MPI.1.1.2.4 Extent of Drawdown

The drawdown in the middle and lower ore zones at the end of mining is presented in Figures MPI.1-12 and MPI.1-13, respectively. The middle ore zone represents significantly more than one-half of the total production area recovery rate, and when the proportioning of the aquifer storage to the ore sand thickness is considered, this ore zone represents the maximum drawdown impact on the aquifer. The extent of the drawdown is relatively large with a five foot drawdown contour extending approximately **5 miles** to the north or northwest from the central Jane Dough mining area. The drawdown cone is elongated to north and slightly to the west and this is attributed to the mining in the Nichols Ranch area prior to mining at Jane Dough. The extent of drawdown in the lower ore zone is generally similar to that of the middle ore zone (see Figure MPI.1-12) with some residual drawdown from the mining in the Nichols Ranch area.

The predicted drawdown in the upper ore zone of the Jane Dough mining area is significantly less than that of the middle and lower ore zones because only limited production occurs in the upper ore zone for Production Area #2 (see Figure MPI.1-11). However, several feet of drawdown is predicted over a large area and this drawdown results from a combination of mining in Production Area #2, vertical communication with the middle ore zone, and mining in the Nichols Ranch area. The drawdown in the upper ore zone (layer three) also results in predicted drawdown in overlying layers two and one, and the greatest drawdown is within the area of increased vertical communication where the mudstone is absent. This predicted drawdown for the lower B sand (layer one) is presented in Figure MPI.1-9. The predicted drawdown for the upper A sand (layer two) is presented in Figure MPI.1-10.

MPI.1.2 Production Area #1 Excursion Control and Retrieval

The potential for excursion was considered in a MODFLOW-96 modeling scenario by adjusting modeling parameters to produce a temporary and local imbalance in production area operation. The imbalance involves either insufficient recovery rate or excess injection rate for a local area such that the local wellfield bleed rate is zero or actually negative representing more injection than recovery. Limiting this condition to a local area of a few wells is considered appropriate because a wider scale imbalance with insufficient bleed is unlikely given continuous monitoring of recovery and injection rates.

Simulation of retrieval of an excursion is essentially a reversal of the process that created the excursion. Increasing the effective wellfield bleed rate for a local area will increase the local drawdown and cause an expansion of the area of gradient reversal. Within this zone of gradient reversal, ground water will be flowing to the recovery wells and any ground water that has been impacted by mining fluids will be retrieved.

MPI.1.2.1 MODFLOW Modeling Changes

The MODFLOW-96 modeling configuration described in Section MPI.1.1.1 was used for the simulation of excursion and retrieval. The model included operation of Production Area #1 with adjustment of recovery rates from two wells in the middle ore zone to create a local imbalance resulting in excursion, followed by overproduction to affect retrieval. In the simulations, the rate adjustments were preceded by a period of normal production area operation.