A G E N D A

WORK SESSION OF THE CITY COUNCIL OF THE CITY OF COTTONWOOD, ARIZONA, TO BE HELD SEPTEMBER 11, 2012, AT 6 P.M., AT THE COTTONWOOD COUNCIL CHAMBERS BUILDING LOCATED AT 826 NORTH MAIN STREET, COTTONWOOD, ARIZONA.

I. CALL TO ORDER

II. ROLL CALL

III. ITEMS FOR DISCUSSION, CONSIDERATION, AND POSSIBLE DIRECTION TO STAFF:

Comments regarding items listed on the agenda are limited to a 5 minute time period per speaker.

1. REVIEW OF POTENTIAL WATER CONSERVATION PROGRAMS FOR THE CITY.

2. ADDITIONAL OPTIONS AND INFORMATION PERTAINING TO THE COTTONWOOD DOG PARK.

3. REVIEW OF INFILL MAP OF VACANT PARCELS THAT ARE AVAILABLE FOR DEVELOPMENT WITHIN THE CITY LIMITS.

IV. ADJOURNMENT

Pursuant to A.R.S. § 38-431.03.(A) the Council may vote to go into executive session on any agenda item pursuant to A.R.S. § 38-431.03.(A)(3) Discussion or consultation for legal advice with the attorney or attorneys of the public body.

The Cottonwood Council Chambers is accessible to the disabled in accordance with Federal "504" and "ADA" laws. Those with needs for special typeface print or hearing devices may request these from the City Clerk (TDD 634-5526.) All requests must be made 24 hours prior to the meeting.

City of Cottonwood, Arizona
City Council Agenda Communication

Print

Meeting Date:	September 11, 2012
Subject:	Water Conservation
Department:	
From:	Tom Whitmer, Natural Resources Director

REQUESTED ACTION

Direction regarding water conservation practices for the city.

SUGGESTED MOTION

If the Council desires to approve this item the suggested motion is: N/A--direction only.

BACKGROUND

Council directed the Natural Resources Director to provide information and an evaluation of conservation programs utilized around the State and a recommendation of possible programs to consider for future adoption by the City.

JUSTIFICATION/BENEFITS/ISSUES

The City has indicated an interest in developing and implementing a comprehensive water conservation program. This draft paper provides a summary of numerous programs that have been successfully implemented around the state and evaluates each program to provide insights into the cost of implementation as well as potential water savings from each. Water conservation has both its supporters as well as its opposition. This paper should provide an education into the reality of potential savings verses the costs, so that Council can make informed decisions on the direction it chooses to pursue regarding the conservation of water.

COST/FUNDING SOURCE

No Cost at this time.

ATTACHMENTS:

Name:	Description:	Type:
9-11-12_Draft_Water_Conservation_Program.pdf	Draft Water Conservation Plan	Cover Memo

WATER CONSERVATION PROGRAM CONSIDERATIONS AND RECOMMENDATIONS

CITY OF COTTONWOOD, ARIZONA

September ___, 2012

INTRODUCTION

Water is one of Cottonwood's most valuable resources, and is addressed in a recently-adopted water management strategies paper outlining seven key policies rooted in smart relations and values:

1. The value of the Verde River;
2. The value of conservation;
3. The value of reliable data;
4. The value of surface water rights;
5. The value of good neighbors;
6. The value of opportunity; and
7. The value of fiscal accountability

Public Perceptions About Water Supply

In the past, the supply of water for consumption by early settlers in the community was limited almost exclusively to the water flowing in rivers and streams. The availability of water was highly valued and easily understood. A person simply had to look at the supplying river or stream to know how much water was available and whether the supply was increasing or decreasing. For those few individuals whose supply of water came from a hand dug well, the actual availability was never quite certain, but the value was definitely understood and reconfirmed with every bucket hauled by hand.

With the advent of technology in the early part of the 20th century and the resulting ability to develop and use groundwater, people's understanding of the availability of water supplies rapidly diminished along with their appreciation for its value. Today, the overwhelming majority of people living in the United States and even in arid areas like Arizona have the perception that water is an unlimited natural resource to be used in whatever ways and quantities they would like. For the average consumer, water always flows on demand from the faucet.

As Cottonwood has acknowledged in its vision for water management strategies, there are a number of reasons why it would like to both conserve water and supplement its water supply to meet ongoing demands. There are financial considerations and aesthetic considerations involving returns to the Verde River. This paper addresses the conservation aspect and sets forth recommendations for consideration and possible adoption.

Cities and towns throughout the west have begun developing and implementing public outreach programs, offering financial incentives, and passing ordinances designed to encourage and even mandate the conservation and management of water. Cottonwood is among those cities and is dedicated to taking a leading role in conserving water resources at the local, regional and statewide level. Even with its commitment to water conservation, however, the City is not interested in pursuing any and all conservation measures simply for the sake of perception. The City has a responsibility to its citizens to be selective in what it chooses to initiate; whether it be a voluntary incentivized program or a mandatory requirement accomplished through policy and ordinance.

Water conservation typically takes place only under moral suasion, incentivized reward, or direct regulation. For purposes of this paper, conservation programs are classified into three categories: (1) Education and Outreach; (2) Incentivized Programs; and (3) Mandatory Conservation Measures. Education and outreach programs play on the moral suasion of the consumer by providing purpose, perspective, and positive reminders of the importance of conserving water. Incentivized programs typically offer financial rewards to customers that implement City approved conservation practices. Mandatory conservation measures are generally the last conservation programs to be initiated and are accomplished through the adoption and implementation of policies and ordinances.

EDUCATION AND OUTREACH

Education and outreach conservation programs are generally considered voluntary in that any conservation of water that may occur is the direct result of voluntary actions taken by the consumers. This typically consists of educational programs targeted for grade schools, conservation signage, and the distribution and availability of conservation-related information designed to educate, remind, and encourage citizens to conserve water. Although it is voluntary for the end user to take the initiative to conserve water, it may require passage of a resolution or ordinance by Council to mandate specific commercial enterprises post proper signage or make available conservation related information.

Conservation Signage and Literature Distribution

Conservation signage and literature distribution programs are designed to be a reminder or to enhance the awareness of the consumer of the importance of conserving water. Advocates of these types of programs argue they are relatively inexpensive to implement and continually remind people of the importance of conserving water. Opponents say that these programs are unable to quantitatively measure the volume of water conserved and argue the money spent on these types of programs could be better spent on other programs that can be definitively quantified. Using these types of programs as the exclusive conservation method are not recommended due to the fact that conservation savings cannot be measured. If, however, the long-term goal is to develop a culture of conservation throughout the community, these programs can serve a vital role in supporting that goal.

Examples of conservation signage and literature programs include:

- Water conservation signage provided by a city is encouraged or required to be posted in all public, semi-public, and governmental restroom and shower facilities.

- Water conservation informational cards and/or brochures provided by a city is encouraged or required to be made available in a visible location in all hotels, motels, and other lodging facilities; including signage indicating daily changes of linens and towels for guests staying multiple nights will occur only upon request.

- Low-water-use landscape literature and water-efficient irrigation guidelines provided by a city is encouraged or required to be provided by retail plant nurseries at the time of sale of any outdoor perennial plants.

- Title companies may be encouraged or required to provide city-authorized indoor and outdoor conservation literature at the time of closing.

- City departments can provide indoor and outdoor conservation literature to all persons applying for a building permit and customers initiating new water service.

Some cities elect to work with local business interests and encourage the posting and distribution of city approved and provided signage and literature, while other cities adopt ordinances mandating this practice. There are financial considerations for these programs. Some of the costs are associated with the time and effort required for the successful implementation of these programs if they are not mandatory, and time and effort is required to maintain the mandatory implementation. The cost of signage and literature is another consideration.

The City of Cottonwood recently printed 10,000 copies each of 10 versions of conservation cards that provide tips and suggestions for conserving water for all residential, commercial and industrial customers. The cards will initially be available at City offices. Other locations where literature may be made available, such as the library and recreation center, are also being considered. The printing cost was about $4,800. If the City elects to implement these types of programs, there will be an on-going cost for printing cards and conservation signage. There will also be the requirement to monitor and maintain the distribution of the conservation literature, as well as the posting of signage. Demand Reduction Strategy I – Water Alert of the "Drought and Water Shortage Preparedness Plan" adopted by the City (discussed in the ordinance section), already encourages hoteliers to post notices that linens will only be changed upon request for guests staying multiple nights**.**

Education

Education is essential for developing a community that is conservation-oriented. Like the conservation signage and literature distribution programs, however, quantifying the volume of water conserved directly from these types of programs is difficult, if not impossible, to measure. Despite the difficulty in quantifying a specific volume of water conserved directly from these types of programs, there tends to be very little opposition to implementing these types of programs. Some of the education type programs that have been adopted throughout the state are as follows:

- Some cities host a water conservation webpage that provides conservation tips and reminders, current level of water conservation strategy, home water audit information, and links to information about water conservation. Some web pages have a section devoted exclusively to new businesses and individuals that highlights the city's conservation requirements.

- Some cities sponsor regular public service announcements on local radio and television related to conserving water.

- Some cities sponsor a leadership training academy for public and potentially interested political candidates to learn about water resources, water systems and conservation programs.

- Some cities independently or in concert with the Cooperative Extension offer conservation home audits.

- Some cities independently or in concert with the Cooperative Extension offer landscape irrigation audits.

- Some cities work with the public schools to develop a water curriculum helping students to establish good water use habits and creating stewards of the future. One example of a program that is offered includes a multi-grade process with a fourth grade and seventh grade curriculum. The fourth grade curriculum focuses on where water comes from, the treatment process and water use decisions and the seventh grade curriculum focuses on the science of water – the importance of keeping drinking water safe and clean, and the economics of water.

