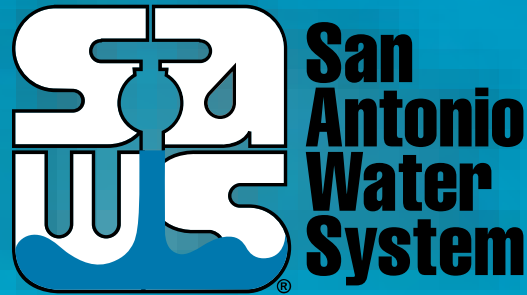


# Mitchell Lake Water Quality Initiative

Gregg Eckhardt  
Senior Analyst, Operations



Peggy Glass, Ph.D.  
Principal, Plummer

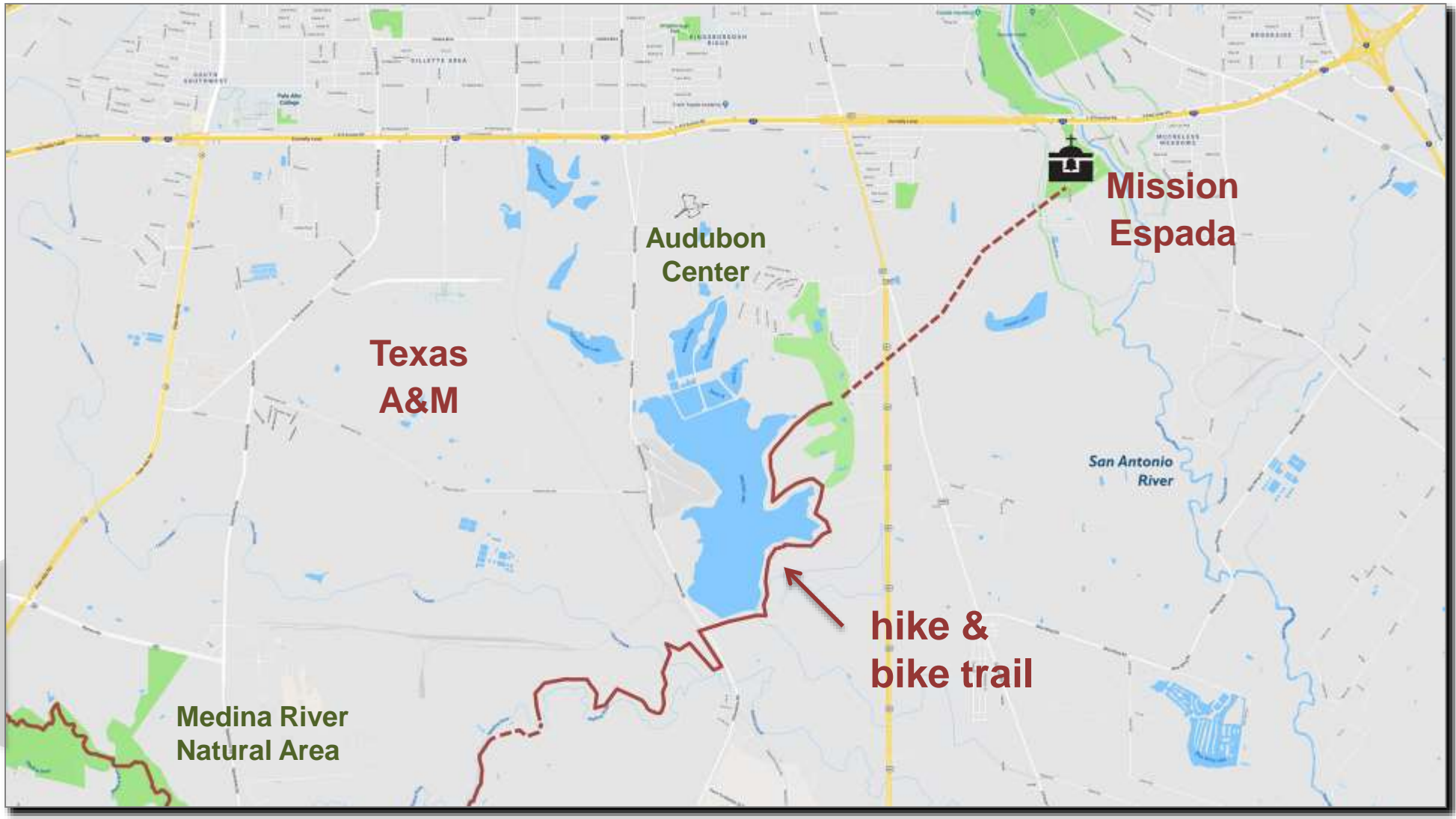


September 13, 2019

MAKING SAN ANTONIO  
**WATERFUL**



# Location of Mitchell Lake



*Bexar county*







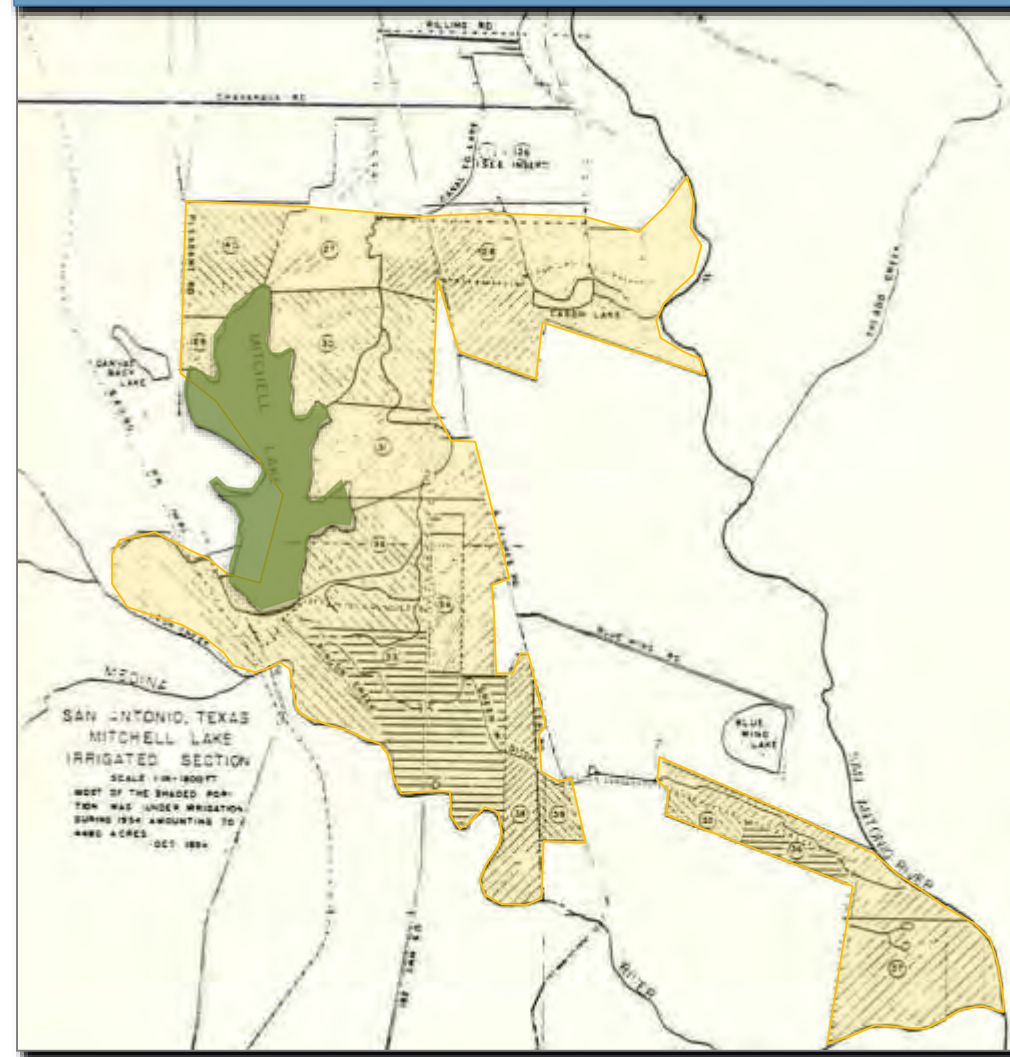
Mitchell Lake Dam



# Report of 1899 City Council Sewer Committee

- "All of this vast volume of water is going to waste, doing nobody any good, and should be taken care of by renting it for irrigation."* - Committee on Sewers, Wm. Davis, Chairman

Irrigated acres around Mitchell Lake, 1954





# Bexar County's Mitchell Lake Termed 585-Acre Cesspool

By **BOB HEATON**

San Antonio might be the only city in Texas with "a 585-acre cesspool."

The reference to Mitchell Lake was made by State Rep. Bill Finck Friday at a meeting between the Bexar County legislative delegation and the Greater San Antonio Chamber of Commerce Legislative Affairs Committee.

In addition to committee members, Reps. Finck, Paul Silber, Frank Lombardino and Nelson Wolff attended, as did City

Councilman Ed Hill.

Finck outlined the water quality bill now in the legislature, saying it would require water flowing into lakes of more than one acre size be of the same quality as that flowing into state streams.

Asked if the Texas Water Quality Board would be in charge of enforcement, Finck said it would not.

"The water quality board is not very good at acting on anything," he charged.

"There is raw sewage in the

Cibolo and in the San Antonio, and they've done nothing, except for a small fine on San Antonio when we failed to come up with a hurricane last year."

Finck was referring to the dumping of 12 million gallons of raw sewage into the San Antonio River in anticipation of heavy rains from Hurricane Celia which failed to materialize.

Enforcement, he said, would be in the hands of the Attorney General's office, if the law is passed.

Heavy penalties are provided,

he added—up to \$10,000 per day.

