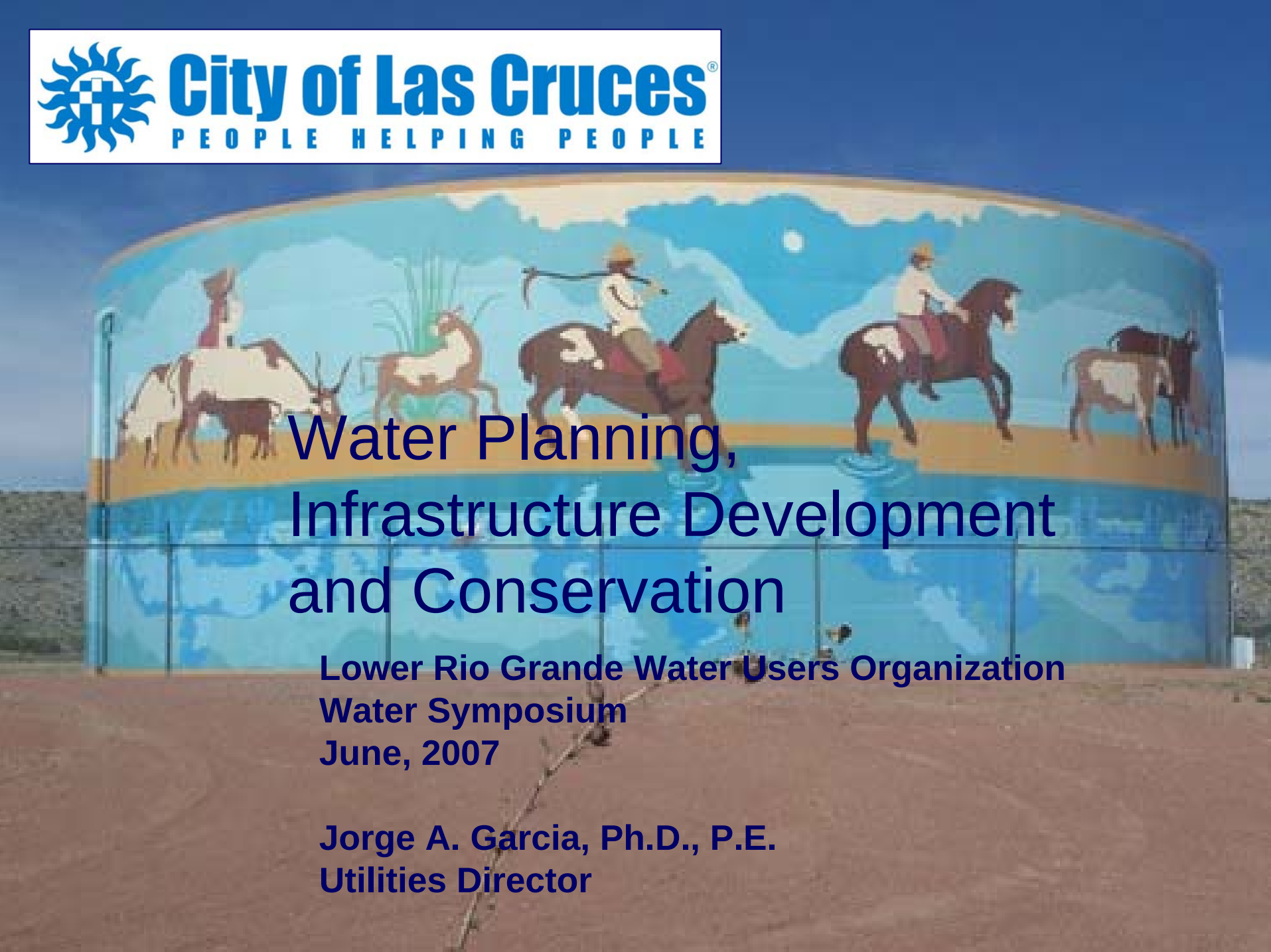
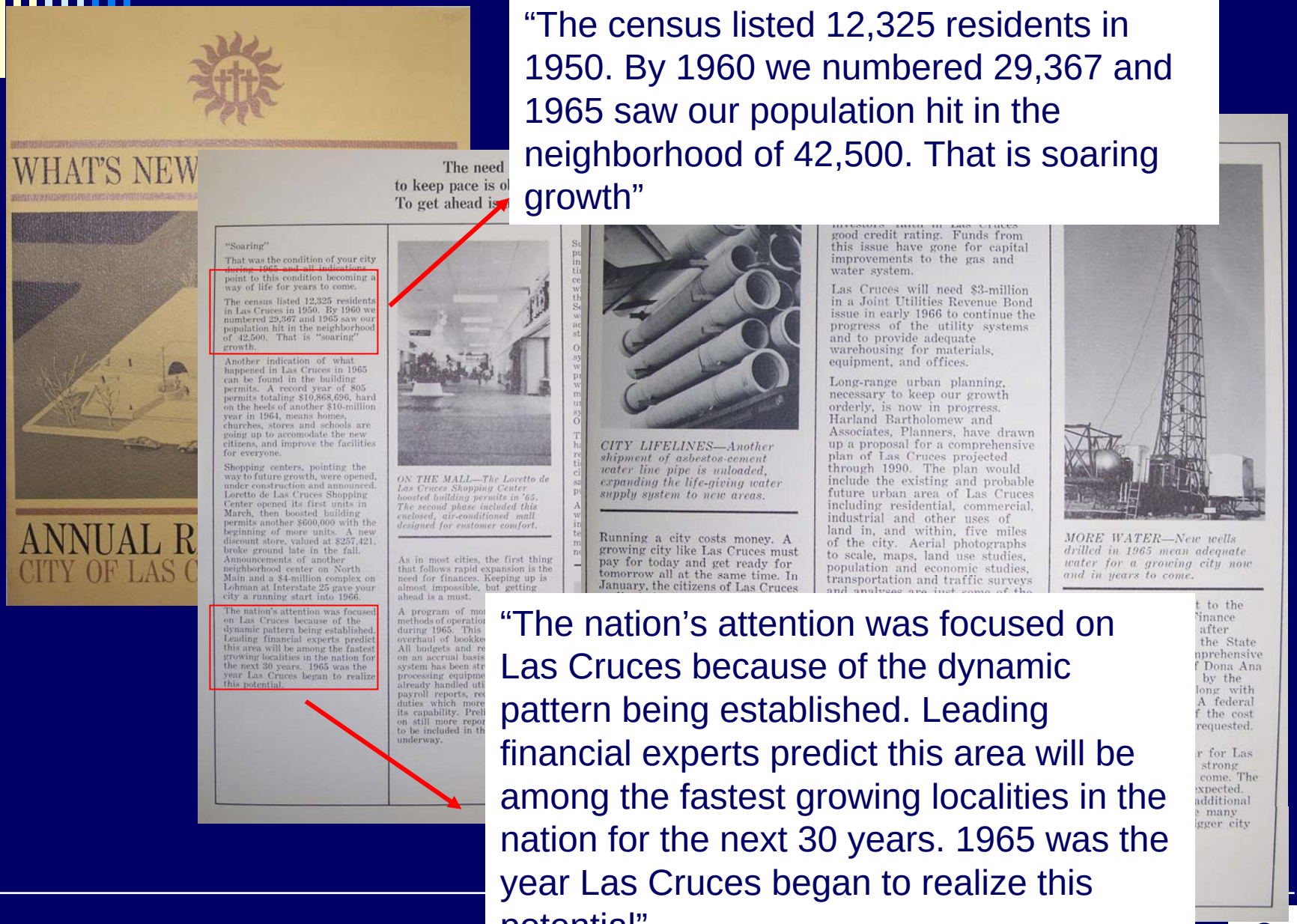


Water Planning, Infrastructure Development and Conservation

Lower Rio Grande Water Users Organization
Water Symposium
June, 2007

Jorge A. Garcia, Ph.D., P.E.
Utilities Director


WHAT'S NEW

ANNUAL R
CITY OF LAS C

The need
to keep pace is o
To get ahead is

"Soaring"

That was the condition of your city during 1965 and all indications point to this condition becoming a way of life for years to come.

The census listed 12,325 residents in Las Cruces in 1950. By 1960 we numbered 29,367 and 1965 saw our population hit in the neighborhood of 42,500. That is "soaring" growth.

Another indication of what happened in Las Cruces in 1965 can be found in the building permits. A record year of 805 permits totaling $10,868,696, hard on the heels of another $10-million year in 1964, means homes, churches, stores and schools are going up to accomodate the new citizens, and improve the facilities for everyone.

Shopping centers, pointing the way to future growth, were opened, under construction and announced. Loretto de Las Cruces Shopping Center opened its first units in March, then boosted building permits another $600,000 with the beginning of more units. A new discount store, valued at $257,421, broke ground late in the fall. Announcements of another neighborhood center on North Main and a $4-million complex on Lohman at Interstate 25 gave your city a running start into 1966.

The nation's attention was focused on Las Cruces because of the dynamic pattern being established. Leading financial experts predict this area will be among the fastest growing localities in the nation for the next 30 years. 1965 was the year Las Cruces began to realize this potential.

ON THE MALL—The Loretto de Las Cruces Shopping Center boosted building permits in '65. The second phase included this enclosed, air-conditioned mall designed for customer comfort.

As in most cities, the first thing that follows rapid expansion is the need for finances. Keeping up is almost impossible, but getting ahead is a must.

A program of mo
methods of operatio
during 1965. This
overhaul of bookke
All budgets and re
on an accrual basis
system has been str
processing equipme
already handled uti
payroll reports, re
duties which more
its capability. Preli
on still more repor
to be included in th
underway.

CITY LIFELINES—Another shipment of asbestos-cement water line pipe is unloaded, expanding the life-giving water supply system to new areas.

Running a city costs money. A growing city like Las Cruces must pay for today and get ready for tomorrow all at the same time. In January, the citizens of Las Cruces

good credit rating. Funds from this issue have gone for capital improvements to the gas and water system.

Las Cruces will need $3-million in a Joint Utilities Revenue Bond issue in early 1966 to continue the progress of the utility systems and to provide adequate warehousing for materials, equipment, and offices.

Long-range urban planning, necessary to keep our growth orderly, is now in progress. Harland Bartholomew and Associates, Planners, have drawn up a proposal for a comprehensive plan of Las Cruces projected through 1990. The plan would include the existing and probable future urban area of Las Cruces including residential, commercial, industrial and other uses of land in, and within, five miles of the city. Aerial photographs to scale, maps, land use studies, population and economic studies, transportation and traffic surveys

MORE WATER—New wells drilled in 1965 mean adequate water for a growing city now and in years to come.

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Finance
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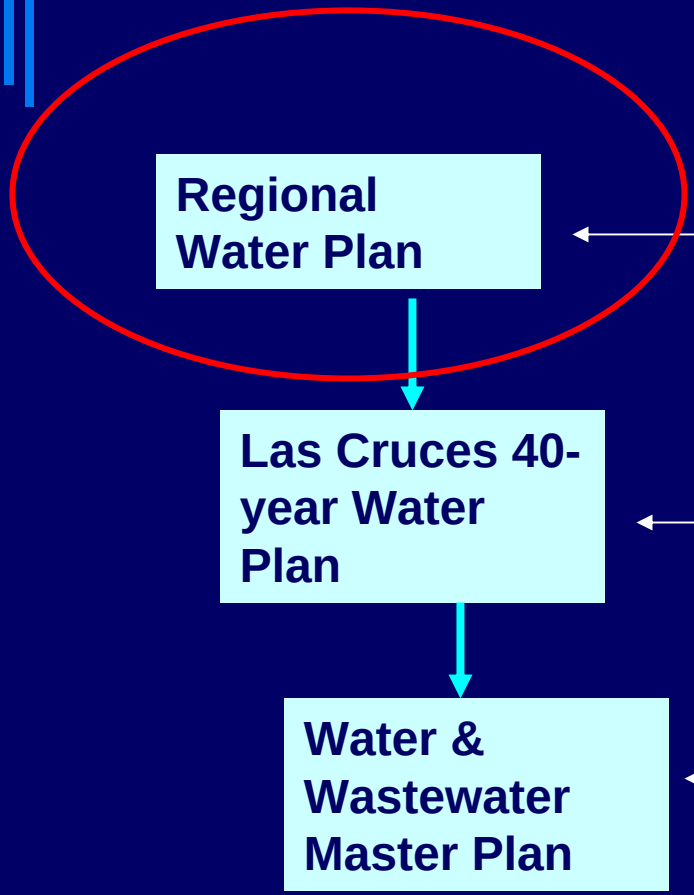
igger city

"The census listed 12,325 residents in 1950. By 1960 we numbered 29,367 and 1965 saw our population hit in the neighborhood of 42,500. That is soaring growth"

"The nation's attention was focused on Las Cruces because of the dynamic pattern being established. Leading financial experts predict this area will be among the fastest growing localities in the nation for the next 30 years. 1965 was the year Las Cruces began to realize this potential"

The water planning process



1994 Regional Plan
New plan completed in August, 2004

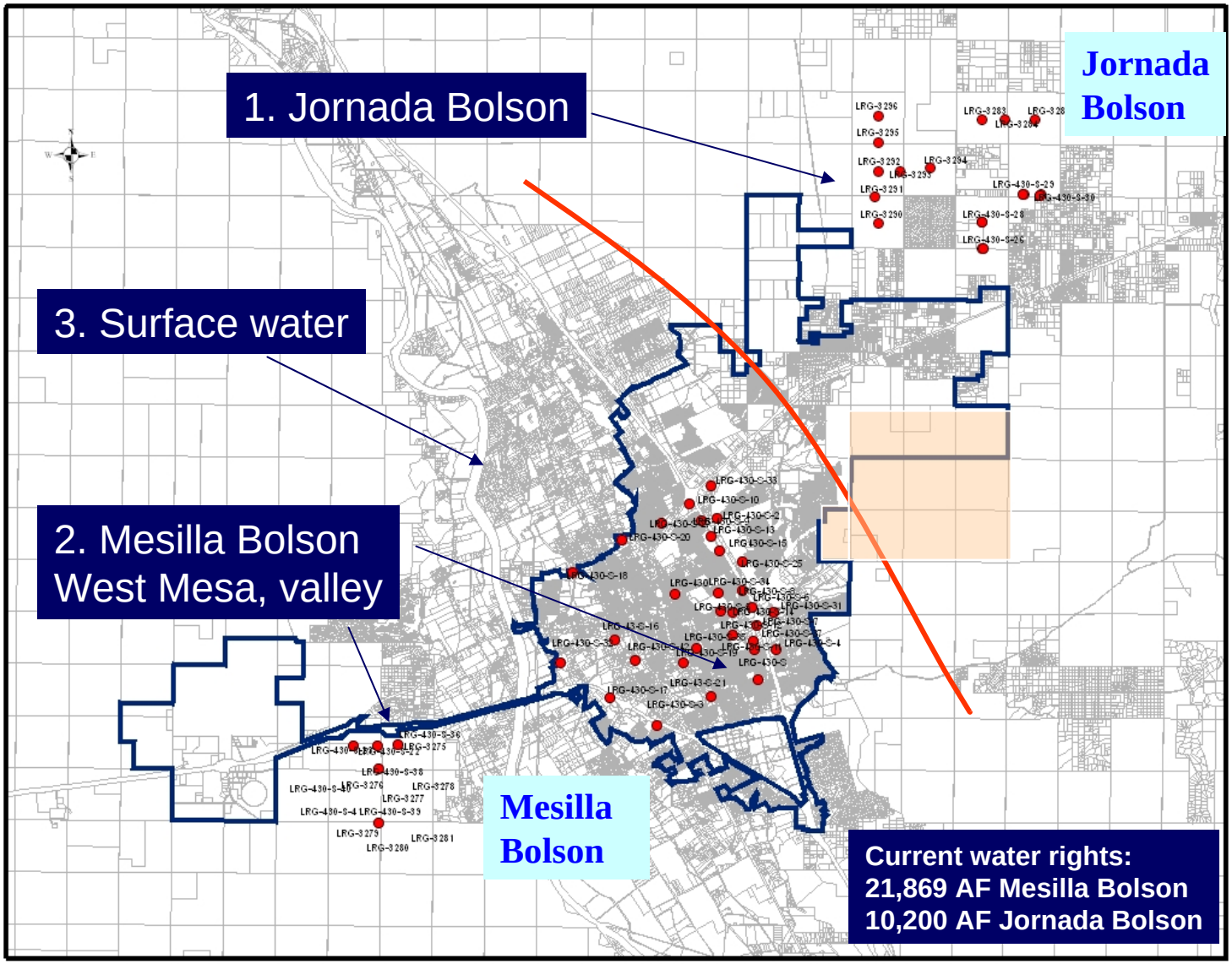
1995 Plan
Update draft completed in January, 2006
Final draft in progress

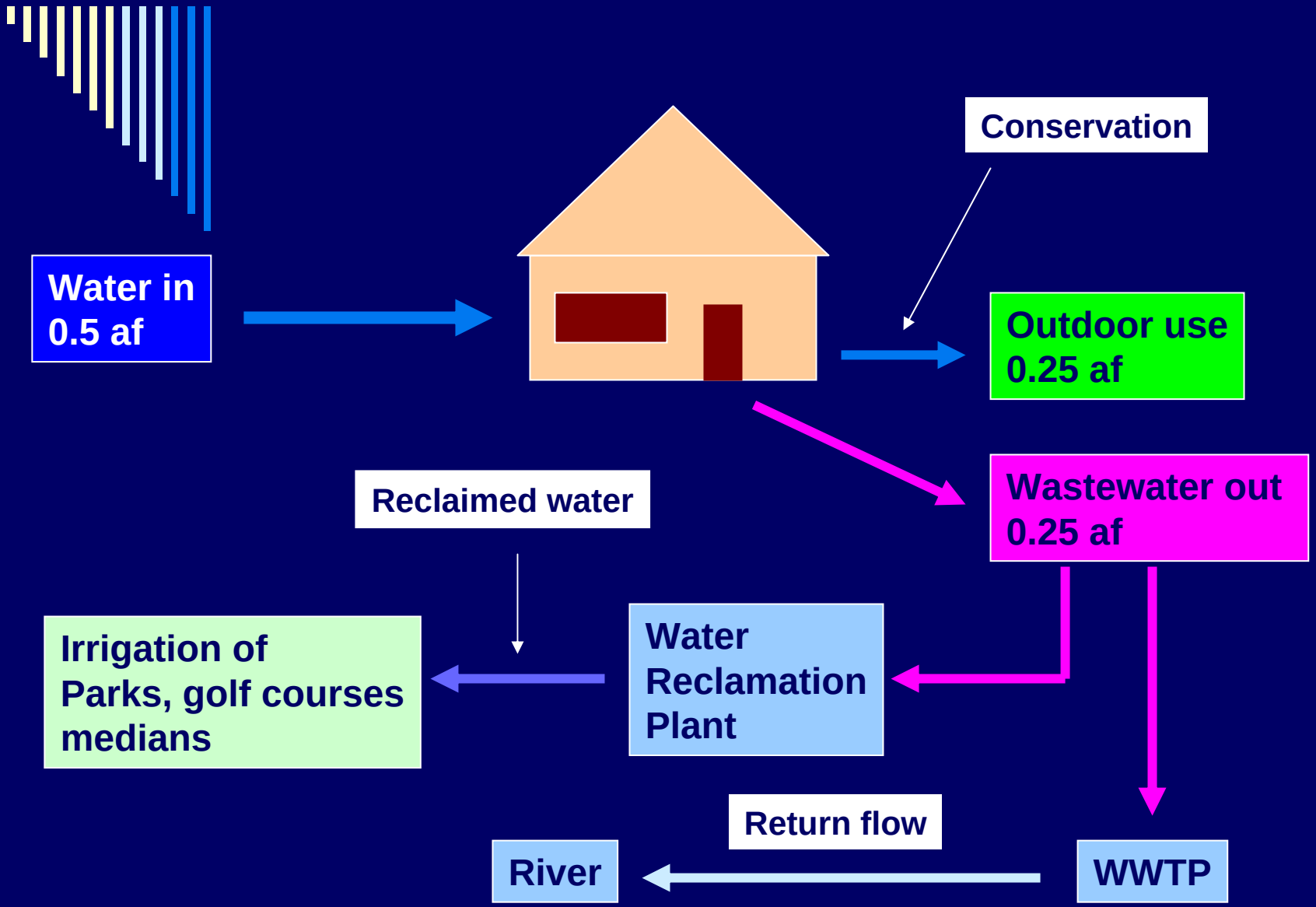
1995 Master Plan
Update currently under Development. To be Completed Fall of 2007

Las Cruces 40-yr Water Plan

- Conjunctive use of surface and groundwater
- Water conservation
- Reclaimed water use
- Aquifer storage and recovery
- Importation
- Potential desalination options

Water supply…..

