



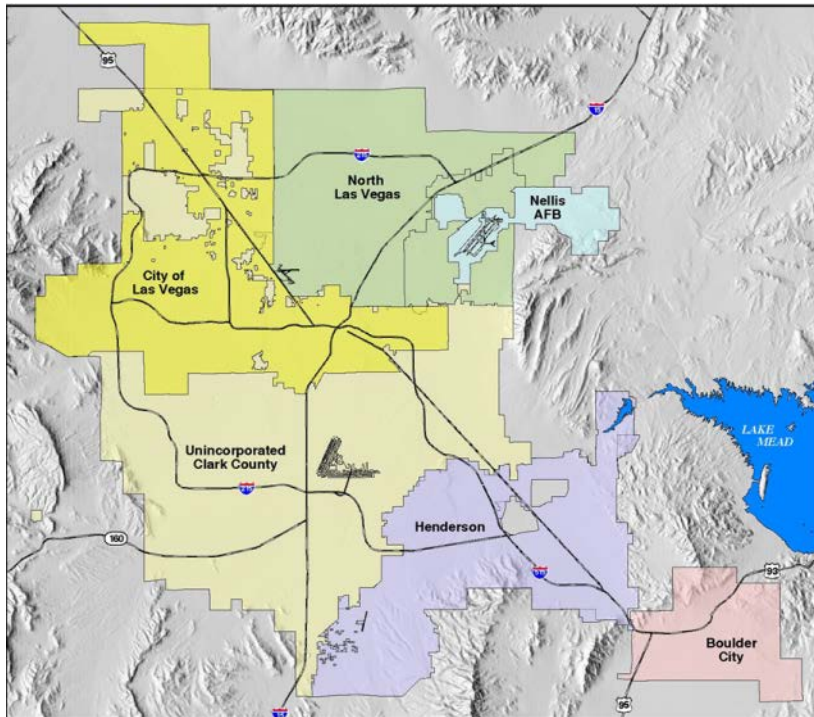
SOUTHERN NEVADA WATER AUTHORITY®

# Using GIS as the Backbone of the World's Largest Water Conservation Rebate Program

**Lou Reinbold**

*Asst. Conservation Programs Coordinator, SNWA*

# Southern Nevada Water Authority (SNWA)



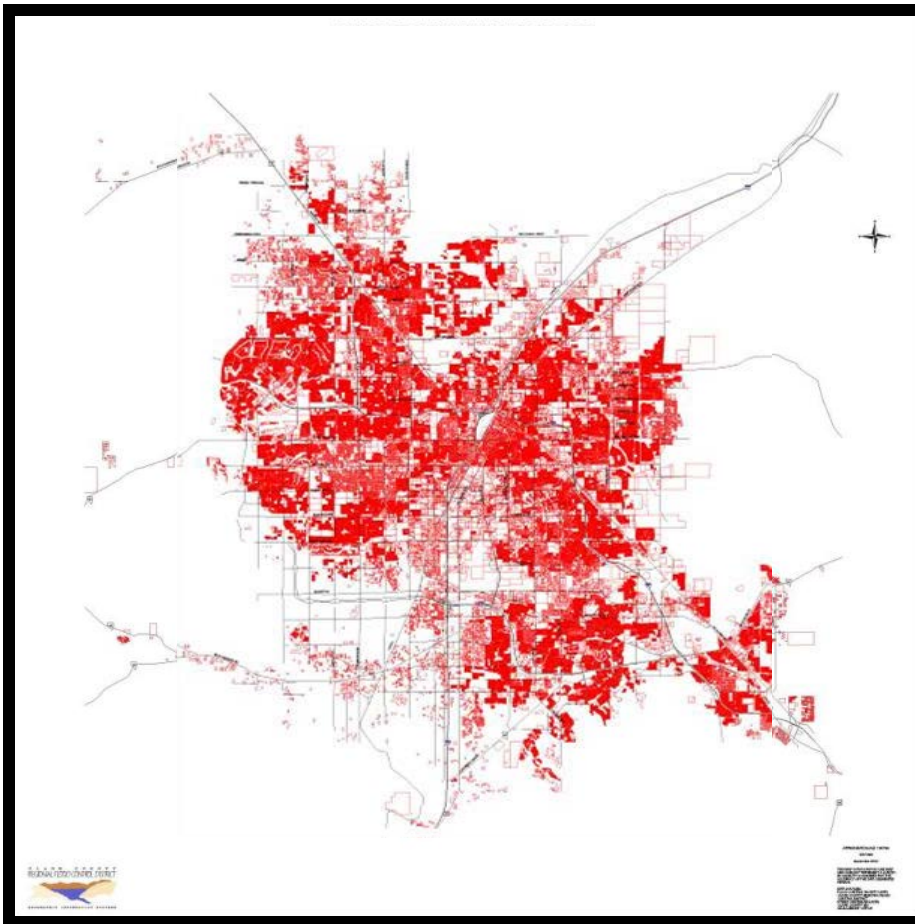
## Member Agencies

- Big Bend Water District
- City of Boulder City
- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County Water Reclamation District
- Las Vegas Valley Water District

# CHALLENGES

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In the 1990's Southern Nevada hit a crisis point: additional water was needed to meet growing demands.



## Population

1950 – 48,000

1960 – 127,000

1970 – 273,000

1980 – 463,000

1990 – 800,000

2000 – 1,400,000

2009 – 2,006,000

# LAS VEGAS AND WATER

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What do you think of?




**The Bellagio**



**The Venetian**



**The Colorado River Basin  
is facing one of the worst  
droughts in recorded  
history.**



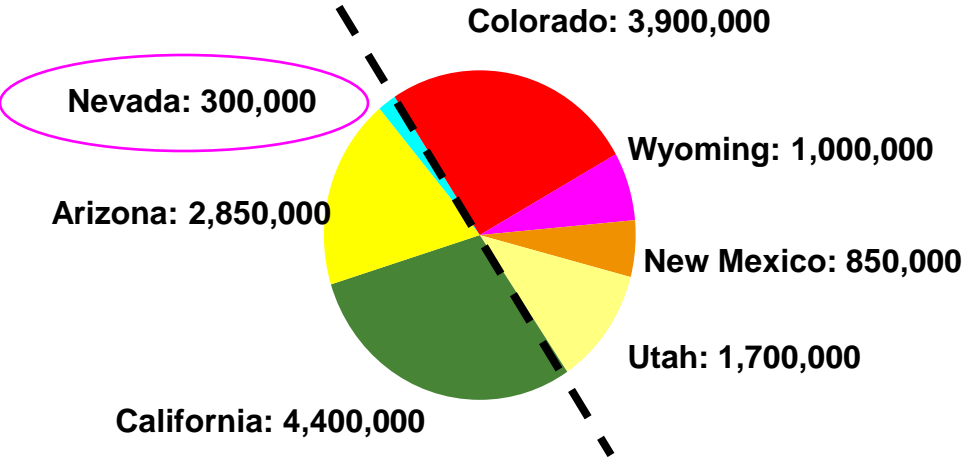
**The Southern Nevada Water Authority meets the water demands of Southern Nevada's 2 million residents and 40 million annual visitors.**

- **\$93 Billion in Gross Domestic Product**
- **71% of Nevada's Total Gross Domestic Product**



