Southern Nevada Water Authority

Lake Mead Intake No. 3

The Last Straw?

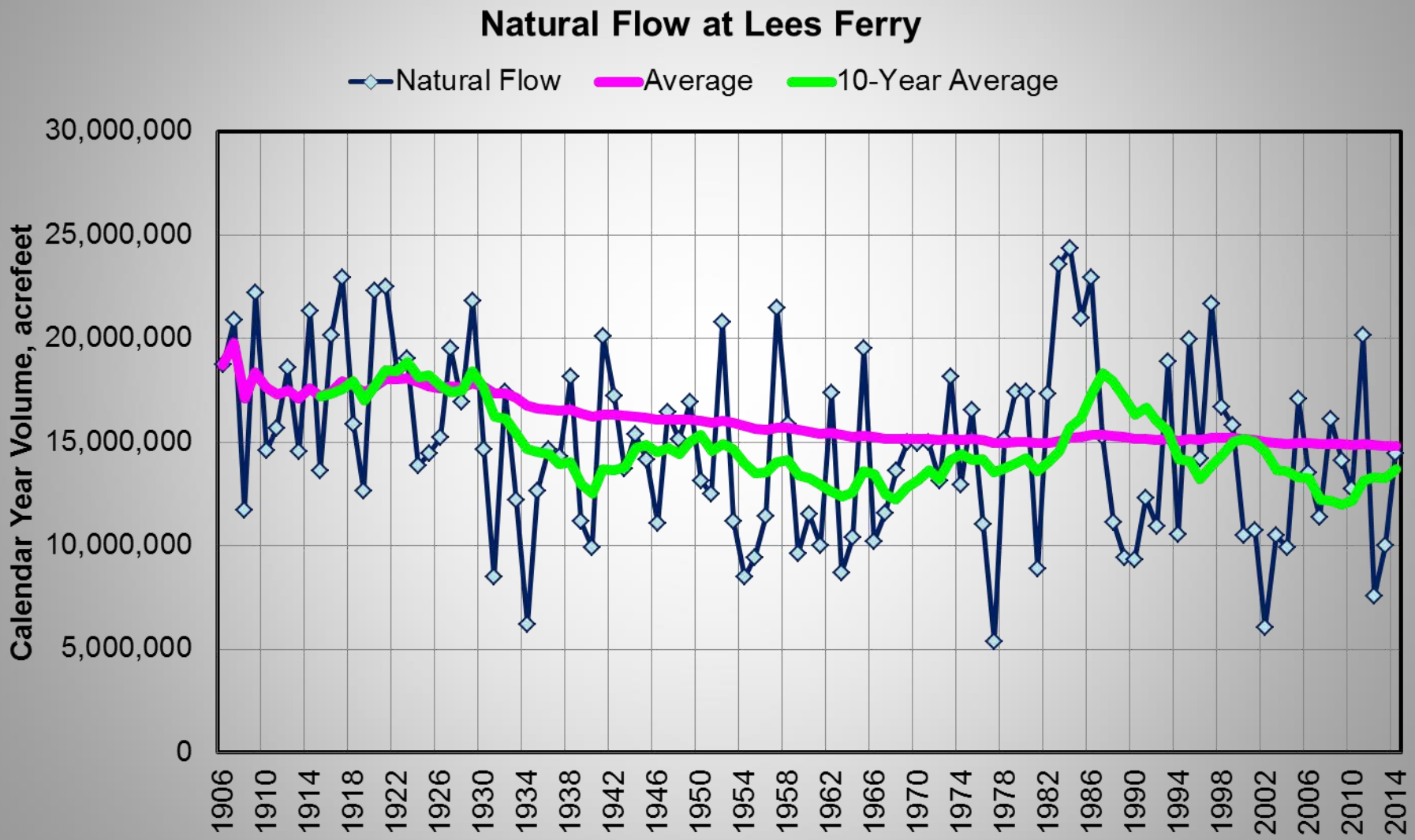
WESTCAS
October 29, 2015

Underlying Intake No. 3 Factors

- Lake Mead is the primary water source for So. Nevada – 90% of supply
- No guarantees on:
  - Lake water quality
  - Lake water level
- Nevada is responsible for:
  - Water treatment
  - Water conveyance

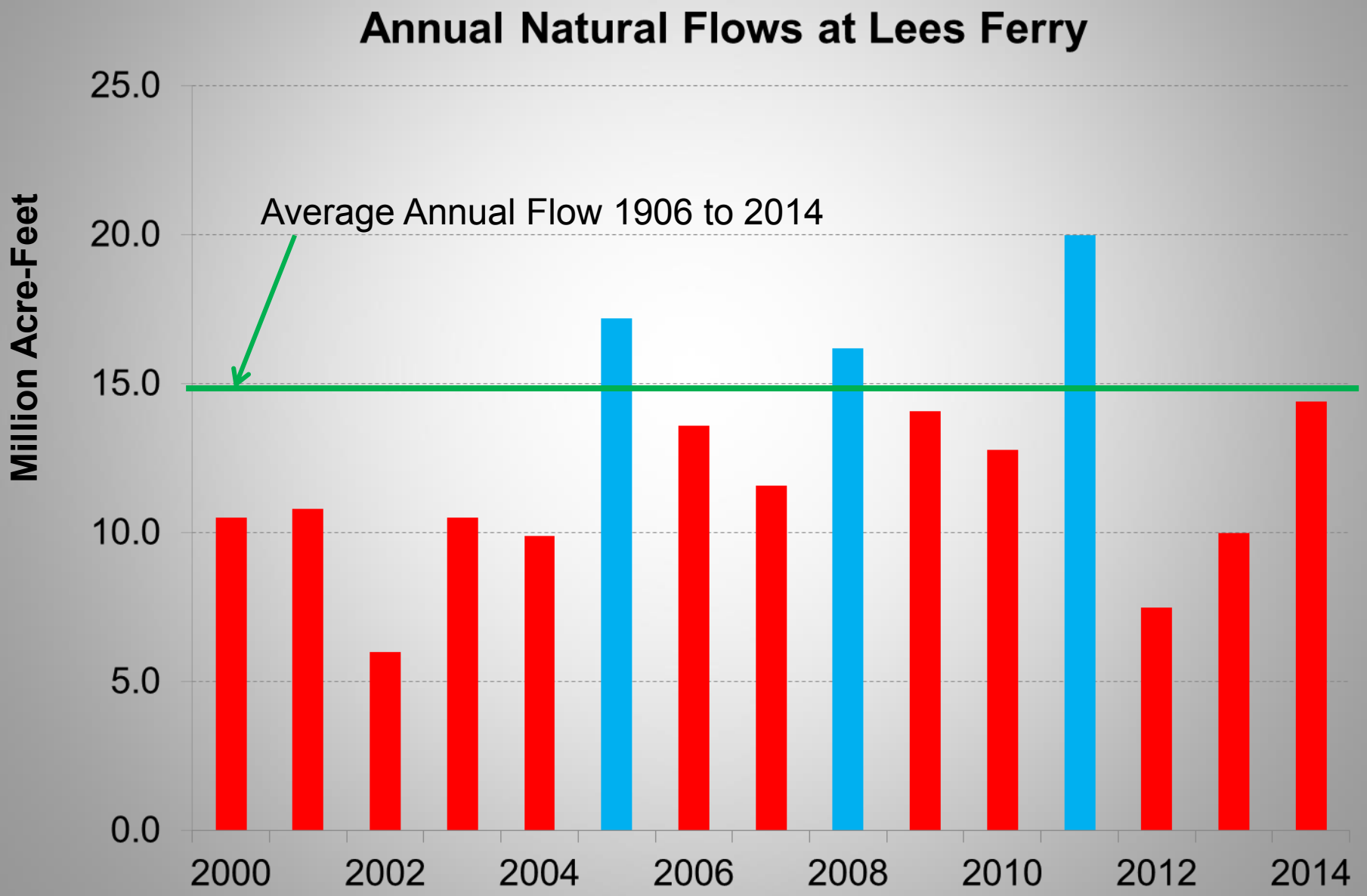
When lake water level was high, as it was from 1975 to 2000, there were no difficulties achieving water quality and water conveyance objectives.

