

2. Project Description

The Taum Sauk Project is located in Reynolds County, Missouri, on the East Fork of the Black River approximately 90 miles southwest of St. Louis, Missouri. The project is a reversible pumped storage project used to supplement the generation and transmission facilities of AmerenUE, and consists basically of a mountain ridge top upper reservoir, a shaft and tunnel conduit, a 450-MW, two-unit pump-turbine, generator-motor plant and a lower reservoir. It was the first of the large capacity pumped-storage stations to begin operation in the United States. The Project was completed in 1962 and the first filling of the Upper Reservoir began in July 1963. The plant went into commercial operation on December 20, 1963. The operating head between the Upper and Lower Reservoir ranges from 776 ft to 860 ft.

New pump/turbine runners were installed in 1999 resulting in a maximum pumping flow of 3,000 cfs per unit compared to a design flow of 2,450 cfs per unit for the original runners. The upper reservoir has a capacity of 4,350 acre-ft. There is no upper reservoir spillway.

The Upper Dam is a continuous hilltop dike 6,562-ft long forming a kidney-shaped reservoir as shown in Figure 1-1. The dike is a concrete-faced dumped rockfill dam (CFRD) from the foundation level to elevation 1570.0 ft and a rolled rockfill between Elevations 1570 and 1589. The upstream slope is 1.3:1 (horizontal:vertical) and the downstream slope is at the natural angle of repose of the material, approximately 1.3:1, as shown in Figure 2-1. The crest is 12- feet wide. A 10-foot high, 1-foot thick reinforced concrete parapet wall atop the fill extended the crest to elevation 1,599 feet, as originally constructed. Since 1963, the settlements of the rockfill embankment at various points have varied between 1 to 2 feet; the low point at the top of the parapet wall, as surveyed by AmerenUE on November 6, 2004 was elevation 1596.99 feet at Panel 72.

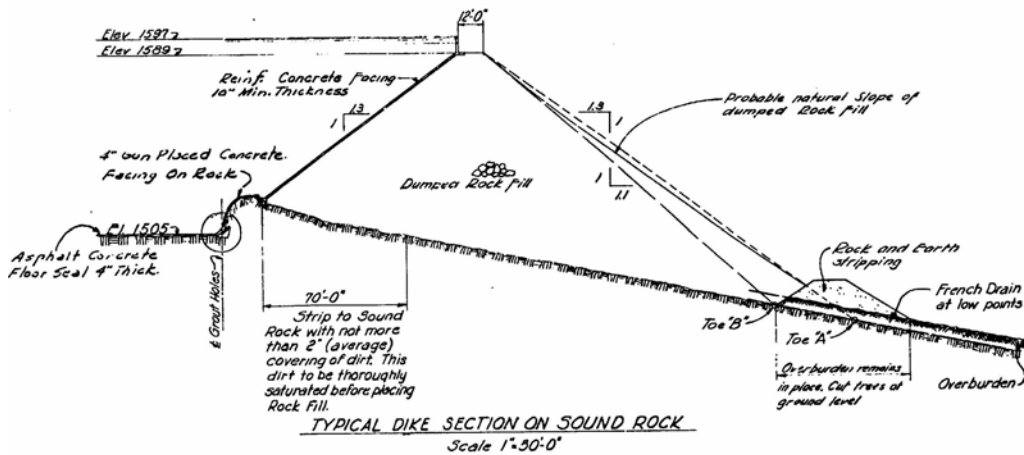


Figure 2-1 Cross section from original design drawings

The pneumatically placed upstream reinforced concrete face slab has a design thickness of 10 inches, and had joints (with copper waterstops) located at the junctures with the parapet wall, the foundation cutoff-slab and with adjacent face panels. The face slab was placed in panels, 60 feet wide at their widest dimension.

The project license was issued on August 26, 1965. The licensee is AmerenUE with headquarters in St. Louis, MO. Taum Sauk is the only pumped storage facility in the AmerenUE system. It is dispatched from the St. Louis control center based on economics and the need to meet requirements of the Mid-West Independent System Operator (MISO) and the Northeast Electric Reliability Council (NERC).

AmerenUE's St. Louis control center staff provide generate mode and pump mode start, stop and generating Megawatt (MW) instructions to operators at Osage control center (Bagnell Dam). In the pumping mode, input MW and pump cfs (cubic feet per second) discharge depend on the head (elevation difference between the upper and lower reservoirs) and are not adjustable. The Osage operators remotely start, stop and load the Taum Sauk units as instructed. Protection circuits are provided at Taum Sauk to prevent operating the units or reservoirs beyond established limits.

Over-pumping protection of the upper reservoir consists of two separate systems, the water level monitoring and control system and the emergency level protection backup system. These over-pumping protection systems were initiated into operation in November of 2004 in conjunction with the installation of a geomembrane liner to reduce reservoir leakage. As part of this "project improvement" the old reservoir control systems which were anchored to the concrete face prior to 2004 were replaced by the new system in November of 2004. The new system was not anchored to the concrete face because it was

decided that the new geomembrane liner should not be penetrated by anchor bolt holes. The HDPE pipe housing the pressure instruments was not positively anchored to the concrete face slab.