Texas Water Savers
News of Water Conservation and Reuse in Texas

Volume 2, Number 3, Winter 1995

Effluent alchemy

Imagine the ideal goods-and-services business of the `90s: a waste product transformed into a commodity with a virtually limitless market, the process offering a sustainable means of conserving a nonrenewable resource and also saving some bucks in the long run.

Ancient alchemists falsely claimed the ability to turn lead into gold, but this true modern-day feat of alchemy occurs at the rate of approximately 1.8 billion gallons daily (about 2 million acre-feet annually) in Texas.

The commodity here is treated wastewater, with its potential for irrigation, toilet flushing, man-made fountains, and other non-contact uses an obvious option for an assured Texas water supply today and the avoidance of expenditures for water resource development in the future. Currently, about 65,000 acre-feet of wastewater are reused annually in the state, more than 90 percent of it for irrigation. Treated effluent is the only increasing source of water that does not require building a dam or drilling a well, according to the Texas Water Development Board.

Impoundment, storage, irrigation, and design issues are being updated by water reuse experts revising Chapter 310 of the Texas Administrative Code. This directive establishes quality, design, and operational requirements for the use of reclaimed water.

In industry, economic concerns drive water-saving efforts, and since costs are proportional to the volume treated and discharged, reuse of water within the plant often makes for a more attractive bottom line. Recycling of cooling and industrial process water and sequential use of water have evolved as the most common forms of in-plant reuse.

Refineries in water-scarce regions, the Corpus Christi area and in West Texas, use 30 to 35 gallons to refine a barrel of oil, compared with Houston and Beaumont refineries, which require two and three times the amount of process water for a similar yield.

Sometimes treated wastewater is the only option. In the drought-prone Lower Rio Grande Valley, an undergarment manufacturer struck a precedent-setting agreement with the City of Harlingen to use treated municipal wastewater for plant process water.

An innovative use of treated wastewater is illustrated Las Colinas, a glittering planned community within Irving. Wastewater purchased from the nearby Trinity River Authority's central treatment plant blends with water diverted from the Elm Fork of the Trinity River for irrigation and maintenance of water levels in aesthetic, manmade canals..

Other industries have found markets for their waste products for commercial purposes: caffeine from decaffeinated coffee, ethanol from sugar refining, mulch from yard waste, even manure from the ranching and farming sectors.

It just makes sense to treat this precious resource like the liquid gold it is.

City opts for treated wastewater

In Las Colinas, an upscale 12,000-acre master-planned community in Irving, glass office towers rise from the urban center. A distance away, sprawling, elegantly landscaped corporate headquarters sit adjacent to golf courses. It is home to the world headquarters of Exxon, GTE, Kimberly-Clark, Boy Scouts of America, and Mothers Against Drunk Driving.

Lake Carolyn receives treated wastewater from the Trinity River Authority's Central Regional Watewater Treatment Plant via an 11-mile pipeline. Raw water pumped from the Elm Fork of the Trinity River blends with the treated effluent. Water from Lake Carolyn is then pumped through a series of canals to maintain levels in the development's 55 lakes.

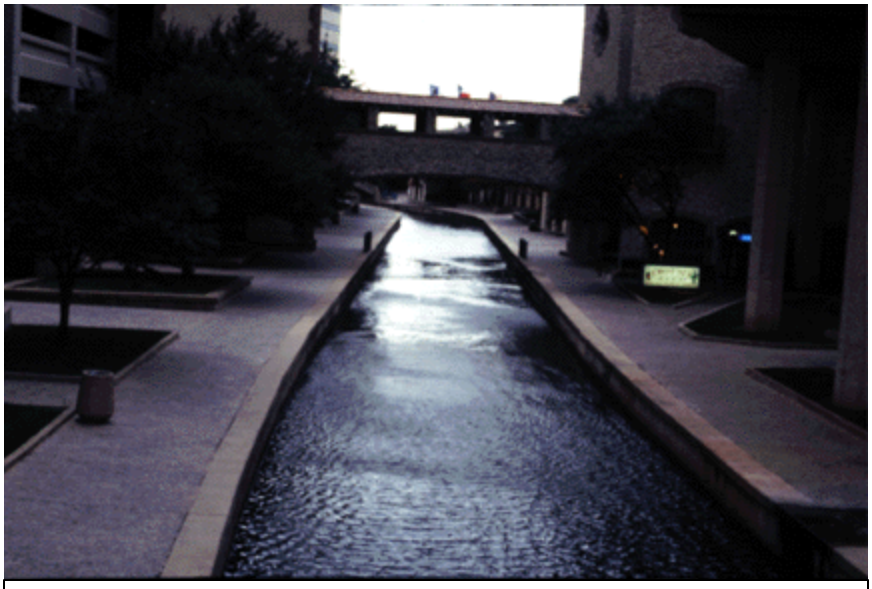
Water--and plenty of it--forms the matrix binding this unique community together, both aesthetically and pracmatically.

