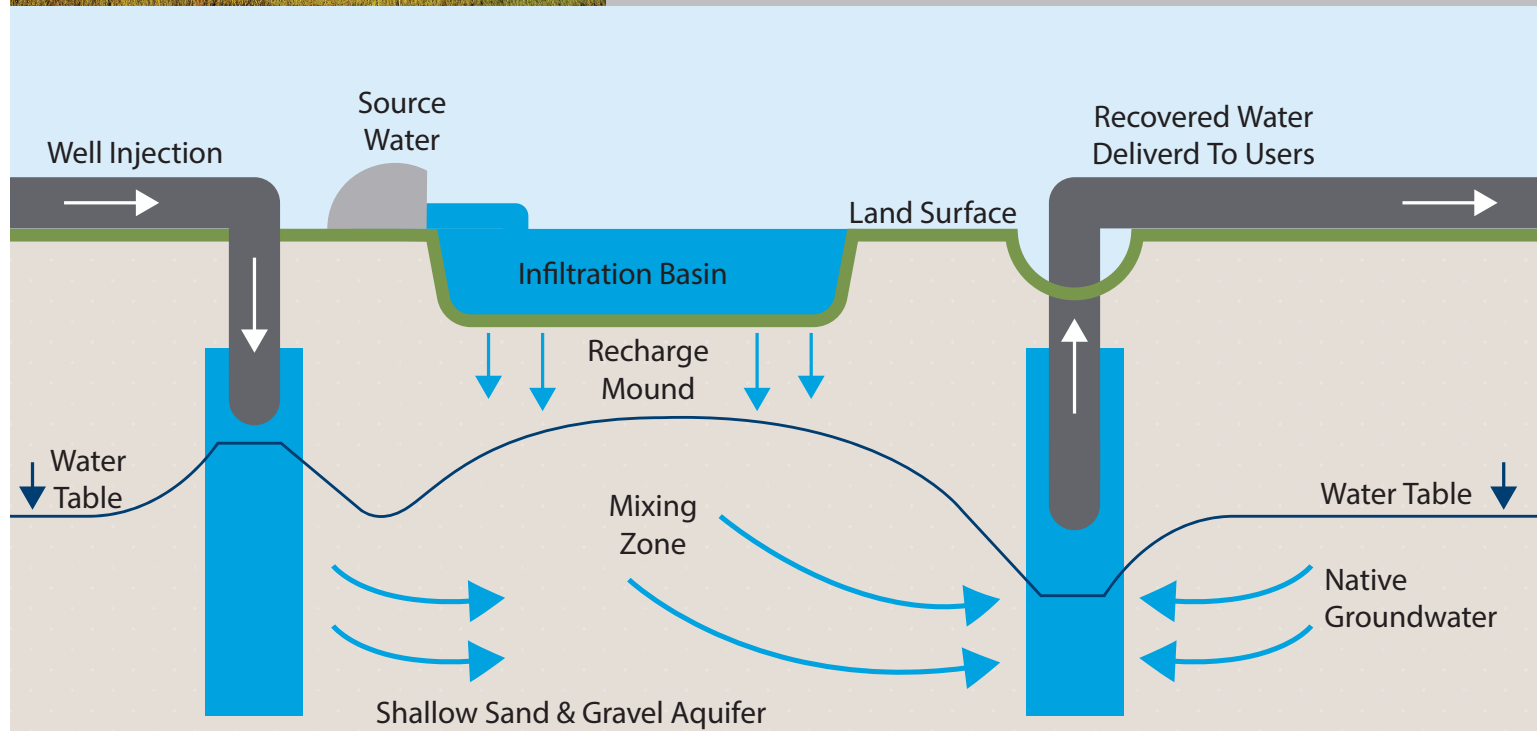


# AQUIFERS



## WHAT IS MANAGED AQUIFER RECHARGE (MAR)?

MAR involves capturing a portion of excess or abundant surface water flows from rivers and streams (often in the spring) and storing that volume of water in an aquifer for later use. Much like surface water reservoirs that augment variable river and stream flow conditions, MAR allows aquifers to be used as underground reservoirs. MAR projects are also referred to as artificial recharge, aquifer storage and recovery, and aquifer recharge and recovery. MAR can be accomplished generally through two means: surface infiltration or well injection.



## STUDY OF MAR POTENTIAL IN ND

Department of Water Resources (DWR) contracted a MAR assessment that was completed in early 2024. The purpose was to evaluate the feasibility and use of MAR in North Dakota's glacial drift aquifers to extend and enhance their resiliency. The work completed included a detailed report, which also supports interactive maps that are available via DWR's Map Services. The report establishes criteria for the definition of five separate "Tiers" by which the MAR potential for North Dakota's glacial drift aquifers could be ranked (see page 2). This will serve as an important step in North Dakota's ability to strategically locate and utilize MAR in the future.



