Parallel Metering & Sub-Metering

CWAC – Urban Agriculture Subcommittee

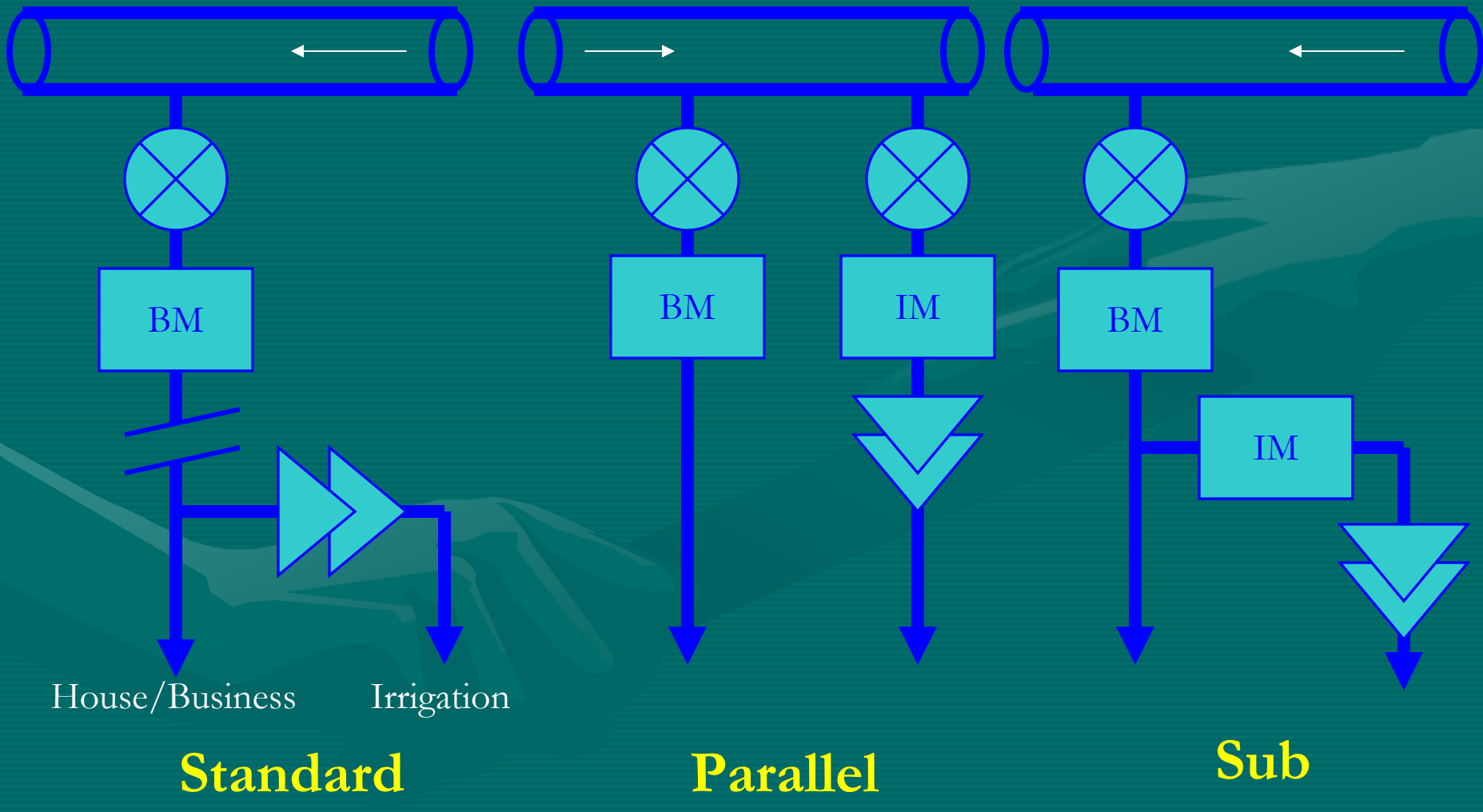
February 5, 2013

Parallel Metering & Sub-Metering Different Customers

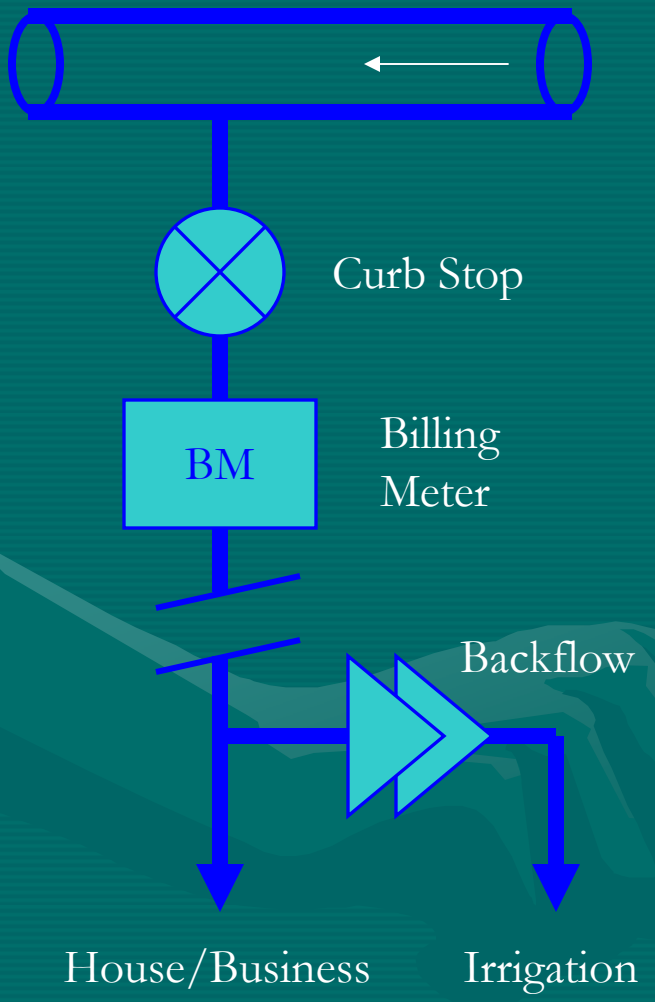
- Residential
  - Block Rate Structure
- Community Garden
  - Commercial Rate with Summer Surcharge

Metering Installation Types

(for irrigation using potable water)



