

Great Salt Lake Commission

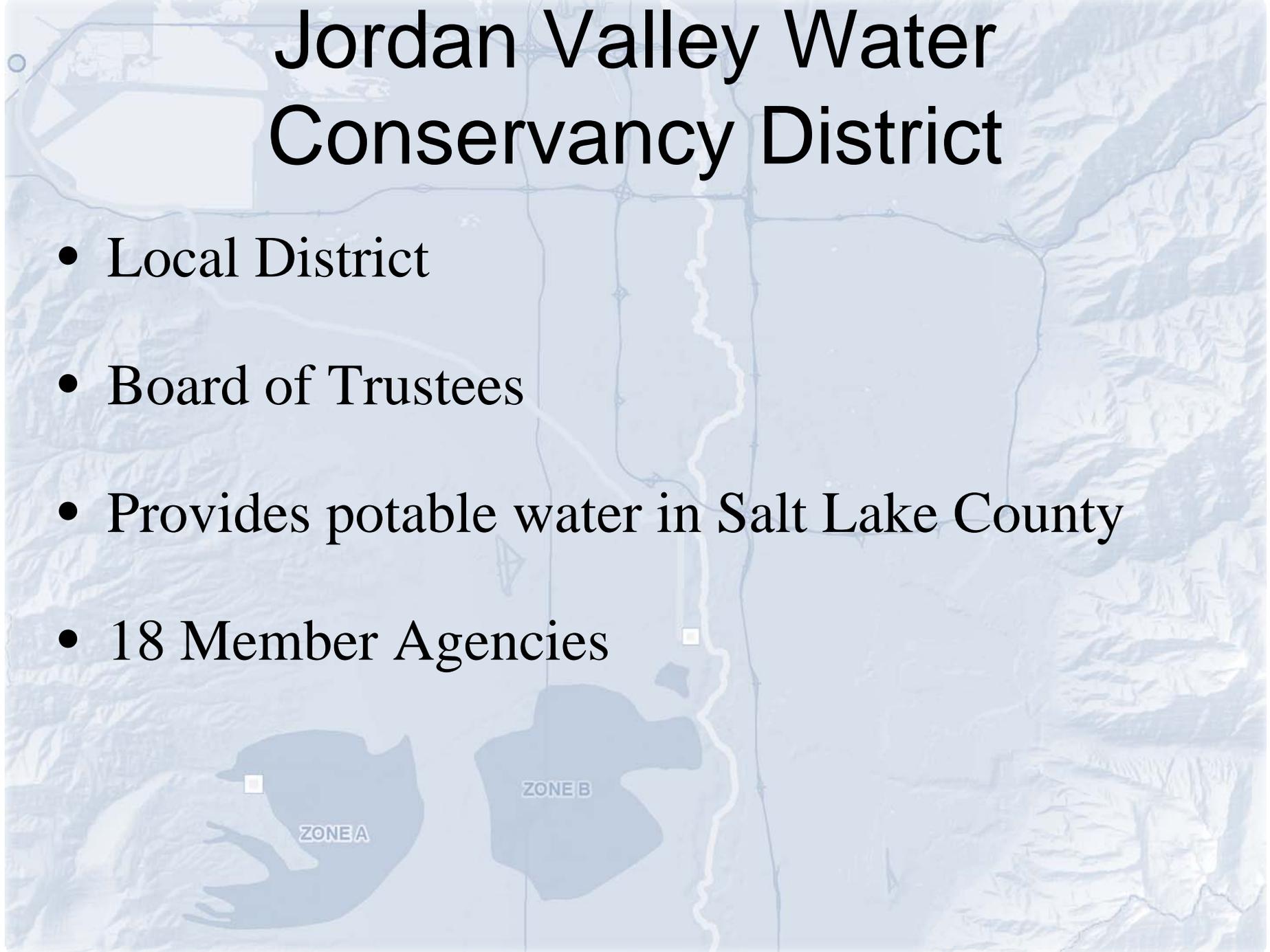


March 2011

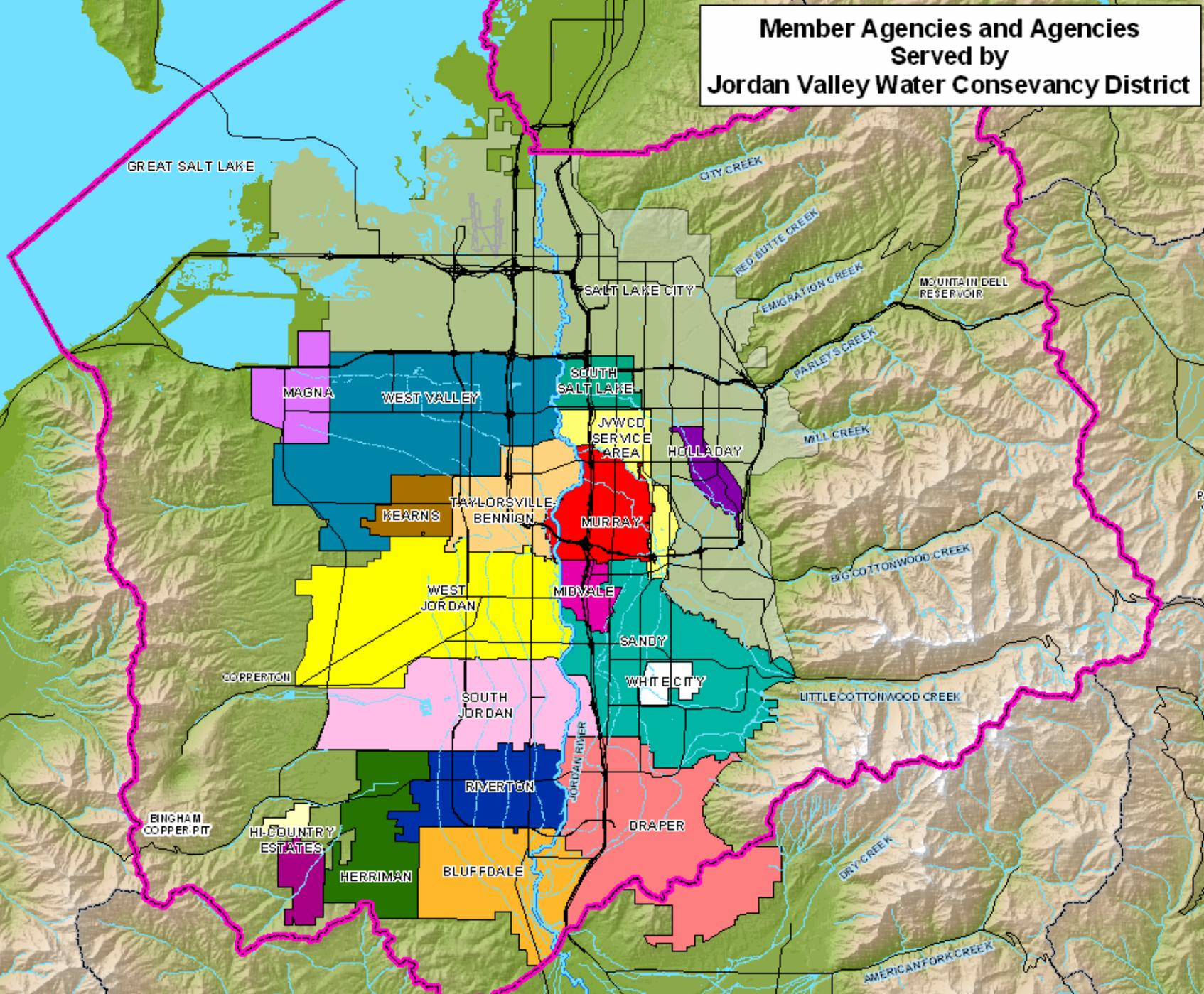


Jordan Valley Water Conservancy District

- Local District
- Board of Trustees
- Provides potable water in Salt Lake County
- 18 Member Agencies



