

# Farm Creek Trunk Sewer Replacement Project Alternative Route Analysis and Discussion of Route Concerns

July 26, 2021

City of Washington, Illinois

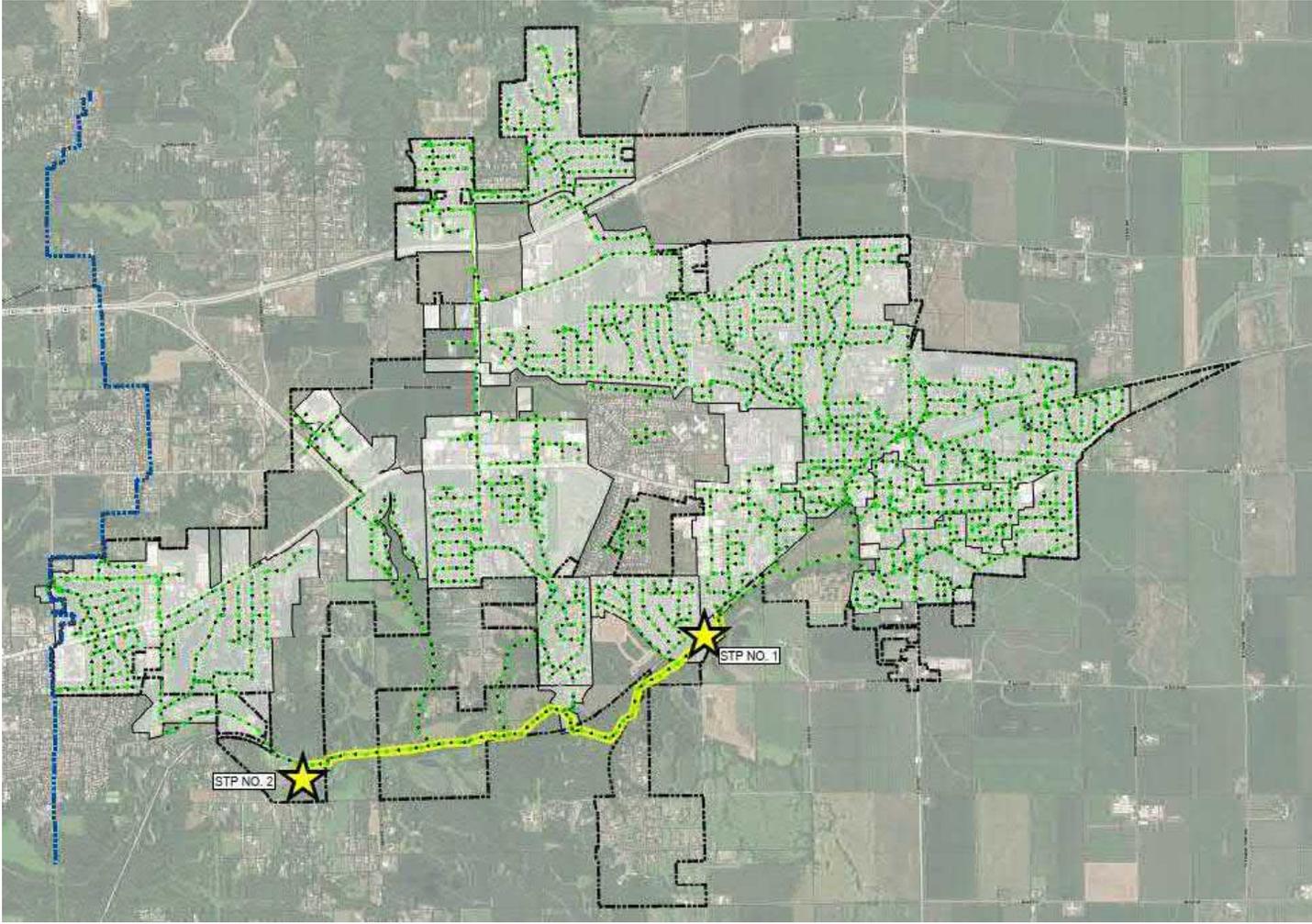




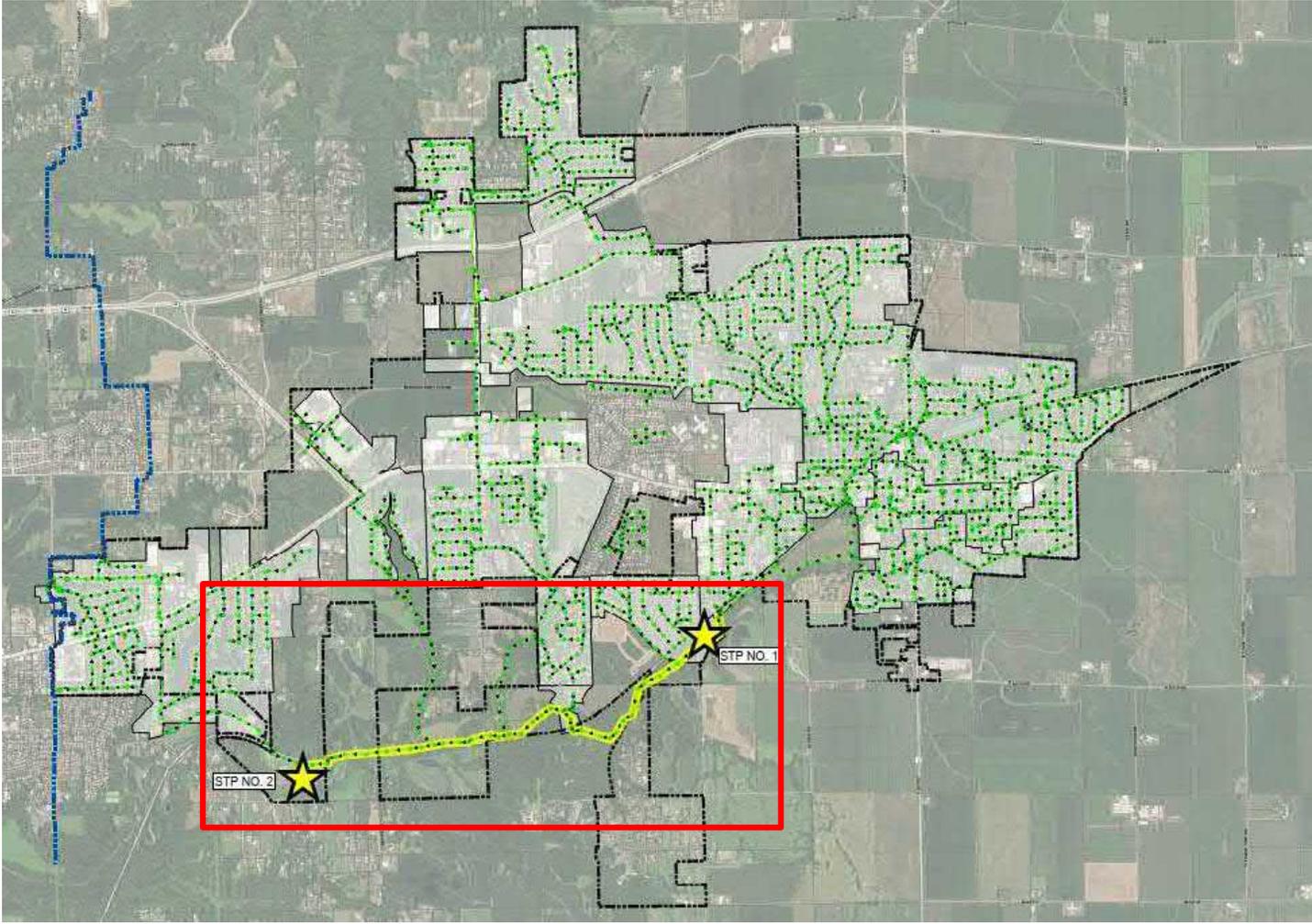
## Presentation Overview

- Review of Project Purpose and Objectives
- Review of Alternatives Analyses
- Status of Project and Next Steps

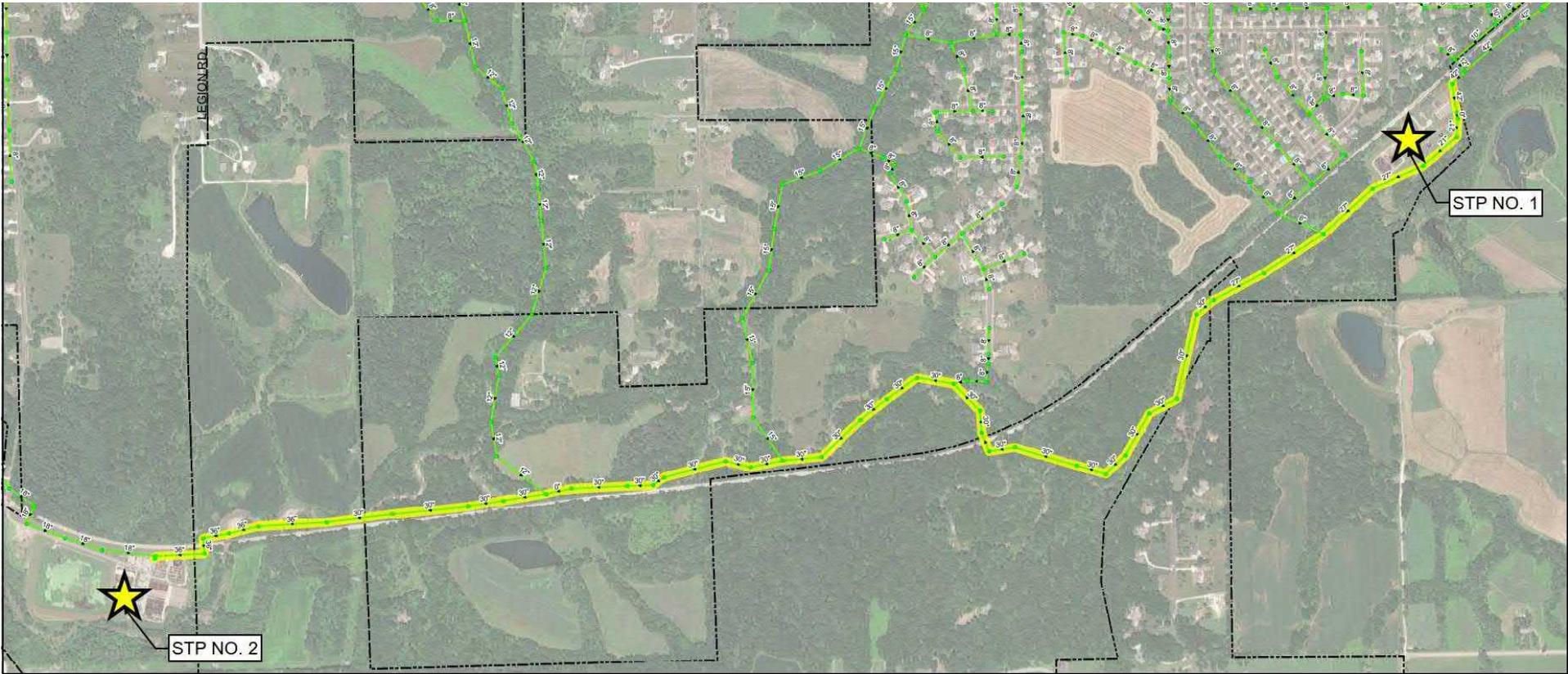
# City of Washington's Sewer Service Area and Corporate Boundary



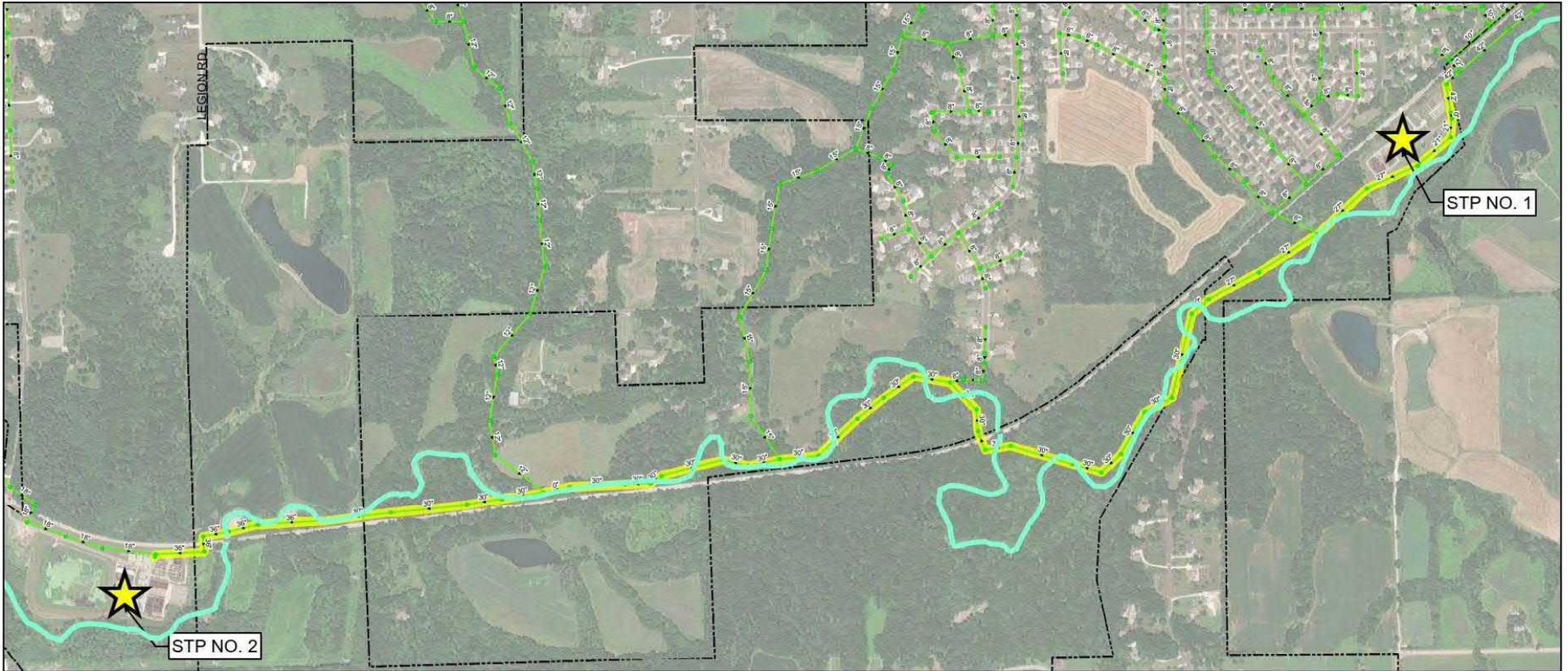
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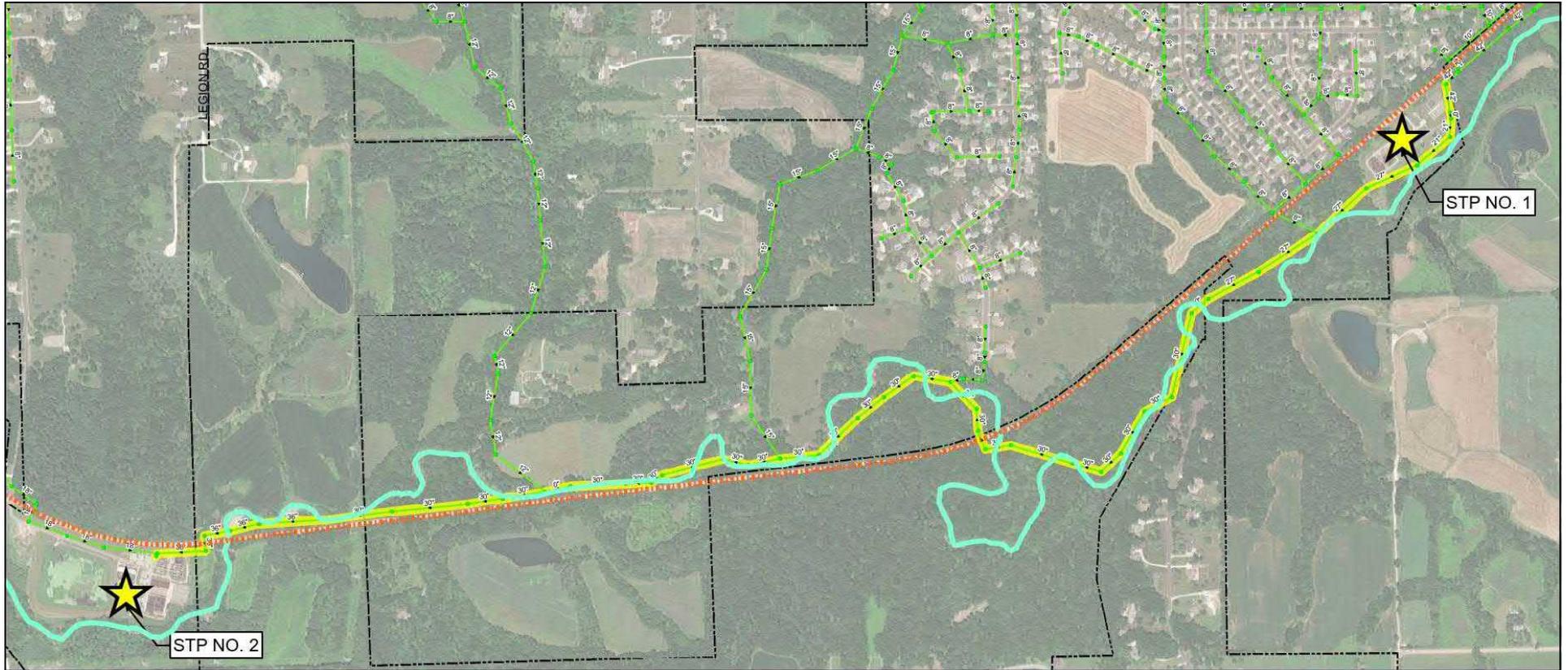
# Existing Farm Creek Trunk Sewer (FCTS)



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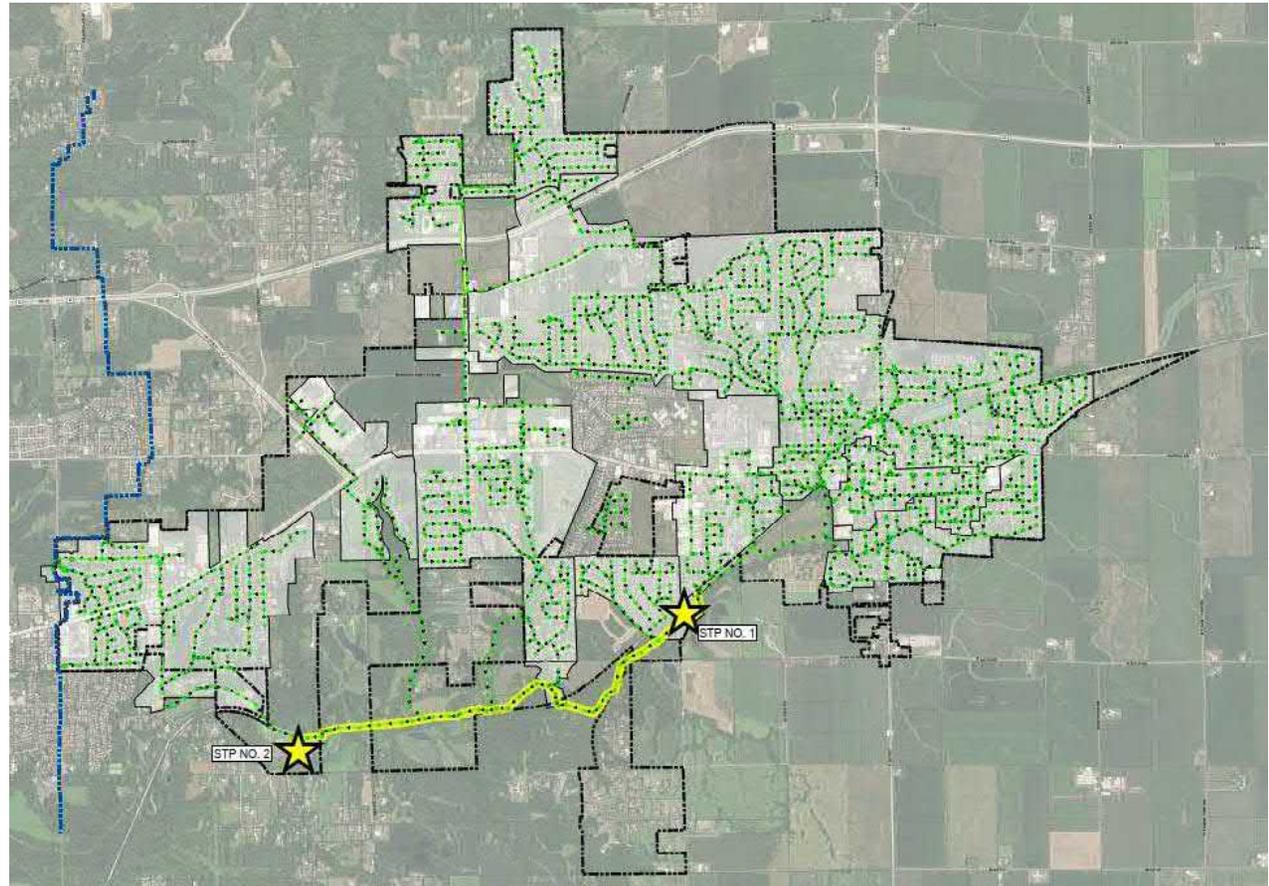


# Existing Farm Creek Trunk Sewer (FCTS)



# FCTS Replacement Project Purpose

- IEPA mandate to decommission STP No. 1



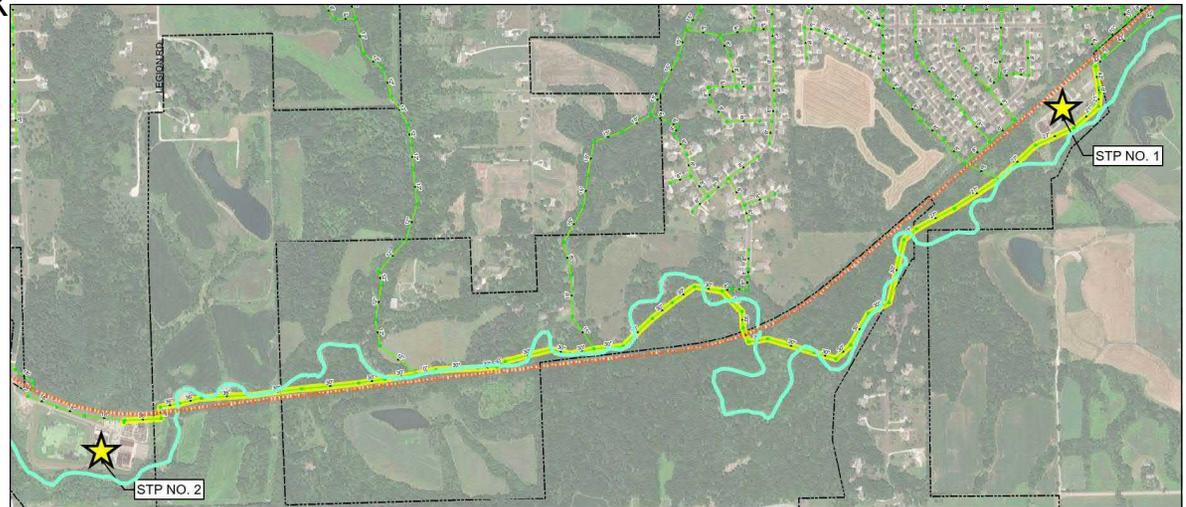
## FCTS Replacement Project Purpose

- IEPA mandate to decommission STP No. 1
- Age and condition of the existing sewer system
- Excess flow conditions during wet weather (I&I)



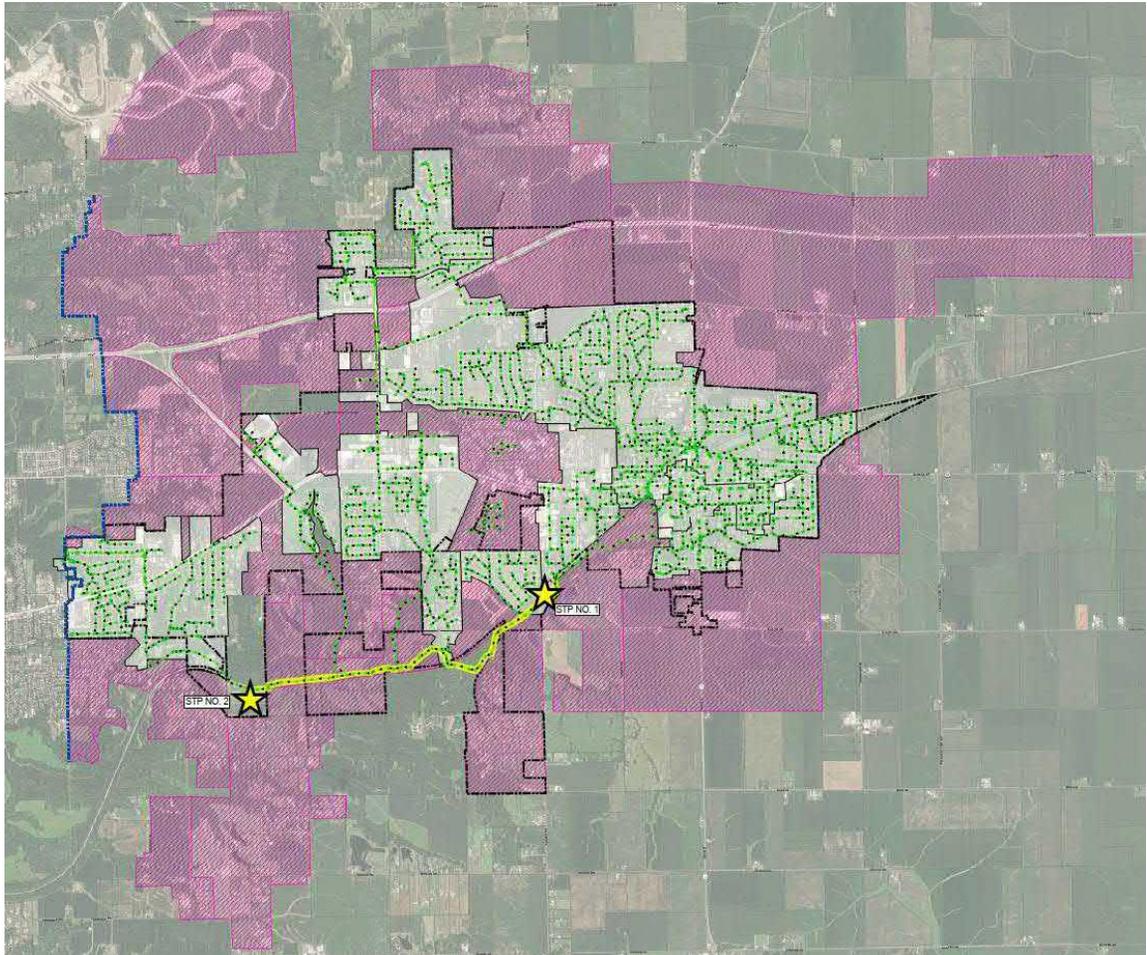
## FCTS Replacement Project Purpose

- IEPA mandate to decommission STP No. 1
- Age and condition of the existing sewer system
- Excess flow conditions during wet weather (I&I)
- Access, operation, and maintenance issues along the creek

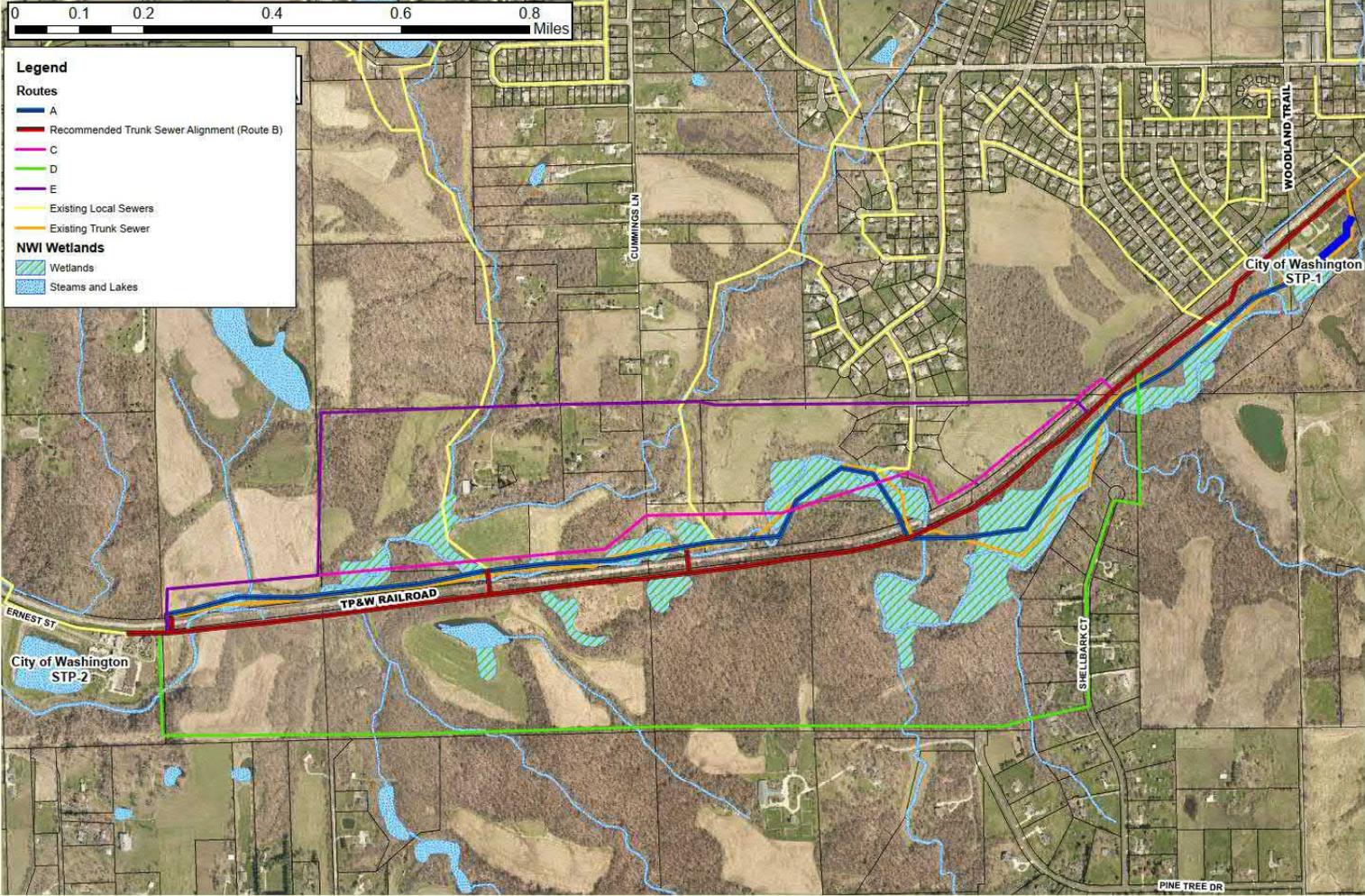


## FCTS Replacement Project Purpose

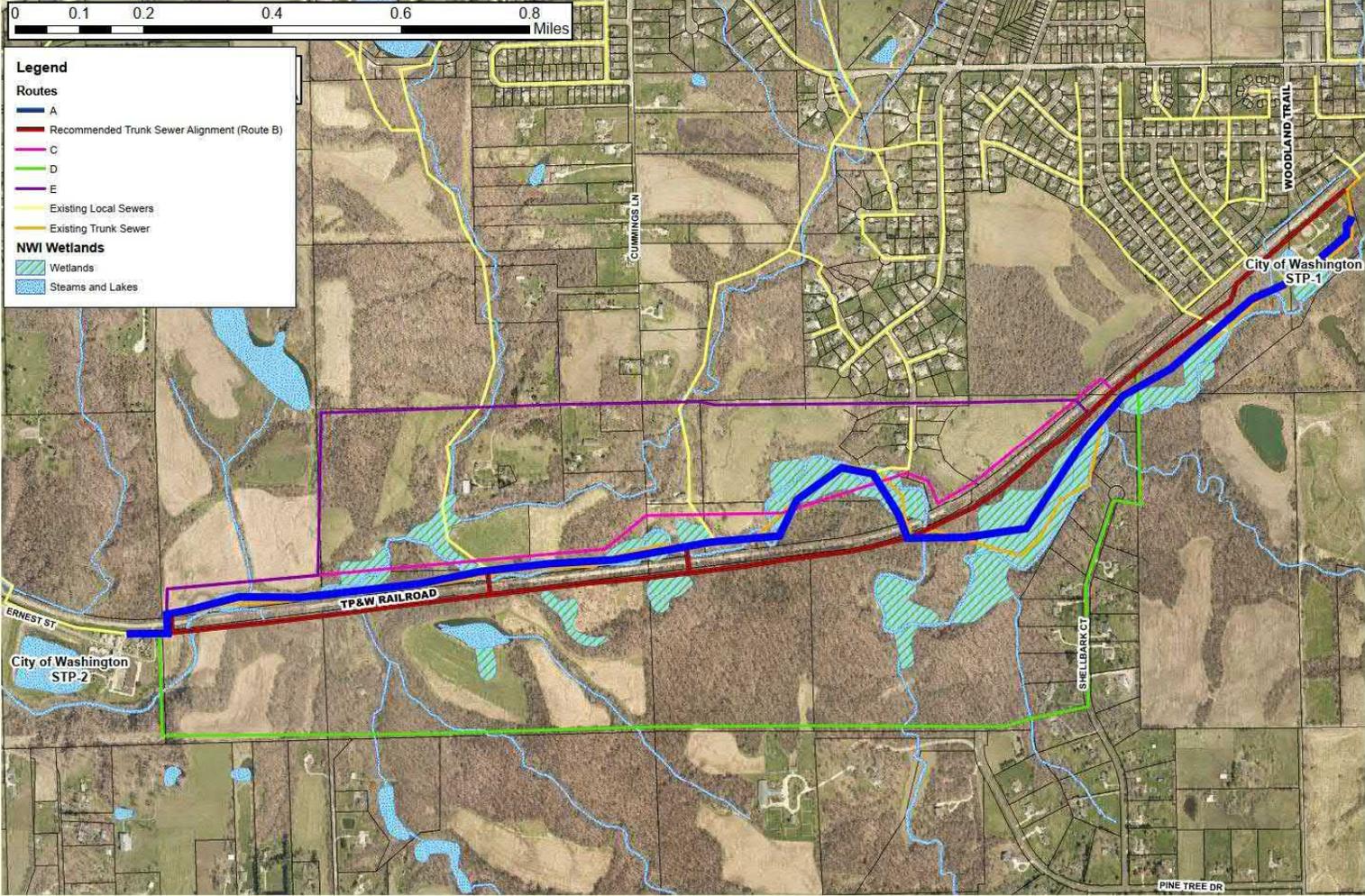
- IEPA mandate to decommission STP No. 1
- Age and condition of the existing sewer system
- Excess flow conditions during wet weather (I&I)
- Operation and maintenance issues along the creek
- Future development exceeding current sewer capacity