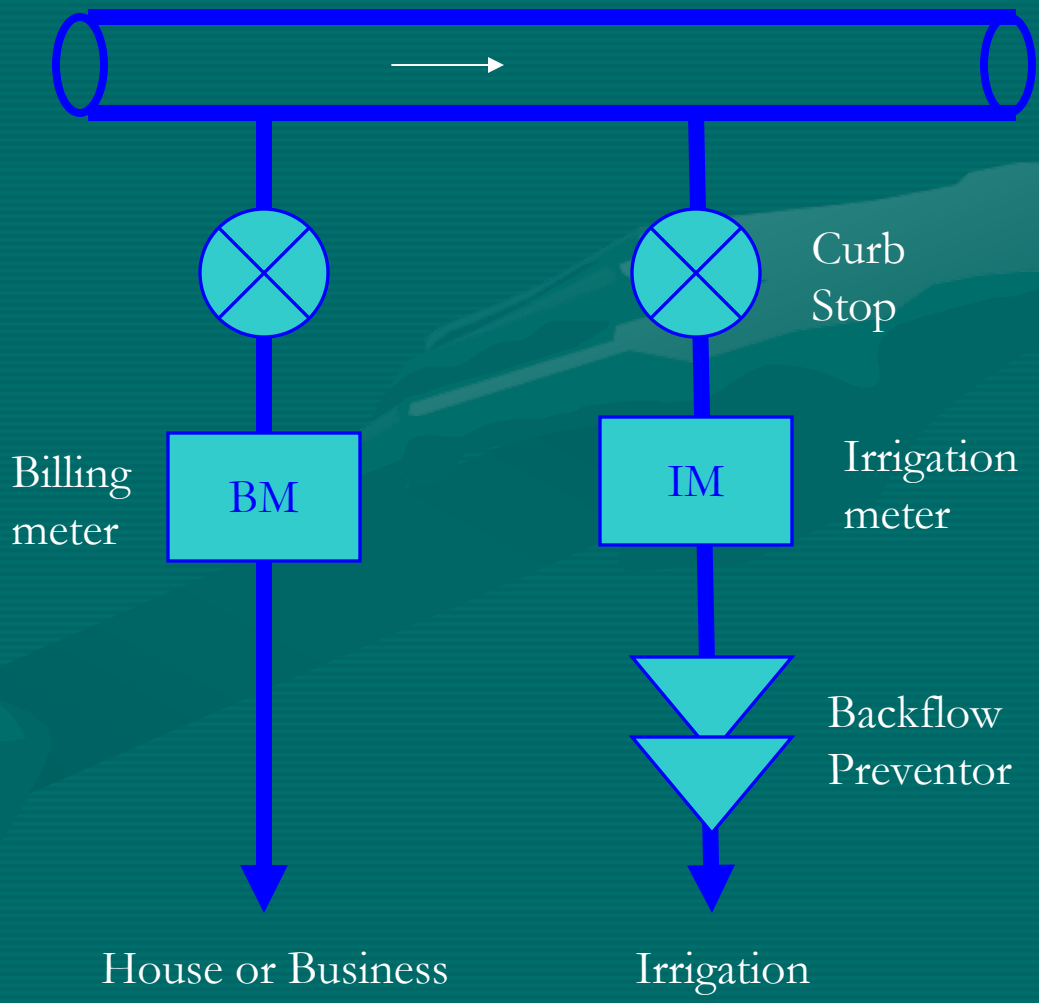
Standard Home or Business



- Billing Meter @ ROW/curb
- Irrigation connection near home/business (may be a long distance away from street)
- Wastewater Fees based on Winter Water use (December, January, & February)

Parallel Metering

- Already used/available to Tucson Water Customers
- Separate meters located at curb/street
- Separate billing for each meter
- **Customer Saving Wastewater Fees, but gaining monthly water meter costs**

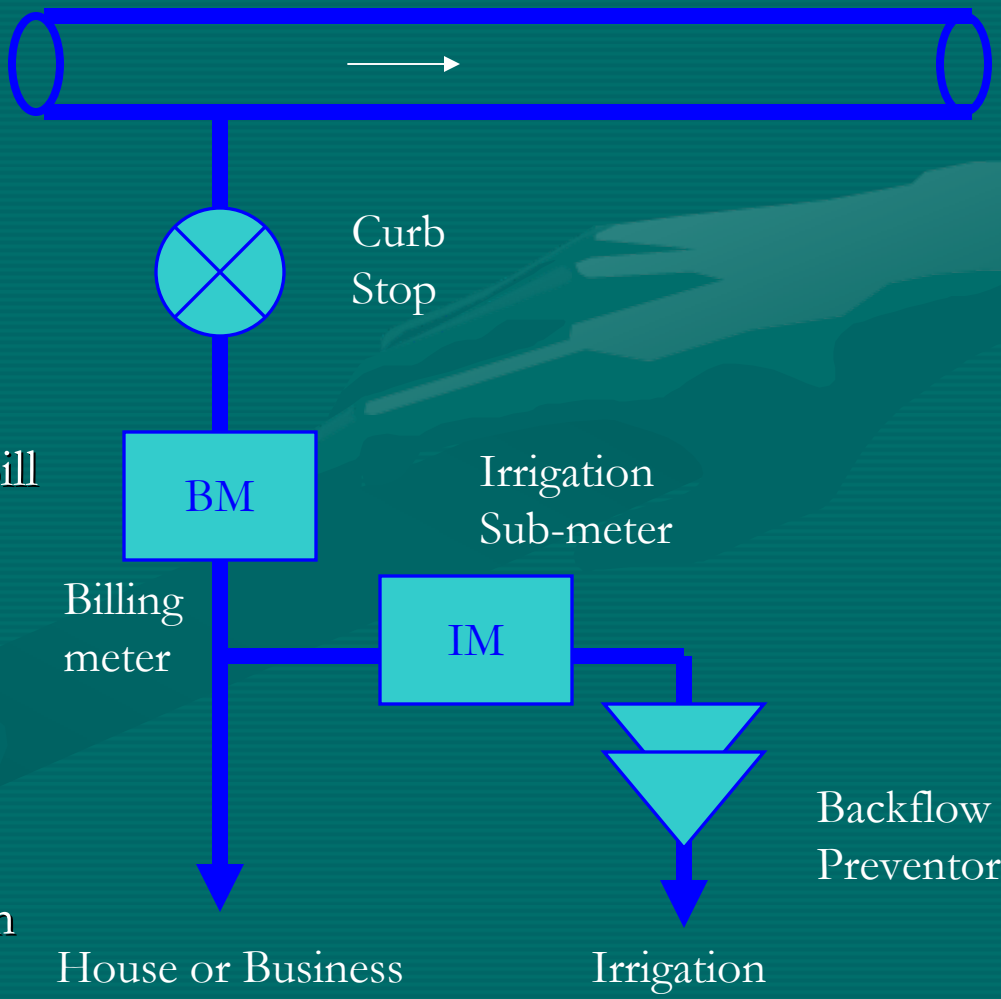


Sub-Metering

- Some Pima County Wastewater Customers already use their own self-reporting irrigation sub-meters (customer reports use directly to County Wastewater and meter does not need to be adjacent to the curb)

- Metro Water has residential provisions
- Must be within 5 feet of Billing Meter, both need to be adjacent to the curb
- Minimal Customer Use (<20)

- Not available at Tucson Water
- Billing System needs set up for single bill for two meters.
- If instituted, Meter will need to be adjacent to the curb.
- Customer Savings would be in wastewater charges. Extra charges will be incurred for the additional meter.
- Only high volume customers who use significant amount of irrigation water in the winter could realize savings.



