



Meridian's Class "A" Recycled Water Program

2016 PNWS Conference - Boise

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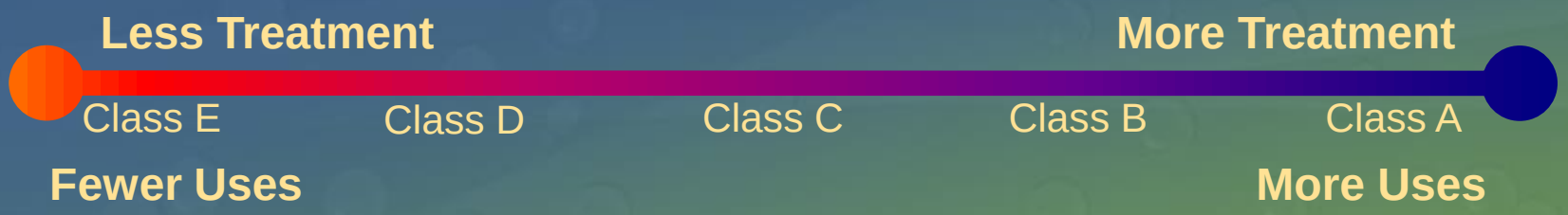
City of Meridian Assistant City Engineer

Recycled Water Defined

- Highly treated wastewater effluent for beneficial use
- Regulated by Idaho Department of Environmental Quality (IDEQ)
- Treatment requirements depend on class of recycled water
- Increased allowable uses with increased treatment



Recycled Water Uses by Class

	Use Description
Class A	•Irrigation – golf courses, schools, parks, residences •Fire suppression •Dust suppression •Toilet flushing at industrial/commercial sites •Industrial water source •Ground water recharge
Class B	•Irrigation – non-residential •Toilet flushing at industrial/commercial sites
Class C	•Irrigation – crops (no contact with edible food crops), cemeteries, roadside vegetation •Toilet flushing at industrial/commercial sites
Class D	Irrigation – fodder, seed, or processed food crops
Class E	Irrigation – forested sites

WHY RECYCLED WATER?

Why Recycled Water?

Initial Program Drivers

- Surface Water Quality Regulations
- EPA NPDES Permit Flow Limit
- Domestic Well Impacts
  - Meridian Potable Water Consumption
  - Summer Irrigation Activity Increases Demand by 170 million gallons/month

City of Meridian: Diving In

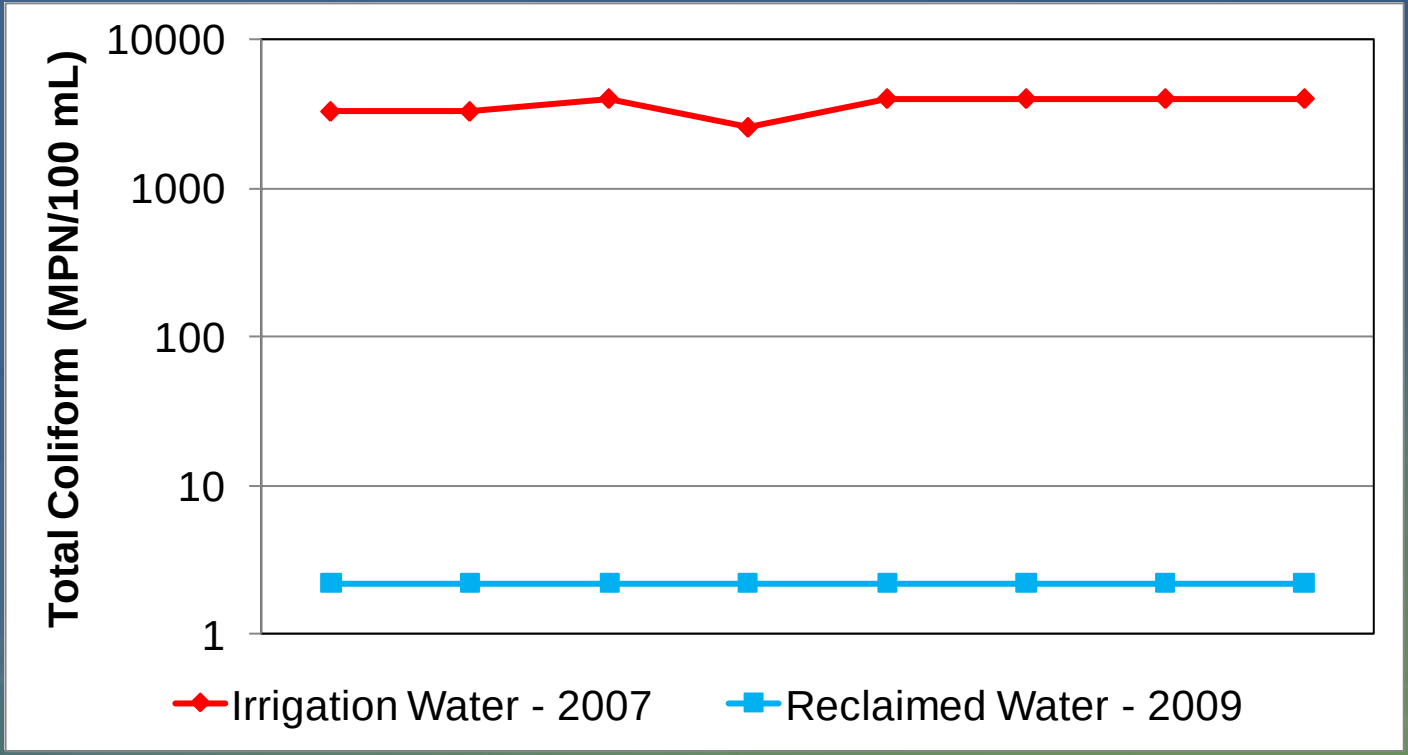
Realizing the Benefits of Recycled Water

- Recycled Water is a “Drought-Proof” Water Supply
- Frees Up Agricultural Water for Agricultural Uses
- Year Round Irrigation – Where Applicable
- Lower Effluent Flow to River
- Less Stringent Limits Than NPDES Permit
- Can Be More Economically and Environmentally Sustainable for WWTPs
- Right Water for the Right Use

