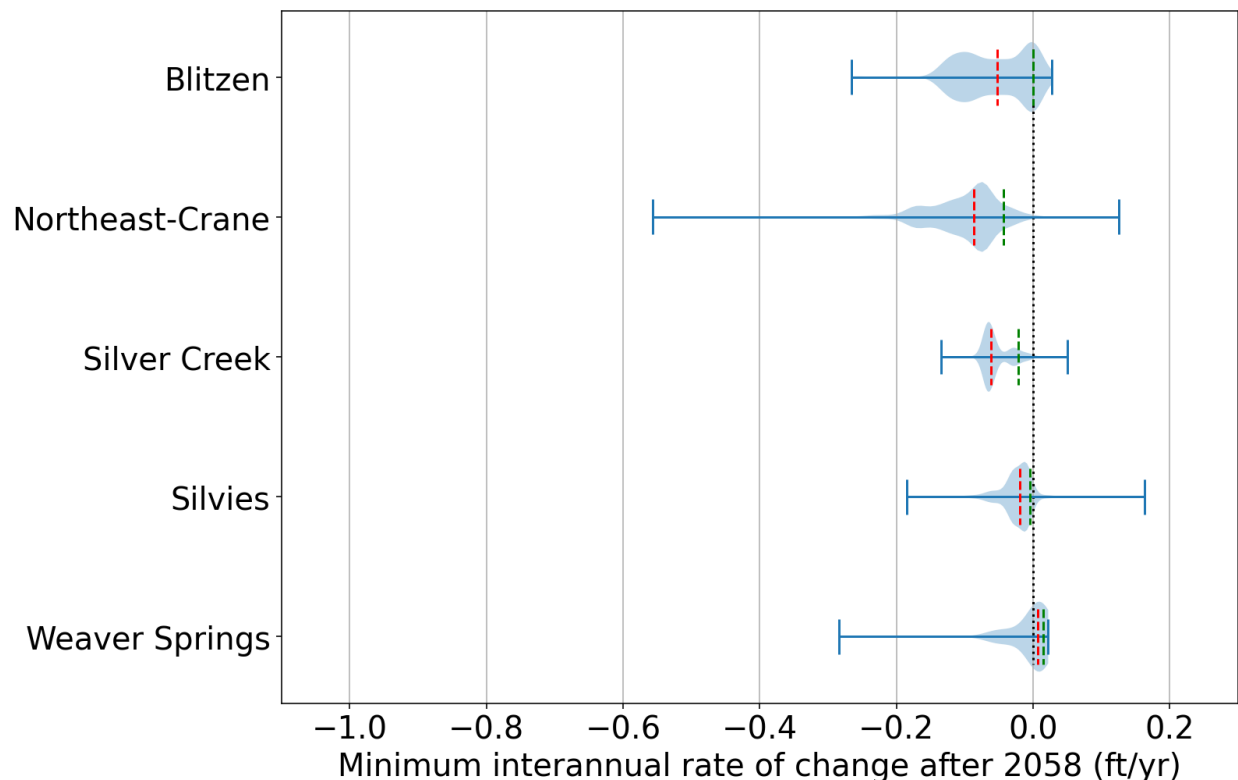


Figure 9: Violin plot showing the distribution of minimum interannual rates of change after 2058 for the Modified Petition Simulation aggregated over the 5 Petition Proposal Critical Groundwater Areas. Red dashed line = median rate. Green dashed line = 90th percentile rate. Black dotted line = 0.0 ft/yr. Compare with Figure 11 in Technical Evaluation of Petition to Amend Division 512.

The checkerboard plot in Figure 10 shows the median groundwater level rate of change after 30 years (minimum rate in 2058 and all successive model years) under the OWRD Proposal, Modified Petition Simulation, and Petition Proposal aggregated over the 7 OWRD Proposal subareas. The Full Pumpage scenario is included for comparison.

Under the Modified Petition Simulation, the median groundwater level rate of change after 30 years is stable only in the Upper Blitzen and Weaver Springs subareas but remains in a state of decline in all other subareas.