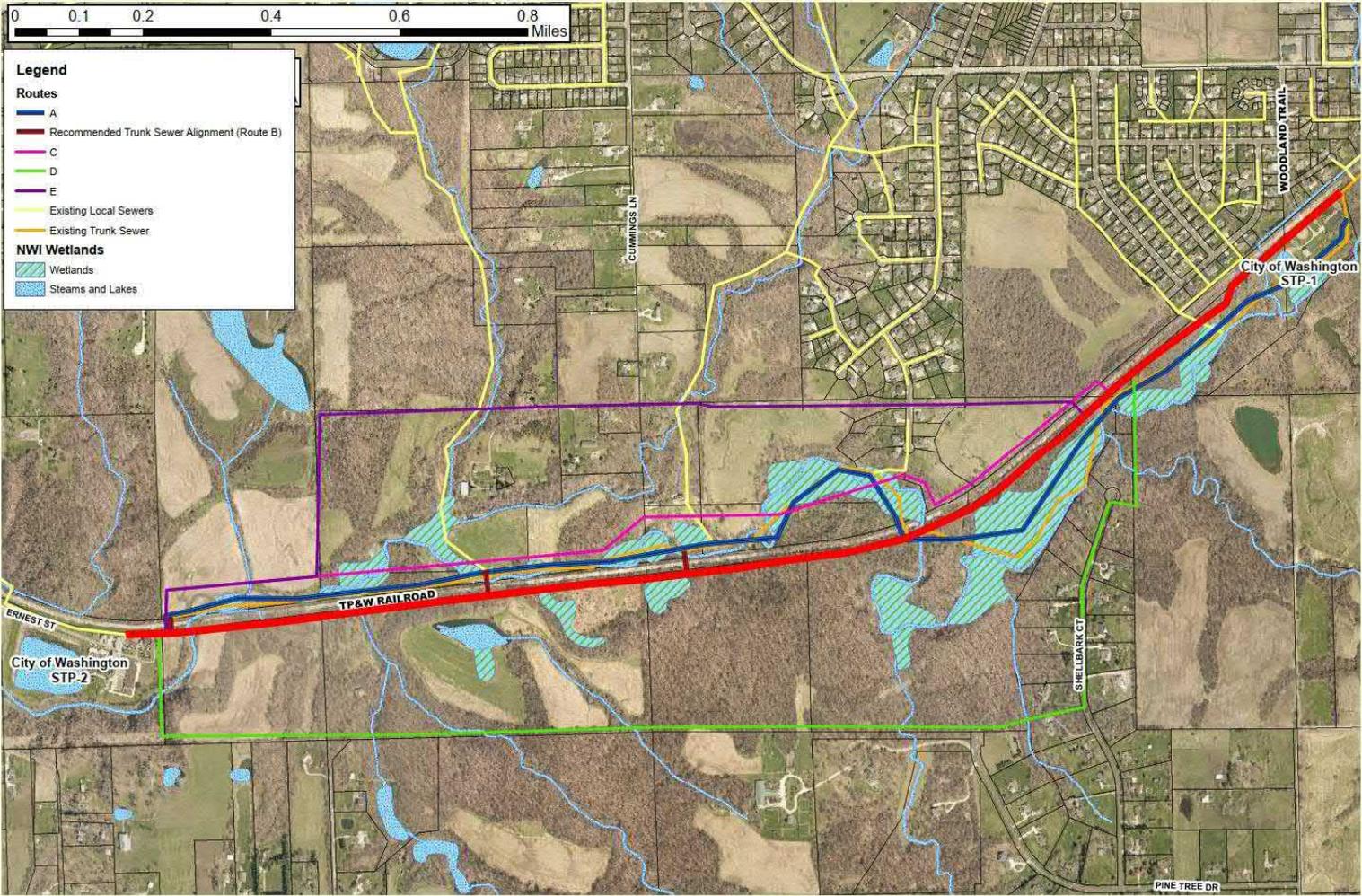
# City's Alternative Alignment Study – 5 Primary Alignments



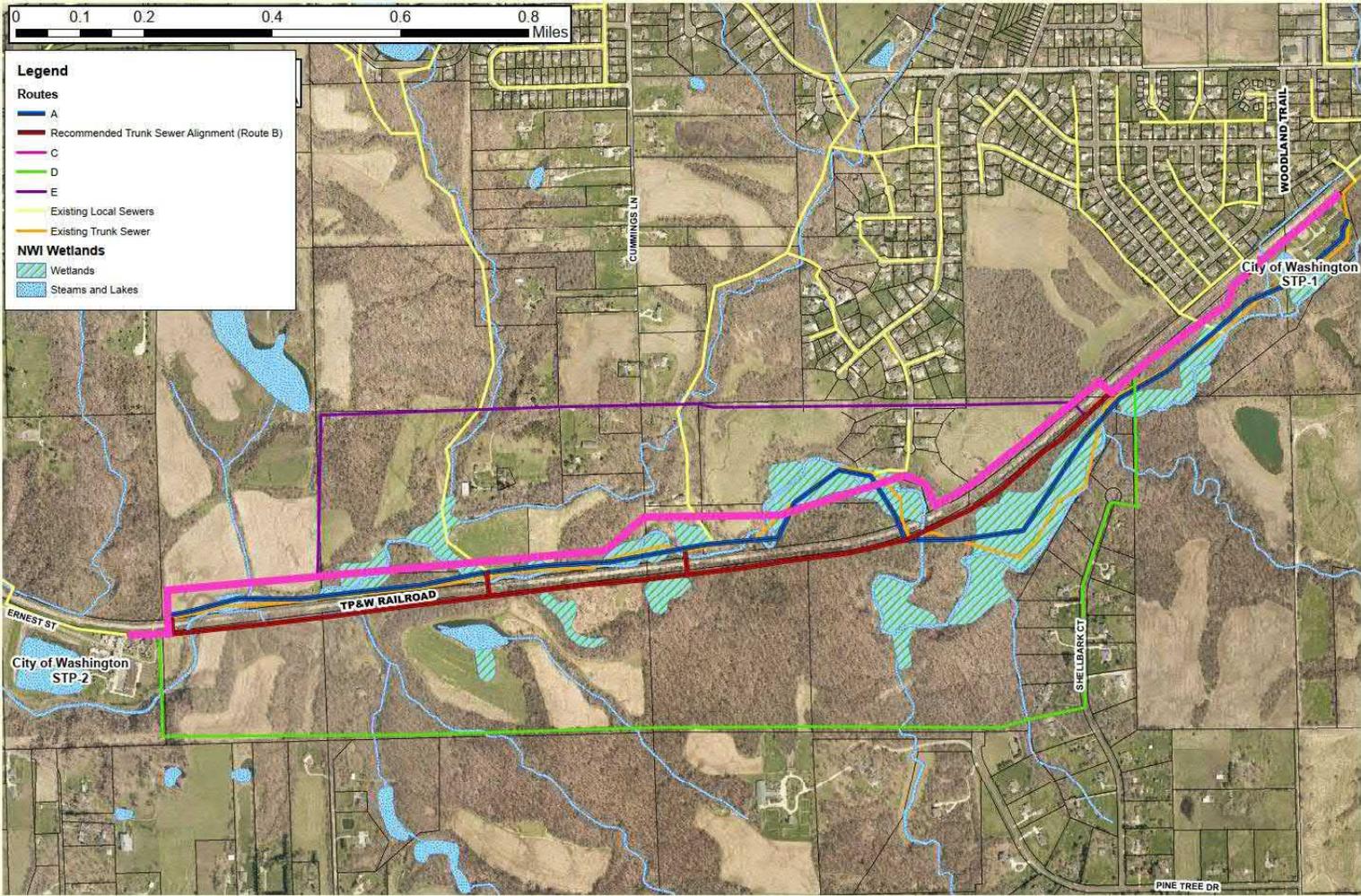
# City's Alternative Alignment Study – Alignment A



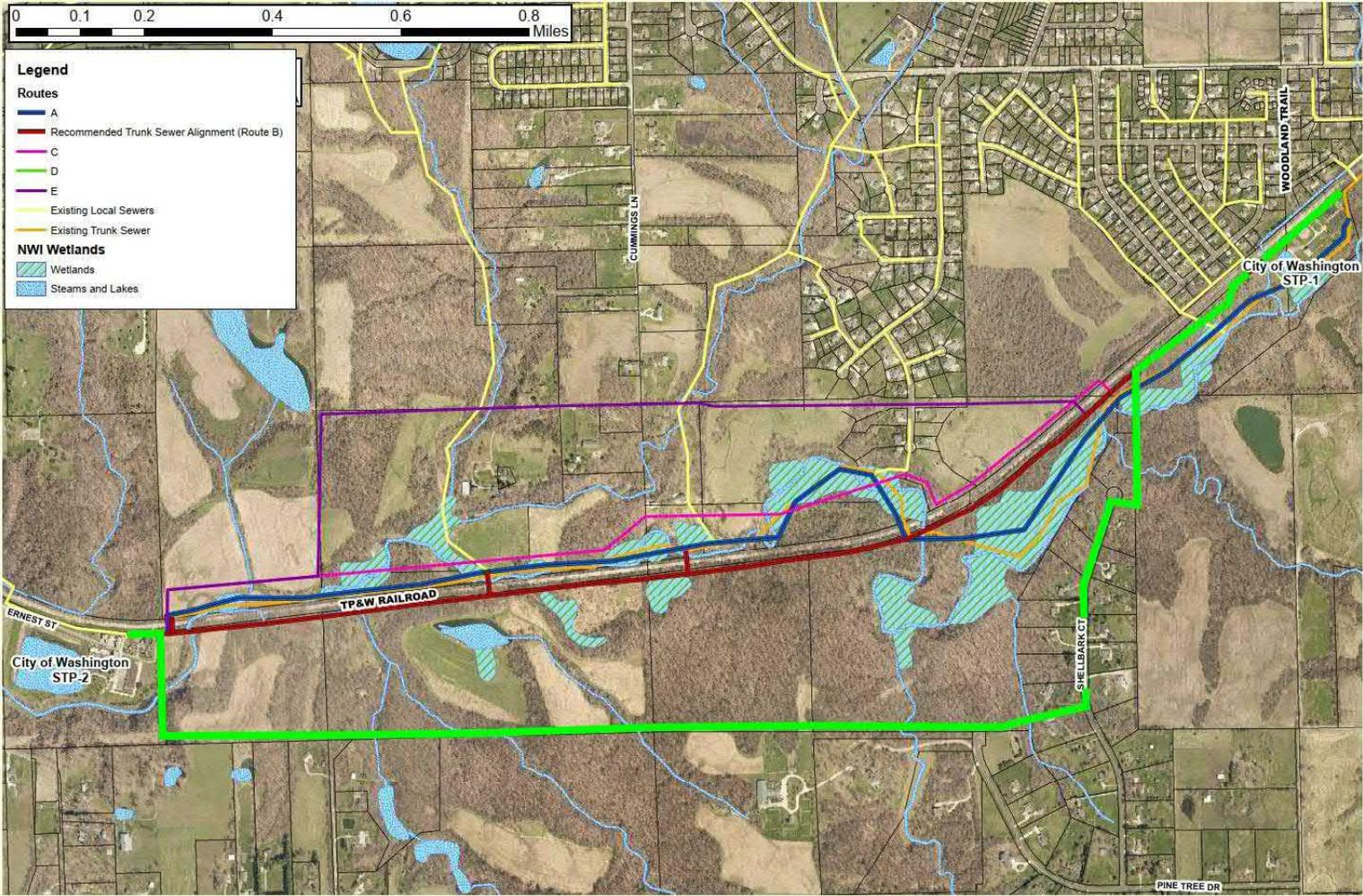
# City's Alternative Alignment Study – Alignment B



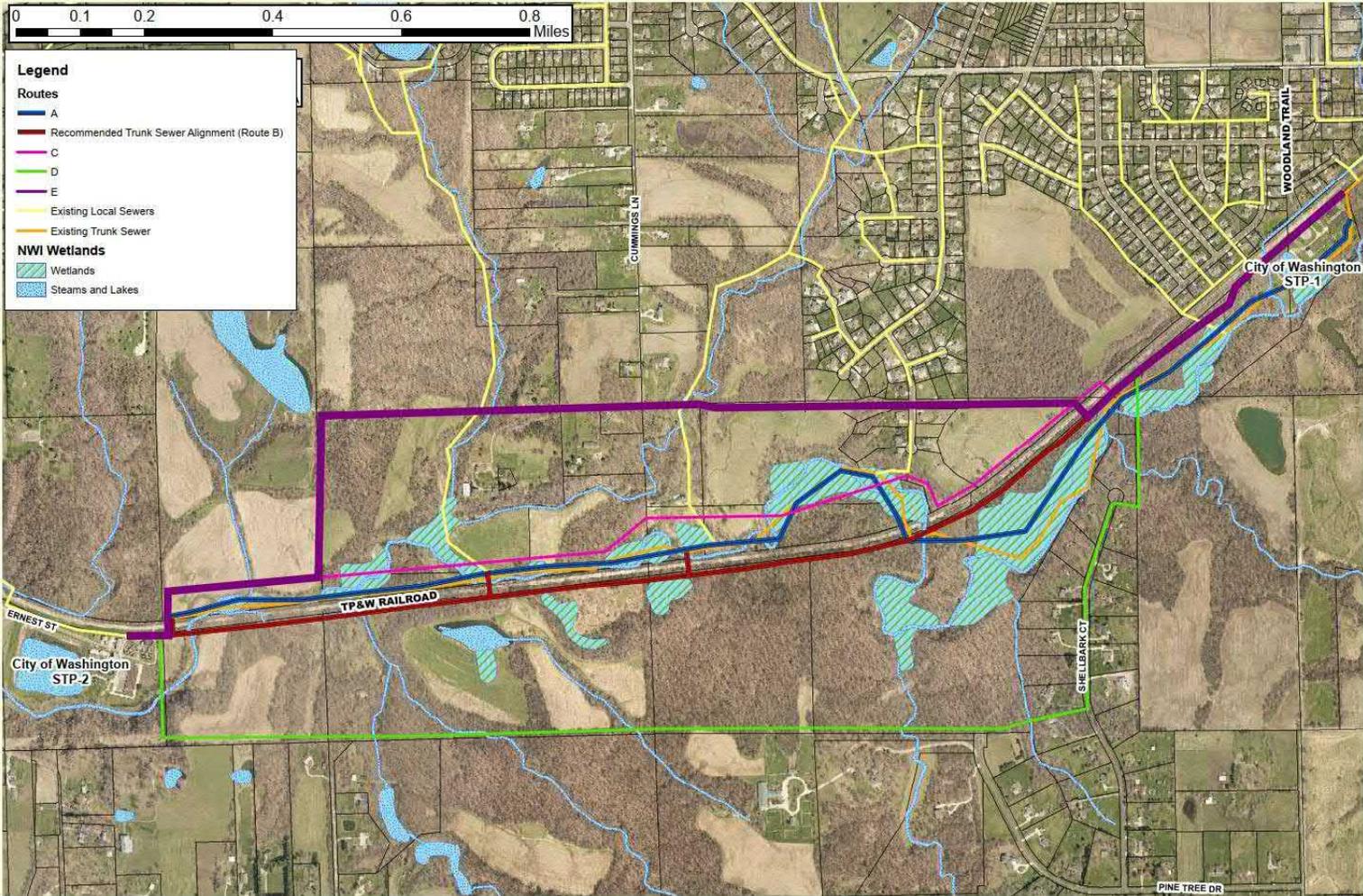
# City's Alternative Alignment Study – Alignment C



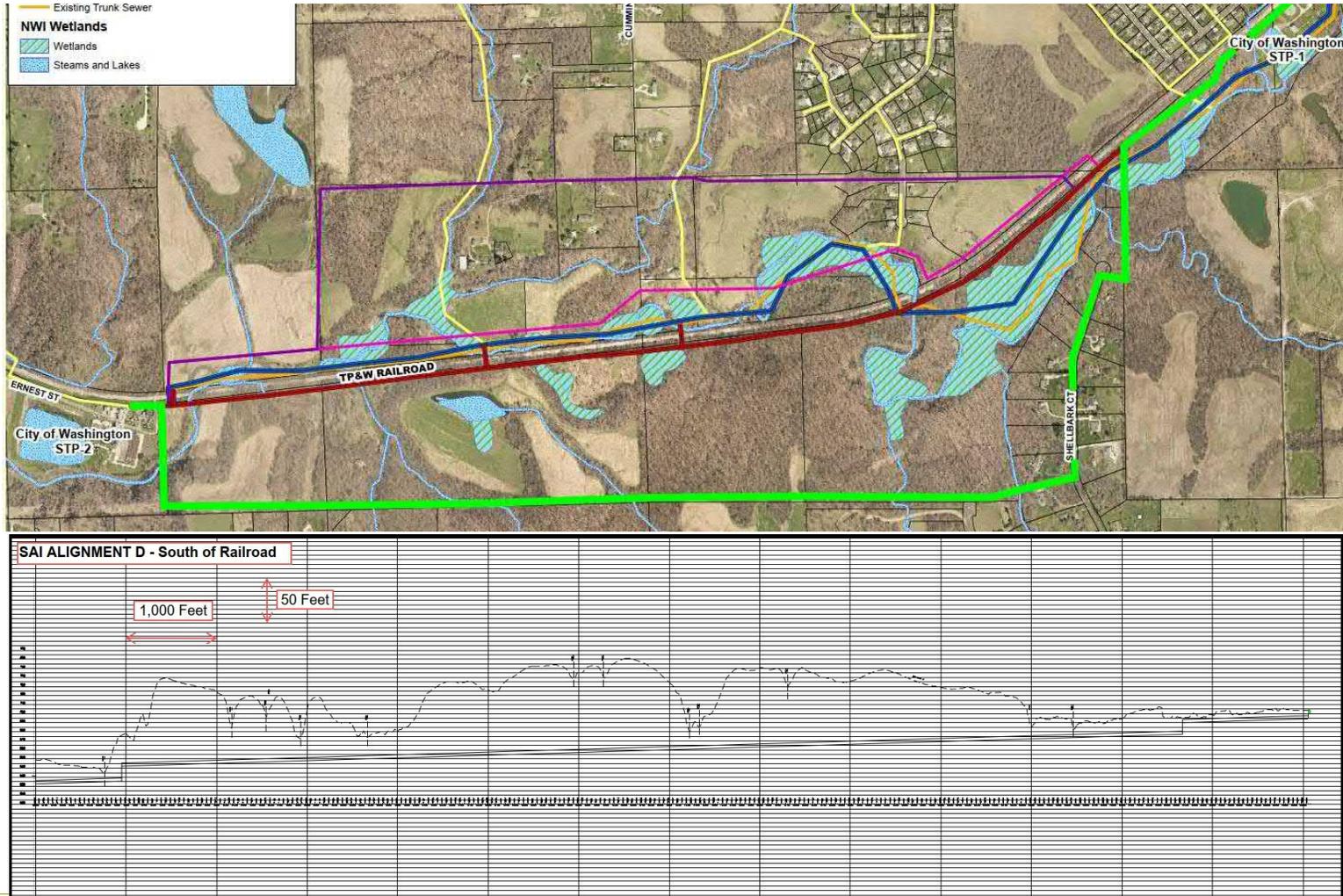
# City's Alternative Alignment Study – Alignment D



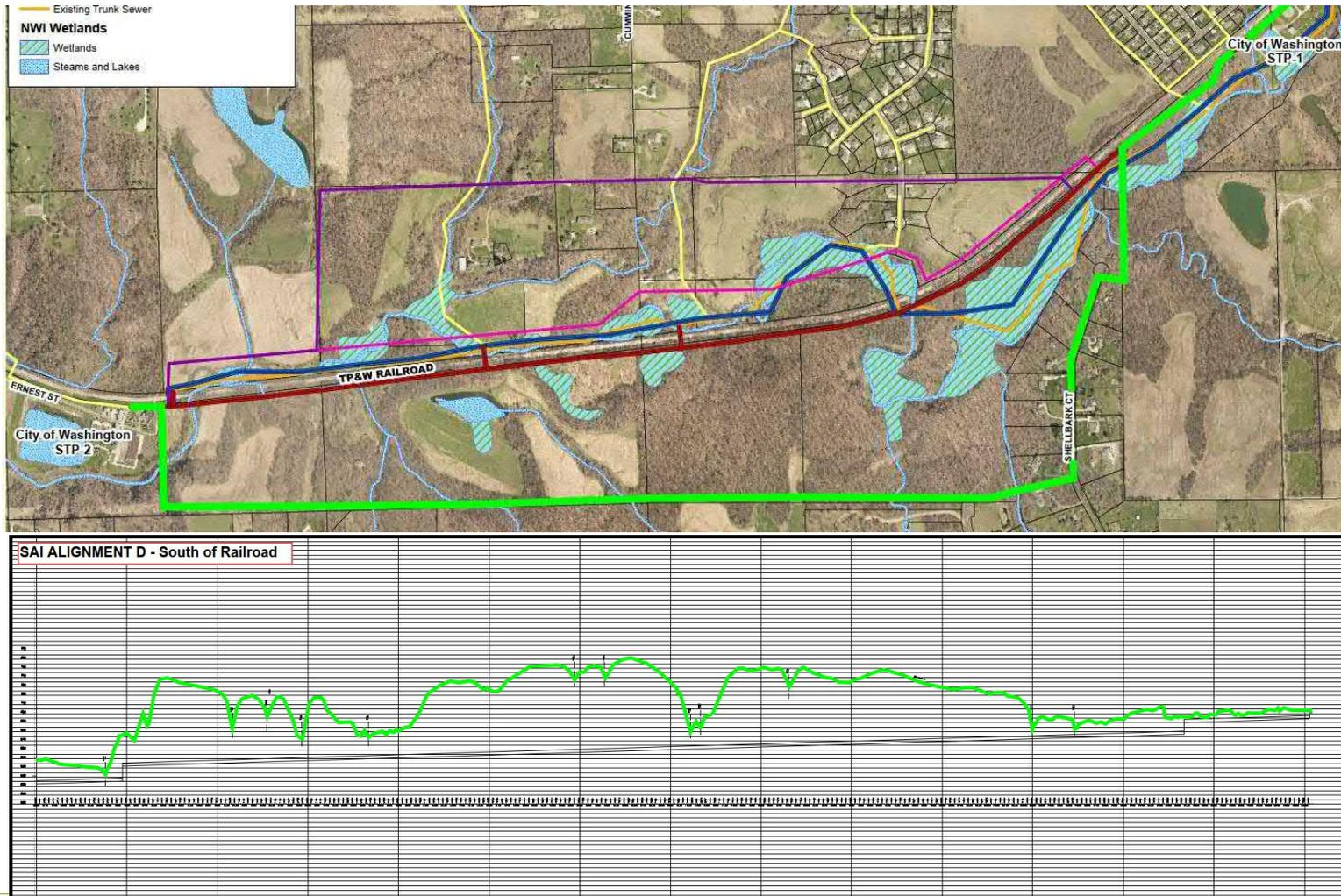
# City's Alternative Alignment Study – Alignment E



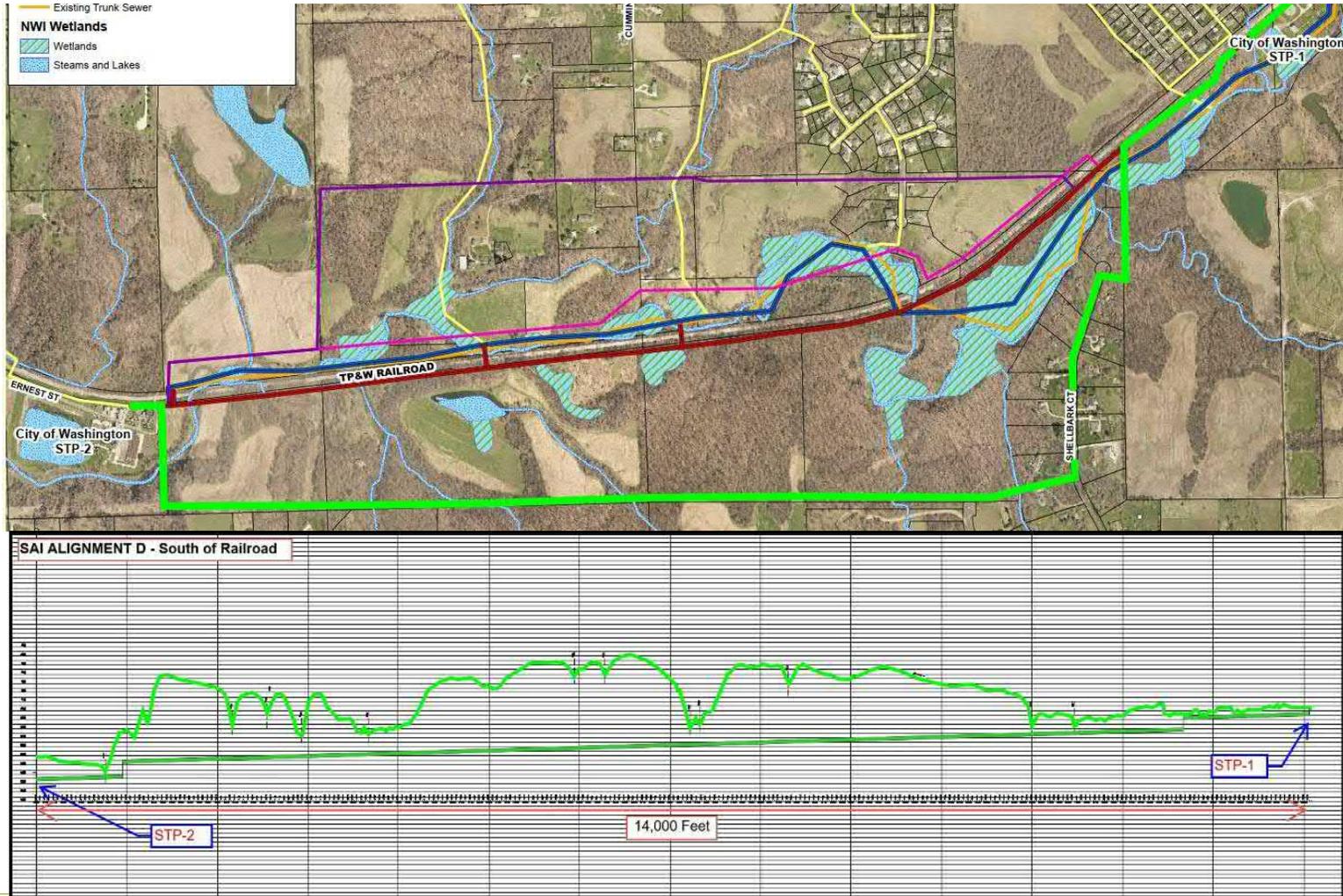
# City's Alternative Alignment Study – Alignment D Profile



