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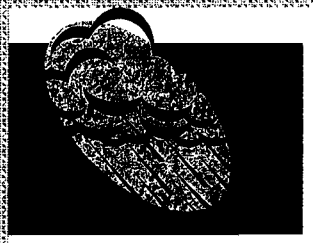

RAINWATER HARVESTING AND GRAY WATER

Presented to:

Community and Neighborhood Services Committee

June 7, 2010

Scott Bouchie, Deputy Director
Donna DiFrancesco, Conservation Specialist
Environmental & Sustainability Division

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RAINWATER HARVESTING
WHAT IS IT?

Capture, diversion and storage of rainwater for plant irrigation or other uses

- **Passive (simple) – utilizing drainage and grading for direct use into landscape**
- **Active (complex) – conveyance, storage and distribution**

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RAINWATER HARVESTING
WHAT IS IT?

Passive Water Harvesting

Active Water Harvesting

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TUCSON COMMERCIAL RAINWATER HARVESTING ORDINANCE

Requirement for New Commercial 06/01/10

- Water harvesting plan & water budget
- Meet 50% landscape demand
  - 3 years for vegetation to get established
  - Meter outdoor water use
- Relief from requirement in a drought
- Annual report

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MESA RAINWATER HARVESTING

Mesa does not prohibit rainwater harvesting

- **Must meet engineering design standards for onsite retention**
  - **-100 year/ 2 hour storm event**
  - **-Drain 36 hours**
  - **-Depth no greater than 12"**

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MESA RAINWATER HARVESTING

Residential Outreach

- Living Green Workshop Series

Workshop Series
LIVING GREEN
EARTH-FRIENDLY ADVICE FOR HOME & GARDEN

- *Harvesting Rainwater for Your Landscape*, Jan. 2010
- 77 attended

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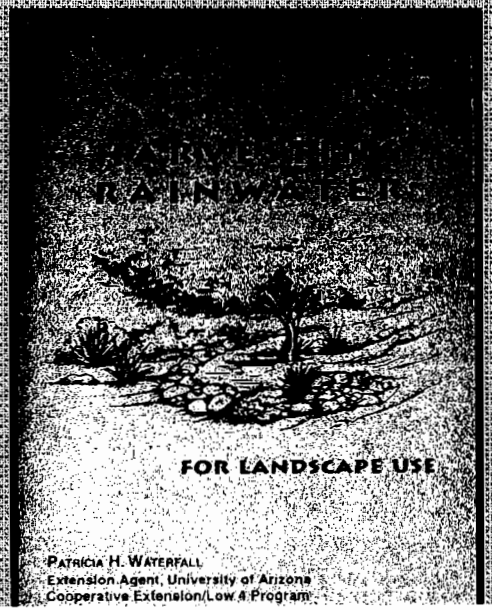
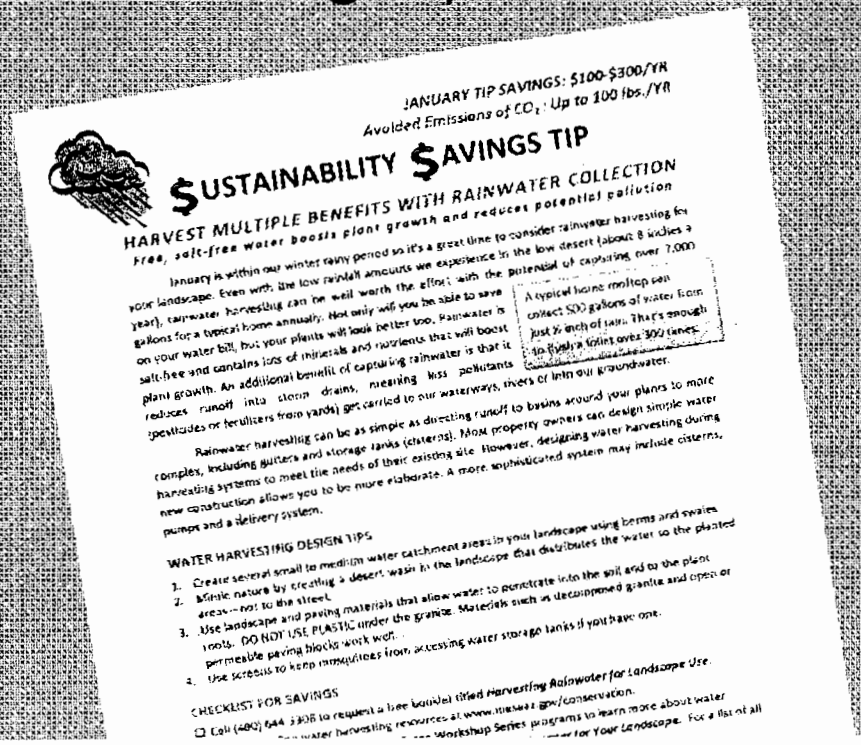
MESA RAINWATER HARVESTING