An objection was voiced from the committee. Finck rapped, "If you don't think Mitchell Lake is offensive, why don't we have a meeting there next time?"

It was pointed out by committeeman Frank Manupelli that tertiary treatment of sewage—required when a plant has no detention pond—costs at least 50 per cent more, and often doesn't work better than ordinary methods.

Silber asked committeemen if

San Antonio Light, March 13, 1971



# TPDES Permit

San Antonio Water System

TPDES Permit No. WQ0010137004

## EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall Number 001

1. During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

The daily average flow of effluent shall be intermittent and variable.

Effluent Characteristic	Discharge Limitations				Minimum Self-Monitoring Requirements	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Max. Measurement Frequency	Single Grab Sample Type
Flow, MGD	Report*	N/A	Report	N/A	One/day*	Instantaneous
Biochemical Oxygen Demand (5-day)	30* (N/A)	45	70	100	One/day*	Grab
Total Suspended Solids	90* (N/A)	135	N/A	N/A	One/day*	Grab
<i>E. coli</i> bacteria, CFU or MPN of per 100 ml	126**	N/A	N/A	394	One/month	Grab

\* Monitoring shall occur when discharging.

\*\* samples for bacteria monitoring shall be taken at the inflow pipe from the Leon Creek WRC

2. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per day by grab sample.\*
3. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
4. Effluent monitoring samples shall be taken at the Outfall.
5. The effluent shall contain a minimum dissolved oxygen of 4.0 mg/l and shall be monitored once per day by grab sample.\*

Page 2











# Texas Largest and Oldest National Audubon Society

- National network of community-based nature centers and chapters
- Partner with SAWWS to make site available for the public and provide environmental education



Community Events



Citizen Science

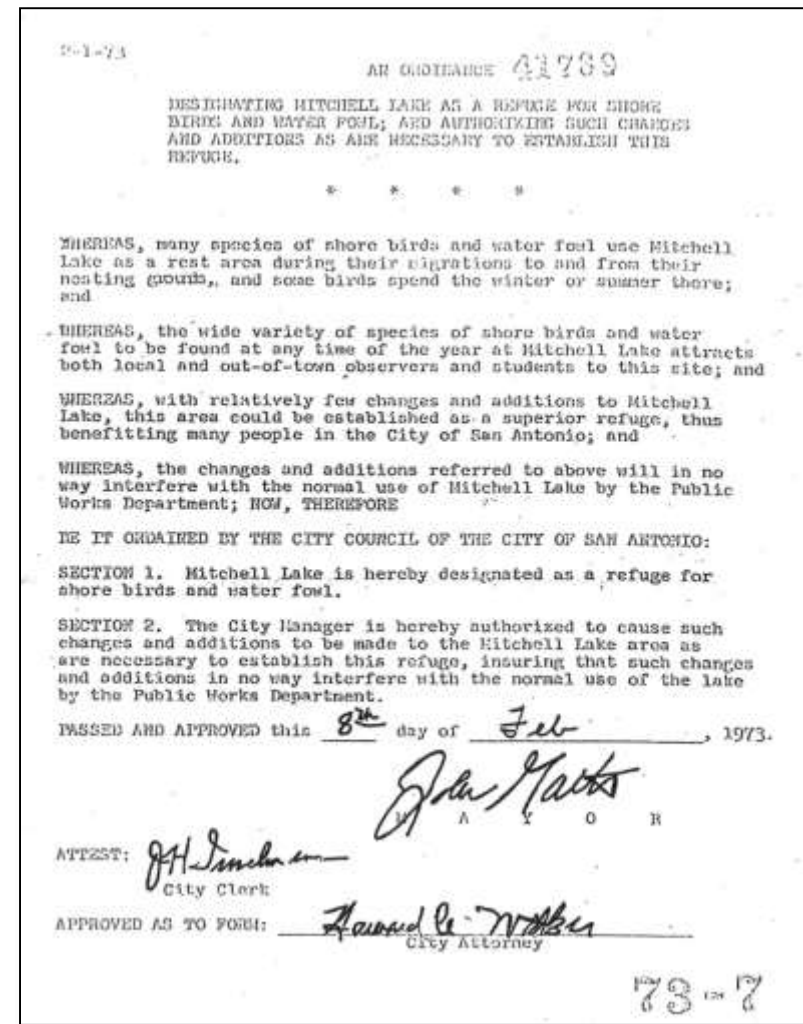


Education Programs



# City Commitments

- 1973 Ordinance - designated Mitchell Lake as a Refuge for Shore Birds and Water Fowl
- 1986 Ordinance - city affirmed it would “continue its commitment to restore and maintain Mitchell Lake.”
- SAWWS provision of up to 3,583 acre-feet of recycled water per year





# Mitchell Lake Today







Discharge to Lake from Leon Creek WRC





Discharge from Mitchell Lake



# 2016 Administrative Order for Mitchell Lake

 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
144E ROSS AVENUE, SUITE 1200  
DALLAS, TEXAS 75202-2732