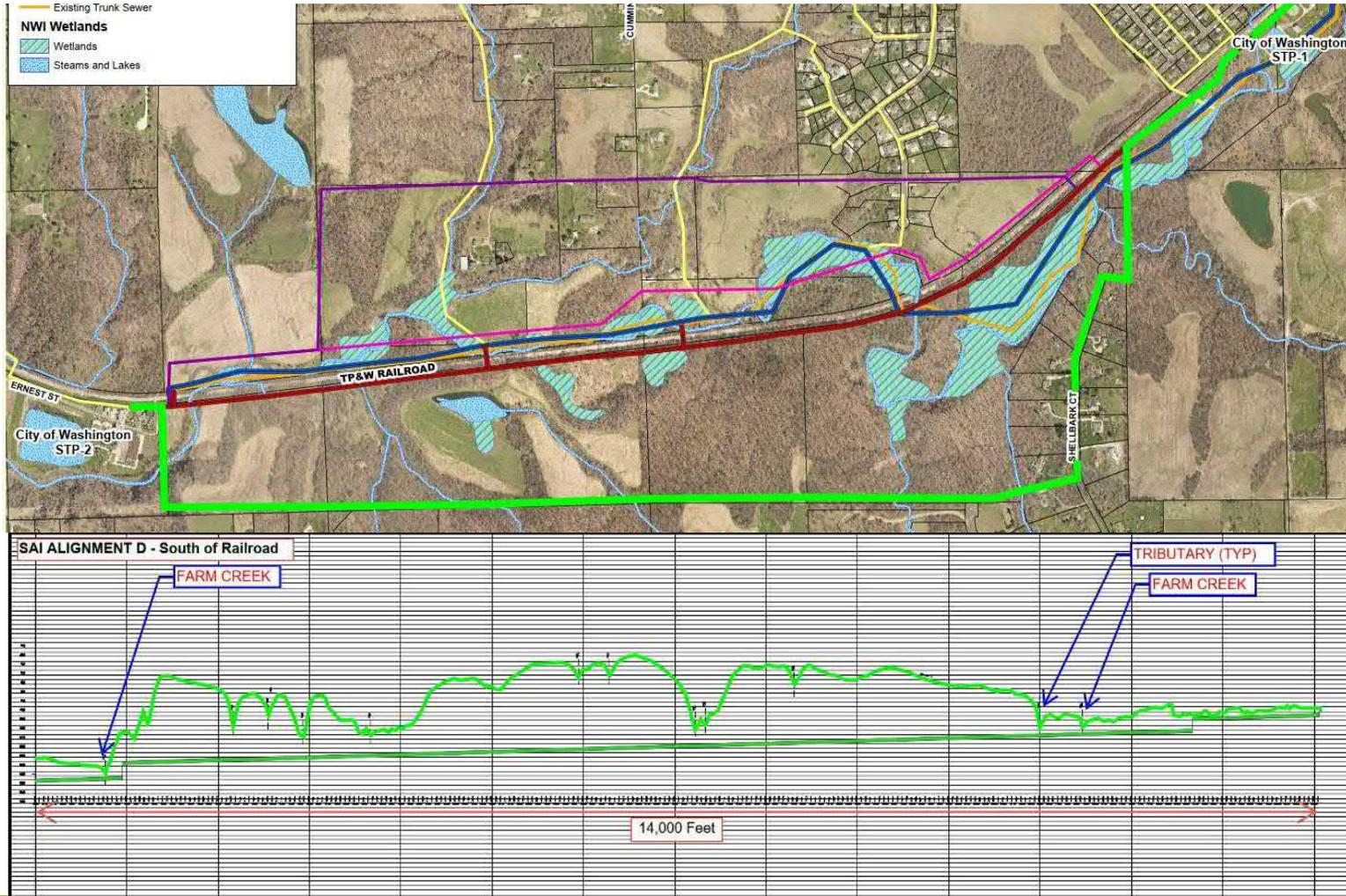
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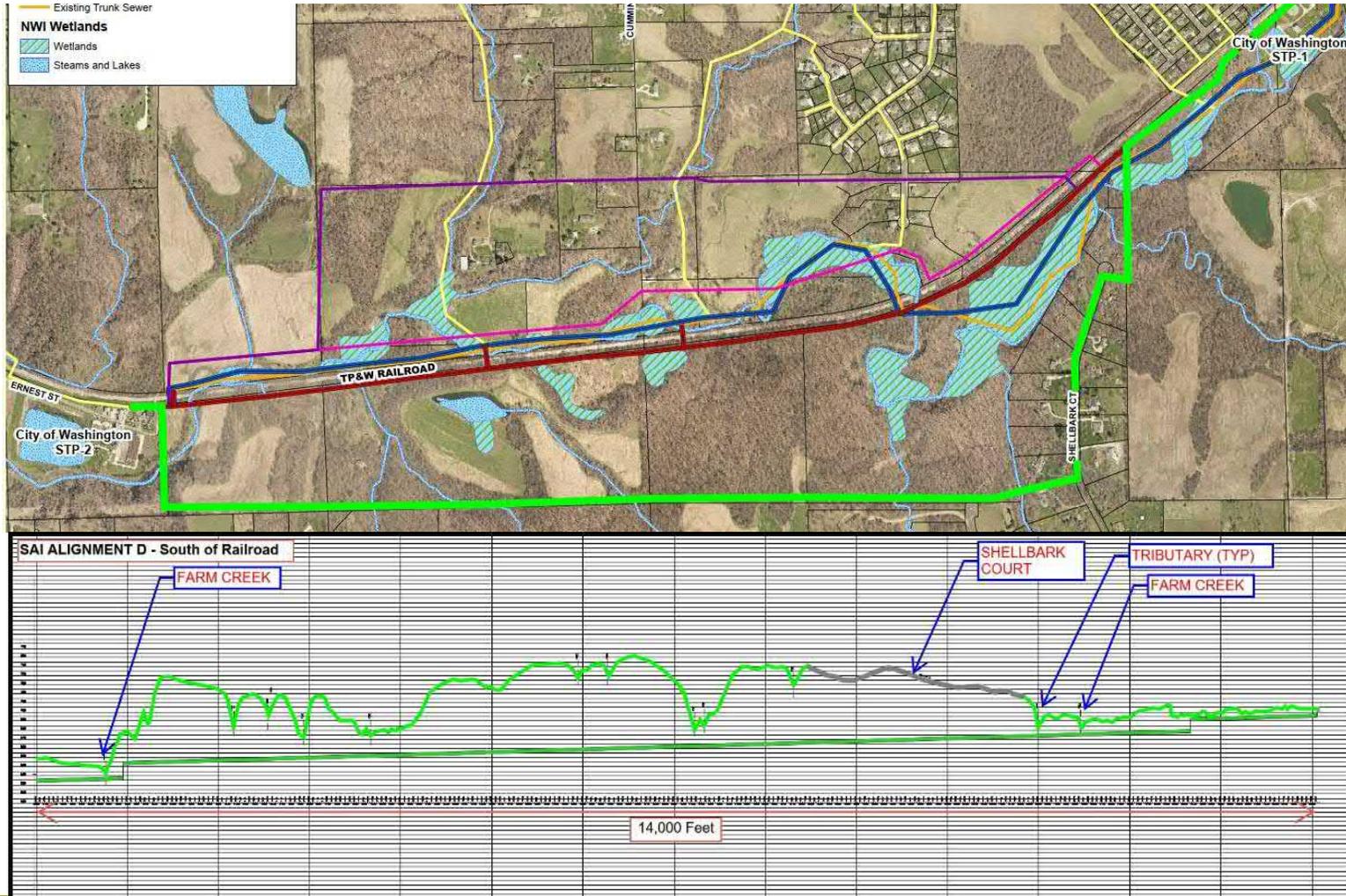
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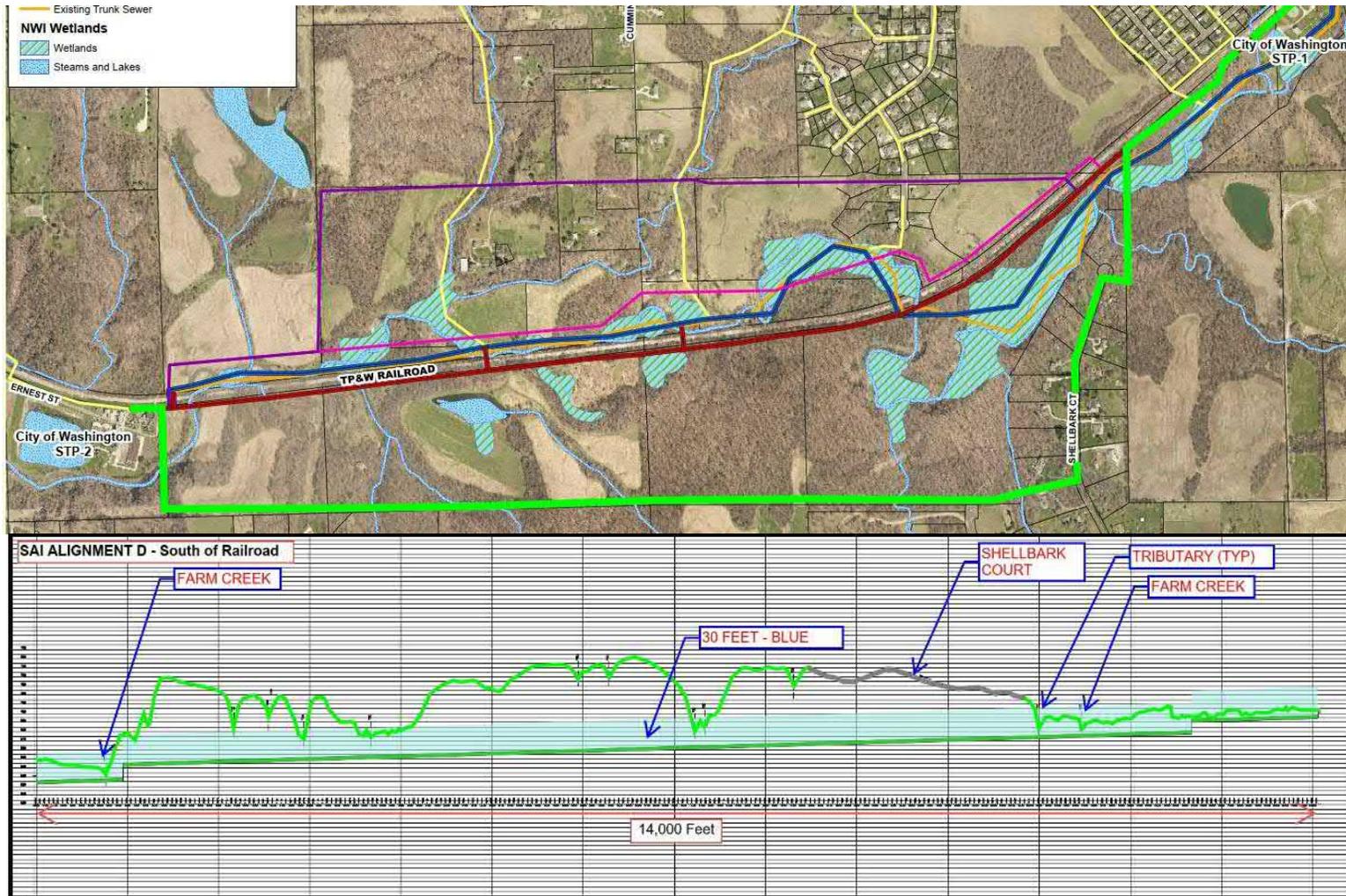
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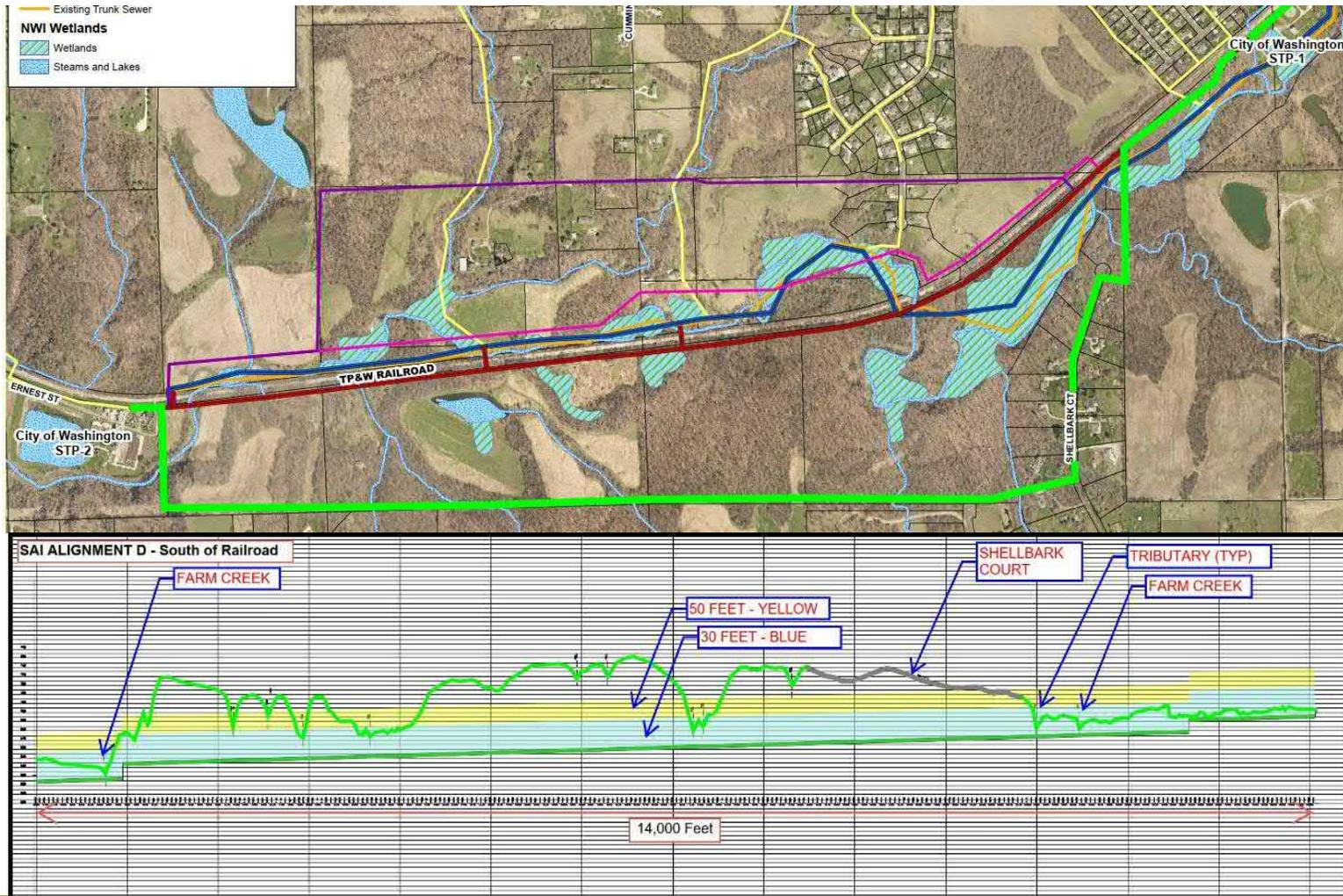
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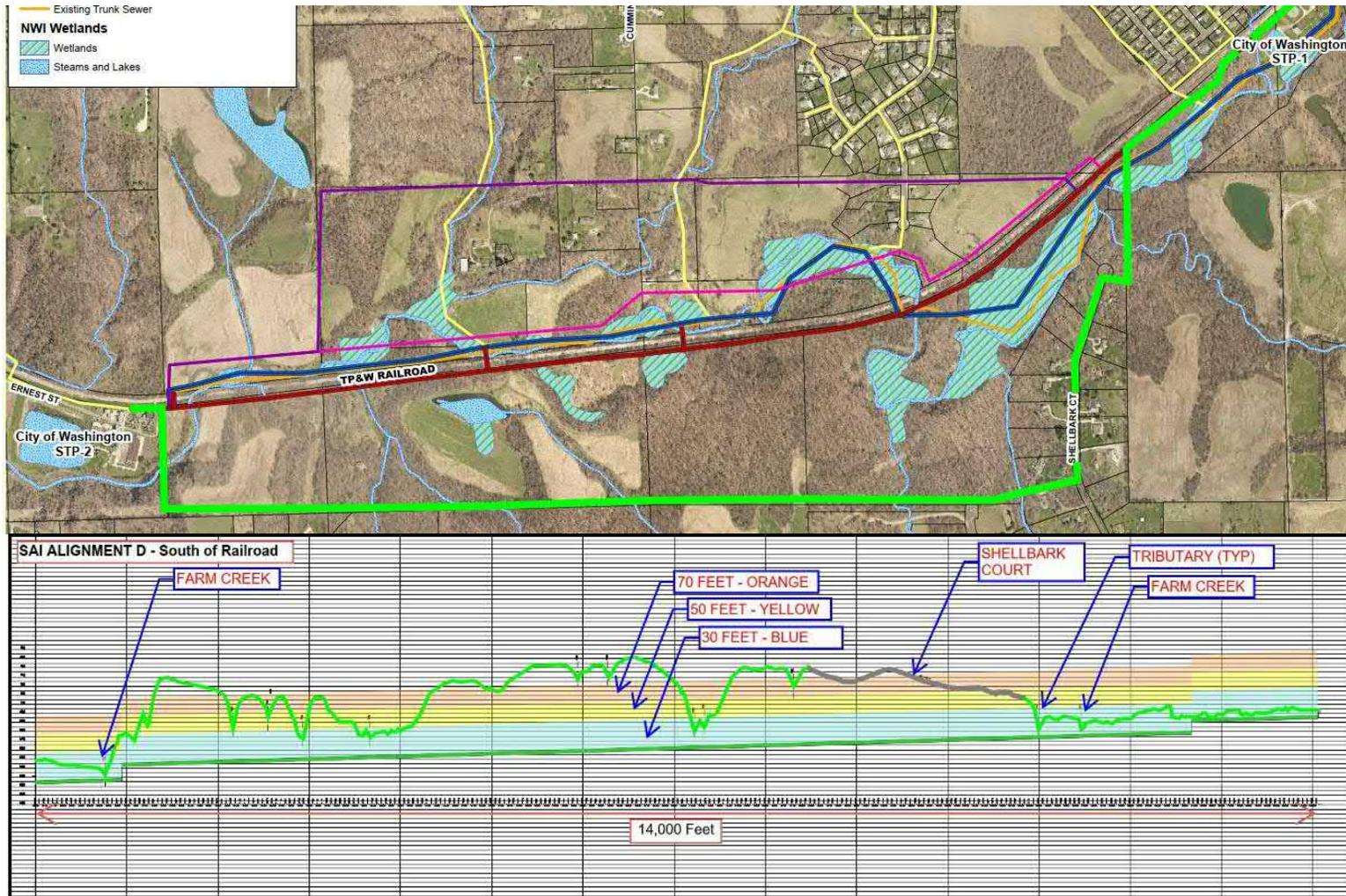
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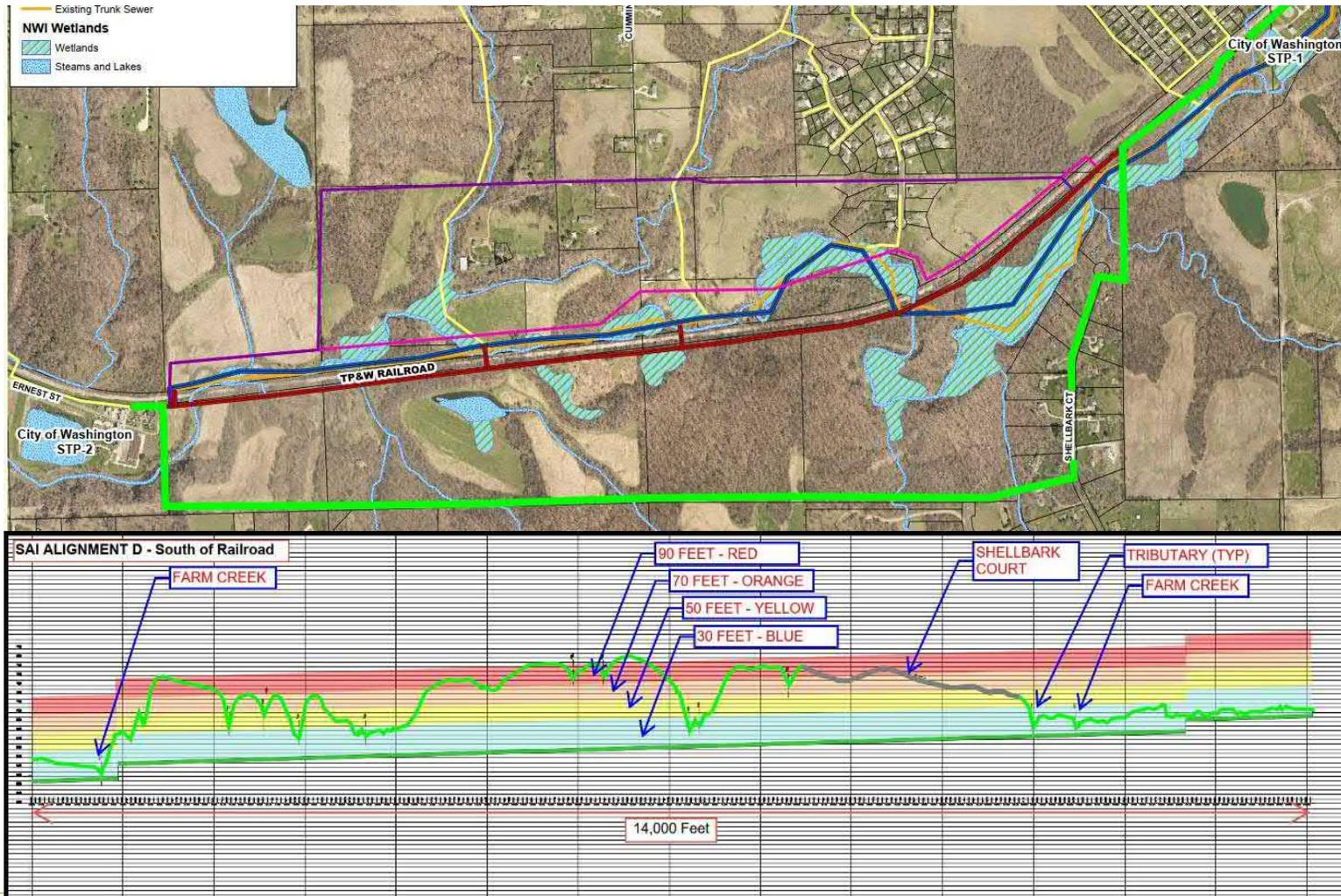
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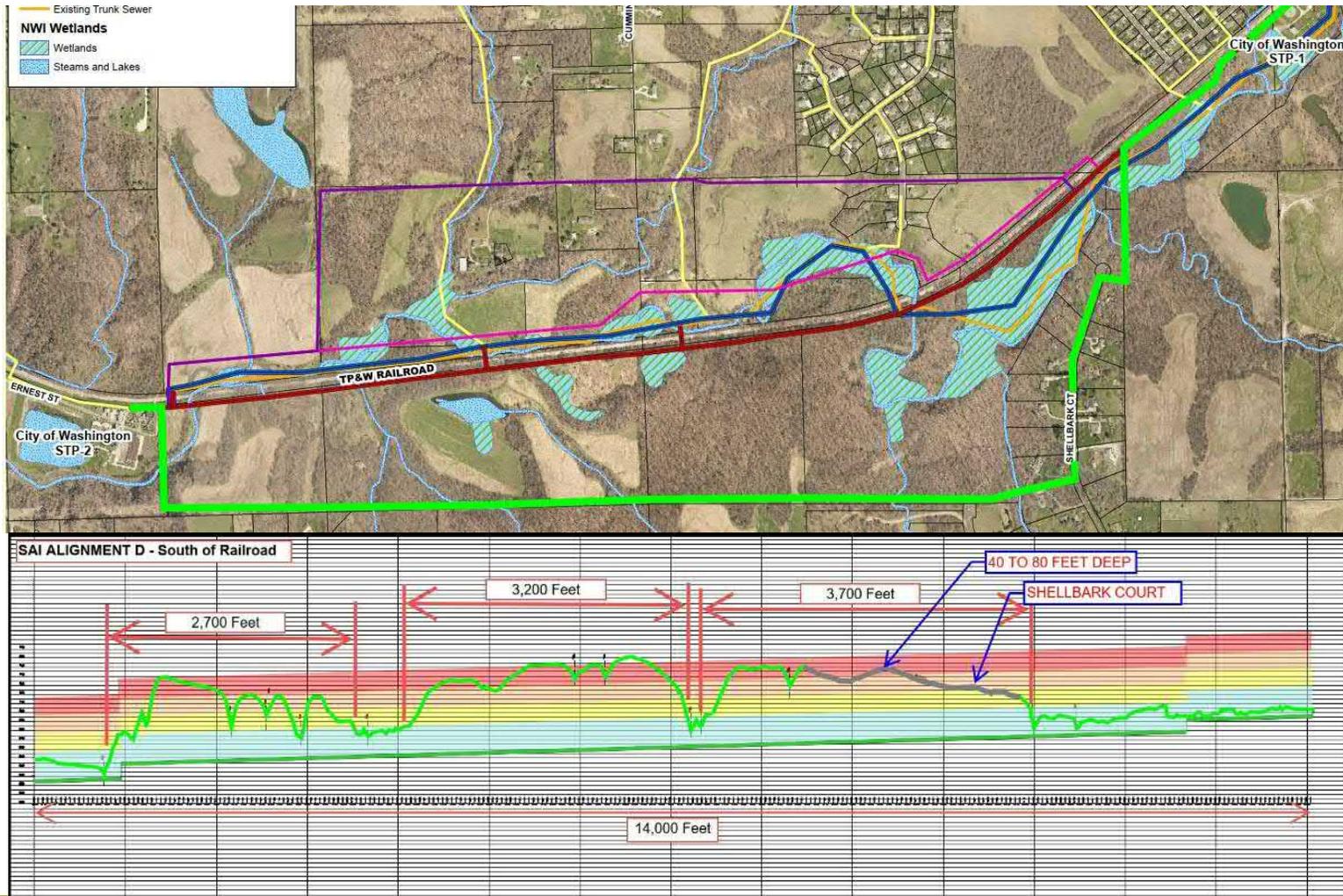
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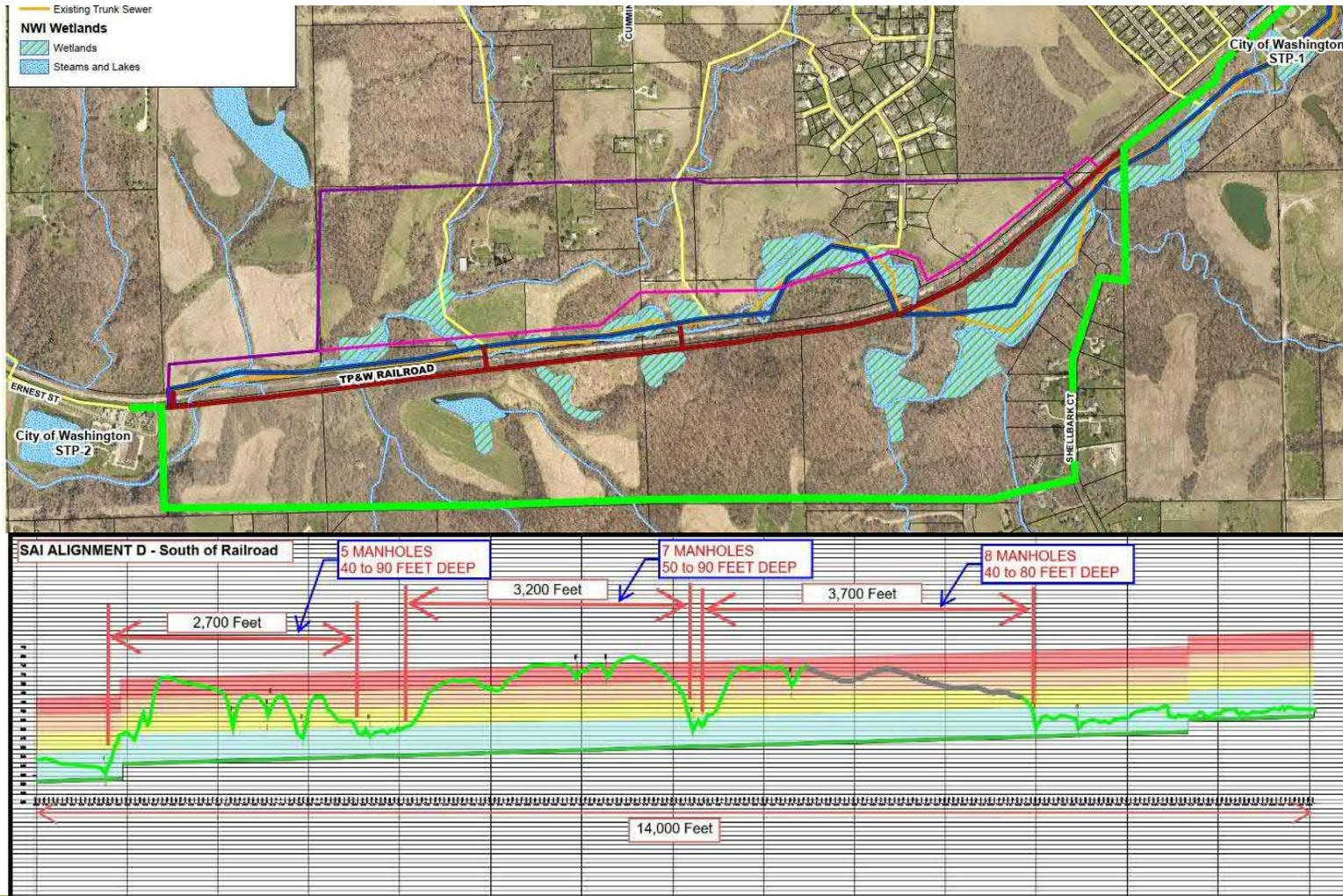
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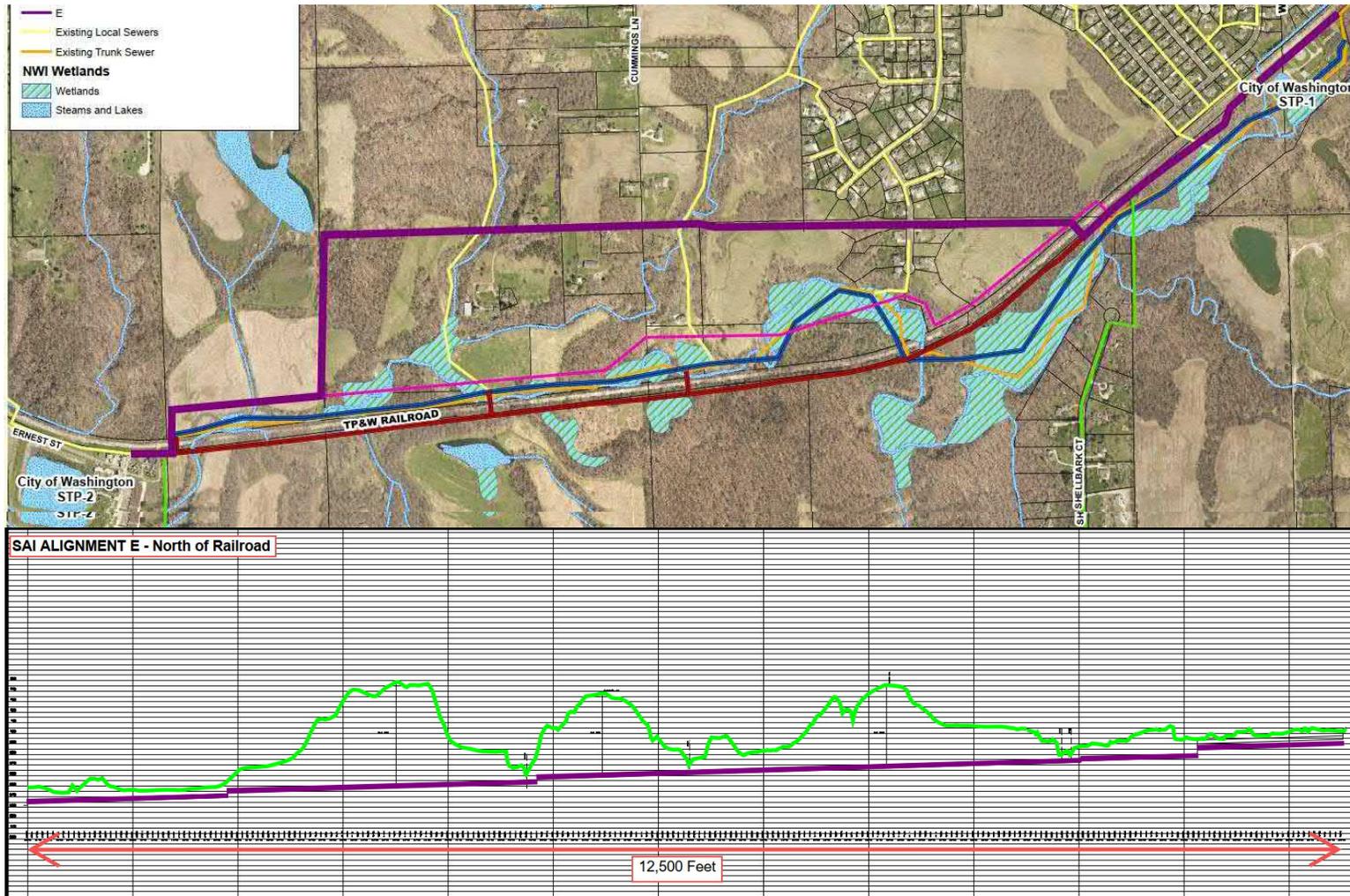
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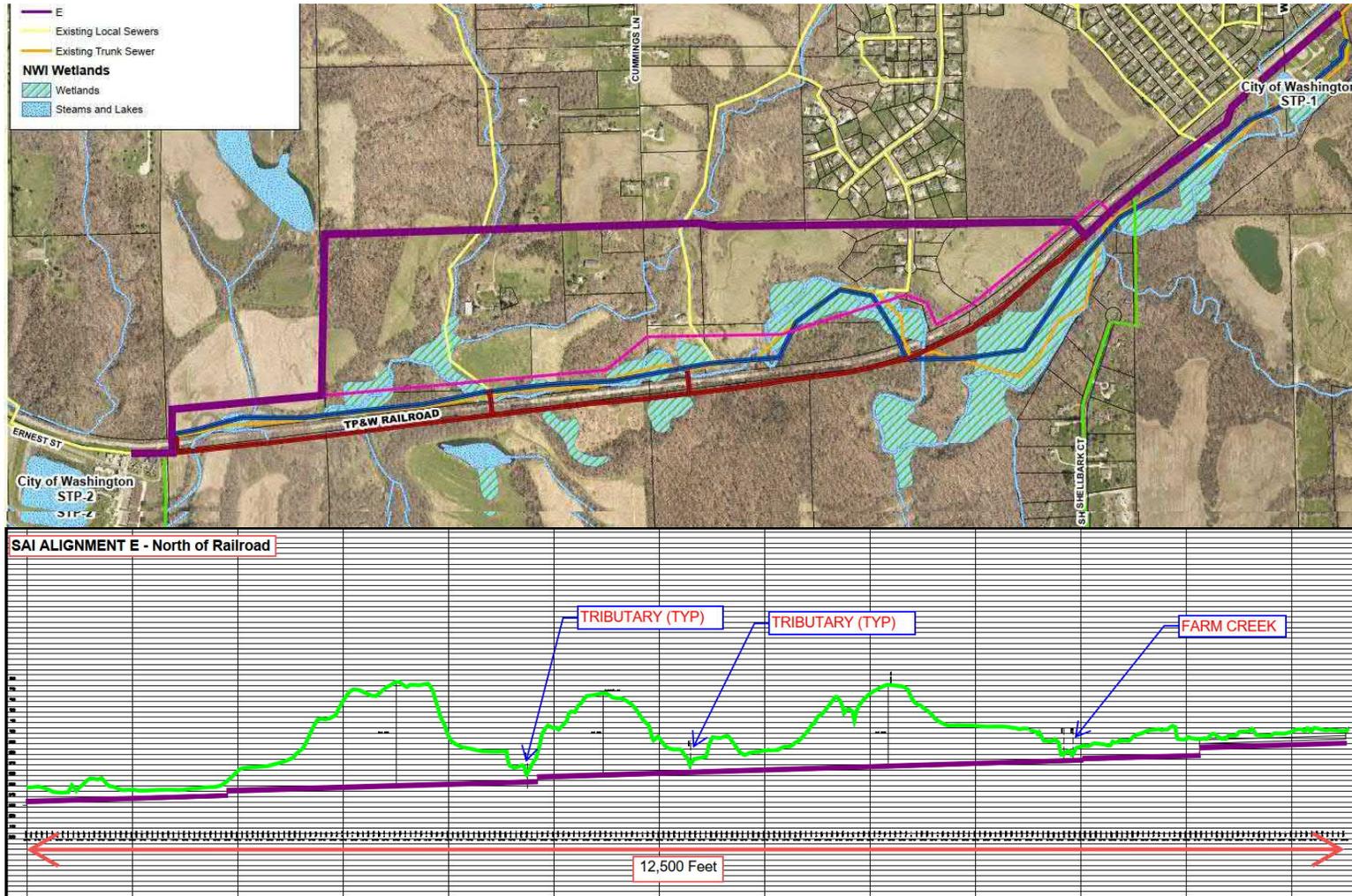
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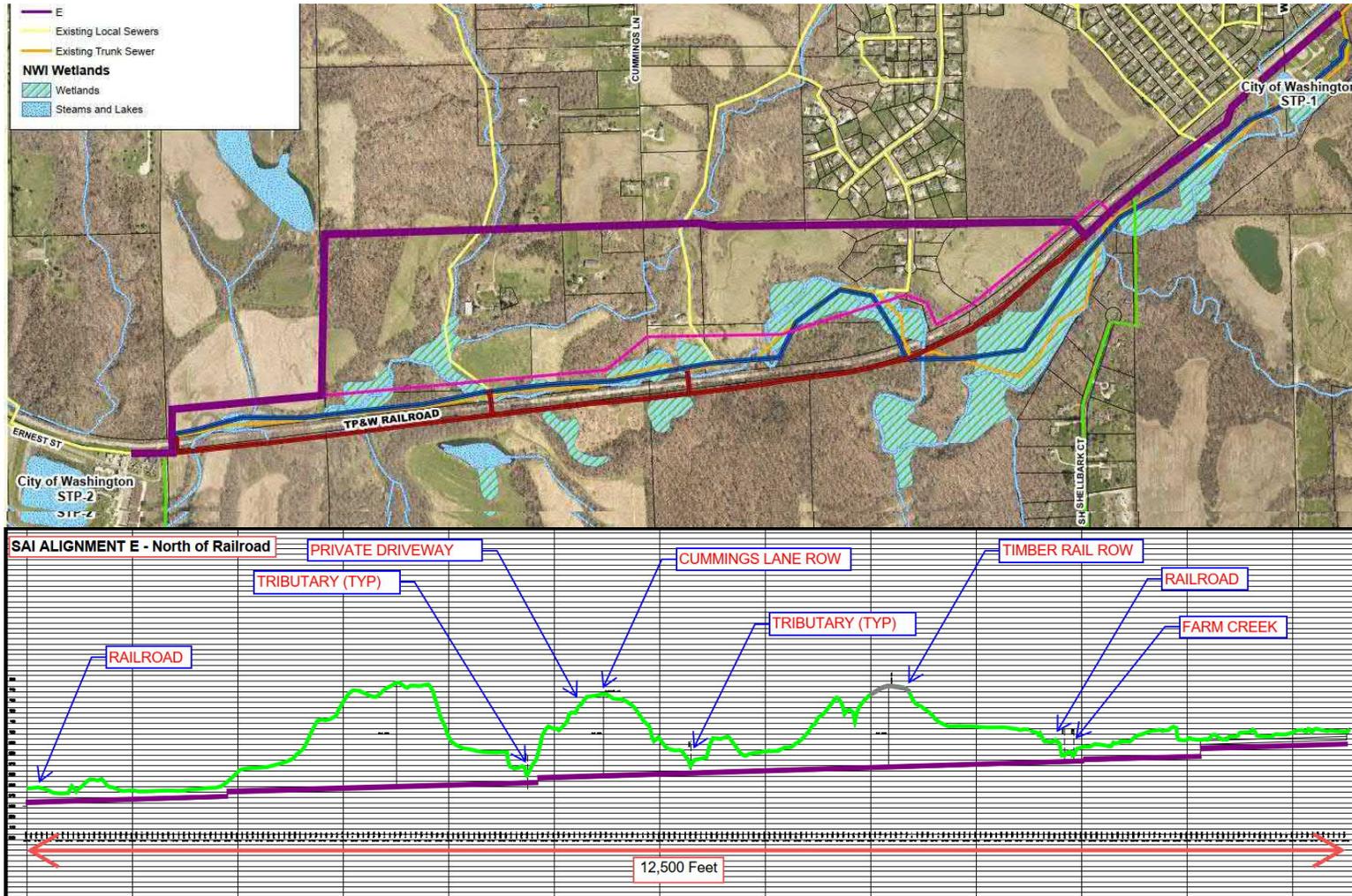
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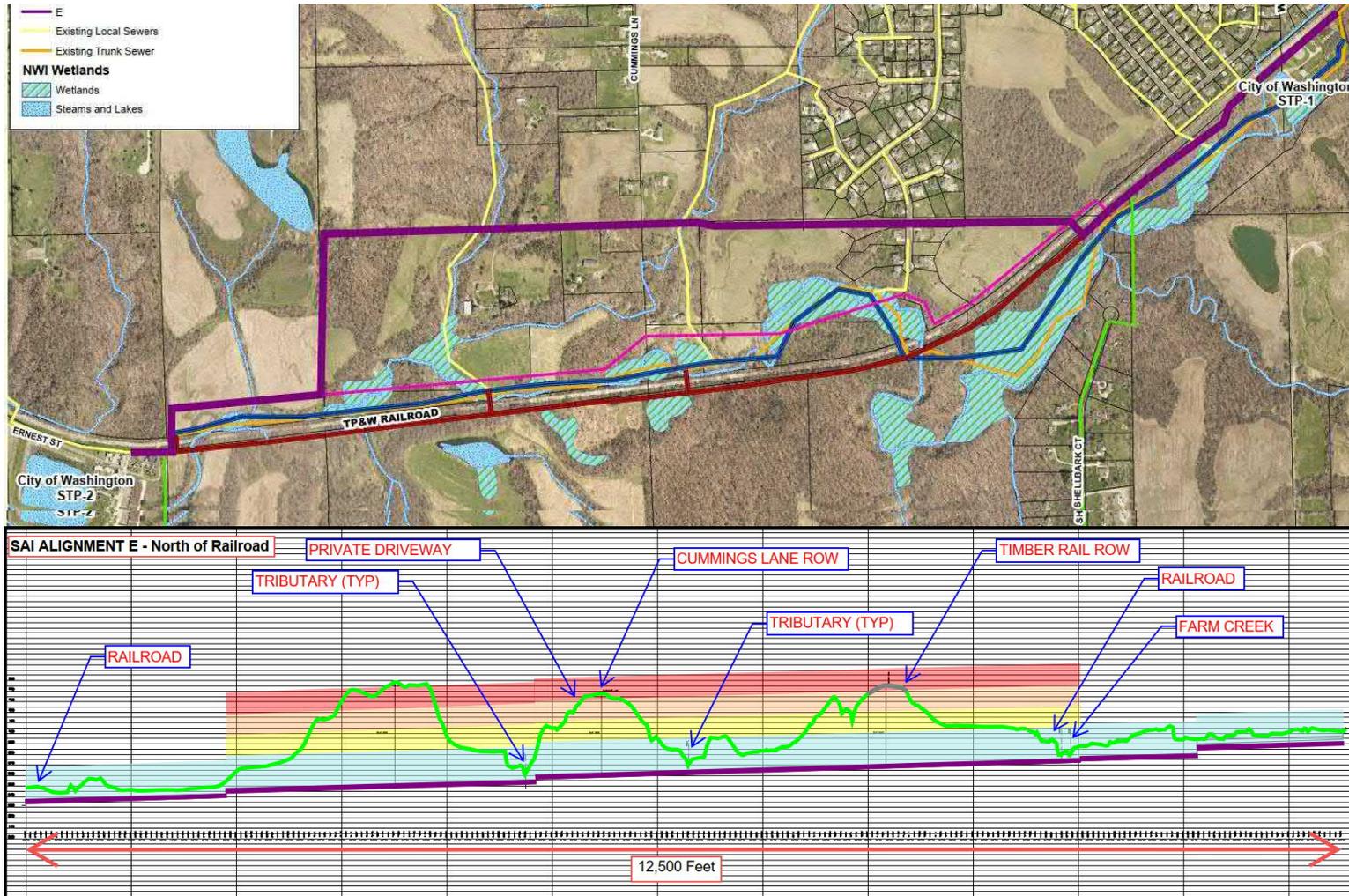
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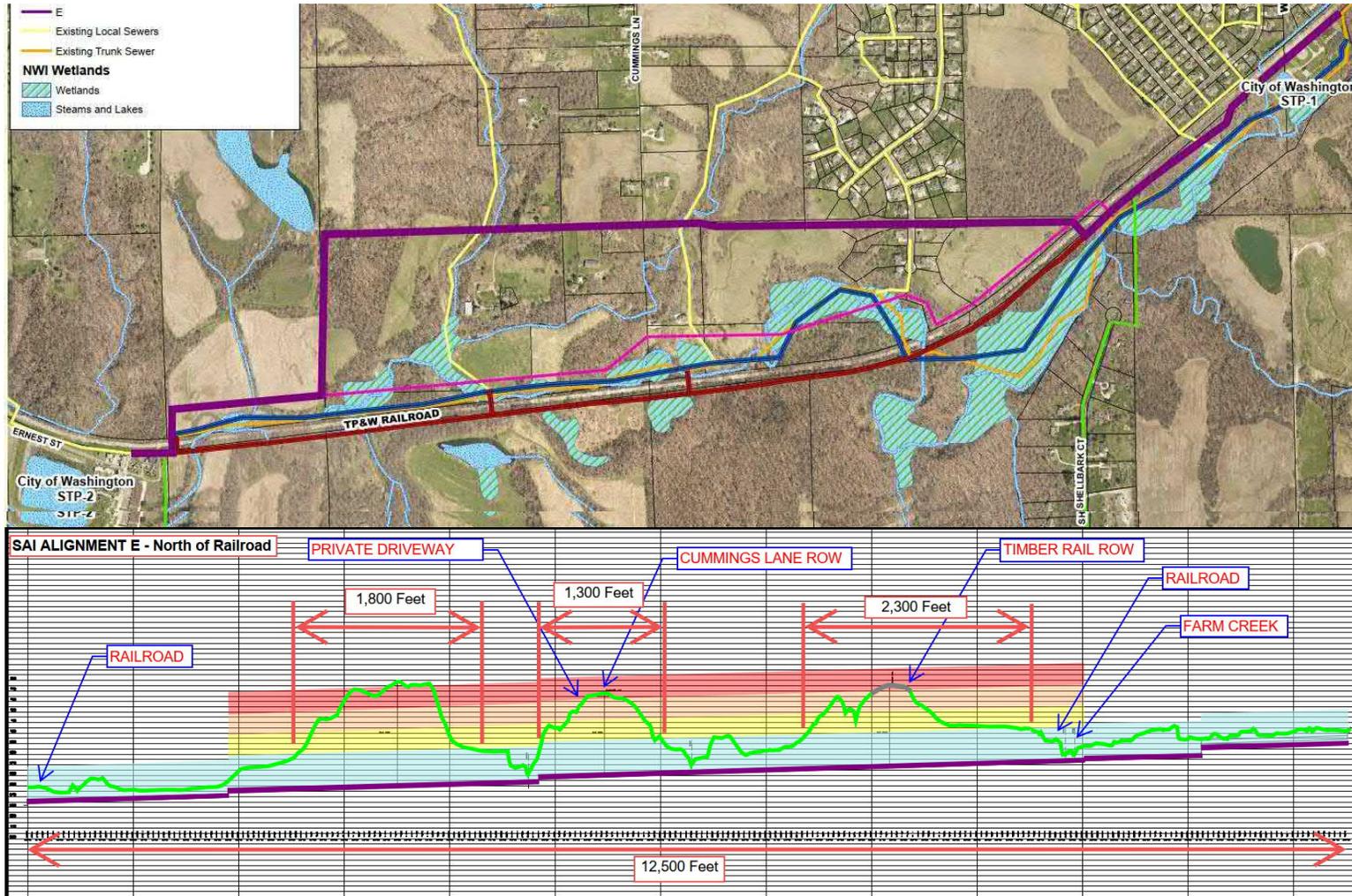
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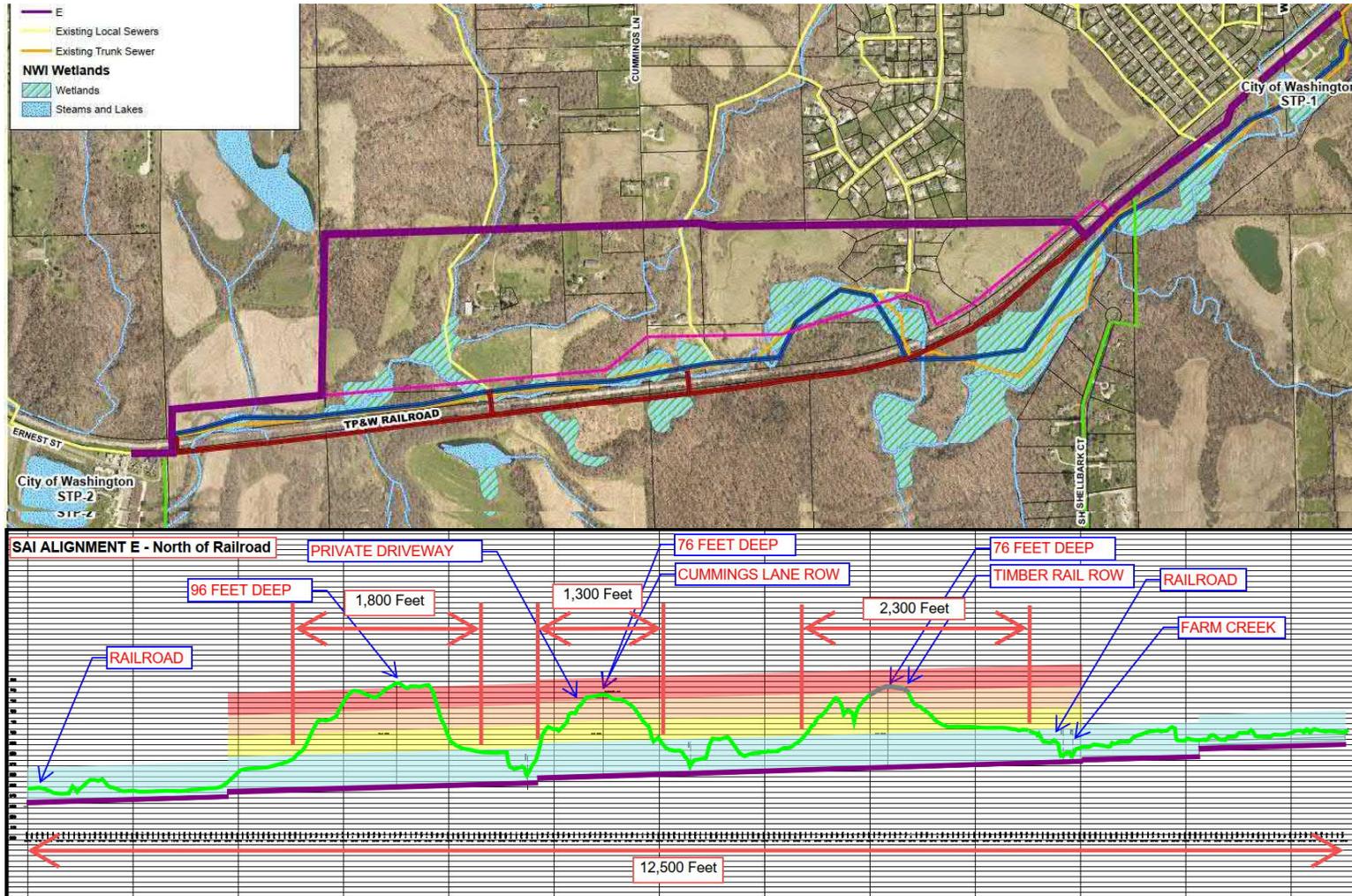
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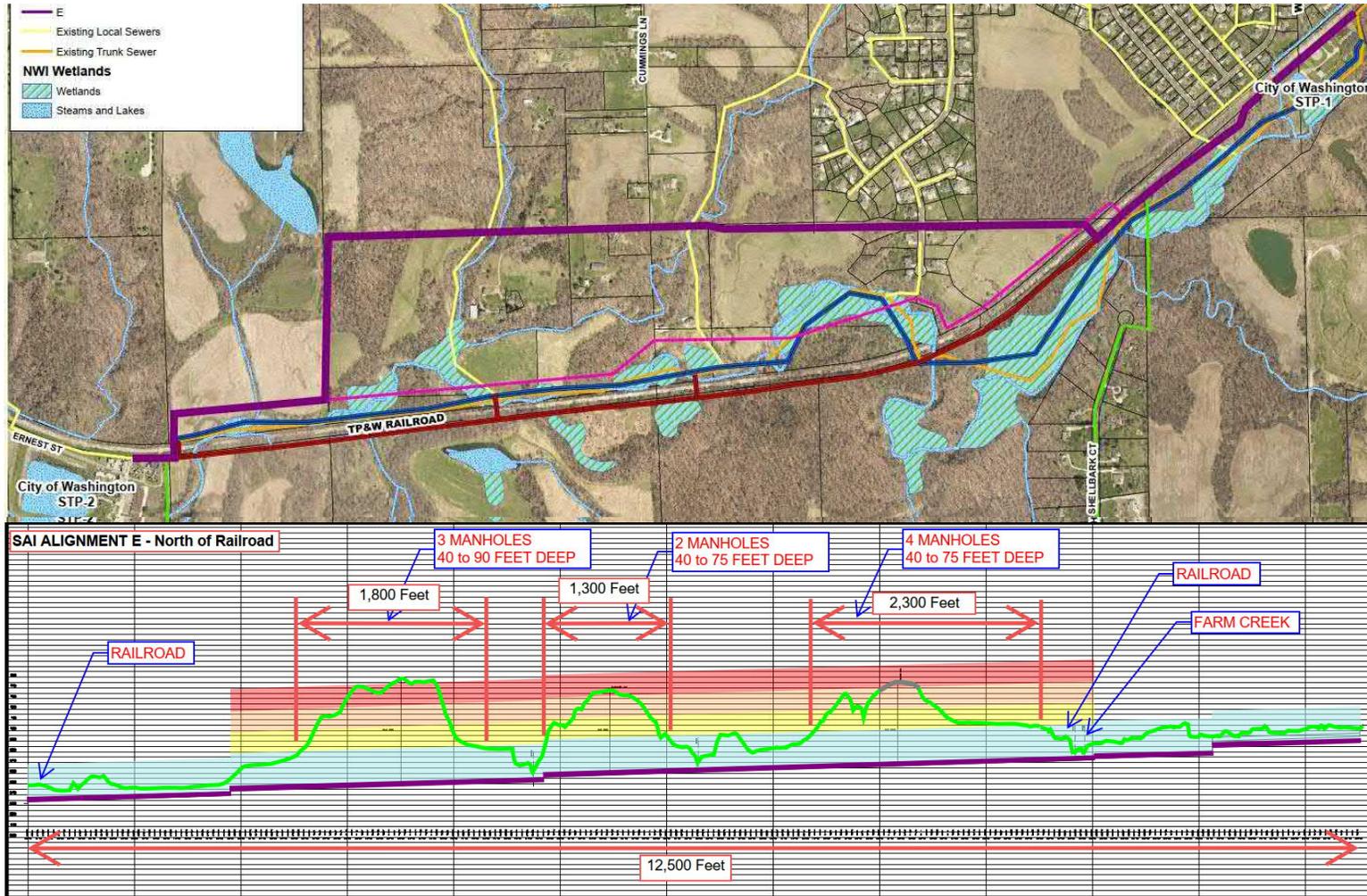
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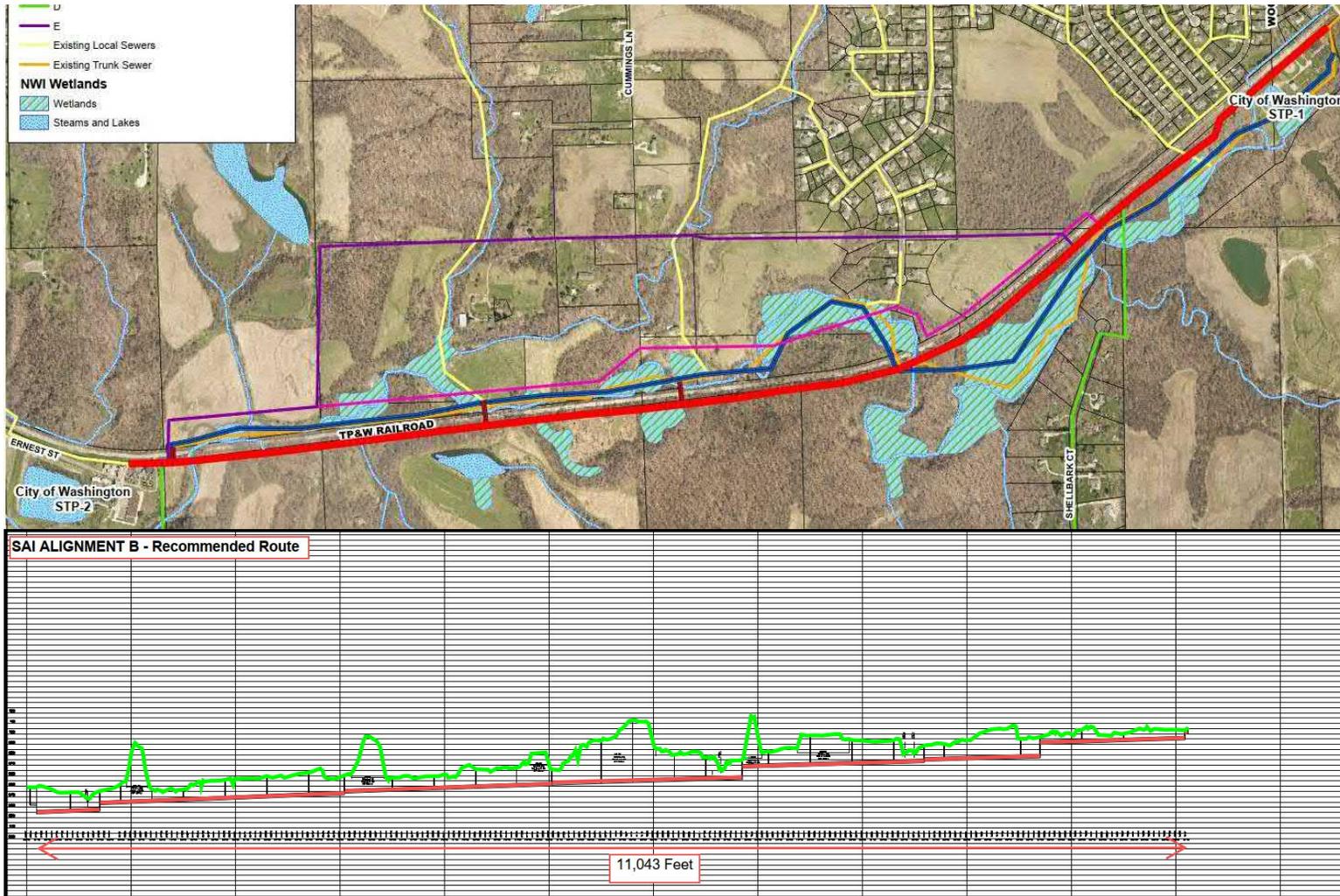
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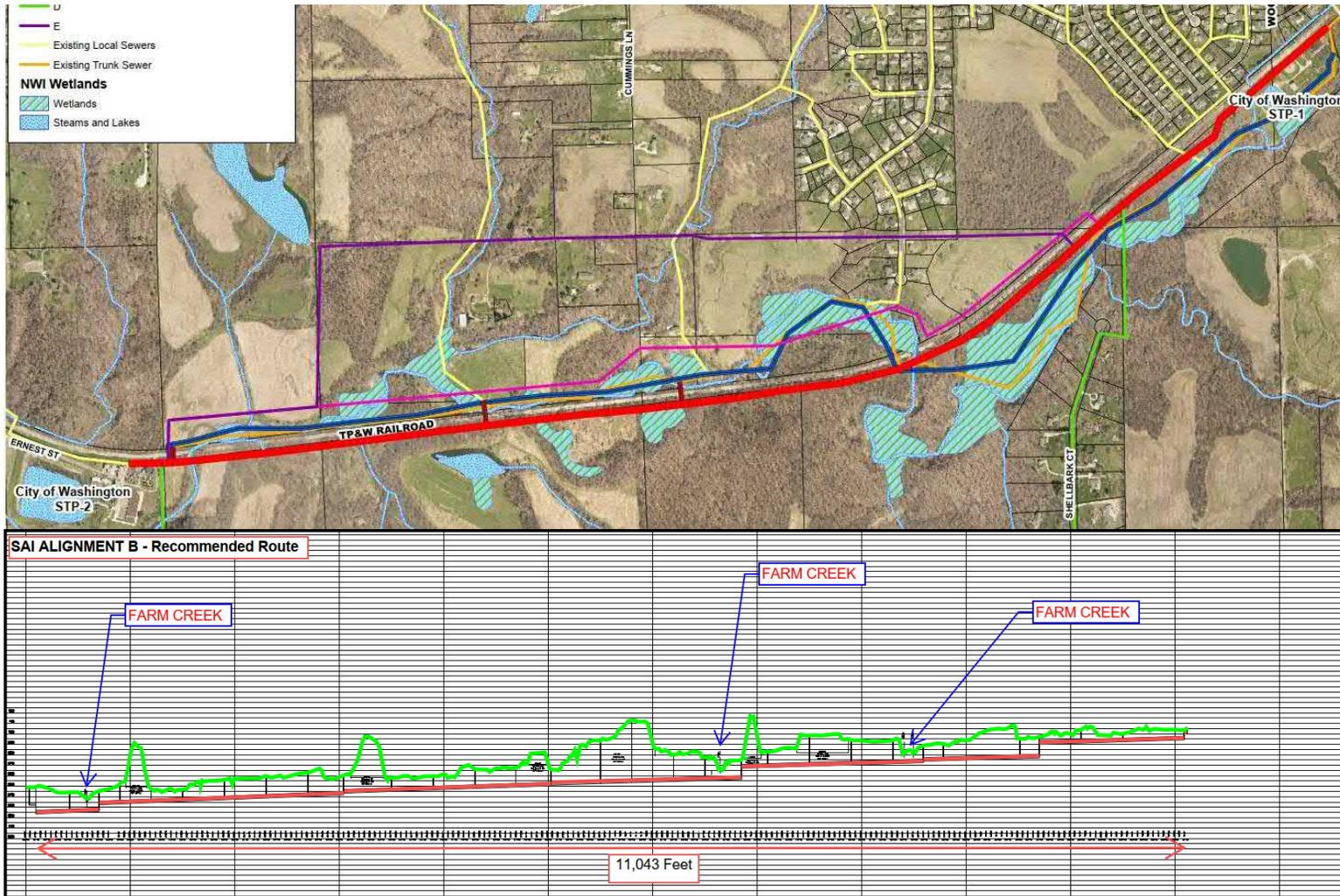
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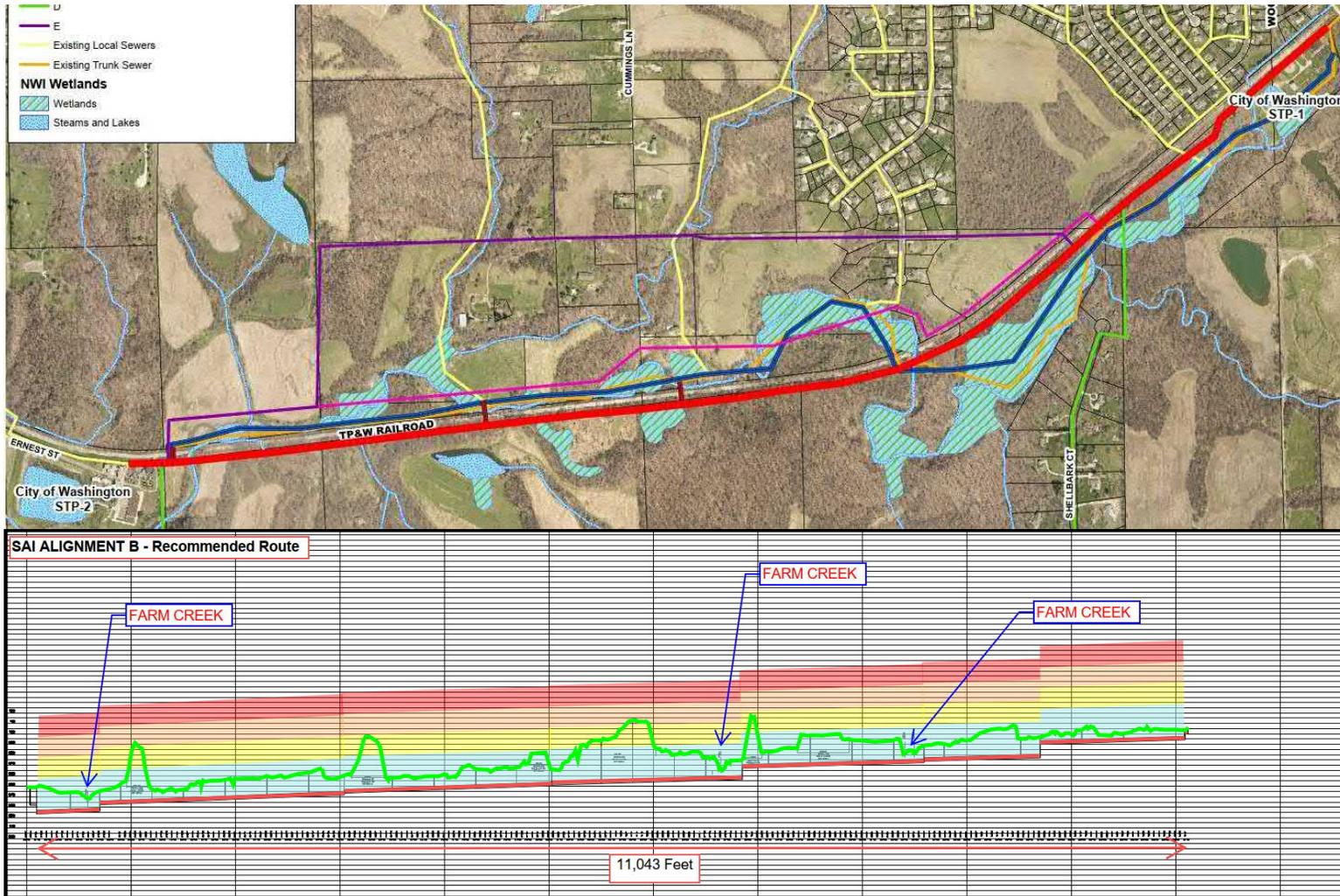
# City's Alternative Alignment Study – Alignment B Profile



