

# Moab UMTRA Project Groundwater Interim Action

Ken Pill

*Groundwater Manager*

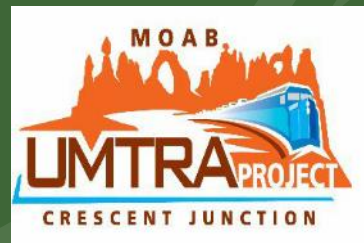
November 15, 2023



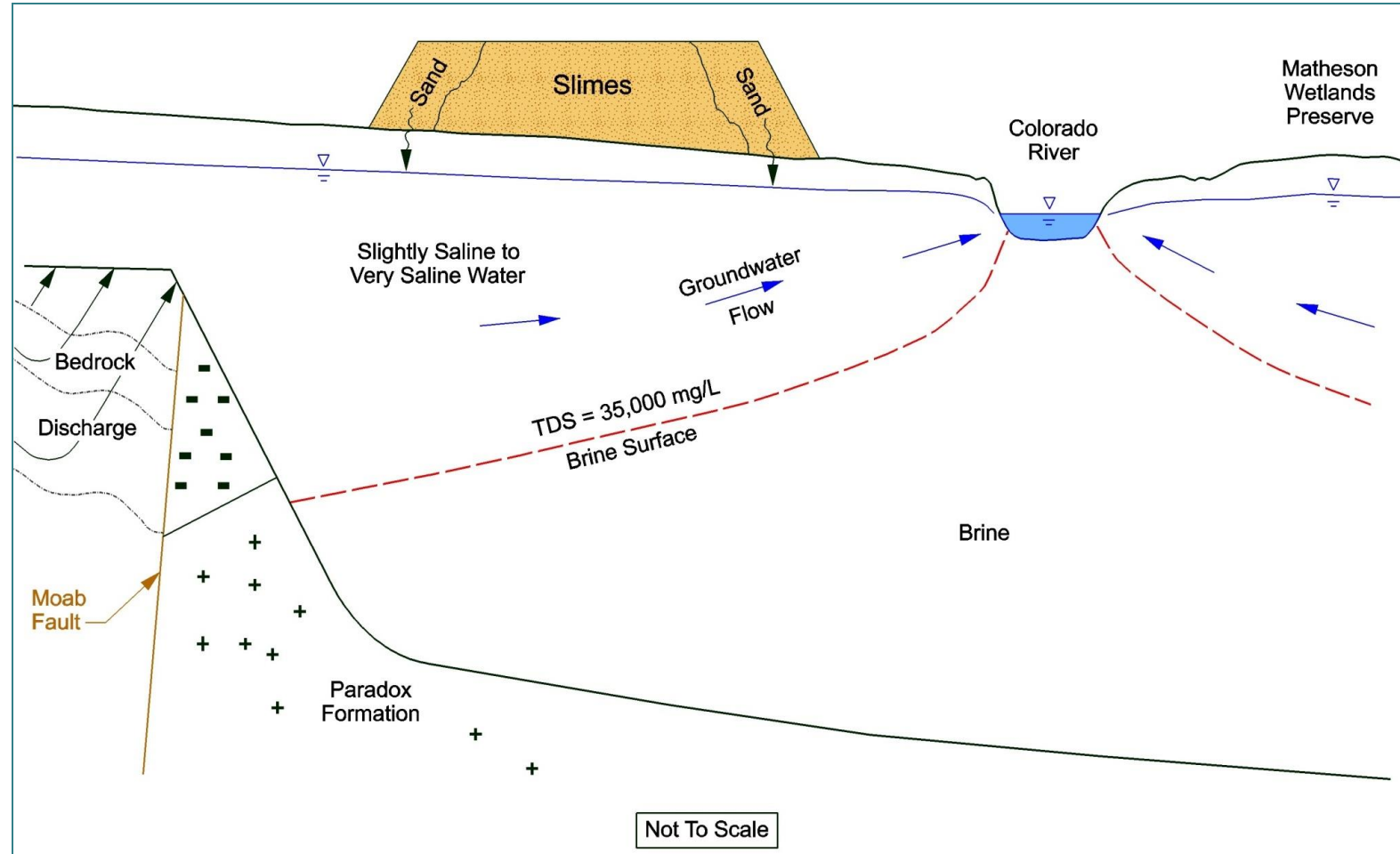
U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

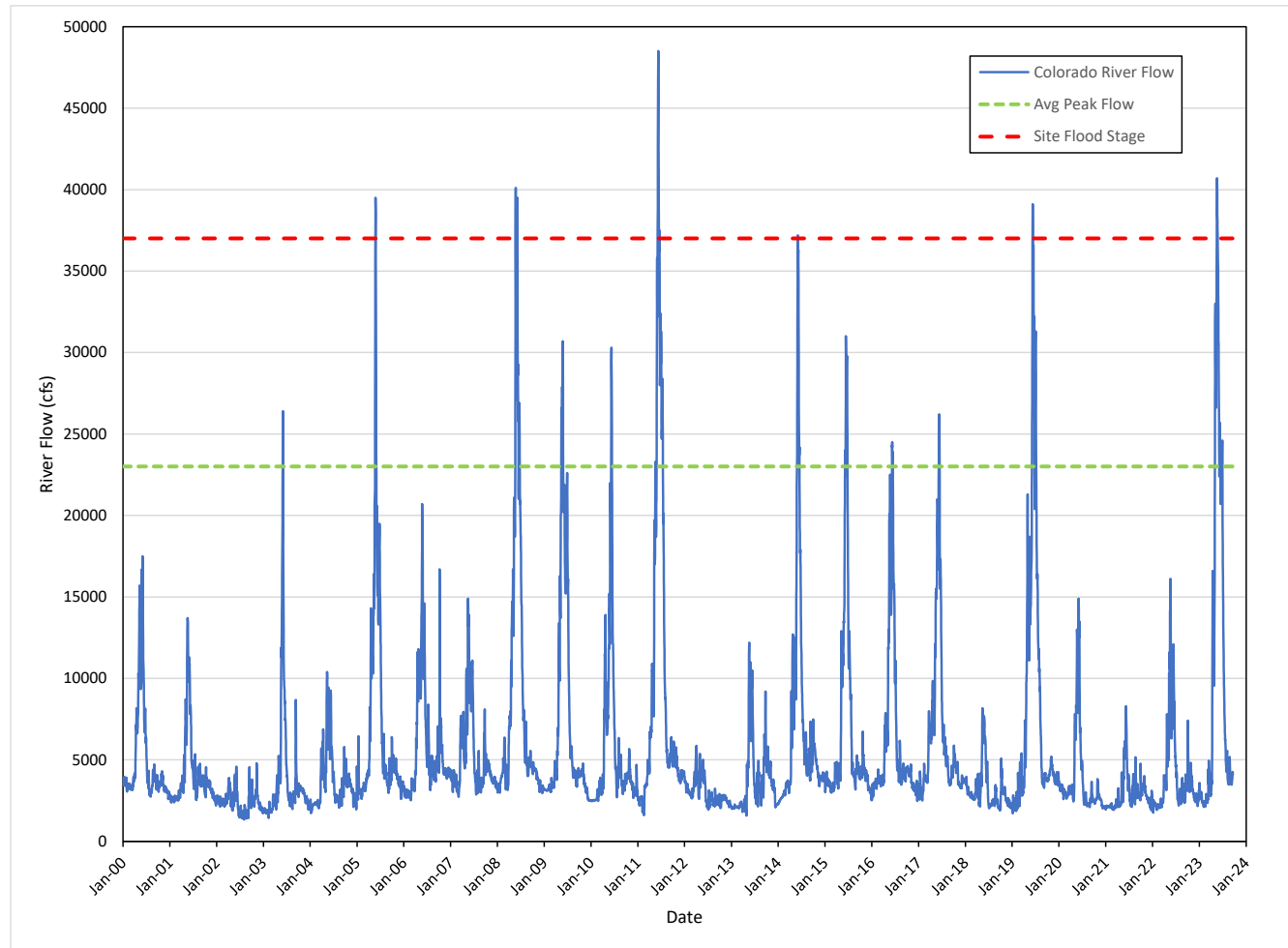
Dedicated to safety. Committed to the environment. | [energy.gov/EM](https://energy.gov/EM)