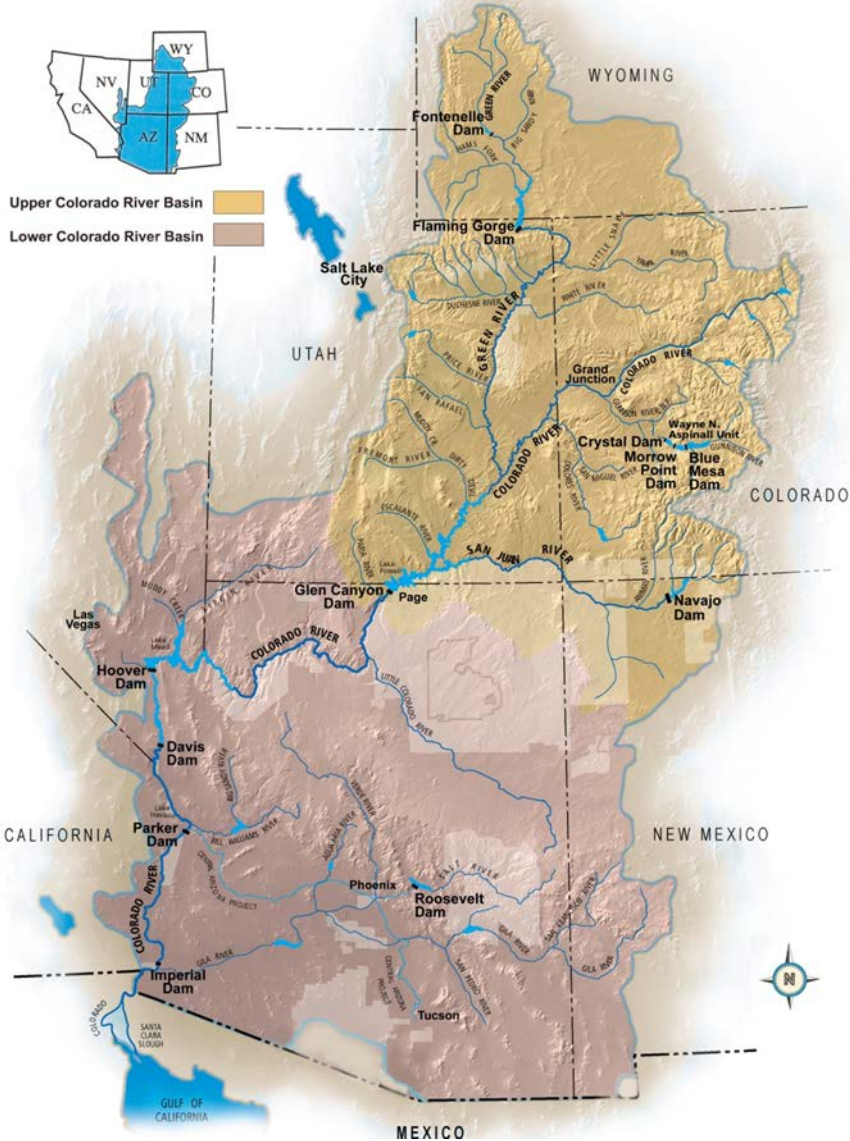
# Colorado River

**UPPER DIVISION  
7.5 million afy**

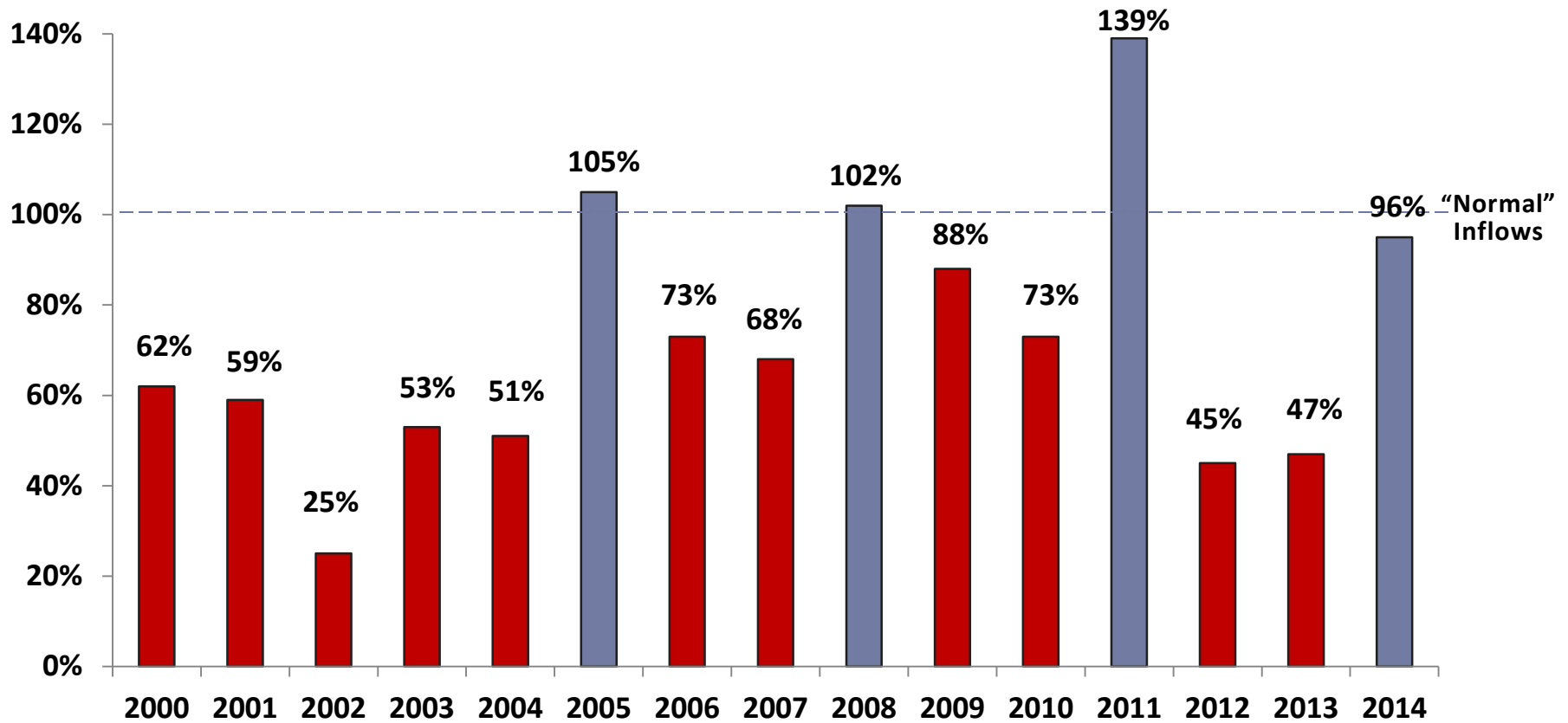


**LOWER DIVISION  
7.5 million afy**