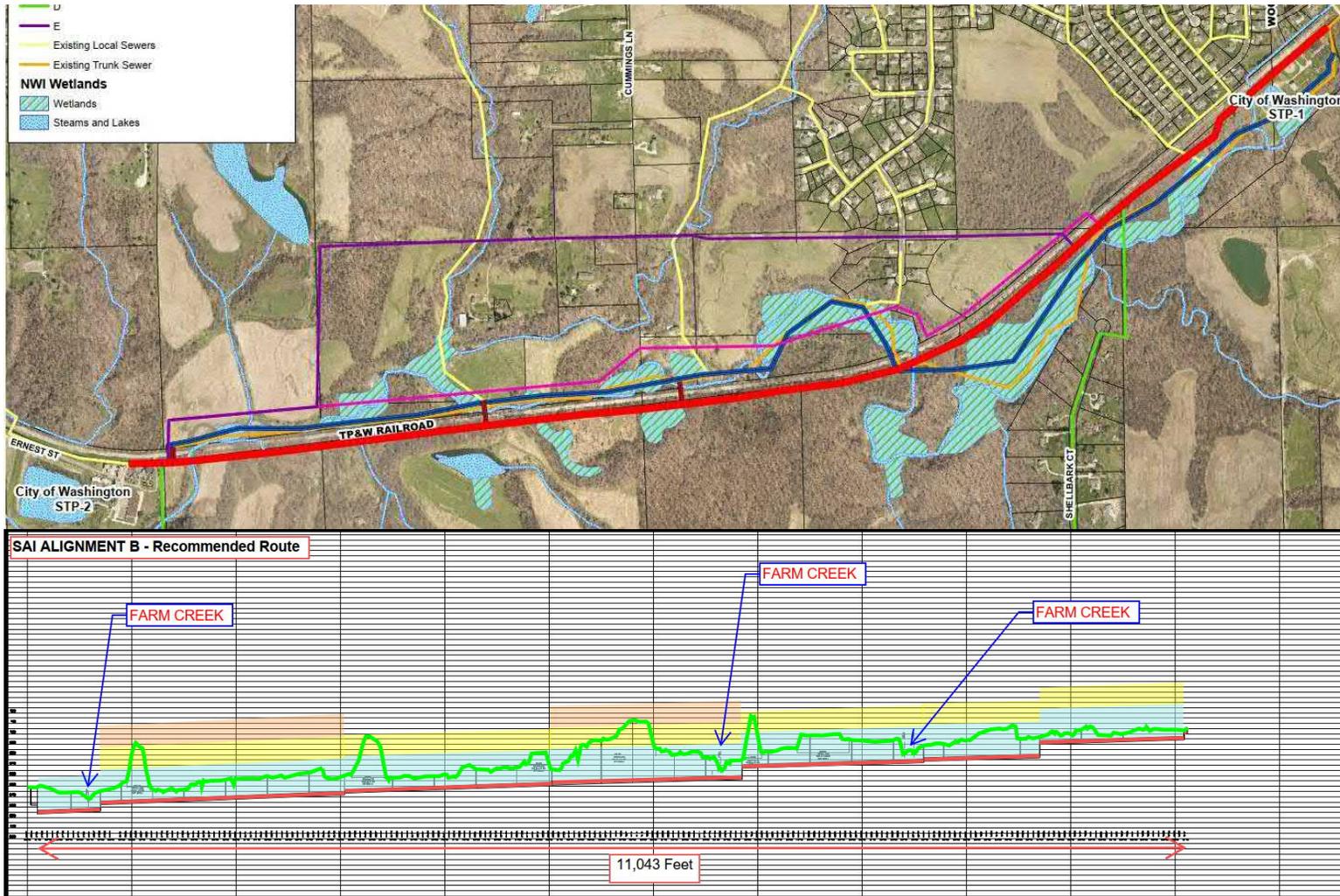
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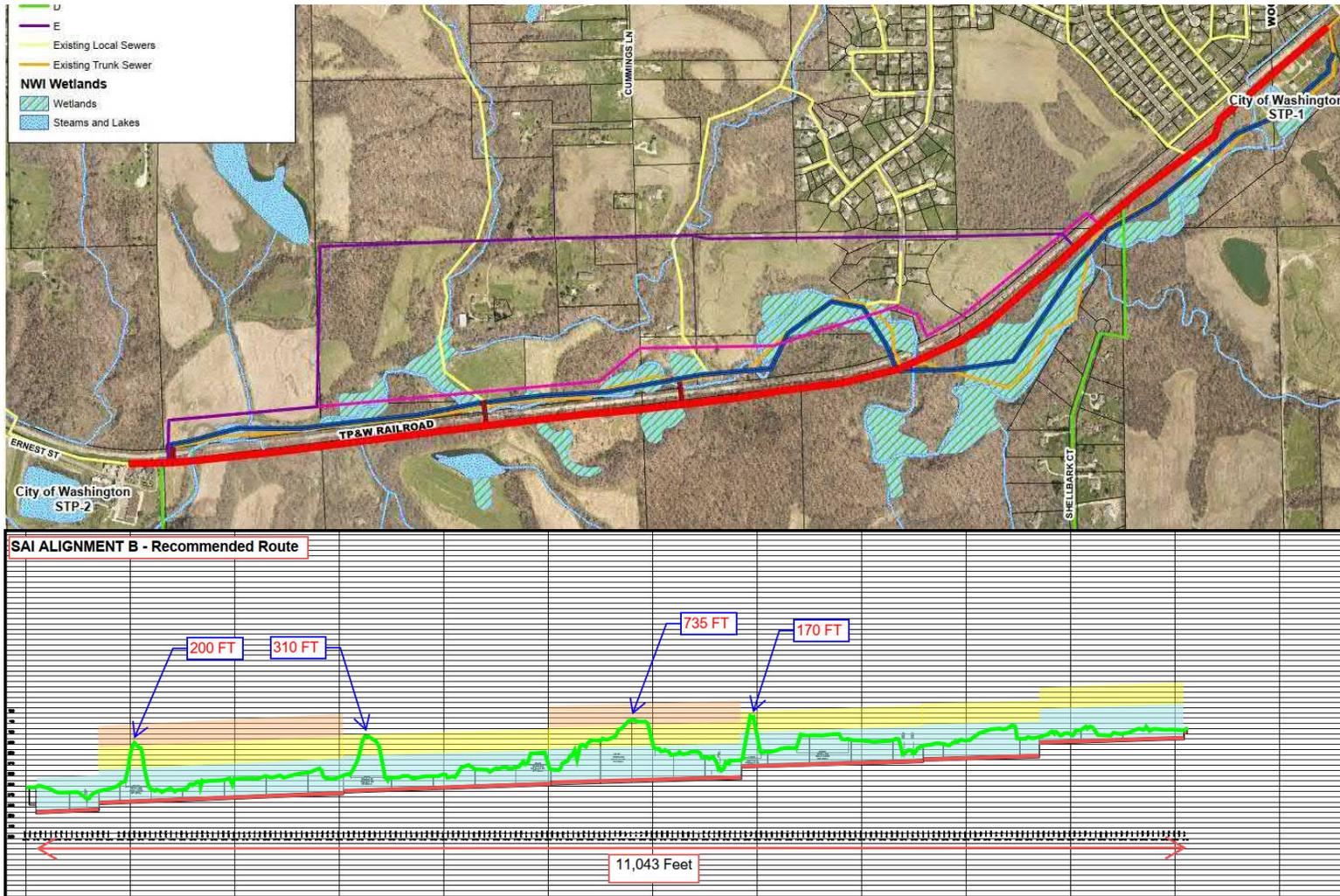
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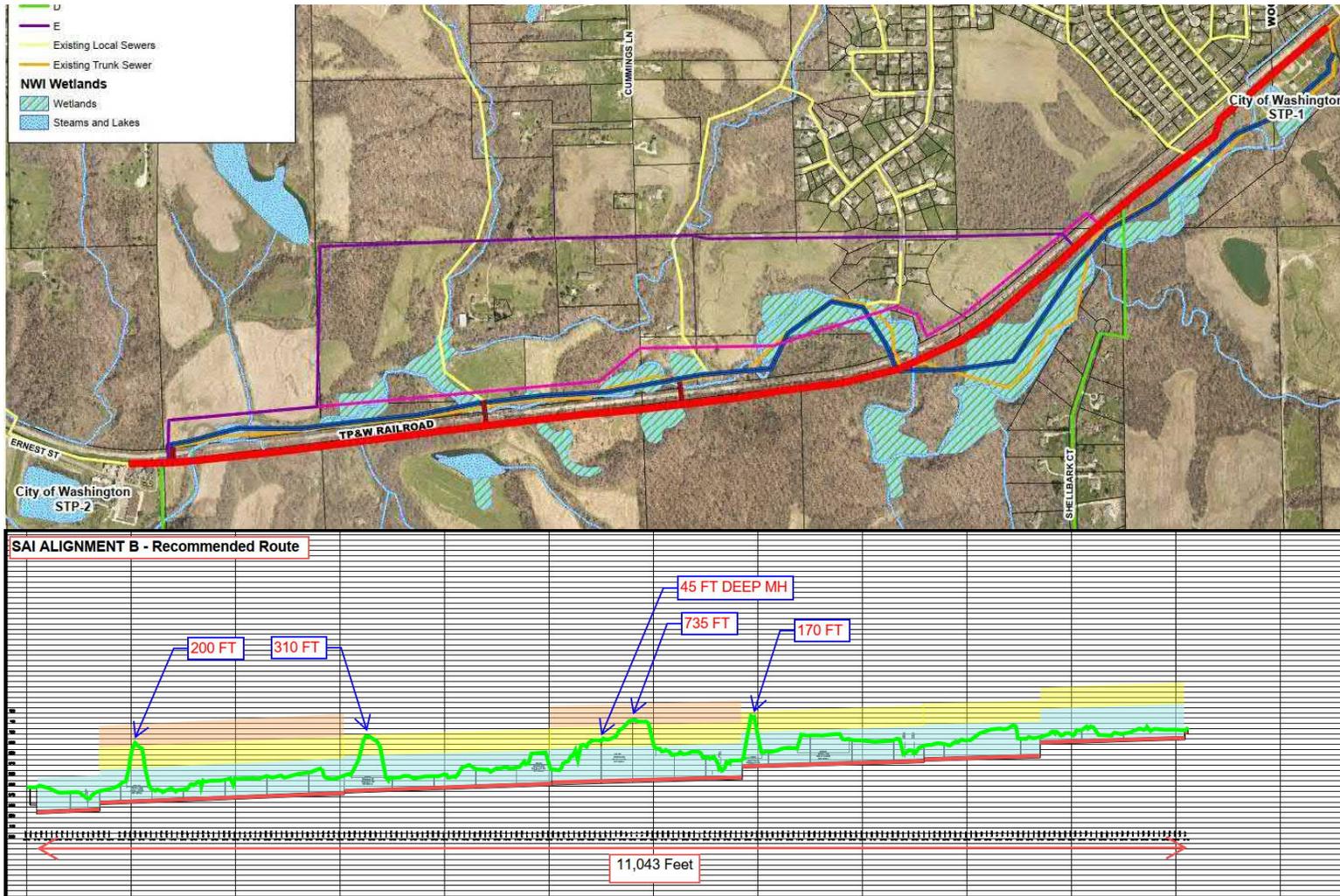
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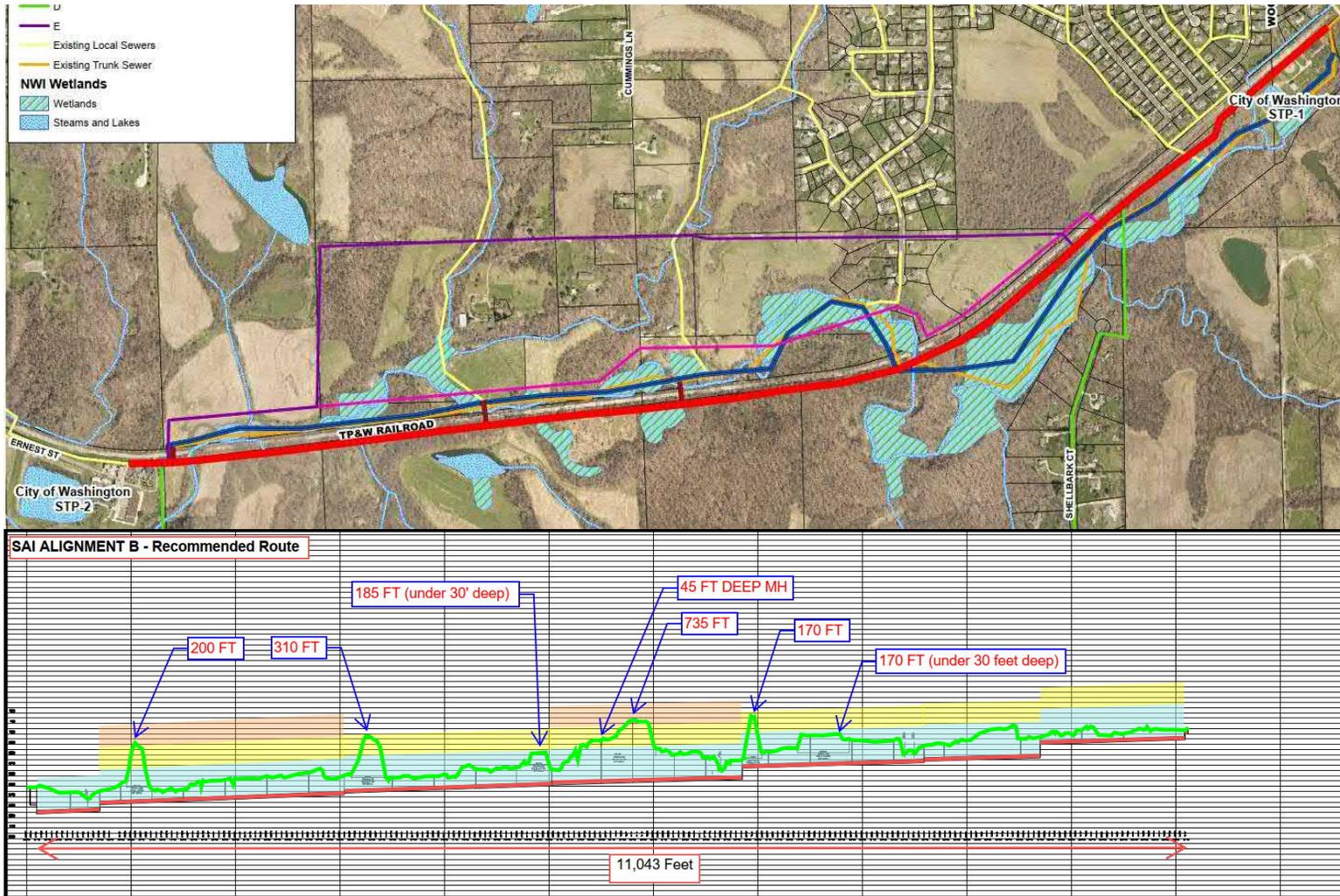
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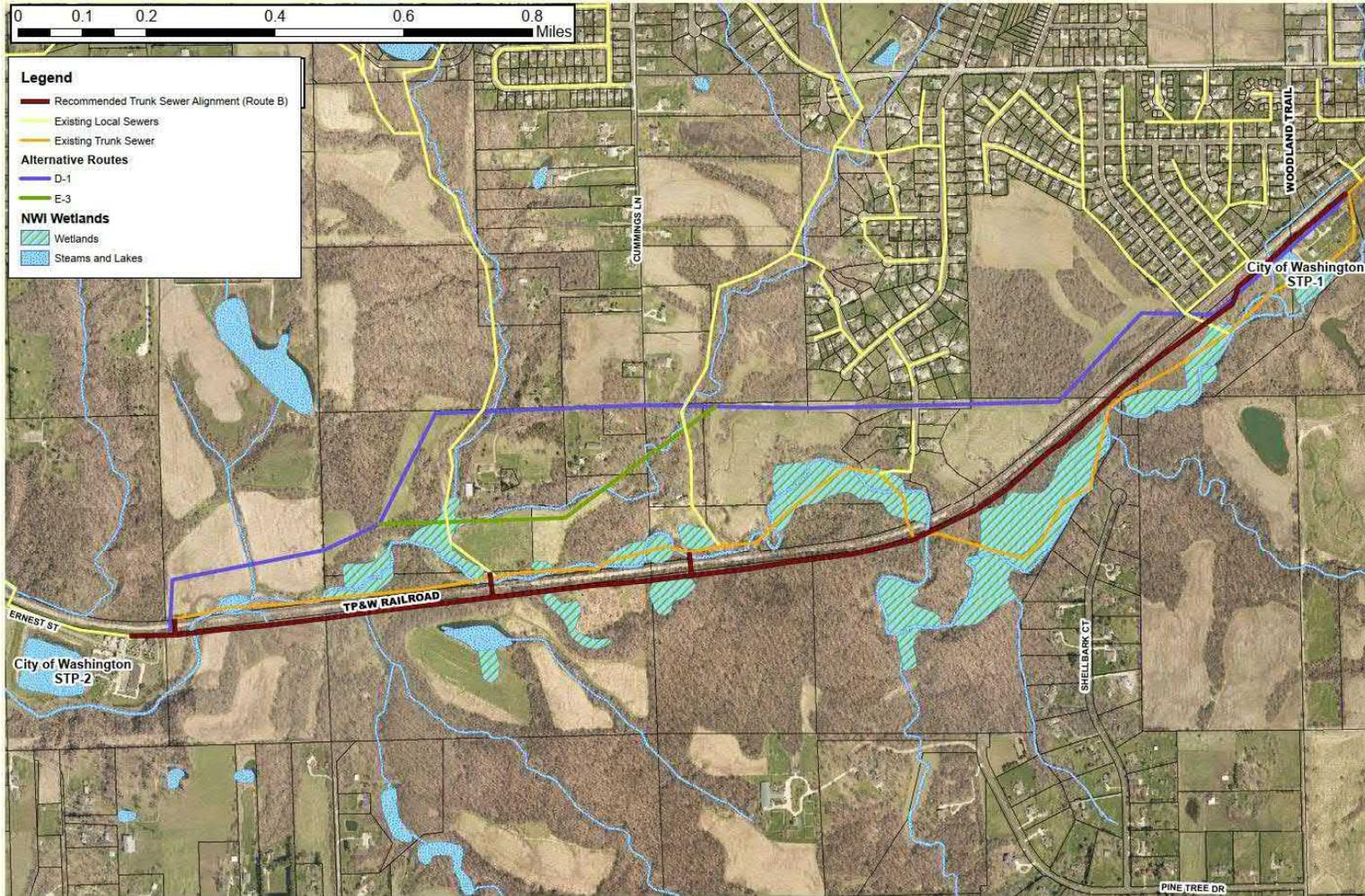
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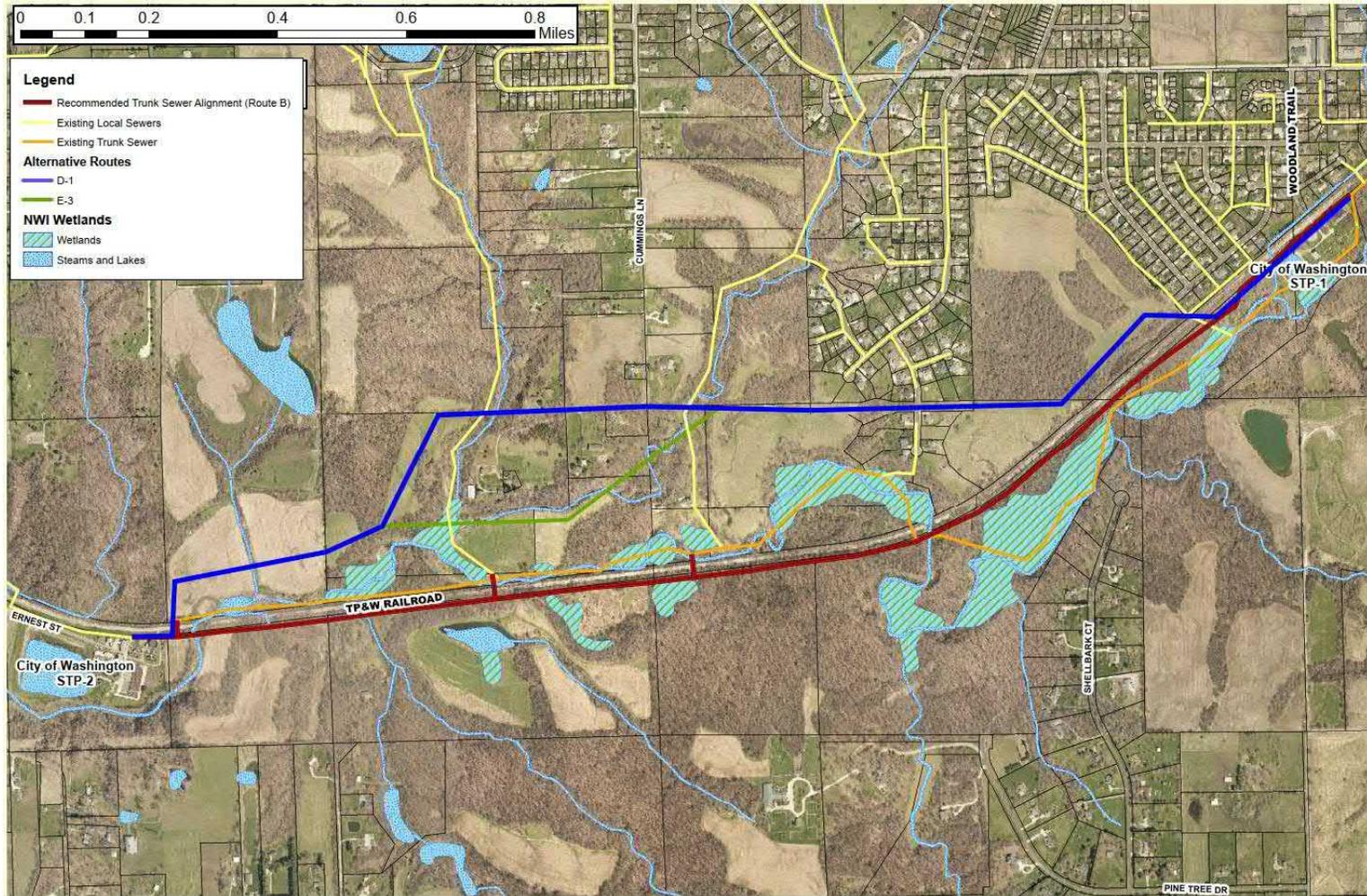
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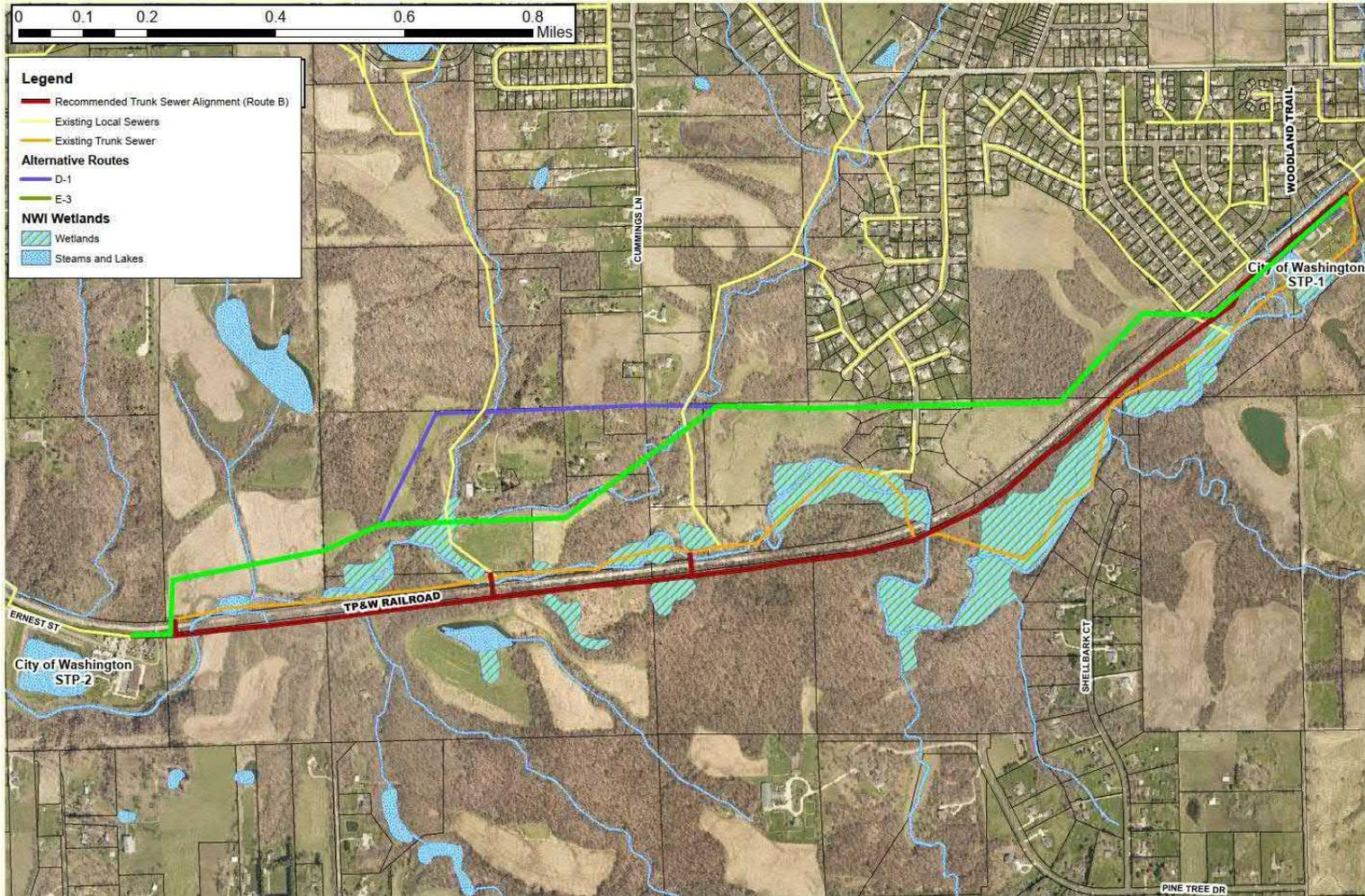
# Landowners' Alternative Alignment Study – 2 Primary Alignments



