

Technical Analysis of In-Valley Drainage Management Strategies for the Western San Joaquin Valley, California

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Executive Summary

The western San Joaquin Valley is one of the most productive farming areas in the United States, but salt-buildup in soils and shallow groundwater aquifers threatens this area's productivity. Elevated selenium concentrations in soils and groundwater complicate drainage management and salt disposal. In this document, we evaluate constraints on drainage management and implications of various approaches to management considered in:

- the San Luis Drainage Feature Re-Evaluation (SLDFRE) Environmental Impact Statement (EIS) (about 5,000 pages of documentation, including supporting technical reports and appendices);
- recent conceptual plans put forward by the San Luis Unit (SLU) contractors (i.e., the SLU Plans) (about 6 pages of documentation);
- approaches recommended by the San Joaquin Valley Drainage Program (SJVDP) (1990a); and
- other U.S. Geological Survey (USGS) models and analysis relevant to the western San Joaquin Valley.

The alternatives developed in the SLDFRE EIS and other recently proposed drainage plans (refer to appendix A for details) differ from the strategies proposed by the San Joaquin Valley Drainage Program (1990a). The Bureau of Reclamation (USBR) in March 2007 signed a record of decision for an in-valley disposal option that would retire 194,000 acres of land, build 1,900 acres of evaporation ponds, and develop a treatment system to remove salt and selenium from drainwater. The recently proposed SLU Plans emphasize pumping drainage to the surface, storing approximately 33% in agricultural water re-use areas, treating selenium through biotechnology, enhancing the evaporation of water to concentrate salt, and identifying ultimate storage facilities for the remaining approximately 67% of waste selenium and salt. The treatment sequence of reuse, reverse osmosis, selenium bio-treatment, and enhanced solar evaporation is unprecedented and untested at the scale needed to meet plan requirements.

All drainage management strategies that have been proposed seek to reduce the amount of drainage water produced. One approach is to reduce the amount of drainage per irrigated acre. From modeling simulations performed for the SLDFRE EIS of the Westlands Area of the SLU, theoretical minimums that can be achieved range from approximately 0.16 to 0.25 acre-feet per acre per year (AF/acre/year). Minimum production rates from the Northerly Area