Sensible and Safe Approach

Safe

- Meets Class A Recycled Water Standards (Idaho DEQ)
- Highly disinfected
- Allowed for almost any use, except drinking
- Continually monitored and tested



MERIDIAN PROGRAM SNAPSHOT

Meridian and Recycled Water:
Some Context

- Center of the Treasure Valley
- Suburb of Boise
- One of the Fastest Growing Cities in the Country:
  - Population Tripled from 1990 to 2000
  - Population Doubled from 2000 to 2008
  - Current Population = approx. 85,000
- About 45 Square Mile Area
- 402 Acres of Open Space
- 24 Miles of Creeks and Streams

Meridian and Recycled Water: Some Context

Wastewater Resource Recovery Facility

- 7.0 MGD Flow Limit (removed from NPDES permit renewal)
- 10.2 MGD Treatment Capacity
- BNR/Activated Sludge, Tertiary Filtration, Ultra-Violet Disinfection
- > 98% Removal Efficiency for TSS, BOD, and Ammonia
- About 500 miles of Pipes, 10 Lift Stations, and >9,000 Manholes

Current Wastewater Program

Testing the Water

First Class A Recycled Water Permit Issued To A City in Idaho At Heroes Park - 2008

- Overcome Challenges:
  - Educate and Build Support with Elected Officials
  - Educate and Build Support with Parks Staff
- Obtain a Project Site Permit First
- Overcome Technical Obstacles:
  - Effluent Quality
  - Nitrogen Content
  - Soil Loadings
  - Disinfection
  - Overspray (Park Amenities)
  - Seepage Tests
  - Production Demand and Redundancy
- Supplied in Summer of 2009

Testing the Water

Develop Partnerships and Leverage Resources

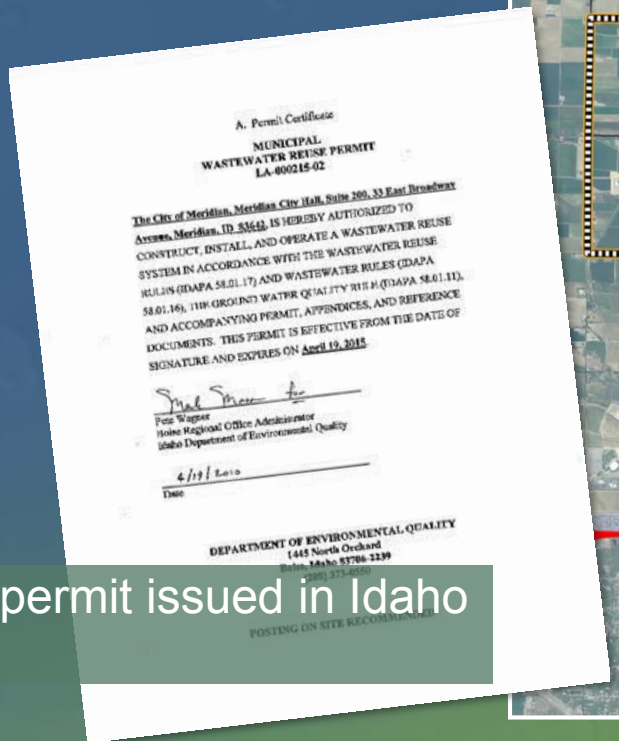
- Build Community Support With Tangibles
  - Community Park Improvements

Park Features:

- Recycled Water Interpretive Plaza and Fountain
- Recycled Water Sourced Restrooms
- Heroes Plaza Educational Planters
- Interpretive Pathways with Drought Tolerant Vegetation and Landscapes
- Water-wise Demonstration Site

Forward Thinking "Citywide" Permit

- 5-year Permit Cycle
- Allowable Uses
  - Irrigation
  - Dust Suppression
  - Toilet Flushing
  - Sewer Flushing
  - Fire Suppression
- Compliance Activities
  - Plans of Operation
  - Runoff Management



A. Permit Certificate

MUNICIPAL
WASTEWATER REUSE PERMIT
LA-000215-02

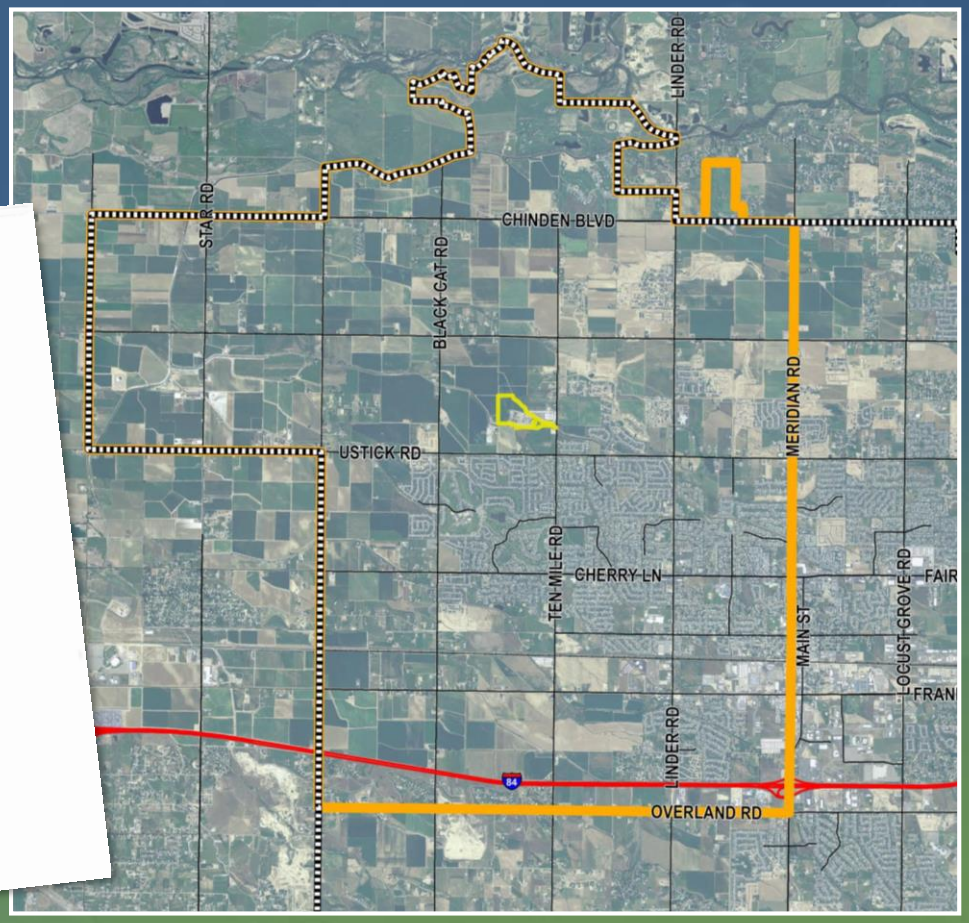
The City of Meridian, Meridian City Hall, Suite 200, 33 East Broadway Avenue, Meridian, ID 83642, IS HEREBY AUTHORIZED TO CONSTRUCT, INSTALL, AND OPERATE A WASTEWATER REUSE SYSTEM IN ACCORDANCE WITH THE WASTEWATER REUSE RULES (IDAPA 58.01.17) AND WASTEWATER RULES (IDAPA 58.01.16), THE GROUND WATER QUALITY RULE (IDAPA 58.01.11), AND ACCOMPANYING PERMIT, APPENDICES, AND REFERENCE DOCUMENTS. THIS PERMIT IS EFFECTIVE FROM THE DATE OF SIGNATURE AND EXPIRES ON April 19, 2015.

