White Paper 1: Fill Mead First: A Technical Assessment | Colorado River Studies

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The Fill Mead First (FMF) plan would establish Lake Mead reservoir as the primary water storage facility of the main-stem Colorado River and would relegate Lake Powell reservoir to a secondary water storage facility to be used only when Lake Mead is full. The objectives of the FMF plan are to re-expose some of Glen Canyon's sandstone walls that are now inundated, begin the process of re-creating a riverine ecosystem in Glen Canyon, restore a more natural stream-flow, temperature, and sediment-supply regime of the Colorado River in the Grand Canyon ecosystem, and reduce system-wide water losses caused by evaporation and movement of reservoir water into ground-water storage. The FMF plan would be implemented in three phases. Phase I would involve lowering Lake Powell to the minimum elevation at which hydroelectricity can still be produced (called minimum power pool elevation): 3490 ft asl (feet above sea level). At this elevation, the water surface area of Lake Powell is approximately 77 mi2, which is 31% of the surface area when the reservoir is full. Phase II of the FMF plan would involve lowering Lake Powell to dead pool elevation (3370 ft asl), abandoning hydroelectricity generation, and releasing water only through the river outlets. The water surface area of Lake Powell at dead pool is approximately 32 mi2 and is 13% of the reservoir surface area when it is full. Implementation of Phase III would necessitate drilling new diversion tunnels around Glen Canyon Dam in order to eliminate all water storage at Lake Powell. In this paper, we summarize the FMF plan and identify critical details about the plan's implementation that are presently unknown. We estimate changes in evaporation losses and ground-water storage that would occur if the FMF plan was implemented, based on review of existing data and published reports. We also discuss significant river-ecosystem issues that would arise if the plan was implemented.