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# Stakeholder Forum Meeting #2

Utah Department of Environmental Quality

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March 31, 2004

# Jordan Valley Water Conservancy District

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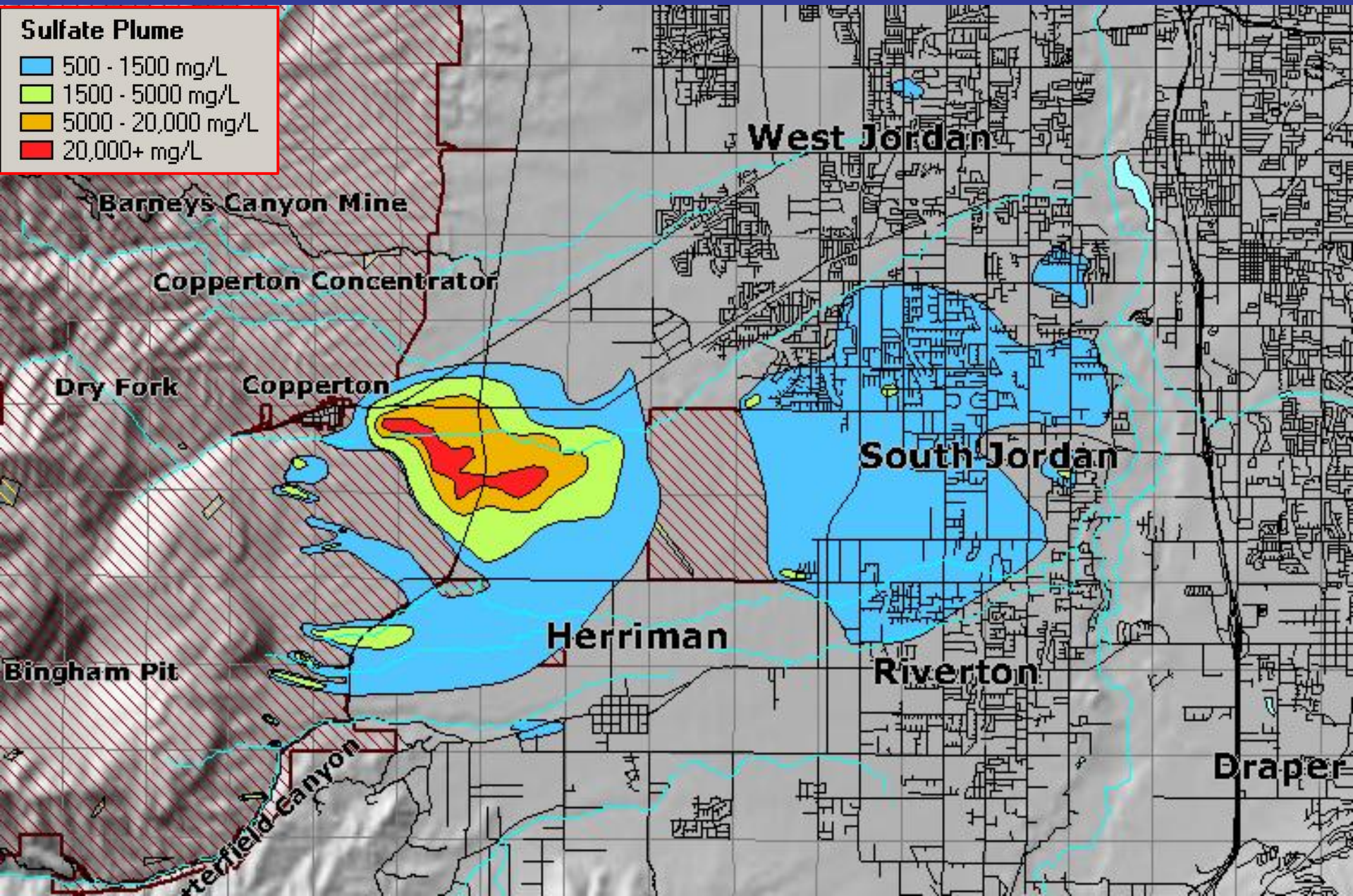
## Southwest Groundwater Remediation and Treatment Project

