The Last Straw?
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

Natural Flow at Lees Ferry

- Natural Flow
- Average
- 10-Year Average

Note: 2013 and 2014 data are provisional
Colorado River Water Supply Trends

Annual Natural Flows at Lees Ferry

Average Annual Flow 1906 to 2014

Million Acre-Feet


Flow: 10.0, 5.0, 9.0, 15.0, 9.0, 9.0, 7.0, 15.0
Lake Mead Historic Water Elevations

In the month of January each year 1971 SNWS became operational.

Source: http://www.usbr.gov/lc/region/g4000/hourly/mead-elv.html
Lake Mead’s Boulder Basin

- Las Vegas Wash
- Treatment Facility
- Intake Facilities at Saddle Island
- Hoover Dam

30 miles to Las Vegas
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
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

Lake Elevation 1,150-ft

Thermocline

INTAKE NO. 1

INTAKE NO. 2
Initial Water Quality Response to Lower Lake Level

Lake Elevation 1,126-ft. (Aug 2004)

Intake extension installed in 2004 produced immediate water quality improvement.
Lake Levels Below Elevation ~ 1,050 Ft Puts Intake No. 1 Out of Service
Water Quality of Lake Mead

Intake 1
Intake 2
Saddle Island

1,000-ft.

Water Surface 1,000-ft.

Thermocline
Thermocline

Target Depth for New Intake

Temp. (°F)
Proposed treated wastewater outfall at Boulder Islands would compromise the water quality objectives for Intake alternatives at Sentinel Island and Black Canyon.
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

Las Vegas Bay

Intake No. 3

Saddle Island

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

Existing Las Vegas Wash Discharge
Lake Elevation 1,000-ft.

2004 Computer Model Results
Lake Mead Intake No. 3
Primary Components

- Intake 1
- Intake 2
- Intake 3

- Pumping Station
- Intake Tunnel
- Discharge Pipelines
- Connection & Modifications

- Exist Water Treatment Facility
- Saddle Island
- Lake Mead
15,000 Concrete Liner Segments
July 1, 2010
Ground Incursion from Fault Zone
8/27/10 Graveyard
TBM Chamber
looking at Eastwall and tail tunnel
- 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

Old Starter Tunnel

Pillar

New Starter Tunnel

2/15/11 @ 23:30
old and new starter tunnels
Assembly Chamber
Intake Riser Fabricated Off-Shore
Assembled Intake Structure Conveyed to Intake Site
Irreparable Cutter Disks

2013 Mar 29
Working Niche In Front of TBM
Main Bearing Seal Replacement
TBM Docks with Intake Structure

10 Dec 2014
Lake Mead Intake No. 3
Phased Completion

**INTAKE STRUCTURE**
- **ACCESS SHAFTS** (Complete)
  - Completed August 2014

**INTAKE TUNNEL (01)**
- Tunnel Completed and Connection Made Dec 2014
  - Completed Mar 2012

**LOW LAKE LEVEL PUMPING STATION**
- (In design and under construction)

**DISCHARGE PIPELINES**

**WATER TREATMENT FACILITY**
- Completed Jun 2010

**CONNECTION TUNNEL (02)**

**INTAKE 1**

**INTAKE 2**

**INTAKE 2 CONNECTION (05)**
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?