In fact, Las Colinas is the largest urban water reclamation project in Texas, with a contract for 8,000 acre-feet per year of secondary treated effluent from the Trinity River Authority's Central Regional Wastewater Treatment Plant. The treated wastewater mixes with an additional 221 acre-feet diverted annually from the Elm Fork of the Trinity River. The entire project is known as the Raw Water Supply Project.

Most apparent in the community is a network of canals winding throughout the Urban Center. Water taxis, imported from Italy, ply the waters between glass-fronted office buildings, outdoor cafes, and constructed waterfalls. Water levels must be maintained

both to meet permit requirements and to assure safe navigation of water taxis. Landscaped area totals 550 acres. Abundant greenspace and four 18-hole golf courses, including the Las Colinas Tournament Player's Golf Course, host of the Byron Nelson Classic, attest to meticulous landscaping and abundant irrigation.

Scattered throughout the development are a series of 55 lakes totaling 470 acres. Canals and pipelines link the lakes, forming an intricate network providing flood control and irrigation water. Lakes and canals are intended for noncontact recreational use.



Canals offer an aesthetic respite, provide a water taxi route, and serve as a practical means to regulate water level in the lakes of Las Colinas.

Contained within the boundaries of Las Colinas, the Dallas County Utility and Reclamation District (formerly Dallas County Municipal Utility District No. 1) was created with responsibility for flood control, storm drainage, water transportation, land reclamation, and lake management. (The word "reclamation" in the title of the district refers to flood plain reclamation.)

During the planning stages of Las Colinas in the early 1970s, developers were concerned with securing an economical, drought-free, high-quality, long-term reliable water supply. The Dallas area has experienced routine water rationing in the past. The Las Colinas developer foresaw increasing potable water rates and the need for water conservation, according to Stan Lynch, the reclamation district's operations manager.

Environmental and water consultant Alan H. Plummer, Jr. examined groundwater, potable water, treated wastewater, and supply from the Elm Fork of the Trinity River. "Groundwater was tested and found to be too salty for golf course irrigation," said Lynch. And because all surface water rights have already been allocated, we could not impound water in surface lakes without a reliable water supply to keep the lakes at spill levels at all times."

Treated wastewater was the only option meeting the criteria of economy, quality, and reliable future supply.

And like a good neighbor, the Trinity River Authority was there. Eleven miles southeast of Las Colinas is the Authority's Central Regional Wastewater Treatment Plant with a treatment capacity of 135 million gallons per day (mgd). The treatment plant can provide a maximum of 16.4 mgd of treated wastewater to DCURD for use in Las Colinas.

Glass towers of Las Colinas' urban center rise behind Lake Carolyn. Raw water from the Elm Fork of the Trinity River is pumped into Lake Carolyn to blend with treated wastewater. The Central Regional Wastewater Plant can supply 16.4 million gallonsper day of treated wastewater to Las Colinas.

Las Colinas is limited to 221 acre-feet annually from the Elm Fork of the Trinity River (and additional water when the river is above 407 feet mean sea level, typically in the spring and fall) because the district must pass sufficient flow downstream to senior Trinity River water rights holders. Thus began the Raw Water Supply Project to provide sufficient water to the Las Colinas development.

