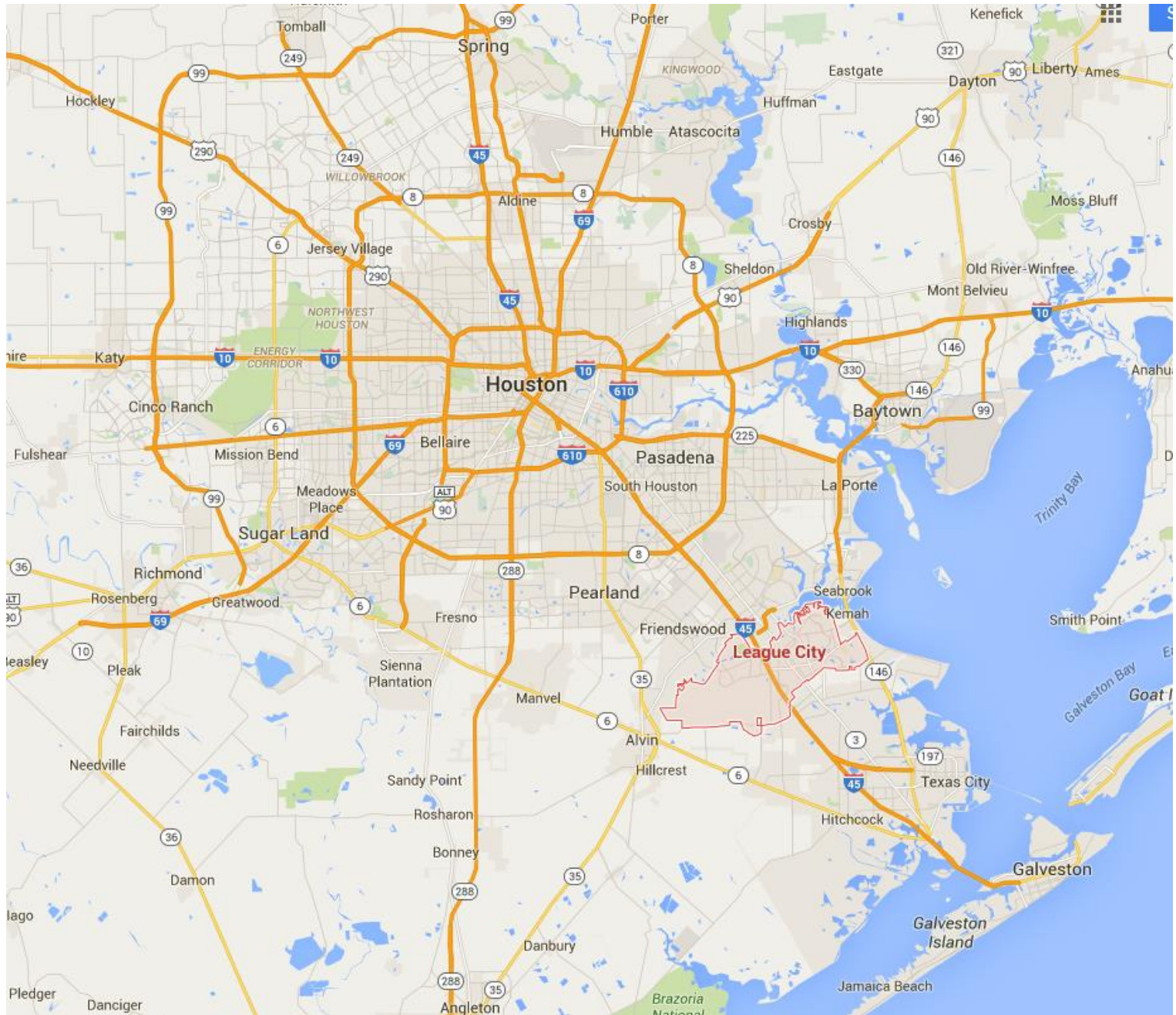


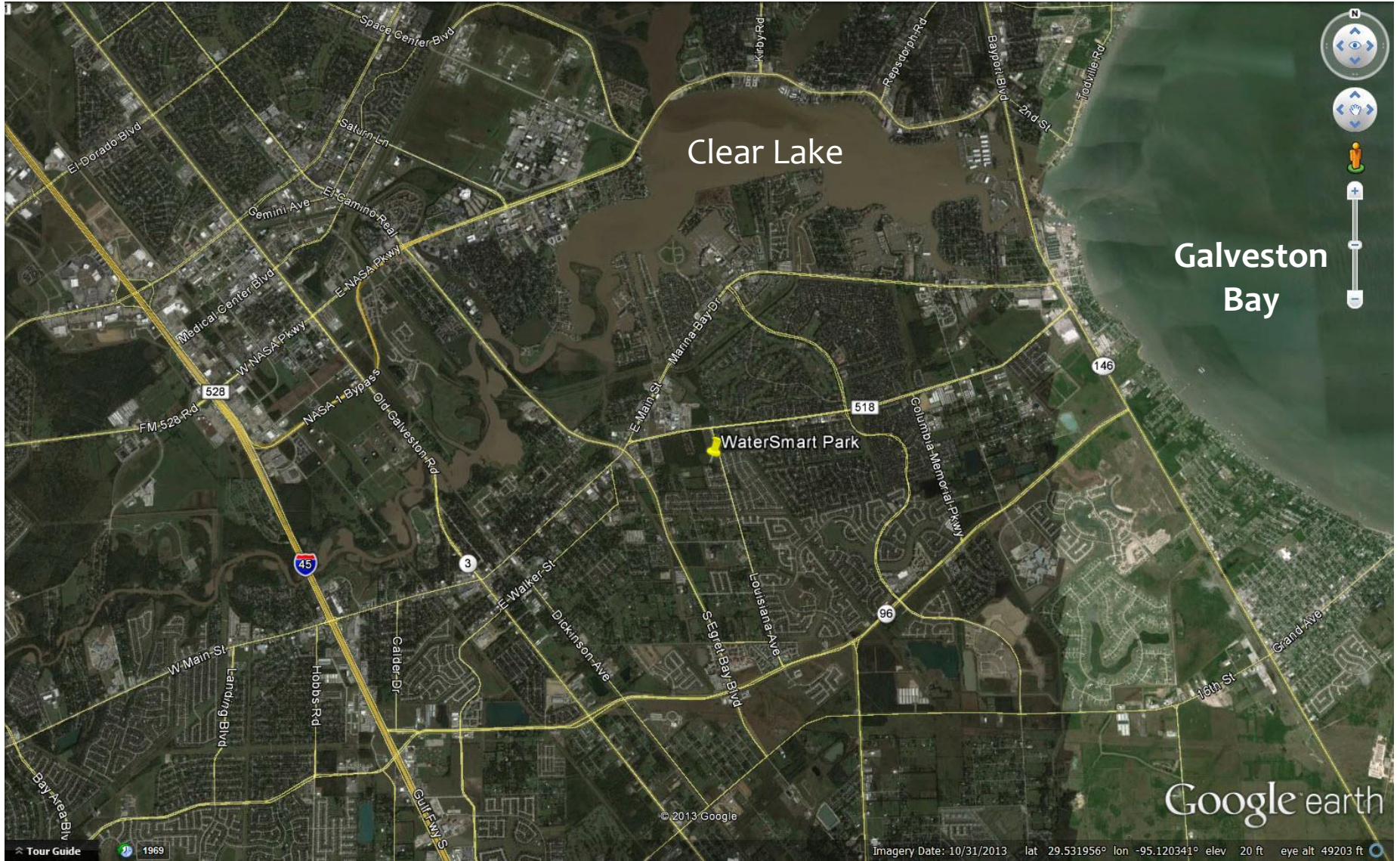
# LID practices at the Ghirardi Family WaterSmart Park, League City, Texas



# Overview

- Project Overview
  - Location
  - Why LID for this site
  - On the ground practices
- Maintenance
  - Planning for maintenance needs
  - Maintenance guide & calendar
  - Lessons learned to date





