



# **Bonner/Milltown/West Riverside Wastewater System Improvements**

## Preliminary Engineering Report

Public Meeting No. 2 | September 20, 2016

HDR Engineering- Craig Caprara and Lizzy Adams



01 Project Background

02 Basis of Planning

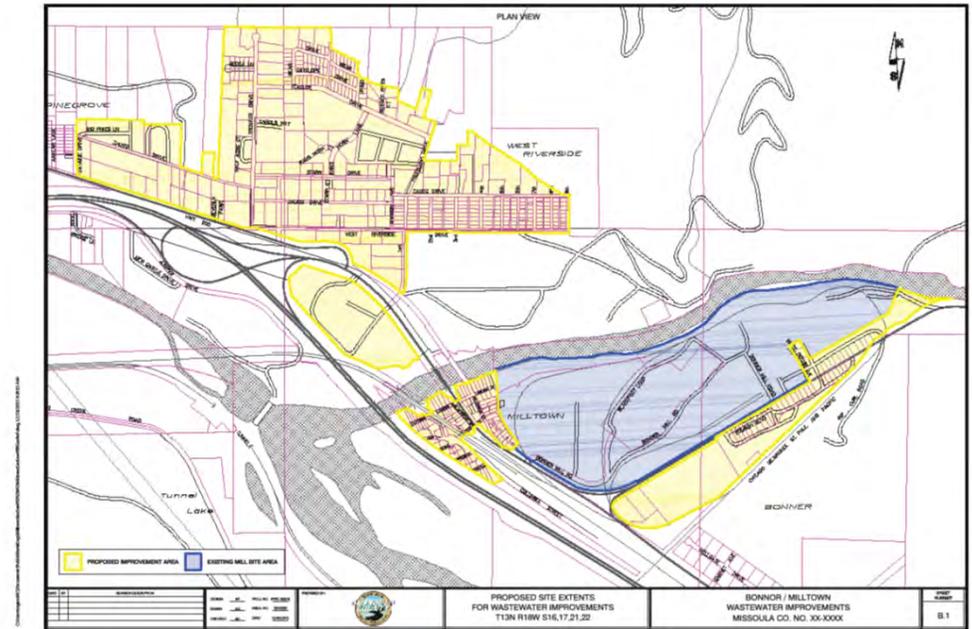
03 Alternatives for Collection,  
Treatment and Disposal



# 01 Project Background

## Project Background

- Area undergoing development pressure
- Areas of high density septic/wells
- *Suspected water quality issues*
- Project involves analysis of community needs and evaluation of alternatives for wastewater collection and treatment



*Project includes analysis of community needs and evaluation of alternatives for wastewater collection and treatment*



# Schedule

				2016								
				A	M	J	J	A	S	O	N	D
<b>PROJECT MANAGEMENT</b>												
	Notice to Proceed			▼								
	Project Management Plan			■								
	Project Coordination Meetings			●	●	●	●	●	●	●	●	
	Quality Control Review			▼				▼			▼	
	Progress Reports			▼	▼	▼	▼	▼	▼	▼	▼	▼
<b>BASIS OF PLANNING</b>												
	Existing Population, Economic and Land Use Baseline			■								
	Population Projections and Distribution			■								
	Develop Service Area Boundary			■								
<b>PUBLIC INVOLVEMENT</b>												
	Public Meeting					●			●		●	
	Stakeholder Meeting			●					▼			
<b>GROUNDWATER ANALYSIS</b>												
	Review existing groundwater data			■								
	Complete groundwater evaluation			■								
<b>ALTERNATIVES ANALYSIS</b>												
	Rating Criteria Development					■						
	Alternative Evaluation Workshop						●		●			
	Technical Feasibility Evaluation					■						
	Alternatives Evaluation Documentation					■						
<b>PRELIMINARY ENGINEERING REPORT</b>												
	Basis of Planning			■				▼				
	Alternatives Analysis				■					▼		
	Proposed Project							■			▼	
	Prepare and Deliver Final PER									■		▼

▼ Project Milestone  
● Project Meeting



# Review of Work to Date

- Review of groundwater data
- Surface water quality review
- Preliminary gravity sewer collection system layout
- Preliminary pump station and forcemain layout (City of Missoula option)
- Alternative screening
- Public Meeting No. 1 (June 22, 2016)





