



# **Regional Wastewater Treatment Consolidation Study**

## **Stakeholder Workshop**

Nov 19, 2021

**Naugatuck Valley  
Council of Governments**



**BLACK & VEATCH**

# Agenda

Introductions

Finalist Group of Regional Alternatives

Base Case and Regional Alternatives Development

→ Wastewater Treatment Plants

→ Conveyance Pipelines and Pumping

→ Collection Systems

Cost & Schedule

Recommendation

# Finalist Group of Regional Alternatives

No.	Alternative Description
3	Derby to Ansonia
4	Derby to Ansonia, Effluent Pumped to Housatonic River
5	Derby and Seymour to Ansonia
5b	Derby and Seymour to Ansonia, Effluent Pumped to Housatonic River

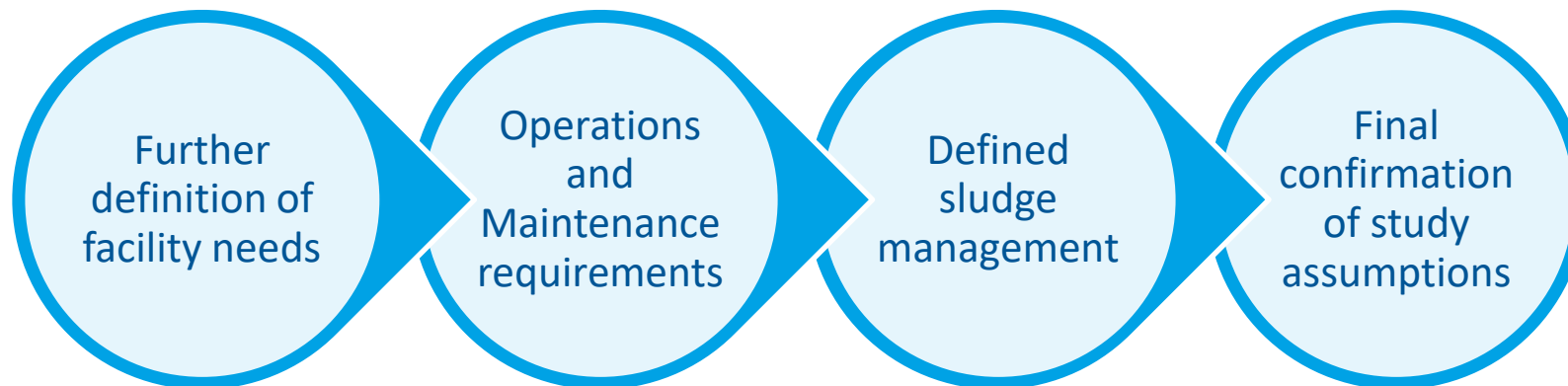


# Base Case and Regional Alternatives Development

Wastewater Treatment Plants

# Wastewater Treatment Plants

- Primary, Secondary & Tertiary Treatment
- Influent Pumping, Preliminary Treatment, Sludge Management, Effluent Disinfection, Other (Buildings, Electrical, Instrumentation & Site)
- Assessed operations and maintenance requirements
- Defined sludge management
- Final confirmation of study assumptions