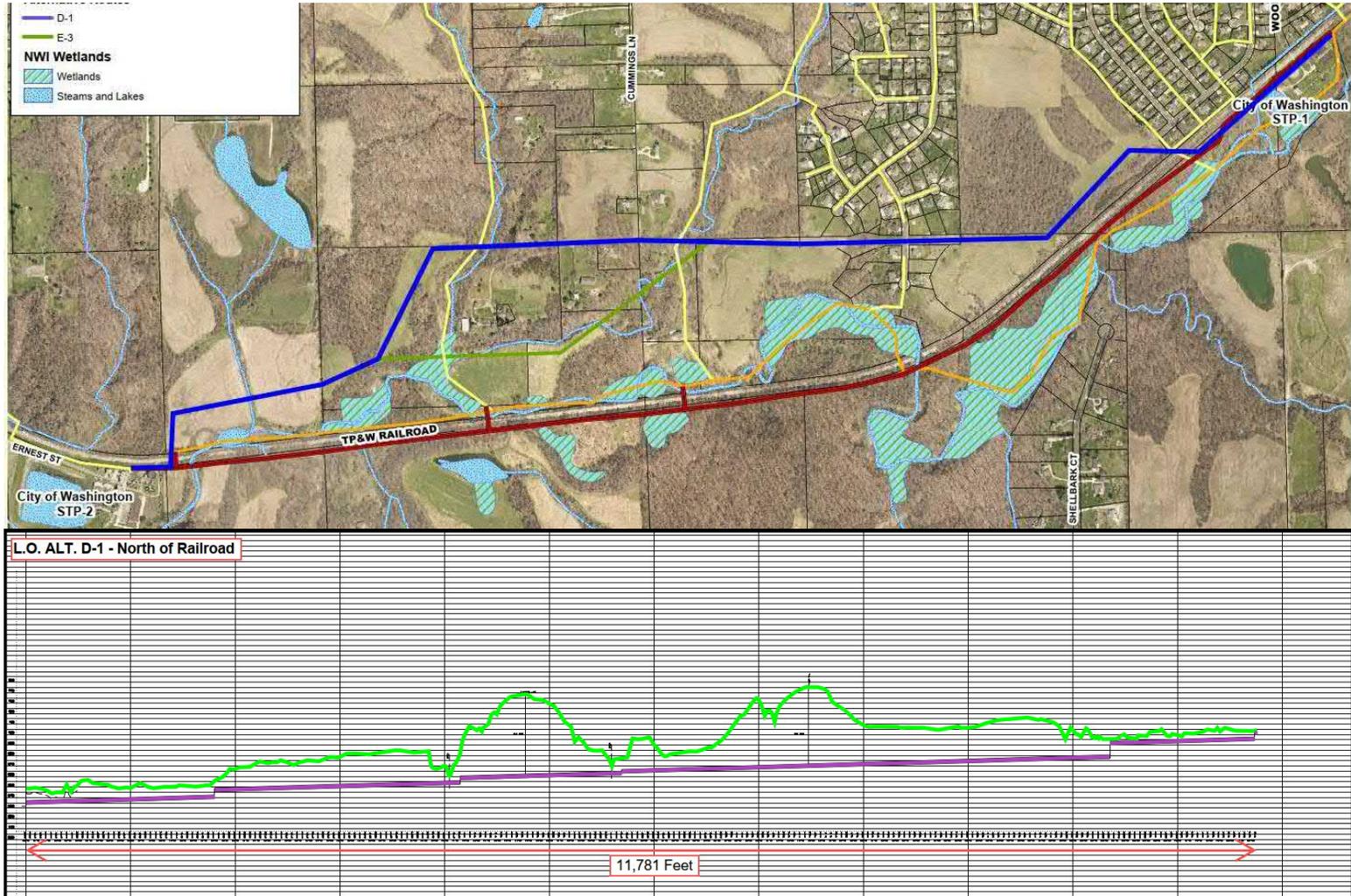
# Landowners' Alternative Alignment Study – Alignment D-1



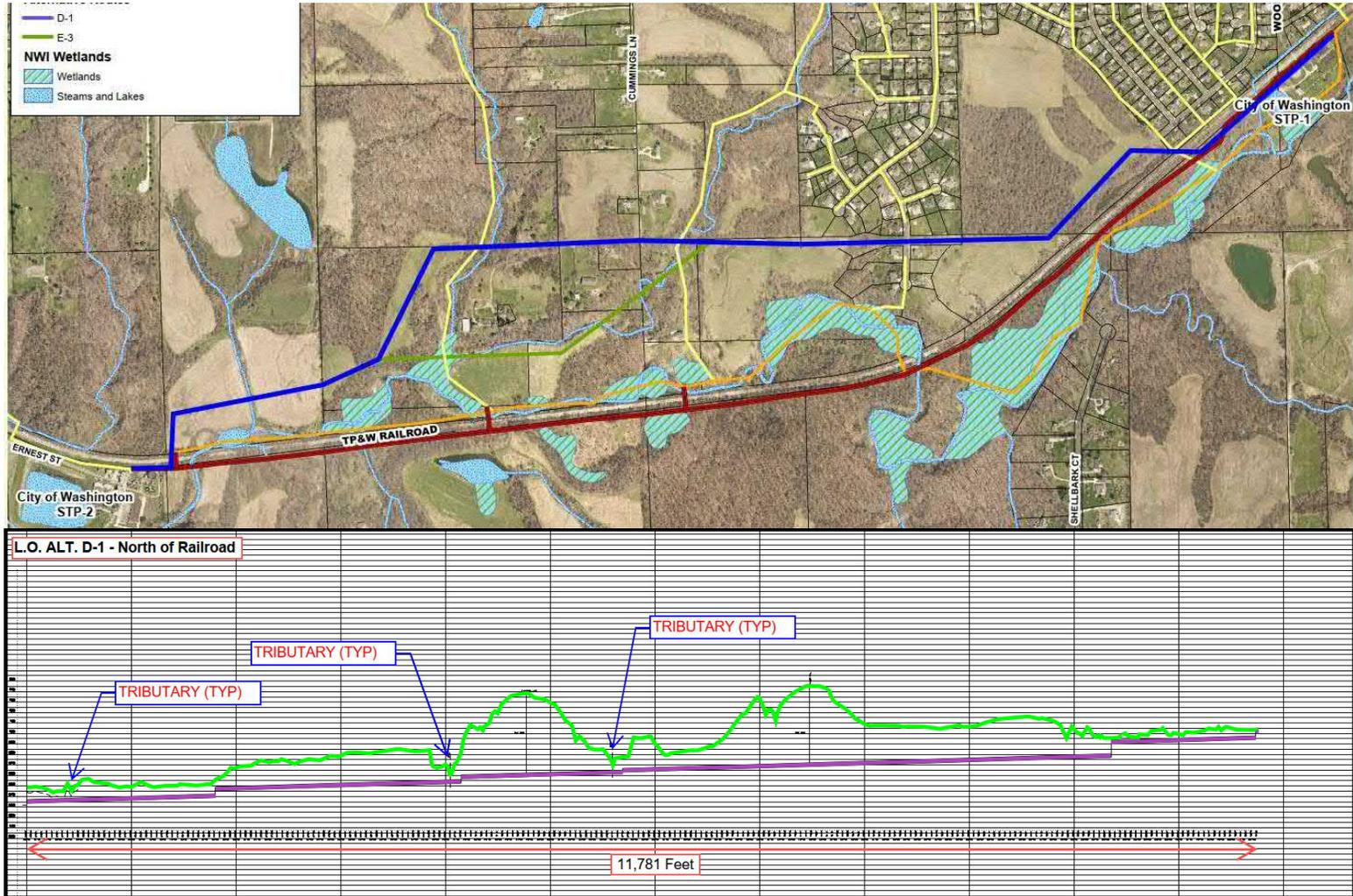
# Landowners' Alternative Alignment Study – Alignment E-3



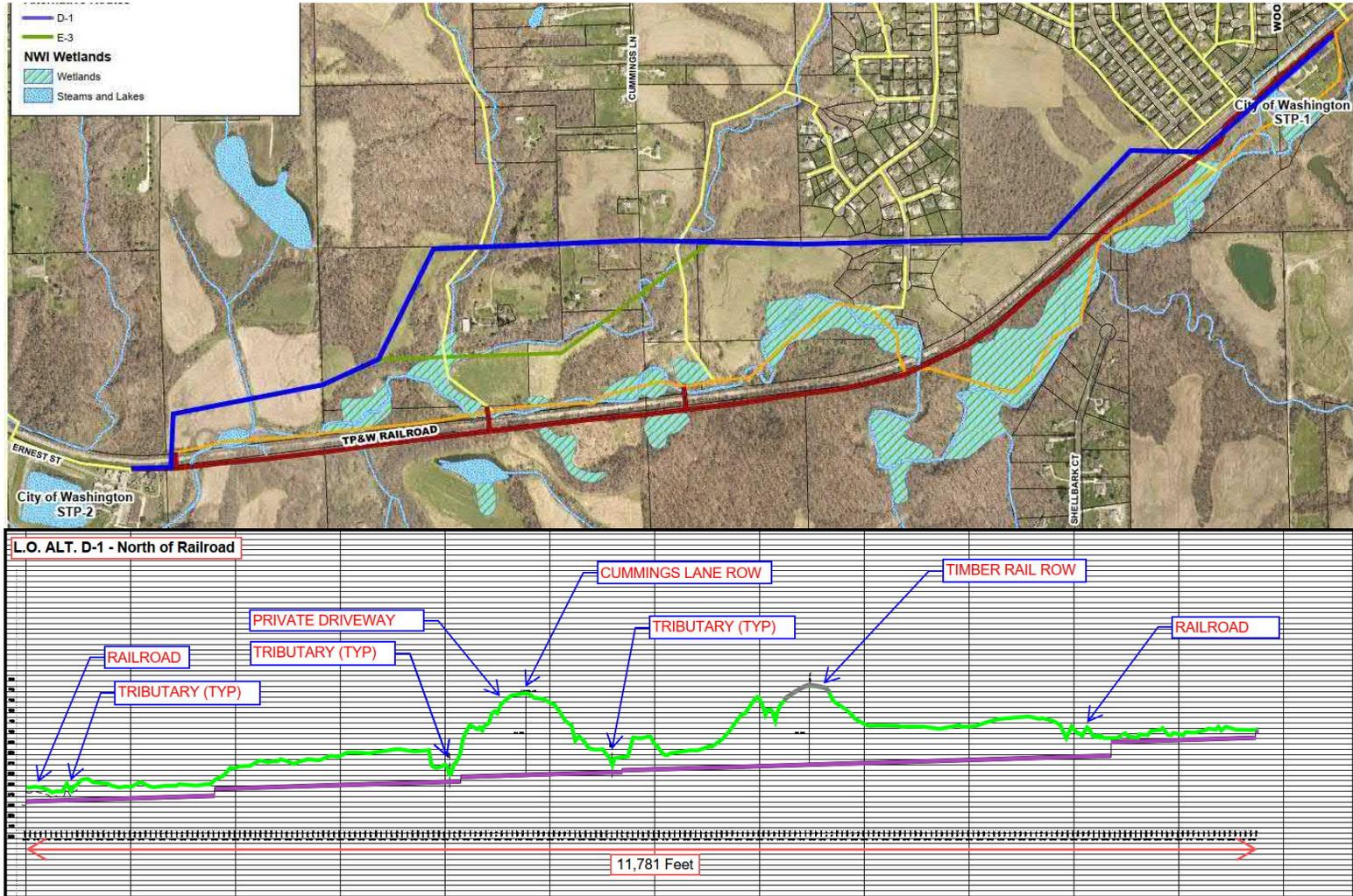
# Landowners' Alternative Alignment Study – Alignment D-1 Profile



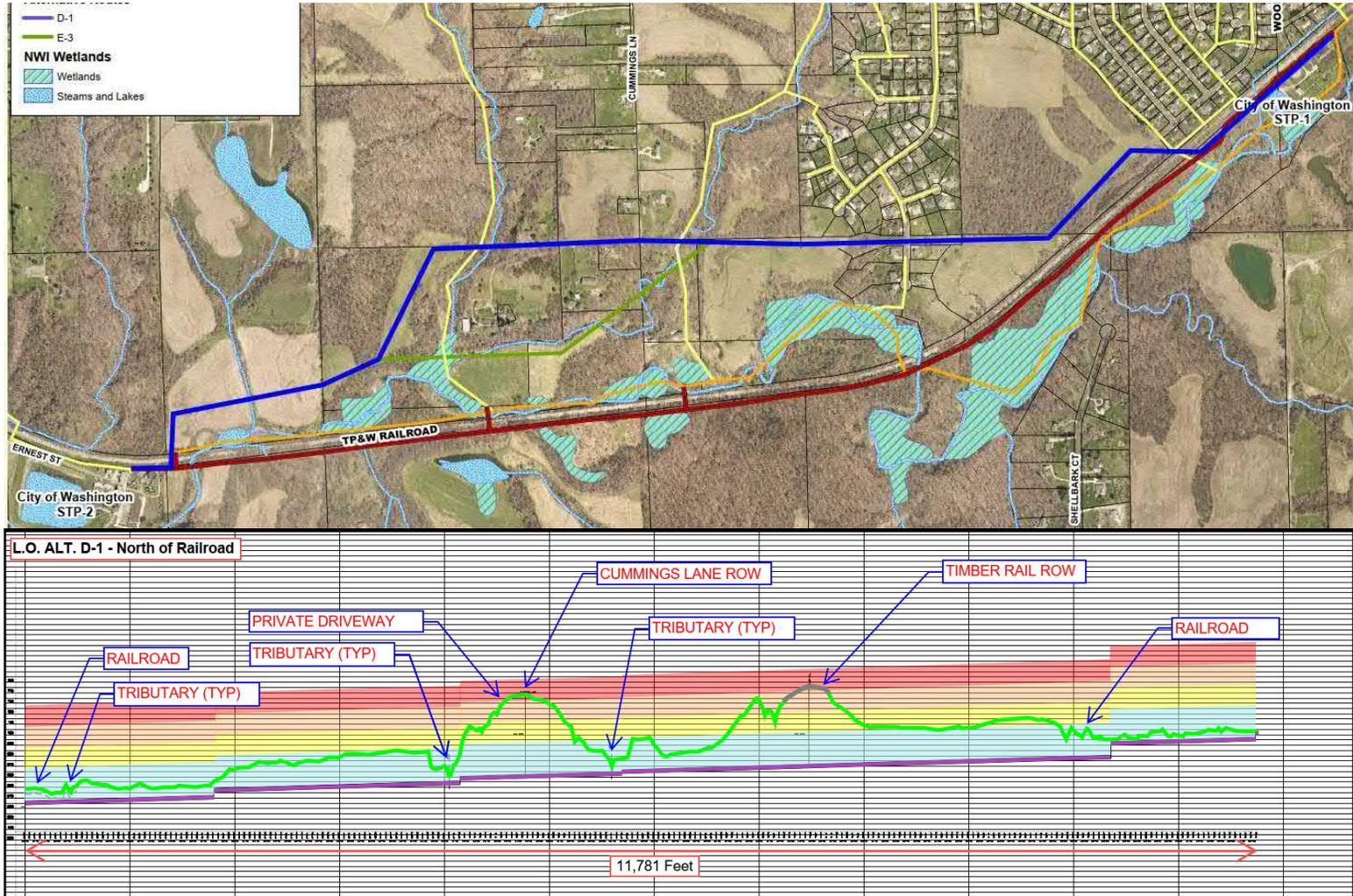
# Landowners' Alternative Alignment Study – Alignment D-1 Profile



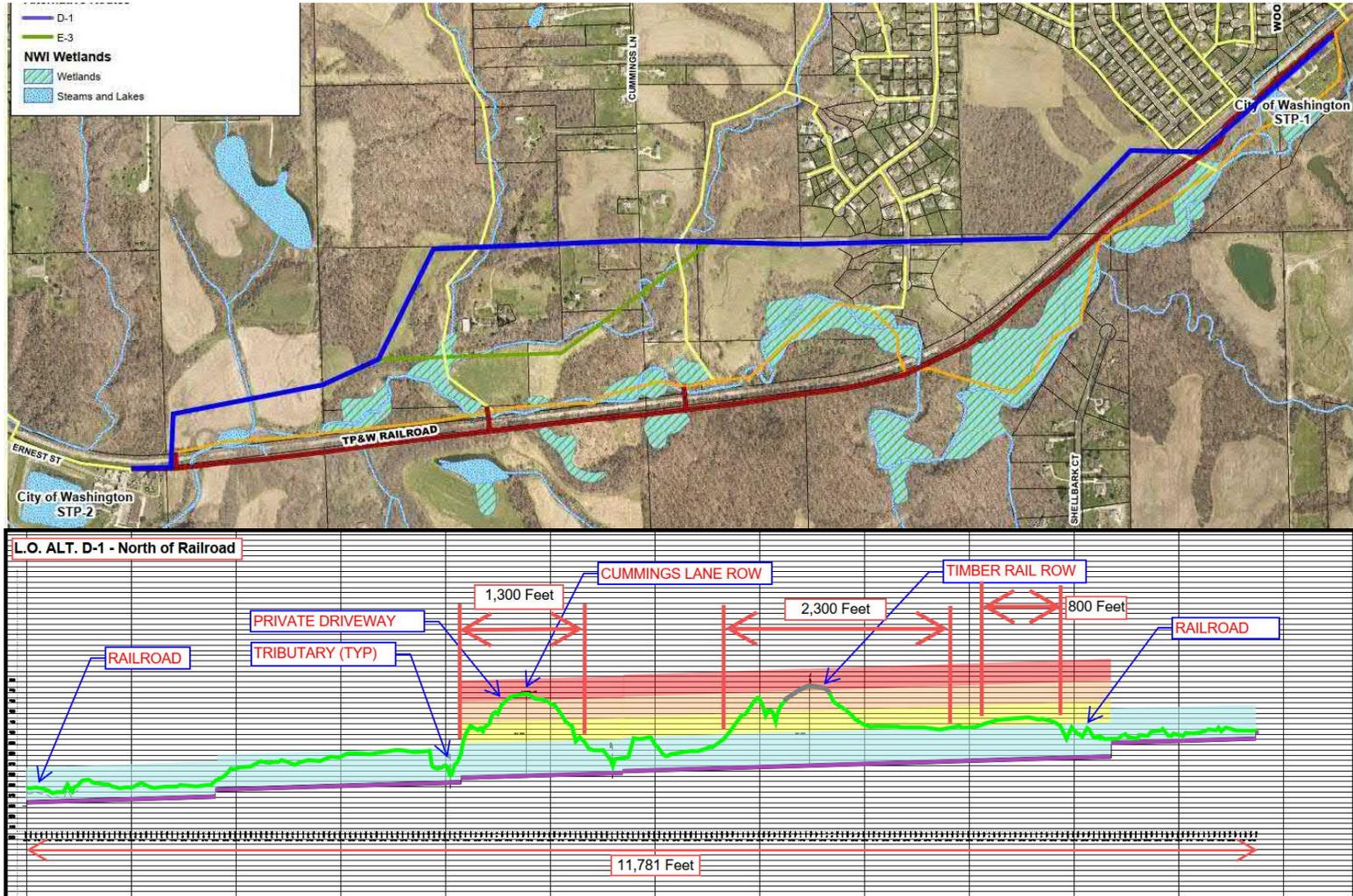
# Landowners' Alternative Alignment Study – Alignment D-1 Profile



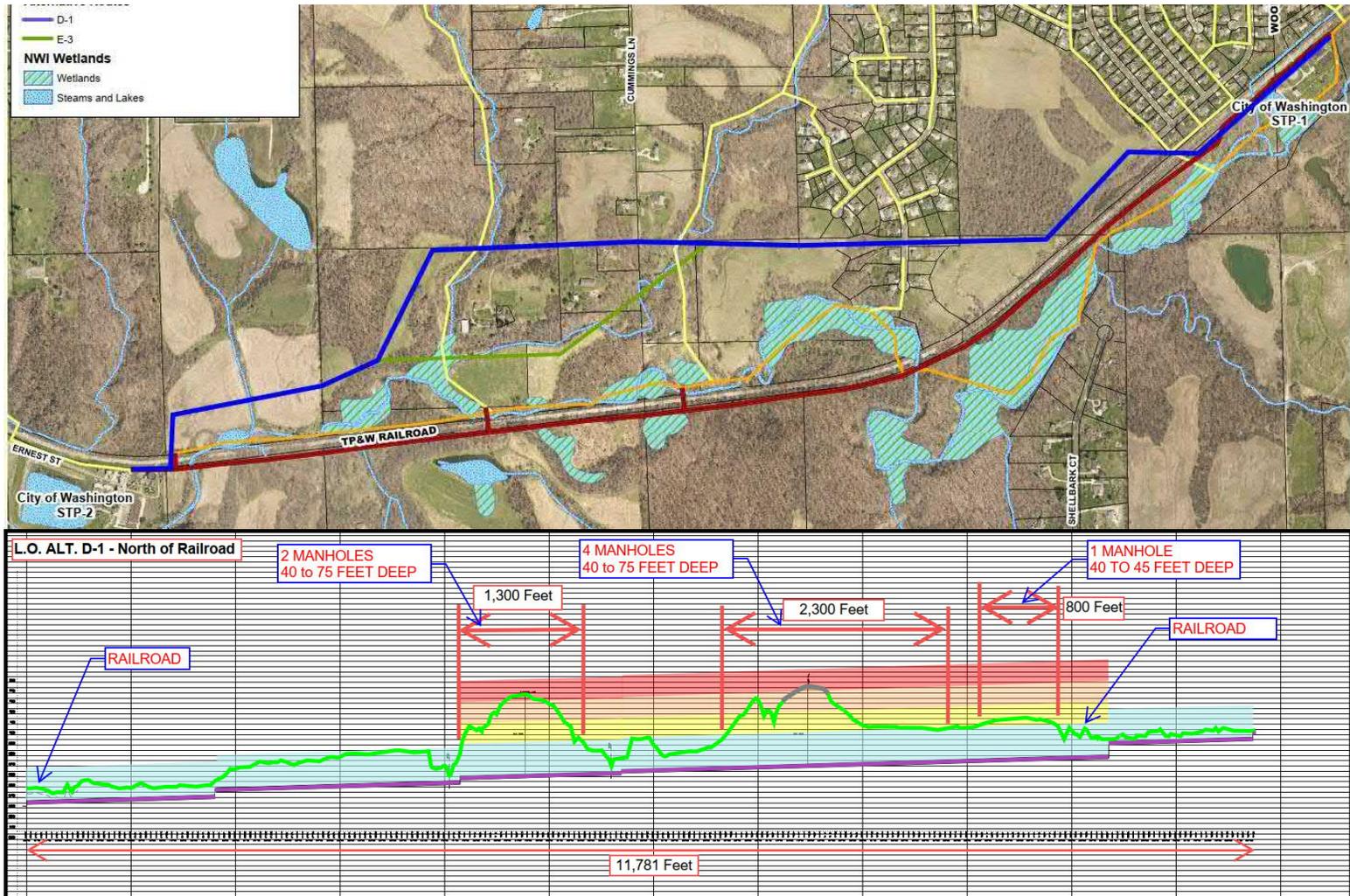
# Landowners' Alternative Alignment Study – Alignment D-1 Profile