In July 1987, an 11-mile, 30-inch-diameter pipeline was completed from the plant to the district's Lake Remle, an off-channel reservoir serving as temporary storage. Water diverted from the Elm Fork is pumped into Lake Carolyn. Trinity River Authority operates the supply pumping facility at their plant.

"Both treated effluent and river water mix in Las Colinas' lakes. The combined water remains in the system approximately 300 days, effectively losing its identity as either effluent or river water," said Lynch.

The district sells the treated wastewater to Las Colinas to irrigate four golf courses, boulevard medians, and greenspaces, as well as to provide for evaporative make-up in the man-made lakes.

Meters at pump stations and discharge points measure water flow. These data are sent to the operations center, where the staff, using off-the-shelf Lookout software, can monitor lake levels and pump station status.

By using lake discharge points and allowing water to spill from lake to lake, the district effectively regulates water levels and promotes circulation. Lake water levels are raised or lowered to control water flow. Low-pressure distribution systems transport water to reservoirs. High-pressure systems serve the irrigation network for customers, greenspaces, and medians.

Water quality, both irrigation and aesthetic quality, is of utmost importance to the district and the Las Colinas development.

All water from the river and treatment plant blends with raw lake water in at least one lake before distribution to 58 discharge points.

Trinity River Authority monitors the quality of treated effluent discharged from their pump station to Lake Remle. The treated effluent must meet the requirements of the river authority's Texas wastewater discharge permit for carbonaceous oxygen demand (7 milligrams/per liter), total suspended solids (15 mg/l), ammonia-nitrogen limit of 3 mg/l or 5 mg/l (summer or winter), turbidity (3 NTU), and fecal coliform (75 CFU/100 ml).

The district tests water from the Elm Fork and selected Las Colinas Lakes to assess the water's irrigation, aesthetic, and recreational quality, according to Lynch.

Irrigational quality of the water is monitored by its sodium adsorption ratio, salinity (measured by conductivity), and pH.

In addition to the components monitored by Trinity River Authority, the district tests for dissolved oxygen, turbidity, pH, ortho-phosphorus and algae.

Six fountain aerators and four waterfalls increase the assimilative capacity and improve lake appearance.

In addition, the district had chemically controlled aquatic weeds and algae since 1983 to maintain water quality and aesthetics and owns and operates a hydraulic dredge used to maintain the capacity of the waterways by removing silt deposits.

Success of the Raw Water Supply Project is attributed to a combination three factors: (1) the excellent quality of reclaimed water supplied by Trinity River Authority, (2) the dilution occurring as treated raaw water from the Elm Fork, the treated efflument, and natural drainage blend during progression through the system, and (3) the district's management of water circulation and blending to maintain water quality.

TWRI welcomes sponsors

Texas Water Resources Institute welcomes six new members and four renewing members to *Texas Water Savers* newsletter. Texas Water Resources Institute is grateful the active proponency of our members on behalf of water reuse and conservation in Texas. We thank you all for your generous support of this valuable project.

New Gold Sponsors: **Texas Sod Producers Association**, a professional organization of sod and turfgrass growers dedicated to providing both popular and newly introduced turfgrasses.

CTSI Corporation, creating programs which unify the goals of conservation of the environment and community improvement.

Renewing Gold Sponsor: **San Antonio Water System**, which has taken a proactive stance in water conservation through its innovative billing system and educational programs.

New Silver Sponsors: **Trinity River Authority**, a conservation and reclamation district empowered by the state to maintain a master plan for basin-wide development and to serve as a local sponsor for federal water projects.

Brazos River Authority, which conducts a multipurpose program for water resources development, including four reservoirs with more than 2 million acre-feet capacity.

Sabine River Authority, which oversees development, planning, and administration of water resources, including Lake Tawakoni and Toledo Bend Reservoir, impounding a total of 5.4 million acre-feet.

Renewing Silver Sponsor: **Lower Colorado River Authority**, which oversees the largest series of dams and reservoirs in Texas, including hyrdoelectric dams and electrical power distribution networks.

New Sponsor: **CH2M Hill**, providing planning, design, program and construction management services, including water supply development and wastewater collection, treatment, and reuse.

Renewing Sponsor: **Alan Plummer & Associates**, offering planning, design, and construction administration of environmental projects, including wastewater collection, treatment, permitting, and reuse; water resource development; environmental site assessments; and wetlands delineation design and construction.