Colorado River Water Supply Trends

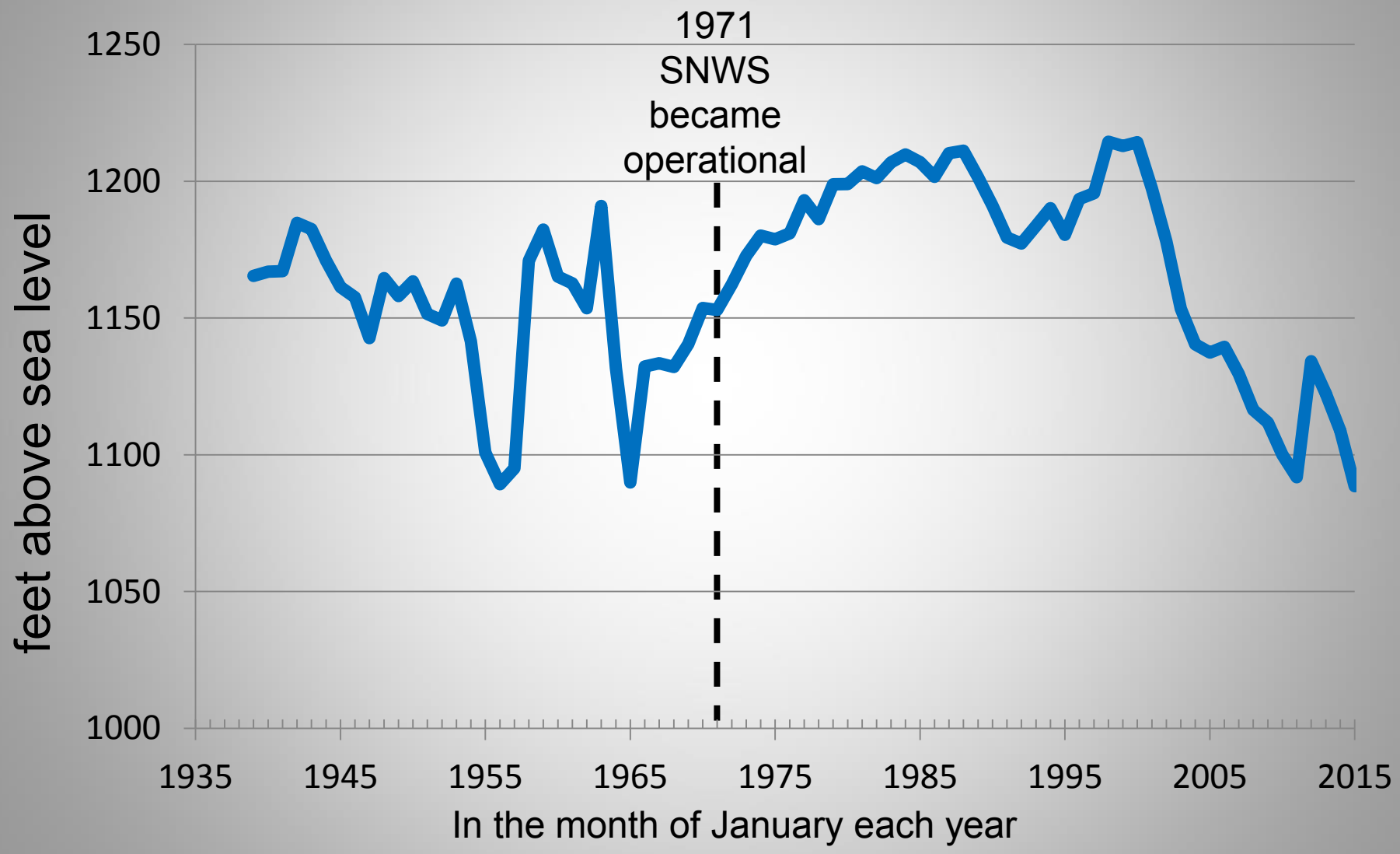


Note: 2013 and 2014 data are provisional

Colorado River Water Supply Trends

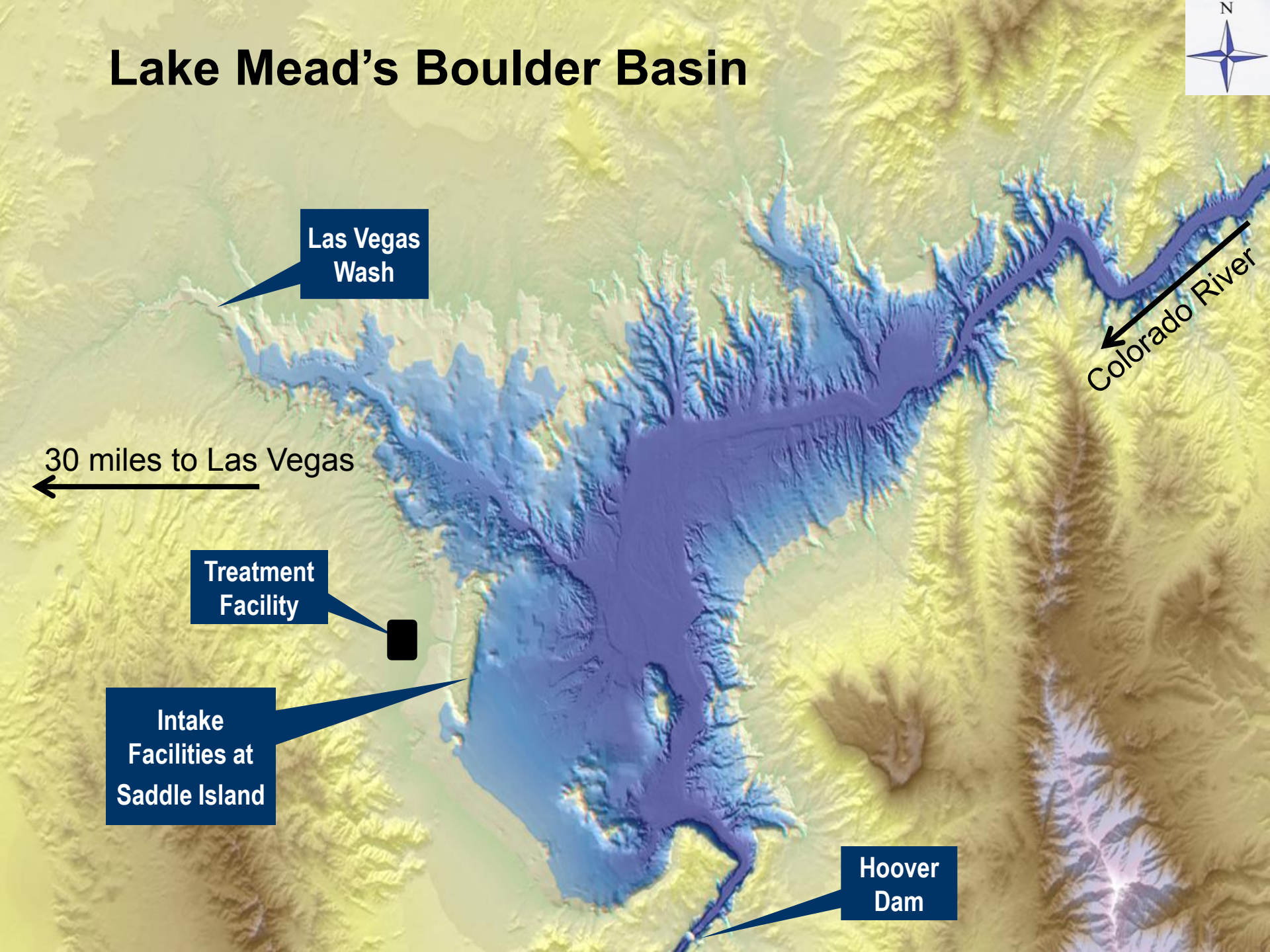


Lake Mead Historic Water Elevations



Source: http://www.usbr.gov/lc/region/g4000/hourly/mead-elv.html

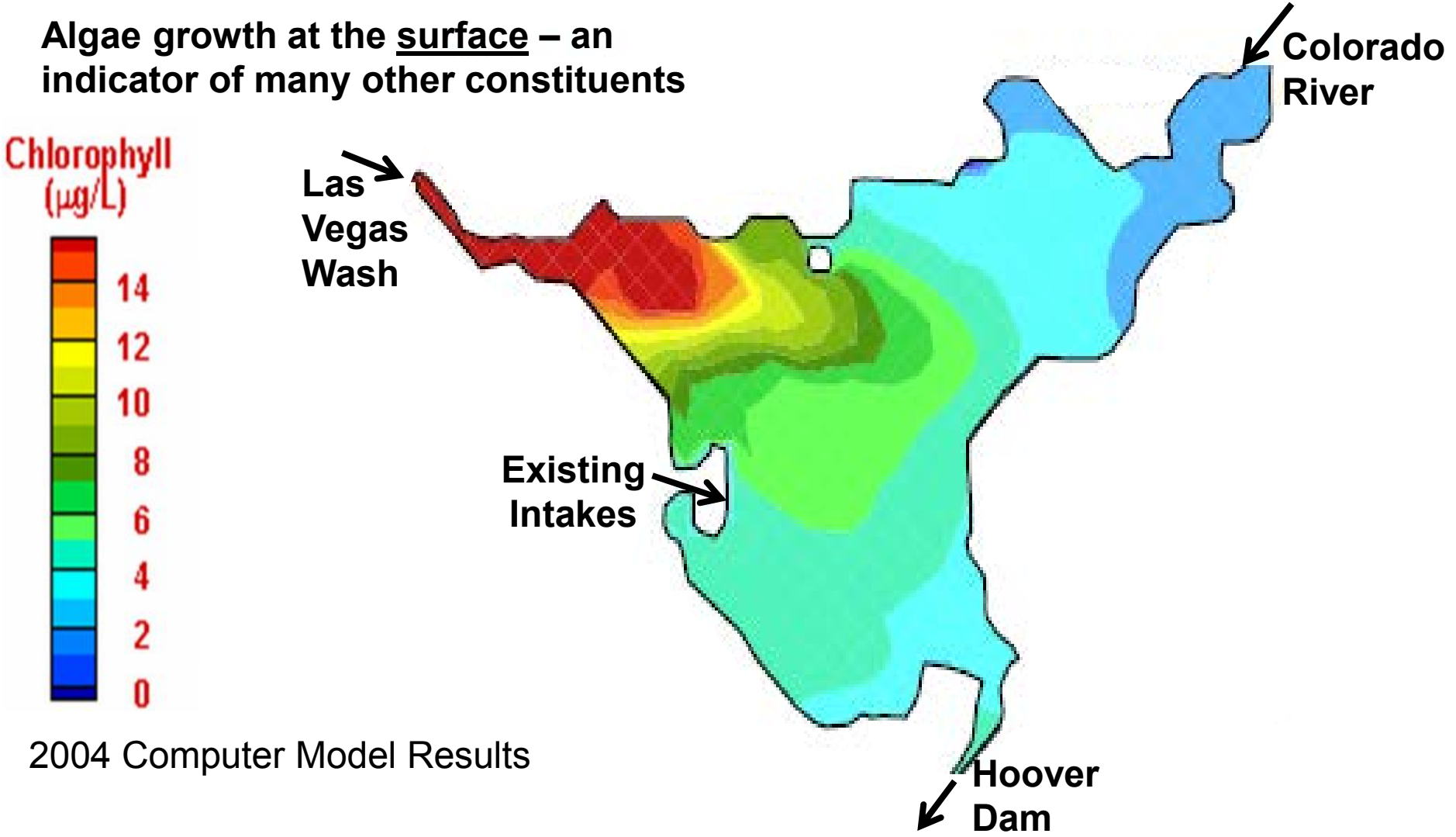
Lake Mead's Boulder Basin



Las Vegas Wash Discharge
Primary Source of Undesirable Constituents

Lake Elevation 1,169-ft.