Residential Outreach

- Sustainability Web site, mesaaz.gov/sustainability
- Conservation Web site, mesaaz.gov/conservation
- Booklets available





JANUARY TIP SAVINGS: $100-$300/YR
Avoided Emissions of CO_2: Up to 100 lbs./YR

$USTAINABILITY $AVINGS TIP

HARVEST MULTIPLE BENEFITS WITH RAINWATER COLLECTION

Free, salt-free water boosts plant growth and reduces potential pollution

January is within our winter rainy period so it's a great time to consider rainwater harvesting for your landscape. Even with the low rainfall amounts we experience in the low desert (about 8 inches a year), rainwater harvesting can be well worth the effort with the potential of capturing over 7,000 gallons for a typical home annually. Not only will you be able to save on your water bill, but your plants will look better too. Rainwater is salt-free and contains lots of minerals and nutrients that will boost plant growth. An additional benefit of capturing rainwater is that it reduces runoff into storm drains, meaning less pollutants (pesticides or fertilizers from yards) get carried to our waterways, rivers or into our groundwater.

A typical home rooftop can collect 500 gallons of water from just ½ inch of rain. That's enough to flush a toilet over 300 times.

Rainwater harvesting can be as simple as directing runoff to basins around your plants to more complex, including gutters and storage tanks (cisterns). Most property owners can design simple water harvesting systems to meet the needs of their existing site. However, designing water harvesting during new construction allows you to be more elaborate. A more sophisticated system may include cisterns, pumps and a delivery system.

WATER HARVESTING DESIGN TIPS

1. Create several small to medium water catchment areas in your landscape using berms and swales.
2. Mimic nature by creating a desert wash in the landscape that distributes the water to the planted areas—not to the street.
3. Use landscape and paving materials that allow water to percolate into the soil and to the plant roots. DO NOT USE PLASTIC under the gravel. Materials such as decomposed granite and open or permeable paving blocks work well.
4. Use screens to keep mosquitoes from accessing water storage tanks if you have one.

CHECKLIST FOR SAVINGS

☐ Call (480) 644-3308 to request a free booklet titled *Harvesting Rainwater for Landscape Use*. ... water harvesting resources at www.mesaaz.gov/conservation.
... Workshop Series programs to learn more about water ... for Your Landscape. For a list of all