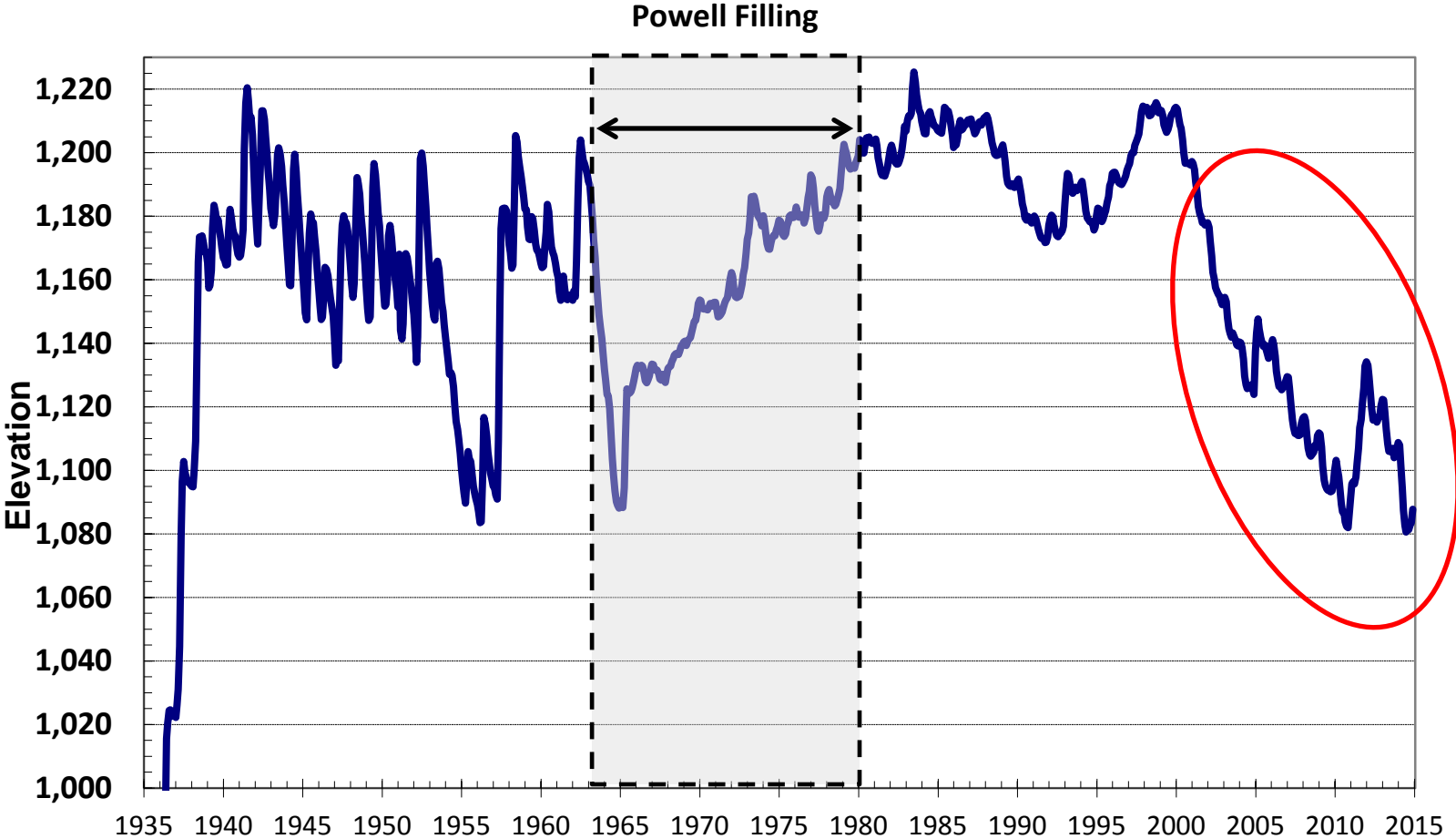
## Colorado River Basin



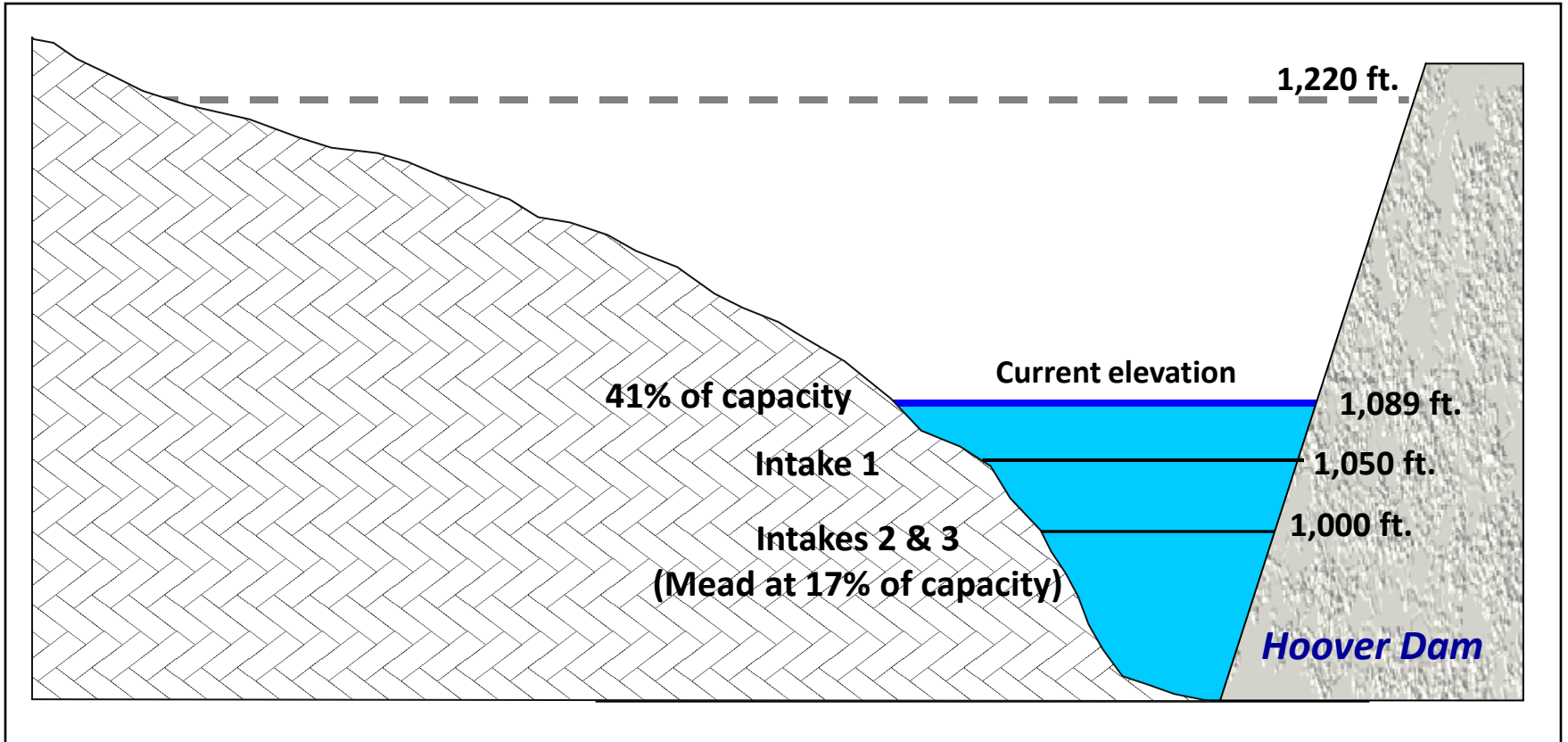
# Lake Powell's annual inflows continue to be below normal.