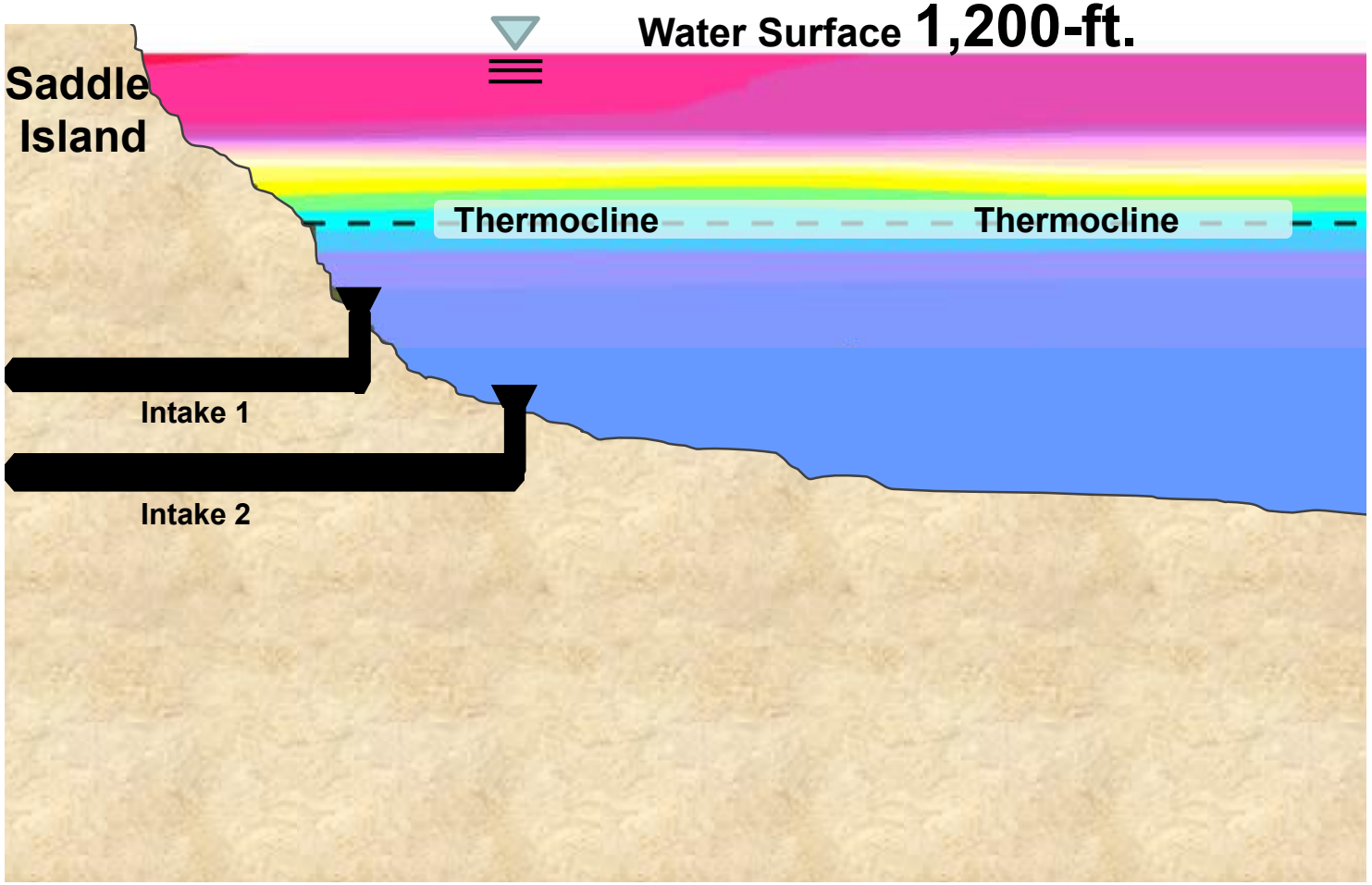
Algae growth at the surface – an indicator of many other constituents