### Reverse Osmosis By-Product Disposal Alternatives

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March 31, 2004

# ZONE A AND ZONE B SULFATE PLUMES



# Reminders

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- Zone A – high sulfate, low pH
- Zone B – moderately high sulfate
- Lost Use – TDS reduction required

# Background

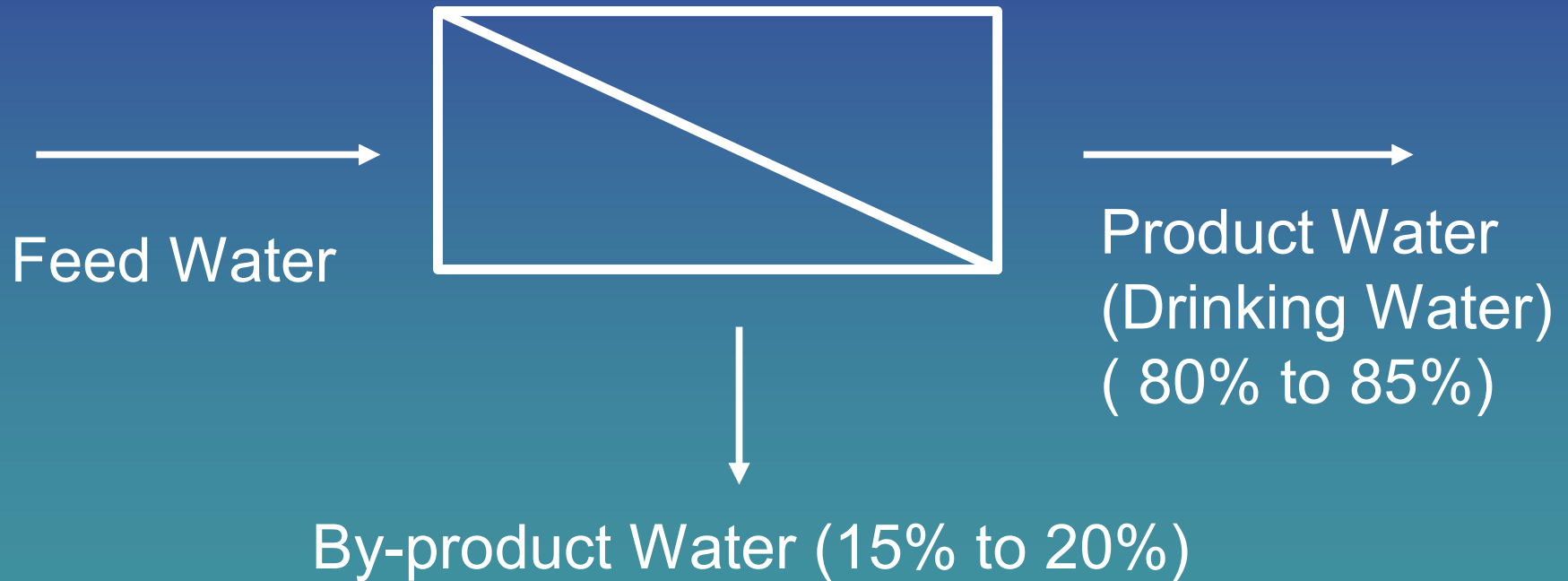
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## Consent Decree Requirements

- 1) Contain the contaminated groundwater zones
- 2) Remediate the aquifer
- 3) Place water to beneficial municipal use

# Zone B and Lost Use Reverse Osmosis (RO) By-Product

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# Zone B, Lost Use and Phase 2 RO By-product Water Characteristics

|                     | <b>Flow<br/>Rate<br/>(cfs)</b> | <b>Flow<br/>Rate<br/>(gpm)</b> | <b>TDS<br/>Concentration<br/>(mg/L)</b> | <b>Selenium<br/>Concentration<br/>(µg/L)</b> |
|---------------------|--------------------------------|--------------------------------|---|--|
| Zone B              | 1.24                           | 557                            | 8,300                                   | 25   |
| Lost Use            | 0.51                           | 229                            | 8,200                                   | 47   |
| Phase 2             | 1.95                           | 876                            | 8,200                                   | 47   |
| Totals              | 3.70                           | 1,662                          |   |  |
| Weighted<br>Average |                                |                                | 8,240                                   | 38-47  |