**AUG 12 2016**

CERTIFIED MAIL - RETURN RECEIPT REQUESTED: 7015 1520 0003 3989 8450

Mr. Steve Clouse  
Chief Operating Officer & Senior Vice-President  
San Antonio Water System  
2100 U.S. Highway 281 North  
San Antonio, TX 78212

Re: Administrative Order; Docket Number: CWA-06-2016-1770  
NPDES Permit Number: TX0065641

Dear Mr. Clouse:

Enclosed is an Administrative Order (AO) issued to the San Antonio Water System (SAWS) for violation of Section 301 of the Clean Water Act (CWA) (33 U.S.C. §§ 1251-1387). Violations were identified during a review of the permit file and Discharge Monitoring Reports submitted to the Environmental Protection Agency, Region 6 (EPA). The violation alleged is for failure to meet effluent limits as required by the permit.

The AO does not assess a monetary penalty; however, it does require compliance with the permit requirements and applicable federal regulations. The first compliance deadline is within thirty days of receipt of the AO. The AO also contains other compliance deadlines and information demands. EPA is committed to ensuring compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) program and my staff will assist you in any way possible. Please reference AO Docket Number CWA-06-2016-1770 and NPDES Permit Number TX0065641 on your response.

If you have any questions, please contact Mr. Ted Pali, P.E., of my staff, at (214) 665-8061.

Sincerely,

  
John Birvins  
Director  
Compliance Assurance and  
Enforcement Division

Enclosures

cc: Mr. Sandy Van Cleave (MC 169)  
Enforcement Section 1  
Texas Commission on Environmental Quality  
P.O. Box 13087  
Austin, TX 78711-3087



