Lake 17 General Fact Sheet

Lake 17 is an artificial impoundment formed by the combination of a dam at the lake itself, and a diversion dam south of the lake. Both the diversion dam and main dam at the lake were constructed in the 1930's with the intended purpose of supplying water for a planned irrigation system. For nearly a century, the large, shallow impoundment has provided critical open water and wetland habitat for a variety of wildlife including birds, mammals, reptiles, and amphibians.

Drainage Areas & Annual 2, 10, 25, 50, 100 Year Runoff Volumes and Peak Flows:

- The lake 17 watershed alone yields snowmelt volumes of 336 acre-feet and 1150 acre-feet for snowfall depth expected on a 5-year and 25-year frequency, respectively.
- Lake 17 has a storage volume of 612 acre-feet at a depth of 5 feet depth which increases to 4111 acre-feet at a depth of 12 feet depth. Twelve feet is the depth at which flow begins to spill into the principal spillway.

These numbers illustrate the low likelihood of Lake 17 ever filling from its own watershed. This conclusion is further compounded by the fact a considerable evaporative loss (est. 42 inches net loss) occurs each year over the entire surface area of the pool.

Directing yields from Little Suction Creek into the Lake 17 watershed significantly increases the reliable yield realized by Lake 17.

- Snowmelt volume increases from 336 acre-feet to 868 acre-feet for a snowfall depth expected on a 5-year frequency.
- Similarly, the 25-year snowmelt volume increases from 1150 acre-feet to 3704 acre-feet.
- Increased pool volumes also mean increased perimeter length and surface area thus increasing the habitat value of the area. The Lake 17 pool perimeter increases by 9 miles and pool surface area increases by 460 acres as the depth increases from 5 feet to 12 feet.

Runoff Volumes and Peak Flows

	Annual	2yr – 24hr	5yr – 24hr	10yr – 24hr	25yr – 24hr	50yr – 24hr	100yr – 24hr
Runoff Volume (ac-ft)	2,820	3,088	-	-	-	-	-
Peak Flow (cfs)	29	50	136	222	367	504	665

- Mean monthly evapotranspiration from March to June = 1.61 inches
- Mean monthly evapotranspiration from June to October = 1.63 inches
- Mean annual precipitation = 14.56 inches

Water Budget:

- 1967 State Water Conservation Board Document:
    - Little Peoples Creek
        - Present Irrigated Acres = 1,359
        - Acres Under Present Facilities = 280
        - Maximum Irrigable Acres = 1,639
    - Operation and Maintenance Costs for People Creek (Hays) = $15.00 per acre for both Indian-owned and non-Indian land
    - Present Users of Peoples Creek (Hays) Unit = 86
    - Acreage Irrigated in 1966 of Peoples Creek (Hays) Unit = 1,151 acres irrigated, 258 acres potentially irrigable
- BIA Design Data:
    - Shows 50 Acres of irrigation at 7.10 gross acre-feet per acre of water needed
        - 355 acre feet for irrigation
    - Shows livestock 0.5 cfs for 12 months = 361 acre feet
    - Total of 716 acre feet water demand

Characteristics	Existing Lake 17 Dam	2013 Proposed Lake 17 Dam
Dam Height	16 feet	17 feet
Dam Length	750 feet	1800 feet
Top Width	16 feet	16 feet
Top of Dam Elevation	3025.50 feet	3026.50 feet
Principal Spillway Crest Elevation	3020.90 feet	3020.90 feet
Auxiliary Spillway Crest Elevation	3022.10 feet	3023.10 feet
Surface Area at Top of Dam Elevation	41,267,533 Square Feet or 947.37 Acres	43,286,799 Square Feet or 993.73 Acres
Surface Area at Principal Spillway Crest Elevation	31,931,936 Square Feet or 733.06 Acres	31,931,936 Square Feet or 733.06 Acres
Surface Area at Auxiliary Spillway Crest Elevation	34,551,241 Square Feet or 793.19 Acres	36,762,883 Square Feet or 843.96 Acres
Storage Volume at Top of Dam Elevation	7,925 Acre-Feet	8,894 Acre-Feet
Storage Volume at Principal Spillway Crest Elevation	4,038 Acre-Feet	4,038 Acre-Feet
Storage Volume at Auxiliary Spillway Crest Elevation	4,954 Acre-Feet	5,773 Acre-Feet
Estimated Average Annual Runoff Volume	2,820 Acre-Feet	2,820 Acre-Feet
Estimated Average Annual Evaporation Volume	2,566 Acre-Feet (42 inches per Year)	2,566 Acre-Feet (42 inches per Year)
Estimated Average Annual Conveyance Loss Volume	4.97 Cubic Feet per Second per Mile	4.97 Cubic Feet per Second per Mile
Estimated Average Annual Storage Volume	2,199 Acre-Feet	2,199 Acre-Feet
Estimated 2-Year Frequency Runoff Volume (50% Probability Occurrence)	3,088 Acre-Feet	3,088 Acre-Feet
Estimated Storage Volume Expected Every Other Year	3,874 Acre-Feet	3,874 Acre-Feet

Lake 17 Pool Alternative Characteristics			
Characteristic	With Diversion at Base Elevation of 3014 feet	Without Diversion at Base Elevation of 3014 feet	Removal of Diversion & Dam
Pool Surface Area	467 Acre Feet	351 Acre Feet	279 Acre Feet
Pool Volume	1,864 Acre Feet	934 Acre Feet	612 Acre Feet
Pool Perimeter	60,130 feet	48,050 feet	38,153 feet

Little Suction Creek Diversion Dam Heights & Characteristics:

- The diversion dam is an earthen structure has a length of 2000 feet and maximum height of 13 feet.

Dam Breach Characteristics:

The breach flow for hazard class was determined to be 14,000 cfs.

- Parameters
    - The projection conditions were created to simulate an 18-hour flow generated from the principal spillway when the water surface is at the crest of the auxiliary spillway (400 cfs) and an initial flow in the channel of 60 cfs (the two-year flow of Little People Creek is 50 cfs).
    - After 18 hours of flow, a time to fail of two hours was computed and a conservative time of one hour was used from the beginning of the breach to the peak.
    - The breach was then carried out another 22 hours past the start of the breach to a low flow of 200 cfs.

Anticipated Costs to Rehab the Diversion and Dam:

- The total construction costs for the project were estimated to be $1,558,167 in 2013.
    - The construction cost for Lake 17 dam improvements were estimated at $877,022 in 2013.
    - The construction cost for diversion dam reconstruction were estimated at $681,145 in 2013.
- The total construction costs for the project were estimated to be $1,998,176 in 2017.
    - The construction cost for Lake 17 dam improvements were estimated at $1,116,136 in 2017.
    - The construction cost for diversion dam reconstruction were estimated at $882,040 in 2017.