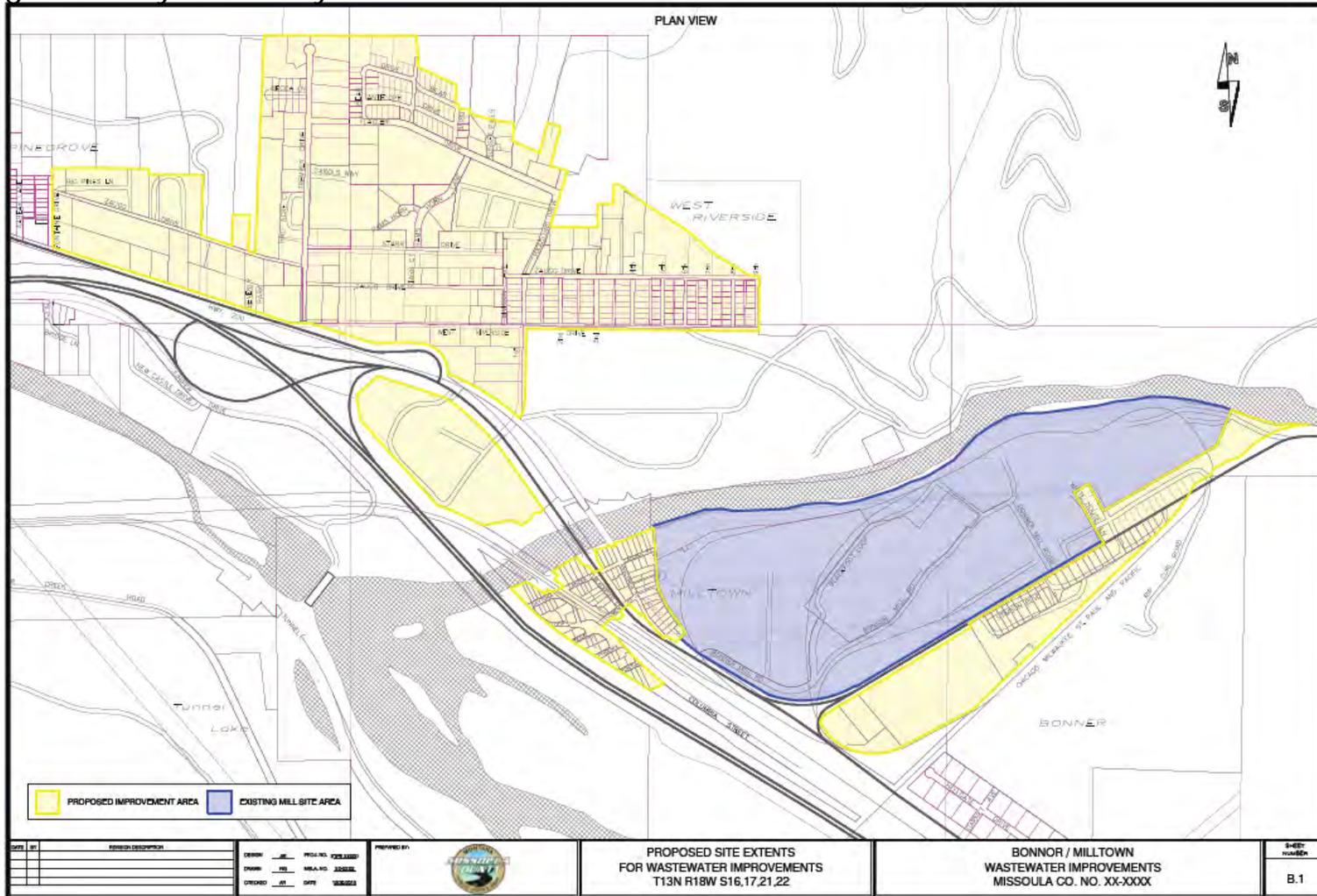


02

## **Basis of Planning**

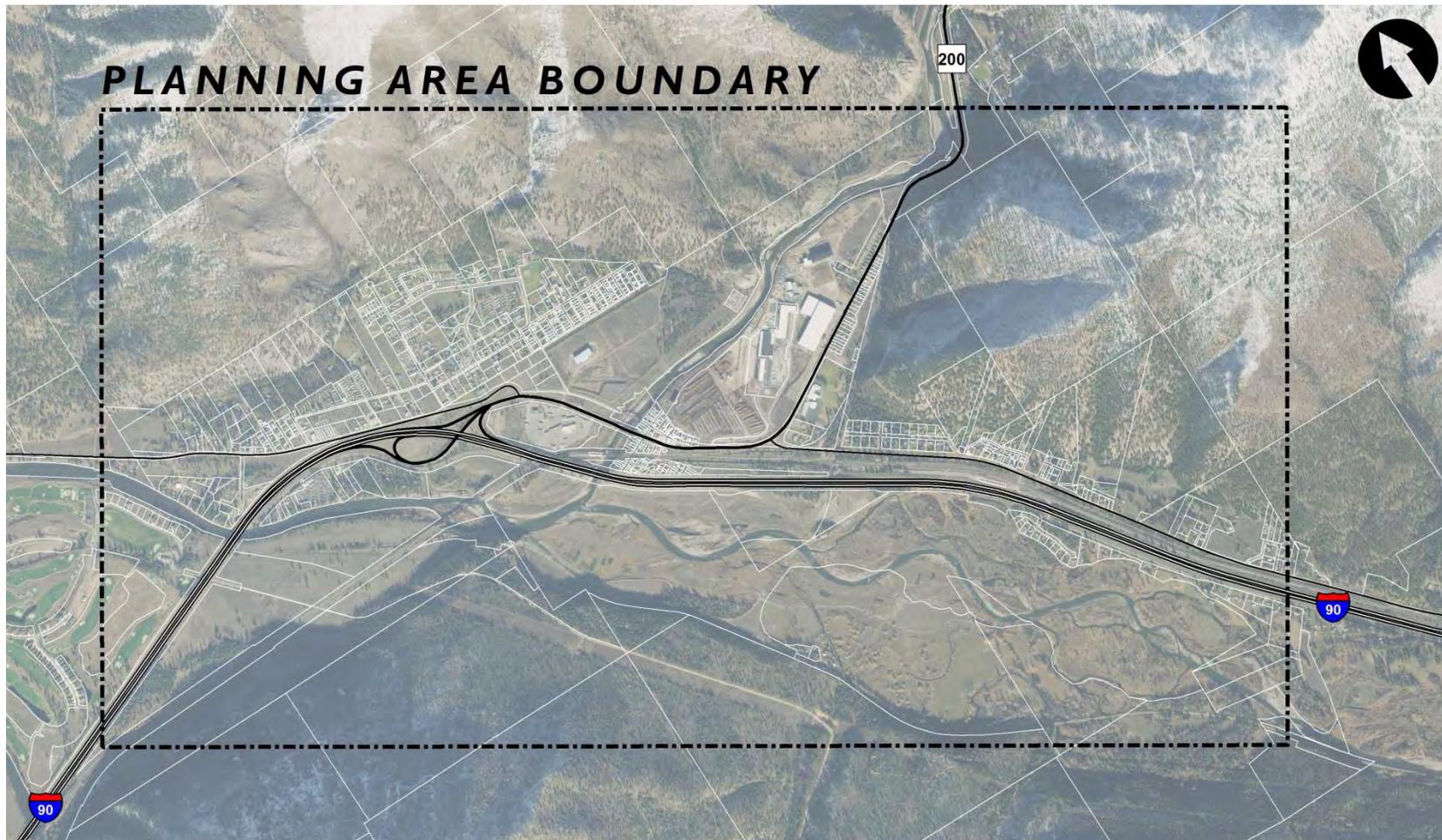
# Vicinity Map

- Original Study Boundary



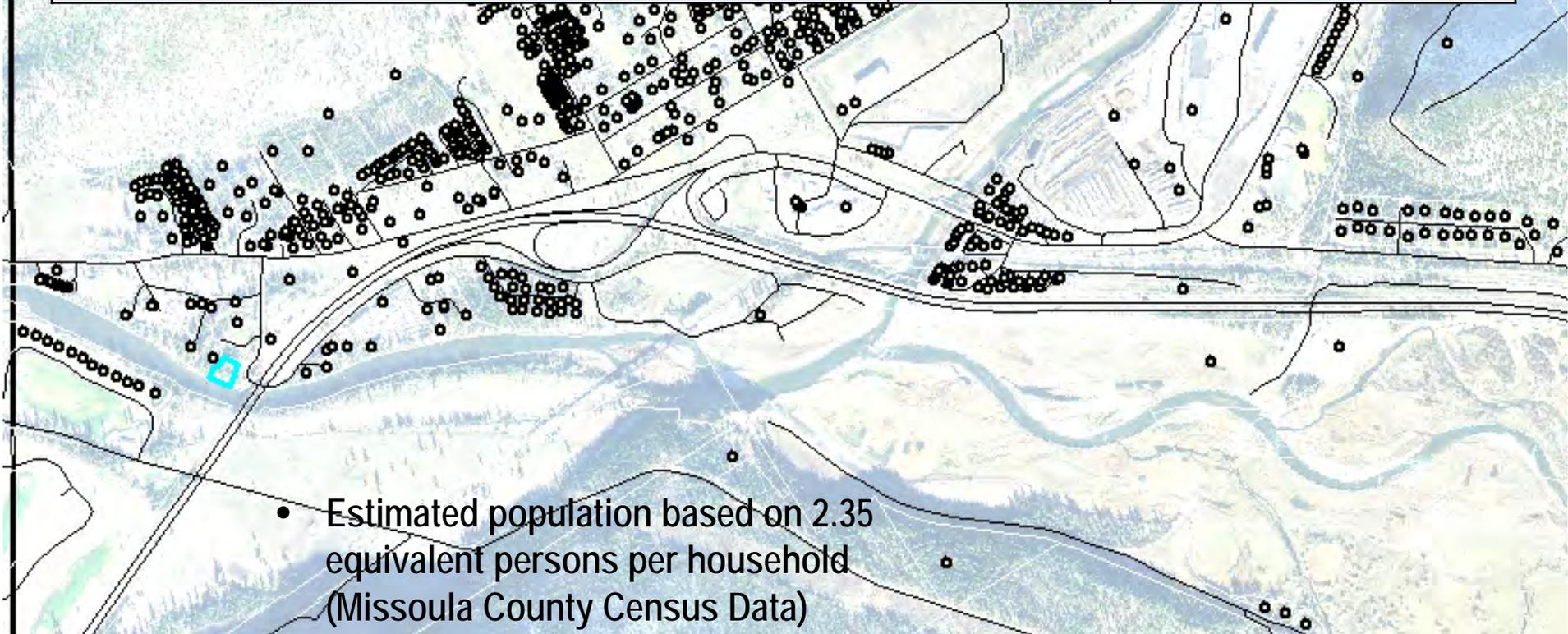