The level of effort and cost to implement these types of programs varies considerably, depending on whether it is independently implemented or implemented in concert with others. The Cooperative Extension currently offers the Project WET program (water education for teachers), which focuses on educating teachers about water, assists teachers in the development of water curriculums for fourth graders, sponsors an annual water festival for fourth graders, and provides conservation workshops for homeowners in the Verde Valley.

The City currently supports the Project WET program, but could potentially expand this program to include a multi-grade water curriculum. This could be done independently of or in partnership with the Cooperative Extension. The City also participates in the development and teaching of a water literacy program for kindergartners independently of Project WET. The City is a co-sponsor of and supports an annual water festival. City staff also teaches a water sustainability class each semester at Northern Arizona University. To expand this program and/or to implement additional educational information outreach in the form of workshops, audits, leadership academies, webpage or others, will require additional resources and/or partnering with and supplying funding support too another agency like the Cooperative Extension.

INCENTIVIZED PROGRAMS

Most cities and towns prefer to encourage water conservation through education and outreach or through offering incentives usually in the form of rebates rather than mandating conservation. Generally speaking, the rebate is intended to offset some or all of the cost of implementing a specific conservation measure.

The use of rebates has been shown to be quite successful, if the measure of success is simply based on the number of people who take advantage of the program. If the measure of success is determined exclusively by the amount of water conserved, many if not most water conservation programs would be considered somewhat of a failure. In terms of the actual volume of water saved, most conservation programs result in very small volumes of water savings. Some would argue, however, that the actual water conserved is only one piece of the bigger picture. The bigger picture in this case is the heightened awareness of the consumer, which ultimately results in the development of a culture of conservation.

The acceptability of these types of programs tends to be fairly high, but these types of programs can present unforeseen issues. For example, a toilet rebate program resulted in issues concerning the disposal of the toilets that were being replaced and the reduction in the liquid fraction required to carry the solids to the wastewater treatment plants.

Incentivized conservation programs that have been offered by cities and towns throughout the state include:

- Conservation Pricing;
- Landscape irrigation audits (commercial);
- Rainwater cisterns;
- Turf removal;
- Landscape conversion to automatic drip systems and incorporation of rainwater sensors;
- Replacement of low efficiency toilets with high efficiency toilets (residential) - 1.6 and 1.28 GPF;
- Replacement of low efficiency toilets with high efficiency toilets (commercial) - 1.6 and 1.28 GPF;
- Installation of waterless urinals (commercial);
- Installation of low water use spray rinsers in commercial restaurants;
- Replacement of low efficiency showerheads with high efficiency shower heads;
- Replacement of low efficiency clothes washing machines for high efficiency washing machines; and
- Hot water recirculators.

The following table presents the range of rebates or awards offered by different cities and towns for each of the identified incentivized conservation programs.

Water Efficiency Improvement Incentive	Range of Incentive Awards
Irrigation Systems	$5,000 or up to one-third the cost for irrigation audits for commercial irrigation customers, sub-metering, and weather-based or soil sensor based controllers. $50 for installation of timer
Rainwater cistern	$0.10 per gallon of storage – minimum 500 gals $400.00 max. award per residential account

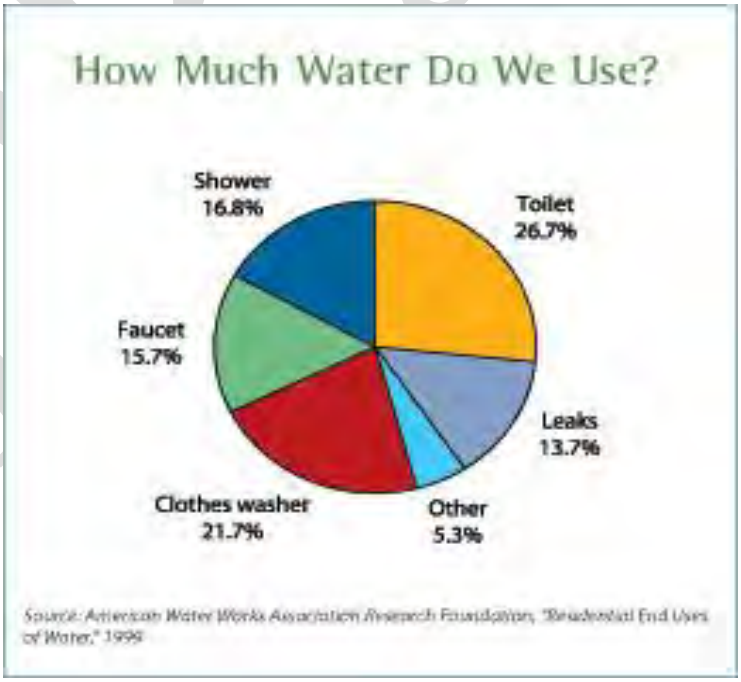
Water Efficiency Improvement Incentive	Range of Incentive Awards
	$800.00 max. award per non-residential account
Turf removal (Minimum and maximum removal requirements and restrictions on replacement landscape)	Minimum of 1000 square feet of established turf must be removed and replaced with xeriscape plants: $0.25 per square foot $400.00 max. award per residential account $800.00 max. award per non-residential account A minimum of 1500 square feet of established turf must be removed and replaced with Xeriscape plants. Rebate amounts are: 1,500 – 2,999 square feet = $500 3,000 – 3,999 square feet = $600 4,000 – 4,999 square feet = $800 $200 for each additional 1,000 square feet removed up to $3,000 maximum for 15,000 square feet $0.50 per square foot, up to $800 for residential accounts and $2,000 for non-residential accounts
Landscape conversion to automatic drip system	$75
Landscape Irrigation audit by Certified Auditor	$75 $100
Installation of High efficiency toilet (residential) (Replacement units 1.6 gallons or less per flush; 2 units maximum per residential account; only available for existing homes built before 1991)	$50.00 per toilet up to 2 toilets per account $100 per toilet up to 4 toilets per account $120 or 50% of the purchase price for 1.28 gpf for residential customers & $100 or 50% of purchase price for multifamily, commercial, and industrial customers $150 credit for 1.28 gpf toilet
Installation of High efficiency or waterless urinal (Commercial) (replacement units 1.0 gallons or less per flush, or alternative flushless design)	$50.00 $125 for waterless urinals
Rotator spray head replacement (minimum of 12 heads replace)	$2.00 per spray head $40.00 maximum award
Leak repairs (one time benefit per property)	$5.00 per repaired leak; $25.00 max. award $20 per leak, maximum $50

Water Efficiency Improvement Incentive	Range of Incentive Awards
Showerheads (not to exceed 2.4 gallons/minute	$10.00 Free to homes built before 1992 Free
Faucet aerators	Free
Rinse Smart Program	Free high-pressure, pre-rinse spray nozzles for restaurants and commercial kitchens
Clothes washer (front load high efficiency model)	$100
Hot water recirculator	$75 must include timer. $50 for insulating pipes
Other qualifying low flow-low tech water smart device (ex: retrofit dual flush mechanisms)	$10.00

Although each of these programs has demonstrated their ability to result in water conservation, it is important to understand that the volume of water conserved may be somewhat surprising when the numbers are analyzed.

For example, offering rebates to replace toilets made prior to 1994 has been a popular program that many cities have engaged in over the past 10 years; partly because the water conserved can be calculated fairly accurately and also because toilets on average account for about 27 percent of the total indoor water use of residential customers.

The following chart presents a listing of the percentage of total indoor water use for each indoor water use feature.



Homes constructed prior to 1994 had no plumbing standards to comply with and as a result the toilets installed averaged 3.5 gallons per flush (gpf) or more. In 1994 the Federal Government established a plumbing code that set the maximum gpf limit for all new toilets at 1.6. For this reason the primary targets of this program are homes constructed prior to 1994. For every 3.5 gpf toilet you replace with a 1.6 gpf toilet, you are saving approximately 1.9 gpf. With most new toilets rated at 1.28 gpf, approximately 2.22 gpf may be conserved for every 3.5 gpf toilet replaced with a 1.28 gpf toilet.

Most cities that have adopted this program have offered from $50 to $100 per toilet rebate to change out toilets that flush at a rate of 3.5 gpf or more. With most new toilets on the market today rated at 1.28 gpf, many cities are still offering rebates for replacing a 1.6 gpf rated toilet with a 1.28 gpf rated toilet, but the overall volume of water conserved is reduced from approximately 2.22 gpf to 0.38 gpf.

If Cottonwood adopts a toilet rebate program and is successful in getting one 3.5 gpf toilet replaced in 10% of its residential customers, the range of cost to the City would be $58,019 to $78,690; depending on whether the City offered a $75 or $100 rebate. If each resident averaged four people per household, the projected amount of water that could potentially be conserved annually is about 27 acre-feet or 8,771,432 gallons, assuming all toilets that were replaced averaged 3.5 gpf and the replacement toilets were rated at 1.6 gpf. If the 3.5 gpf toilets were replaced with 1.28 gpf toilets, the projected amount of water that could be conserved annually for a family of four is about 31 acre-feet or 10,202,000 gallons. The total volume of water projected to be conserved from this type of program is about 1 percent of the City's current total water pumped annually.

This equates to a cost per acre-foot of savings from about $1900 to more than $5000 per acre-foot depending on the amount of rebate, the gpf rating of the toilets being replaced, the gpf rating of the new toilets being used, and the number of people per household.

The following Tables 1A, 1B, 1C and 1D provides an actual breakdown of the projected cost to the City to implement a $75 or $100 toilet rebate program, as well as the projected volume of water that could be conserved if 10%, 15%, and 20% of the single family residential customers replaced one 3.5 gpf toilet with a 1.6 or 1.28 gpf toilet. The following tables present the information for households based on 4 and 2.3 people per household and an average of four flushes per person per day. The average number of people per household in Yavapai County is 2.3 people.

