



Solving Mosier Aquifer Declines

Wasco County Soil and Water Conservation District

www.wascoswcd.org

Presentation for Mosier Residents & Partners

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Mosier Grange Hall

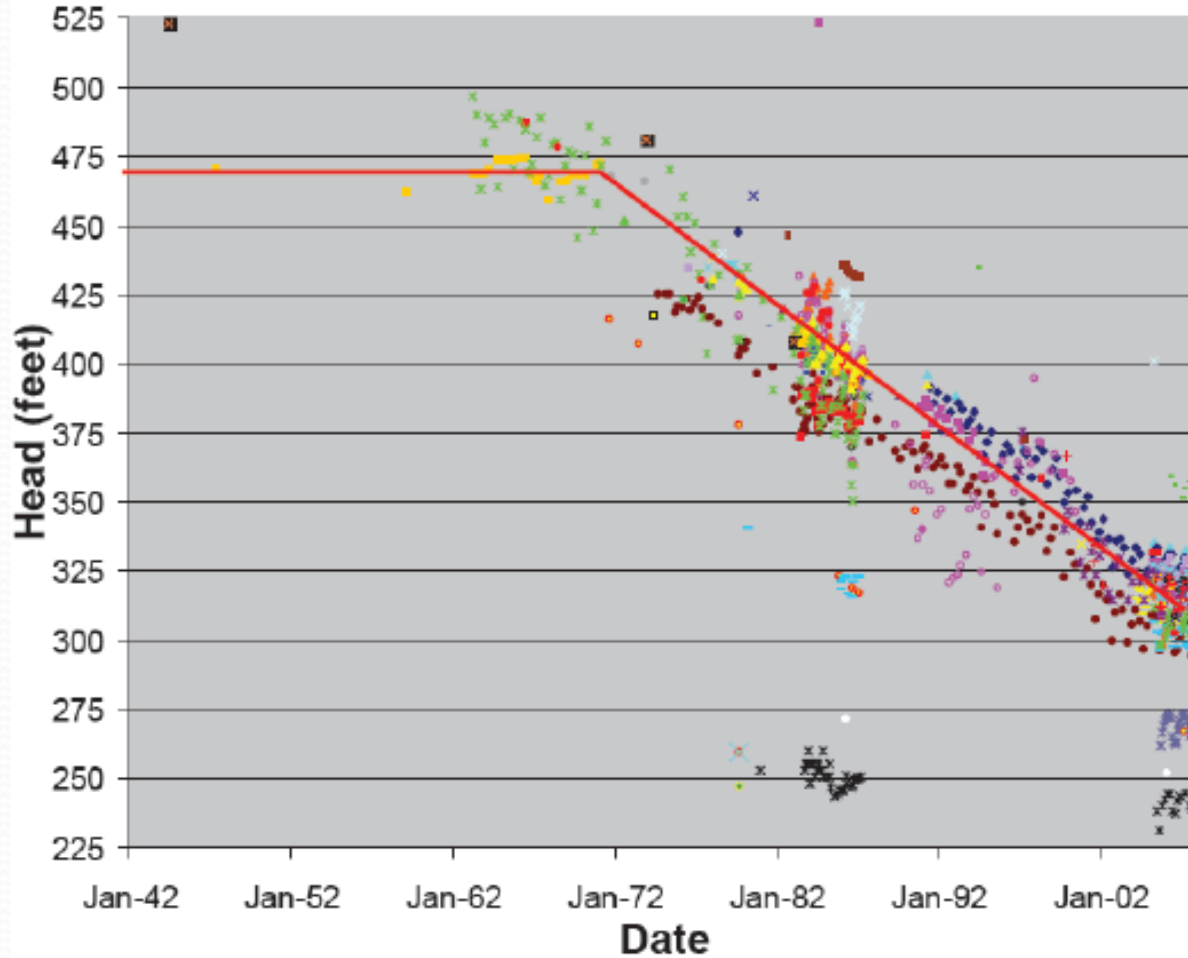
October 15, 2013



Groundwater Aquifer Declines

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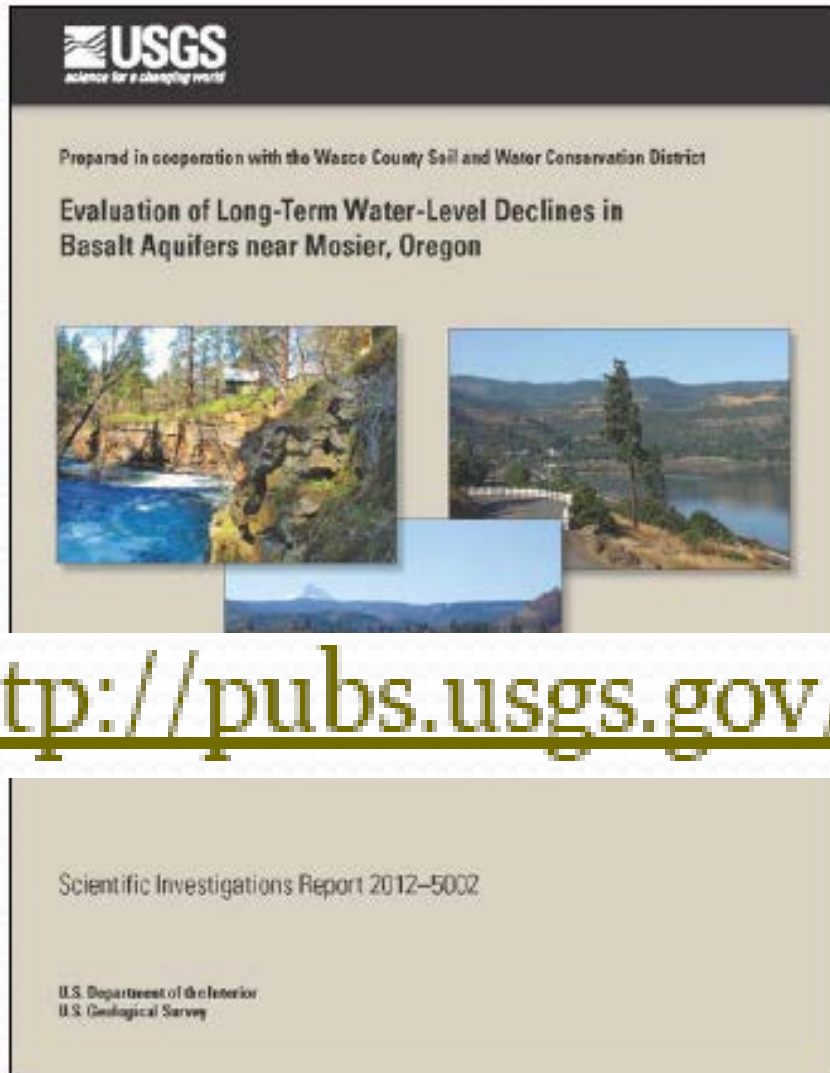
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USGS Scientific Investigations Report 2012-5002

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<http://pubs.usgs.gov/sir/2012/5002/>