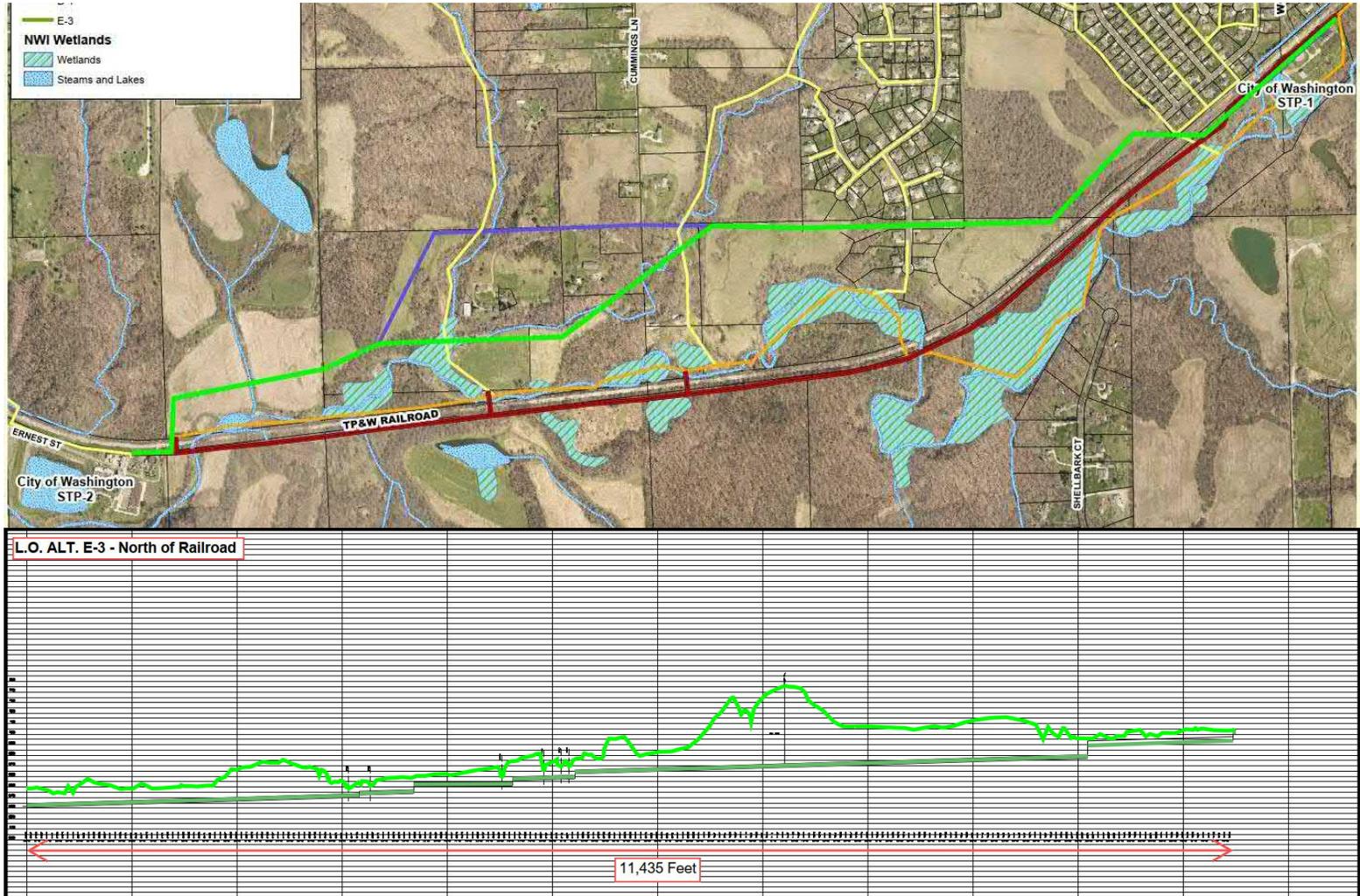
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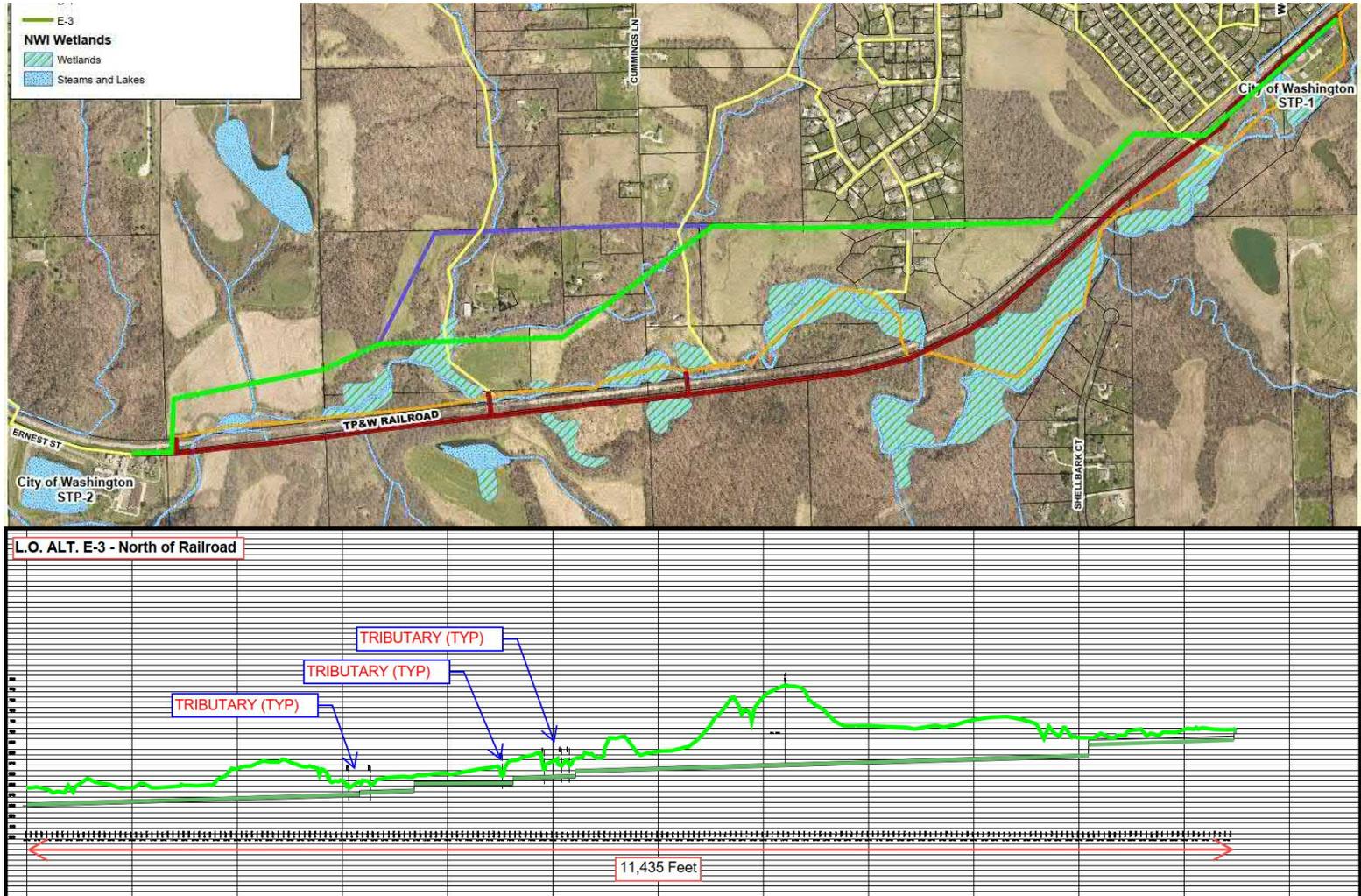
# Landowners' Alternative Alignment Study – Alignment D-1 Profile



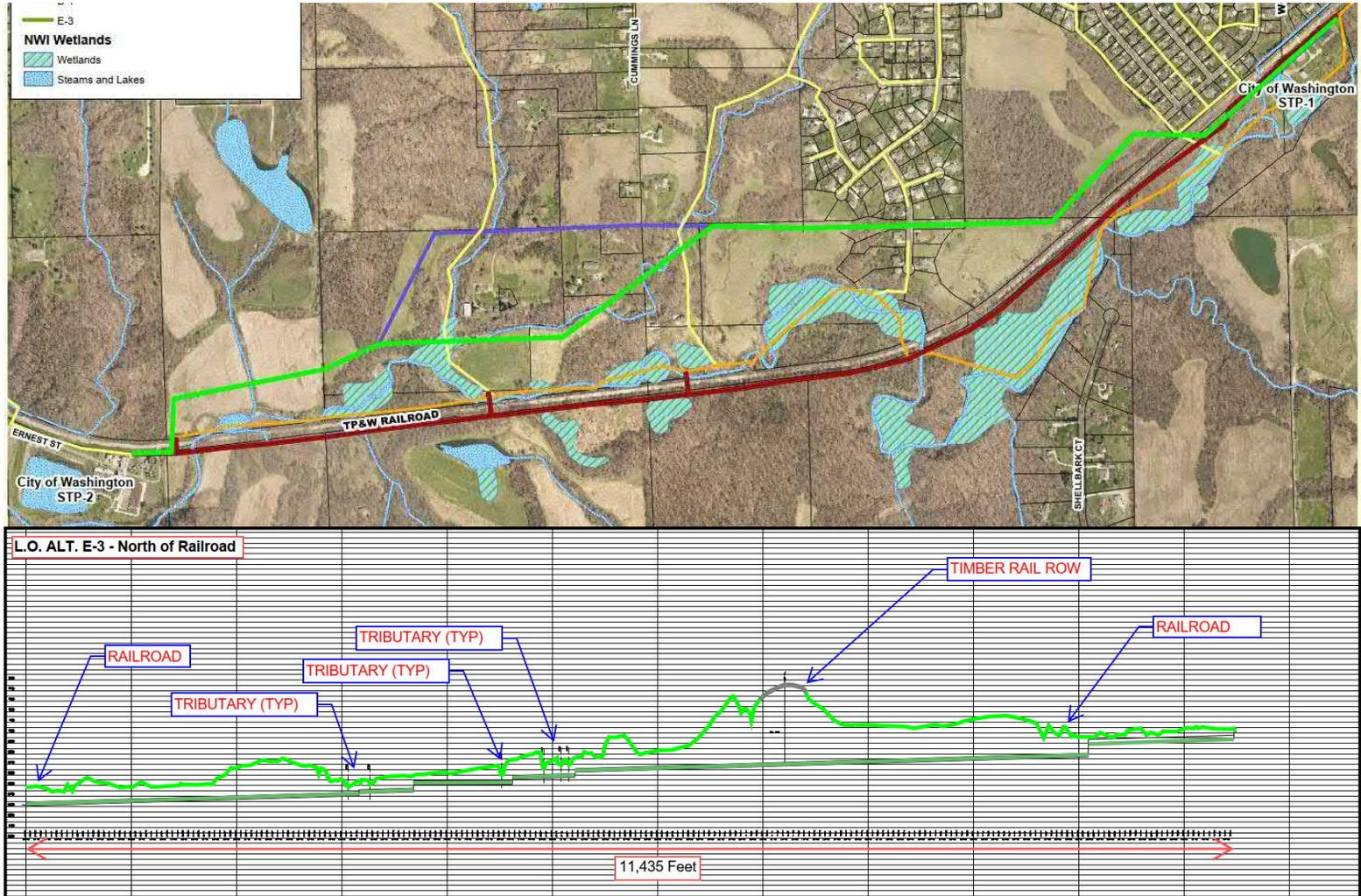
# Landowners' Alternative Alignment Study – Alignment E-3 Profile



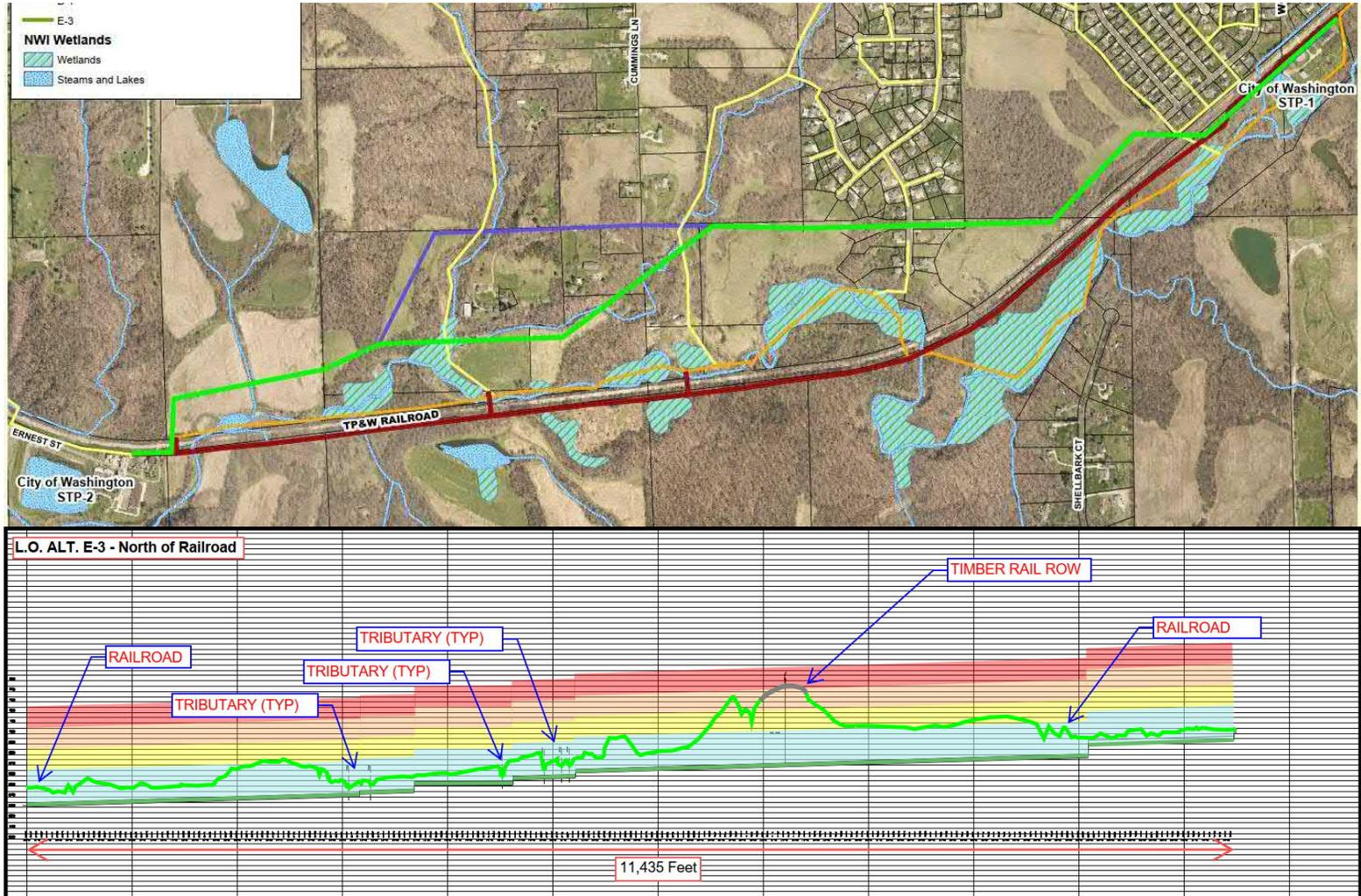
# Landowners' Alternative Alignment Study – Alignment E-3 Profile



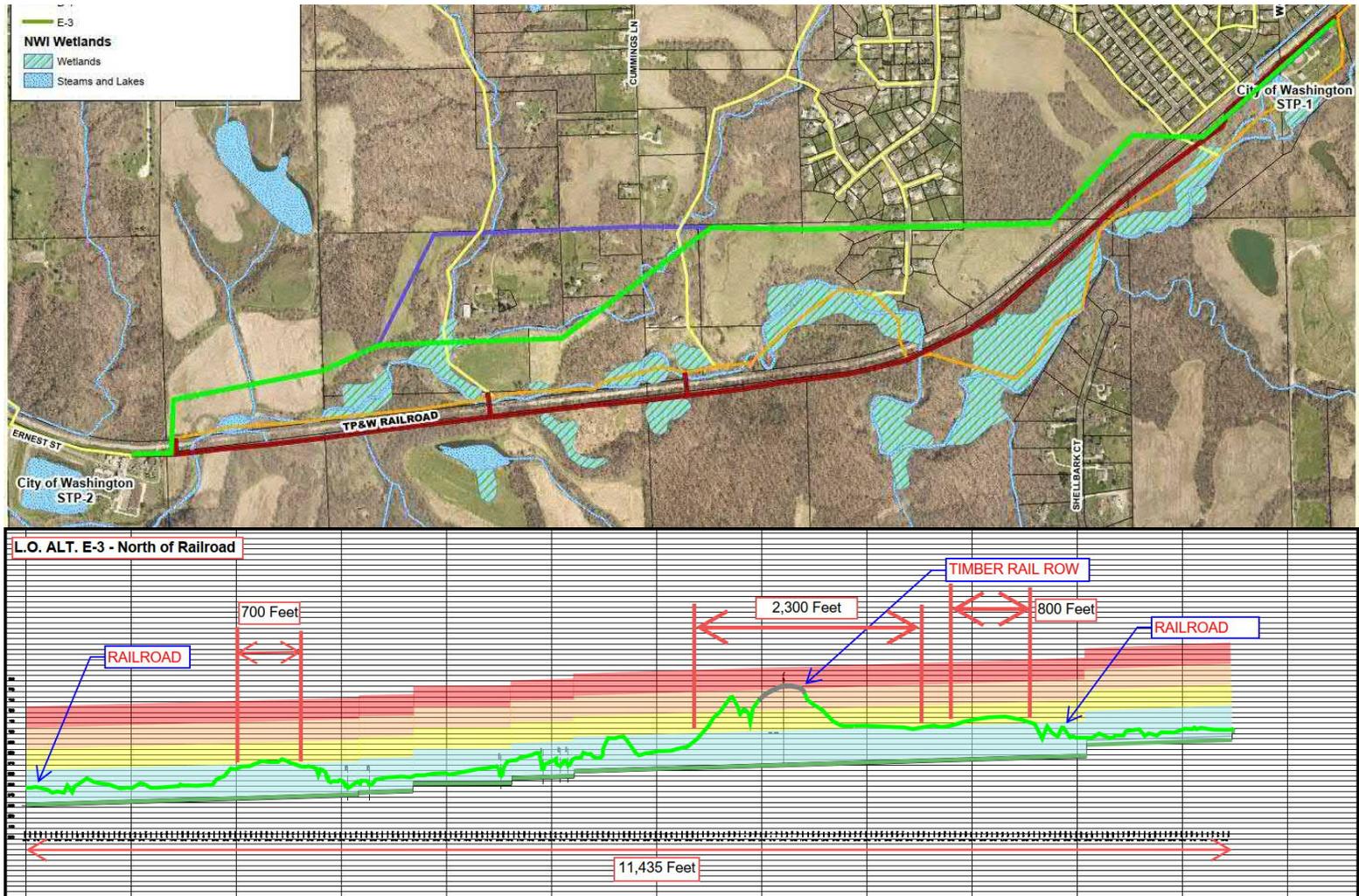
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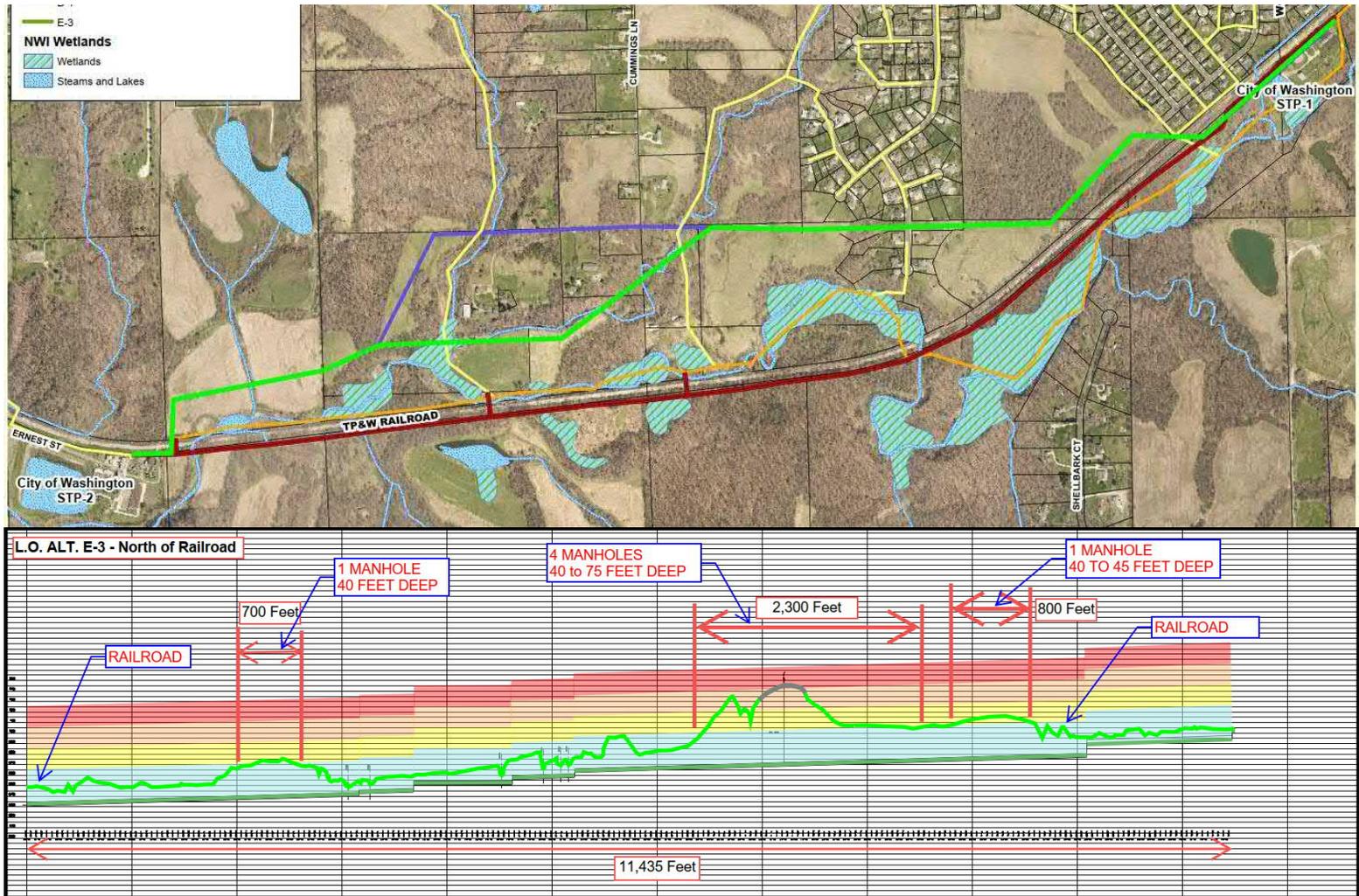
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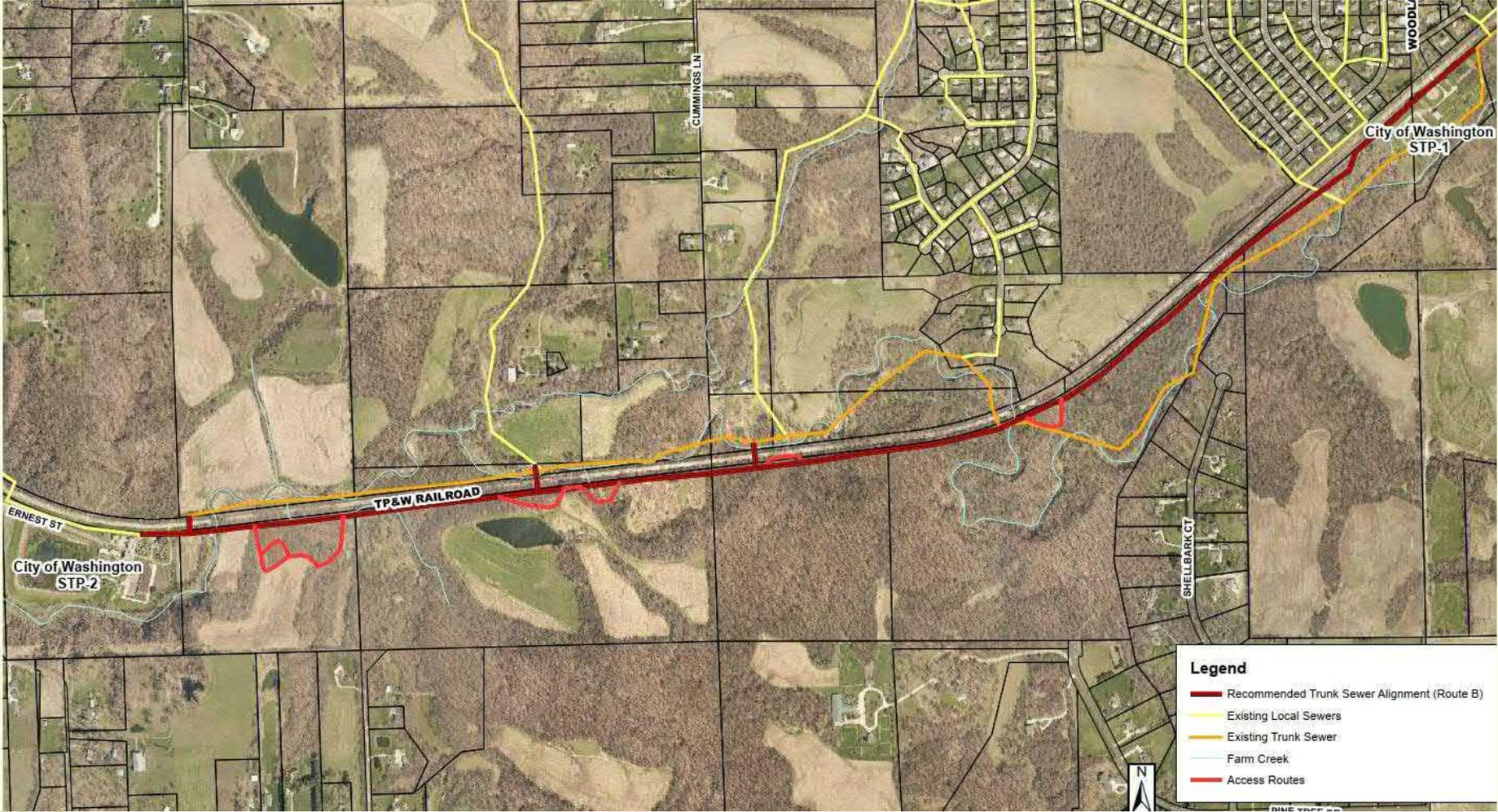
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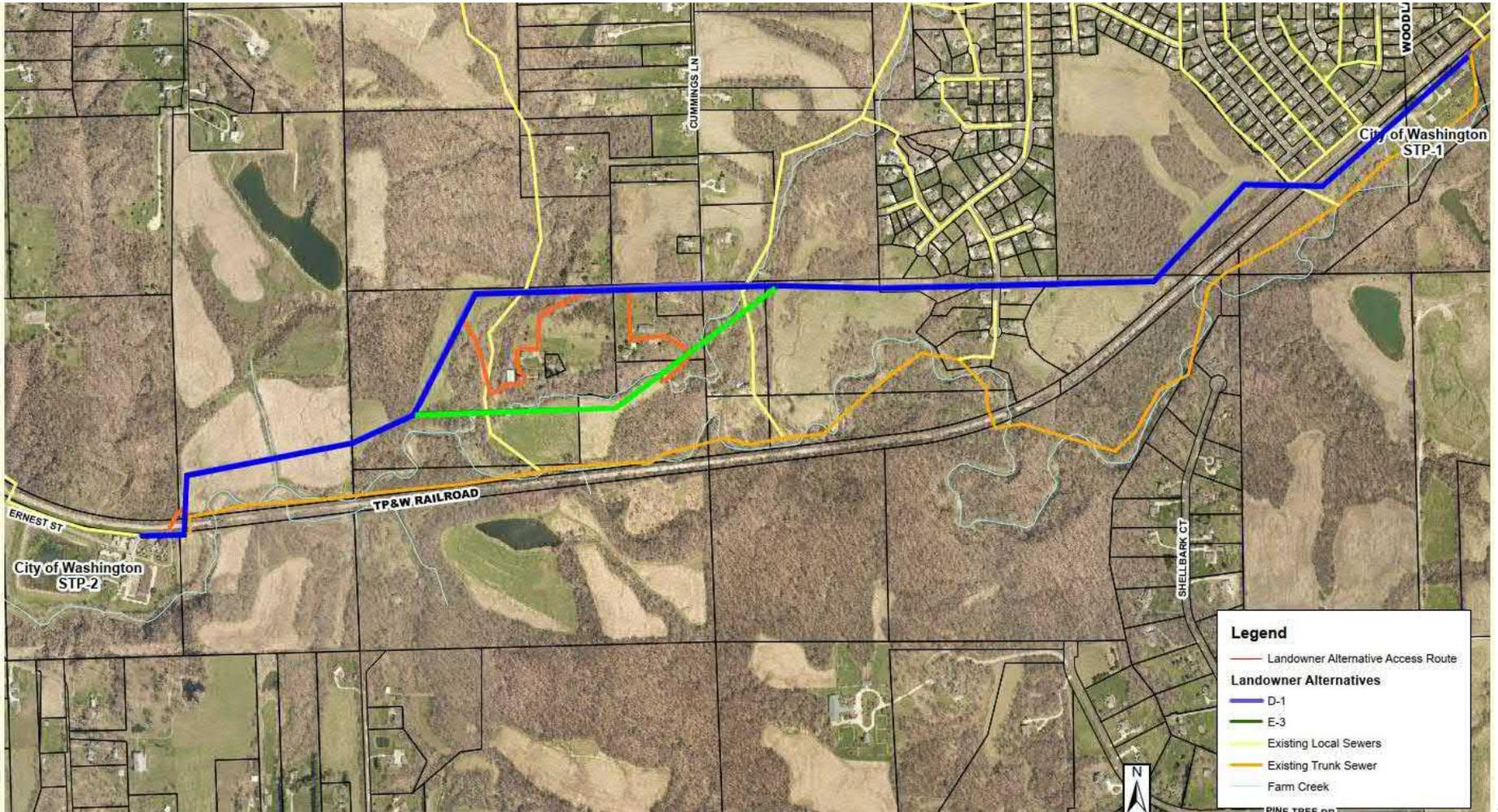
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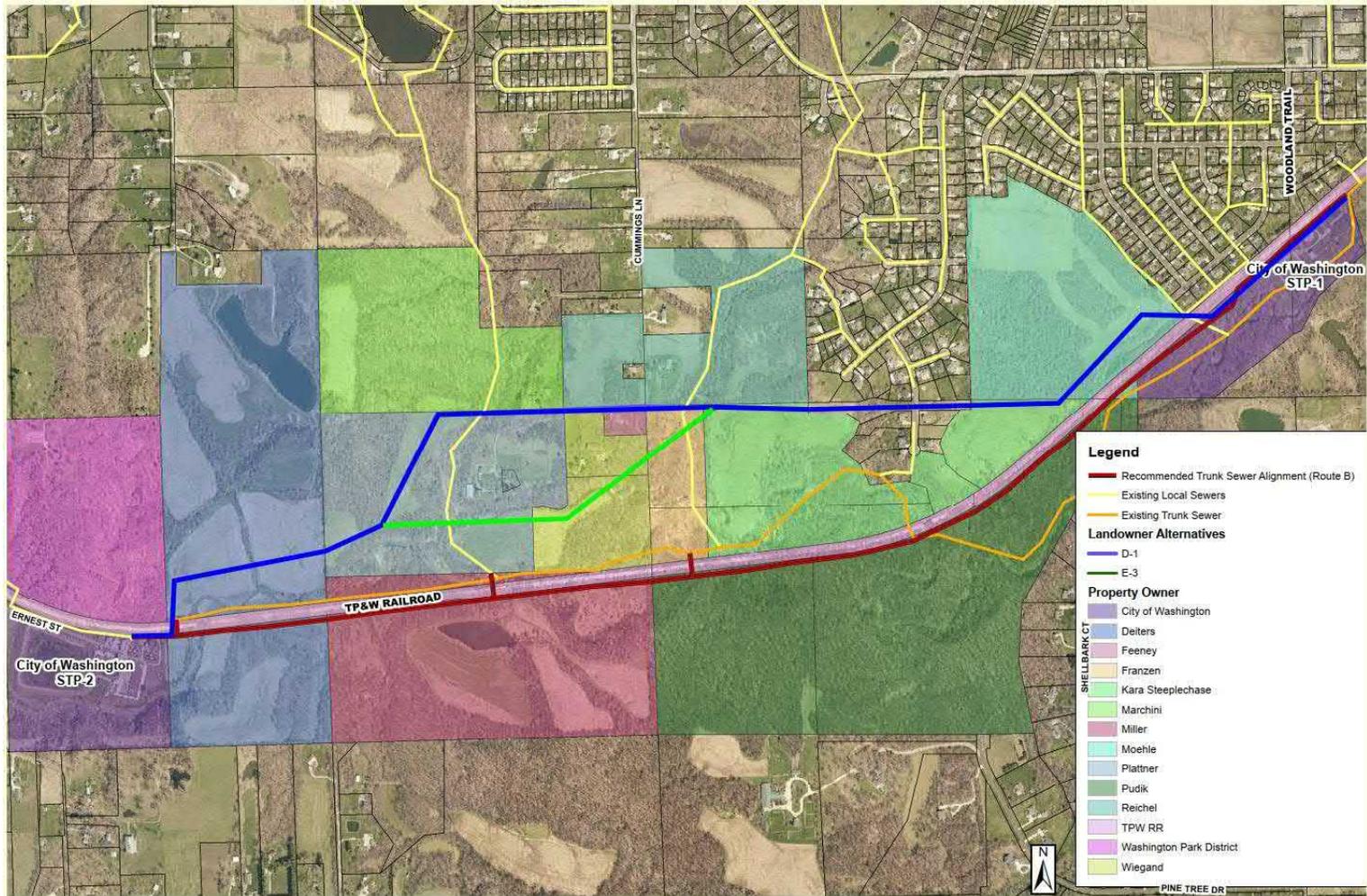
# Accessibility – Alignment B (Proposed Route)



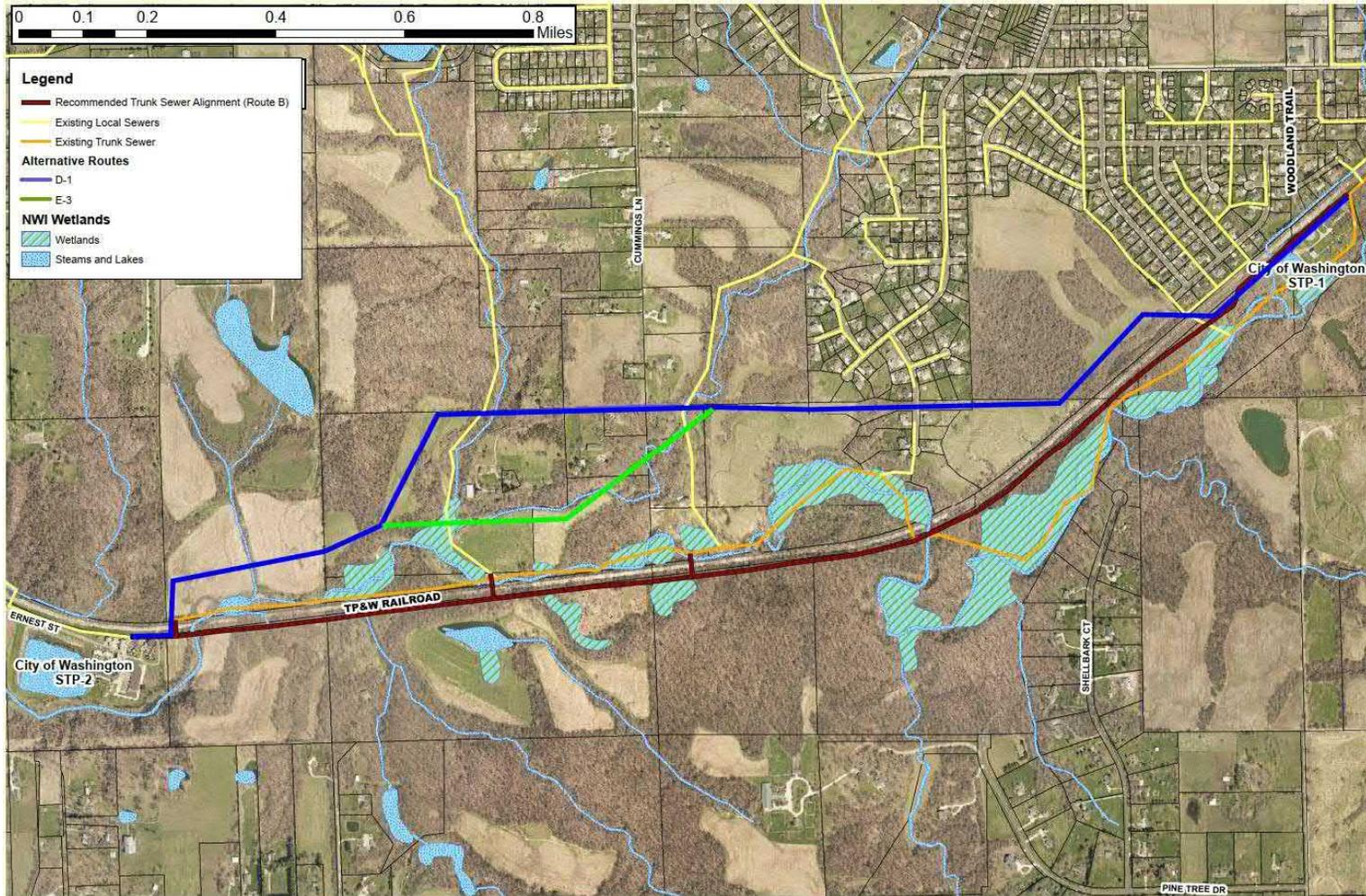
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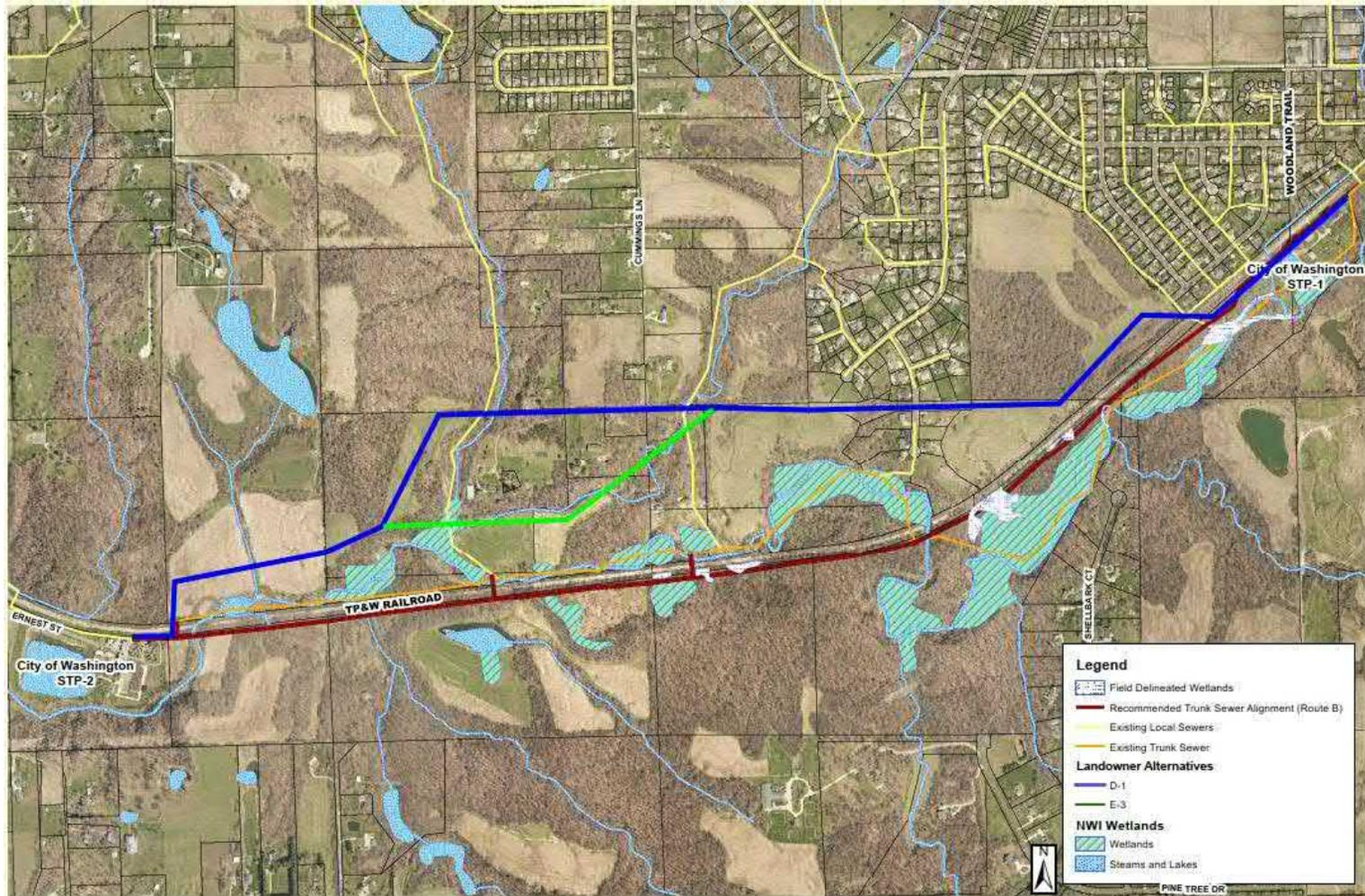
# Property Owners and Easements