TABLE 1A

Single Family Residential Customers	Percentage of 3.5 gpf toilets replace w 1.6 gpf	Toilets Replaced	Projected Potential Gallons Saved Annually Family of 4	Projected Potential Acre-Feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Projected Cost per Acre-foot @ $75	Cost per Acre-foot @ $100
7869	10%	787	8,731,442	27	$59,018	$78,690	$2,202	$2,937
7869	15%	1180	13,097,164	40	$88,526	$118,035		
7869	20%	1574	17,462,885	54	$118,035	$157,380		

TABLE 1B

Single Family Residential Customers	Percentage of 3.5 gpf toilets replace w 1.28 gpf	Toilets Replaced	Projected Potential Gallons Saved Annually Family of 4	Projected Potential Acre-Feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Cost per Acre-foot @ $75	Cost per Acre-foot @ $100
7869	10%	787	10,202,001	31	$59,018	$78,690	$1,885	$2,513
7869	15%	1180	15,303,002	47	$88,526	$118,035		
7869	20%	1574	20,404,002	63	$118,035	$157,380		

TABLE 1C

Single Family Residential Customers	Percentage of 3.5 gpf toilets replace w 1.6 gpf	Toilets Replaced	Projected Potential Gallons Saved Annually Family of 2.3	Projected Potential Acre-Feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Cost per Acre-foot @ $75	Cost per Acre-foot @ $100
7869	10%	787	5,020,579	15	$59,018	$78,690	$3,830	$5,107
7869	15%	1180	7,530,869	23	$88,526	$118,035		
7869	20%	1574	10,041,159	31	$118,035	$157,380		

TABLE 1D

Single Family Residential Customers	Percentage of 3.5 gpf toilets replace w 1.28 gpf	Toilets Replaced	Projected Potential Gallons Saved Annually Family of 2.3	Projected Potential Acre-Feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Cost per Acre-foot @ $75	Cost per Acre-foot @ $100
7869	10%	787	5,866,151	18	$59,018	$78,690	$3,278	$4,371
7869	15%	1180	8,799,226	27	$88,526	$118,035		
7869	20%	1574	11,732,301	36	$118,035	$157,380		

For cities that have an aggressive effluent recharge and reuse program, the actual water savings from indoor water use conservation programs becomes less than what is projected. For example, the City of Cottonwood currently captures about 45 percent of the total water delivered and is committed to reusing and/or recharging 100 percent of the effluent generated after treatment. This means that a portion of all indoor water use that is conserved that would have been available for reuse is no longer available and will have to be made up from another source. Perhaps the best way to understand this is through a water balance approach presented in the following Table 2A.

Table 2A

Demand	No Conservation (ac-ft)	With Conservation Program - assumes a projected 30 ac-ft of savings from indoor conservation & 100% Reuse of Effluent (ac-ft)
M&I	3000	2970
Irrigation	1350	1350
Total Demand	4350	4320
Sources of Supply	Ac-ft	Ac-ft
Groundwater	3000	2984
Effluent 45% capture	1350	1336
Total supply	4350	4320
Actual water conserved	0	16.5

In this example, 3000 acre-feet of annual groundwater demand will produce about 1350 ac-feet of effluent based on an average 45 percent capture rate. Reducing the M&I demand through a toilet rebate program to 2970 ac-feet, will reduce the total effluent generated to about 1336 acre-feet. If the irrigation demand that is being met by 100 percent treated effluent is held constant at 1350 acre-feet, the 1336 acre-feet of available treated effluent supply is no longer sufficient to meet the irrigation demand and as such the difference would have to be made up with another source, i.e. groundwater. The actual water conserved would be about 55 percent of the projected 30 acre-feet of conservation savings or 16.5 ac-ft.

If the irrigation demand in the previous example is only 500 acre-feet with the remainder of the treated effluent recharged back into the aquifer, the actual conservation is still 55% of the projected conservation savings.

Table 2B

Demand	No Conservation (ac-ft)	30 ac-ft of conservation savings and 100% Reuse & Recharge of Effluent
M&I	3000	2970
Irrigation	500	500
Recharge	(850)	(836.5)
Actual water conserved	0	16.5

Total Groundwater Depleted	2150	2133.5

If treated effluent is not being reused or recharged, the actual conservation savings would then be equal to the projected conservation savings. For conservation measures directed at outdoor water use, the projected and the actual conservation savings should be the same.

Based on the example above and utilizing the 45 percent average effluent capture rate, the actual volume of water conserved would be equal to about 55 percent of the projected conservation savings for each of the four toilet rebate programs. See Tables 3A, 3B, 3C, 3D:

Table 3A

Projected Potential Savings Family of 4 (Ac-ft)	Actual Potential Savings (Ac-ft)	Cost with $75 Rebate	Cost with $100 Rebate	Actual Cost per Acre-foot @ $75	Actual Cost per Acre-foot @ $100
27	15	$59,018	$78,690	$3,935	$2,937
40	22	$88,526	$118,035		
54	29	$118,035	$157,380		

Table 3B

Projected Potential Acre-Feet of Savings Family of 4	Actual Potential Savings (Ac-ft)	Cost with $75 Rebate	Cost with $100 Rebate	Actual Cost per Acre-foot @ $75	Actual Cost per Acre-foot @ $100
31	17	$59,018	$78,690	$3,427	$4,570
47	26	$88,526	$118,035		
63	34	$118,035	$157,380		

Table 3C

Projected Potential Acre-Feet of Savings Family of 2.3	Actual Potential Acre-feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Actual Cost per Acre-foot @ $75	Actual Cost per Acre-foot @ $100
15	8	$59,018	$78,690	$6,964	$9,286
23	13	$88,526	$118,035		
31	17	$118,035	$157,380		

Table 3D

Projected Potential Acre-Feet of Savings Family of 2.3	Actual Potential Acre-feet of Savings	Cost with $75 Rebate	Cost with $100 Rebate	Actual Cost per Acre-foot @ $75	Actual Cost per Acre-foot @ $100
18	10	$59,018	$78,690	$5,961	$7,947
27	15	$88,526	$118,035		
36	20	$118,035	$157,380		

The following Table 4 provides a range of projected annual water savings for some of the incentivized conservation programs identified. For all indoor water conservation measures the

assumed actual conservation savings is about 55 percent of the projected annual water conservation savings.

TABLE 4

Fixture or Water Use	Water Use with Regular Fixtures	Water Use with Conservation Fixtures	Water Conserved	Projected Total Annual Gallons of Water Conserved Family of 4	Actual Gallons of Water Conserved Family of 4
Showerhead	≥3 gpm	≤ 2.4 gpm	≥0.6 gpm	8760 gallons (10 minute shower)	4818
Faucets	2 to 3 gpm	≤ 2 gpm with aerator	0 to 1 gpm	500 gallons Turning off faucet while brushing teeth can save as much as 1200 gallons per person annually	275
Washing Machines	40 gals per load (gpl)	≤27 gpl	13 gpl	5200 gallons (400 full loads/year)	2860
Toilets	3.5 gpf	1.6 gpf	1.9 gpf	11,096	6103
Faucet Leak Repairs				347 gallons (10 drips per minute)	185
Turf Removal				9,351 gallons (500 sq-ft. @ 2.5 ac-ft/ac)	
*Waterless Urinals (commercial)	1 gpf	0	1 gpf	25,000 gallons (2 urinals/restroom)	13,750

*Plumbing Engineer; Michael Funari, Director of Engineering Zurn Industries,

The projected estimated total annual water savings by implementing these programs along with the cost to the City are identified in the following Table 5:

TABLE 5

Fixture or Water Use	Total Number Replaced	Potential Gallons Saved Annually	Potential Acre-Feet of Savings	Actual Acre-ft of Savings	Cost to City	Actual Cost per Acre-foot of savings	Range of Cost for Fixture
Showerhead Family of 4 ($10 rebate)	787	6,894,120	21.2	11.6	$7,870	$676	$15 to $50
	1180	10,336,800	31.7	17.4	$11,800		
	1574	13,788,240	42.3	23.3	$15,740		
Faucets Aerators Family of 4 (free)	787	393,500	1.2	0.7	$6,296	$9,479	$6 to $8
	1180	590,000	1.8	1.0	$9,440		
	1574	787,000	2.4	1.3	$12,592		
Washing Machines ($100)	787	4,092,400	12.6	6.9	$78,700	$11,393	$900 to $1500
	1180	6,136,000	18.8	10.4	$118,000		
	1574	8,184,800	25.1	13.8	$157,400		
Toilets	787	8,731,442	26.8	14.7	$78,690	$5,339	$100 to $300 +

Fixture or Water Use	Total Number Replaced	Potential Gallons Saved Annually	Potential Acre-Feet of Savings	Actual Acre-ft of Savings	Cost to City	Actual Cost per Acre-foot of savings	Range of Cost for Fixture
Family of 4 ($100/toilet)	1180	13,097,164	40.2	22.1	$118,035		$99/installation
	1574	17,462,885	53.6	29.5	$157,380		
Faucet Leak Repairs ($5 / repair)	787	265,219	0.8	0.4	$3,935	$8,790	Variable
	1180	397,660	1.2	0.7	$5,900		
	1574	530,438	1.6	0.9	$7,870		
Turf Removal ($0.25/sqft)	500 sq.ft.	9,351	.029		$125	$7,920	?
Waterless Urinals – 2 urinals per restroom ($100/urinal)	50	1,250,000	3.8	2.1	$10,000	$4,740	$300 to $700 + $1.00 per 1000 uses or approximately $25 annually
	100	2,500,000	7.7	4.2	$20,000		
	150	3,750,000	11.5	6.3	$30,000		

The one incentivized program that is somewhat different from those listed in the two tables is conservation pricing. The cost of water to the consumer has proven to be the most successful incentive for encouraging consumers to conserve and is based on the "Law of Demand". The "Law of Demand" derives from the empirical fact that, all else equal, as the price of a good or service increases, the quantity demanded tends to decrease.