Pete Wagner
Boise Regional Office Administrator
Idaho Department of Environmental Quality

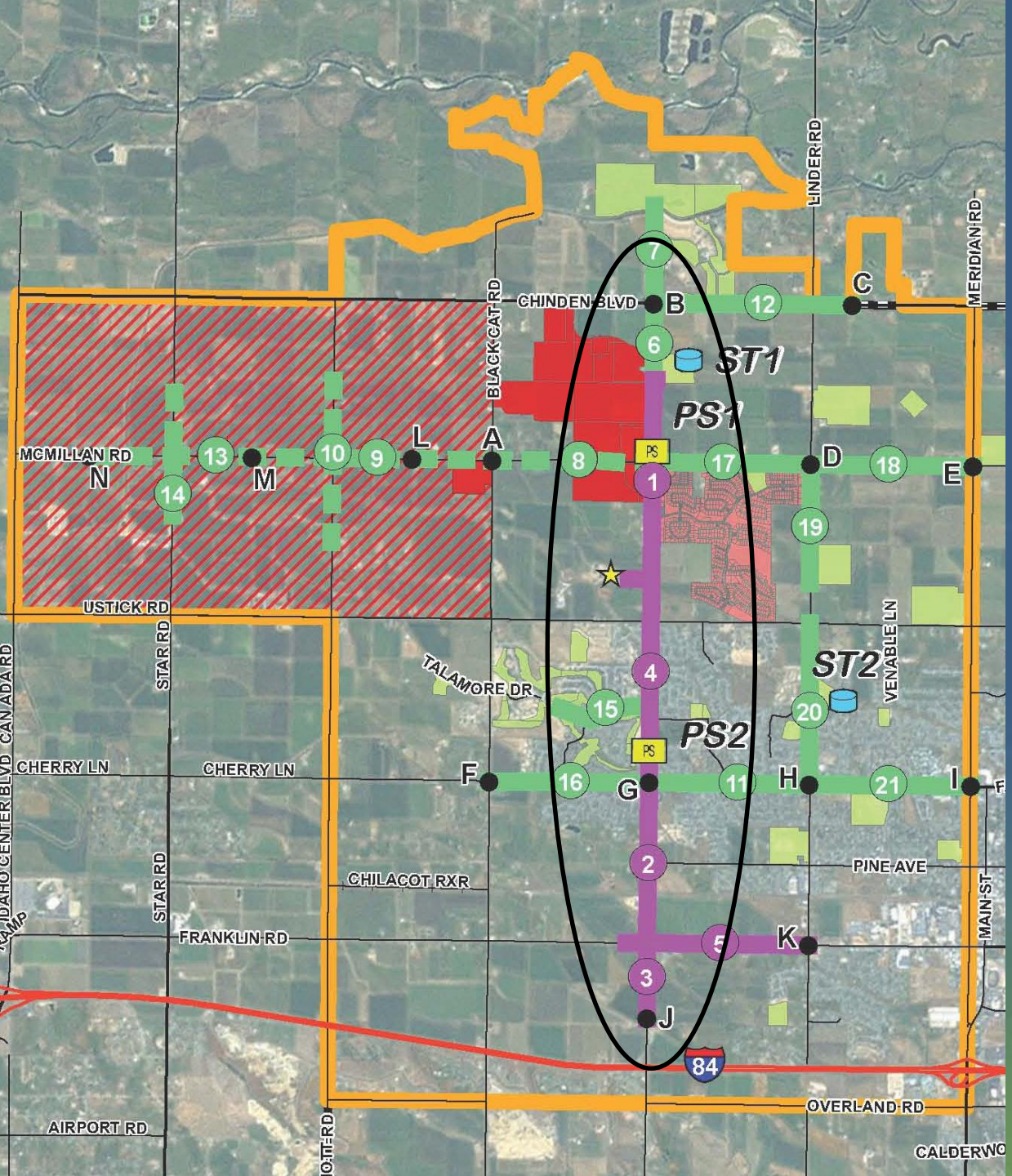
4/19/2010
Date

DEPARTMENT OF ENVIRONMENTAL QUALITY
1445 North Orchard
Boise, Idaho 83706-2239

POSTING ON SITE RECOMMENDED



First "Citywide" permit issued in Idaho (April 19, 2010)



City Provided Infrastructure Needs

Pumping:

- Completed (2010)
  1,600 gpm
- Future (2040) potential
  9,000 gpm

Piping:

