INTEGRATING ASR AND DPR TO ENHANCE THE CITY OF KERRVILLE’S WATER SUPPLY

By Richard Weatherly (Freese and Nichols) and Kristine Day (City of Kerrville)

Introduction

The City of Kerrville currently provides 100% of its summertime wastewater effluent flow as reuse water for irrigation and industrial customers. In addition, potential non-potable reuse customers have continued to approach the City requesting reuse water but the City does not have additional reuse supply capacity to meet potential customer’s summertime demands. The sustainable reuse system FNI investigated would collect and store wintertime wastewater effluent flows in storage ponds near the wastewater treatment plant and convey the additional volume to new customers during the summertime months. The ponds would provide additional reuse storage to allow flexibility to match year-round reuse water supply and demand. The proposed reuse project would include two phases: Phase 1 would consist of pond(s) with a total storage capacity of 105 MG and Phase 2 would consist of either additional pond storage or utilizing that effluent supply for potable use. The City’s challenge was to balance and determine the feasibility of the project from both a financial and technical engineering and regulatory perspective.

The City utilizes approximately 90% surface water for its potable supply and that surface water supply is limited during droughts due to junior water rights. The remainder of the City’s water supply comes from groundwater wells as well as Aquifer Storage and Recovery (ASR) supplied by surface water injection wells. As a result on the recent drought in Central Texas, water restrictions have been enacted for all potable water customers throughout the City. The City is investigating the potential to utilize the wastewater effluent for direct potable reuse application by utilizing the ASR facilities for storage.

(Continued on page 2)
Methodology

The study included investigation of necessary environmental permitting, geotechnical conditions, hydrologic and hydraulic analyses and regulatory requirements for the implementation of this future reuse project. The goal of the study was to identify potential obstacles or fatal flaws in the concept, determine how best to maximize storage pond volume while minimizing cost and provide the City with a clear Reuse Program path forward.

FNI began the project by investigating the environmental and geotechnical site conditions. Environmental scientists walked the entire study area and found no wetlands, endangered species or flowering plants. The environmental investigation determined that all work for the proposed system could be completed under the USACE Nationwide permit.

The purpose of the geotechnical investigation was to explore the subsurface conditions and determine if suitable material is available for use in constructing the proposed pond embankments. In order to do this, eight soil boring locations were chosen and maximum excavation pond depths were determined based on the groundwater level and depth at which bedrock was encountered. Suitable material was available on site for pond construction and an HOPE geomembrane liner with geonet was recommended for the pond. It was also critical to coordinate with the City Landfill Master Plan because the reuse pond study area overlapped areas designated as future City landfill in the City Landfill Master Plan, as seen on Figure 1.

The floodplain evaluation portion of the study determined the impacts of the ponds on the 100-year floodplain. The proposed North Pond flood stage increases would affect additional property and floodplain or pond layout modifications would be required. The South Pond flood stage increases are contained on City property so the study identified the South Pond to be the most feasible alternative for Phase I.

FNI then analyzed the topographic information provided by the survey in order to determine how to transfer the reuse water from the existing treatment plant site. A 24-inch gravity pipe was proposed from the Wastewater Treatment Plant to the proposed South pond.

In order to remove the South reuse storage pond from the floodplain, the pond was designed with a berm elevation of 1628 ft, a maximum water level of 1625 ft and a minimum water level of 1592.5 ft. Under this design, the proposed South pond will store 105 MG of non-potable reuse water. A rendering of the proposed 105 MG reuse storage pond and pump station is shown on Figure 2 (next page).

Currently, the non-potable reuse water system is served by a reuse pump station at the Kerrville Water Resource Recovery Facility and 8-inch reuse water lines that distribute non-potable reuse water to existing customers. As part of this project, the existing reuse pump station will be removed from service and replaced with a new reuse pump station located on the southwest corner of the new reuse pond facility. The future reuse pump station will connect to and utilize the existing non-potable reuse water lines as well as pipeline extensions to future customers.

FNI developed a hydraulic model of the non-potable reuse distribution system using the Innovyze H20Map Water software. Maximum reuse demands for existing and proposed customers are based on the customer’s summer irrigation water demand. Based on the location of the customers, proposed demands and ground elevations, FNI determined that two pressure planes would be required for the City’s future non-potable reuse system. The pressure planes were designated as the North Pressure Plane and South Pressure Plane.

(Continued on page 3)
Discussion and Conclusions

FNI presented the results of the study on this sustainable water reuse system in a Reuse Feasibility Report. The study recommended that the City construct the 105 MG reclaimed water storage pond as the first phase of the project. Council directed City Staff to evaluate the financial feasibility of the Phase 1 reuse project. City Staff determined that the City will be able to implement the first phase without increasing water rates. The City has met with the potential reuse customers regarding connection to the City’s non-potable reuse system. The Phase 1 project design is currently in progress and will be complete in October 2015 with construction scheduled to begin in March 2016.