Water rates can be more than a means of meeting utility revenue requirements. Water rates can be used to communicate to water users the private and social costs of water development. Water users can then base their consumption decisions on a more accurate accounting of the benefits and costs of using more or less water. If done and presented correctly, conservation pricing of water can be a powerful means of signaling the importance and scarcity of the resource to water users, most of whom experience very little connection between their water usage and their total bill. At a time when water demands are increasing while water supplies are remaining constant, conservation pricing is an effective way to communicate the true value of water.

The most successful pricing programs are those that include an inverted rate block or tiered rate structure. These types or programs have a pricing escalator included in the structure, such that the more water the consumer uses the more the water costs per gallon. The City of Cottonwood currently has a four block tiered rate structure with pricing breaks offered that in comparison to other municipalities is one of the more aggressive rates. The following Table 6 presents a comparison of consumptive use water rates for 16 cities and towns in Arizona including the City of Cottonwood.

TABLE 6

Water Provider	Type of Rate Structure	Consumption Charges only 5,000 gallons	Consumption Charges only 7,000 gallons	Consumption Charges only 10,000 gallons	Consumption Charges only 15,000 gallons
Buckeye	Increasing Rate Block (5 Blocks)	$11.00	$16.30	$25.60	$65.35
Casa Grande (Private Water Co.)	Increasing Rate Block (3 Blocks)	$5.98	$8.96	$13.43	$20.88
Chandler	Increasing Rate Block (4 Blocks)	$7.40	$10.36	$14.80	$24.75
Clarkdale	Increasing Rate Block (3 Blocks)	$16.00	$24.00	$36.00	$64.00
Cottonwood	Increasing Rate Block (4 Blocks)	$14.79	$21.17	$30.74	$53.49
Lake Havasu	Increasing Rate Block (4 Blocks)	$6.75	$9.45	$13.61	$22.41
Mesa	Increasing Rate Block (3 Blocks)	$11.50	$16.10	$23.00	$37.95
Payson	Increasing Rate Block (4 Blocks)	$8.79	$16.53	$28.14	$50.24
Peoria	Increasing Rate Block (4 Blocks)	$4.47	$9.85	$17.92	$34.12
Phoenix	Flat rate, High Month Season	$0.00	$0.00	$8.85	$26.40
Prescott	Increasing Rate Block (4 Blocks)	$17.18	$25.78	$38.68	$70.93
Safford	Increasing Rate Block (3 Blocks)	$6.20	$8.68	$12.40	$20.15
Scottsdale	Increasing Rate Block (3 Blocks)	$9.00	$12.60	$21.88	$38.63
Sierra Vista (Private Water Co.)	Increasing Rate Block (3 Blocks)	$8.05	$11.27	$16.10	$26.20
Tucson	Increasing Rate Block (4 Blocks)	$6.95	$9.73	$13.90	$34.99

Water Provider	Type of Rate Structure	Consumption Charges only 5,000 gallons	Consumption Charges only 7,000 gallons	Consumption Charges only 10,000 gallons	Consumption Charges only 15,000 gallons
Yuma	Increasing Rate Block (3 Blocks)	$7.10	$9.94	$14.45	$22.05

Residential Rates for Water Service by City
Rates do not account for any additional fees such as conservation, development, impact, or others

Incentivized programs tend to have an immediate effect on the conservation of water that can, in most cases, be measured and quantified. Incentivized programs other than conservation pricing, however, tend not to have a long-lasting effect as far as changing a consumer's behavior towards conservation. Any long-term conservation savings is reliant upon the effectiveness of the water savings device installed. Conservation pricing, on the other hand, does play a definite role in changing a consumer's behavior in the short and long-term. As effective as conservation pricing structures can be, there are many challenges. Educating the consumer tends to increase the acceptability to some degree, but even the most informed often balk at the suggestion of an increase in the cost of water.

The City has yet to really offer incentive programs in the form of rebates or rewards. The City did adopt the rinse smart program whereby low-flow power rinse nozzles for commercial restaurants were made available at no cost. The City's current tiered pricing structure is considered to be a fairly aggressive conservation pricing program and in comparison to other cities in Arizona, would be considered one of the better conservation pricing programs.

MANDATORY CONSERVATION MEASURES

Existing Programs: The Drought and Water Shortage Preparedness Plan.

In 2006, the City of Cottonwood adopted as ordinance the "Drought and Water Shortage Preparedness Plan" ("the Plan"). The purpose of the Plan was to prepare the City for a possible water shortage and to minimize and/or eliminate the potential for impacts to its water use customers. The objective of the Plan was to identify water use strategies that the City could implement during times of shortage that would result in a reduction in municipal, commercial and industrial water use demands. Despite the water use strategies being mandated during the summer months or during periods of water supply shortage, the City is committed to conservation and strongly encourages all water users to adhere to Water Resource Status Level I and its corresponding Demand Reduction Strategy I – "Water Alert" – on a daily basis.

Resource Status Level I is currently only in effect at times when water demand exceeds safe production capability for five consecutive days and/or during the months of May, June, July, August and September. The Demand Reduction Strategy I – Water Alert, associated with Resource Status Level I consists of the following measures:

- Water shall be conserved both inside and outside the home using best practices available to minimize waste.

- Landscaping for residential uses shall be accomplished with plant materials that require little or no supplemental irrigation water.
- Outdoor water usage shall not occur between the hours of 9:00 a.m. and 5:00 p.m. Watering days shall be coordinated with your address. Even numbered addresses may irrigate on Wednesday, Friday, and Sunday. Odd numbered addresses may irrigate on Tuesday, Thursday, and Saturday. For places where there is no discernable address, the even date schedule should be followed (right-of-ways, medians, etc.).
- No irrigation shall be allowed on Monday.
- No Person shall waste water.
- Cooling of outdoor areas with water or misting devices is prohibited.
- Restaurants shall serve water to customers only upon request, and shall display table tents or other types of public notice to this affect.
- Hotels shall wash a customer's linens if a stay is in excess of one night on request only, and the hotel shall display notice to this affect.
- Construction projects are required to use reclaimed water or effluent for construction and dust control purposes.
- Requests for commercial provisions must be made to the Cottonwood Utilities Director

As stated previously, these actions are only mandatory during periods of time when it is ordered by the City Manager or the Director of Utilities and during the months of May through September.

Potential Mandatory Conservation Measures

Based on the City Council's expressed interest in becoming a leader in water conservation, the Council has directed staff to provide an overview and listing of potential conservation measures for the City Council to consider. Staff identified the following programs, all of which have been implemented by one or more cities or towns throughout Arizona. It should be noted that the City has already implemented and/or participated in some of the programs identified. Many ordinances that other cities and towns have adopted apply to restrictions pertaining to new developments and consumers. Others address already existing residential and commercial consumers. Some cities also offer incentives in conjunction with specific mandatory conservation requirements to lessen the upfront out of pocket expenses associated with implementing certain conservation requirements. An example of this is the mandatory requirement of installing waterless urinals in all public restrooms. For cities that have implemented this requirement, most if not all of the cost of acquiring and installing the waterless urinals was offset by the city.

A number of municipalities have taken the approach that current consumers should not have to bear the cost of the additional expenses of developing new resources to meet the water demands of future consumers. Based on this premise, they have adopted ordinances that specifically require "new" developments to have fairly restrictive conservation measures built in to the development in order to be approved. Examples of these types of ordinances include no evaporative cooling, limited or no turf landscaping, recirculating hot water systems, no swimming pools, gray water reuse systems (purple pipe), no RO or water softening systems, etc.

Requiring these types of programs for all new developments is easier to accomplish and less expensive than requiring existing customers to retrofit existing homes and business.

Examples of new water conservation ordinances and standards adopted by some cities and towns in Arizona are listed below.

Indoor Residential Water Conservation

- Mandatory restriction on the installation of evaporative coolers in new homes
- Mandatory restrictions on the installation of RO and water softening units

Indoor Commercial/Industrial Water Conservation

- Mandatory retrofit to waterless urinals by existing businesses
- Mandatory required use of waterless urinals for all new public, commercial, multi-family-residential common-use buildings, and in all commercial and industrial restroom remodels.
- Mandatory requirement to use self-closing faucets in all commercial restrooms
- Mandatory installation of high efficiency washers in new multi-family and commercial laundry
- No reverse osmosis water vending machines
- Hot water heaters shall not be installed more than 40 feet from hot-water-using fixtures
- Lodging facilities shall be required to not provide daily linen and towel changing for those guests staying multiple nights unless guests specifically request each day that the linen and towels be changed.
- Mandatory restriction on the installation of evaporative coolers in new commercial and industrial buildings.