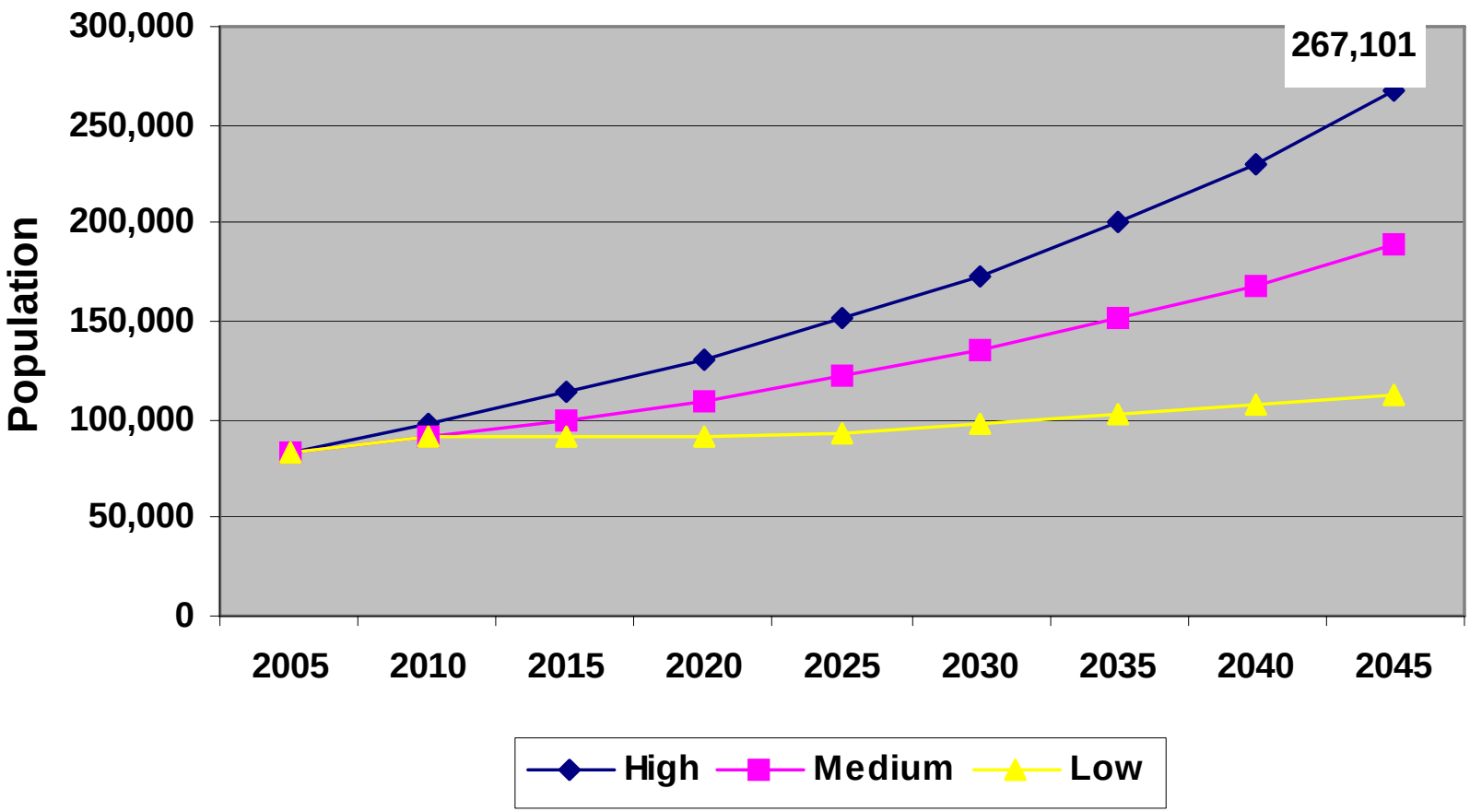




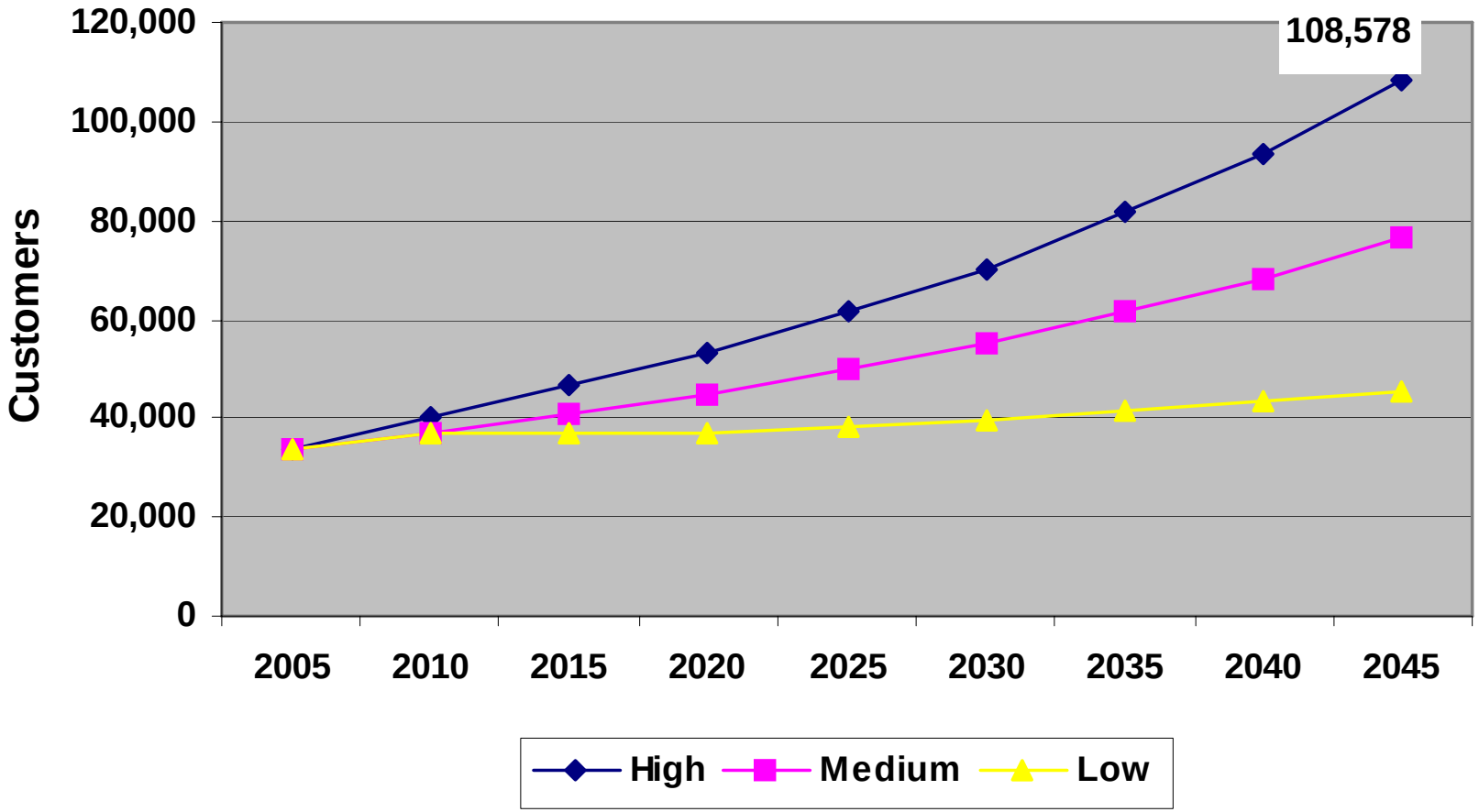
1 acre-foot (AF) = 325,851 gallons

1 MGD = 1,120 AFY

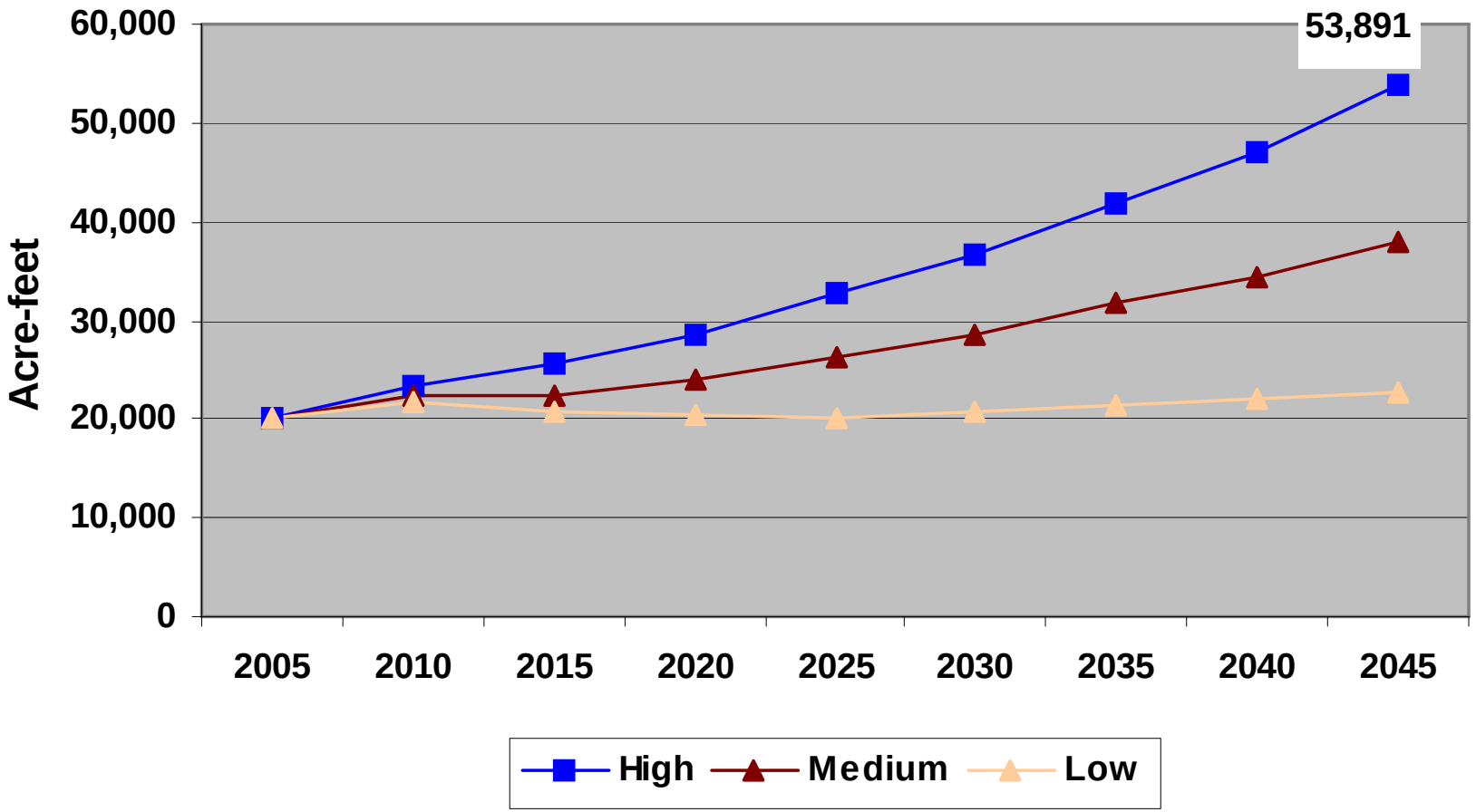
Water Plan Population Projections



Water Plan Customer Projections



Water Plan Demand Projections



Projected demand and water rights

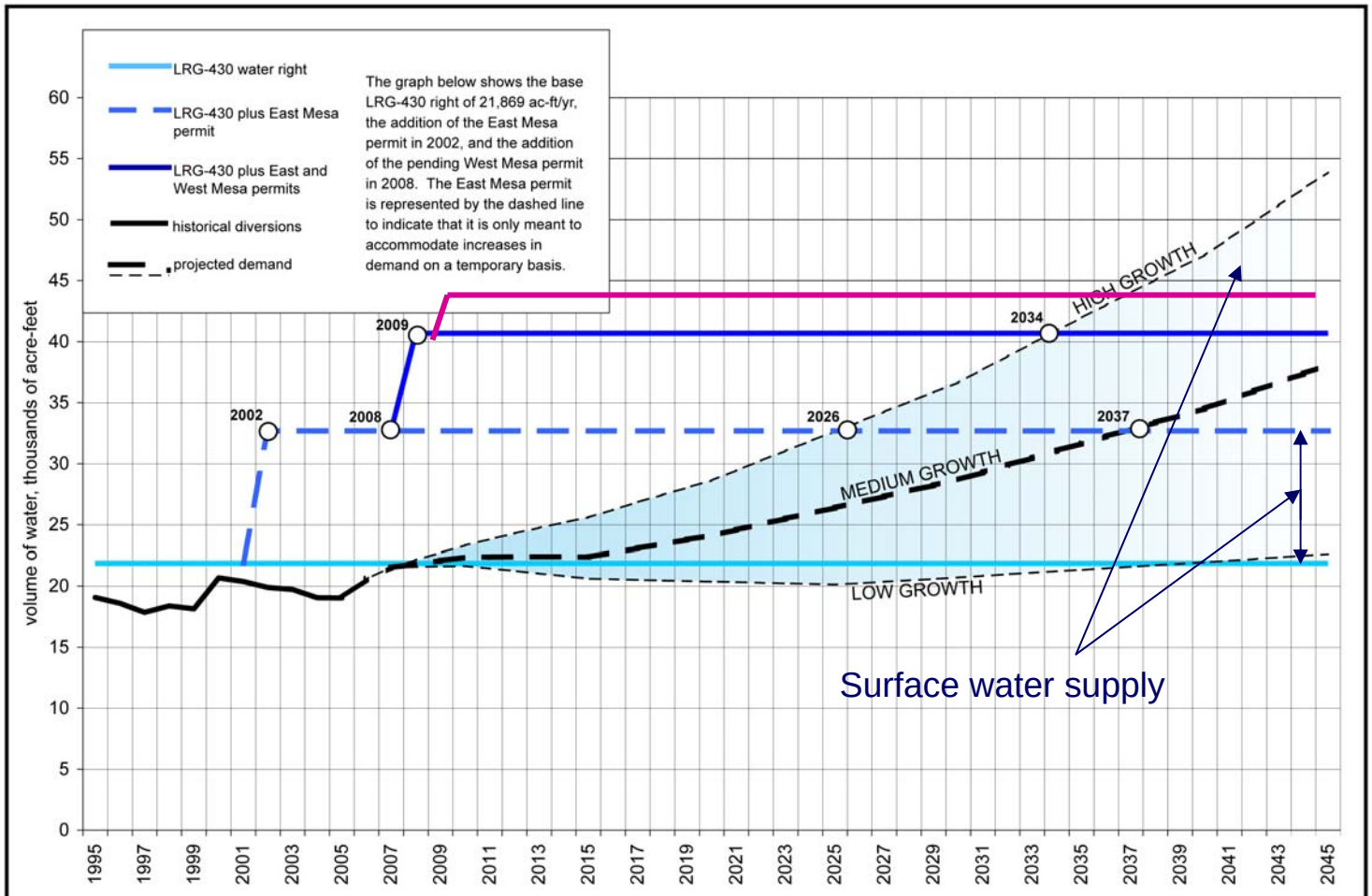
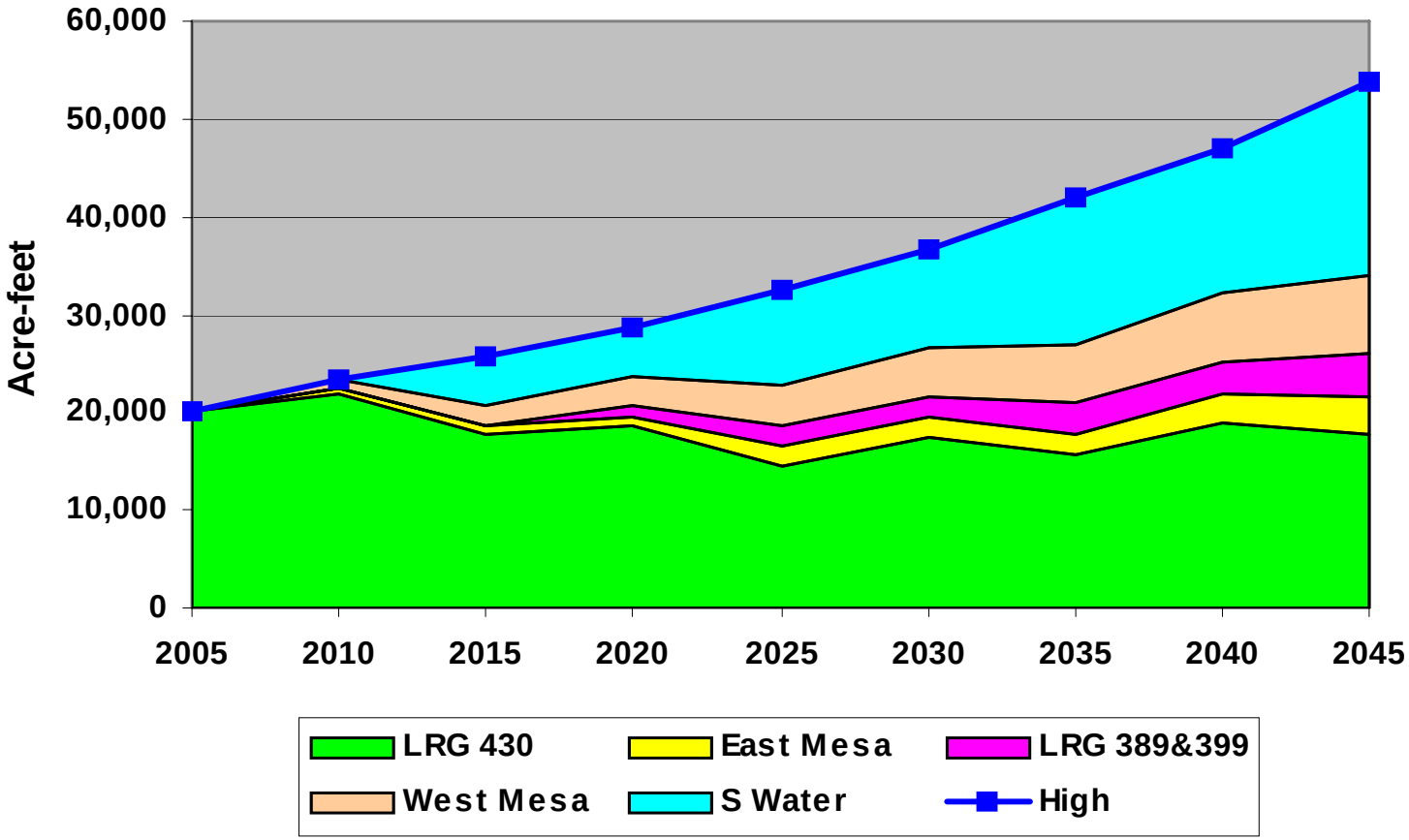


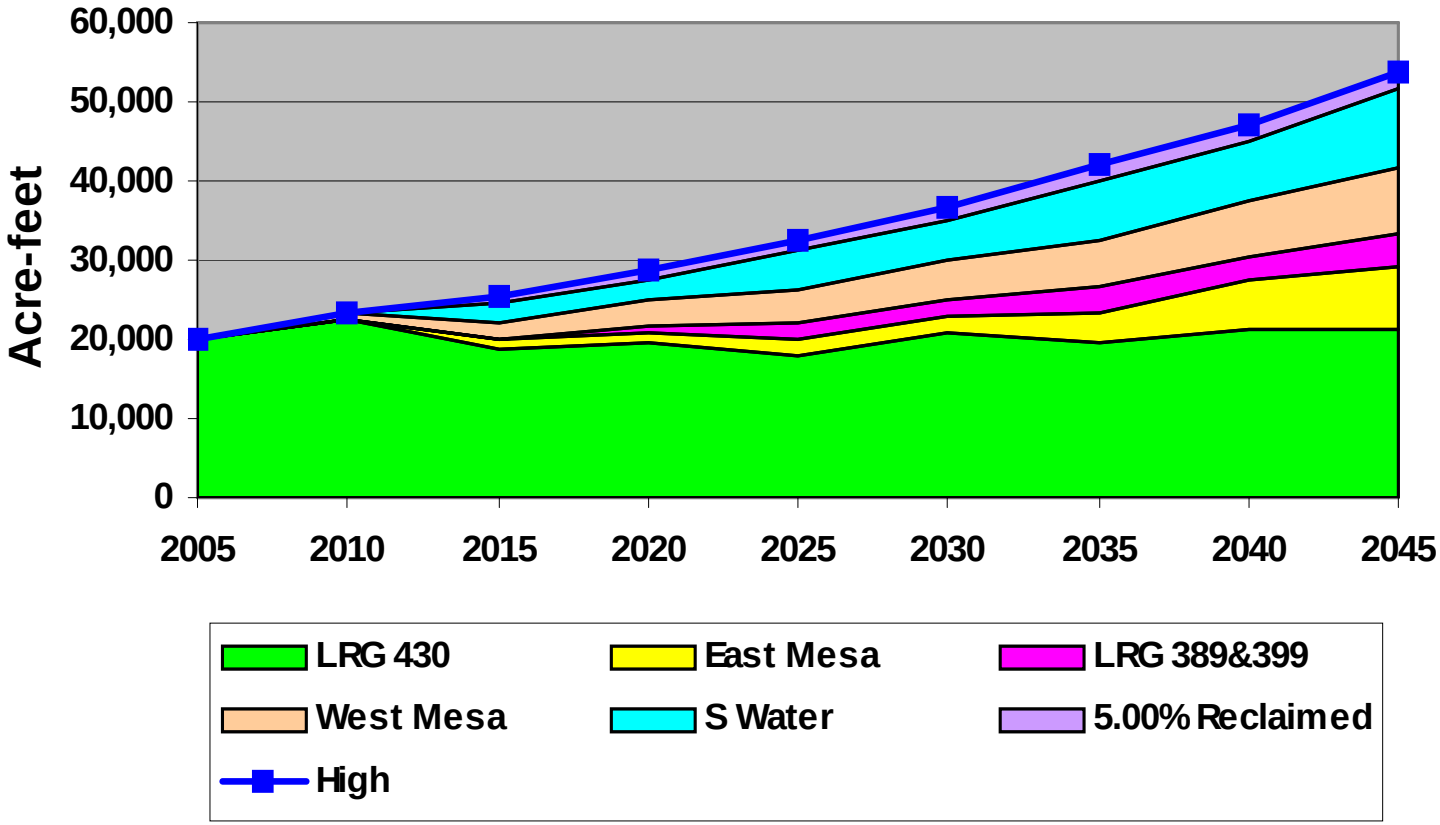
Figure 10. Graph showing City of Las Cruces historical water diversions for 1960 to 2005 and projected water demands for 2006 to 2045 represented by a band representing low to high growth rates, City of Las Cruces's total existing adjudicated water rights, and current and pending permits.