BASALT LAYERS

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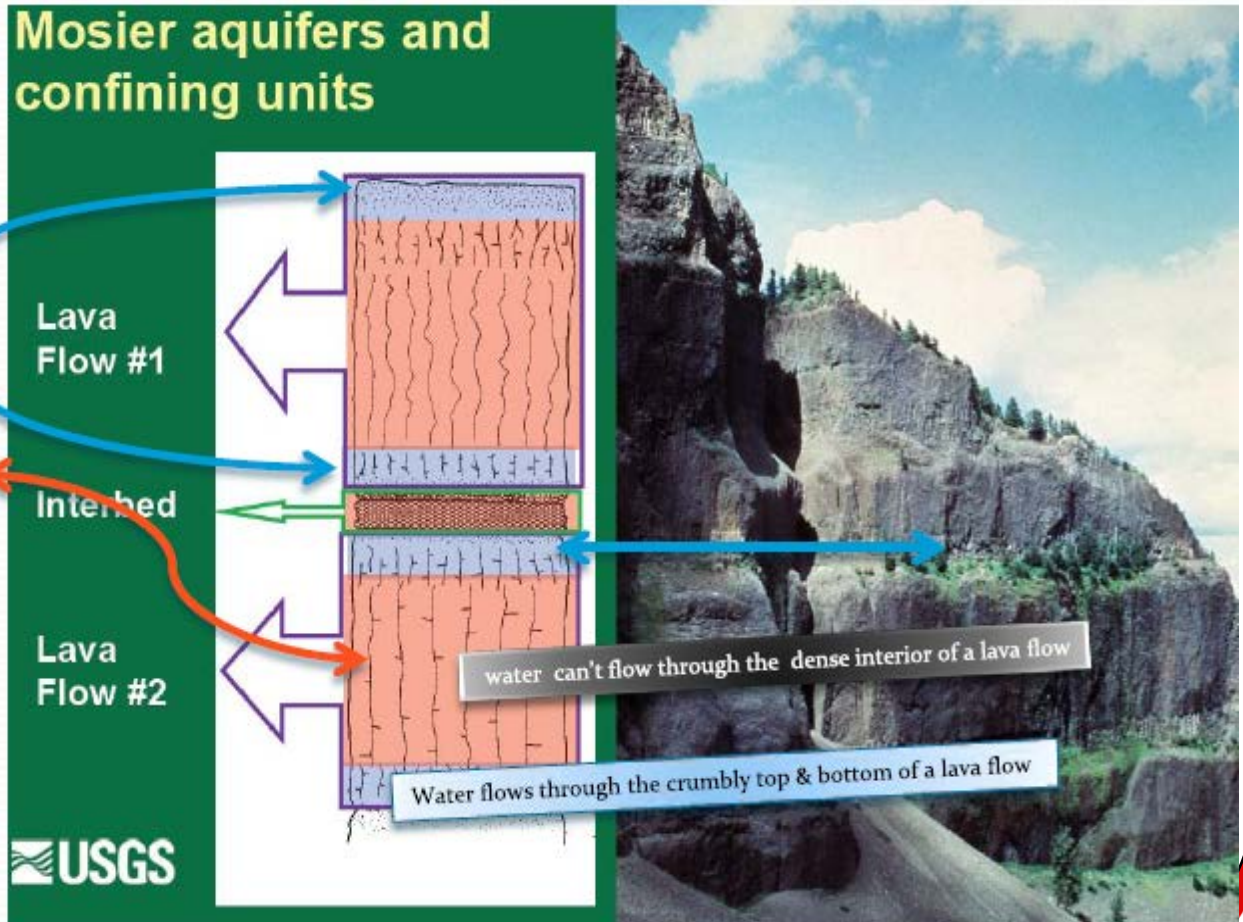
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Mosier's main aquifers are found in basalt = old lava flows...

Mosier aquifers and confining units

Each lava flow is more crumbly on the top and bottom. The top and bottom of the layers contain **aquifers**.

Each lava flow is more solid in the middle. The dense interior of each layer is a **confining unit**.

