

Appendix I Energy Consumption Calculations

LA RIVER PATH



Total Operation Energy Consumption - Vehicles (Diesel)

1	2	3	4	5	6	
CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
11	2,204.62	23,803	10.21	22.51	1,057	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

7

MMBTU
146.67

=Col 5 * Col 6 / 1 mil

Construction MMBTU	147
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Total Operation Energy Consumption - Vehicles (Gas)

1	2	3	4	5	6	
CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
9	2,204.62	18,760	8.78	19.36	969	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

7

MMBTU
134.40

=Col 5 * Col 6 / 1 mil

Construction MMBTU	134
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Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Energy Saved from Trip Reductions - Vehicles (Gas)

1	2	3	4	5	6	
CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
36	2,204.62	80,248	8.78	19.36	4,145	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

7
MMBTU
574.92

=Col 5 * Col 6 / 1 mil

Operation MMBTU	575
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Sources:
Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.
Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Total Construction Energy Consumption: Proposed Project - Diesel

		1	2	3		4	5	6
Year	Proposed Project Emissions CO2e (metric tons/year)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
2025	1,959	5,424	2,204.62	11,956,951	10.21	22.51	531,184	138,700
2026	1,534			=Col 1* Col 2			=Col 3 / Col 4	
2027	1,931				Climate Registry 2020	Conversion factor		Oak Ridge National Lab 2019

7
MMBTU
73,675.21
=Col 5 * Col 6 / 1 mil

Construction MMBTU 73,675

Total Construction Energy Consumption: Proposed Project - Gas

		1	2	3		4	5	6
Year	Proposed Project Emissions CO2e (metric tons/year)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
2025	455	1,168	2,204.62	2,575,134	8.78	19.36	133,013	138,700
2026	312			=Col 1* Col 2			=Col 3 / Col 4	
2027	401				Climate Registry 2020	Conversion factor		Oak Ridge National Lab 2019

7
MMBTU
18,448.92
=Col 5 * Col 6 / 1 mil

Construction MMBTU 18,449

Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Total Construction Energy Consumption: Option 1 - Diesel

1 2 3 4 5 6

Year	Option 1 Emissions CO2e (metric tons/year)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
2025	1,889	5,202	2,204.62	11,469,017	10.21	22.51	509,508	138,700
2026	1,812	=Col 1* Col 2			Climate Registry 2020		=Col 3 / Col 4	
2027	1,502				Conversion factor		Oak Ridge National Lab 2019	

7
MMBTU
70,668.71
=Col 5 * Col 6 / 1 mil

Construction MMBTU **70,669**

Total Construction Energy Consumption: Option 1 - Gas

Year	Option 1 Emissions CO2e (metric tons/year)	1	2	3	4	5	6	
Year	Option 1 Emissions CO2e (metric tons/year)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
2025	476	1,041	2,204.62	2,294,216	8.78	19.36	118,503	138,700
2026	383	=Col 1* Col 2			Climate Registry 2020		=Col 3 / Col 4	
2027	181				Conversion factor		Oak Ridge National Lab 2019	

7
MMBTU
16,436.35
=Col 5 * Col 6 / 1 mil

Construction MMBTU **16,436**

Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Total Construction Energy Consumption: Option 2 - Diesel

Year	Option 2 Emissions CO2e (metric tons/year)	1	2	3	4	5	6	
Year	Option 2 Emissions CO2e (metric tons/year)	Total CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)

2025	2,528	6,158	2,204.62	13,576,059.14	10.21	22.51	603,112	138,700
2026	1,969			=Col 1* Col 2			=Col 3 / Col 4	
2027	1,661				Climate Registry 2020	Conversion factor		Oak Ridge National Lab 2019

7
MMBTU
83,651.68
=Col 5 * Col 6 / 1 mil

Construction MMBTU 83,652

Total Construction Energy Consumption: Option 2 - Gas

		1	2	3		4	5	6
Year	Option 2 Emissions CO2e (metric tons/year)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
2025	649	1,485	2,204.62	3,274,888	8.78	19.36	169,157	138,700
2026	476			=Col 1* Col 2			=Col 3 / Col 4	
2027	361				Climate Registry 2020	Conversion factor		Oak Ridge National Lab 2019

7
MMBTU
23,462.14
=Col 5 * Col 6 / 1 mil

Construction MMBTU 23,462

Sources:
 Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.
 Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Construction - Energy Consumption by Year - Proposed Project (Diesel)

			1	2	3		4	5	6
Year	Proposed Project Emissions CO2e (metric tons/year)	Proposed Project Emissions CO2e (metric tons/year) (diesel)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
2025	2,414	1,959	1,959	2,204.62	4,319,213	10.21	22.51	191,880	138,700
2026	1,846	1,534	1,534	2,204.62	3,381,541	10.21	22.51	150,224	138,700
2027	2,332	1,931	1,931	2,204.62	4,256,197	10.21	22.51	189,080	138,700