# Constructed Wetlands Below Lake

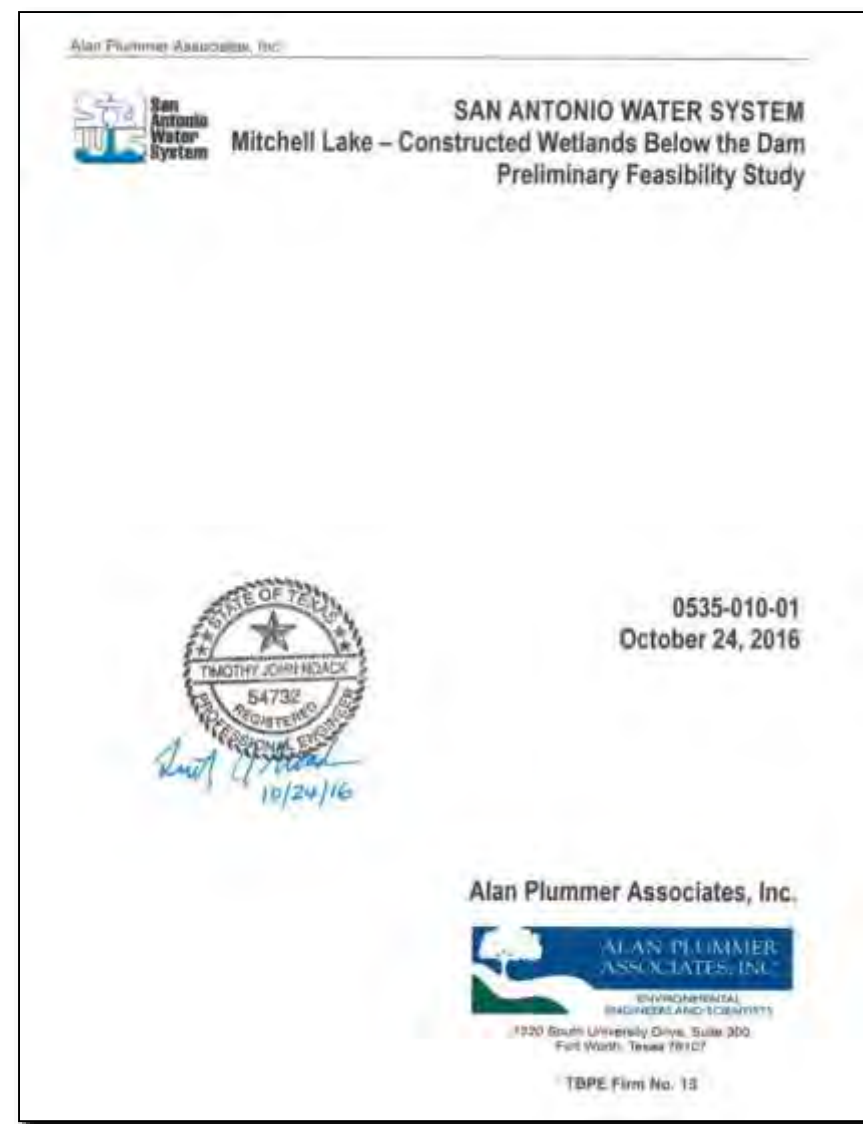
- Approximately 120 acres





# 2016 Preliminary Feasibility Study

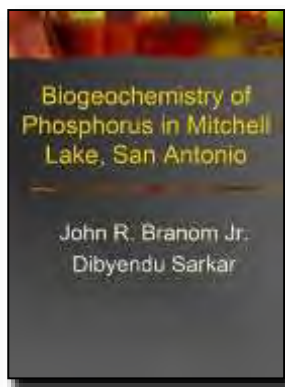
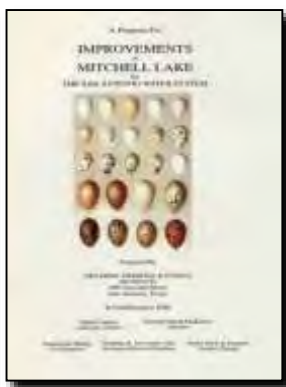
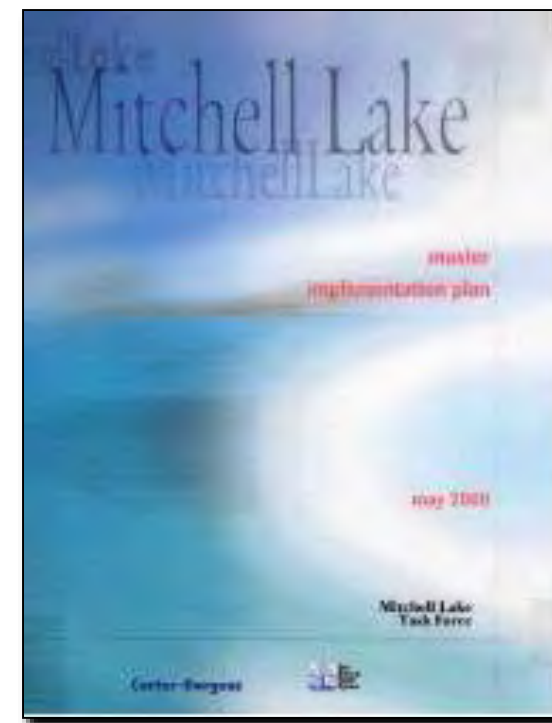
- Suitability of land
- Gravity flow
- Quality of wetland discharge
- Management of stormwater inflows





# Community Involvement and Plans

- 1987 Mitchell Lake Recovery Advisory Committee
- 1997 Mitchell Lake Steering Committee
- 1997 Mitchell Lake Wetlands Feasibility Study
- 1999 Mitchell Lake Task Force
- 2000 Site Master Plan completed
- *Many additional specialized studies*





# 2018 EPA Schedule Order for Constructed Wetlands

	2021												2022												2023												2024																
Major Work Activities	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S										
Engage Phase 2 Consultants	█																																																				
Phase 2 Wetland Design		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█																																		
Advertise/Bid/Award																			█	█	█																																
Phase 2 Construction																							█	█	█	█	█	█	█	█	█	█	█	█	█																		
Operation/Contingencies																																													█	█	█	█					