# Derby Plant – Base Case



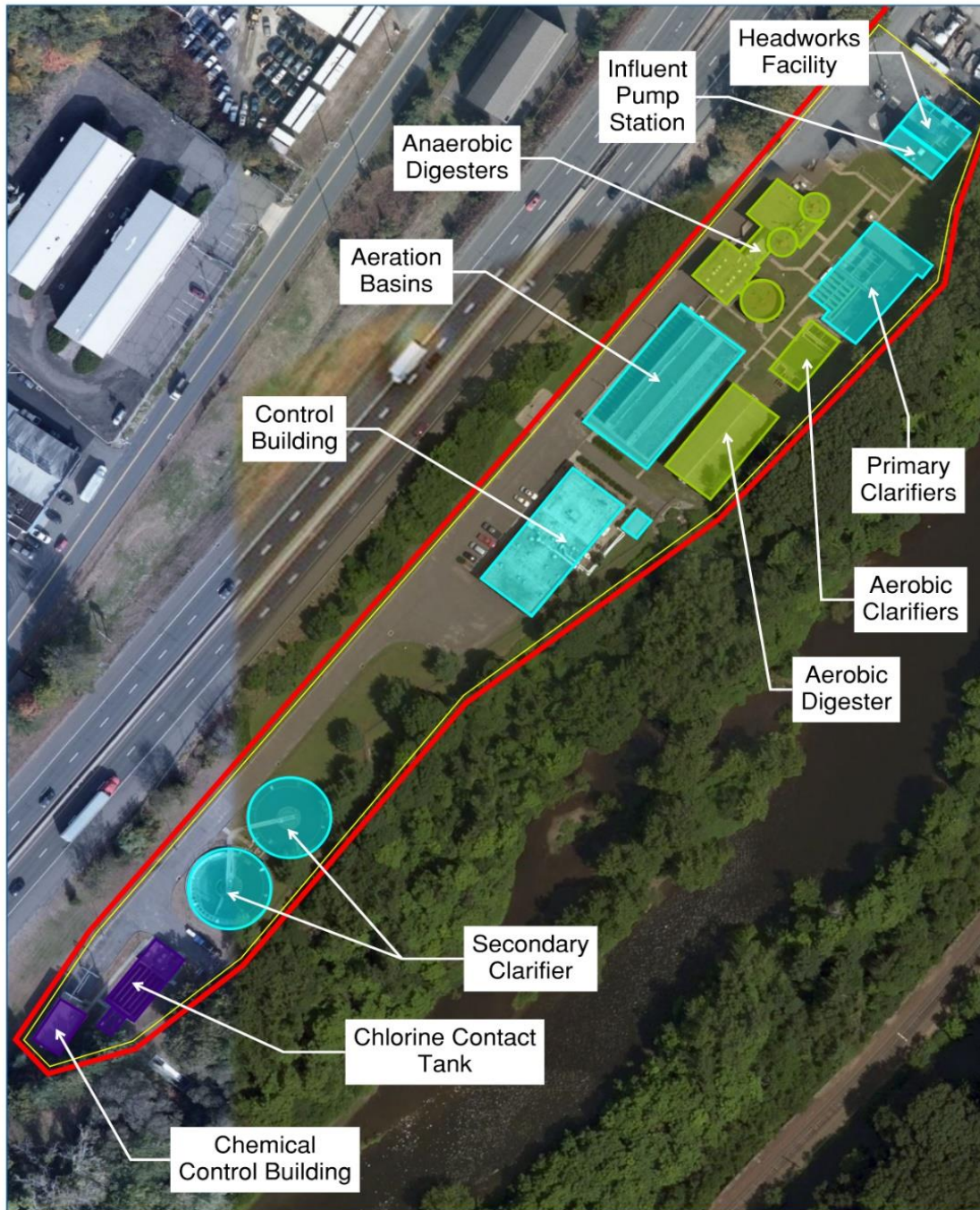
- Significant upgrades required
  - Pumping
  - Preliminary Treatment
  - Primary Treatment
  - Secondary Treatment
  - Sludge Processing
  - Electrical and I&C
  - Building and Sub-systems





# Seymour Plant – Base Case

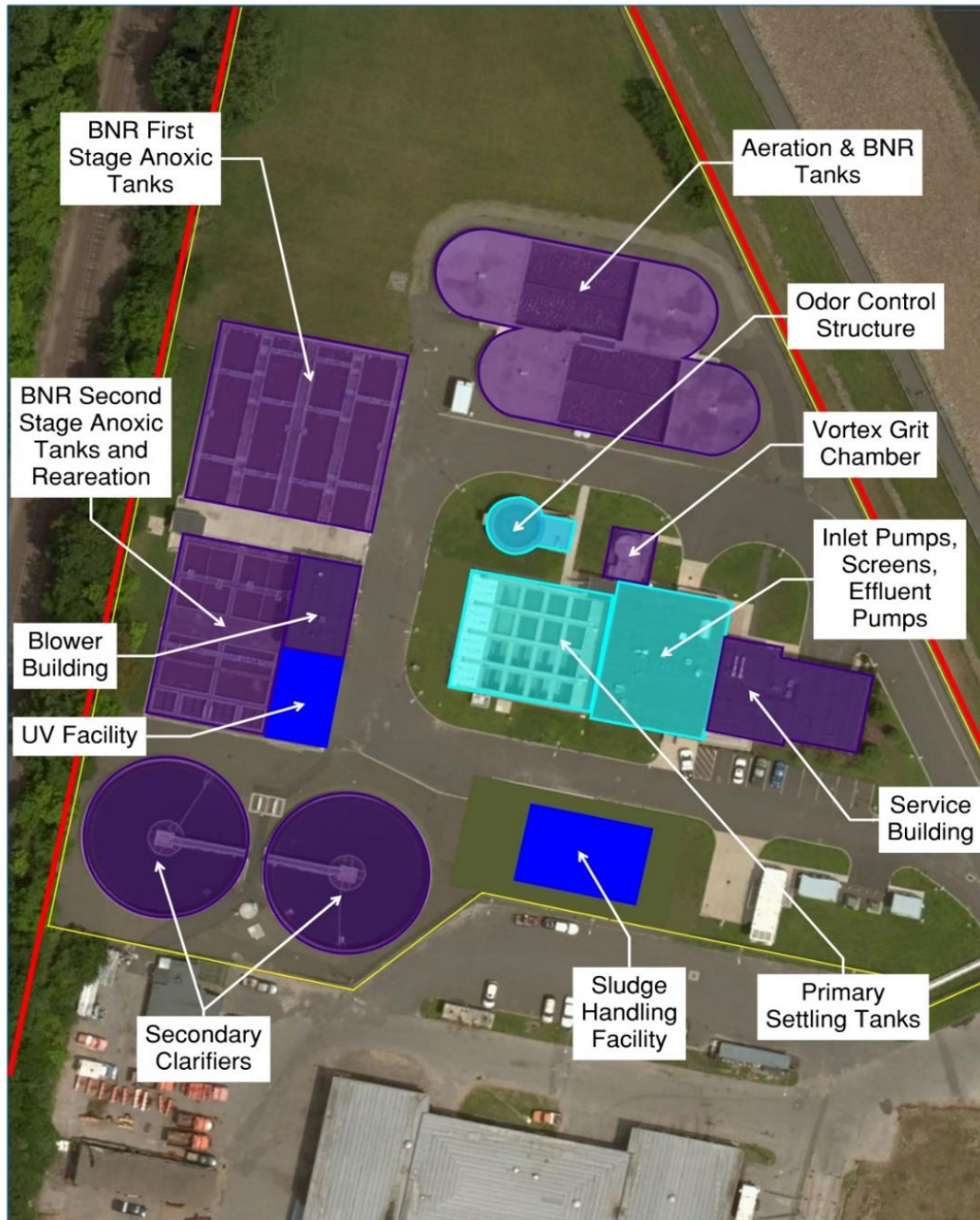
- Major upgrades required
  - Headworks
  - Pumping
  - Primary Treatment
  - Secondary Treatment
  - Sludge Handling
  - Electrical and I&C
  - Buildings





