

RECLAMATION

Managing Water in the West

Reclamation Activity Report

Oklahoma-Texas Area Office



U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region

July 2010

Mission Statements

The mission of the *Department of the Interior* is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the *Bureau of Reclamation* is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Table of Contents

Introduction.....	1
Ongoing and Recently Completed Activities.....	1
Planning Program.....	1
General Investigations – ONGOING:.....	1
General Investigations – RECENTLY COMPLETED.....	3
Native American Technical Assistance - ONGOING	4
Native American Technical Assistance – RECENTLY COMPLETED:	6
Construction Assistance	6
Reclamation-Wide Programs.....	6
WaterSMART (<i>Sustain and Manage America’s Resources for Tomorrow</i>).....	6
WaterSMART Grants.....	7
Basin Studies.....	7
Title XVI – Water Reclamation and Reuse Program	8
Research and Development Program	9
Contact Information	10

Introduction

The Bureau of Reclamation (Reclamation) Oklahoma-Texas Area Office (OTAO) is responsible for administering 11 Reservoir Projects and associated water distribution systems in southern Kansas, Oklahoma, and Texas. Reclamation works in conjunction with other Federal and State agencies, Indian tribes, and local entities in performing these responsibilities. Significant areas of activity include providing oversight of operations and maintenance of existing facilities and water resources planning along with construction assistance.

The purpose of this Activity Report is to provide a selected summary of current and recently completed activities within the area.

Ongoing and Recently Completed Activities

Planning Program

General Investigations – ONGOING:

Texas Brackish and Impaired Water (TX), Special Study

Status: Ongoing

Description: This study includes four main activities that further the Texas Water Development Board (TWDB) innovative water technologies program:

1. Advancing stormwater harvesting;
2. Advancing water reuse;
3. Advancing Aquifer Storage and Recovery (ASR); and
4. Advancing seawater/brackish desalination.

Activities involve an evaluation of the political, institutional, regulatory, and technical issues associated with the advancement of innovative water management solutions in Texas. Based on data acquired, the TWDB will make recommendations on how to most efficiently implement the Texas innovative water technologies program.

High Plains Ogallala Aquifer (KS), Special Study

Status: Ongoing

Description: Reclamation is collaborating with the Kansas Water Office (KWO), Southwest Groundwater Management District No. 3 (GMD3), and the Kansas Geological Survey (KGS) to study and obtain an understanding of Ogallala Aquifer characteristics through development of a transient groundwater model of the area under the jurisdiction of GMD3. The model will be used to:

1. Characterize Aquifer subunits,
2. Determine water budgets, and
3. Test the possible Aquifer responses to various management scenarios.

The study will also incorporate a regional economic impact analysis to determine the most efficient policy options aimed at achieving sustainability goals to extend the economic life of the Aquifer.

The Kansas State Water Plan set 2010 objectives of reducing water level decline rates within the Ogallala Aquifer and implementing enhanced water management in target areas. Models are expected by the end of FY 2010.

South Central Regional Assessment (OK), Special Study

Status: Ongoing

Description: The study is intended to characterize the Garber-Wellington Aquifer (GWA) in south-central Oklahoma in terms of:

1. Geologic framework,
2. Aquifer boundaries,
3. Hydraulic properties,
4. Water levels,
5. Groundwater flow, and
6. Water budget.

The study will develop a digital, transient groundwater flow model that will be used to evaluate the allocation of water rights and simulate the Aquifer for the purposes of developing management options to ensure a dependable water supply for future growth. Results of the study are expected by the end of FY 2011.

Oklahoma Comprehensive Water Plan (OK), Special Study

Status: Ongoing

Description: The first phase of this study consists of modernizing the State water rights administration database. The second phase consists of developing hydrologic models to update and/or confirm the firm yield of seven Reclamation reservoirs in Oklahoma.

Additional phases include, but are not limited to:

1. Technical and engineering studies to identify areas with aging infrastructure;
2. Evaluation of regional and local water supply/demand gaps, which includes development of multi-parameter models to calculate the maximum sustainable yield of State aquifers;
3. Identification of regional and local water management strategies; and
4. Water allocation modeling to determine the feasibility of implementing water management solutions.

The water plan is scheduled for completion in FY 2012.

Fort Cobb Reservoir (OK), Appraisal Investigation of Alternatives for Water Augmentation

Status: Ongoing

Description: This study is an investigation of alternatives to augment the water supply of the Fort Cobb Reservoir Division, Washita Basin Project.