# Vicinity Map

- Current Study Boundary



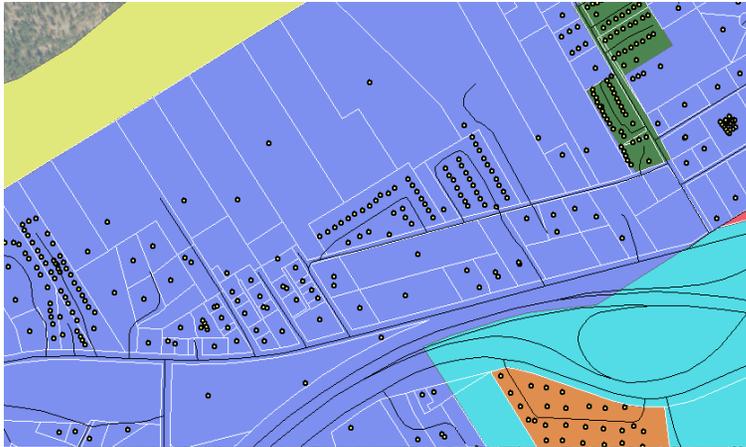
# Existing Population - Estimates

Source	Year	Population
American Community Survey, Bonner- West Riverside CDP	2015	1,656
Missoula County GIS- Structure Count of Expanded Planning Boundary	2016	1800 + Commercial

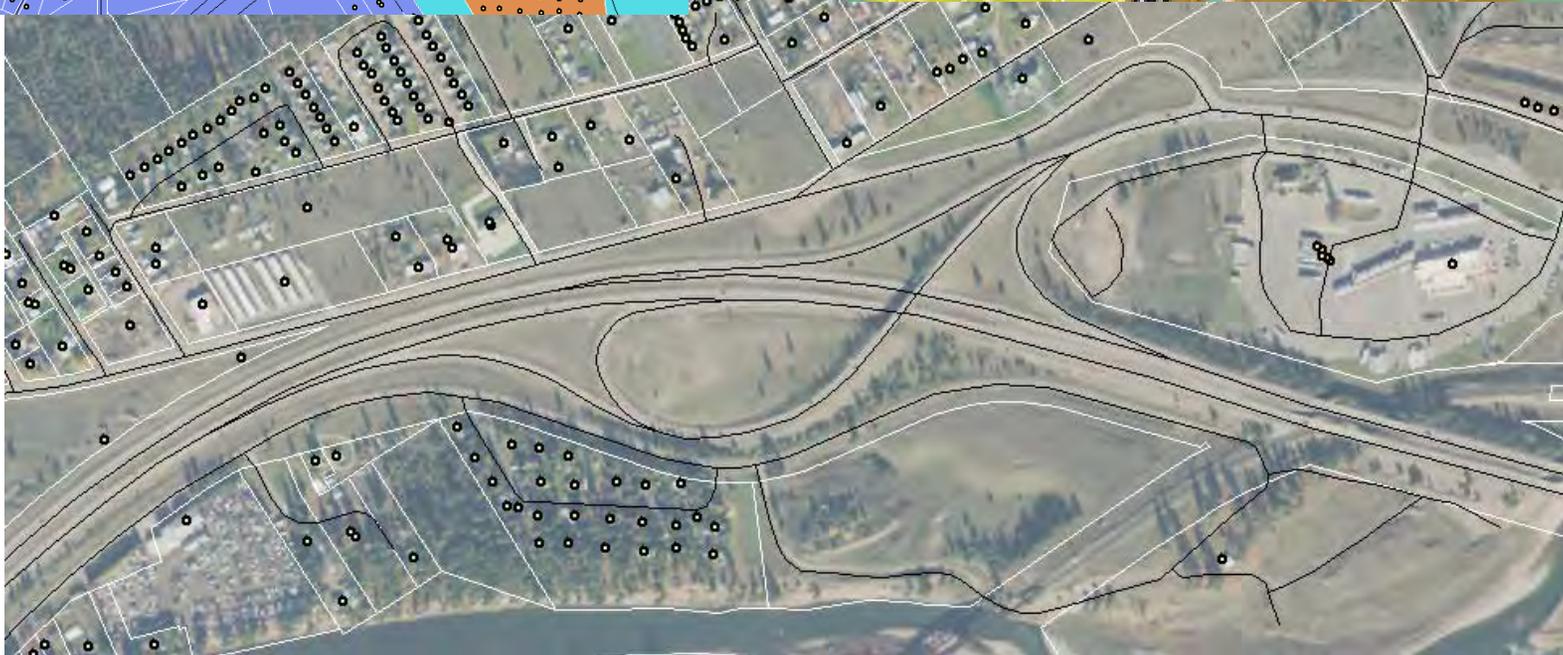
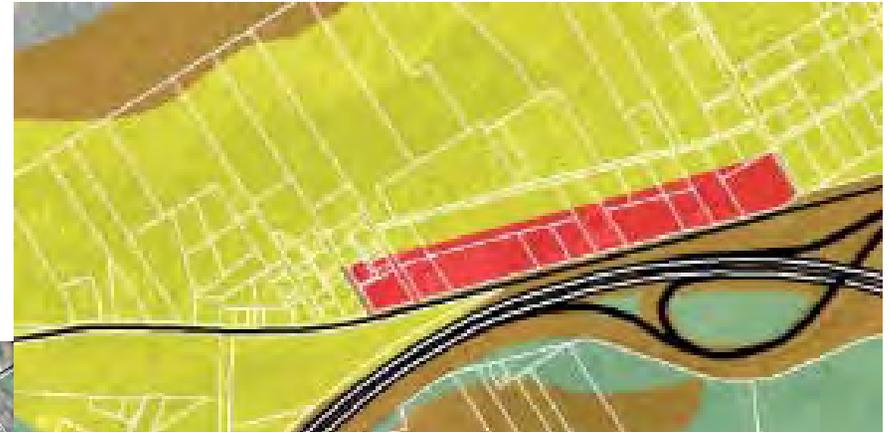