=Col 1* Col 2

=Col 3 / Col 4

Climate Registry 2020

Conversion factor

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
26,613.72	20,836.06	26,225.43

=Col 5 * Col 6 / 1 mil

Construction MMBTU	26,614	20,836	26,225
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Construction - Energy Consumption by Year - Proposed Project (Gas)

			1	2	3		4	5	6
Year	Proposed Project Emissions CO2e (metric tons/year)	Proposed Project Emissions CO2e (metric tons/year) (gasoline)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
2025	2,414	455	455	2,204.62	1,002,423	8.78	19.36	51,778	138,700
2026	1,846	312	312	2,204.62	687,926	8.78	19.36	35,533	138,700
2027	2,332	401	401	2,204.62	884,785	8.78	19.36	45,702	138,700

=Col 1* Col 2

=Col 3 / Col 4

Climate Registry 2020

Conversion factor

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
7,181.62	4,928.48	6,338.83

=Col 5 * Col 6 / 1 mil

Construction MMBTU	7,182	4,928	6,339
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Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Construction - Energy Consumption by Year - Option 1 (Diesel)

1 2 3 4 5 6

Year	Option 1 Emissions CO2e (metric tons/year)	Option 1 Emissions CO2e (metric tons/year) (diesel)	CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2	kg of CO2 per gallon of diesel	pounds of CO2 per gallon of diesel	gallons of diesel	Btu/gal (gross)
2025	2,365	1,889	1,889	2,204.62	4,164,217	10.21	22.51	184,994	138,700
2026	2,195	1,812	1,812	2,204.62	3,994,035	10.21	22.51	177,434	138,700
2027	1,683	1,502	1,502	2,204.62	3,310,765	10.21	22.51	147,080	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
25,659	24,610	20,400

=Col 5 * Col 6 / 1 mil

Construction MMBTU	25,659	24,610	20,400
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Construction - Energy Consumption by Year - Option 1 (Gas)

Year	Option 1 Emissions CO2e (metric tons/year)	Option 1 Emissions CO2e (metric tons/year) (gasoline)	1 CO2 Metric Tons	2 pounds CO2 per metric ton	3 pounds CO2	4 kg of CO2 per gallon of gasoline	5 pounds of CO2 per gallon of gasoline	6 gallons of gasoline	Btu/gal (gross)
2025	2,365	476	476	2,204.62	1,048,773	8.78	19.36	54,172	138,700
2026	2,195	383	383	2,204.62	845,413	8.78	19.36	43,668	138,700
2027	1,683	181	181	2,204.62	400,029	8.78	19.36	20,663	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
7,513.68	6,056.76	2,865.91

=Col 5 * Col 6 / 1 mil

Construction MMBTU	7,514	6,057	2,866
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Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.

Construction - Energy Consumption by Year - Option 2 (Diesel)

Year	Option 2 Emissions CO2e (metric tons/year)	Option 2 Emissions CO2e (metric tons/year) (diesel)	1 Total CO2 Metric Tons	2 pounds CO2 per metric ton	3 pounds CO2	4 kg of CO2 per gallon of diesel	5 pounds of CO2 per gallon of diesel	6 gallons of diesel	Btu/gal (gross)
2025	3,176	2,528	2,528	2,204.62	5,572,895.87	10.21	22.51	247,574	138,700
2026	2,445	1,969	1,969	2,204.62	4,340,613.63	10.21	22.51	192,830	138,700

2027	2,023	1,661	1,661	2,204.62	3,662,549.65	10.21	22.51	162,708	138,700
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=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
34,338.55	26,745.58	22,567.55

=Col 5 * Col 6 / 1 mil

Construction MMBTU	34,339	26,746	22,568
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Construction - Energy Consumption by Year - Option 2 (Gas)

Year	Option 2 Emissions CO2e (metric tons/year)	Option 2 Emissions CO2e (metric tons/year) (gasoline)	1	2	3	kg of CO2 per gallon of gasoline	pounds of CO2 per gallon of gasoline	gallons of gasoline	Btu/gal (gross)
			CO2 Metric Tons	pounds CO2 per metric ton	pounds CO2				
2025	3,176	649	649	2,204.62	1,429,709	8.78	19.36	73,849	138,700
2026	2,445	476	476	2,204.62	1,048,596	8.78	19.36	54,163	138,700
2027	2,023	361	361	2,204.62	796,583	8.78	19.36	41,146	138,700

=Col 1* Col 2

Climate Registry 2020

Conversion factor

=Col 3 / Col 4

Oak Ridge National Lab 2019

2025	2026	2027
MMBTU	MMBTU	MMBTU
10,242.80	7,512.41	5,706.93

=Col 5 * Col 6 / 1 mil

Construction MMBTU	10,243	7,512	5,707
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Sources:

Oak Ridge National Laboratory. 2019. Transportation Energy Data Book, Edition 37. Table B.4: Heat Content for Various Fuels.

Climate Registry. 2020. Default Emissions Factors. Table 2.1.