

5.	<p>Update on Landfill Gas to Energy Efforts</p> <p>This report provides the Transportation and Infrastructure Subcommittee with an update on the City's Landfill Gas to Energy efforts.</p> <p>This item is for information and discussion.</p>	<p>John A. Trujillo, Public Works Director</p> <p>Page 9</p>
6.	<p>Colorado River Resiliency Program</p> <p>This report provides the Transportation & Infrastructure Subcommittee with a drought update and a summary of the planned Colorado River Resiliency program elements for FY2015/16.</p> <p>This item is for information and discussion.</p>	<p>Kathryn Sorensen, Water Services Director</p> <p>Page 13</p>
7.	<p>Call to the Public: Consideration, discussion, and concerns from the public. Those wishing to address the Subcommittee need not request permission in advance. Action taken as a result of the public comment will be limited to directing staff to study the matter or rescheduling the matter for further consideration and decision at a later date.</p>	<p>Chair Williams</p>
8.	<p>Request for Future Agenda Items</p>	<p>Chair Williams</p>
9.	<p>Adjournment</p>	<p>Chair Williams</p>

For further information, please call Tim Merritt, Management Assistant, City Manager's Office, at 602-495-5676 or Gabriel Morales at 602-534-9222. 7-1-1 Friendly.

Persons paid to lobby on behalf of persons or organizations other than themselves shall register with the City Clerk prior to lobbying or within five business days thereafter, and must register annually to continue lobbying. If you have any questions about registration or whether or not you must register, please contact the City Clerk's Office at 602-262-6811.

For reasonable accommodations, call Tim Merritt at 602-262-7684 or Gabriel Morales at 602-534-9222 as early as possible to coordinate needed arrangements. 7-1-1 Friendly.

March 25, 2015

CITY COUNCIL REPORT

TO: Rick Naimark
Deputy City Manager

FROM: Albert Santana
Light Rail Project Administrator

SUBJECT: METRO, REGIONAL PUBLIC TRANSPORTATION AUTHORITY, AND
MARICOPA ASSOCIATION OF GOVERNMENTS MEETINGS

This report provides the Transportation and Infrastructure Subcommittee with copies of past and/or upcoming meeting agendas/summaries for METRO light rail, Valley Metro/Regional Public Transportation Authority (RPTA), and the Maricopa Association of Governments (MAG). This item is for information only.

THE ISSUE

Within Maricopa County, there are several agencies with different charges relating to public transit and transportation planning.

Valley Metro/RPTA: In 1993, the Regional Public Transportation Authority Board adopted the name Valley Metro as the identity for the regional transit system in metropolitan Phoenix. Under the “Valley Metro” brand, local governments fund the Valley-wide transit system which the public sees on the streets today. Valley Metro Board member agencies include Avondale, Buckeye, Chandler, El Mirage, Gilbert, Glendale, Goodyear, Maricopa County, Mesa, Peoria, Phoenix, Queen Creek, Scottsdale, Surprise, and Tempe. Councilwoman Thelda Williams serves as Phoenix’s representative on the RPTA Board of Directors.

METRO: METRO is the brand name for Valley Metro Rail Inc., a nonprofit, public corporation charged with the design, construction, and operation of the Valley’s light rail system. The cities that participate financially in the light rail system each have a representative on the METRO Board of Directors. Cities on the board include Chandler, Glendale, Mesa, Phoenix, and Tempe. METRO is structured on a “pay-to-play basis” with voting power allocated based on investment in the system. Councilwoman Thelda Williams serves as Phoenix’s representative and is the current chair of the METRO Board of Directors.

The Maricopa Association of Governments (MAG): MAG is a Council of Governments that serves as the regional agency for the metropolitan Phoenix area. When MAG was formed in 1967, elected officials recognized the need for long-range planning and policy development on a regional scale. Issues such as transportation, air quality, and human services affect residents beyond the borders of individual jurisdictions. MAG is the designated metropolitan planning organization (MPO) for transportation planning in the Maricopa County region. Mayor Stanton serves as Phoenix’s representative.