Irrigation Meter Install Cost - Parallel vs Sub-Metering

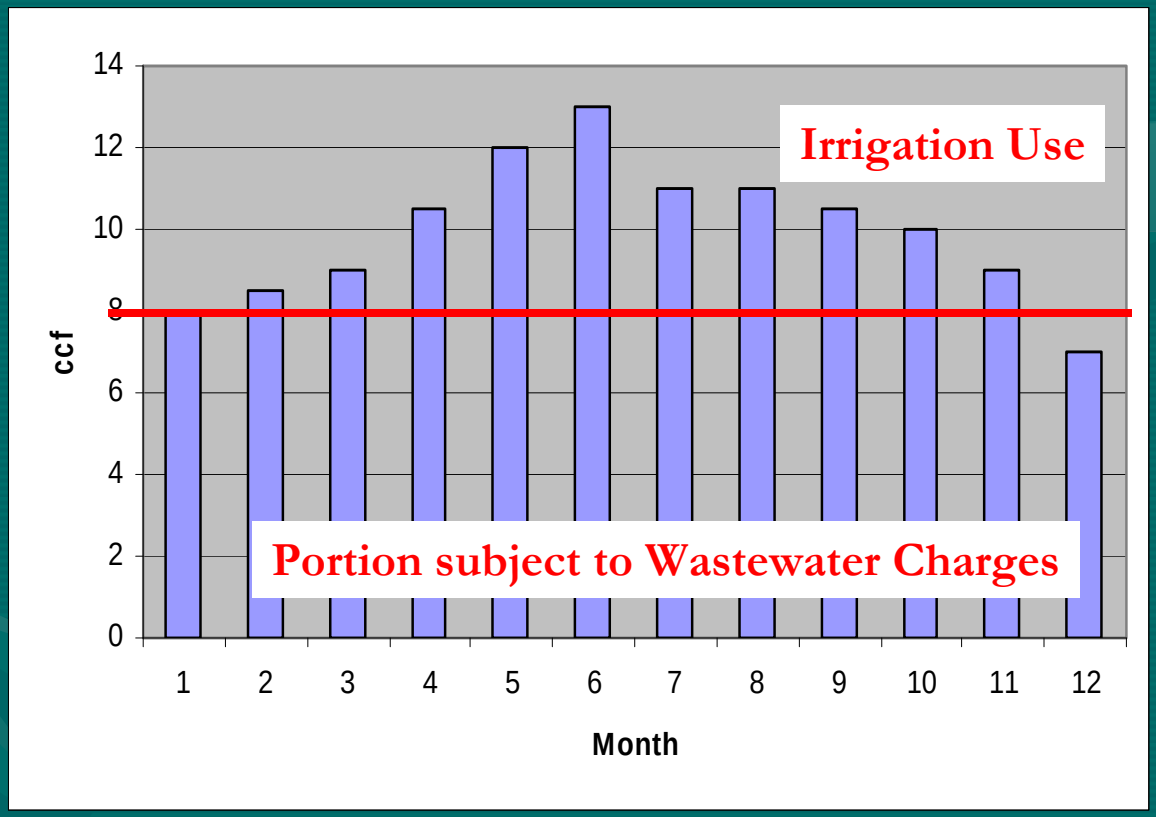
- **Parallel Irrigation Meter**
  - Meter Installation Fee varies due to:
    - Service Line availability
    - Pavement
    - Main Extension
  - **System Equity Fee examples**
    - **5/8" = 1,577$**
    - **1" = 3,943$**
  - **CAP Resource Fee examples**
    - **5/8" = 207$**
    - **1" = 518$**
  - Backflow Permit
- **Sub-Meter for Irrigation**
  - Meter Installation likely Fee Less as Service Line already exists, Pavement normally not involved and Main Extensions are unlikely
  - **System Equity Fee?**
  - **CAP Resource Fee?**
  - Backflow Permit

Irrigation Meter installation costs do not include costs incurred by customer to install a Backflow Preventor, or to run piping from the meter to the irrigation system, or the Cost of installation of an irrigation system on customer property

Basis of Monthly Wastewater Charges

(when there is a single/standard billing meter)

- Dec/Jan/Feb = Wastewater Use Determination
- Additional Water Used from March to November is assumed to be irrigation use



Only includes monthly cost of service,
Does not include costs related to initial meter and irrigation system installation

Monthly Water Billing Consideration
Parallel vs Sub-Metering

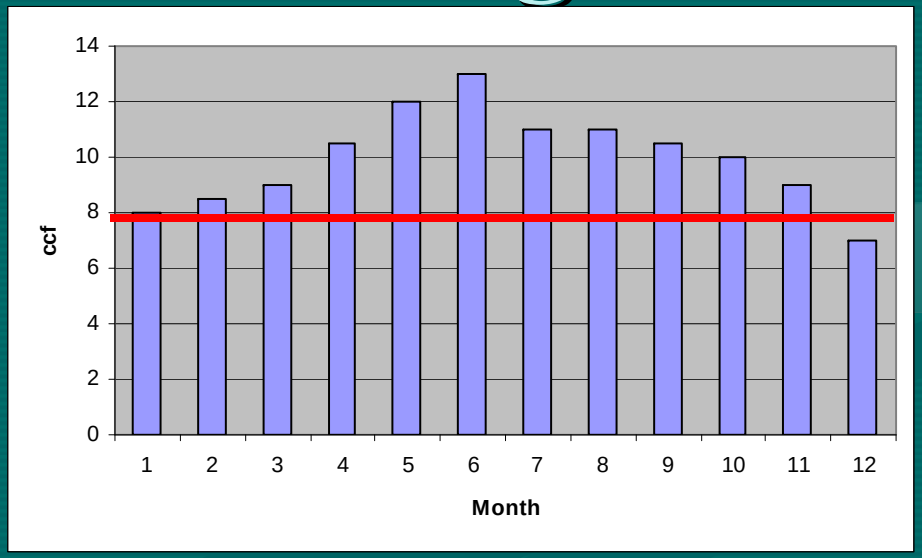
Each Meter includes:

- Monthly Service Charge
- CAP Fee
- Conservation Charge
- Usage Charges
  - Commercial
    - = 2.35$/ccf
  - Residential Block
    - 1-10 ccf = 1.26$
    - 11-15 ccf = 2.45$
    - 21-35 ccf = 6.45$
    - 36+ ccf = 10.45

Parallel Meters

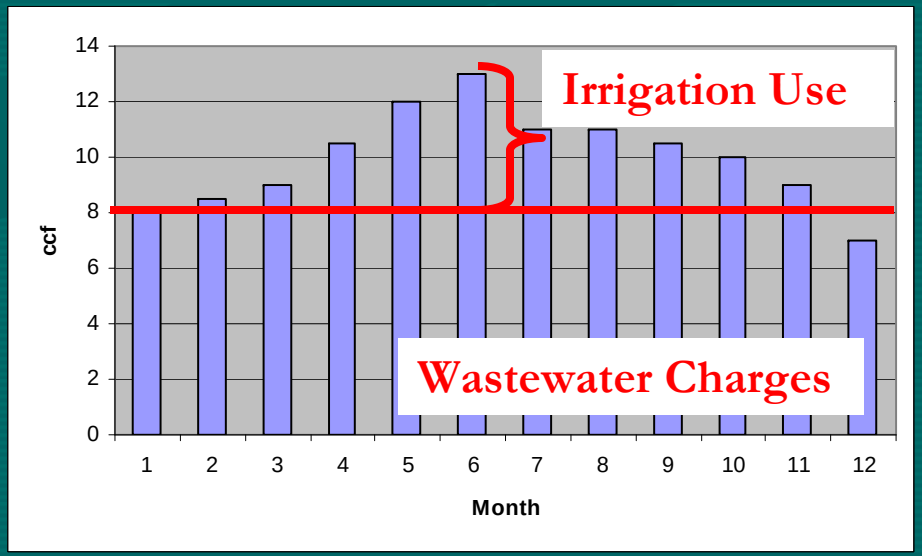
Irrigation Meter Use w/o Wastewater

Main Billing Meter Use w/Wastewater



Sub-Metering

Main Billing Meter Use



What Costs need to be offset to Justify a Parallel Irrigation Meter to Save Wastewater Fees?