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CONDENSER





# Water Quality Comparisons

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|                                     | TDS<br>(mg/L)<br>(ppm) |
|-------------------------------------|------------------------|
| Zone B Feed                         | 1,600                  |
| Lost Use Feed                       | 1,200                  |
| Zone B By-product                   | 8,300                  |
| Lost Use By-product                 | 8,200                  |
| Phase 2 By-product                  | 8,200                  |
| Provo River                         | 250                    |
| Jordan River                        | 1,100                  |
| Great Salt Lake                     | 100,000                |
| Drinking Water Standard             | 500/1,000              |
| Agricultural Standard               | 1,200/2,000            |
| Aquatic Wildlife Standard           | N/A                    |
| JVWCD Drinking Water Treatment Goal | 250                    |

# Water Quality Comparisons

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|                                     | Selenium<br>( $\mu\text{g/L}$ )<br>(ppb) |
|-------------------------------------|--|
| Zone B Feed                         | 4  |
| Lost Use Feed                       | 6  |
| Zone B By-product                   | 25                                       |
| Lost Use By-product                 | 47                                       |
| Phase 2 By-product                  | 47                                       |
| Provo River                         | 1  |
| Jordan River                        | 2  |
| Great Salt Lake                     | 0.2                                      |
| Drinking Water Standard             | 50                                       |
| Agricultural Standard               | N/A                                      |
| Aquatic Wildlife Standard           | 4.6                                      |
| JVWCD Drinking Water Treatment Goal | 50                                       |



# RO By-product Disposal Efforts to Date by Jordan Valley

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- Costs and technical feasibility of disposal alternatives were evaluated
- Impacts to Jordan River and its water quality were evaluated
- A discharge permit to Jordan River was applied for and issued
- Evaluations involved Jordan Valley, two engineering firms, and the Utah Division of Water Quality (more than 1,000 man hours of effort over two years time)

# RO By-product Disposal Alternative #1 No Action by Jordan Valley

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- Jordan Valley withdraws the Joint Proposal
- Jordan Valley withdraws its \$23 million
- Jordan Valley withdraws use of its water rights
- Jordan Valley withdraws use of its water transmission system

# RO By-product Disposal Alternative #2 Discharge to Jordan River

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- Permit to discharge to Jordan River issued in August 2003
- Public concerns expressed regarding environmental impacts
- Jordan Valley's Board of Trustees considered the concerns expressed
- Jordan Valley's Board of Trustees withdrew Jordan River discharge permit

# RO By-product Disposal Alternative #3 Deep Well Injection

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- Deep well drilled near Zone B plant
- Well drilled at least 5,000 feet deep



# RO By-product Disposal

## Alternative #4

### Discharge to Great Salt Lake

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- Pump by-product from West Jordan to Great Salt Lake (GSL) in 23 mile pipeline
- Construct a new discharge pipeline (8" to 12") into Great Salt Lake
- Discharge into south arm of GSL east of Saltair

# RO By-product Disposal

## Alternative #5

### Discharge to KUCC GSL Discharge Pipeline

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- Pump by-product from West Jordan to GSL in a 26 mile pipeline
- Discharge by-product into existing KUCC GSL discharge pipeline

# RO By-product Disposal Alternative #6

## Discharge to KUCC Tailings Impoundment

- Pump by-product from West Jordan to Magna in a 20 mile pipeline
- Pump by-product up 400 feet into KUCC Tailings Impoundment
- Nutrient (phosphorus) levels in Lost Use by-product will enhance algal blooms in Tailings Impoundment

# RO By-product Disposal Alternative #7 Evaporation

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- 2,450 acre feet per year divided by 3 feet of evaporation per year equals 820 acres of evaporation pond surface area
- Addition of 20% for dikes and maintenance roads equals 980 acres



# RO By-product Disposal Alternative #8 Distillation

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- Heat by-product to boiling – capture steam
- Dispose of solid salts
  - Municipal landfill
  - KUCC tailings impoundment
  - re-use of salts

# RO By-product Disposal Alternative #9

## Discharge to KUCC Tailings Pipeline

- Pump by-product west along 7800 South to KUCC tailings pipeline
- Discharge by-product into tailings pipeline
- 540 psi (1250 feet) pump lift required