Member Agencies and Agencies Served by Jordan Valley Water Conservancy District



GREAT SALT LAKE

SALT LAKE CITY

CITY CREEK

RED BUTTE CREEK

EMIGRATION CREEK

PARLEY'S CREEK

MOUNTAIN DELL RESERVOIR

MAGNA

WEST VALLEY

SOUTH SALT LAKE

JVWCD SERVICE AREA

HOLLADAY

MILL CREEK

KEARNS

TAYLORSVILLE

BENNION

MURRAY

BIG COTTONWOOD CREEK

WEST JORDAN

MIDVALE

SANDY

COPPERTON

SOUTH JORDAN

WHITE CITY

LITTLE COTTONWOOD CREEK

BINGHAM COPPER PIT

HI-COUNTRY ESTATES

RIVERTON

DRAPER

LITTLE COTTONWOOD CREEK

HERRIMAN

BLUFFDALE

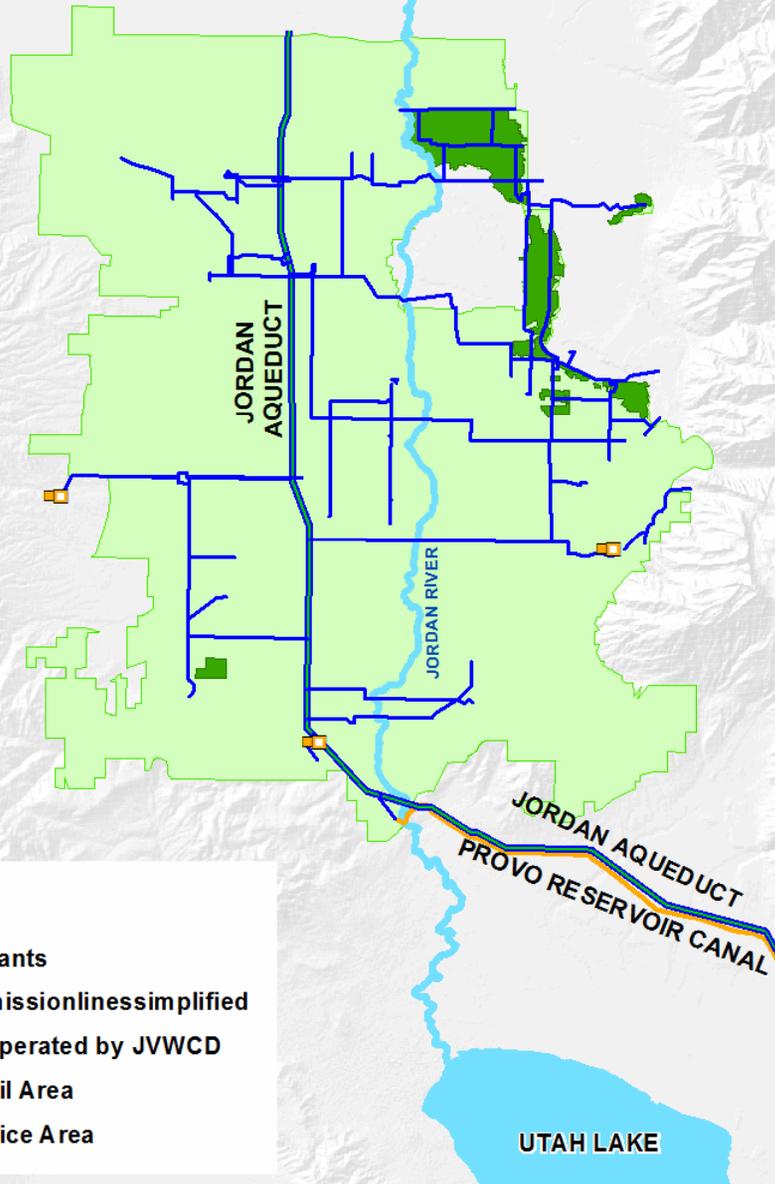
DRY CREEK

AMERICAN FORK CREEK



GREAT SALT LAKE

JVWCD Transmission System



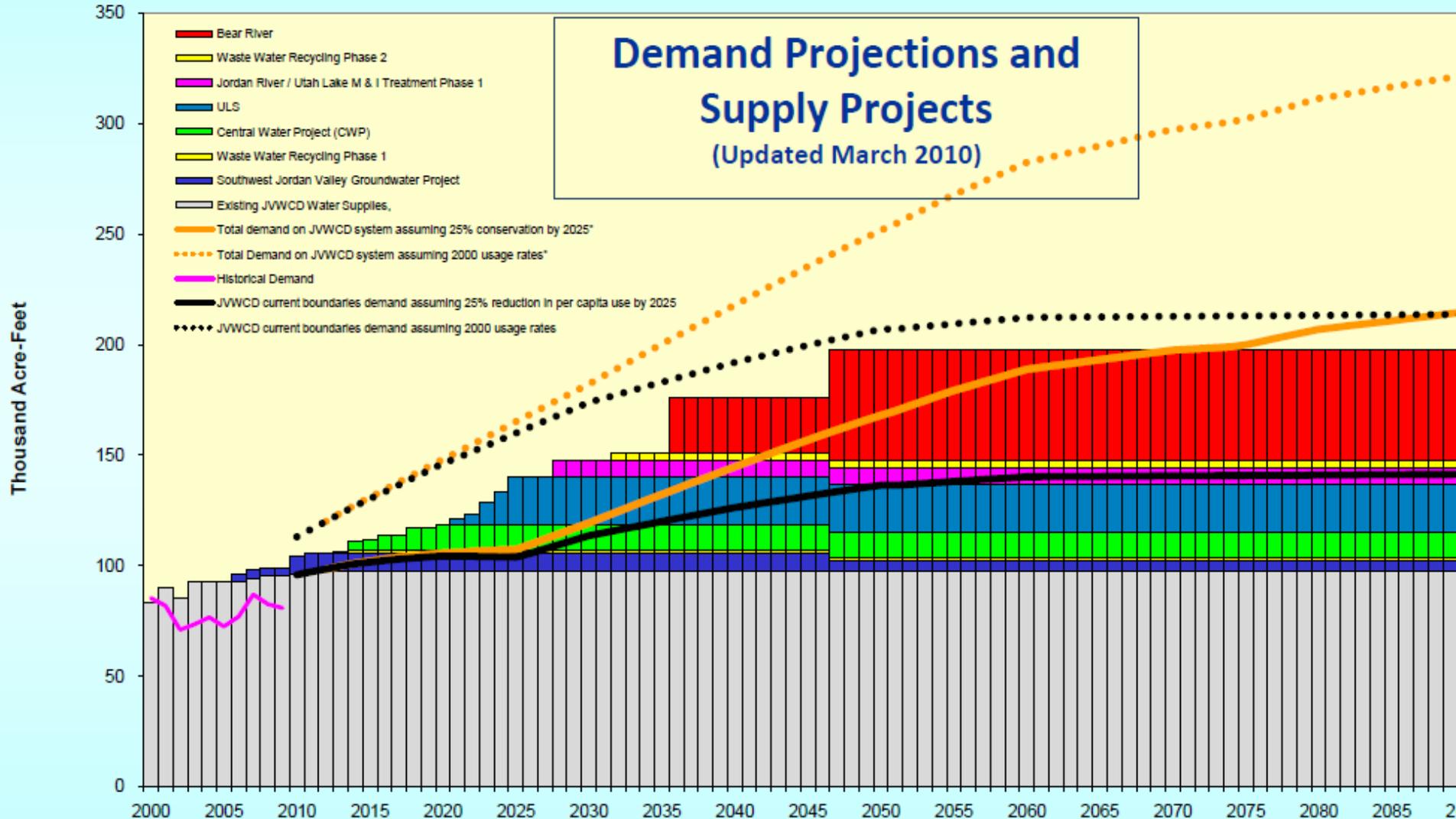
Legend

-  Treatment Plants
-  Water Transmission Lines (simplified)
-  Aqueducts operated by JVWCD
-  JVWCD Retail Area
-  JVWCD Service Area

UTAH LAKE

**Jordan Valley Water Conservancy District
Drought Year Water Supply Plan
(With 25% Conservation by 2025)**

**Demand Projections and
Supply Projects
(Updated March 2010)**



* Demand projections based on GOPB 2008 Baseline Report population projections

Year

GREAT SALT LAKE



INTRA-VALLEY TRANSMISSION SYSTEM

JORDAN AQUEDUCT

JORDANELLE RESERVOIR

SERWTP

JVWTP

DEER CREEK RESERVOIR

CWP PIPELINE

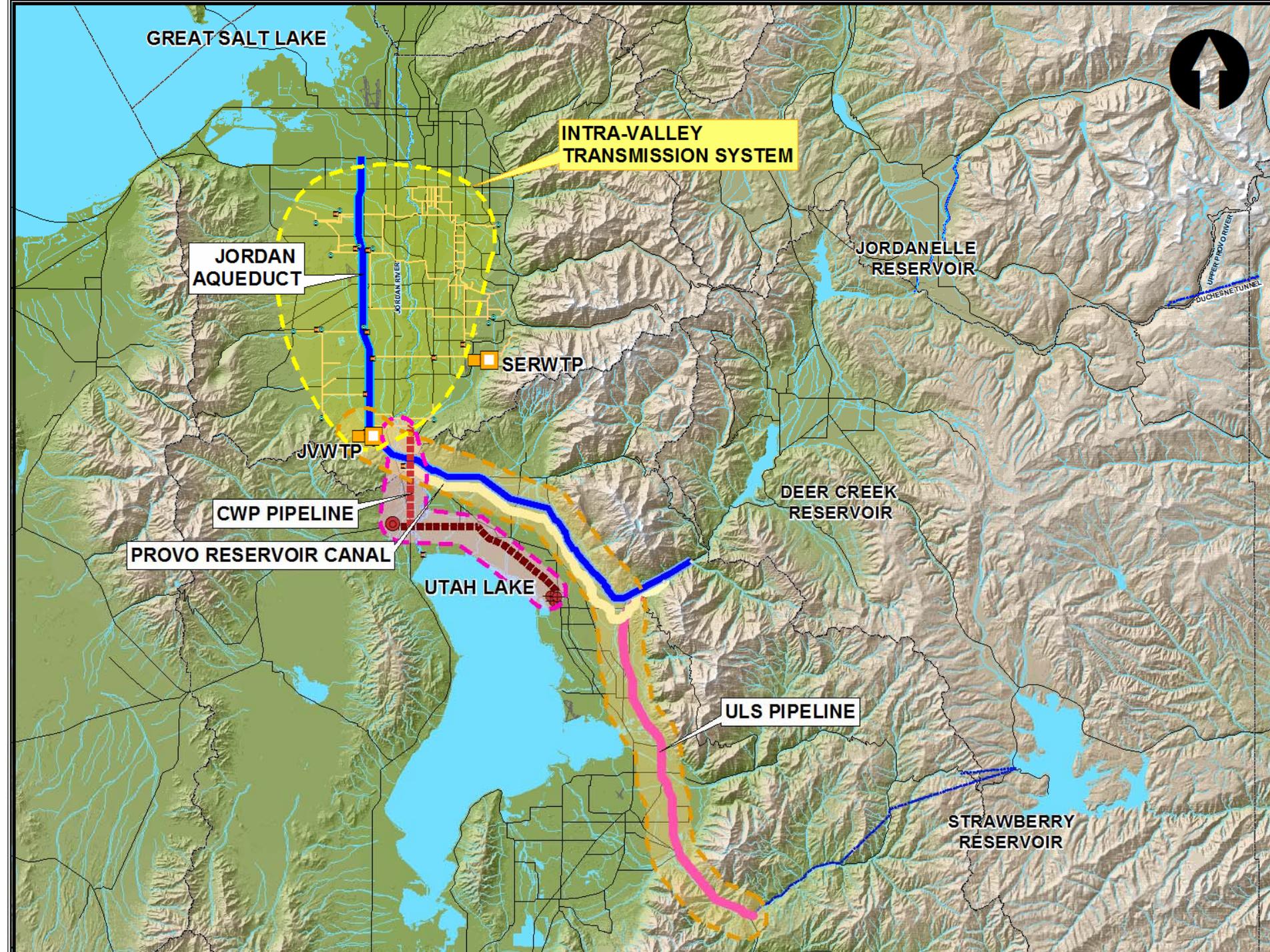
PROVO RESERVOIR CANAL

UTAH LAKE

ULS PIPELINE

STRAWBERRY RESERVOIR

UPPER PROVO RIVER
DUCHESNE TUNNEL





Sulfate Plumes Exist – Groundwater is Unusable

Human Health Impact – Laxative Effect



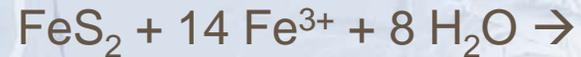
Acid Rock Drainage (ARD)