# Future Population - Methodology (Critical to Project Success)

Blue is "Unzoned" (0 dwellings per acre)

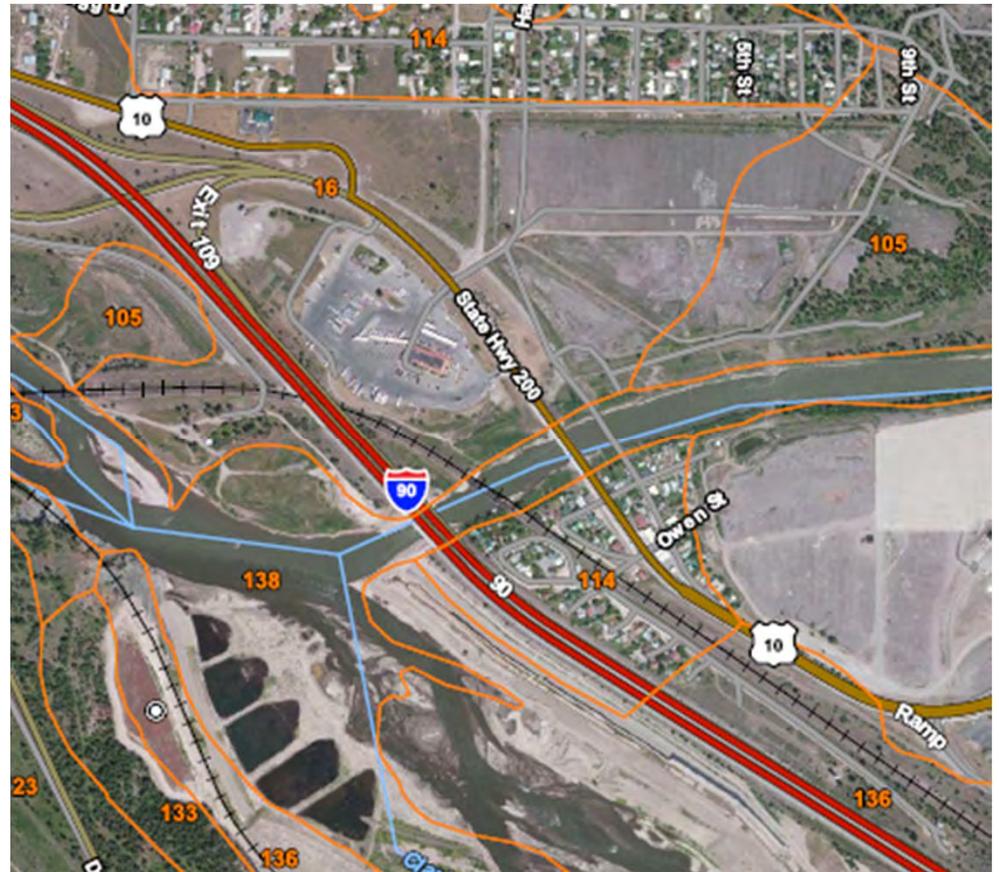


Land Use is Residential (2 dwellings per acre)