Outdoor Residential Water Conservation

- No new grass allowed
- No expansion of existing turf areas
- Limitation on the amount of turf in new homes
- Mandatory use of reclaimed water on all turf areas greater than 5 acres if available
- No daytime watering plants or turf areas allowed
- Mandatory xeriscape landscape requirements for new developments
- No watering of native plants.
- No new plants that require spray irrigation allowed
- Watering and car washing on assigned days only
- Discharging water into streets or sidewalks prohibited.
- No water waste
- Hosing of sidewalks and driveways prohibited

Commercial/Industrial Water Conservation

- Low water use plants for all new commercial projects
- Non-residential landscape water-use efficiency standards
- Hosing of sidewalks, parking lots and driveways prohibited
- No misters or cooling towers

- No evaporative cooling in buildings over 3,000 sq. ft.
- No installation of evaporative coolers in commercial buildings
- Mandatory requirement to install recirculating systems for all new evaporative cooling systems, decorative water fountains, car washes and commercial and industrial clothes washers
- No new motels over 44 rooms
- No spas in motel rooms
- No new swimming pools
- Developers of projects over 150,000 gallons water use per month must furnish new water supply to Town
- Drinking water by request only in restaurants
- Mandatory low water use spray rinsers in commercial restaurants
- Mandatory use of treated effluent for all new golf courses
- No spray type fountains
- No treated, metered, potable water from the municipal water supply system may be used for the purpose of filling or refilling artificial lakes.
- Zoning restrictions related to water use

Enforcement of Ordinances

Conservation ordinances in cities and towns in Arizona are generally enforceable through three different methods: payment of the administrative fees, prosecution as a civil violation, and ultimately, termination of service. Administrative fees can be assessed through customer water bills. Administrative fees employed by cities range from $20 to $50 for the first violation, with each additional violation increasing in differing increments. Some administrative fees assessed by a city for multiple violations are capped while others are not capped and continue to increase with each repeat violation. As an example, the Town of Payson caps their administrative fees at $200, while Flagstaff has no cap and each repeat violation doubles the previous assessed fee.

Most cities rely on citizens reporting violators of ordinances. Flagstaff, however, employs students during the summer to bicycle through neighborhoods looking for violations of the landscape irrigation policies (odd/even watering and time of day watering). Administrative fees collected are used to pay for the student's time.

In the City of Cottonwood, a violation of the Plan during a mandatory Demand Reduction Strategy level I, II, or III, results in the levying of the following surcharges:

- A surcharge of $ 25.00 shall be assessed to the account of record for a violation of Demand Reduction Strategy I "Water Alert" – § 13.16.030(A)(5) et seq.
- A surcharge of $ 50.00 shall be assessed to the account of record for a violation of Demand Reduction Strategy II "Water Emergency" – § 13.16.030(A)(6) et seq.
- A surcharge of $ 100.00 shall be assessed to the account of record for a violation of Demand Reduction Strategy III "Water Crisis" – § 13.16.030(B)(7) et seq.

Surcharges double for every repeat violation. Each succeeding surcharge under the prevailing strategy level may be twice the previous surcharge assessed for the previous violation. The cycle of surcharges for violations of this Plan begin anew on January 1, of each year.

The City's current mandatory conservation policies and ordinances are associated with the "Drought and Water Shortage Preparedness Plan," adopted in 2006. As stated previously, these actions are only mandatory during periods of time when it is ordered by the City Manager or the Director of Utilities and during the months of May through September.

SUGGESTED CONSERVATION PROGRAMS

The most successful conservation programs incorporate programs from all three categories, education and outreach, incentives, and mandatory programs. Implementing programs from all three categories has a synergistic effect because of the interrelationship of the three programs. Education and outreach provides the basis and foundation for justifying the implementation of conservation measures. Incentivized programs other than pricing demonstrate a commitment on the part of the City to the importance of the conservation programs and the adoption of policies and ordinances serves to implement the programs being proposed. Without building the foundation and justification of the need for conserving water, gaining the public's acceptance of price increases and mandatory water conservation practices will be a tremendous challenge.

With this in mind, the following conservation programs are recommended for consideration due to their success in other communities. While all of the suggested programs have merit, adopting some or all of them would elevate the City into the top tier of cities and towns statewide that are considered to be leaders in promoting water conservation.

Suggested Education and Outreach Programs:

- The recently-completed conservation tips and suggestion cards should be continued to be made available at City offices, with plans to expand their availability to other locations such as the library and recreation center. Other locations that may be considered for future distribution are nurseries.

- A water conservation webpage should be developed that provides conservation tips and reminders, current level of water conservation strategy and its associated conservation requirements, and links to information about water conservation and water resources.

- The City should sponsor an annual leadership training academy for public and potentially interested political candidates to learn about water resources, water systems and conservation programs, as well as the different functions of the City departments, land use plans, etc. This could potentially be incorporated into the current Verde Valley Leadership program.

- The City should work in concert with the Cooperative Extension to offer conservation home and business audits.

- The City should work with Cooperative Extension to expand and develop the current public schools water curriculum to include kindergarten, fourth grade and seventh grade.

- The City should initiate a contest within the local high school to produce a conservation video that will be judged by local citizens.

Suggested Incentivized Conservation Programs:

- Offer rebates for the installation of waterless urinals in all public restroom facilities.
  - Average costs of waterless urinals range from about $300 to $700 with an operating cost of about $1 for every 1000 uses or about $25 per year.

- Offer rebates to homeowners for replacement of toilets made prior to 1994 with ≤1.6 gallons per flush toilet.
  - Home Depot carries several brands that actually have higher ratings than the older 3.5 gpf toilets. The average cost of toilets rated as excellent range from a low of about $170 to a high of about $300. The cost to have the toilet installed is about $99.

- The City already has a tiered rate conservation pricing structure that should be maintained and periodically evaluated for its effectiveness.

Suggested Mandatory Conservation Measures:

Existing Customers --

- Conservation measures associated with the Demand Reduction Strategy I "Water Alert" should be formally adopted as the accepted operating practice year round.
- Intentionally discharging water into streets or sidewalks should be prohibited.

New Developments (Residential and Commercial) --

- Mandatory restriction on the installation of evaporative coolers in new homes.
- Mandatory restriction on the installation of evaporative coolers in new commercial and industrial buildings.
- Mandatory restrictions on the installation of RO and water softening units in new homes.
- Mandatory required use of waterless urinals for all new public, commercial, multi-family-residential common-use buildings, and in all commercial and industrial restroom remodels.
- Mandatory installation of high efficiency washers in new and updated multi-family and commercial laundries.
- Mandatory requirement to use self-closing faucets in all new commercial restrooms.
- Mandatory prohibition on the installation of new spray type fountains.
- Mandatory use of treated effluent for all new golf courses.
- Mandatory use of reclaimed water on all turf areas greater than 5 acres if available.

City of Cottonwood, Arizona
City Council Agenda Communication

Print

Meeting Date:	September 11, 2012
Subject:	Dog Park Options
Department:	Development Services
From:	Morgan Scott, Development Services

REQUESTED ACTION

Review additional options and information regarding the dog park and receive direction from Council.

SUGGESTED MOTION

If the Council desires to approve this item the suggested motion is: N/A

BACKGROUND

For the last several years the City of Cottonwood has operated and maintained a dog park at Riverfront Park. The facility, although popular among dog owners, has caused some concerns among nearby property owners who have been affected by the noise created from the dog park. A work session was held on August 14, 2012 to review staff options for a solution to the concerns regarding the existing dog park operation. After staff's presentation and public comment they were directed to compile additional information and return to Council at a subsequent work session.

JUSTIFICATION/BENEFITS/ISSUES

See attachments for benefits/issues for each site

COST/FUNDING SOURCE

ATTACHMENTS:

Name:	Description:	Type:
dog_park.pdf	Dog Park presentation	Backup Material

City of Cottonwood
Dog Park

Options

- Humane Society on Mingus Ave
- North Clear Zone near Black Hills Auto
- Reclaimed Water Pond on Mingus Ave
- Sound Barriers at existing Site
- Rearranging existing site

Humane Society

- Benefits:
  - Easily Accessible
  - May be monitored by nearby transfer station attendant
  - 450’ from the nearest residence
  - Located near humane society where noise is not an issue
  - Area: approximately 100’x200’ (approximately 0.45 acres)
- Concerns:
  - Some uneven Terrain
  - Reclaimed water within 200’
  - Additional Noise

Humane Society Costs

- Fence: 1,010’ of fence @ $12/foot = $12,120
- 10 space gravel parking lot = $1,000 (cost estimate assumes work is conducted by City crews). Parking lot will remove approximately 0.1 acres from the site.
- Irrigation: $3,600
- Tree Relocation (6 trees) $1,850
- TOTAL EST. COST: **$18,570**
  - Price per acre: $41,266.67

North Clear Zone

- Benefits:
  - Easily Accessible from Black Hills Drive
  - Relatively flat
  - Space is not currently in use, little impact on airport
  - Reclaimed water already on site
  - Over 800’ from nearest Residence
  - Area: approximately 1.4 acres, more space available
- Concerns:
  - Possible future airport expansion may impact site

North Clear Zone Costs

- Fence: 1,050’ of fence @ $12/foot = $12,600
- 10 space gravel parking lot = $1,000 (cost estimate assumes work is conducted by City crews). Parking lot will remove approximately 0.1 acres from the site.
- Irrigation: $0.00 (irrigation already in place)
- Tree Relocation (6 trees) $1,850
- TOTAL EST. COST: **$15,600**
  - Price per acre: $11,035.71

Reclaimed Water Pond

- Benefits:
  - Easily Accessible
  - Relatively flat
  - Space is not currently in use
  - Reclaimed water already on site
  - Large distance from any residence
  - Area: approximately 1.15 acres
- Concerns:
  - Land is currently leased and would need to be purchased/leased by the City

Reclaimed Pond Costs

- Fence: 900’ of fence @ $12/foot = $10,800
- 10 space gravel parking lot = $1,000 (cost estimate assumes work is conducted by City crews). Parking lot will remove approximately 0.1 acres from the site.
- Irrigation: $4,100
- Tree Relocation (6 trees) $1,850
- Lease property $400/month
- TOTAL EST. COST: **$17,750 + $400 / month**
  - Price per acre: $15,434.78

Sound Barriers

- Wall
- Earth Berm
- Material

Proposed Sound Wall Location

Sound Barrier Wall

- ADOT Sound Barrier Wall

Wall Height	Price per linear foot	Length	Total Cost
6’	$92.00 / ft	550’	$50,600
8’	$116.00/ft	550’	$63,800
10’	$142.00/ft	550’	$78,100
12’	$250.00/ft	550’	$137,500