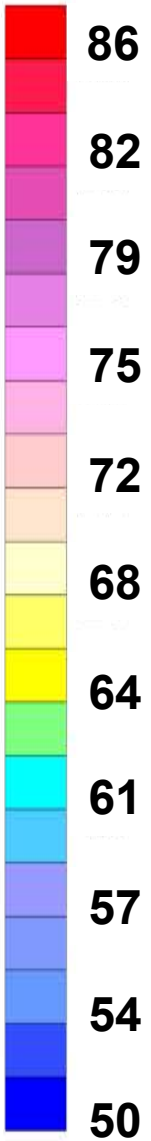


2004 Computer Model Results

Water Quality of Lake Mead

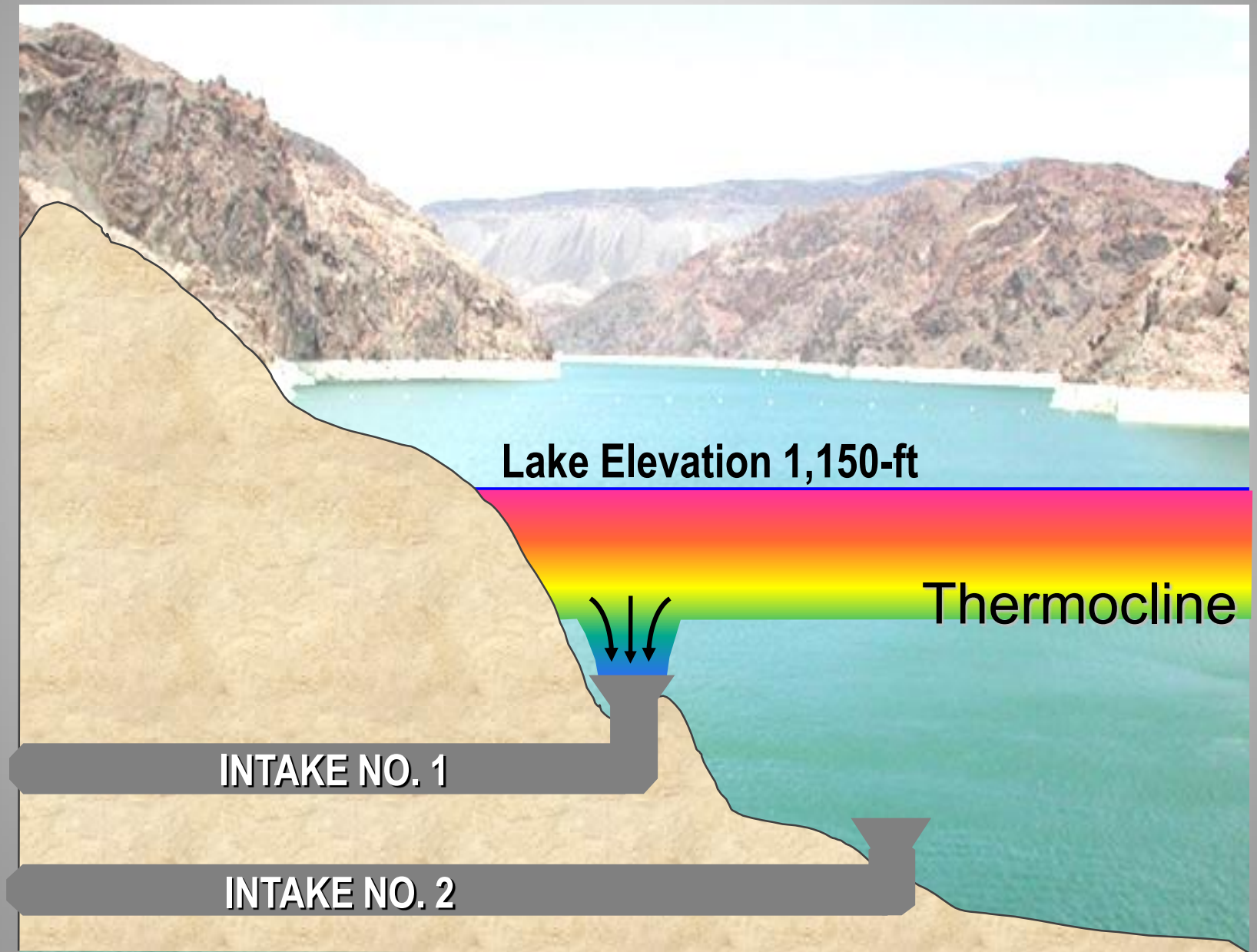
Aug. 2000



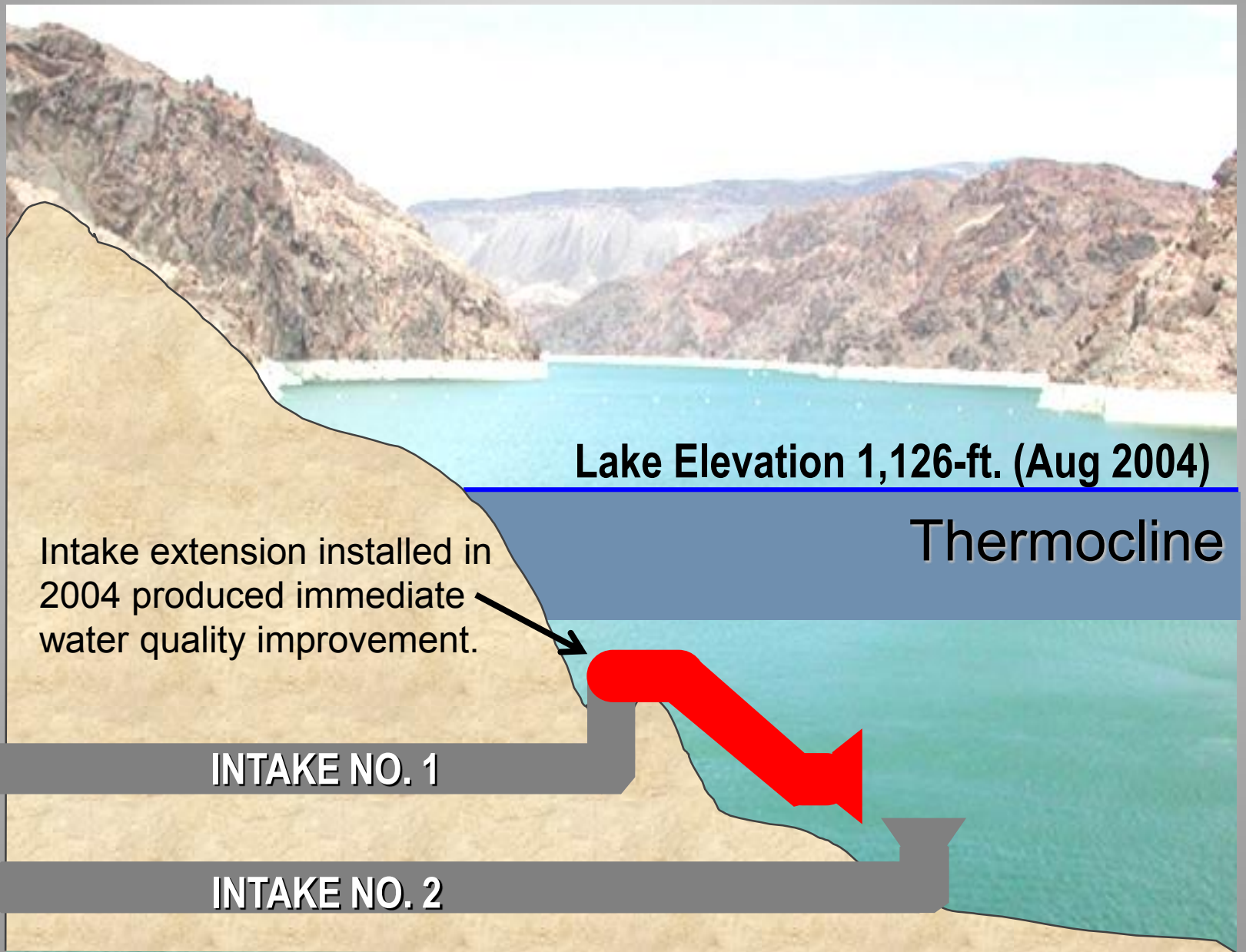


Intakes below the thermocline substantially avoid the impacts of poor water quality effects from Las Vegas Wash discharges

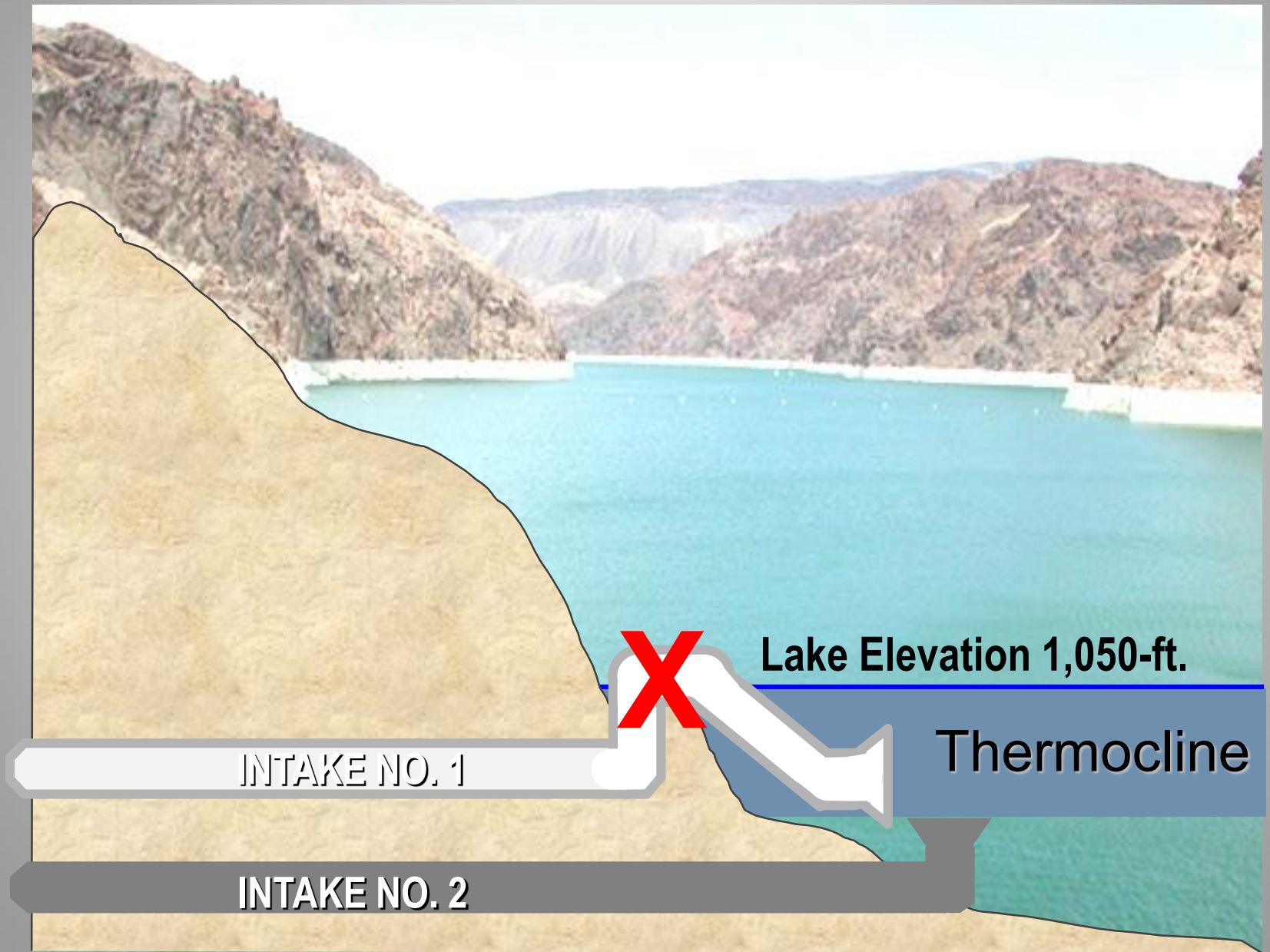
Impact of Lower Lake Level in 2002



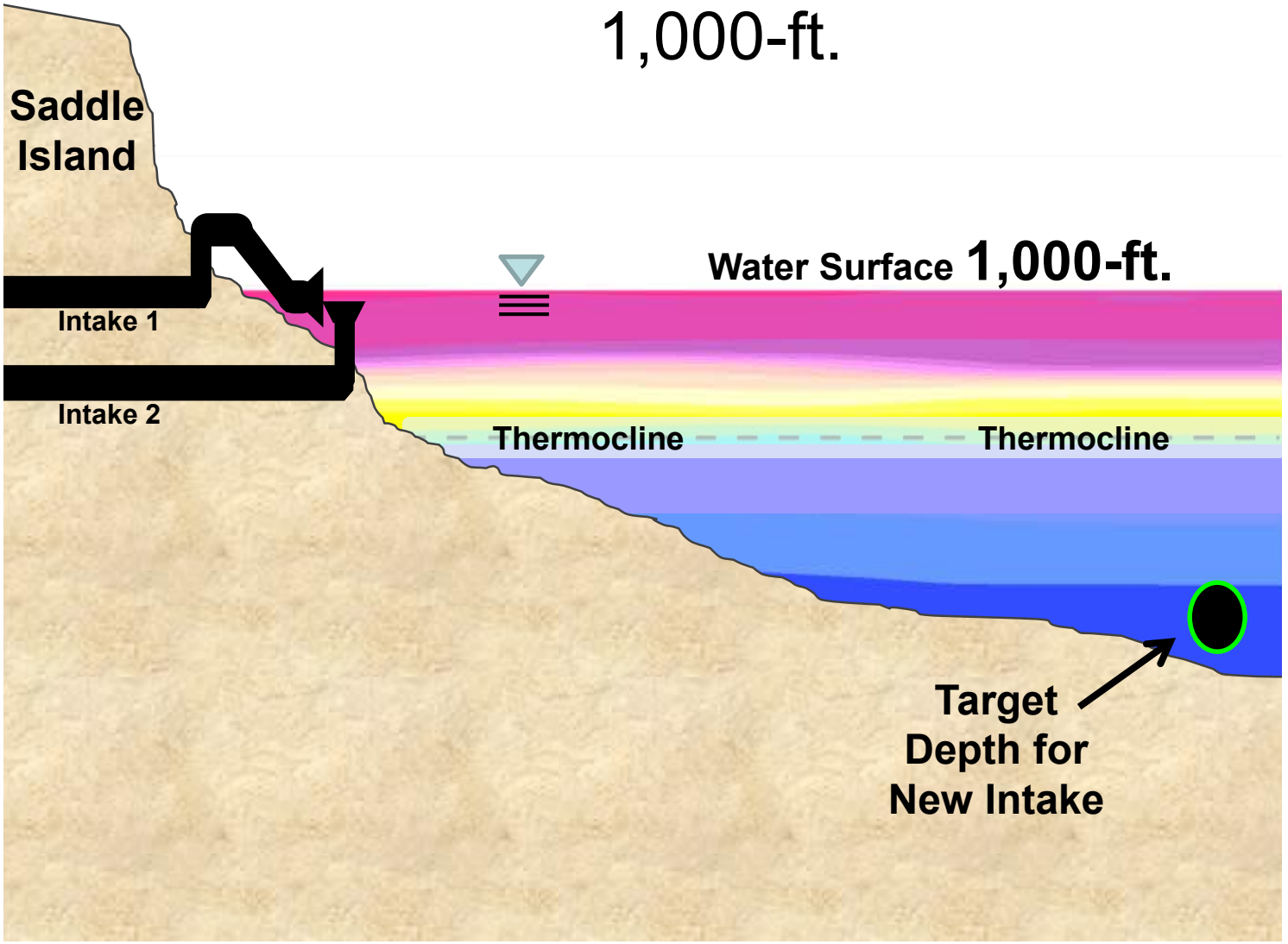
Initial Water Quality Response to Lower Lake Level