OTHER INFORMATION

The goal of staff is to provide the Transportation and Infrastructure Subcommittee with agendas for future meetings of these bodies. Meeting dates do not coincide and agendas are not available until close to the meeting date. However, prior to reaching each Board of Directors meeting, most agenda items are reviewed by staff committees which include City of Phoenix members. An attachment to the Subcommittee packet will provide meeting agendas and/or additional information for previous and upcoming METRO, RPTA and MAG meetings.

RECOMMENDATION

This item is for information only.

Attachments

CITY COUNCIL REPORT

TO: Karen Peters
Senior Executive Assistant

FROM: Kathryn Sorensen
Water Services Director

SUBJECT: WASTEWATER TREATMENT PLANTS RENEWAL PROGRAM

THE ISSUE

This report provides information to the Transportation and Infrastructure Subcommittee regarding the Water Services Department's Wastewater Treatment Plant Renewal Program.

BACKGROUND

City of Phoenix Water Services Department owns three Wastewater Treatment Plants (WWTPs). Wastewater is reclaimed at these plants in support of public health, environmental protection, and sustainable water resource management.

- 91st Avenue WWTP, located at 91st Avenue and Broadway Road, was originally built in the early 1960s and expanded several times, with the last expansion in the mid 2000's. The plant is jointly owned by the Sub-Regional Operating Group (SROG) consisting of the Cities of Phoenix, Glendale, Mesa, Scottsdale, and Tempe. It has a treatment capacity of 230 mgd.
- 23rd Avenue WWTP, which is located at 22nd Avenue and West Lower Buckeye Road, was originally built in the early 1930s and expanded in 1940s, 1960s, and again in 1990s. The plant has a treatment capacity of 63 mgd.
- Cave Creek Water Reclamation Plant (WRP), located at North Cave Creek Road and East Deer Valley Road, was originally built in the 1990s and has a treatment capacity of 8 mgd. The Cave Creek WRP is designed to treat wastewater flows from north of the Central Arizona Project (CAP) canal in the Cave Creek Road area. As an efficiency measure, this plant is currently shuttered.

OTHER INFORMATION

The primary goal of the renewal program is to ensure reliable performance of the wastewater treatment systems. The main infrastructure components for renewal have been identified through operator feedback and asset management evaluations using a combination of risk analysis and remaining useful life calculations for the plant assets. The Wastewater Engineering and Treatment Divisions assessed these needs and prioritized them based on risk and budget constraints.

The entire renewal program currently has a 10-year budget of \$93.43M for the 91st Avenue WWTP, \$41.7M for the 23rd Avenue WWTP, and \$11.43M for the Cave Creek WRP. The renewal program is scheduled to occur annually for the 91st Avenue and 23rd Avenue WWTPs. The program includes replacement of plant facilities which have approached the end of their useful lives, and optimization and rehabilitation of plant facilities to extend their useful lives to minimize total plant lifecycle capital cost. The Cave Creek WRP renewal program is scheduled to start in FY 2015-2016. The costs will be used to update and rehabilitate plant components prior to bringing the plant back on-line.

RECOMMENDATION

This report is for information and discussion.

CITY COUNCIL REPORT

TO: Karen Peters
Senior Executive Assistant

FROM: Kathryn Sorensen
Water Services Director

SUBJECT: WASTEWATER COLLECTION SYSTEM ODOR CONTROL

THE ISSUE

This report provides information to the Transportation and Infrastructure Subcommittee about two odor control studies that were conducted on portions of the Water Services Department's Wastewater Collection System.

BACKGROUND

City of Phoenix Water Services Department's wastewater collection system includes approximately 4,800 miles of sewer pipe conveying 67 billion gallons of wastewater per year. The odor control program currently in place for the wastewater collection system includes twenty-one chemical feed sites and nine air scrubber systems at lift stations.