A&M profs use risk modeling to figure optimum supply

Study to analyze water supply size

Water resource practices focus on management, development, conservation, and water transfer, usually with the goal of assuring a low-risk municipal water supply. To keep lawns green, bathtubs full, and car washes running, water utilities typically size the water supply system for a worst-case scenario: severe droughts of low probability.

Because water consumers are risk averse, and also because water utilities are able to pass on the cost of development to those consumers, the tendency to size the water supply system for the severe drought contingency remains the industry standard.

Ronald Griffin and James Mjelde of the Department of Agricultural Economics at Texas A&M University have been awarded a $39,000 grant from Texas Water Development Board to analyze optimal water supply level by modeling risk in selected Texas communities.

Griffin and Mjelde propose a three-step process. First, they will search for and assess existing suitable risk-based management models for a foundation. Second, they will survey residents of selected communities to elicit opinions on risk preference of actual consumers. Finally, applying the data to the chosen model, they will determine efficient reliability planning for the selected communities.

Aside from the obvious costs of "playing it safe," there is the environmental angle. According the project proposal, "When municipal water users decrease the risk of water supply shortfalls, they are shifting risk to nonmunicipal users. Obviously, some water use(s) must incur the shortfall during drought conditions." Traditionally, that risk is shifted to natural, aquatic and habitat systems. These systems are residual claimants, using only water left over after man has diverted water for his purposes.

Exchange program benefits local groups

by Rick Ruiz
CTSI Corporation

Of course residential water conservation is the right thing to do in theory, but difficult in practice. Now a proven, community-based approach to conservation programs is saving water and helping communities cope with problems like gang violence, school funding shortages and shrinking budgets for local community groups.

CTSI International achieves "conservation with a conscience" with their community-based organization program. CTSI has assisted water districts, mostly in California, in pairing member agencies with local organizations to create community-based marketing and distribution programs. The community-based organizations are trained to promote an ultra low flush toilet (ULFT) exchange, later collecting rebates offered by the utility for each exchange. These programs have been especially beneficial to low-income customers who found it difficult to participate in traditional rebate programs because they could not afford the initial up-front cost of a new toilet, then wait to be reimbursed.

"When we looked at water conservation from the community's point of view, we could see an opportunity to do more with money already being spent by local water agencies," said Lois Craft, president and co-founder of CTSI Corporation. "By designing programs in partnership with water agencies and community groups, we've been able to create jobs, train workers, and create small, locally run businesses without additional expense to the water agencies."

CTSI has used this community-based approach to assist large and small water agencies across the country. For example, CTSI has created and managed the $25 million ultra-low flush toilet (ULFT) retrofit program operated by the Metropolitan Water District of

Southern California. CTSI also has designed and implemented programs from Atlanta to San Diego ranging in size form 100 to 10,000 ULFTs.

In 1992, CTSI developed, implemented, and funded the first communited-based organization toilet exchange program in the country, working with an East Los Angeles-based group, Mothers of East Los Angeles, to market and distribute ULFTs. The company's pilot was so successful and cost-effective, that in 1992, the Metropolitan Water District adopted and expanded the program.

Since then, CTSI has distributed more that 300,000 ULFTs that save 3.9 billion gallons (12,000 acre-feet) of water annually. for Metropolitan Water District. Besides saving water, the program created nearly 100 full-time jobs for inner city residents and paid more than $5 million to the community-based organization to develop and operate independent, small ULFT distribution businesses. CTSI trains the community-based organizations' workers in every aspect of business operation, from warehousing to data entry to marketing to management.

The community-based organizations, in turn, have reinvested their earnings in support of community-oriented programs like graffiti abatement, scholarships, tutorial assistance, and economic development that can provide more job opportunities.

CTSI also set a new national standard for the toilet recycling industry. Virtually all of the 300,000 units replaced through the exchange program are kept out of the waste stream, instead they are crushed and mixed with recycled tires used to repave roads or repair pot holes.

