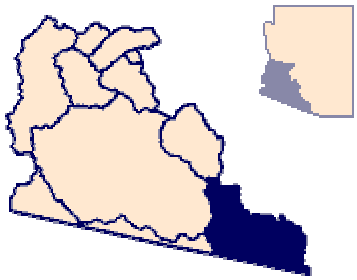
SAN SIMON WASH BASIN



The San Simon Wash basin is located wholly within the Tohono O'Odham Indian Reservation in south-central Arizona (Figure 15). The basin contains approximately 2,300 square miles of land which is characterized by low mountains separated by broad alluvial basins. The basins are underlain by a thick sequence of basin-fill deposits. The mountains are composed of crystalline and consolidated sedimentary rock, and thin alluvial deposits are present in the narrow mountain valleys and on pediments (Hollett, 1981). The San Simon Wash basin is bounded by the Ajo Mountains on the west, the Baboquivari Mountains to the east, the International Boundary to the south and the South Comobabi, Quijota, Cimarron, Sauceda, and Sikort Chuapo mountain ranges to the north.

Storm runoff usually occurs as sheetflow and floods of short duration. Some runoff is diverted to catchment tanks (charcos) for use by livestock; however, runoff is not known to be diverted for irrigation or public-supply uses (Hollett, 1981).

Groundwater development has been minimal in this area. In 1979, approximately 2,700 acre-feet of groundwater were withdrawn. Irrigation at Papago Farms accounted for 2,200 acre-feet and 500 acre-feet were used for public and livestock supplies (Hollett, 1981).

In the San Simon Wash area, groundwater primarily is found in the basin-fill deposits. These can be divided into four different sedimentary deposits: alluvial-fan deposits, stream-channel deposits, deltaic deposits, and lakebed-clay deposits. Very small amounts of groundwater are present in the crystalline and consolidated sedimentary rocks and thin alluvial deposits in the mountains.

The alluvial-fan deposits are located on the perimeter of the basin. Water yield to wells that tap these deposits is variable. A well in the thin sediments overlying the pediments may yield less than 50 gallons per minute, whereas properly designed and constructed wells that tap more than 200 feet of alluvial-fan material may yield more than 1,500 gallons per minute (Hollett, 1985).

Stream-channel deposits are created by high velocity streamflow which deposits mainly boulders, gravel, and sand. Well yields within these deposits may be greater than 1,800 gallons per minute (Hollett, 1985).

Deltaic deposits are an accumulation of sediment deposited at the mouth of a river. Those deposits are a consequence of a reduction in streamflow velocity and a release of suspended sediment as the moving stream enters a still body of water. Deltaic deposits usually consist of a sequence of clay, silt, sand, and gravel. Such deposits are found in the Papago Farms area and are estimated to be about 800-feet thick in some areas. Yields to wells that tap these deposits at Papago Farms have been measured at more than 3,000 gallons per minute (Hollett, 1985).

Lakebed-clay deposits, thick sequences of fine-bedded silts and clays that were deposited in a calm lake or playa, generally form in an arid to semiarid environment. These laterally-extensive deposits extend to depths of more than 1,000 feet. Wells that tap the lakebed-clay deposits in the center of the basin generally yield less than 50 gallons per minute (Hollett, 1985).

Nearly all of the recoverable groundwater in the basin is in the basin-fill. The saturated thickness of the basin-fill ranges from zero near the edges of the basin to over 8,000 feet near the International Boundary. The groundwater occurs in the basin-fill under unconfined conditions. Wells yield 1,500 to 2,500 gallons per minute in saturated basin-fill between 400 to 700 feet below land surface. Wells completed in units between 200 to 400 feet below land surface yield 200 to 600 gallons per minute. (Hollett, 1981). Depth to water in the basin-fill deposits ranges from around 150 feet below land surface to over 600 feet below land surface, with an average depth around 300 feet below land surface. Groundwater

movement in the basin-fill is toward the Papago Farms area, located in the southwest portion of the basin, and then southward into Mexico (Hollett, 1981).

There are high concentrations of arsenic in two areas in the basin-fill: between Kom Vo and Pisinimo and near the International Boundary. Measured arsenic concentrations range from 62 micrograms per liter near Kom Vo to 960 micrograms per liter near the International Boundary (Hollett, 1981). The maximum contaminant level for arsenic is 50 micrograms per liter. The arsenic seems to be concentrated more in the basin-center lake-bed deposits and may contaminate groundwater that flows through and past the clays for a considerable distance downstream (Hollett, 1985).

In the San Simon Wash area, the total dissolved solids (TDS) concentrations generally are between 180 and 4,900 milligrams per liter (mg/l). Most of the public water supplies contain less than 500 mg/l. Public water supplies that contain more than 500 mg/l of TDS are primarily from shallow wells (less than 60 feet deep) that penetrate the mountain hard rock (Hollett, 1981).

Fluoride concentrations generally are good overall; however, there are some high fluoride concentrations in the area between the International Boundary and the Papago Farms area. Fluoride levels in this area range from 7.6 mg/l to 54 mg/l. Generally levels are less than 5 mg/l (Hollett, 1981).