

Aquifer Storage and Recovery Challenges

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GROUND WATER PROTECTION COUNCIL



Who is the GWPC?



Challenges Overview

- What and Why ASR
- Participants/Organization
- Water Quality
- Water Rights
- Economics
- Water Quality Interaction
- Injection Requirements / Well Construction
- State Challenges

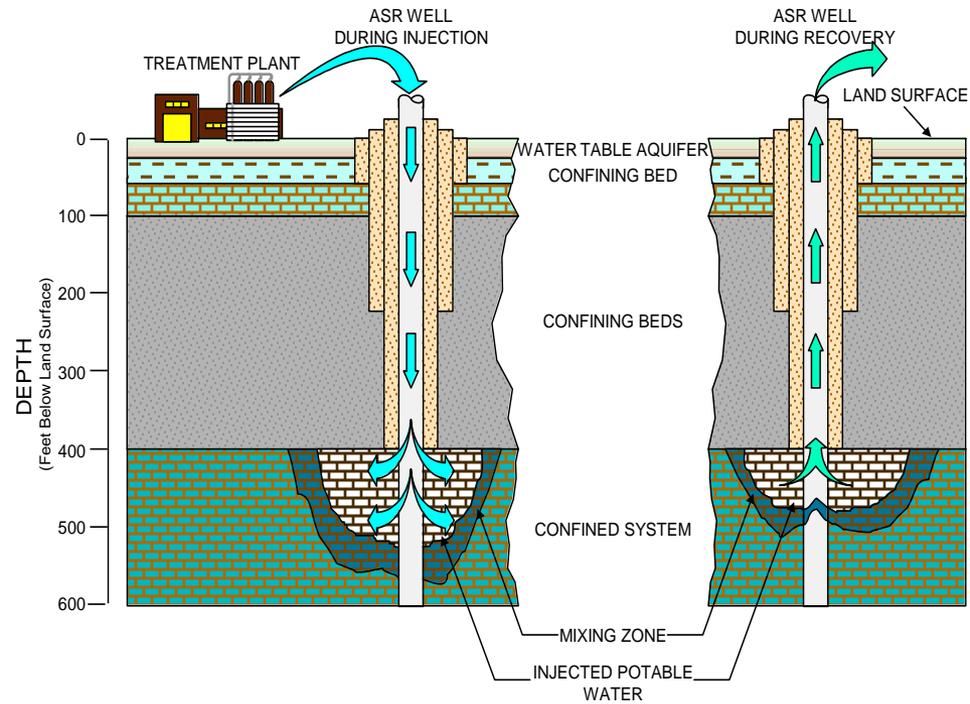
SPECIAL THANKS

SOME SLIDES COURTESY OF:

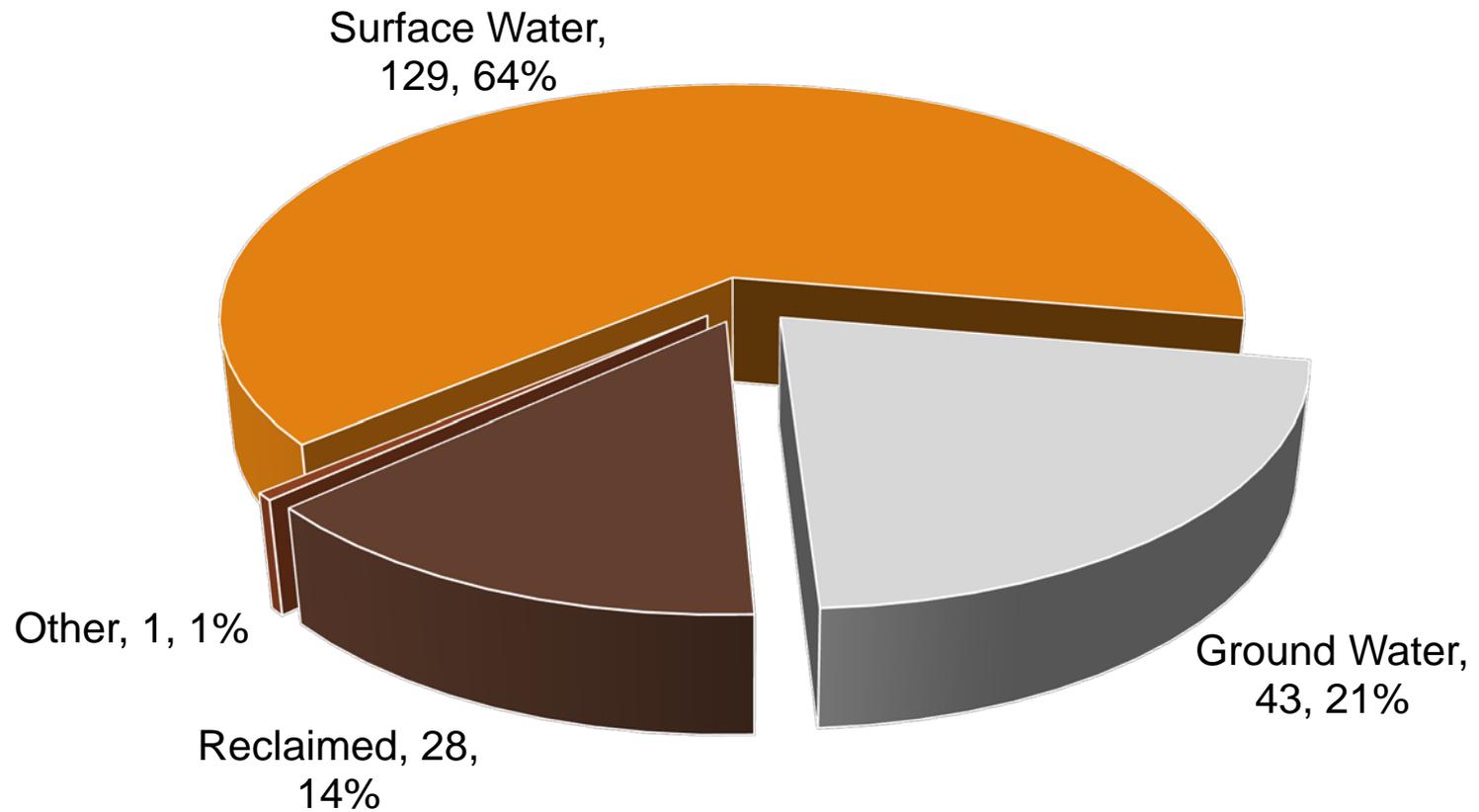
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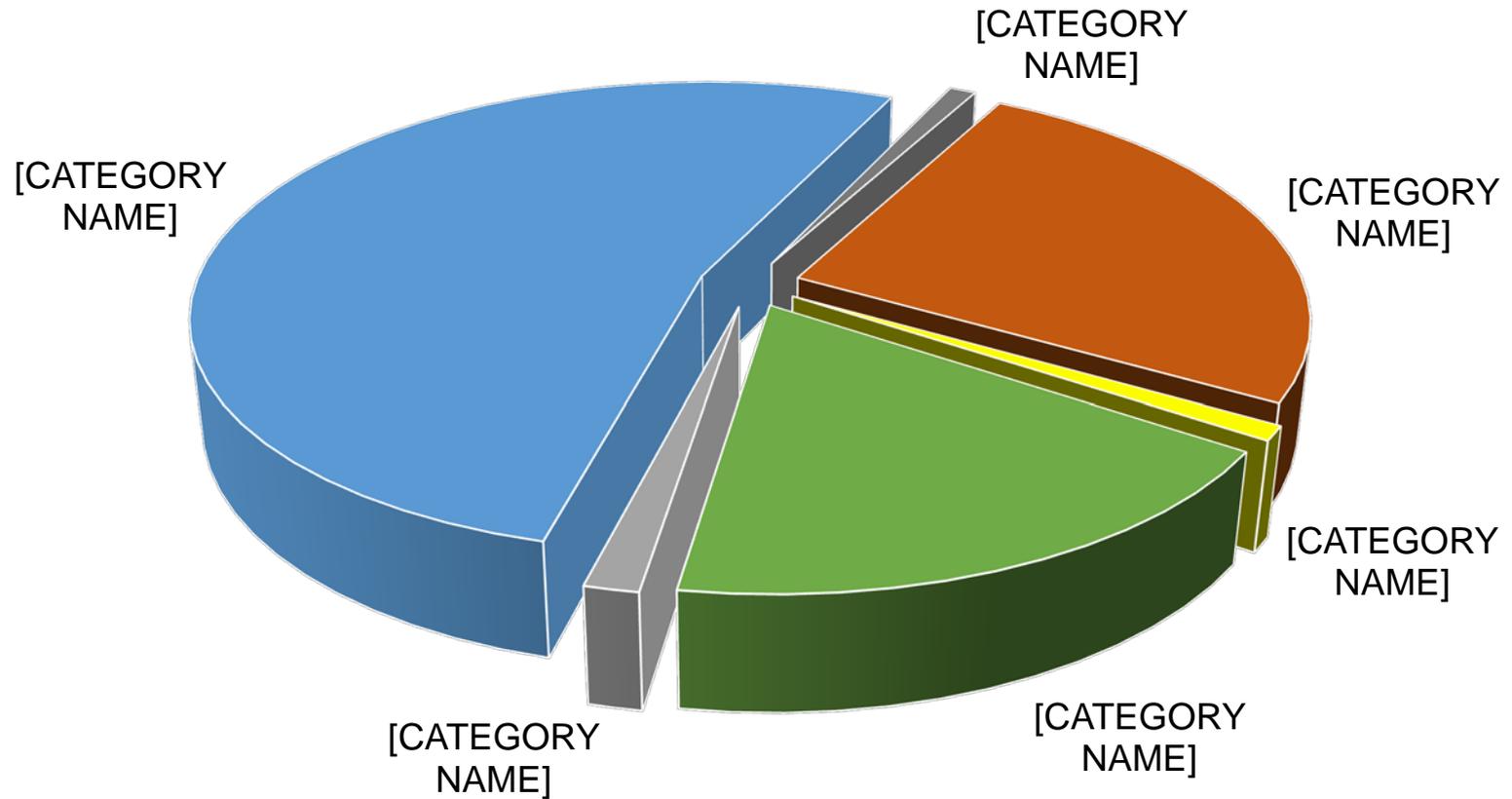
What is ASR?