In searching for new ways to use the community-based organization approach, CTSI decided to work with local high schools. Working with students, parents and teachers to market the ULFTs in the neighborhoods around the schools proved to be an effective way to create interest and awareness in the program. One school earned $32,000 in just two days by distributing ULFTs. Typically, schools use their earnings to fund art, theatre, and athletic programs.

The value-added measure does not stop at revenues. CTSI's Student Alliance Against Racism and Violence provides a forum for young people to increase communication and understanding by highlighting the common human experience. The program addresses underlying sources of youth violence through interaction and dialogue between diverse student populations. Following the workshop, students work together provide the organization, motivation and leadership for the toilet exchange program.

"We think it is important to leverage the scarce resources available today so that the broadest cross-section of each community has a chance to benefit from a given program," said Craft.

For more information, call CTSI's Mike Mahoney, (714) 253-2050 or (800) 660-8028.

Plant one of Texas' best

The Trinity River Basin in the eastern half of Texas has an overall length of 360 miles, draining 18,000 square miles of the state's land area. The Trinity River Authority's political subdivision comprises all of five and parts of twelve counties within the Trinity River Basin. Dallas and Fort Worth were founded on the banks of the Trinity River, and dominate the upper portion of the Trinity Basin.

In the primary treatment, foreign objects are first screened from the wastewater; next, small particles are filtered out; then solids that either settle or float are removed.

The Trinity River Authority (TRA), was established in 1955 by the Texas Legislature with the original (but never realized) purpose of planning the construction of an inland ship channel from the Port of Houston and for developing a master plan for development of the Trinity River watershed.

Soon after its founding, however, TRA redirected its priorities and pioneered the concept of regional wastewater treatment. In 1960, the Central Regional Wastewater System, with a processing capacity of 30 million gallons per day (mgd) was placed into operation to serve four customers. Today the Grand Prairie plant processes wastewater from 19 cities and the Dallas/Fort Worth Airport. Its rated capacity is 135 mgd, and TRA will soon seek and uprating of the plant's permitted capacity to 162 mgd. Phase IV expansion will raise the plant's rated capacity to approximately 177 mgd, and Phase V will increase the rated capacity to approximately 202 mgd. Financing of plant construction is achieved through the sale of revenue bonds. Debt service and operating costs are borne by the plant's utility customers on a pro rata basis.

TRA is a nonprofit, wholesale provider of service and treatment. Customer cities all pay the same per-unit fee for treatment. Funds remaining after the final audit are distributed back to customers.

At present, the sole retail customer of treated wastewater is the Dallas County Utility and Reclamation District, entirely encompassed by the Las Colinas master planned development. (See companion article on page 1.)

Revenues derived from the sale of up to 7.14 mgd of effluent offsets a portion of the costs of treatment, according to Bill Smith, manager of Water Resources Planning for TRA.

The treatment planthas been recognized by the Environmental Protection Agency as one of the best large-scale treatment plants in a five-state region, and was also lauded by the Texas Natural Resources Conservation Commission as one of the best in Texas.

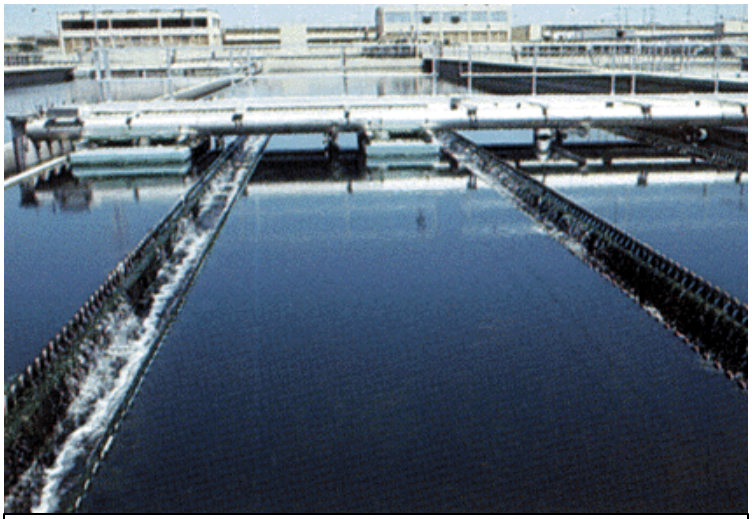
Sludges are blended with lime, chemically stabilized, and thickened in large filter presses to a dryness of about 34 percent in the sludge dwatering process.