Clear Lake

Galveston Bay

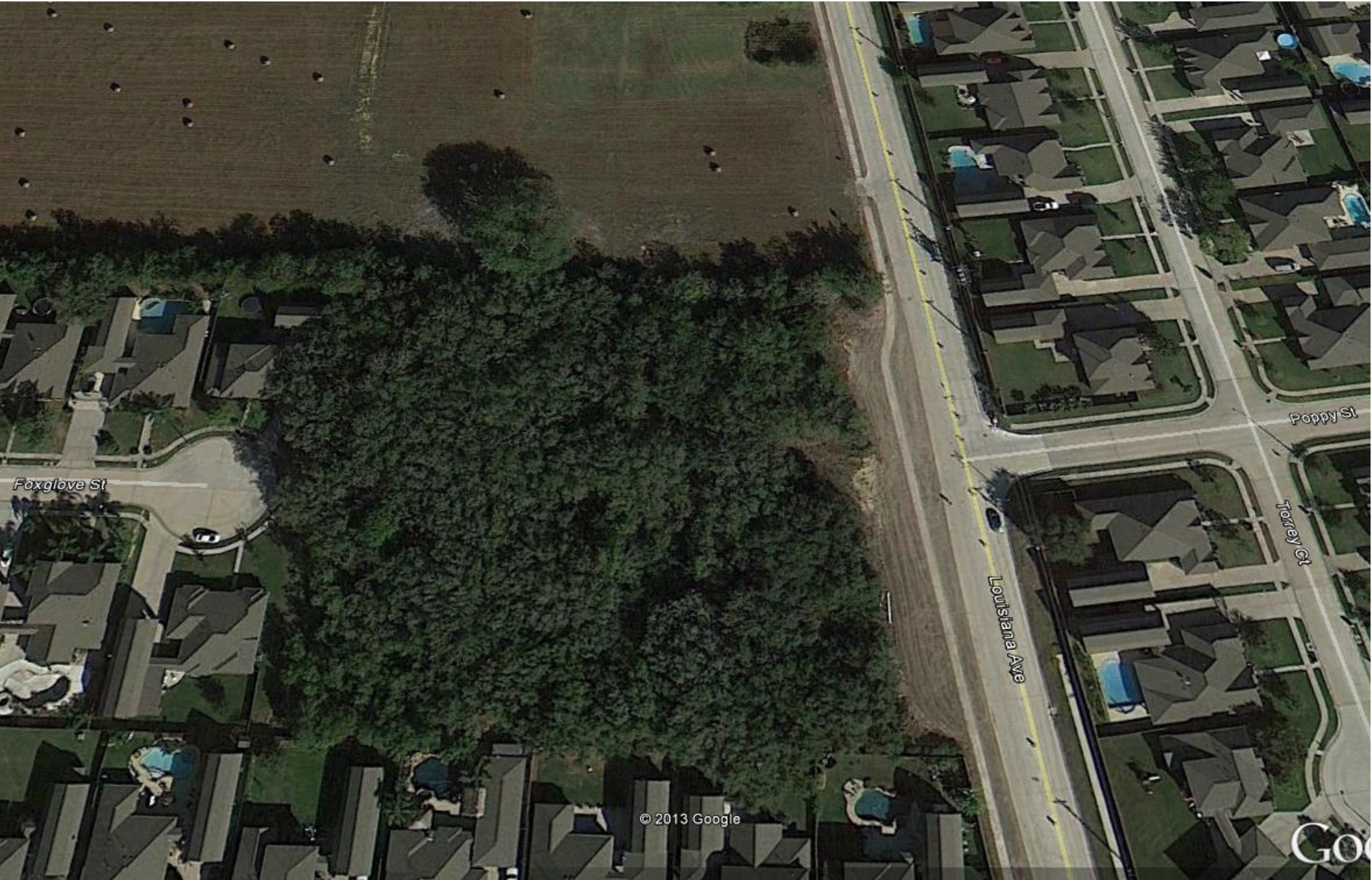
WaterSmart Park

Google earth

Tour Guide

1969

Imagery Date: 10/31/2013 lat 29.531956° lon -95.120341° elev 20 ft eye alt 49203 ft