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS

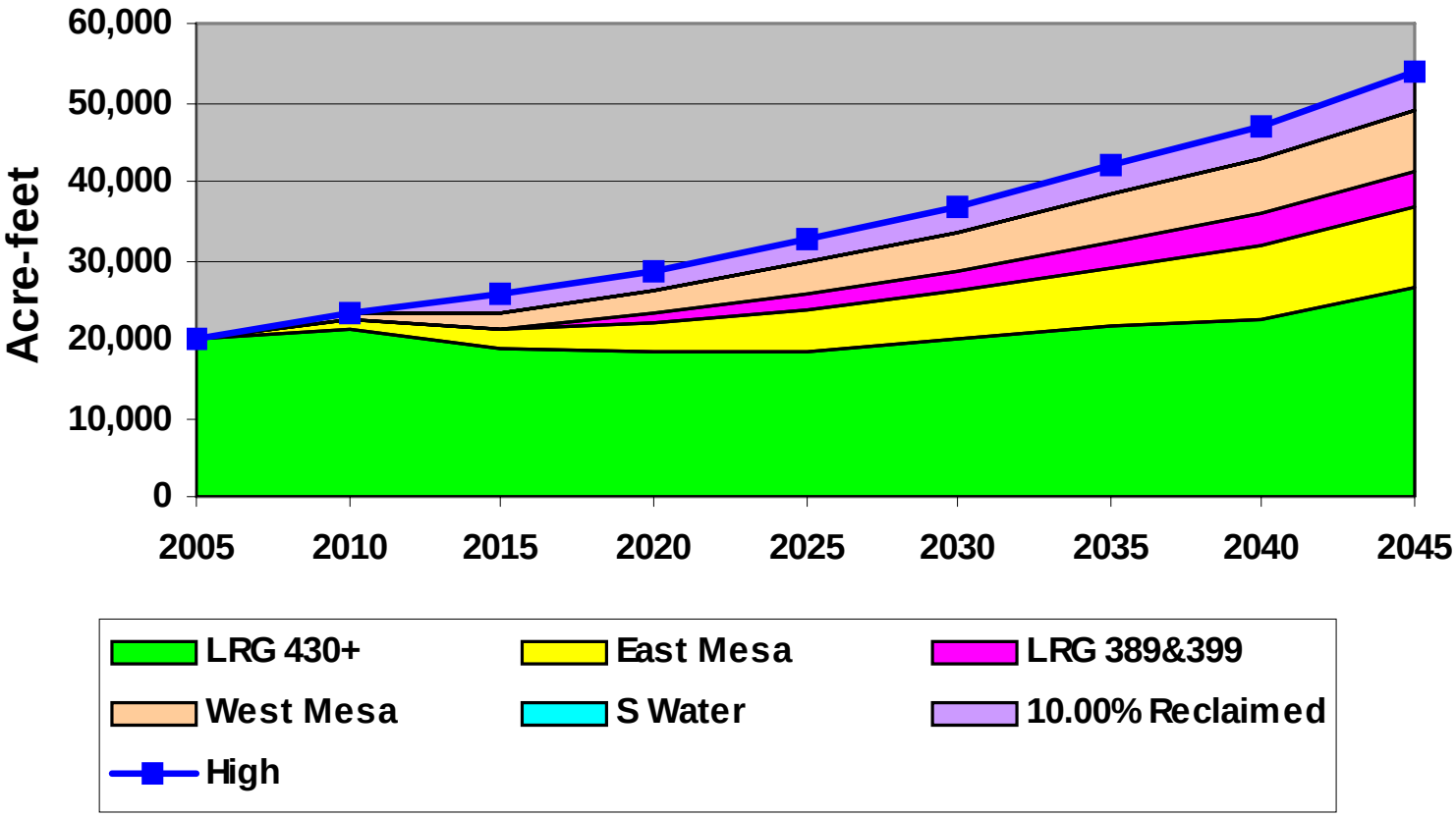
Water Plan Demand & Available Supply
Sample Management Scenario 1



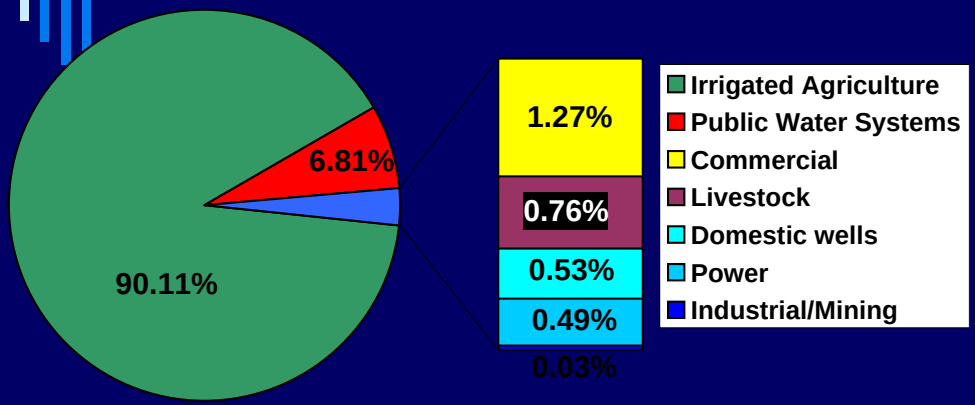
Water Plan Demand & Available Supply
Sample Management Scenario 2

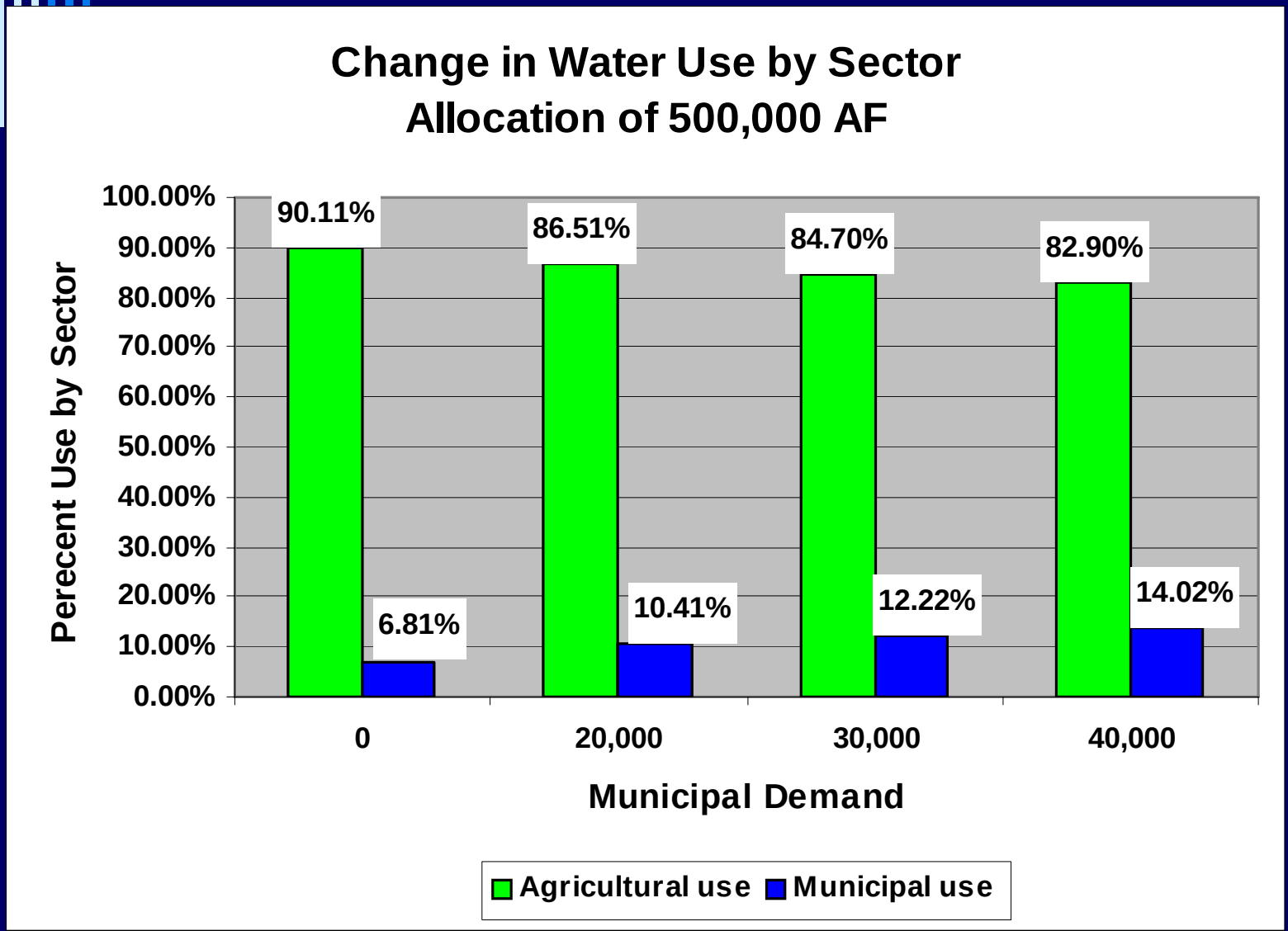


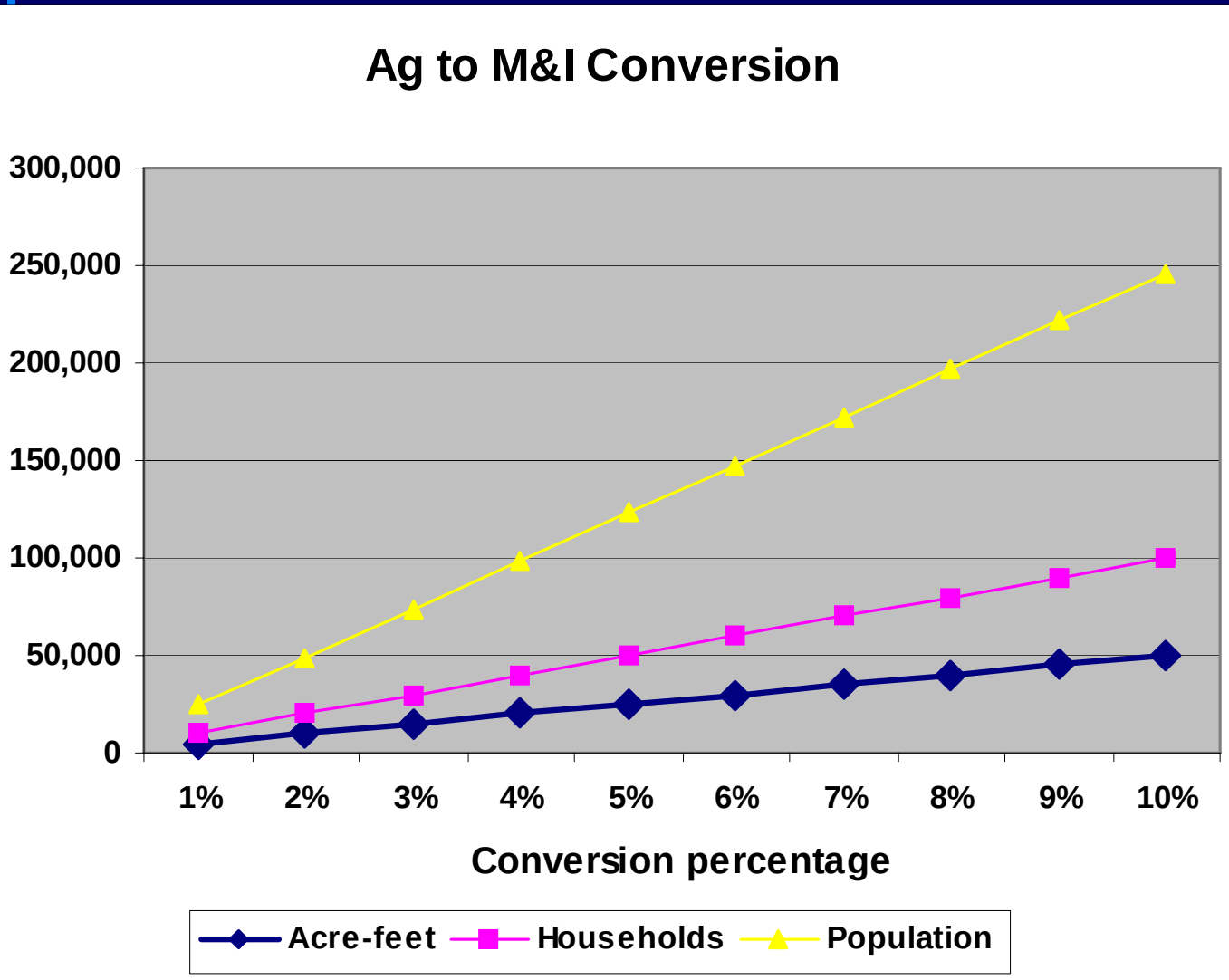
Water Plan Demand & Available Supply
Sample Management Scenario 3



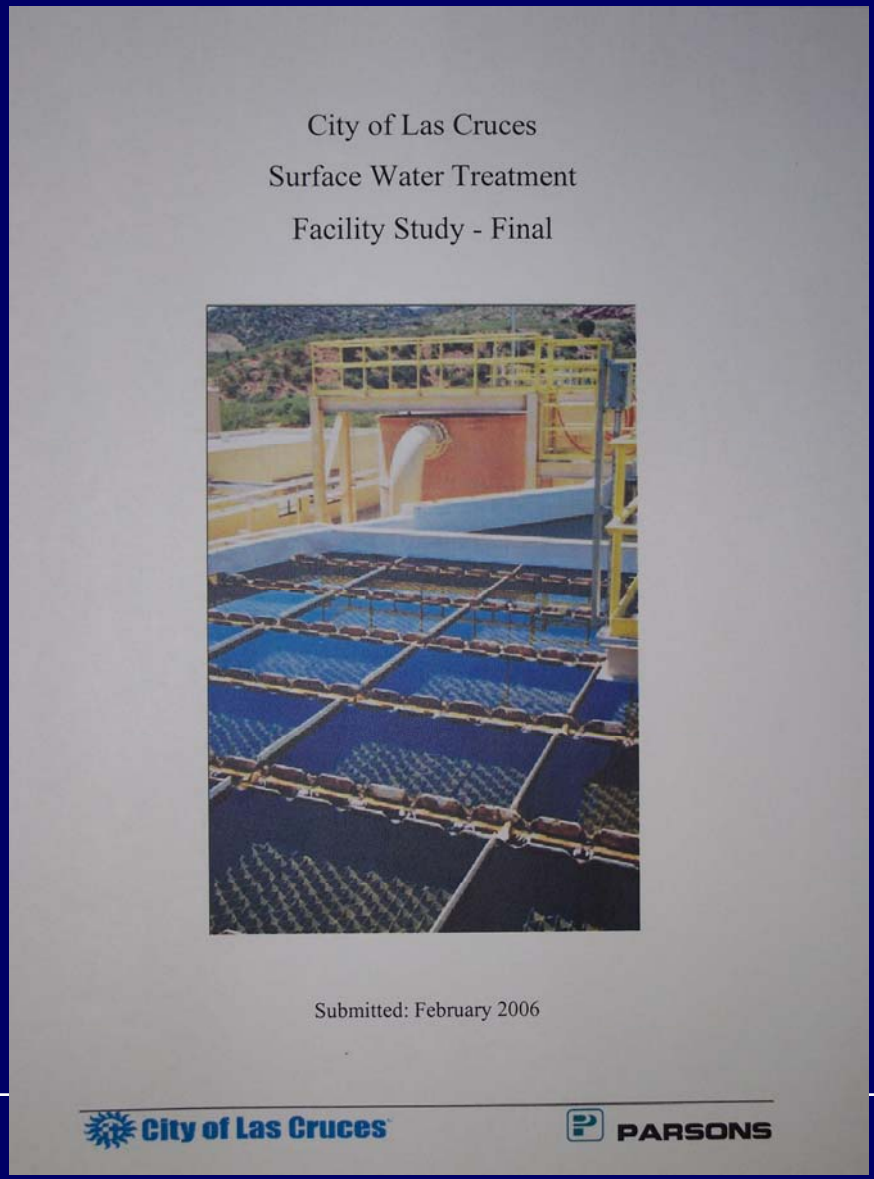
Water Use by Sector in LRG




Change in Water Use by Sector
Allocation of 500,000 AF
Perecent Use by Sector
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
90.11%
6.81%
86.51%
10.41%
84.70%
12.22%
82.90%
14.02%
0
20,000
30,000
40,000
Municipal Demand
Agricultural use
Municipal use

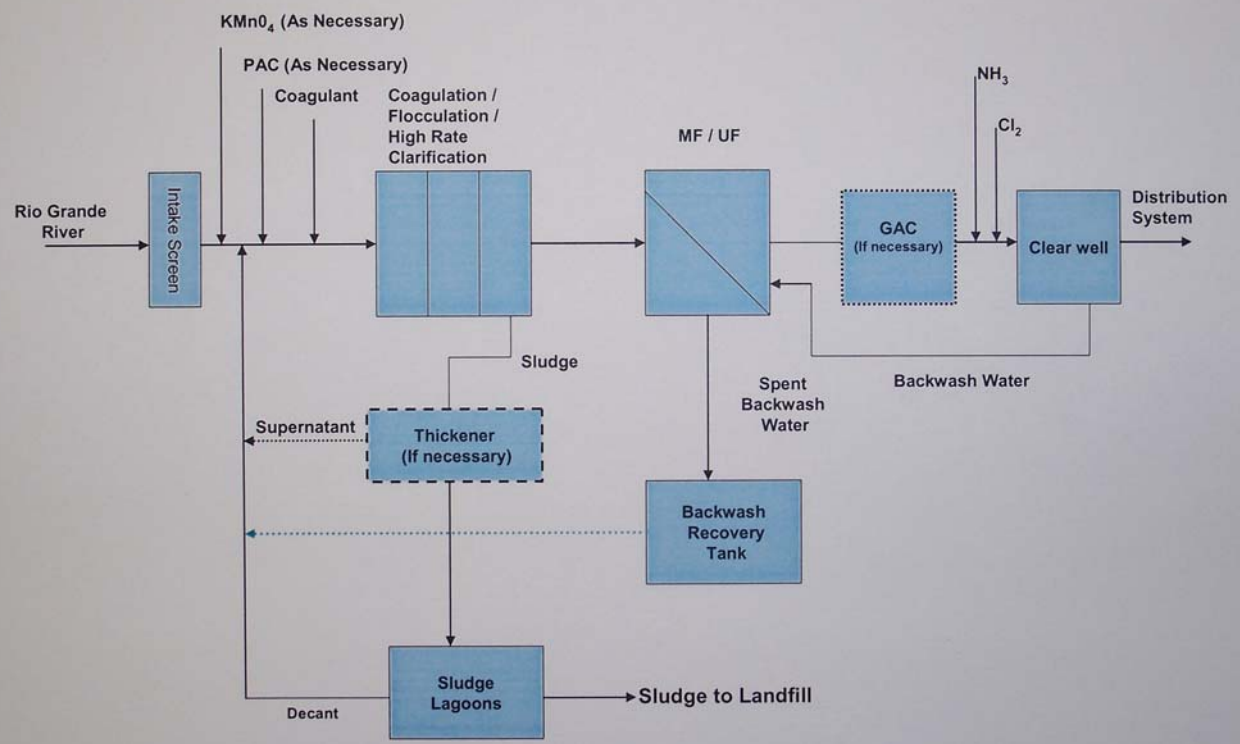

Ag to M&I Conversion
300,000
250,000
200,000
150,000
100,000
50,000
0
1%
2%
3%
4%
5%
6%
7%
8%
9%
10%
Conversion percentage
Acre-feet
Households
Population

2006 Surface Water Treatment Facility Study



2006 Surface Water Treatment Facility Study

Figure 19: Process Block Flow Diagram fo Surface Water Treatment Plant



20 mgd initial capacity
11,312 afy

2006 Surface Water Treatment Facility Study

Figure 20

Treatment Plant Site Layout

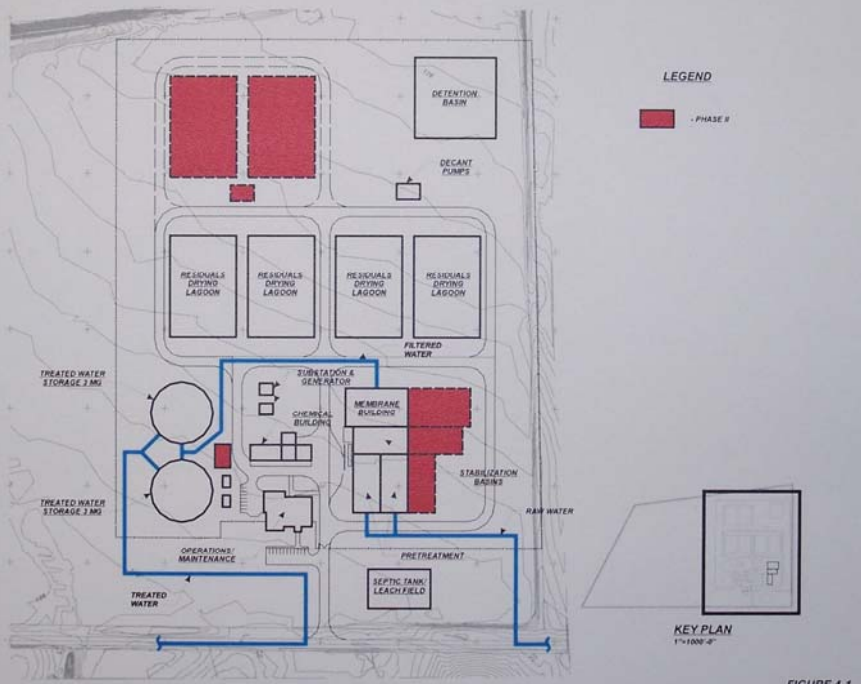


FIGURE 4-1
WTP SITE LAYOUT

Water Rights Ordinance…….