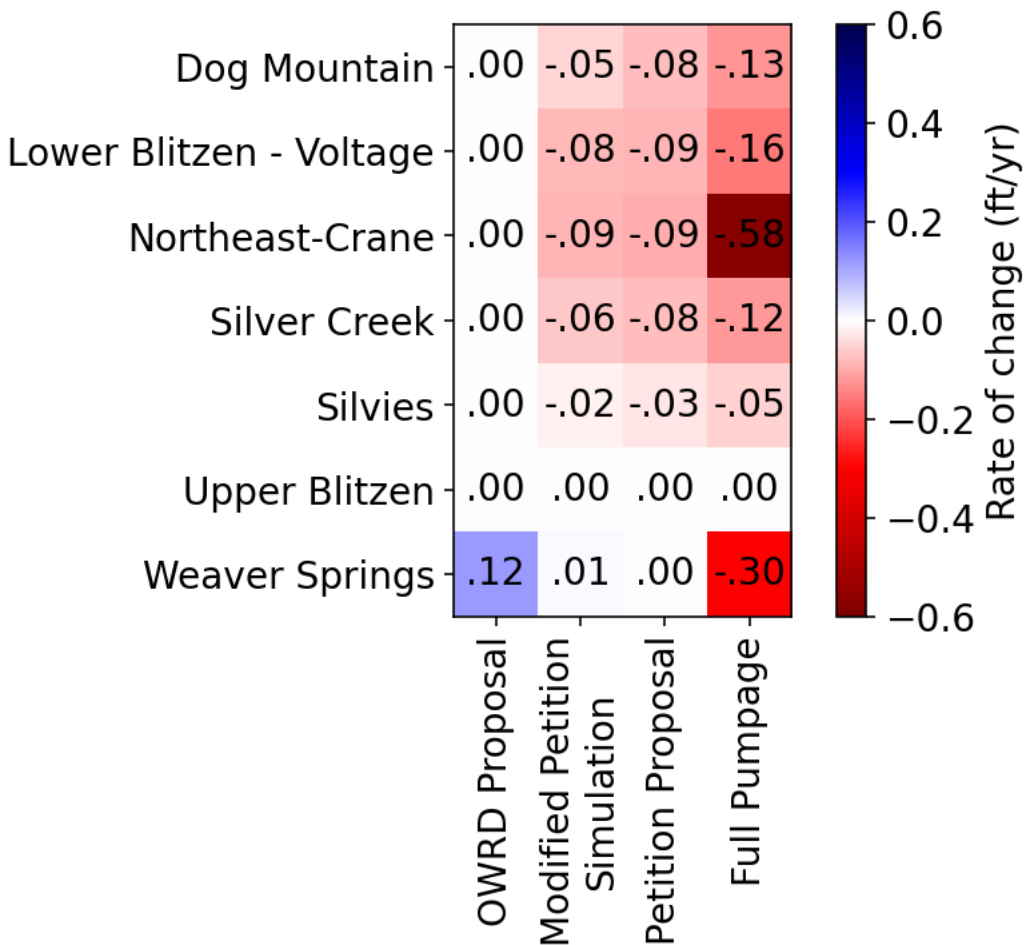


Figure 10: Checkerboard plot showing median rates of change after 30 years (minimum rate for the remainder of the simulation period) for the OWRD Proposal, Modified Petition Simulation, and Petition Proposal aggregated over the 7 OWRD Proposal subareas. Full Pumpage scenario included for comparison. Subareas are presented in alphabetical order from top to bottom. The color bar on the right shows how increasing interannual rates are represented by shades of blue, and decreasing rates by shades of red. Compare with Figure 14 in Technical Evaluation of Petition to Amend Division 512.

Impacts to Dry Domestic Wells

The number of dry domestic wells in 2058 under the OWRD Proposal, Modified Petition Simulation, and the Petition Proposal are presented in Table 3 as aggregated over the 7 OWRD Proposal subareas. The number of dry domestic wells modeled in 2018 is included for comparison. A well is considered dry in the model if the modeled water levels drop below the bottom of the well.

Table 3: Counts of number of domestic wells that lose access to water due to modeled water levels dropping below the bottom of the well. The results of the Petition Proposal and Modified Petition Simulation are aggregated over the 7 OWRD Proposal subareas for comparison. Compare with Table 7 in Technical Evaluation of Petition to Amend Division 512.

Subarea	Historic Model	OWRD Proposal	Modified Petition Simulation	Petition Proposal
Year	2018	2058	2058	2058
Dog Mountain	4	7	7	7
Lower Blitzen-Voltage	7	9	12	13
Northeast-Crane	27	46	60	61
Silver Creek	4	4	4	4
Silvies	23	25	25	25
Upper Blitzen	1	1	1	1
Weaver Springs	11	9	15	15
All	77	101	124	126

Impacts to Springs and Streams

Modeled annual groundwater discharge to springs and streams in lowland areas in 2058 under the OWRD Proposal, Petition Proposal and Modified Petition Simulation is presented in Table 4 as aggregated over the 7 OWRD Proposal subareas. Modeled values in 1980 from the historic model are included for comparison.