**As a result, Lake Mead water elevations have declined more than 100 feet during the past 14 years.**



# LAKE MEAD ELEVATION



Current Colorado River System Content: 49%

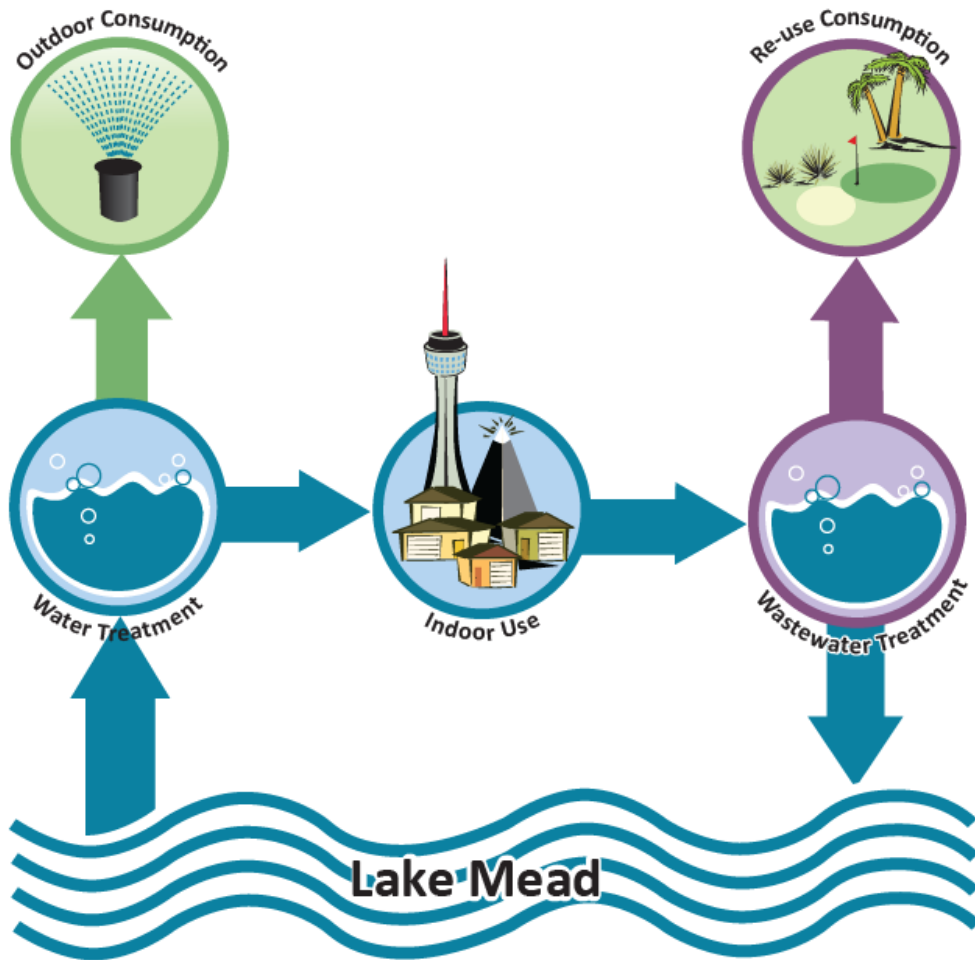
# Inner Las Vegas Bay



**March 7, 2000, elevation 1213 Feet**



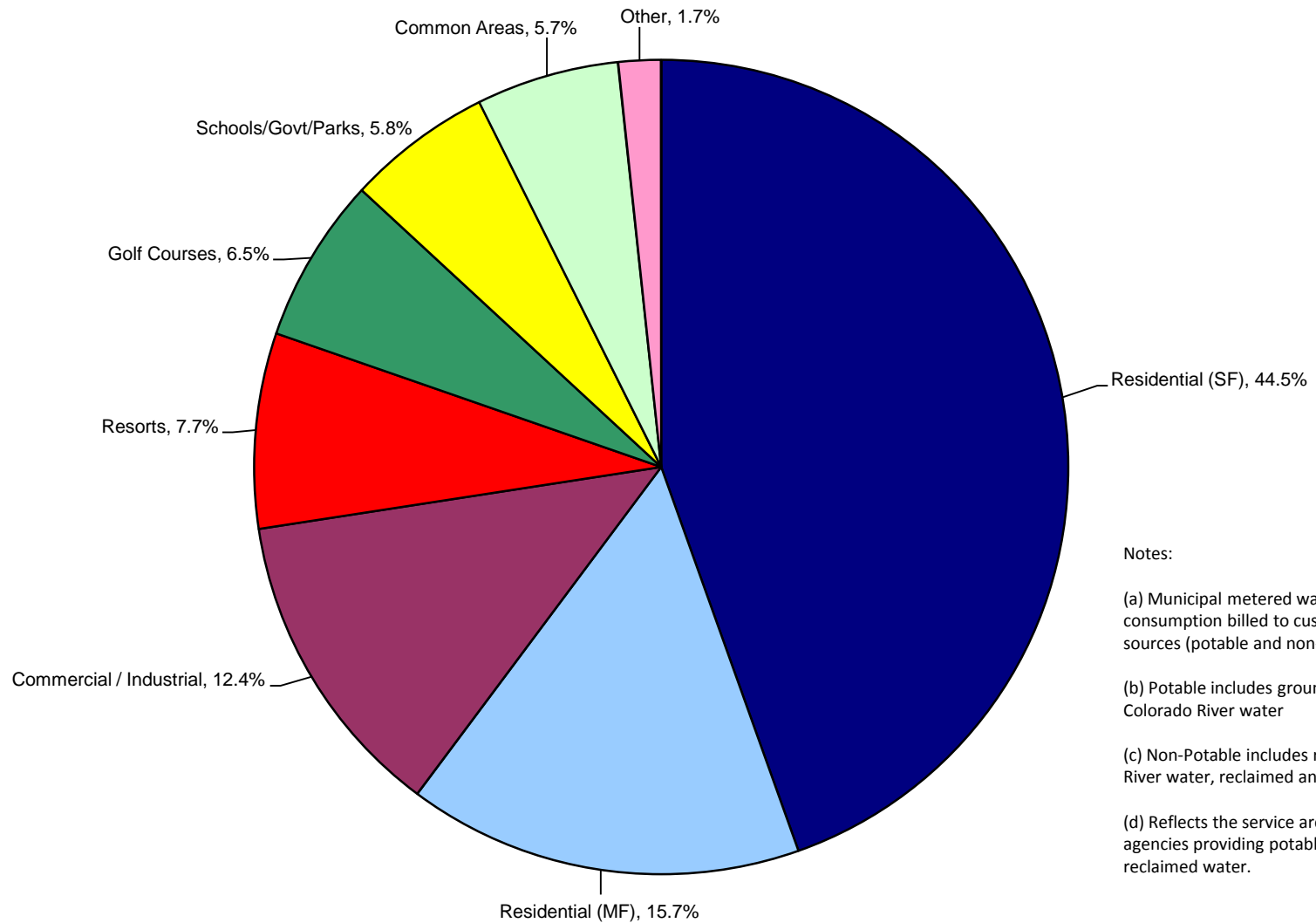
**April 11, 2002, elevation 1170 Feet**



Return-flow credits allow Southern Nevada to reuse 99% of the water used indoors.

Conservation Programs are targeted at the outdoor water use that can't be re-used. Outdoor water use in Southern Nevada makes up 60% of total usage.

# How is Water Used?



Notes:

(a) Municipal metered water consumption billed to customers from all sources (potable and non-potable).

(b) Potable includes ground water and Colorado River water

(c) Non-Potable includes raw Colorado River water, reclaimed and reused water

(d) Reflects the service areas of all SNWA agencies providing potable and/or reclaimed water.

# WaterSmart Landscapes Program

- Began in 1999. Customers are paid to remove turf from their landscape and replace it with desert landscaping.
- \$1.50 per square foot (up to 5,000 sq ft) then \$1.00 per square foot up to \$300,000 per property per year.
- Irrigation and planting requirements
- Ensure permanent water savings through a Conservation Easement placed on the land.





# WSL Program to Date

- **Converted of 170,000,000 Sq Ft of turf**
- **Conversions have resulted in a savings of over 78,000,000,000 gallons of water!**
- **New water savings of approximately 9.6 Billion gallons per year**
- **3,000 landscape conversion annually**
- **All properties are measured by Conservation field staff**