- Number one environmental concern facing the mining industry



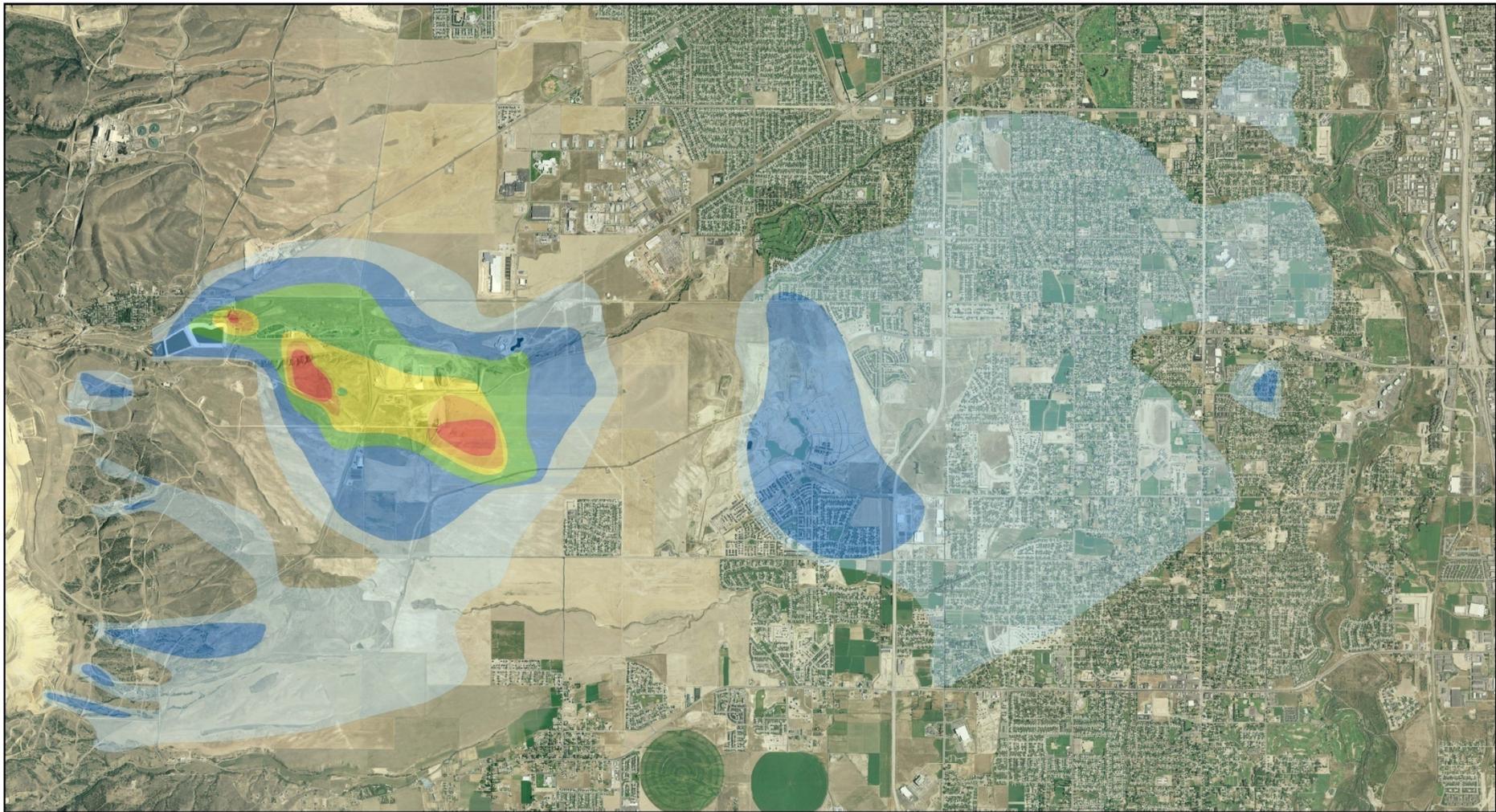
Carol Bates/NASA

biologically mediated
 te









2007 SO4 CONCENTRATIONS

- 20,000+ SO4 mg/L
- 15,000 - 19,999 SO4 mg/L
- 10,000 - 14,999 SO4 mg/L
- 5,000 - 9,999 SO4 mg/L
- 1,500 - 4,999 SO4 mg/L
- 500 - 1,499 SO4 mg/L

0 3,500 7,000
Feet

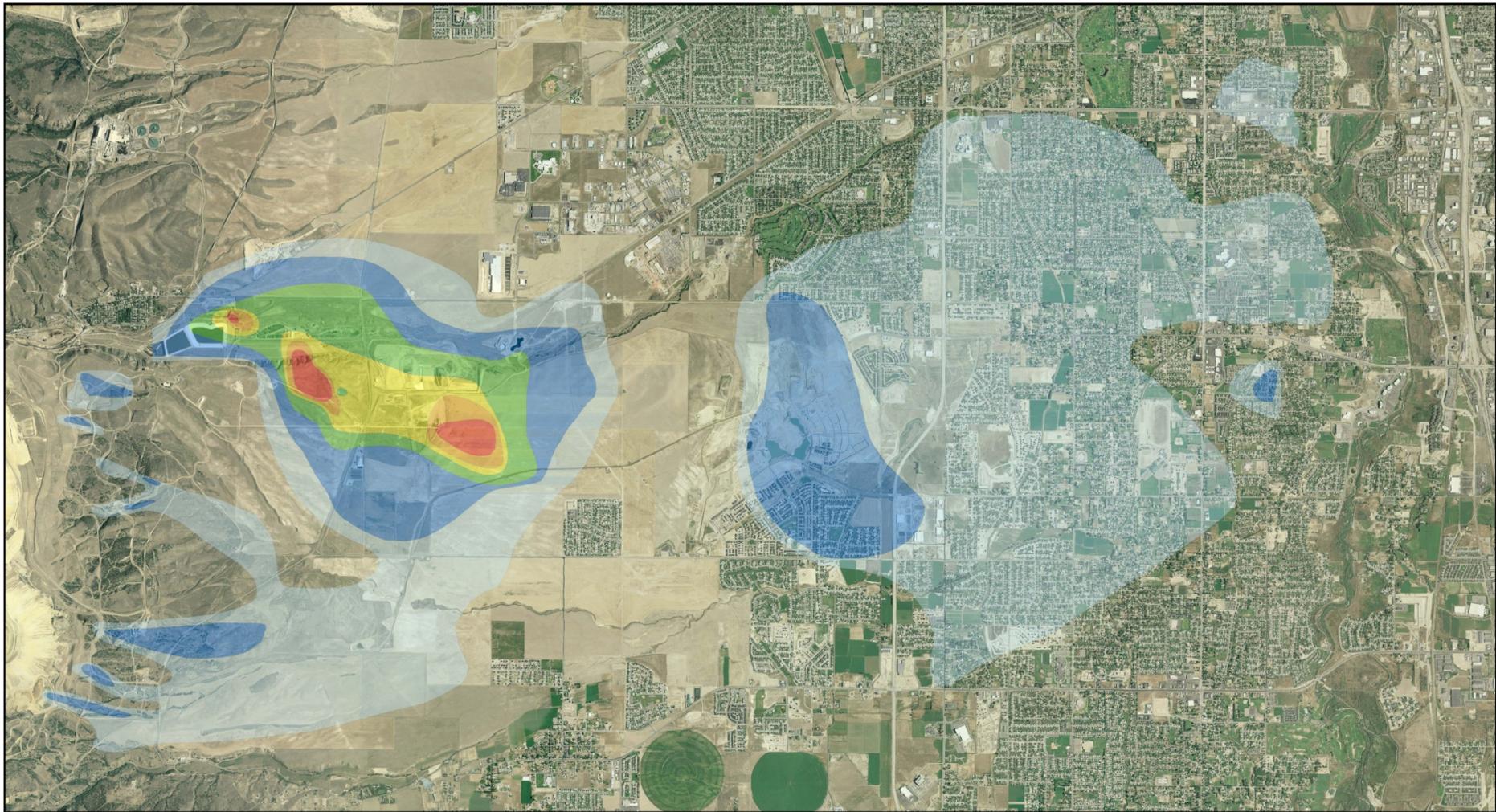








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2007 SO4 CONCENTRATIONS

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Sulfate Plumes Exist – Groundwater is Unusable

Human Health Impact – Laxative Effect

Project Accomplishes

- Sulfate contained and relocated
- Drinking water produced
- Aquifer remediated



Project Facilities

Legend



Pump Stations



Reservoirs



Shallow Aquifer Wells



Deep Aquifer Wells (Zone B)