The treatment plant has a service area of over 450 square miles, and is located about 500 feet from the Trinity River. Processed wastewater not delivered to the district flows into the West Fort of the Trinity River. Outfall water quality must comply with TRA's wastewater discharge permit from the State of Texas.

The plant uses state-of-the-art activated sludge and filtration techniques to reduce bioche mical oxygen demand and total suspended solids by 98 and 97 percent, respectively.

Owing to a gap between the perception and reality regarding the quality of treated wastewater, the treatment plant has necessarily served as a front runner in addressing concerns about treated wastewater. But in fact, water samples from the Trinity River upstream of the plant are often of a lower quality that than in the outfall from the treatment plant.

Bill Tatum, Plant Manger, relates the story of an irate



Chlorine contact basins, where water is chlorinated for disinfection is one of the last stages of wastewater treatment at the Trinity River Authority's Central Wastewater Treatment Plant.

citizen concerned with the plant's discharge product. After a tour of the plant and explanation of its operation, he left asking how he, too, could receive treated effluent.

Primary sludge (solids separated by gravity) and secondary sludge produced by the activated sludge process are thickened in gravity and dissolved air floatation thickeners.

In a comparison reminiscent of the Pepsi-Coke comparisons, visitors, when challenged by Tatum, could not distinguish with any degree of certainty, a flask of effluent water from a flask of river water.

The plant's state-of-the-art treatment consists of (1) primary treatment that removes foreign objects such as rags and sticks, and removal of settleable solids in primary clarifiers; (2) primary clarification in flow equalization basins that provide dampers to even out high and low flow diurnal loadings; (3) secondary treatment that utilizes microorganisms to consume organic and inorganic contaminants; (4) tertiary treatment that utilizes gravity sand filters to remove additional solids, optional carbon adsorption for toxicity removal and finer removal of solids, and chlorination and dechlorination. Primary, secondary and digested anaerobic solids generated within the treatment processes are thickened and chemically stabilized in three large filter presses, and the sludge is additionally blended with lime. The dewatered sludge cake is stabilized and pasteurized, then used in a pilot project involving municipal landfill soil supplement or deposited at the plant's landfill. Plans are underway to seek out agricultural uses for this sludge.

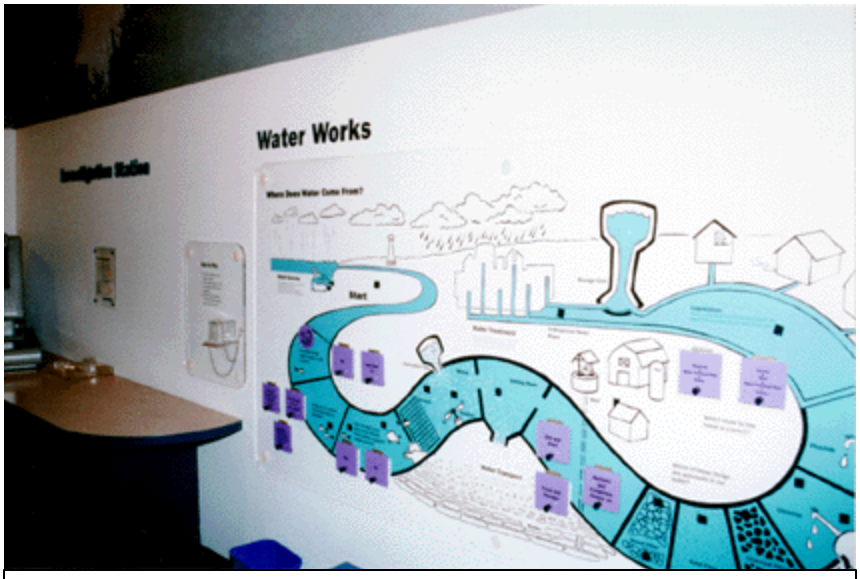
Houston gameboard wins national honor

An interactive gameboard designed and installed by the City of Houston at the Houston Children's Museum was awarded first place in the Innovative Partnership Category of the U.S. Bureau of Reclamation's Leadership in Water Conservation Awards.

