

Irrigation Engineering Support

ACE has developed an excellent working relationship with several irrigation companies through cost-effective and timely solutions to storage and delivery system problems. Additionally, ACE provides general irrigation engineering support to individual farmers, irrigation / ditch companies, and major irrigation districts, including those affiliated with USBR-funded projects.

General support services include:

- Basin planning and reservoir siting studies, in support of irrigation water supply.
- Inventory, assessment and design of structures and systems for rehabilitation of irrigation project canals and hydraulic structures.
- Design of telemetry control systems to operate irrigation project facilities.
- Resident engineering services for construction of rehabilitation structures.
- Institutional and economic studies in support of engineering services, given ACE's broad understanding of Reclamation Law.

Specific projects managed or participated in by ACE include:

- Highline Irrigation District Watershed Rehabilitation Project, Saratoga, WY: This study involved the development of conceptual designs for rehabilitation of severely eroded irrigation ditches. Design features included pipe drop structures, measurement structures, diversion structures, and canal stabilization measures.
- Goshen Irrigation District Rehabilitation Project, Torrington, WY: ACE was retained to conduct a feasibility study of measures to improve operational management of water deliveries, reduce maintenance, and reduce seepage losses associated with the main canal and laterals of the District.
- Goshen Irrigation District Siphons, Tunnels, and Canal Rehabilitation, Torrington, WY: This project involved the analysis, evaluation and design of improvements to a series of tunnels and inverted siphons through a canal system with a maximum capacity of 1,500 cfs. The project also included evaluation and design of rehabilitation alternatives for a pump station along the Laramie River.



Evaluation of Goshen Irrigation District Structures

Irrigation Engineering Support (Continued)

- *Sidon Canal Rehabilitation Project, Big Horn County, WY:* ACE staff completed the evaluation and conceptual design for the Shoshone River Diversion Structure and Headgate. Specific tasks completed included a geomorphic evaluation of the study reach; analysis of channel hydraulics and river mechanics; and preparation of conceptual designs.
- *Goshen Irrigation District Horse Creek Re-regulating Reservoir, Goshen County, WY:* This study investigated the feasibility of storing excess flows (operational waste) and storm flows in a re-regulating reservoir sited on Horse Creek in Goshen County, Wyoming. Specific tasks included a detailed analysis of diversion and spill records, a geotechnical / geological investigation, development of conceptual designs, and completion of an economic analysis.
- *Etna Irrigation District Rehabilitation Project, Salt River, WY:* ACE staff completed the investigation of channel hydraulics, geomorphic evaluation of vertical and lateral trends in the Salt River and evaluation of long-term sediment transport and debris within the river. Alternative diversion designs were prepared including fish ladders and fish screens. ACE also completed a water rights investigation, determination of flows available to meet the irrigation demand, and investigation of long-term aggradation/degradation trends involving sediment continuity principles.
- *Sand Lake/Cañon Canal Rehabilitation Project, Carbon County, WY:* This project consisted of the rehabilitation of canal facilities for both the Cañon Canal and Dutton Canal for the Wheatland Irrigation District. ACE was responsible for the inventory of existing facilities, identification of proposed improvements, and conceptual design and cost estimates for the improvements. Work also included a dam-break analysis of Sand Lake and an investigation of alternative water sources for replacement of the Rock Creek diversions.
- *Guernsey Reservoir Silt Run Alternative Evaluation, Platte County, WY:* ACE engineers completed an evaluation of alternatives to the Guernsey Reservoir Silt Run. The work included an evaluation of the sediment distribution, delivery within the reservoir. Benefits of the silt run associated with canal seepage, maintenance of the canal and irrigation efficiency were also evaluated. Costs of the silt run were identified and included reduced efficiency of the power plan and payment for power revenues forgone during the silt run.
- *Little Snake River Basin Small Reservoir Project, WY:* This project included the investigation of the feasibility of constructing several small reservoirs/stock ponds within the basin. Design criteria for the reservoirs were prepared, permitting requirements identified, and estimates of long-term reservoir yield generated for each reservoir site. Suitability of borrow sources was evaluated along with the potential for benefits for wetlands and wildlife. Institutional constraints associated with water rights and interstate compacts were also investigated. Conceptual designs and cost estimates were prepared.