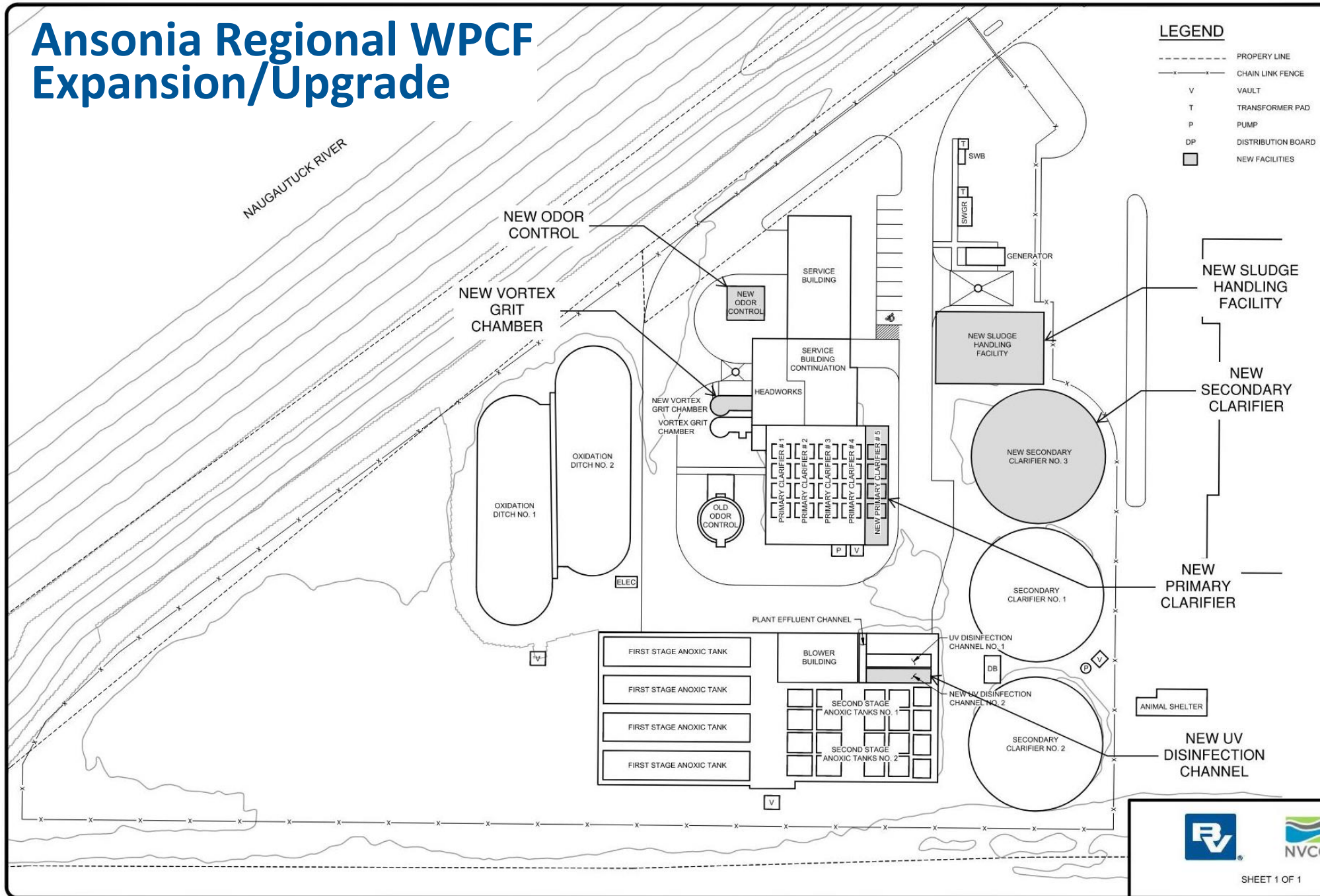
# Ansonia Plant – Base Case

- Moderate upgrades required
  - Headworks
  - Disinfection
  - Effluent Pumping
  - Sludge Handling