**pilot wetlands**

**Mitchell Lake dam**

**constructed wetlands**

**contract negotiations for tract**

Leon Creek

Medina River

Medina River

Medina River

Medina River

Medina River

Medina River

Pasaunton Rd

Pasaunton Rd

Pasaunton Rd

Pasaunton Rd

Pasaunton Rd

Pasaunton Rd

Pasaunton Rd

Farm-To-Market 2537

Fenix St

Laredo Rd

Pvt Rd

Laredo Rd

Marines/Laura Rd

Marines/Laura Rd

Marines/Laura Rd

281

S Flores Rd

1927

Blue Wing Rd

7th St

4th St

2nd St

5th St

6th St

7th St

8th St

9th St

10th St

11th St

12th St

13th St

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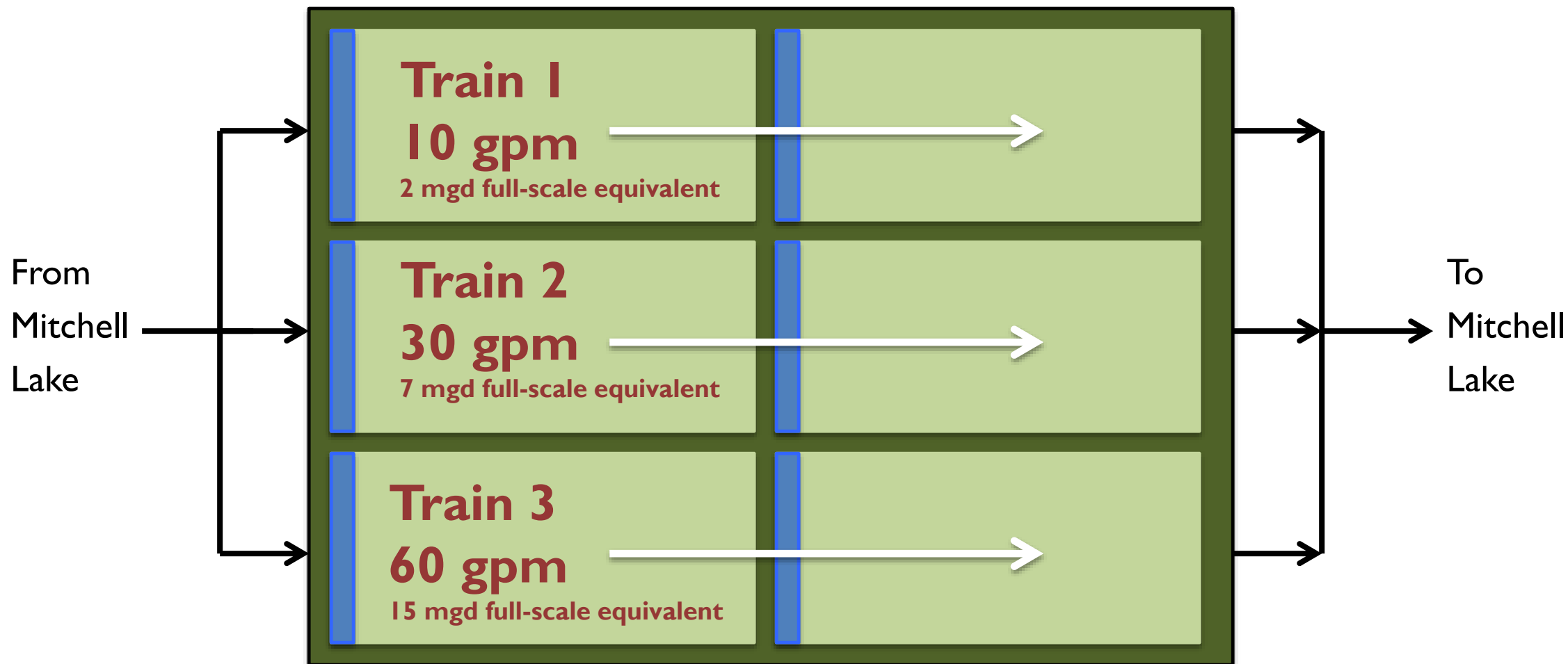
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# Pilot Wetlands