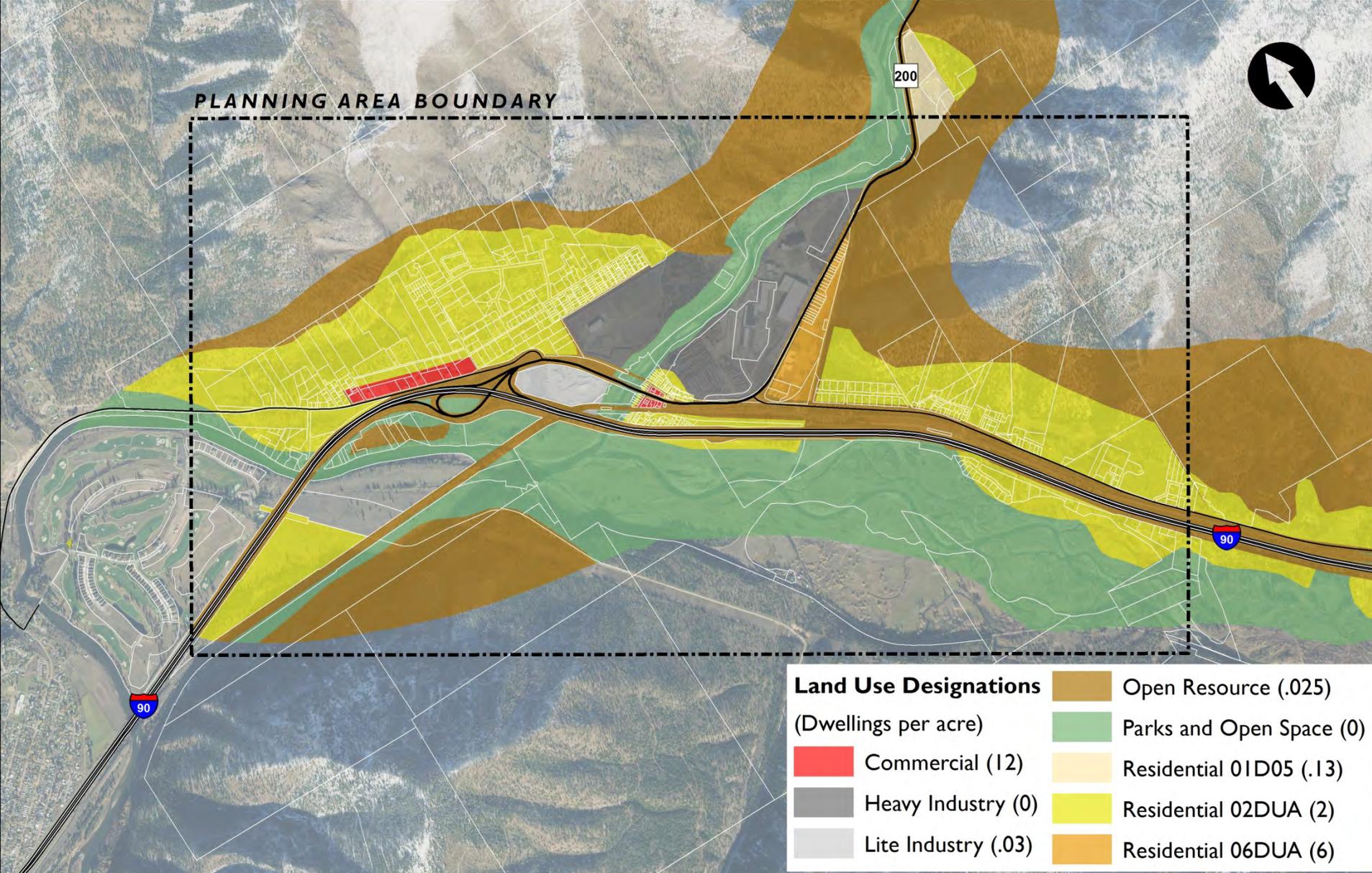


# Future Population – Impacts of Zoning/Land Use

- Missoula County Growth Policy- May 2016
  - Identifies Bonner as “ready for redevelopment” and as having “additional capacity for further industrial business”.
  - Tax Increment Financing (TIF)
  - Targeted Economic Development Districts (TEDD)
- Updated Land Use and Zoning
  - Expected in 2017/2018



# Future Population –Land Use Assumptions



## Future Population –Estimates

Estimated Existing Population	1834
Missoula County Persons Per Household	2.35
Missoula County Growth Rate, 10 Year	11.6%
Missoula County Growth Rate, 20Year	28.0%
Estimated Potential Growth	847
20 year Growth Rate Estimation	513
Build Out Potential Population	2681
20 Year Population	2348