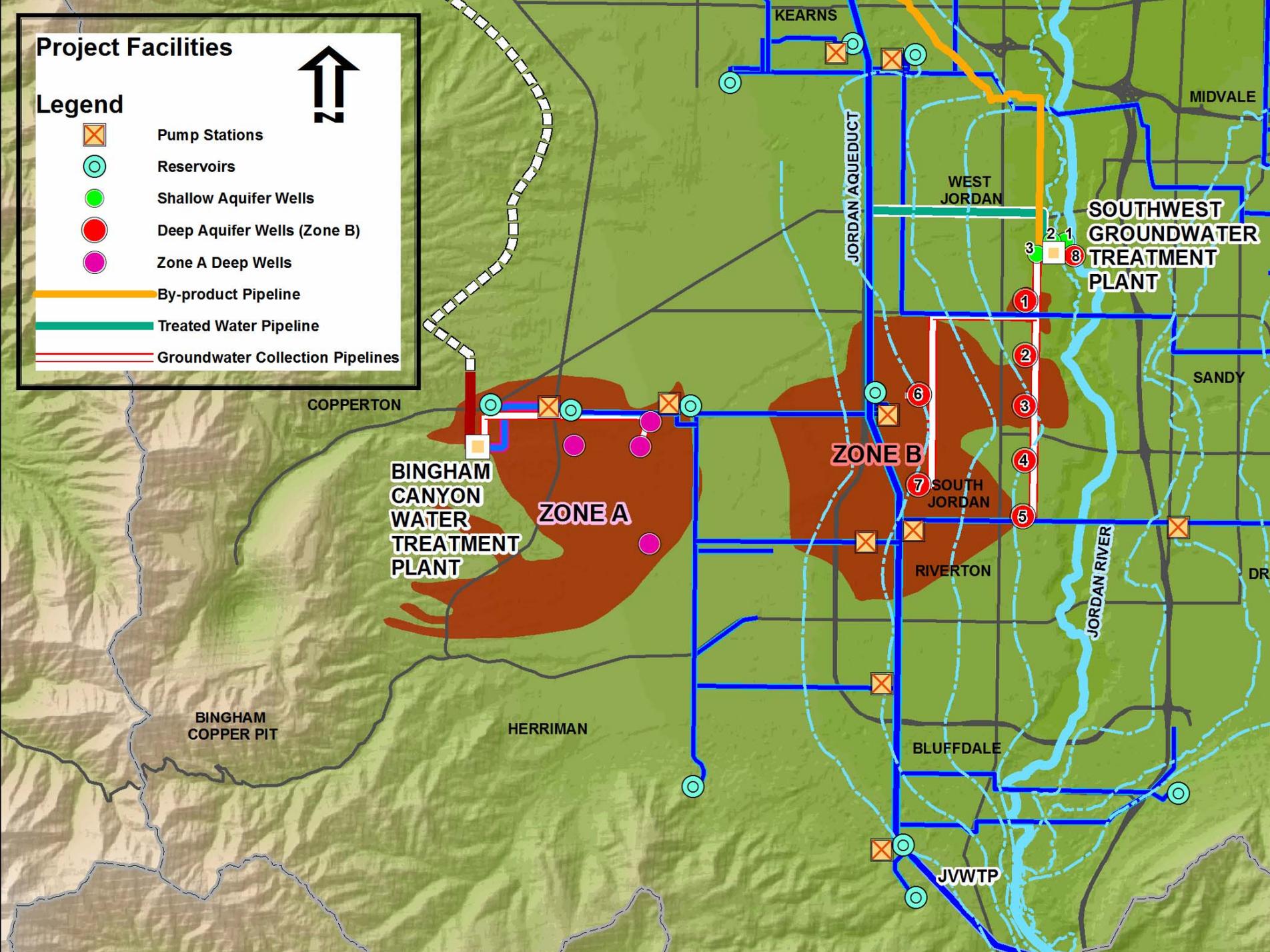


Zone A Deep Wells

By-product Pipeline

Treated Water Pipeline

Groundwater Collection Pipelines



COPPERTON

BINGHAM CANYON WATER TREATMENT PLANT

ZONE A

ZONE B

SOUTH JORDAN

RIVERTON

BLUFFDALE

JVVWTP

JORDAN AQUEDUCT

JORDAN RIVER

WEST JORDAN

MIDVALE

SANDY

DR

SOUTHWEST GROUNDWATER TREATMENT PLANT

BINGHAM COPPER PIT

HERRIMAN

KEARNS

2-1

3

1

2

3

4

5

6

7

8

1

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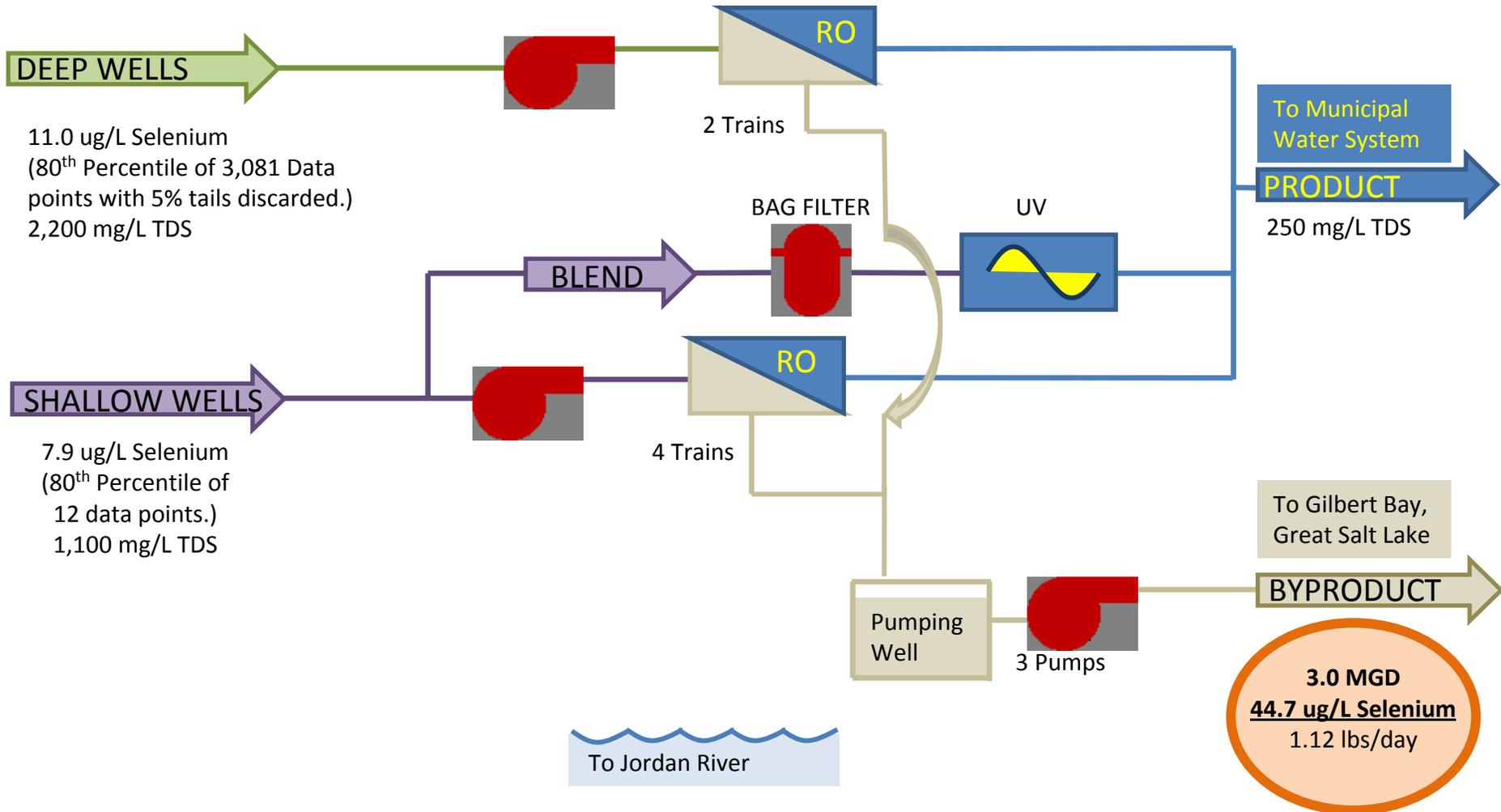
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PROCESS FLOW DIAGRAM

Normal Operation



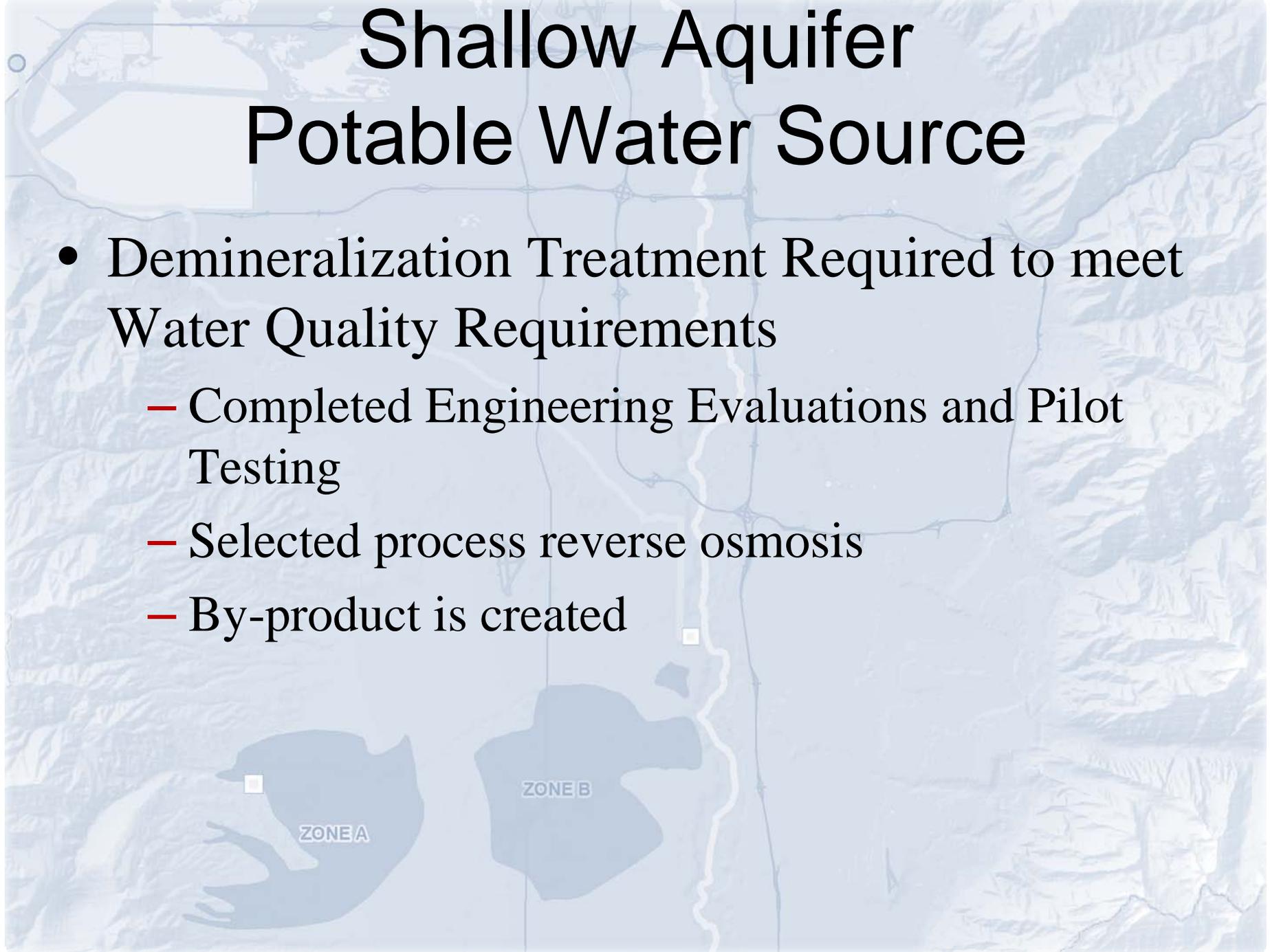
Shallow Aquifer Potable Water Source

- Total Dissolved Solids (TDS) is an issue
 - TDS means: dissolved salts and minerals
- Shallow Aquifer TDS: 1,100 mg/L
- Drinking Water Standard: 500 mg/L
- JWCD goal: 250 mg/L
 - Matches other supplies