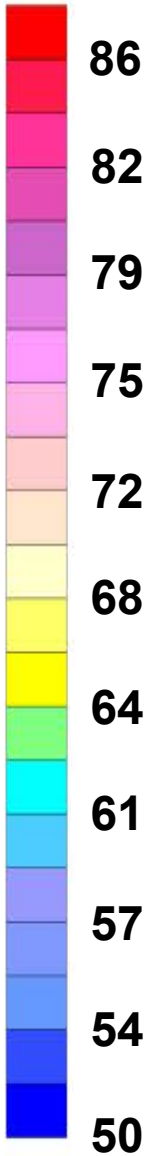


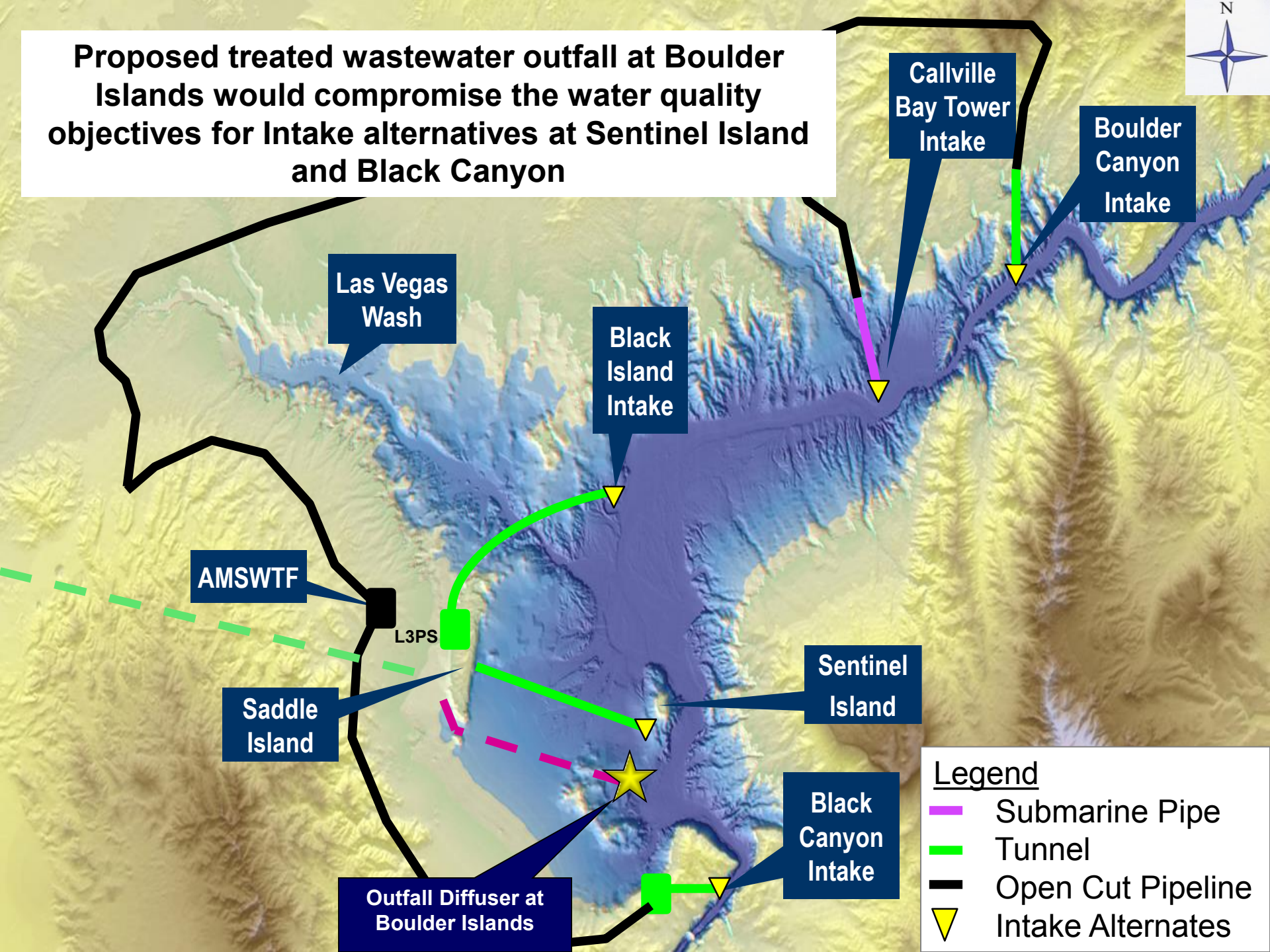
Lake Levels Below Elevation ~ 1,050 Ft Puts Intake No. 1 Out of Service



Water Quality of Lake Mead






Proposed treated wastewater outfall at Boulder Islands would compromise the water quality objectives for Intake alternatives at Sentinel Island and Black Canyon
N
Callville Bay Tower Intake
Boulder Canyon Intake
Las Vegas Wash
Black Island Intake
AMSWTF
L3PS
Saddle Island
Sentinel Island
Black Canyon Intake
Outfall Diffuser at Boulder Islands
Legend
Submarine Pipe
Tunnel
Open Cut Pipeline
Intake Alternates

Tunnel Intake Concepts Evaluation 2004 - 2005

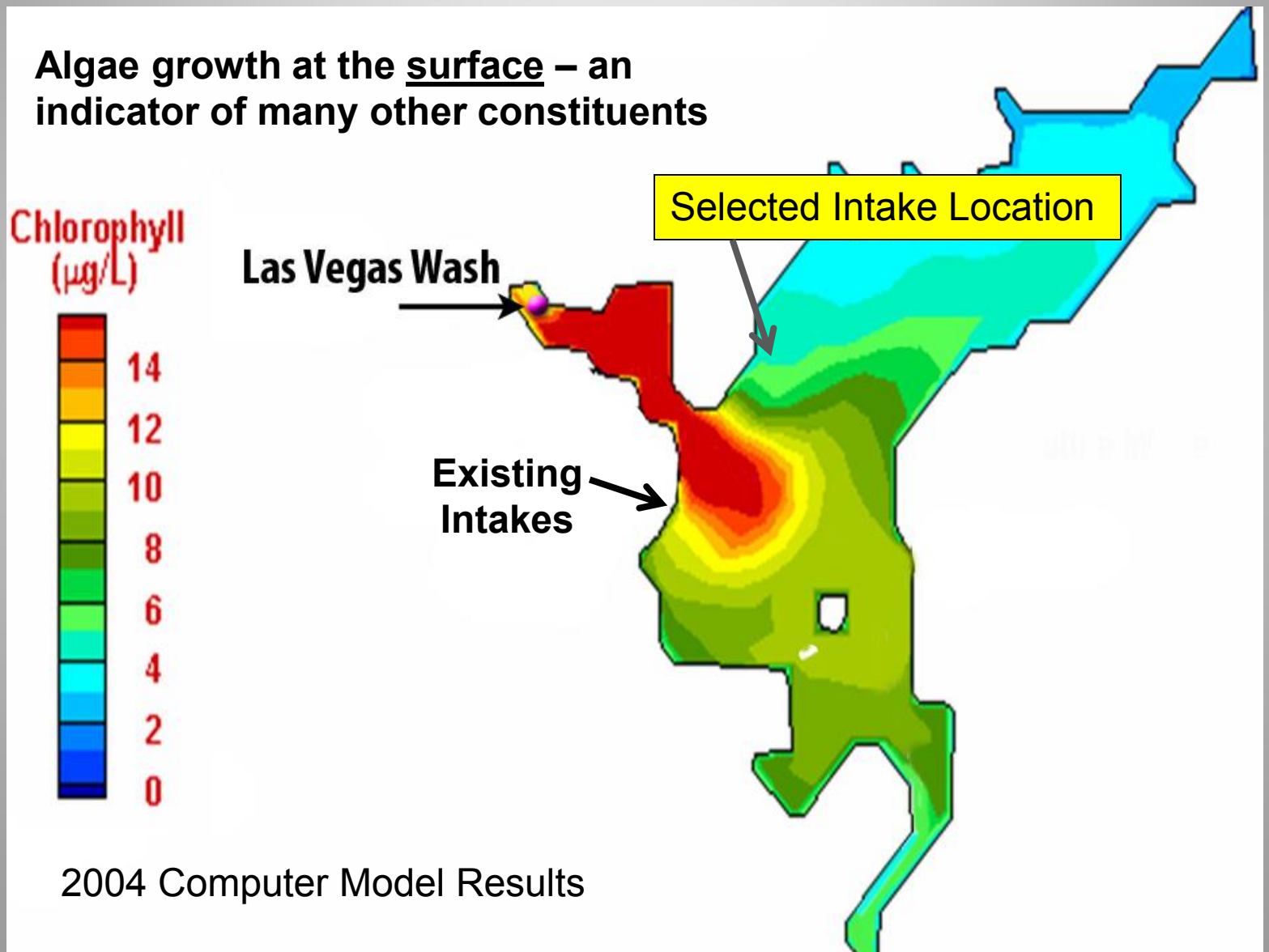
Major Factors Considered

- Water quality variations around the Lake
- Geologic conditions
- Lake bottom topography
- Construction feasibility
- Environmental impacts and permitting
- Construction cost & schedule
- Long-term maintenance and replacement cost