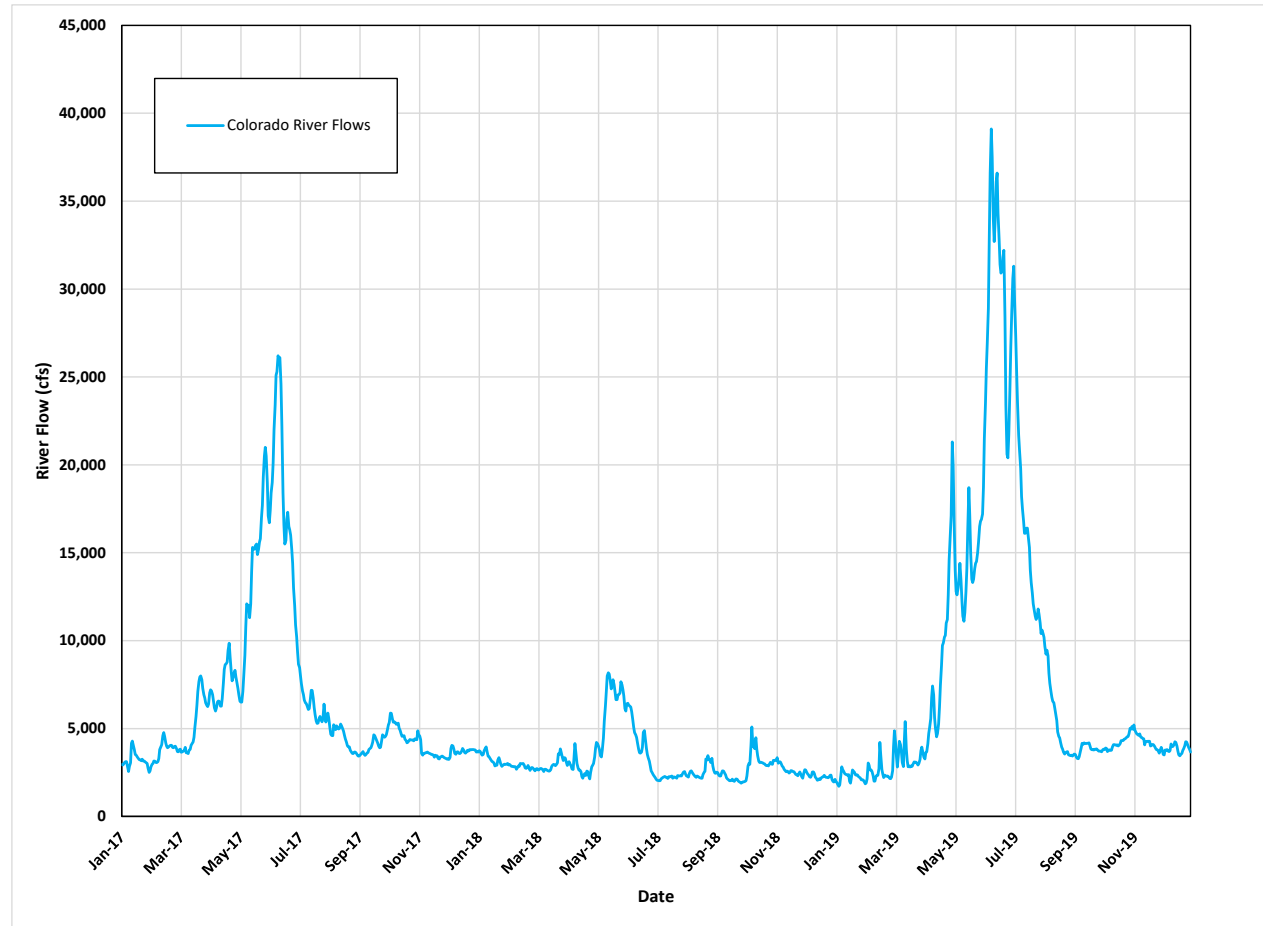
# Groundwater System Conceptual Model



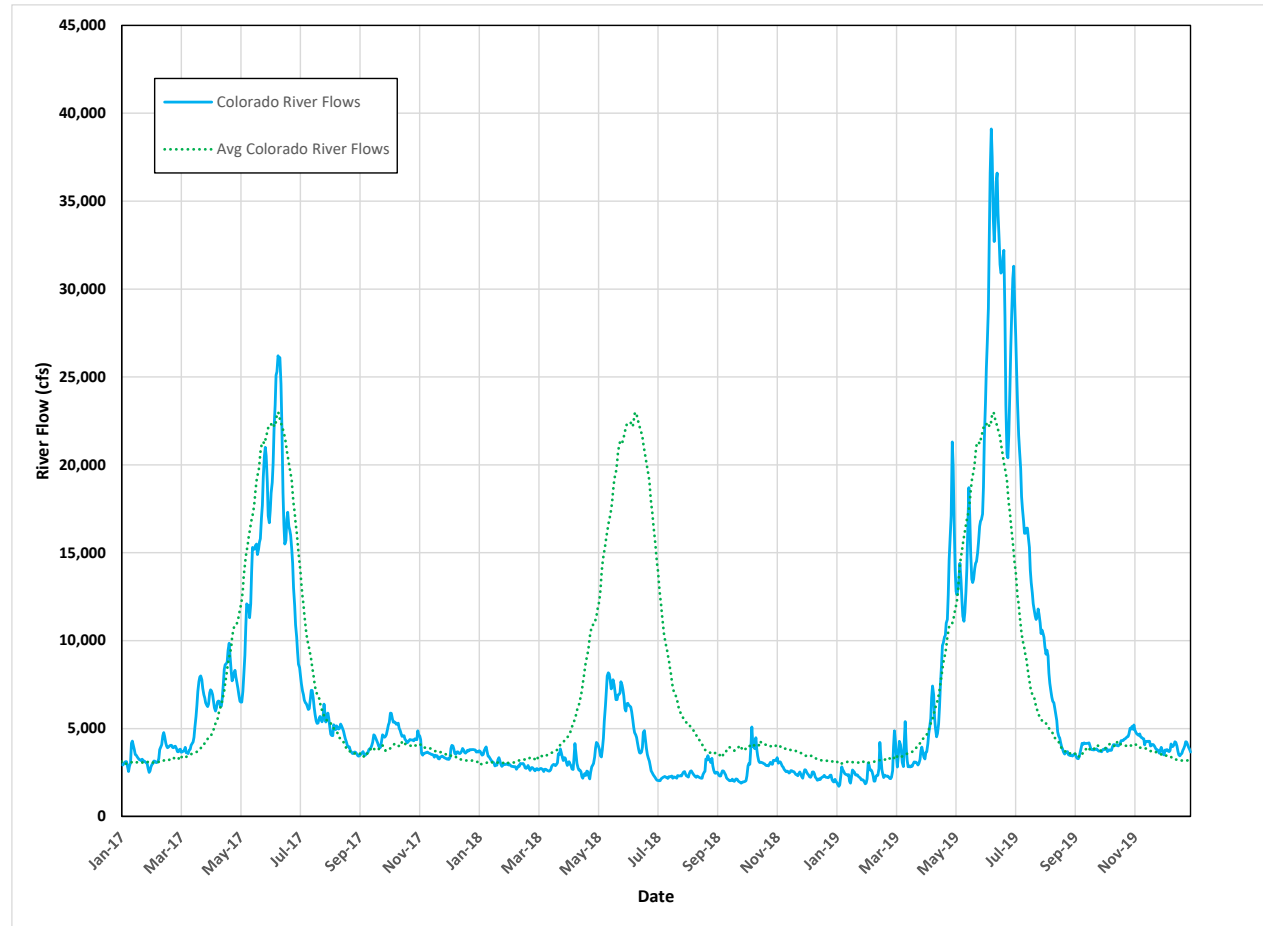
# Colorado River Flows, 2000 - 2023



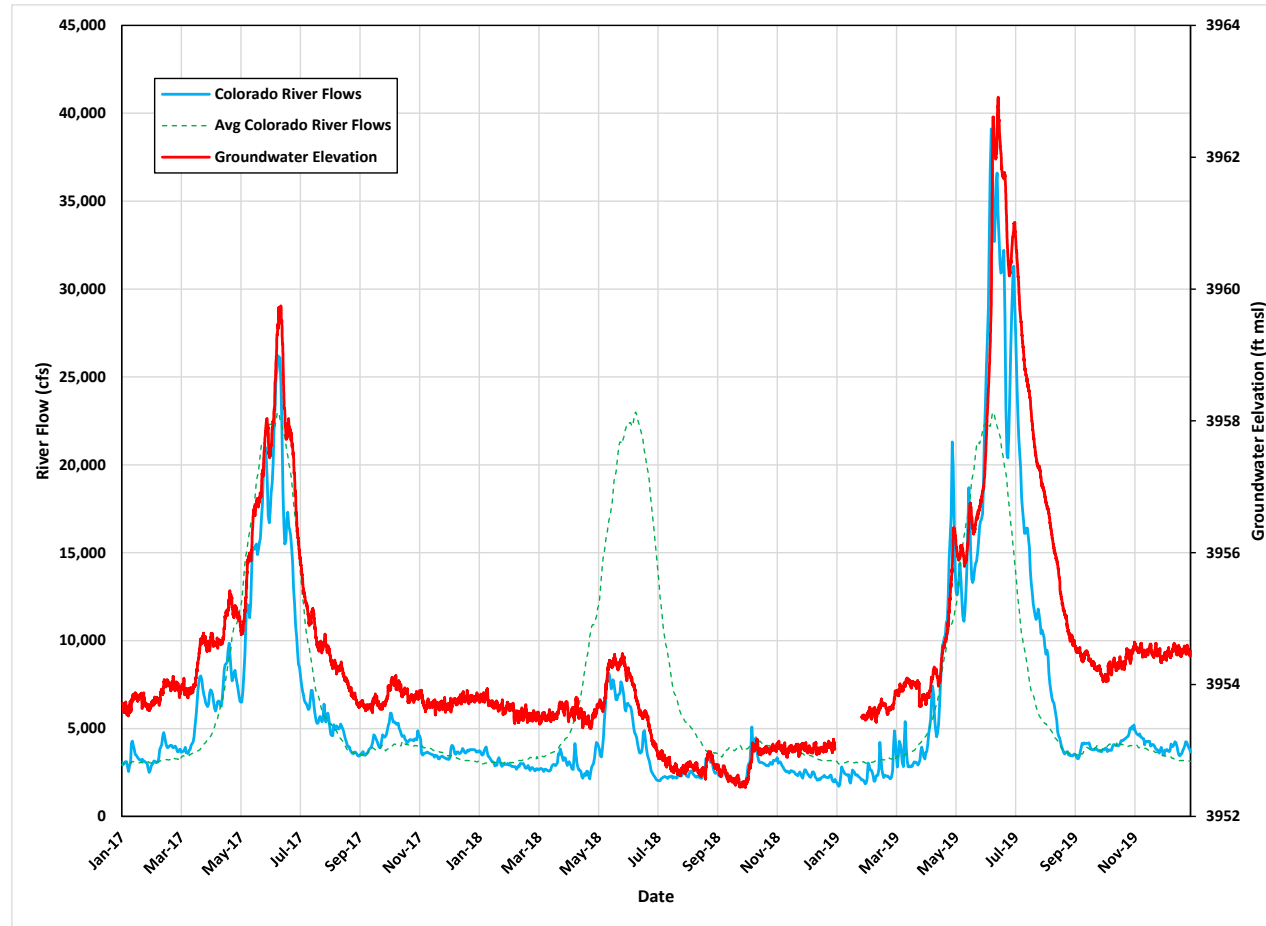
# Groundwater/Surface Water Interaction



# Groundwater/Surface Water Interaction

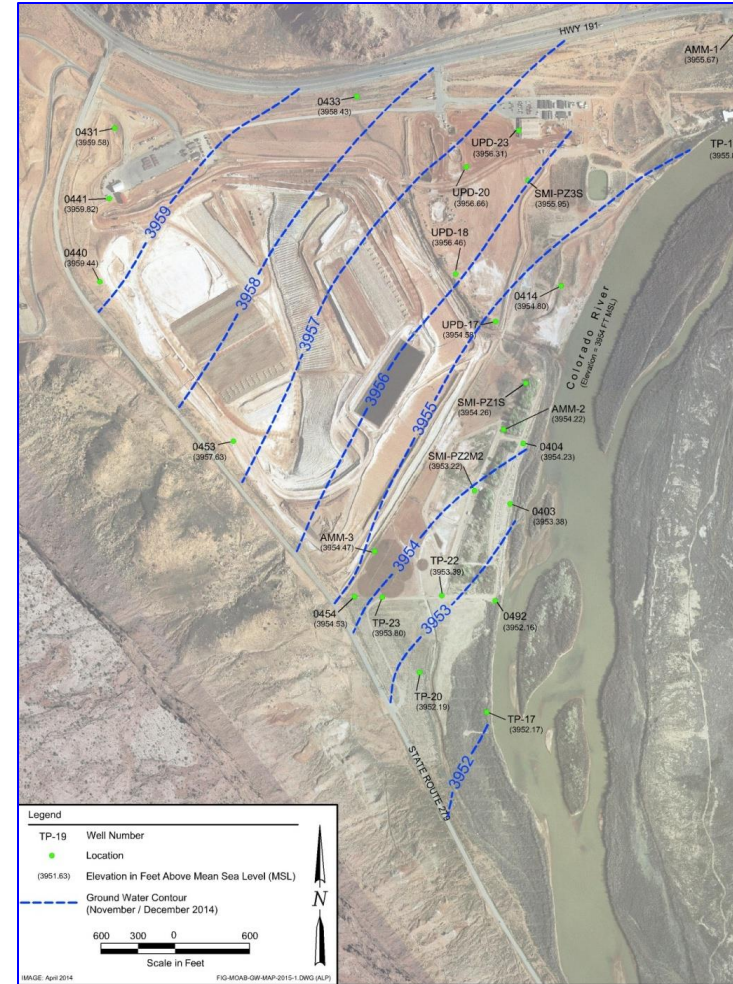