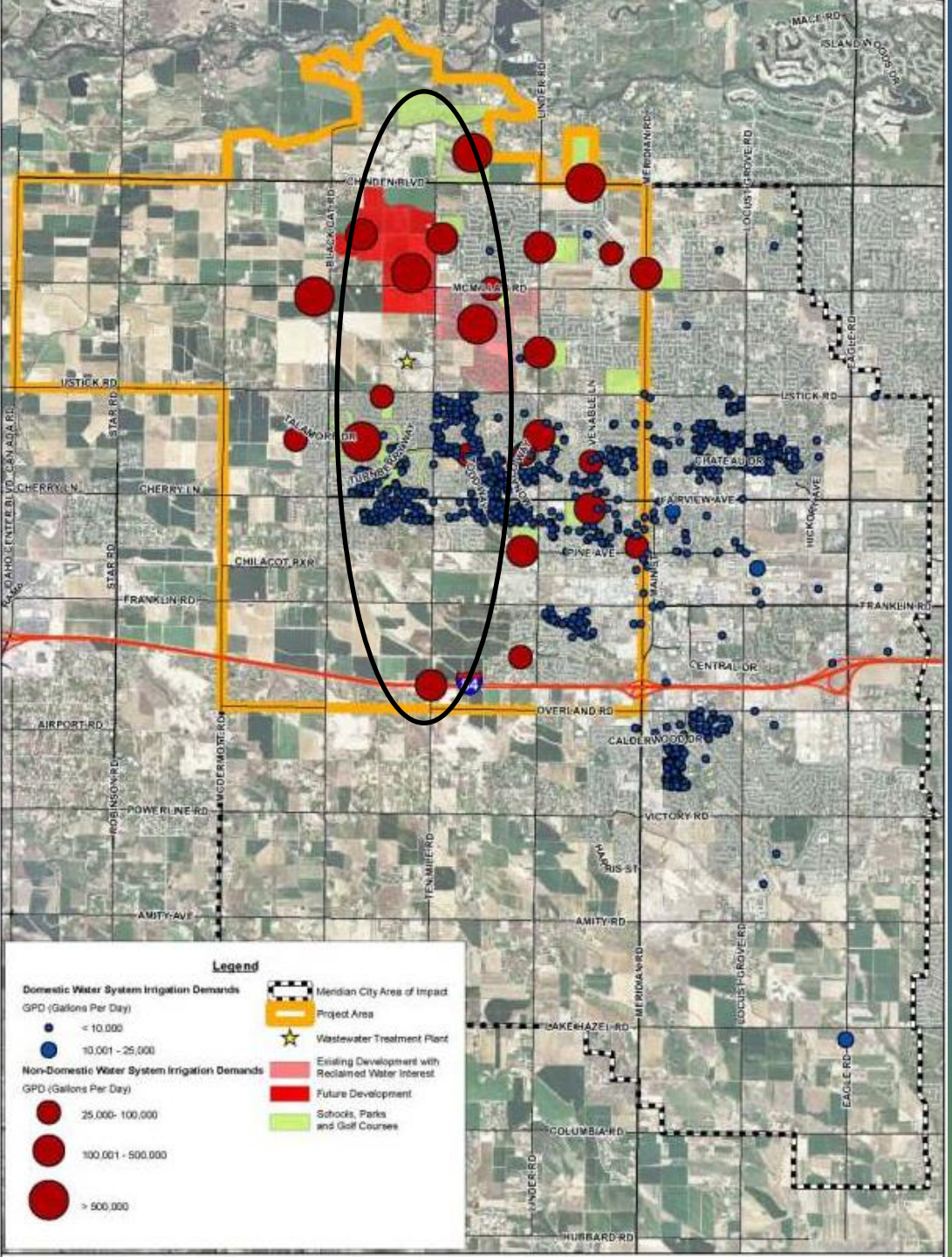
- Existing
  27,000 LF
- Potential future (2040)
  51,000 LF

Storage:

- Completed (2010)
  1.0 MG
- Future (2040) potential
  3.0 MG

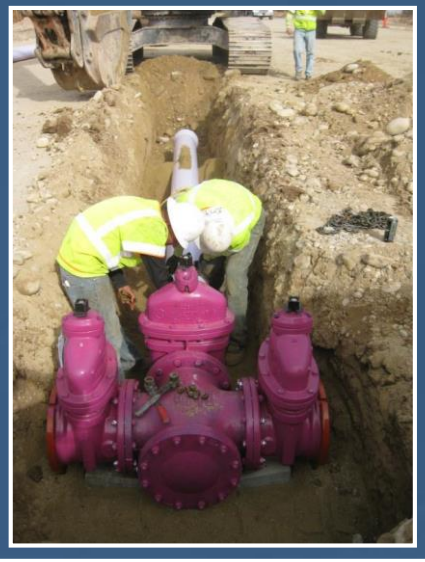
Potential Use Sites

- Focus on Nearby Irrigation Opportunities
  - Golf Courses
  - Parks and Open Spaces
  - Ten Mile Interchange Area
- Accommodate Growing Areas



Summary of Meridian's Recycled Water Program

- City-wide permit
  - Heroes Park
  - Ten Mile Interchange
  - WalMart
  - Fast Eddy's
  - Treatment Plant
  - Future 7 acre park
- Treatment system
- Backbone infrastructure



MERIDIAN'S RECYCLED WATER OUTLOOK

Regulatory Issues Related to Recycled Water Use in Meridian

- Boise River Phosphorus TMDL
  - Submitted to EPA
  - 0.10 mg/L summer allocation
  - 0.35 mg/L winter allocation
- NPDES Permit
  - P limits reflect TMDL concentrations
  - Public Comment period
    - Closed October 21st
  - Following steps
    - DEQ and EPA respond to comments (30, 60, 90+ days)
    - Release final NDPES permit-30 day notification

Recycled Water Outlook in Meridian

- Phosphorus TMDL/NPDES Permit Impact on Recycled Water Program
  - Winter Phosphorus Limits
    - WRRF Upgrades
  - TMDL Trading Framework
    - Trading Ratio/offsets
  - TMDL Implementation Plan
    - Schedule for completion

Timeline

TMDL Trading Framework Issued?