Fort Cobb Reservoir provides Municipal and Industrial (M&I) water to several power generation facilities, the City of Anadarko, and the City of Chickasha. A previously completed appraisal study (2006) evaluated alternatives to expand the capacity of the delivery system and determined that alternatives to augment the water supply of the reservoir should be investigated before any decision is made relating to conveyance system expansion. Previous studies indicate that demand will exceed supply by 2030. Reclamation held a project alternative meeting with the stakeholders to identify potential alternatives.

The draft report is pending subject to the firm yield re-evaluation of all Oklahoma Reservoirs constructed by Reclamation. The firm yield ascertained by the evaluation will address climate change as well as other changes in reservoir conditions.

Norman Project (OK), Critical Need Water Supply Study

Status: Ongoing

Description: The first phase of the study is currently underway and will address the immediate and critical short-term water supply needs. Specifically, the study will evaluate the operational changes necessary to store and regulate non-project water purchased from the City of Oklahoma City. Preliminary results indicate that importation of water during times of drought is an effective means to augment the yield of the reservoir with minimal environmental impact and no cost to the Federal government. The next phases of the study will address the long-term water supply needs and will include an evaluation of other alternatives (i.e., water reuse) that are beyond the short-term solution of purchasing and storing non-Project water.

Lake Thunderbird, located on the Little River in central Oklahoma, was constructed as part of the Norman Project for Municipal and Industrial (M&I) water supply, flood control, recreation, and Fish & Wildlife purposes. The Central Oklahoma Master Conservancy District (COMCD), the project water right holder, currently provides water to the member cities of Del City, Midwest City, and Norman. Reclamation completed an appraisal study in August 2005 which concluded that additional water needs exist and Lake Thunderbird could store and regulate non-project water to augment supplies.

The Consolidated Natural Resources Act of 2008 (P.L. 110-229) authorized the Secretary of the Interior to utilize \$900,000 for a feasibility study to evaluate alternatives to augment the COMCD water supply. Appropriations for FY09, in the amount of \$121,000, were made available to begin the feasibility study.

General Investigations – RECENTLY COMPLETED

Arbuckle-Simpson Aquifer (OK), Water Resources Management Special Study

Status: Complete

Description: During recent years, a number of issues have emerged which have caused concern about the utilization and continued health of the Arbuckle-Simpson Aquifer. These issues include concern over water use, competition for water, pumping water to areas beyond the recharge zones of the Aquifer, and water quality. In order to assure the future well-being of the Aquifer, the Oklahoma Water Resources Board (OWRB) entered into a cost-sharing agreement with Reclamation to undertake a five year study of the hydrology within the Aquifer including detailed assessments of the formation hydrogeology, water quality and vulnerability, as well as groundwater-surface water interactions.

The Aquifer has been designated a sole source Aquifer by the EPA. The health and economic future of a large number of Oklahoma residents is dependent upon protecting the quantity and quality of water in the Aquifer. The Aquifer is an important source of water supply for the citizens of Ada, Sulphur, Mill Creek, and Roff; the Chickasaw National Recreational Area; and many farmers and ranchers owning land overlying the Aquifer. Contributions from the Aquifer also provide perennial flows for many streams and natural springs in the area.

A public meeting was held in August 2009 to discuss the results of the study and seek public comments on potential Aquifer management scenarios. Final steps are being undertaken by OWRB to combine the science with public input to make policy recommendations to the State

Legislature on how to manage the Aquifer. The study was completed at the end of FY 2009. Final reports are expected in mid-FY 2010.

High Plains Ogallala Aquifer (TX), Special Study

Status: Complete

Description: Past land use changes have greatly impacted water resources in the Texas High Plains, often with opposing effects on water quantity and quality. Reclamation, in partnership with the University of Texas, Bureau of Economic Geology, and the Texas Water Development Board undertook the study to increase the understanding of the processes, including irrigated return flows and control of diffuse natural recharge to the Ogallala Aquifer realized by the conversion of rangeland to dry land agriculture. The study is complete, and final results are anticipated to be provided as a report in FY 2010.