# Groundwater/Surface Water Interaction



# Groundwater Flow Direction

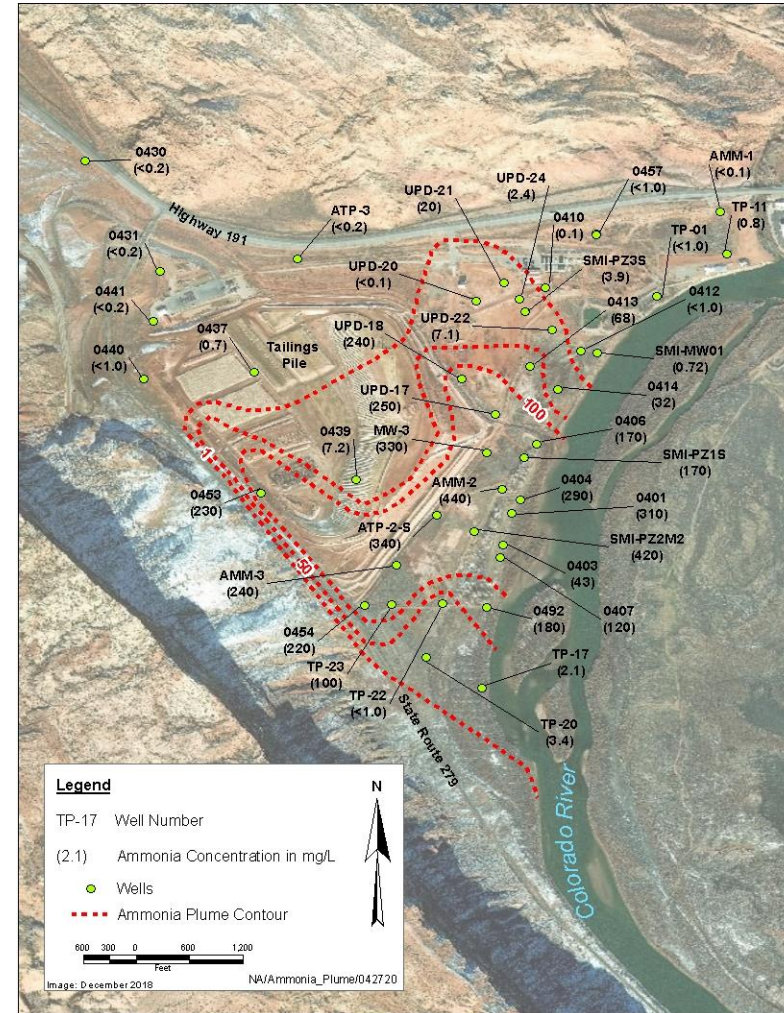
- Dec 2021 data
- During river base flow (river gaining) groundwater flow direction is towards SE
- Flow direction reverses within ~150 ft of riverbank during spring runoff flows (losing conditions)





# Shallow Zone Ammonia Plume

- Dec 2021 data
- Contaminant concentrations highest above brine interface
- Above 2,000 mg/L in some locations





**Legend**

- TP-17 Well Number
- (1.5) Uranium Concentration in mg/L
- Wells
- Uranium Plume Contour