Due to the organic constituents in wastewater and associated natural biological activity, wastewater moving through the sewer system generates odors. Depending on various physical factors in the sewer system, such as sewer slopes, deflections, siphons, wastewater age and temperature, these odors may escape the sewer and create nuisance odors in the environment.

Resolving odor issues is not an exact science. Practices include sealing manholes, as well as adding odor control chemicals to reduce release of the odors from the wastewater. Air scrubbers are in place at most lift stations since odors at these sites can be released due to turbulence associated with lift station wastewater movement.

OTHER INFORMATION

As a customer service initiative, the Water Services Department commissioned two odor control studies. The recommendations from the two odor control studies are under review. Through these evaluations, potential solutions for controlling odors at three of the City of Phoenix's largest sewer interceptors were identified.

39th Avenue Interceptor

The 39th Avenue Interceptor Odor Control Study examined odor generation sources from the approximately 20-mile-long interceptor which ranges from 33 to 66 inches in diameter. This interceptor starts at 47th Avenue and Pinnacle Peak Road, travels south

and east along 39th Avenue, then south and eventually discharges into the Salt River Outfall Interceptor at 47th Avenue and Lower Buckeye Road.

Field work for the study has been completed and recommendations are under review by City staff. The recommendations consist of implementing a chemical injection odor control station and two air scrubbing odor treatment stations along the interceptor. Upon concurrence with study recommendations, the project will move into the design phase and will then be conducted in a phased approach. This project currently has a budget of \$9.3M (FY2014-15 through 2016-17) for study related costs, land acquisition, design, and construction.

Salt River Outfall Interceptor (SRO) and the Southern Avenue Interceptor (SAI)

The SRO/SAI Interceptor Odor Control Study investigated current and potential future odor generation in the Salt River Outfall Interceptor (SRO) and the Southern Avenue Interceptor (SAI). Both interceptors are jointly owned by the Sub-Regional Operating Group (SROG) cities (Glendale, Mesa, Phoenix, Scottsdale, and Tempe) and operated by the City of Phoenix.

The approximately 23-mile-long SRO extends from the northeast corner of Tempe Town Lake and Indian Bend Wash generally following the Salt River to Sky Harbor Airport and continues west through Phoenix to Broadway Road at 59th Avenue to the 91st Avenue Wastewater Treatment Plant (WWTP).

The approximately 20-mile-long SAI starts at 48th Street and Southern Avenue, extending west along Southern Avenue to 51st Avenue, crossing the Salt River at 51st Avenue, continuing northwest to Broadway Road then west to the 91st Avenue WWTP. The two interceptors range from 48 inches to 84 inches in diameter.

Field work for the study has been completed, and recommendations are under review by SROG member cities. The recommendations in the draft report include implementing air scrubbing stations on the two sewer interceptors. Upon concurrence with study recommendations, the project will move into the design phase and will then be conducted in a phased approach.

The project currently has a budget of \$43.6M (FY2015-16 through 2018-19) for all costs including land acquisition, design and construction. These costs will be shared by our SROG partners based on each partner's capacity/use of the interceptors (approximately Phoenix 45 percent, other SROG partners 55 percent).

RECOMMENDATION

This report is for information and discussion.

CITY COUNCIL REPORT

TO: Rick Naimark
Deputy City Manager

FROM: John A. Trujillo
Public Works Director

SUBJECT: UPDATE ON LANDFILL GAS TO ENERGY EFFORTS

This report provides the Transportation and Infrastructure Subcommittee with an update on the City’s Landfill Gas to Energy efforts.

THE ISSUE

The City maintains five closed landfills within the City limits and one open landfill located at SR 85 and Patterson Road in the City of Buckeye. The decomposition of materials in both active and closed landfills produces gas that includes methane. With the amount of new material sent to the SR 85 Landfill daily, the gases generated have a 49.6 percent methane content. Conversely, inactivity at the closed landfills causes methane levels to decline over time as noted in a review of methane content at the City’s landfill flares conducted in February 2015.