- First enacted in 1985….Ord #623
  - Acreage based
  - Payment due at time of annexation
- Modified in 1998…..Ord #1670
  - Acreage based
  - Increased payment amount
- Modified in 2000….Ord #1843
  - Conveyance or payment-in-lieu due at time of development
  - Payment based on meter size, rather than acreage
  - Added conveyance of Project water rights

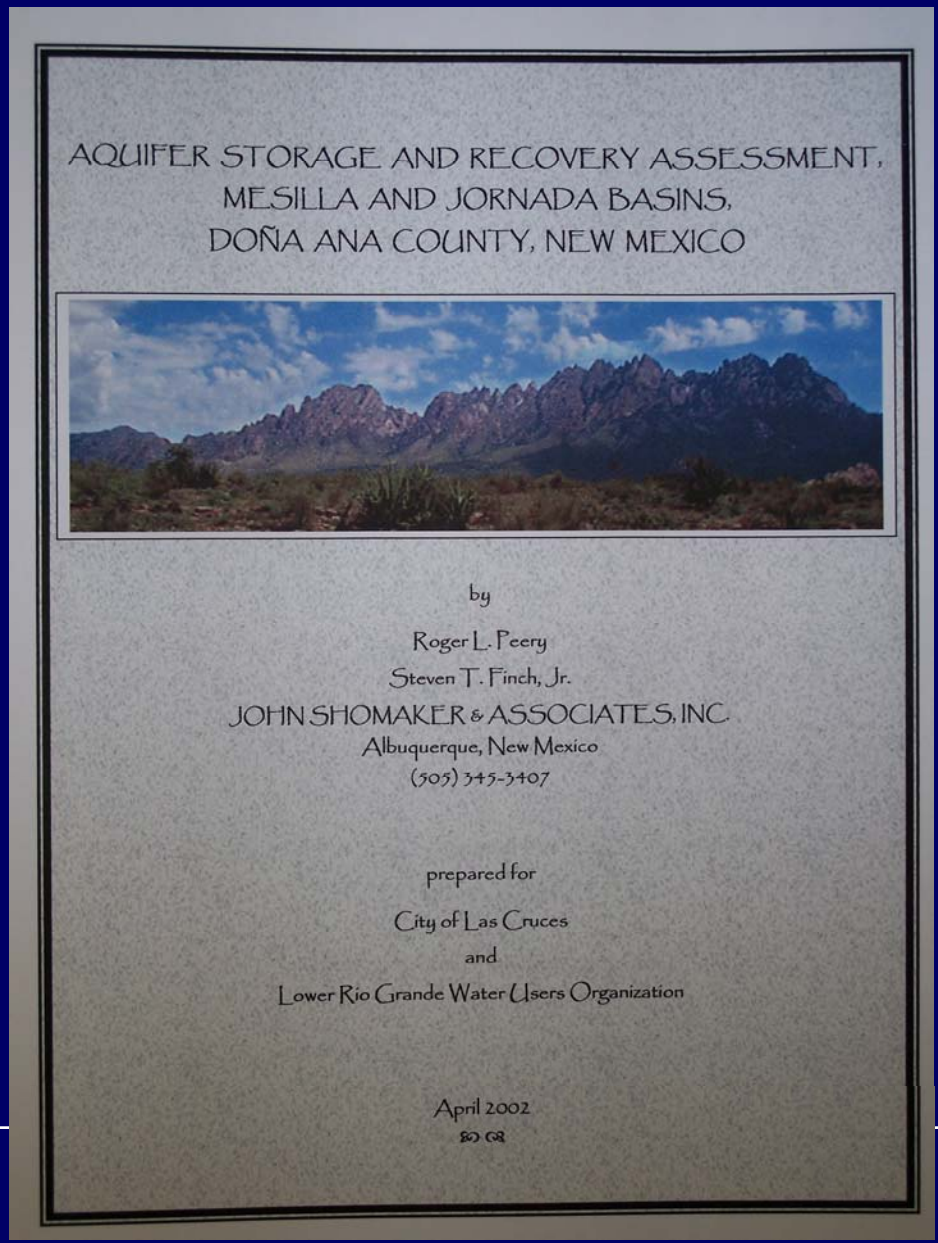
Water Rights Ordinance 1843…

- Conveyance of Water Rights or Project Water Rights is a Prerequisite for Development of Land.
  - *"Each landowner or developer shall convey surface or ground water rights or project water rights to the City at the time of development."*
- Payment in Lieu of Conveyance for Non-Water Righted Land.
  - *" The landowner or developer of non-water righted land may, in lieu of conveying water rights or project water rights to the City, pay to the City a sum of money which will enable the City to acquire water rights or project water rights. The amount of the payment in lieu of conveyance shall be based on the size of the City water meter or meters to be placed on the land."*

Reclaimed water use

- City currently in the design phase of the East Mesa Water Reclamation Facility
- Will initially treat 0.5 million gallons per day (MGD) and later expanded to 1.0 MGD
- Tertiary treated water will be used for irrigation of landscapes, golf course, medians, etc
- Reclaimed water use offsets fresh water demands

2002 Aquifer Storage and Recovery Study



AQUIFER STORAGE AND RECOVERY ASSESSMENT,
MESILLA AND JORNADA BASINS,
DOÑA ANA COUNTY, NEW MEXICO

by

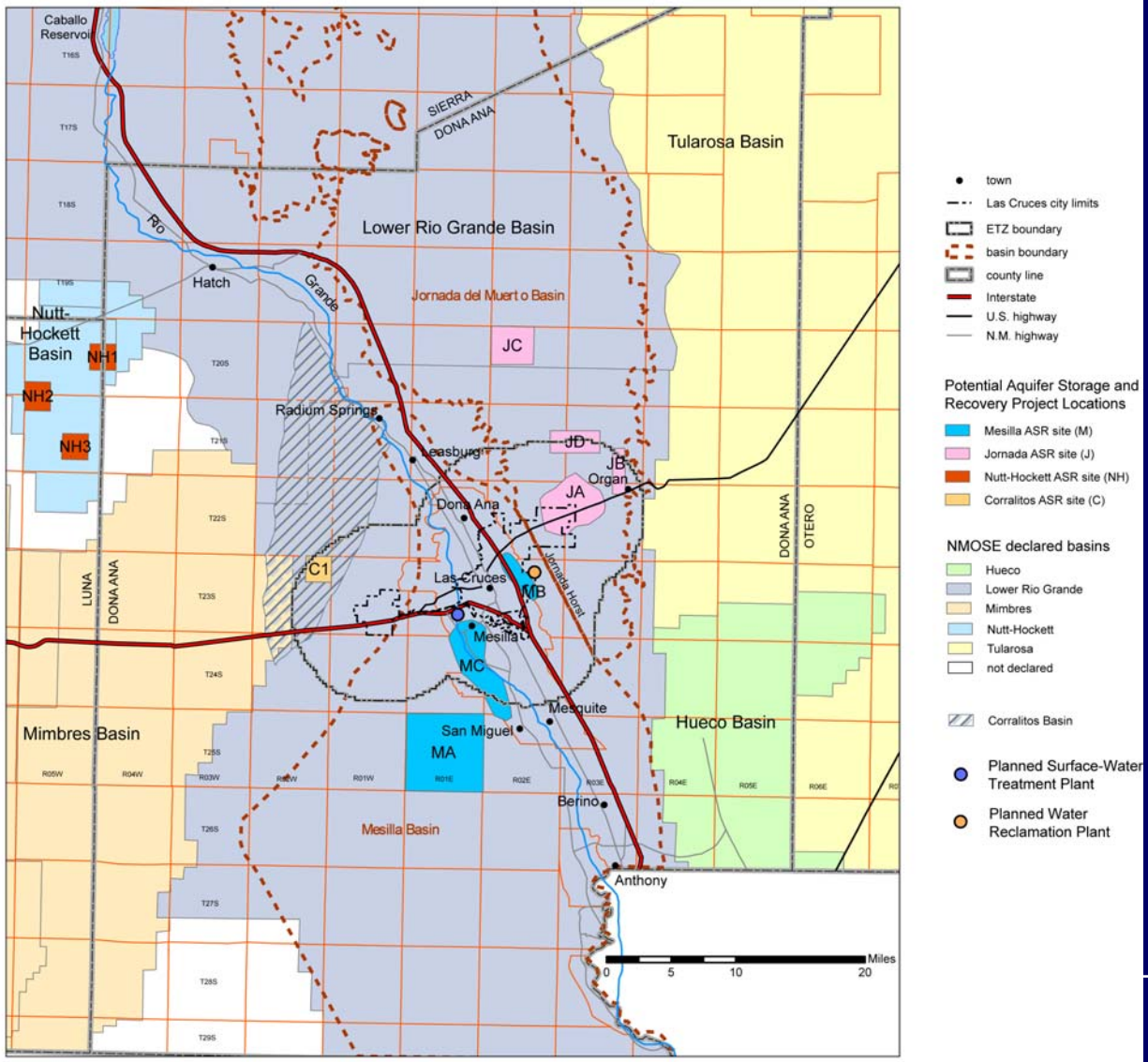
Roger L. Peery
Steven T. Finch, Jr.
JOHN SHOMAKER & ASSOCIATES, INC.
Albuquerque, New Mexico
(505) 345-3407

prepared for

City of Las Cruces
and
Lower Rio Grande Water Users Organization

April 2002

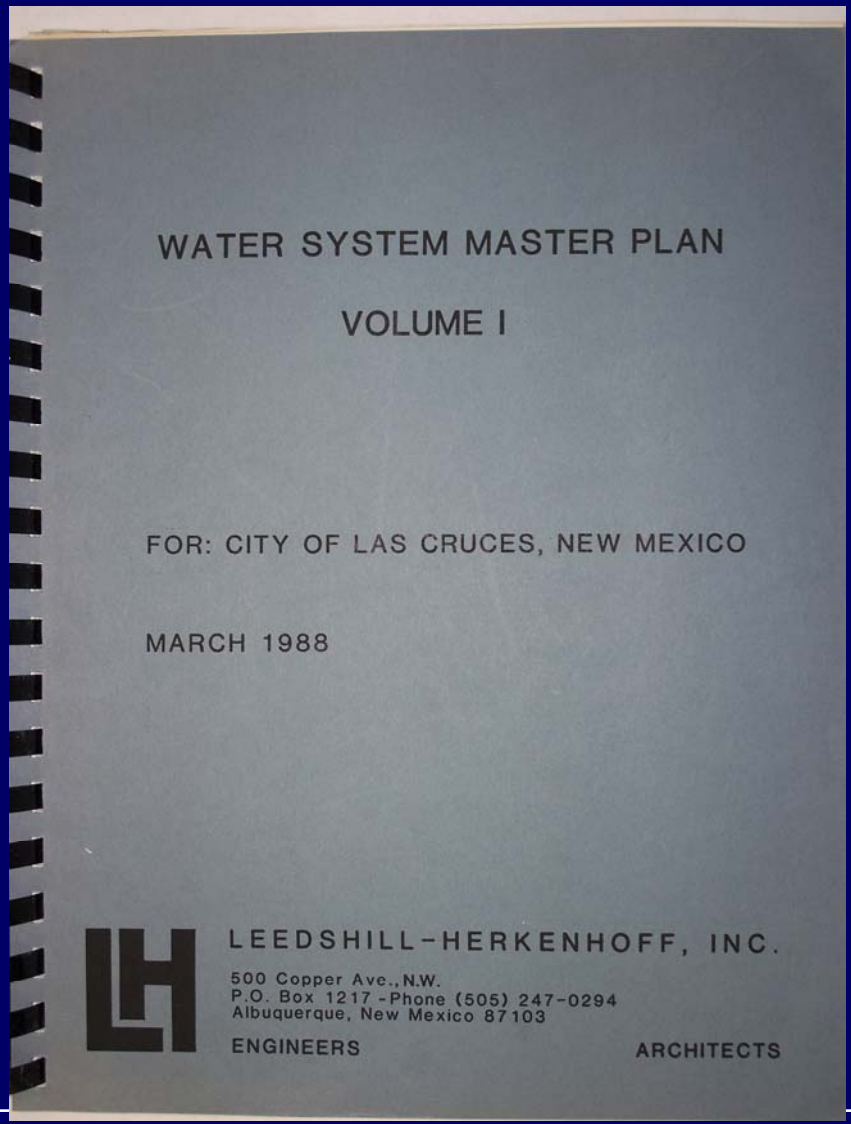
Aquifer storage and recovery (ASR)



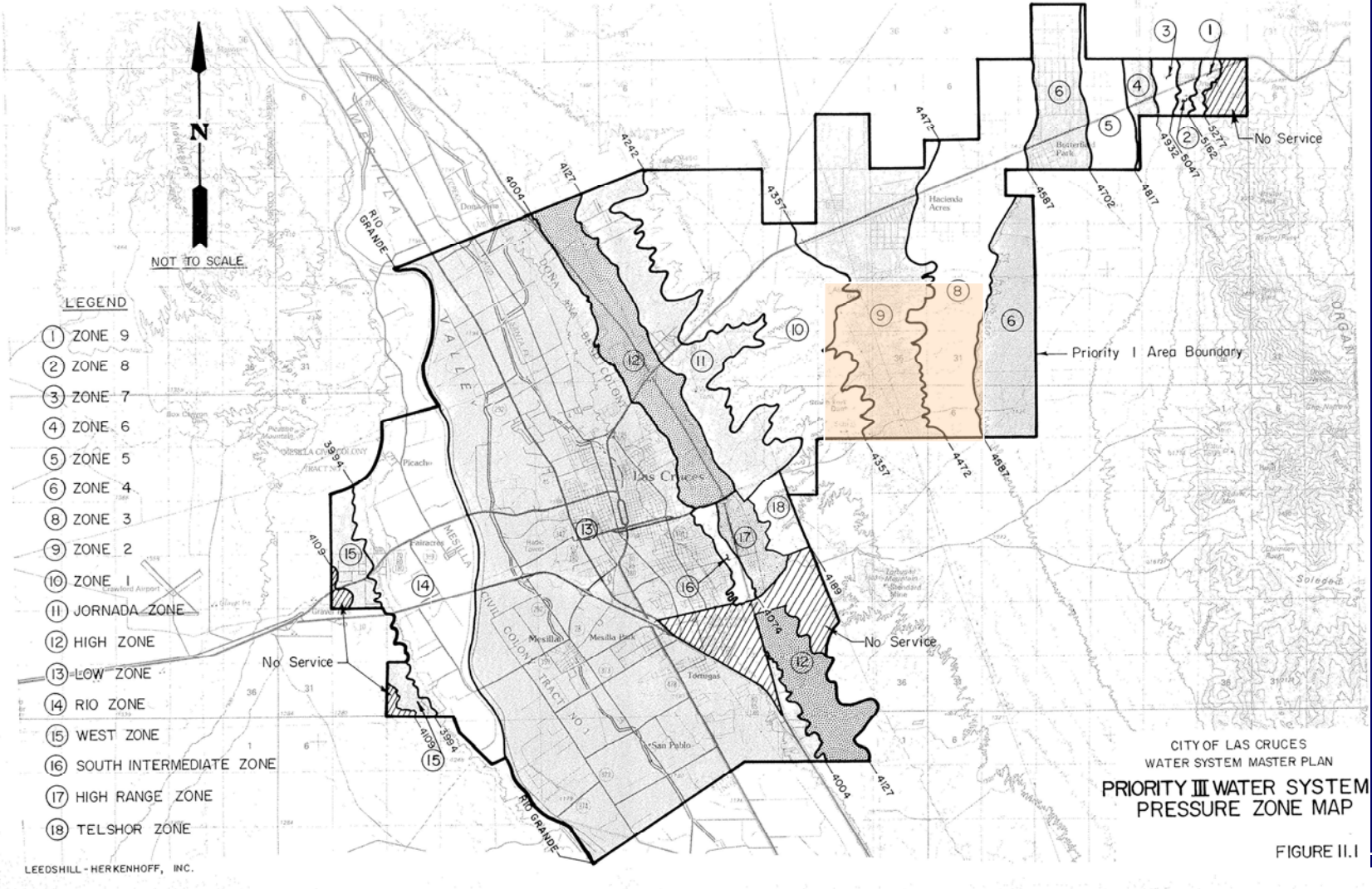
Water & Wastewater Master Plan

- Provides guidance for infrastructure development
- Delineates specific water and wastewater projects to meet growth needs
- Defines the “capital improvement plan” as required by Development Fee Act