Scale: 0 to 1,200 Feet

Image: December 2018

NA/Uranium Plume/042320

- Dec 2021 data
- U plume more widespread compared to NH3 plume
- Northeast portion of plume due to former processing facility/waste disposal activities
- Maximum concentration of 12 mg/L

- [illegible]

# Groundwater Program Interim Action Systems

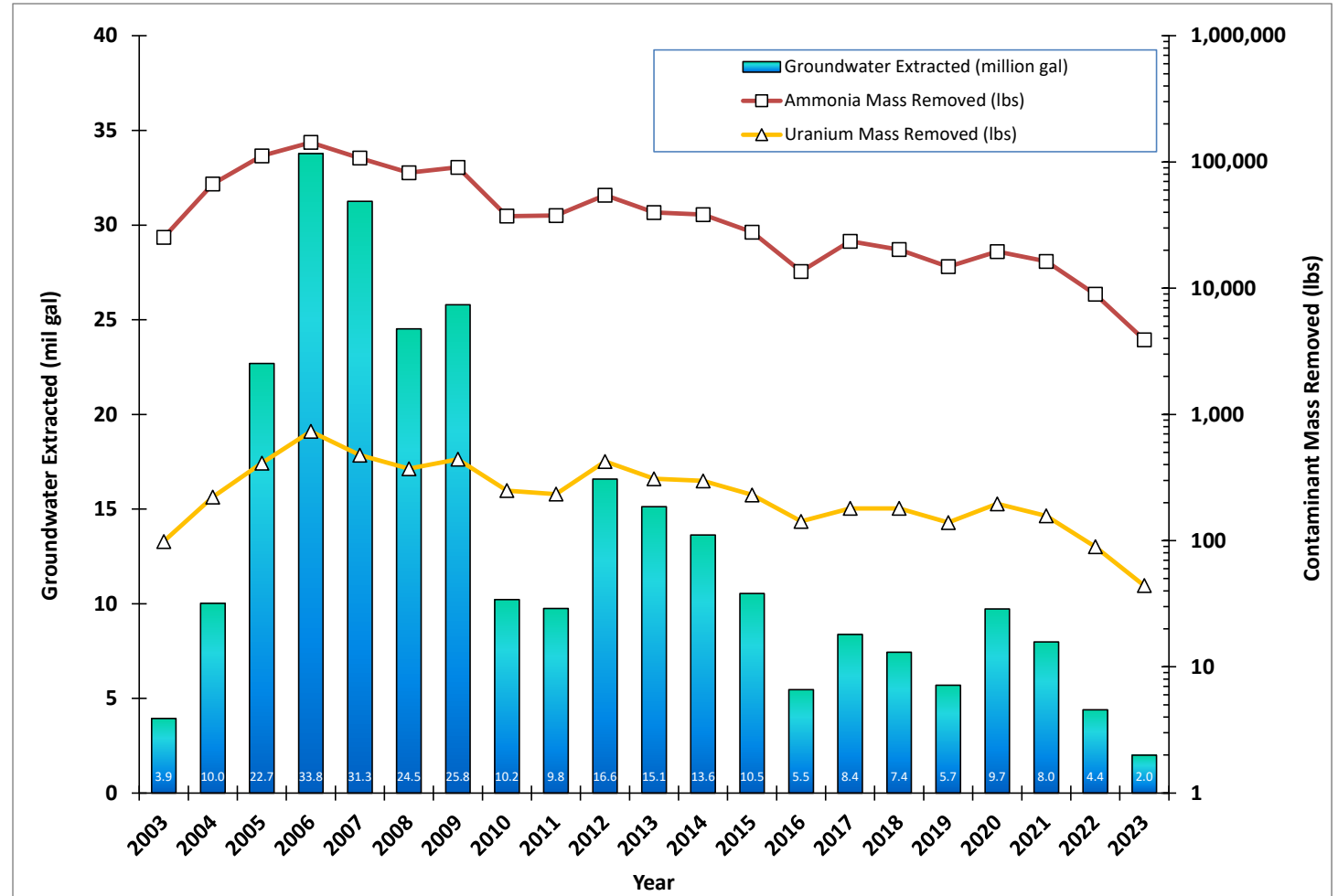
- Groundwater Contaminant Mass Removal
  - **Groundwater Extraction System** – pumps groundwater from the aquifer near the base of the tailings pile, used for CA dust control. Especially beneficial during drought conditions
- Critical Habitat Protection
  - **Freshwater Injection System** – injects filtered Colorado River water upgradient of habitat 15 to 35 ft below ground surface (bgs)
  - **Surface Water Diversion System** – delivers fresh water into habitat areas