A joint effort of the City of Houston and the Children's Museum, the project was recognized from among 20 entries for heightening awareness of conservation and reuse and for its potential for long-term conservation benefits, according the USBR.

The gameboard, consisting of two 4-foot by 6-foot panels on opposite walls, poses questions about water conservation, water purification, wastewater treatment, and careers

in the water industry. Flip doors hide the answers. A pair of dice controls movement around the board.



This interactive gameboard, a joint project of the City of Houston and the Houston Children's Museum, asks and answers questions on water purification, distribution, and conservation, and careers in the water industry. The gameboard is on permanent display in the museum's "Our Small Planet" exhibit.

The nationally recognized Houston's Children's Museum serves approximately 200,000 visitors annually. On permanent exhibit, the gameboards are mounted on opposite walls of the museum's "Our Small Planet" exhibit, part of the Meadows Environmental Gallery which is dedicated to exploring environmental issues.

The primary objective of the overall exhibit is to teach children about domestic water use and area wetlands in an interactive environment that is both fun and educational, according to Pat Truesdale, Houston's water conservation manager.

Houston is facing the need to address water conservation to meet the challenge created by increasing water demands, problems associated with subsidence from groundwater pumping, and the potential costs of transportation of surface water.

In the same competition, The Harris-Galveston Coastal Subsidence District was awarded first place in the Education Mentor Category by the USBR for its innovative "Learning to be Waterwise and Energy Efficient" program, a partnership between the District and the public schools. Schoolchildren learned of conservation through a curriculum reinforced with a home conservation kit. (see *Texas Water Savers*, Fall 1995.) Carole Baker is Director of Public Information for The Subsidence District.

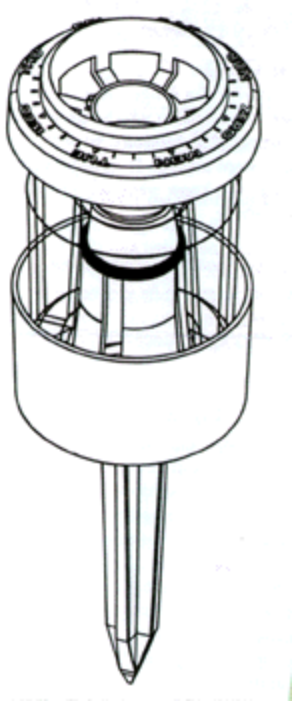
Gadgets simplify home water conservation

Toys. Gotta have `em.

But how about toys dedicated to conserving water? And we're not talking plumbing fixtures here. Toys with a purpose ... and a little fun.

Say your neighbor has a home weather station. He drones on over the back fence about relative humidity and barometric pressure and rainfall.

Enter the Moisture Smart Watering Gauge, a 5-inch-tall miniature pan evaporimeter. Stake this baby into your lawn, fill with water, check the water level a few days later, and watch his eyes widen when you casually mention the week's evapotranspiration rate. And, by the way, you'll be doing both your lawn and your water bill a favor by timing and regulating your irrigation routine based on evapotraspiration rates. The Watering Gauge accounts for evaporation, as well as sprinkler input and rainfall.



The Moisture Smart Watering Gauge is a miniature pan evaporimeter designed to evaporate water at the same rate as healthy grass, allowing a simple, visual measure of the current irrigation requirements of healthy plants. Watering intervals and amounts can be adjusted accordingly.

For more information, call Moisture Smart in Spokane, Wash. at (509) 838-3771.

Now it's Saturday morning, the guy next door is engaging in his weekend ritual--washing the sport utility vehicle. He fills his bucket, blasts the hose, wets, washes, and rinses, then applies a bit of elbow grease to the wax process. Thirty gallons of water and three hours down the pike, but that baby gleams.

In contrast, you fill your bucket with water, dampen a clean cloth, apply a bit of one of several "dry" car wash products, buff with a dry cloth, and repeat for the entire truck. Your sport utility vehicle also gleams. Total water use: one 5-gallon bucket of water. Two such products on the market are Posh Wash Car Care Creme (Flair Image, Houston) and Dri-Wash `n Guard (Enviro-Tech International, Houston, 800-619-9848).