(commercial customer)

- **Standard Meter**
  - Installation Cost of 1 Meter
  - Monthly Fees
    - Monthly Service Charge for one Meter
    - CAP Fee
    - Conservation Charge
    - Usage Charges

- **Billing Meter + Parallel Irrigation Meter**
  - Installation cost of 2 Meters
  - Monthly Fees
    - Monthly Service Charge for 2 Meters
    - CAP Fee
    - Conservation Charge
    - Usage Charges

How much irrigation water use to justify a parallel meter? It's Site Specific!

Water Charges to be offset by Wastewater Cost = Installation cost & Monthly Service Fee

Example: 5/8" meter, new service, pavement		Installation Cost	Monthly Cost for Payback Period		
			3 yr	5 yr	7 yr
Install	Meter	$2,414			
	System Equity Fee	$1,311			
	CAP Fee	$ 200			
	Backflow Permit	$ 82			
	Totals	$4,007	$111.31	$66.78	$47.70
Monthly	Service Charge		$ 8.27	$ 8.27	$ 8.27
Total Monthly Offset Needed			**$119.58**	**$75.05**	**$55.97**
Wastewater cost is $3.523/ccf (July 2013). Approximate Monthly CCF (of irrigation use) for payback is:			34 ccf	22 ccf	16 ccf

Other Customer irrigation system install costs not included. Rate Changes, Inflation & Taxes not included. Average Wastewater Customer pays for 8 ccf /month of wastewater charges

How to ensure Parallel or Sub-Meter is strictly used for Irrigation?

- **Tucson Water responsibility stops at the Meter**, and does not police water use within customer property
- After the irrigation meter is installed customer can easily connect the irrigation line to other uses besides irrigation, such as:
  - direct connection to the house or business (TW Recently identified a bathroom connected to the irrigation system of a business)
  - cross connection with the main potable line (with resultant backflow concern)

Options for Public Protection and ensuring irrigation meter is used properly

- Yearly cross connection testing (added cost)
- Require backflow on both the household use meter and the irrigation meter (increased cost)
- Increased Backflow regulatory requirements (which would necessitate more backflow personnel at Tucson Water and higher costs)

Questions?

Urban Agriculture
A Typical Community Garden

What is the definition of Urban Agriculture in Tucson?

- **Plan Tucson:**
  - AG1 Reduce barriers to food production and distribution at home and in community settings.
  - AG2 Adopt zoning and land use codes that promote and facilitate the equitable growth and distribution of locally produced food.
  - AG3 Promote an equitable food system that is environmentally and economically sustainable

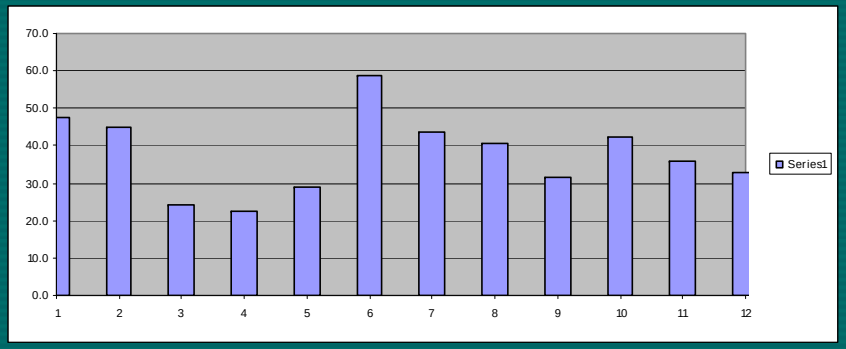
Typical Community Gardens

- Customer plots
- Users pay a fee

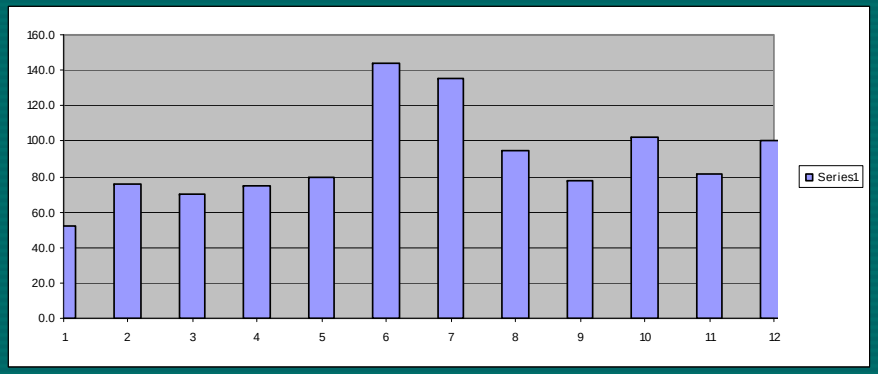
Community Gardens in Tucson (Examples)