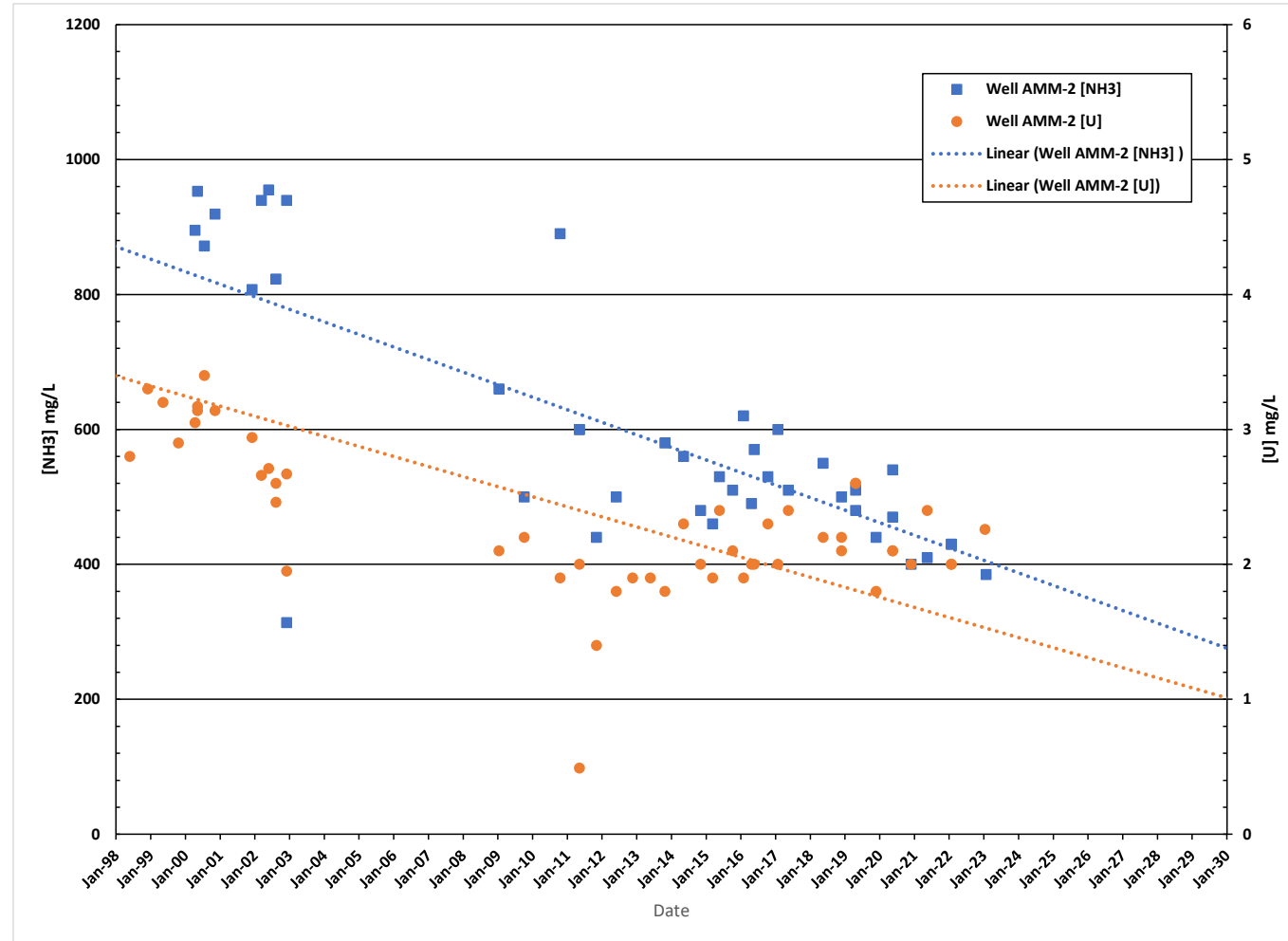


# Groundwater Extraction System

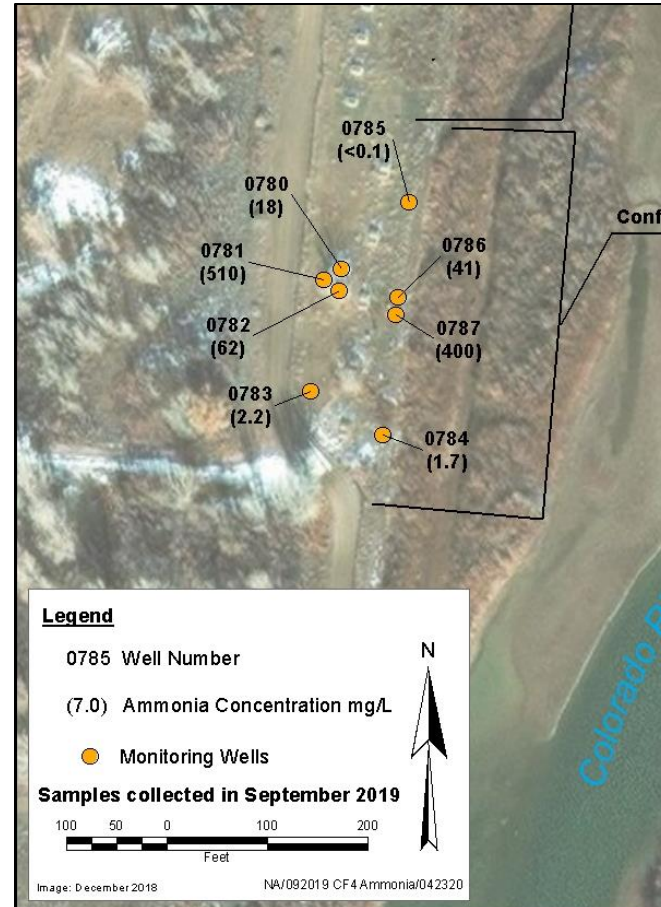
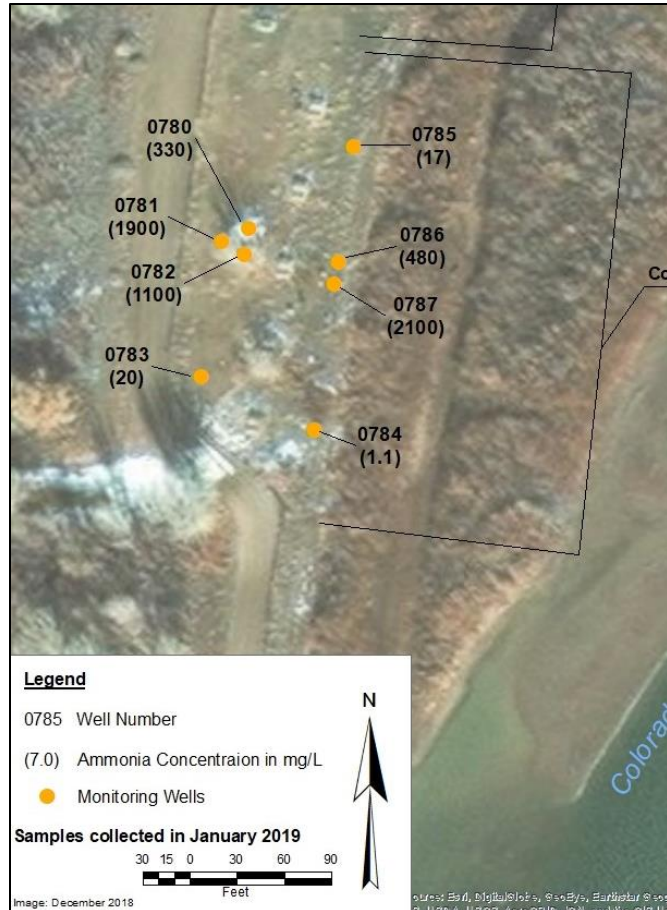
- As of Nov 2023
  - 279 mil. gal. groundwater extracted
  - 984,500 lbs NH3 removed
  - 5,650 lbs of U removed