- Quote Provided by Brian Herman, with Precision Structural Concrete LLC

Earth Berm

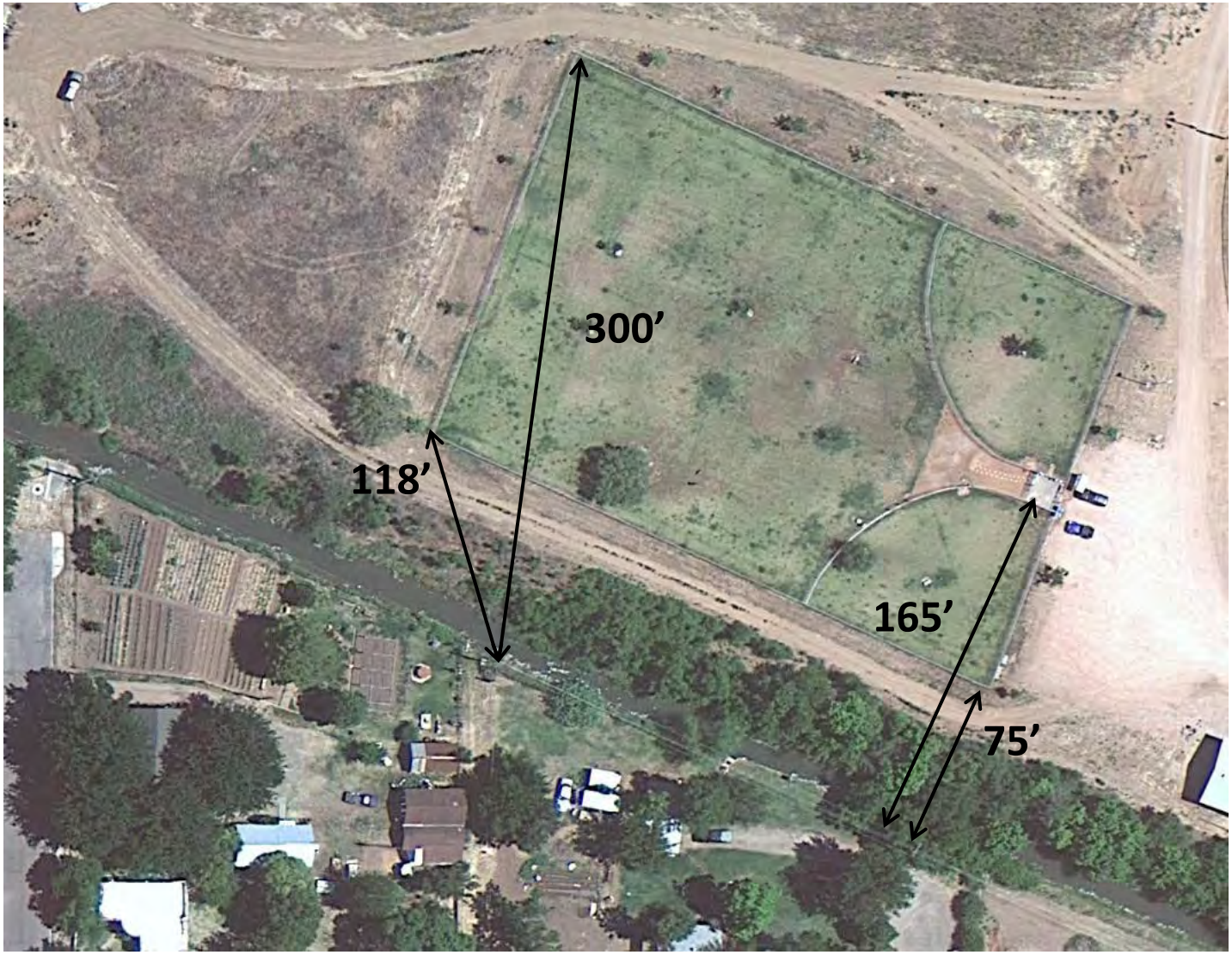
Berm Height	Width	Length	Volume (Cu Yd)	Cost /Cu Yd	Total Cost
6’	**24**	550’	2,933	$6	$14,667
8’	**32**	550’	5,215	$6	$26,074
10’	**40**	550’	8,150	$6	$40,740
12’	**48**	550’	11,733	$6	$58,667

Cost per yard Estimate provided by Tiffany Construction, 8-26-12

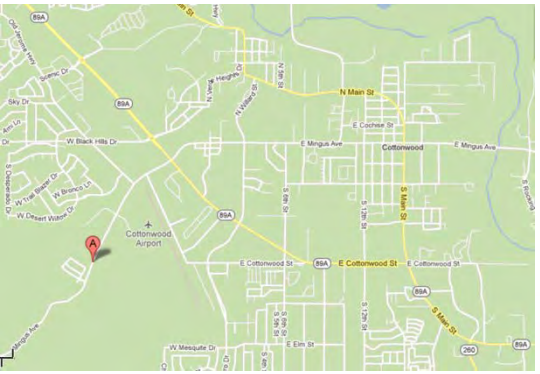
Sound Barrier: Material

- 6’ tall chain link fence with Accoustifence
  - Fence: 550’@ $12/ft = $6,600
  - Accoustifence barrier = $7,608
  - Total = **$14,208**
- 12’ tall chain link fence with Accoustifence
  - Fence: $7,400
  - Accoustifence barrier = $15,216
  - Total = **$22,626**

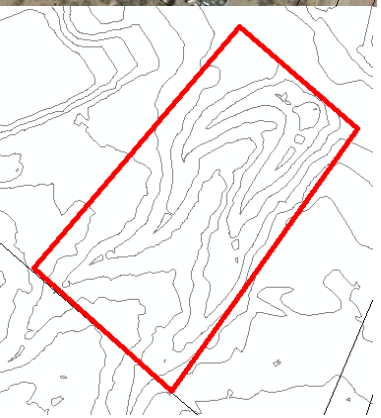
Rearranging Current Dog Park



QUESTIONS?

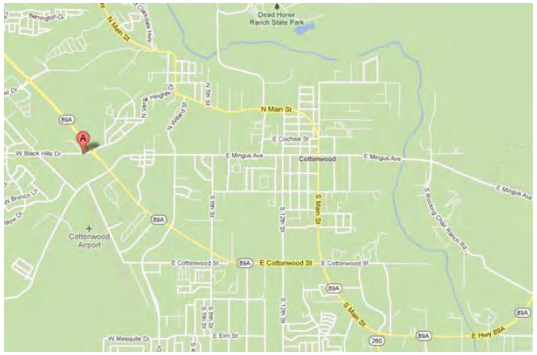


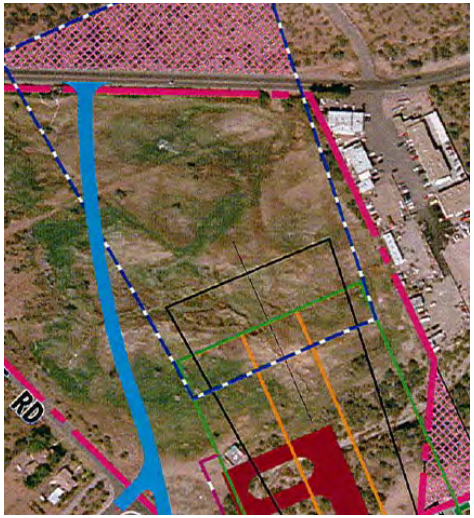
Humane Society Images



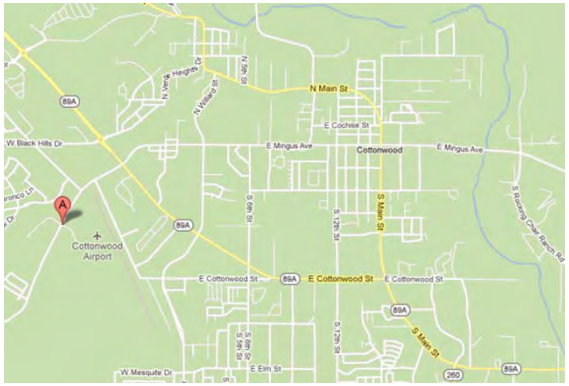
- Picture taken from transfer station driveway looking west, new Humane Society building in the rear, Mingus Mountain in the background.

North Clear Zone Images



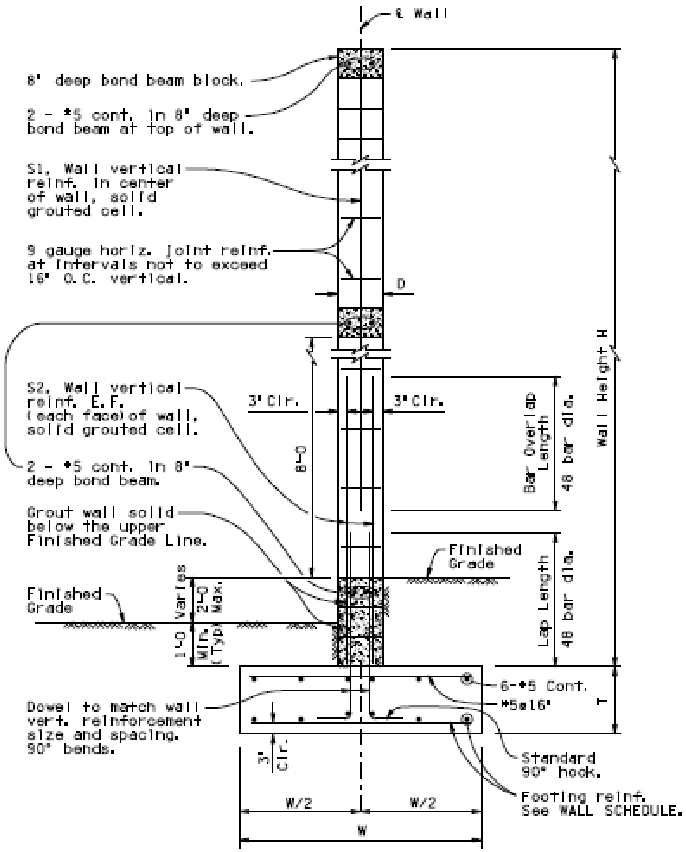


Reclaimed Pond Images

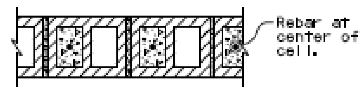


Current Dog Park Stats

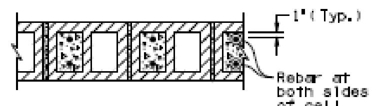
- Area: 200’x300’ (approximately 1.38 acres)



TYPICAL WALL SECTION
(For Wall Height 18'-0 to 26'-0)



SECTION THROUGH S1



SECTION THROUGH S2

TYPICAL SECTIONS THROUGH VERTICAL WALL REINFORCEMENT

NOTE:

See DWG. SD 8.02 (1 of 2) "WALL DETAILS AT JOINTS AND ENDS" for details not shown here.