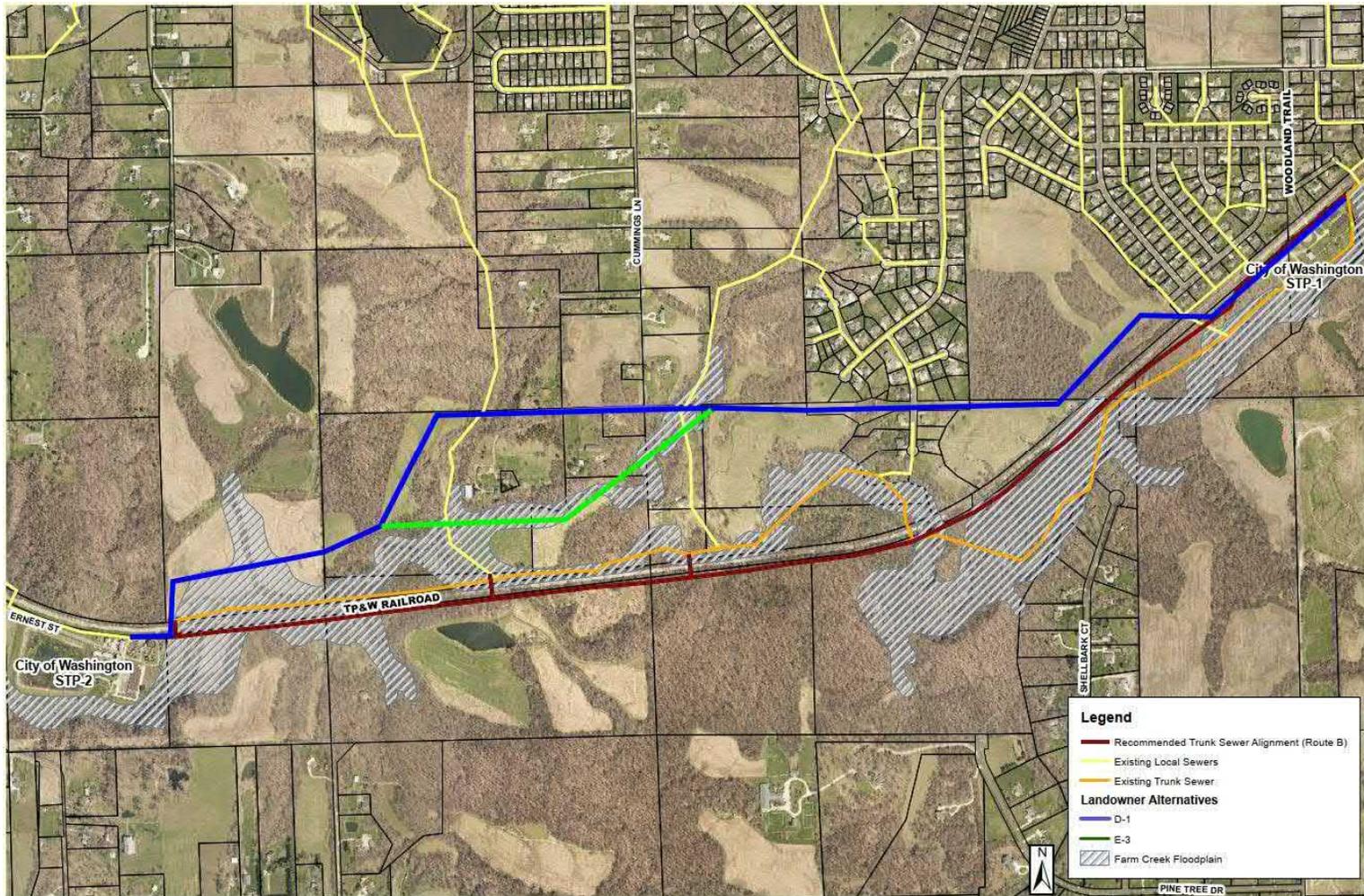
# Environmental Impacts – Wetlands (National Inventory)



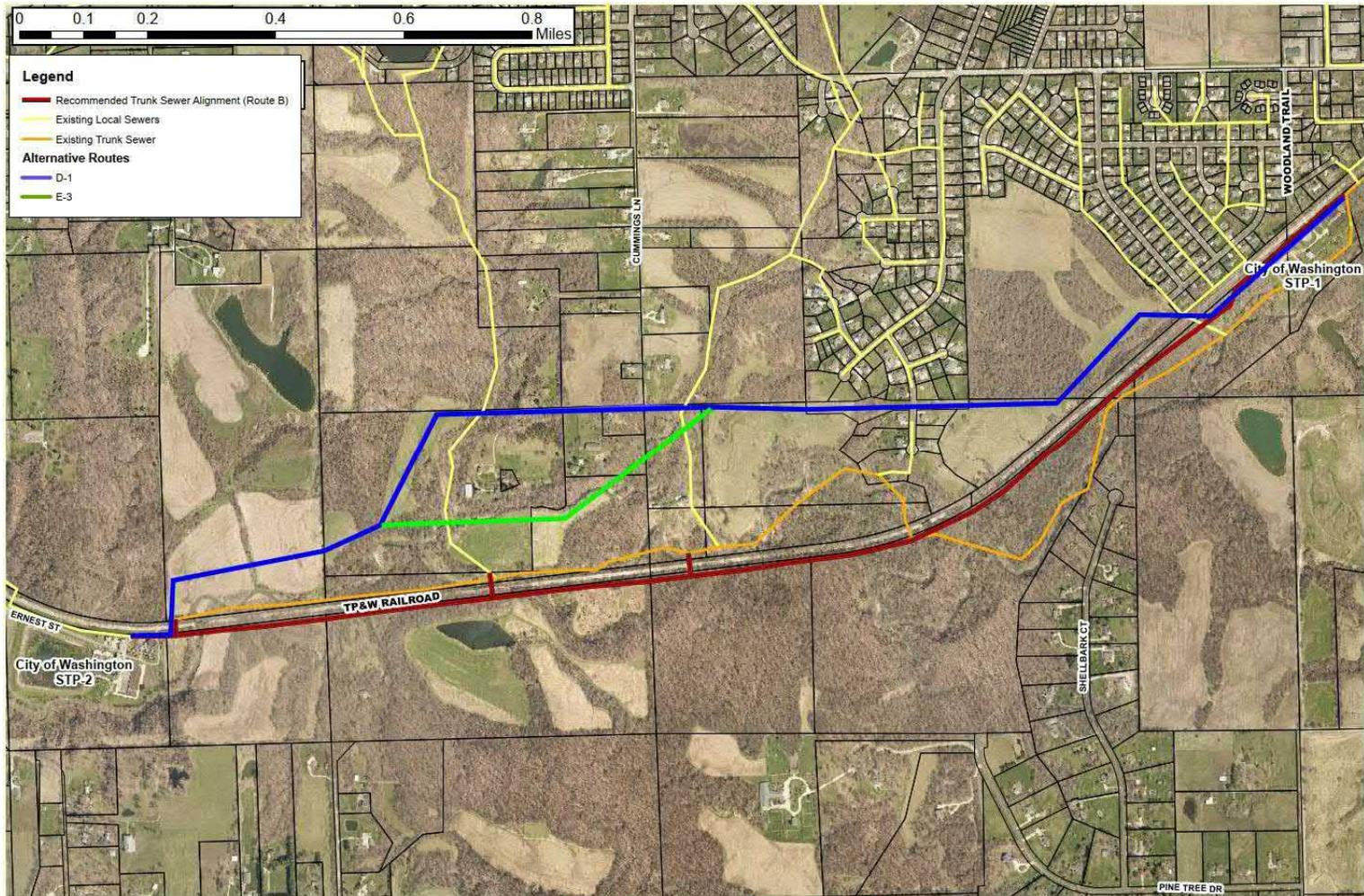
# Environmental Impacts – Wetlands (Delineations)



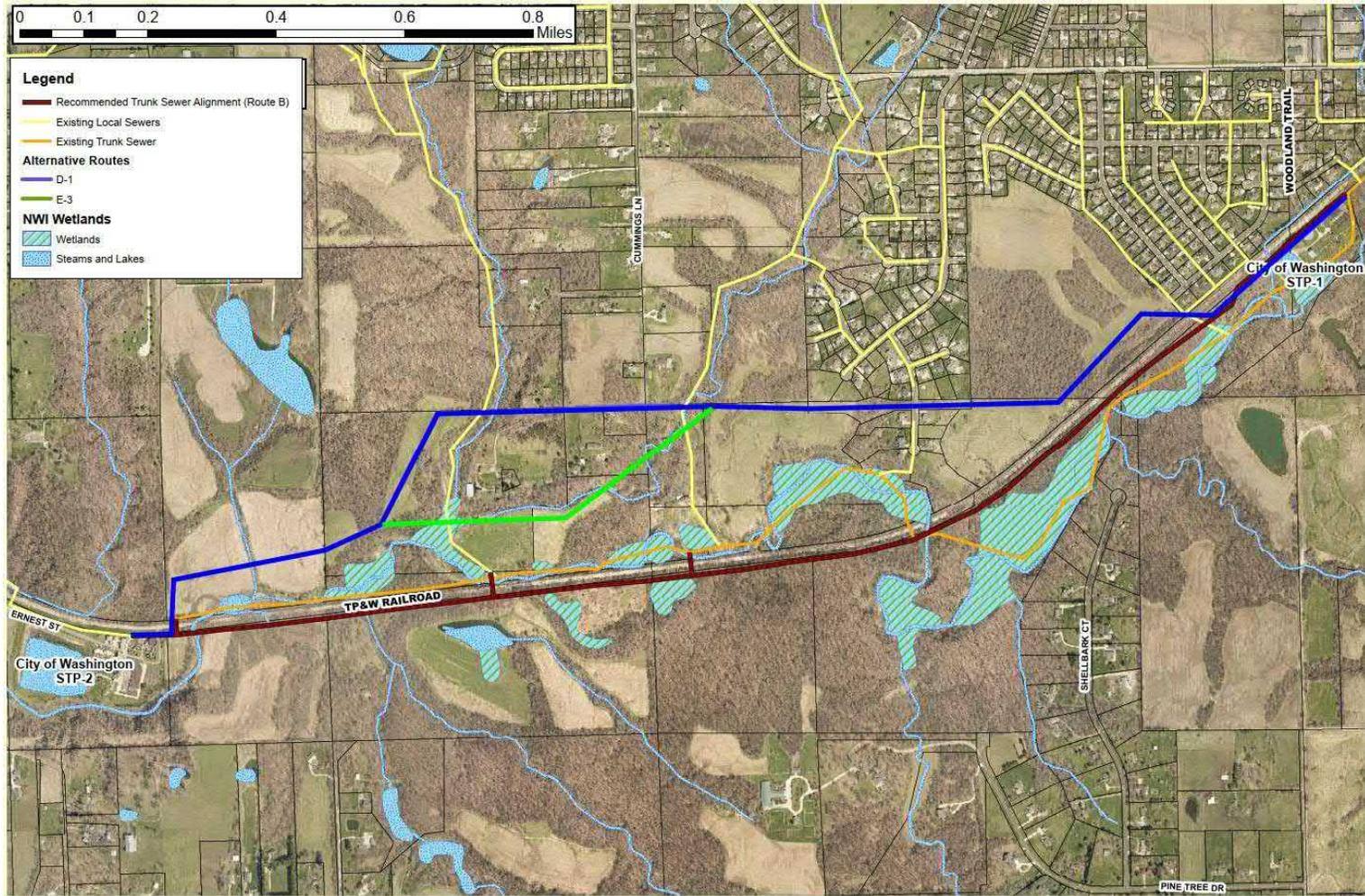
# Environmental Impacts – Flood Plain



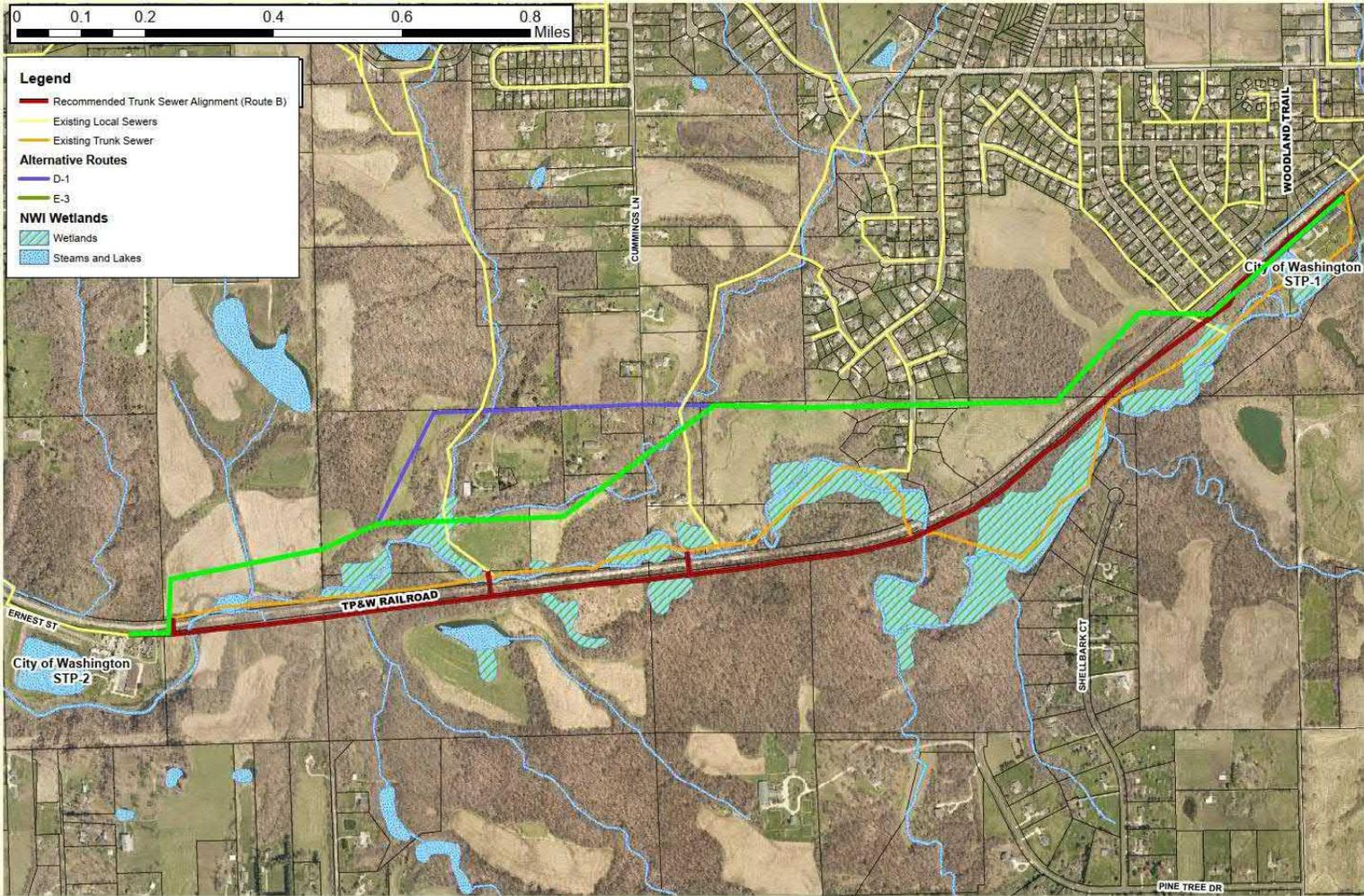
# Environmental Impacts - Trees



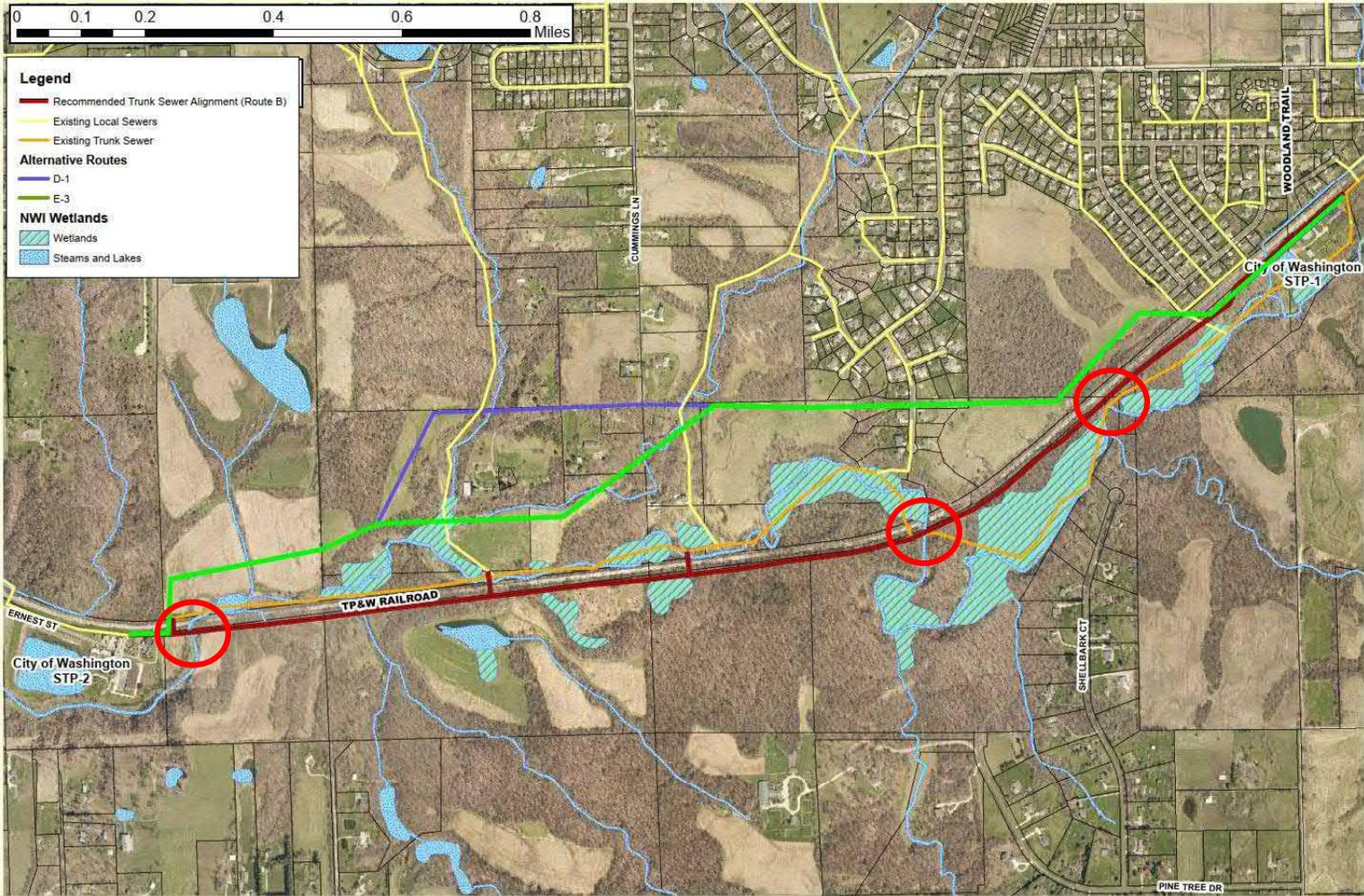
# Environmental Impacts – Archeological



# Farm Creek Influence



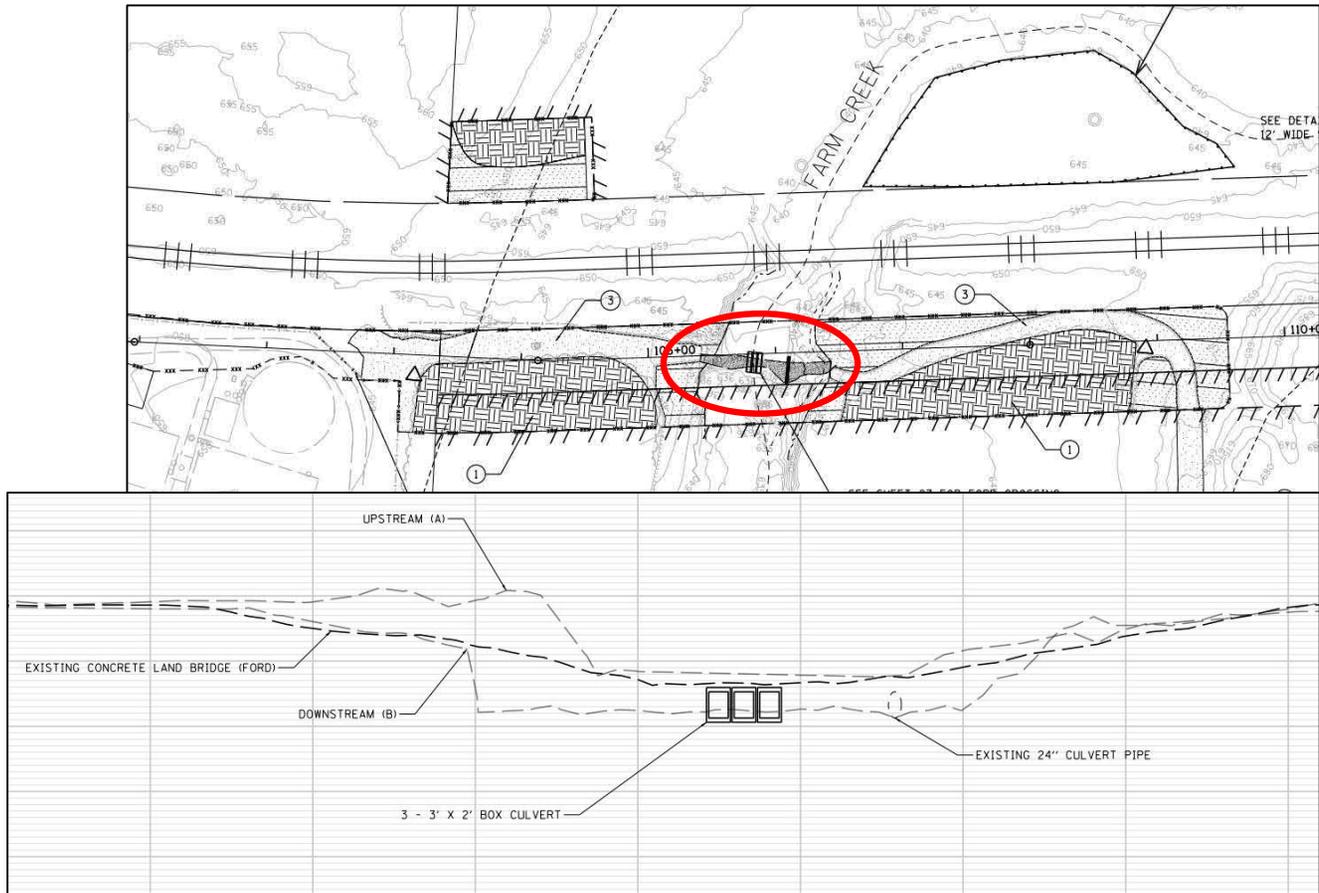
# Farm Creek Influence



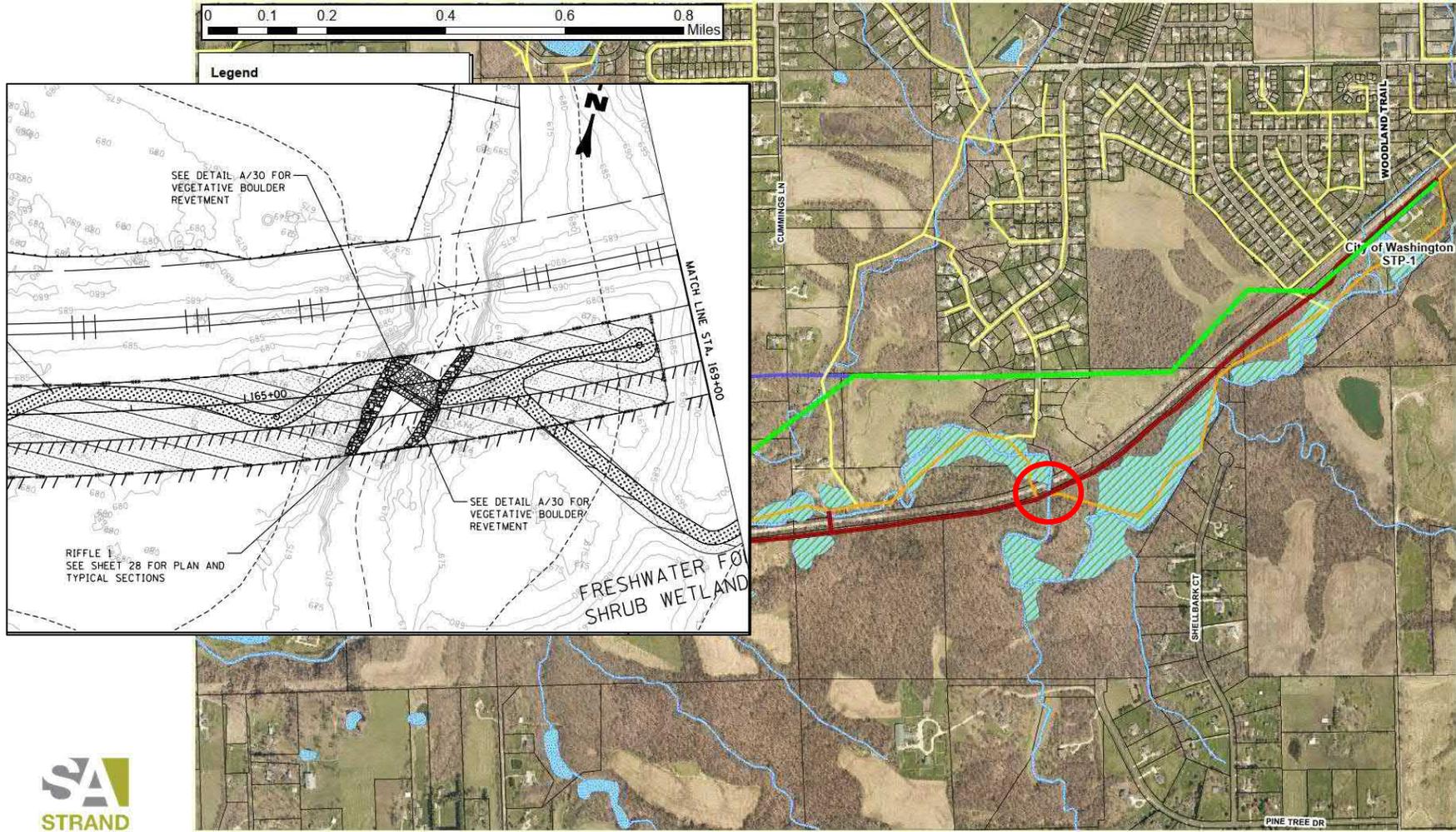
# Farm Creek Influence – At STP-2



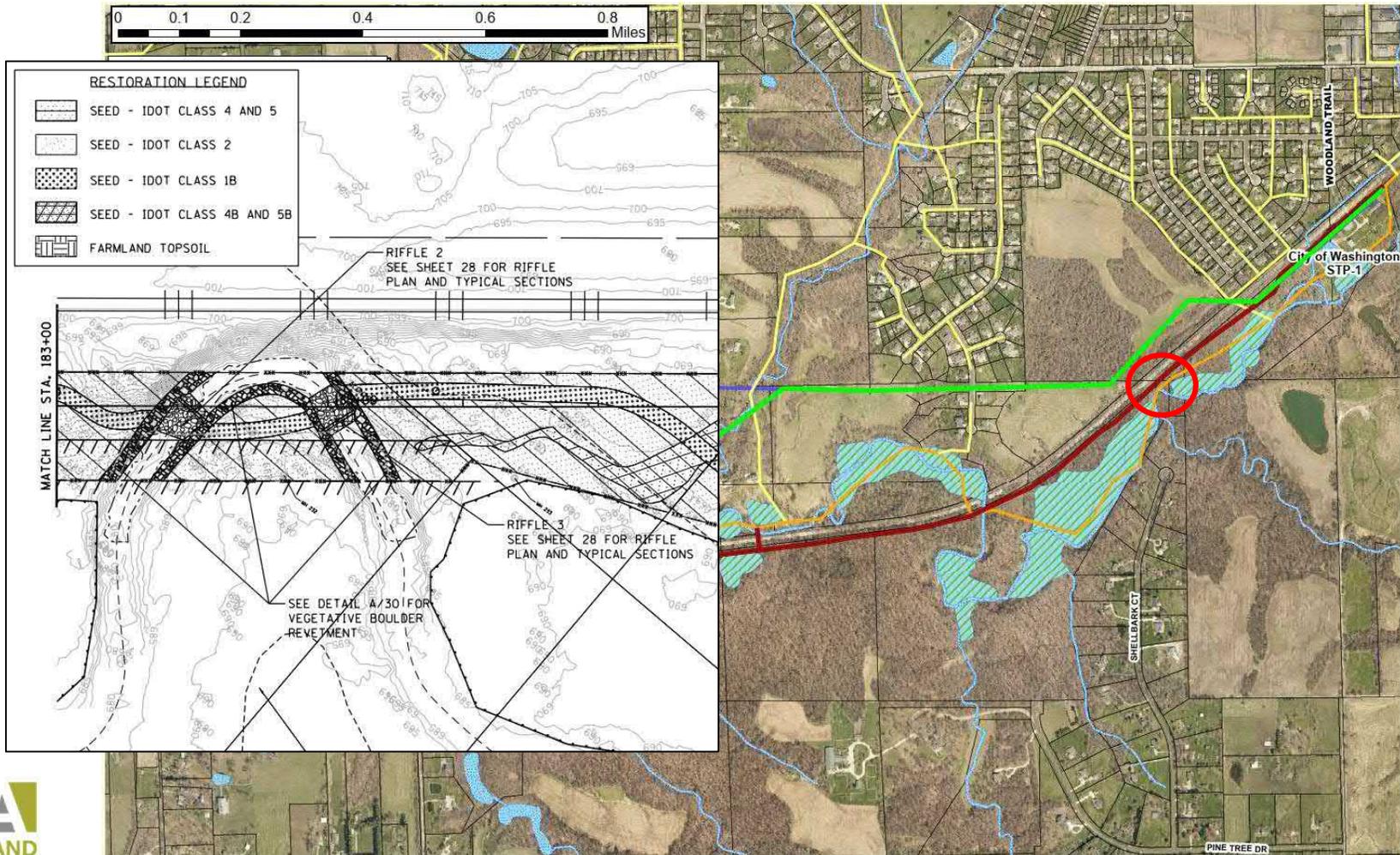
# Farm Creek Influence – At STP-2



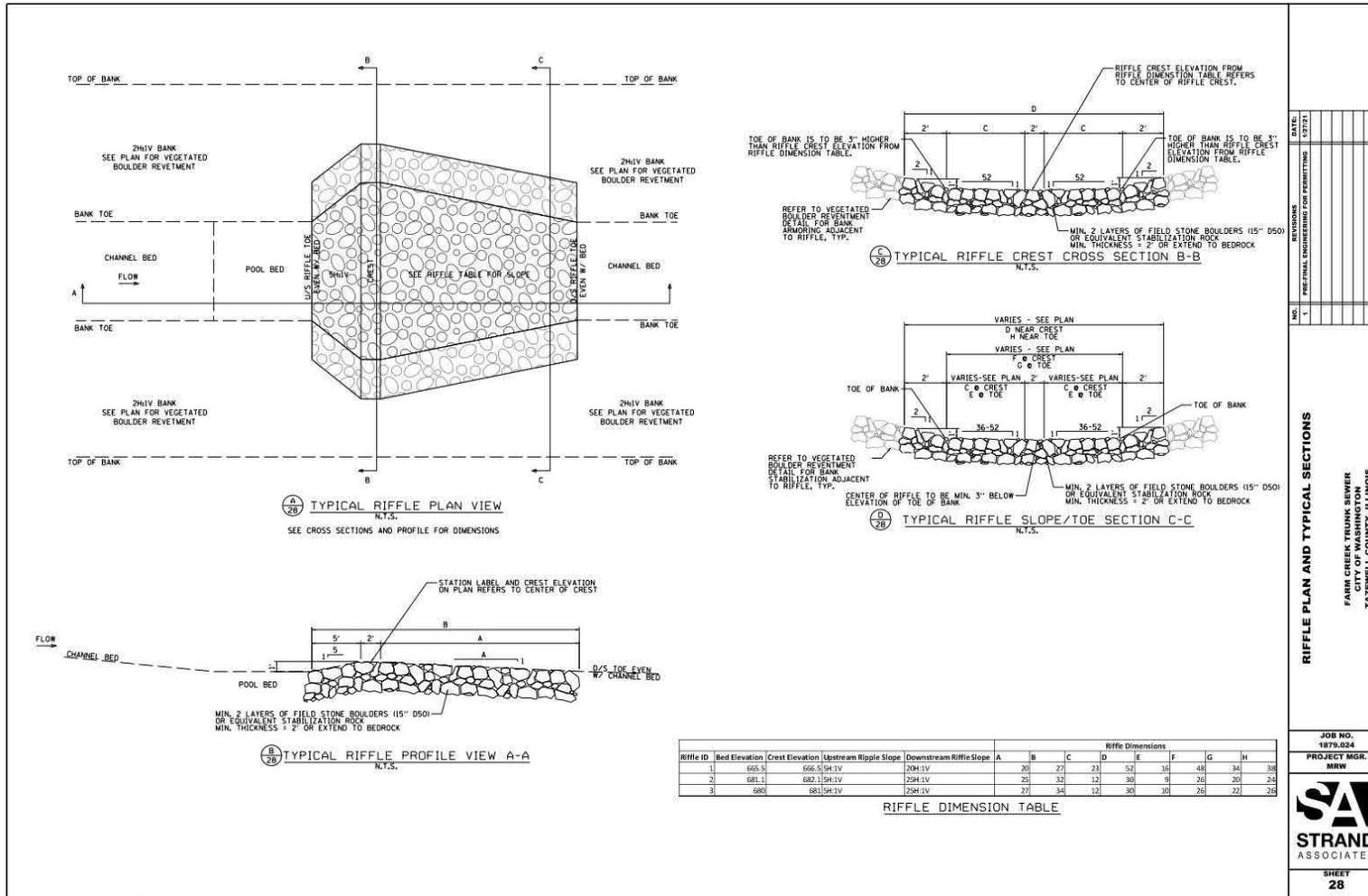
# Farm Creek Influence – At Other Creek Crossing