# Groundwater Extraction System Impacts

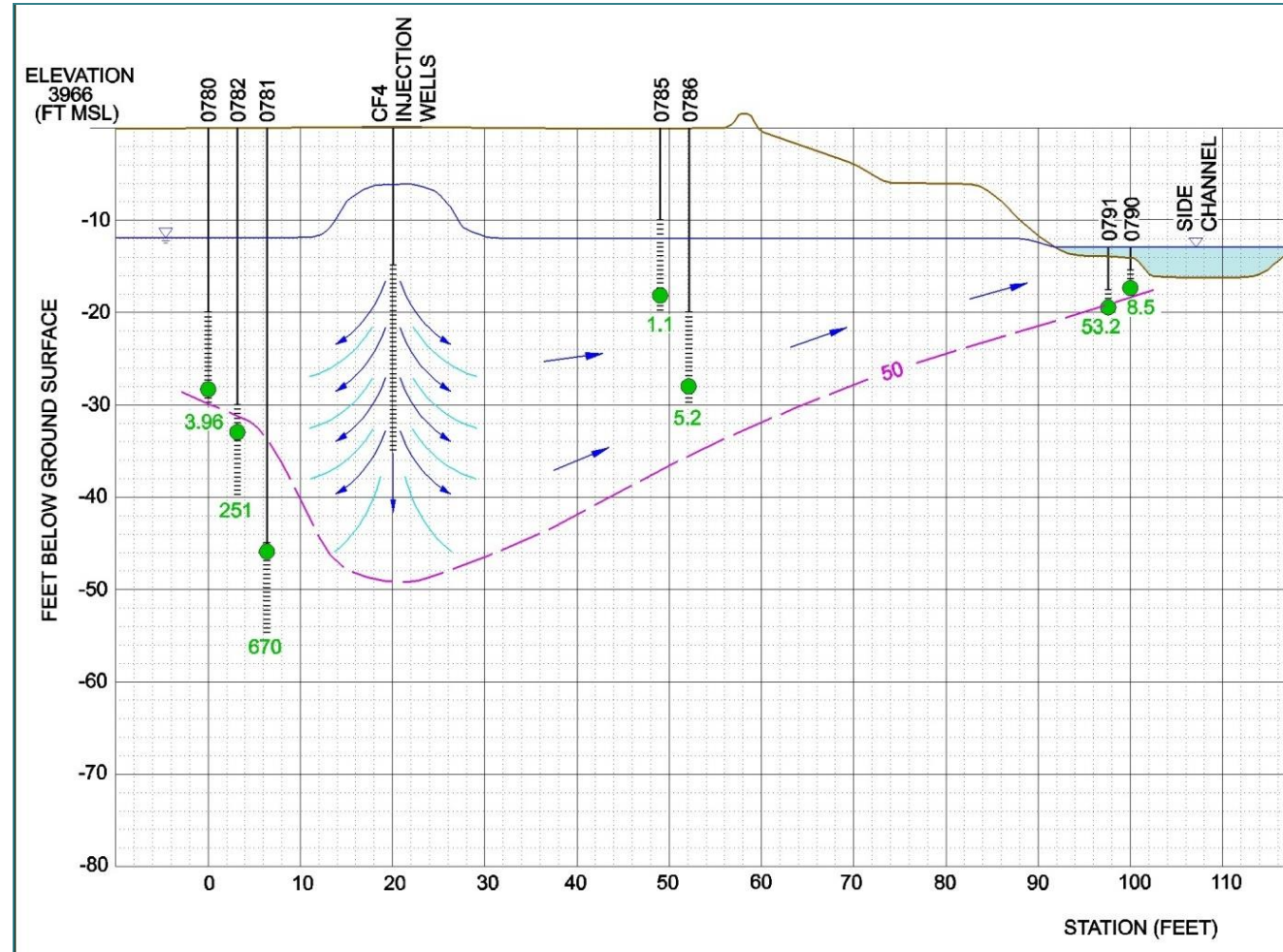


# Freshwater Injection System



- After freshwater lens develops in response to runoff, system operated to supplement the lens
- Operating consistently since 2010
  - 111 mil. gal. injected through Nov 2023