- Dunbar
- St Marks
- Benedictine Sisters

Dunbar



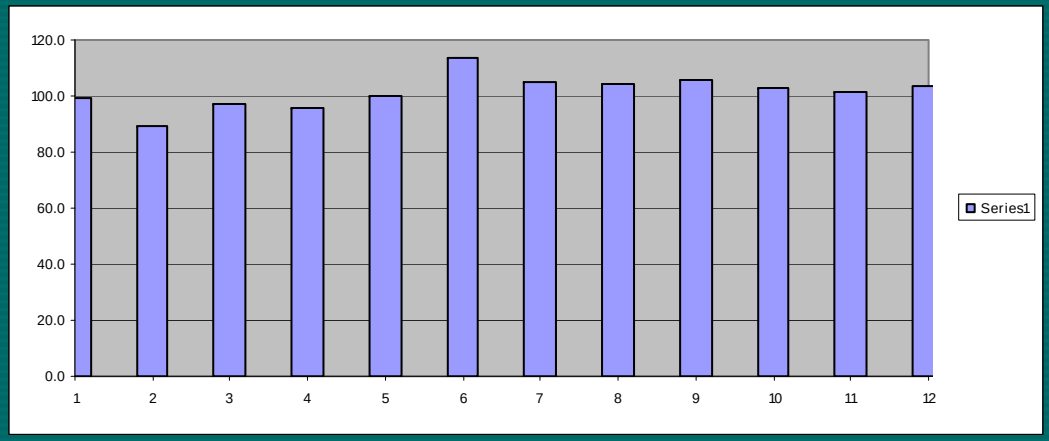
- Irrigation Meter Only



St. Marks

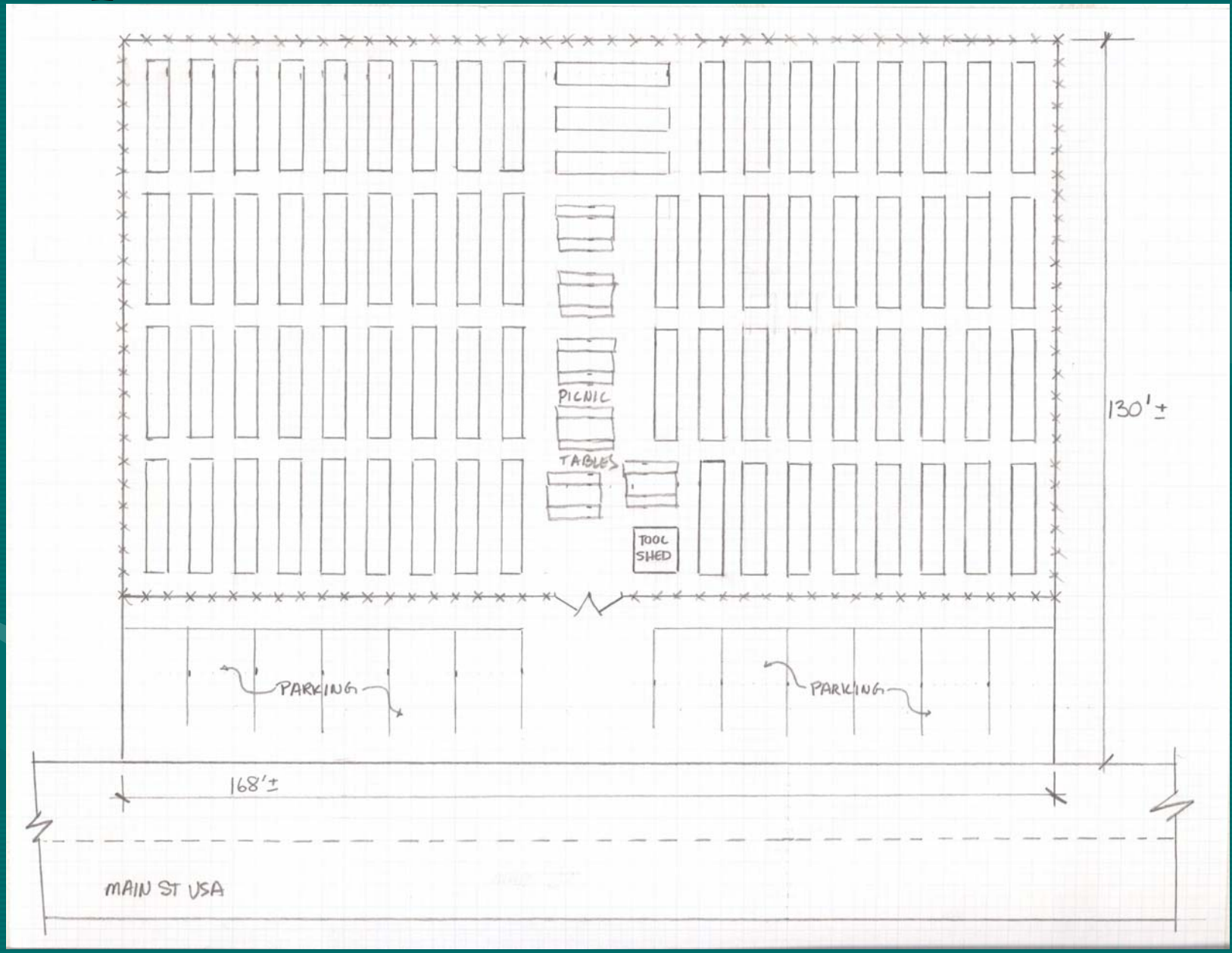
- No Separate Irrigation Meter

Benedictine Sisters

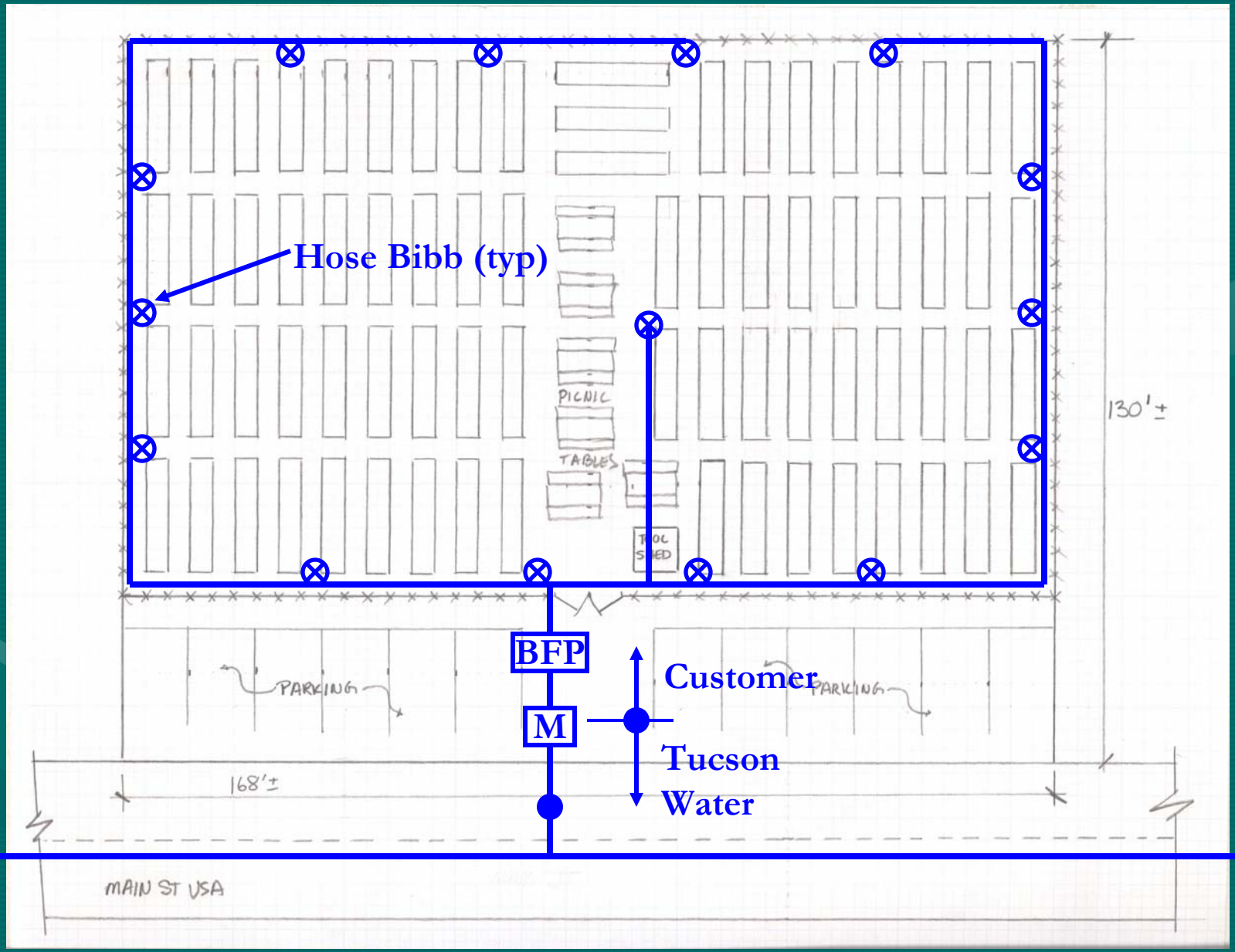


- No Separate Irrigation Meter
- Consistent Yearly Water Use

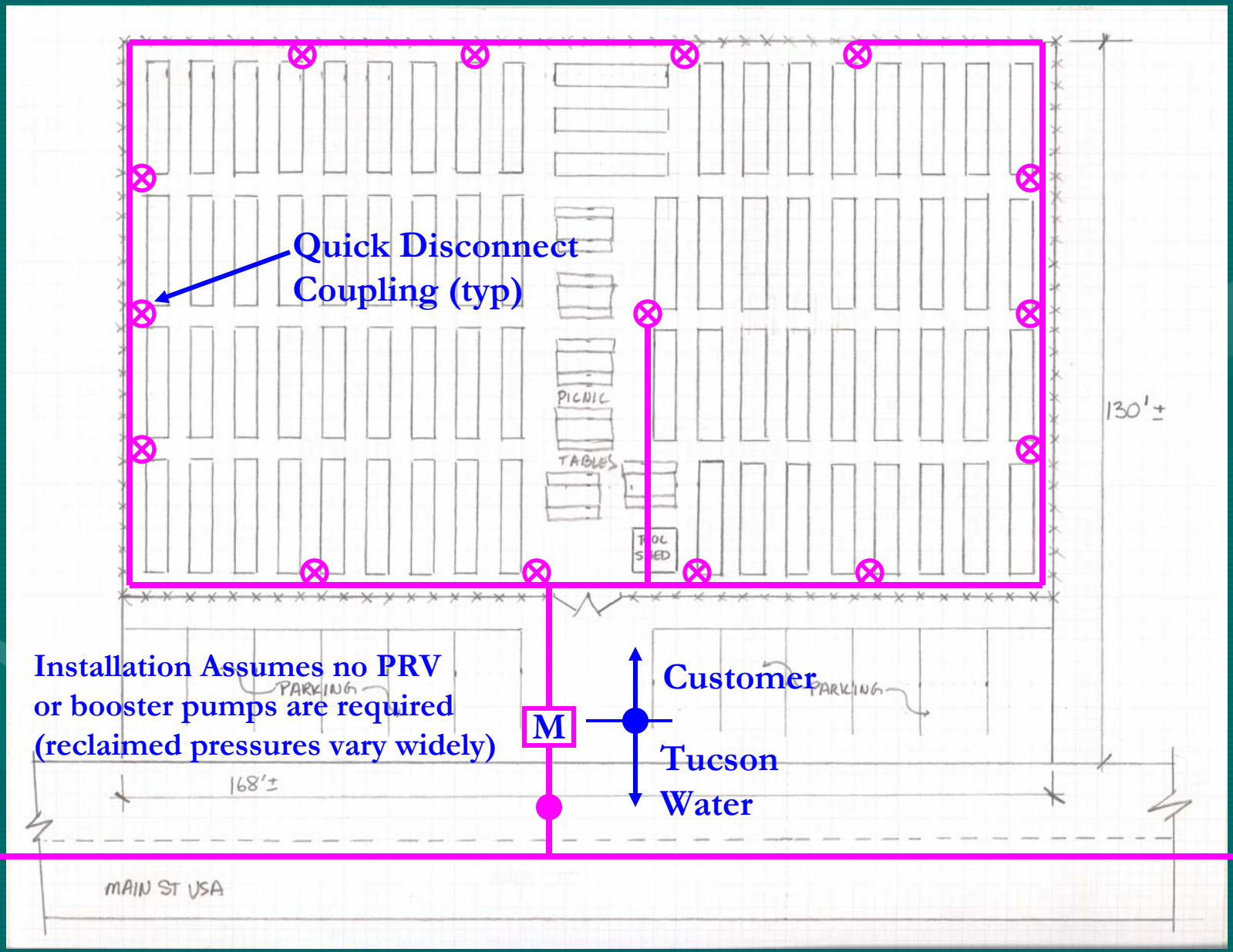
Typical ½ acre Community Garden



Community Garden w/Potable Water



Community Garden w/Reclaimed Water



MEMORANDUM

DATE: July 13, 2012

TO: New Area Development

FROM: Alan D. Forrest
Director
Tucson Water

SUBJECT: **Water Meter Sizing Guidelines**

Water meters shall be sized in accordance with the maximum design capacity shown in the table below. Fixture unit counts were interpolated using accepted plumbing codes in effect as of the date of this memorandum. Any variation in calculating the fixture unit counts to determine water meter size shall be at the discretion of technical staff.

Meter Size (inches)	Maximum UPC Fixture Units[1] ()	Maximum IPC Fixture Units[2] ()	Tucson Water Maximum Meter Design Capacity (gpm)
5/8"	20	11	15
¾"	35	28	22.5
1"	78	78	37.5
1-1/2"	250	250	75
2"	480	480	120
3"	1530	1530	270
4"	3470	3470	475
6"	8900	8900	1050

Notes:

1. Fixture unit limits were interpolated from Appendix A of the 2006 Uniform Plumbing Code (UPC) and assume the use of flush tanks.
2. Fixture unit limits were interpolated from Table E103.3(3) of the International Plumbing Code (IPC) and assume the use of flush tanks.
3. For meter sizes larger than 6" consult New Services.

AF/JO/jr

Table 6-1 M22 AWWA

What is the Meter Size for this Community Garden?

- 15 Hose Bibbs @ 2.5 Fixture Units/Hose Bibb = 37.5 Fixture Units
- 1" Meter

Typical Winter* Monthly Bill

assuming a 1-inch meter, commercial rate for potable, 1,500 gal use/100 sf (Merrill Eisenberg) and 5,840 sf usable garden area

	Potable Meter		Reclaimed Meter
Service Charge	$16.23		$12.21
Water Use	$2.25/ccf		$1.83/ccf
CAP Charge	$0.36/ccf		$0
Conservation Fee	$0.07/ccf		$0
Monthly Cost	$329.79		$226.32
1,500 gal/mo(5,840sf/100sf) = 87,600 gal/mo = 117 ccf			

* Summer Charges for Potable Water may vary due to Customer use. 9.1% Taxes not shown

Typical Meter Installation Cost

Assuming a 1-inch meter, no existing service line, pavement replacement required, existing distribution main in adjacent street

	Potable Meter		Reclaimed Meter
Meter (w/pavement)	$2,504.00		$2,504.00
System Equity Fee	$3,278.00		$0
CAP Resource Fee	$500.00		$0
Backflow Permit	$82.00		$0
Totals	$6,364.00		$2,504.00