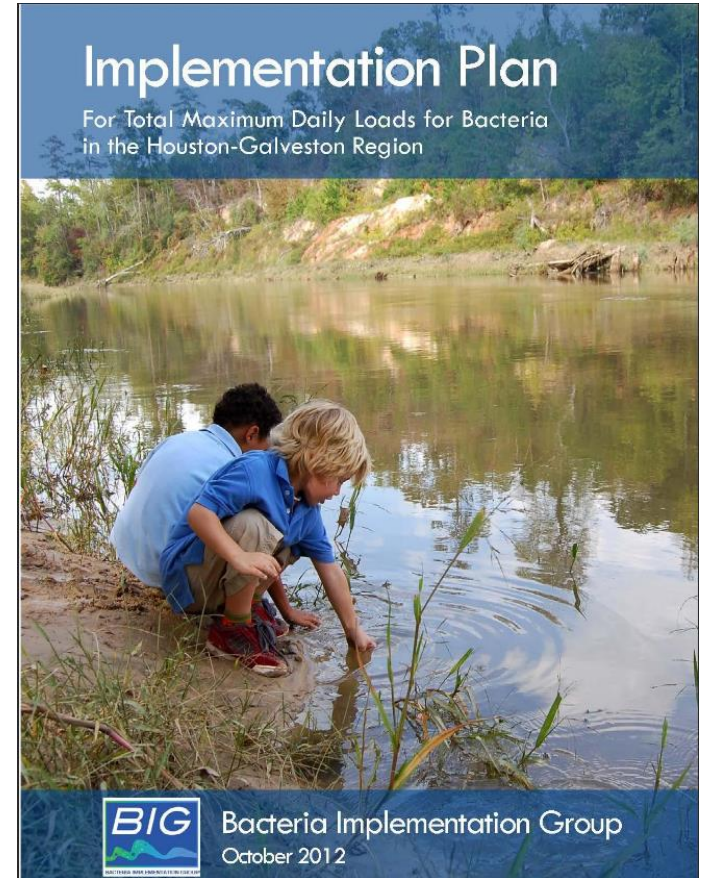


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Go

# Why LID for this site?

- Local water quality impairments
- Bacteria Implementation Plan
- Grant Funding
- Good location for a demonstration project
- Close location for a long term sampling site



# How?

Funding	 <p>The funding section features three logos. On the left is the United States Environmental Protection Agency logo, a circular emblem with a green leaf and a blue globe. In the center is the TCEQ logo, showing a stylized landscape with a white cloud, green hills, and blue waves. On the right is the Galveston Bay Estuary Program logo, which includes a white egret and the text 'GALVESTON BAY ESTUARY PROGRAM' and 'A PROGRAM OF THE TCEQ'.</p>
Partners	 <p>The partners section features three logos. On the left is the League City Texas logo, with a colorful sailboat and the text 'League City TEXAS'. In the center is the Texas A&amp;M AgriLife Extension logo, with the text 'TEXAS A&amp;M AGRILIFE EXTENSION'. On the right is the Sea Grant Texas logo, with a blue bird and the text 'Sea Grant Texas AT TEXAS A&amp;M UNIVERSITY'.</p>
Landscape Architect	 <p>The landscape architect section features the TBG logo, which consists of the letters 'T', 'B', and 'G' in white, each inside a black square, arranged horizontally.</p>
Engineer	 <p>The engineer section features the IDS Engineering Group logo, which includes a diamond-shaped grid icon and the text 'IDS Engineering Group'.</p>

# Implemented LID Practices

- Rain Gardens
- Pervious pavers
- Green roof
- Rainwater harvesting
- Bioswales









**Pavestone Eco-Priora concrete paver system**

Live Roof, tray system





# Other Implemented Practices

- Work with the existing landscape
- Create wildflower areas
- Reduce turf areas
- Use native plantings





# Maintenance



# Maintenance

- Have a plan from the beginning
- Share information
- Provide training
- Be available





# Maintenance Guide

- Our Goals
  - Be comprehensive
  - Make it easy to reference
  - Make it easy to use

## Ghirardi Family WaterSmart Park Maintenance Guide



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# Rain Gardens



## Rain Garden Maintenance Tasks:

1. Avoid walking in the rain garden as much as possible. This will compact soil and not allow water to penetrate into the soil.
2. Weed and remove invasive plants regularly.
3. Remove trash and debris.
  - a. Trash and debris will prevent rain garden from functioning properly.
  - b. Trash and debris will add to the pollutant load.
4. Check for erosion.
  - a. Erosion may occur at the area where water enters the rain garden.
    - i. Add a splash pad, riprap, etc. to disperse the water energy.
    - b. Erosion may indicate there is not enough vegetation to hold the soil in place.
      - i. Add more plants.
      - ii. Mulch slopes (preferably with compost) until plants fill in the areas.
5. Remove sediment build-up.
  - a. It can prevent runoff from entering the rain garden.
  - b. It may increase the amount of time it takes the water to soak into the soil.
  - c. Plants may become choked with sediment.
    - i. Remove as soon as possible by hand or small shovel.
    - ii. Use a rake to loosen soil around plants once sediment has been removed.
6. Watering
  - a. Plants need at least 2 full growing seasons to become established. Water regularly especially during extended dry periods. Roots of new plantings are fragile and shallow and will be damaged or cause the plant to die if allowed to dry out.
  - b. Plantings around the edge need to dry out after rain event, so do not apply extra water. These typically like dryer conditions and will rot if kept wet.
  - c. Water early morning and deeply. This will allow leaves to dry, helping to prevent mildew and allow water to sink in before the sun causes evaporation.
7. Pruning (There are different recommendations for different plants. This may require some research or advice from a plant expert.)
  - a. Prune and remove dead stalks/branches/flowers to main appearance and keep the plant growing and healthy.
  - b. Early spring is a good time to cut back plants that do not have woody stems—only when you see signs of new growth at the base.
    - i. Grasses should be cut back to 12"; soft-stemmed plants should be cut back to 8".
    - ii. Shrubs and other woody plants may be cut back by 1/3 after flowering.