Native American Technical Assistance - ONGOING

Seminole Nation (OK), Assessment of the Sasakwa Rural Water System Distribution System

Status: Ongoing

Description: The Sasakwa rural water system is located in the southeastern corner of Seminole County, Oklahoma and is owned by the Seminole Nation. The system provides potable water to approximately 75 residential customers. The system is experiencing long term deterioration. Reclamation completed a report entitled "Evaluation and Repair Recommendation for the Existing Water and Distribution System" in September, 2001. In this evaluation, Reclamation evaluated upgrades to existing water supply production wells, standpipes, pump control system, and the wells supplying the treatment plant. The work recommended in the report is now complete, and Reclamation will prepare an additional report addressing any upgrades to the existing distribution system.

Caddo Nation (OK), Stream Bank Restoration Assessment Report

Status: Ongoing

Description: A tributary to Sugar Creek near Lookeba, Caddo County, Oklahoma is severely eroded. A ten to fifteen foot deep cut is not only threatening riparian land, the erosion is also a threat to a cemetery with early turn of the century graves. More recent burials are also being threatened by erosion of a stream channel. This area is located on a tract of land designated as allotted land with approximately 20 graves at the location. The cemetery is designated with the State of Oklahoma site trinomial "34CD678", designated by the State Historic Preservation Office and the Oklahoma Archeological Survey. Reclamation will provide an assessment report discussing options for stabilization of the stream bank. The Caddo Nation will utilize this report to apply for a grant to assist in funding of design and construction for stabilization measures.

Pawnee Nation (OK), Wellhead Protection Plan

Status: Ongoing

Description: The Pawnee Nation is concerned about contamination of shallow public water supply wells in Pawnee County, OK. The Nation is preparing a water management plan for Black Bear Creek and would like to include a well protection plan for these public supply wells.

Reclamation will undertake the following task:

1. Identification of the groundwater flow direction,
2. Source water delineation for the existing wells,
3. Identification of the zone of influence in the existing wells, and
4. Potential contaminants within the zone of influence and adjacent surface areas in close proximity to the wells.

Chickasaw Nation (OK), Beneficial Use of Water from Hydraulic Fracturing**Status:** Ongoing**Description:** Reclamation will prepare a *Proof of Concept* that reviews water analysis to address the potential beneficial uses of any by-products from water utilized in the Hydraulic Fracturing Treatment Process of oil and gas wells.

Reclamation will prepare a report that attempts to:

1. Quantify the volume and sources of water utilized for hydraulic fracture treatments of shale formations in the local area;
2. Review existing technology being used for treatment and disposal of treatment fluids;
3. Perform an analysis of water used in such fracture treatment processes;
4. Identify and quantify beneficial products from brine concentrate, if any;
5. Identify issues and costs in extracting beneficial products, if any; and
6. Compare value of recovered products to revenue streams generated from the sale of such products.

This investigation may include brackish water treatment and disposal costs saved, or avoided, and discussion of issues in treating concentrate produced from the desalination of brackish groundwater for use in the hydraulic fracture treatment process.

Cherokee Nation (OK), Water Infrastructure Assessment**Status:** Ongoing**Description:** A large Native American population is located in northern Adair and southern Delaware counties in northeast Oklahoma and the inhabitants are without access to public water supplies. Currently, the public depends on groundwater wells for supply. A majority of these wells have issues with yield, fecal coliform contamination, and secondary containments such as iron, manganese, and hydrogen sulfide. A small number of homes may use springs or other untreated and unprotected surface water supplies for drinking water.

The Cherokee Nation is interested in providing treatment and distribution services to several communities. This may be accomplished through assistance of the existing rural water districts by expansion or development of a water supply project for the area. The Cherokee Nation is one of the federally recognized Indian Tribes in Oklahoma.

The tribal headquarters is located in Tahlequah, Oklahoma, 60 miles east of Tulsa.

Cherokee Nation (OK), Technical Assistance in Water Resources Planning**Status:** Ongoing**Description:** The Cherokee Nation is interested in developing a Water Resource Planning Office. Reclamation will develop a report detailing the issues and concerns that a water resources office should address. Reclamation will also suggest different staffing levels that may be required.***Kickapoo Nation of Oklahoma (OK), Assessment of Water Supply Systems*****Status:** Ongoing**Description:** The Kickapoo Nation requested Reclamation to perform an assessment of their six water supply systems.

The assessment would identify deficiencies in the existing systems and include alternatives for tying the systems together and connecting to service outlying residents.

Alabama-Quassarte Tribal Town (OK), Needs Assessment of Water Supply and Waste Water Systems

Status: Ongoing

Description: The Alabama-Quassarte Tribal Town has requested Reclamation assistance in determining the current state of the existing water system, assessing the future demand for water and wastewater, and recommending improvements for the development of a water and wastewater system for the tribal trust property.