# Future Wastewater Flow and Load

Estimated Bonner/Milltown/West Riverside Flow and Load

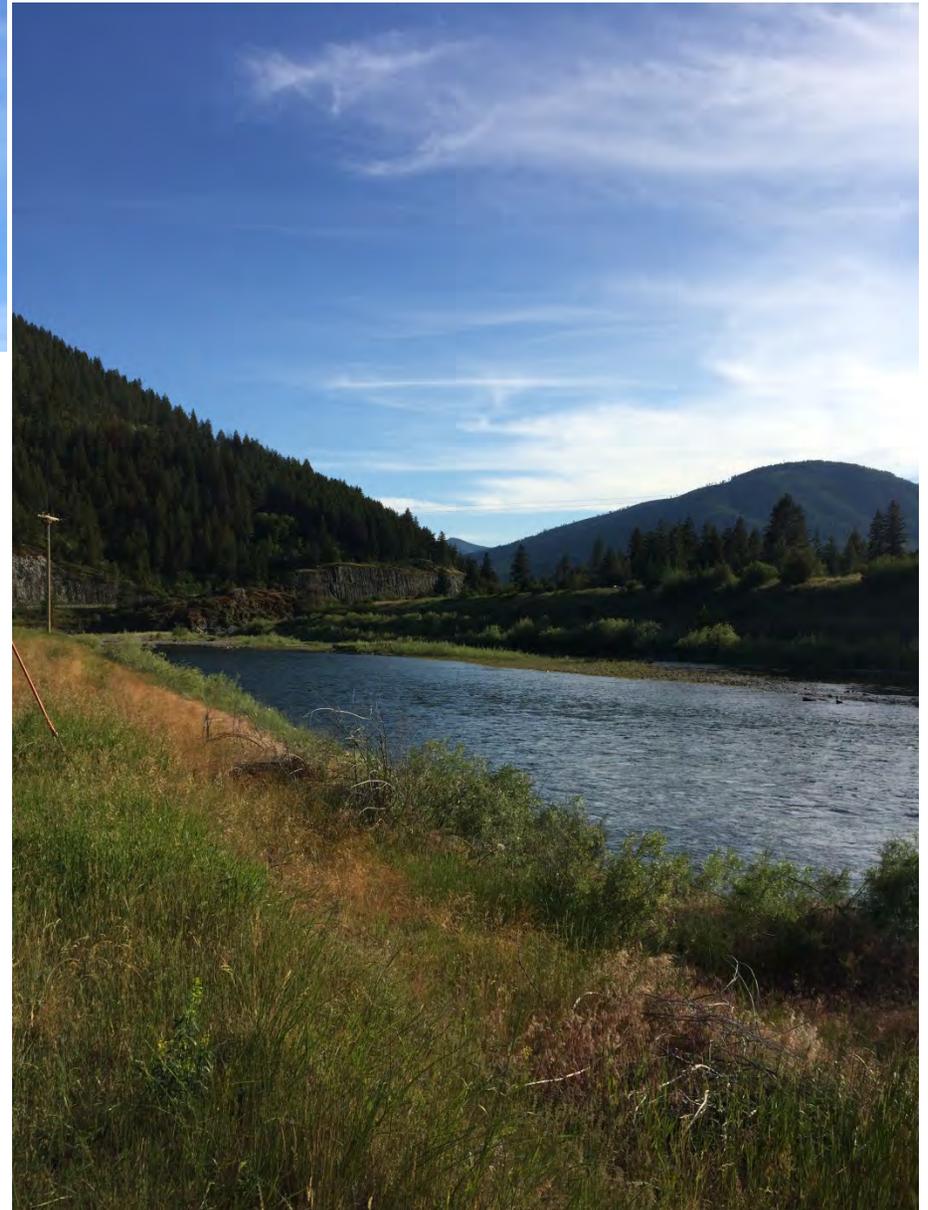
	20-Year	Build-Out
Ave. Daily Flow (MGD)	0.23	0.27

Similar System – Town of Stevensville

	20-Year	Build-Out
Ave. Daily Flow (MGD)	0.21	0.40



## Public Input – How do you see your community growing?





# 03 Potential Alternatives for Collection, Treatment and Disposal

# Alternative Considerations

1. The three elements of a wastewater facility include collection, treatment and disposal.
2. Each element of the facility impacts the cost of the other elements because sum of the elements may not be compatible
3. For Example:
  - a) Lagoon treatment is not compatible with surface water discharge.
  - b) STEP collection systems may not be compatible with mechanical treatment and therefore not compatible with surface water discharge



# Wastewater Disposal

Four General Options for Disposing of Wastewater

1. Discharge to Surface Water
  - a) Outfall (pipe)
2. Land Application
  - a) Irrigation
3. Discharge to Groundwater
  - a) Drainfield
  - b) Infiltration Ponds
4. Discharge to City of Missoula
  - a) Pipeline to Missoula – No Treatment



# Wastewater Disposal

What Drives Wastewater Disposal?  
(Not Including Cost)