# Turf Analysis Project (TAP)

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## Technical Details

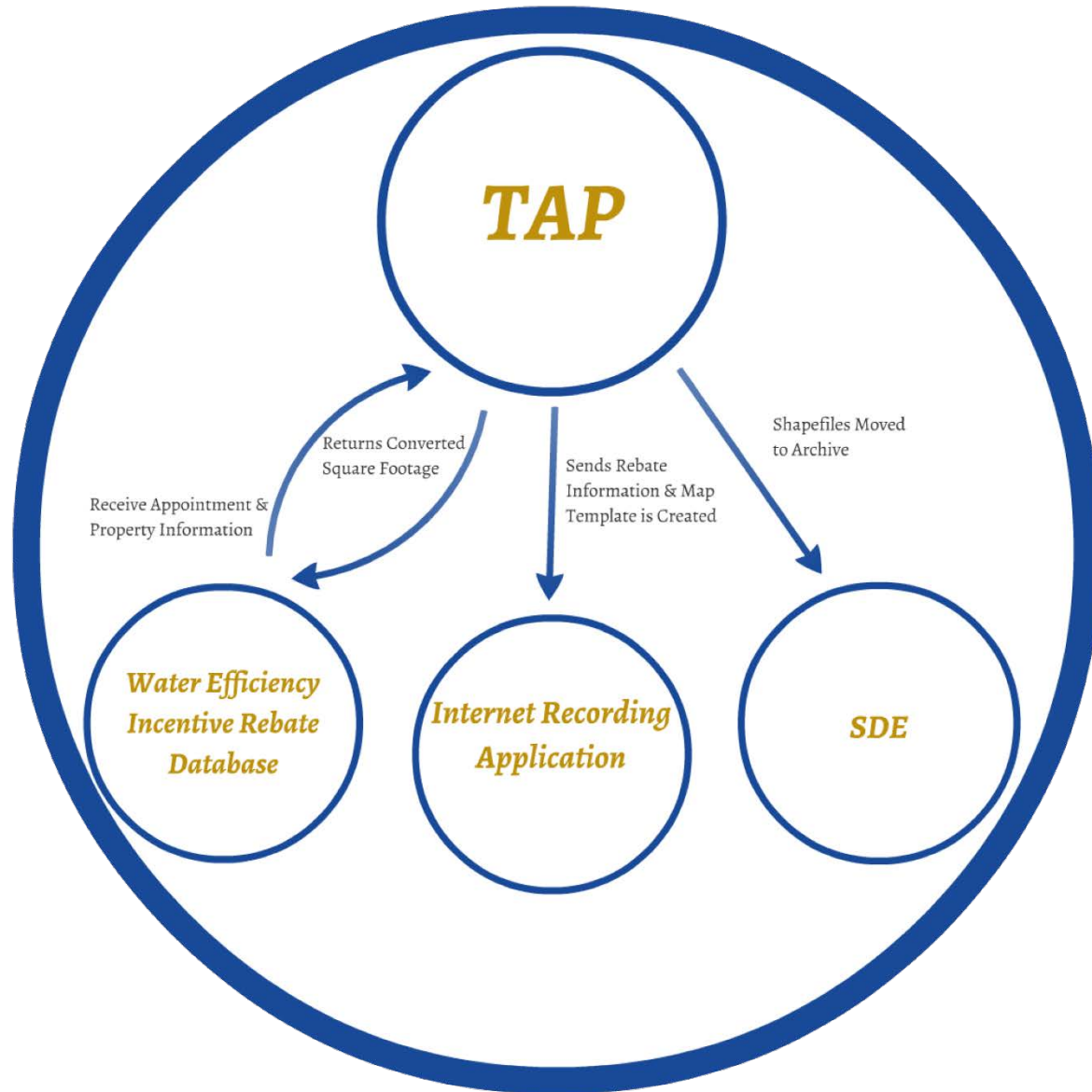
- Custom ArcGIS Application using an ArcMap add-in
- Utilizes ArcGIS Server and LizardTech
- Numerous Data Layers
- Interfaces with multiple applications

**Vital to the creation of Conservation Easement Legal Documents**

**On Average 8,000 maps per year are created using TAP**

- 2,000 Pre Conversion Maps
- 3,000 Post Conversion Maps
- 3,000 Exhibit C Maps

# TAP Diagram



# Parcel Information / Application Overview

The image shows a screenshot of the ArcMap software interface. The main window displays an aerial photograph of a residential neighborhood with parcel boundaries overlaid in cyan. A 'Parcel Information' dialog box is open in the center, listing various attributes for a selected parcel. The dialog box has a title bar with 'Parcel Information' and standard window controls. The attributes listed are:

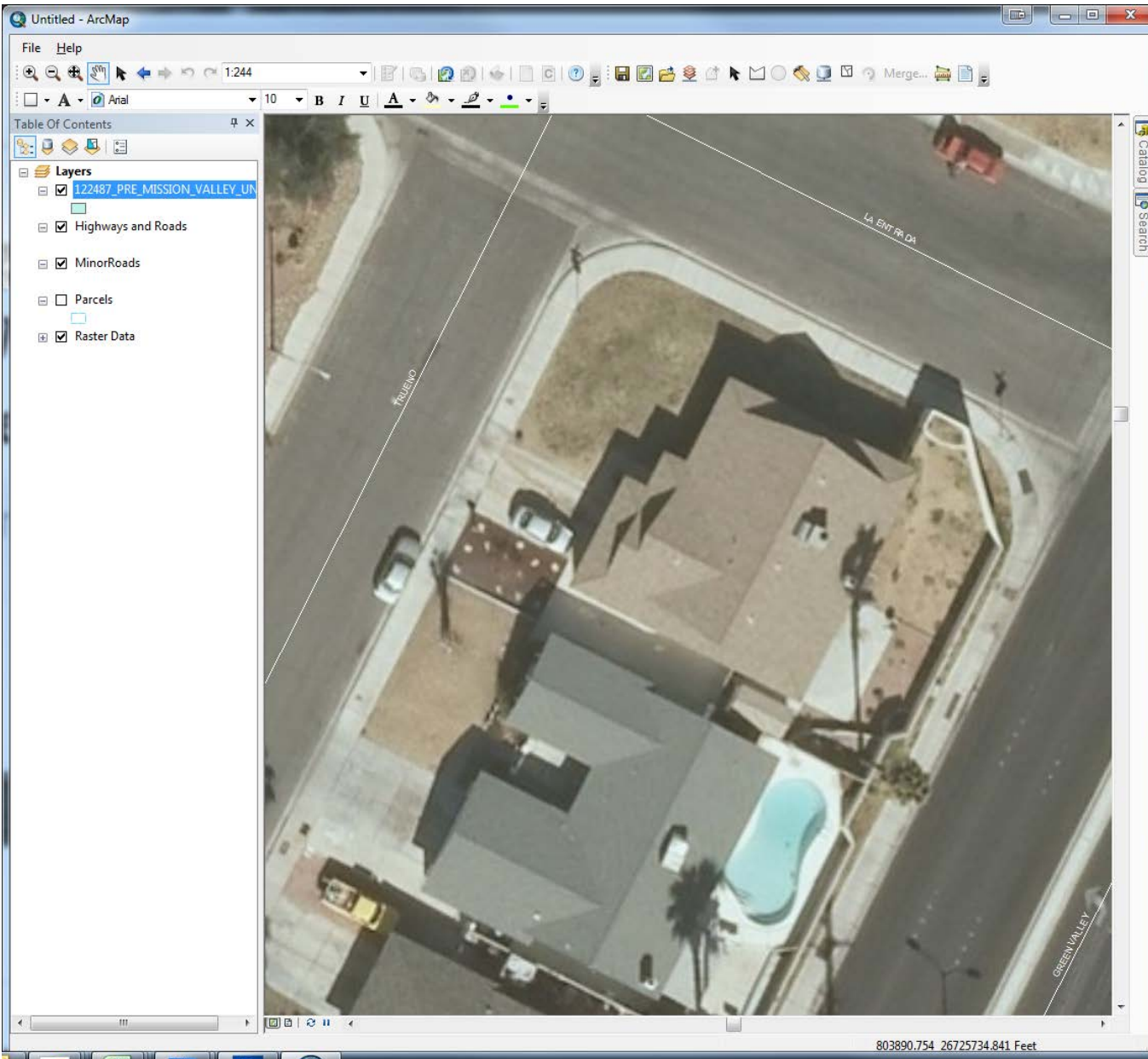
- Parcel Number:
- Address:
- Owner's Name:
- Zip Code:
- Lots Size (sq ft):
- Land Use:
- Constructed Year:
- Sale Price:
- Sale Date:
- Sub Name:

At the bottom of the dialog box is a 'Close' button with a red 'X' icon. The background map shows streets such as EL FERRO, LA MESA, GREEN VALLEY, and BELVEDERE. The software interface includes a 'Table Of Contents' on the left with layers like 'Highways and Roads', 'Minor Roads', 'Parcels', and 'Raster Data'. The top toolbar shows various navigation and editing tools, and the scale is set to 1:1,200.