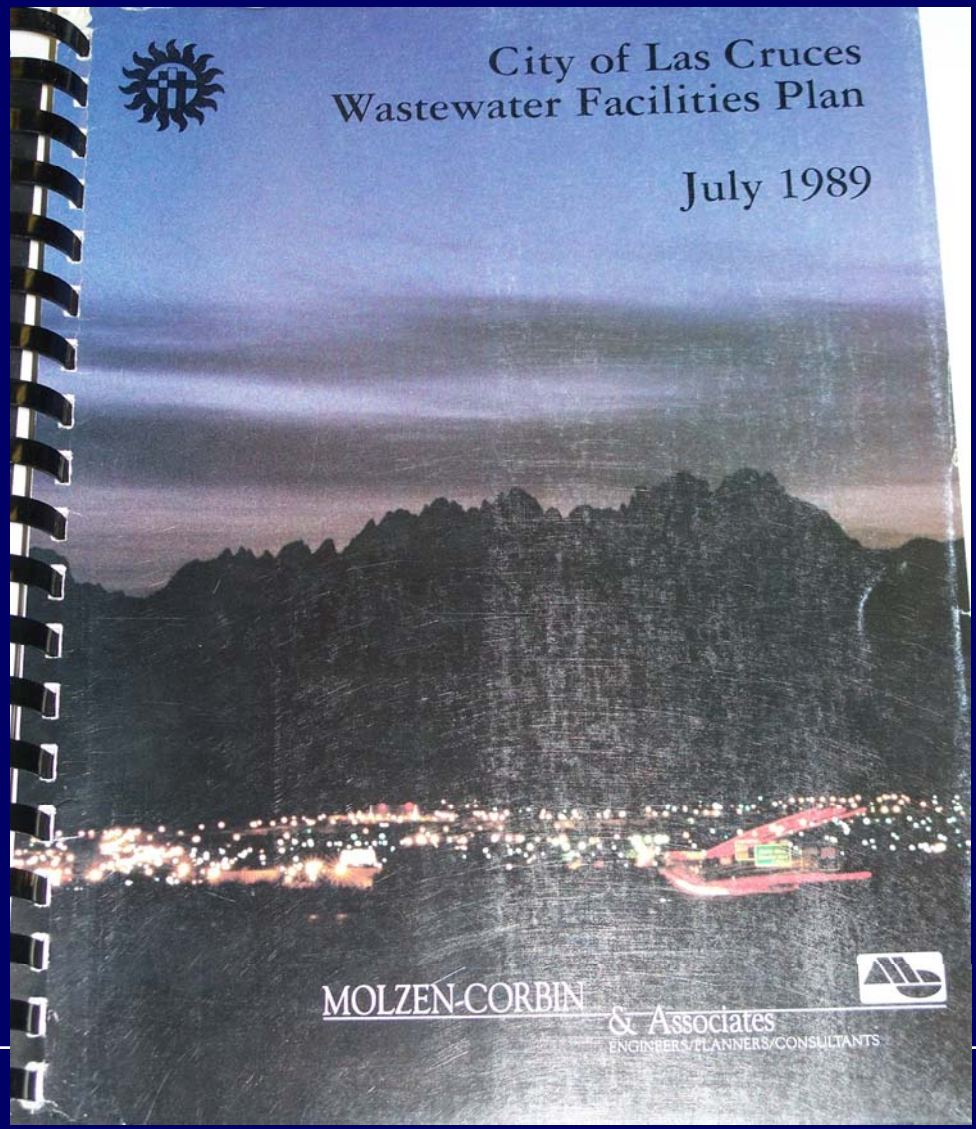
1988 Water & Wastewater Master Plan



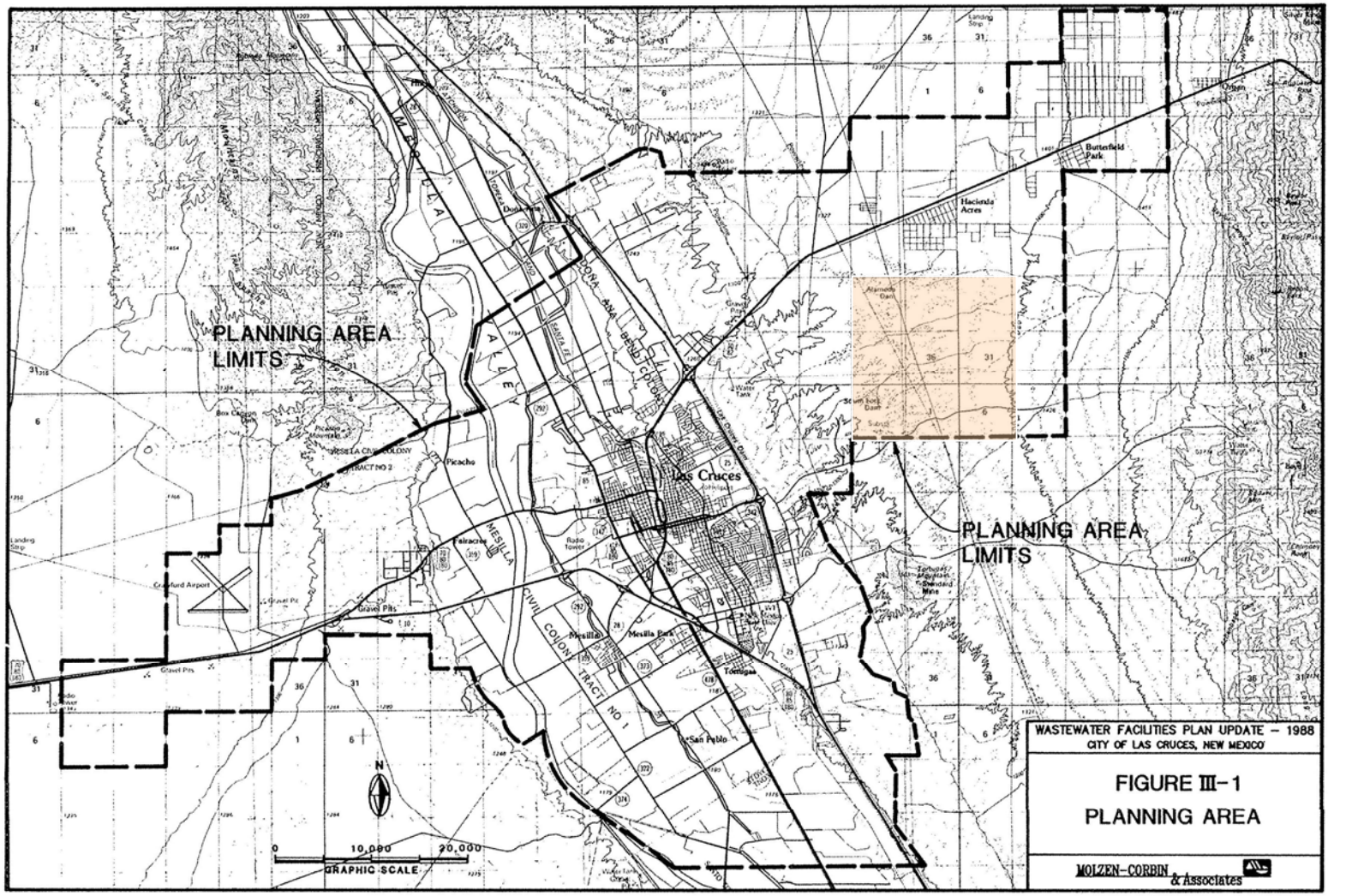
1988 Water Master Plan



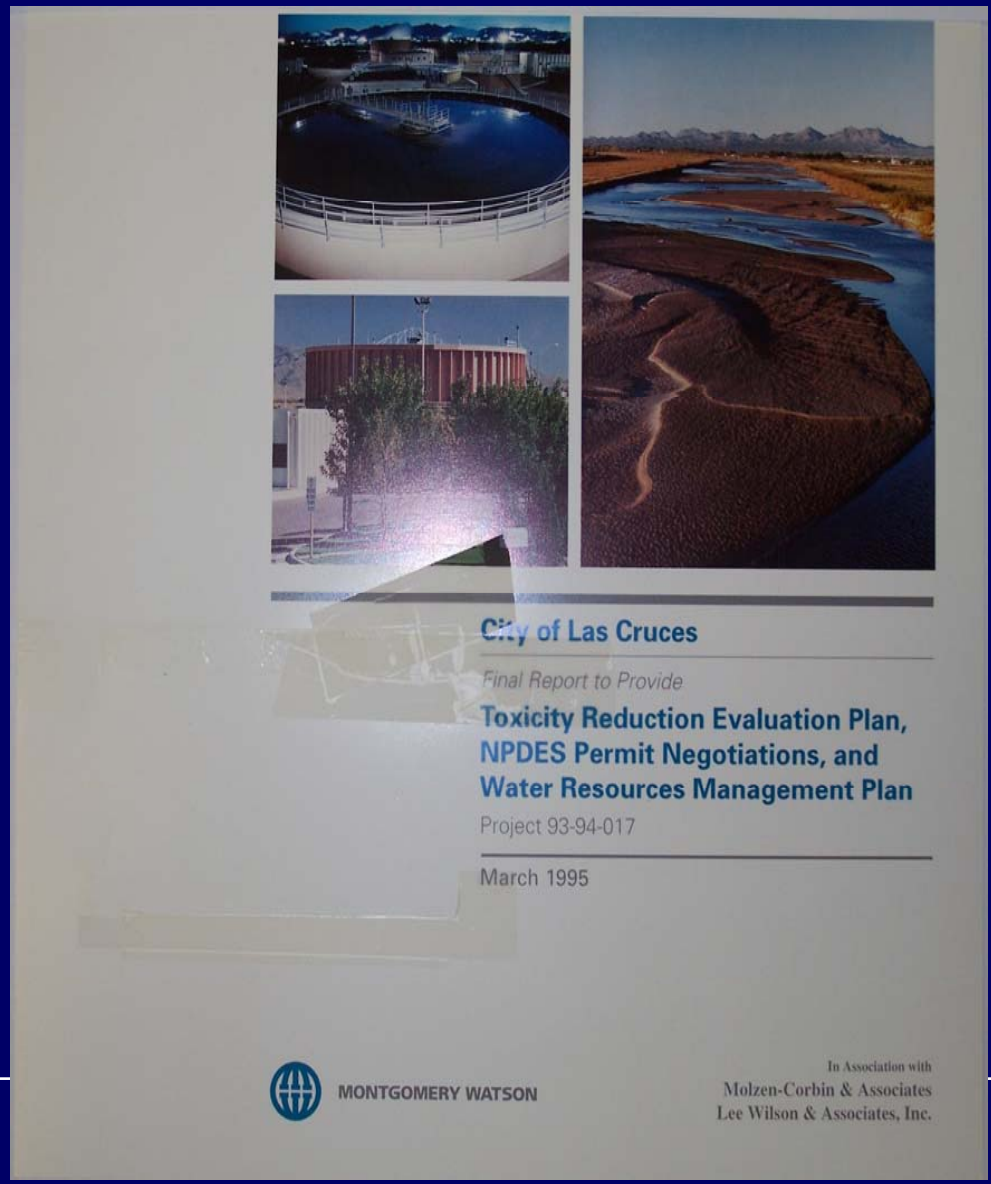
1989 Wastewater Master Plan



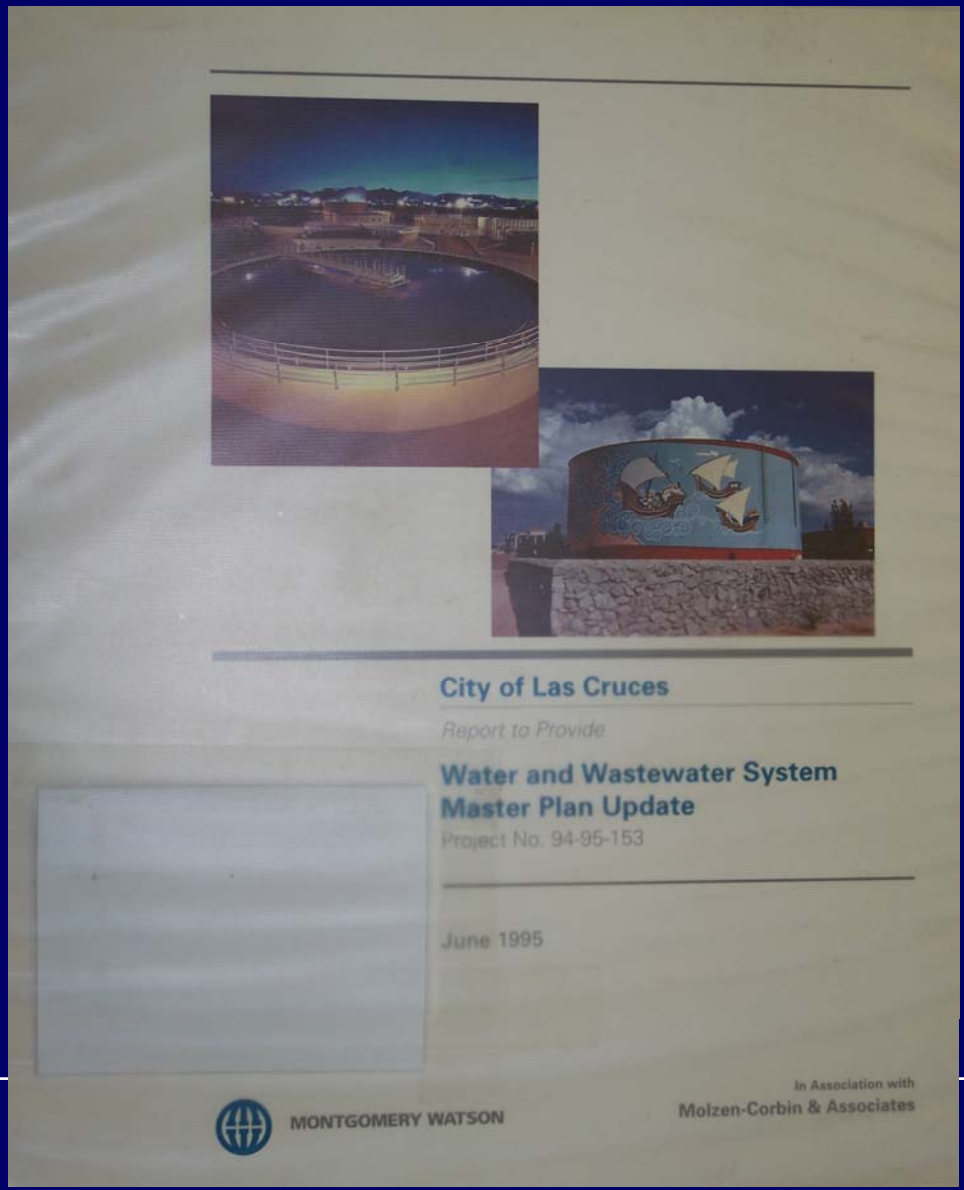
1989 Wastewater Master Plan



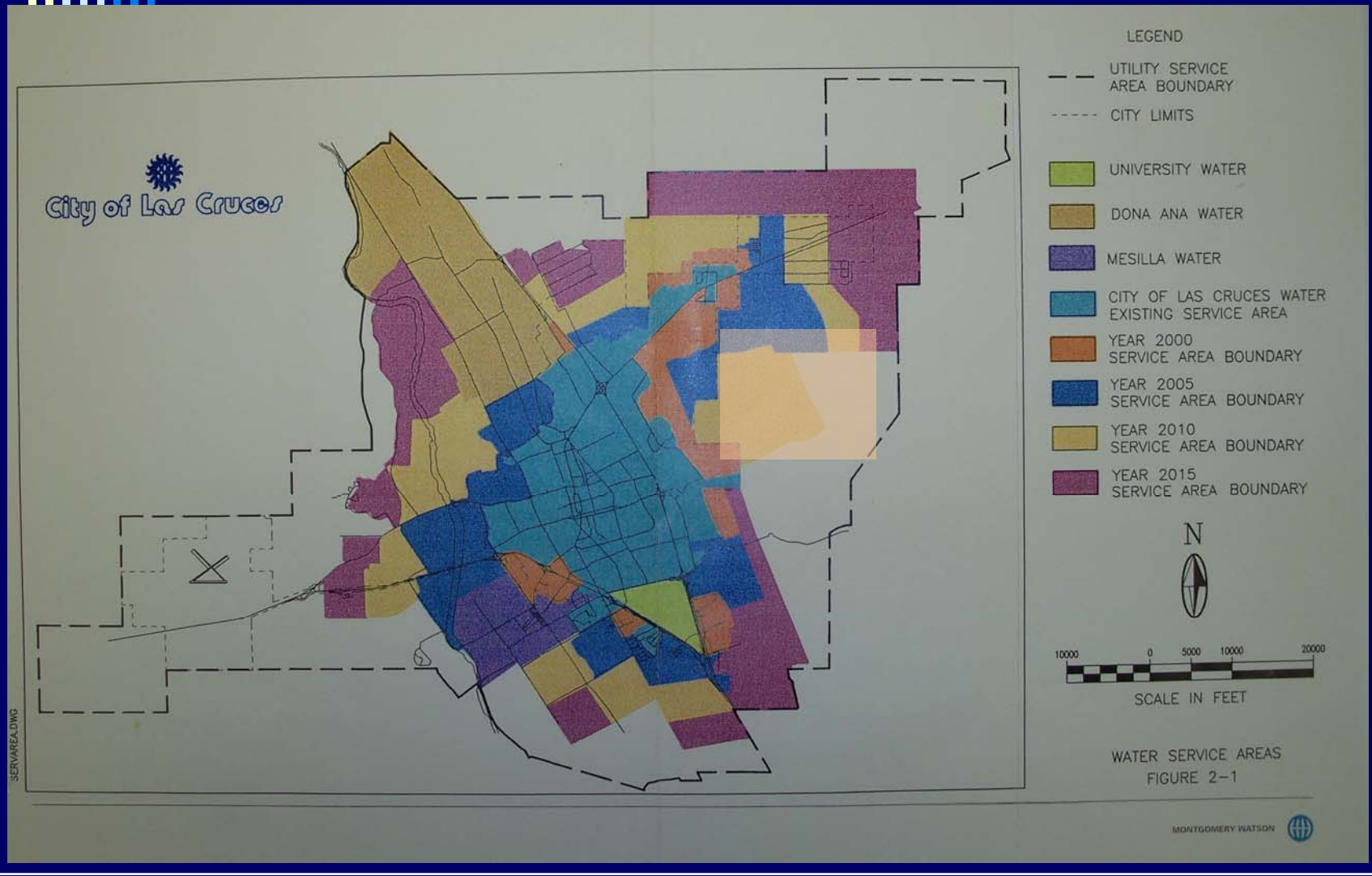
1995 Resources Management Plan



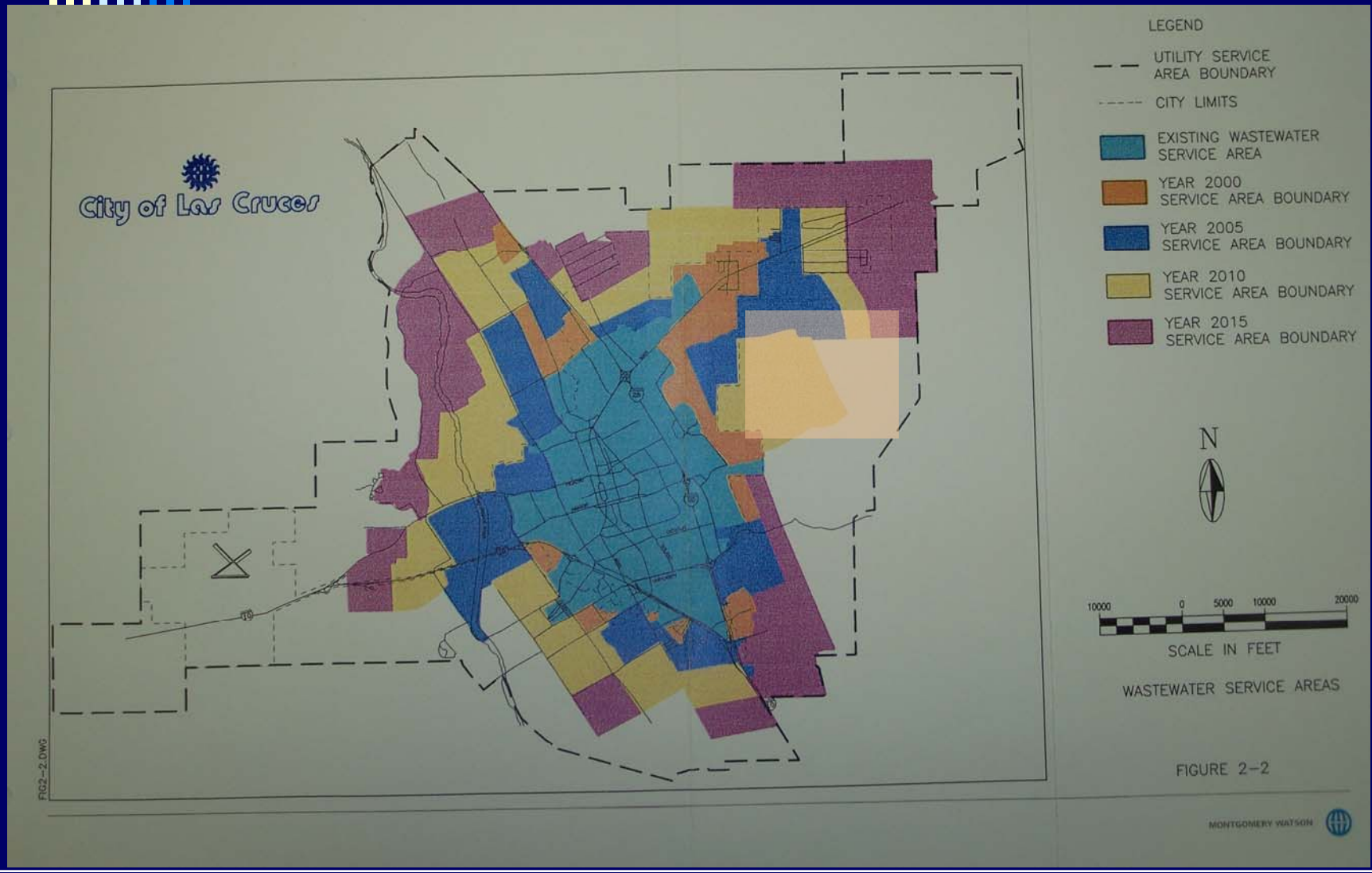
1995 Water & Wastewater Master Plan



1995 Water & Wastewater Master Plan



1995 Water & Wastewater Master Plan



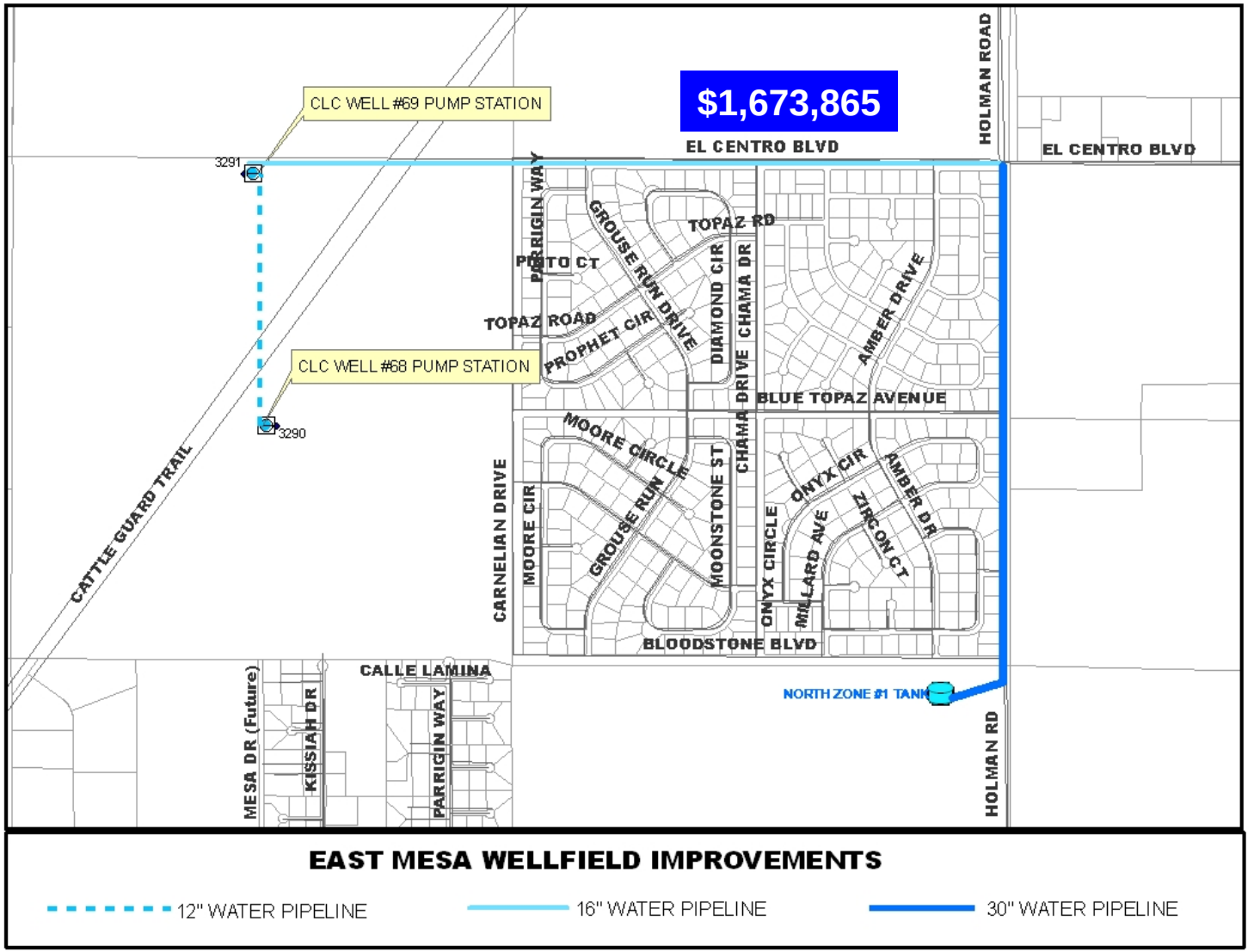
Water Infrastructure Development

Adrienne Widmer, P.E.
Projects & Water Right Manager

East Mesa

LRG 3296
LRG 3295
LRG 3294
LRG 3293
LRG 3292
LRG 3291
Well 69
LRG 3290
Well 68
$1,030,500
$644,063
$136,026
WELL 41
WELL 40
D067 HOLMAN R
CHAMA DR
MESA DR
HOLMAN RD
PEACHTREE HILLS RD
HANGER LAKE RD
WEISNER RD
ARROYO RD
BRAHMAN RD
MAIN ST - US 70
US 70

