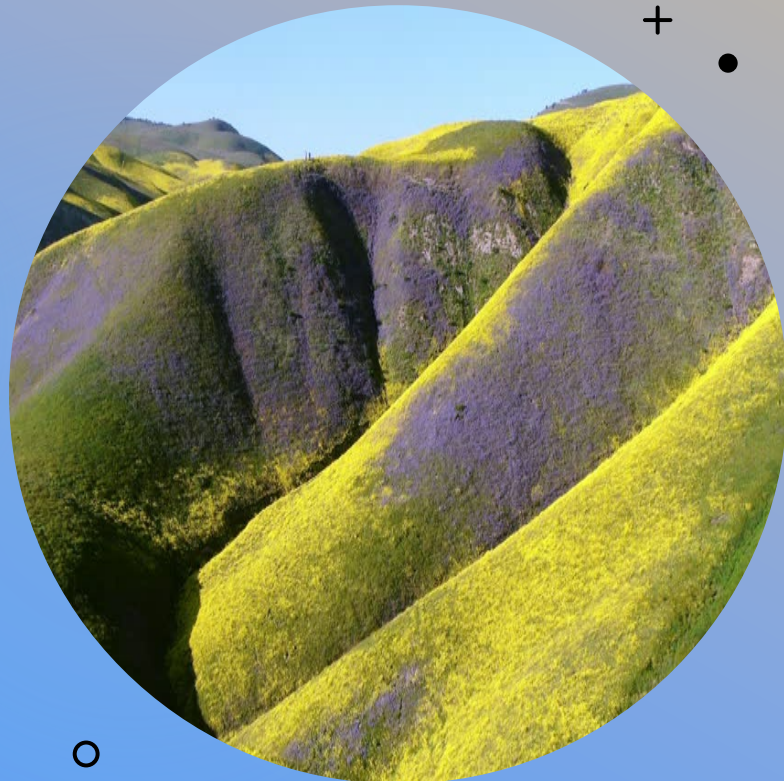


# Riverside County Department of Waste Resources - Environmental Engineering Landfill Systems

TODD D. SHIBATA, P.E.

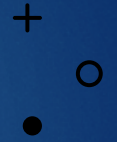
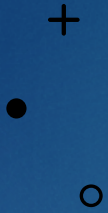
- ▶ “Managing Waste for a Better Tomorrow”
- ▶ Apply environmental engineering
  - ▶ Permitting
  - ▶ Design
  - ▶ Operation
  - ▶ Maintenance
  - ▶ Corrective Action
  - ▶ Closure





# AGENDA

Introduction to Landfills  
Landfill Permitting and Design  
Air Quality Systems  
Water Quality Systems



# INTRODUCTION TO LANDFILLS





Where  
does our  
waste  
go?