Final NPDES Permit Issued?

Draft NPDES Permit issued

2016+

Phosphorus TMDL submitted to EPA

WalMart Landscape irrigation

2015

Recycled Water use at car wash and Ten Mile Interchange

2013

2012

Ten Mile corridor Piping Projects

2011

Final class A “citywide” permit issued by IDEQ

2010

Booster station/reservoir design-build operational

First use of recycled water at Heroes Park

2009

Final class A permit for Heroes Park issued by IDEQ

2008

Phase 1 cloth media filters installed

2007

Final Heroes Park permit application submitted to IDEQ

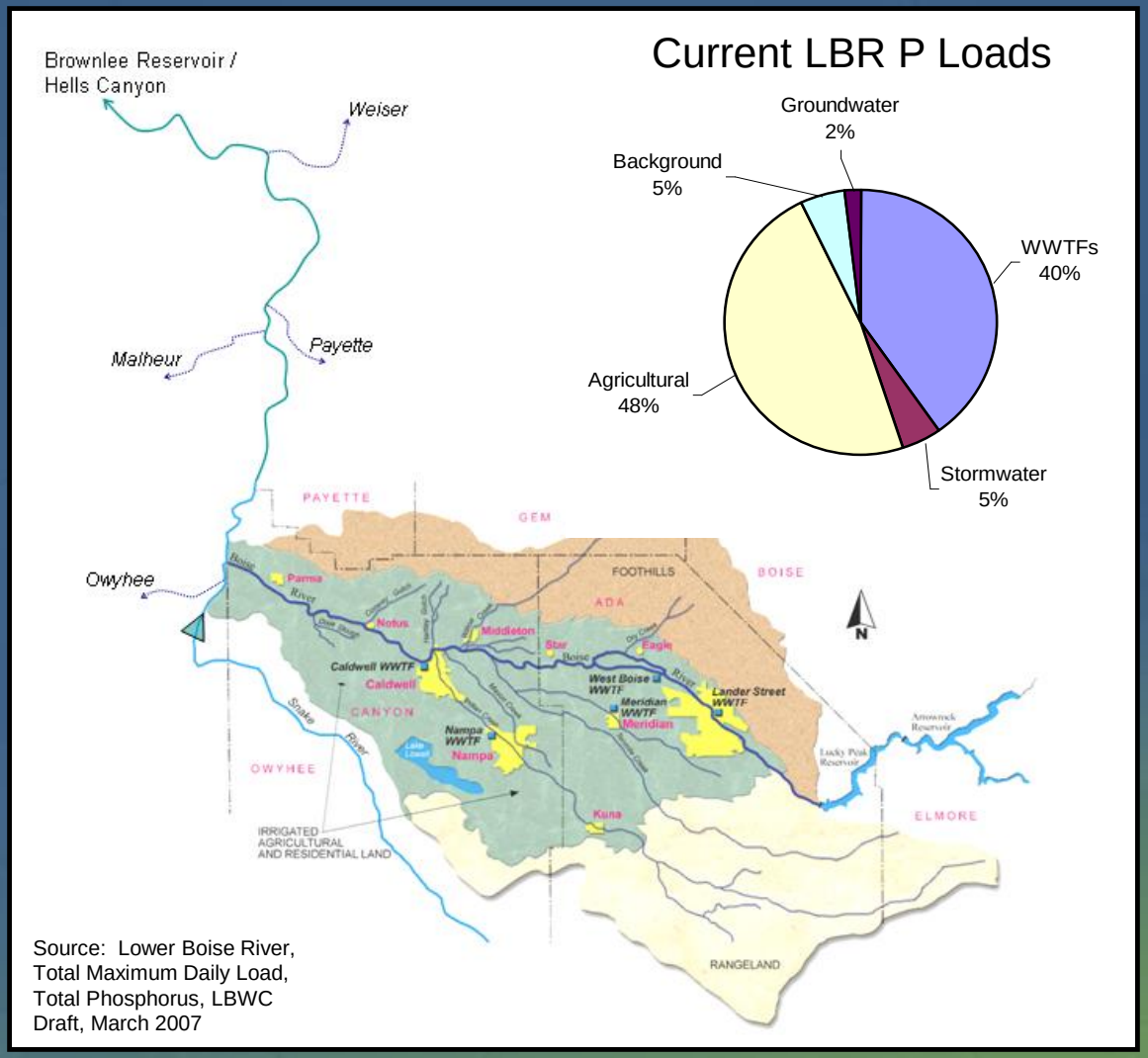
2005

City recognizes upcoming challenges with TP TMDL and water rights

Questions


RECLAIMED WATER
The Right Water for the Right Use
WE ARE USING WATER WISELY
MERIDIAN
IDAHO
DO NOT DRINK
FROM THE IRRIGATION SYSTEM