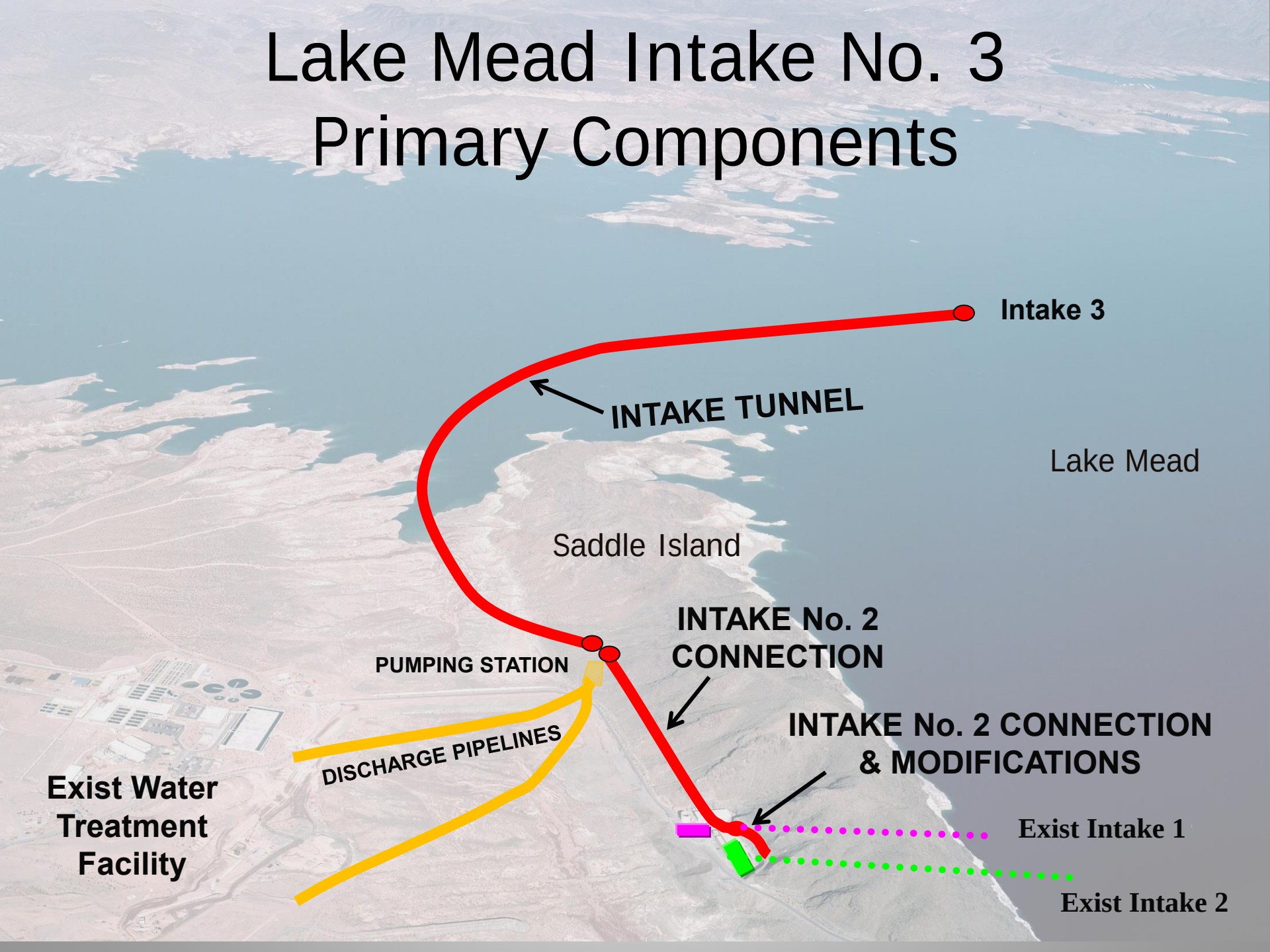
Shrinking Lake Shoreline

Existing Las Vegas Wash Discharge

Lake Elevation 1,000-ft.



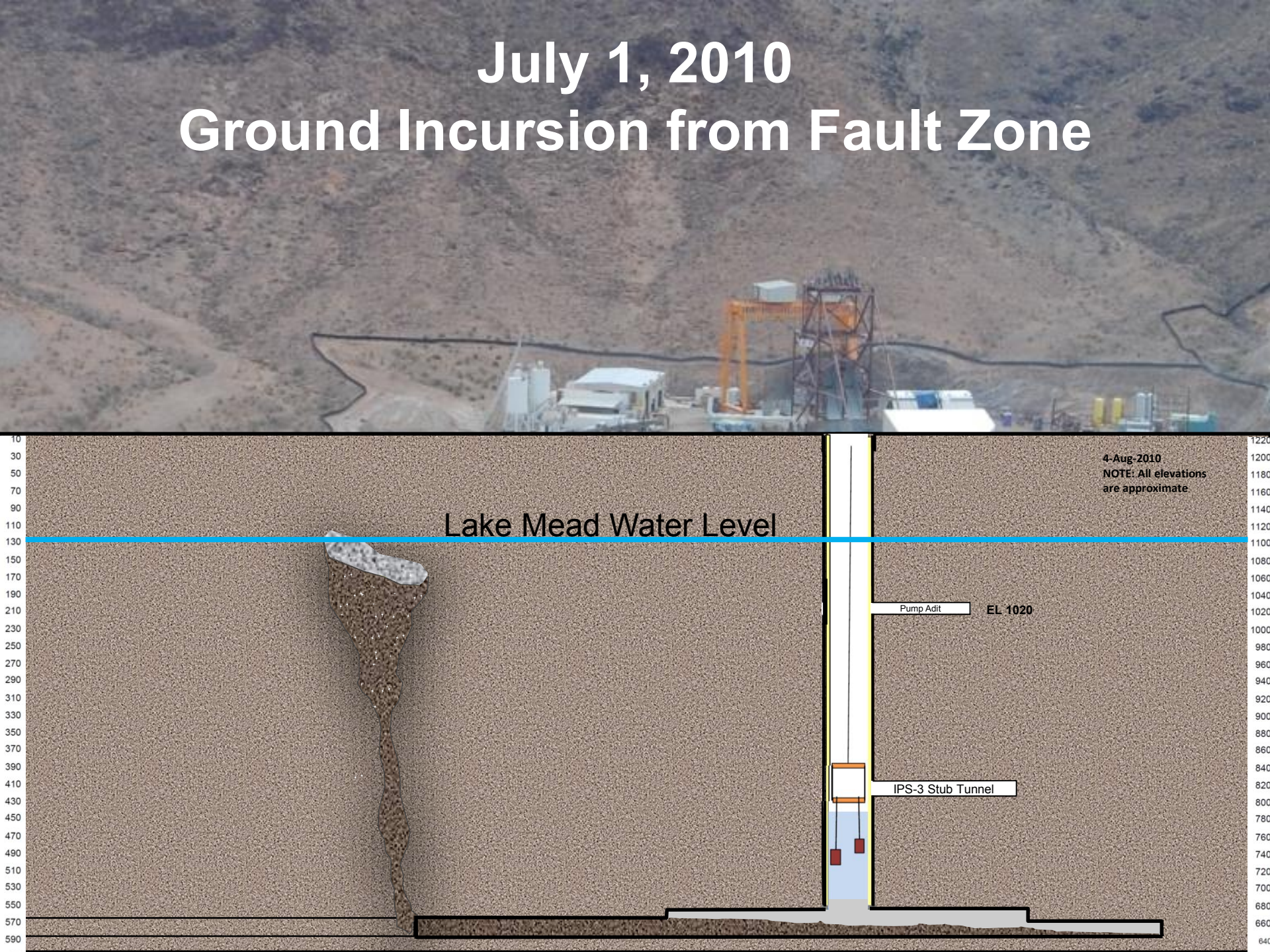
Lake Mead Intake No. 3
Primary Components