1.3 wetted acres











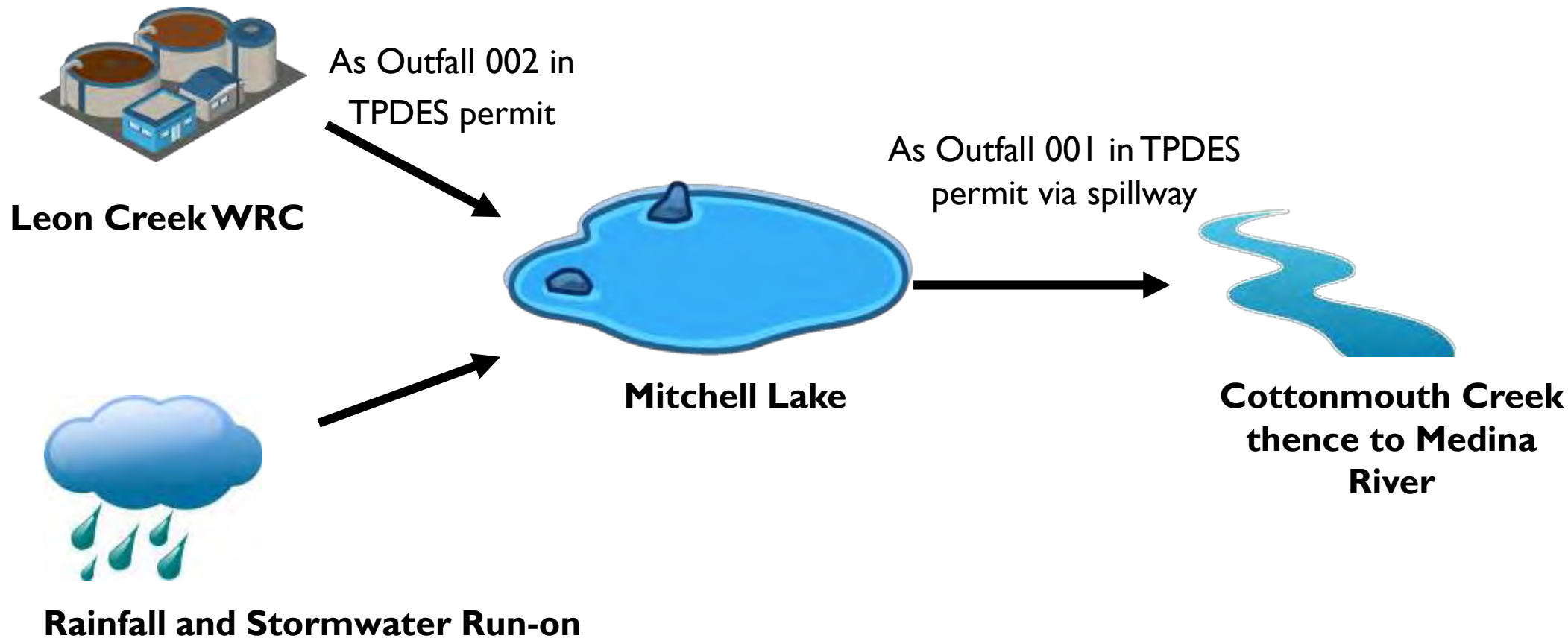


# Regulatory Considerations

- Cultural Resources
- Floodplain
- Phase I Environmental Site Assessment (ESA)
- TPWD Sand, Gravel and Marl Permit
- Mitchell Lake TPDES Permit
- Leon Creek Water Recycling Center TPDES Permit
- Corps of Engineering 404 Permit



# Current Scenario





# Future Scenario



As Outfall 002 in TPDES permit



Mitchell Lake



Constructed Wetlands

Via spillway

As stormwater structural control or designated outfall



Cottonmouth Creek thence to Medina River



Rainfall and Stormwater Run-on





# Regulatory Challenge – Mitchell Lake TPDES Permit

- More Stringent Effluent Quality Limits
- Bypass Prohibition





## Proposed Solution – Mitchell Lake TPDES Permit

- There is an 8.7 square mile watershed
- There have been no discharges to Mitchell Lake of raw, or partially treated, wastewater or treatment residuals since 1987



Permit as a structural control in the MS4 permit





# MS4 Considerations

≈ Water Quality Standards

≈ Anti-backsliding

≈ Permit limits for Leon Creek Water Recycling Center





## Water Quality Standards - Uses

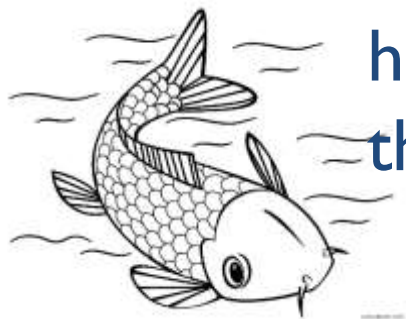
- High Quality Waterfowl Habitat
- Non-contact Recreation
  - Limited Access
  - Turbid
  - Audubon visitors advised to stay out of water as a safety consideration





## Water Quality Standards - Uses

- Limited Aquatic Life Use based on aquatic community--  
San Antonio River Authority biological sampling 1995
  - “Fish community assemblages indicate a limited and unbalanced diversity”
  - Regarding benthic macroinvertebrates, “only the hardiest and most tolerant aquatic species” can thrive here



# Water Quality Standards - Uses

- Limited Aquatic Life Use based on hydrology
- Would be intermittent without discharge from Leon Creek Water Recycling Center