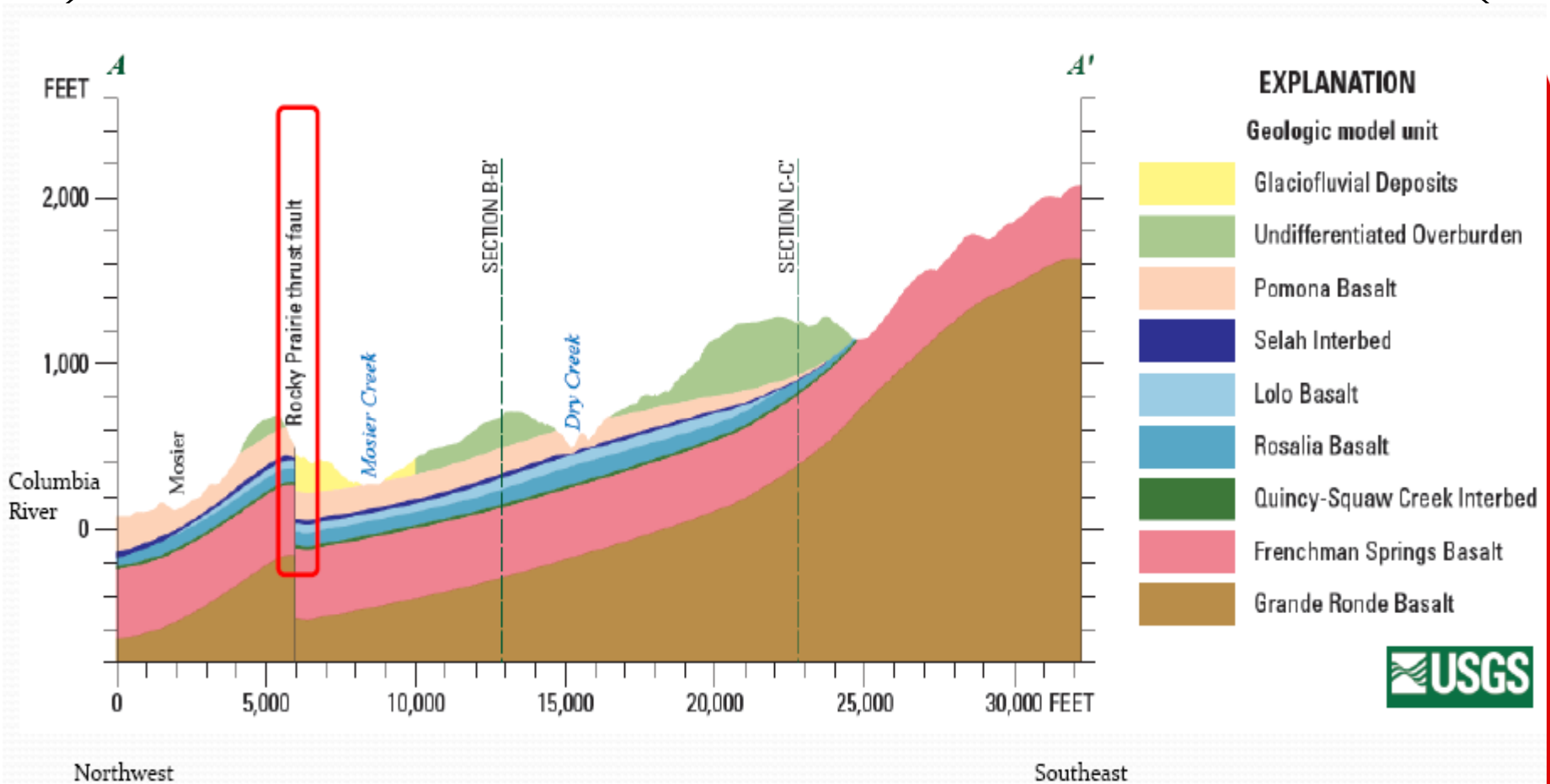




GEOLOGICAL CROSS SECTION

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Cause of Decline

Why are water levels dropping in Mosier-area wells?

The USGS conducted:

- extensive data collection , and
- computer modeling of Mosier's aquifers,

And determined that:

“leakage through **commingling wells** is a significant and likely **the dominant cause of water level declines.**”