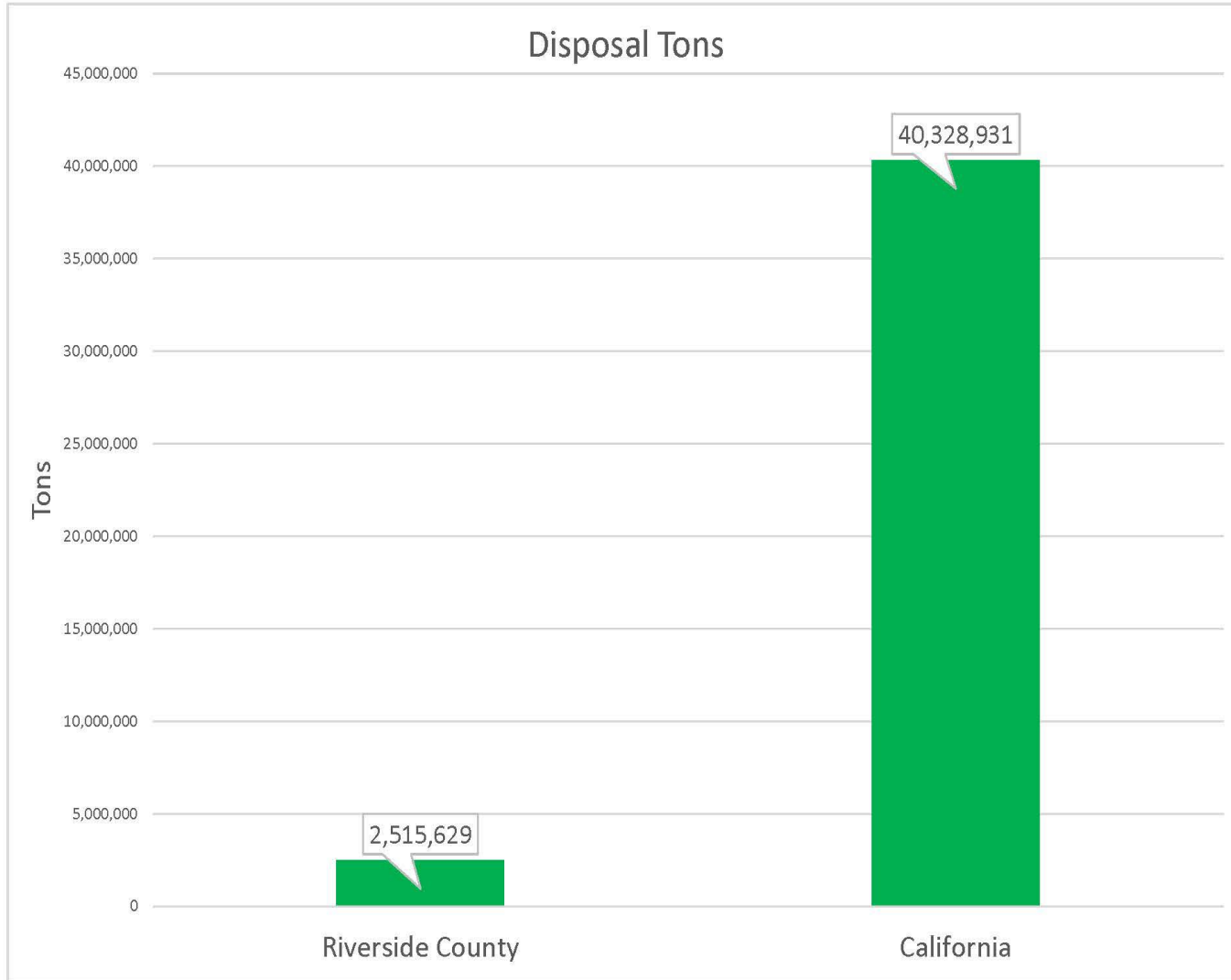
## Without Infrastructure



## Modern Landfill







# 2019 Landfill Disposal

# Landfill Primer

## Background

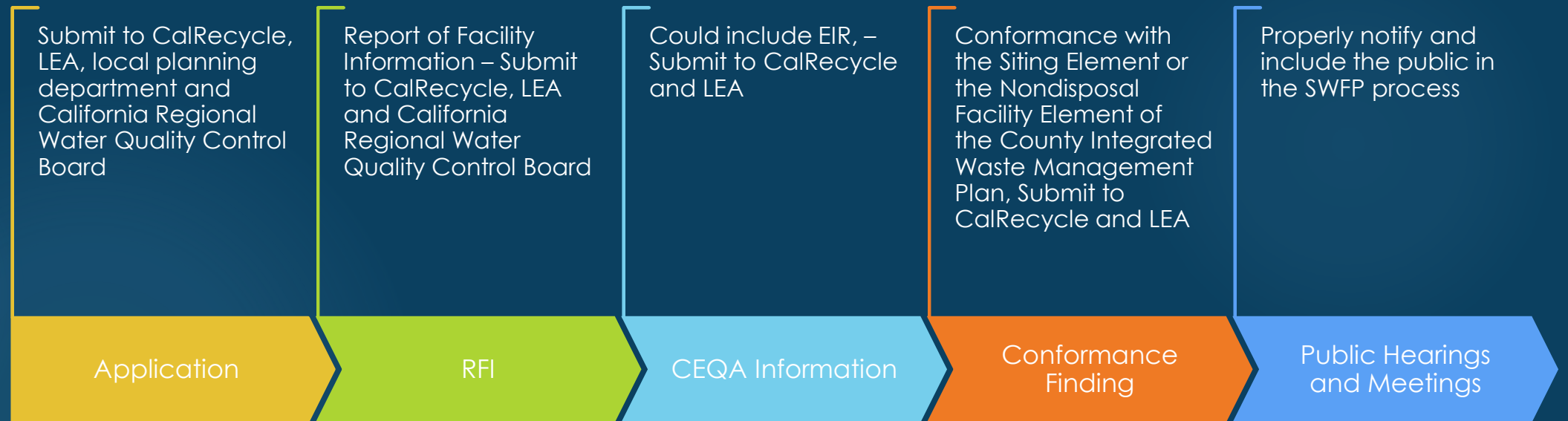
- ▶ Integrated waste management system
- ▶ Solid waste disposal

