



A NEW IDEA

Newsletter of the Irrigation District Engineering and Assistance Program

Issue 1, December 2004

New Pipeline 'Leaked Like a Sieve'

Replacing canals with underground pipelines seems like a "no brainer," an obvious way to reduce losses and improve operational efficiency. In our tests, we have found that old, deteriorating canals can have water loss rates as high as 90 to 1200 ac-ft/mile/year.

Recently, at the request of the United Irrigation District, the IDEA team conducted a leakage test on a newly constructed pipeline. When tested at normal operating pressures, the pipeline had very high losses, or as one team member commented: "it leaks like a sieve!"

The 1.7 mile pipeline leakage rate was measured at 65,000 gal/day, or projected annual loss of 43 ac-feet per year! Following repairs, we retested the pipeline and found that the repairs reduced losses to 1800 gal/day or a projected annual loss of 1.2 ac-feet/year, a 97% reduction.



Barroso benchmarking standpipe in preparation for test

This project brings up several important issues that districts should consider when contracting rehabilitation services. Two basic questions are: what construction methods and standards should be used and what are the performance standards for leakage of newly constructed pipelines?

The ASAE (American Society of Agricultural Engineers) has design and construction standards for both unreinforced concrete and thermoplastic irrigation pipelines (S376.2, S261.7), but these construction standards do not include guidelines on acceptable leakage rates.

The IDEA team is interested in conducting additional tests on underground pipelines in order to help establish regional recommendations on acceptable losses.

Our First Newsletter

Welcome to the first newsletter of the Irrigation District Engineering and Assistance (IDEA) Program. The purpose of the newsletter is to, not only to keep you up to date on our activities, but to provide a forum for discussing important issues related to irrigation district management, improvement and rehabilitation project planning.

The IDEA Program first began in 1990's with Extension demonstration projects to introduce surge flow irrigation and lay-flat tubing into districts in the Lower Rio Grande Valley and to determine changes needed in district operations to ensure the success of the technologies. In 1996, the program expanded to GIS mapping

and training. Then, in the late 1990's came two regional water planning projects in which the IDEA team completed the first analysis of potential water savings through irrigation district improvements.

In 2003, in response to requests from the Region M Water Planning Group, we worked with districts to determine, for the first time, the extent and volume of the municipal water supply networks of irrigation districts.

Our programs have continued to grow, and IDEA is now the most extensive University based program of this kind in the United States.

Irrigation Districts Have Database Problems

"Most districts have old, outdated databases that are long past needing replacement" was the conclusion of a recent IDEA report: ***Upgrading Existing Databases; Recommendations for Irrigation Districts***. The authors of the report are David Flahive, System Analyst, and Guy Fipps, Professor and Extension Agricultural Engineer.

While only 7 pages in length, the report is actually the cumulation of about 3 years of work examining existing database systems of districts and analyzing their present and future data needs.

The report reviews the advantages and disadvantages of major commercial database software, and provides two recommended options depending on the technical expertise of district staff:

- SQL Server with Microsoft Windows
- MySQL with Red Hat Linux.



David Flahive, the *IDEA* Team's System Analyst

The SQL/Windows option would require the least in-house expertise, while MySQL/Linux is the least expensive, most solid option.

The report provides hardware recommendations and cost estimates for both computers and software.

Client Software

The report also discusses issues related to the existing "client software" (the software that district personnel use to input data and retrieve reports from their database).

We recommend that districts consider teaming together when doing database upgrades in order to share client software development costs.

Dr. Fipps is planning on meeting with irrigation district managers in early 2005 to discuss this in more detail. The report is available on line at <http://idea.tamu.edu>.

Congressional District Maps

Even before the Texas Legislature redrew our congressional districts in 2003, there was confusion about who represented the irrigation districts in Congress. In the Texas-Mexico border region, there are 5 congressional districts which divide counties and irrigation districts.

Due to several requests from Washington for information on which irrigation districts are in congressional districts, the IDEA team created a new series of maps that show both the current congressional districts (108th Congress) and the new districts of the 109th Congress which begins in January 2005.

The maps of the 109th Congress are shown in a special insert in this issue of ***A New Idea***.

Representatives for the 109th Congress corresponding to these districts are as follow:

- 15 - Rubin Hinojosa
- 16 - Silvestre Reyes
- 23 - Henry Bonilla
- 25 - Lloyd Doggett
- 27 - Solomon Ortiz

Copies of the maps were made available to all congressional offices as well as to irrigation districts in the border region.

The maps may be view or downloaded from the IDEA website (<http://idea.tamu.edu>). Large format copies of the maps printed on glossy paper may also be ordered.