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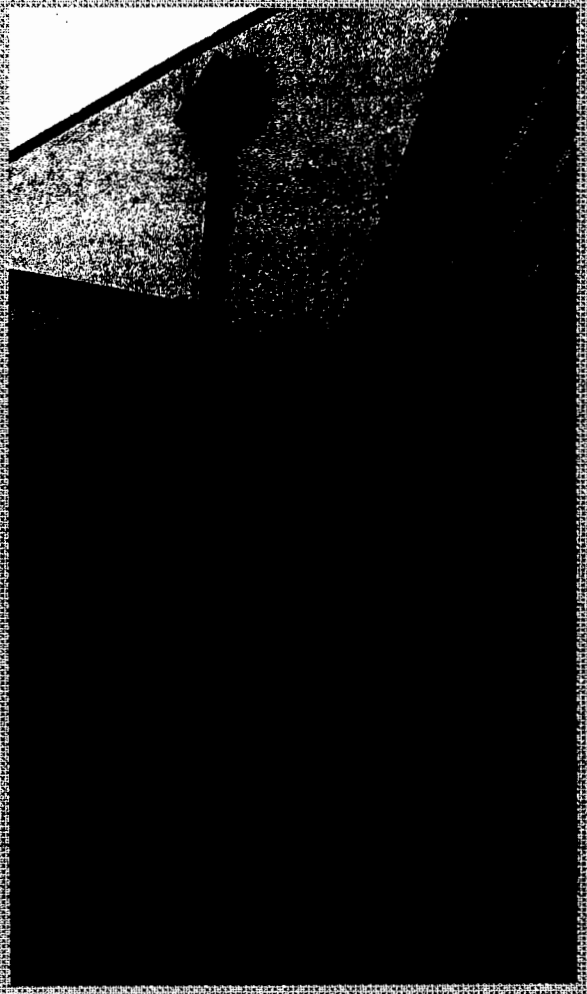
MESA RAINWATER HARVESTING

Residential Outreach

- Dobson Ranch demonstration site



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MESA RAINWATER HARVESTING

Residential Outreach

- Dobson Ranch demonstr

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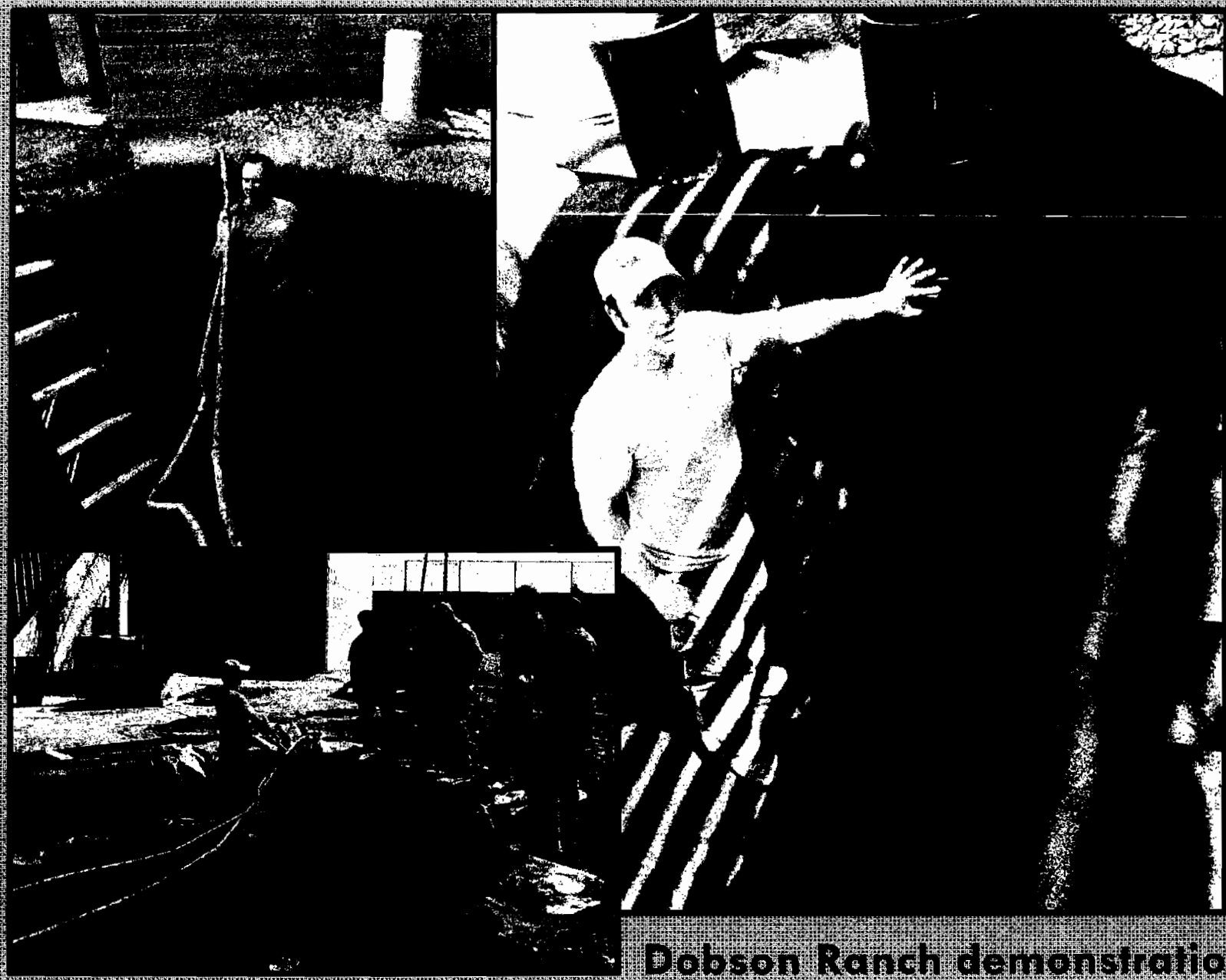