Tunnel Boring Machine On Site - 2009

15,000 Concrete Liner Segments

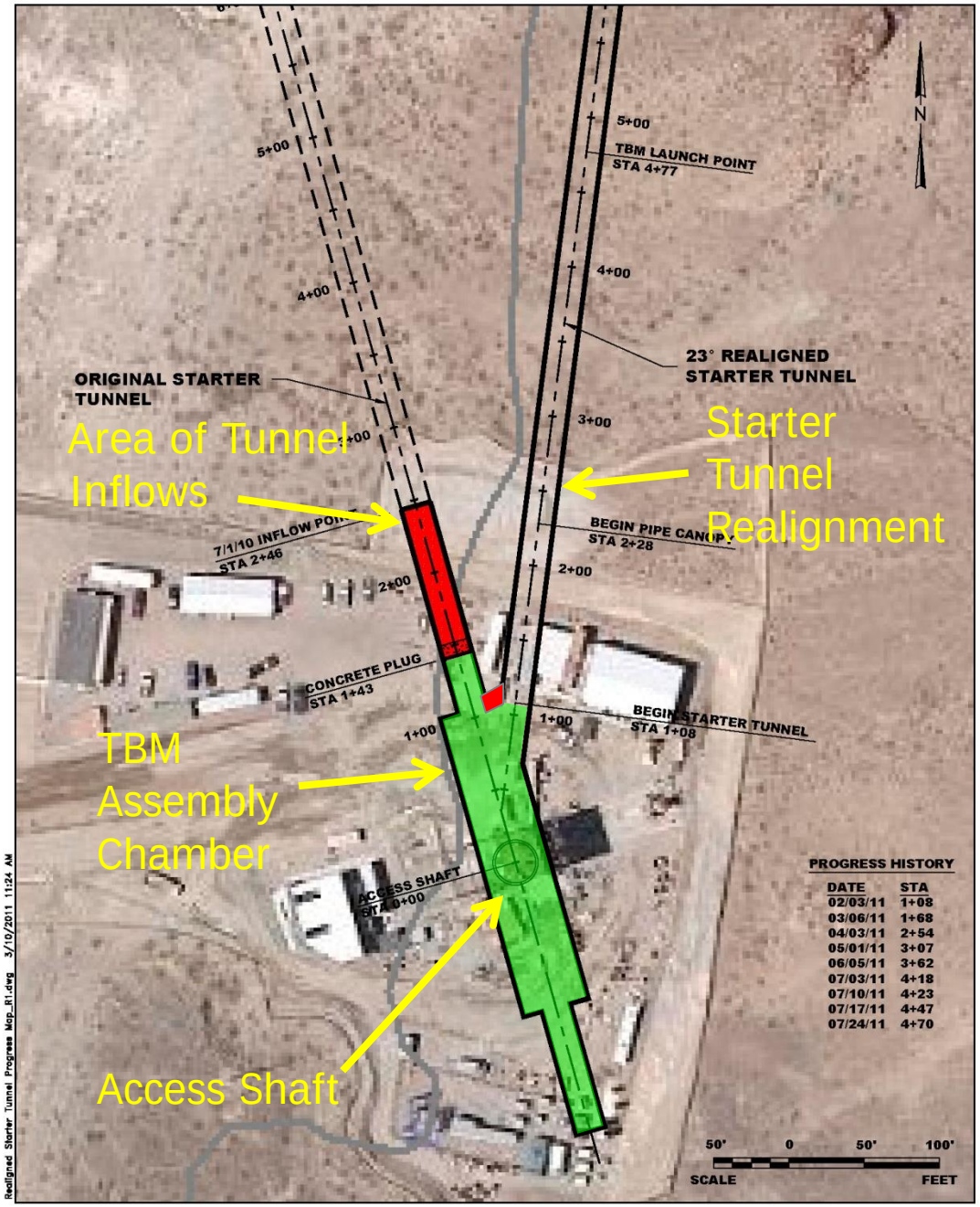
July 1, 2010
Ground Incursion from Fault Zone




KENNEDY
EGT
NES amida
CAUTION
08/28/2010 06:50

Starter tunnel


8/27/10 Graveyard
TBM Chamber
looking at Eastwall and tail tunnel
HITACHI



- After the July 2010 inflow event, inflows occurred again in October and December.
- In January 2011, work began on a new Starter Tunnel alignment to bypass the fault zone.

Feb 15 – Concrete Support Pillar In Place

Assembly Chamber

Tunnel Boring Machine Underground - 2011

Intake Riser Fabricated Off-Shore

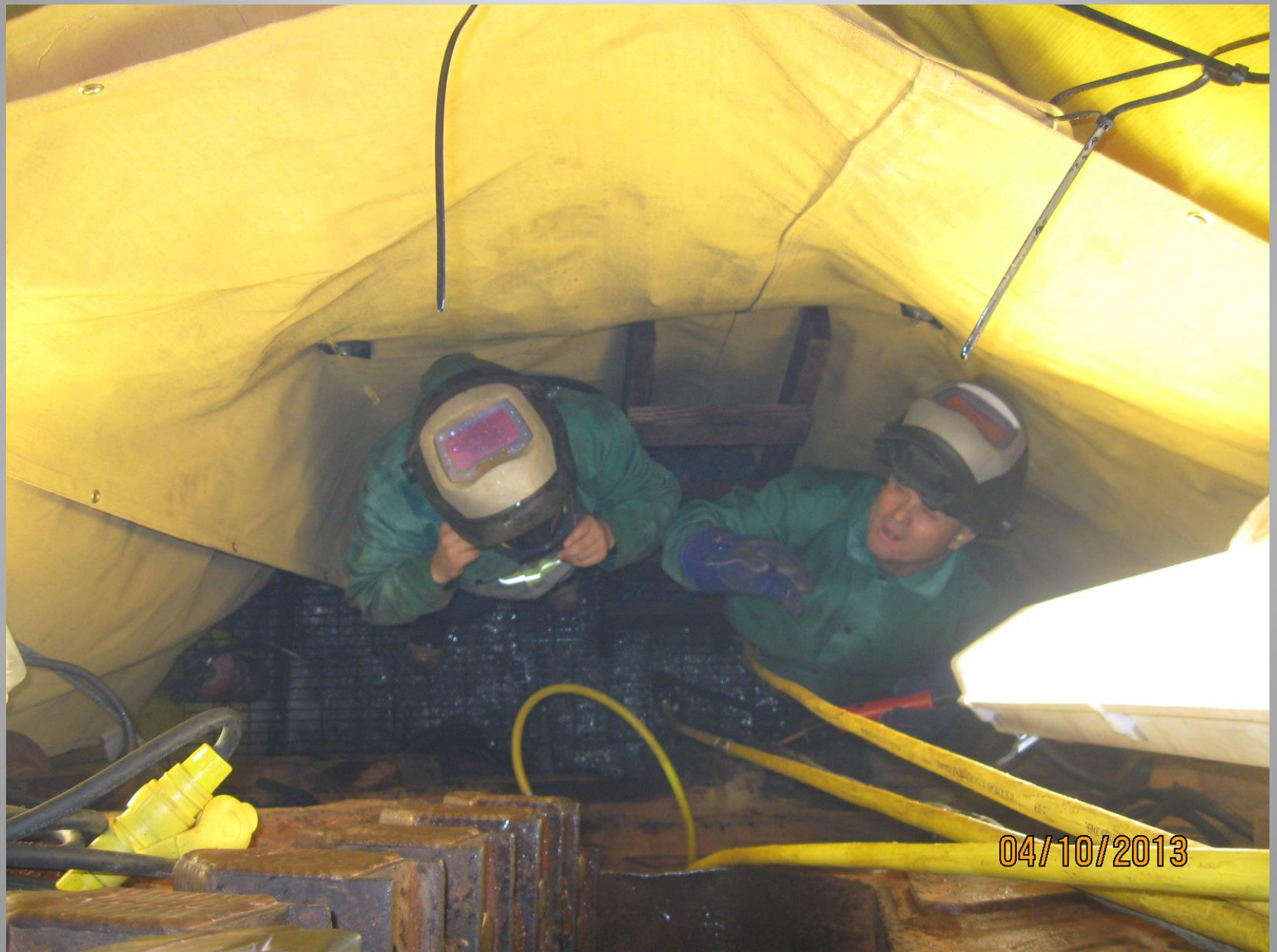
Assembled Intake Structure Conveyed to Intake Site