Typical sources of water



Uses of Recovered Water



Why Use ASR

Store water for Future

- Raw water
- Potable water
- Irrigation
- Fire/other

Blend water for quality purposes

Water quality improvements

Combat saltwater intrusion (coastal)

Multi-Stakeholder Process

On the local level: city planners, government, water utilities, land owners, public,

On the state level: water quality and underground injection control (DEQ), water rights and availability (OWRB), and other potential partners (ag, conservation, etc)

On the Federal level: may require EPA approval of updated UIC rules

Water Quality

Different requirements exist based on the source of the water (treated drinking water, storm water, treated wastewater, treated surface or groundwater)

Recovered water may contain constituents not in the injected water or existing aquifer

May have to treat twice (injected water and recovered water) to meet standards and customer acceptance

Water Rights

Appropriate permissions, agreements, rights of both injected water and aquifer

Limiting other activity in the area surrounding the well

Understanding adjacent/nearby land and water uses

Economics

Compare costs/economics of ASR to other available sources in the area

How to finance?

Existing financing and bond instruments may not understand ASR projects.

Down-Hole Chemistry

Identify potential sources of recharge water and treatment requirements

Understand the hydrogeologic characteristics & chemical composition of receiving aquifers

Understand chemical interaction between recharge water and aquifer (metals mobilization)