# Maintenance Calendar

Although BMP facilities require maintenance throughout the year in order to perform well, the calendar below will offer general reference for scheduling activities.

Action	Timing	Spring	Summer	Fall	Winter	Comments
Inspect site — each individual facility	After each rain event of 1 in. or greater during a 24 hr period	✓	✓	✓	✓	Such rain events may occur any time of year
Remove debris and trash from inlets, outfalls and within the facility	Monthly (in anticipation of a large rain event and after rainfall of 1 in. in a 24 hr.	✓	✓	✓	✓	
Correct erosion problems	After each rain event of 1 in. or greater during a 24 hr period	✓	✓	✓	✓	
Remove sediment from the base of facility	As need or when accumulation reaches 2-3 in. in depth		✓			Most easily done during dry periods or summer
Check soil levels — add as needed to maintain proper depth	Periodically, especially at the end of a growing season	✓	✓	✓		As compost decomposes, soil levels may drop
Check mulch levels to maintain	Periodically, and/or early spring and late fall and especially after a rain event of 1 in.	✓	✓	✓		After heavy rainfall, mulch may float to fill in low areas or collect too closely to crowns of plants, causing the plant to rot.
Fertilize with organic fertilizer	1-2 times per year	✓		✓		

# Training

- Hands on is best
- Keep it relevant
- Keep it short
- Bring food



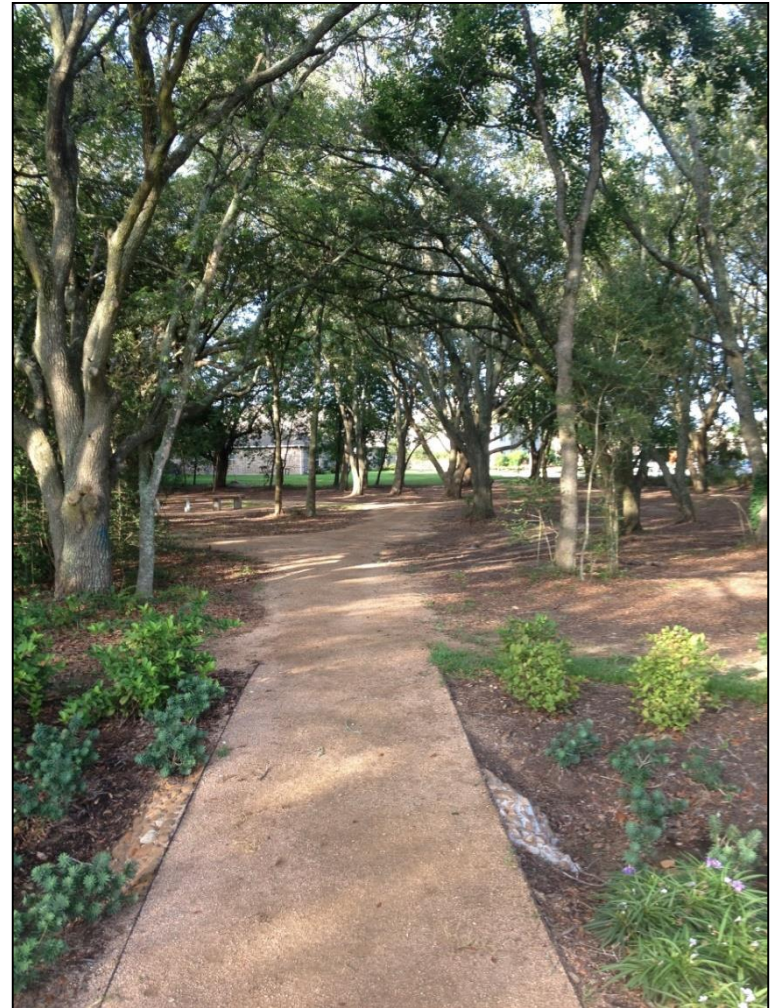
# League City's Lessons Learned

- Maintenance burden is no more than at similar parks
- Strain of limited resources and staffing, like others
- Public perception & appreciation of this park is high so there is extra motivation to keep up with maintenance



# Lessons Learned

- Sometimes decisions are out of your hands
  - Switched from native hardwood mulch to no-float cypress mulch for rain gardens
  - Lack of edging on natural area walkways; decomposed granite is spreading



[tcwp.tamu.edu/ghirardi-watersmart-park](http://tcwp.tamu.edu/ghirardi-watersmart-park)

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