Caddo Nation (OK), Rush Springs Groundwater/Surface water interaction and Rush Springs Spring Inventory

Status: Ongoing

Description: The Caddo Nation is concerned with the long term depletion of the Rush Springs Aquifer.

Reclamation has entered into an agreement with the U. S. Geologic Survey to begin gathering data for a study to determine the location of springs and wetlands as well as the yield of the Rush Springs Aquifer.

Native American Technical Assistance – RECENTLY COMPLETED:

Construction Assistance

Equus Beds (KS), Groundwater Recharge Project, Wichita Project, Kansas, City of Wichita

Status: Ongoing

Description: On October 5, 2006, the President signed P.L. 109-299 authorizing Reclamation to participate in the construction of the Equus Beds Aquifer Recharge and Recovery Component as a Division of the existing Wichita Project. Authorization for construction expires 10 years from the date of enactment. Reclamation has completed an Environmental Impact Statement (EIS) and the Record of Decision (ROD) was signed on January 19, 2010.

There are three remaining phases to the authorized project. The City of Wichita completed construction of Phase I prior to authorization and is currently beginning construction of Phase II.

Reclamation may provide 25 percent, up to a maximum of \$30,000,000 (2003 indexed), of the total estimated construction project cost.

Reclamation-Wide Programs

WaterSMART (Sustain and Manage America's Resources for Tomorrow)

The United States faces an increasing set of water resource challenges. Aging infrastructure, rapid population growth, depletion of groundwater resources, impaired water quality associated with particular land uses and land covers, water needed for human and environmental uses, and climate variability and change all play a role in determining the amount of fresh water available at any

given place and time. Water shortage and water-use conflicts have become more commonplace in many areas of the United States, even in normal precipitation years. As competition for water resources grows – for irrigation of crops, growing cities and communities, energy production, and the environment – the need for information and tools to aid water resource managers also grows. Water issues and challenges are increasing across the Nation but particularly in the West and Southeast due to prolonged drought. These water issues are exacerbating the challenges facing traditional water management approaches which by themselves, no longer meet current needs. The Department of Interior has developed the WaterSMART program and is working to achieve a sustainable water strategy to meet the water needs of the Nation.

These programs include Water Smart Grants, Reclamation Basin Study Program that began in FY 2009, and Title XVI, Water Recycling and Reuse Program. Through these programs, Reclamation will provide competitive grants for water marketing and conservation projects; initiate basin-wide planning studies that will address the impacts of climate change; and continue funding of water reuse and recycling projects.

WaterSMART Grants

Reclamation offered Funding Opportunity Announcements (FOAs) in FY 2010 under the following categories:

- System Optimization Review Grants
- Water and Energy Efficiency Grants
- Advanced Water Treatment Pilot and Demonstration Grants
- Research Grants

At this time the recipients of the FY2010 FOA applications have not been announced.

Recipients of previous Challenge Grants in Oklahoma, and Texas include:

- City of McAllen (TX) FY2005 and FY2008 Grants
- Cameron County Irrigation District No. 2 (TX) FY 2007 and FY2008 grants
- Brownsville Irrigation District No. 2 (TX) FY2005 and FY2008 grants
- Lugert-Altus Irrigation District (OK) FY 2008
- Harlingen Irrigation District (TX) FY2004 and FY2009 grants

Basin Studies

Through the Basin Study Program, Reclamation will partner with basin stakeholders to conduct comprehensive studies that define options for meeting future water demands in targeted river basins in the West. The Basin Study Program is intended to identify basin-wide water supply issues that could potentially be resolved with changes to the:

1. Operation of water supply systems,
2. Modifications to existing facilities,
3. Development of new facilities, and/or
4. Non-structural changes.

The Basin Studies will incorporate the latest science, engineering technology, climate models, and innovation. The desired outcomes are basin-specific plans recommending collaboratively developed solutions that will help meet water demands and foster sustainable development. Through these studies, Reclamation and participants may gain a common understanding of water management problems, set joint goals to improve basin conditions, and conduct trade-off analysis to identify potential solutions to basin-wide water supply issues.

Reclamation will collaborate with willing States and local entities on a 50/50 cost-share basis to conduct the studies. Because this is not a financial assistance program, the Reclamation share of the study costs may only be used to support work done by Reclamation staff or Reclamation contractors. Reclamation may not pass funding directly through to the non-Federal cost-share partners in the form of Grants or Cooperative Agreements.