Why Recycled Water?
Surface Water Quality Regulations

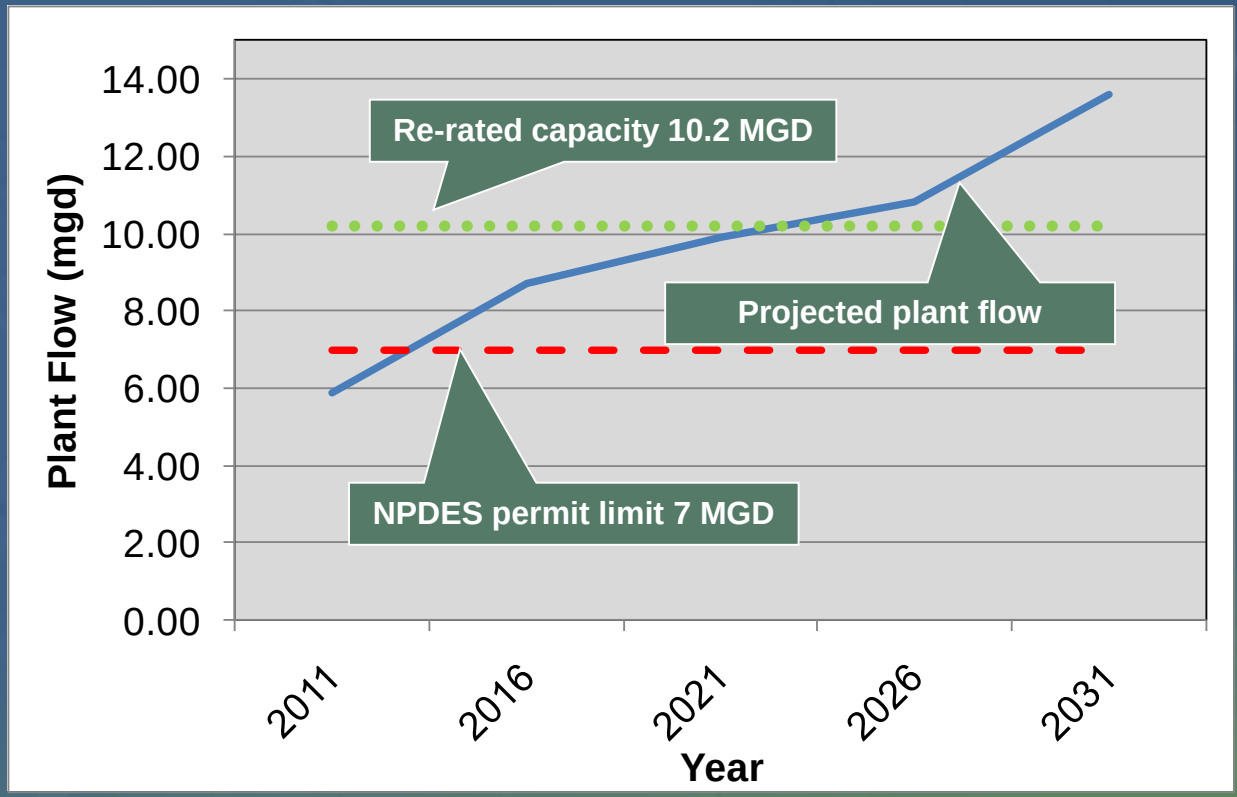


Source: Lower Boise River, Total Maximum Daily Load, Total Phosphorus, LBWC Draft, March 2007

- **Existing Boise River TMDL:**
  - Sediment
  - Bacteria
  - Temperature
- **Proposed Phosphorus Load Allocations**
  - LBR Contributes 8% of SR-HC Load
  - 80% Reduction in 1 Permit Cycle
  - 98% Reduction in 2 Permit Cycles

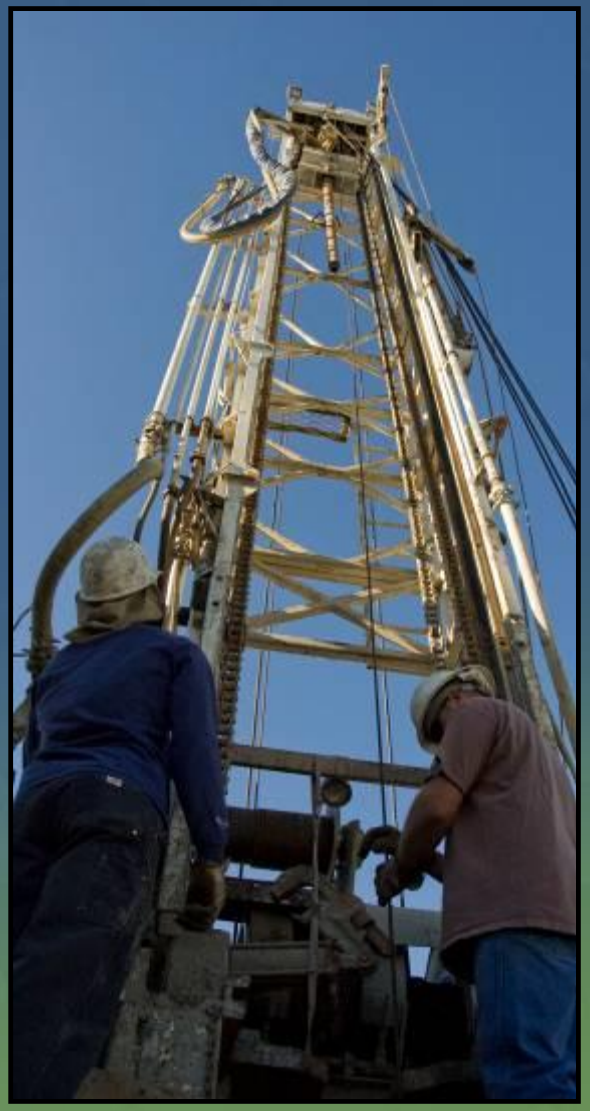
Why Recycled Water?
NPDES Flow Limits

- **EPA NPDES Permits:**
  - Meridian Plant is Flow Restricted under NPDES
  - EPA Continues to Delay Renewal of NPDES Permits
  - Operating Under 1999 Flow Limits (7 MGD)
  - Applied in 2004
  - No Action by EPA
- **Plant Capacity:**
  - IDEQ-Approved Re-rating at 10.2 MGD



Why Recycled Water?
Domestic Well Impacts

- **Meridian Potable Water Consumption**
  - Winter Average = 148 million gallons/month
  - Summer Average = 318 million gallons/month
- **Summer Irrigation Activity Increases Demand by 170 million gallons/month**
  - Potential Conservation of 1.2 billion gallons per year through recycled water in Old Town



Classes of Recycled Water

- Current Rules – Class E
  - Primary effluent quality
  - Buffer distances required
  - Agronomic application rate
  - No grazing
  - No animal feed within four weeks
- Current Rules - Class D
  - Treatment: Oxidation and disinfection
    - 230 total coliform per 100 mL (TC/100mL)
  - Buffer distances required
  - Agronomic application rate
  - No grazing
  - Irrigate fodder, seed, or processed food crops