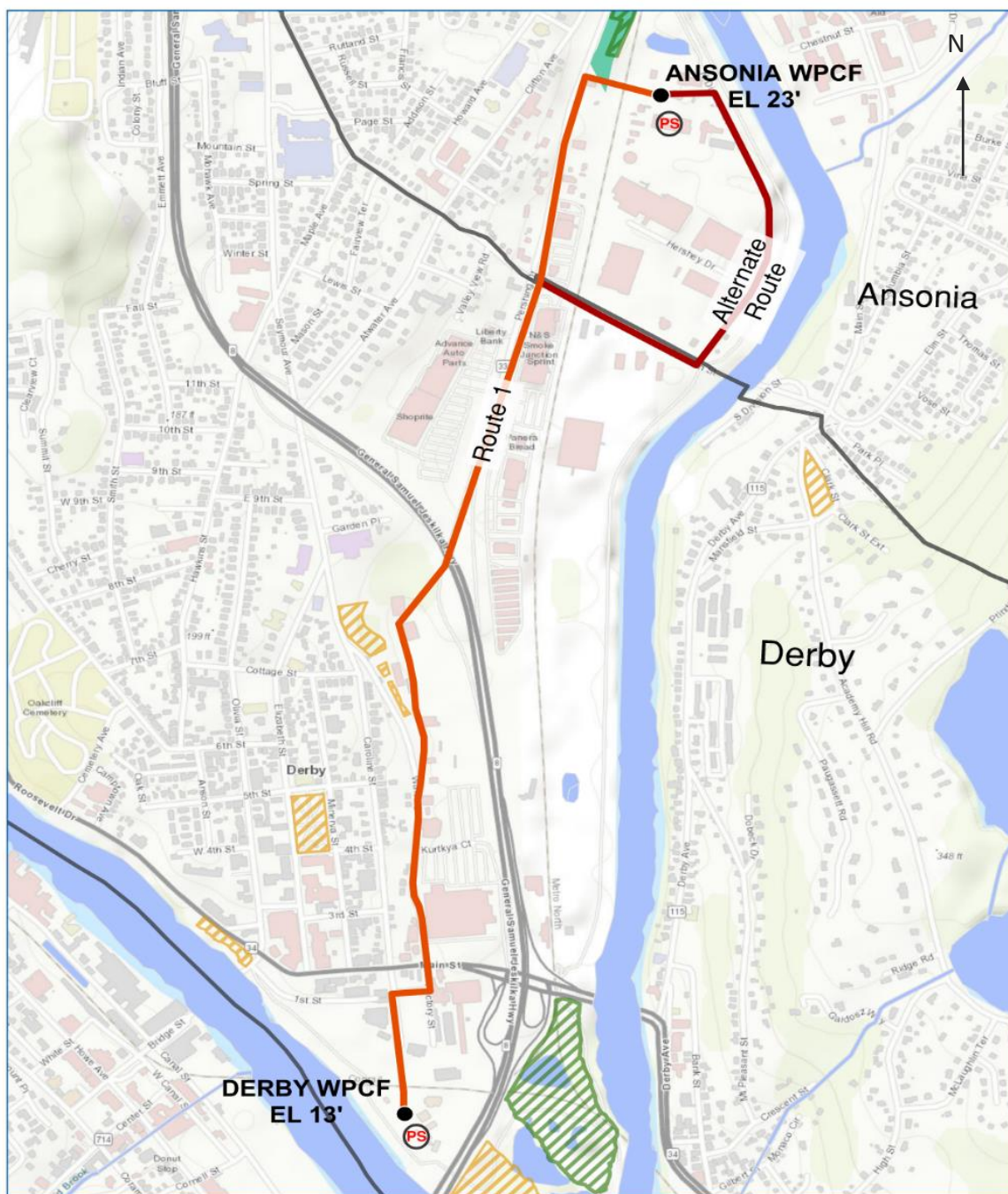


# Ansonia Regional WPCF Expansion/Upgrade

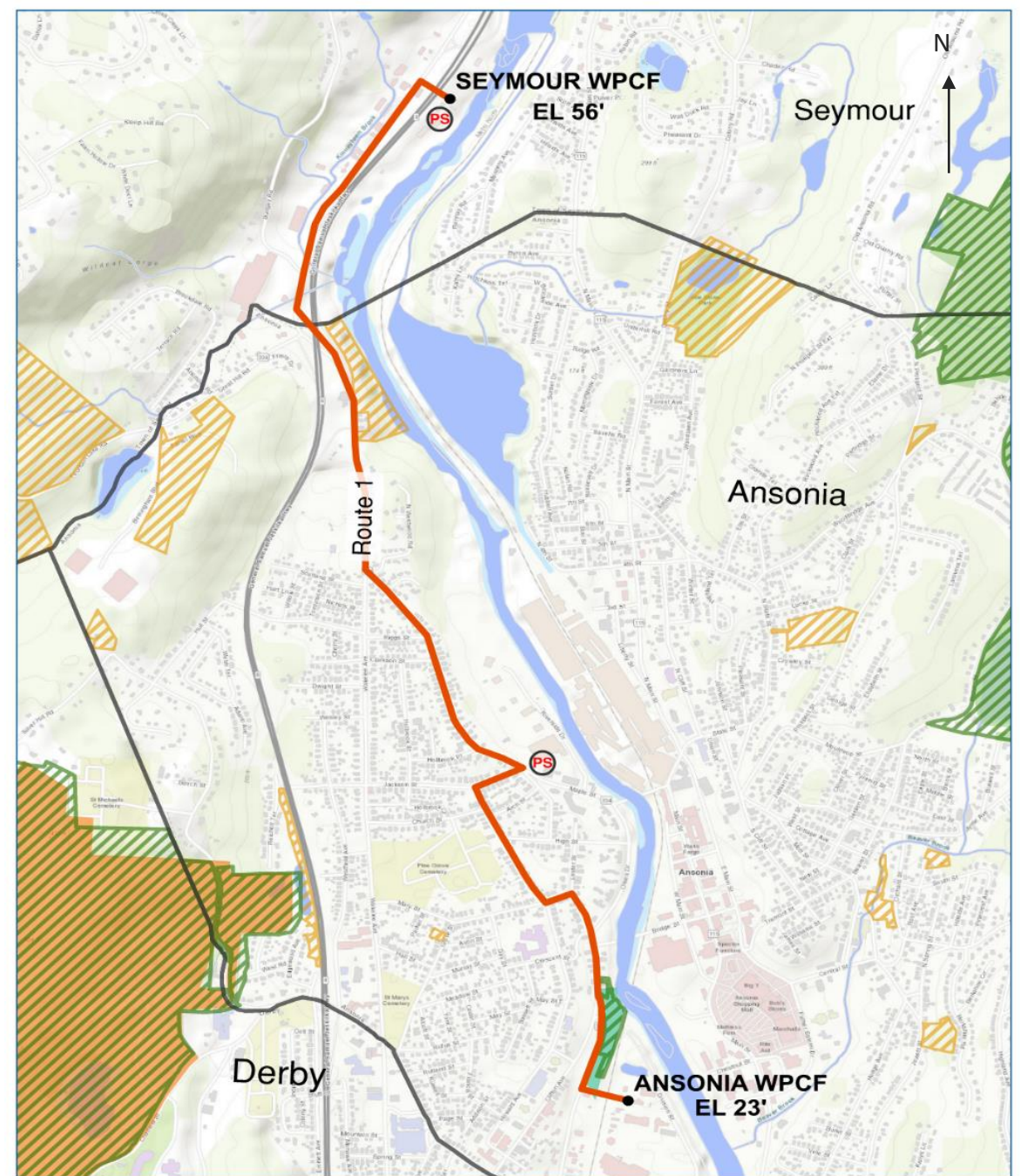


# Conveyance Pipelines





**Derby