15 Feb 2012

Irreparable Cutter Disks

2013 Mar 29

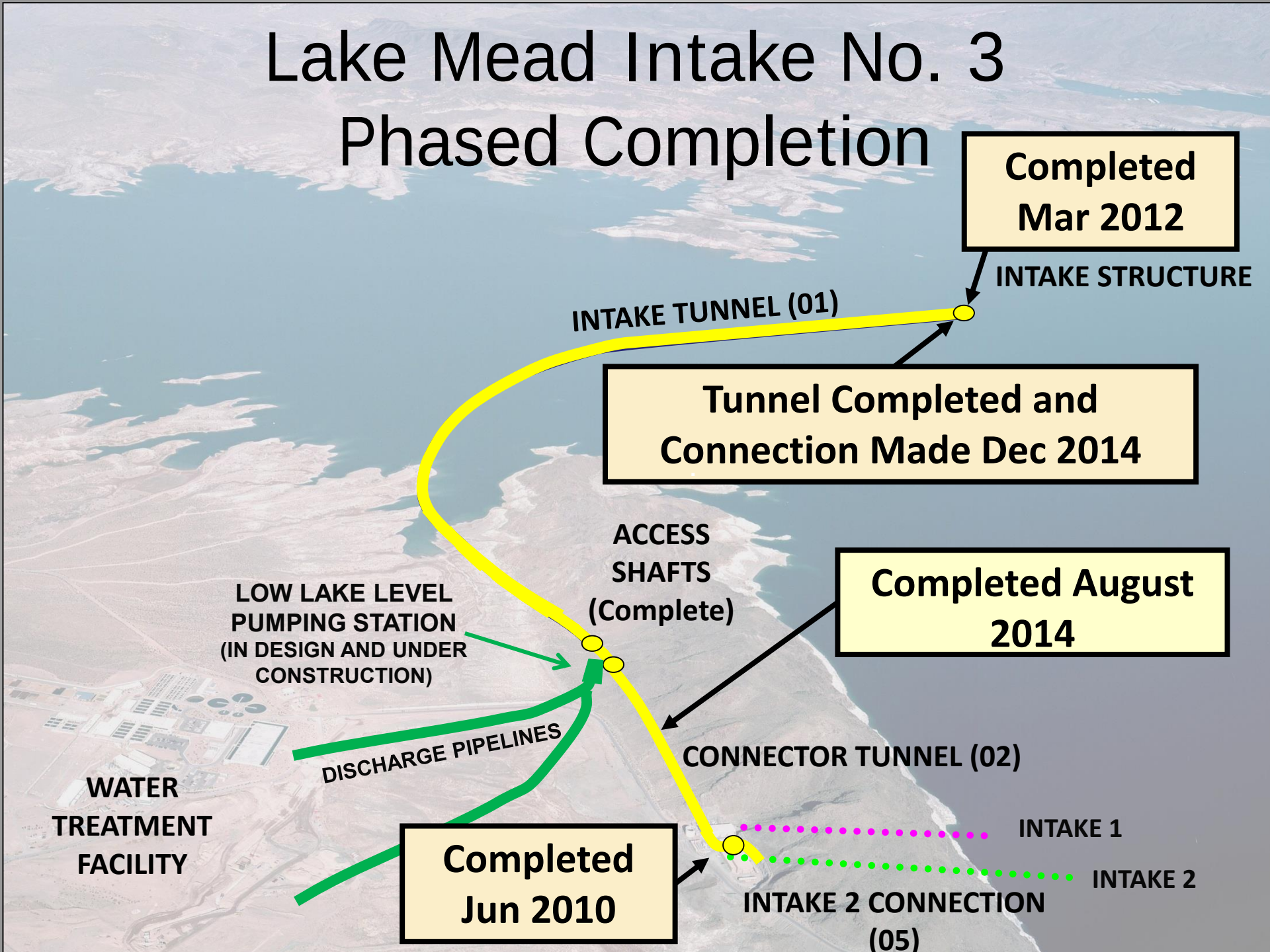
Working Niche In Front of TBM

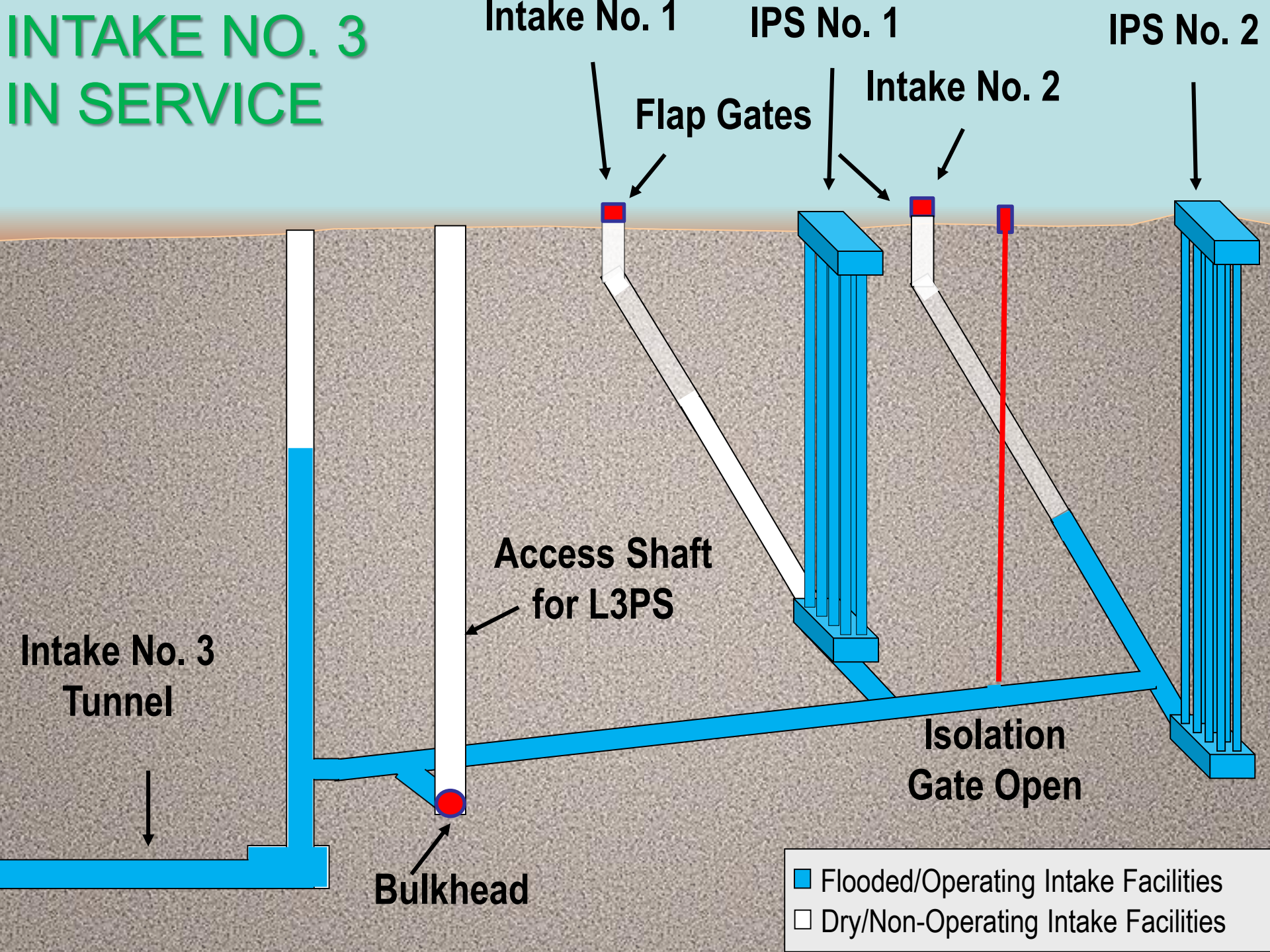


Main Bearing Seal Replacement

TBM Docks with Intake Structure

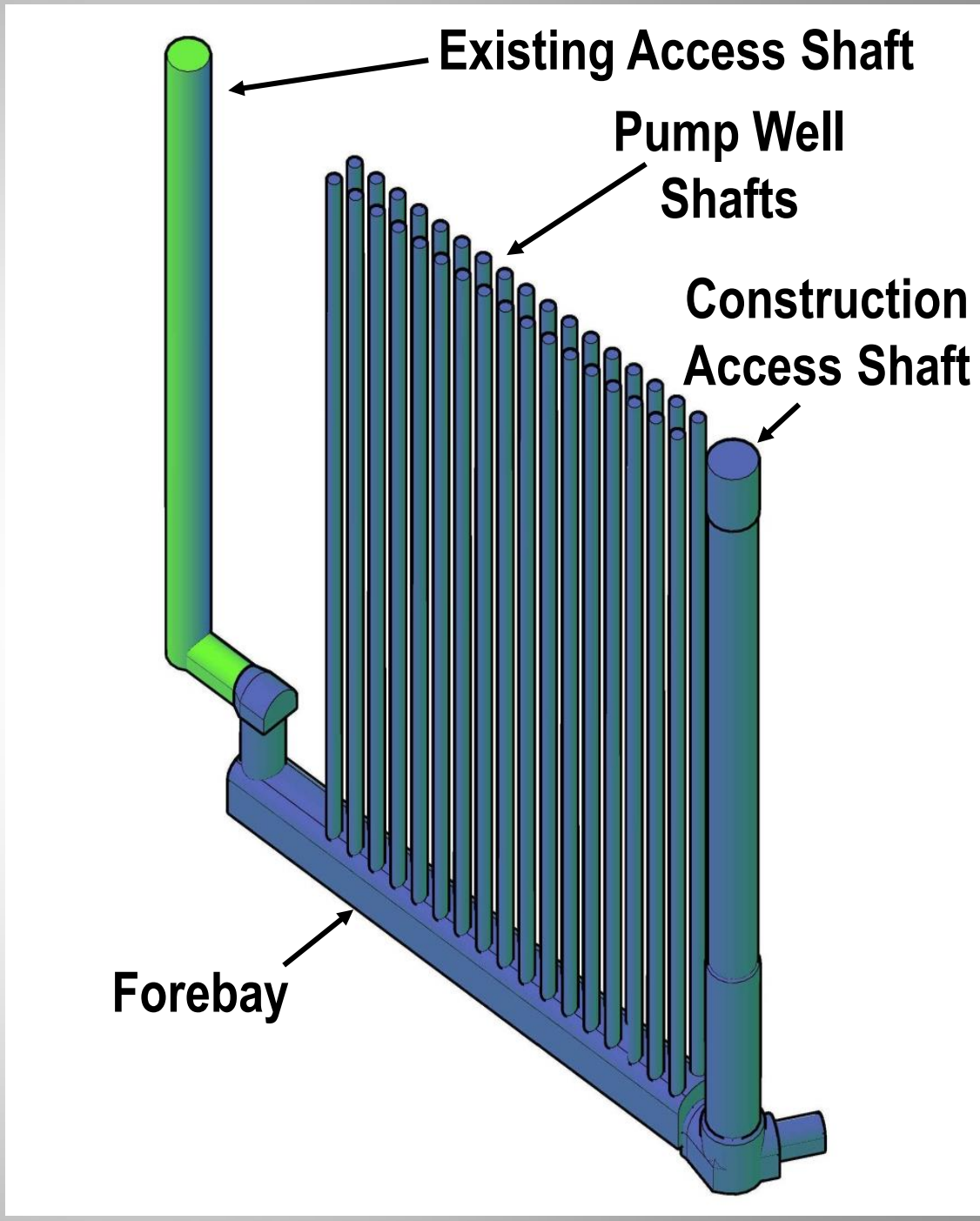
Lake Mead Intake No. 3 Phased Completion




INTAKE NO. 3
IN SERVICE
Intake No. 1
IPS No. 1
IPS No. 2
Flap Gates
Intake No. 2
Access Shaft
for L3PS
Intake No. 3
Tunnel
Isolation
Gate Open
Bulkhead
Flooded/Operating Intake Facilities
Dry/Non-Operating Intake Facilities

Low Lake Level Pumping Station (L3PS)

- Approved as part of advisory panel recommendations in December 2014.
- Connects to the Intake No. 3
- Substitutes for Intake Pumping Stations 1 and 2 at very low lake levels.
- Will operate between lake elevations 875 and 1060.
- Added to Major Construction and Capital Plan in May 2015.
- Construction started June 2015
- Anticipated completion 2020




Questions?