Landfill	Activity	Methane Content	Methane Quantity
Deer Valley Landfill	Closed in 1972	16.6%	Declining
19 th Avenue Landfill	Closed in 1979		Declining
• Cell A-1		16.9%	
• Cell A		18.5%	
Del Rio Landfill	Closed in 1980	18.7%	Declining
27 th Avenue Landfill	Closed in 1999	33.6%	Declining
Skunk Creek Landfill	Closed in 2005		Declining
• Flare Station 1		39.6%	
• Flare Station 2		31.5%	
SR 85 Landfill	Opened in 2006	49.6%	Increasing

Landfill gas can be used for gas to energy projects in two primary ways. The methane in the gas can be cleaned, compressed and injected into a natural gas pipeline or compressed and used as a vehicle fuel with CNG vehicles. Alternatively, the gas can be cleaned and burned in a gas turbine or internal combustion engines to produce electricity and delivered to the electrical grid for distribution by the local electrical utility.

Landfill Gas to Energy projects with electrical utilities or other interested developers typically require sustaining at least 40 percent methane content to be considered viable. Based on this threshold, the S.R. 85 Landfill is considered the most viable location for a project with the electrical utilities.

In July 2013, City consultant Tetra Tech BAS completed a Landfill Gas to Energy Feasibility Study of the SR 85 Landfill. In the study, the consultant identified and evaluated 14 project options for the landfill based on estimated upfront costs and volatility of the electricity and natural gas markets. Two out of the 14 options were determined viable based on an estimated positive net present value within 10 years of operation. Despite having a positive net value, both options included significant capital investments ranging from \$10 million to \$13 million. Since this study, the price of natural gas has dropped to historic lows, which are making Landfill Gas to Energy or fuel projects less attractive.

On May 20, 2014, staff from the Public Works Department and Office of Environmental Programs met with APS to discuss opportunities for Landfill Gas to Energy projects and financing options at the City's landfills within its service area. APS has programmed and is in the process of completing the projects needed to generate 15 percent of their energy from renewable sources by 2025 to comply with the Corporation Commission's 2006 Renewable Energy Standard and Tariff. To accomplish this goal, APS partnered and coordinated with the City on multiple solar projects including the 10 megawatt (MW) project at the SR 85 Landfill that is currently underway; a 1.2 MW project at the downtown parking garages that was operational in January 2014; a 7 MW project at the Lake Pleasant Water Treatment Plant that was operational in December 2012; and a 5.4 MW project at Aviation Facilities that was operational in December 2011.

OTHER INFORMATION

Through these efforts, the City has identified the following challenges and opportunities for consideration:

Challenges

1. Partnering with electrical utilities is necessary to secure favorable Power Purchase Agreements to reduce the upfront costs for wheeling electricity.
2. Partnering with electrical utilities is necessary to move and market green gas from Landfill Gas to Energy projects. Low natural gas prices make green gas projects expensive.
3. Declining landfill gas volumes and methane content at the City's closed landfills limits project feasibility to the SR 85 Landfill.

Opportunities

The Call for Innovators process could identify other opportunities and emerging technologies to address these challenges.

On March 9, 2015, the City issued a Call for Innovators (CFI) to request information from private sector innovators with technologies and manufacturing processes that transform trash into energy and new products. Through this CFI, the City seeks to better understand the industry and identify specific business opportunities for future competitive processes and possible Landfill Gas to Energy projects.

On February 21, 2007, City Council approved entering into an agreement with Ameresco to develop a Landfill Gas to Energy project at the Skunk Creek Landfill, but gas quality and market pricing caused the project to be abandoned.

RECOMMENDATION

This item is for information and discussion.

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CITY COUNCIL REPORT

TO: Karen Peters
Senior Executive Assistant to the
City Manager

FROM: Kathryn Sorensen
Water Services Director

SUBJECT: COLORADO RIVER RESILIENCY PROGRAM

This report provides the Transportation & Infrastructure Subcommittee with a drought update and a summary of the planned Colorado River Resiliency program elements for FY2015/16.