# Shapefile Creation & Drawing Toolbar

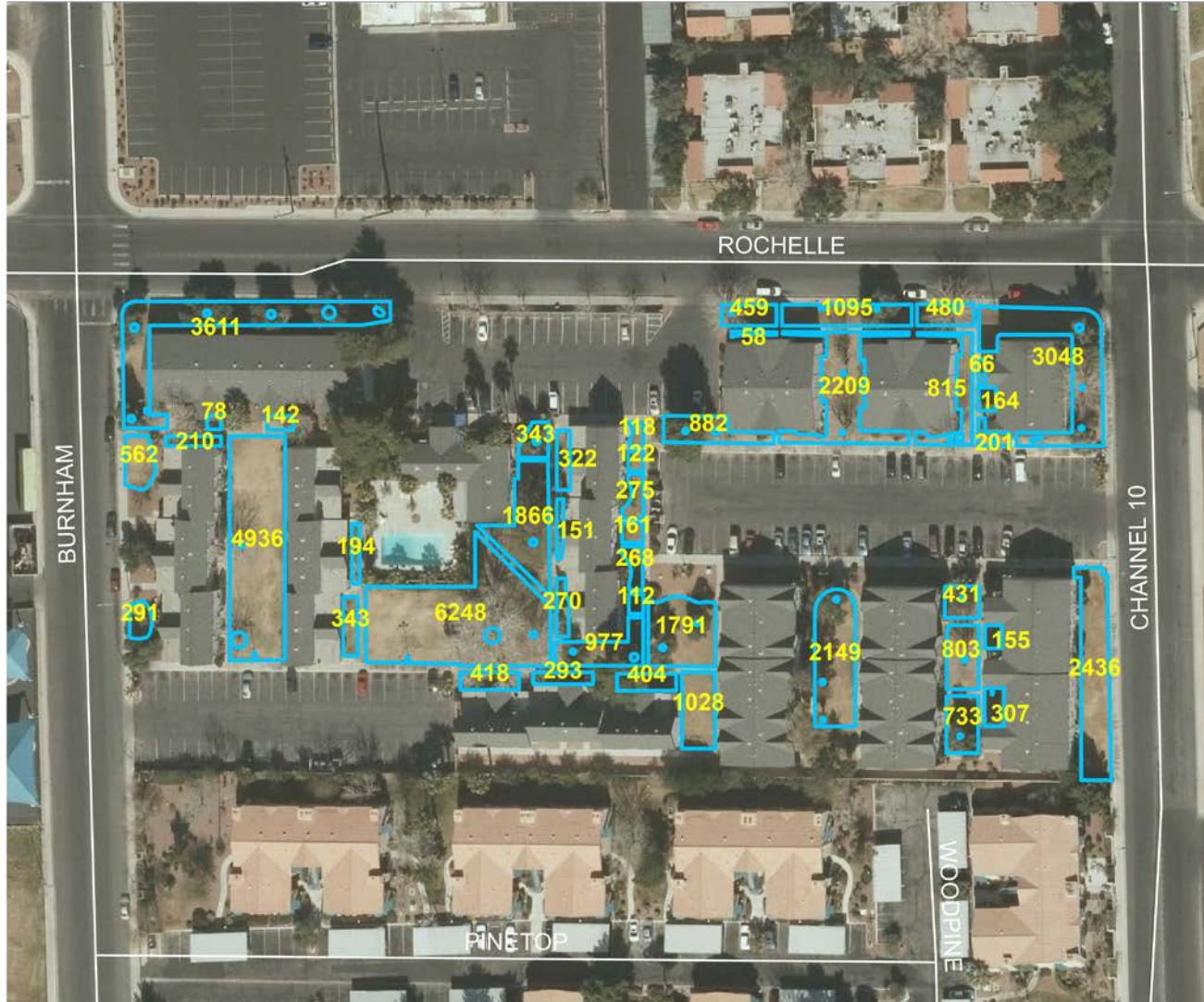
## Notes:

- Shapefiles are automatically created based on property & work order attributes.
- Custom Toolbars created with program necessary buttons.
- Some buttons are greyed out unless a user is in a specific user class.
- Historical shapefile archive for all properties.



# Map Creation

Pre-Measure Sq Ft= 42,025



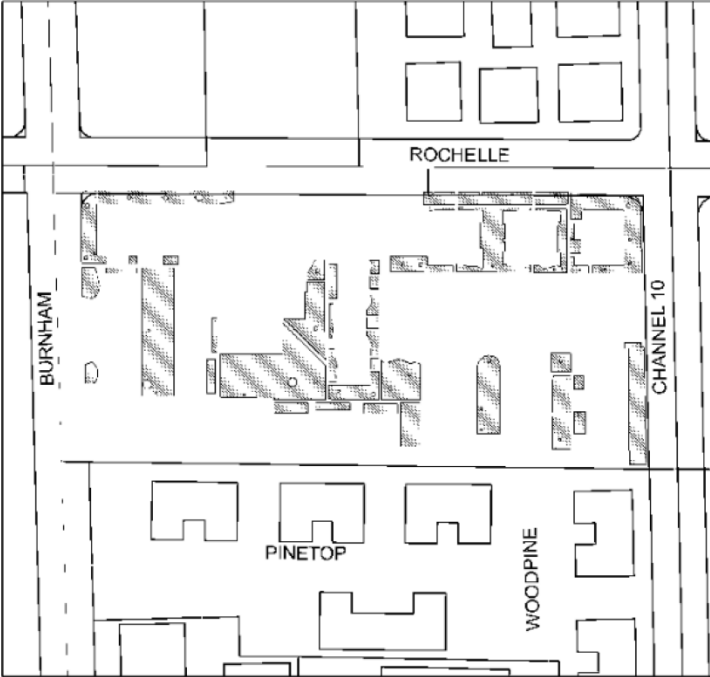
Source:  
Clark County GIS Management Office  
Southern Nevada Water Authority

WSL Rebate Calculations are conducted by the Conservation Department of SNWA and are approximate figures. All other data on the map is for display purposes only, and no liability is assumed to the accuracy of that data delineated herein.