Title XVI – Water Reclamation and Reuse Program

The Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Public Law 102-575, Reclamation Projects Authorization and Adjustment Act of 1992 – Title XVI Reclamation Wastewater and Groundwater Study and Facilities Act, as amended – 43 United States Code [U.S.C.] 390th et seq.) is commonly referred to as the Title XVI Program. This program directs the Secretary of the Interior, acting pursuant to the Reclamation Act of 1902, as amended, to undertake a program to investigate and identify opportunities for water reclamation and reuse.

Through this program, Reclamation provides:

1. Financial and technical assistance for appraisal and feasibility studies,
2. research and demonstration projects, and
3. full-scale construction of facilities to treat naturally impaired waters, including, but not limited to:
 - a. Brackish waters and/or
 - b. Domestic, industrial, and agricultural wastewaters, for the purposes of reuse.

Eligible recipients of Title XVI funding are identified under the 1902 Act and include:

1. States;
2. Regional or local authorities;
3. Indian tribes or tribal organizations; or
4. Other entities such as:
 - a. Water conservation or conservancy district,
 - b. Wastewater district, or
 - c. Rural water district,

All recipients must be located within the 17 Western States or Hawaii.

Reclamation may provide Federal funds up to a maximum of 50 percent (%) of Research and Demonstration Projects, 100% of Appraisal Level Studies, and up to 50% cost-share for Feasibility Level Studies. Construction activities for full-scale projects can receive a maximum of 25% Federal funding, generally up to \$20 million maximum of the total project cost.

Participation in Title XVI activities in OTA0 has been dynamic and complex. To date, twelve projects have been at various stages of project planning, seven of which are active. OTA0 has received in excess of \$2.3 million in funding to participate in the Title XVI Program, all of which

has been received through designated and write-in funding. Fiscal Year 2009 appropriations in the amount of \$700,000 indicate that interest in the Title XVI Program continues to grow in OTAO.

Research and Development Program

The Science and Technology (S&T) Program is the primary Research and Development (R&D) arm of Reclamation. The R&D Program is a Reclamation-wide competitive, merit-based program that is focused on innovative solutions for Reclamation water and facility managers to assist western water managers and stakeholders. The program has contributed many of the tools and capabilities in use today by Reclamation and western water managers.

Over the past 7 years, the R&D Office has funded approximately 800 research projects totaling \$50 Million Dollars that have led to many important tools, solutions, and improvements in the way water and power infrastructure and related resources are managed. Effective partnerships are a primary R&D proposal award consideration. The emphasis is on efficiency and effectiveness through collaborative R&D with stakeholders, universities, non-profit organizations, the private sector, and other Federal, state, and local agencies with water and water-related roles and capabilities. Collaborative R&D projects achieve cost-sharing with partners through in-kind services and/or direct funding contributions.

For Fiscal Year 2011 funding, the Reclamation call for proposals targeted projects with a focus on:

1. The spread of invasive Zebra and Quagga Mussels;
2. Potential impacts of climate change on water resources; and
3. Advanced water treatment processes and technologies.

However, proposals were considered in all areas affecting Reclamation, including broad categories of:

1. Environmental issues in water delivery/management;
2. Water and power infrastructure reliability;
3. Water operations decision support; and
4. Conserving or expanding water supplies.

To learn more about Reclamation's R&D Program, please visit <http://www.usbr.gov/research/science-and-tech/>, the Reclamation S&T Program brochure, a PDF version, that may be downloaded. The link: "*Portfolio of Research Projects.*", can be viewed at this site. This link provides a database of ongoing R&D projects and also provides useful information about the Reclamation research agenda, proposal review criteria, proposal selection process, priorities, and program goals.

To date, two R&D projects have received funding within OTAO:

1. Evaluation of Joint Influences of Climate Change and Land Cover on Water Availability (Fiscal Year 2009 and 2010)
2. Treatment of Variable Water Sources: Adaptations for a Flexible Desalination System (Fiscal Year 2010)

Contact Information

Mark A. Treviño, Area Manager
512.899.4150

James Allard, Deputy Area Manager
405.470.4810

Collins Balcombe, Supervisory Program Coordinator
Planning and Environmental Group
512.899.4162

Matt Warren, Supervisory Civil Engineer
Supervisor of Facility Operations Group
405.470.4830

Jeff Tompkins, Supervisory Natural Resource Specialist
Supervisor of Land Resources Group
405.470.4821