THE ISSUE

Current projections show a 21% probability of a shortage declaration on the Colorado River in 2016 and a 54% probability of shortage in 2017. There has never been a shortage declaration on the Colorado River, and without one or more years of significantly higher-than-normal snowfall on the basin, the threat of shortage will continue to increase until a shortage must actually be declared. As the possibility of a Colorado River shortage looms larger with each passing year, Arizona will be faced with a level of uncertainty that has never been dealt with before. Although the probability that Phoenix will see any reduction in its Colorado River supplies in the foreseeable future remains extremely low, this broader uncertainty in water supplies could itself be disruptive and generate fears that result in negative impacts to the entire region.

In the court of public opinion, Phoenix is held to a much higher standard regarding water availability than nearly any other city in the nation. While Phoenix can readily demonstrate that it has a diverse water resource portfolio and excellent redundancy of supplies, facts do not always sway opinion, and the mere perception of any kind of water supply problem can have deep repercussions for our economy. Therefore, we continue to hold ourselves to a higher standard and insure our economy against the potential for high-profile, hard-to-predict, and rare water supply availability events that lie outside of normal expectations: i.e., the “black swan” events.

Unfortunately, the Colorado River system is not resilient; it is governed through a structure that enhances rather than mitigates risk. It is this magnification of risk that can drive Phoenix into the black swan scenarios in which water supply availability is not adequate to meet demands. Serious issues that involve the resiliency of the Colorado River are on the horizon. Drought intensifies, but does not cause these issues, and one good winter snowpack will not solve them.

To this end, a new section of the Water Capital Improvement Program (CIP), the Colorado River Resiliency Program, was approved by the Mayor and Council on October 21, 2014. It is designed to fund various resiliency efforts to help protect the

City against water shortage events on the Colorado River. The Water Services Department has been reviewing several projects to be included in the program. These projects are grouped into the following program elements.

System-wide Colorado River Resiliency

- *Storage of Phoenix Water in Lake Mead* – the City was able to facilitate an arrangement between the Central Arizona Water Conservation District (CAWCD) and the Salt River Valley Water Users' Association (SRP), through which 15,000 acre-feet (AF) of water will remain in Lake Mead in 2015 to improve current reservoir levels. In October 2014, the City ordered 15,000 AF of Colorado River water for delivery to the SRP groundwater savings facility and the Granite Reef Underground Storage Project (GRUSP) in 2015 to be stored and recovered in future shortage years. Meanwhile, the CAWCD had credit to some of the water behind Roosevelt Dam on the Salt River system through an exchange between CAWCD and SRP more than ten years ago. The CAWCD agreed to deliver a portion of this Salt River water to the SRP groundwater savings facility and GRUSP in Phoenix's name, replacing the Colorado River water Phoenix was planning on storing there. Phoenix then was able to "forbear" the Colorado River water it had ordered, effectively leaving the water in Lake Mead. Phoenix is made whole through this arrangement: Phoenix pays for the water as if it were Colorado River water as was planned, but will actually store Salt River water instead, and end up with the same amount of underground storage credits. Because Phoenix is made whole using CAWCD's water from Roosevelt Lake, the water remaining in Lake Mead will be classified as Intentionally Created Surplus water in CAWCD's name.
- *Expanded System Conservation Program* – the City continues to explore the potential for participating in a larger-scale Colorado River System Conservation Program that would engage a broad group of constituencies in both funding and implementation. In particular, the City is examining the mechanisms through which it could participate in implementation of an extraordinary conservation program that leaves conserved water in the River for the benefit of the system.