The second phase of the recommended reuse project will focus on completion of a feasibility study on the use of reclaimed water injected into ASR for direct potable reuse purposes. The Phase 2 study is currently in progress. Direct potable reuse (OPR) requirements are evaluated on a case by case basis by the Texas Commission on Environmental Quality (TCEQ) and preliminary regulatory meetings with the TCEQ have been conducted. Sampling is scheduled to begin in August 2015 and have a one year duration. It is required that the effluent be treated to drinking water standards before injection into the ASR. After completion of sampling, the City will present results to TCEQ as well as a proposed treatment scheme to treat the water to drinking water standards.

Contact Anne Whittington to RSVP (anne@acctx.org)
MESSAGE FROM THE PRESIDENT

It is truly an honor and a privilege to have the opportunity to serve all of you as President of the San Antonio Section of the Water Environment Association of Texas (WEAT). Since its inception, this chapter has grown into an amazing group of individuals passionate about water and wastewater thanks to strong leadership of a very involved, active membership. I am dedicated to continuing the development of our chapter, along with the South Texas Chapter of the American Water Works Association (AWWA), and other officers of the WEAT San Antonio section. Cale Underberg is serving as Past President, Mehmet Boz as Vice President, Amy Middleton as Treasurer, and Kim Keefer continues her term as Secretary.

In 2015, San Antonio experienced the second wettest January through June in recorded history, with a total rainfall of 29.7 inches recorded at the airport (the annual average rainfall in San Antonio is just over 30 inches). In fact, in late June, the drought appeared to have subsided with less than five percent of Texas classified in any category of drought. But drier conditions have once again returned, and nearly 60 percent of the state is back in some degree of drought. Much of Central Texas is currently in moderate drought conditions. This just reinforces the importance of what we do as water professionals. Water is a precious, life-sustaining and often scarce resource. It is up to us to spread awareness to the community.

We closed out the summer with our annual Water For People “Sweat for a Cause” Golf Tournament on August 28. An incredible $34,000 was raised for Water For People! I’d like to thank the generous sponsors of this event; the participants and everyone who helped plan this event. As we look ahead to the rest of 2015, our 11th Annual Scholarship Dinner and Fundraiser is coming up on November 19th, at the San Francisco Steakhouse. We are thrilled to announce Ron Nirenberg, District 8 City Councilman, as our keynote speaker for the event. Ron is very passionate about water issues and I know he will deliver a great message to our membership, so don’t miss it! There are still Gold and Silver sponsorships available.

I am looking forward to the rest of my term as President of the WEAT San Antonio chapter. I welcome any ideas or suggestions you have on how we can continue to grow and develop this organization!

Sincerely,

Heather Lindner, PE
President, WEAT San Antonio Chapter

SPECIAL THANKS TO OUR JULY SPEAKER & SPONSOR
Thank you to Amy Middleton, from SARA for speaking about Clarifier Rehabilitation at our July 16, 2015 meeting. A big thanks also to Pape-Dawson Engineers for sponsoring.

SPECIAL THANKS TO OUR AUGUST SPEAKER & SPONSOR
Thank you to Andrea Beymer, of SAWS for speaking about the Vista Ridge Integration Project at our August 20, 2015 meeting. Special thanks to Freese & Nichols for sponsoring.

SPECIAL THANKS TO OUR SEPTEMBER SPEAKER & SPONSOR
Thank you to Paula Lemonds of HDR for speaking about Hill Country Water Studies at our September 17, 2015 meeting. Thank you to HDR for sponsoring.
BASURA BASH
TAWWA/WEAT SAN ANTONIO CHAPTER

Saturday, November 7, 2015
8:30 - 11:30 a.m.

Location: Olmos Basin Park

To sign up,
email Rikki Anderson
at Rikki.Anderson@freese.com

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Thank You 2015 Sponsors for helping us raise $34,000 for Water For People! Special thanks to Title & Platinum Sponsors!

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THIRD QUARTER 2015
The South Texas Chapter of TAWWA and San Antonio Section of WEAT are now on Facebook!
Please go to the link below and “Like” South Texas Water Professionals to be connected and stay informed about upcoming events and activities.

Visit us at www.facebook.com/SouthTexasWaterProfessional
LOOKING FOR VOLUNTEERS!

TAWWA has an Education Division which has the objective to promote and encourage training, upgrading and certification of water plant operators, managers and other utility personnel; and to promote and encourage water education. The Division is dedicated to the promotion of water education through a proactive effort to support membership and consumer educational opportunities in Texas.