to Ansonia**



**Seymour to Ansonia**

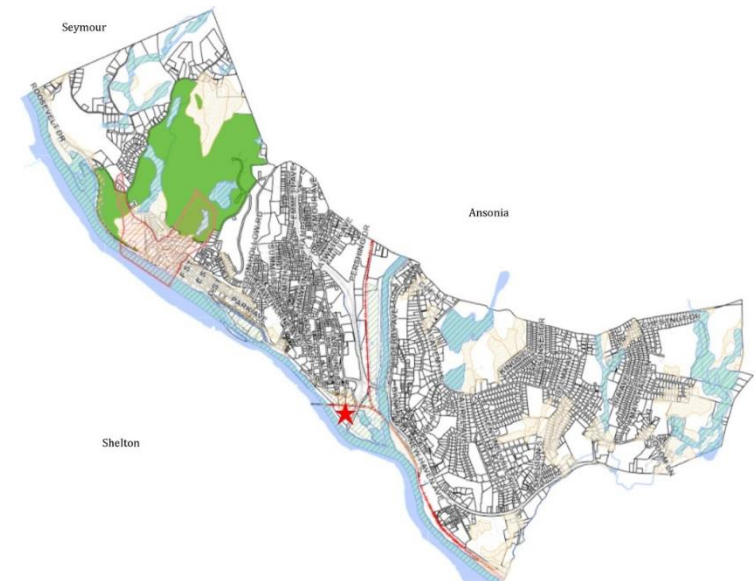
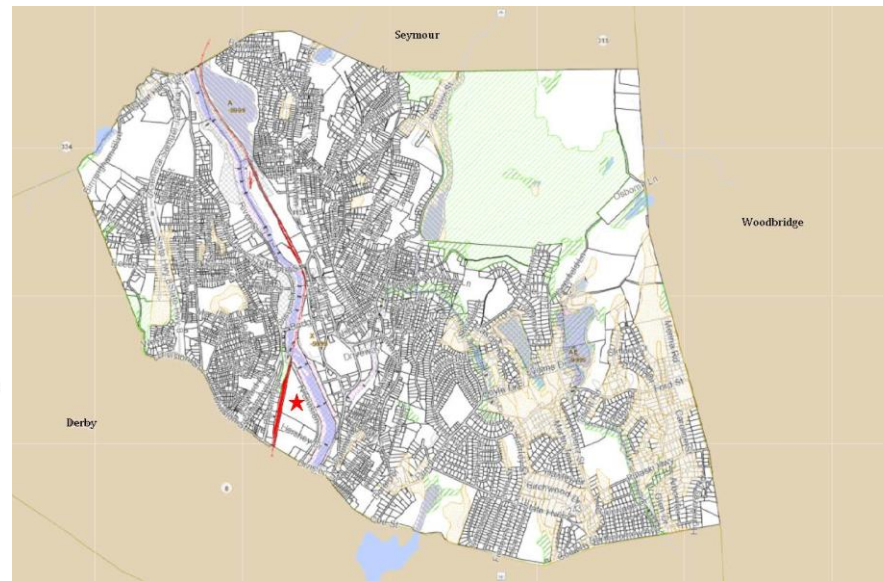
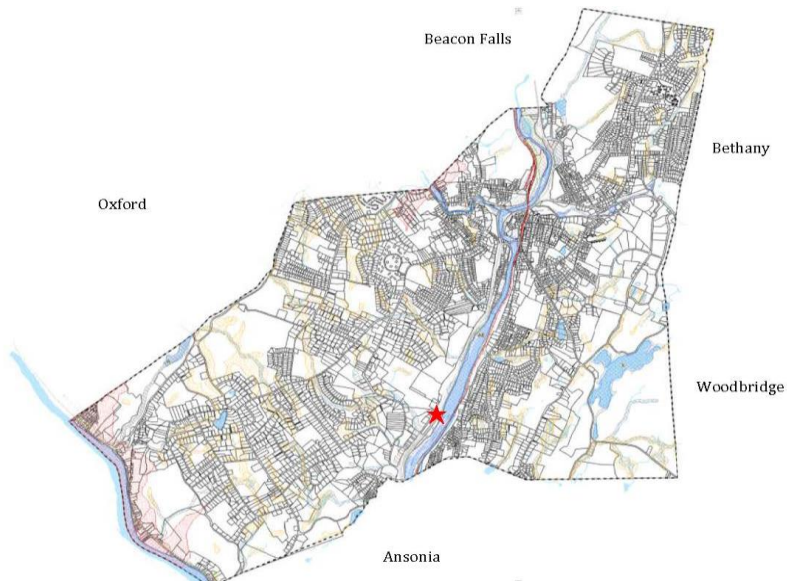