WALL SCHEDULE

Wall Height H	Wall Thick D*	Ftg. Depth T	Ftg. Width W	Reinforcing** Wall, Vertical S1 Size & Spacing	Reinforcing** Wall, Vertical S2 Size & Spacing E.F.	Reinforcing** Footing Bottom Trans.	Reinforcing** Footing Bottom Long.	Factored Average Soil Bearing Pressure (psf)
18'-0 to 19'-11	12"	1'-9	6'-0	#5@16"	#5x6'-6 @ 16"	#6@16"	6-#5	1,900
20'-0 to 21'-11	12"	2'-0	6'-3	#6@16"	#6x6'-6 @ 16"	#6@16"	6-#6	2,100
22'-0 to 23'-11	12"	2'-3	6'-6	#8@16"	#6x7'-0 @ 16"	#6@16"	6-#6	2,300
24'-0 to 26'-0	12"	2'-6	6'-9	#8@16"	#7x8'-0 @ 16"	#6@16"	6-#6	2,600

* Nominal Dimension, ** Additional Reinf. required at Control Joints.

GENERAL NOTES (Continued):

Materials Notes:

Masonry: f'm = 1500 psi, ASTM C90, Medium or Normal weight, Running Bond, SLUMP BLOCK unless noted otherwise.

Mortar: ASTM C270, Type S, Cube Strength 1800 psi, ASTM C91 cement.

Grout: ASTM C476, Type Coarse, Cube strength 2000 psi.

Reinforcing Steel: ASTM A615, Grade 60.

Joint Reinforcing: 9 Gauge Ladder or Truss type, Standard weight, fy=33,000 psi, ASTM A82 Wire.

Special Inspection Notes:

Special inspection and testing, provided by the Department, are required for the masonry noise wall stem to assure quality materials and construction.

(A) Pre-construction:

1) Verify correct block type to be used.
2) Verify correct mortar and grout to be used.
3) Verify the location, spacing, size and lap length of vertical reinforcing dowel bars and wall reinforcement that is within plus or minus ½" of the plan dimension as measured normal to the wall and plus or minus 2" in the longitudinal direction.
4) Verify that masonry units are clean and free from dirt when placed in the wall. Masonry units shall be dry before placement.

(B) Construction:

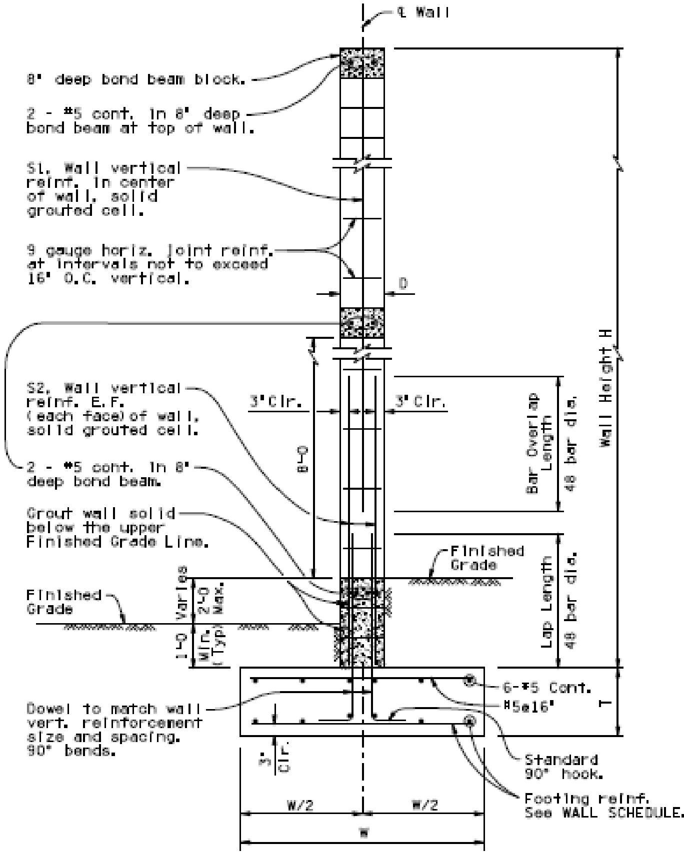
1) Observe, periodically, the placement of the masonry units and the making of the mortar. Verify that the initial bed joint thickness is not less than ¼" or more than 1"; subsequent bed joints shall not be less than ¼" or more than ⅝" in thickness.
2) Observe all grout placements.
3) Verify horizontal joint reinforcing size, location, and spacing.
4) Verify that all concrete masonry units are placed in uniform and true course, level and plumb with a tolerance of ¼" in 8 feet, non-cumulative.
5) Verify that concrete masonry units are placed to the desired height with joints of uniform thickness. Level, plumb and straighten before the mortar stiffens. Bond shall be plumb throughout.
6) Verify that all concrete masonry units are cured by sprinkling twice a day for minimum of 2 days.

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
BRIDGE GROUP STRUCTURE DETAIL

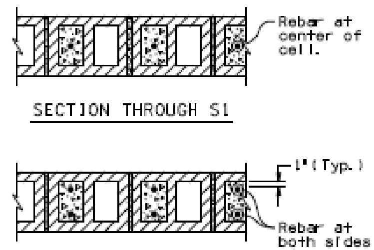
SOUND BARRIER WALL
(MASONRY)

SD 8.02 (2 of 2)

OF



TYPICAL WALL SECTION
(For Wall Height 18'-0 to 26'-0)



TYPICAL SECTIONS THROUGH VERTICAL WALL REINFORCEMENT

NOTE:
See DWG. SD 8.02 (1 of 2) "WALL DETAILS AT JOINTS AND ENDS" for details not shown here.

GENERAL NOTES (Continued):

Materials Notes:

Masonry: f'm = 1500 psi, ASTM C90, Medium or Normal weight, Running Bond, SLUMP BLOCK unless noted otherwise.

Mortar: ASTM C270, Type S, Cube Strength 1800 psi, ASTM C91 cement.

Grout: ASTM C476, Type Coarse, Cube strength 2000 psi.

Reinforcing Steel: ASTM A615, Grade 60.

Joint Reinforcing: 9 Gauge Ladder or Truss type, Standard weight, fy=33,000 psi, ASTM A82 Wire.

Special Inspection Notes:

Special inspection and testing, provided by the Department, are required for the masonry noise wall stem to assure quality materials and construction.

(A) Pre-construction:

1) Verify correct block type to be used.
2) Verify correct mortar and grout to be used.
3) Verify the location, spacing, size and lap length of vertical reinforcing dowel bars and wall reinforcement that is within plus or minus ½" of the plan dimension as measured normal to the wall and plus or minus 2" in the longitudinal direction.
4) Verify that masonry units are clean and free from dirt when placed in the wall. Masonry units shall be dry before placement.

(B) Construction:

1) Observe, periodically, the placement of the masonry units and the making of the mortar. Verify that the initial bed joint thickness is not less than ¼" or more than 1"; subsequent bed joints shall not be less than ¼" or more than ⅝" in thickness.
2) Observe all grout placements.
3) Verify horizontal joint reinforcing size, location, and spacing.
4) Verify that all concrete masonry units are placed in uniform and true course, level and plumb with a tolerance of ¼" in 8 feet, non-cumulative.
5) Verify that concrete masonry units are placed to the desired height with joints of uniform thickness. Level, plumb and straighten before the mortar stiffens. Bond shall be plumb throughout.
6) Verify that all concrete masonry units are cured by sprinkling twice a day for minimum of 2 days.

WALL SCHEDULE

Wall Height H	Wall Thick D*	Ftg. Depth T	Ftg. Width W	Reinforcing**				Factored Average Soil Bearing Pressure (psf)
				Wall, Vertical		Footing		
				S1	S2			
				Size & Spacing	Size & Spacing E.F.	Bottom Trans.	Bottom Long.	
18'-0 to 19'-11	12"	1'-9	6'-0	#5@16"	#5x6'-6 @ 16"	#6@16"	6-#5	1,900
20'-0 to 21'-11	12"	2'-0	6'-3	#6@16"	#6x6'-6 @ 16"	#6@16"	6-#6	2,100
22'-0 to 23'-11	12"	2'-3	6'-6	#8@16"	#6x7'-0 @ 16"	#6@16"	6-#6	2,300
24'-0 to 26'-0	12"	2'-6	6'-9	#8@16"	#7x8'-0 @ 16"	#6@16"	6-#6	2,600

* Nominal Dimension, ** Additional Reinf. required at Control Joints.