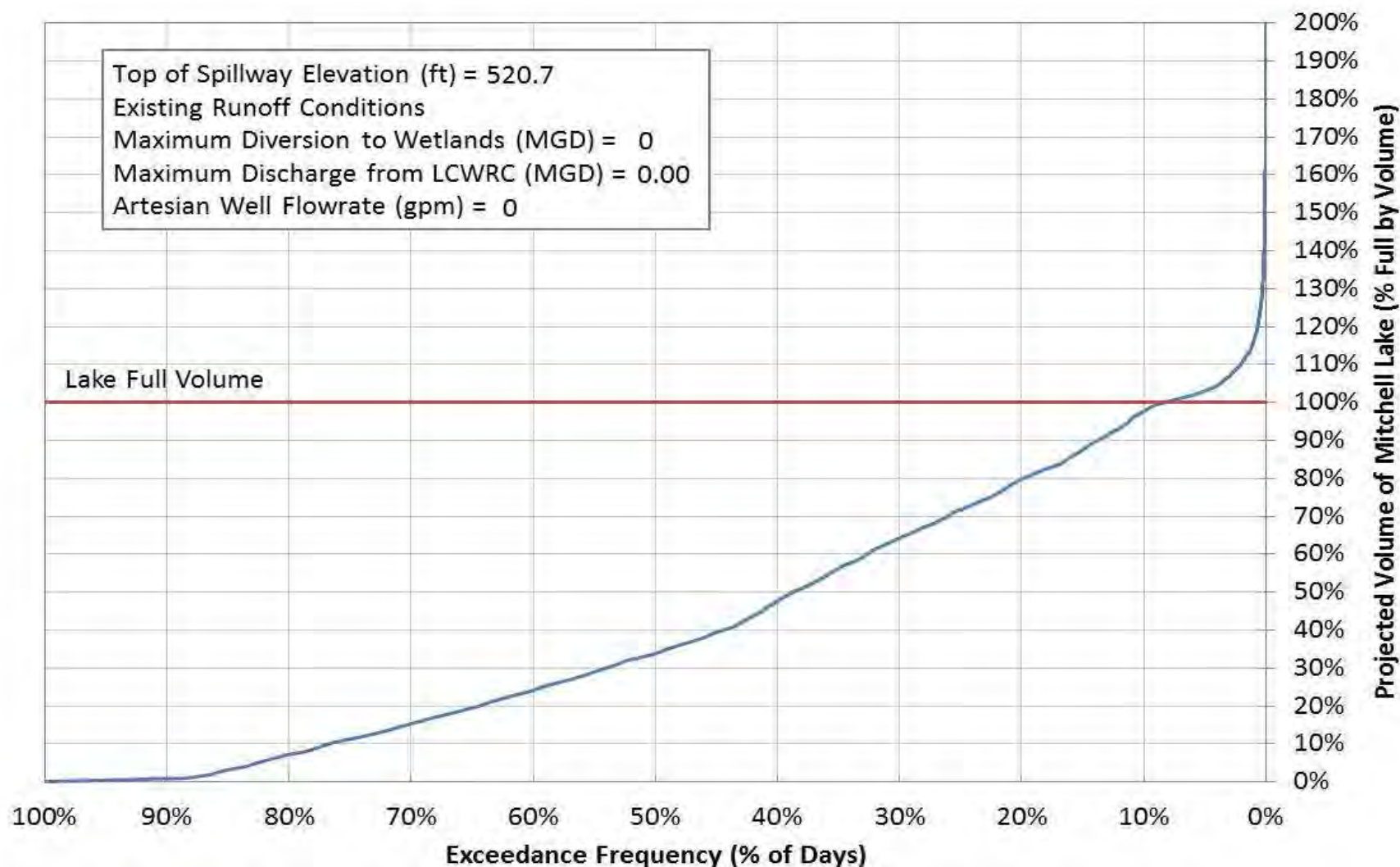
# Water Quality Standards - Hydrology

## Mitchell Lake and Polders in 1980's



# Water Quality Standards Hydrology – Water Balance Model

- Water balance model 1965-2018
- Existing conditions – no discharges from Leon Creek Water Recycling Center
- <10% of volume 22.3% of time
- Dry 456 days (2.3%)





# Proposed Water Quality Standards



- ≈ Daily average dissolved oxygen = 3.0 mg/L
- ≈ Escherichia coli = 2,060 MPN/100ml



## Anti-Backsliding - Improved Quality

Discharge Quality		
Parameter	TPDES Permit Limit	Wetlands Discharge Quality
BOD <sub>5</sub> (mg/L)*	30	10-15
TSS (mg/L)*	90	20-30
NH <sub>3</sub> -N (mg/L)*	No limit	3-5
DO (mg/L)	4	4-5
pH (s.u.)	6-9	6-9
*30-day average		



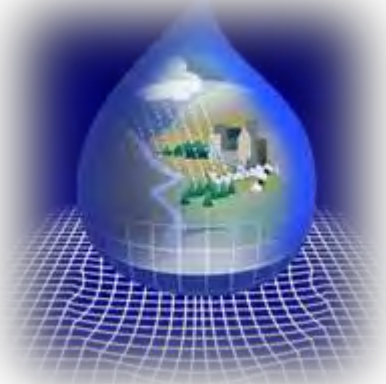
# Anti-Backsliding

- Anti-backsliding applies to water quality-based effluent quality permit limits
- An exception can be granted “if material and substantial alterations occurred”
- Reduced frequency of releases over spillway



# Leon Creek Water Recycling Center TPDES Permit

- ✓ Current project determined bathymetry and water quality
- ✓ WASP Model is being constructed
- ✓ Modeling challenge is reproducing algae growth and impacts





## 404 Permit

Questions still to be answered –



- To what extent does the designation of the water in Mitchell Lake as Waters in the State change the requirements for a 404 permit?
- Is the project eligible for an exemption or a nationwide permit, or will an individual permit be required?

# Water Rights

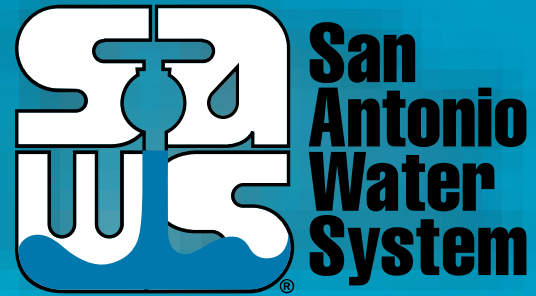


- Mitchell Lake is permitted to impound 2,640 acre-feet of water. This will not change.
- The water balance model demonstrates that more flows will be passed to downstream water rights holders because of the continuous discharge to the wetlands.



# Mitchell Lake

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Senior Analyst, Operations



Peggy Glass, Ph.D.  
Principal, Plummer



September 13, 2019

MAKING SAN ANTONIO  
**WATERFUL**