# Map Creation – Legal Templates

Dynamic Fields

1 → Parcel Number: Exhibit C



2 → Total Sq. Ft. Incentive Amount

3 → Legal Description

0 45 90 180 270 360 Feet

NORTH

Legend  
Converted Area  
Parcels

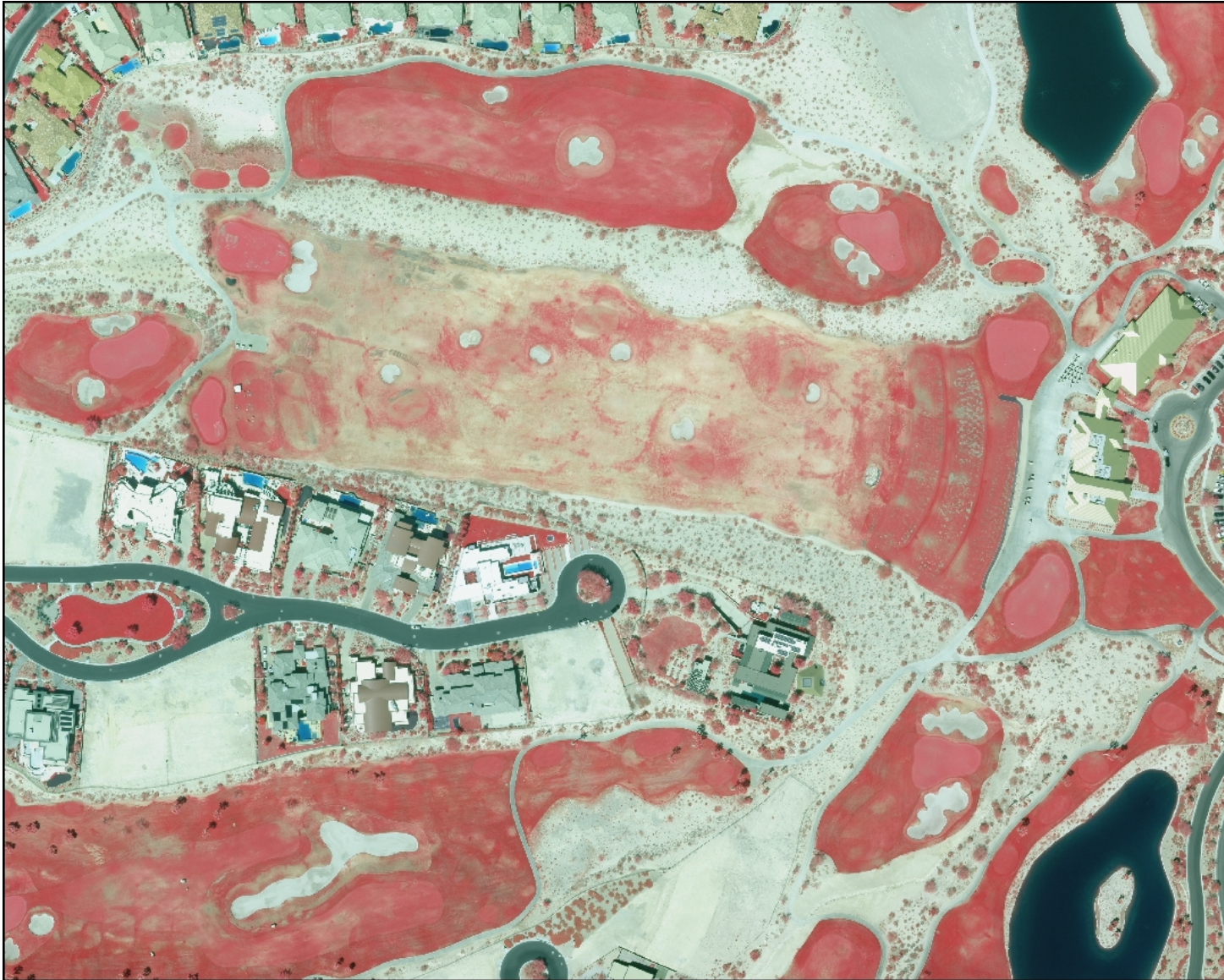
Dynamic Fields

1. Parcel Number
2. Total Square Footage and Rebate Amount
3. Legal Description

Notes:

- Exhibit C map is a requirement for the creation of the Conservation Easement.
- Map format is automated. Format is fixed to comply with PRIA standards.
- User simply verifies data and saves the map.

# What's Out There?

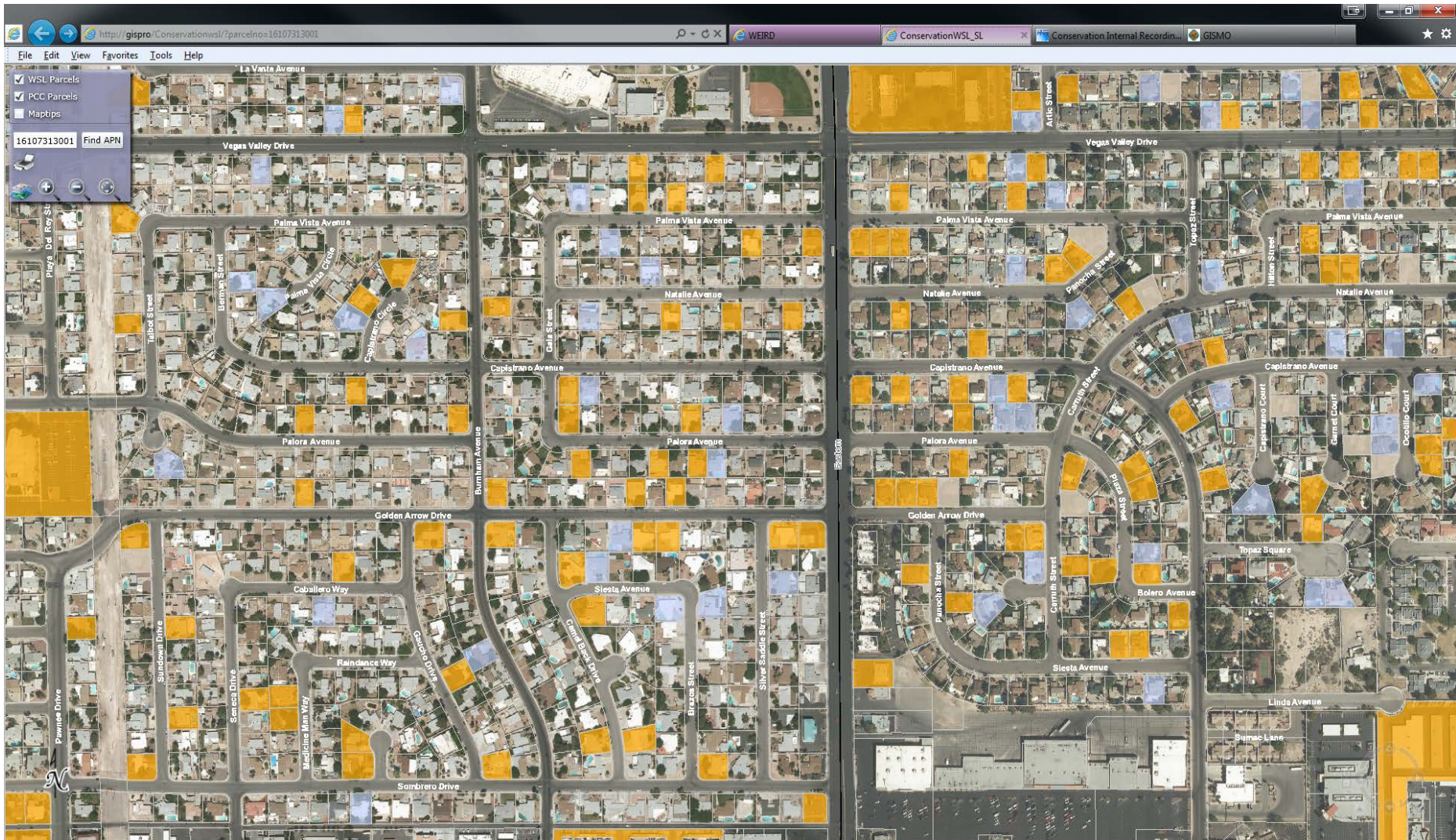




# What's Out There?



# Target Marketing



# Golf Course Play Areas

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- **What if we can visualize where the players actually go on courses?**
- **This can tell us where ideal prospective future areas for conversion are.**
- **We can examine past conversions and see if the selections were good fits for the players.**
- **While these are the primary areas of interest for SNWA, other findings can be made, including:**
  - Pace of play per hole and even per shot/ (and how might that relate to conversions)
  - Maintenance efficiency for a given area.
  - Mowing pattern efficiency.



Green Valley North

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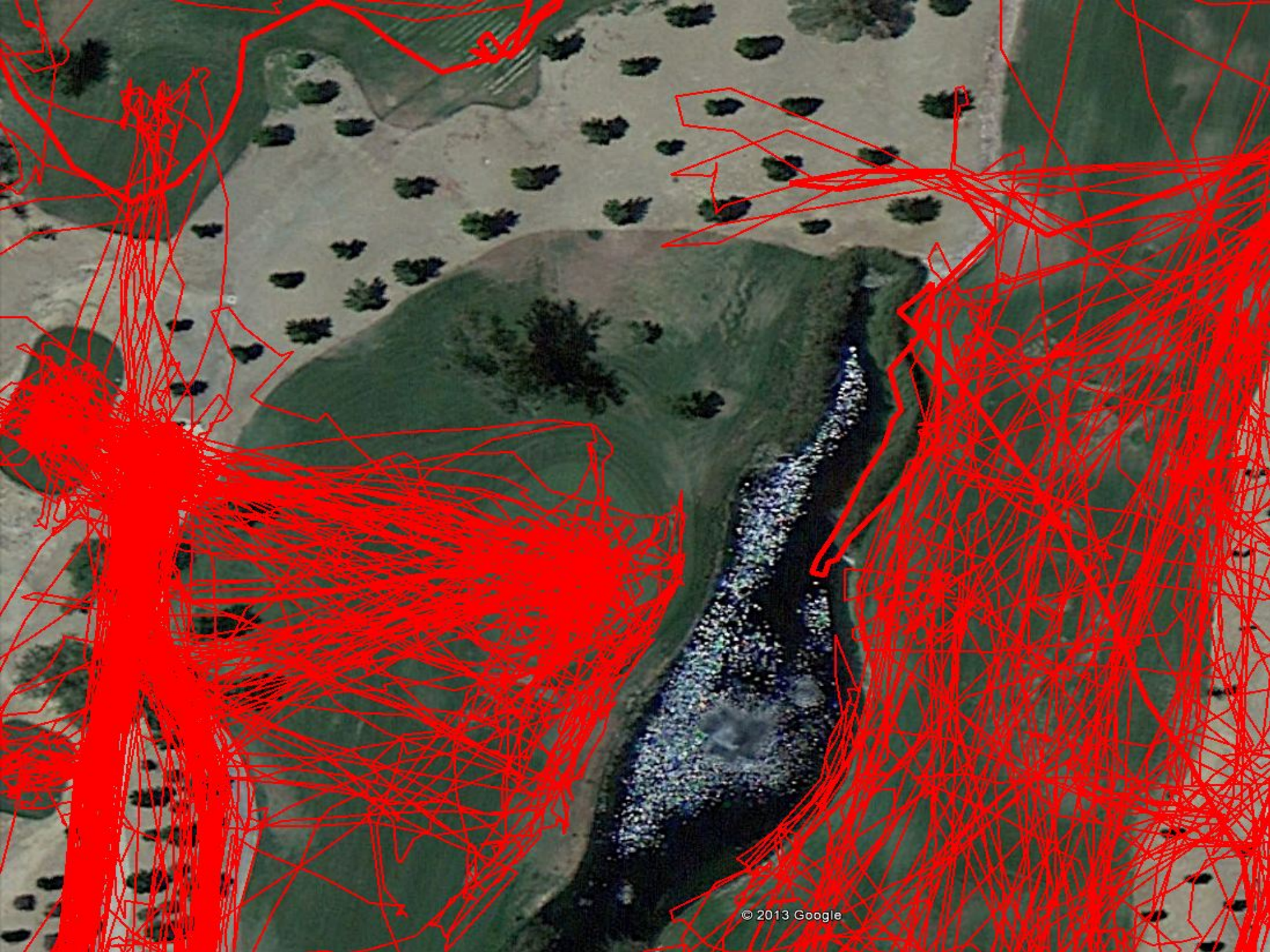