# Base Case and Regional Alternatives Development

Collection Systems

# Collection Systems – Derby, Ansonia, Seymour

- Old collection systems.
- Derby and Ansonia: more than 70% is vitrified clay (VC) pipe.
- All three systems are leaky, with very high I/I. Peak wet weather flows can exceed plant capacity.
- Significantly higher expenditures are required for sewer replacement/ repairs due to poor condition of system and years of deferred replacement.
- USEPA Order required collection system improvements, including I/I Control Plan and CMOM Corrective Action Plan.



# Cost & Schedule

Capital Costs

O&M Costs

Present Worth Analysis



# Capital Cost: Treatment Plants – Base Cases

Derby	Ansonia	Seymour
\$51,700,000	\$16,500,000	\$24,900,000

# Capital Cost: Treatment Plants – Ansonia Regional Alternatives

Ansonia + Derby	Ansonia + Derby (Effluent to Housatonic)	Ansonia + Derby + Seymour	Ansonia + Derby + Seymour (Effluent to Housatonic)
\$40,700,000	\$26,500,000	\$50,800,000	\$35,700,000



# Capital Cost: Conveyance Pipelines and Pump Stations

	Derby to Ansonia	Derby to Ansonia (Effluent to Housatonic)	Seymour to Ansonia
Conveyance Pipeline	\$13,000,000	\$19,700,000	\$20,200,000
Pump Stations, Screenings, Grit Removal	\$6,300,000	\$6,300,000	\$11,400,000
<b>Total</b>	<b>\$19,300,000</b>	<b>\$26,000,000</b>	<b>\$31,600,000</b>



# Capital Costs: Collection Systems

	Derby	Ansonia	Seymour
Collection System Length (miles)	41.2	65.3	63.0
System replacement rate (yr 1-5)	2.5%	2%	2%
System replacement rate (yr 6-25)	1.2%	1%	0.75%
System replacement cost (yr 1-5)	\$2,860,000	\$3,620,000	\$3,500,000
System replacement cost (yr 6-25)	\$7,030,000	\$9,280,000	\$6,720,000
Pump station replacement cost	\$4,380,000	\$3,150,000	\$2,100,000
<b>Total</b>	<b>\$14,300,000</b>	<b>\$16,100,000</b>	<b>\$12,300,000</b>





# O&M Costs: Base Case

Annual Costs	Ansonia	Derby	Seymour
Electricity Costs	\$313,500	\$145,600	\$97,000
Chemical Costs	\$90,900	\$66,700	\$46,600
Chemical Disinfection Costs	\$0	\$8,300	\$8,300
Sludge Disposal Costs	\$379,200	\$249,000	\$228,500
Labor Cost	\$1,070,800	\$1,215,100	\$1,070,800
<b>Total Annual O&amp;M Costs</b>	<b>\$1,878,000</b>	<b>\$1,685,000</b>	<b>\$1,451,000</b>