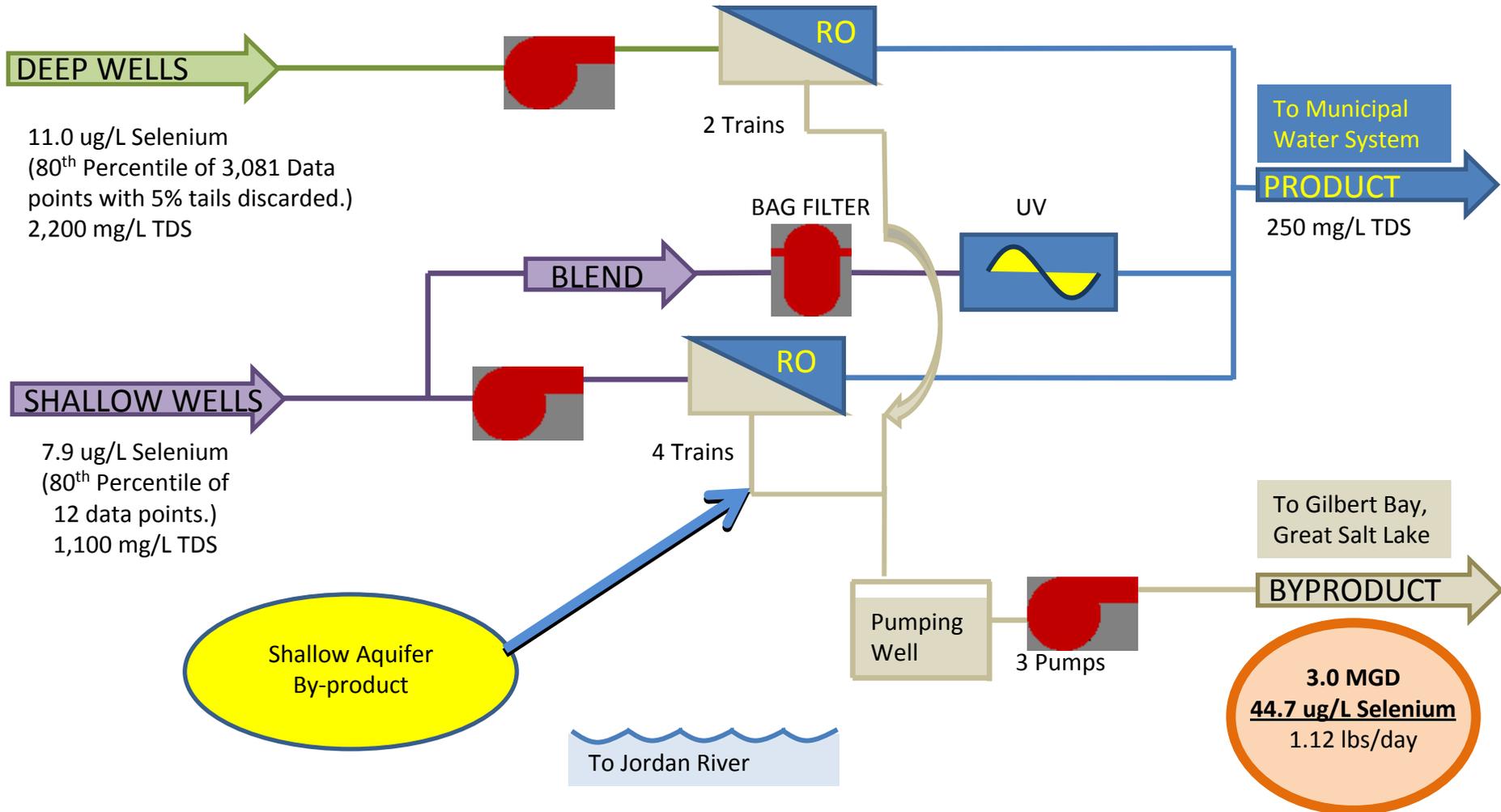
Shallow Aquifer Potable Water Source

- Demineralization Treatment Required to meet Water Quality Requirements
 - Completed Engineering Evaluations and Pilot Testing
 - Selected process reverse osmosis
 - By-product is created



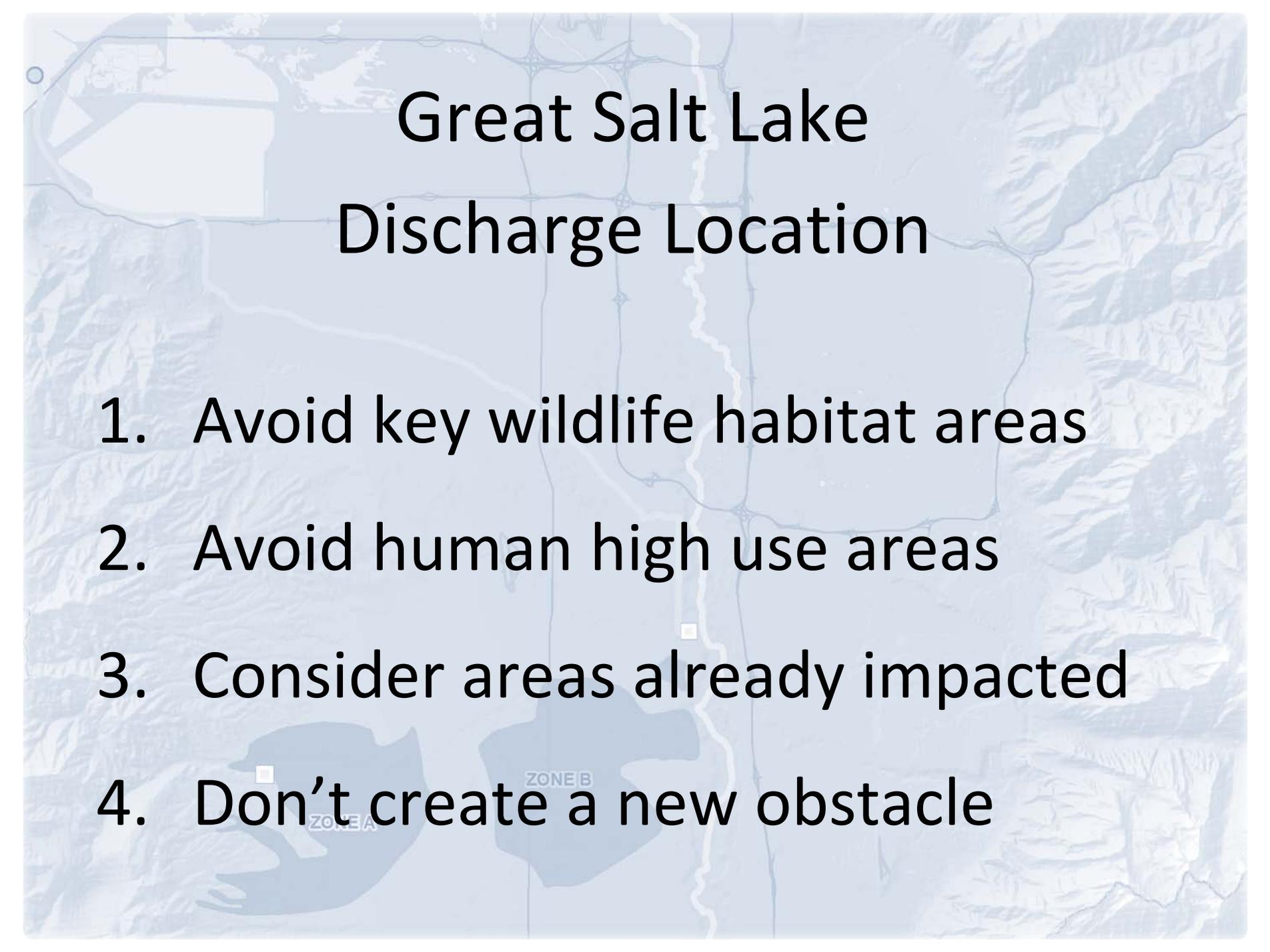
PROCESS FLOW DIAGRAM

Normal Operation



Alternative Disposal Alternatives

- N.1 Alternative Treatment Technologies
- N.2 Secondary Water Use
- N.3 Discharge to Great Salt Lake
- N.4 Discharge to KUC GSL Outfall Pipeline
- N.5 Zone B to KUC Tailings Impoundment
- N.6 Distillation
- N.7 Distillation - disposal of salts
- N.8 Zone B to Tailings Pipeline
- N.9 Zone B to Tailings Impoundment, Lost Use to GSL
- N.10 Zone B to Tailings Impoundment, Lost Use to KUC GSL Discharge
- N.11 Zone B to Tailings Impoundment, Lost Use Distillation
- N.12 Zone B to Tailings Impoundment, Lost Use to GSL
- N.13 Zone B to Tailings Pipeline, Lost Use to KUC GSL Outfall
- N.14 Zone B to Tailings Pipeline, Lost Use Distillation
- N.15 Water Cost Methodologies
- N.16 Discharge of Zone B By-product to KUC Facilities Perpetually
- N.18 Selenium Removal Treatment
- N.19 Deep Aquifer Hydrogeology