## Permitting & Design

- ▶ Federal Regulations
- ▶ State Regulations – CalRecycle, State Regional Water Quality Control Board, Air Resources Control Board
- ▶ Local Regulations – Local Enforcement Agency, Regional Water Quality Control Boards, South Coast Air Quality Management District
- ▶ Specialty Consultants



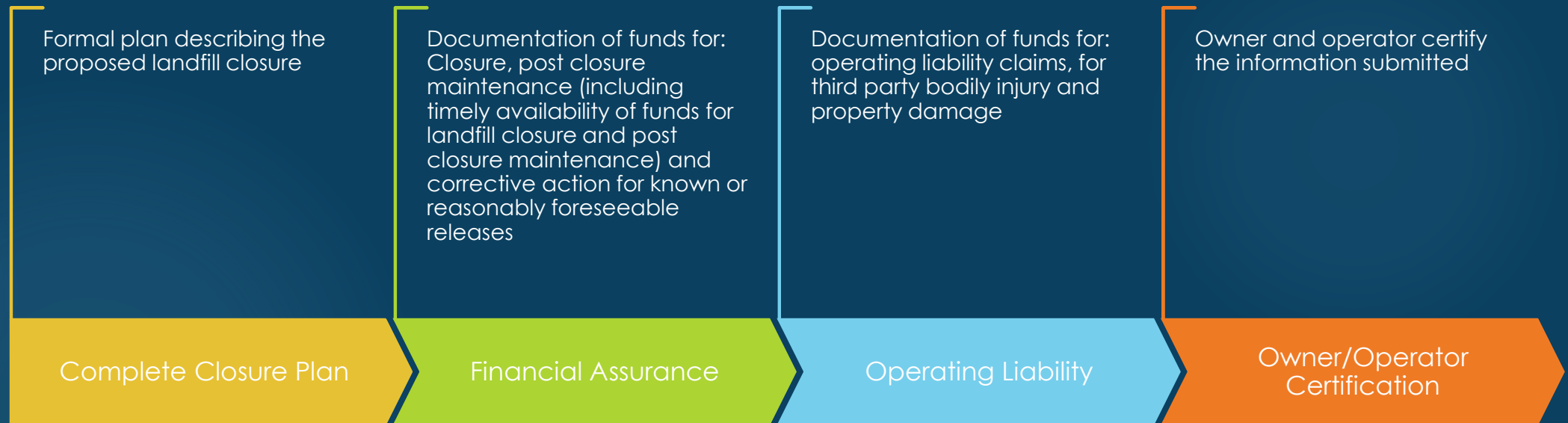
# Solid Waste Facility Permit



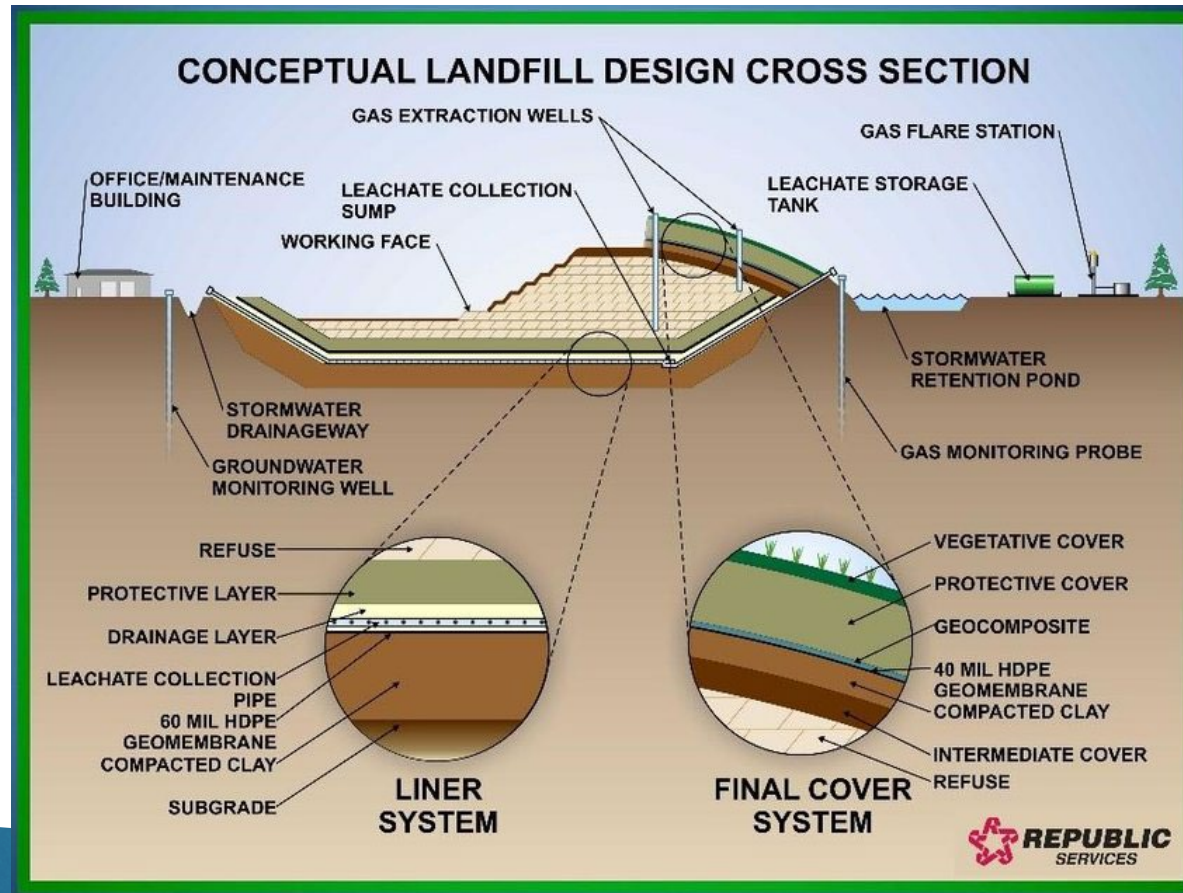


# Solid Waste Facility Permit

10







# Design Schematic





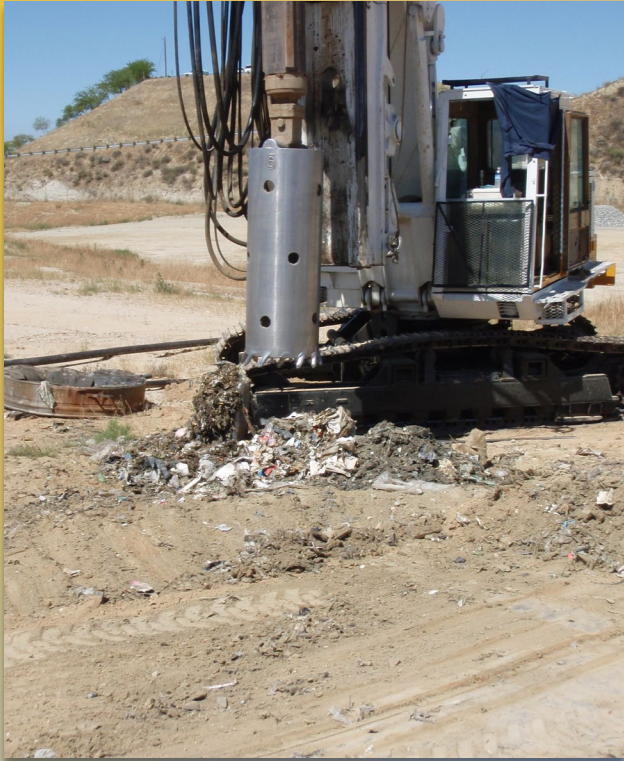