Dobson Ranch demonstration

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New Stormwater Permit

ADEQ
Arizona Department of Environmental Quality

Requires over next 4 years

- **Evaluation of feasibility and benefits of rainwater harvesting**
- **ID changes needed to existing code to encourage/enhance**
- **Estimate cost**

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New Stormwater Permit

ADEQ
Arizona Department of Environmental Quality

Requires over next 4 years

- **Review ROI in developing rainwater harvesting**
- **Use of Permeable pavement, vegetative roofs**
- **ID areas where it can implemented**

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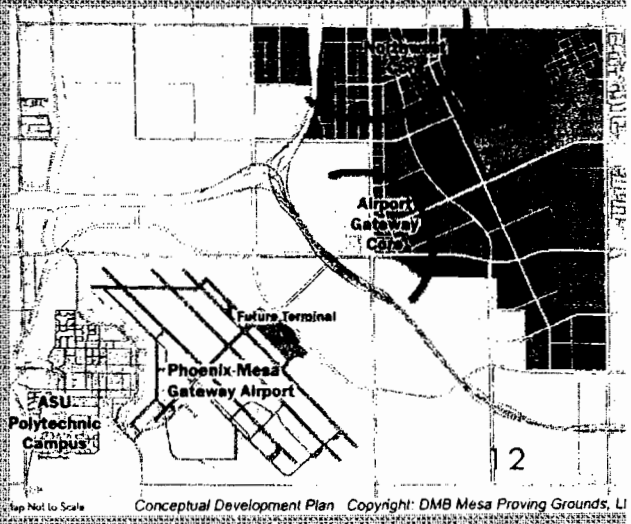
FUTURE DEVELOPMENT

- DMB Development
- Integrated stormwater reuse in public areas
  - -Reduce potable water usage/increase use of stormwater/rainwater runoff
  - -Decentralized retention basins
  - -Reduced stormwater in streets



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RECOMMENDATIONS

- Continue Education
  - Living Green workshops
- Outreach
  - Developer Advisory Forum
  - Internal city departments
- Monitor Tucson program
- Develop educational manual
- Review progress with committee in the future