ASR = Class V Injection Well

Regulated as Class V Injection – SDWA

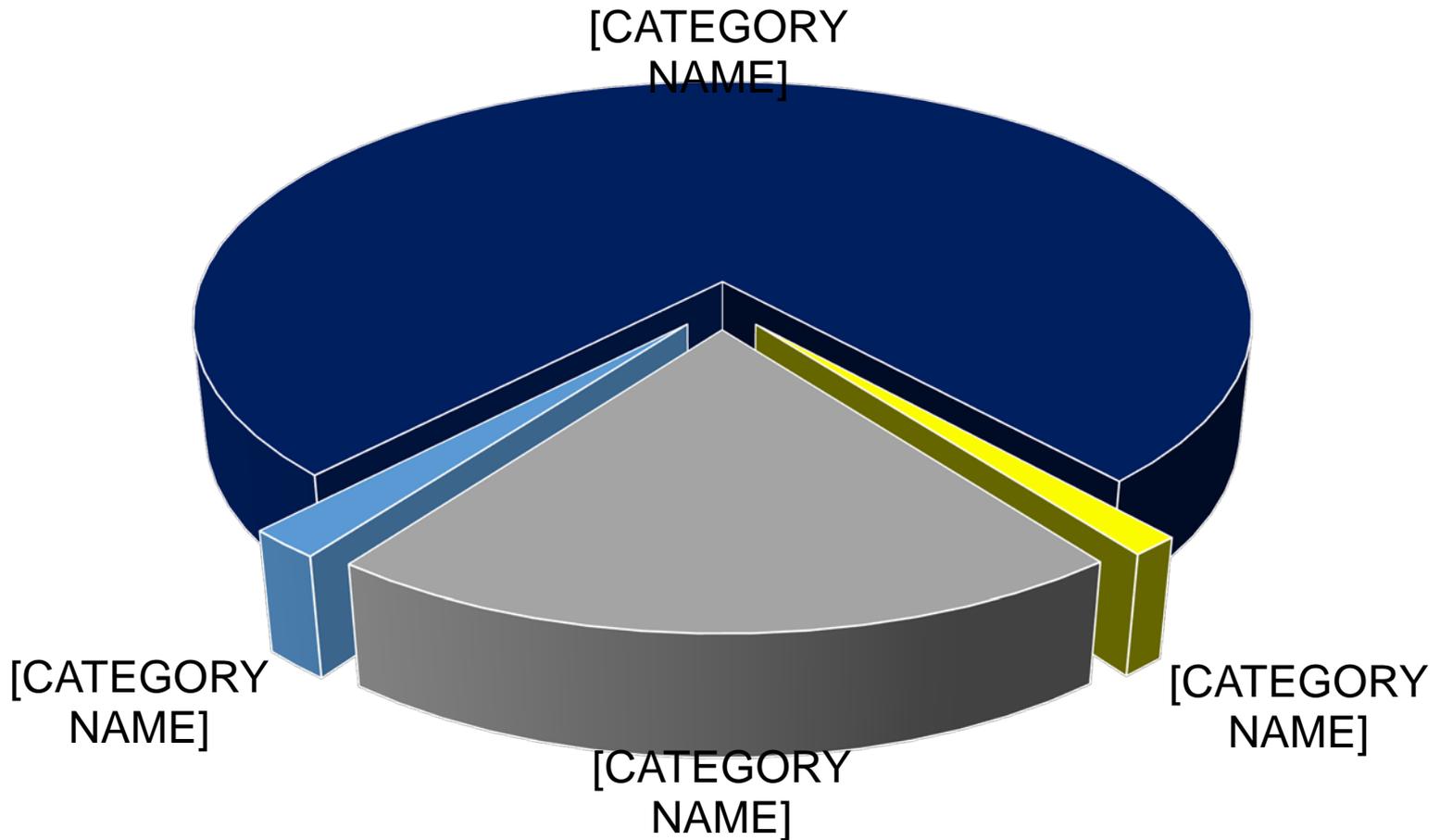
Must be approved by primacy enforcement agency

Regulations vary by state

- Quality of water injected
- Construction and casing
- Movement of fluid into USDW prohibited by federal law

Well Construction & Maintenance

Typical types of casing material



Summary

ASR can be a useful tool to help manage water supplies

Knowledge of the formation, geology, and chemistry are major issues for success

Clogging is an ongoing issue with all water, but especially raw surface water and reclaimed water

Success is not a short term issue

- Requires multiple cycles to determine success

Needs

Address regulatory constraints

Site Selection

- Proper geologic setting for injection and recovery, presence of metals, etc

Experts Needed

- Important to know as much as possible about the sub-surface geology, hydrology, and geo-chemistry

Research Needs

- Viability of specific approaches in Oklahoma

State Challenges

Balance the use/need of ASR for drinking water management with the potential for contamination of underground sources of drinking water (proper permitting, monitoring, well construction, ect).

Address water rights concerns, processes, and agreements for both the injected and recovered water

Thank you

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