# Farm Creek Influence – At Other Creek Crossing



# Farm Creek Influence – At Other Creek Crossing



DATE: 1/17/21

NO. 1

REVISED FOR PERMITTING

RIFFLE PLAN AND TYPICAL SECTIONS

FARM CREEK TRUNK DRAINAGE  
CITY OF WASHINGTON  
TAZEWELL COUNTY, ILLINOIS

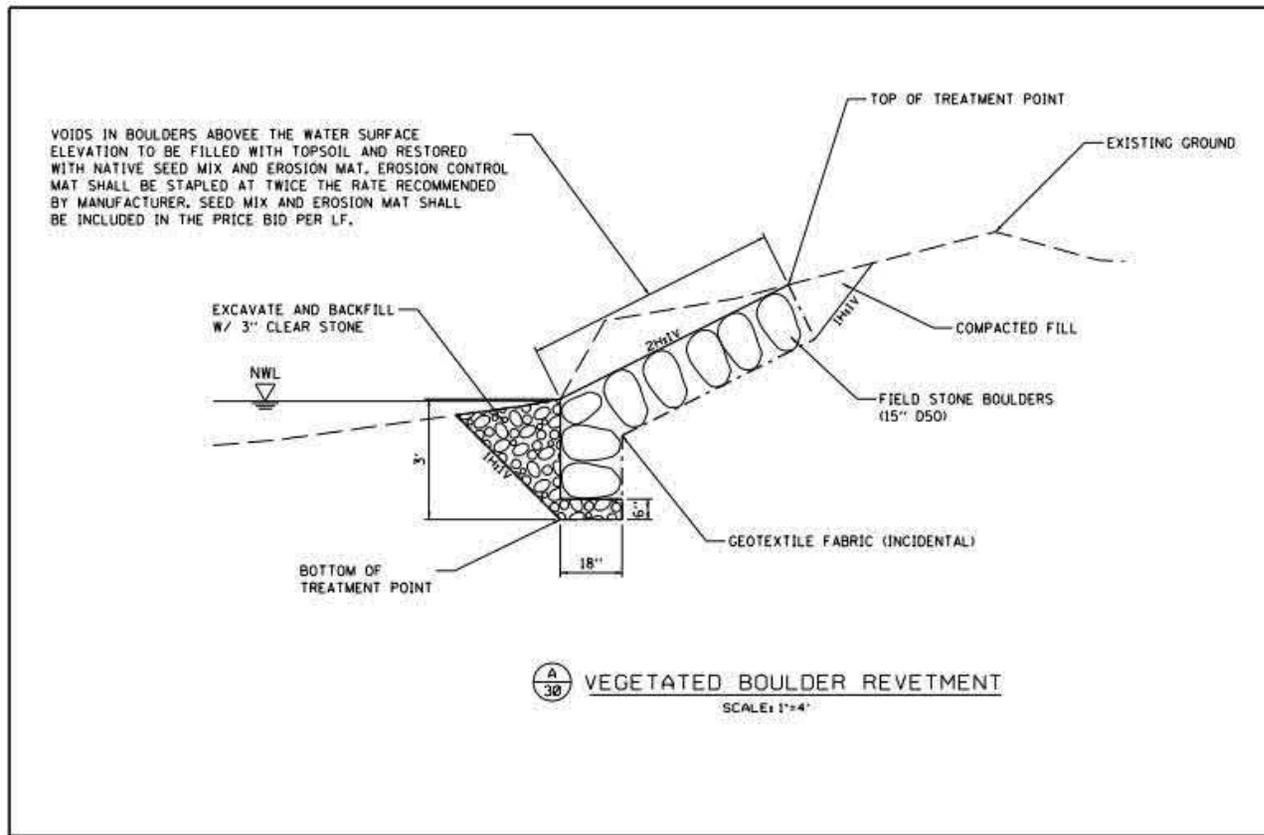
JOB NO. 1879.024

PROJECT MGR. MRW

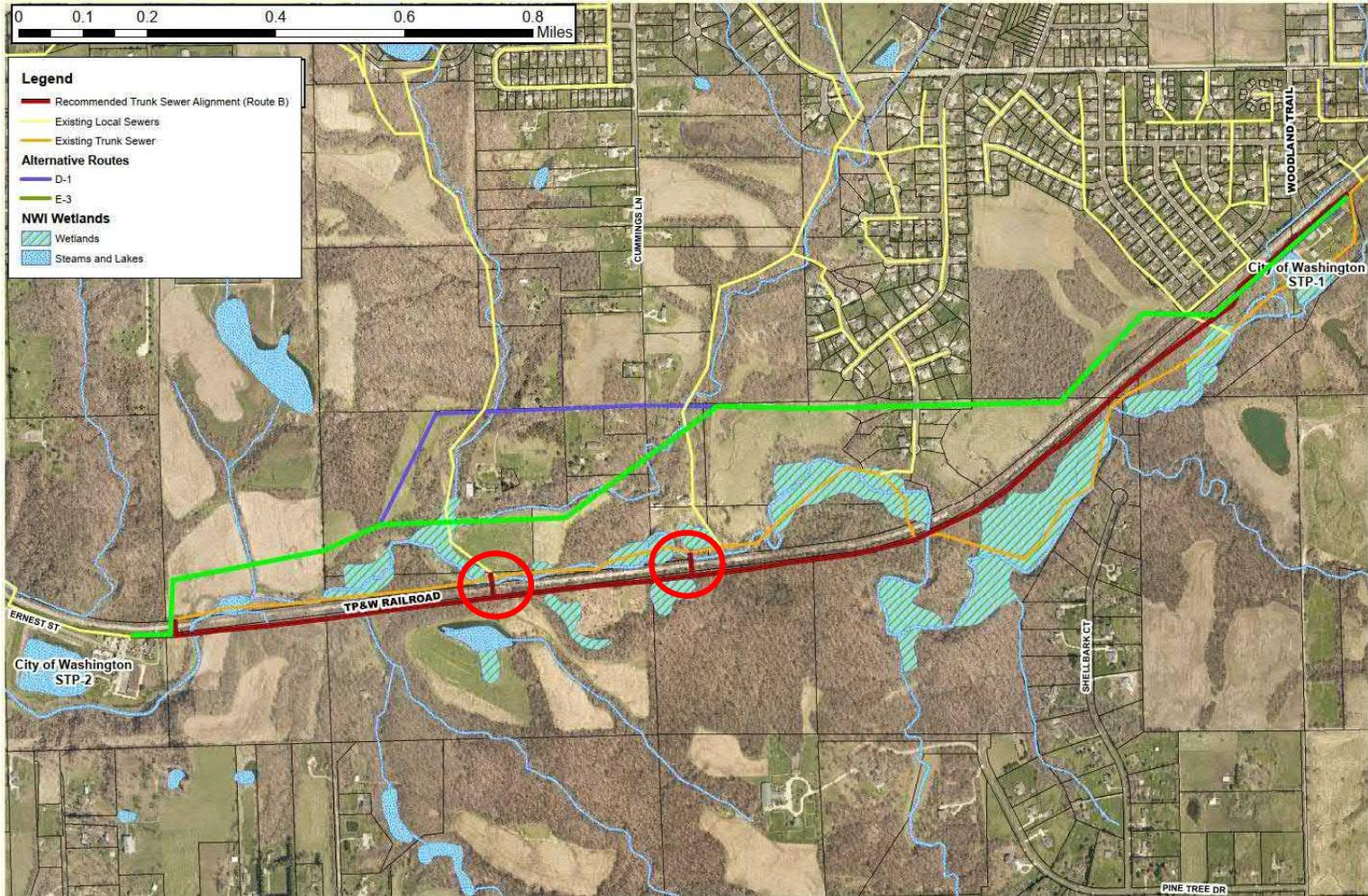
STRAND ASSOCIATES

SHEET 28

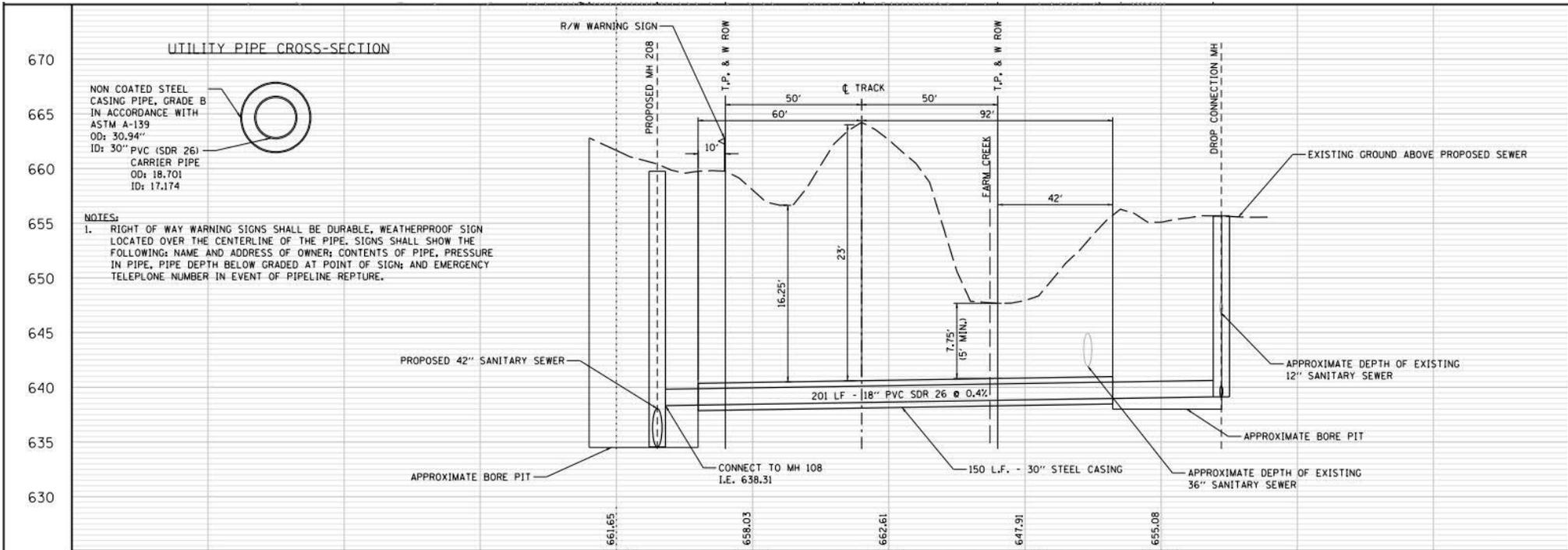
# Farm Creek Influence – At Other Creek Crossing



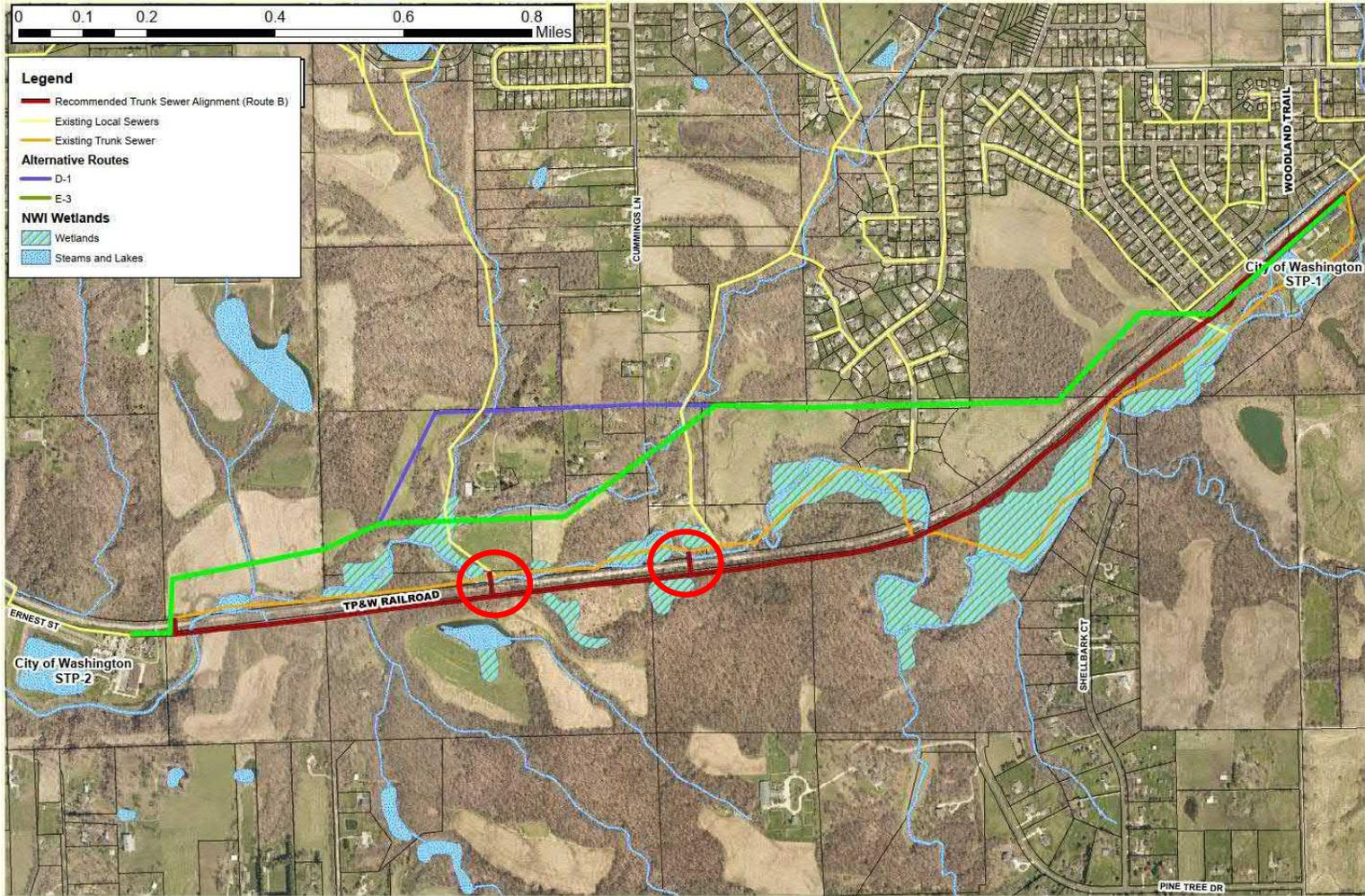
# Farm Creek Influence – Local Sewer Crossings



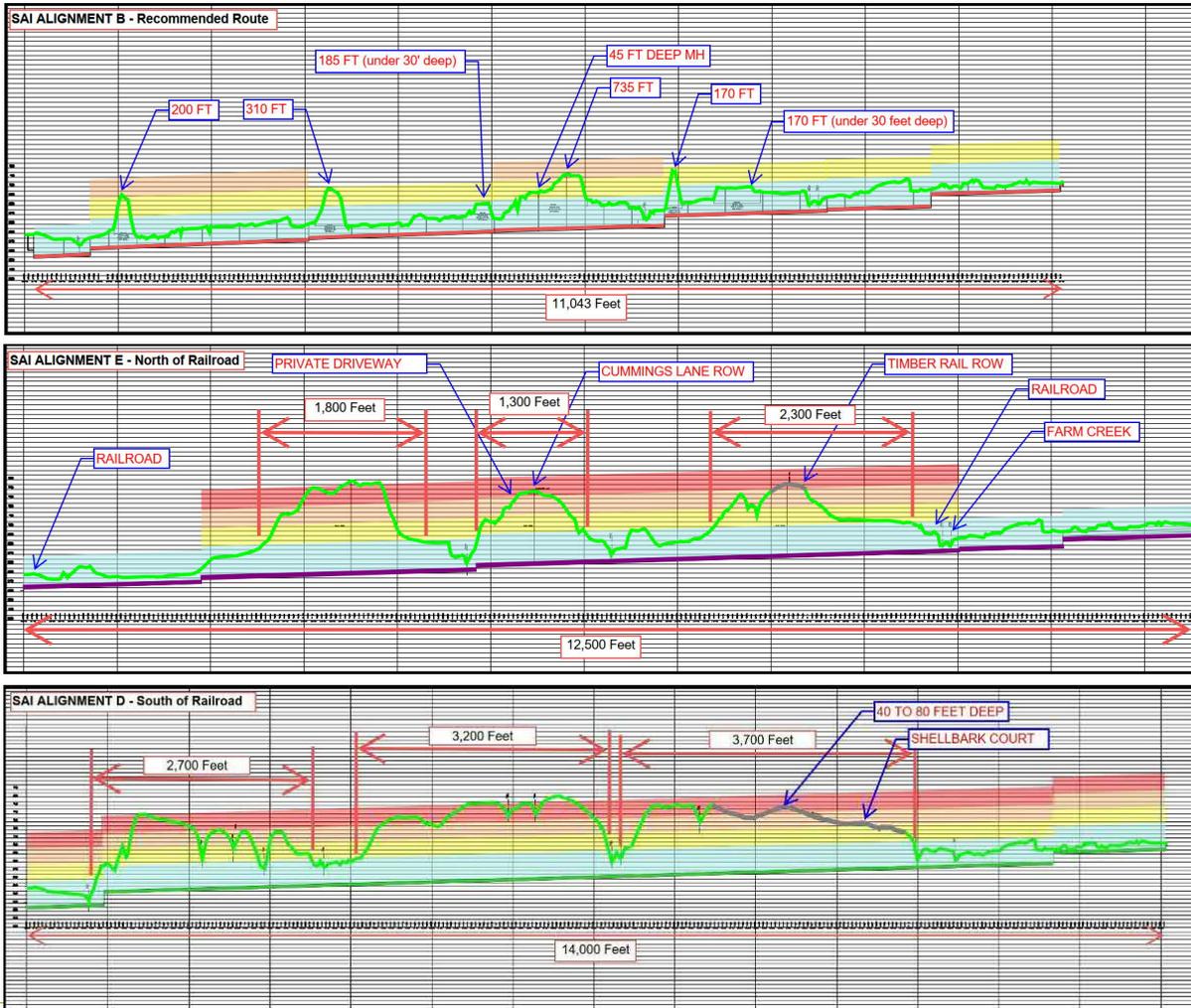
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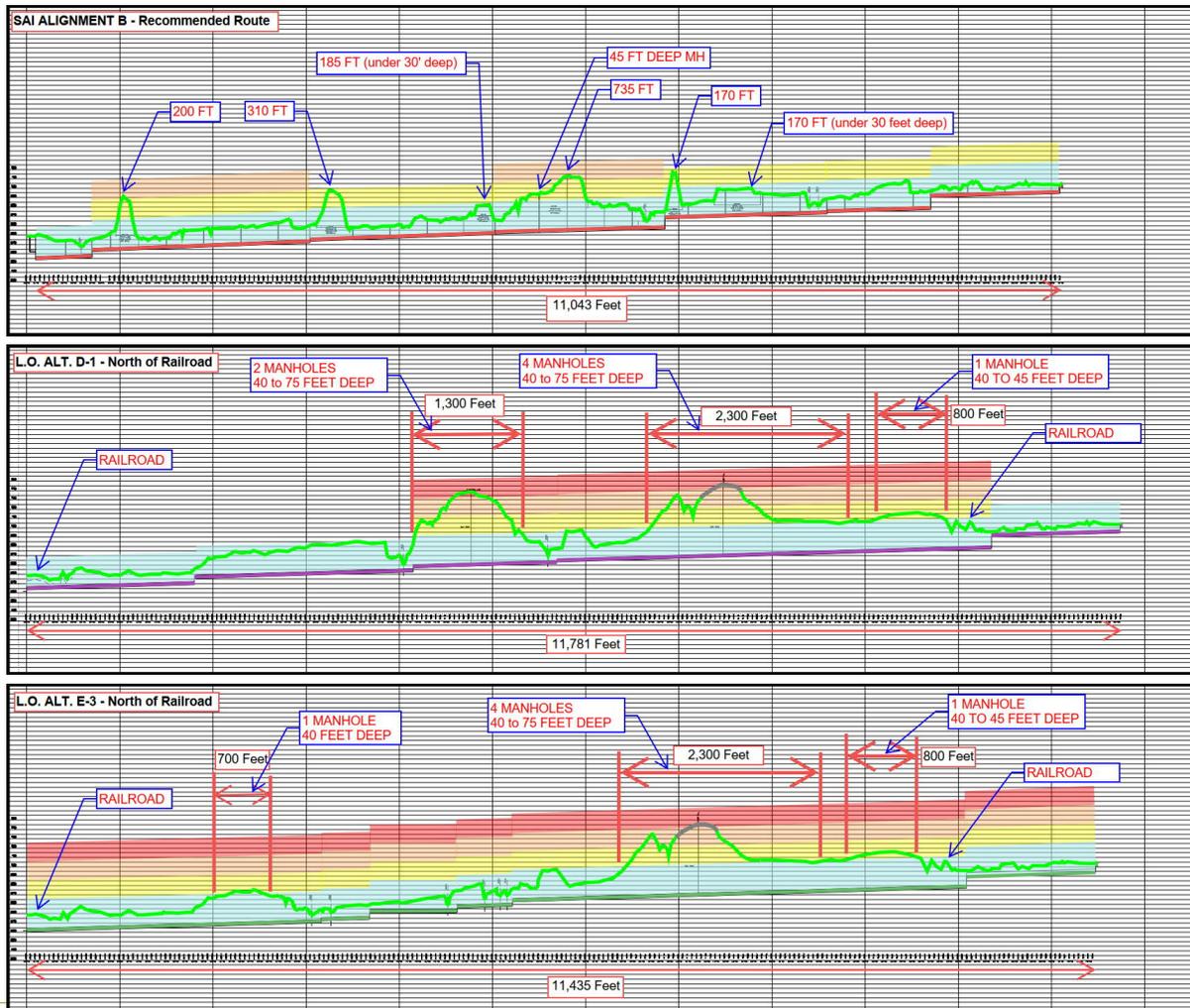
# Local Sewer Connections



# Opinion of Probable Cost – Strand Alignments B, D, and E



# Opinion of Probable Cost – Strand Aligmt. B and L.O. Aligmts. D-1 and E-3



# Opinion of Probable Cost

Farm Creek Trunk Sewer Replacement  
City of Washington Illinois

Description	Units	Estimated Unit Price	ENGINEER'S OPCC (ROUTE B) Preliminary Engineering Report OPCC		ENGINEER'S OPCC (ROUTE D) Preliminary Engineering Report OPCC		ENGINEER'S OPCC (ROUTE E) Preliminary Engineering Report OPCC		ENGINEER'S OPCC (ROUTE D-1) Preliminary Engineering Report OPCC		ENGINEER'S OPCC (ROUTE E-3) Preliminary Engineering Report OPCC	
			Estimated Quantity	Estimated Probable Cost	Estimated Quantity	Estimated Probable Cost	Estimated Quantity	Estimated Probable Cost	Estimated Quantity	Estimated Probable Cost	Estimated Quantity	Estimated Probable Cost
FOUNDATION MATERIAL	CY	\$52.00	417.12	\$21,690.00	475	\$24,700.00	500	\$26,000.00	500	\$26,000.00	575	\$29,900.00
RESTORATION-SEED, class 2 (topsoil,fertilizer,excelsior blanket, mulch incidental)	ACRE	\$9,654.55	4.3	\$41,707.67	8.6	\$82,739.51	7.7	\$73,878.57	7.2	\$69,609.32	7.5	\$72,409.14
RESTORATION-SEED, class 4/5 (topsoil,fertilizer,excelsior blanket, mulch incidental)	ACRE	\$9,654.55	4.3	\$41,707.67	8.6	\$82,739.51	7.7	\$73,878.57	7.2	\$69,609.32	7.5	\$72,409.14
RESTORATION-SEED, class 4B/5B (topsoil,fertilizer,excelsior blanket, mulch incidental)	ACRE	\$9,654.55	4.3	\$41,707.67	8.6	\$82,739.51	7.7	\$73,878.57	7.2	\$69,609.32	7.5	\$72,409.14
PERIMETER EROSION BARRIER	FT	\$4.00	7508	\$30,032.00	12,000	\$48,000.00	10,000	\$40,000.00	10,000	\$40,000.00	10,000	\$40,000.00
TREE REMOVAL (OVER 6 UNITS DIAMETER)	EA	\$12.00	7508	\$90,096.00	10,000	\$120,000.00	10,500	\$126,000.00	11,000	\$132,000.00	12,000	\$144,000.00
STABILIZED CONSTRUCTION ACCESS	EA	\$6,000.00	0	\$0.00	0	\$0.00	0	\$0.00	0	\$0.00	0	\$0.00
SANITARY SEWER, 42-IN HOBAS - OPEN CUT	LF	\$350.00	9385	\$3,284,750.00	4,400	\$1,540,000.00	7100	\$2,485,000.00	7,181	\$2,513,350.00	7,235	\$2,532,250.00
SANITARY SEWER, 42-IN HOBAS - TRENCHLESS	LF	\$896.55	1740	\$1,560,000.00	9,600	\$8,606,896.55	5400	\$4,841,379.31	4,600	\$4,124,130.00	4,200	\$3,765,510.00
SANITARY SEWER, 12-IN PVC SDR 26 - OPEN CUT	LF	\$80.00	520	\$41,600.00	550	\$44,000.00	575	\$46,000.00	550	\$44,000.00	600	\$48,000.00
SANITARY SEWER, 18-IN PVC SDR 26 - OPEN CUT	LF	\$140.00	220	\$30,800.00	300	\$42,000.00	325	\$45,500.00	350	\$49,000.00	400	\$56,000.00
SANITARY SEWER, 42-IN HOBAS - BORE AND JACK 60" STEEL CASING (RAILROAD CROSSING)	LF			\$0.00		\$0.00	240	\$240,000.00	240	\$240,000.00	240	\$240,000.00
TRENCHLESS CONSTRUCTION, 8-IN SANITARY SEWER WITH 20-IN STEEL CASING	LF	\$400.00	140	\$56,000.00	200	\$80,000.00	225	\$90,000.00	250	\$100,000.00	300	\$120,000.00
TRENCHLESS CONSTRUCTION, 18-IN SANITARY SEWER WITH 30-IN STEEL CASING	LF	\$450.00	280	\$126,000.00	360	\$162,000.00	400	\$180,000.00	450	\$202,500.00	500	\$225,000.00
NEW 12-IN INSIDE EXISTING 30-IN	LF	\$1,250.00	12	\$15,000.00		\$0.00		\$0.00		\$0.00		\$0.00
PROTECT EXISTING SANITARY SEWER AT CROSSINGS	EA	\$4,000.00	3	\$12,000.00	3	\$12,000.00	3	\$12,000.00	3	\$12,000.00	3	\$12,000.00
ABANDONMENT OF EXISTING SANITARY MANHOLES	EA	\$2,000.00	39	\$78,000.00	39	\$78,000.00	39	\$78,000.00	39	\$78,000.00	39	\$78,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, LESS THAN 20' DEEP	EA	\$9,000.00	14	\$126,000.00	6	\$54,000.00	12	\$72,000.00	12	\$108,000.00	8	\$72,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 20' TO 25' DEEP	EA	\$12,000.00	3	\$36,000.00	1	\$12,000.00	2	\$24,000.00	3	\$36,000.00	2	\$24,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 25' TO 30' DEEP	EA	\$15,000.00	1	\$15,000.00	2	\$30,000.00	2	\$30,000.00	1	\$15,000.00	2	\$30,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 30' TO 35' DEEP	EA	\$18,000.00	1	\$18,000.00		\$0.00	2	\$36,000.00	2	\$36,000.00	4	\$72,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 35' TO 40' DEEP	EA	\$21,000.00	1	\$21,000.00		\$0.00	2	\$42,000.00	2	\$42,000.00	2	\$42,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 40' TO 45' DEEP	EA	\$25,000.00		\$0.00	4	\$100,000.00	2	\$50,000.00	2	\$50,000.00	2	\$50,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 45' TO 50' DEEP	EA	\$26,000.00		\$0.00		\$0.00	2	\$52,000.00	2	\$52,000.00	2	\$52,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 50' TO 55' DEEP	EA	\$28,000.00		\$0.00	4	\$112,000.00	1	\$28,000.00	2	\$56,000.00	2	\$56,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 55' TO 60' DEEP	EA	\$30,000.00		\$0.00	6	\$180,000.00	1	\$30,000.00	2	\$60,000.00	2	\$60,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 60' TO 65' DEEP	EA	\$31,000.00		\$0.00		\$0.00	2	\$62,000.00	2	\$62,000.00	2	\$62,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 65' TO 70' DEEP	EA	\$32,000.00		\$0.00		\$0.00	2	\$64,000.00	2	\$64,000.00	2	\$64,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 70' TO 75' DEEP	EA	\$33,000.00		\$0.00		\$0.00		\$0.00		\$0.00	2	\$66,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 75' TO 80' DEEP	EA	\$34,000.00		\$0.00	4	\$136,000.00	1	\$34,000.00		\$0.00	3	\$102,000.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 80' TO 85' DEEP	EA	\$35,000.00		\$0.00	4	\$140,000.00	2	\$70,000.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 85' TO 90' DEEP	EA	\$42,000.00		\$0.00	4	\$168,000.00	1	\$42,000.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 90' TO 95' DEEP	EA	\$45,000.00		\$0.00		\$0.00	2	\$90,000.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 6-FT DIA, 90' TO 95' DEEP	EA	\$50,000.00		\$0.00		\$0.00	2	\$100,000.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 6-FT DIA CONSTRUCTED ON EXISTING SEWER PIPE	EA	\$12,000.00	3	\$36,000.00		\$0.00		\$0.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 8-FT DIA, LESS THAN 20 FT DEEP	EA	\$18,000.00	5	\$90,000.00		\$0.00		\$0.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 8-FT DIA, 20-25 FT DEEP	EA	\$22,000.00	3	\$66,000.00		\$0.00		\$0.00		\$0.00		\$0.00
SANITARY MANHOLE, TYPE A, 8-FT DIA JUNCTION MANHOLE	EA	\$20,000.00	2	\$40,000.00	2	\$40,000.00	2	\$40,000.00	2	\$40,000.00	2	\$40,000.00
OUTSIDE DROP MANHOLE CONNECTION, 18"	EA	\$8,000.00	1	\$8,000.00	1	\$8,000.00	1	\$8,000.00	1	\$8,000.00	1	\$8,000.00
<b>SUBTOTAL CONSTRUCTION</b>				<b>\$5,927,091.00</b>		<b>\$11,985,815.09</b>		<b>\$9,243,515.01</b>		<b>\$8,398,807.97</b>		<b>\$8,307,887.43</b>
MOBILIZATION (CONTRACTOR PROFIT, BONDS, INSURANCE)	LS		2%	\$118,541.82	2.00%	\$239,716.30	2%	\$184,870.30	2.00%	\$167,976.16	2%	\$166,157.75
ENGINEERING AND LEGAL	LS		5%	\$296,354.55	5.00%	\$599,290.75	5%	\$462,175.75	5.00%	\$419,940.40	5%	\$415,394.37
<b>TOTAL BASE PROJECT</b>				<b>\$6,341,987.37</b>		<b>\$12,824,822.15</b>		<b>\$9,890,561.06</b>		<b>\$8,986,724.53</b>		<b>\$8,889,439.55</b>
Contingencies - Base			25.00%	\$1,481,772.75	25.00%	\$2,996,453.77	25%	\$2,310,878.75	25%	\$2,099,701.99	25%	\$2,076,971.86
<b>Total - Base Project w/ Contingencies</b>				<b>\$7,823,760.12</b>		<b>\$15,821,275.92</b>		<b>\$12,201,439.81</b>		<b>\$11,086,426.52</b>		<b>\$10,966,411.41</b>

# Landowner Slide 30 Data Comparison

Feature/Element	SAI Alignment B		L.O. Alignment D-1		L.O. Alignment E-3		SAI Alignment D	SAI Alignment E
	7/12/21 H.O. Presentation	7/26/21 SAI Determination	7/12/21 H.O. Presentation	7/26/21 SAI Determination	7/12/21 H.O. Presentation	7/26/21 SAI Determination	7/26/21 SAI Determination	7/26/21 SAI Determination
Total Linear Feet (Trunk Sewer only)	10,425	11,043	10,455	11,781	10,205	11,435	14,000	12,500
Average Manhole Depth, FT.	22.35	23	24.04		21.20			
Average Sewer Depth, FT.		21.3		30.9		25.7	35	52.9
Farm Creek Crossings/Tributary Crossings	6	5/1	0	2/3	0	2/7	1/3	2/6
Wetland Crossing, L.FT.	2200	812	0	486	200	766	400	500
Floodplain Crossings, L.FT.	3300	2848	610	1092	1310	2973	1619	975
Trenchless Construction, L.FT.	3095	1775	3100	4600	1610	4200	9600	4200
Jack and Bore Locations	12	2	8	2	5	2	0	2
Open Access Corridors, L.FT. (% of Route)	650 (7%)	2047 (19%)	7405 (74%)	8963 (76%)	7145 (73%)	8339 (73%)	4710 (34%)	7420 (59%)
Forest/Forested Riparian, L.FT. (% of Route)	8,735 (93%)	8996 (81%)	2570 (26%)	2818 (24%)	2,580 (27%)	3096 (27%)	9290 (66%)	5080 (41%)
Alignment in Public ROW, L.FT. (% of Route)	0 (0%)	2873 (26%)	2710 (27%)	3896 (33%)	2,000 (21%)	3219 (28%)	4875 (35%)	5360 (43%)
Construction Cost Estimate		\$ 7,823,773.00		\$ 11,086,426.00		\$ 10,966,411.00	\$ 15,821,275.00	\$ 11,884,639.00

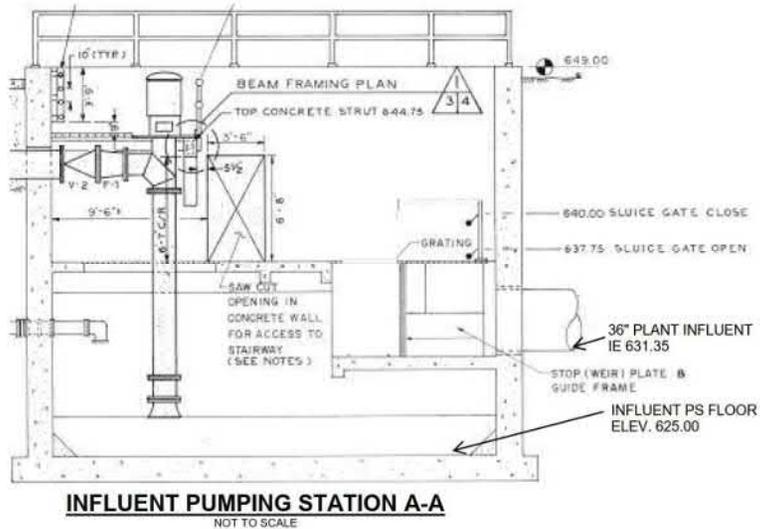
## Influent Pumping Station Replacement Purpose

- IEPA mandate to decommission STP No. 1
- Future development capacity needs
- Hydraulic restrictions at existing influent pump station
- Recurring operation and maintenance problems



# Influent Pumping Station Replacement Purpose

- IEPA mandate to decommission STP No. 1
- Future development capacity needs
- Hydraulic restrictions at existing influent pump station
- Recurring operation and maintenance problems
- NOT driven by depth of new trunk sewer



# Cost Opinion Update

City of Washington, Illinois	
Preliminary Engineering Study for the Farm Creek Trunk Sewer	Section 10 - Opinion of Probable Cost
<b>10.02 TOTAL PROJECT COST</b>	
The City has proposed the replacement of the Farm Creek Trunk sewer that runs between STP 1 and STP 2 and replacing the influent pumping station. Construction will consist of approximately 10,125 feet of sanitary sewer pipe ranging from eight-inch to forty-eight-inch and replacing the influent pumping station. Also included in this project will be site restoration, erosion control, cleaning, capping, and abandonment in place of the existing trunk sewer and other necessary appurtenances.	
1) Design Engineering (including planning and form preparation):	\$ 662,400.00
2) Construction Engineering (including bidding):	\$ 700,000.00
3) Other Professional Services (separate legal, loan admin, etc.):	\$ 80,000.00
4) Construction (Trunk Sewer and Influent pump station):	\$ 10,638,773.47
5) Contingency (at 10% of estimated construction costs):	\$ 1,063,877.35
6) Total Estimated Project Costs	\$ 13,145,050
Design of the project is currently underway and is being funded through City funds. However, the City intends to finance \$13,145,050 of the proposed project with a loan from the IEPA Water Pollutions Control Loan Program.	

\$7,823,773 Farm Creek Trunk Sewer

\$2,815,000 Influent Pump Station

\$10,638,000 Total

## FCTS Replacement Project Goals

- Be responsible to the taxpayer by implementing cost-effective solutions – construction and O&M
- Be accessible for maintenance
- [Limit] Number, size, and impact of easements required
- Protect the new sewer from instability and erosion of Farm Creek
- Achieve durability and reliability in trunk sewer function and operation
- Be respectful of nature and the environment
- Be responsive to and consistent with long-range plans, initiatives, and missions:
  - City of Washington, Tazewell County, Regional
  - IDNR and IEPA
  - Illinois Forestry and Forest Action Plan
  - USACE and USEPA





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