Regional Colorado River Resiliency

- *Phoenix/Tucson Colorado River Partnership* – Phoenix and two Tucson-area water providers (City of Tucson and Metropolitan Domestic Water Improvement District) have developed a first-ever joint storage arrangement in which Phoenix will be storing Colorado River water in the Tucson-area aquifers. In future times of shortage on the Colorado River, the Tucson-area providers will rely on this additional storage to meet their demands, while Phoenix will have access to an equal portion of the Tucson-area water providers' Colorado River water for use at Phoenix surface water treatment plants. The City has committed to store 1,000 AF of its Colorado River water in Tucson as a pilot for calendar year 2015 at a cost of approximately \$175,000. The amount of water stored in Tucson aquifers should increase significantly in future years.

- *Dry-Year Option Investigation* – As part of its larger system resiliency planning, the City is also in early stages of coordinating with potential partners for a mutually-beneficial “dry-year option” program that would give the City access to higher priority Colorado River water during extraordinary CAP shortage conditions.

Local Resiliency

- *Continued Underground Storage* – Water Services intends to use a significant portion of the Colorado River Resiliency Fund to store more of the City’s unused Colorado River water in local aquifers at GRUSP and through SRP’s groundwater savings facility; the goal is to store between 10,000 AF and 20,000 AF per year at a cost of approximately \$1.5M to \$3.2M. The City is in exploratory talks with a local partner regarding a cooperative well-sharing program that would allow Phoenix to access wells during Colorado River shortage conditions to recover this stored water. In addition, the City is working to increase the capacity of its existing aquifer storage and recovery (ASR) well program to provide for resiliency in the event of extreme Colorado River shortages. ASR wells serve dual purposes: they can be used to store water underground during non-shortage years; and recover water during shortages. Water Services expects to spend approximately \$1.5M to \$2M on the expansion of the ASR program over the next year.
- *Watershed Protection and Restoration* – The City is in discussions with SRP and the National Forest Foundation regarding partnership in the Northern Arizona Forest Fund effort to ensure that the watershed that supplies the Salt and Verde Rivers is as healthy and productive as possible. Funds will be used to complete high-priority restoration projects on National Forests in the Salt and Verde River watersheds. Types of projects will include:
 - Forest thinning and prescribed burning—restore natural fire to the forest ecosystem, mechanically thin small-diameter trees to reduce fuel loading, minimize bark beetle impact, and improve understory and soil conditions;
 - Stream and wetland restoration—restore and stabilize stream banks, reconstruct and enhance wetlands, and install fencing to protect sensitive habitats; and
 - Sediment and erosion management—improve runoff and drainage conditions, and reduce sediment loading into springs, streams, and wet meadows.

Water Services is continuing to explore the possibility of partnership with the Nature Conservancy in some of its efforts on the Verde and Colorado Rivers. Water Services expects to spend approximately \$200,000 on watershed protection and restoration projects over the next year.

- *Enhanced Aquifer Management* – Ultimately, groundwater is the source that Phoenix can fall back on during extreme shortages on the Colorado River. However, for groundwater to play its role, the City must ensure that current groundwater levels are maintained for future generations that may desperately need it as a redundant supply.

Currently, groundwater users can pump in one area of the aquifer and recharge or replenish in an area very distant from that pumping, a paradigm that allows localized depletion of the aquifer. The City, along with other stakeholders, has been participating in development of new mechanisms designed to protect groundwater levels by creating a better nexus between the location of pumping and recharge. These concepts would (1) create incentives to recharge in the same hydrologic sub-basin in which recovery will occur, (2) create disincentives for recovering in a different sub-basin from which the recharge occurs, and (3) protect water stored underground from being pumped by an entity that didn't store it.

- *Groundwater modeling* –The City is undertaking substantial improvements to local and regional modeling in order to study the direct and indirect impacts that could be associated with extreme Colorado River shortages and a corresponding increase in groundwater pumping and decrease in groundwater recharge in the Phoenix area, and to develop plans to address those impacts. Water Services expects to spend approximately \$200,000 on these modeling efforts.

RECOMMENDATION

This report is for information and discussion.