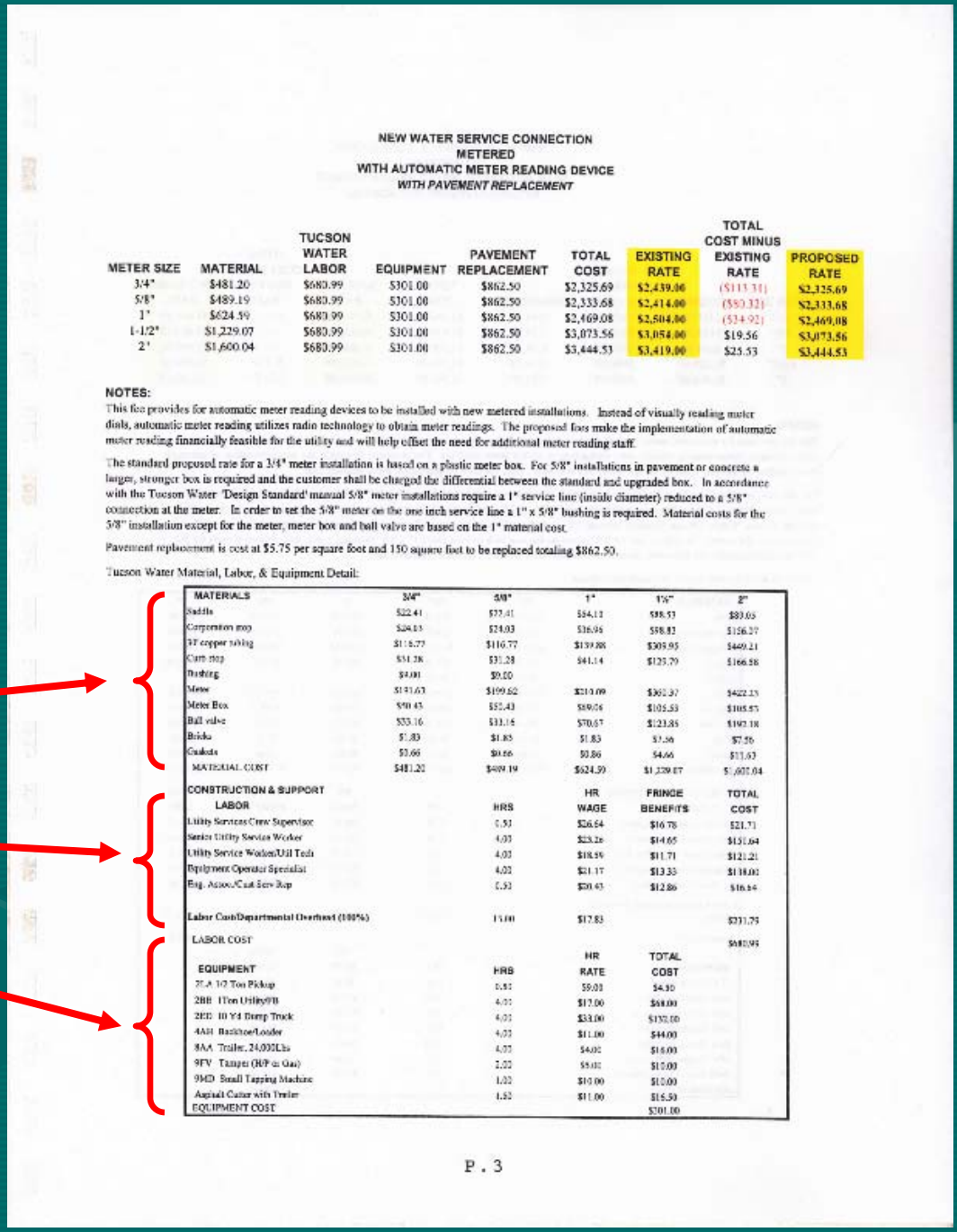
Costs do not include any piping or appurtenances beyond the billing meter

What is included in the Meter Installation Costs?

- Meter Installation
- Backflow Permit
- System Equity Fee
- CAP Resource Fee

Meter Installation Cost Example

- Materials
- Labor
- Equipment



NEW WATER SERVICE CONNECTION
METERED
WITH AUTOMATIC METER READING DEVICE
WITH PAVEMENT REPLACEMENT

METER SIZE	MATERIAL	TUCSON WATER LABOR	EQUIPMENT	PAVEMENT REPLACEMENT	TOTAL COST	EXISTING RATE	TOTAL COST MINUS EXISTING RATE	PROPOSED RATE
3/4"	$481.20	$680.99	$301.00	$862.50	$2,325.69	$2,439.00	($113.31)	$2,325.69
5/8"	$489.19	$680.99	$301.00	$862.50	$2,333.68	$2,414.00	($80.32)	$2,333.68
1"	$624.59	$680.99	$301.00	$862.50	$2,469.08	$2,504.00	($34.92)	$2,469.08
1-1/2"	$1,229.07	$680.99	$301.00	$862.50	$3,073.56	$3,054.00	$19.56	$3,073.56
2"	$1,600.04	$680.99	$301.00	$862.50	$3,444.53	$3,419.00	$25.53	$3,444.53

NOTES:

This fee provides for automatic meter reading devices to be installed with new metered installations. Instead of visually reading meter dials, automatic meter reading utilizes radio technology to obtain meter readings. The proposed fees make the implementation of automatic meter reading financially feasible for the utility and will help offset the need for additional meter reading staff.

The standard proposed rate for a 3/4" meter installation is based on a plastic meter box. For 5/8" installations in pavement or concrete a larger, stronger box is required and the customer shall be charged the differential between the standard and upgraded box. In accordance with the Tucson Water 'Design Standard' manual 5/8" meter installations require a 1" service line (inside diameter) reduced to a 5/8" connection at the meter. In order to set the 5/8" meter on the one inch service line a 1" x 5/8" bushing is required. Material costs for the 5/8" installation except for the meter, meter box and ball valve are based on the 1" material cost.

Pavement replacement is cost at $5.75 per square foot and 150 square feet to be replaced totaling $862.50.

Tucson Water Material, Labor, & Equipment Detail:

MATERIALS	3/4"	5/8"	1"	1½"	2"
Saddle	$22.41	$22.41	$54.13	$88.53	$88.53
Corporation stop	$24.03	$24.03	$36.98	$88.83	$156.27
3/4" copper tubing	$110.77	$110.77	$139.88	$309.95	$469.21
Curb stop	$31.28	$31.28	$41.14	$125.79	$166.58
Bushing	$4.00	$9.00			
Meter	$141.63	$199.62	$213.09	$361.37	$422.33
Meter Box	$90.43	$92.43	$89.06	$105.53	$105.53
Ball valve	$33.16	$33.16	$70.67	$123.85	$193.18
Bricks	$1.83	$1.83	$1.83	$7.56	$7.56
Gaskets	$3.66	$9.66	$9.86	$4.66	$11.63
MATERIAL COST	$481.20	$489.19	$624.59	$1,229.07	$1,600.04

CONSTRUCTION & SUPPORT LABOR	HRS	HR WAGE	FRINGE BENEFITS	TOTAL COST
Utility Services Crew Supervisor	0.50	$26.64	$16.78	$21.71
Senior Utility Service Worker	4.00	$23.26	$14.65	$151.04
Utility Service Worker/Util Tech	4.00	$18.59	$11.71	$121.21
Equipment Operator Specialist	4.00	$21.17	$13.33	$138.00
Eng. Assoc/Cust Serv Rep	0.50	$20.43	$12.86	$16.64
Labor Cost/Departmental Overhead (100%)	13.00	$17.83		$231.79
LABOR COST				$680.99

EQUIPMENT	HRS	HR RATE	TOTAL COST
2EA 1/2 Ton Pickup	0.50	$9.00	$4.50
2BB 1Ton Utility/DB	4.00	$17.00	$68.00
2ED 10 Yd Dump Truck	4.00	$33.00	$132.00
4AH Backhoe/Loader	4.00	$11.00	$44.00
8AA Trailer, 24,000Lbs	4.00	$4.00	$16.00
9FV Tamper (H/P or Gas)	2.00	$5.00	$10.00
9MD Small Tapping Machine	1.00	$10.00	$10.00
Asphalt Cutter with Trailer	1.00	$11.00	$15.50
EQUIPMENT COST			$301.00

P. 3

Backflow Permit

- Labor
- Equipment

BACKFLOW PREVENTION PERMIT

TUCSON WATER LABOR	EQUIPMENT	TOTAL COST	EXISTING RATE	TOTAL COST MINUS EXISTING RATE	PROPOSED RATE
$67.51	$9.00	$76.51	**$82.00**	($5.49)	**$76.51**

NOTES:
Tucson Water determines when a backflow prevention assembly is required for a connection to the water system. Prior to the installation of any backflow prevention assembly the customer is required to obtain a permit from Tucson Water. A separate permit must be obtained for each required backflow prevention assembly installed, including replacement. This fee recovers the cost of issuing the permit and inspecting the installation of the assembly.