# O&M Costs: Ansonia Regional Alternatives

Annual Costs	Ansonia + Derby	Ansonia + Derby (Effluent to Housatonic)	Ansonia + Derby + Seymour	Ansonia + Derby + Seymour (Effluent to Housatonic)
Electricity Costs	\$503,800	\$508,300	\$655,000	\$669,900
Chemical Costs	\$159,900	\$127,800	\$201,100	\$160,000
Chemical Disinfection Costs	\$38,300	\$38,300	\$42,800	\$42,800
Sludge Disposal Costs	\$627,000	\$627,000	\$832,600	\$832,600
Labor Cost	\$1,503,800	\$1,503,800	\$1,792,400	\$1,792,400
Total Annual O&M Costs	\$6,191,000	\$6,185,000	\$7,944,000	\$7,995,000



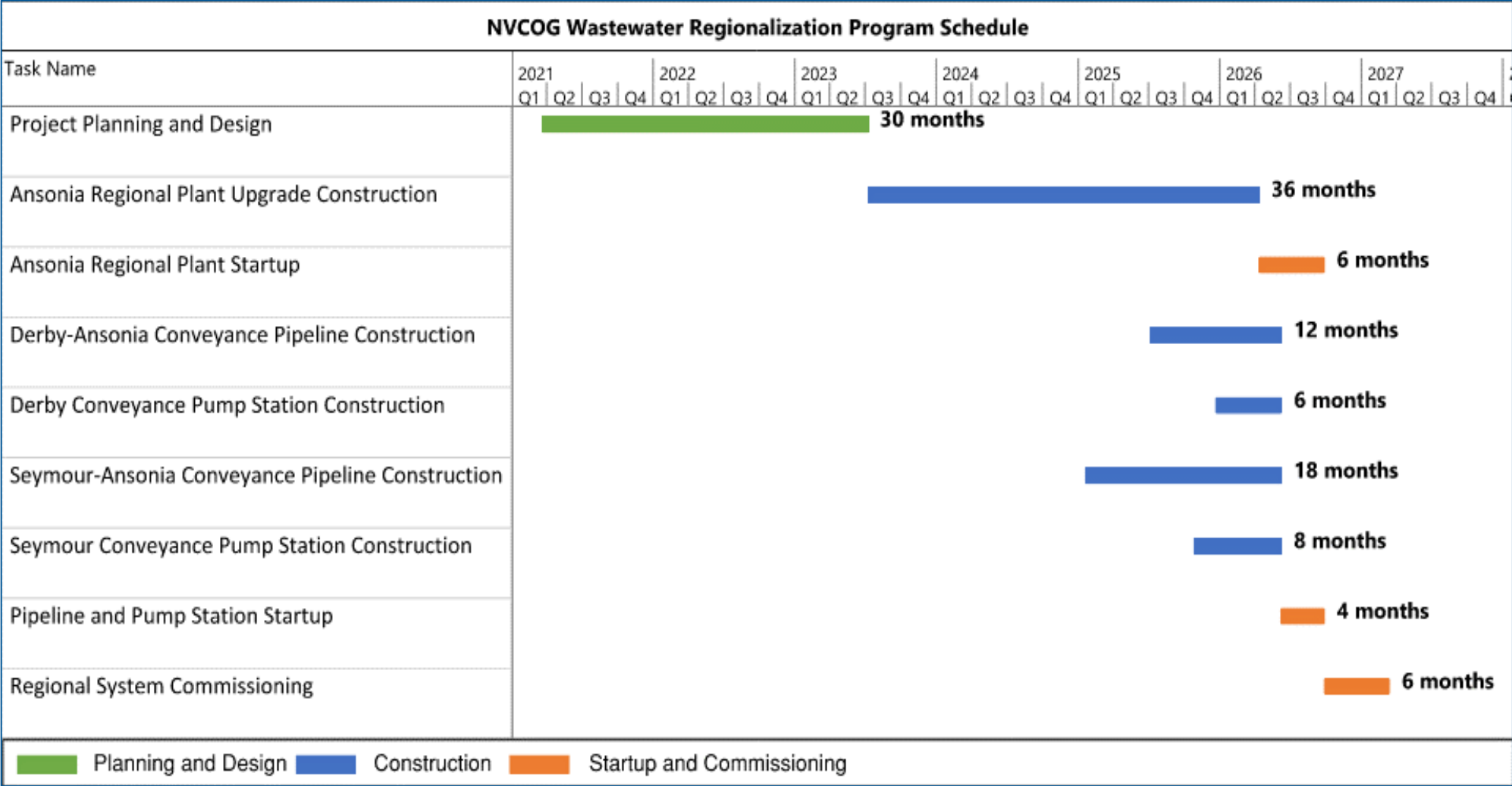
# Comparison of Base Case and Recommended Regional Alternatives with Grants