Personnel News



Ty Beall



Martin Barroso & Noemi Perez



Burak Turan

Noemi Perez was employed as an Agricultural Technician from 2002 - 2004 and worked on IDEA projects related to the *Irrigation Conservation in the Rio Grande Basin Initiative*. Noemi now works for the Edinburg Irrigation District as a GIS technician.

Ty Beall who worked as part of the IDEA team on the *Integrated Water Resources Plan Project* from 1999 - 2001, has returned to the Lower Rio Grande Valley after 3 years in New Mexico. Ty is now employed as a GIS technician by United Irrigation District.

In September, **Martin Barroso**, Agricultural Technician with Texas Cooperative Extension since 2001, was promoted to the professional position of GIS Specialist in recognition of his GIS skills and good work on various irrigation district projects.

After two years as an Extension Graduate Assistant, **Milton Henry** has returned to Jamaica to resume his job as Director of Systems with the National Irrigation Commission of Jamaica (NIC). Milton has spent the last two years in a PhD program at Texas A&M University and providing engineering support for the IDEA program. He will complete his research and write a dissertation in Jamaica, then return to Texas A&M for his final defense and graduation. This is a part of a cooperative program with the NIC. We expect that Milton's research will benefit both Texas and Jamaica.

Askar Karimov came aboard as an Extension Associate in May 2004 and is headquartered in Weslaco. Askar is from the former Soviet Union Republic of Uzbekistan in Central Asia. He completed a MS in Water Resources Engineering at Indiana University in Spring 2004. Askar would like to work with the IDEA program for the next two years "to gain valuable practical experience in irrigation district management and rehabilitation." Uzbekistan has about 12 million irrigated acres, most of which is through irrigation schemes similar to our districts.



Henry in Jamaica



Askar Karimov

Burak Turan has just begun a Ph.D. program at Texas A&M University and is employed half time as a Student Technician in the IDEA program. Burak is particularly interested in the development of computer models that can be used to optimize water delivery in irrigation districts. Burak has professional engineering experience and has worked in the design of facilities for irrigation scheme expansion in Turkey.

Water Measurement Workshop

A **Water Measurement Workshop** will be held February 2 - 3, 2005 in the Lower Rio Grande Valley at a location to be announced. Instructors include Dr. Bob Hill, Professor and Extension Agricultural Engineer at Utah State University and Dr. Guy Fipps. This will be Dr. Hill's third trip and workshop in the LRGV.

The workshop is designed for irrigation district managers, directors, employees, and others with an interest in flow measurement methods, technologies and costs. The emphasis will be on understanding the advantages of various options, not engineering design.

Day 1

The morning session will provide an overview of the basic principles of flow measurement, equipment, and structures such as weirs and flumes. The optional afternoon session will include demonstration and hand-on instruction of portable flow measurement equipment, including acoustic and mechanical devices.

Day 2

An informal technical tour will be organized during which the instructors and interested participants will see existing or proposed water measurement locations and discuss measurement options.

GPS/GIS Short Courses

In November, the IDEA team conducted two short courses in El Paso and Weslaco. The 2-day **GIS (Geographical information Systems)** provided instruction on the use of ArcGIS 8.0 and 9.0 software, and the 1-day **GPS** classes covered how to operate survey and consumer grade GPS software. Tuition rates were reduced for irrigation district personnel as a result of funding through the Rio Grande Basin Initiative.

Districts and agencies sending personnel included Texas Water Development Board, USDA-NRCS, and the following districts: Elephant Butte, El Paso Co., Hudspeth, Lower Valley, United, San Benito, Mercedes, San Juan, and Edinburg. Also attending were Rio Queen, CLM Farms and Bladerunner Farms.

These classes are generally offered twice a year. To request a class or for more information see the IDEA Website <http://idea.tamu.edu>.

GIS Account Access Tool

David Flahive, System Analyst, is making progress in developing a GIS-based account access and display system for use in irrigation districts. His tool will allow water account holders to view their accounts, both on an interactive map as well as in "table format."

The tool will allow users many options, depending on the needs of the district, including verifying and correcting information, verifying field and turnout locations, water ordering and

tracking, and irrigation water network status. David expects to demonstrate the new tool at the Water Measurement Workshop in early 2005.

As part of this effort, David has been reviewing the structure and organizations of district databases and will be developing a recommended organization structure for districts modernizing their databases.

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The Irrigation District Engineering and Assistance Program is under the direction of Dr. Guy Fipps and is a program of the Irrigation Technology Center, a center of the Texas Water Resources Institute, Texas A&M University System, administrated through Texas Cooperative Extension and the Texas Agricultural Experiment Station. IDEA Team members include Martin Barroso, David Flahive, Yanbo Huang, Askar Karimov, Eric Leigh, and Burak Turan. Website: <http://idea.tamu.edu>.