# Freshwater Injection System



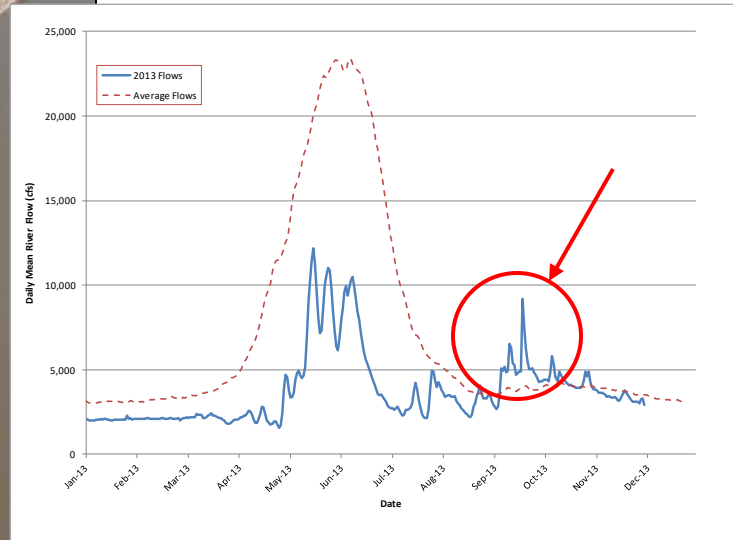


# Suitable Habitat Potential

- Closed upstream, open downstream
- After spring runoff peak through Sept 30



# Side Channel Changes



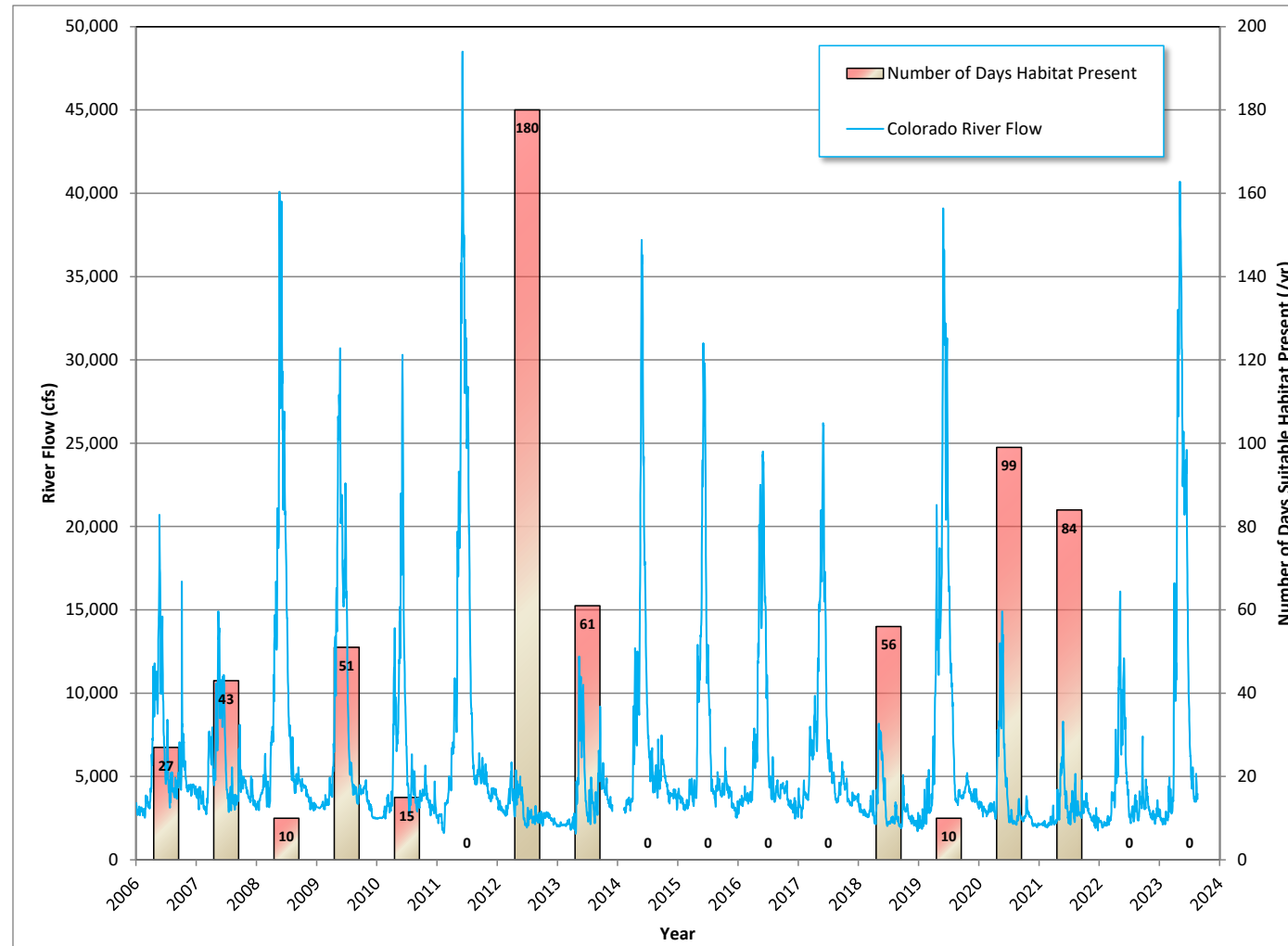


# Surface Water Diversion System

- Operation depends upon Colorado River flows and side channel configuration (dynamic system)
- System can apply water to areas where most effective at reducing ammonia concentrations based on sampling results
- Manifolds reduce erosion

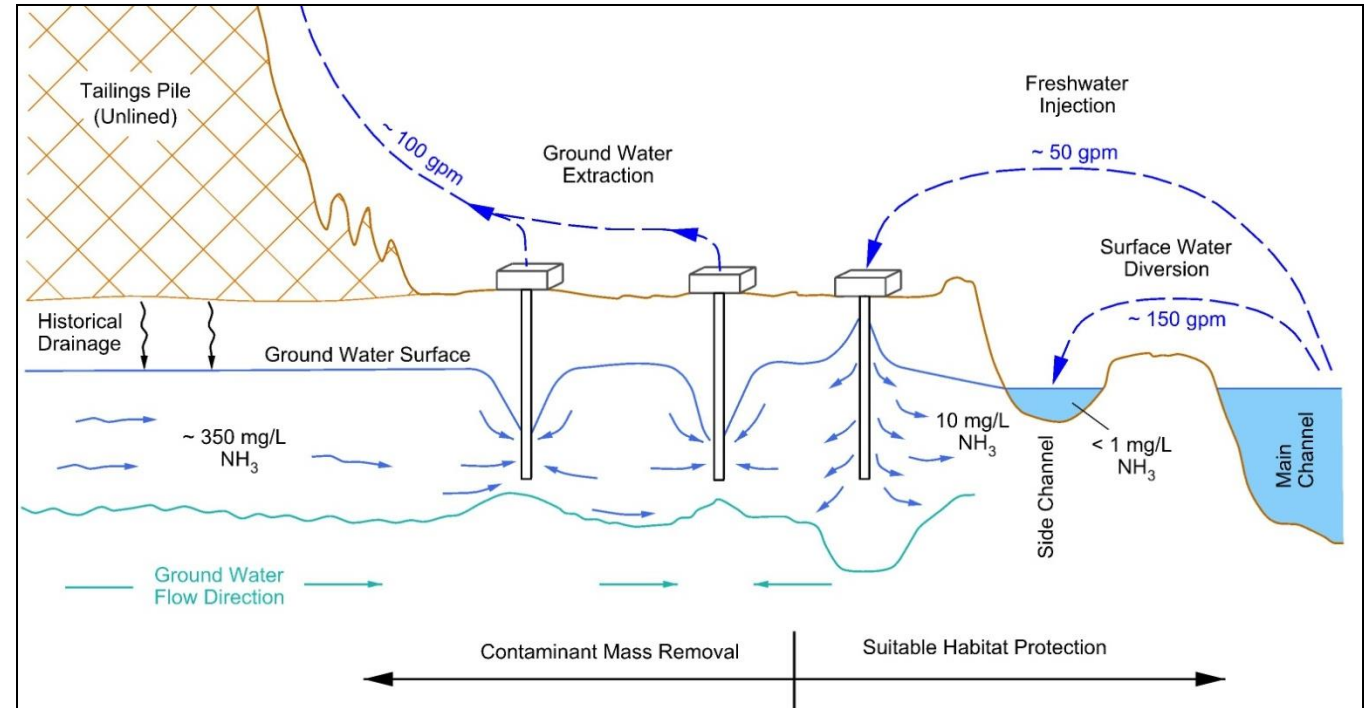


# Suitable Habitat Potential



# Groundwater Program Activities - Summary

- Contaminant Mass Removal
  - Groundwater extraction near base of tailings
- Suitable Habitat Protection
  - Freshwater injection along riverbank
  - Surface water diversion directly into side channel





**QUESTIONS?**