According to estimates derived from the USGS groundwater-flow simulation model:

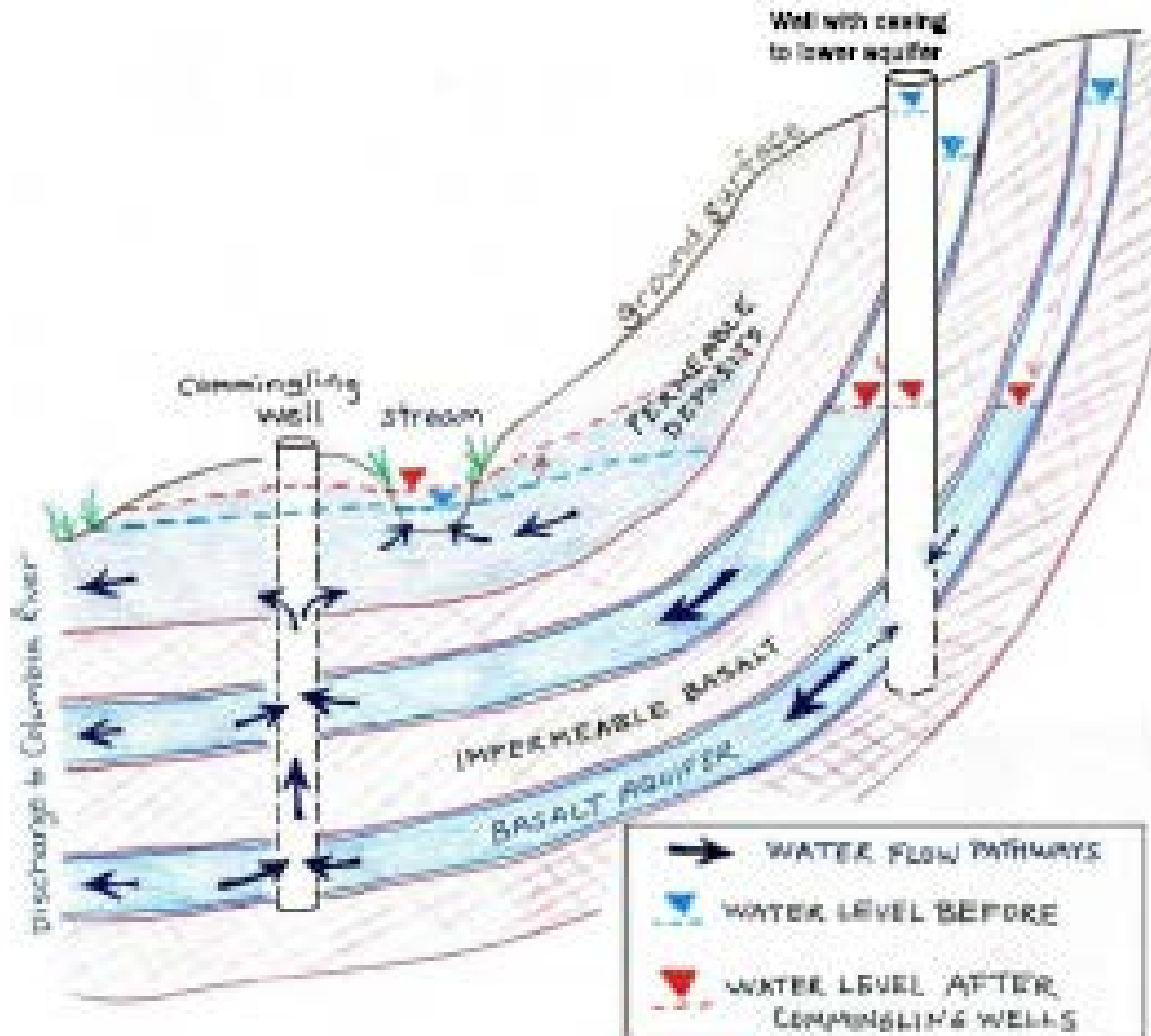
- **80 – 90% of the water level declines are due to commingling.**
- The remaining 10 – 20% of the declines can be attributed to pumping.
- Changes in precipitation have not contributed significantly to the declines.