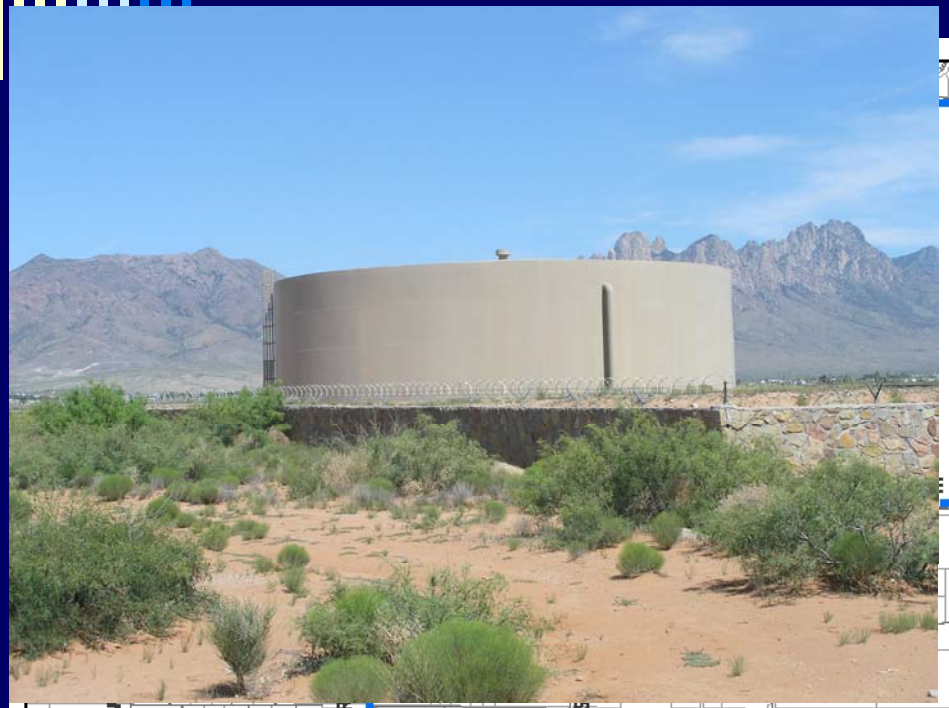
Zone 1 Water Supply Project- Phase I



Well 69 pump station construction


CAT

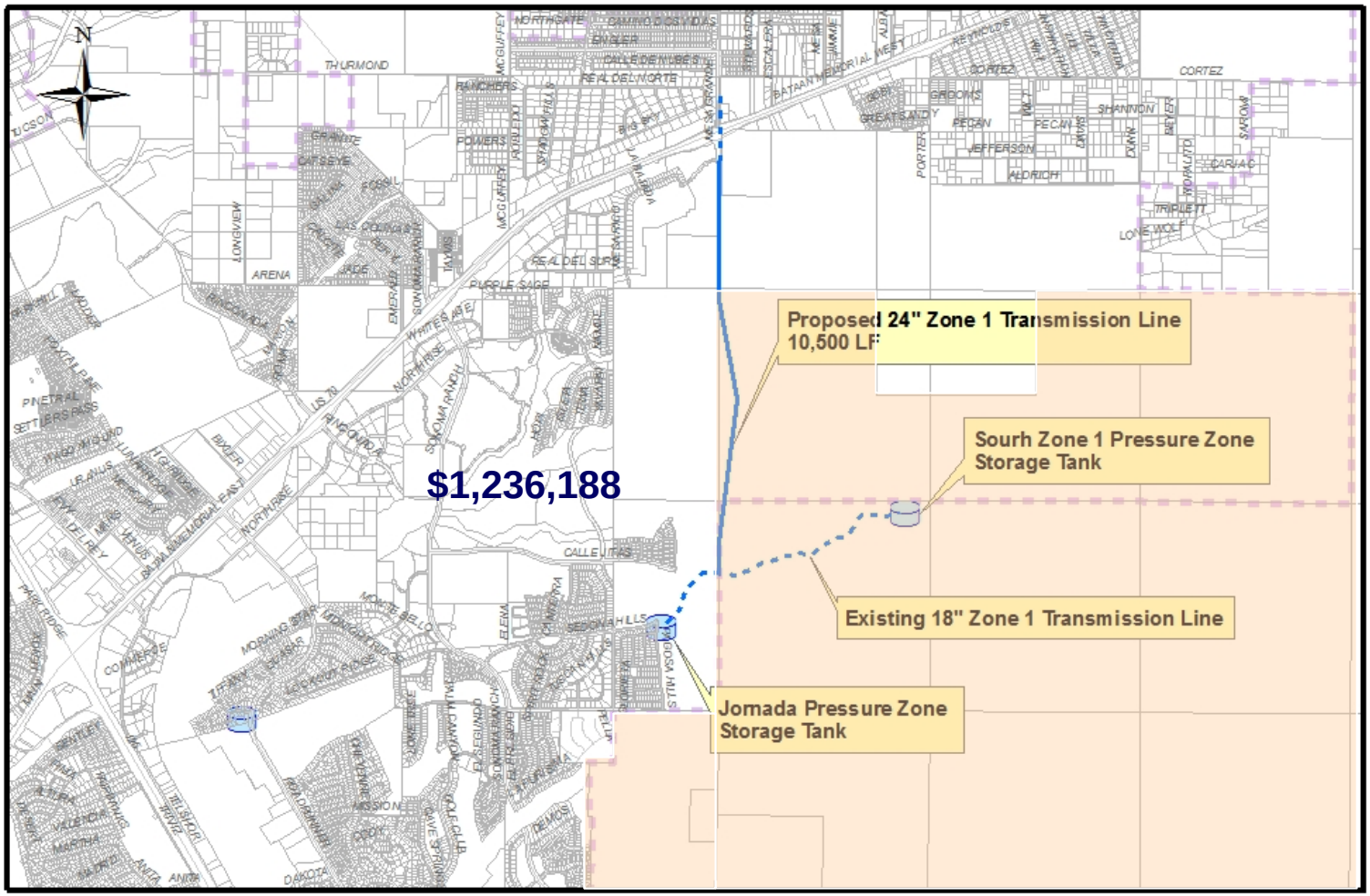
Tank connection

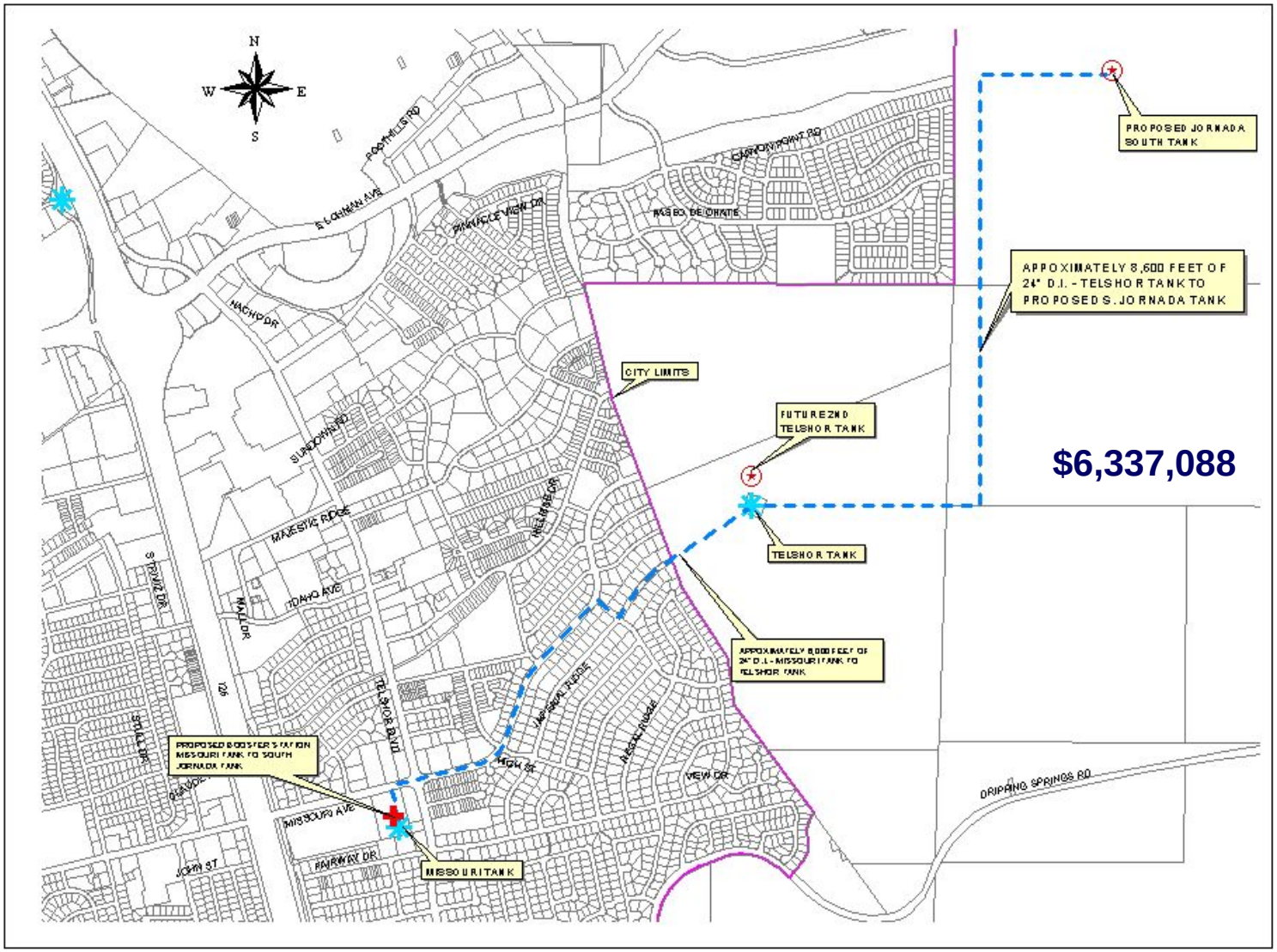


NORTH ZONE #1 TANK
430-S-26
$1,932,188
KINGS ROAD
FAITH RD
STANLEY RD
KEEL RD
HANGER LAKE ROAD
HILLS RD
HOLMAN RD
N MAIN ST
BATAAN MEMORIAL WEST
DOUGLAS AVE
MESA GRANDE DR
CALLE DE PAZ
SAN AUGUSTIN DR
Zone I Water Supply – Phase II
$3,781,322
CORTEZ DR
JEFFERSON LN
DUNN DR
BEYER RD
NOPALITO RD
CARAWAY RD
SAROMI LN
ZONE 1 WATER TRANSMISSION PIPELINE
36" WATER PIPELINE - PREFERRED ALIGNMENT
36" WATER PIPELINE - ALTERNATE ALIGNMENT

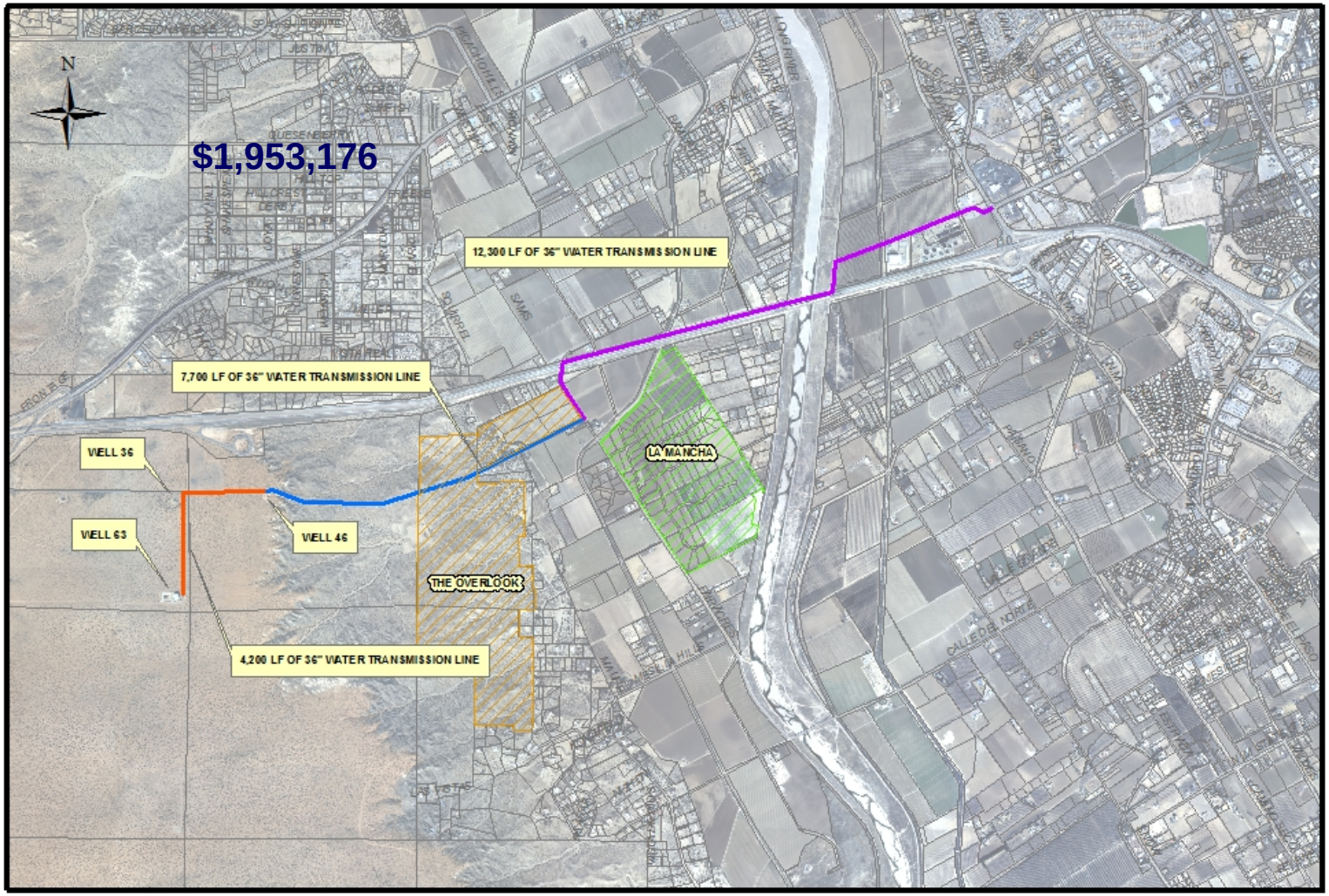
36-inch pipeline construction

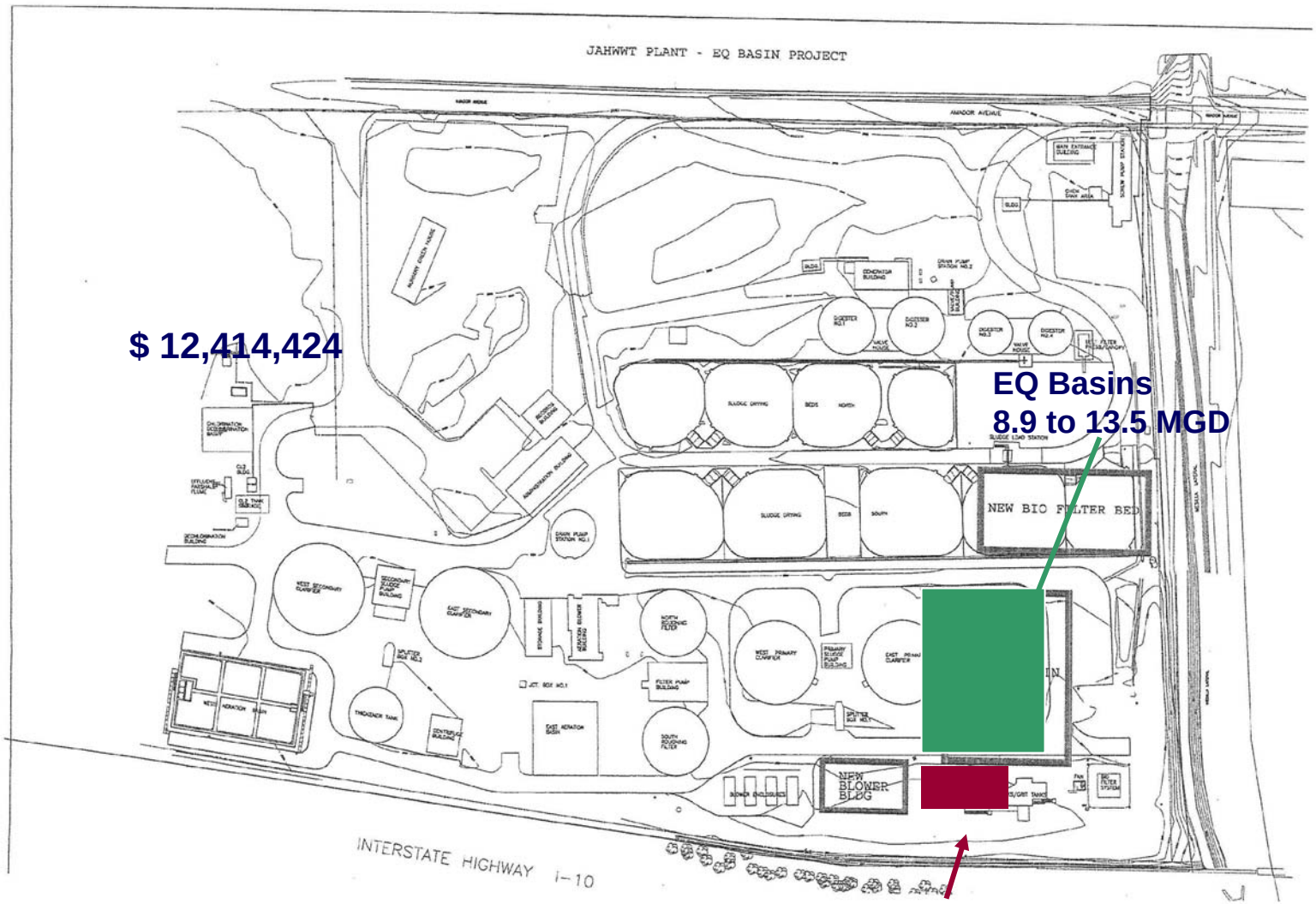
PROPOSED 24-INCH ZONE 1 WATER TRANSMISSION LINE




N
W
E
S
FOOTHILLS RD
ELDORADO AVE
PINNACLE VIEW DR
CANYON POINT RD
ASSOCIATE DRIVE
HACHO DR
SUNDOWN RD
MAJESTIC RIDGE
SPRING DR
MAJOR DR
IDAHO AVE
HELMER DR
TELSHOR BLVD
HIGH ST
JAMISON RIDGE
MESA RIDGE
VIEW DR
MISSOURI AVE
FAIRWAY DR
JOHN ST
DRIPPING SPRINGS RD
PROPOSED JORNADA SOUTH TANK
APPOXIMATELY 8,600 FEET OF 24" D.I. - TELSHOR TANK TO PROPOSED S. JORNADA TANK
CITY LIMITS
FUTURE 2ND TELSHOR TANK
TELSHOR TANK
APPOXIMATELY 8,000 FEET OF 24" D.I. - MISSOURI TANK TO TELSHOR TANK
PROPOSED BOOSTER STATION MISSOURI TANK TO SOUTH JORNADA TANK
MISSOURI TANK
$6,337,088

CITY OF LAS CRUCES WEST MESA WATER TRANSMISSION LINES




JAHWWT PLANT - EQ BASIN PROJECT
$ 12,414,424
EQ Basins
8.9 to 13.5 MGD
NEW BIO FILTER BED
NEW BLOWER BLDG
INTERSTATE HIGHWAY I-10
Entrance Works