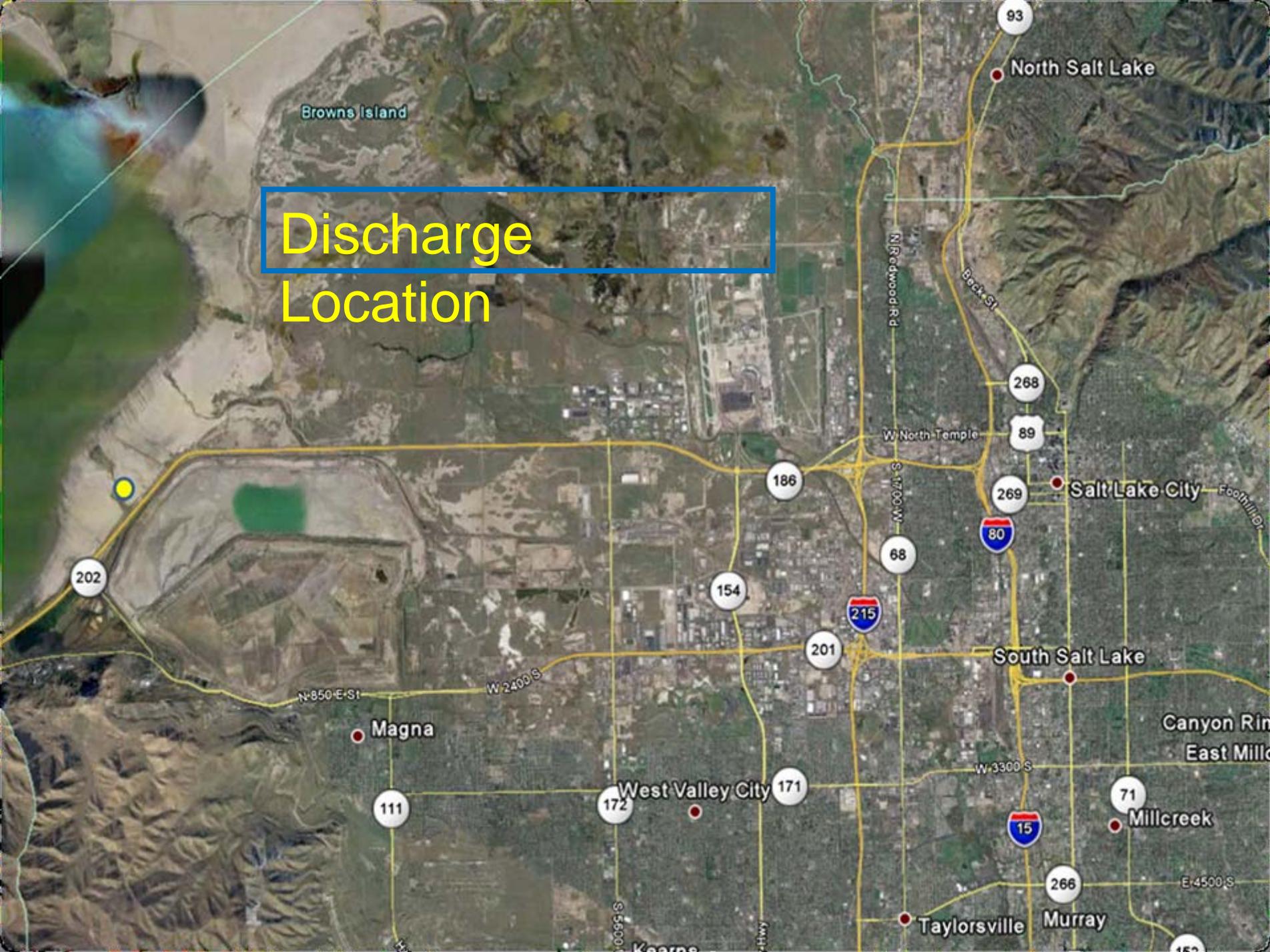
A topographic map of the Great Salt Lake basin, showing the lake's outline and surrounding terrain. A white line indicates a proposed discharge route from the lake towards the south. Two areas are shaded in light blue and labeled 'ZONE A' and 'ZONE B'. A small white square marks the discharge location on the route.

Great Salt Lake Discharge Location

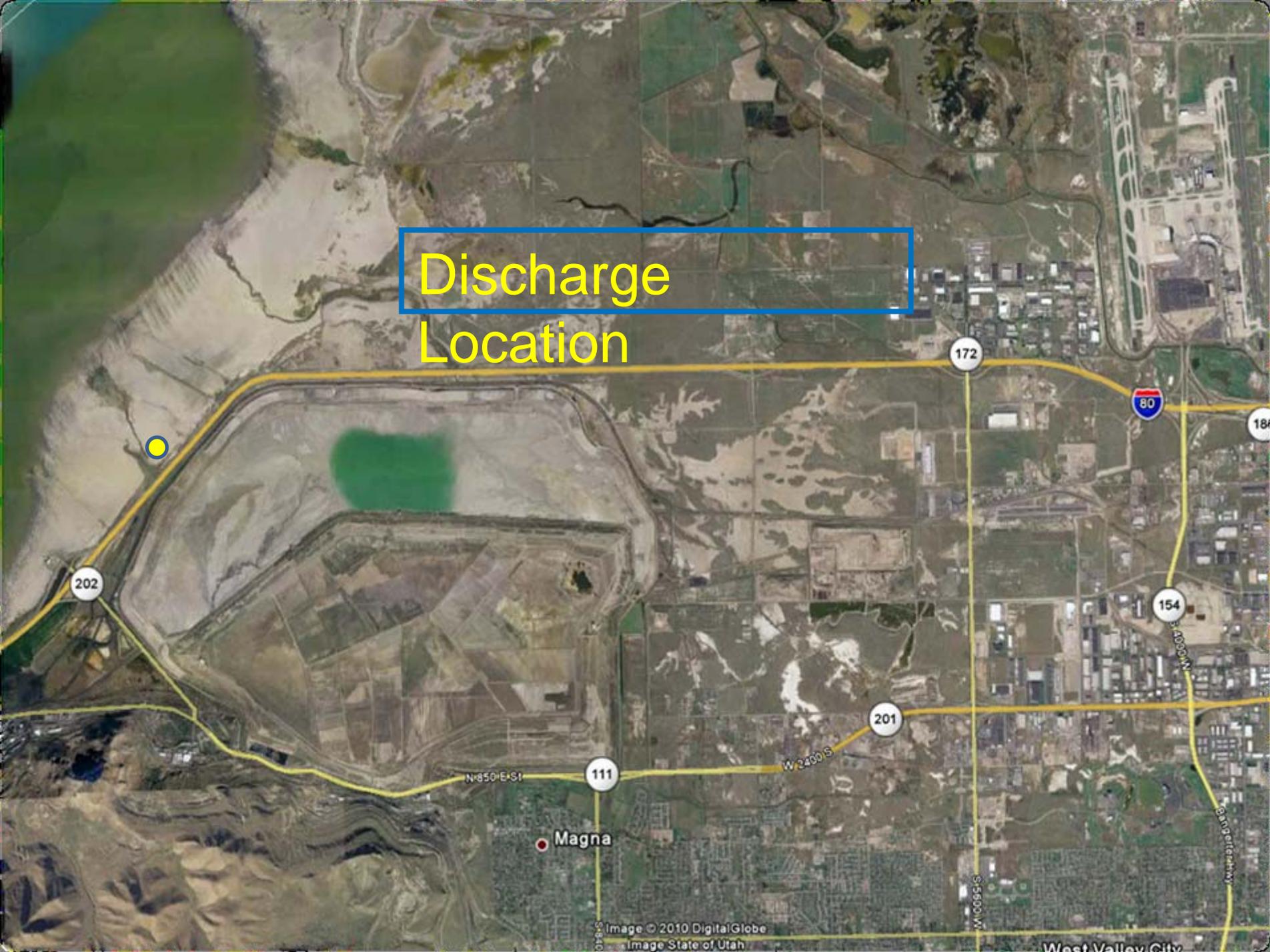
1. Avoid key wildlife habitat areas
2. Avoid human high use areas
3. Consider areas already impacted
4. Don't create a new obstacle



Discharge
Location



Discharge Location



Discharge Location



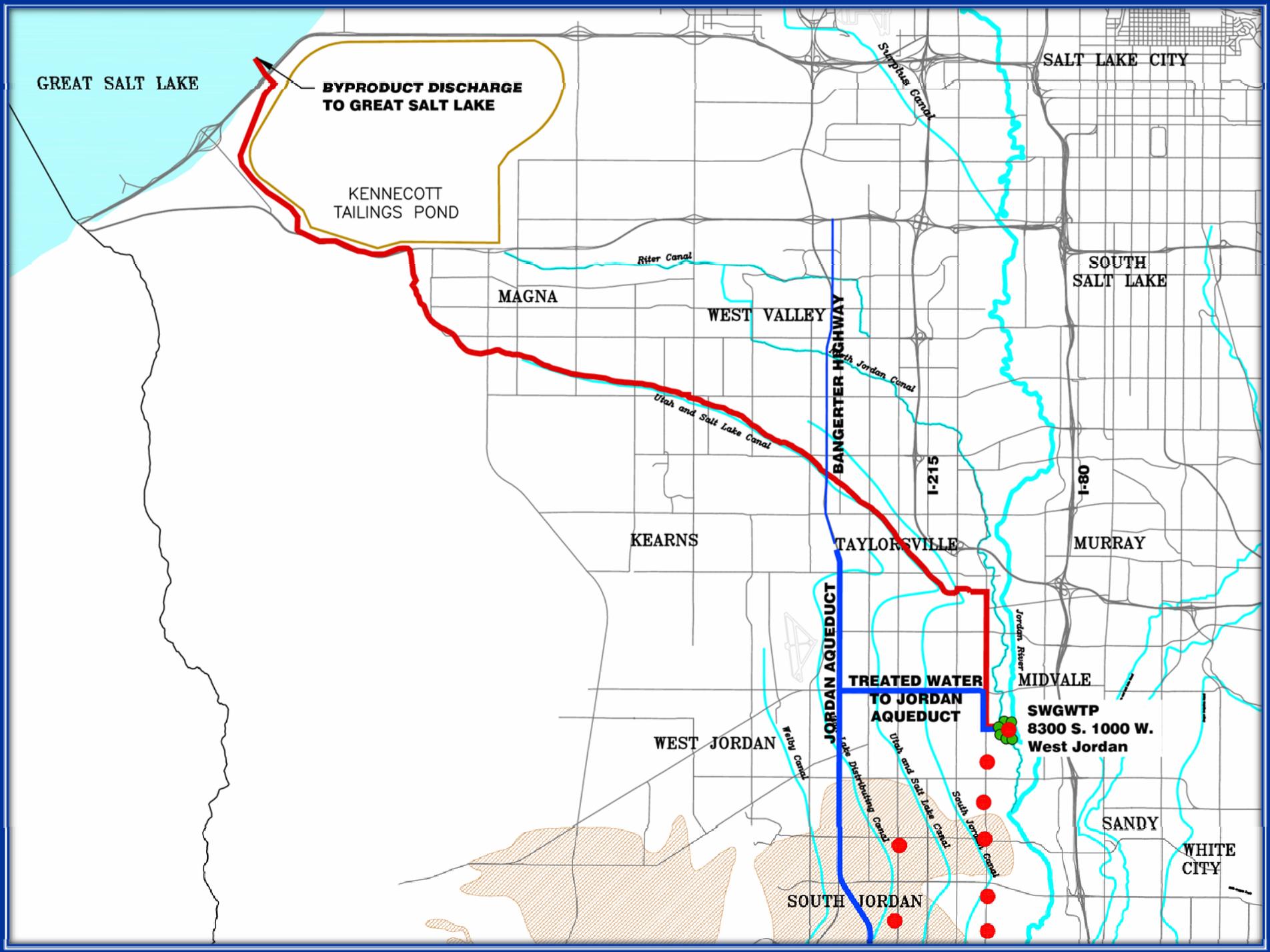
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111