1. Discharge to Surface Water
  - a) State/Federal Regulations
2. Land Application
  - a) Land Availability
  - b) Soils
3. Discharge to Groundwater
  - a) State/Federal Regulations
  - b) Land Availability
  - c) Soils
4. Discharge to City of Missoula
  - a) City Specific Requirements/Conditions for Connection
    - Waiver of protest to annexation
    - Connection/Impact Fees
    - Monthly O&M costs



# Wastewater Treatment

## Three General Options for Treating Wastewater

1. Do Nothing
  - a) Applies to City of Missoula Connection
2. Mechanical
  - a) Multiple forms and levels of treatment
  - b) High O&M Costs
3. Lagoon-Based
  - a) Aerated or Facultative
  - b) Low O&M Costs
4. Community Cluster Systems
  - a) Subsurface Sand Filtration (Advantex)
  - b) Passive Aerobic Treatment and Dispersal (Advanced Enviro-Septic)
  - c) Small Package Mechanical
  - d) Low O&M Costs



# Wastewater Treatment and Disposal Compatibility

Element	Mechanical	Lagoon-Based	Community Cluster
Connect to Missoula	NR	NR	NR
Surface Water	C	NC	NC
Land Application	C	C	C
Groundwater	C	C	C

NR – Not Required

C – Compatible

NC – Not Compatible

# Wastewater Collection

Two General Options for Treating Wastewater

1. Systems that Collect Solids
  - a) Conventional Gravity
  - b) Vacuum Sewers
2. Systems that don't Collect Solids
  - a) Septic Tank Effluent Pump (STEP) Systems w/ Low Pressure Force Mains
  - b) Small Diameter Variable Grade Sewers
  - c) Maintenance of Septic Tanks Req'd



# Wastewater Treatment and Collection Compatibility

Element	Systems that Collect Solids	Systems that don't Collect Solids
Connect to Missoula	C	C
Mechanical	C	NC
Lagoon-Based	C	NC
Community Cluster	NC	C

NR – Not Required

C – Compatible

NC – Not Compatible

## Potential Alternatives

- Do Nothing
  - No collection system, individual on-site treatment, groundwater discharge
- Connect to Missoula
  - Collection system (solids), no treatment, pipeline to Missoula
  - Collection system (no solids), no treatment, pipeline to Missoula
- Surface Water Discharge
  - Collection system (solids), mechanical treatment, pipeline to river
- Land Application
  - Collection system (solids), mechanical treatment, irrigation
  - Collection system (solids), lagoon-based treatment, irrigation
  - Collection system (no solids), cluster community treatment, irrigation
- Groundwater Discharge
  - Collection system (solids), mechanical treatment, groundwater discharge
  - Collection system (solids), lagoon-based treatment, groundwater discharge
  - Collection system (no solids), cluster community treatment, groundwater discharge

# Alternative Screening Process

- Do Nothing
  - No collection system, individual on-site treatment, groundwater discharge
- Connect to Missoula
  - Collection system (solids), no treatment, pipeline to Missoula
  - Collection system (no solids), no treatment, pipeline to Missoula
- Surface Water Discharge
  - ~~Collection system (solids), mechanical treatment, pipeline to river~~ Very expensive, discharge permit unlikely
  - Collection system (solids), mechanical treatment, utilization of existing Mill MPDES Discharge Permit for effluent discharge Blackfoot River
- Land Application
  - ~~Collection system (solids), mechanical treatment, irrigation~~
  - ~~Collection system (solids), lagoon-based treatment, irrigation~~
  - ~~Collection system (no solids), cluster community treatment, irrigation~~

Land availability and winter storage a major limitation
- Groundwater Discharge
  - Collection system (solids), mechanical treatment, groundwater discharge
  - Collection system (solids), lagoon-based treatment, groundwater discharge
  - Collection system (no solids), cluster community treatment, groundwater discharge

# What does a project like this cost?

- City of Conrad, MT
  - Population: 2,600
  - ADF: 0.5 MGD
  - New mechanical treatment plant, surface water discharge
  - \$3.7 M (treatment only)
- Seeley Lake Water and Sewer District
  - Population: 1,660
  - New mechanical treatment plant, new collection system (solids) and groundwater discharge
  - \$22 M
- Woods Bay Sewer District
  - Population: 650 properties (low density...1.7 square miles)
  - New Collection System (solids and no solids) and pipeline to Bigfork
  - Collection: \$15,000,000 (\$8.8 million/sq. mile)
  - Pipeline to Bigfork (4.5 miles): \$4,000,000
- Connect to Missoula
  - Pumping Station and Pipeline to Missoula: ~\$

# Moving Forward

- Detailed Alternatives Evaluation
- Draft PER
- Public Meeting #3
  - November 15, 2016
  - Present alternatives and budget costs
  - Present preliminary recommendations
- Finalize PER
- Public Meeting #4
  - **December 6, 2016**
  - Present final report and recommendations



QUESTIONS?