POI1

POI1

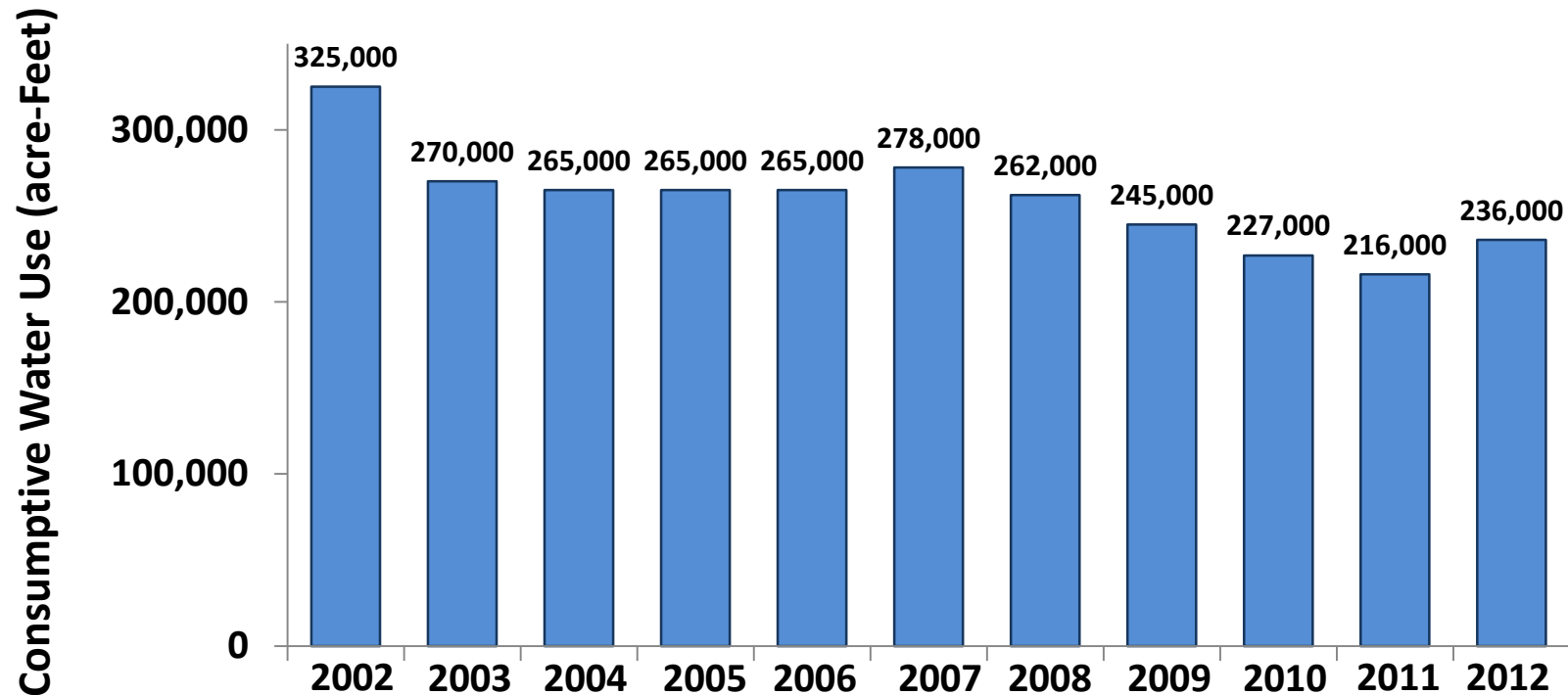
POI1

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# Conservation Achievements

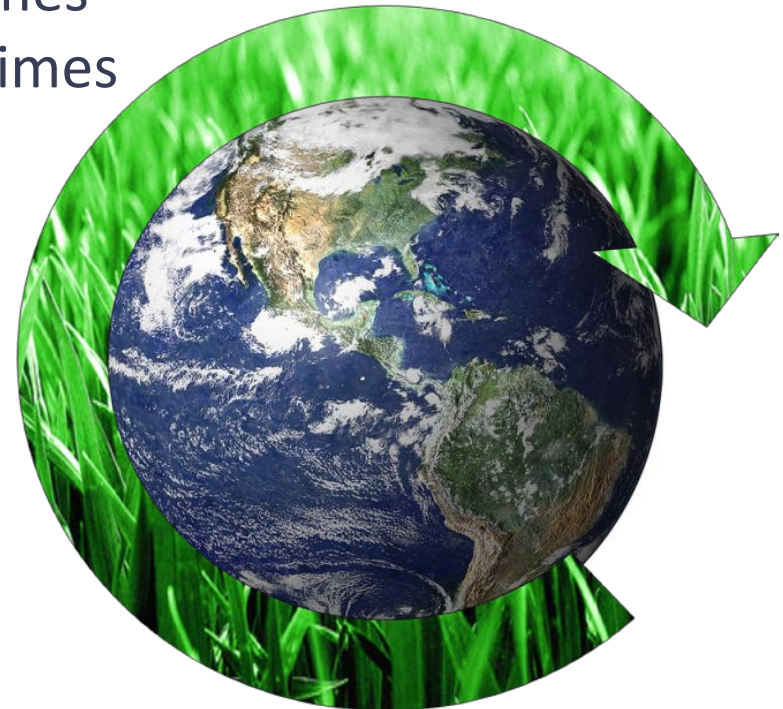
**Our community has made significant conservation achievements.**



**Southern Nevada uses nearly 90,000 fewer acre-feet of water than it did just over ten years ago, despite an annual population increase of nearly 500,000 residents and millions of annual visitors.**

# Fun Facts

- Southern Nevada has removed enough grass for a roll of sod to extend 87% of earth's circumference!
- Enough water has been saved to:
  - Fill 882,000 Olympic Swimming Pools
  - Fill the Luxor Hotel Pyramid 217 times
  - Fill the Empire State Building 283 times
- Saved 240,234 acre feet of water.
- Entire years' worth of water saved!





# Questions?

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To learn more please visit

[snwa.com](http://snwa.com)

[watersmartinnovations.com](http://watersmartinnovations.com)

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