Magna

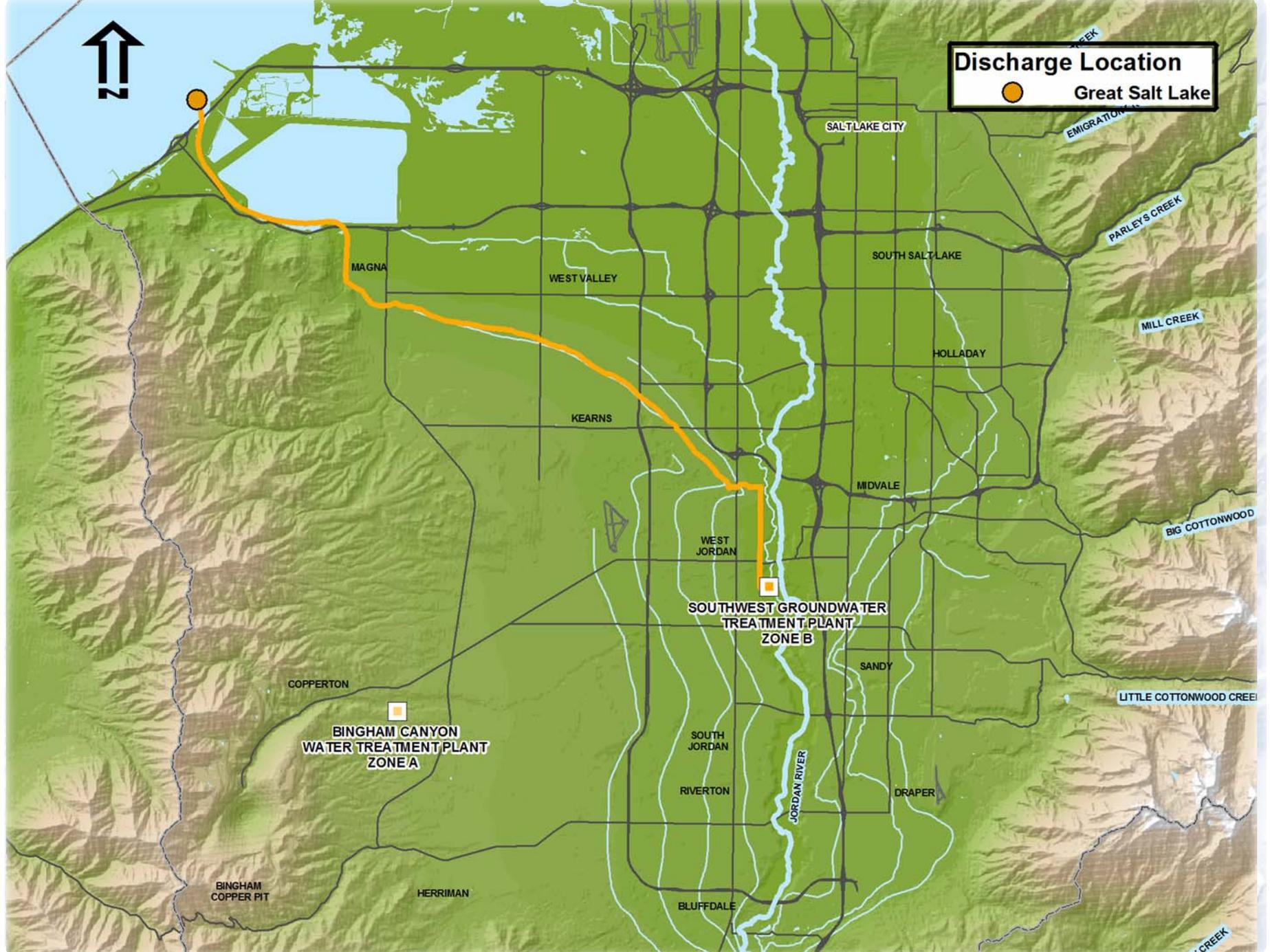


Discharge
Location



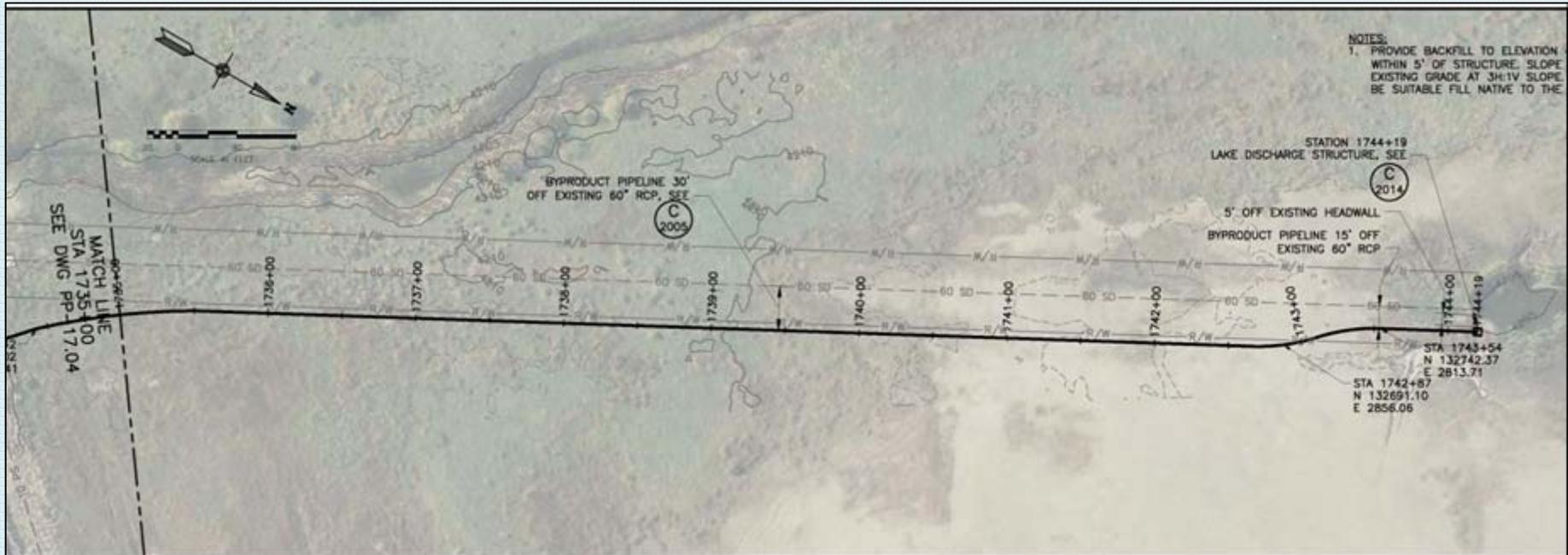


Discharge Location
● Great Salt Lake



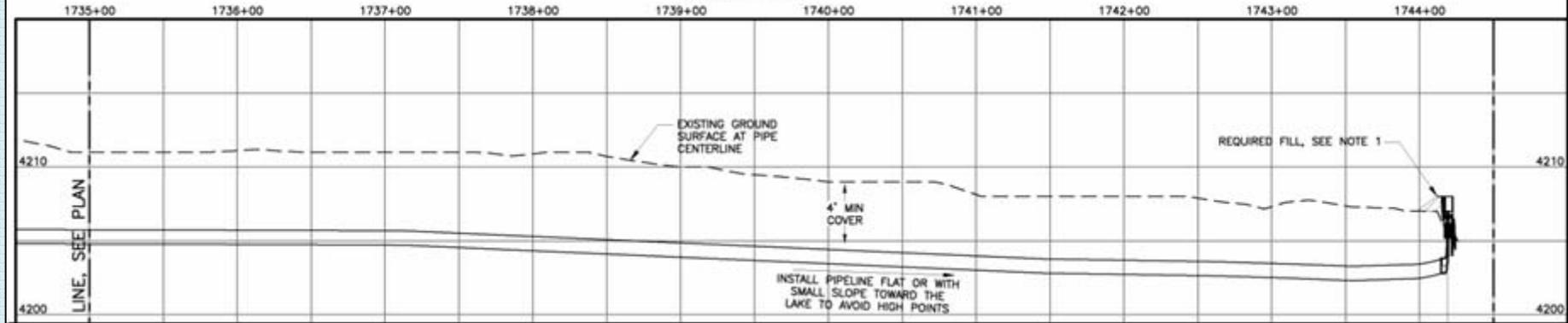
An aerial photograph showing a wide river valley. The river is in the center, flowing from the top towards the bottom. The valley floor is a mix of light brown and tan, with some green patches. To the right, there are several parallel roads or tracks. A yellow dot is placed on the riverbank, indicating a specific location. A blue box with yellow text is in the bottom left corner.