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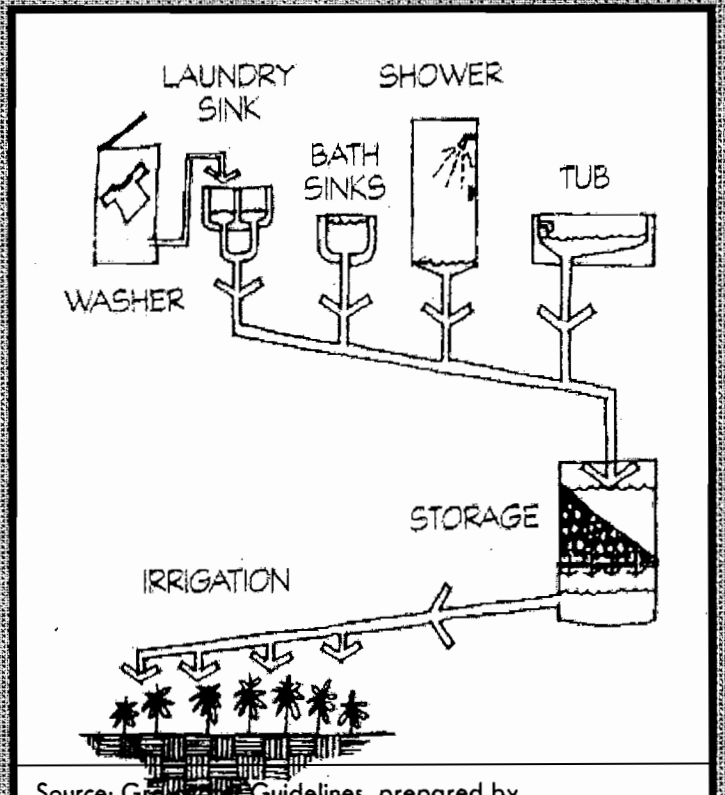
WHAT IS GRAY WATER

Wastewater from:

- **Laundry**
- **Bathtubs**
- **Showers**
- **Bathroom sinks**



Source: Graywater Guidelines, prepared by Water Conservation Alliance of Southern Arizona

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CITY OF TUCSON GRAY WATER

Requirements on new residential 06/01/10

- Stub out connections within 3 feet of foundation
- Drains for bathroom sinks, showers and bathtubs, segregated from other drains
- Separate stub outs for clothes washing machine

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CITY OF MESA GRAY WATER

For Residential

Mesa Does not prohibit gray water systems

- **Must comply w/13 provisions of ADEQ permit**
  - **-Residential use only**
  - **-Stays on property**
  - **-Non-food plant (except citrus and nut trees)**
- **No City can limit use of gray water if it meets requirements**

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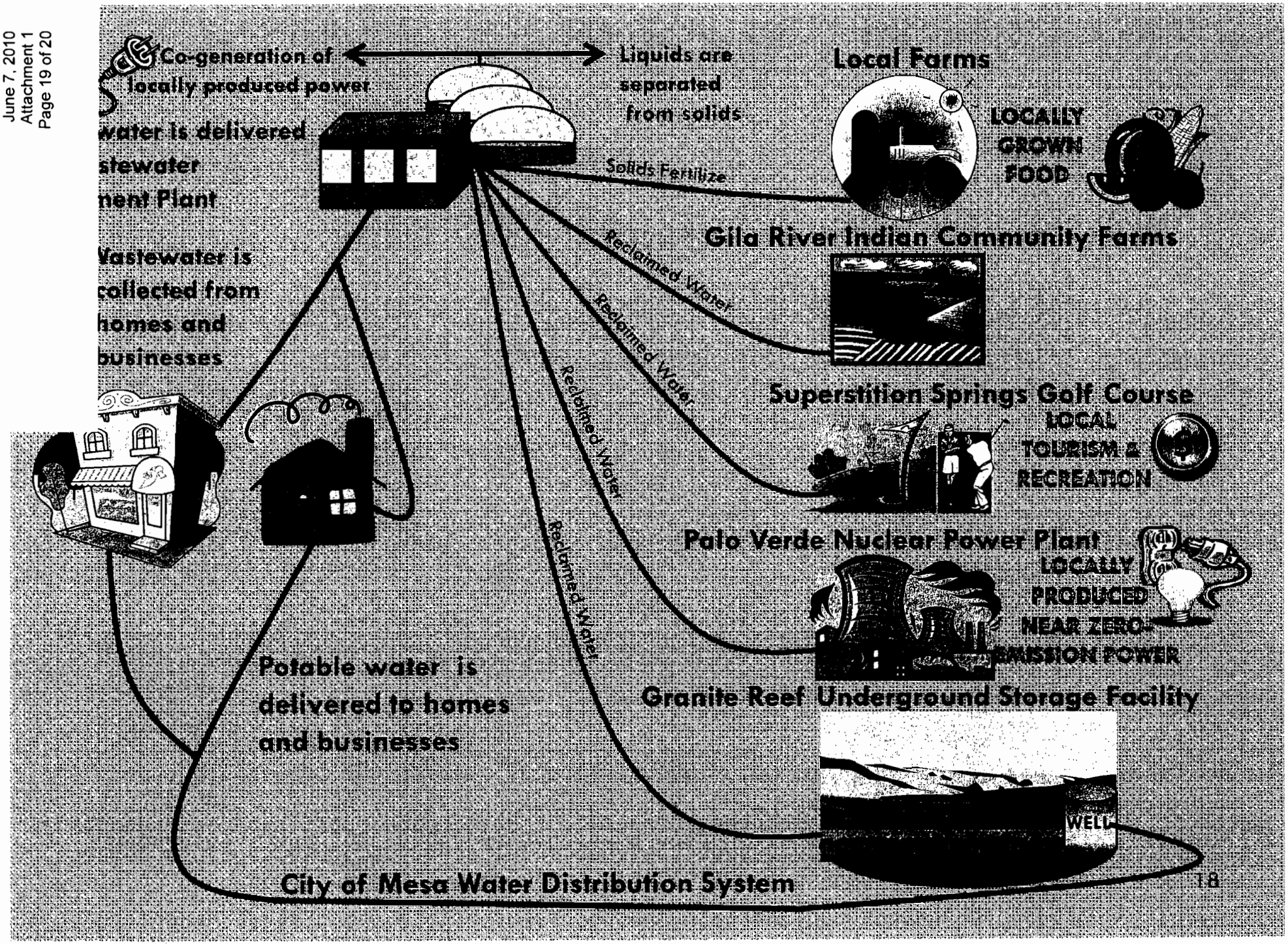
CITY OF MESA GRAY WATER