# Construction





# Air Quality Systems





# Gas Wells





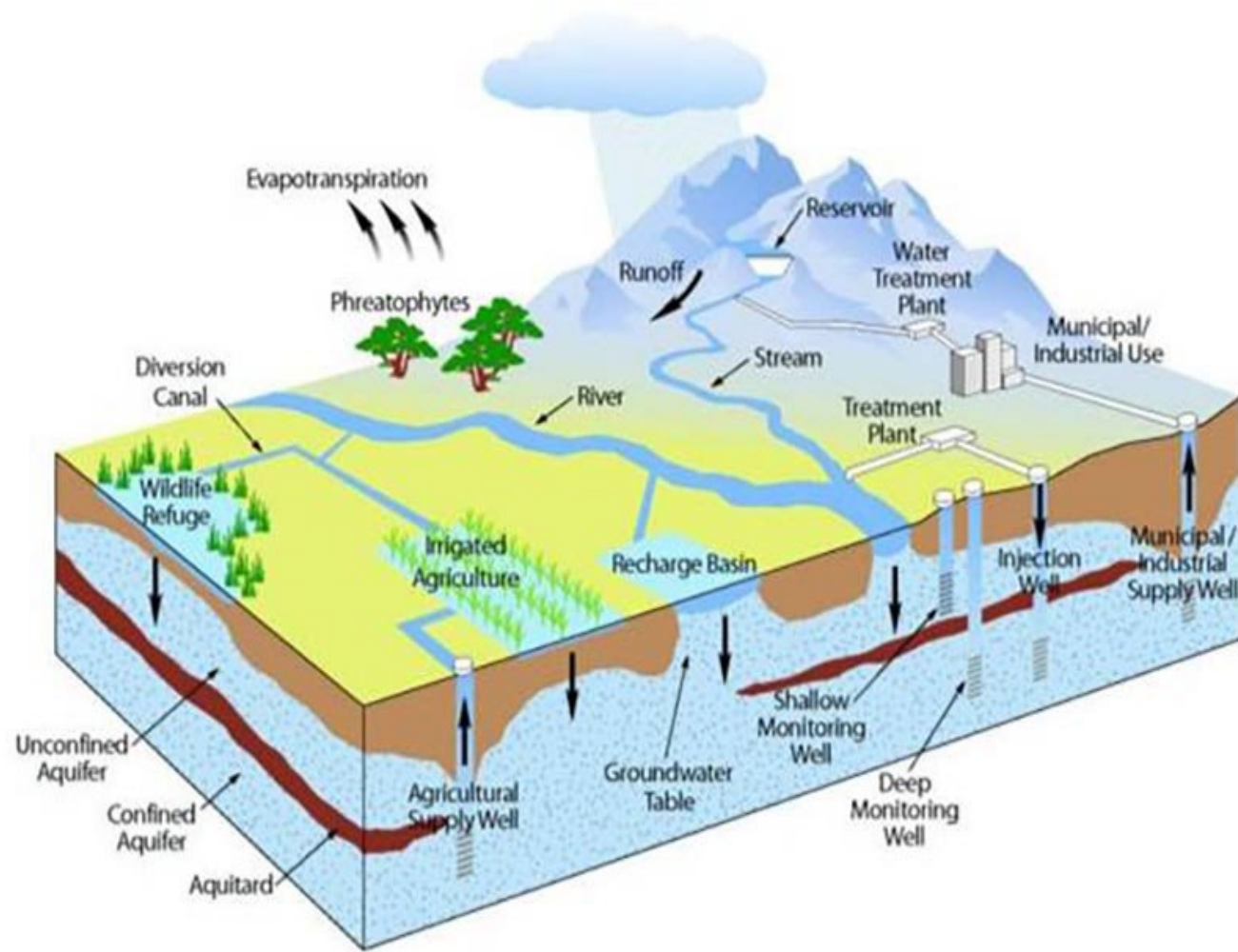
# Gas Collection System





# Gas Monitoring

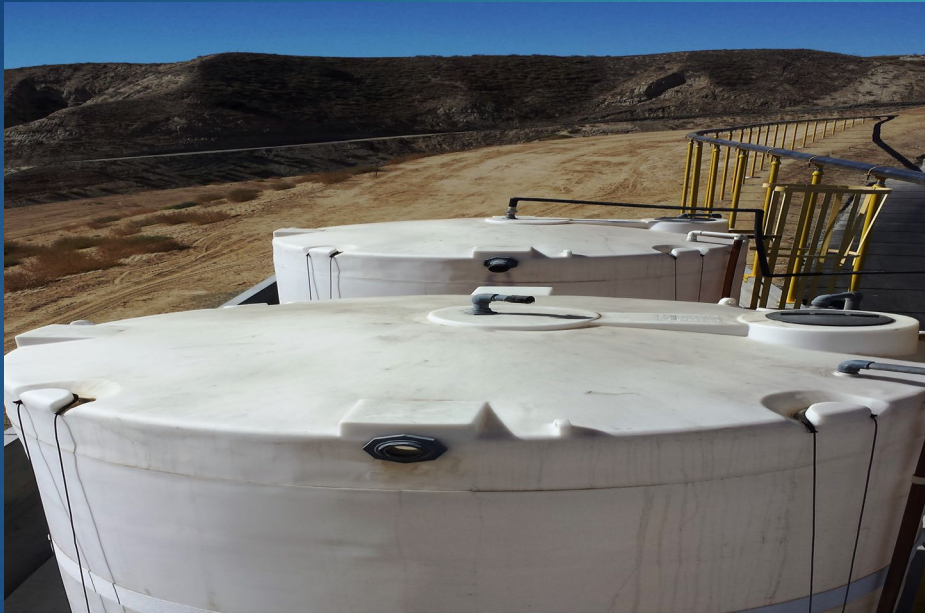




# Water Quality Systems



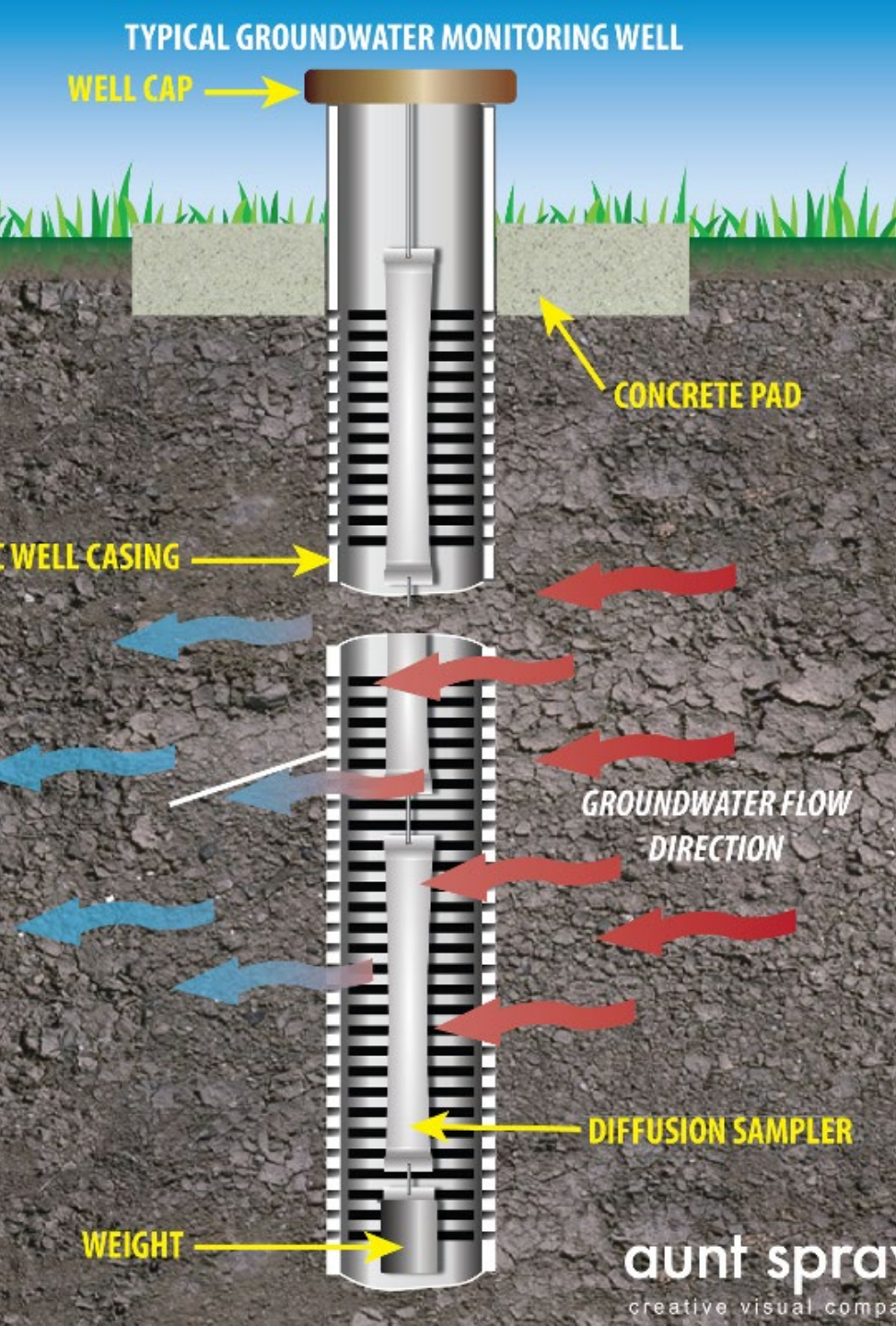
## Leachate & Gas Condensate



## Stormwater







# Groundwater Monitoring





# Groundwater Monitoring Well Construction





## Groundwater Monitoring Well Sampling



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# THANK YOU

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