How about the garden? Mulch, the gardener's mantra, is of course, the simplest and most effective method of reducing evaporation from planting beds and for protecting roots from high temperatures. Soaker hoses also allow less evaporation than sprinkers. (Sprinkler irrigation may lose up to one-third its output to evaporation depending upon droplet size, wind conditions, and humidity.) To double your ecological punch, one brand of drip hose is even made from recycled tires. Inquire at local garden shops.

But you want more? How about a flowmeter that regulates water output from a faucet and actually cuts off the flow after a pre-set limit? These and drip hoses are available at nurseries and garden supply stores.

Another option for the garden is hydrogel, small granuales of hydrophilic polymers which absorb water, expanding to several times their dry volume. Although research results on their applicability to water conservation is mixed, added to the soil, they do have the effect of flattening out the peaks and troughs of soil moisture within watering

cycles. Hydrogel is also the material sewn into bandanas, soaked in water, and worn around the neck.

What toy list would be complete without something for the computer? Gardner Pardner is personal gardening database management software created by Lila and Jim McAteer of Hempstead, Texas. This Windows-based database software, the basic "Weekender" version and the more detailed "Hobbyist," automates the task of keeping track of plants. Both versions offer fields for entering plant data: their cost, bloom time, transplant date, moisture, hardiness zones, and fertilizer date. With easy accessibility to plant information, the software makes it easier for home gardeners to meticulously maintain and irrigate their gardens, including xeriscapes.

Like buying savings bonds or eating a nutritious breakfast, using water-saving products is both good and good for you. Consider these "toys with a conscience."

AWWA Conservation & Reuse Awards

The Texas Section/American Water Works Association is accepting entries for the annual Water Conservation/Reuse Awards. This will be the third year the Section has recognized water utilities, private companies, government agencies, and others who have developed or who are using innovative and successful methods for water efficiency and conservation. Past winning projects have included educational programs, rebate programs, and industry.

Entries will be evaluated on conservation activity that supports and promotes the efficient use of water and can include completed projects or projects in the initiation or implementation phase. Criteria for evaluation has been established by the Texas Section/AWWA water Conservation and Reuse Committee. Entries will be judged on innovation, implementation, execution, benefits and results, transferability and program evaluation.

Entries should be submitted for either of two categories: Direct Programs that reduce water consumption and increase water use efficiency, and Indirect Programs that include education and demonstration projects, where results may not be measured in tangible terms. Awards will be divided by small utility, large utility, and non-utility.

For the second year, the Texas Section will recognize water reuse projects with an award named in honor of Bob Derrington, whose contributions to water reclamation and conservation were numerous. He was Director of Utilities for the City of Odessa from 1978 until his death in 1990. All reuse projects are eligible for the Bob Derrington Water Reclamation Award.

The award program is open to all who are active in promoting and supporting water conservation and reuse in Texas. Entries must be received by January 31, 1996, and should include the following information: completed entry form, project summary (no longer than two pages) with description, information on research, planning, execution, and evaluation. Supporting material should be kept to a minimum.

Awards will be presented at the Texas Section Annual Conference in Austin in April. Entries should be mailed to Cheri Vogel, LCRA, AWWA Conservation Committee, P.O. Box 220, Austin, TX 78767. For additional information, call Cheri Vogel at (800) 776-5272, ext. 7586.

1995 Texas/AWWA Water Conservation & Reuse Awards Entry Form
Entries must be received by January 31, 1996.

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Category (circle one)
  Direct small utility (<=50,000)
  Direct large utility (>50,000)
  Direct non-utility
  Indirect small utility (<=50,000)
  Indirect large utility (>50,000)
  Indirect non-utility
Person submitting entry _____________________________________________
Phone _______________________________________________________________
Organization/Company_________________________________________________
Address______________________________________________________________
City_____________________________________ZIP code___________________
Names(s) to be used for award________________________________________
Project name_________________________________________________________
__ Include this submission for the Bob Derrington Water Reclamation
   Award
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