Wastewater Plant Expansion…

On-going entrance works construction

$ 2,825,424

New entrance works

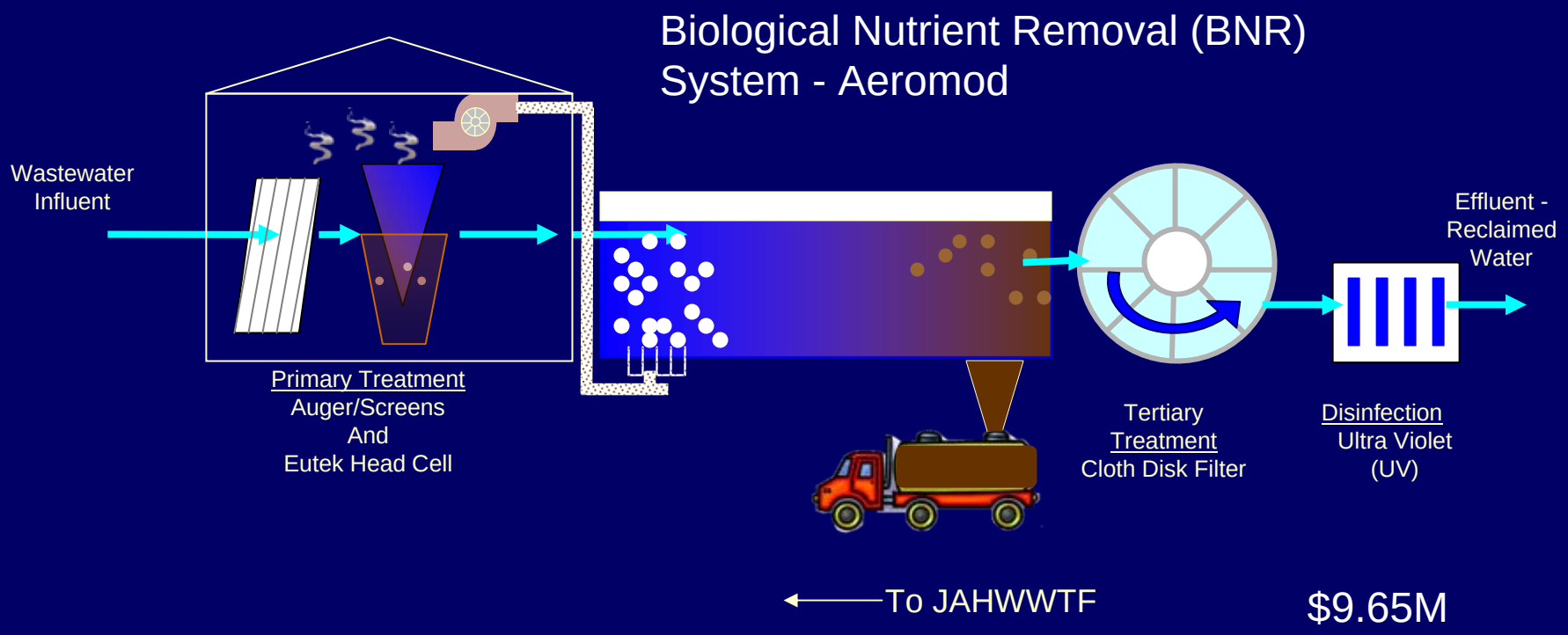
Demolition of old entrance works

New belt press

Sludge compost operation

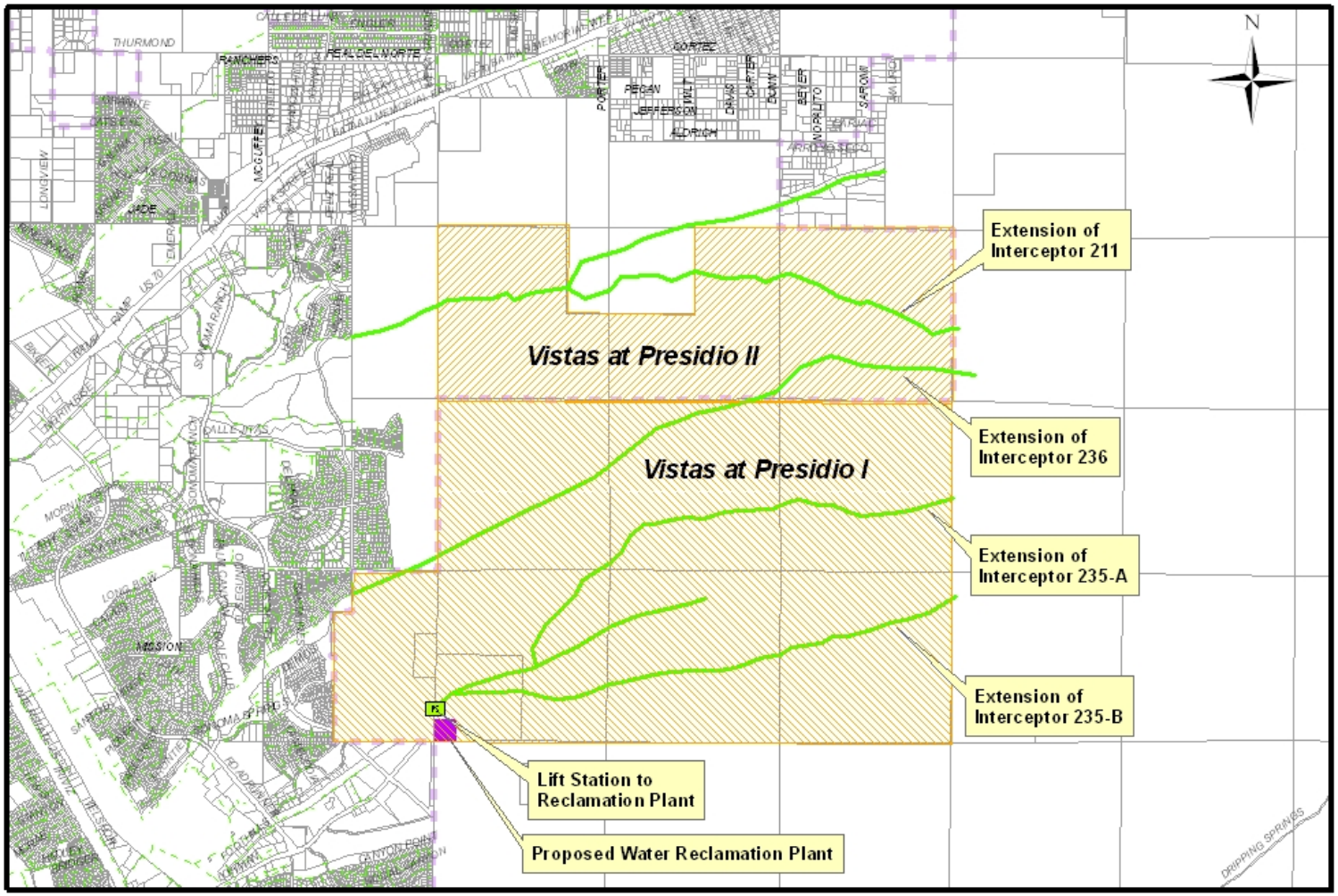

Water Reclamation Plant
N
W
E
S
WATER RECLAMATION FACILITY
CITY LIMITS
SONORA RANCH
SONORA SPRINGS
MISSION
POOL CLUB
PIONEER
FAIRGROUNDS
SOUTH

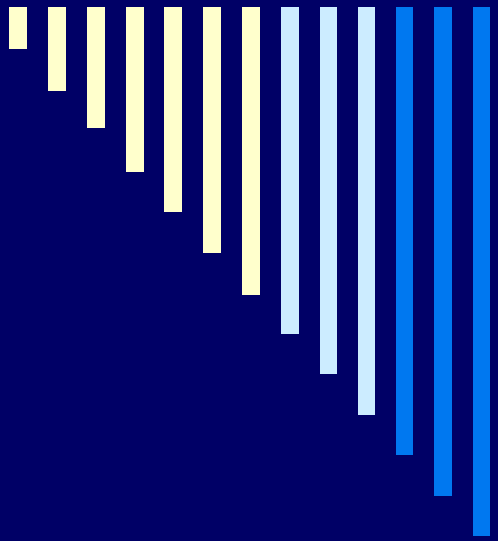
Water reclamation plant



Demonstrates odor control treatment method

PRELIMINARY SEWER SERVICE PLAN
FOR
THE VISTAS AT PRESIDIO





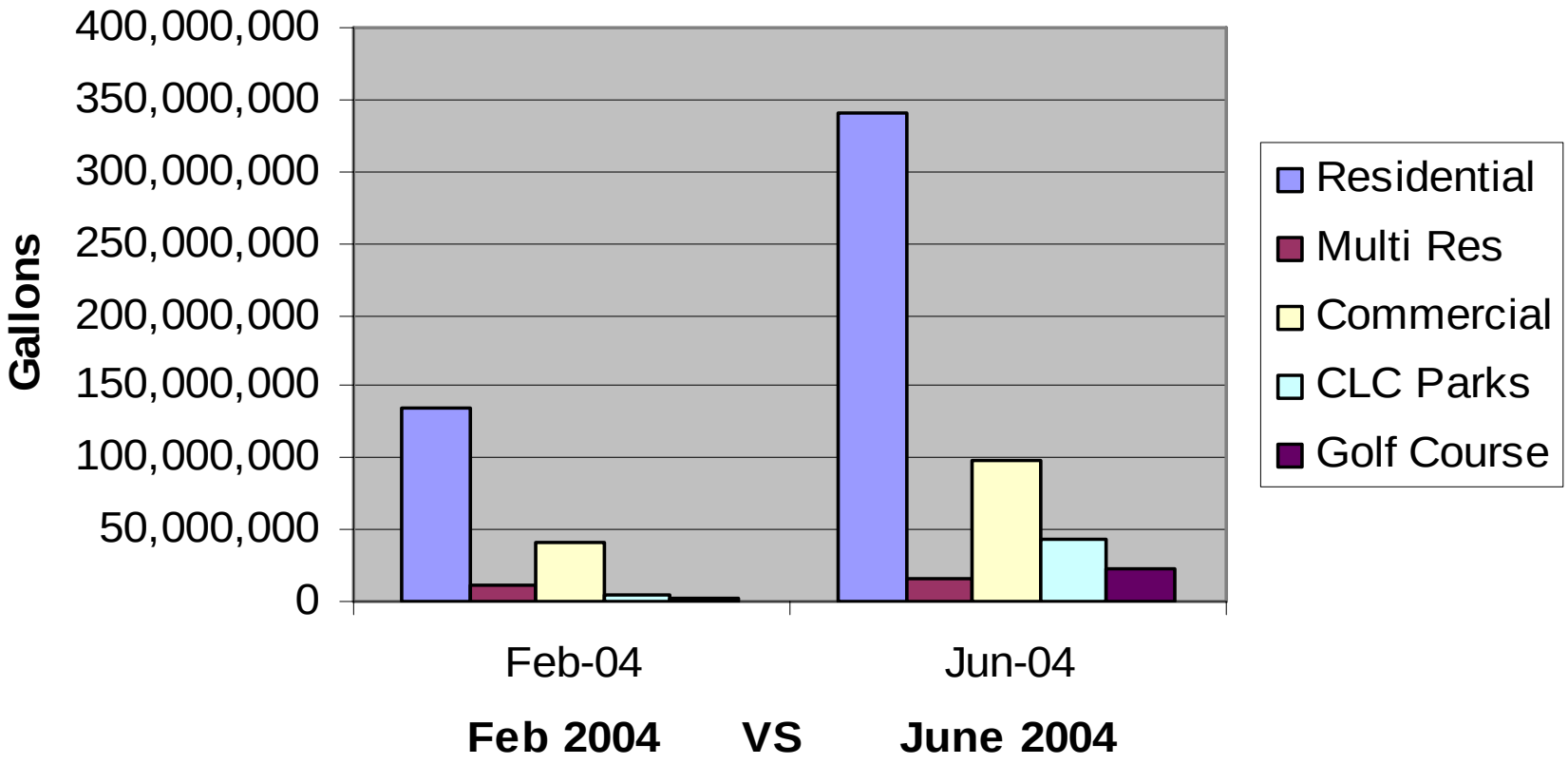
Water Conservation

Joshua G. Rosenblatt
Water Conservation Coordinator

Benefits of Water Conservation

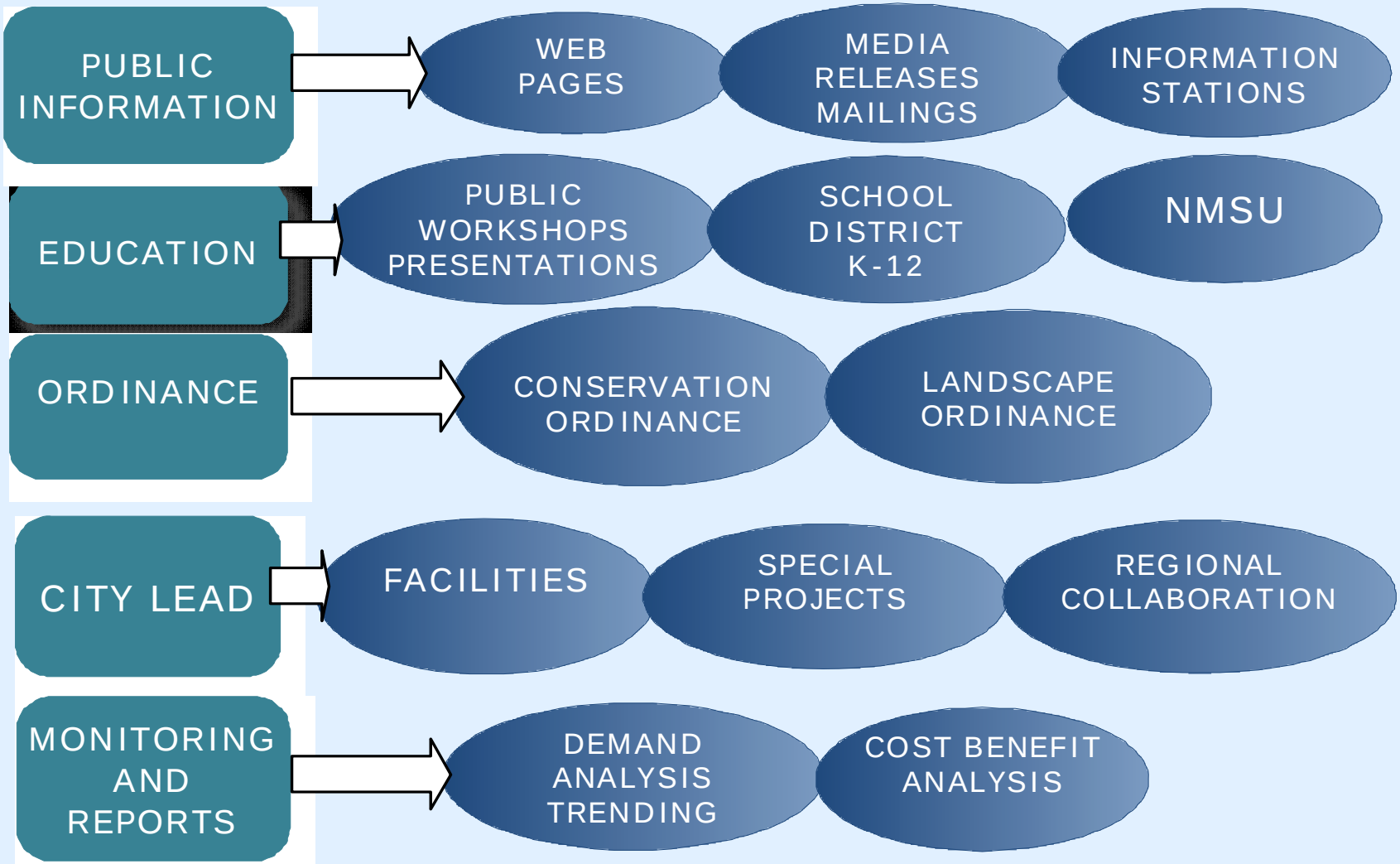
- Increasing efficient use is the least expensive way to enhance water supplies
- Extend water and wastewater infrastructure lifespan and operating costs
- Conservation program maintains compliance with OSE & NMDFA
- Las Cruces is Proactive

2004 Winter VS Summer City Customer Water Consumption



Feb 2004 VS June 2004

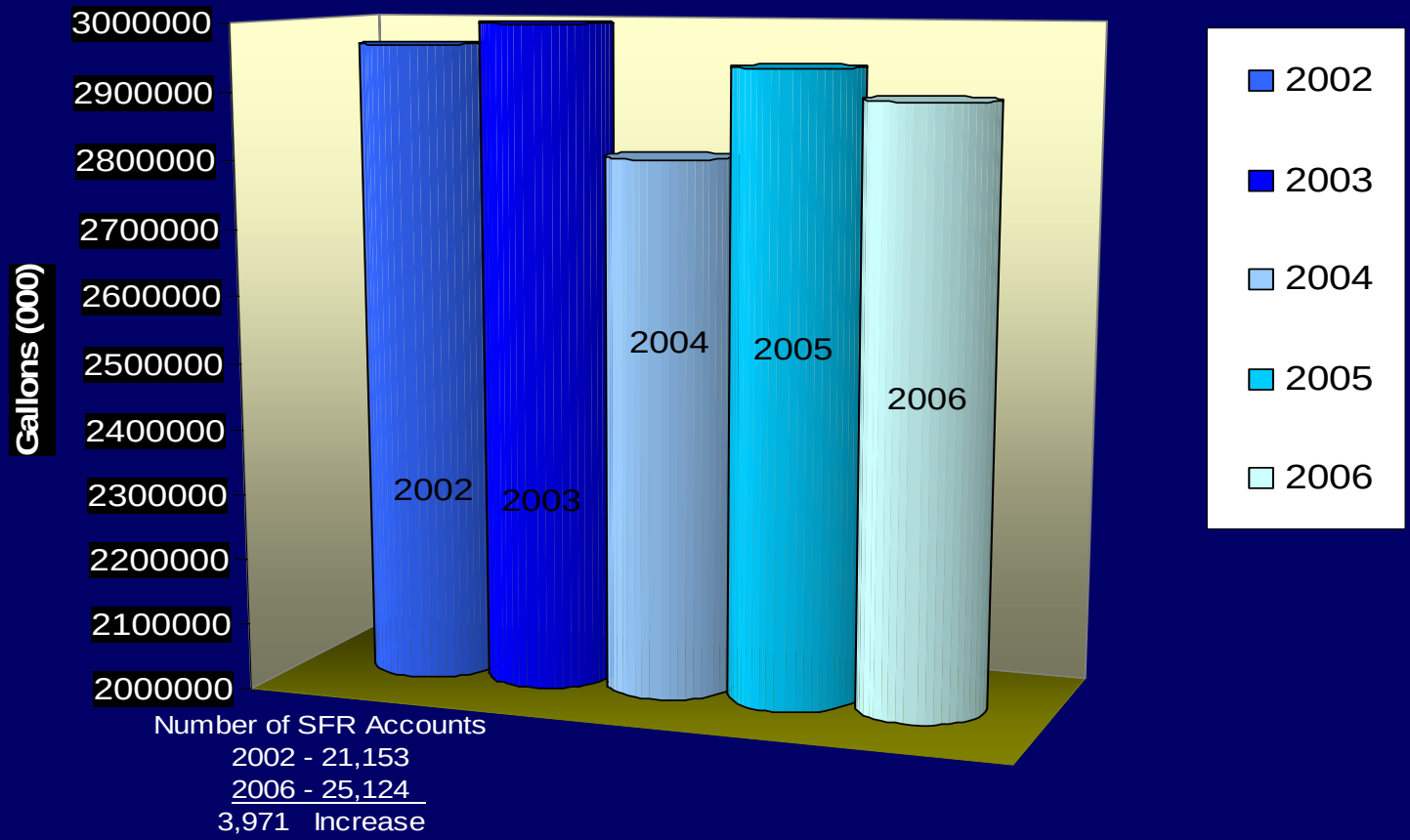
PHASE 1 WATER CONSERVATION - MAIN COMPONENTS



Creating a Water Wise Oasis "LUSH & LEAN" Initiative

- Two (2)Bureau of Reclamation Grants awarded in recognition of the City's "Lush & Lean" Initiative.

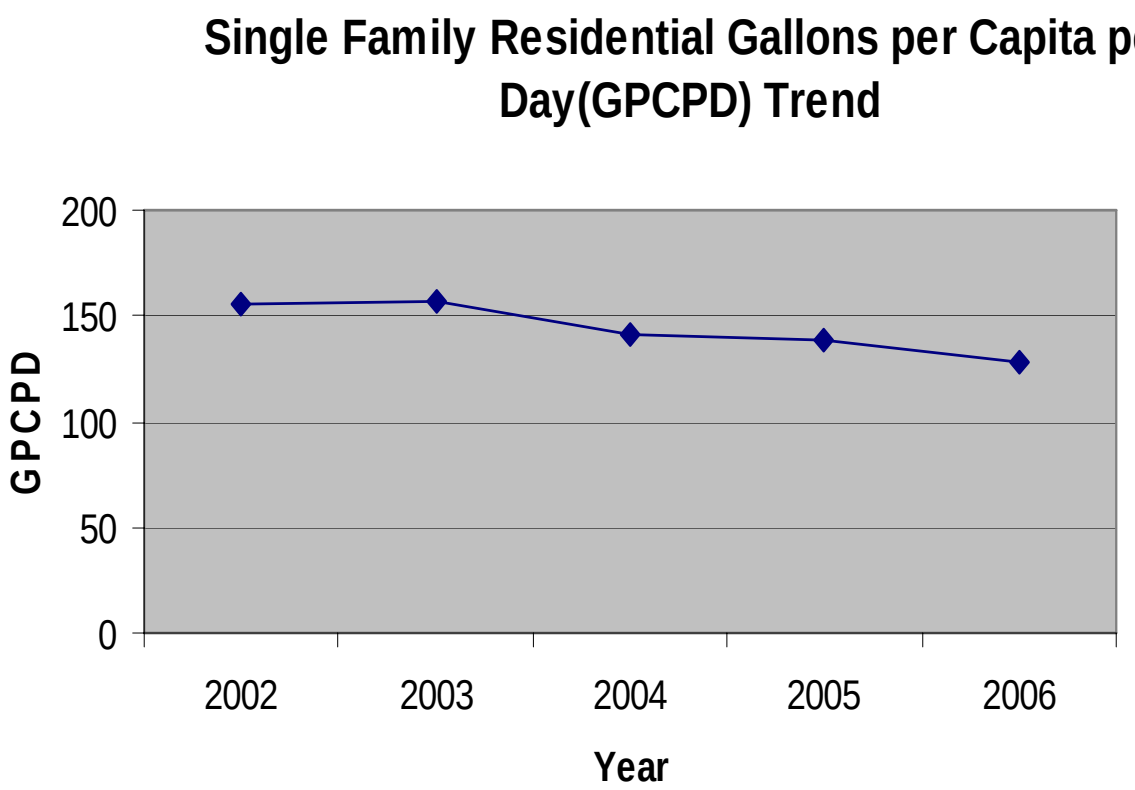
GATHERING HISTORY FOR MESURING PERFOMANCE
Total Annual Single Family Water Demand
City of Las Cruces Accounts 2002 to 2006



Number of SFR Accounts
2002 - 21,153
2006 - 25,124
3,971 Increase

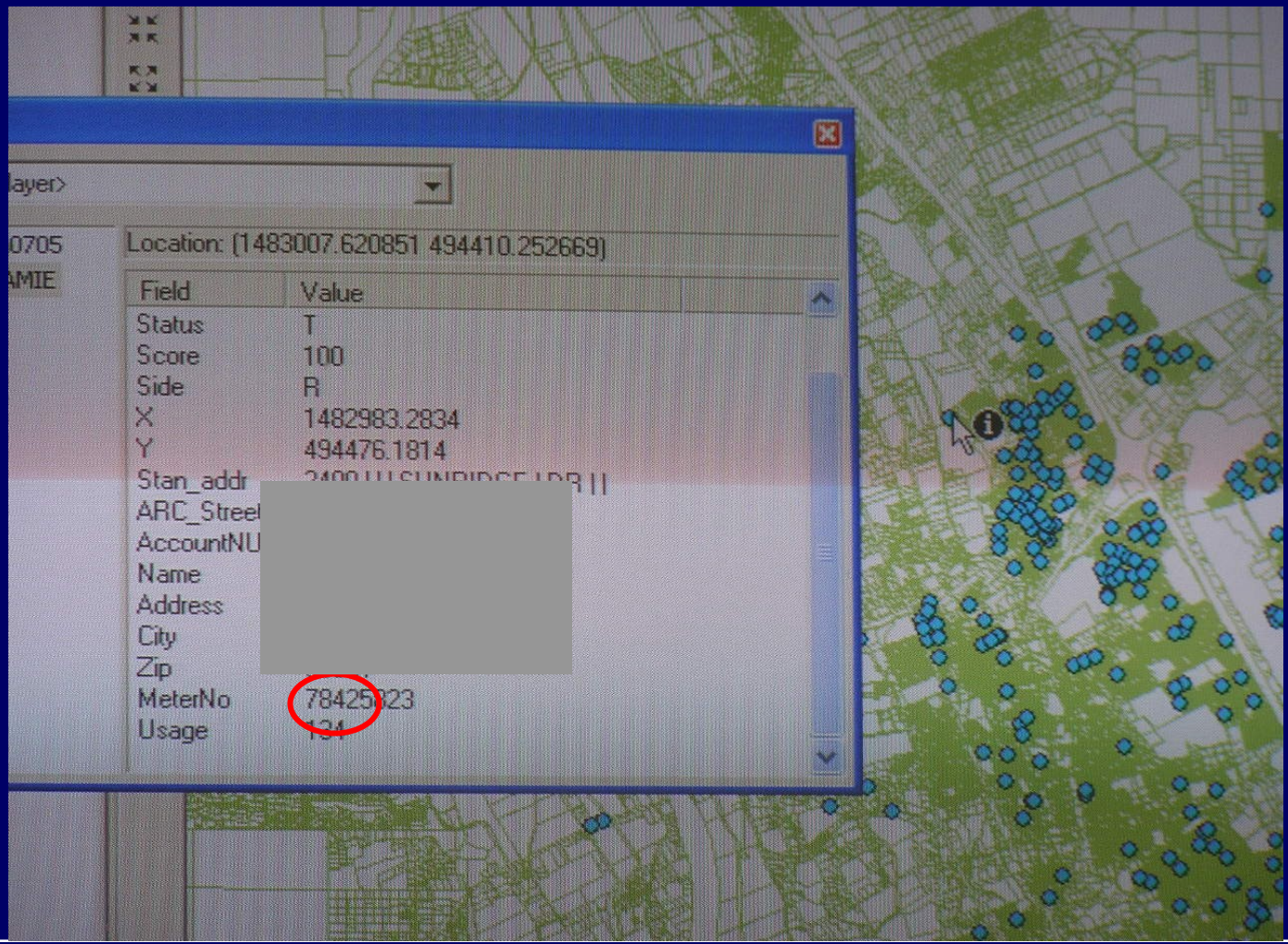
Summer Conservation Impact	2005 Gallons (000)	2006 Gallons (000)	ACTUAL % Diff
Total SFR	**2,938,778**	**2,895,550**	-1.5
June	355,808	386,454	1.1
July	428,178	373,904	-12.7
August	313,151	287,554	-8.2
3 Month Total	**1,097,137**	**1,047,912**	-4.5
Per Cent of Total	37.3%	36.2%	-1.1
Scenario 5%	**54,857**	**49,225**	**-4.7**
Annual Reduction	**1.9%**	**1.7%**	**Actual**