No.	Regionalization Alternative	Regional Alternative Costs (\$M)			Base Case, No Regionalization	Base Case (\$M)			Present Worth Savings in Regionalization (\$M)
		Capital	O&M	Total		Capital	O&M	Total	
3	Derby to Ansonia	\$58.7	\$57.5	\$116.2	WPCF's Remain in Derby, Ansonia	\$68.6	\$67.9	\$136.5	\$20.3
4	Derby to Ansonia; Effluent Pumped to Housatonic	\$53.3	\$57.1	\$110.4	WPCF's Remain in Derby, Ansonia	\$68.6	\$67.9	\$136.5	\$26.1
5	Derby & Seymour to Ansonia	\$94.4	\$74.2	\$168.6	WPCF's Remain in Derby, Ansonia, Seymour	\$94.5	\$95.6	\$190.1	\$21.5
5b	Derby & Seymour to Ansonia; Effluent Pumped to Housatonic	\$88.4	\$73.8	\$162.2	WPCF's Remain in Derby, Ansonia, Seymour	\$94.5	\$95.6	\$190.1	\$27.9





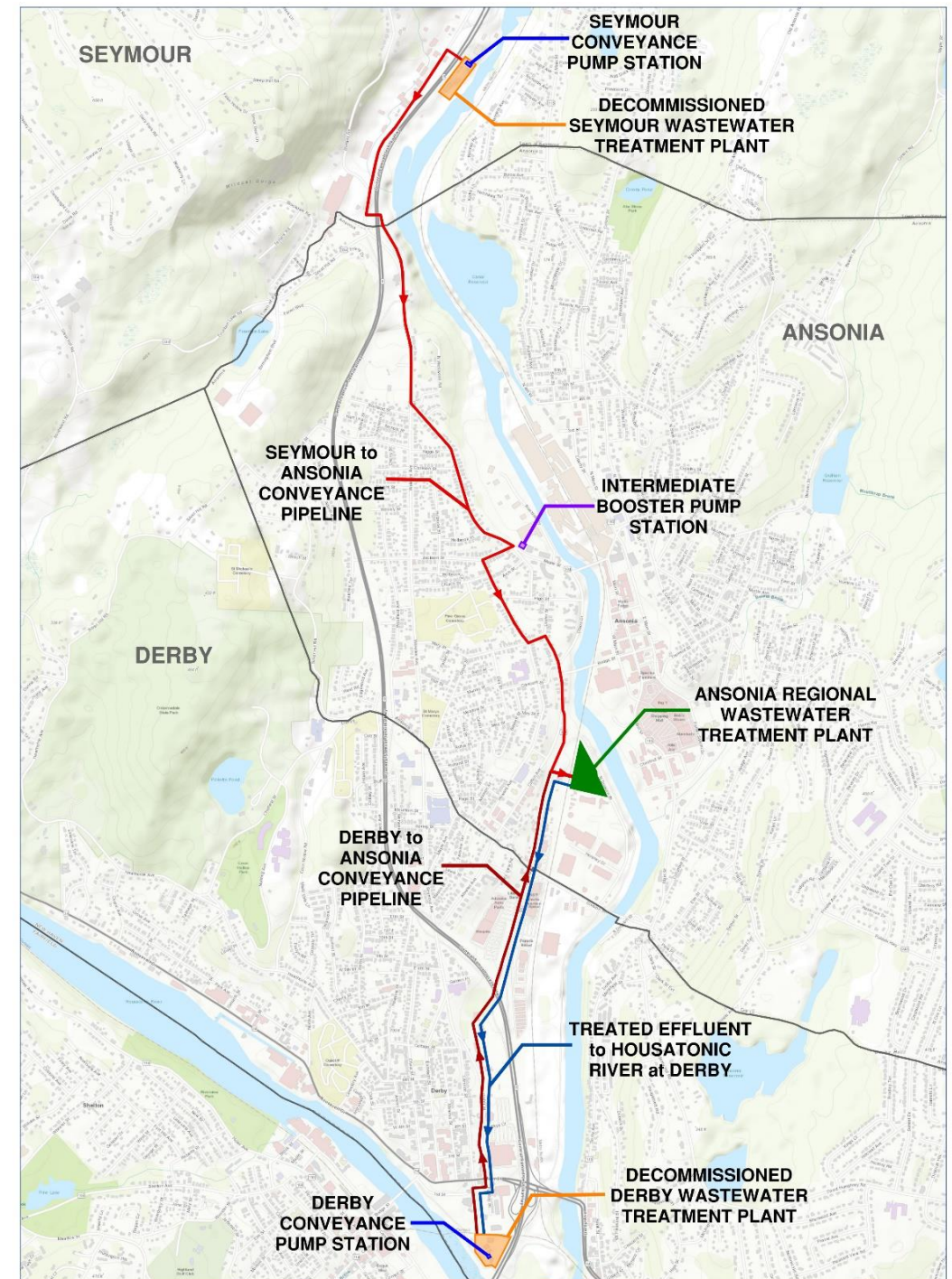
# Overall Schedule



# Recommendation

## 5b – Recommended Wastewater Regionalization Plan

- Expand & Upgrade existing Ansonia WWTP to Regional WWTP
- Convert existing Derby and Seymour WWTP to conveyance pump stations
- Install wastewater pipelines from Derby and Seymour to Ansonia
- Additional booster pump station between Seymour and Ansonia
- Treated Effluent routed to Derby to discharge at the Housatonic River



# Questions