To see the 2024 Assessment of Managed Aquifer Recharge Potential For Aquifers In ND report and other MAR information, including links to the DWR Map Service, which also includes interactive aquifer water quality maps, **scan the QR code!**

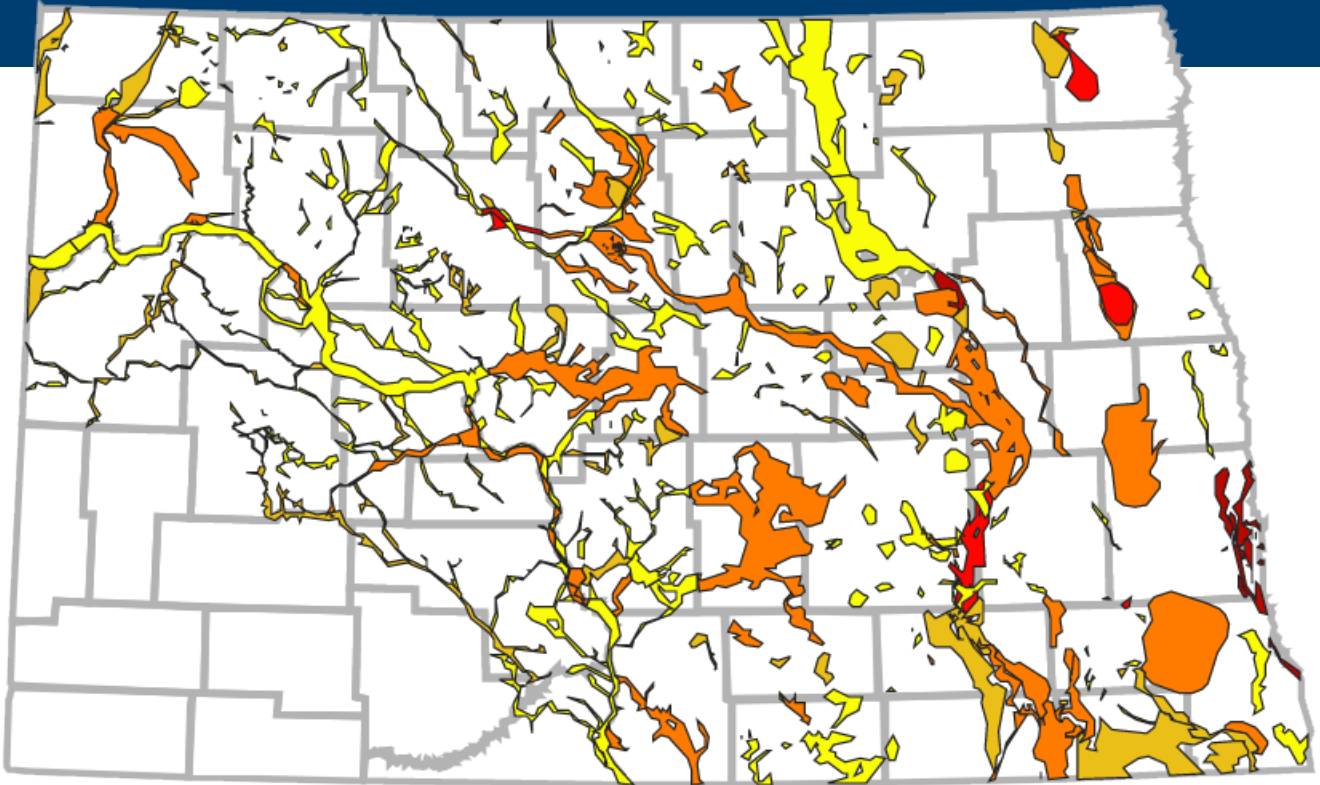
## WHY IMPLEMENT MAR IN ND?

Given the growth and progression of water development in North Dakota, many of the state's groundwater systems are now approaching full appropriation. As many of North Dakota's major groundwater systems approach sustainable limits, it will become increasingly difficult to approve additional appropriation without some form of augmentation such as MAR. However, as North Dakota looks to implement MAR in the future where opportunities exist, it is important to recognize that this is not a new concept in the state.

## HISTORY OF MAR IN ND

MAR has previously been used or tested in several instances and at multiple locations in North Dakota. Most notably, beginning in 1932, Valley City recharged Sheyenne River water into an abandoned gravel pit overlying a surficial aquifer where a hand dug municipal well was located. That simple yet effective design is still in operation today, with no major changes to the original concept.

# MAR TIER RANKINGS



## TIER 5 (POOR MAR POTENTIAL)

This rating indicates that MAR would likely be ineffective or unsuitable given hydrogeological context. An example aquifer in Tier 5 is Colfax aquifer in Richland County.

## TIER 4 (FAIR MAR POTENTIAL)

This rating suggests that MAR may provide some level of aquifer recharge potential or benefit, but there are significant limitations or inefficiencies. An example aquifer in Tier 4 is Apple Creek aquifer in Burleigh County.

## TIER 3 (GOOD MAR POTENTIAL)

This rating is given when MAR could be generally effective and appropriate in limited site-specific areas. An example aquifer in Tier 3 is Ray aquifer in Williams County.

## TIER 2 (VERY GOOD MAR POTENTIAL)

This rating indicates that MAR could be highly effective and well-suited to the local hydrogeological conditions. An example aquifer in Tier 2 is Sunde aquifer in Ward County.

## TIER 1 (EXCELLENT MAR POTENTIAL)

This is the highest rating, signifying that MAR could be exceptionally effective, and sustainable when integrated into the overall water management system. An example aquifer in Tier 1 is West Fargo aquifer in Cass County.

## NEXT STEPS

The Assessment of Managed Aquifer Recharge Potential for Aquifers in North Dakota report will provide the foundation for a second phase of MAR assessment in ND. More specifically, future efforts could include scenario modeling and pilot projects.



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MAY 2025