Desalting plant.—The cost estimates in this report for the desalting plant are based upon estimates provided by the Office of Saline Water. The reference plant concept represents 1990–1995 projections and is a combination multi-effect, vertical tube and multistage flash evaporator. Both the vertical tube and horizontal condenser surfaces are shaped to promote high heat transfer rates. The maximum brine temperature is limited to 250 degrees F., with acid pretreatment of feed to reduce scale formation problems in the evaporator.

The reference plant has a capacity of 1 billion gallons per day (bgd) divided into four trains of 250 million gallons per day (mgd) each. The concept includes improvements in plant technology which are currently undergoing laboratory tests.

For purposes of this analysis, plants were sized for each stage to provide the quantity of desalted water desired for delivery at Lake Mead plus the anticipated 5 percent conveyance losses. The capacities of the stages are as follows:

Stage (year)	Plant output (million gallons per day)	Delivery to Lake Mead	
		Million gallons per day	Acre-feet per year
1990	1,044	992	1,000,000
2000	522	496	500,000
2010	522	496	500,000
Total	2,088	1,984	2,000,000

Economic advantages are derived from the dual-purpose design of the nuclear electric power and desalting complex. Both purposes share in the economy of scale of a large reactor and the common site. The turbines operate efficiently with high-temperature, high-pressure steam produced by the reactor while the evaporator makes use of the turbine exhaust steam at lower temperature and pressures and acts as a condenser for the turbines. Possible future modifications of evaporator design to utilize the vapor compression process or increased brine temperatures might result in the production of water with less electric power output.

Conveyance System

Location and general description.—The aqueduct system which would convey the desalted water from the Pacific Coast to Lake Mead will be 313 miles in length. It would consist of 85 miles of pipeline, 77 miles of tunnel, 135 miles of lined canal, and 16 miles of pumping plant discharge and penstock lines. Ten pumping plants would be required to lift product water 4,277 feet, and three power drops would be utilized to recover the energy in 1,682 feet of head. The route is shown on the frontispiece map.

From the desalting complex, product water would be conveyed for regulation and storage to the proposed De Luz site on the Santa Margarita River downstream from De Luz Creek which is at Mile 10 of the aqueduct. The aqueduct would then cross Murrieta Creek in the Temecula Valley about 1 mile southeast of Murrieta, and continue with the aid of a number of pump lifts through pipelines and tunnels to the summit of the San Gorgonio Pass about 1 mile south of Banning. A series of tunnels and pipelines would convey water to the foot of the Little San Bernardino Mountains. At this point a pumping plant would lift water to a gravity tunnel 17.8 miles in length for conveyance under the Little San Bernardino Mountains. From the tunnel outlet portal, about 2 miles east of Joshua Tree, the aqueduct would turn to the north and by means of pipelines, tunnels, and canal would proceed to the east side of El Dorado Valley and through a pass about 2.5 miles east of Boulder City, Nevada, to its terminus in Lake Mead at a point east of Hemenway Wash and about 2 miles west of Hoover Dam in Boulder Basin.

Storage reservoir.—For purposes of this study, the De Luz Dam site was used for regulation. In detailed studies a number of alternative storage sites near the desalting plant would be considered. The dam would be located on the Santa Margarita River immediately downstream from De Luz Creek and about 10