Classes of Recycled Water

- Current Rules – Class C
  - Treatment: Oxidation and disinfection
    - 5-Day Median: 23 TC/100 mL
    - Max: 230 TC/100 mL
    - Weekly sampling
  - Agronomic application rate
  - Buffer distances required
  - Contact non-edible portion of food crops

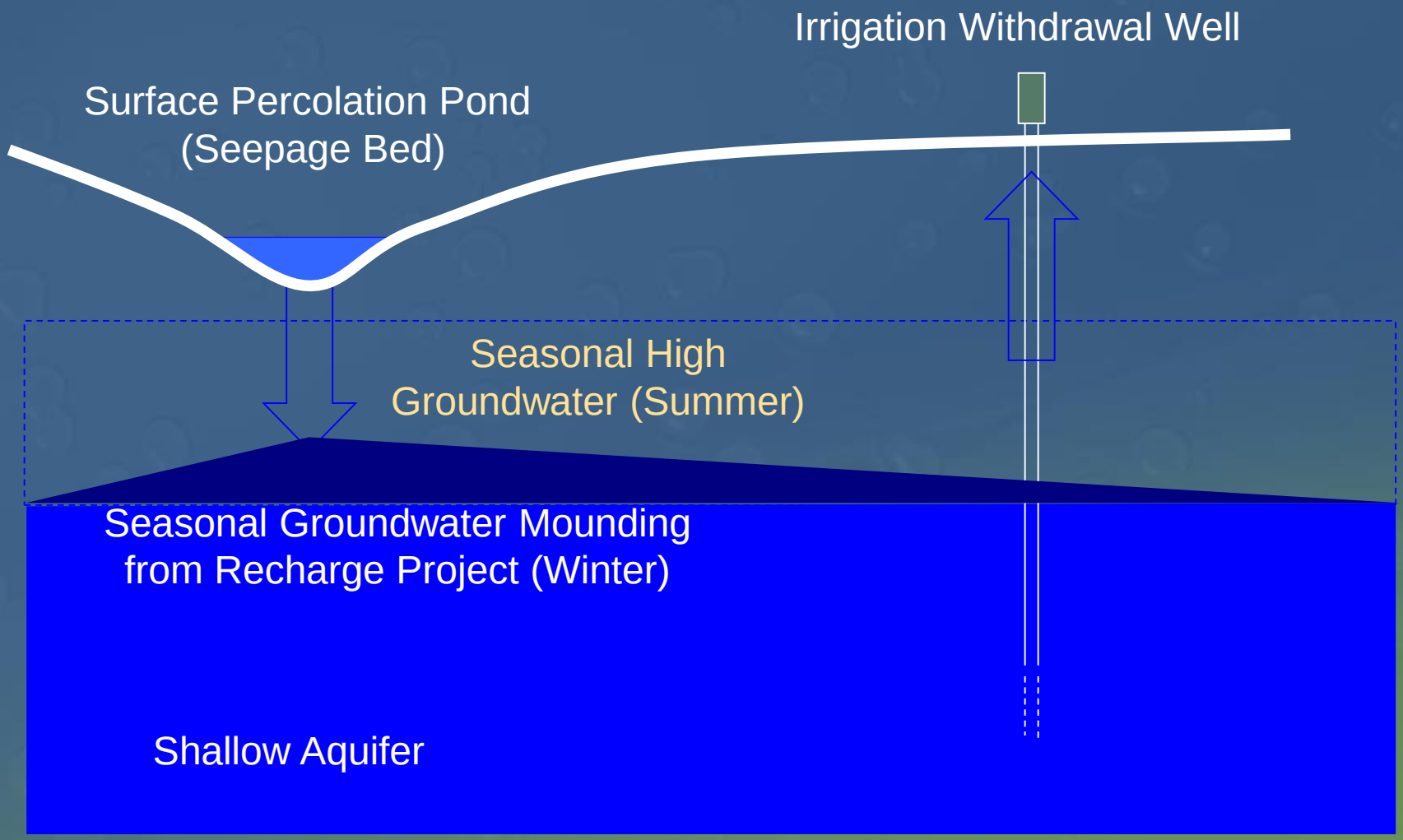
Classes of Recycled Water

- Current Rules – Class B
  - Treatment: oxidation, coagulation, clarification, filtration, and disinfection
    - 7-Day median: 2.2 TC/100 mL
    - Max: 23 TC/100mL
    - Daily sampling
    - Required chlorine residual after disinfection contact time
  - Buffer distances required
  - Distribution system operator certification
  - Increased number of irrigation sites possible
- Changes – Class B
  - Turbidity requirements
    - Granular or cloth media
      - 24 hr mean – 5 NTU
      - Max – 10 NTU