Note to Designers:
The information presented in this Standard Detail has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent professional examination and verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
BRIDGE GROUP STRUCTURE DETAIL

SOUND BARRIER WALL
(MASONRY)

DRAWING NO. SD 8.02 (2 of 2)

SHEET NO. OF

Tree Relocation Quote

- John Hancock Tree Relocation Scottsdale, AZ
- 480-833-0655
- info@hancocktreerelocations.com
- $500 travel fee
- $225 per tree

City of Cottonwood, Arizona
City Council Agenda Communication

Print

Meeting Date:	September 11, 2012
Subject:	Infill Map
Department:	Development Services
From:	Morgan Scott, Development Services

REQUESTED ACTION

Review and comment on the infill map compiled by staff

SUGGESTED MOTION

If the Council desires to approve this item the suggested motion is: N/A

BACKGROUND

One of the Council's strategic initiatives was to create an infill map which identified parcels within the city which were available for development. Staff has compiled the requested map and wishes to present this draft to Council for review and comment.

JUSTIFICATION/BENEFITS/ISSUES

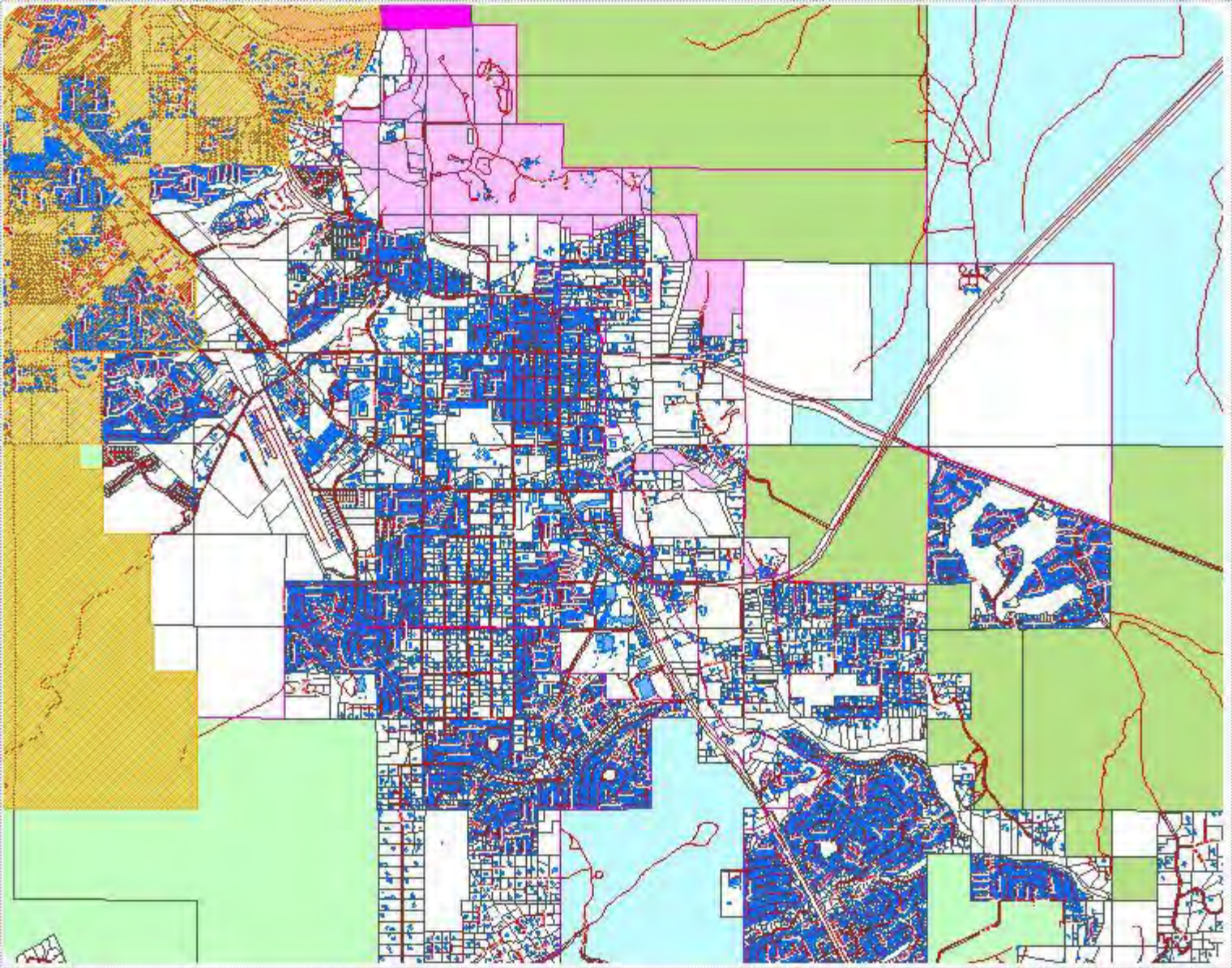
The ability to readily identify infill parcels which are undeveloped will assist staff in both responding to citizen requests for this information and planning for future infill development.

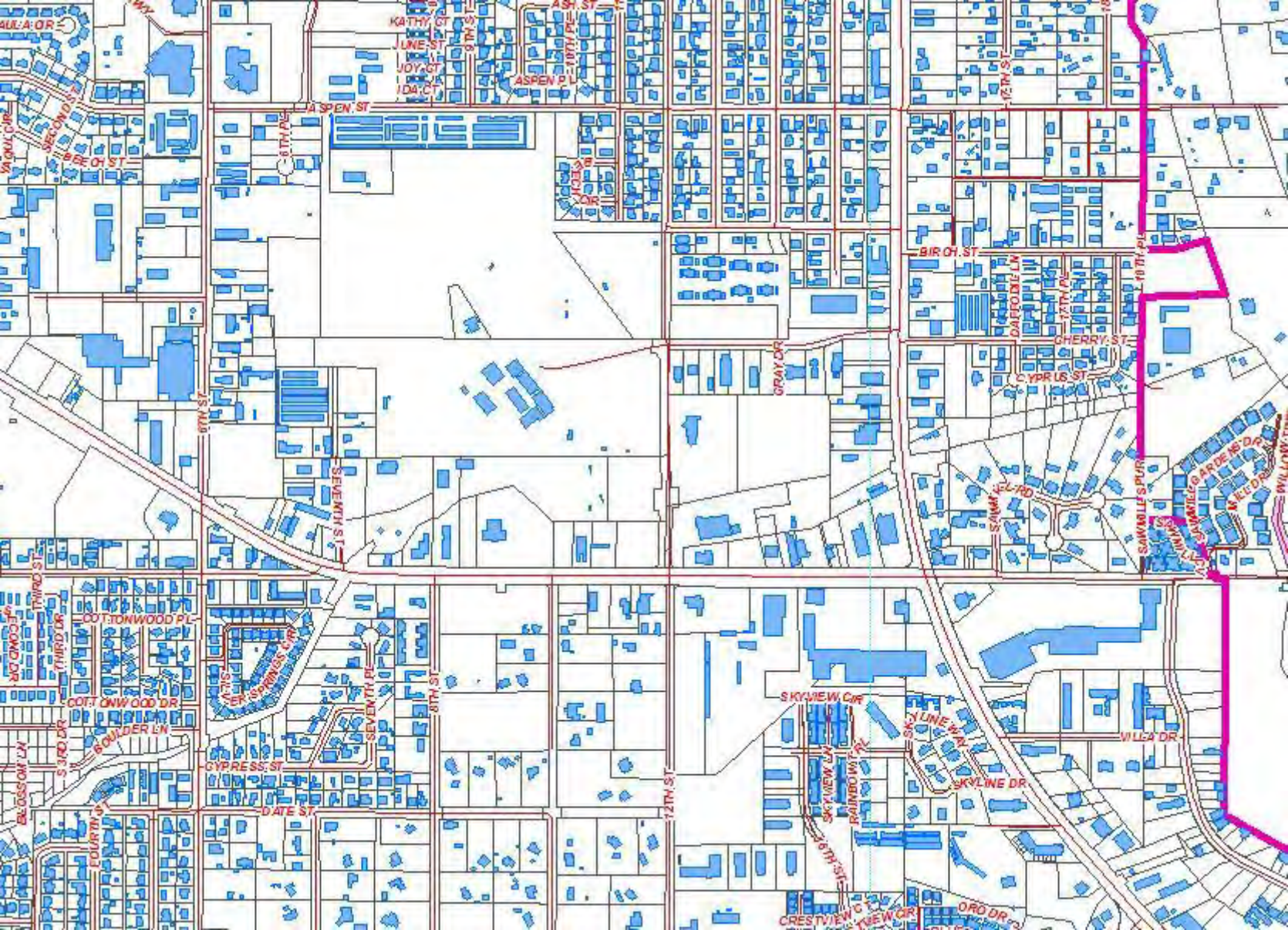
COST/FUNDING SOURCE

N/A

ATTACHMENTS:

Name:	Description:	Type:
Infill_map1.jpg	Infill map	Cover Memo
Infill_map2.jpg	Infill map 2	Cover Memo




ASPEN ST
6TH AVE
6TH ST
9TH ST
10TH PL
KATHY CT
JUNE ST
JOY CT
ASPEN PL
BIRCH ST
12TH PL
CHERRY ST
CYPRESS ST
GRAY DR
SAWMILL RD
SAWMILL SPUR
SEVENTH ST
SEVENTH PL
8TH ST
12TH ST
THIRD ST
THIRD DR
COTTONWOOD PL
COTTONWOOD DR
BOULDER LN
DATE ST
FOURTH ST
SKYVIEW CIR
SKYLINE CIR
SKYLINE DR
RAINBOW TRL
VILLA DR
ORO DR
CRESTVIEW CIR