The *Measure* of Success - Production and Demand Analysis



GIS Developments

Smart Data Points



Swimming Pools VS Lawns

It's the Year 2010 PHASE I 5 YEAR ACCOMPLISHMENTS

Public Outreach

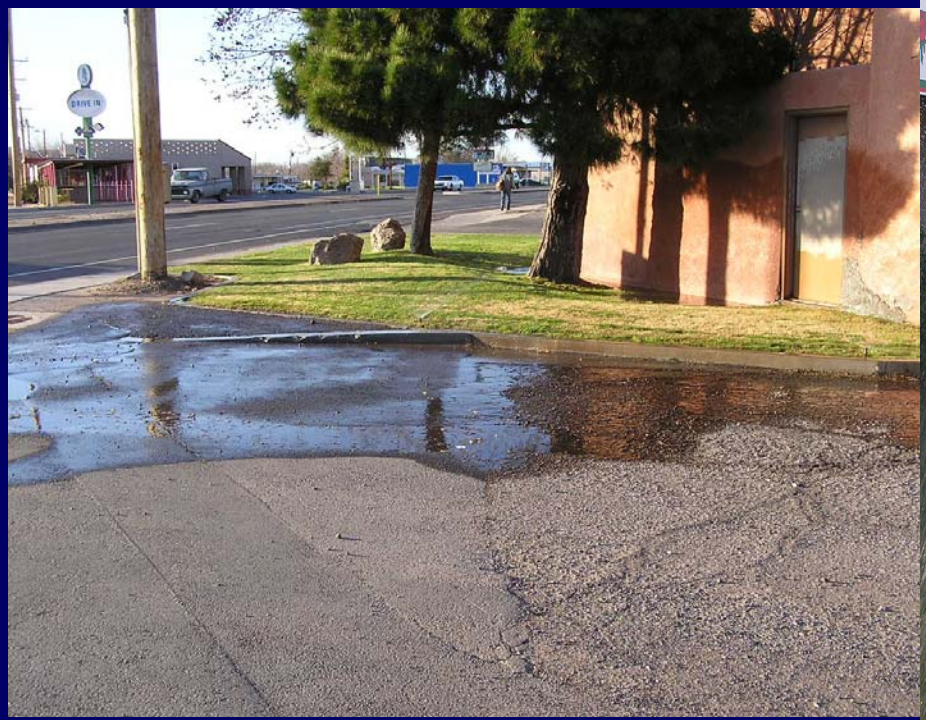
- K-12 Outreach
- City Lead By Example
- Enhanced Enforcement
- Demand Monitoring and Trending Methods Established
- 1% per year reduction

The results of Phase I and measured community response will provide the framework for all subsequent conservation measures to achieve both short and long range goals

Beyond Phase 1 – Proposed Future Initiatives

- Conservation Surcharge (Ex. >2x Avg) on utility bill
- Revised Landscape ordinance to include residential properties, lawn permits
- Heightened enforcement by Codes with assistance from utility staff and public reporting.
- Fines placed on utility bills.

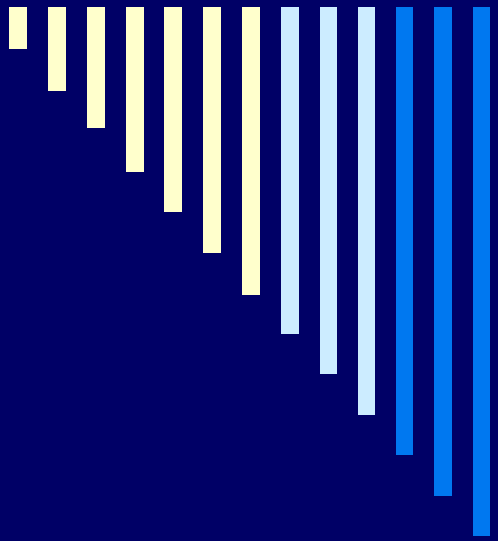
Report Water Wasting 528-4100



City of Las Cruces

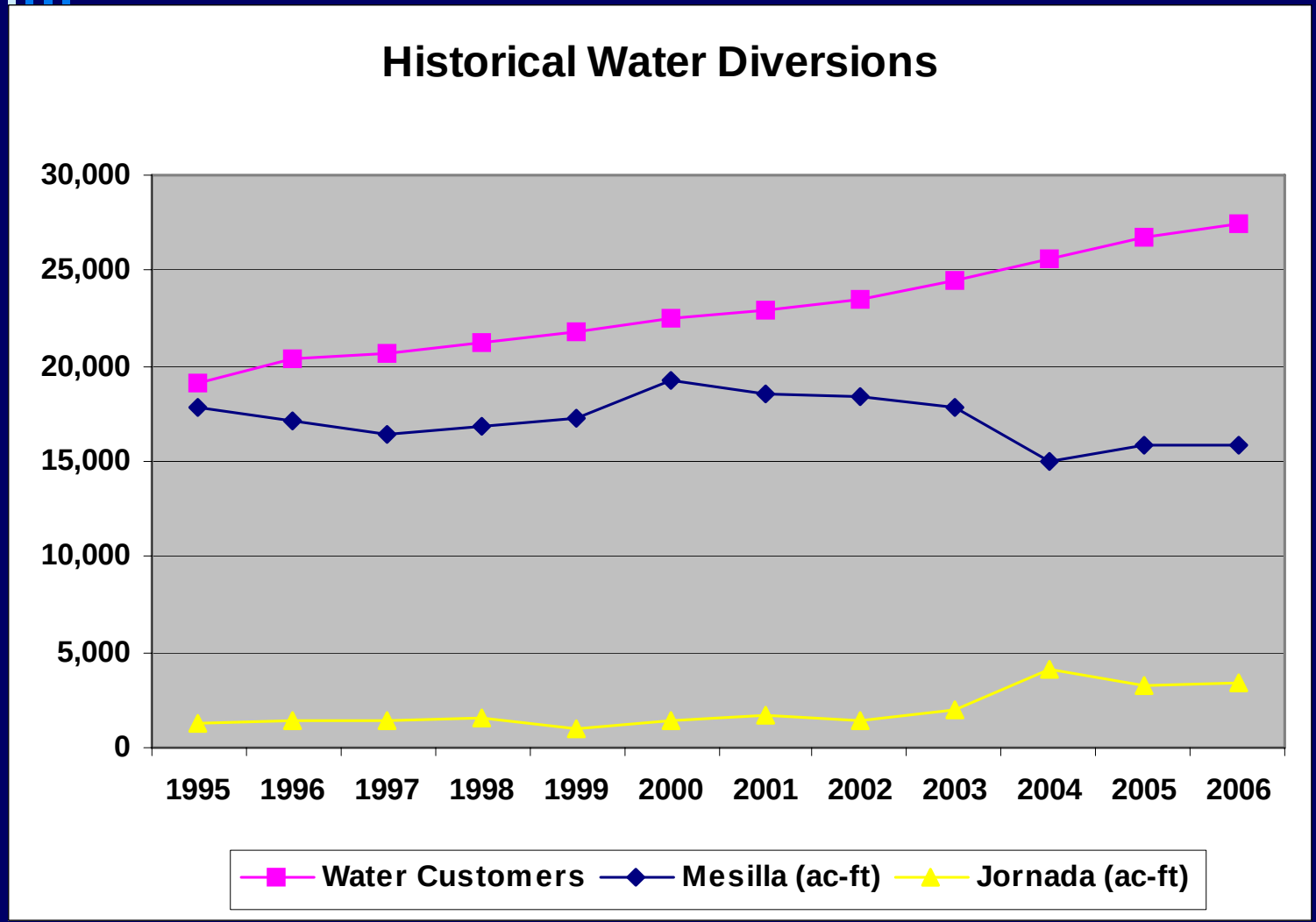
water conservation program

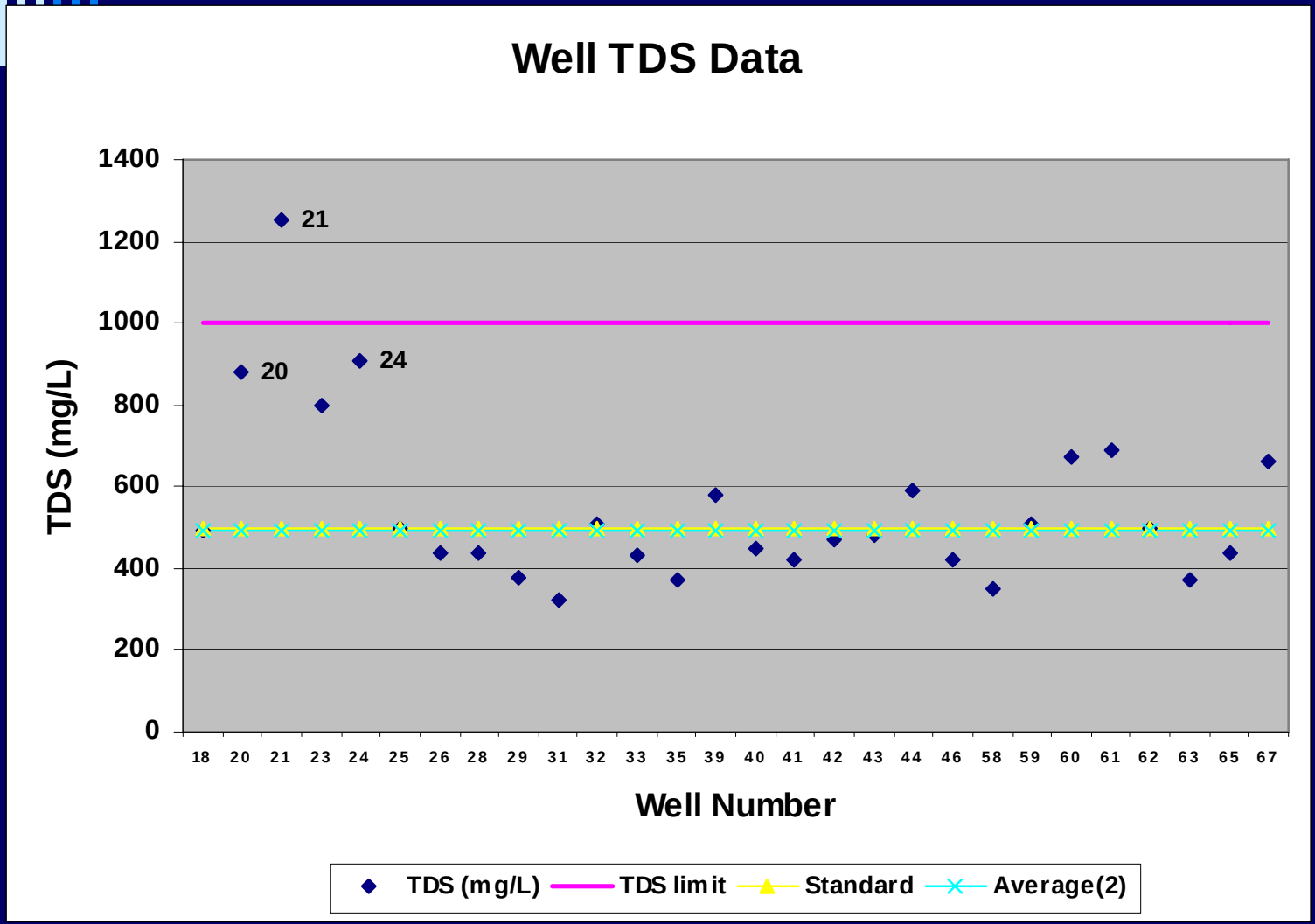
- The Conservation Program is off to a great start
- We have exceeded the first years goal
- Strong public and administrative support
- Many simple cost effective steps are underway that will measurably contribute to demand reduction year after year.

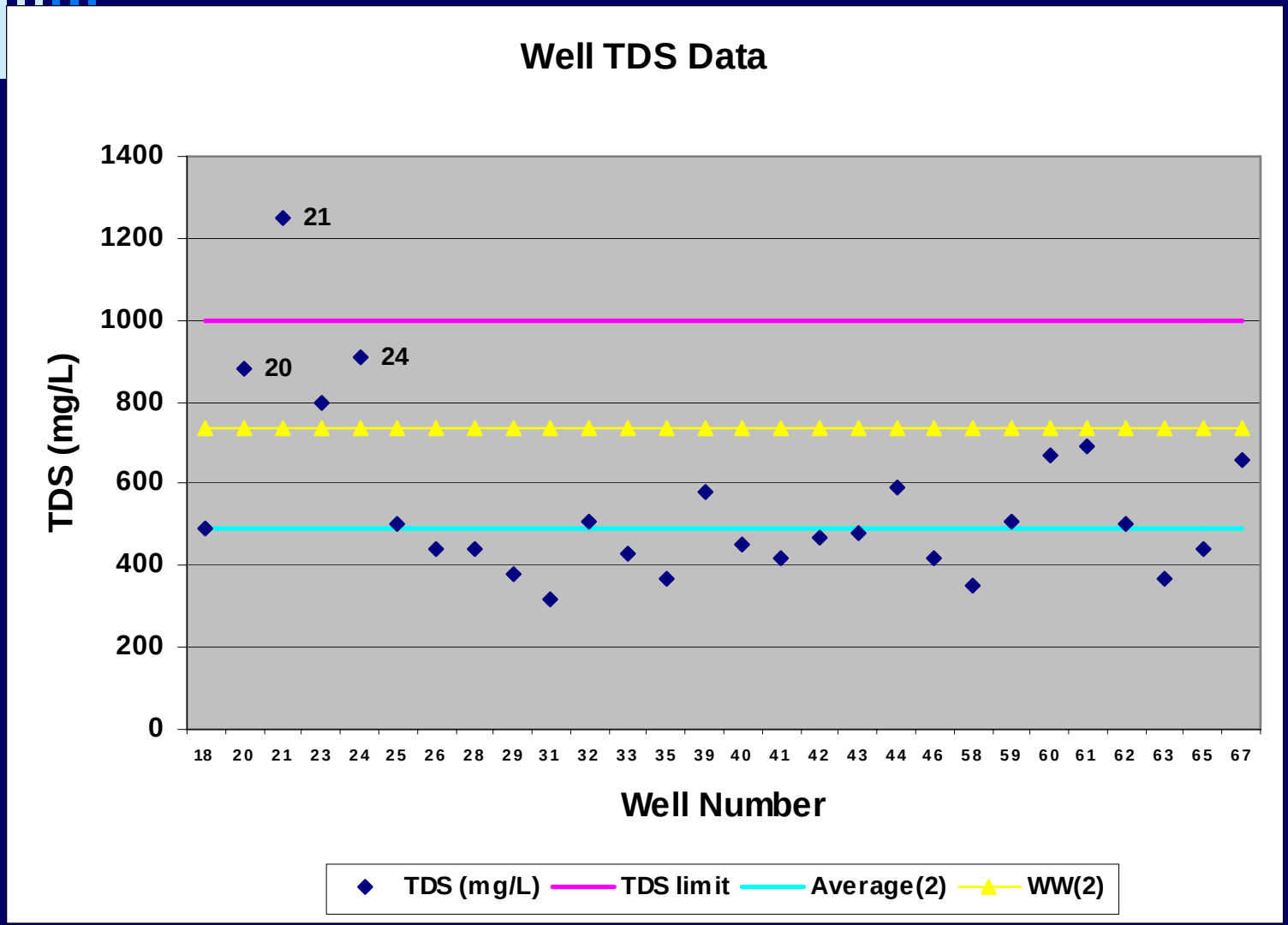


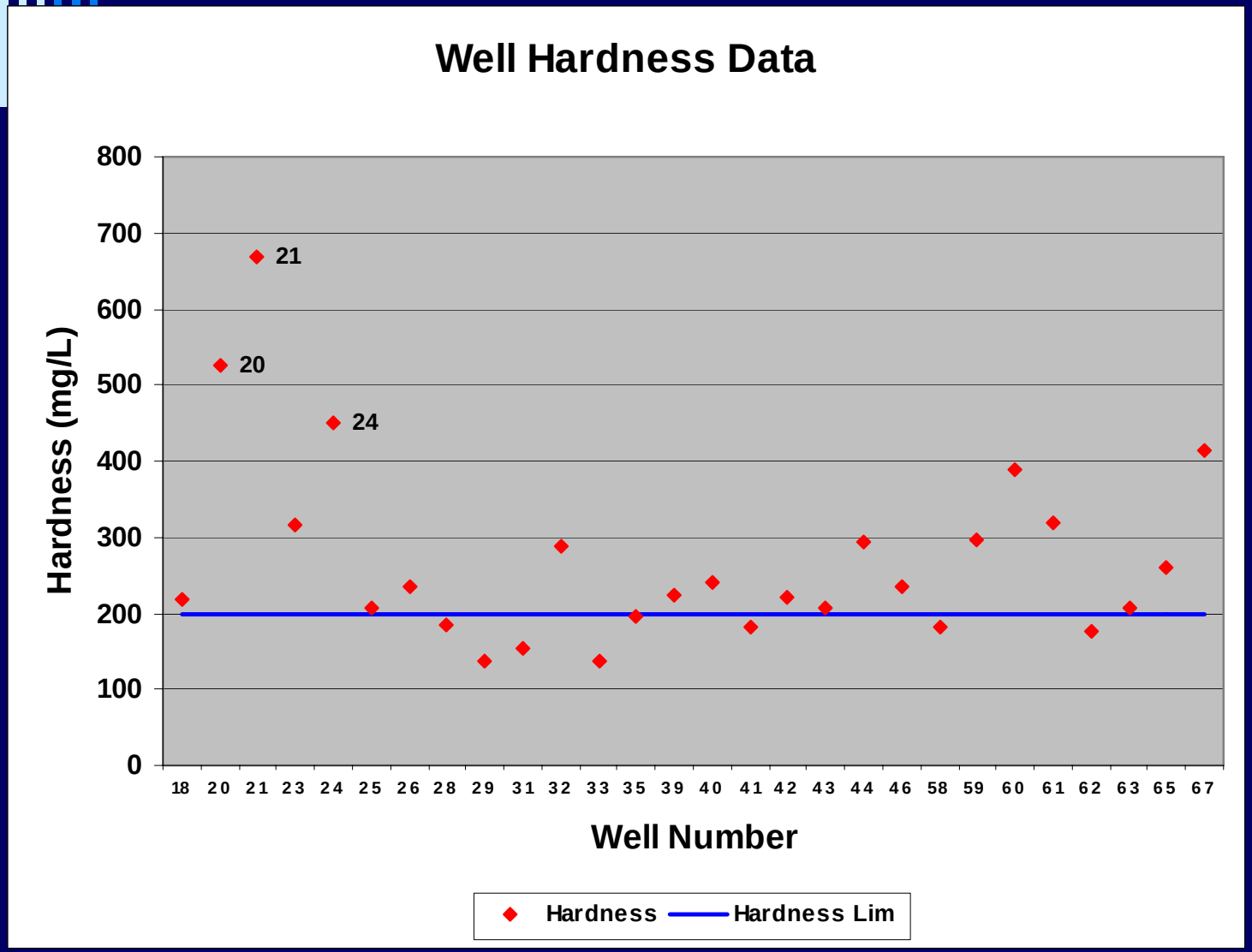
End of Presentation

Thank you


Historical Water Diversions
30,000
25,000
20,000
15,000
10,000
5,000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Water Customers
Mesilla (ac-ft)
Jornada (ac-ft)


Well TDS Data
TDS (mg/L)
1400
1200
1000
800
600
400
200
0
21
20
24
18 20 21 23 24 25 26 28 29 31 32 33 35 39 40 41 42 43 44 46 58 59 60 61 62 63 65 67
Well Number
TDS (mg/L)
TDS limit
Standard
Average(2)


Well TDS Data
1400
1200
1000
800
600
400
200
0
TDS (mg/L)
21
20
24
18 20 21 23 24 25 26 28 29 31 32 33 35 39 40 41 42 43 44 46 58 59 60 61 62 63 65 67
Well Number
TDS (mg/L)
TDS limit
Average(2)
WW(2)


Well Hardness Data
Hardness (mg/L)
800
700
600
500
400
300
200
100
0
21
20
24
18 20 21 23 24 25 26 28 29 31 32 33 35 39 40 41 42 43 44 46 58 59 60 61 62 63 65 67
Well Number
Hardness
Hardness Lim