Table 4: Annual groundwater discharge to springs and streams in lowland portions of each subarea, in units of TAF/yr (thousand acre-feet per year). The results of the Petition Proposal and Modified Petition Simulation are aggregated over the 7 OWRD Proposal subareas for comparison. Compare with Table 8 in Technical Evaluation of Petition to Amend Division 512.

Subarea	Historic Model	OWRD Proposal	Modified Petition Simulation	Petition Proposal
Year	1980	2058	2058	2058
Dog Mountain	0.0	0.0	0.0	0.0
Lower Blitzen-Voltage	9.2	3.5	2.9	2.9
Northeast-Crane	4.0	2.0	1.8	1.8
Silver Creek	17.8	9.6	8.8	8.5
Silvies	8.9	3.4	3.2	2.9
Upper Blitzen	11.6	10.6	10.6	10.5
Weaver Springs	0.2	0.0	0.0	0.0
All	51.8	29.1	27.3	26.7

Impacts to Natural Evapotranspiration (ET)

Modeled annual natural evapotranspiration in lowland areas in 2058 under the OWRD Proposal, Petition Proposal, and Modified Petition Simulation is presented in Table 5 as aggregated over the 7 OWRD Proposal subareas. Modeled values in 2018 from the historic model are included for comparison.

Table 5: Annual natural evapotranspiration in lowland portions of each subarea, in units of TAF/yr (thousand acre-feet per year). Results are presented from 2018 under the historical pumpage scenario, as well as in year 2058 from the OWRD Proposal, Petition Proposal, and Modified Petition Simulation. The results of the Petition Proposal and Modified Petition Simulation are aggregated over the 7 OWRD Proposal subareas for comparison. Compare with Table 9 in Technical Evaluation of Petition to Amend Division 512.

Subarea	Historic Model	OWRD Proposal	Modified Petition Simulation	Petition Proposal
Year	2018	2058	2058	2058
Dog Mountain	0.3	0.2	0.2	0.2
Lower Blitzen-Voltage	4.8	4.1	3.3	3.1
Northeast-Crane	2.0	0.4	0.3	0.3
Silver Creek	17.9	14.7	13.4	13.1
Silvies	21.8	17.5	15.0	14.0
Upper Blitzen	1.5	1.5	1.5	1.5
Weaver Springs	0.7	0.6	0.5	0.5
All	49.0	38.9	34.1	32.7

Summary and Discussion

The Department evaluated and compared the hydrologic outcomes of the Modified Petition Simulation using the Harney Basin Groundwater Model (Gingerich and others, 2024). The differences in modeled outcomes between the Modified Petition Simulation, the OWRD Proposal, and the Petition Proposal reflect how these proposals define the management areas and implement pumping reductions across the basin. Model results show that each simulation influences groundwater levels, rates of decline, and related impacts in different ways over time. The somewhat higher overall pumping reductions and accelerated implementation of those reductions under the Modified Petition Simulation resulted in somewhat higher water levels, and somewhat reduced impacts to domestic wells, springs and streams, and natural evapotranspiration as compared to the Petition Proposal.

Key model results include:

- In nearly all areas groundwater levels in the Modified Petition Simulation are lower than the OWRD Proposal and somewhat higher than the Petition Proposal at 30 years and at the end of the model period.
- Under the Modified Petition Simulation, the maximum median rate of decline in 2058 in all subareas was less than 0.1 feet per year. However, in most areas at least 90% of wells continue to decline in 2058 or later.
- By 2058, the number of modeled dry domestic wells is higher under the Modified Petition Simulation than under the OWRD Proposal, with an addition 23 domestic wells modeled to go dry. Overall, there are two fewer wells modeled to go dry under the Modified Petition Simulation as compared to the Petition Proposal.
- Modeled groundwater discharge to springs and streams in 2058 is 1.8 thousand acre-feet lower under the Modified Petition Simulation as compared to the OWRD Proposal, and 1.2 thousand acre-feet higher as compared to the Petition Proposal.
- Modeled annual natural ET in 2058 is 4.8 thousand acre-feet per year lower under the Modified Petition Simulation as compared to the OWRD Proposal, and 1.4 thousand acre-feet higher as compared to the Petition Proposal.

References

Gingerich, S.B., D.E. Boschmann, G.H. Grondin, and H.J. Schibel, 2024. Groundwater Model of the Harney Basin, Southeastern Oregon. U.S. Geological Survey. doi:10.3133/sir20245017.

<https://pubs.usgs.gov/publication/sir20245017>

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<https://www.oregon.gov/owrd/programs/policylawandrules/OARS/Documents/Memo%20-%20Technical%20Evaluation%20of%20Petition%20to%20Amend%20Division%20512.pdf>