Commingling Wells

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NEXT STEPS

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Use less water – high efficiency irrigation systems already in place

**Use aquifer storage and recovery methods / artificial recharge
Not much to gain unless commingling wells fixed**

**Systematically evaluate suspected commingling wells
in priority zones – **Beginning November 2013****

Begin repairing or decommissioning and replacing faulty wells



INITIAL PLAN

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WASCO COUNTY SWCD LONG RANGE OUTLOOK

ACTIONS TO BE ACCOMPLISHED	2016-2025	2026-2035	2036-2045
MOSIER WELL EVALUATIONS (84 WELLS ZONES 1, 2, &3)	[Gantt bar spanning 2016-2025]		
MOSIER GW RESTORATION - REPAIR ZONE 1 WELLS (EST 13)	[Gantt bar spanning 2016-2025]		
MOSIER GW RESTORATION - REPAIR ZONE 2 WELLS (EST 13)	[Gantt bar spanning 2026-2035]		
MOSIER GW RESTORATION - REPAIR ZONE 3 WELLS (EST 16)	[Gantt bar spanning 2036-2045]		

ASSUMES
NO OUTSIDE FUNDING
COST SHARE WITH WELL OWNERS

WORK ON ZONES 1, 2, AND 3 DONE BY 2040



THE UPDATED PLAN

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																		DATE		
	2013				2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
MOSIER WELLS ZONE 1 EVALUATIONS				—	—															
MOSIER WELLS ZONE 2 EVALUATIONS								—	—											
MOSIER WELLS ZONE 3 EVALUATIONS												—	—							
ZONE 1, 2, 3 WELL REPAIRS EST 42 TOTAL																				

START REPAIRS

**ASSUMES
 LOCAL AND SOME GRANT FUNDING
 ZONE 1-3 EVALUATIONS DONE BEFORE REPAIRS START
 REPAIRS BEGIN FALL 2016**



UPDATED PLAN (CONT)

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																				DATE
	2016				2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ZONE 1 REPAIRS 13				—	—	—	—	—	—	—	—	—	—	—	—	—				
ZONE 2 REPAIRS 4																		—	—	—
	2021				2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ZONE 2 REPAIRS 9	—	—		—	—	—	—	—	—	—	—	—								
ZONE 3 REPAIRS 6												—	—	—	—	—	—	—	—	—
	2026				2027				2028				2029				2030			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ZONE 3 REPAIRS 10	—	—		—	—	—	—	—	—	—	—	—	—	—	—					

Assumes

Repairs by zone: 13, 13, 16 (13 year repair effort starting 2016)
 Repairs cost \$100k per well, landowner 50% cost share
 and SWCD can continue to budget \$150k per year. No inflation.



EXPECTED RESULT

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