Discharge
Location



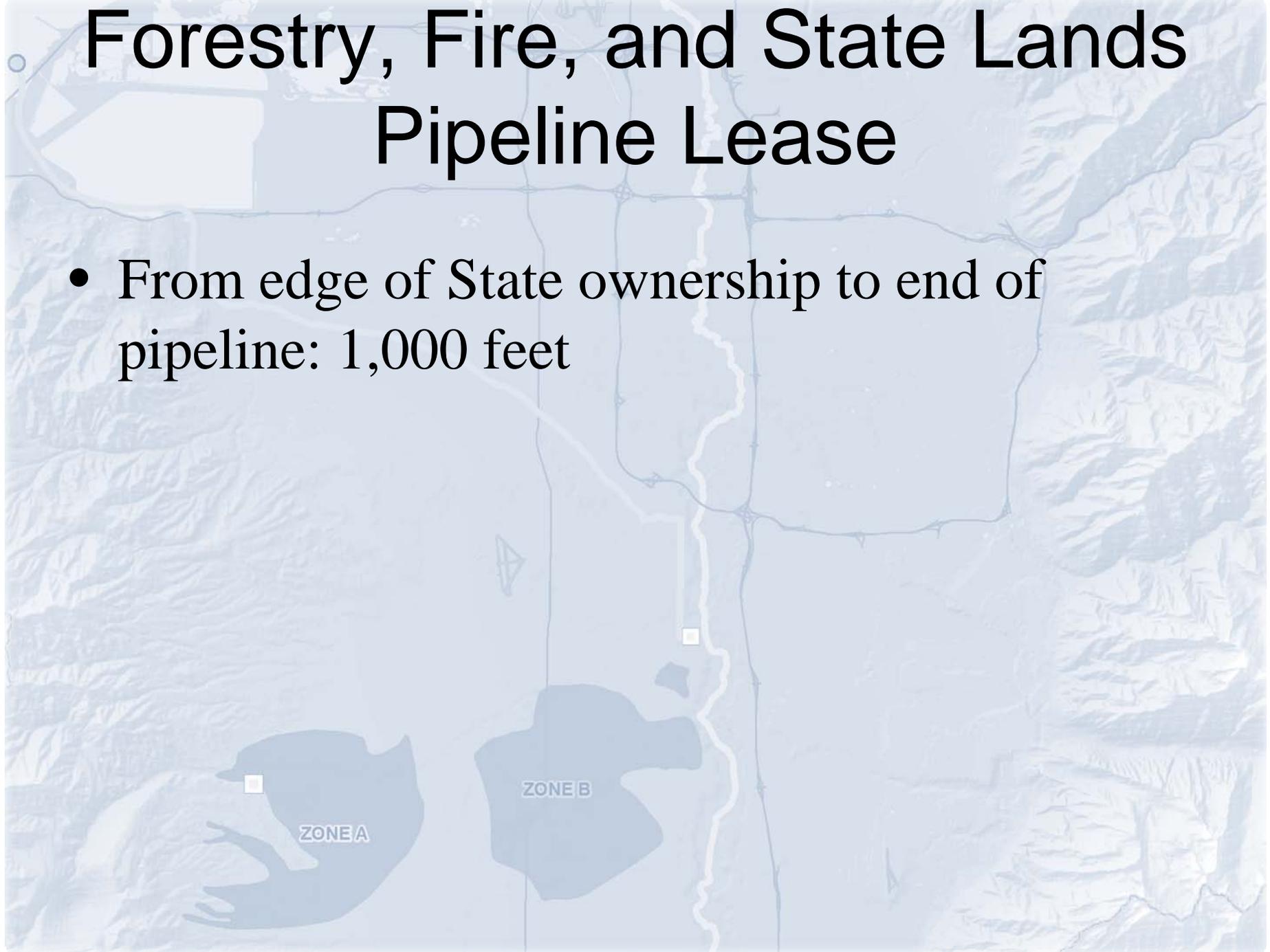
- NOTES:
1. PROVIDE BACKFILL TO ELEVATION WITHIN 5' OF STRUCTURE. SLOPE EXISTING GRADE AT 3H:1V SLOPE. BE SUITABLE FILL NATIVE TO THE

PLAN
SCALE: 1" = 40'-0"



Forestry, Fire, and State Lands Pipeline Lease

- From edge of State ownership to end of pipeline: 1,000 feet



Why Construct Pipe into the Lake?

- Kennecott's discharge created habitat
 - Habitat supported by groundwater discharge
- Concern for exposure to wildlife
 - End of pipe to edge of water

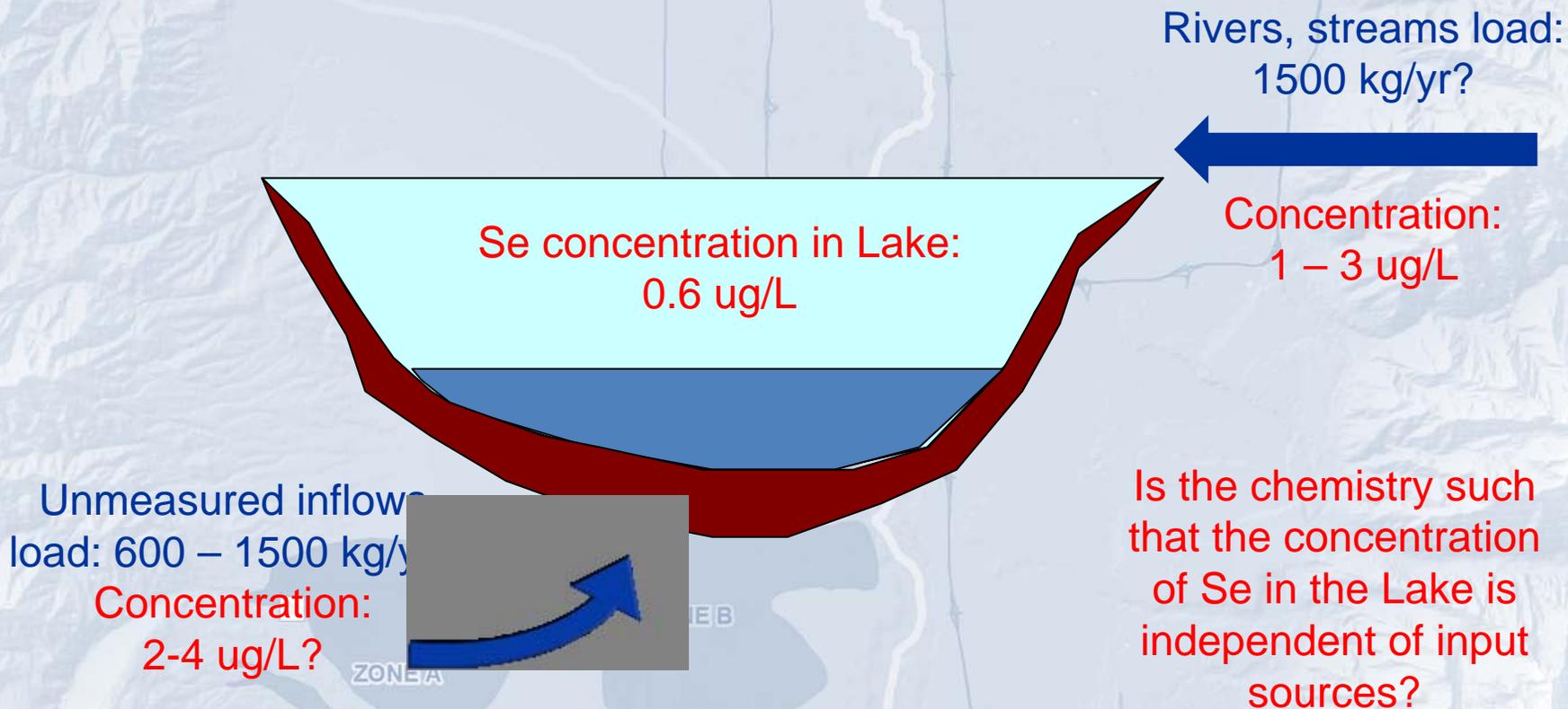


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Discharge
Location

Project 3

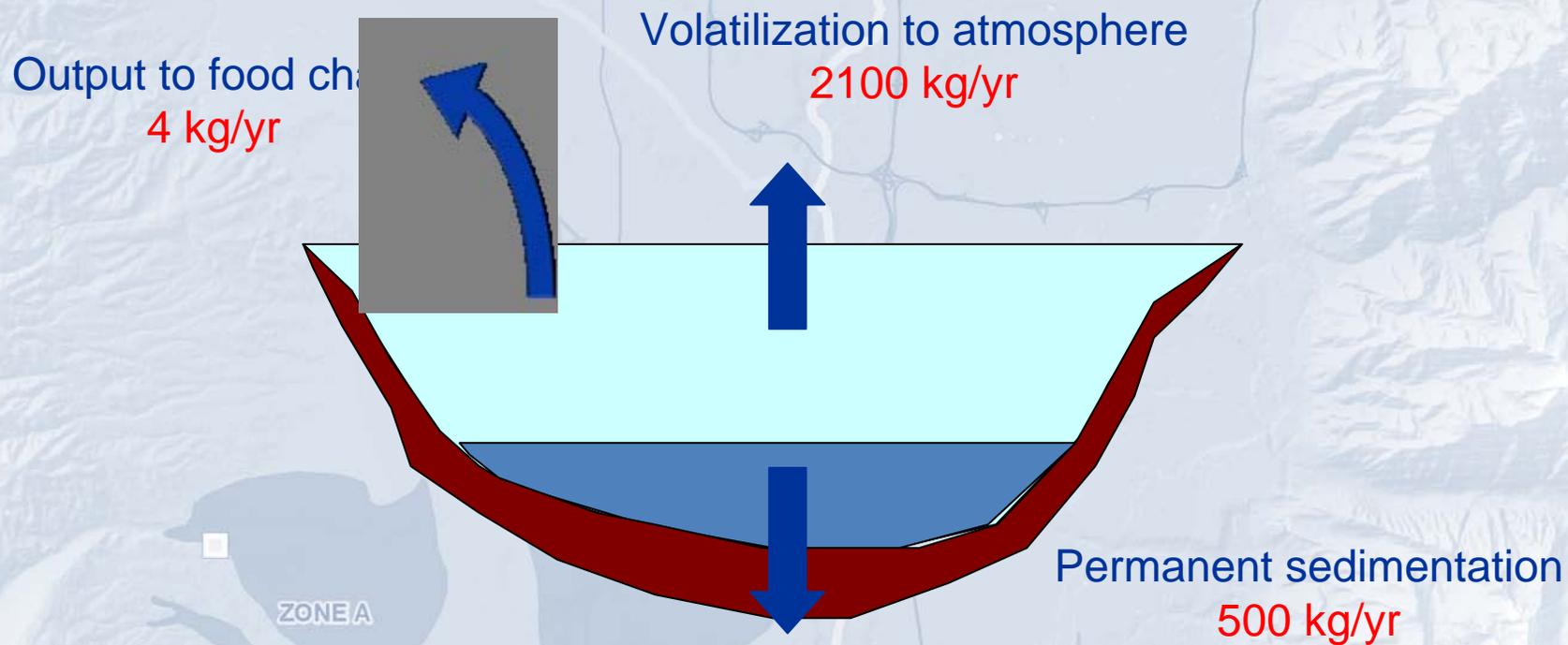
Selenium Loads to Great Salt Lake



Thanks to DEQ for this information

Project 4

Selenium Flux (Transport and Fate)



Thanks to DEQ for this information



Sulfate Plumes Exist – Groundwater is Unusable

Human Health Impact – Laxative Effect

Final Design Modeled Pumping Scenario

40 Year Simulation

Final Design Modeled Pumping Scenario

100 Year Simulation



Sulfate Plumes Exist – Groundwater is Unusable

Human Health Impact – Laxative Effect