

# Preliminary Investigation B:

## Water Resources

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The Arroyo Seco watershed is a major source of local water supply. The Arroyo Seco and its mountain watershed contribute about 40% of the water supply for Pasadena and neighboring communities.

### *The Raymond Basin*

The Arroyo Seco watershed feeds the Raymond Basin aquifer, a 40 square mile groundwater basin that extends from La Canada and the San Rafael hills on the west to Santa Anita Canyon on the east, from the foothills of the San Gabriel Mountains to the Raymond fault, a seven mile seismic feature, which runs along the boundary between Pasadena and South Pasadena and then extends out through San Marino and Arcadia to Santa Anita Canyon on the east. The groundwater basin is recharged by the Arroyo Seco, a tributary of the Los Angeles River, and by Eaton Canyon, Santa Anita Canyon and other streams in the watershed of the San Gabriel River. The Arroyo Seco stream contributes approximately one third of the natural replenishment of the aquifer.

The long-term average yield of the Raymond Basin is about 30,000 acre-feet per year. Pumping rights in the Raymond Basin are adjudicated, i.e. determined by a court order, and managed by the Raymond Basin Management Board. The goal of the basin management program is to ensure a safe yield which will balance extraction with natural replenishment. Sixteen pumpers have rights to pump from the Raymond Basin. Three major subareas make up the aquifer: the Monk Hill subarea, which underlies La Canada and Northwest Pasadena, the larger Pasadena subarea, which underlies Pasadena and Altadena, and the Santa Anita subarea, which underlies Arcadia and Sierra Madre.

### *Spreading Program*

The Pasadena Water & Power Department, on behalf of the Raymond Basin pumpers, diverts water from the Arroyo Seco at a diversion structure several hundred yards above the mouth of the Arroyo near Jet Propulsion Laboratory. The water is directed into 13.5 acres of percolation ponds that line the east side of the Devil's Gate reservoir. Pasadena has the right to divert as much as 25 cubic feet per second of the Arroyo Seco and Millard Canyon stream flow. The *Hahamongna Watershed Park Master Plan*, conceptually approved by the Pasadena City Council, would reconfigure the spreading basins and add an additional nine acres on the east side of the Hahamongna basin.

Raymond Basin pumpers aim to maximize the spreading operations in the Arroyo Seco to maintain the groundwater level and to reduce local dependency on expensive, imported water. A major groundwater storage program, the Raymond Basin Conjunctive Use Program, has been in negotiations with the Metropolitan Water District of Southern California for several years.

Under that program MWD will build a pipeline and additional pumps and wells to allow for the storage of up to 75,000 acre feet of imported water in the basin with a dry year yield of up to 25,000 acre feet per year to meet regional needs. In addition the City of Pasadena maintains a storage account in the basin to supplement its annual extraction rights.

Until recent years the Raymond Basin was renown for its superior quality. Colorado River water was originally imported into the basin in 1941 to supplement local resources. In order to achieve the basin management objective of 450 parts per million (ppm) of total dissolved solids, the spreading of imported water was not allowed out of concern that the aquifer would be degraded by salt-laden imported water. Artificial recharge of the basin currently can only occur through the in-lieu method, in which pumpers, instead of extracting their adjudicated right, use surface deliveries from MWD to replace their local resources. The Raymond Basin Conjunctive Use Program will bring imported water from northern California with a lower salt content than Colorado River water into the basin. This water can then be spread in percolation basins or injected into the aquifer by pumps. This will allow for greater storage, increased reliability and improved flexibility in the management of the basin.

### *Contamination*

Non-point sources of water pollution from urban development and lack of vegetation buffers all contribute to the degradation of water quality in the arroyo. The Los Angeles Regional Water Quality Control Board has listed trash and algae as two major contaminants that pollute the Arroyo Seco stream. Trash often originates in urban areas, and public gathering places, washing off the streets into the storm drain system, which flow to the arroyo. Algae growth is a result of high amounts of nutrients causing a depletion of healthy levels of oxygen in the water. These nutrients can come from turf fertilizer, animal fecal matter and other sources.

In the last two decades serious contamination has been identified in the Hahamongna section of the Arroyo near Jet Propulsion Laboratory. The area is now a Superfund site, and NASA/JPL has undertaken extensive studies to develop a cleanup program, which they are expected to begin in 2002. The first contaminants discovered were volatile organic chemicals such as carbon tetrachloride and trichloroethylene at levels significantly above the drinking water standards. The discovery forced the closing of four local wells for several years until a treatment plant was installed in 1990. In 1997 perchlorate, a rocket fuel component, was found in the basin near JPL, forcing the closure of one well in the Arroyo. Pasadena and other local water companies have had to curtail production and install expensive treatment processes to treat the contamination.