Tucson Water Labor Detail:

SUPPORT & INSPECTION LABOR	HRS	HR WAGE	FRINGE BENEFITS	TOTAL COST
Administrative Assistant	0.25	$19.07	$12.01	$7.77
Backflow Prevention Inspector	1.00	$22.98	$14.47	$37.45
Labor Cost/Departmental Overhead (100%)	1.25	$17.83		$22.29
LABOR COST				$67.51

EQUIPMENT	HRS	HR RATE	TOTAL COST
2LA 1/2 Cargo Van	1.00	$9.00	$9.00

System Equity Fee

- The system equity fee is a one-time charge assessed new connections to the central potable water system to recover costs associated with previous investments in capacity currently available to meet the needs of growth.
- The system equity fee is designed to be consistent with:

  The City's financial and growth management policies and Industry standard methods for calculating capacity reimbursement fees for new development, established by the American Water Works Association (AWWA)

CAP Resource Fee

- Adopted in FY 2007, provides for the recovery of an equitable portion of the costs incurred, or estimated to be incurred, for acquisition of CAP water rights from future connections to the central potable system.

- Revenues collected from the CWRF are restricted to resource acquisition and/or capital improvement costs related to delivery/treatment of that new water resource. The funds can be used as the water resources are purchased or as the related capital projects are constructed, or for reimbursement of previous outlays for such purposes.

Are there Meter installation fees that CWAC would recommend to Mayor and Council to waive for Urban Agriculture?

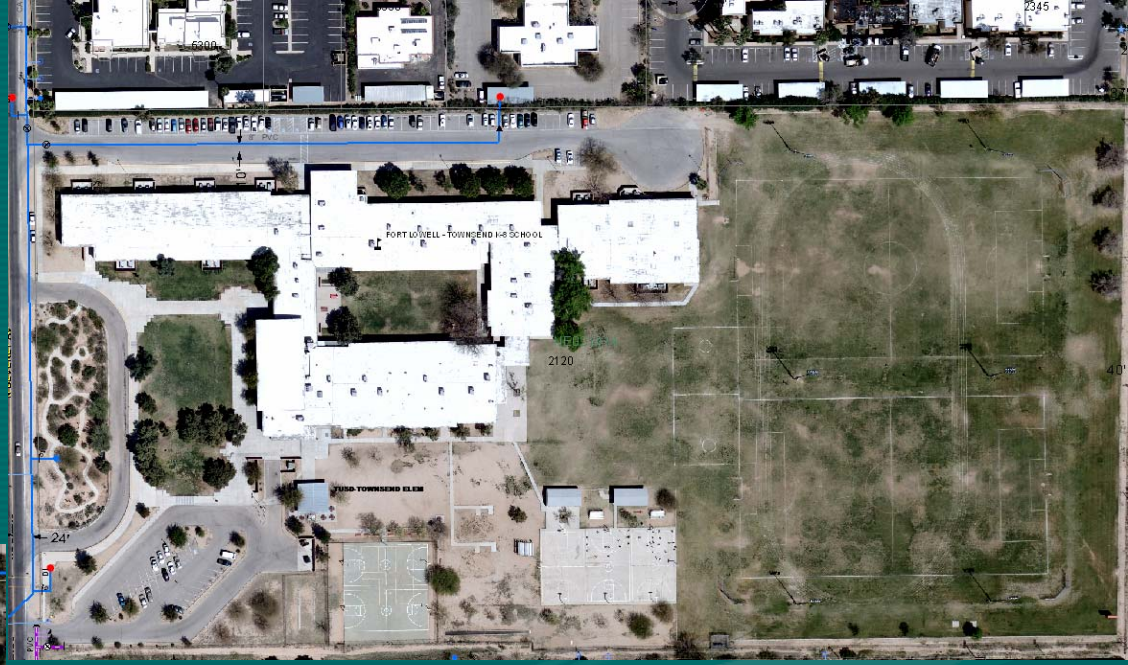
- If So
  - Further Staff Analysis may be needed for specific items
  - Attorney Consultation
  - Bond Council
  - Recommendations need to be referred to Finance Sub-Committee for Rate Adjustment

Any fee that is waived will need to be borne by other customers to subsidize Urban Agriculture

TUSD Schools

(with reclaimed water)

that are closing



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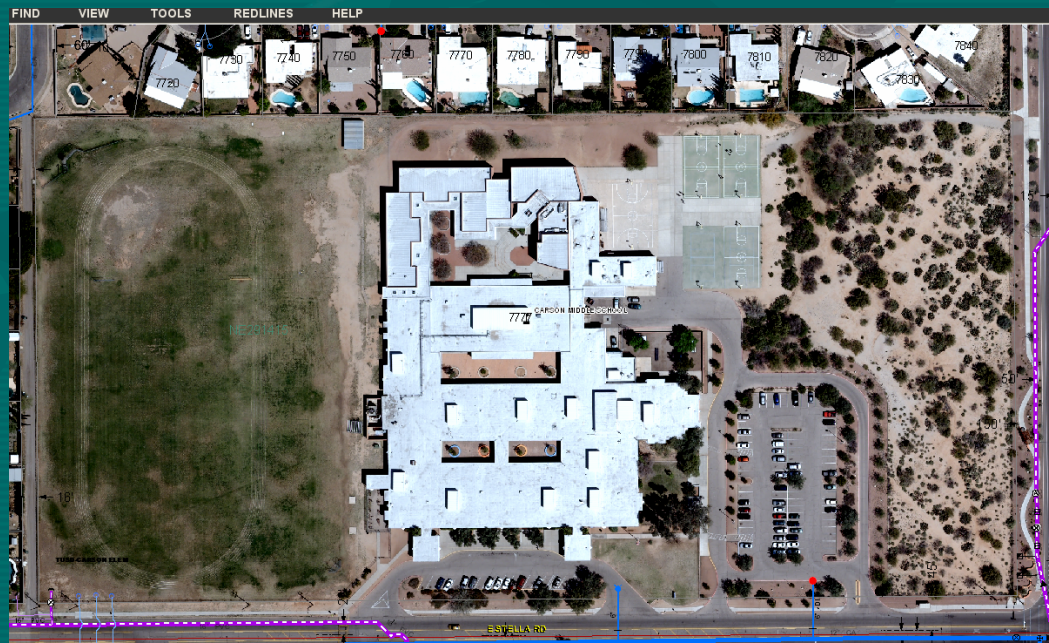

Questions?