Classes of Recycled Water

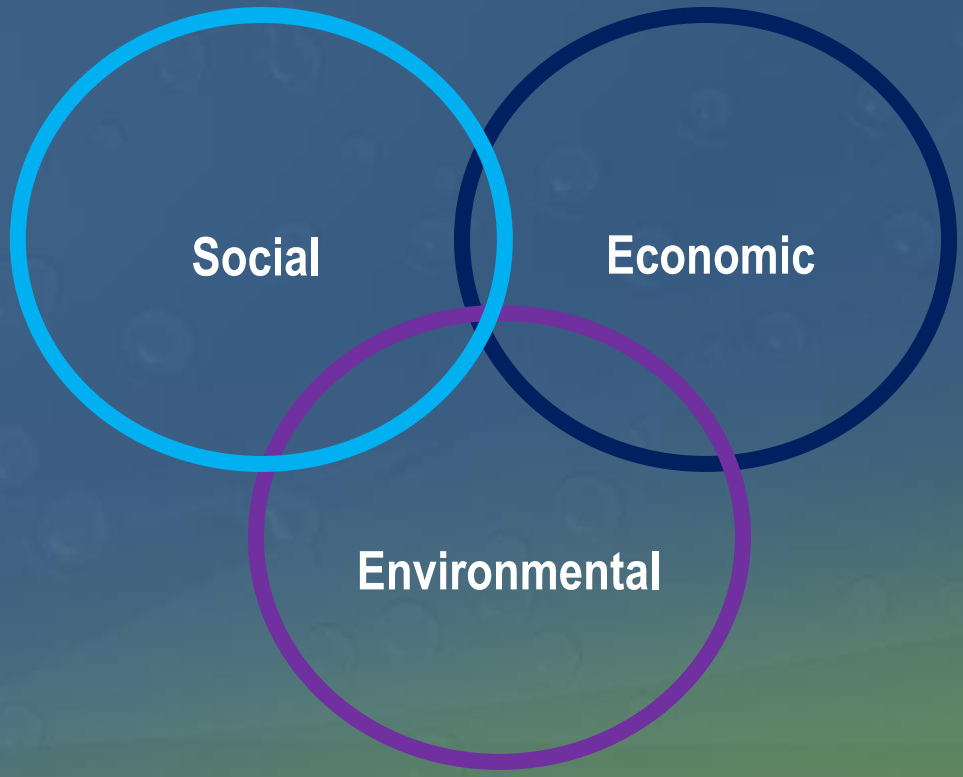
- Current Rules – Class A
  - Treatment: oxidation, coagulation, clarification, filtration, and disinfection
    - 7-Day median: 2.2 TC/100 mL
    - Max: 23 TC/100mL
    - Daily sampling
    - Required chlorine residual
  - No buffer distances for landscape irrigation
  - No distribution system operator certification
  - Treatment redundancy required
- Changes – Class A
  - Turbidity requirements
    - Granular or cloth media
      - 24 hr mean – 5 NTU
      - Max – 10 NTU
    - Membrane filtration
      - 24 hr mean – 0.2 NTU
      - Max – 0.5 NTU
  - Redundancy per wastewater rules
  - Comply with groundwater quality rule for recharge

Recycled Water as a Resource for Groundwater Recharge

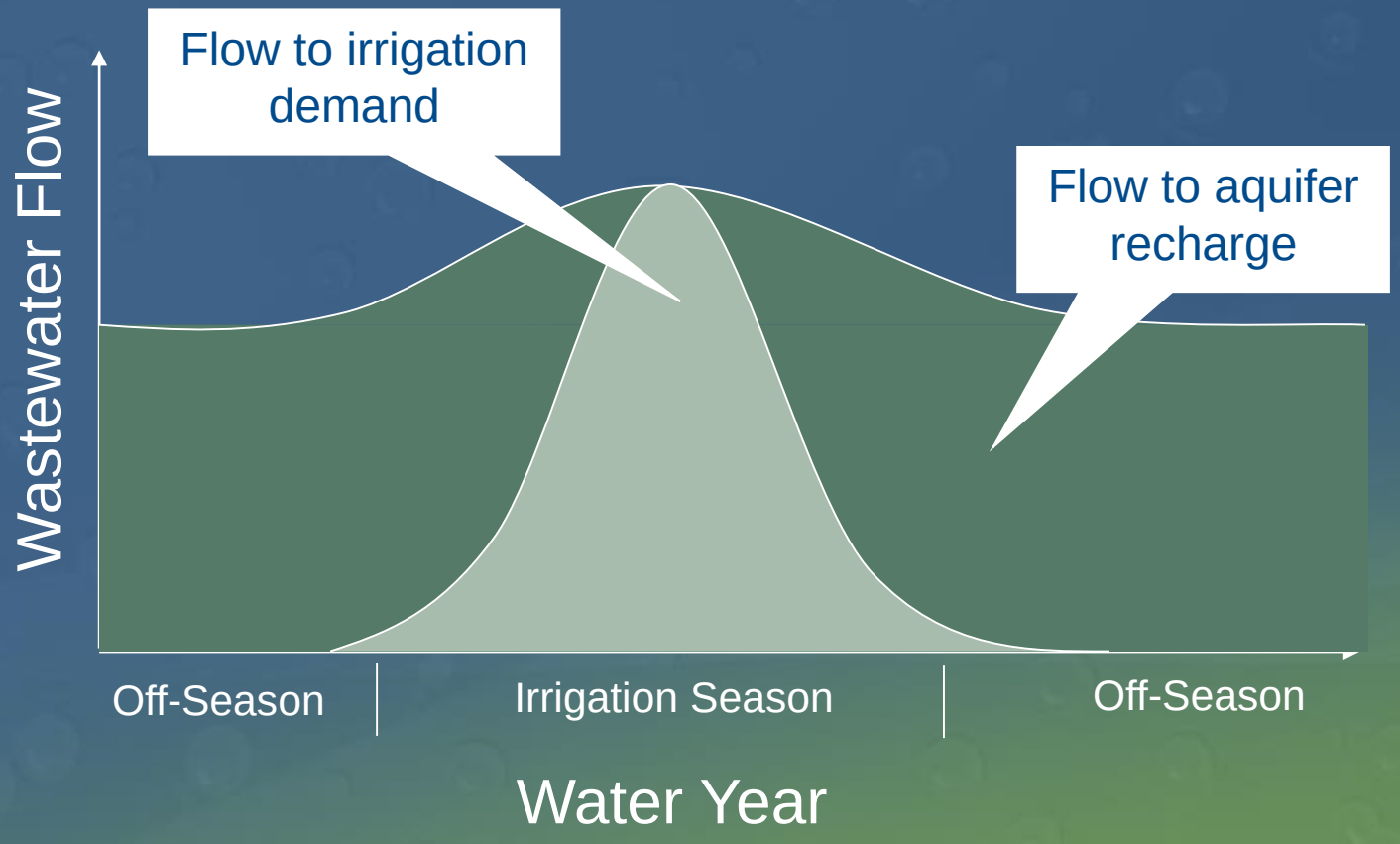


Technical Challenges of using Recycled Water for Groundwater Recharge

- Site selection
  - Depth to groundwater
  - Soils and geology
  - Wellhead capture zones
- Nitrate management
  - Nitrate priority areas?
    - \+ Dilution, but…
    - \- Increase mass of nitrate
  - Low nitrate areas?
    - \- Increase mass of nitrate
    - \- Expensive treatment



In the Treasure Valley, year-round recharge of recycled water



Booster Pump Station and Reservoir

Heroes Park

- In Operation since 2010