The TAWWA Education Division has 5 committees
- Competitions
- Consumer Outreach
- Partnership Development
- K-12+ Education
- Member Education

For more info, please visit the TAWWA website at http://www.tawwa.org/?page=advocacy
If you are interested in serving on any of these committees, please feel free to contact:
- Melissa Bryant at mbryant@sara-tx.org, or
- Joshua Milks at jmilks@cpyi.com

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CALL FOR ABSTRACTS
Value of Water – Texas

At Texas Water 2016, the Value of Water – Texas program (formerly One Water – Many Stories) is spotlighting the effect of population growth to our industry. According to Forbes American Fastest Growing Cities 2015, five of the Top 10 of those cities are located in Texas. While this booming population growth is positive in terms of economic development, our water and wastewater utilities are stressed to maintain supply, quality and level of service to meet residential, commercial and industrial demand. The Value of Water – Texas program is designed to foster networking and dialogue amongst water and wastewater utilities of all sizes focusing on the community outreach component of a project or challenges experienced with responding, interacting or communicating to your end users. Real-life experiences and lessons learned will be told. This program includes oral presentations, interactive discussions and an opportunity to meet and discuss outreach with the program speakers in a dynamic environment.

Potential speakers are invited to submit an abstract for consideration in telling your story that addresses the communication and outreach aspect of the following topics:

A. Water Management during times of drought, flood or both
B. Water Resource Planning for intensive population growth
C. Cultural/Behavioral impacts, especially for those users new to Texas
D. Water and Wastewater rates
E. Growing industries
F. Aging infrastructure

Abstracts will be reviewed by the Value of Water – Texas planning committee. Deadline is October 30, 2015. The link for submittal is: http://www.texas-water.com/abstractsubmittal.html

In an attempt to better serve the Young Professional (YP) members, we are asking that all members under the age of 35 or less than 10 years in the industry, please e-mail Kim Keefer at kkeefer@pape-dawson.com with their name, e-mail, and phone number.

If there are others in your office who are not yet TAWWA/WEAT members, but might be interested in participating in TAWWA/WEAT functions, please pass this request on to them. All members of the water and wastewater community are welcome!

Want to be taken off the email list or change your contact info?
Please e-mail Ann Peche at ann.peche@saws.org or Kim Keefer at kkeefer@pape-dawson.com
DODSON’S DRIVE
YP SUMMIT SPONSORSHIP

Dodson’s Drive was started to honor the life and work of Mr. Kenneth D. Dodson. The Benefit is focused toward the Young Professionals (YPs) of WEAT/TAWWA and was established to further the work and education of the YPs represented in our water and wastewater industry by sponsoring one YP to attend the annual WEF/AWWA YP Summit. The upcoming YP Summit will take place on February 24, 2016 in San Diego, CA.

ARE YOU ELIGIBLE FOR ASSISTANCE?

To be eligible for benefit assistance from Dodson’s Drive, you must meet the following minimum requirements:

- Be an active member of your Section’s Young Professionals committee.
- Demonstrate leadership qualities.
- Submit a statement outlining how your receipt of the benefit assistance will benefit WEAT and/or TAWWA.
- Be an active, dues paying member of the Water Environment Association of Texas (WEAT) and/or the Texas Section of AWWA (TAWWA) for a period of not less than twelve months preceding the date of the application.
- Reside and be employed by an engineering firm, municipality, utility district, manufacturer or construction company in Texas that is associated with the water or wastewater industry.

SPECIAL CONSIDERATIONS

Special consideration will be given to those that previously served in the US active military, armed forces, coast guard, and/or reserves.

If you meet the eligibility criteria shown above, carefully complete all parts of the following application http://www.weat.org/yp.shtml (half way down the page...)

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SIPHONS, FORCE MAINS & LIFT STATIONS CONFERENCE
AND EXPO

January 26-27, 2016 · San Marcos, Texas

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Speakers will include industry and municipal leaders in their field of expertise. Register on line at www.weat.org
September 24, 2015

American Water Works Assoc. South TX Chapter
San Antonio Section of the Water Environment Assoc. of TX
2800 US Highway 281 North
San Antonio, TX 78212-3106

Dear Friends:

At a time when you kindly remembered someone dear to you, you also thought of the students at Texas A&M University and extended your support to them. On behalf of our students, thank you for your gift of $350.00 for the Bradley Groves '78 Endowed Memorial Scholarship Fund.

This support is meaningful to the students who benefit from the scholarship awards made available through the memorial scholarship fund. Your thoughtfulness will help provide for the education of a deserving Aggie.

We are honored to have received this memorial gift and have notified Al '55 and Janie Groves, Mr. Blake Groves, Mrs. Christine Groves Cheney and Mrs. Lauren Groves of your donation.

Best regards,

Nic Tauntion '07
Director of Development
Local TAWWA/WEAT Contacts

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Upcoming Meetings and Events

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<tr>
<td>November 5, 2015</td>
<td>YP Forum</td>
<td>AWWA/WEAT</td>
<td>San Antonio, Texas</td>
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<td>November 7, 2015</td>
<td>Basura Bash</td>
<td>AWWA/WEAT</td>
<td>Olmos Basin Park</td>
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<td>November 19, 2015</td>
<td>Scholarship Dinner</td>
<td>AWWA/WEAT</td>
<td>Old San Francisco Steak House</td>
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New WEAT Members

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