Gray Water Concerns

- Potential issues with
  - -Stagnant water
  - -Product usage
- Needs to be engineered correctly
- Wastewater reuse potential


Co-generation of
locally produced power
water is delivered
stewater
nent Plant
Wastewater is
collected from
homes and
businesses
Liquids are
separated
from solids
Local Farms
LOCALLY
GROWN
FOOD
Solids Fertilize
Gila River Indian Community Farms
Reclaimed Water
Reclaimed Water
Reclaimed Water
Reclaimed Water
Superstition Springs Golf Course
LOCAL
TOURISM &
RECREATION
Palo Verde Nuclear Power Plant
LOCALLY
PRODUCED
NEAR ZERO-
EMISSION POWER
Potable water is
delivered to homes
and businesses
Granite Reef Underground Storage Facility
WELL
City of Mesa Water Distribution System

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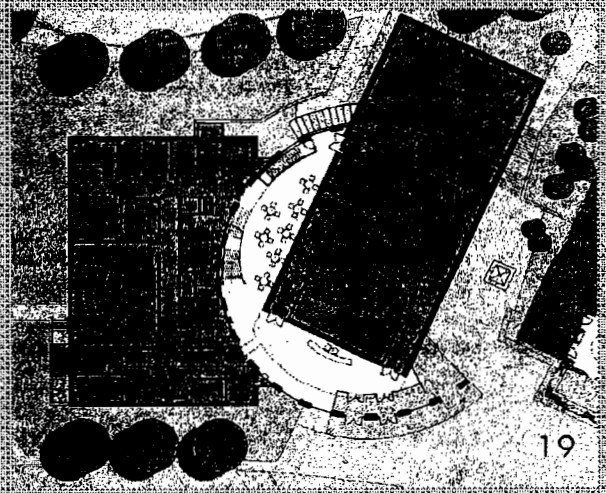
RECOMMENDATIONS

- Continue education
  - -Living Green Workshops
  - -Developer Advisory Forum
- Work with internal City Departments to address issues/concerns
- Educate Developers on sustainable development at pre-submittals
- Monitor Tucson and others for successes/pitfalls